2. DESCRIPTION OF ALTERNATIVES

2.1 Introduction

Chapter Contents

The Interstate Bridge Replacement (IBR) Program is a continuation of the previously suspended Columbia River Crossing (CRC) project with the same purpose to replace the aging Interstate Bridge across the Columbia River with a modern, seismically resilient multimodal structure. The proposed infrastructure improvements are located along a 5-mile stretch of the Interstate 5 (I-5) corridor that extends from approximately Victory Boulevard in Portland to State Route (SR) 500 in Vancouver, as shown in Figure 2-1.

The alternatives evaluated to address the project's Purpose and Need were presented in the CRC Draft Environmental Impact Statement (EIS) (2008) and Final EIS (2011) (Appendix T) and are briefly summarized below. The 2008 CRC Draft EIS evaluated a No-Build Alternative and four build alternatives[1] (see Table 2-1). The reasonable range of alternatives evaluated in the CRC Draft EIS included design components (e.g., river crossing type, transit mode) that had passed a Purpose and Need screening process (CRC 2007, 2008), and had been bundled with additional improvements for freight, active transportation, highway traffic, and transportation system management and transportation demand management. Section 2.5.1 includes details about the initial screening effort for the CRC project's National Environmental Policy Act (NEPA) alternatives analysis that determined the range of alternatives evaluated in the CRC Draft EIS. The 2011 CRC Final EIS (Appendix T) identified a Locally Preferred Alternative (LPA), which was based on Alternative 3, and included design options[2] of stacked transit/highway bridges and a high-capacity transit (HCT) northern terminus at Clark College. The CRC project completed its NEPA compliance with the identification of a Selected Alternative in a Record of Decision (ROD) in 2011 (CRC 2011) and was revised by two NEPA re-evaluations that were completed in 2012 and 2013. The CRC Selected Alternative identified in the 2011 ROD, as revised by the 2012 and 2013 re-evaluations, is referred to in this Final Supplemental Environmental Impact Statement (SEIS) as the "CRC LPA."[3] In 2014, the CRC project was suspended because it did not secure adequate state funding to advance to construction.

Table 2-1. CRC Draft EIS Alternatives and Design Options

Design Components	Alternative 1 (No-Build)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Multimodal River Crossing and Highway	Existing Bridges	Replacement	Replacement	Supplemental	Supplemental

[1] A build alternative includes a set of corridor-wide multimodal improvements defined to address the project's purpose and need.

[2] Design options are refinements to an alternative being considered for a specific project component. The design options for each component represent a range of potential options for the design of the component. Identifying design options allows for the analysis and disclosure of the range of potential impacts for that specific component.

[3] FHWA and FTA published a notice to prepare a Supplemental Environmental Impact Statement for the Interstate Bridge Replacement Program in the Federal Register (Volume 88, Number 65) on April 5, 2023. This notice referred to the Selected Alternative from the 2011 CRC Project's ROD, which was also known as the Locally Preferred Alternative (LPA). For purpose of this SEIS, the CRC LPA refers to the CRC Selected Alternative from the 2011 ROD, as revised by the 2012 and 2013 re-evaluations.

Design Components	Alternative 1 (No-Build)	Alternative 2	Alternative 3	Alternative 4	Alternative 5
River Crossing Options	Existing Bridges	(A) Stacked Transit/ Highway Bridge (B) Separate Transit and Highway Bridges	(A) Stacked Transit/Highway Bridge (B) Separate Transit and Highway Bridges	Upgrade Existing Bridges and Add New Supplemental Bridge	Upgrade Existing Bridges and Add New Supplemental Bridge
HCT Mode [a]	None	BRT	LRT	BRT	LRT
HCT Northern Terminus Options	N/A	(A) Kiggins Bowl, (B) Lincoln, (C) Clark College MOS, or (D) Mill Plain MOS	(A) Kiggins Bowl, (B) Lincoln, (C) Clark College MOS, or (D) Mill Plain MOS	(A) Kiggins Bowl, (B) Lincoln, (C) Clark College MOS, or (D) Mill Plain MOS	(A) Kiggins Bowl, (B) Lincoln, (C) Clark College MOS, or (D) Mill Plain MOS
TDM/TSM	Current Programs	Expanded TDM/TSM programs	Expanded TDM/TSM programs	Expanded TDM/TSM programs	Expanded TDM/TSM programs

Source: CRC 2008

a HCT Mode also dictates the location of a maintenance base expansion. BRT would entail expanding a bus maintenance facility in eastern Vancouver. LRT would entail expanding the Ruby Junction Light-Rail Operations and Maintenance Facility in Gresham.

BRT = bus rapid transit; CRC = Columbia River Crossing; EIS = Environmental Impact Statement; HCT = high-capacity transit; I-5 = Interstate 5; LRT = light-rail transit; MOS = minimum operable segment; N/A = Not applicable; TDM = transportation demand management; TSM = transportation system management

In 2019, a bi-state legislative committee requested that the Oregon Department of Transportation (ODOT) and the Washington State Department of Transportation (WSDOT) restart the CRC project, renaming it the *IBR Program*. The CRC project was never constructed, and the overall problems—the needs for the project—that the CRC project sought to address still existed and remained unresolved. Some detailed characteristics of those problems had evolved and, in some cases, worsened over time (see Section 1.3, Purpose and Need for the IBR Program). The alternatives analysis from the CRC EIS is unchanged. The CRC LPA was identified as the starting point for IBR Program.

After completing an evaluation of the Purpose and Need, as discussed in Chapter 1 of this Final SEIS, the IBR Program began evaluating whether past design assumptions still addressed today's changed conditions, including physical environment, community priorities, and regulations, or whether updates would be needed (see Section 2.5.2, Updating the CRC LPA). Design modifications were identified to address the changed conditions, resulting in the IBR Program advancing a Modified LPA. In 2021, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) issued a NEPA re-evaluation that assessed the extent of changes in conditions and determined an SEIS should be prepared to identify and disclose new adverse impacts and mitigation associated with changes in conditions affecting the CRC LPA that occurred since 2013 (IBR 2021a). In addition to evaluating the Modified LPA in this Final SEIS, an updated No-Build Alternative is also evaluated and provides baseline conditions and a no action option for decision-makers.

Figure 2-1. IBR Program Location Overview

While the main components (i.e., a pair of replacement bridges across the Columbia River, extension of light-rail into Vancouver, improvements to seven interchanges, active transportation improvements, and variable-rate tolling) have not changed since the CRC LPA, some details of these components have been revised because of changed conditions. As part of the development of alternatives for the CRC project, multiple river crossing and transit components were screened against the Purpose and Need. Components that met the Purpose and Need became part of the alternatives evaluated in the CRC EIS. Early public input in the IBR Program identified changes to four of the previously screened river crossing and transit components; these four components were rescreened to determine whether component changes would now meet the Purpose

and Need.[4] The IBR Program confirmed that these components still did not meet Purpose and Need (IBR 2021b, 2021c, 2021d, 2021e).

The CRC LPA was updated in close coordination with federal, tribal, state, regional, and local partners[5] to establish the Modified LPA. Section 2.5.1, Selected Alternative in the 2011 Record of Decision and Subsequent Modifications in 2012 to 2013, summarizes the differences between the CRC LPA and the Modified LPA. Section 2.5.2, Updating the CRC LPA, summarizes the changes that have occurred since the 2013 CRC re-evaluation and evaluation of changed conditions and the modifications that were required to address such changes, including revisiting past screening and investigating variations on prior design components. This is further detailed in Appendix D, Design Options Development, Screening, and Evaluation Technical Report.

The Modified LPA was developed through a collaborative process with the local and regional agencies partnering with the IBR Program as well as consultation with tribes.

The updated version of the CRC LPA is referred to as the IBR Program Modified LPA. Local partner agencies, via their respective boards, councils, and commissions, endorsed the foundational elements[6] of the Modified LPA through resolutions in 2022 (see Section 2.5.4, IBR Program's Adoption of Foundational Components of the Modified LPA, and Attachment F to Appendix D; IBR 2022).

Two alternatives were subsequently evaluated in the Draft SEIS (2024): (1) the Modified LPA and its design options (described in Section 2.2, Description of Alternatives), and (2) a No-Build Alternative, which serves as a baseline for evaluating environmental impacts and a no-action option for decision-makers (described in Section 2.4, No-Build Alternative). The SEIS identifies the differences between the CRC LPA and the Modified LPA. Brief summaries of the differences between the CRC LPA and the Modified LPA, and what triggered those changes, are included throughout this chapter in callout boxes titled *What's changed with IBR?* If there is no callout box, there are no changes from the CRC LPA. For additional detail on the changes, refer to Sections 2.5.1, Selected Alternative in the 2011 Record of Decision and Subsequent Modifications in 2012 to 2013 and 2.5.2, Updating the CRC LPA.

Further background on development of the Modified LPA is described in Section 2.5, Development of the Modified LPA. This section summarizes the changes that have occurred since 2013 that prompted modifications in the design and highlights the differences between the CRC LPA and IBR Program Modified LPA.

On September 20, 2024, the Draft SEIS was published for a 60-day public comment period. Following the public comment period, the Modified LPA was further refined in response to public comments, as well as design progression, continued coordination with regulatory agencies, and continued consultation with tribes. The analysis of the Modified LPA (including all design options) and the No-Build Alternative has been updated

[4] The four previously screened river crossing and transit components were a new tunnel technology (immersed tube) (IBR 2021b), an amended "common sense alternative" (IBR 2021d), a "third/supplemental bridge" (IBR 2021e), and high-speed rail on a new bridge one mile west of I-5, parallel to the BNSF Railway bridge (IBR 2021c).

[5] Local partner agencies include the Tri-County Metropolitan Transportation District (TriMet), Clark County Public Transportation Benefit Area (C-TRAN), Oregon Metro, Southwest Washington Regional Transportation Council (RTC), City of Portland, City of Vancouver, Port of Portland, and Port of Vancouver.

[6] The "foundational elements" of the Modified LPA are based on what the local partner agencies endorsed through resolution and conditions in 2022. Endorsement by local partner agencies of these foundational elements did not preclude consideration of other reasonable design options. For example, since the endorsements occurred and the IBR Program advanced, details of the Modified LPA have progressed and evolved. As a result, several design options that were not included in the partners' endorsement are included and analyzed in this SEIS. The 2022 Modified LPA recommendations and each of the partners' resolutions and conditions regarding the Modified LPA that reflect the formalized partner process are found in Attachment F to Appendix D of this SEIS.

in this Final SEIS. Additionally, this Final SEIS identifies the **IBR Program Recommended Design Options** (herein referred to as Recommended Design Options; see Section 2.2, Components of the Modified LPA). The Recommended Design Options are based on feedback received during the public comment period and a comparison of technical and environmental impacts and benefits. The IBR Program recommends advancing the Modified LPA with the Recommended Design Options to final design and construction. The process for identifying the Recommended Design Options is further detailed in Appendix K.

Section 2.2, Components of the Modified LPA, describes specific components of the IBR Program's Modified LPA and design options and identifies the Recommended Design Options. Section 2.3, Modified LPA Construction describes how the Modified LPA would be constructed. Section 2.4, No-Build Alternative, describes the No-Build Alternative. Section 2.5, Development of the Modified LPA, describes how design options for the Modified LPA were created and evaluated and the ways in which the Modified LPA differs from the CRC LPA. Section 2.6, Additional Compliance, addresses additional regulatory compliance that is underway for the Modified LPA. Section 2.7, Anticipated Permits and Approvals, includes the federal, state, and local permits, clearances, and approvals that are anticipated to be required to construct the Modified LPA.

2.2 Components of the Modified LPA

The basic proposed components of the Modified LPA[7] evaluated in the SEIS are:

- A new pair of Columbia River bridges—one for northbound and one for southbound travel—built west of the existing bridge. The new bridges would each include three through lanes, safety shoulders, and one auxiliary lane in each direction. When all highway, transit, and active transportation would be moved to the new Columbia River bridges, the existing Interstate Bridge (both spans) would be removed.[8] The primary navigation channel would be relocated approximately 500 feet south (measured by the channel centerline) of its existing location near the Vancouver shoreline.
- A 1.9-mile light-rail transit (LRT) extension of the current Metropolitan Area Express (MAX) Yellow Line from the Expo Center MAX Station in North Portland, where it currently ends, to a terminus near Evergreen Boulevard in Vancouver. Improvements would include new stations at Hayden Island, downtown Vancouver (Waterfront Station), and near Evergreen Boulevard (Evergreen Station), as well as reconstruction of the existing Expo Center MAX Station. The Tri-County Metropolitan Transportation District of Oregon (TriMet), which operates the MAX system, would also operate the Yellow Line extension.
- Associated LRT improvements such as traction power substations (TPSS),[9] an overhead catenary system, signal and communications support facilities, an overnight light-rail vehicle (LRV) facility at the Expo Center, 19 new LRVs, and an expanded maintenance facility at TriMet's existing Ruby Junction Light-Rail Operations and Maintenance Facility (OMF).
- Connections to local bus transit service, including bus rapid transit (BRT) and express bus routes, in collaboration with the Clark County Public Transit Benefit Area Authority (C-TRAN), in addition to the proposed new LRT service.
- Shoulders on I-5 from Interstate Avenue/Victory Boulevard to SR 500/39th Street to accommodate express bus-on-shoulder service in each direction.

[7] All transportation facilities would be designed to current AASHTO, WSDOT, and ODOT specifications.

[8] For purposes of this SEIS, the existing I-5 bridges over the Columbia River are referred to as the "Interstate Bridge". The new replacement I-5 bridges over the Columbia River are referred to as the "Columbia River bridges".

[9] Each TPSS would be approximately 75 feet by 50 feet, including parking and access areas.

- Associated bus transit service improvements, including three additional bus bays for new buses at the existing C-TRAN OMF (see Section 2.2.7, Transit Operating Characteristics, for more information about this service).
- Improvements to seven I-5 interchanges and I-5 mainline improvements between Interstate Avenue/ Victory Boulevard in Portland and SR 500/39th Street in Vancouver. Some adjacent local streets would be reconfigured to complement the new interchange designs and improve local east-west connections.
- Six new adjacent bridges across North Portland Harbor: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping with the existing bridge (which would be removed). The bridges would carry (from west to east) LRT tracks, southbound I-5 off-ramp to Marine Drive, southbound I-5 mainline, northbound I-5 mainline, northbound I-5 on-ramp from Marine Drive, and an arterial bridge for local traffic to Hayden Island with a shared-use path for pedestrians and bicyclists.
- A variety of improvements for people who walk, bike, and roll throughout the study area, including a system of shared-use paths, bicycle lanes, sidewalks, enhanced wayfinding, and facility improvements to comply with the Americans with Disabilities Act. These are referred to in this document as "active transportation improvements."
- Variable-rate tolling, including signage and equipment, for motorists using the river crossing as a demand-management and financing tool.

In addition to the basic components described above, the Modified LPA includes five sets of design options. The design options are related to (1) the number of auxiliary lanes; (2) the bridge configuration; (3) the presence of the C Street ramps; (4) the I-5 alignment in downtown Vancouver; and (5) the park and rides. The Recommended Design Options are identified with bold text and an asterisk in Table 2-2.

- **Auxiliary Lanes.** Options for one or two auxiliary lanes. Auxiliary lanes are ramp-to-ramp connections on the highway that improve interchange safety by providing drivers with more space and time to merge, diverge, and weave at highway access points.
    - The one auxiliary lane design option would extend across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange.
    - The two auxiliary lane design option would extend a second auxiliary lane in each direction of I-5 in addition to the one auxiliary lane included in the Modified LPA. The second auxiliary lane would also extend across the Columbia River bridges in addition to and in combination with the existing auxiliary lanes from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street.
- **Bridge Configurations.** Three bridge configurations are under consideration.
    - Double-deck fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
    - Single-level fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
    - Single-level movable-span bridges: with the movable spans over the primary navigation channel: 178 feet of vertical navigation clearance in the open position and 90 feet in the closed position (the north barge channel would have 99 feet of vertical navigation clearance and the south barge channel would have 90 feet of vertical navigation clearance).

- **C Street Ramps.** Options that retain or eliminate the existing C Street ramps in downtown Vancouver.
- **I-5 Alignment in Downtown Vancouver.** Options that maintain the I-5 mainline at its current location or shift the I-5 mainline up to 40 feet westward in downtown Vancouver between the SR 14 interchange and Mill Plain Boulevard interchange.
- **Park and Rides.** Options to provide parking capacity to accommodate 1,270 vehicles at designated park and rides near the Waterfront Station and Evergreen Station to serve LRT riders.

Table 2-2. Modified LPA Design Options Studied in the Draft and Final SEIS

Modified LPA Component	Design Options
Auxiliary lanes	• **One auxiliary lane in each direction on the new Columbia River bridges and nearby sections of I-5*** • Two auxiliary lanes in each direction of I-5 would extend across the Columbia River bridges in addition to and in combination with existing auxiliary lanes from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street
Bridge configuration	• Double-deck fixed-span bridge configuration • **Single-level fixed-span bridge configuration*** • Single-level movable-span bridge configuration
C Street ramps	• **With C Street ramps*** • Without C Street ramps
I-5 Alignment in downtown Vancouver	• **Centered I-5 alignment*** • Westward shift of I-5 alignment
Park and Rides	• Provide parking capacity to accommodate 1,270 vehicles distributed across just two park and rides: one park and ride with 570 parking spaces near the Waterfront Station and one park and ride with 700 parking spaces near the Evergreen Station. The locations for park and rides that were evaluated included: – Potential Waterfront Station park and rides ▪ Columbia Way (below I-5) ▪ Columbia Street/SR 14 ▪ Columbia Street/Phil Arnold Way – Potential Evergreen Station park and rides ▪ Library Square ▪ Columbia Credit Union • **Provide parking capacity to accommodate 1,270 vehicles dispersed among five park and rides listed above [a]***

Notes:
* Recommended Design Options are in bold.
a Depending on final design considerations, the decision may be made to use fewer than the five sites. The analysis assumes all five sites as it encompasses all physical impacts.

In each resource section of Chapter 3, Existing Conditions and Environmental Consequences, different combinations of design options are analyzed to compare the differences in reasonably foreseeable environmental effects or benefits among the design options. All of these design options were identified and evaluated in the Draft SEIS and continue to be fully evaluated in this Final SEIS. All design element decisions will be captured in the Amended Record of Decision as part of the selected alternative.

The transportation improvements proposed for the Modified LPA and the design options are shown in Figure 2-2.

Section 2.2.1, Interstate 5 Mainline, describes the overall configuration of the I-5 mainline through the study area, and Sections 2.2.2, Portland Mainland and Hayden Island (Subarea A), through Section 2.2.5, Upper Vancouver (Subarea D), provide additional detail on four geographic subareas (A through D), which are shown on Figure 2-3. In each subarea, improvements to I-5, its interchanges, and the local roadways are described first, followed by transit and active transportation improvements. Design options are described under separate headings in the subareas in which they would be located. The description of the Modified LPA and design options are based on conceptual design and are subject to refinement as the design is finalized. The IBR Program will continue to consult with regulatory agencies, local agencies with jurisdiction, and tribes to seek opportunities for improvements, and avoidance and minimization of impacts.

Figure 2-2. Modified LPA Components

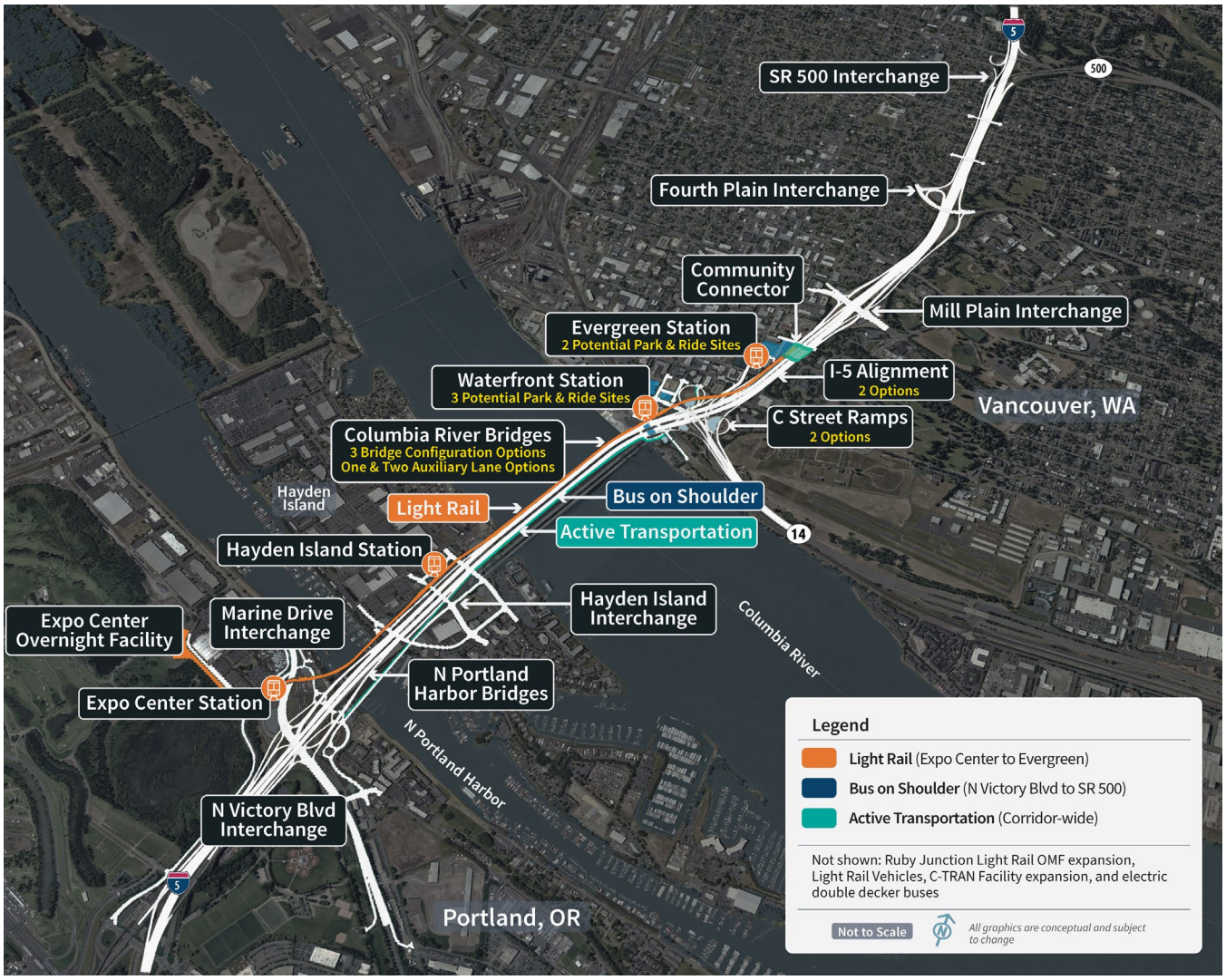


Figure 2-3. Modified LPA – Geographic Subareas

2.2.1 Interstate 5 Mainline

Today, within the 5-mile corridor, I-5 has three, typically 12-foot-wide, through lanes in each direction, an approximately 6- to 12-foot-wide inside shoulder, and an approximately 6- to 12-foot-wide outside shoulder, with the exception of the Interstate Bridge, which has approximately 1- to 2-foot-wide inside and outside shoulders. There are currently intermittent one and two auxiliary lane sections between the Victory Boulevard and Hayden Island interchanges in Oregon and between SR 14 and SR 500 in Washington.

The Modified LPA would include three 12-foot through lanes from Interstate Avenue/Victory Boulevard to SR 500/39th Street and one or two 12-foot auxiliary lanes, as detailed below and shown on Figure 2-4. Many of the existing auxiliary lanes on I-5 between the SR 14 and Main Street interchanges in Vancouver would remain, although they would be reconfigured. The existing auxiliary lanes between the Victory Boulevard and Hayden Island interchanges would be replaced with changes to on- and off-ramps and interchange reconfigurations. The existing Interstate Bridge over the Columbia River does not have auxiliary lanes; the Modified LPA would add one or two auxiliary lanes in each direction across the new Columbia River bridges.

The Modified LPA would also include shoulders (11- to 14-foot inside shoulders and 10- to 14-foot outside shoulders) to be consistent with ODOT and WSDOT design standards. The inside shoulder would be used by express bus service to bypass mainline congestion, known as "bus on shoulder" (refer to Section 2.2.7, Transit Operating Characteristics). The shoulder would be available for express bus service when general-purpose speeds are below 35 miles per hour (mph).

What's changed with IBR?

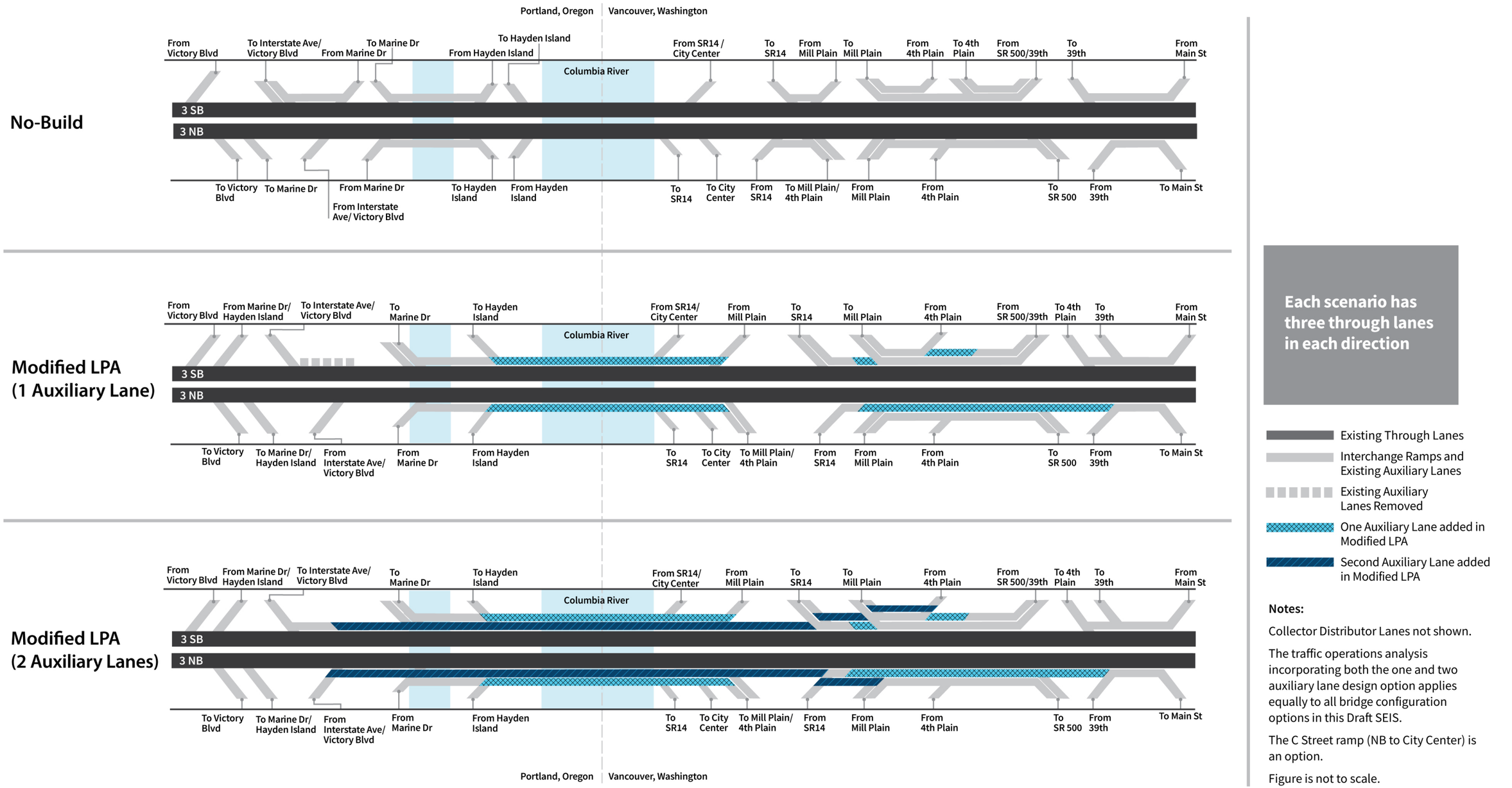
In response to local agency policies and community priorities, the Modified LPA includes design options for one auxiliary lane and for two auxiliary lanes in each direction, whereas the CRC LPA included two auxiliary lanes in each direction. The two auxiliary lane design option has the same alignment and lane configuration as the CRC LPA. Otherwise, the proposed configuration of the I-5 highway is similar between CRC and IBR.

Auxiliary Lane Design Options

The Modified LPA includes design options for one auxiliary lane in each direction or two auxiliary lanes in each direction across the Columbia River bridges in addition to and in combination with existing auxiliary lanes in the area. The one auxiliary lane design option would include an auxiliary lane in each direction across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange. The two auxiliary lane design option would include a second auxiliary lane from the Interstate Avenue/Victory Boulevard interchange and the SR 500/39th Street interchange, including on the Columbia River bridges (see Figure 2-4). This section provides an overview of the one auxiliary lane and the two auxiliary lane design options.

Figure 2-5, which shows a single-level fixed-span bridge configuration for comparison purposes, shows that the scale of the physical impacts (footprint, or the limits of permanent improvements) would be similar for the Modified LPA with one auxiliary lane design option and the Modified LPA with two auxiliary lanes design option, except over the Columbia River and in downtown Vancouver. For all bridge configuration design options, the two auxiliary lane design option would add a net of approximately 16 feet (8 feet in each direction) in total roadway width to the Columbia River bridges compared to the one auxiliary lane design option.

Figure 2-4. Auxiliary Lane Configurations



Each scenario has three through lanes in each direction

- Existing Through Lanes
- Interchange Ramps and Existing Auxiliary Lanes
- Existing Auxiliary Lanes Removed
- One Auxiliary Lane added in Modified LPA
- Second Auxiliary Lane added in Modified LPA

Notes:

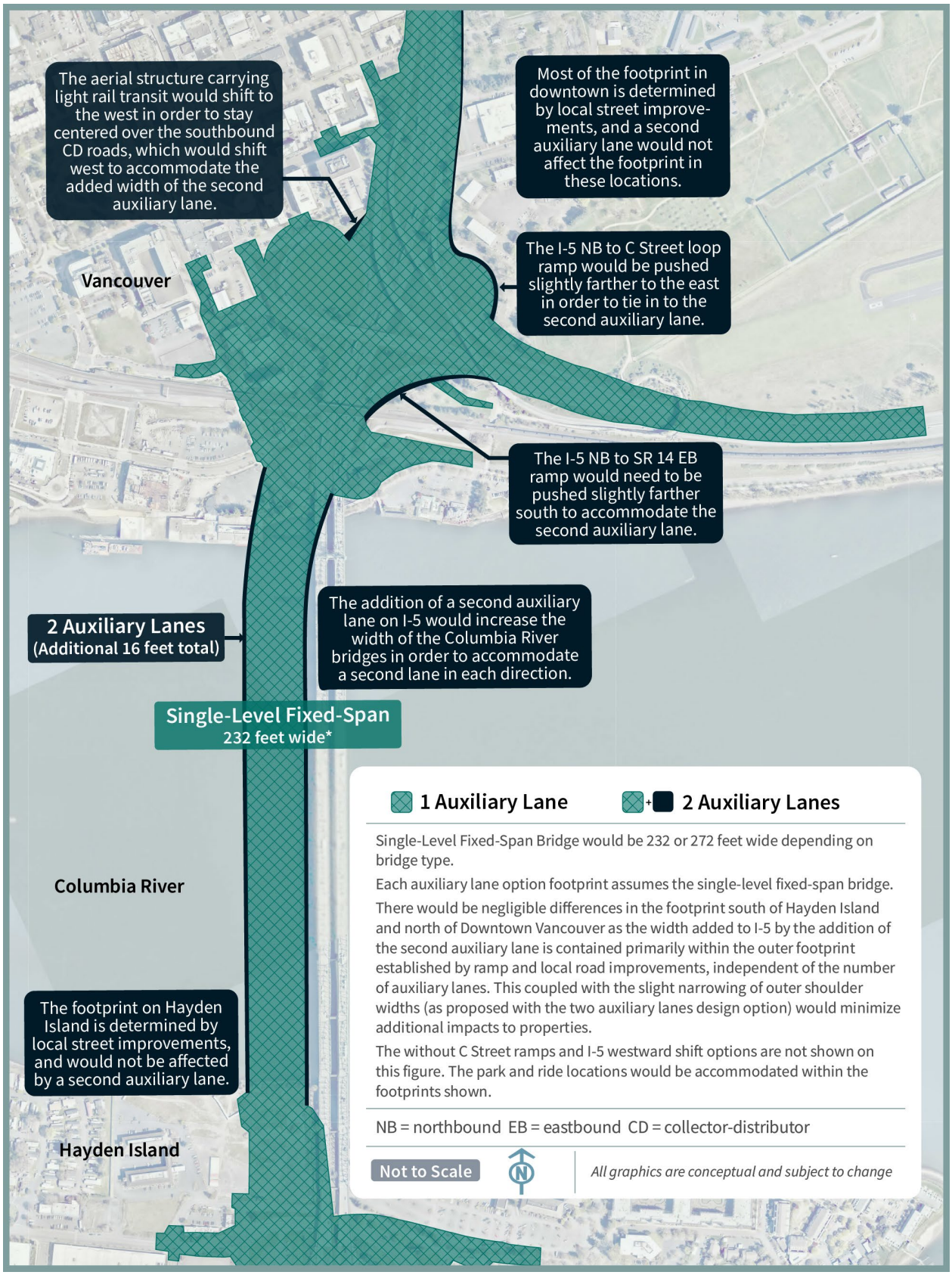
Collector Distributor Lanes not shown.

The traffic operations analysis incorporating both the one and two auxiliary lane design option applies equally to all bridge configuration options in this Draft SEIS.

The C Street ramp (NB to City Center) is an option.

Figure is not to scale.

Figure 2-5. Auxiliary Lane Configuration Footprint Differences



Note: All dimensions are approximate.

One Auxiliary Lane Design Option – Recommended Design Option

The one auxiliary lane design option would include a 12-foot-wide auxiliary lane in each direction across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange.

On northbound I-5, the auxiliary lane would extend the existing auxiliary from the Marine Drive on-ramp to the Hayden Island off-ramp to continue across the Columbia River bridge, and end at the combined off-ramp to Mill Plain/Fourth Plain Boulevard, north of SR 14 (see Figure 2-4). The existing auxiliary lane from the SR 14 on-ramp to the Mill Plain/Fourth Plain off-ramp would be extended to connect to the existing auxiliary lane from the 39th Street on-ramp to the Main Street off-ramp, creating an auxiliary lane beginning at the SR 14 on-ramp and ending at the Main Street off-ramp. The existing auxiliary lane located between the Mill Plain Boulevard on-ramp and the SR 500 off-ramp would remain.

The IBR Program recommends advancing the one auxiliary lane in each direction of I-5 design option. The one and two auxiliary lane design options would provide important benefits to highway operations and safety. Both options received a mix of positive and negative feedback from the public. The one auxiliary lane design option is recommended because it would reduce overall environmental impacts while improving transportation operations and safety. The one auxiliary lane design option is also supported by local transportation agencies.

See Appendix K for additional details on the Recommended Design Options.

On southbound I-5, the two existing auxiliary lanes between SR 500/39th Street and Mill Plain Boulevard would remain, with some reconfiguration due to the braided ramps between the SR 500/39th Street and Fourth Plain Boulevard interchanges. The new auxiliary lane across the Columbia River would begin at the Mill Plain Boulevard on-ramp and would continue across the Columbia River bridge, connecting to the existing auxiliary lane on Hayden Island and ending at the Marine Drive off-ramp. The existing southbound auxiliary lane between Marine Drive and Victory Boulevard/Interstate Avenue would be removed due to ramp reconfigurations as part of the Marine Drive braided ramp with the Victory Boulevard/Interstate Avenue off-ramp.

