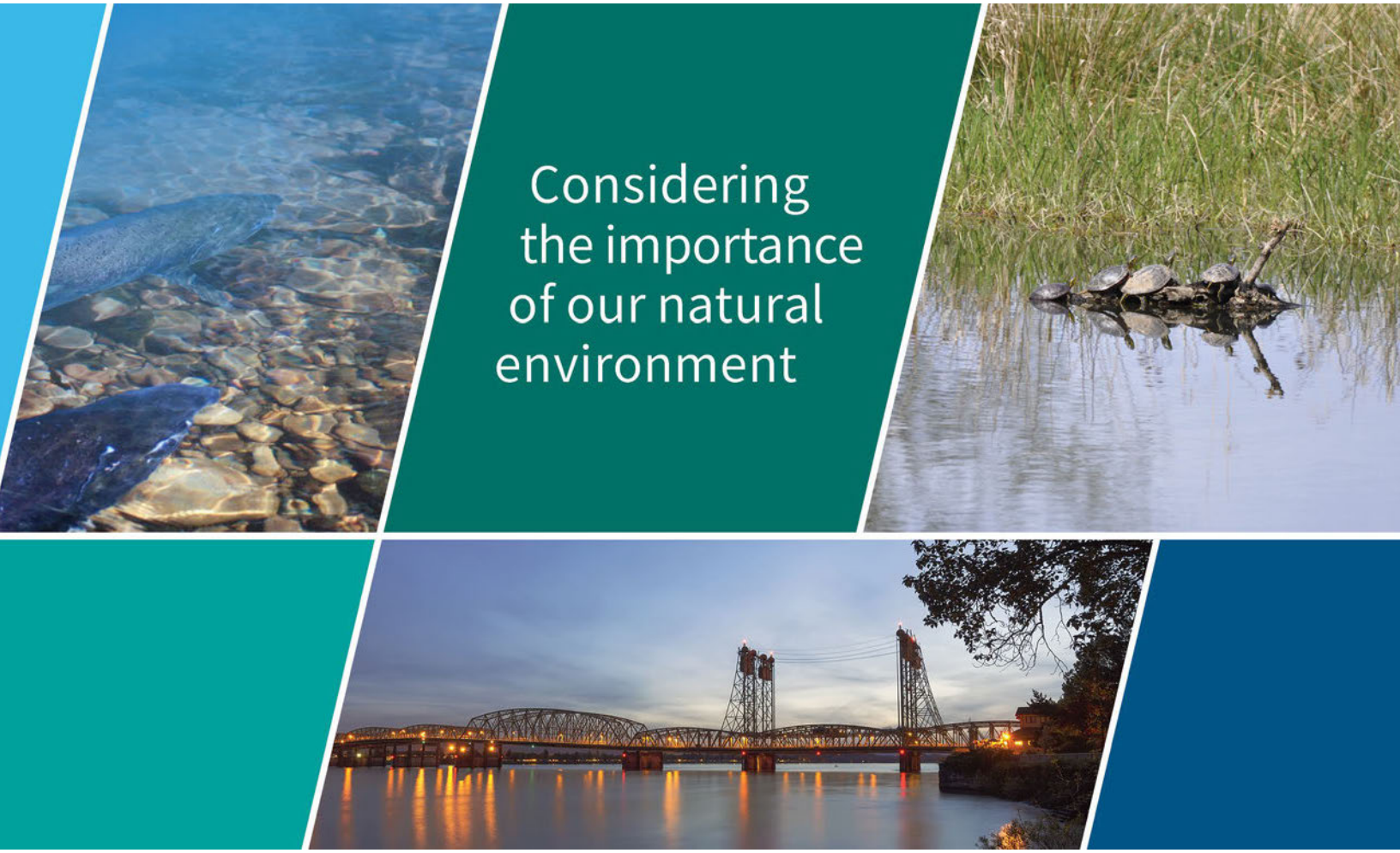
Interstate BRIDGE Replacement Program



Archaeology Technical Report

March 2026

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APPENDIX A. LIST OF CONSULTING PARTIES

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials
APE	area of potential effects
BMP	best management practice
BP	years Before Present
BRT	bus rapid transit
CCFS	Columbia Corridor Flood Safety
C-D	collector-distributor
CFR	Code of Federal Regulations
cm	centimeters
CRC	Columbia River Crossing
CTR	Commute Trip Reduction
C-TRAN	Clark County Public Transit Benefit Area Authority
DAHP	Department of Archaeology and Historic Preservation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GPR	ground-penetrating radar
HBC	Hudson's Bay Company
I-5	Interstate 5
IBR	Interstate Bridge Replacement Program
LPA	locally preferred alternative
LRT	light-rail transit
LRV	light-rail vehicle
m	meters

Acronym/Abbreviation	Definition
MAX	Metropolitan Area Express
mm	millimeters
NAGPRA	Native American Graves Protection and Repatriation Act
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NGVD29	national geodetic vertical datum of 1929
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
ODOT	Oregon Department of Transportation
OMF	Operations and Maintenance Facility
ORS	Oregon Revised Statute
OTC	Oregon Transportation Commission
PA	programmatic agreement
PMLS	Portland Metro Levee System
PNCD	Preliminary Navigation Clearance Determination
RCW	Revised Code of Washington
ROD	Record of Decision
RTC	Southwest Washington Regional Transportation Council
RTP	Regional Transportation Plan
SEIS	Supplemental Environmental Impact Statement
SOV	single-occupancy vehicle
SR	State Route
TPSS	traction power substation

Acronym/Abbreviation	Definition
TriMet	Tri-County Metropolitan Transportation District of Oregon
UFSWQD	Urban Flood Safety and Water Quality District
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USCG	U.S. Coast Guard
VNHR	Vancouver National Historic Reserve
WSDOT	Washington Department of Transportation
WSTC	Washington State Transportation Commission

1. PROGRAM OVERVIEW

The Interstate Bridge Replacement (IBR) Program Modified Locally Preferred Alternative (LPA) is a modification of the LPA for the Columbia River Crossing (CRC) project, which completed the National Environmental Policy (NEPA) process with a signed Record of Decision (ROD) in 2011 and two re-evaluations that were completed in 2012 and 2013. The CRC project was discontinued in 2014. The IBR Program's Supplemental Environmental Impact Statement (SEIS) is evaluating the effects of changes in project design since the CRC ROD, as well as changes in regulations, policy, and physical conditions.

This technical report identifies archaeological resources, including those that are listed, or eligible for listing, in the National Register of Historic Places (NRHP) and describes and evaluates direct and indirect effects from the IBR Program. The construction and operation of transportation infrastructure can have adverse effects on archaeological resources. The Modified LPA would be designed to avoid and/or minimize these effects on listed or eligible archaeological resources to the greatest extent possible. A programmatic agreement (PA) is