Two Auxiliary Lane Design Option

The two auxiliary lane design option would include the same improvements as described under the one auxiliary lane design option and would add a second 12-foot-wide auxiliary lane in each direction of I-5 across the Columbia River bridges to further improve safety and operations in the corridor.

On northbound I-5, the inside auxiliary lane would extend from the combined Interstate Avenue/Victory Boulevard on-ramp, continue across the Columbia River bridge, and end at the SR 500/39th Street interchange, connecting to the existing auxiliary lane between the SR 14 on-ramp and Mill Plain on-ramp and the existing auxiliary lane between the 39th Street on-ramp and the Main Street off-ramp. The outside auxiliary lane would extend from the Marine Drive on-ramp across the Columbia River bridge and end at the Mill Plain/Fourth Plain Boulevard off-ramp. A new outside auxiliary lane would begin at the SR 14 on-ramp connecting to the existing auxiliary lane between the Mill Plain Boulevard on-ramp and the SR 500/39th Street off-ramp.

On southbound I-5, the two existing auxiliary lanes between SR 500/39th Street and Mill Plain Boulevard would remain, with some reconfiguration due to the braided ramps between the SR 500/39th Street and Fourth Plain Boulevard interchanges. In addition, there would be a third auxiliary lane between the Fourth Plain Boulevard on-ramp and the Mill Plain Boulevard off-ramp to improve operations and safety between these two closely spaced ramps. The existing auxiliary lane between the SR 500/39th Street on-ramp would extend to the SR 14 collector-distributor off-ramp. This auxiliary lane would then continue across the

Columbia River bridge to the Interstate Avenue/Victory Boulevard off-ramp. The outside auxiliary lane would extend from the Mill Plain on-ramp across the Columbia River bridge to connect to the existing auxiliary lane between Hayden Island and the Marine Drive off-ramp.

2.2.2 Portland Mainland and Hayden Island (Subarea A)

This section discusses the geographic Subarea A (Figure 2-3 provides an overview of the geographic subareas). Figure 2-6 shows highway and interchange improvements in Subarea A, including the North Portland Harbor bridges.

Levee System Improvements

Within Subarea A, the IBR Program has the potential to alter three federally authorized levee systems:

- The Oregon Slough segment of the Peninsula Drainage District Number 1 levee (PEN 1).
- The Oregon Slough segment of the Peninsula Drainage District Number 2 levee (PEN 2).
- The PEN1/PEN2 Cross Levee segment of the PEN 1 levee (Cross Levee).
- The levee systems are shown on Figure 2-7, and intersections with Modified LPA components are described throughout this section (Section 2.2.2, Portland Mainland and Hayden Island (Subarea A), where appropriate. Within Subarea A, the IBR Program study area intersects with PEN 1 to the west of I-5 and with PEN 2 to the east of I-5. PEN 1 and PEN 2 include a main levee along the south side of North Portland Harbor and are part of a combination of levees and floodwalls. PEN 1 and PEN 2 are separated by the Cross Levee that is intended to isolate the two districts if one of them were to fail. The Cross Levee is located along the I-5 mainline embankment, except in the Marine Drive interchange area, where it is located on the west edge of the existing ramp from Marine Drive to southbound I-5.[10]

What's changed with IBR?

The Portland Metro Levee System (PMLS) project was initiated in 2019, and the Columbia Corridor Flood Safety (CCFS) projects were established in 2013, after the CRC LPA. The PMLS and CCFS projects did not request any changes to the CRC LPA or the Modified LPA. There will be continued coordination throughout the design phase to ensure acceptable tie-ins to the existing levee system and levee modifications proposed by PMLS.

There are two concurrent projects underway that are planning improvements to PEN1, PEN2, and the Cross Levee to reduce flood risk:

- The U.S. Army Corps of Engineers (USACE) Portland Metro Levee System (PMLS) project.
- The Columbia Corridor Flood Safety (CCFS) projects (formerly known as "Flood Safe Columbia River" and "Levee Ready Columbia").

The Urban Flood Safety and Water Quality District (UFSWQD)[11] is working in partnership with the USACE on the PMLS project, which includes improvements at PEN 1 and PEN 2 (e.g., raising these levees to elevation 38.2 feet for earthen levees and 39.2 feet for flood walls North American Vertical Datum of 1988 [NAVD 88]).[12] Additionally, as part of the CCFS projects, UFSWQD has identified the need to raise a low spot in the Cross Levee on the southwest side of the Marine Drive interchange.

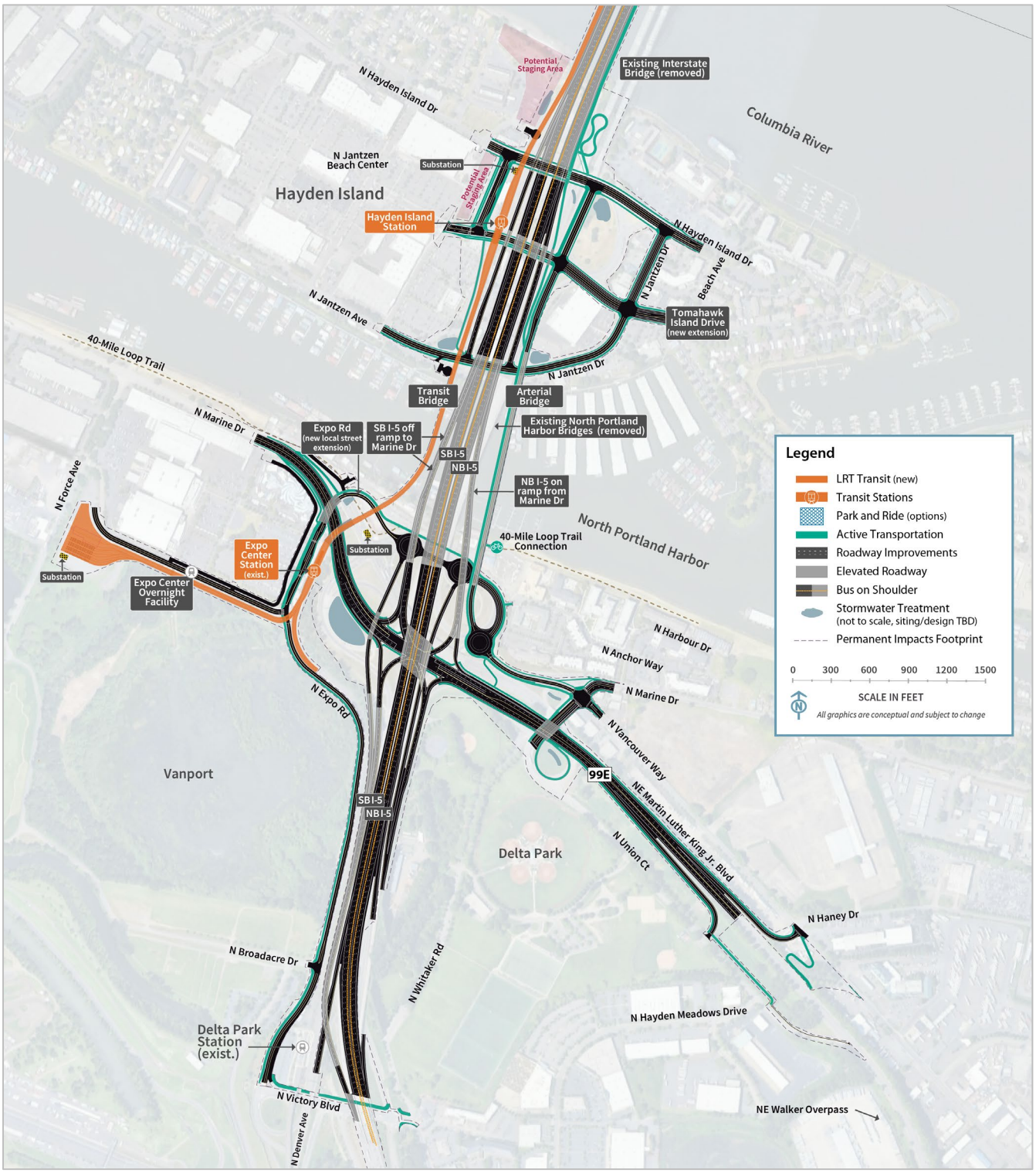
[10] The portion of the original Denver Avenue levee alignment within the Marine Drive interchange area is no longer considered part of the levee system by UFSWQD.

[11] UFSWQD includes PEN 1 and PEN 2, Urban Flood Safety and Water Quality District No. 1, and the Sandy Drainage Improvement Company.

[12] NAVD 88 is a vertical control datum (reference point) used by federal agencies for surveying.

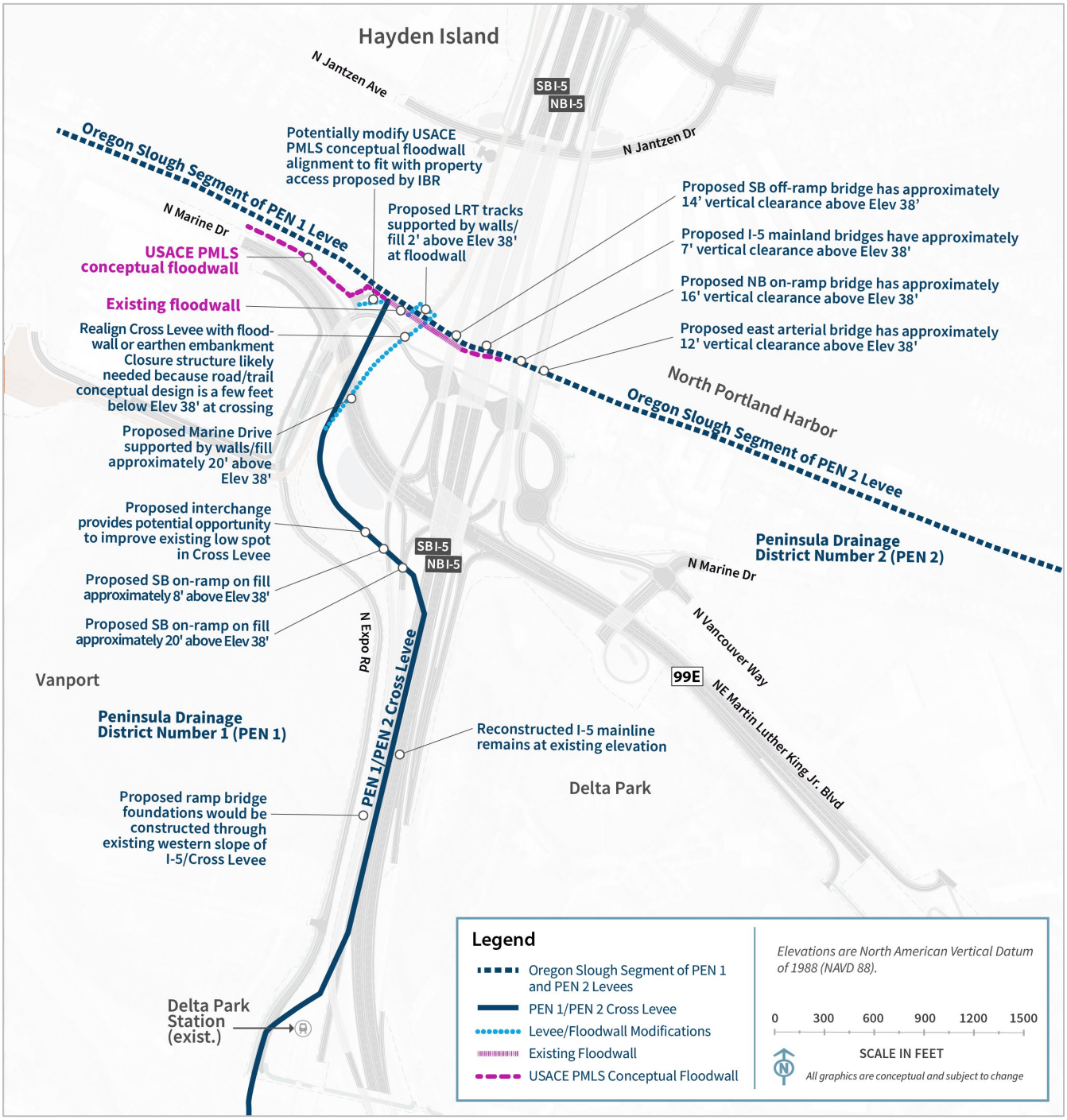
The IBR Program is in close coordination with UFSWQD and the USACE to ensure that the IBR Program's design efforts consider the timing and scope of the PMLS and the CCFS proposed modifications. The intersection of the IBR Program proposed actions to both the existing levee configuration and the anticipated future condition based on the proposed PMLS and CCFS projects are described below, where appropriate.

Figure 2-6. Portland Mainland and Hayden Island (Subarea A)



LRT = light-rail transit; NB = northbound; SB = southbound; TBD = to be determined

Figure 2-7. Levee Systems in Subarea A



Highways, Interchanges, and Local Roadways

Victory Boulevard/Interstate Avenue Interchange Area

The southern extent of the Modified LPA would improve two ramps at the Victory Boulevard/Interstate Avenue interchange (see Figure 2-6 and Figure 2-8). The first ramp improvement would be the southbound I-5 off-ramp to Victory Boulevard/ Interstate Avenue; this off-ramp would be braided below (i.e., grade separated or pass below) the Marine Drive to the I-5 southbound on-ramp (see the Marine Drive Interchange Area section below). The other ramp improvement would lengthen the merge distance for northbound traffic entering I-5 from Victory Boulevard and from Interstate Avenue.

The existing I-5 mainline between Victory Boulevard/Interstate Avenue and Marine Drive is part of the Cross Levee (see Figure 2-7). The Modified LPA would require some pavement reconstruction of the mainline in this area; however, the improvements would mostly consist of pavement overlay, and the profile and footprint would be similar to existing conditions.

What's changed with IBR?

The Victory Boulevard/Interstate Avenue interchange design is similar to the CRC LPA, except that the IBR Modified LPA on-ramp to northbound I-5 and southbound off-ramp from I-5 would merge and diverge directly from I-5 versus starting or ending the auxiliary lanes. This modification was a result of revising the design to include a one auxiliary lane option in addition to a two auxiliary lane option.

Marine Drive Interchange Area

The next interchange north of the Victory Boulevard/Interstate Avenue interchange is at Marine Drive. All movements within this interchange would be reconfigured to improve safety and operations for motorists entering and exiting I-5, and all active transportation users accessing areas in the vicinity of the interchange. In addition, Marine Drive would be raised over the proposed LRT extension to separate motorist and transit users. The proposed Marine Drive interchange configuration would be a single-point urban interchange. Figure 2-8 shows Marine Drive interchange's layout and construction footprint.

Martin Luther King Jr. Boulevard would have new more direct connections to I-5.

What's changed with IBR?

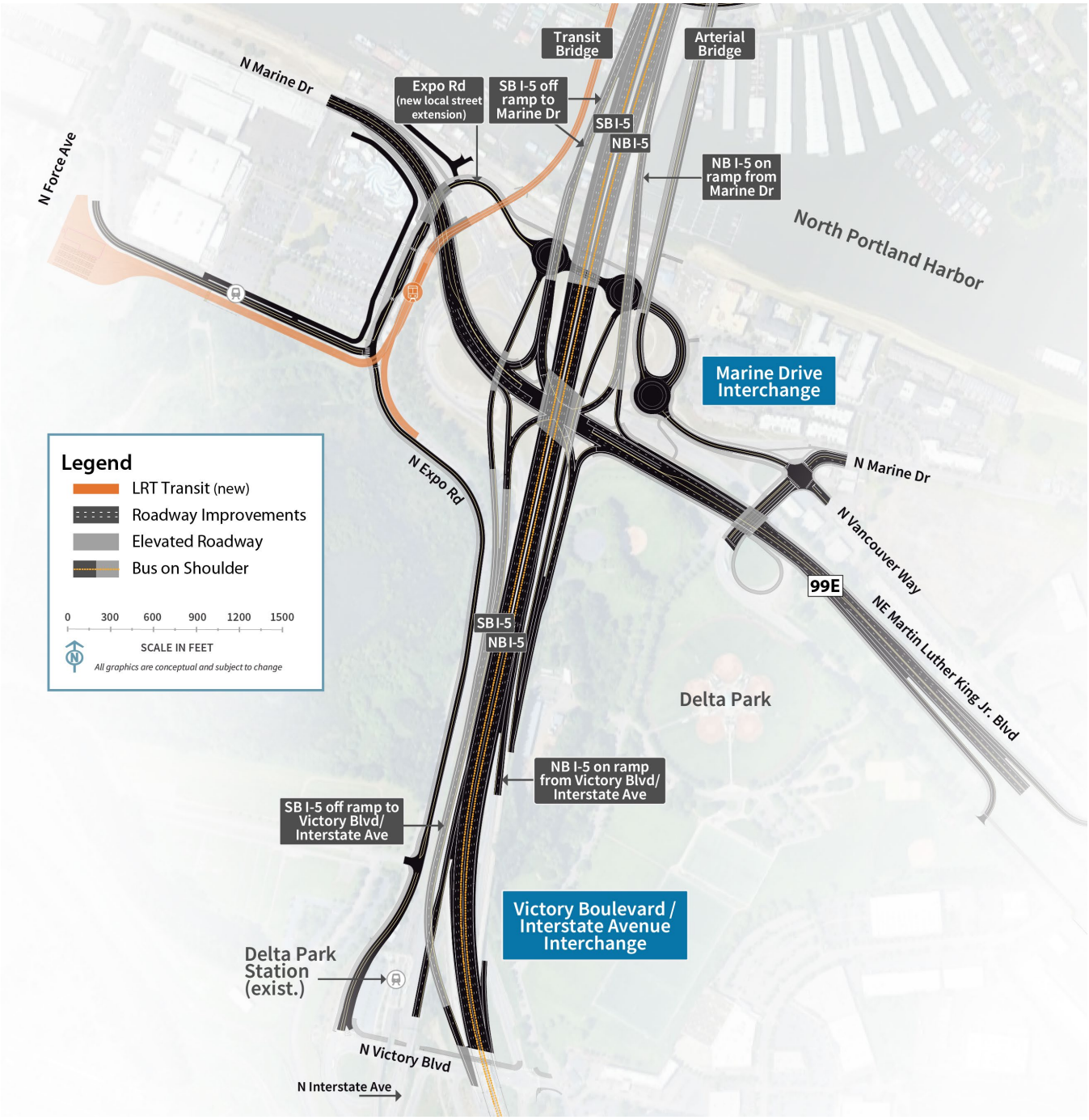
Both the Modified LPA and CRC LPA include a single-point interchange at Marine Drive; however, due to changes in local agency priorities, the Modified LPA does not include a planned future phase to replace the Marine Drive eastbound to I-5 north ramp with a directional flyover ramp that would bypass the traffic signal at the interchange that was included in the CRC LPA.

The new interchange configuration would change the westbound Marine Drive and westbound Vancouver Way connections to Martin Luther King Jr. Boulevard. An improved connection farther east of the interchange (near Haney Drive) would provide access to westbound Martin Luther King Jr. Boulevard for these two streets. The existing access to westbound Martin Luther King Jr. Boulevard from Vancouver Way east of Haney Drive would be closed. For eastbound travelers on Martin Luther King Jr. Boulevard exiting to Union Court, the existing loop connection would be replaced with a new connection farther east (between the access to the East Delta Park Owens Sports Complex and N Hayden Meadows Drive).

Expo Road from Victory Boulevard to the Expo Center would be reconstructed with improved active transportation facilities. North of the Expo Center, Expo Road would be extended under Marine Drive and continue under I-5 to the east, connecting with Marine Drive and Vancouver Way through three new connected intersections. The westernmost intersection would connect the new local street extension to I-5 southbound. The middle intersection would connect the I-5 northbound off-ramp to the local street extension. The easternmost intersection would connect the new local street extension to an arterial bridge

crossing North Portland Harbor to Hayden Island. This intersection would also connect the local street extension to Marine Drive and Vancouver Way.

Figure 2-8. Transit and Roadway Improvements in North Portland



To access Hayden Island using the arterial bridge from the east on Martin Luther King Jr. Boulevard, motorists would exit Martin Luther King Jr. Boulevard at the existing off-ramp to Vancouver Way just west of the Walker Street overpass. Then motorists would travel west on Vancouver Way, through the intersection with Marine Drive and straight through the intersection to the arterial bridge.

From Hayden Island, motorists traveling south to Portland via Martin Luther King Jr. Boulevard would turn onto the arterial bridge southbound and travel straight through the intersection onto Vancouver Way. At the

intersection of Vancouver Way and Marine Drive, motorists would turn right onto Union Court and follow the existing road southeast to the existing on-ramp onto Martin Luther King Jr. Boulevard.

The conceptual floodwall alignment from the proposed USACE PMLS project is located on the north side of Marine Drive, near two industrial properties, with three proposed closure structures[13] for property access. The Modified LPA would realign Marine Drive to the south to maintain traffic on existing Marine Drive during construction. The Modified LPA would provide access to the two industrial properties via the new local road extension from Expo Road. Therefore, the change in access for the two industrial properties could require small modifications to the floodwall alignment (a potential shift of approximately 5 to 10 feet to the south) and closure structure locations. The IBR Program is coordinating with USACE PMLS and the UFSWQD on modifications to the floodwall alignment.

Marine Drive and the two southbound on-ramps would travel over the Cross Levee approximately 10 to 20 feet above the proposed elevation of the improved levee, and they would be supported by fill and retaining walls near an existing low spot in the Cross Levee.

The I-5 southbound on-ramp from Marine Drive would continue on a new bridge structure. Although the bridge's foundation locations have not been determined yet, they would be constructed through the western slope of the Cross Levee (between the existing I-5 mainline and the existing light-rail).

North Portland Harbor Bridges

To the north of the Marine Drive interchange is the Hayden Island interchange area, which is shown in Figure 2-6. I-5 crosses over the North Portland Harbor when traveling between these two interchanges. The Modified LPA proposes to replace the existing I-5 bridge spanning North Portland Harbor to improve seismic resilience.

Six new parallel bridges would be built across the waterway under the Modified LPA: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping the location of the existing bridge (which would be removed). From west to east, these bridges would carry:

- The LRT tracks.
- The southbound I-5 off-ramp to Marine Drive.
- The southbound I-5 mainline.
- The northbound I-5 mainline.
- The northbound I-5 on-ramp from Marine Drive.
- An arterial bridge between the Portland mainland and Hayden Island with a shared-use path for pedestrians and bicyclists.

All new structures would have at least as much vertical navigation clearance over North Portland Harbor as the existing North Portland Harbor bridge.

What's changed with IBR?

The Modified LPA design for crossing North Portland Harbor includes six new bridges spanning the harbor. The CRC LPA would have included five bridges including reusing the existing highway bridge to accommodate northbound and southbound mainline I-5 traffic while adding four new bridges to carry the LRT tracks, local traffic, and ramps from I-5 to and from the Marine Drive interchange.

The passage of time, the age of the existing bridge, and the structural integrity of the existing bridge were key in the proposal to replace the I-5 mainline bridges rather than retrofit them. The current proposal to replace the North Portland Harbor I-5 highway bridge would require separate bridges for the I-5 mainline to accommodate maintenance of traffic during construction and would create an opportunity for the IBR Program to straighten the alignment of the Columbia River bridges, which reduces impacts.

[13] Levee closure structures are put in place at openings along the embankment/floodwall to provide flood protection during high water conditions.

All of the six bridges would be designed and constructed to have sufficient clearance over the levees for access and maintenance. The foundation locations for the five roadway bridges have not been determined at this stage of design, but some foundations could be constructed through landward or riverward levee slopes.

Hayden Island Interchange Area

All traffic movements for the Hayden Island interchange would be reconfigured. Figure 2-6 shows the layout and construction footprint of the Hayden Island interchange. A partial interchange would be built on Hayden Island with a northbound I-5 on-ramp from Jantzen Drive and a southbound I-5 off-ramp to Jantzen Drive. This would improve ramp lengths to provide sufficient merging/diverging areas compared to the existing substandard ramps that require acceleration and deceleration in a short distance. The I-5 mainline would be partially located on fill across the island and partially elevated to provide east-west connections on Hayden Island.

There would not be a southbound I-5 on-ramp or northbound I-5 off-ramp located on Hayden Island. Connections to Hayden Island for those movements would be via the local access (i.e., arterial) bridge connecting North Portland to Hayden Island (Figure 2-9). Vehicles traveling northbound on I-5 wanting to access Hayden Island would exit with traffic going to the Marine Drive interchange, cross under Martin Luther King Jr. Boulevard to the new intersection at the Expo Road local street extension, and use the arterial bridge to cross North Portland Harbor. Vehicles on Hayden Island looking to enter I-5 southbound would use the arterial bridge to cross North Portland Harbor, cross under I-5 using the new Expo Road local street extension to the westernmost intersection, cross under Marine Drive, merge with the Marine Drive southbound on-ramp, and merge with I-5 southbound south of Victory Boulevard.

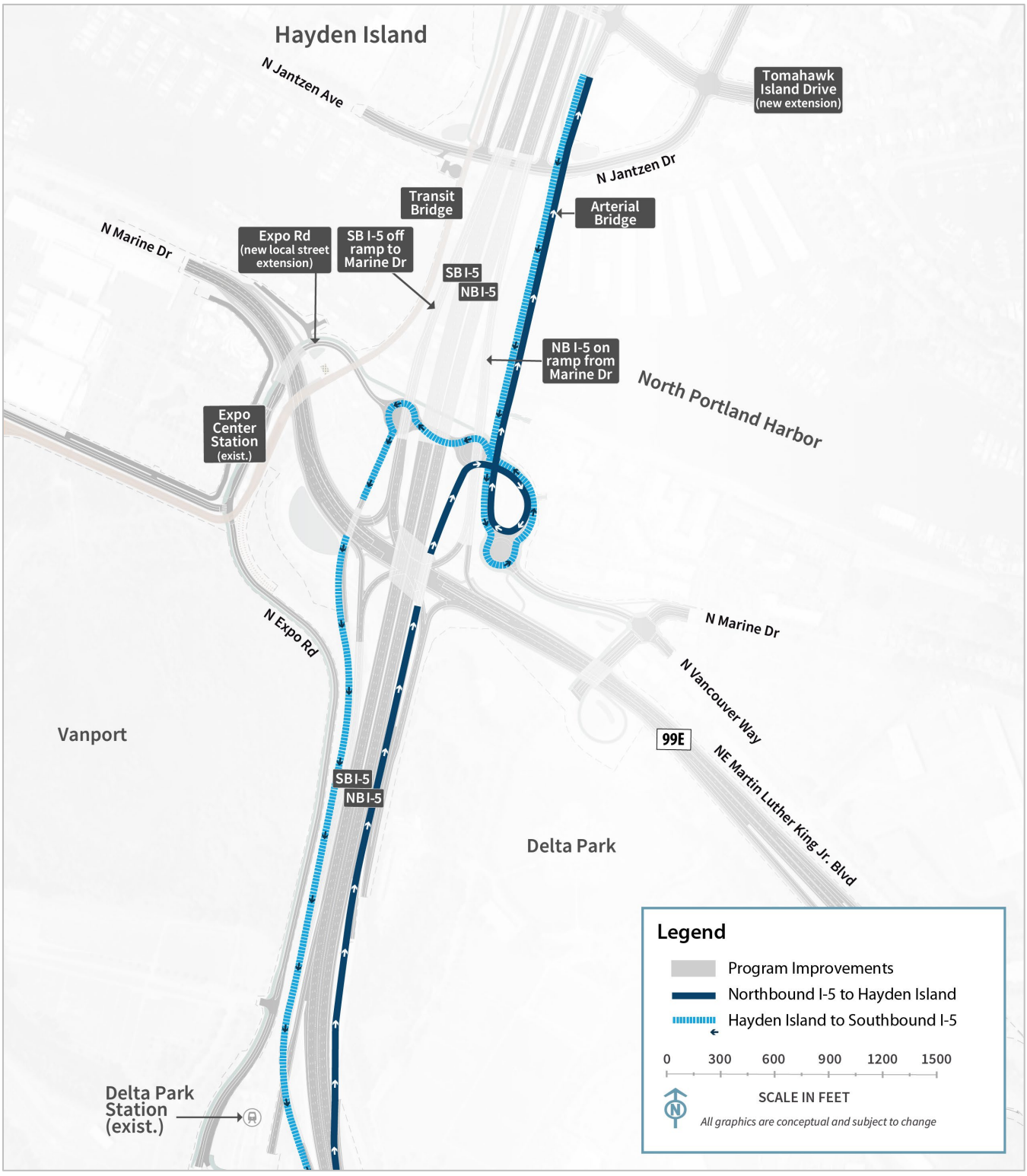
Improvements to Jantzen Avenue may include additional left-turn and right-turn lanes at the interchange ramp terminals and active transportation facilities. Improvements to Hayden Island Drive would include new connections to the new arterial bridge over North Portland Harbor. The existing I-5 northbound and southbound access points from Hayden Island Drive would also be removed. A new extension of Tomahawk Island Drive would travel east-west through the middle of Hayden Island and under the I-5 interchange, thus improving connectivity across I-5 on the island.

What's changed with IBR?

In response to local agency policies and community priorities, the IBR Program identified design modifications that could reduce the footprint (and associated impacts) on Hayden Island. Section 2.5.3, IBR Design Option Development and Screening, describes the screening process used to select design modifications. The Modified LPA includes a partial interchange on Hayden Island, with an off-ramp from southbound I-5 and an on-ramp to northbound I-5 instead of the CRC LPA's proposed full interchange in a split tight-diamond configuration with access to and from both directions of I-5. With the Modified LPA, vehicles traveling between Hayden Island and the Portland mainland would use the new arterial bridge across North Portland Harbor.

Because of the modification to the Hayden Island interchange, local roadways on Hayden Island would also be configured somewhat differently in the Modified LPA than in the CRC LPA.

Figure 2-9. Vehicle Circulation between Hayden Island and the Portland Mainland



NB = northbound; SB = southbound

Transit

A new light-rail alignment for northbound and southbound trains would be constructed within Subarea A (Figure 2-6) to extend from the existing Expo Center MAX Station over North Portland Harbor to a new station at Hayden Island. An overnight LRV facility would be constructed on the southwest corner of the Expo Center property (Figure 2-6) to provide storage for trains during hours when MAX is not in service. This facility is described in Section 2.2.6, Transit Support Facilities. The existing Expo Center MAX Station would be modified to remove the westernmost track and platform. Other platform modifications, including track realignment and regrading the station, are anticipated to transition to the extension alignment. This could require reconstruction of the operator break facility, signal/communication buildings, and TPSSs. The existing TPSS at the end of TriMet's MAX Yellow Line would be decommissioned. A new TPSS would be constructed to the east of the LRT tracks and south of Expo Road, as well as at the overnight LRV facility, east of N Force Avenue. Immediately north of the Expo Center MAX Station, the LRT alignment would curve east toward I-5, pass beneath an elevated Marine Drive, cross the proposed Expo Road local street extension and the 40-Mile Loop Trail at grade, then rise over the existing levee onto a light-rail bridge to cross North Portland Harbor.

After crossing the new Expo Road extension, the new light-rail track would cross over the main levee (Figure 2-7). The light-rail profile is anticipated to provide sufficient clearance above the improved levees at the existing floodwall (and improved floodwall), and the tracks would be constructed on fill supported by retaining walls above the floodwall. North of the floodwall, the light-rail tracks would continue onto the new light-rail bridge over North Portland Harbor.

As the Modified LPA's light-rail extension would cross the north end of the existing Cross Levee, the IBR Program is proposing to realign the Cross Levee to the east of the light-rail alignment. This realigned Cross Levee would intersect the new Expo Road extension. A levee closure structure would be required because the proposed roadway is a few feet lower than the proposed elevation of the improved levee.

On Hayden Island, proposed transit components include northbound and southbound LRT tracks over Hayden Island; the tracks would be elevated at approximately the height of the new I-5 mainline. An elevated LRT station would also be built on the island immediately west of I-5. Active transportation facilities, described below, would connect to the new Hayden Island Station. A new TPSS would be constructed at the Hayden Island Station, north of the transit platform. If a single-level fixed-span or movable-span Columbia River bridge configuration were implemented, the light-rail alignment would extend north on Hayden Island along the western edge of I-5 before transitioning onto the outer (western) edge of the new western single-level bridge over the Columbia River. For the double-deck configuration, the light-rail alignment would transition to the lower level of the new double-deck southbound I-5 bridge over the Columbia River.

Active Transportation

In the Victory Boulevard interchange area (Figure 2-6), active transportation facilities would be provided on Victory Boulevard beneath I-5 and Interstate Avenue between Expo Road and the northbound on/off-ramp terminal east of I-5. Active transportation facilities would also be provided along Expo Road between Victory Boulevard and the Expo Center. These facilities would provide direct connections between the Victory Boulevard and Marine Drive interchange areas, as well as links to the Delta Park and Expo Center MAX Stations.

What's changed with IBR?

The Modified LPA would modify the alignment of the CRC LPA shared-use path to connect to other planned active transportation projects in the area (e.g., the 40-Mile Loop Trail, the two-way cycle track on Fourth Plain).

New shared-use path connections throughout the Marine Drive interchange area would provide access between the Bridgeton neighborhood (on the east side of I-5), Hayden Island, and the Expo Center MAX Station. There would also be

connections to the existing portions of the 40-Mile Loop Trail, which runs north of Marine Drive under I-5 through the interchange area. The path would continue along the extension of Expo Road under the interchange to the intersection of Marine Drive and Vancouver Way, where it would connect under Martin Luther King Jr. Boulevard to Delta Park.

East of the Marine Drive interchange, active transportation facilities on Martin Luther King Jr. Boulevard and on the parallel street, Union Court, would connect travelers to Marine Drive and across the arterial bridge to Hayden Island. The active transportation facilities on Martin Luther King Jr. Boulevard would provide westbound and eastbound cyclists and pedestrians with off-street crossings of the interchange and would also provide connections to both the Expo Center MAX Station and the 40-Mile Loop Trail to the west.

The new arterial bridge over North Portland Harbor would include a shared-use path for pedestrians and bicyclists (Figure 2-6). On Hayden Island, active transportation facilities would be provided on Jantzen Avenue, Hayden Island Drive, and Tomahawk Island Drive and would connect to the Hayden Island Station. The shared-use path on the arterial bridge would continue along the arterial bridge to the south side of Tomahawk Island Drive. A parallel, elevated path from the arterial bridge would continue adjacent to I-5 across Hayden Island and cross above Tomahawk Island Drive and Hayden Island Drive to connect to the outer edge of the new single-level, or lower level of the double-deck eastern bridge over the Columbia River. A ramp down to the north side of Hayden Island Drive would be provided from the elevated path.

2.2.3 Columbia River Bridges (Subarea B)

This section discusses the geographic Subarea B (Figure 2-3 provides an overview of the geographic subareas). Figure 2-10 shows highway and interchange improvements in Subarea B.

Highways, Interchanges, and Local Roadways

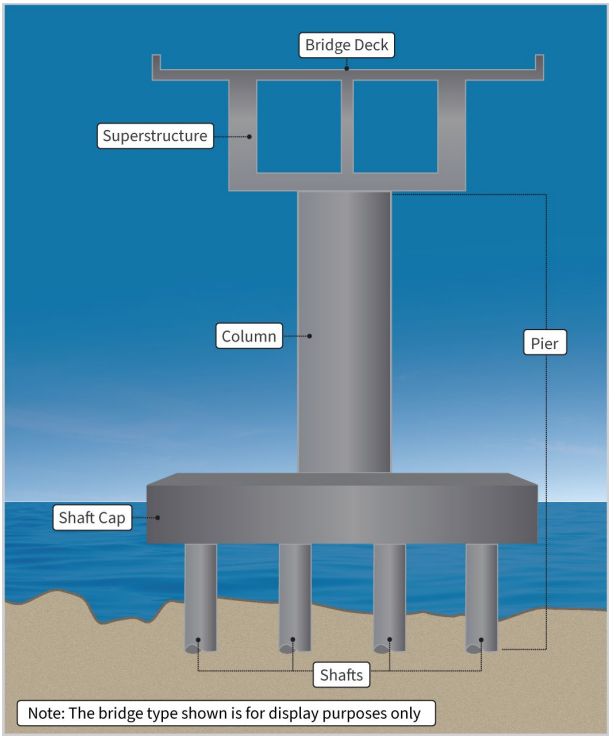
The two existing parallel northbound and southbound I-5 bridges that cross the Columbia River were constructed in 1917 and 1958, respectively. When the 1958 bridge was constructed, pier 5 of the 1917 bridge was removed and the profile was raised to match the new bridge. For the IBR Program, the two existing bridges would be replaced by two new parallel bridges, located west of the existing bridges (Figure 2-10). The new bridges would be designed to current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications and AASHTO Seismic Guide Specifications and in compliance with ODOT and WSDOT design criteria. With all bridge configuration design options, the new eastern bridge would accommodate northbound highway traffic and a shared-use path. The new western bridge would carry southbound traffic and light rail tracks. Whereas the existing bridges each have three lanes with no shoulders, each of the two new bridges would accommodate three through lanes, one or two auxiliary lanes, and shoulders on both sides of the highway. Lanes and shoulders would be built to full design standards.

As with the existing bridge (Figure 2-12), the new Columbia River bridges would provide three navigation channels: a primary navigation channel and two barge channels (Figure 2-13). The current location of the primary navigation channel is near the Vancouver shoreline where the existing lift spans are located. The IBR Program is coordinating with the USACE to obtain authorization to change the location of the primary navigation channel. Under the Modified LPA, the primary navigation channel would be shifted south approximately 500 feet (measured by channel centerlines), and the existing center barge channel would shift north and become the north barge channel. The new primary navigation channel would be 400 feet wide (this width includes a 300-foot USACE-authorized channel and a 50-foot channel maintenance buffer on each side of the authorized channel), and the two barge channels would also each be 400 feet wide.

Figure 2-10. Columbia River Bridges (Subarea B)

The existing Interstate Bridge has nine in-water pier sets[14] and four pier sets on land (pier locations are shown on Figure 2-12). The new Columbia River bridges (any bridge configuration) would be built on six in-water pier sets, plus multiple piers on land (pier locations are shown on Figure 2-13). Each in-water pier set would be supported by a foundation of drilled shafts; each group of shafts would be tied together with a concrete shaft cap. Columns or pier walls would rise from the shaft caps and connect to the superstructures of the bridges (Figure 2-11).

Figure 2-11. Bridge Foundation Concept



Bridge Configuration Options

Three bridge configuration options are being considered: (1) double-deck fixed-span (with one bridge type); (2) a single-level fixed-span (with various potential bridge types); and (3) a single-level movable-span (with one bridge type). Both the double-deck and single-level fixed-span configurations would provide 116 feet of vertical navigation clearance at their respective highest spans, which was the vertical navigation clearance of the CRC LPA. The CRC LPA included a double-deck fixed-span bridge configuration. The single-level fixed-span configuration was developed and is being considered as part of the IBR Program in response to the physical and contextual changes (e.g., design and operational considerations) since 2013 that allowed for opportunities to examine a refinement in the double-deck bridge configuration (e.g., ingress and egress of transit from the lower level of the double-deck fixed-span configuration on the north end of the southbound bridge).

Consideration of the single-level movable-span configuration as part the IBR Program was necessitated by the U.S. Coast Guard's (USCG) review of the Program's navigation impacts on the Columbia River and issuance of a Preliminary Navigation Clearance Determination (PNCD) (USCG 2022). The USCG PNCD set the preliminary vertical navigation clearance recommended for the issuance of a bridge permit at 178 feet; this is the current vertical navigation clearance of the Interstate Bridge. On January 16, 2026, the USCG issued a revised PNCD for the new Columbia River bridges and set the preliminary vertical navigation clearance at 116 feet or greater (USCG 2026).

What's changed with IBR?

The CRC LPA included a double-deck fixed-span bridge configuration. The single-level fixed-span configuration was developed for the Modified LPA in response to physical and contextual changes (i.e., design and operational considerations) that necessitated examination of LRT ingress and egress of transit from the lower level of the double-deck fixed-span configuration on the north end of the southbound bridge.

The single-level movable-span configuration was developed to provide up to 178 feet VNC as recommended by the USCG in the Preliminary Navigation Clearance Determination (USCG 2022). In January 2026, the USCG issued a revised PNCD for the new Columbia River bridges. All three bridge configurations for the Modified LPA provide at least 116 feet of VNC and are consistent with the revised PNCD.

[14] A pier set consists of the pier supporting the northbound bridge and the pier supporting the southbound bridge at a given location.

Figure 2-12. Existing Navigation Clearances of the Interstate Bridge

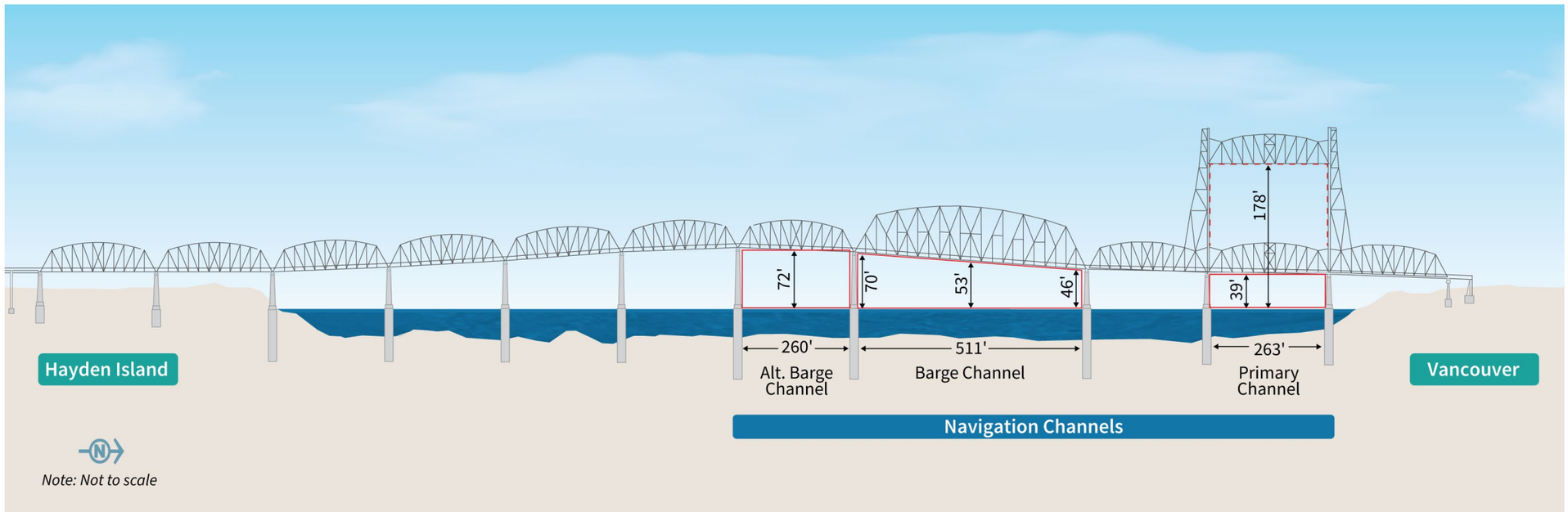
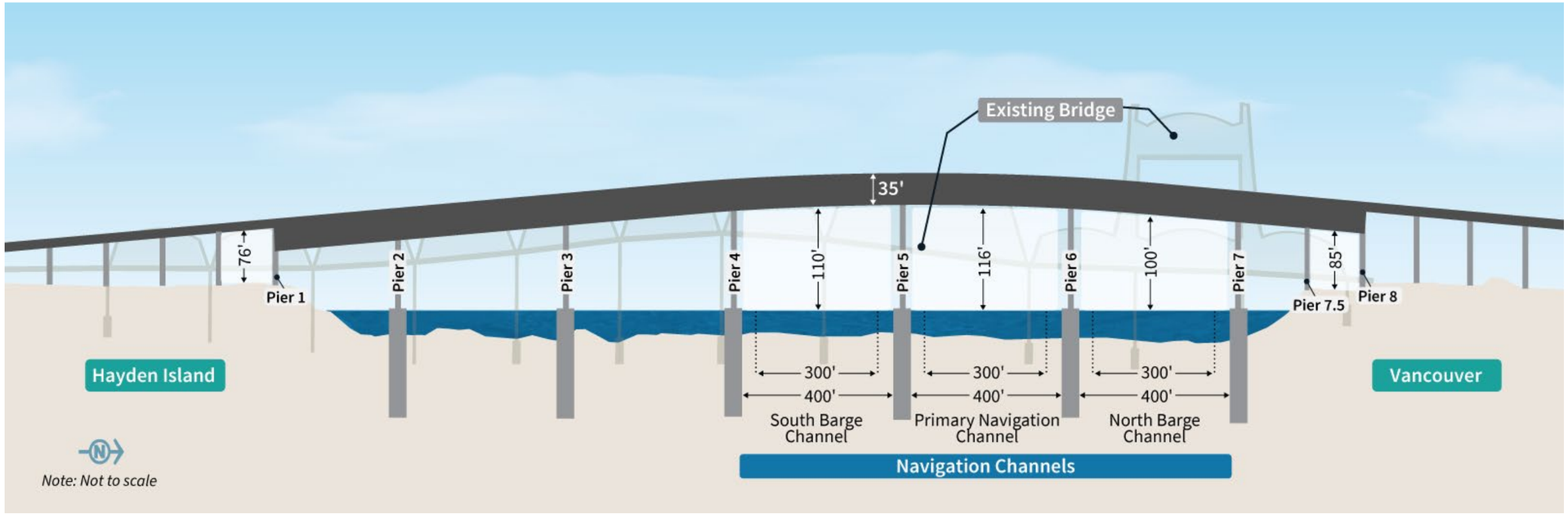


Figure 2-13. Navigation Clearances and proposed profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration



Note: The location and widths of the proposed navigation channels would be same for all bridge configuration and bridge type options. The three navigation channels would each be 400 feet wide (this width includes a 300-foot USACE-authorized channel (shown in dotted lines) plus a 50-foot channel maintenance buffer on each side of the authorized channel). The vertical navigation clearance would vary, as described in the following sections.

The IBR Program is carrying forward the three bridge configurations, each of which meets the IBR Program's Purpose and Need, to address changed conditions to ensure a permittable bridge configuration is within the range of options considered in the SEIS. Each of the bridge configuration design options provides at least 116 feet of vertical navigation clearance (VNC) and is consistent with the January 2026 PNCD issued by the USCG. Additional discussion on pending actions to obtain authorizations from USCG and USACE for the Columbia River bridges' primary navigation channel location are described in Section 2.6, Additional Compliance.

Each of the bridge configurations assumes one auxiliary lane; two auxiliary lanes could be applied to any of the bridge configurations. All typical sections with one auxiliary lane would provide 14-foot shoulders to accommodate bus on shoulder and maintain traffic during construction of the Modified LPA and future maintenance.

Double-Deck Fixed-Span Configuration

The double-deck fixed-span configuration would be two side-by-side, double-deck, fixed-span steel truss bridges. Figure 2-14 shows an example of this configuration (this image is subject to change and is shown as a representative concept; it does not depict the final design). The double-deck fixed-span configuration would provide 116 feet of vertical navigation clearance for river traffic using the primary navigation channel and 400 feet of horizontal navigation clearance at the primary navigation channel, as well as barge channels.

Figure 2-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration

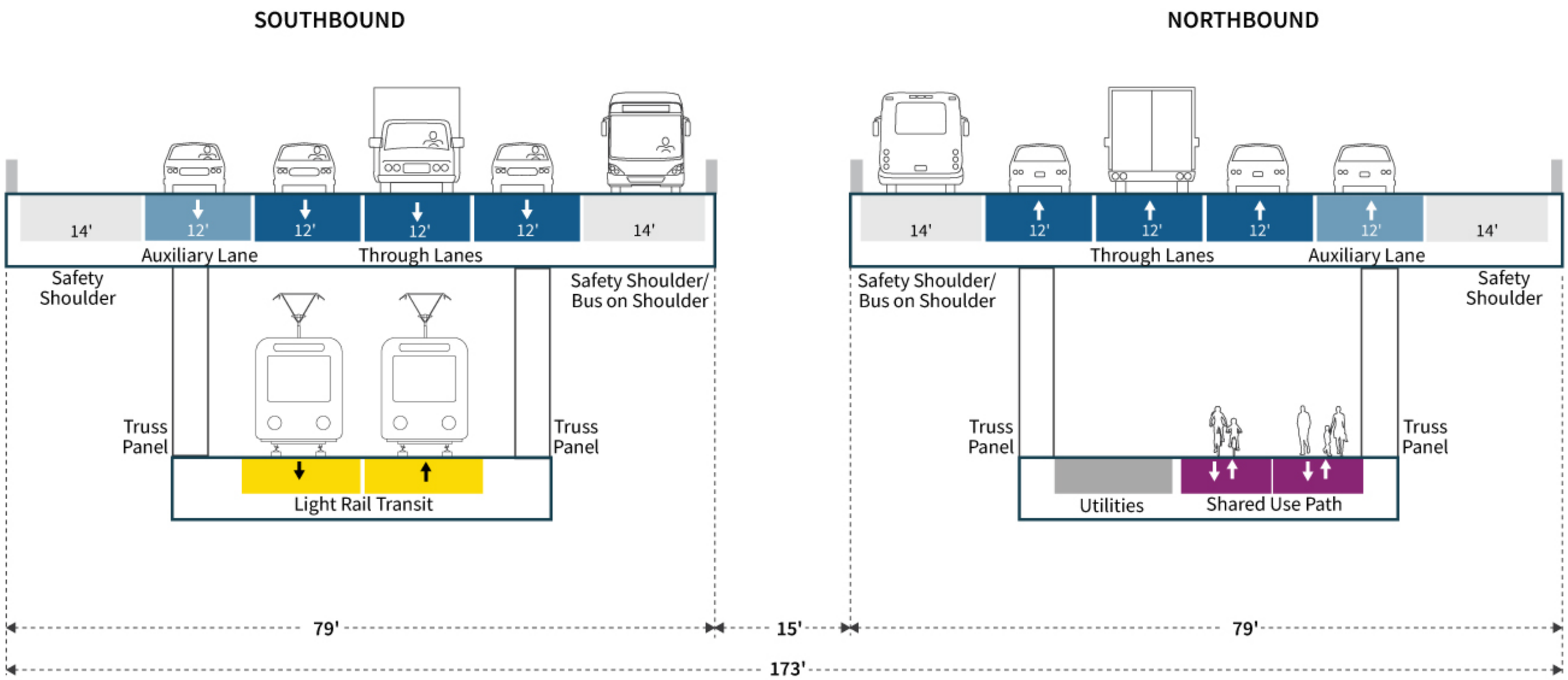
Note: Visualization is looking southeast from Vancouver.

The eastern bridge would accommodate northbound highway traffic on the upper level and the shared-use path and utilities on the lower level. The western bridge would carry southbound traffic on the upper level and one set of light-rail tracks (one northbound track and one southbound track) on the lower level. Each bridge deck would typically be 79 feet wide, with a total out-to-out width of approximately 173 feet.[15]

Figure 2-15 shows a typical cross section of the two parallel double-deck bridges. Like all bridge configuration design options under consideration, the double-deck fixed-span configuration would have six in-water pier sets. Each pier set would require 12 in-water drilled shafts, for a total of 72 in-water drilled shafts. Each individual shaft cap would be approximately 50 feet by 85 feet. This bridge configuration would have up to a 4% maximum grade on both the Oregon and Washington sides. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

[15]"Out-to-out width" is the measurement between the outside edges of the bridge across its width at the widest point.

Figure 2-15. Typical Cross Section of the Double-Deck Fixed-Span Configuration



Notes: Design is not final and subject to change. Widths may vary with final design. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Single-Level Fixed-Span Configuration – Recommended Design Option

The single-level fixed-span configuration would have two side-by-side, single-level, fixed-span steel or concrete bridges. This Final SEIS considers two single-level fixed-span bridge type options: a girder (steel or concrete segmental) bridge and an extradosed bridge. [16] The description in this section applies to both bridge types (unless otherwise indicated). Conceptual examples of both options are shown on Figure 2-16. These images are subject to change and do not represent final design.

This configuration would provide 116 feet of vertical navigation clearance for river traffic using the primary navigation channel and 400 feet of horizontal navigation clearance at the primary navigation channel, as well as barge channels, which is consistent with the January 2026 PNCD issued by the USCG.

The eastern bridge would accommodate northbound highway traffic and the shared-use path; the bridge deck would be approximately 104 feet wide. The western bridge would carry southbound traffic and light-rail tracks; the bridge deck would be approximately 113 feet wide. The I-5 highway, light-rail tracks, and the shared-use path would be on the same level across the two bridges, instead of being divided between two levels as with the double-deck configuration. The total out-to-out width of the single-level fixed-span configuration (extradosed option) would be approximately 272 feet at its widest point, approximately 99 feet wider than the double-deck configuration. The total out-to-out width of the single-level fixed-span configuration (girder option) would be approximately 232 feet at its widest point. Figure 2-17 shows a typical cross section of the single-level configuration with an extradosed bridge as shown by the 10-foot-wide bridge columns. Figure 2-18 shows a typical cross section with a girder bridge, which would not have the 10-foot-wide bridge columns shown on Figure 2-17.

There would be six in-water pier sets with 16 in-water drilled shafts on each combined shaft cap, for a total of 96 in-water drilled shafts. The combined shaft caps for each pier set would be approximately 50 feet by 230 feet.

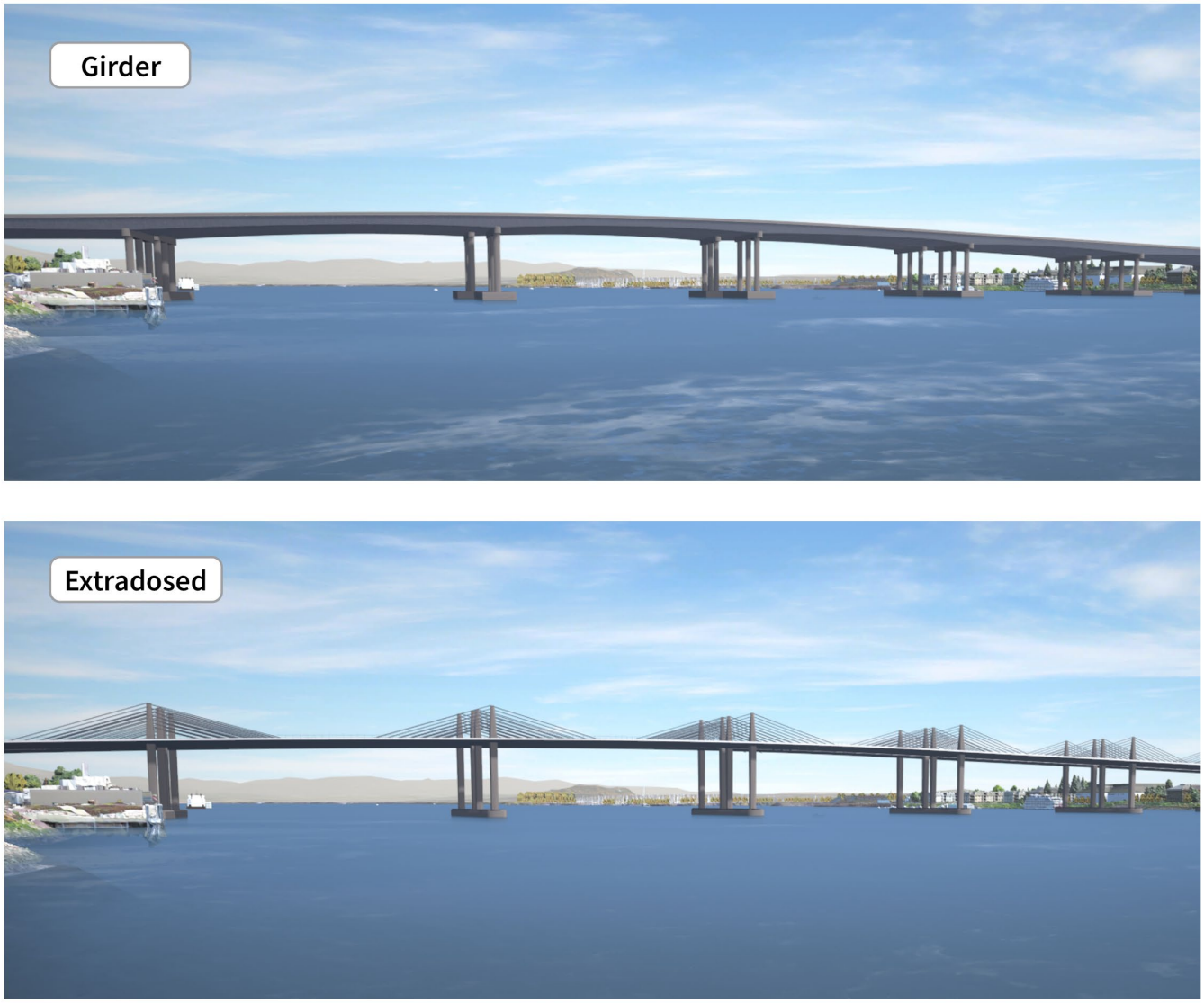
The IBR Program recommends advancing the single-level fixed-span bridge configuration. All bridge configurations would provide important benefits to highway operations and safety and have similar impacts to many resources. The main differences between either of the fixed-span configurations and the movable-span configuration is that the latter would provide more vertical clearance to accommodate larger vessels and a lower grade for all land-based transportation modes (which would benefit freight and active transportation users in particular), but this configuration would also periodically disrupt all other land-based transportation modes (personal vehicles, freight, transit, and active transportation) with bridge openings. The main differences between the double-deck and single-level fixed-span configurations are that the slightly higher grade of the former would impact freight traffic and active transportation users, and the latter would have faster emergency response times (although there would also be more exposure to vehicles) and give users of the shared-use path a greater sense of security due to "eyes on the path." The fixed-span configurations received generally positive comments from the public, while there was mixed feedback on the movable-span because of the tradeoffs given above.

See Appendix K for additional details on the Recommended Design Options.

[16] The Draft SEIS also included a finback as a single-level fixed-span bridge type. As the design of the various bridge types progressed, it was determined that the finback would have higher risks associated with increased cost and construction schedule as this bridge type is less common and applying this bridge type to the scale of the new Columbia River bridges would introduce more design and construction challenges than the other bridge type options. Other bridge types, such as concrete or steel girder and extradosed would have fewer risks and would be a more suitable for this location. As a result, it was dropped from further consideration.

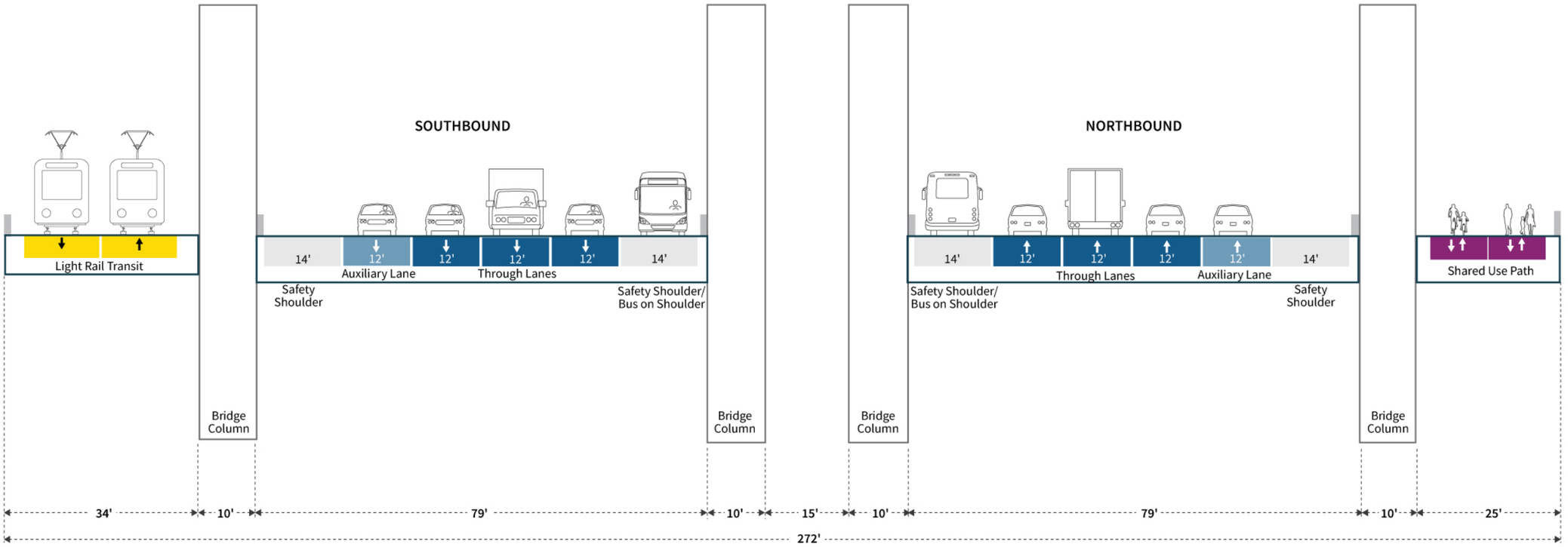
This bridge configuration would be expected to have an approximate grade of 3% on both the Oregon and Washington sides of the bridge. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

Figure 2-16. Conceptural Drawings of Single-Level Fixed-Span Bridge Types



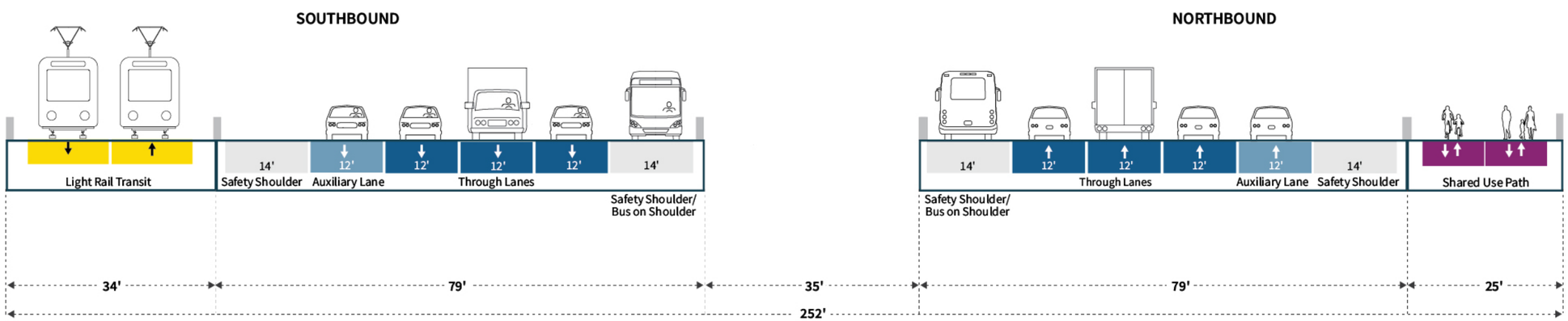
Note: Visualizations are for illustrative purposes only. They do not reflect property impacts or represent final design. Visualization is looking southeast from Vancouver.

Figure 2-17. Typical Cross Section of the Single-Level Fixed-Span Configuration (Extradosed Type)



Notes: Design is not final and subject to change. Widths may vary with final design. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Figure 2-18. Typical Cross Section of the Single-Level Fixed-Span Configuration (Girder Type)



Notes: Design is not final and subject to change. Widths may vary with final design. The cross section for a girder bridge type would be the same as an extradosed bridge type except that it would not have the four 10-foot bridge columns. The distance between the two bridges could be reduced to 10 feet. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Single-Level Movable-Span Configuration

The single-level movable-span configuration would have two side-by-side, single-level steel girder bridges with movable spans between Piers 5 and 6. For the purpose of this Final SEIS, the IBR Program assessed a vertical lift movable-span configuration with counterweights based on the analysis in the *River Crossing Bridge Clearance Assessment Report – Movable-Span Options,* included as part of Attachment C in Appendix D, Design Options Development, Screening, and Evaluation Technical Report. A conceptual example of a vertical lift-span bridge is shown in Figure 2-19. These images are subject to change and do not represent final design.

A movable span must be located on a straight and flat bridge section (i.e., without horizontal curvature and with minimal grade). To comply with these requirements, and for the bridge to maintain the highway, transit, and active transportation connections on Hayden Island and in Vancouver while minimizing property acquisitions and displacements, the movable span is proposed to be located approximately 500 feet south of the existing lift span, between Piers 5 and 6.

The single-level movable-span configuration would provide approximately 90 feet of vertical navigation clearance over the proposed relocated primary navigation channel when the movable spans are in the closed position, with 99 feet of vertical navigation clearance available over the north barge channel. It satisfies the requirement of a minimum of 72 feet of vertical navigation clearance (the existing Interstate Bridge's maximum clearance over the alternate [southernmost] over the barge channel when the existing lift span is in the closed position).

In the open position, the movable span would provide 178 feet of vertical navigation clearance over the proposed relocated primary navigation channel.

Similar to the fixed-span configurations, the movable span would provide 400 feet of horizontal navigation clearance for the primary navigation channel and for each of the two barge channels.

The vertical lift-span towers would be approximately 243 feet high, which would be slightly shorter than the existing lift-span towers, which are 247 feet high.

Similar to the single-level fixed-span configuration, the eastern bridge would accommodate northbound highway traffic and the shared-use path, and the western bridge would carry southbound traffic and light-rail tracks. The I-5 highway, light-rail tracks, and shared-use path would be on the same level across the bridges instead of on two levels as with the double-deck configuration. Typical cross sections of the single-level movable-span configuration are shown in Figure 2-20; the top section depicts the vertical lift spans (Piers 5 and 6), and the bottom section depicts the fixed spans (Piers 2, 3, 4, and 7). The movable and fixed cross sections are slightly different because the movable span requires lift towers, which are not required for the fixed spans of the bridges.

There would be six in-water pier sets and two piers on land per bridge. The vertical lift span would have 22 in-water drilled shafts each for Piers 5 and 6; the shaft caps for these piers would be approximately 50 feet by 312 feet to accommodate the vertical lift spans. Piers 2, 3, 4, and 7 would have 16 in-water drilled shafts each; the shaft caps for these piers would be the same as for the fixed-span options (approximately 50 feet by 230 feet). The single-level movable-span configuration (with a vertical lift span) would have a total of 108 in-water drilled shafts.

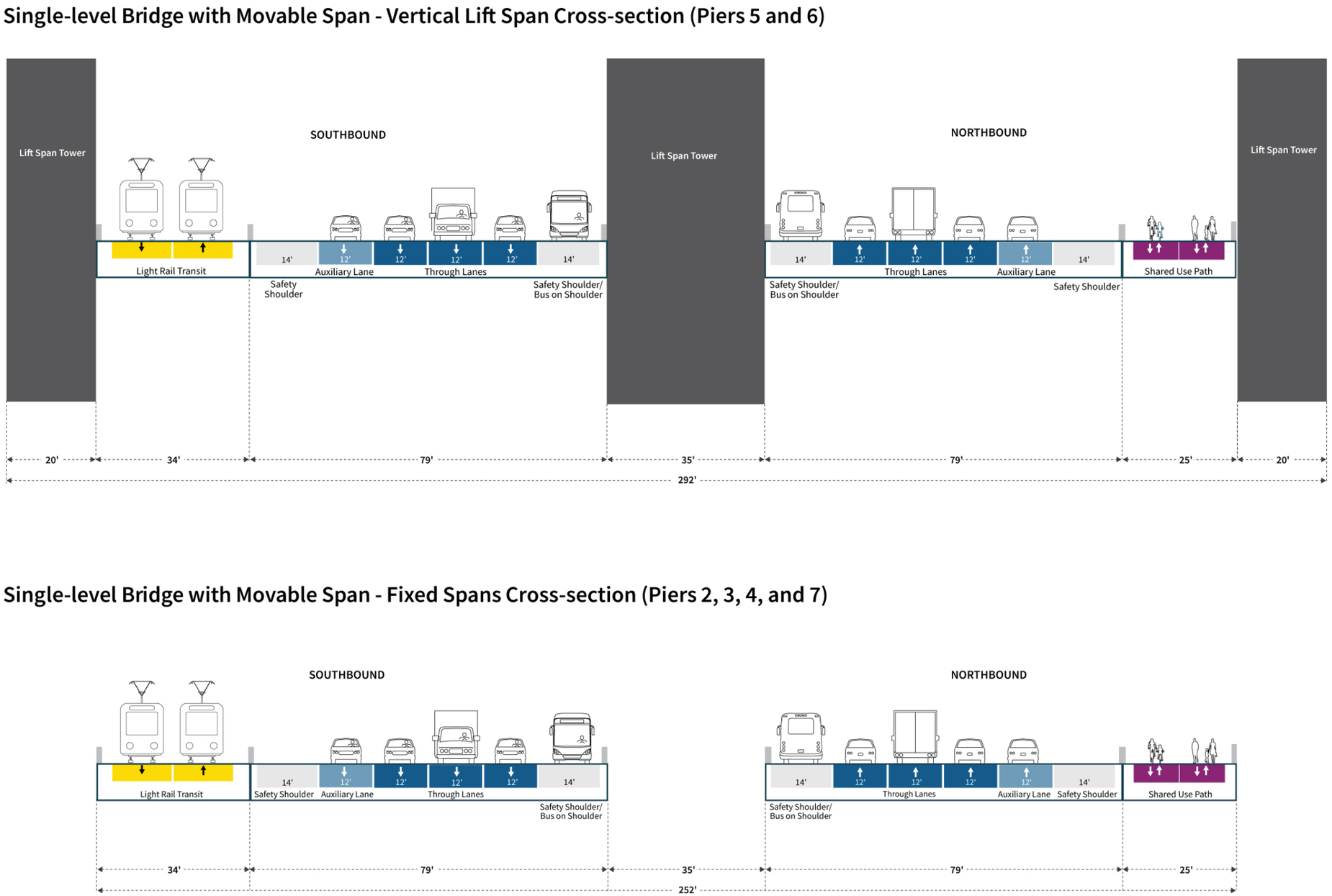
This single-level movable-span configuration would have an approximate grade of 3% on the Oregon side of the bridge and an approximate grade of 1.5% on the Washington side. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

Figure 2-19. Conceptual Drawings of Single-Level Movable-Span Configurations in the Closed and Open Positions

Visualizations are for illustration purposes only. They do not reflect property impacts or represent final design.

Note: Visualization is looking southeast (upstream) from Vancouver.

Figure 2-20. Typical Cross Section of the Single-Level Movable-Span Bridge Type



Notes: Design is not final and subject to change. Widths may vary with final design. The one auxiliary lane design option is used for illustration purposes. The two auxiliary lane design option would add approximately 8 feet to each bridge (i.e., 16 feet to the total width).

Bridge Configuration Comparison

This section summarizes and compares each of the bridge configurations. Table 2-3 lists the key considerations for each bridge configuration. Figure 2-21 compares each of the three bridge configurations' footprints with the one auxiliary lane design option (refer to Figure 2-5 for a comparison of the one and two auxiliary lane design options footprints). The footprints of each configuration would differ in only three locations: over the Columbia River and at the bridge landings on Hayden Island and Vancouver. The rest of the I-5 corridor would have the same footprint. Over the Columbia River, the footprint of the double-deck fixed-span configuration would be approximately 173 feet wide. Comparatively, the extradosed bridge type of the single-level fixed-span configuration would be approximately 272 feet wide (approximately 99 feet wider), and the single-level fixed-span configuration with a girder bridge type would be approximately 232 feet wide (approximately 59 feet wider). The single-level movable-span configuration would be approximately 252 feet wide (approximately 79 feet wider than the double-deck fixed-span configuration), except at Piers 5 and 6, where larger bridge foundations would require an additional width of approximately 40 feet to support the movable span. The single-level configurations would have a wider footprint at the bridge landings on Hayden Island and Vancouver because transit and active transportation would be located adjacent to the highway, rather than below the highway in the double-deck option.

Figure 2-22 compares the basic profile and elevation of each configuration. The single-level fixed-span configuration and the lower deck of the double-deck fixed-span would have similar elevations, but the upper deck of the double-deck bridge would be approximately 35 feet higher. The single-level movable-span configuration would have a lower profile than the fixed-span configurations when the span is in the closed position.

Figure 2-21. Bridge Configuration Footprint Comparison

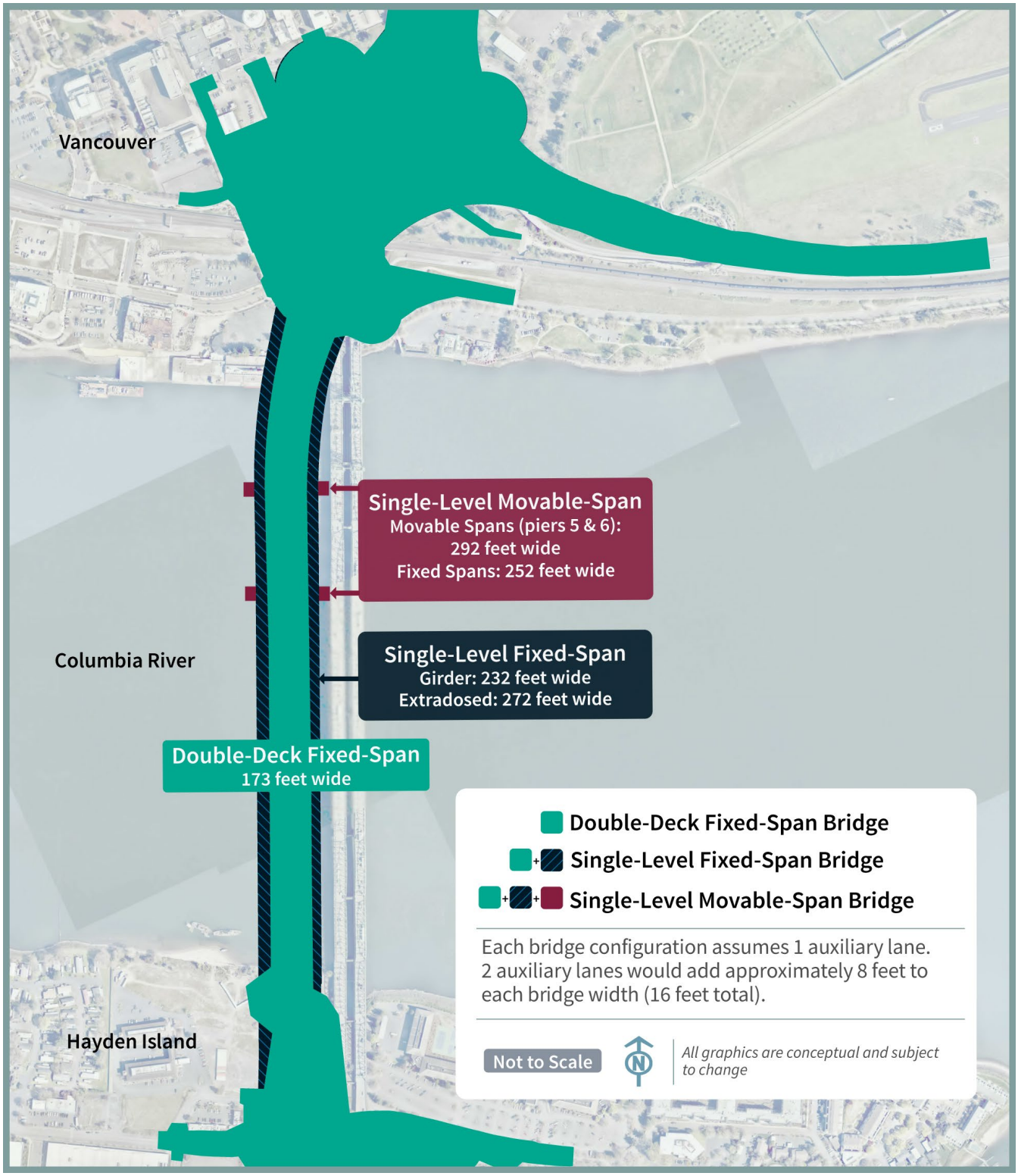
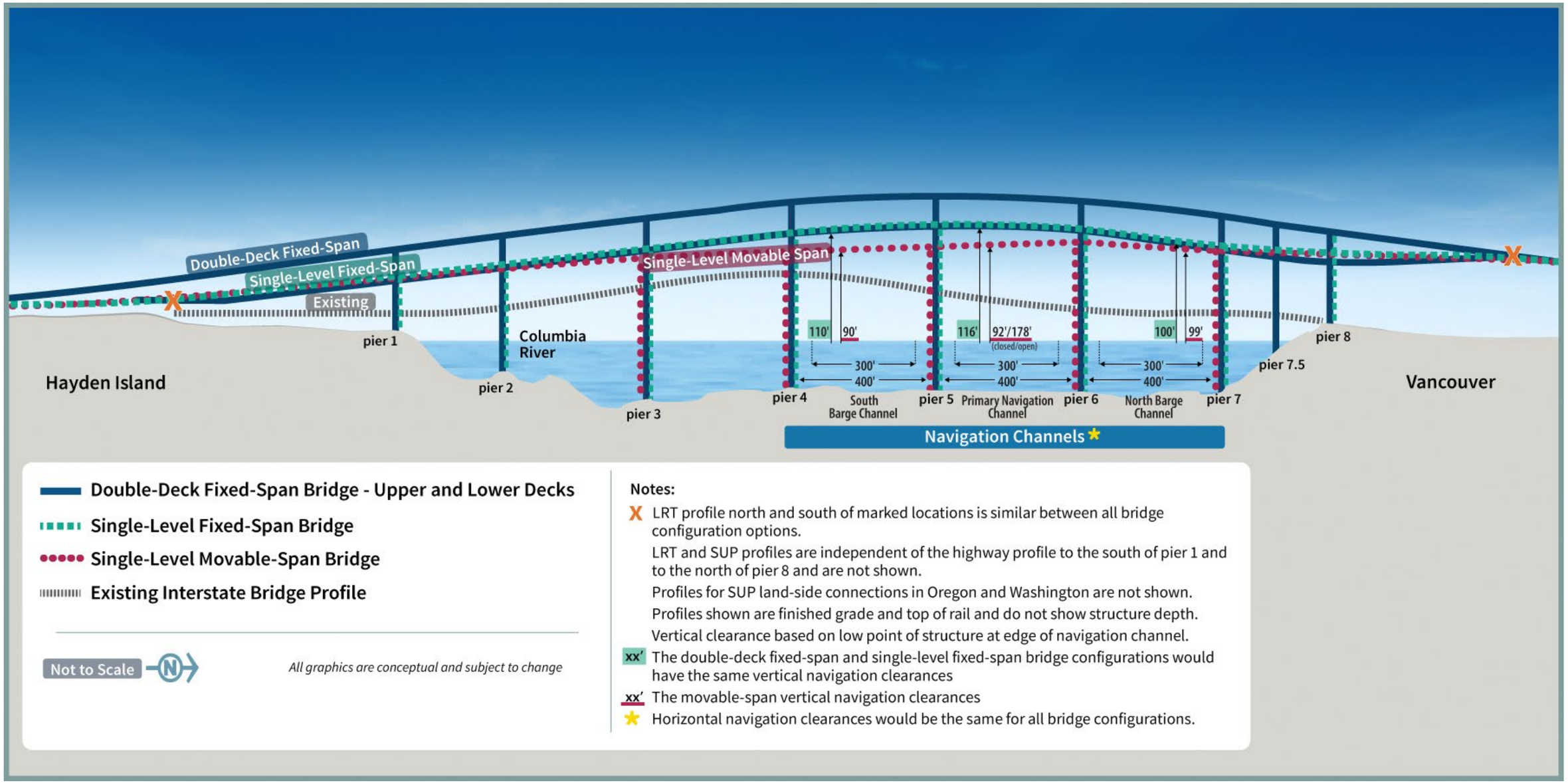


Figure 2-22. Bridge Configuration Profile Comparison



LRT = light-rail transit; SUP = shared-use path

Table 2-3. Summary of Bridge Configurations

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Bridge type	Steel through-truss spans	Double-deck steel truss	Single-level, concrete or steel girders, or extradosed	Single-level, steel girders with vertical lift span
Number of bridges	Two	Two	Two	Two
Movable-span type	Vertical lift span with counterweights.	N/A	N/A	Vertical lift span with counterweights
Movable-span location	Adjacent to Vancouver shoreline.	N/A	N/A	Between Piers 5 and 6 (approximately 500 feet south of the existing lift span)
Lift opening restrictions for vessels	Weekday peak AM and PM highway travel periods. [b] Typical bridge opening/gate closure durations are approximately 9 to 27 minutes depending on the purpose of the bridge lift (i.e., maintenance or vessel traffic) and lift elevation (i.e., partial lift or full lift). From 2007 to 2024, there was an average of 152 lifts per year (IBR 2025).	N/A	N/A	• Considering 2007–2024 trends in vessels transiting under the Interstate Bridge, there would be fewer bridge lifts compared to the No-Build Alternative due to increased vertical navigation clearance in the closed position (99 feet compared to 72 feet).

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
				• Additional restrictions to daytime bridge openings would be requested to consolidate fewer bridge openings outside of morning, midday, and evening peak hours when vehicle and transit demand is high in order to improve LRT on-time performance and system reliability and reduce highway congestion. Changes to bridge opening restrictions would require future federal rulemaking process and authorization by USCG (beyond the assumed No-Build Alternative bridge restrictions for peak AM and PM highway travel periods).[b]

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
				• Typical opening durations are assumed to be 9 to 18 minutes [c] for the purposes of impact analysis but would ultimately depend on various operational considerations related to vessel traffic and river and weather conditions. Additional time would also be required to stop traffic prior to opening and restart traffic after the bridge closes.
Out-to-out width [d]	138 feet total width.	~173 feet total width.	Girder: ~232 feet total width. Extradosed: 272 feet total width	• ~292 feet at the movable span • ~252 feet at the fixed spans
Deck widths	52 feet (SB) 52 feet (NB)	~79 feet (SB) ~79 feet (NB)	Girder: • ~113 feet (SB) • ~104 feet (NB) Extradosed: • ~133 feet (SB) • ~124 feet (NB)	~113 feet (SB) ~104 feet (NB)
Vertical navigation clearance	Primary navigation channel: • 39 feet when closed • 178 feet when open Barge channel: • 46 feet to 70 feet Alternate barge channel: • 72 feet	Primary navigation channel: • 116 feet maximum North barge channel: • 100 feet maximum South barge channel: • 110 feet maximum	• Primary navigation channel: • 116 feet maximum. North barge channel: • 100 feet maximum South barge channel: • 110 feet maximum	• Primary navigation channel: • Closed position: ~90 feet. Open position: 178 feet North barge channel: • ~99 feet maximum South barge channel: • ~90 feet maximum

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Horizontal navigation clearance	• 263 feet for primary navigation channel • 511 feet for barge channel • 260 feet for alternate barge channel	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)	400 feet for all navigation channels (300-foot USACE authorized channel plus a 50-foot channel maintenance buffer on each side)
Maximum height of bridge component (elevation relative to NAVD 88)[e]	247 feet at top of lift tower	~166 feet	Girder: ~137 feet. Extradosed: ~179 feet at top of pylons	~243 feet at top of lift tower
Movable span length (from center of pier to center of pier)	278 feet	N/A	N/A	450 feet
Number of in-water pier sets	Nine	Six	Six	Six
Number of in-water drilled shafts	N/A	72	96	108
Shaft cap sizes	N/A	50 feet by 85 feet	50 feet by 230 feet	• Piers 2, 3, 4, and 7: 50 feet by 230 feet • Piers 5 and 6: 50 feet by 312 feet (one combined footing at each location to house tower/equipment for the lift span)
Conceptual vertical grade [f]	4.8%	~4% on the Washington side ~4% on the Oregon side	~3% on the Washington side. ~3% on the Oregon side	~1.5% on the Washington side. ~3% on the Oregon side
Light-rail transit location	N/A	Below highway on SB bridge	West of highway on SB bridge	West of highway on SB bridge
Express bus	Shared roadway lanes	Inside shoulder of NB and SB (upper) bridges	Inside shoulder of NB and SB bridges	Inside shoulder of NB and SB bridges

Component	No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration	Modified LPA with Single-Level Fixed-Span Configuration [a]	Modified LPA with Single-Level Movable-Span Configuration
Shared-use path location	Sidewalk adjacent to roadway in both directions	Below highway on NB bridge	East of highway on NB bridge	East of highway on NB bridge

All dimensions and quantities are approximate.

a When different bridge types are not mentioned, data applies to both bridge types under the single-level fixed-span bridge configuration.

b The No-Build Alternative assume existing conditions that restrict bridge openings during weekday peak periods (Monday through Friday 6:30 a.m. to 9 a.m.; 2:30 p.m. to 6 p.m., excluding federal holidays). For the Modified LPA with a single-level movable-span bridge configuration design option, additional timing restrictions, which would increase restrictions on the timing for and duration of bridge openings, except for emergencies, would be requested and coordinated with the USCG. Bridge openings would be required for vessels and/or cargo with heights greater than 72 feet under the No-Build Alternative; whereas, bridge openings for vessels and/or cargo requiring more than 99 feet of clearance would be required for the Modified LPA with the movable-span bridge configuration design option.

c For the purposes of the transportation analysis in this Final SEIS (Section 3.1, Transportation), the movable-span opening time is assumed to be an average of 13.2 minutes.

d "Out-to-out width" is the measurement between the outside edges of both northbound and southbound bridge across its width at the widest point and includes the space between the two bridges. The deck width is the measurement of the outer edges of either the northbound bridge or the southbound bridge.

e NAVD 88 (North American Vertical Datum of 1988) is a vertical control datum (reference point) used by federal agencies for surveying.

f The maximum allowable vertical grade according to ODOT and WSDOT standards on the I-5 mainline is 4%.

I-5 = Interstate 5; LPA = Locally Preferred Alternative; LRT = light-rail transit; N/A = not applicable; NAVD 88 = North American Vertical Datum of 1988; NB = northbound; ODOT = Oregon Department of Transportation; SB = southbound; SEIS = Supplemental Environmental Impact Statement; USACE = U.S. Army Corps of Engineers; USCG = U.S. Coast Guard; WSDOT = Washington State Department of Transportation

2.2.4 Downtown Vancouver (Subarea C)

This section discusses the geographic Subarea C (Figure 2-3 shows an overview of the geographic subareas). Figure 2-23 shows highway and interchange improvements in Subarea C.

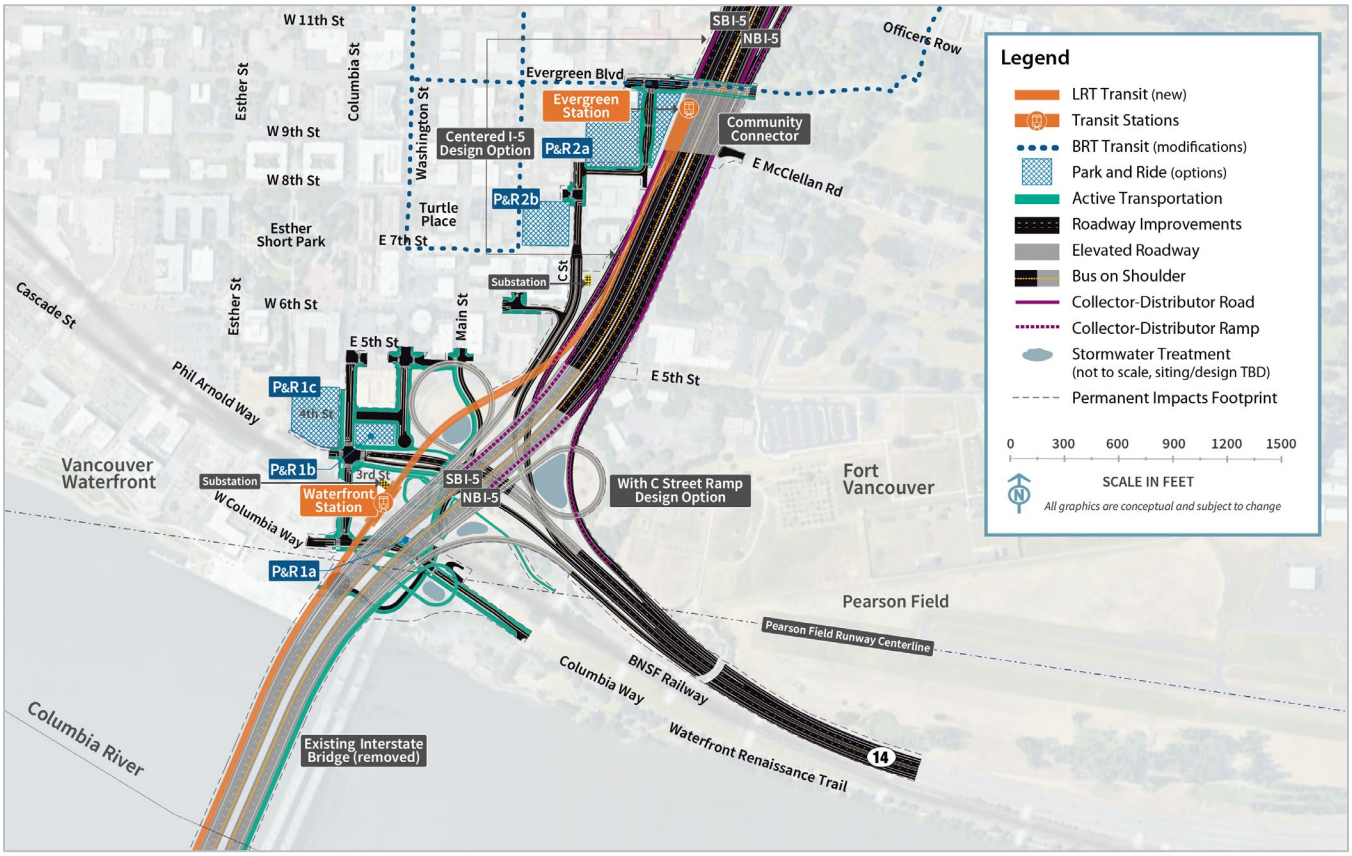
Highways, Interchanges, and Local Roadways

North of the Columbia River bridges in downtown Vancouver, improvements are proposed to the SR 14 interchange (Figure 2-23).

SR 14 Interchange/Downtown Vancouver

The new Columbia River bridges would touch down just north of the SR 14 interchange (Figure 2-23). The function of the SR 14 interchange configuration would remain essentially the same as it is now, but the interchange would be elevated to meet the new Columbia River bridges that cross over the BNSF Railway tracks. Direct connections between I-5 and SR 14 would be rebuilt. Access to and from downtown Vancouver would be provided as it is today, but the connection points would be relocated. Access from downtown Vancouver to eastbound SR 14 would be relocated from the Washington Street and W 5th Street intersection to a new intersection at Columbia Street and W 3rd Street. Access from westbound SR 14 would also be shifted from C Street to the new Columbia Street and W 3rd Street intersection. Access from downtown Vancouver to southbound I-5 would be relocated from the Washington Street and W 5th Street intersection to C Street. Access from northbound I-5 to downtown Vancouver would remain at C Street. Connections to downtown Vancouver would vary under the two design options under consideration for this area (with C Street ramps and without C Street ramps), as detailed below.

Figure 2-23. Downtown Vancouver (Subarea C)



BRT = bus rapid transit; LRT = light-rail transit; NB = northbound; P&R = park and ride; SB = southbound

Main Street would be extended between 5th Street and Columbia Way. Vehicles traveling from downtown Vancouver to access SR 14 eastbound would use the new extension of Main Street to the intersection underneath I-5. If coming from the west or south (waterfront) in downtown Vancouver, vehicles would use the Phil Arnold Way/3rd Street extension to the intersection, then continue to SR 14 eastbound. The existing Columbia Way roadway under I-5 would be realigned to the north of its existing location and would intersect both the new Main Street extension and Columbia Street with T intersections.

In addition, the existing overcrossing of I-5 at Evergreen Boulevard would be reconstructed.

What's changed with IBR?

The CRC project did not evaluate options to eliminate the C Street ramps or shift the I-5 mainline westward. Both options are included in the IBR Program in response to federal and state coordination that required analysis of options to reduce or shift the footprint and associated direct and temporary impacts in Vancouver.

C Street Ramp Design Options

With C Street Ramps – Recommended Design Option

The design option with C Street ramps would provide access to and from downtown Vancouver similar to existing conditions but with some of the connection points relocated. Access from northbound I-5 to downtown Vancouver would be rebuilt in the same location as the current connection. Downtown Vancouver I-5 access to and from the south would be consolidated at C Street with SR 14 connections to and from downtown at Columbia Street/W 3rd Street (Figure 2-24).

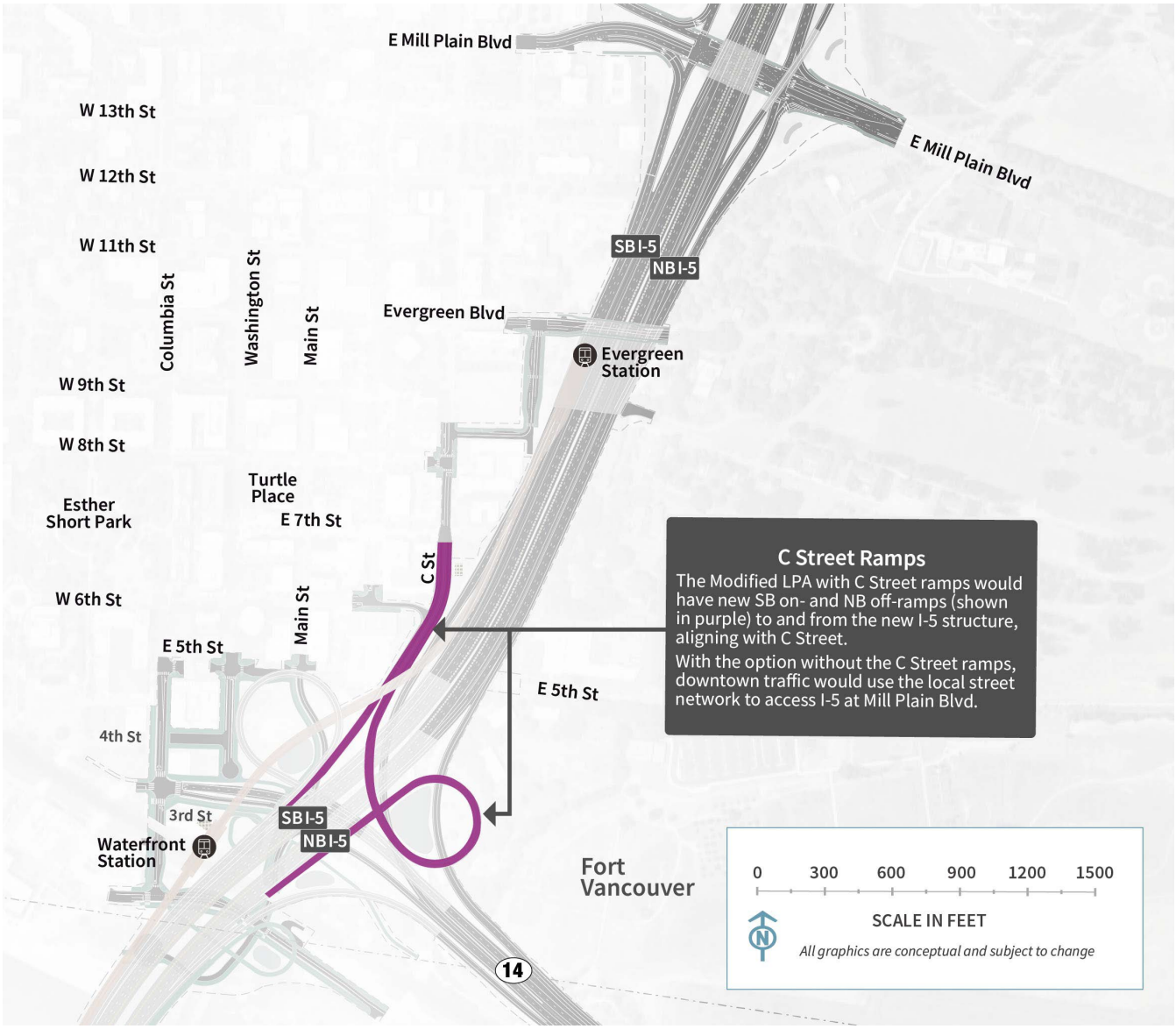
Without C Street Ramps

Under this design option, downtown Vancouver I-5 access to and from the south would be through the Mill Plain interchange rather than C Street. There would be no eastside loop ramp from northbound I-5 to C Street and no directional ramp on the west side of I-5 from C Street to southbound I-5. The existing eastside loop ramp would be removed. This option would reduce the footprint of the Modified LPA in this area.

The IBR Program recommends advancing the with C Street ramps design option. Both C Street ramp design options would provide important benefits to highway operations and safety and have similar impacts to many other resources, particularly the natural environment. While there would be some short-term construction cost savings and reduced visual impacts without C Street ramps, there would be greater impacts to local traffic as traffic that would have used the C Street ramps would be routed to the Mill Plain interchange, thereby increasing traffic volumes on the local street network and requiring additional mitigation. Both design options received a mix of positive and negative feedback from the public; however, there were more comments in support of the with C Street ramps design option. The with C Street ramps design option also has more support from the local partner agencies.

See Appendix K for additional details on the Recommended Design Options.

Figure 2-24. Modified LPA with C Street Ramps



I-5 Alignment Design Options

Centered I-5 – Recommended Design Option

This design option would maintain the location of the existing I-5 mainline alignment through downtown Vancouver between the SR 14 interchange and the Mill Plain Boulevard interchange.

I-5 Shifted West

This design option would shift the I-5 mainline and ramps approximately 40 feet to the west between SR 14 and Mill Plain Boulevard.

The IBR Program recommends advancing the centered I-5 alignment design option. Both I-5 mainline alignments would provide important benefits to highway operations and safety and have similar impacts to many other resources, particularly the natural environment. The westward shift design option would notably increase acquisitions resulting in the displacement of an additional three businesses (with approximately 140 employees) and 33 residential units, and the physical removal of the historic Normandy Apartments. However, the westward shift would reduce the area of acquisition and other impacts to the Vancouver National Historic Reserve (VNHR) Historic District (which includes the Fort Vancouver NHS). While some public comments noted the reduced impacts to the VNHR Historic District from the westward shift design option, others raised concerns about its effects on safety, congestion, and increased residential and business displacements.

See Appendix K for additional details on the Recommended Design Options.

Collector-Distributor Roadways

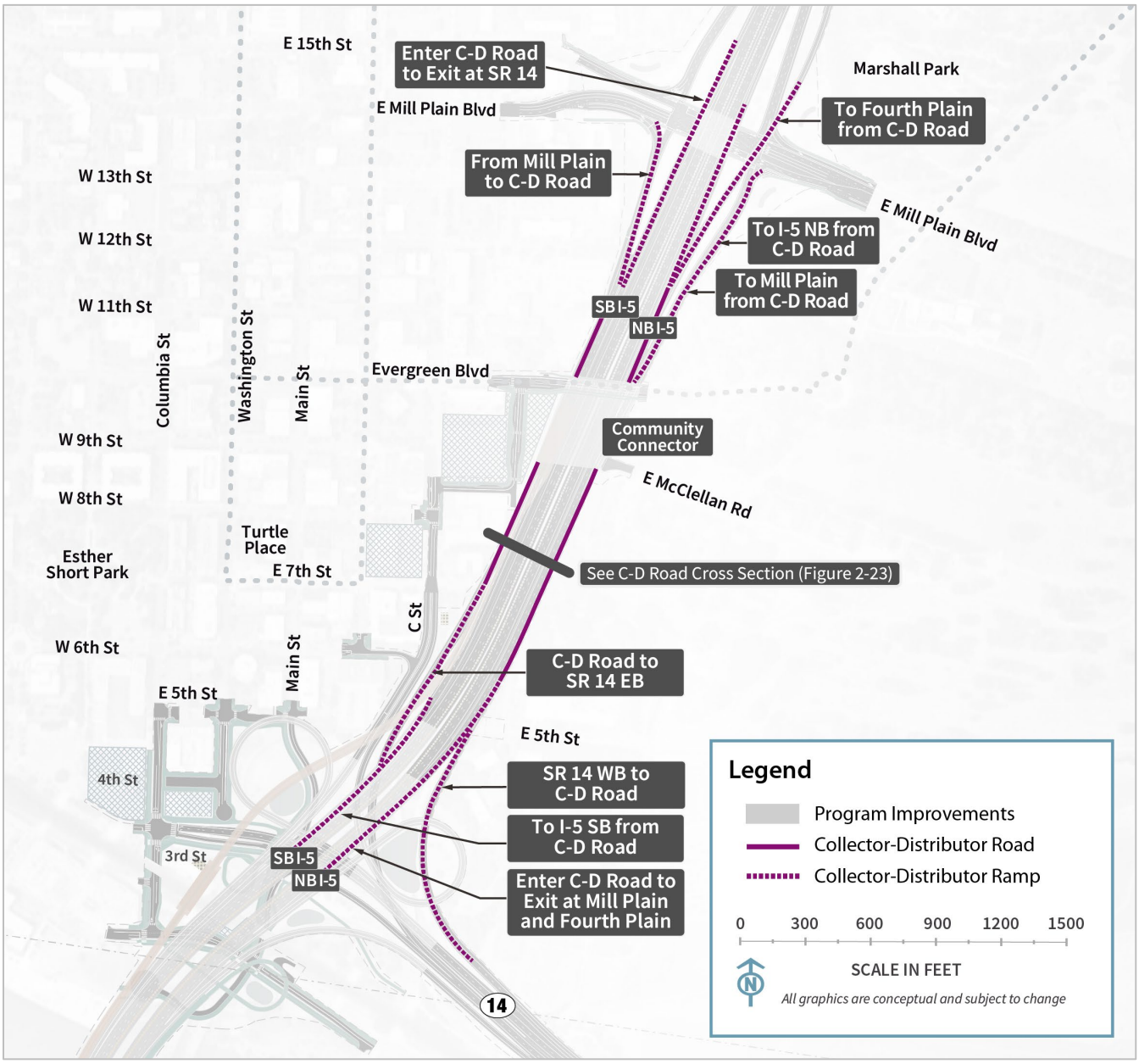
Figure 2-25 shows the location of the collector-distributor (C-D)[17] roadways in downtown Vancouver, and Figure 2-26 shows a typical cross section of the C-D roadways.

The on-ramp from SR 14 westbound would join the I-5 northbound off-ramp to Mill Plain/Fourth Plain Boulevard, forming the northbound C-D roadway between SR 14 and Fourth Plain Boulevard. The C-D roadway would provide access from northbound I-5 to the off-ramps at Mill Plain Boulevard and Fourth Plain Boulevard. The C-D roadway would also provide access from SR 14 westbound to the off-ramps at Mill Plain Boulevard and Fourth Plain Boulevard, and to the on-ramp to I-5 northbound.

On southbound I-5, the off-ramp to SR 14 would join the southbound I-5 on-ramp from Mill Plain Boulevard to form a C-D roadway. The C-D roadway would provide access from southbound I-5 to the off-ramp to eastbound SR 14 and from Mill Plain Boulevard to the off-ramp to eastbound SR 14 and the on-ramp to southbound I-5.

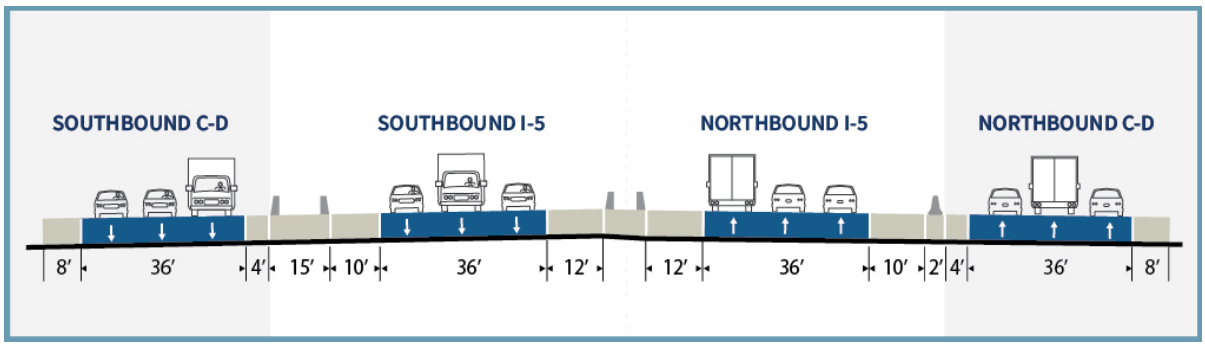
[17] A collector-distributor roadway parallels and connects the main travel lanes of a highway and frontage roads or entrance ramps.

Figure 2-25. Collector-Distributor Roadways



C-D = collector-distributor; EB = eastbound; NB = northbound; SB = southbound; WB = westbound

Figure 2-26. Typical Cross Section of the Collector-Distributor Roadways



The location of this cross-section is shown on Figure 2-25.

Transit

Light-Rail Alignment and Stations

Under the Modified LPA, the light-rail tracks would exit the highway bridge and be on their own bridge along the west side of the I-5 mainline after crossing the Columbia River (Figure 2-23). The light-rail bridge would cross over the BNSF Railway tracks. An elevated light-rail station near the Vancouver waterfront (Waterfront Station) would be situated near the overcrossing of the BNSF tracks between Columbia Way and 3rd Street. Access to the elevated station would be primarily by elevator because the station would be situated approximately 90 feet above existing ground level. A stairwell(s) would be provided for emergency egress. The number of elevators and stairwells provided would be based on the ultimate platform configuration, station location relative to the BNSF trackway, projected ridership, and fire and life safety requirements. Passenger drop-off facilities would be located at ground level and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Waterfront Station. A new TPSS would be constructed north of the transit platform. The elevated light-rail tracks would continue north, cross over the westbound SR 14 on-ramp and the C Street/6th Street on-ramp to southbound I-5, and- then straddle the southbound I-5 C-D roadway. Transit components in the downtown Vancouver area would be similar between the C Street ramp and I-5 westward shift design options discussed above.

What's changed with IBR?

In response to changes in community and local agencies' priorities, and to reduce property and streetscape impacts compared to the CRC LPA, the light-rail alignment proposed in the Modified LPA was realigned to run along the west side of I-5 along an elevated structure in Vancouver, with an elevated station at the Vancouver waterfront and an at-grade station near Evergreen Boulevard, adjacent to the Community Connector. In the CRC LPA, the light-rail alignment would have used a stand-alone structure from the Columbia River bridges to transition to/from at-grade tracks along Washington and Broadway Streets, with stations in downtown Vancouver at 9th and 15th Streets. The CRC LPA light-rail alignment would then have extended into upper Vancouver and turned east on 17th Street, terminating at Clark College (east of I-5 on McLoughlin Boulevard).

The Modified LPA was developed in close coordination with C-TRAN, TriMet, and the City of Vancouver and was informed by extensive community input and data. A terminus at Evergreen maximizes transfer opportunities given the direct connections to several local bus routes, as well as planned BRT routes.

North of the Waterfront Station, the light-rail tracks would continue to the Evergreen Station, which would be the terminus of the light-rail extension (Figure 2-23). The light-rail tracks from downtown Vancouver to the terminus would be entirely on an elevated structure supported by single columns, where feasible, or by straddle bents[18] on either side of the roadway where needed. The Evergreen Station would be located at the same elevation as Evergreen Boulevard and the proposed Community Connector, and it would provide connections to the existing C-TRAN BRT system. Passenger drop-off facilities would be near the station and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Evergreen Station. A new TPSS would be located on the south side of 7th Street, approximately 750 feet south of Evergreen Station.

[18] A straddle bent is a type of bridge support structure that "straddles" vehicle lanes and supports a flyover ramp.

Park and Rides

The Modified LPA would provide parking capacity to accommodate 1,270 vehicles at designated park and rides in Vancouver along the LRT alignment (Figure 2-23) located near the Waterfront and Evergreen LRT stations. Parking capacity would be provided for 570 vehicles near the Waterfront Station and for 700 vehicles near the Evergreen Station.

The park and rides would be designed to accomplish the following:

- Support transit ridership.
- Promote station access by walking, biking, rolling, and transit.
- Support City of Vancouver objectives to increase mobility and access for a vibrant downtown.
- Include existing parking facilities in downtown Vancouver to help meet the projected demand for park and rides in areas where City of Vancouver studies show surplus parking supply.

Additional information regarding the park and rides can be found in Section 3.1, Transportation, and the Transportation Technical Report.

As presented in the Draft SEIS, the Modified LPA would provide parking capacity for LRT riders by locating a single park and ride near the Waterfront Station with approximately 570 parking spaces; three sites were considered for this facility. Similarly, a single park and ride near the Evergreen Station would provide approximately 700 parking spaces; two sites were considered. Based on further design analysis, public comment received on the Draft SEIS, and coordination with local agencies, the approach to providing parking capacity for LRT riders was adjusted to focus on dispersed parking across more facilities, including using all three sites previously identified near the Waterfront Station and both sites previously identified near the Evergreen Station. The approach to disperse parking capacity across more sites would correlate to smaller sites in terms of structure size above or below ground.

The sites under consideration are described below, and the evaluation of impacts and benefits to developing a single, large park and ride at each of the two LRT station or five smaller park and rides are evaluated in Chapter 3.

Park and rides can expand the catchment area of public transit systems (the geographic area from which a station draws ridership), making transit more accessible to people who live farther away from fixed-route transit service, and attracting new riders who might not have considered using public transit otherwise.

What's changed with IBR?

The park-and-ride options have changed from the CRC LPA due to the change in LRT alignment and new development in Vancouver. The CRC LPA had three park and rides: Columbia (near the SR 14 interchange), Mill Plain (in uptown Vancouver), and Clark (on McLoughlin Boulevard near Clark College). Under the Modified LPA, the Columbia (Waterfront Station) park and ride was modified because of new development at the CRC LPA site. The other park and rides were modified because of the change in the LRT terminus to Evergreen Boulevard in Vancouver, instead of Clark College in Vancouver, which was the light-rail terminus under the CRC LPA. C-TRAN has also implemented Bus Rapid Transit and related services, and downtown Vancouver land uses are increasingly more dense and transit-supportive.

Waterfront Station Park and Rides

Studies included in Appendix D have shown the need for park-and-ride capacity to accommodate 570 vehicles in the vicinity of the Waterfront Station. Three possible sites are analyzed in this SEIS (see Figure 2-23):

- 1a. Columbia Way (below I-5). This 0.75-acre site could be developed as a new aboveground one-level parking structure. Access would be via Columbia Way. It could support approximately 70 parking spaces.
- 1b. Columbia Street/SR 14. This 0.50-acre site could be developed as a new aboveground six-level structure along the east side of Columbia Street and north of the SR 14 westbound off-ramp. Access would be via Washington Street. It could accommodate approximately 250 parking spaces. To provide all 570 parking spaces at this site, the structure would need to be 10 to 12 levels.
- 1c. Columbia Street/Phil Arnold Way (Waterfront Gateway Site). This 1.5-acre site could be developed as a new surface lot along the west side of Columbia Street, north of Phil Arnold Way. Access would be via Phil Arnold Way. A surface lot would provide approximately 250 parking spaces. To provide all 570 parking spaces at this site, a new four-level structure would be needed.

Evergreen Station Park and Rides

Studies included in Appendix D have shown the need for park and rides to accommodate 700 vehicles in the vicinity of the Evergreen Station. Two possible sites are analyzed in this SEIS (see Figure 2-23):

- 2a. Library Square. This 3.2-acre site could be developed as a new underground three- to four-level structure east of C Street and south of Evergreen Boulevard. It could accommodate approximately 400 parking spaces. To provide all 700 parking spaces at this site, the structure would require seven or more levels below ground.[19] This site could be combined with Site 2b to provide a total of 700 spaces.

The IBR Program recommends advancing 1,270 park-and-ride spaces dispersed across five sites in Vancouver along the light rail alignment, including three sites near the Waterfront Station and two sites near the Evergreen Station. All of the park and rides would provide similar benefits to the community by increasing the transit stations' catchment areas and making transit more accessible. There could be minor localized differences in traffic patterns and transit ridership depending on the location of spaces. Dispersing the 1,270 parking spaces across five park and rides rather than concentrating the spaces at a single location each near the Waterfront Station and Evergreen Station would promote compatibility with local planning goals and plans for multiuse development, multimodal access, and attractive public spaces. As the FTA's Capital Investment Grant process progresses, the IBR Program team will refine the Program's transit components, which will contribute to further information on parking needs to support transit ridership.

Studies (Appendix D) leading to the Modified LPA in 2022 evaluated a mix of light-rail station sites and park and rides and found that 1,270 spaces serving the Waterfront and Evergreen Stations, combined with bus, and active transportation improvements, would attract the most riders.

See Appendix K for additional details on the Recommended Design Options.

[19] The maximum depth of an underground parking structure at Library Square is provided for comparative purposes only. An underground parking structure would likely not exceed 3 or 4 levels due to engineering and environmental constraints.

- 2b. Columbia Credit Union. This approximately 1-acre site is an existing parking structure/commercial building and provides an estimated 400 parking spaces to current users on four levels aboveground. The parking capacity would not be exclusively available for transit users; however, up to 300 spaces could be used for transit riders. This site could be combined with Site 2a to provide a total of 700 spaces.

Active Transportation

Within the downtown Vancouver area, the shared-use path on the northbound (or eastern) bridge would exit the bridge at the SR 14 interchange, loop down on the east side of I-5 via a vertical helix path, cross back below I-5 to the west side of I-5, run beneath the elevated light-rail crossing over BNSF, and then loop down to connect to the Main Street extension at the intersection underneath I-5 with connections to the Waterfront Station from the active transportation facilities. Connections to the Waterfront Renaissance Trail would be made by facilities along Main Street and Columbia Way (Figure 2-23). Access would be provided across state right of way beneath the new bridges to provide a connection between the recreational areas along the City's Columbia River waterfront east of the bridges and existing and future waterfront uses west of the bridges.

Active transportation components in the downtown Vancouver area would be similar for all design options.

As part of the Modified LPA, a Community Connector is proposed to be built over I-5 just south of Evergreen Boulevard and east of the Evergreen Station (Figure 2-23). The structure is proposed to include off-street pathways for active transportation modes including pedestrians, bicyclists, and other micro-mobility modes, and public space and amenities to support the active transportation facilities with connections to the Evergreen Station from the active transportation facilities. The primary intent of the Community Connector is to improve connections between downtown Vancouver on the west side of I-5 and the Vancouver National Historic Reserve on the east side.

2.2.5 Upper Vancouver (Subarea D)

This section discusses the geographic Subarea D (Figure 2-3 for an overview of the geographic subareas). Figure 2-27 shows all highway and interchange improvements in Subarea D.

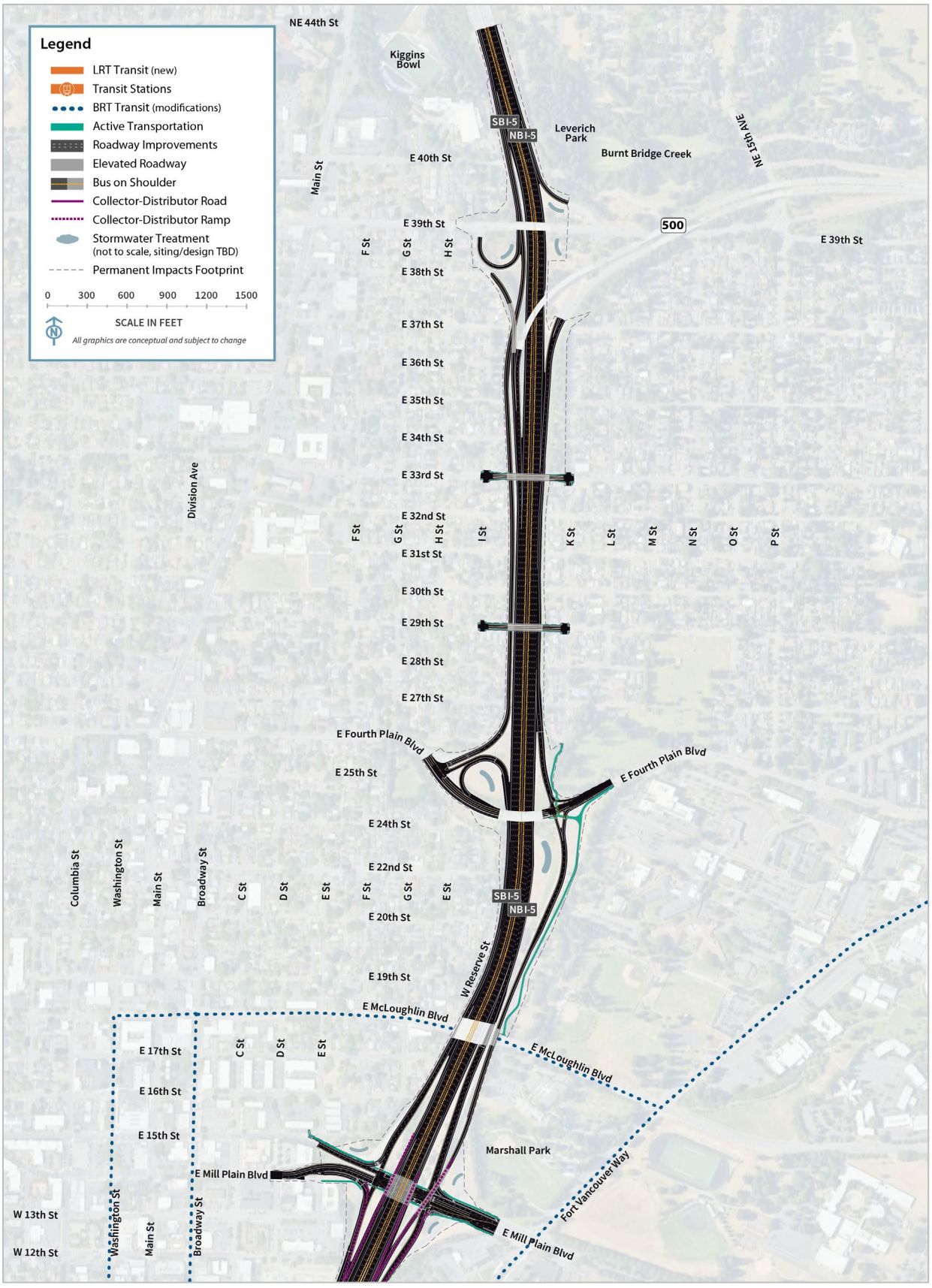
Highways, Interchanges, and Local Roadways

Within the upper Vancouver area, the IBR Program proposes improvements to three interchanges—Mill Plain, Fourth Plain, and SR 500—as described below.

Mill Plain Boulevard Interchange

The Mill Plain Boulevard interchange is north of the SR 14 interchange (see Figure 2-27). This interchange would be reconstructed as a tight-diamond configuration but would otherwise remain similar in function and footprint to the existing interchange. The ramp terminal intersections would be sized to accommodate high, wide, heavy freight vehicles that travel between the Port of Vancouver and I-5. The off-ramp from I-5 northbound to Mill Plain Boulevard would diverge from the C-D road that would continue north, crossing over Mill Plain Boulevard, to provide access to Fourth Plain Boulevard via a C-D roadway. The off-ramp to Fourth Plain Boulevard would be reconstructed and would cross over Mill Plain Boulevard east of I-5, similar to the way it functions today.

Figure 2-27. Upper Vancouver (Subarea D)



BRT = bus rapid transit; LRT – light-rail transit; TBD = to be determined

Fourth Plain Boulevard Interchange

At the Fourth Plain Boulevard interchange (Figure 2-27), improvements would include reconstruction of the I-5 ramp terminal intersections. The existing bridge for Fourth Plain Boulevard over I-5 would be retained. Northbound I-5 traffic exiting to Fourth Plain Boulevard would first exit to the northbound C-D roadway, which provides off-ramp access to Fourth Plain Boulevard and Mill Plain Boulevard. The westbound SR 14 to northbound I-5 on-ramp also joins the northbound CD roadway before continuing north past the Fourth Plain Boulevard and Mill Plain Boulevard off-ramps as an auxiliary lane. The southbound I-5 off-ramp to Fourth Plain Boulevard would be braided below the 39th Street on-ramp to southbound I-5. This change would eliminate the existing nonstandard weave between the SR 500 interchange and the off-ramp to Fourth Plain Boulevard. It would also eliminate the existing westbound SR 500 to Fourth Plain Boulevard off-ramp connection. The existing overcrossing of I-5 at 29th Street would be reconstructed to accommodate a widened I-5, provide adequate vertical clearance over I-5, and provide pedestrian and bicycle facilities.

SR 500/39th Street Interchange Area

The northern terminus of the I-5 improvements would be in the SR 500 interchange area (Figure 2-27). The improvements would primarily be to connect the Modified LPA to existing ramps. The off-ramp from I-5 southbound to 39th Street would be reconstructed to establish the beginning of the braided ramp to Fourth Plain Boulevard and restore the loop ramp to 39th Street. Ramps from existing I-5 northbound to SR 500 eastbound and from 39th Street to I-5 northbound would be partially reconstructed. The existing bridges for 39th Street over I-5 and SR 500 westbound to I-5 southbound would be retained. The 39th Street to I-5 southbound on-ramp would be reconstructed and braided over (i.e., grade separated or pass over) the new I-5 southbound off-ramp to Fourth Plain Boulevard.

The existing overcrossing of I-5 at 33rd Street would also be reconstructed to accommodate a widened I-5, provide adequate vertical clearance over I-5, and provide pedestrian and bicycle facilities.

Transit

There would be no LRT facilities in upper Vancouver. Proposed operational changes to bus service, including I-5 bus-on-shoulder service, are described in Section 2.2.7, Transit Operating Characteristics.

What's changed with IBR?

The Modified LPA design at the SR 500 interchange is similar to the CRC LPA, although the CRC LPA would have contained future phased options to construct new direct connections between I-5 and SR 500 to and from the north including a northbound on-ramp and southbound off-ramp, and a tunnel beneath I-5. In response to changes in local agencies' priorities, the Modified LPA does not include these connections to and from the north. The CRC 2013 NEPA re-evaluation also considered a phased construction option that would have limited improvements to the existing SR 500 interchange ramps. The Modified LPA would have the same limited improvements to the SR 500 interchange.

What's changed with IBR?

The Modified LPA design at the SR 500 interchange is similar to the CRC LPA, although the CRC LPA would have contained future phased options to construct new direct connections between I-5 and SR 500 to and from the north including a northbound on-ramp and southbound off-ramp, and a tunnel beneath I-5. In response to changes in local agencies' priorities, the Modified LPA does not include these connections to and from the north. The CRC 2013 NEPA re-evaluation also considered a phased construction option that would have limited improvements to the existing SR 500 interchange ramps. The Modified LPA would have the same limited improvements to the SR 500 interchange.

Active Transportation

Several active transportation improvements would be made in Subarea D consistent with City of Vancouver plans and policies. On the east side of I-5, a new shared-use path would connect E McLoughlin Boulevard to Fourth Plain Boulevard. At the Fourth Plain Boulevard interchange, there would be improvements to provide better bicycle and pedestrian mobility and accessibility; these include bicycle lanes, neighborhood connections, and a connection to the City of Vancouver's planned two-way cycle track on Fourth Plain Boulevard. The reconstructed overcrossings of I-5 at 29th Street and 33rd Street would provide pedestrian and bicycle facilities on those cross streets. No new active transportation facilities are proposed in the SR 500 interchange area. Active transportation improvements at the Mill Plain Boulevard interchange include buffered bicycle lanes and sidewalks, pavement markings, lighting, and signing.

What's changed with IBR?

The Modified LPA's active transportation improvements in upper Vancouver are similar to those proposed in the CRC LPA. However, the Modified LPA includes a connection to the city of Vancouver's planned two-way cycle track on Fourth Plain Boulevard that was not yet proposed when the CRC Final EIS was completed.

2.2.6 Transit Support Facilities

Ruby Junction Light-Rail OMF Expansion

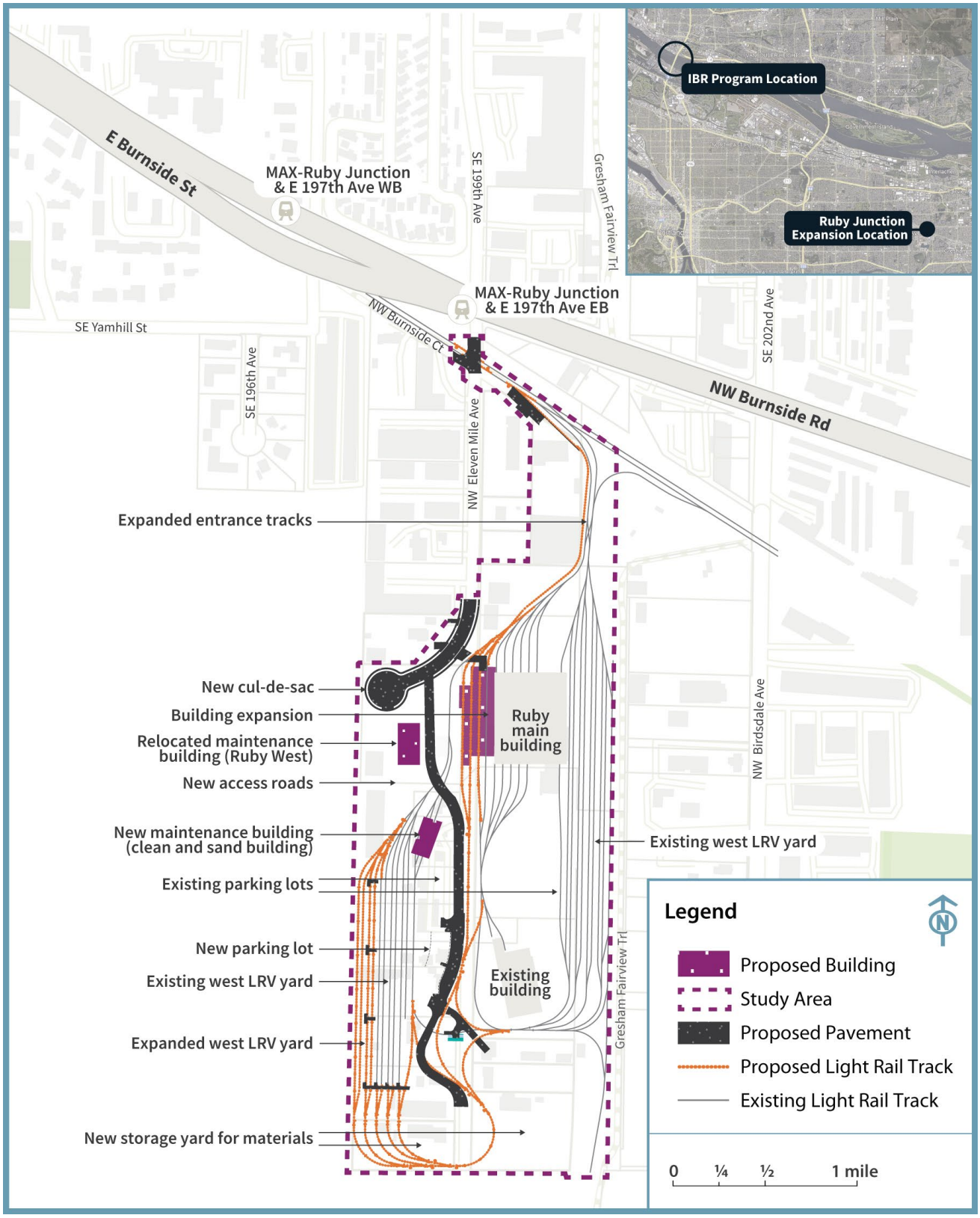
The TriMet Ruby Junction Light-Rail OMF in Gresham, Oregon, would be expanded to accommodate the additional LRVs associated with the Modified LPA's LRT service (the Ruby Junction location relative to the study area is shown in Figure 2-28). Improvements would include additional storage tracks for LRVs and maintenance materials and supplies; expanded LRV maintenance bays, expanded parking and employee support areas for additional personnel; an additional maintenance building for daily cleaning and periodic weather-dependent treatments for LRV maintenance, demolition, and relocation of a maintenance building (Ruby West); tenant improvements and new structures for affected operations; and a third lead track at the northern entrance to the Ruby Junction Light-Rail OMF. Adjacent parcels would be acquired to accommodate maintenance and storage needs required for or impacted by the Modified LPA. Figure 2-28 shows the proposed footprint of the expansion.

What's changed with IBR?

The Modified LPA would expand the TriMet Ruby Junction Light-Rail OMF to accommodate additional LRVs. The CRC LPA also would have expanded Ruby Junction; some of that expansion was completed in the years following the CRC ROD through other projects. The changes described with the Modified LPA include both new and previously proposed elements that have not already been completed to accommodate planned LRT service associated with the IBR Program.

The existing main building would be expanded west to provide additional maintenance bays. Today, Eleven Mile Avenue extends from NW Burnside Road and dead ends at the southern limits of the existing OMF. To make space for the building expansion, the existing Eleven Mile Avenue public right of way would be vacated and would terminate in a new cul-de-sac west of the main building. A new cul-de-sac would be required to meet City of Gresham code requirements for fire access and turnaround. New internal/non-public access roads would be constructed to maintain access to TriMet buildings south of the cul-de-sac; these would impact an existing maintenance building (Ruby West), which would be demolished and rebuilt within Ruby Junction Light-Rail OMF.

Figure 2-28. Ruby Junction Light-Rail Operations and Maintenance Facility Study Area



EB = eastbound; LRV = light-rail vehicle; WB = westbound

The existing western LRV storage yard, west of Eleven Mile Avenue, would be expanded to the west to accommodate additional storage tracks and a runaround track (a track constructed to bypass congestion in the maintenance yard). This expansion would require partial demolition of an existing TriMet building (just north of the LRV storage) and would require relocating the material storage yard to the southeastern corner of the campus. Immediately east of the storage yard, a double track LRV maintenance building would be constructed impacting existing parking. Various other surface parking areas in the west yard would also be relocated north of the cul-de-sac.

All tracks in the west LRV storage yard would also be extended southward to connect to the proposed runaround track. The runaround track would connect to existing and proposed tracks adjacent to the existing Ruby Junction building located to the south. The connections to the runaround track would require partial demolition of an existing TriMet building and, full demolition of one existing building and partial demolition of another building on the adjacent private property to the south. These affected functions would be housed in a new replacement building on site.

A third track would be needed at the north entrance to the Ruby Junction Light-Rail OMF to accommodate increased train volumes without decreasing service. The additional track would also reduce operational impacts during construction and maintenance outages for the yard. Constructing the third track would require reconstruction of Burnside Court east of Eleven Mile Avenue. An additional crossover would also be needed on the mainline track where it crosses Eleven Mile Avenue; it would require reconstruction of the existing track crossings for vehicles, bicycles, and pedestrians.

Expo Center Overnight LRV Facility

An overnight facility for LRVs would be constructed on the southwest corner of the Expo Center property (as shown on Figure 2-29). The inclusion of the Expo Overnight Facility allows TriMet the ability maintain current service and maintenance operations on their Blue Line system and reduce deadheading between Ruby Junction and the northern terminus of the MAX Yellow Line extension. Deadheading occurs when LRVs travel without paying passengers to move the vehicles to and from service. Currently, Blue Line is maintained through a limited nighttime work window. With the inclusion of the Expo Overnight Facility, trains originating service at Evergreen have substantially less deadhead time, reducing Yellow Line operating costs, and Blue Line maintenance windows are retained.

What's changed with IBR?

An overnight LRV facility at the Expo Center was not part of the CRC LPA, which assumed additional LRVs would be accommodated through the expansion of the Ruby Junction Light-Rail OMF. The overnight LRV facility was developed in response to contextual changes (i.e., transit service and system) that necessitated the IBR Program to examine ways to reduce the long-term operations and maintenance, and the associated costs on the system.

The facility would provide a yard access track, storage tracks for approximately 13 LRVs, one building for light LRV maintenance and operator facilities, a TPSS, a sand silo, a parking lot for operators and facility staff, space for security personnel, and other associated facilities. This facility and the lead tracks connecting to it would necessitate relocation and reconstruction of the internal circulation road from the Expo Road entrance to approximately 100 feet west of Building E of the Expo Center (including southern areas of the parking lot, including gates and booths). However, it would not affect existing Expo Center buildings.

The overnight facility lead track would connect to the mainline tracks by crossing Expo Road just south of the existing Expo Center MAX Station. The connection tracks would require relocation of one or two existing LRT facilities, including a TPSS building and potentially the existing signals/communication building, which are both just south of the Expo Center MAX Station. Existing artwork at the station may require relocation.

Figure 2-29. Expo Center Overnight LRV Facility

Additional Bus Bays at the C-TRAN Operations and Maintenance Facility

Three bus bays would be added to the existing C-TRAN OMF located at 2425 NE 65th Avenue in Vancouver. These additional bus bays, which would not require the acquisition of any new property, would provide maintenance capacity for the additional express bus service on I-5 (Section 2.2.7, Transit Operating Characteristics). Modifications to the facility would accommodate new vehicles as well as maintenance equipment.

2.2.7 Transit Operating Characteristics

LRT Operations

Nineteen new LRVs would be purchased to operate the extension of the MAX Yellow Line. These vehicles would be similar to those currently used for the TriMet MAX system. With the Modified LPA including all design options, LRT service in the new and existing portions of the Yellow Line in 2045 would operate with 6.7-minute average headways[20] during the 2-hour morning peak period. Midday and evening headways would be 15 minutes, and late-night headways would be 30 minutes. LRT service would operate between the hours of approximately 5 a.m. (first southbound train leaving Evergreen Station) and 1 a.m. (last northbound train arriving at the station), which is consistent with current service on the Yellow Line. LRVs would be deadheaded at Evergreen Station before beginning service each day. A third track at this northern terminus would accommodate layovers.

What's changed with IBR?

The Modified LPA includes express bus service on I-5 between Salmon Creek and downtown Portland to provide needed capacity for carrying trips across the Columbia River. The Modified LPA includes fewer park-and-ride spaces than the CRC LPA; express bus on I-5 provides needed service for cross-river markets farther into Clark County that would have been served by the additional park-and-ride capacity in the CRC LPA. With the inclusion of additional express bus service, the Modified LPA needed to include express bus vehicles and maintenance facility capacity.

Express bus service across the Columbia River bridges was not part of the CRC LPA, which assumed express bus service would truncate at one of the light rail stations in downtown Vancouver or Clark College to provide service for cross-river travel. The CRC LPA did not include any additional express bus vehicles or maintenance facility capacity for express bus.

Express Bus Service and Bus on Shoulder

C-TRAN provides bus service that connects to LRT and augments travel between Washington and Oregon with express bus service to key employment centers in Oregon. Beginning in 2022, the main express route providing service in the I-5 corridor, Route 105, had two service variations. One pattern provides service between Salmon Creek and downtown Portland with a single intermediate stop at the 99th Street Transit Center, and one provides service between Salmon Creek and downtown Portland with two intermediate stops: the 99th Street Transit Center and downtown Vancouver. This route currently provides weekday service with 20-minute peak and 60-minute off-peak headways.

In 2045, for both the No-Build Alternative and Modified LPA, C-TRAN Route 105 would be revised to only provide direct service from the Salmon Creek Park and Ride and 99th Street Transit Center to downtown Portland with no intermediate stops in downtown Vancouver. Under the Modified LPA with all design options, this route would operate at 5-minute peak headways with no service in the off-peak, compared to 10-minute peak headways under the No-Build Alternative. Under both the No-Build Alternative and the Modified LPA, C-TRAN Route 105 intermediate stop service through downtown Vancouver would be replaced with C-TRAN Route 101, which would provide direct service from downtown Vancouver to downtown Portland and would operate at 15-minute peak and 30-minute off-peak headways and 10-minute peak and 30-minute off-peak headways, respectively.

Two other existing C-TRAN express bus service routes would remain unchanged after completion of the Modified LPA. C-TRAN Route 190 would continue to provide service from the Andresen Park and Ride in Vancouver to Marquam Hill in Portland. This route would continue to operate on SR 500 and I-5 within the study area. Route headways would be 10 minutes in the peak periods with no off-peak service. C-TRAN Route 164 would continue to provide service from the Fisher's Landing Transit Center to downtown Portland. This

[20] Headways are defined as gaps between arriving transit vehicles.

route would continue to operate within the study area only in the northbound direction during PM service to use the I-5 northbound high-occupancy vehicle lane in Oregon before exiting to eastbound SR 14 in Washington. Route headways would be 10 minutes in the peak and 30 minutes in the off-peak. These two routes provide the same routing and frequencies in both the No-Build Alternative and the proposed Modified LPA.

C-TRAN express bus Routes 105 and 190 are currently permitted to use the existing southbound inside shoulder of I-5 from 99th Street to the Interstate Bridge in Vancouver. However, the existing shoulders are too narrow for bus-on-shoulder use in the rest of the I-5 corridor in the study area. The Modified LPA would include inside shoulders on I-5 that would be wide enough (approximately 14 feet on the Columbia River bridges and 11.5 to 12 feet elsewhere on I-5) to allow northbound and southbound buses to operate on the shoulder, except where I-5 would have to taper to match existing inside shoulder widths at the north and south ends of the corridor. Figure 2-6, Figure 2-10, Figure 2-23, and Figure 2-27 show the potential bus-on-shoulder use over the Columbia River bridges. Bus on shoulder could operate on any of the Modified LPA bridge configurations and bridge types. Additional approvals (including a continuing control agreement), in coordination with ODOT, may be needed for buses to operate on the shoulder on the Oregon portion of I-5.

After completion of the Modified LPA, two C-TRAN express bus routes operating on I-5 through the study area would be able to use bus-on-shoulder operations to bypass congestion in the general-purpose lanes. C-TRAN Route 105 would operate on the shoulder for the full length of the study area. C-TRAN Route 190 would operate on the shoulder for the full length of the corridor except for the distance required to merge into and out of the shoulder as the route exits from and to SR 500. These two express bus routes (105 and 190) would have a combined frequency of every 3 minutes during the 2045 AM and PM peak periods. To support the increased frequency of express bus service, eight double-decker or articulated buses would be purchased.

With the C Street ramps design option, C-TRAN Route 101 would use bus-on-shoulder south of the SR 14 interchange but would not use the full extent of bus-on-shoulder lanes that would be included in the Modified LPA as the route would need to begin merging over early to use the C Street off-ramp to access downtown Vancouver. Without the C Street ramps design option, C-TRAN Route 101 would be rerouted to use the Mill Plain interchange to access downtown Vancouver. Under this design option, the Route 101 would also not use the full extent of bus-on-shoulder lanes that would be included in the Modified LPA but would use the bus-on-shoulder south of Mill Plain Boulevard and begin merging over early to use the Mill Plain off-ramp.

C-TRAN Route 164 would not be anticipated to use bus-on-shoulder operations because of the need to exit to SR 14 from northbound I-5.

Local Bus Route Changes

What's changed with IBR?

The TriMet Line 6 bus route has changed since the CRC LPA. This operational change, as well as changes in local agency priorities, led to the proposal to terminate the route at the Expo Center MAX Station under the Modified LPA.

Two TriMet bus routes would be adjusted to accommodate the transit improvements associated with the Modified LPA. TriMet Line 6 bus route would be changed to terminate at the Expo Center MAX Station instead of Hayden Island, where it terminates currently and in the No-Build Alternative. The new Line 6 route would require passengers to transfer to the new LRT connection to access Hayden Island. TriMet Line 6 is anticipated to travel from Delta Park MAX Station north along Expo Road. to the Expo Center MAX Station. Table 2-4 shows the existing service and anticipated future changes to TriMet Line 6. In addition to Line 6, TriMet Route 11 could require slight modifications to maintain transfers to the Expo Center MAX station, depending on the final design of the station and surrounding area.

As part of the Modified LPA, several local C-TRAN bus routes would be changed to better complement the new light-rail extension. Most of these changes would reroute existing bus lines to provide a transfer opportunity

at the proposed new Evergreen Station. Table 2-4 shows existing service and anticipated future changes to C-TRAN bus routes. In addition to the changes noted in Table 2-4, other local bus route modifications may move service from Broadway to C Street.

For both TriMet and C-TRAN detailed service planning analysis, including obtaining public feedback for service changes associated with the Modified LPA, would be conducted prior to the start of revenue service.

Table 2-4. Proposed TriMet and C-TRAN Bus Route Changes

Bus Route	Existing Route	Changes with Modified LPA
TriMet Line 6	Connects Goose Hollow, Portland City Center, N/NE Portland, Jantzen Beach, and Hayden Island. Within the study area, service currently runs between Delta Park MAX Station and Hayden Island via I-5.	Route would be revised to terminate at the Expo Center MAX Station. Route is anticipated to travel from the Delta Park MAX Station, north along Expo Road to connect via facilities on the west side of I-5 with the Expo Center MAX Station.
TriMet Line 11	Connects East Columbia, Expo Center, Smith/Bybee lakes, Rivergate and St. Johns via Marine Drive, Lombard, Columbia, Fessenden, and Ivanhoe.	Stops along Marine Drive would be relocated or the line would be rerouted slightly to connect via facilities on the west side of I-5 with the Expo Center MAX Station.
C-TRAN Fourth Plain and Mill Plain bus rapid transit (The Vine)	Runs between downtown Vancouver and the Vancouver Mall Transit Center via Fourth Plain Boulevard, with a second line along Mill Plain Boulevard. In the study area, service currently runs along Washington and Broadway Streets through downtown Vancouver.	Route would be revised to begin/end near the Evergreen Station in downtown Vancouver and provide service along Evergreen Boulevard to Fort Vancouver Way, where it would travel to or from Mill Plain Boulevard or Fourth Plain Boulevard depending on clockwise/counterclockwise operations. The Fourth Plain Boulevard route would continue to serve existing Vine stations beyond Evergreen Boulevard.
C-TRAN #2 Lincoln	Connects the 99th Street Transit Center to downtown Vancouver via Lincoln and Kaufman Avenues. Within the study area, service currently runs along Washington and Broadway Streets between 7th and 15th Streets in downtown Vancouver.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #25 St. Johns	Connects the 99th Street Transit Center to downtown Vancouver via St. Johns Boulevard and Fort Vancouver Way. Within the study area, service currently runs along Evergreen Boulevard, Jefferson Street/Kaufman Avenue, 15th Street, and Franklin Street in downtown Vancouver.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #30 Burton	Connects the Fisher's Landing Transit Center with downtown Vancouver via 164th/162nd Avenues and 18th, 25th, 28th, and 39th Streets. Within the study area, service currently runs along McLoughlin Boulevard and on Washington and Broadway Streets between 8th and 15th Streets.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #60 Delta Park Regional	Connects the Delta Park MAX station in Portland with downtown Vancouver via I-5. Within the study area, service currently runs along I-5, Mill Plain Boulevard, and Broadway Street.	Route would be discontinued.

2.2.8 Tolling

Consistent with the CRC LPA, tolling cars and trucks that would use the new Columbia River bridges is proposed as a method to help fund the bridge construction and future maintenance, as well as to provide different mode, time, and destination choices for trips across the Columbia River. The sections below describe the tolling authority and tolling operations.

Tolling Authority

Federal and state laws provide authority to toll the I-5 crossing. The IBR Program plans to toll the new Columbia River bridges under the federal tolling authorization program codified in 23 U.S. Code (U.S.C.) § 129 (Section 129). Section 129 allows public agencies to impose new tolls on federal-aid interstate highways for the reconstruction or replacement of toll-free bridges or tunnels. In 2023, the Washington State Legislature authorized tolling on the Interstate Bridge, with toll rates and policies to be set by the Washington State Transportation Commission (WSTC). In Oregon, the legislature authorized tolling on the Interstate Bridge in 2013 and gave the Oregon Transportation Commission (OTC) the authority to set toll rates and policies. Subsequently, in January 2025, the OTC reviewed and approved the I-5 tollway project application that designated the IBR Program as a "tollway project" and the facility (the I-5 bridge) as a tollway for construction as defined in Oregon Revised Statutes (ORS) 383.003(8) and pursuant to ORS 383.015.

At the beginning of 2024, the OTC and the WSTC entered into a bi-state tolling agreement to establish a cooperative process for setting toll rates and policies. This included the formation of the I-5 Bi-State Tolling Subcommittee, which consists of two commissioners each from the OTC and WSTC and tasked the subcommittee with developing toll rate and policy recommendations for joint consideration and adoption by each state's commission. At the direction of the commissions, all toll scenarios being analyzed in the next round of tolling analysis (referred to as a level 3 toll traffic and revenue study) for the IBR Program assume a low-income discount. Formal action is still needed by the commissions to implement rates and policies, including discounts and exemptions.

In December 2024, a Memorandum of Understanding (MOU) was executed by both states that outlined their shared understanding of tolling operations, including cooperation between the state Departments of Transportation and roles and responsibilities for the IBR Program. Toll collection would be managed by WSDOT, including drivers' option to use *Good To Go!* accounts for paying tolls. In addition to the MOU, the two states plan to enter into a separate agreement guiding the sharing and uses of toll revenues, including the order of uses (flow of funds) for bridge construction, debt service, and other required expenditures. WSDOT and ODOT also plan to enter into one or more agreements addressing implementation logistics, toll collection, and operations and maintenance for tolling the bi-state facility.

Tolling Operations

The Modified LPA includes a proposal to apply variable tolls on vehicles using the Columbia River bridges with the toll collected electronically in both directions. Tolls would vary by time of day with higher rates during peak travel periods and lower rates during off-peak periods. The IBR Program evaluated multiple toll scenarios with two different variable toll schedules by time of day. For purposes of this NEPA analysis, the lowest toll schedule was analyzed, with tolls assumed to range between $1.50 and $3.15 (state fiscal year 2026 dollars) for passenger vehicles and light trucks (i.e., vehicles with two axels) with a *Good To Go!* account. The assumed toll range and other assumptions are documented in the IBR Program Level 2 Toll Traffic and Revenue Study (IBR 2023). Medium and heavy trucks (i.e., vehicles with more than two axels) would be charged a higher toll than passenger vehicles and light trucks. Passenger vehicles and light trucks without a *Good To Go!* account would pay an additional $2.00 per trip to cover the cost of identifying the vehicle owner from the license plate and invoicing the toll by mail.

It is assumed that tolling would begin on the existing Interstate Bridge, referred to as "pre-completion tolling," in 2027, allowing time after receiving a Record of Decision to hire a contractor, install tolling equipment, and conduct the rate-setting process. The purpose of pre-completion tolling would be to generate initial capital construction funding on a pay-as-you-go basis. Later, toll revenue would be used to secure a portion of Program financing to pay back bonds or loans. Pre-completion tolling would also help pay current interest on the debt to minimize interest costs. Once the new Columbia River bridges are completed, the traffic and tolling operations would shift from the existing Interstate Bridge over to the new bridges, and 24-hour tolls would be implemented; this is referred to as "post-completion tolling."

The start dates for pre-completion tolling would be determined based on the IBR Program environmental and construction timelines; placeholders for tolling start dates were used in this NEPA analysis. This NEPA analysis assumed that pre-completion tolling on the existing Interstate Bridge would be toll-free overnight between 11 p.m. and 5 a.m. (IBR 2023). The OTC and WSTC are also considering this as an option during the level 3 toll traffic and revenue study; however, a decision has not been made on whether these toll-free hours would be implemented. This toll-free period could help avoid situations where users would be charged during lane or partial bridge closures when construction delays may occur.

Tolls would be collected using an all-electronic toll collection system using transponder pass readers and license plate cameras mounted to structures over the roadway. Each traffic lane and shoulder would have a pass reader and license plate camera to ensure accurate detection of vehicles. Toll collection booths would not be required. Instead, motorists could obtain a pass and set up a *Good To Go!* account that would automatically bill the account holder associated with the pass each time the vehicle crossed the bridge. Customers without passes would be tolled by a license plate recognition system that would bill the address of the owner registered to that vehicle's license plate.

There would be two separate "toll zones," which are the area in which the tolling system would detect and classify passing vehicles and then transmit pertinent information to the toll zone controller (Figure 2-30). There would be one zone for northbound traffic and one zone for southbound traffic. During pre-completion tolling, the toll zones would be located on I-5 in Vancouver, between the Interstate Bridge and the BNSF Railway. The location of the post-completion toll zones would be determined at a later date, but it is anticipated that both toll zones would remain in Vancouver.

Tolling Equipment

Below are the key types of equipment used to collect data for billing purposes.

Transponders: Small tags affixed to vehicles that communicate with tolling equipment as the vehicle passes.

Antenna/Readers: As a vehicle with a transponder enters a toll zone, an antenna transmits a signal between the transponder and the reader. The reader then transmits pertinent information to the toll zone controller.

Automatic Vehicle Classification: Various roadway devices installed overhead and/or in pavement to detect and identify the vehicle type (i.e., truck, bus, personal vehicle, etc.).

License Plate Image Capture Cameras: Cameras and software that capture images of license plates as vehicles pass.

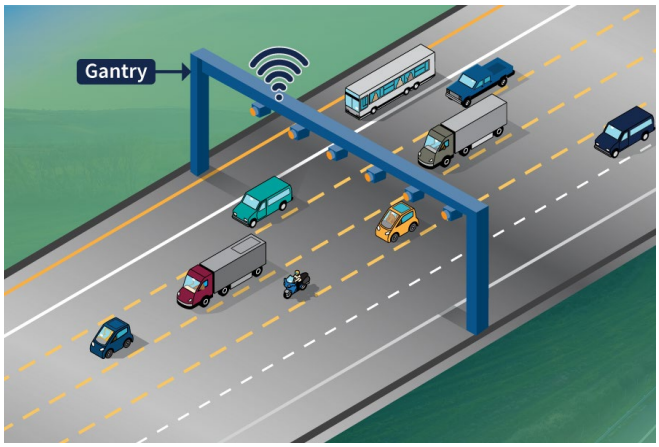
Digital Video Audit System: Various types of cameras monitor traffic flow and equipment locations.

One gantry (i.e., overheard structure) would be located in each toll zone (Figure 2-30). Generators and equipment cabinets would be located nearby, which would house various equipment needed to support toll operations. Additional equipment cabinets would be placed throughout the Program area to support tolling operations, such as near the toll rate signage (see below).

As previously noted, a key element of tolling would be variable-rate pricing, where toll rates would differ based on the time of day a vehicle uses the bridge. To accomplish this, toll rate signs would be installed at route decision points on local roads, I-5 on-ramps, and on I-5, including locations north and south of the

bridges where drivers make informed route decisions (e.g., I-5/I-205 junction and I-5/I-84 junction). The intent of the toll rate signs is to provide both static and variable pricing information. The static sign would contain details such as direction, wayfinding, or other information. These signs would also include a variable message sign panel that would show toll rate(s) in effect at that time.

Figure 2-30. Toll Zone



2.2.9 Transportation System- and Demand-Management Measures

Many well-coordinated transportation demand-management and system-management programs are already in place in the Portland-Vancouver metropolitan region. In most cases, the impetus for the programs comes from state regulations: Oregon's Employee Commute Options rule and Washington's Commute Trip Reduction law (described in the sidebar).

The physical and operational elements of the Modified LPA provide the greatest transportation demand-management opportunities by promoting other modes to fulfill more of the travel needs in the corridor. These include:

- Major new light-rail line in exclusive right of way, as well as express bus routes and bus routes that connect to new light-rail stations.
- I-5 inside shoulders that accommodate express buses.
- Modern bicycle and pedestrian facilities that accommodate more bicyclists and pedestrians and improve connectivity, safety, and travel time.
- Park and rides.
- A variable-rate toll on the new Columbia River bridges.

In addition to these fundamental elements of the Modified LPA, facilities and equipment would be implemented that could help existing or expanded transportation system management measures maximize the capacity and efficiency of the system. These include:

- Replacement or expanded variable message signs in the primary study area. These signs alert drivers to incidents and events, allowing them to seek alternate routes or plan to limit travel during periods of congestion.
- Replacement or expanded traveler information systems with additional traffic monitoring equipment and cameras.

- Replacement or expanded traveler information systems with additional traffic monitoring equipment and cameras.
- Expanded incident response capabilities, which help traffic congestion to clear more quickly following accidents, spills, or other incidents.
- Queue jumps or bypass lanes for transit vehicles where multilane approaches are provided at ramp signals for on-ramps. Locations for these features will be determined during the detailed design phase.
- Active traffic management strategies including ramp metering and dynamic speed limits. These strategies are intended to manage congestion by controlling traffic flow.

State Laws to Reduce Commute Trips

Oregon and Washington have both adopted regulations intended to reduce the number of people commuting in single-occupancy vehicles (SOVs). Oregon's Employee Commute Options Program, created under Oregon Administrative Rule 340-242-0010, requires employers with over 100 employees in the greater Portland area to provide commute options that encourage employees to reduce auto trips to the work site. Washington's 1991 Commute Trip Reduction (CTR) Law, updated as the 2006 CTR Efficiency Act (Revised Code of Washington §70.94.521) addresses traffic congestion, air pollution, and petroleum fuel consumption. The law requires counties and cities with the greatest traffic congestion and air pollution to implement plans to reduce SOV demand. An additional provision mandates "major employers" and "employers at major worksites" to implement programs to reduce SOV use.

2.2.10 Off-site Mitigation Sites

The IBR Program will provide off-site mitigation for unavoidable impacts to natural resources, including fish and wildlife species and their habitats, wetlands, surface waters, floodplains, and other regulated habitat features (refer to Sections 3.14, Water Quality and Hydrology; 3.15, Wetlands; and 3.16, Ecosystems).[21] Applicable federal, state, and local regulatory frameworks require mitigation sequencing that includes avoidance and minimization of impacts, and compensatory mitigation to achieve "no net loss" of the resource or its functions. Mitigation must fully offset the impacts of the Modified LPA and achieve this "no net loss" standard. The Modified LPA would result in unavoidable impacts to natural resources, which would require mitigation under one or more regulatory frameworks. Mitigation plans and mitigation bank use plans will be prepared to provide compensation for any such unavoidable impacts to regulated resources (wetlands, waters, floodplain, sensitive habitats) and to demonstrate that the IBR Program will achieve "no net loss" of function of these resources. The IBR Program is preparing functional assessments and coordinating with regulatory agencies to quantify the amount and type of compensatory mitigation required to offset Program impacts and achieve "no net loss."

It is anticipated that compensatory mitigation for unavoidable impacts to aquatic and terrestrial habitats and species in Washington will be provided through the purchase of credits from the proposed Wapato Valley Mitigation and Conservation Bank (Figure 2-31). The bank is approximately 876 acres and is located in the Columbia River floodplain at the mouth of the Lewis River, approximately 19 river miles downstream of the Interstate Bridge. Approval of the bank is expected in 2026.

[21] On-site mitigation is identified and analyzed in relevant subsections of Chapter 3, Existing Conditions and Environmental Consequences of this SEIS.

Figure 2-31. Potential Compensatory Mitigation Sites

It is anticipated that compensatory mitigation for unavoidable impacts to wetlands, and aquatic and terrestrial habitats and species in Oregon will be provided partially through the purchase of advance mitigation credits at ODOT's proposed Columbia Bottomlands Advance Mitigation/Conservation Site, and partially through the purchase and protection under conservation easement of a site on West Hayden Island (shown on Figure 2-31). The Columbia Bottomlands Advanced Mitigation/Conservation site is located in Scappoose Bay, a slough of Multnomah Channel, in Columbia County, Oregon. The site is located approximately 1 mile upstream of where the Multnomah Channel meets the Columbia River and

approximately 20 river miles downstream of the Interstate Bridge. The site has been designed to provide advance mitigation credits for impacts to wetlands and aquatic and terrestrial habitats and species for future ODOT projects. All impacted wetlands and other water features would be mitigated in accordance with current USACE mitigation policies, and the conditions of the Section 404 Permit. All compensatory mitigation plans would be developed in coordination with the USACE and other appropriate agencies as part of the Section 404 permitting process. The USACE and other appropriate agencies would determine the appropriate level of mitigation based upon the functions lost or adversely affected as a result of impacts to aquatic resources.

The proposed site on West Hayden Island is approximately 65 acres in size and is located approximately 2.5 river miles downstream of the Interstate Bridge, on the south side of the island adjacent to North Portland Harbor. The site is currently owned by the Oregon Department of State Lands, but ODOT has proposed to purchase this site and place it under a conservation easement. One or more compensatory mitigation projects may also be conducted on the site. The specific activities to be conducted at this site would be developed in coordination with the applicable regulatory agencies for each of the various permit applications.
In addition to the compensatory wetland and habitat mitigation described above, the IBR Program may need to excavate material from within the 100-year floodplain to address the compensatory excavation requirements of the City of Portland's recently updated floodplain ordinance. If such activity is required, it is anticipated that this material would be removed from upland portions of the 65-acre parcel on West Hayden Island described above, or from aquatic areas adjacent to this parcel. If such excavation activities are conducted, excavated materials will be disposed of at a location approved to receive that type of material.

2.3 Modified LPA Construction

Construction of the IBR Program would be sequenced in accordance with many factors, such as the scale of improvements, different types of infrastructure and associated construction specialties required, timing of funding received, maintenance of traffic on I-5, navigation on the Columbia River, seasonal and weather constraints, permit conditions, and other considerations. Multiple construction packages are anticipated to be developed and delivered by different agencies—WSDOT, ODOT, TriMet, and C-TRAN—that will use various delivery methods (e.g., design-bid-build, design-build, progressive design-build, construction manager/general contractor [CM/GC]).

The first construction packages are anticipated to be the new Columbia River bridges and approaches. Subsequent construction packages would be sequenced throughout the Program area. Early construction activities may occur in the Program area to prepare for the bridge replacement work. Demolition of the existing Interstate Bridge would take place after the new Columbia River bridges were opened to traffic. Construction of other components of the Modified LPA would be sequenced during and after the construction of the new Columbia River bridges begins.

Electronic tolling infrastructure for the existing Interstate Bridge would be constructed and operational near the start of construction on the new Columbia River bridges and would be constructed and operational for the new Columbia River bridges in time for their opening. The toll rates and policies for tolling (including pre-completion tolling) would be determined by the OTC and WSTC (refer to Section 2.2.8, Tolling).

2.3.1 Construction Components, Packaging Plan, and Duration

Table 2-5 lists the main construction components of the Modified LPA along with the estimated construction durations and descriptions of the associated work. Construction packages are also listed in Table 2-5 and illustrated in Figure 2-32. These main construction components would be defined by some functional improvement to the Program corridor; for example, construction of the new bridges would be coordinated with the construction of the connections to the existing I-5, enabling use of the new bridges while other

components of the Program are constructed. Each listed component would require multiple construction packages—small and large, general and specialty. As construction progresses, interim connections may be in place while subsequent components are built and final connections and finishes are completed. This preliminary construction plan may change as the Program advances toward construction. Construction packages may further be combined or separated throughout delivery of the Program. Construction of all components identified in the Program could last more than 10 years.

The estimated durations are shown as ranges to reflect the potential for Program funding to be sequenced over time. In addition to funding, contractor schedules, regulatory restrictions on in-water work, river navigation considerations, permits and approvals, weather, materials, and equipment could all influence construction duration and overlap of construction of certain components. Certain work below the ordinary high-water mark of the Columbia River and North Portland Harbor would be restricted to minimize impacts to species listed under the Endangered Species Act and their designated critical habitat.

Throughout most periods of construction, three travel lanes in each direction on I-5 (accommodating personal vehicles, freight, and buses) would remain open during peak hours. Off-peak and weekend restrictions and closures could be required during construction. Active transportation connections would be maintained throughout construction. Advanced coordination and public notice would be given for restrictions, intermittent or longer-term closures, and detours for highway, local roadway, transit, and active transportation users via accessible facilities and wayfinding (refer to Section 3.1, Transportation, for additional information, including for local street and ramp or interstate access closures). At least one Columbia River navigation channel would remain open to shipping throughout construction. Advanced coordination and notice would be given for restrictions or intermittent closures to navigation channels as required (refer to Section 3.2, Navigation, for additional information).

Table 2-5. Preliminary Construction Packaging Plan

Component and General Location	Estimated Duration	Description	Construction Packages
Columbia River bridges, approaches, and demolition of Interstate Bridge *Hayden Island to Evergreen Boulevard*	6 to 8 years	• General sequence for new bridges would include initial preparation and installation of foundation piles, shaft caps, pier columns, superstructure, and deck elements, followed by systems and finish work. • SR 14 interchange would be constructed in a separate construction package and must be completed before all traffic could be transferred to the new Columbia River bridges. • Demolition of the existing Interstate Bridge could begin only after traffic is transferred to the new Columbia River bridges.	• Columbia River Bridges [a] • Approaches [a] • Pre-completion Tolling Signage and Equipment Installation • SR 14 A • Evergreen Bridge • Interstate Bridge Demolition

Component and General Location	Estimated Duration	Description	Construction Packages
Light-rail and bus-on-shoulder transit *Expo Station to Evergreen Station; Ruby Junction*	4 to 7 years	• The light-rail alignment would be partially supported by the southbound Columbia River bridge and approach structure guideways. • Light-rail construction would include all infrastructure associated with light-rail elements of the Transit Packages construction package (e.g., overhead catenary system, tracks, stations, and park and rides). • Bus-on-shoulder would include corresponding bus elements of the Transit Packages construction package.	• North Portland Harbor Transit Bridge • Marine Drive A (supports transit improvements) • Hayden Island A (supports transit improvements) • Light-rail Overnight Facility • Transit Packages • Ruby Junction
Marine Drive and Hayden Island interchanges and North Portland Harbor bridges *Marine Drive to Hayden Island*	4 to 10 years	• Hayden Island interchange construction duration would not necessarily entail continuous active construction. • The North Portland Harbor bridges could include sequenced construction of southbound bridges, northbound bridges, and demolition of the existing North Portland Harbor bridge to maintain traffic mobility during construction. • Hayden Island and Marine Drive interchanges could be broken into several contracts, which could spread work over a longer duration.	• Hayden Island Surface Streets • Hayden Island Interchange • North Portland Harbor Bridges • Oregon I-5 Southbound • Oregon I-5 Northbound • North Portland Harbor Bridge Removal • Marine Drive Interchange • North Expo Road
Mill Plain Boulevard, Fourth Plain Boulevard, and SR 500/39th Street interchanges *Mill Plain Boulevard to SR 500*	3 to 4 years	• Construction of these interchanges could be independent from each other.	• Mill Plain Boulevard Interchange • Washington North

a The Columbia River Bridges and Approaches construction packages include light-rail guideway from the Hayden Island Bridge Approach, the Columbia River bridges, north to Evergreen Boulevard.

Figure 2-32. Preliminary Construction Packages

2.3.2 Potential Staging Sites and Casting Yards

Equipment and materials would be staged in the primary study area throughout construction generally within existing or newly purchased right of way, on land vacated by existing transportation facilities (e.g., I-5 on Hayden Island), or on nearby parcels. However, at least one large site could be required for construction offices, equipment maintenance and storage, maintenance of traffic equipment, employee parking, and construction material storage and other needs. Criteria for suitable sites include large, open areas for heavy machinery and material storage, waterfront access for barges (either a slip or a dock capable of handling heavy equipment and material) to convey material to the construction zone, and roadway or rail access for landside transportation of materials by truck or train.

Two potential major staging sites have been identified (Figure 2-6). Both sites are located on Hayden Island on the west side of I-5. A large portion of both parcels would be required for new right of way for the Modified LPA. Other staging sites may be identified during the design process or by the contractor. Following construction of the Modified LPA, the staging sites could be converted to other uses.

In addition to on-land sites, some staging activities for construction of the new Columbia River and North Portland Harbor bridges would take place on the river itself. Temporary work structures, barges, barge-mounted cranes, derricks, and other construction vessels and equipment would be present on the river during most or all of the bridges' construction period. The IBR Program is working with USACE, USCG, and the Federal Aviation Administration to obtain necessary clearances for these activities.

A casting or staging yard could also be required for construction of the overwater bridges if a precast concrete segmental bridge design is used. A casting yard would require access to the river for barges, a slip or a dock capable of handling heavy equipment and material, a large area suitable for a concrete batch plant and associated heavy machinery and equipment, and access to a highway or railway for delivery of materials. Such a site would likely be between approximately 50 and 100 acres. As with the staging sites, casting yards would be identified during the design process or by the contractor and would be subject to the same contract and permit requirements to implement the best management practices (BMPs) described in Appendix M unless more stringent permitting requirements and conditions are required at the time of identification.

All material staging, equipment staging areas, equipment fueling areas, and casting yards would be contained and located outside of environmentally and culturally sensitive areas. To the extent practicable, these sites would be located in upland locations, on areas that are already or have been previously disturbed. These activities would be conducted consistent with the impact minimization BMPs described in Appendix M. Construction of the Modified LPA would also include revegetating temporarily disturbed areas consistent with federal, state, and local regulations, and the net result would be no net loss of habitat function in the long term. As with the staging sites, casting or staging yard sites may be identified as the design progresses or by the contractor and would be evaluated via a NEPA re-evaluation or supplemental NEPA document for potential environmental impacts at that time.

2.4 No-Build Alternative

The No-Build Alternative illustrates how transportation and environmental conditions would likely change by the year 2045 if the Modified LPA is not built. This alternative makes the same assumptions as the Modified LPA regarding population and employment growth through 2045, and it assumes that the same transportation and land use projects in the region would occur as planned.

Regional transportation projects included in the No-Build Alternative are those in the financially constrained 2018 *Regional Transportation Plan* (RTP) adopted in December 2018 by the Metro Council (Metro 2018a) and in March 2019 (RTC 2019) by the Southwest Washington Regional Transportation Council (RTC) Board of

Directors (referred to collectively as the 2018 RTP in this Final SEIS).[22] The 2018 RTP has a planning horizon year of 2040 and includes projects from state and local plans necessary to meet transportation needs over this time period; financially constrained means these projects have identified funding sources. The Transportation Technical Report lists the projects included in the financially constrained 2018 RTP.

The implementation of regional and local land use plans is also assumed as part of the No-Build Alternative. For the IBR Program analysis, population and employment assumptions used in the 2018 RTP were updated to 2045 in a manner consistent with regional comprehensive and land use planning. In addition to accounting for added growth, adjustments were made within Portland to reallocate the households and employment based on the most current update to Portland's comprehensive plan, which was not complete in time for inclusion in the 2018 RTP.

Other projects assumed as part of the No-Build Alternative include major development and infrastructure projects that are in the planning stage, permitting stage, or partway through phased development. They include the Waterfront Vancouver project, Terminal 1 development, the Renaissance Boardwalk, the Waterfront Gateway project, improvements to the levee system, several restoration and habitat projects, and the Portland Expo Center.

In addition to population and employment growth and the implementation of local and regional plans and projects, the No-Build Alternative assumes that the existing Interstate Bridge would continue to operate as it does today. As the bridge ages, needs for repair and maintenance would potentially increase, and the bridge would continue to be at risk of mechanical failure or damage from a seismic event.

2.5 Development of the Modified LPA

As described earlier in this chapter, the 2011 ROD for the CRC project included a Selected Alternative that was modified through NEPA re-evaluations in 2012 and 2013 (CRC LPA). The CRC project was suspended in 2014. In 2019, a bi-state legislative committee requested that ODOT and WSDOT restart the CRC project, renaming it the IBR Program. This section describes the 2011 Selected Alternative cleared through the CRC NEPA process, changes that have occurred since that NEPA process was completed, and the screening of new design options for the IBR Program.

2.5.1 Selected Alternative in the 2011 Record of Decision and Subsequent Modifications in 2012 to 2013

Substantial technical analysis was completed to support the development of the CRC project. During the initial screening effort for the CRC project's NEPA alternatives analysis, the CRC team conducted a two-step screening process that narrowed the number of alternatives to be evaluated in the Draft EIS. Step A evaluated 23 river crossing and 14 transit components using a pass/fail test designed to eliminate components beyond the scope of the project or ideas that clearly could not address the project's Purpose and Need statement. Results of screening criteria, including why certain components were eliminated from further consideration, are detailed in Appendix C of the CRC Draft EIS (2008) and are summarized as follows:

[22] The 2018 RTP was the adopted regional transportation plan available when the IBR Program initiated the SEIS. In 2023, Oregon Metro and RTC updated their respective RTPs as part of their five-year update cycle, as required under 23 CFR § 450.324. The 2023 RTP was adopted by Oregon Metro in 2023 and RTC in 2024, several years after the IBR Program Draft SEIS analysis was initiated in early 2021. To use the regional travel demand model supporting the 2023 RTP, additional refinement and coordination would be necessary for it to be ready for use in a facility-specific study, such as the IBR Program. This refinement and coordination process is lengthy and can take up to a year and a half for a complex project with numerous partner agencies, like the IBR Program. Therefore, the NEPA lead agencies exercised their discretion and determined, based on their technical expertise, that the 2018 RTP and Travel Demand Model continued to be the most appropriate base tool for the purposes of comparing the No-Build Alternative to the Modified LPA and design options in the Final SEIS.

- Fourteen of the 23 river crossing components were eliminated from further consideration. Some of the river crossing components that were eliminated included a high-level replacement bridge, supplemental bridge, replacement tunnel, and new corridor crossings.
- Eight of the 14 transit components were eliminated. Transit components that were eliminated included high-speed rail, ferry service, monorail system, magnetic levitation railway, commuter rail in the BNSF trackage, heavy rail, personal rapid transit, and people mover/automated guideway transit.

During Step B, components were scored on the project's Vision and Values (see Chapter 1 for more information on the Purpose and Need and Vision and Values). No components were removed from consideration based on Step B screening, so this had no effect on the development of the Modified LPA nor on any of its proposed design options. During the CRC project, the joint lead agencies, with the help and recommendation of the CRC Task Force, developed a vision for how to address the Purpose and Need and the values they would follow in doing so, which resulted in a Vision and Values statement. Because the Vision and Values statement included elements that are no longer consistent with federal requirements, the Vision and Values statement is not included in this federal NEPA document. Any values that are not consistent with current federal requirements were not considered in this Final SEIS and will not be considered in the Amended Record of Decision. To the extent the laws of the States of Washington or Oregon require WSDOT or ODOT to consider the Vision and Values statement, those details and analysis are provided in the State Environmental Policy Act (SEPA) Addendum. The remaining options were then shared with external partners and combined into 12 multimodal alternatives. These 12 alternatives received extensive public and agency input and analysis. In November 2006, based on this input and analysis, CRC project staff recommended advancing a range of alternatives to the CRC Draft EIS that included two HCT modes and a replacement mid-level fixed-span bridge (CRC 2007). The CRC staff recommendation stated "a replacement bridge would accommodate all types of travel over the Columbia River, including vehicles, freight, public transit, bicycles, and pedestrians. The bridge would be built high enough to avoid the need for a lift span [under the then-effective Coast Guard requirements]. It also would be designed to avoid impacts to the airspace of Pearson Air Park [sic]" (CRC 2007). The results of the analyses of these build alternatives in the CRC EIS informed project planning, design, and preconstruction activities. FHWA and FTA issued the ROD for the project on December 7, 2011. After the ROD was issued in 2011, the project design was further refined, and two NEPA re-evaluations were completed in 2012 and 2013, which analyzed the bridge height[23] and phased construction, respectively.[24]

2.5.2 Updating the CRC LPA

Table 2-6 lists the components of the CRC LPA, the corresponding modifications in the Modified LPA, and the changed conditions that prompted the modifications; the sections that follow detail the changed conditions that have occurred since 2013 and how those changed conditions resulted in modifications to the CRC LPA. Figure 2-33 shows, generally, which CRC project components have been changed for the Modified LPA.

[23] The Bridge Height NEPA Re-evaluation was signed by FHWA and FTA in December 2012. This re-evaluation considered an increase in the bridge's maximum vertical navigation clearance height from 95 feet to 116 feet; no significant additional impacts were identified. This re-evaluation was prepared in response to a request from the USCG to conduct additional analysis on navigation impacts. The CRC project team prepared an updated survey of river users and vessels and published a Navigation Impact Report in 2012 that provided detailed evaluation of midlevel bridge design refinement options with vertical clearances ranging from 95 to 125 feet above zero Columbia River Datum. Based on this analysis, and to further reduce navigational impacts, the CRC project maintained a fixed-span bridge but refined the bridge design and increased the bridge height to allow a vertical clearance in the primary navigation channel of 116 feet above zero Columbia River Datum.

[24] The Phased Construction NEPA Re-evaluation was signed by FHWA and FTA in September 2013. This re-evaluation considered the effects of phasing the construction of the Selected Alternative; phasing was disclosed as an option in the Final EIS and ROD. The re-evaluation also included design refinements to the full Selected Alternative as described in the ROD to make the first phase operate better. Some of the design refinements included modifying the Hayden Island interchange in the Selected Alternative first phase to reduce the number of new bridges over North Portland Harbor and to reduce cost while still improving interchange performance. The September 2013 re-evaluation found that the impacts associated with the full Selected Alternative and the Selected Alternative first phase were similar and within the range of impacts reported in the Final EIS and ROD.

Table 2-6. Changed Conditions Necessitating Modifications to the CRC LPA

Component	CRC LPA	IBR Program Modified LPA	Changed Conditions
Columbia River bridges (#6 in Figure 2-33)	• Replacement on a curved alignment: – Double-deck fixed-span truss bridge with 116 feet VNC.	• Replacement on a straight alignment: – Double-deck fixed-span truss bridges with 116 feet VNC. – Single-level fixed-span with 116 feet VNC. – Single-level movable-span with 178 feet VNC.	• 2013 Bridge Permit • USCG Bridge Permit Application Guide • Design optimization
I-5 highway (#1, 2, 4, 5, 6, and 7 in Figure 2-33)	• Improvements to seven interchanges (from south to north): Victory Boulevard, Marine Drive, Hayden Island (full interchange), SR 14, Mill Plain Boulevard, Fourth Plain Boulevard, and SR 500 (with new direct connections between SR 500 and I-5, new on- and off-ramps, and a tunnel beneath I-5), as well as related enhancements to the local street network • Two auxiliary lanes added between Interstate Avenue/Victory Boulevard to SR 500	• Improvements to seven interchanges (from south to north): Victory Boulevard, Marine Drive, Hayden Island (partial interchange), SR 14, Mill Plain Boulevard, Fourth Plain Boulevard, and SR 500 (without proposed I-5 connections, ramps, or tunnel), as well as related enhancements to the local street network • One or two auxiliary lanes between Marine Drive and SR 500. The two auxiliary lane option has the same alignment and lane configuration as the CRC LPA from Interstate Avenue/Victory Boulevard to SR 500 • An option that shifts the I-5 mainline up to 40 feet westward in downtown Vancouver between the SR 14 interchange and Mill Plain Boulevard interchange • An option that eliminates the existing C Street ramps in Vancouver	• Historic resources • Portland land use • Vancouver land use • Freight movements • Portland's transportation hierarchy • Design optimization
North Portland Harbor bridges (#4 in Figure 2-33)	• Improvements to seismically retrofit the existing I-5 mainline bridge over North Portland Harbor; three new bridges over this waterway associated with I-5; and one new multimodal bridge carrying LRT, local traffic, pedestrians, and bicyclists	• Replace the existing I-5 mainline bridge over North Portland Harbor and construct six new bridges that would carry LRT, southbound I-5 off-ramp, southbound I-5 mainline, northbound I-5 mainline, northbound I-5 on-ramp, and an arterial road for local traffic, pedestrians, and bicyclists	• Updated AASHTO LRFD Bridge Design Specifications and AASHTO Seismic Guide Specifications • Degraded seismic resiliency

Component	CRC LPA	IBR Program Modified LPA	Changed Conditions
Active Transportation (see Figure 2-33)	• Bicycle and pedestrian improvements throughout the project corridor, including a multiuse path connecting to the existing active transportation system and the Community Connector over I-5, just south of Evergreen Boulevard	• Modified alignment to bicycle and pedestrian improvements throughout the project corridor, including a multiuse path connecting to the existing active transportation system and the Community Connector over I-5, just south of Evergreen Boulevard	• Active transportation connections • Portland's transportation hierarchy • Design optimization
Transit (#3, 6, 7, 8, and 9 in Figure 2-33)	• Extension of LRT from the Expo Center MAX Station in Portland to Clark College in Vancouver via at-grade tracks in Downtown Vancouver and associated transit improvements • Five transit stations: one on Hayden Island, three in downtown Vancouver, and a terminus station near Clark College • Three park and rides: Columbia (near the SR 14 interchange), Mill Plain (in uptown Vancouver) and Clark (on McLoughlin Boulevard near Clark College) • Improvements would have been made to retrofit the existing rails and electrical system on the Steel Bridge to allow trains to travel at a higher speed • Local bus route changes • Expansion of the Ruby Junction LRT maintenance facility	• Extension of LRT from the Expo Center MAX Station in Portland to Evergreen Boulevard in Vancouver via elevated tracks adjacent to I-5 and associated transit improvements • Four light-rail transit stations: one new station each on Hayden Island, in downtown Vancouver (Waterfront Station), and at the terminus near Evergreen Boulevard. The existing station at Expo Center in Portland would be reconstructed • Park and rides: 1,270 parking spaces at five sites including three at Waterfront Station (Columbia Way, Columbia Street/SR 14, or Columbia Street/Phil Arnold Way) and two at Evergreen Station (Library Square or Columbia Credit Union) • Local and express bus route changes, including bus on the I-5 shoulders • Expansion of the Ruby Junction light-rail maintenance facility and a new overnight facility near Expo Center • 19 new LRVs • Shoulders on I-5 to accommodate express bus-on-shoulder service in each direction • Additional bus bays for new electric double-decker buses at the C-TRAN operations and maintenance facility	• Vancouver land use • Historic resources • Transit system and service • Design optimization

Component	CRC LPA	IBR Program Modified LPA	Changed Conditions
• Transportation demand and system management measures	• Variable-rate tolling for motorists using the river crossing as a demand-management and financing tool • Other TDM and TSM measures, including variable message signage, traveling information systems, ramp metering, signal prioritization, and other traffic management tools	• Variable-rate tolling for motorists using the river crossing as a demand-management and financing tool • Other TDM and TSM measures, including variable message signage, traveling information systems, ramp metering, signal prioritization, and other traffic management tools	• No changed conditions

Note: All dimensions and quantities are approximate.

AASHTO = American Association of State Highway and Transportation Officials; CRC = Columbia River Crossing; C-TRAN = Clark County Public Transit Benefit Area Authority; I-5 = Interstate 5; IBR = Interstate Bridge Replacement; LPA = Locally Preferred Alternative; LRFD = load and resistance factor design; LRT = light-rail transit; LRV = light-rail vehicle; MAX = Metropolitan Area Express; PNCD = Preliminary Navigation Clearance Determination; SR = State Route; TDM = transportation demand management; TSM = transportation system management; USCG = U.S. Coast Guard; VNC = vertical navigation clearance

Figure 2-33. IBR Program Modifications to the CRC LPA Components

IBR Program Modifications

9 Park and Rides

Modifies park-and-ride locations

8 Light-Rail Transit

Modifies alignment through downtown Vancouver to hug I-5 and moves terminus from Clark College to near Evergreen Blvd

7 Downtown Vancouver

Modifies access to/from SR 14 (design options for with and without C Street ramps, and for a centered I-5 alignment and I-5 westward shift)

Modifies Waterfront Station location

6 Columbia River Bridges

Modifies the two bridges from a curved alignment to a straight alignment (three bridge configuration options: double-deck fixed-span, single-level fixed-span, or single-level movable-span)

5 Hayden Island Interchange

Modifies full interchange to partial interchange

Minor modifications to local road configuration

4 North Portland Harbor I-5 Bridge

Replaces existing North Portland Harbor I-5 bridges (instead of retrofitting) and moves local access bridge to east side of I-5

3 Expo Center Overnight Facility

Adds overnight maintenance facility for TriMet light-rail vehicles

2 Marine Drive Interchange

Modifies interchange access

1 Victory Boulevard Interchange

Minor modifications to access

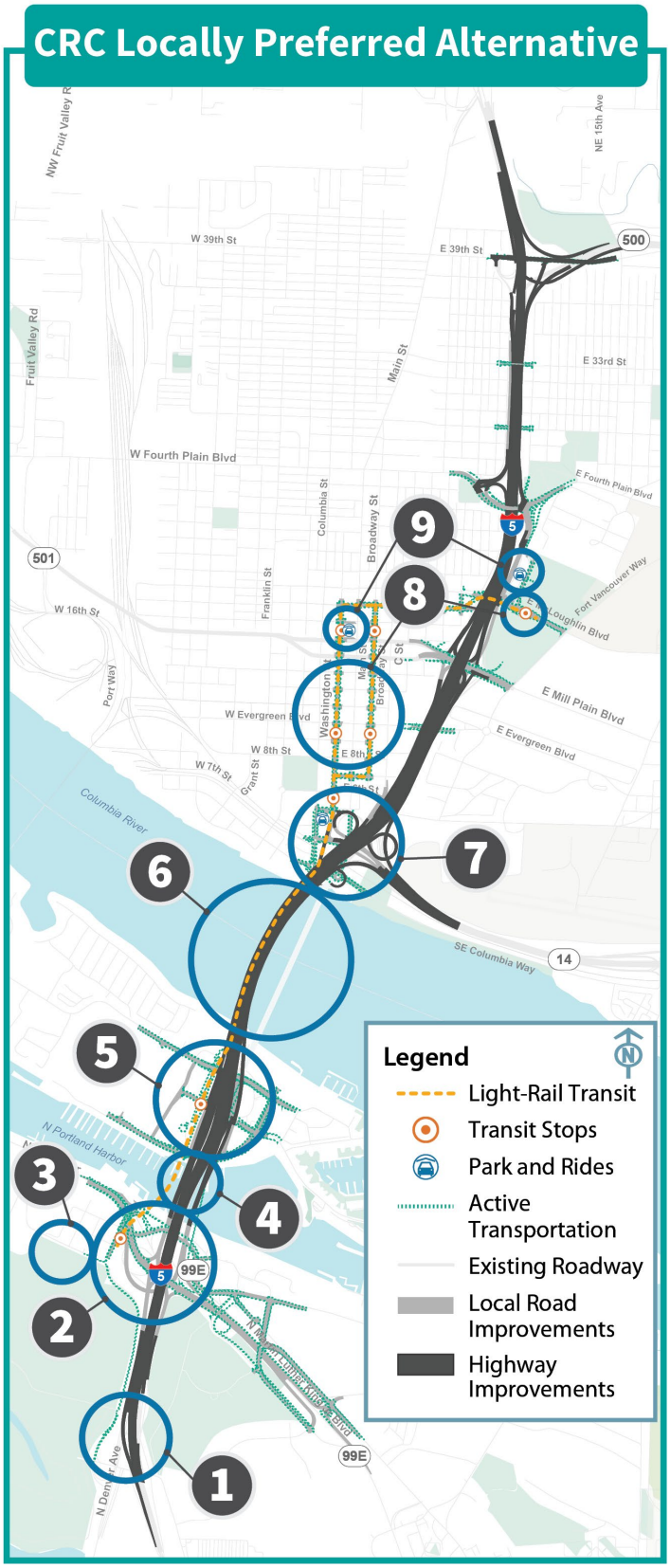
Active Transportation

Modifies alignment of shared-use path and ties in to planned projects (e.g., 40-Mile Loop Trail and two-way cycle track on Fourth Plain)

Auxiliary Lanes

Includes design options for one or two auxiliary lanes

CRC Locally Preferred Alternative



Changes in Conditions Since 2013

Since the issuance of the CRC ROD, as revised by the 2012 and 2013 re-evaluations (CRC LPA), existing environmental conditions have changed; these changes range from physical changes in the environment within the Program footprint to regulatory changes to changes in community priorities and interests. Many of these physical and quantifiable changes have caused agencies to adjust their preferences and priorities to better reflect the evolving needs of the communities they represent. The changed conditions since 2013 include the following:

- **Active transportation connections.** Local agencies have made changes to active transportation planning, including both existing and planned active transportation in Portland and Vancouver. For example, currently planned or existing active transportation that was not in existence at the time of the CRC project include the 40-Mile Loop Trail in Portland and the two-way cycle track on Fourth Plain Boulevard in Vancouver. This changed condition resulted in modifications to the active transportation component of the Modified LPA.
- **2013 Bridge permit.** The USCG Bridge Permit was issued on September 27, 2013 with the understanding that the CRC project reached agreements with affected river users to address future business operation impacts. Because the CRC project was suspended in 2014 and the river users' agreements were never fulfilled, this permit is no longer valid. The height and span of the replacement bridges need to be reexamined in accordance with the USCG Bridge Permit application guidance (March 2025), with input from USCG to ensure the replacement bridge design would meet reasonable needs of navigation and would obtain required permits. This changed condition resulted in modifications to the Columbia River bridge component of the Modified LPA.
- **Changes in regulations.** Many environmental regulations, procedures, and permit requirements have changed or been updated since the issuance of the CRC LPA. The discipline-specific technical reports prepared for this Final SEIS include additional detail on specific regulations that have changed since 2013.
- **Degraded seismic resiliency.** With no improvements made to the existing North Portland Harbor bridge, its seismic resiliency continues to degrade as time passes. This changed condition resulted in modifications to the North Portland Harbor bridge component of the Modified LPA.
- **Demographics.** The Portland-Vancouver metropolitan area added more than a quarter of a million residents between 2010 and 2020 (U.S. Census Bureau 2010, 2020). This changed condition did not result in design modifications, but was considered in the existing conditions and environmental consequences analysis in Chapter 3.
- **Design optimization.** Engineering decisions related to the CRC LPA were reviewed for some components to determine if avoidance and minimization to environmental resources, constructability improvements, or cost-reduction strategies were available. Additionally, because of the intrinsic connectivity of each of the Program elements, a change in design to one component of the CRC LPA often necessitated a design change to a connected component. This resulted in design modifications to the Columbia River bridges, the I-5 highway (including a reduced Hayden Island interchange footprint), active transportation, and transit components of the Modified LPA.

- **Endangered Species Act (ESA).** ESA listings and critical habitat designations have changed since the 2013 consultations with the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) (NOAA n.d.; USFWS 2021). These changes require consideration of how to best avoid and minimize impacts to species and their habitat, including the timing of the in-water work and updating run timing for salmon species. The IBR Program inititiated new Section 7 ESA consultations with NOAA Fisheries and USFWS on September 25, 2023, to bring the consultations up to date with current species listings and critical habitat designations and to reflect changes in best available science. USFWS issued a new Letter of Concurrence on December 11, 2023, and NOAA Fisheries issued a new biological opinion on June 27, 2025. This changed condition did not result in design modifications, but was considered in the existing conditions and environmental consequences analysis in Chapter 3.
- **Freight movements.** Freight movements by truck have changed, with less freight anticipated to be moved through the Hayden Island interchange because the Port of Portland is no longer planning to develop West Hayden Island into a port facility. Meanwhile, industrial development, much of which uses trucks for delivery, has grown in North Portland industrial areas, which has added truck volume to the Marine Drive interchange. This changed condition resulted in modifications to the I-5 highway component of the Modified LPA.
- **General Bridge Act of 1946, as amended (USCG Bridge Permit Application Guide).** USCG issued a new bridge permit application guide in July 2016 and updated it in March 2025 (COMDTPUB P16591.3E), which requires the preparation and submittal of a navigation impact report to the USCG to analyze the navigational impacts from bridge design alternatives and document current and prospective navigation on a waterway. A navigation impact report is prepared early in project planning and is updated periodically during project development because waterways and waterway usage are dynamic and may change over time. The USCG then issues a PNCD to inform the NEPA alternatives analysis for the environmental documentation (USCG 2016). Also, the USCG Bridge Permit process must now be completed in accordance with the USCG-FHWA-FTA-Federal Railroad Administration (FRA) Memorandum of Understanding (2014) and the USCG-FHWA Memorandum of Agreement (2014).[25] This changed condition resulted in modifications to the Columbia River bridge component of the Modified LPA.
- **Historic resources.** Additional historic-aged structures potentially eligible for listing on the National Register of Historic Places have aged into consideration since the previous historic period survey. To thoroughly consider resources that may reach historic-age during construction, the historic resources period has been extended 15 years to consider buildings built in or prior to 1982. This changed condition resulted in modifications to the I-5 highway and transit components of the Modified LPA.

[25] The USCG-FHWA-FTA-FRA Memorandum of Understanding (2014) and the USCG-FHWA Memorandum of Agreement (2014) outline a stepwise process for new projects that require NEPA compliance for actions including new or replacement bridges over navigable waterways. This process typically sequences the preparation of a Navigation Impact Report by the project proponent and issuance of a PNCD by the USCG before the range of alternatives are identified to be evaluated in a NEPA document. The IBR Program is not a new project; and therefore, the IBR Program attempts to follow the process as closely as possible with several adjustments, recognizing the USCG bridge permit process would be a new permitting action whereas this NEPA document is supplementing the earlier Draft EIS (2008), Final EIS and ROD (2011) (Appendix T), and two re-evaluations (2012 and 2013). When the IBR Program began, the IBR Program confirmed the Purpose and Need from the CRC EIS remained valid. Design modifications were identified to address changed conditions since the prior NEPA documents were published, resulting in the IBR Program advancing a Modified LPA, including adding two new bridge configurations—a single-level fixed-span and a single-level movable-span.

- **Housing costs.** The cost of housing has increased significantly, forcing some households to relocate to neighborhoods where housing is more affordable but that may be farther from job and activity centers (Metro 2015). The combination of longer distances traveled and limited public transit service in these areas puts an added transportation cost burden on these community members, including many who moved from Portland, Oregon, to Clark County, Washington, but still need to travel to Portland for work, medical appointments, family, or other needs (Metro 2018b). Related to rising housing costs is a growing houseless population throughout the region (Clark County Council for the Homeless 2022; Multnomah County Joint Office of Homeless Services 2022). The number of encampments has increased, including in the highway right of way and throughout the study area. This changed condition did not result in design modifications, but was considered in the existing conditions and environmental consequences analysis in Chapter 3.
- **Levees.** UFSWQD is working in partnership with USACE on the PMLS project, which includes improvements at PEN 1 and PEN 2. Additionally, as part of the CCFS projects, UFSWQD has identified the need to raise a low spot in the Cross Levee on the southwest side of the Marine Drive interchange. These levee improvement efforts will require the IBR Program to stay above a 38-foot elevation (NAVD 88). Alterations to I-5 will require review by the USACE, UFSWQD, and the City of Portland for compliance with levee requirements associated with the PMLS and CCFS projects. This changed condition did not result in design modifications but was considered in the existing conditions and environmental consequences analysis in Chapter 3.
- **Portland land use.** Portland has undergone significant changes in land use policy, particularly through the adoption of the *2035 Comprehensive Plan*, which emphasizes the integration of nature and green infrastructure and encourages the design and management of streets to serve as multifunctional spaces (City of Portland 2020). Planned land uses on Hayden Island and near Marine Drive have changed, with a shift to less intensive uses (e.g., a marine terminal is no longer planned at the west end of Hayden Island). Portland's 2009 *Hayden Island Plan* calls for the development of new parks and open spaces for habitat on Hayden Island, including a potential new park west of the existing I-5 and under the replacement bridges (City of Portland 2009). Portland's *2035 Comprehensive Plan* also anticipates several watershed restoration projects in the Delta Park area (City of Portland 2020). This changed condition resulted in modifications to the I-5 highway component of the Modified LPA.
- **Portland transportation hierarchy.** The City of Portland uses a transportation hierarchy to prioritize modes when making transportation investment and design decisions. Variations of this hierarchy existed during the CRC project, but it was last updated with policy 9.6 in the City of Portland's *2035 Comprehensive Plan* (City of Portland 2020). The prioritization of modes has changed since the CRC project, including the elevation of transit to the third priority, following walking and biking. This changed condition resulted in modifications to the I-5 highway and active transportation components of the Modified LPA.
- **Tolling.** Tolling on the new Columbia River bridges was included in the CRC analysis and continues to be included in the IBR Program analysis in Chapter 3.

- **Traffic.** Changes have occurred since 2013 in traffic volumes. The IBR Program has updated its regional travel demand models (RTDM) and traffic models to extend the forecast to 2045 (CRC used 2030). The internal naming convention for the RTDM used in the CRC analysis was called "Ivan." Since the CRC ROD was issued, the "Ivan" RTDM was updated. The version used for the IBR Program is called "Kate v 2.0." The travel demand modeling and traffic analysis in this SEIS is based on the most current information and the adopted transportation plan available when the IBR Program initiated the IBR Program SEIS. The 2018 RTP was jointly adopted by Metro in 2018 (Metro 2018a) and by RTC in 2019 (RTC 2019). Metro and RTC subsequently updated their respective RTPs as part of their 5-year update cycle, as required under 23 Code of Federal Regulations (CFR) § 450.324. The 2023 RTP was adopted by Metro in 2023 and RTC in 2024, several years after the IBR Program Draft SEIS analysis was initiated in early 2021. Therefore, the NEPA lead agencies exercised their discretion and determined, based on their technical expertise, that the 2018 RTP RTDM continued to be the most appropriate base tool for the purposes of comparing the No-Build Alternative to the Modified LPA and design options in the Final SEIS. This changed condition resulted in design modifications to components of the Modified LPA.
- **Transit system and service.** Changes in existing transit services and activities include the construction and operation of the C-TRAN Fourth Plain and Mill Plain Vine BRT routes,[26] which began service in 2017 and 2023, respectively, and bus-on-shoulder operations on I-5 north of the Interstate Bridge, which began in 2020. A third BRT line that would extend north from downtown Vancouver along Highway 99 is in the planning stage. A Fourth Plain extension serving Fourth Plain Boulevard and 162nd Avenue is also in the planning stage. TriMet has also expanded operations and planning for additional BRT service in the region. This changed condition resulted in modifications to the transit component of the Modified LPA.
- **Updated AASHTO LRFD Bridge Design Specifications and the AASHTO Seismic Guide Specifications.** The current AASHTO LRFD Bridge Design Specifications and the AASHTO Seismic Guide Specifications have been updated. This changed condition resulted in modifications to the North Portland Harbor bridge component of the Modified LPA.
- **Vancouver land use.** Localized development has occurred in downtown Vancouver and at the Vancouver waterfront that includes building permit applications, construction, and buildings developed since issuance of the CRC ROD. This development is consistent with local development plans including the Vancouver City Center Vision, Waterfront Master Plan, and Terminal 1 Concept Development Plan. Design modifications are necessary to minimize property impacts and improve access. This changed condition resulted in modifications to the I-5 highway and transit components of the Modified LPA.

How the Changed Conditions Modified the CRC LPA and Resulted in the IBR Program Modified LPA

Many of the changed conditions listed above resulted in modifications to certain CRC LPA components and resulted in the Modified LPA. How the changed conditions led to each Modified LPA component is described below.

[26] The Fourth Plain and Mill Plain Vine BRT routes run between downtown Vancouver and the Vancouver Mall Transit Center via Fourth Plain Boulevard, with a second line along Mill Plain Boulevard. In the primary study area, service currently runs along Washington and Broadway Streets through downtown Vancouver.

Columbia River Bridges

The following changed conditions contributed to modifications to the Columbia River bridges component: USCG Bridge Permit Application Guide, the 2013 Bridge Permit, USCG -FHWA-FTA-FRA Memorandum of Understanding (2014) and the USCG-FHWA Memorandum of Agreement (2014), and design optimization. Modifications to the Columbia River bridges include straightening the bridge alignment and adding additional bridge configuration options.

The Modified LPA has a straightened bridge alignment because of the changed conditions that prompted replacement of the North Portland Harbor bridge (described below). Previously, the North Portland Harbor bridge would have been retrofitted in place, which would have required the Columbia River bridges to have a curved alignment in order to connect to the existing North Portland Harbor bridge. Under the Modified LPA, the replacement North Portland Harbor bridges would be located west of the existing location, shifting I-5 slightly west and enabling the Columbia River bridges to have a straight alignment, which would improve constructability.

The Modified LPA also has two single-level bridge configuration options (the CRC LPA included a double-deck fixed-span bridge configuration). These single-level bridge configurations were included in response to design optimization efforts to address ingress and egress of transit.

A single-level movable-span configuration was included in response to changes to the USCG Bridge Permit Application Guide and because the 2013 Bridge Permit has expired. After following the updated USCG permit process, the USCG issued a PNCD in June 2022 that required at least 178 feet of vertical navigation clearance (VNC), which is consistent with the existing VNC of the Interstate Bridge. The single-level movable-span configuration would provide 178 feet of VNC. On January 16, 2026, the USCG issued a revised PNCD for the new Columbia River bridges and set the preliminary vertical navigation clearance at 116 feet or greater. All bridge configurations considered as part of the Modified LPA would be consistent with the January 2026 PNCD.

I-5 Highway

The following changed conditions contributed to modifications to the I-5 highway component: historic resources, Portland and Vancouver land use, freight movements, and design optimization. Modifications to the I-5 highway include changes to interchanges and access, the addition of one auxiliary lane, and the addition of options to remove the C Street ramp and shift the I-5 alignment west in downtown Vancouver.

Some interchange improvements and access were modified in response to changed conditions, including changes to Portland and Vancouver land uses and changes to freight movement. For example, the Hayden Island interchange was changed from a full interchange in the CRC LPA to a partial interchange in the Modified LPA due to reductions in planned freight movement on the island and changes in Portland land use.

A one auxiliary lane design option was included as part of the Modified LPA to reduce the highway footprint while reducing congestion and improving safety on I-5. To optimize the design, further modifications to interchanges were necessitated to accommodate one auxiliary lane.

Design optimization efforts also resulted in adding an option to shift the I-5 mainline slightly west in downtown Vancouver to evaluate another approach to minimize impacts to environmental resources on both sides of I-5. Design optimization efforts also resulted in adding an option to eliminate the C Street ramps in Vancouver to reduce the Program footprint.

North Portland Harbor Bridge

Both of the following changed conditions contributed to modifications to the North Portland Harbor component: updated AASHTO LRFD Bridge Design Specifications and AASHTO Seismic Guide Specifications

and degraded seismic resiliency. Modifications to the North Portland Harbor bridge include replacing the bridge instead of retrofitting it.

The Modified LPA replaces the North Portland Harbor bridge because the bridge's seismic resiliency has continued to degrade over time, to the point that it would be cost-prohibitive to retrofit the existing bridge to address seismic vulnerability. In addition, the current AASHTO LRFD Bridge Design Specifications and the AASHTO Seismic Guide Specifications have been updated and, when applied to the existing bridge, indicate an increased need to replace this seismically deficient structure to improve seismic resiliency in the corridor. Replacement bridges over North Portland Harbor and the Columbia River would be designed to the same seismic and resiliency standards to provide consistent seismic resiliency from the North Portland mainland to Vancouver, a complete river crossing.

Active Transportation

The following changed conditions contributed to modifications to the active transportation component: active transportation connections, Portland's transportation hierarchy, and design optimization. Modifications to the active transportation component include modifications in the design to connect to existing and planned active transportation systems in the Program area. Bicycle and pedestrian improvements would continue to be incorporated throughout the Program area.

Some details of the bicycle and pedestrian improvements were modified due to changes in active transportation connections and a change in the City of Portland's transportation hierarchy. For example, existing and planned active transportation projects in Portland and Vancouver that prompted design modifications to maintain connectivity include the 40-Mile Loop Trail in Portland and the two-way cycle track on Fourth Plain Boulevard in Vancouver.

Additionally, the changed conditions that prompted the replacement of the North Portland Harbor bridge (described above) allowed the IBR Program to optimize the location of the local arterial bridge to the east of I5 under the Modified LPA (previously west of I-5 in the CRC LPA), which necessitated changes in active transportation connections in the vicinity of the Marine Drive and Hayden Island interchanges. In addition, design optimization efforts resulted in realigning active transportation facilities near modified interchanges.

Changes to transit station locations and the LRT alignment (described below) also led to changes in active transportation connections to these transit facilities.

Transit

The following changed conditions contributed to modifications to the transit components: Vancouver land use, historic resources, the existing and planned regional transit system and service, and design optimization. Modifications to the transit component include modifications to the LRT alignment, terminus, and station locations; bus-on-shoulder and express bus operations; and transit facilities.

Changes to Vancouver land use, including new development and new transit service, have increased development in downtown Vancouver, in and around the Vancouver waterfront, and along the path of the LRT alignment under the CRC LPA. In addition, there was an increase in the number of historic resources (i.e., additional historic-aged structures potentially eligible for listing on the National Register of Historic Places, as described in Section 3.8, Cultural Resources) in downtown Vancouver. These changed conditions necessitated design modifications, including shifting the LRT alignment adjacent to I-5, elevating the LRT tracks, and adjusting the LRT terminus. These modifications help minimize property impacts in Vancouver and improve access to C-TRAN bus routes.

In addition to a change in alignment, the terminus at Clark College in the CRC LPA has been modified to end near Evergreen Boulevard. Since the CRC LPA, C-TRAN has implemented a BRT system that serves the area of the CRC LPA terminus at Clark College. This new service was one of the contributing reasons for a change in

LRT terminus under the Modified LPA. In the Modified LPA, a terminus near Evergreen Boulevard maximizes transfer opportunities to C-TRAN transit service as it provides direct connections to several local routes, as well as existing and planned BRT routes.

The change in LRT alignment and terminus (described above), as well as new development in downtown Vancouver (Vancouver Land Use), and transit systems and service enhancements that have been made within the Program footprint as part of C-TRAN's transportation planning, also necessitated changes to the stations and park and rides and the number of parking spaces that are planned for as part of the Modified LPA.

The CRC LPA assumed that the I-5 express bus service would be reduced between downtown Vancouver and Portland, with the I-5 route from Salmon Creek ending in downtown Vancouver and forcing a transfer to light-rail for the trip across the Columbia River. C-TRAN began express bus-on-shoulder operations in limited sections of its express routes in 2017, after the CRC project was halted. The successful implementation of express bus-on-shoulder on the southbound inside shoulder of I-5 in Vancouver—along with local agency and community priorities to minimize transfers and provide added capacity that is needed to meet cross-river demand—prompted the design modifications to I-5 shoulders through the Program area in the Modified LPA. With these changes, the Modified LPA with all design options would allow C-TRAN to continue to provide express bus service operating in shoulders in the southbound direction and add the ability to operate in shoulders in the northbound direction. The shoulder operations would extend through the entire Program area and would allow faster operational speeds than are currently possible (35 mph maximum speeds vs. 25 mph maximum speeds currently). In addition to bus-on-shoulder design modifications, service increases on I-5 express buses would be needed because cross-river transit demand with the Modified LPA would exceed the capacity being provided on the Yellow Line extension alone. This is in part because the Modified LPA would have a limited number of proposed park and rides and spaces in Washington. Additionally, strong demand from outer areas of Clark County that may not have pedestrian access to transit increased the importance of C-TRAN's connected express bus service across the Columbia River. The need for greater express bus service in turn necessitated the need for additional bus bays at the C-TRAN OMF.

Both TriMet and C-TRAN continually update their service in response to changing system needs. Since the CRC LPA was developed, both agencies have implemented BRT service, and C-TRAN has implemented cross-river regional service and modified how it operates its express services. Both BRT services have been updated in future year networks to reflect how these agencies currently operate and how they anticipate operating in the future, which is different from the assumptions upon which the CRC LPA was based. To accommodate current transit service and operations for both agencies, the designs of both the Waterfront and Evergreen Stations include integration of C-TRAN BRT, express and local bus service and, at the redesigned Expo Station, include integration of TriMet local bus service.

An overnight LRV facility at the Expo Center was not part of the CRC LPA, which assumed that LRVs would be accommodated through the expansion of the Ruby Junction OMF. With changes to the Modified LPA in Vancouver in responses to contextual changes (i.e., transit system and service), as discussed above in Section 2.2.6, the IBR Program examined ways to reduce the long-term operations and maintenance and associated costs, and improve reliability on the system. The Expo Overnight Facility would result in substantially less deadhead time for trains originating at Evergreen Station for service, reduce Yellow Line operating costs, and retain maintenance and operations windows for the Blue Line. This led to the consideration and inclusion of the Expo Center site as an overnight LRV facility.

Transportation Demand and System Management Measure

There were no changes to the transportation demand and system management measures from the CRC LPA to the Modified LPA.

2.5.3 IBR Program Design Option Development and Screening

> The IBR Program held a targeted period of engagement between January and April 2021 to gather feedback from advisory groups and the public on transportation problems and to understand community priorities and values.

During the early planning phase for the IBR Program, feedback from partner agencies, tribes, organizations, and the public identified changed conditions within the study area that had occurred since the selection of the CRC LPA. As a result, the IBR Program identified several components of the CRC LPA that required design modifications. Potential options for each of these components went through a multitiered screening process that included input from Program partners, tribes, and community members. Screening metrics that reflect the Program's Purpose and Need were developed in Fall 2021. The screening process took place prior to issuance of notice in the Federal Register that FHWA and FTA would prepare an SEIS for the IBR Program. The screening process, including why design options were advanced or dropped from further screening, is described below and further detailed in Appendix D, Design Options Development, Screening, and Evaluation Technical Report. The components evaluated were:

- Hayden Island and Marine Drive
- Main Columbia River crossing
- Transit mode, general alignment, and termini
- Auxiliary lanes

The evaluation of each component is described briefly below. For more detailed information on the process by which design modifications were required to address changed conditions since the 2011 ROD, as revised by the 2012 and 2013 re-evaluations, and were developed and screened, see Appendix D, the Design Options Development, Screening, and Evaluation Technical Report.

Hayden Island and Marine Drive

The IBR Program identified the changes in conditions since 2013 (bulleted below) related to Marine Drive and Hayden Island through advisory group input, community feedback, and input from agency partners serving on the Hayden Island/Marine Drive Task Force[27] (refer to Appendix D, Design Options Development, Screening, and Evaluation Technical Report, for additional information). The following changed conditions, detailed in Section 2.5.2, Updating the CRC LPA, necessitated the development of design options for the Marine Drive and Hayden Island interchanges:

- Freight movements
- Levee
- North Portland Harbor bridge
- Portland land use
- Design optimization
- Portland's transportation hierarchy

The primary design considerations for Hayden Island and Marine Drive were the interchange type on Hayden Island and the resulting multimodal connections with Marine Drive and I-5. The IBR Program evaluated

[27] The Hayden Island/Marine Drive Task Force met 18 times between late spring 2021 and early winter 2022. There was an average of 50 participants per meeting, with staff from 10 local partner agencies and technical staff from the IBR Program.

multiple concepts, ultimately advancing five full-, partial-, and no-interchange options for Hayden Island into the screening process. All design options included a full interchange at I-5/Marine Drive; an arterial bridge across North Portland Harbor to serve local traffic; a shared-use path for active transportation connecting North Portland, Hayden Island, and the 40-Mile Loop Trail; and the extension of Tomahawk Island Drive under I-5 to provide an additional east-west local street connection on Hayden Island.

The Hayden Island/Marine Drive Task Force identified the following five design options to advance for screening (refer to Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for a complete description of each design option):

- Design Option 1 – Full Interchange: Like the CRC LPA, this option would include a full, split tight-diamond interchange at Hayden Island and a single-point urban interchange (SPUI) at Marine Drive.
- Design Option 2 – Partial Interchange 1: This option would include a full-access folded-diamond interchange at Marine Drive and a half-diamond interchange on Hayden Island.
- Design Option 3 – Partial Interchange 2: This option would also have a full-access folded-diamond interchange at Marine Drive and a half-diamond interchange on Hayden Island and would add a local street bridge east of I-5.
- Design Option 4 – No Interchange: This option would have no interchange on Hayden Island and a full-access folded-diamond interchange at Marine Drive.
- Design Option 5 – Partial Interchange 3: Similar to Design Options 2 and 3, the partial interchange configuration under this option would provide I-5 ramps to/from the north to Hayden Island via Jantzen Drive. However, Design Option 5 would use a full-access SPUI at Marine Drive, similar to Design Option 1, to resolve some of the challenges posed by the folded-diamond interchange configuration.

During screening, the task force collected data for approximately 90 metrics and scored each design option against the others for a given metric. Screening metrics, which reflect the Program's Purpose and Need, were categorized as adaptation, natural environment, built environment, active transportation, transit access, vehicles, freight, cost, and seismic. The task force also identified design and operational flaws in Design Options 2, 3, and 4 that made them infeasible. Design Options 1 and 5 performed best out of all design options. They had a similar freight/vehicle traffic performance on Marine Drive, including at ramp terminal intersections, and were both compatible with all transit investments currently under consideration.

Tradeoffs and benefits between Design Options 1 and 5 are listed in Table 2-7 to further differentiate between the two options.

Table 2-7. Tradeoffs and Benefits Between Hayden Island/Marine Drive Design Options 1 and 5

Design Option 1 – Full Interchange	Design Option 5 – Partial Interchange
Larger footprint over North Portland Harbor.	**Smaller** footprint over North Portland Harbor.
More floating home impacts.	**Fewer** floating home impacts.
Larger scale and complexity of I-5 over Hayden Island provides **lower-**quality experience for active transportation and transit access on east-west streets.	**Smaller** scale and complexity of I-5 over Hayden Island provides **higher-**quality experience for active transportation and transit access on east-west streets.
Hayden Island vehicle/freight access to/from Portland **via Hayden Island Drive I-5 ramps.**	Hayden Island vehicle/freight access to/from Portland **via local roads and I-5 ramps that cross under Marine Drive.**
Hayden Island vehicle/freight access to/from Vancouver via Jantzen Drive I-5 ramps.	Hayden Island vehicle/freight access to/from Vancouver via Jantzen Drive I-5 ramps.

Based on the findings in Table 2-7, Design Option 5 (Partial Interchange) was advanced for further study and refinement and ultimately inclusion in the Modified LPA. Design Option 5 would construct a partial interchange at Hayden Island and a full interchange at Marine Drive; it was advanced because it would be designed to minimize impacts while making improvements to freight and workforce traffic and active transportation on Hayden Island and Marine Drive. Refer to Appendix D, the Design Options Development, Screening and Evaluation Technical Report, for additional detail.

Main River Crossing

The IBR Program identified the changes in conditions since 2013 (bulleted below) related to the main river crossing through advisory group input, community feedback, and input from agency partners serving on the River Crossing Task Force[28] (refer to Appendix D, Design Options Development, Screening, and Evaluation Technical Report, for additional information). The following changed conditions, detailed in Section 2.5.2, Updating the CRC LPA, necessitated the development of design options for the river crossing. Additionally, design options for the river crossing are necessary to accommodate the potential design changes identified for the Hayden Island and Marine Drive interchanges, described above.

- Active transportation connections
- 2013 Bridge Permit
- Changes in regulations
- ESA
- Transit system and service
- Vancouver land use

The river crossing area covers the main span of the existing Interstate Bridge over the Columbia River. This component extends from where the bridge begins on Hayden Island to where the bridge touches down in Vancouver. The design options considered ways to move all modes across the river, as well as the configuration of these modes in relation to each other (e.g., the location of the shared-use path in relation to vehicle lanes and transit lines). The design options included variations designed for a two-bridge or one bridge river crossing option, and they assumed a mid-level fixed-span bridge that provides 116 feet of VNC.[29]

Following agency and public input, the River Crossing Task Force identified three design options to advance for screening (refer to Attachment C.C-1, River Crossing Bridge Clearance Assessment Report – Movable Span Options, in Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for a complete description of each design option):

- Design Option 1 – Two Straight Bridges (Refined 2013 Design): Like the CRC LPA, this option would have two bridges; however, in this option the alignment for both bridges would be straight.

[28] The River Crossing task force consisted of technical staff from ODOT, WSDOT, C-TRAN, TriMet, Metro, RTC, City of Portland, City of Vancouver, Port of Portland, Port of Vancouver, and the IBR Program. The task force met 11 times between summer 2021 and winter 2022 with an average of 50 participants per meeting.

[29] 116 feet of vertical navigation clearance was assumed during this screening effort because it was the same vertical navigation clearance assumed after the CRC project's 2012 re-evaluation regarding bridge height. Additional analysis regarding the consideration of a tunnel and movable-span bridge is included in Attachment C-1 of the Design Options Development, Screening, and Evaluation Technical Report (Appendix D).

- Design Option 2 – One Bridge (Double-Stacked):[30] This option would consolidate all elements into one bridge, with southbound highway lanes on top of northbound highway lanes. In this option, transit would be on the lower level and the shared-use path would be on the upper level.
- Design Option 3 – One Bridge (Hybrid-Stacked):[31] This option would be similar to Design Option 2, but the shared-use path would be cantilevered from the lower level on the east side of the bridge and transit would remain on the lower level.

During screening, the task force collected data for approximately 90 metrics and scored each design option against the others for a given metric. Screening metrics were categorized as adaptation, natural environment, built environment, active transportation, vehicles/freight, and cost. Design Options 1 and 3 performed the best of the design options during the screening.

Tradeoffs and benefits between Design Options 1 and 3 are listed in Table 2-8 to further differentiate between the two options.

Table 2-8. Tradeoffs and Benefits between River Crossing Design Options 1 and 3

Design Option 1 – Two Straight Bridges	Design Option 3 – One Bridge (Hybrid-Stacked)
Reduces shared-use path users' exposure to noise and elements.	**Increases** shared-use path users' exposure to noise and elements.
Creates **visually uncluttered** structures on Hayden Island and scales them to surroundings.	Results in **complex** bridge approaches on Hayden Island and in Vancouver.
Easier-to-fund river crossing bridge because it would allow phased construction to maintain operational traffic on I-5 across the Columbia River.	**Harder**-to-fund river crossing bridge because it would not allow for phased construction or maintenance on I-5 across the Columbia River.
No undesignated space on upper deck.	**Creates undesignated** space on upper deck.
Fewer right-of-way acquisitions and impacts to Fort Vancouver.	**More** right-of-way acquisitions and impacts to Fort Vancouver because the lower deck would be wider on the eastern side and would require additional right of way to accommodate the shared-use path ramp from the bridge to ground level.
Smaller footprint over land.	**Larger** footprint over land because the lower deck would be wider on the eastern side and would require additional right of way to accommodate the shared-use path ramp from the bridge to ground level.
Simpler wayfinding on northbound I-5.	Overhead structure **complicates** wayfinding on northbound I-5 (requires approvals for signage smaller than standards).
Can maintain traffic on existing Interstate Bridge during construction.	**Cannot maintain** traffic on existing Interstate Bridge during construction.
Longer construction period.	**Shorter** construction period.

[30] "Double stacked" means that both the northbound and southbound highway would be stacked, and the transit and shared-use path would be stacked. The upper level of the bridge would have southbound highway traffic adjacent to the shared-use path and the lower level would have northbound highway traffic adjacent to transit.

[31] "Hybrid stacked" means that the northbound and southbound highway would be stacked. The upper level of the bridge would have southbound highway traffic. The lower level of the bridge would have northbound highway traffic. The shared-use path would be cantilevered from the lower level on the east side of the bridge. Transit would be on the lower level on the west side of the bridge.

Design Option 1 – Two Straight Bridges	Design Option 3 – One Bridge (Hybrid-Stacked)
Emergency vehicles access shared-use path via **shared-use path ramps** on Hayden Island and downtown Vancouver.	Emergency vehicles access shared-use path via **northbound I-5** or **shared-use path ramps** on Hayden Island and downtown Vancouver.
Likely uses **more** construction materials (based on the footprint, not expected air pollutant emissions).	Uses marginally **fewer** construction materials (based on the footprint, not expected air pollutant emissions).
More in-water piers/obstructions: • 12 in-water piers (each pair of piers measures approximately 200 feet combined in direction of river channel).	**Fewer** in-water piers/obstructions: • 6 in-water piers (each pier measures approximately 175 feet in direction of river channel).
Larger footprint over aquatic habitat (approximately 12 acres).	**Smaller** footprint over aquatic habitat (approximately 10 acres).
Lower deck shared-use path **not visible** to vehicular traffic, does not benefit from "eyes on the path" (a safety concern for active transportation users).	**Allows some visibility** between shared-use path and vehicular traffic on lower deck.

Based on the findings shown in Table 2-8, Design Option 1 (Two Straight Bridges) was advanced for further study and refinement. Design Option 1 would construct two bridges from Hayden Island to Vancouver on a straight alignment. The eastern bridge would accommodate northbound highway traffic on the upper bridge deck, with a bicycle and pedestrian path underneath; the western bridge would carry southbound traffic on the upper bridge deck, with two-way transit below. Design Option 1 was advanced because it would have fewer impacts and can maintain traffic during construction. Design Option 1 is referred to as the double-deck fixed-span configuration in this SEIS. Refer to Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for additional information.

The CRC project proposed to construct a bridge with a VNC of 116 feet because that design balanced the needs of navigation, airfield operations, and surface transportation, while minimizing additional landside and environmental impacts. In September 2013, the USCG issued a bridge permit for the construction of the replacement bridges over the main span of the Columbia River as proposed by the CRC project. That permit expired when CRC was suspended; other required permits/authorizations were not completed and mitigation was not implemented within three years, so a new bridge permit would be required for the IBR Program. In November 2021 (revised in May 2022), the IBR Program prepared a navigation impact report as an update to the 2012 CRC Navigation Impact Report to reflect changed conditions and development since the original navigation impact report and to reflect the change in USCG guidance since the CRC project was suspended. The IBR Program's Navigation Impact Report provides detailed consideration of a fixed-span bridge over the Columbia River with a vertical clearance of 116 feet to 121 feet over 0 feet Columbia River Datum because these heights and associated avoidance and mitigation strategies would be expected to support reasonable navigation.

In June 2022, USCG issued a PNCD that set a requirement for a vertical clearance of 178 feet for the reasonable needs of navigation. In response to the determination, the IBR Program developed a bridge configuration for the Modified LPA that would include a single-level movable-span bridge over the Columbia River that provides 178 feet of VNC. The IBR Program also added a single-level fixed-span configuration in response to physical and contextual changes since 2013 that warranted a refinement in the double-deck configuration based on current design and operational requirements. The IBR Program carried forward the three bridge configurations to address changes in the USCG bridge permitting process and to ensure a permittable bridge configuration is evaluated in the Final SEIS. All three bridge configurations would be consistent with the January 2026 PNCD and are described in Section 2.2.3, Columbia River Bridges (Subarea B) and are analyzed throughout this Final SEIS.

Transit – Mode, General Alignment, and Termini

The IBR Program identified the following changes in conditions since 2013 related to transit through advisory group input, community feedback, and input from agency partners serving in the Transit Options Technical Session (refer to Appendix D, Design Options Development, Screening, and Evaluation Technical Report, for additional information). These changes, detailed in Section 2.5.2, Updating the CRC LPA, led to the development of transit options that were analyzed.

- Transit system and service
- Vancouver land use

The IBR Program and the agency partners serving in the Transit Options Technical Session developed 13 representative transit investments (listed in Table 2-9) to better understand how different combinations of mode (BRT and LRT), alignment, station locations, termini (end points), and park and rides could perform relative to each other. Twelve of the 13 representative transit investments were modeled through the Metro/RTC regional travel demand model to arrive at forecasts for the year 2045. One of the representative transit investments was removed from consideration prior to modeling. IBR Program partners and the IBR Program team developed measures to better understand how the representative transit investments would perform relative to each other.

The IBR Program's screening process confirmed the CRC decision to extend LRT into Vancouver; however, the process and the changed conditions identified above also led to refinements of the proposed alignment, station locations, park and rides, and termini locations as compared to CRC. The IBR Program advanced the extension of LRT from the Expo Center MAX Station in Portland north to a new station on Hayden Island, continuing across the Columbia River on the new Columbia River bridges, following I-5 to multiple stations in Vancouver with a northern terminus at Evergreen Station. Table 2-9 describes the 13 representative transit investments that were evaluated, and the sections below describe how the Modified LPA transit mode, general alignment, and termini were advanced. Refer to Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for additional information.

Table 2-9. Representative Transit Investment Descriptions

Representative Transit Investment	General Description
No-Build	The No-Build scenario reflects planned systemwide increases in background transit service by both TriMet and C-TRAN as adopted by both Metro and RTC in their respective regional transportation plans but reflects no replacement of the existing Interstate Bridge, no reconstructed interchanges, no tolls on the Interstate Bridge, and no extension of additional high-capacity transit service north from the existing MAX Yellow Line alignment into Vancouver.
2045 CRC ROD	2013 CRC LPA, assuming fully dedicated LRT tracks extending from the Expo Center MAX Station to a terminus near McLoughlin/I-5 via the Vancouver central business district. Includes five new stations and three park and rides.
Bus on Shoulder	Express bus operates as bus on shoulder in study area (both directions). Regional route operates in the auxiliary lanes between the Vancouver central business district and Hayden Island, Delta Park. No new stations or park and rides.
BRT Turtle Place to Expo Center MAX Station	Dedicated BRT lane between the Expo Center MAX Station and a terminus at Turtle Place in downtown Vancouver. Includes three stations: Expo Center, Hayden Island, and Turtle Place.

Representative Transit Investment	General Description
BRT I-5 to Kiggins Bowl	Fully dedicated BRT lane between the Expo Center MAX Station and a terminus near McLoughlin Boulevard/I-5. Dedicated lane on Vancouver segment assumed to be adjacent to I-5 with a dedicated connection to Hayden Island and the Expo Center MAX Station similar to the 2013 LPA. Includes six stations: Kiggins Bowl, 33rd Street, McLoughlin Boulevard, Evergreen Boulevard, Hayden Island, and the Expo Center MAX Station.
BRT in ROD Alignment	Fully dedicated BRT lane between the Expo Center MAX Station and a terminus near McLoughlin Boulevard/I-5 to the Expo Center MAX Station with alignment and station locations similar to CRC project. Includes six stations: I-5/McLoughlin, McLoughlin and Washington Street (southbound)/16th and Broadway (northbound), 12th and Washington (southbound)/13th and Broadway (northbound), Turtle Place, Hayden Island, and the Expo Center MAX Station.
Hybrid	Fully dedicated LRT tracks between the Expo Center MAX Station and a new station at Hayden Island and fully dedicated BRT lane between Hayden Island and Turtle Place. Includes two stations: Hayden Island and Expo Center MAX Station.
LRT One Station in Vancouver	Fully dedicated LRT tracks between the Expo Center MAX Station and a terminus near Turtle Place in downtown Vancouver. Includes two stations: Hayden Island and Turtle Place.
LRT I-5 to McLoughlin	Fully dedicated LRT tracks between the Expo Center MAX Station and a terminus near McLoughlin Boulevard/I-5. Dedicated tracks on Vancouver segment assumed to be adjacent to I-5 with a dedicated connection to Hayden Island and the Expo Center MAX Station similar to 2013 LPA. Includes three stations: I-5/McLoughlin, Evergreen, and Hayden Island.
LRT I-5 to Kiggins Bowl	Fully dedicated LRT tracks from the Expo Center MAX Station to a terminus near I-5/Kiggins Bowl. Dedicated tracks on Vancouver segment assumed to be adjacent to I-5 with a dedicated connection to Hayden Island and Expo Center MAX Station similar to 2013 LPA. Includes five stations: Kiggins Bowl, 33rd Street, I-5/McLoughlin, Evergreen, and Hayden Island.
LRT Delta Park to McLoughlin	Fully dedicated LRT Extension from Delta Park (joint Hayden Island/Expo Center MAX Station) to a terminus near McLoughlin/I-5 on an I-5-adjacent alignment (Center/West Side of I-5). This option was eliminated from consideration due to the removal of access to the Expo Center, one of the largest event venues in the region, and was not evaluated using the travel demand model.
LRT I-5 to McLoughlin with Columbia	Fully dedicated LRT tracks between the Expo Center MAX Station to a terminus near McLoughlin Boulevard/I-5. Dedicated tracks on Vancouver segment assumed to be adjacent to I-5 with a dedicated connection to Hayden Island and the Expo Center MAX Station similar to 2013 LPA. Includes four stations: I-5/McLoughlin, Evergreen, Waterfront, and Hayden Island.
LRT I-5 to Evergreen with Columbia	Fully dedicated LRT tracks between the Expo Center MAX Station to a terminus near I-5/Evergreen. Dedicated tracks on Vancouver segment assumed to be adjacent to I-5 with a dedicated connection to Hayden Island and the Expo Center MAX Station similar to the 2013 LPA. Includes three stations: Evergreen, Waterfront, and Hayden Island.

BRT = bus rapid transit; CRC = Columbia River Crossing; LPA = Locally Preferred Alternative; LRT = light-rail transit; RTC = Southwest Washington Regional Transportation Council

Mode

The IBR Program considered three transit modes to meet transit demand: express bus operating on the shoulder, BRT, and LRT. Bus-on-shoulder capability in the study area was included in all representative transit investments and was removed from consideration as a standalone transit option since it would provide substantially less capacity than other transit options to meet demand.

Based on analysis and coordination with partner agencies, the advantages and disadvantages listed in Table 2-10 were identified for BRT and LRT. Based on these findings, and when considering the specific needs of the HCT investment for the IBR Program, LRT was advanced as the preferred transit mode. See Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for additional information on the transit mode evaluation.

Table 2-10. Summary of Transit Mode Evaluation

Light-Rail Transit	Bus Rapid Transit
• Higher vehicle capacity allows the Program to carry more people across the river. • Compared to existing conditions and BRT, would improve access to jobs and services for many residents in part due to the one-seat ride experience that would not involve transfers for more riders. • Allows for preservation of the current and future C-TRAN Vine and express bus system while providing convenient connections to new LRT stations. • Offers a more competitive travel time compared with trips that require a transfer at the Expo Center MAX Station. • Extension of the MAX Yellow Line from the Expo Center MAX Station into Vancouver best integrates existing transit investment in the region in a manner that maintains both C-TRAN's and TriMet's respective approaches to operations of their transit systems.	• Lower vehicle capacity than LRT and would require a transfer to connect to the regional light-rail system. • Less competitive travel time compared to LRT due to a required transfer at the Expo Center MAX Station. • Compared to existing conditions, would improve access to jobs for many residents. • Preserves the current and future C-TRAN Vine and express bus system. • Did not rate as favorably for cost effectiveness, mobility, congestion relief and environmental benefits.

Note: The information in this table is from the design option screening and evaluation conducted in 2021 and 2022 (see Appendix D).
BRT = bus rapid transit; FTA = Federal Transit Administration; LRT = light-rail transit

Alignment

Twelve potential transit alignments were evaluated by the Program and partner agencies. These potential alignments fell into two categories: accessing downtown Vancouver or aligning with the existing I-5 corridor. Detailed conceptual design work on the potential alignments (and their impacts) was brought to the advisory groups, community groups, and partner agencies.

When advancing an alignment, a key consideration was the need to integrate new transit investments while considering the existing and planned transit networks of TriMet and C-TRAN. Since 2013, C-TRAN has developed a BRT system, The Vine, with two BRT lines in operation and two in planning. The Vine and C-TRAN express bus service provide frequent and reliable service within Clark County and to downtown Portland, respectively. The extent to which any transit investment could complement The Vine system, including existing and planned service, was evaluated.

The City of Vancouver has worked with C-TRAN to design station environments for The Vine system on Broadway and Washington Streets in the central business district. Design elements of the transit alignment could be coordinated with existing design for The Vine to provide more efficient functionality within the larger transit network and respective operating environments. The downtown Vancouver LRT alignment would impact C-TRAN's BRT alignments in the downtown area. In addition to the existing and planned transit networks, potential alignments could impact existing development in the study area. In comparison to the I-5 alignment, the downtown Vancouver alignment would require additional property and streetscape impacts.

Through analysis and coordination with local transit providers, it was determined that an I-5 alignment would:

- Have fewer potential property impacts compared to a downtown Vancouver alignment.
- Avoid impacts to C-TRAN network and The Vine service.
- Avoid impacts to the City of Vancouver's vision and downtown development.
- Provide increased transfer options to additional C-TRAN routes.
- Connect directly to downtown Vancouver library, jobs, services, and amenities.
- Support transit-oriented development opportunities at Library Square and on nearby City-owned parcels.
- Maximize transfer opportunities given planned direct connections to several local routes, as well as existing and planned BRT routes.
- Provide convenient access to Evergreen Boulevard, which connects east over I-5 to the Vancouver National Historic Reserve, and west through downtown to Main Street and Esther Short Park via the planned 9th Street pedestrian way.

Based on evaluations during screening, along with feedback from the community and partner agencies, the I5 general alignment was advanced for further study.

Terminus

The IBR Program evaluated terminus options for each alignment and mode (described above) based on ridership, impacts, and preservation of and connections to existing systems. These terminus options included Hayden Island in Portland and Waterfront, Turtle Place, Evergreen/I-5, McLoughlin/I-5, and Kiggins Bowl in Vancouver.

The evaluation of Hayden Island as a terminus was a hybrid option that included the extension of LRT north from the Expo Center MAX Station to Hayden Island and the extension of BRT from Turtle Place south to Hayden Island. This option did not perform as well as others in the evaluation process from a ridership standpoint (between 1,800 and 14,400 fewer riders than other terminus options considered [see Attachment D to Appendix D]), and ultimately it was removed from consideration in combination with the decision to select LRT as the mode to extend into Vancouver.

Two of the Vancouver terminus options would have just one station in Washington State, at either Waterfront or Turtle Place. Three of the Vancouver terminus options would have more than one station in Washington State. The Evergreen/I-5 option would have two stations, the McLoughlin/I-5 option would have three stations, and the Kiggins Bowl option would have four stations. The single-station terminus options did not perform as well from a ridership standpoint as options that extended farther into Vancouver that included more stations, regardless of which mode was considered (for BRT, the ridership was between 2,900 and 17,300 lower and for LRT, the ridership was between 3,200 and 12,600 lower with a single-station terminus option [see Attachment D to Appendix D]). Terminus options north of Evergreen Boulevard with more stations (McLoughlin/I-5 and Kiggins Bowl) resulted in higher forecasted ridership, but with greater potential impacts to properties and increased costs.

Through analysis and conversations with project partners, it was determined that an Evergreen Boulevard terminus would:

- Have fewer potential property impacts compared to other locations.
- Have lower operating and capital costs compared to other locations.

- Avoid property impacts to Clark Community College as a result of the station, alignment, and park and ride that were included in options that assumed McLoughlin/I-5 as a terminus.
- Avoid impacts to C-TRAN network and The Vine service.
- Avoid impacts to the City of Vancouver's vision and downtown development.
- Provide increased transfer options to additional C-TRAN routes.
- Connect directly to downtown library, jobs, services, and amenities.
- Support transit-oriented development opportunities at Library Square and on nearby City-owned parcels.
- Maximize transfer opportunities given planned direct connections to several local routes, as well as existing and planned BRT routes.
- Provide convenient access to Evergreen Boulevard, which connects east over I-5 to the Historic Reserve, and west through downtown to Main Street and Esther Short Park via the planned 9th Street pedestrian way.

Based on evaluation during screening along with feedback from partner agencies, the IBR Program and partner agencies recommended advancing the terminus at Evergreen Boulevard for further study and refinement.

Auxiliary Lanes

Auxiliary lanes improve traffic safety and reliability by providing sufficient merge, diverge, and weaving space for vehicles entering and exiting the highway while allowing the through traffic to maintain fuel-efficient driving speeds in the adjacent through lanes. The IBR Program identified changes in conditions since 2013 related to auxiliary lanes through advisory group input, community feedback, and input from agency partners (refer to Appendix D, the Design Options Development, Screening, and Evaluation Technical Report, for additional information). Changes in community priorities and feedback regarding the project's footprint and related concern for overall potential environmental impacts necessitated the development of design options for auxiliary lanes.

In addition to maintaining the existing three through lanes in each direction across the bridge, the IBR Program evaluated the addition of one and two auxiliary lanes in each direction. One auxiliary lane and two auxiliary lanes were advanced for additional analysis and consideration. The results of the auxiliary lane evaluation are summarized in Table 2-11 and described in more detail in Appendix D, the Design Options Development, Screening and Evaluation Report.

Because it would reduce overall environmental impacts while improving transportation operations and safety, one auxiliary lane northbound and one auxiliary lane southbound were recommended to be included in the Modified LPA. The Modified LPA includes one auxiliary lane in each direction across the new Columbia River bridges between Marine Drive and Mill Plain Boulevard, which would allow for weave, merge, and diverge movements outside the through lanes. Initial findings indicate that I-5 does not meet all transportation performance standards with this configuration, and close interchange spacing remains an issue. Therefore, a two auxiliary lane design option is also included for analysis in this Final SEIS. The two auxiliary lane design option consists of two auxiliary lanes in both the northbound and southbound directions across the Columbia River bridges.

The addition of auxiliary lanes (one or two) can help optimize use of the existing three through lanes and allow for more efficient movement through the corridor, as well as facilitate local trips across the Columbia River, thus improving safety, helping to relieve congestion with better traffic flow, and reducing air pollution from vehicles idling in congestion. Studying one or two auxiliary lanes in each direction recognizes the desire

to balance all of the regional needs and priorities, including safe, efficient, and reliable transportation (including transit and vehicular travel). Refer to Appendix D, the Design Options Development, Screening, and Evaluation Report, for additional information.

Table 2-11. Summary of Initial Auxiliary Lanes Evaluation Results

General Benefits of Auxiliary Lanes Compared to the No-Build Alternative	Specific Additional Benefits of One Auxiliary Lane Compared to the No-Build Alternative	Specific Additional Benefits of Two Auxiliary Lanes Compared to the No-Build Alternative
• Mode choice benefits (high-capacity transit, bus on shoulder, and active transportation). • Mode shift; the daily transit share is anticipated to increase from 7% to 11%. • Reduced overall congestion • Off-peak benefits, including weekends. • Less diversion to local streets. • Faster congestion recovery from crashes and incidents. • Fewer lane changes required (i.e., lane balance). • Safety improvements realized due to fewer sideswipe crashes and improved visibility. • Lane widths to allow for current vehicle widths, turning, and comfort. • Anticipated air pollution reduction due to less congestion.	• Travel time improvements: – Southbound AM travel time would be reduced by 3 minutes (5% faster) between I-5/I-205 split and I-405. – Northbound PM travel time would be reduced by 11 minutes (30% faster) between Broadway Street and SR 500. • Reduced congestion: – Congestion would be reduced by 37% (southbound) and 36% (northbound) during the 8-hour AM/PM peak period.	• Travel time improvements: – Southbound AM travel time would be reduced by 6 minutes (10% faster) between I-5/I-205 split and I-405. – Northbound PM travel time would be reduced by 25 minutes (70% faster) between Broadway Street and SR 500. • Reduced congestion: – Congestion would be reduced by 48% (southbound) and 75% (northbound) during the 8-hour AM/PM peak period.

Note: The data in this table are from the design option screening and evaluation conducted in 2021 and 2022 (see Appendix D). Updated data are included in Section 3.1, Transportation.

2.5.4 IBR Program's Adoption of Foundational Components of the Modified LPA

The boards, councils, and commissions of each of the eight IBR Program partners—including the regional transit agencies, cities, metropolitan planning organizations, and ports—met between June 22 and July 14, 2022, to consider the IBR Program's recommendation for the Modified LPA and voted to endorse the IBR Program's Modified LPA through a resolution by each agency. In addition to the Modified LPA resolutions, many partners included conditions reflecting their priorities and requests for additional work, considerations, and analysis. Attachment F to Appendix D includes the Modified LPA recommendations and each of the partners' resolutions and conditions regarding the Modified LPA that reflect the formalized partner process. The IBR Program partners' endorsement of the Modified LPA and conditions did not preclude consideration of other reasonable design options in the Draft or Final SEIS and will not influence the federal joint lead agencies' Amended Record of Decision. The IBR Program acknowledges that the preliminary analysis to support the Modified LPA was conceptual; more design refinement, transportation and transit analysis, financial analysis, and environmental evaluation was needed to better understand the impacts and benefits of the Modified LPA as the Program continued to develop a multimodal corridor solution. Therefore, the IBR

Program is committed to further refinements and analysis, as well as sharing the results to gather additional input on the Modified LPA.

Environmental analyses for this Final SEIS have been conducted to evaluate benefits and impacts to environmental and community resources (e.g., air quality, land use, transportation, etc.) and to identify potential mitigation for adverse impacts. Agencies, tribes, advisory groups, and the public were consulted during the development of the Draft and Final SEIS, including the public comment period on the Draft SEIS.

2.6 Additional Compliance

Several environmental compliance processes were underway at the time the Draft SEIS was published, and some continue to be underway at the time this Final SEIS is published. Changes to the Modified LPA from ongoing environmental compliance would be coordinated across all relevant agencies.

2.6.1 Compliance Activities Completed Since Draft SEIS

The following environmental compliance activities were underway at the time the Draft SEIS was published and have now been completed.

- **ESA, Section 7 and Magnuson-Stevens Fishery Conservation and Management Act.** Obtained a biological opinion from NOAA Fisheries and a concurrence letter from USFWS prior to the publication of the Final SEIS. These documents are included as Appendix O to this Final SEIS.
- **Section 4(f) of the U.S. Department of Transportation Act of 1966.** Section 4(f) documentation with correspondence from the officials with jurisdiction updated from the Draft 4(f) evaluation and incorporated into a Final 4(f) evaluation by FHWA and FTA. The final decision on the Section 4(f) Evaluation will be made at the time a ROD is issued. The correspondence is included as Appendix Q and the Section 4(f) evaluation is included as Chapter 4 to this SEIS.
- **Section 106 of the National Historic Preservation Act.** The IBR Program has coordinated with FHWA, FTA, and the National Park Service on Section 106 compliance for the Modified LPA, which is considered a new undertaking under Section 106. The IBR Program updated the Area of Potential Effects (APE), updated historic property inventories, evaluated additional historic properties, assessed potential additional effects on historic properties, and coordinated with consulting parties and tribes. Given the complexities of the IBR Program and the anticipated mix of construction contract delivery methods, FHWA and FTA prepared a new programmatic agreement (PA) instead of a memorandum of agreement to resolve known adverse effects for this undertaking and establish processes for ongoing Section 106 consultation after the PA is executed. In addition to resolving known adverse effects to historic built environment resources, the PA includes processes for phased investigations, evaluations, assessments of effects and resolution of adverse effects for archaeological resources, as well as processes related to consultation regarding Program changes, historic properties of religious and cultural significance to Indian tribes, post-review discoveries, and treatment of human remains, among others. FHWA and FTA, in coordination with WSDOT and ODOT, consulted with the Oregon State Historic Preservation Office, Washington Department of Archaeology and Historic Preservation, tribes, and other consulting parties to draft the PA. The draft PA was made available to the public prior to publication of the Final SEIS. The final PA, which has been executed and filed with the Advisory Council on Historic Preservation, is attached to the Final SEIS as Appendix N.

2.6.2 Compliance Activities Underway

The following environmental compliance activities are underway at the time this Final SEIS is published and will be completed prior to construction.

- **Section 6(f) of the Land and Water Conservation Act and Federal Lands to Parks.** Three parklands within the study area (East Delta Park, Marshall Park, and Old Apple Tree Park) were either created or improved with grants from the Land and Water Conservation Act or through the Federal Lands to Parks (FLP) Program. Both programs require replacement of land converted out of park ownership and use. Potentially impacted Section 6(f) resources and FLP resources are disclosed in this Final SEIS. Detailed impacts, determination of Section 6(f) and FLP parkland converted to transportation use, and potential mitigation are described in Section 3.21 of this Final SEIS.
- **Tribal consultation.** Continue tribal consultation to identify impacts and mitigation for cultural resources and natural resources.
- **Marine Mammal Protection Act of 1972.** The IBR Program submitted an application for a letter of authorization to NOAA Fisheries on January 14, 2025. It is anticipated that the letter of authorization is expected to be issued by March 2026.
- **Revised Code of Washington (RCW) 68.24.090**. Removal of the dedication from the Old Post Cemetery, or any other similarly dedicated cemetery within the APE, will be conducted under the Washington State process identified in RCW 68.24.090 and overseen by the Clark County Superior Court. Construction may not proceed within the Old Post Cemetery until the dedication is removed prior to initiation of IBR Program construction activities at this location. Additional procedures will be outlined in a Cemetery Treatment Plan prepared by WSDOT and ODOT. The Cemetery Treatment Plan will be provided to the Washington State Department of Archaeology and Historic Preservation, the National Park Service regarding the Vancouver National Historic Reserve, the U.S. Department of the Army, and the Tribes for review and comment.
- **U.S. Army Corps of Engineers Section 408.** Obtain Section 408 authorizations from USACE for alterations to a USACE Civil Works project. Anticipated activities include developing and submitting design packages to address proposed alterations to the federally authorized navigation channel in the Columbia River, levees along North Portland Harbor, and other aids to navigation as well as conducting any additional environmental analysis required to support the design advancement of these alterations. In addition, the Modified LPA proposes to relocate the Columbia River primary navigation channel from its current location along the north shore to the south. The result would be generally swapping the locations of the current primary navigation channel with the barge channel (which would become the north barge channel) and expanding the vertical and horizontal navigation clearances of both channels. Authorizations would be issued by USACE following issuance of the ROD and prior to the beginning of construction.
- **U.S. Army Corps of Engineers Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.** Obtain Section 404/Section 10 permits from USACE for impacts to designated waters of the United States. Program activities underway to support the permit applications include wetland delineation, coordination with USACE to provide jurisdictional determination, and evaluation of potential impacts to wetlands and other waters as well as evaluating impacts associated with excavation, filling, and other potential modifications to the navigation channels related to the development of the Modified LPA. Permits would be issued by USACE following issuance of the ROD and prior to the beginning of construction.

- **U.S. Coast Guard Bridge Permit, under the Authority of the General Bridge Act of 1946.** Obtain USCG Bridge permits for construction of bridges across navigable waterways under the jurisdiction of USCG. USCG issued new bridge permit application guidance in July 2016 and updated it in March 2025 (COMDTPUB P16591.3E). The IBR Program will submit new bridge permit applications for bridges proposed over these waterways in accordance with the 2016 Bridge Permit Application Guidance, as amended in 2025. In addition, the IBR Program will comply with the USCG-FHWA-FTA-FRA (2014) Memorandum of Understanding (2014) and the USCG-(2014) FHWA Memorandum of Agreement. The bridge permits would be issued after the ROD is published and prior to the start of construction. If the single-level movable-span configuration is selected, the IBR Program will also coordinate with USCG to alter the current bridge lift opening timing restrictions to optimize openings for vessels while minimizing delays to highway and transit operations via the federal rulemaking process. Consideration of the three bridge configurations involves coordination with USACE and USCG regarding multiple navigation related items. Table 2-12 summarizes the current and future actions necessary to reach resolution on an acceptable bridge configuration for the IBR Program.

Table 2-12. Navigation Considerations

Navigation Consideration	Decision Authority	Steps to Resolve	Timing
Vertical Navigation Clearance. The PNCD was issued with 178 feet of vertical navigation clearance, and the Modified LPA fixed-span bridge configurations provide 116 feet of vertical navigation clearance.	USCG	IBR Program coordinated with affected river users to resolve vertical navigation clearance requirements and entered into agreements.	Completed
		IBR Program prepared an updated navigation impact report as new information was available to inform reconsideration of the PNCD.	Completed
		USCG evaluated the updated navigation impact report and issued a revised PNCD.	Completed
		IBR Program prepared and submitted an application for USCG Bridge Permit.	Completed
		USCG to issue Bridge Permit.	Prior to construction
Alternatives to Navigation Channels and the Upper Vancouver Turning Basin (Vancouver to The Dalles). The Modified LPA would alter navigation channel locations, move the primary navigation south, and move the turning basin west.	USACE	IBR Program to submit a final application for Section 408 Authorization to modify the federal navigation channels.	Current/ongoing
		Obtain Section 408 Authorization to change the channel location.	Prior to construction
Horizontal Navigation Clearance	USCG/USACE	If the movable-span configuration is selected, the IBR Program would coordinate with USACE to optimize the horizontal clearance for navigation, channel maintenance, design feasibility, and cost.	Following identification of the selected alternative in the ROD
		If necessary, USCG to reissue PNCD to reflect modified horizontal navigation clearance.	Prior to construction

Navigation Consideration	Decision Authority	Steps to Resolve	Timing
		IBR Program to include information reflecting horizontal navigation clearance in USCG Bridge Permit and USACE Section 408 Authorization applications.	Prior to construction
		USCG to issue bridge permit. USACE to issue Section 408 Authorization.	Prior to construction
Movable-Span Opening Restrictions (timing)	USCG	IBR Program to evaluate the impacts from daytime and nighttime bridge openings to vehicular traffic, transit service, and maritime operations as part of the movable-span opening restriction request (refer also to Section 3.1, Transportation, and Section 3.2, Navigation).	Included in the Draft SEIS (2024) and this Final SEIS
		If the movable-span configuration is selected, the IBR Program would prepare a request for movable-span operating limitations for USCG consideration.	Following the ROD
		USCG to evaluate the IBR Program request and determine the need for review or rulemaking including the need to obtain information from the navigation community on movable-span restrictions.	Following submittal of request from the IBR Program
		USCG to complete rulemaking process including public review.	Prior to completion of the bridge

IBR = Interstate Bridge Replacement; LPA = Locally Preferred Alternative; PNCD = preliminary navigation clearance determination; ROD = record of decision; SEIS = supplemental environmental impact statement; USACE = U.S. Army Corps of Engineers; USCG = U.S. Coast Guard

2.7 Anticipated Permits and Approvals

Table 2-13 lists the federal, state, and local permits, clearances, and approvals that are anticipated to be required to construct the Modified LPA.

Table 2-13. Anticipated Permits and Approvals

Permit or Approval	Issuing Agency
Form 7460-1 permits for permanent and construction obstructions	FAA
23 U.S.C. § 129(a)(1)(E), Federal Tolling Authority	FHWA
Access revision report approval	FHWA
Design analysis approval	FHWA
Design approval	FHWA
Real estate acquisition review	FHWA
Right-of-way (interstate) approval	FHWA
Right-of-way (railroad) approval	BNSF Railway
ESA Section 7 consultation	NOAA Fisheries, USFWS
Magnuson-Stevens Fishery Conservation Management Act	NOAA Protected Resources Division
Marine Mammal Protection Act	NOAA Fisheries

Permit or Approval	Issuing Agency
National Historic Preservation Act Section 106	FHWA, FTA, National Park Service (NPS), Oregon State Historic Preservation Office (SHPO), Washington State Department of Archaeology and Historic Preservation (DAHP)
Archaeological Resources Protection Act permit	NPS
Section 4(f) of the U.S. Department of Transportation Act of 1966 determination	FHWA, FTA
Section 6(f) of the Land and Water Conservation Fund Act documentation	FHWA, FTA, NPS
Bridge permit in accordance with the General Bridge Act of 1946	USCG
Section 404 of the CWA permit	USACE
Section 14 of the Rivers and Harbors Appropriation Act of 1899, as amended and codified in 33 U.S.C. § 408 (Section 408)	USACE
Section 10 of the Rivers and Harbors Appropriation Act of 1899, as amended and codified in 33 U.S.C. § 401 et seq.	USACE
Sole Source Aquifer Protection Act approval	U.S. Environmental Protection Agency
Migratory Bird Treaty Act	USFWS
FLP Program	U.S. General Services Administration, NPS
Approval of rail crossing, intersection, signals, and right-of-way encroachment permit	ODOT, WSDOT
Voluntary Cleanup Pathway approval	Oregon Department of Environmental Quality (DEQ)
CWA National Pollutant Discharge Elimination System construction stormwater permits	DEQ, Washington State Department of Ecology (Ecology)
CWA Section 401 water quality certifications	DEQ, Ecology
Air quality permits	DEQ, Ecology
Removal-Fill Permit	Oregon Department of State Lands (DSL)
Lease/Bridge Easement Permit	DSL
Oregon Fish Passage Act approval	Oregon Department of Fish and Wildlife
Archaeological Excavation Permit	SHPO
Aquatic use authorization	Washington State Department of Natural Resources (DNR)
Hydraulic Project Approval	Washington Department of Fish and Wildlife
Approval for removal of cemetery dedication as codified in RCW 68.24.090	Clark County Superior Court
Track Access Permit(s)	TriMet
City of Portland local permits and approvals (design review/land use review, historic resources review, noise variance, improvements in right of way, building permit – site development, sign permit, trade permits, non-park use permit)	City of Portland

Permit or Approval	Issuing Agency
City of Vancouver local permits and approvals (public facilities master plan [hybrid approach], transportation development review, traffic impact analysis, shoreline substantial development permit, critical areas permit, noise permit, waiver of certificate of appropriateness, building permit, trade permits, temporary use permit, access closure, sign permit [temporary])	City of Vancouver
Right-of-way permit for any encroaching in public right of way or City easements, tree permit, design review	City of Gresham

CWA = Clean Water Act; DAHP = Washington State Department of Archaeology and Historic Preservation; DEQ = Oregon Department of Environmental Quality; DNR = Washington State Department of Natural Resources; DSL = Oregon Department of State Lands; Ecology = Washington State Department of Ecology; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FHWA = Federal Highway Administration; Fisheries = National Marine Fisheries Service; FLP = Federal Lands to Parks; FTA = Federal Transit Administration; NOAA = National Oceanic and Atmospheric Administration; NPS = National Park Service; ODOT= Oregon Department of Transportation; RCW = Revised Code of Washington; SHPO = Oregon State Historic Preservation Office; TriMet = Tri-County Metropolitan Transportation District; USACE = U.S. Army Corps of Engineers; U.S.C. = U.S. Code; USCG = U.S. Coast Guard; USFWS = U.S. Fish and Wildlife Service; WSDOT = Washington State Department of Transportation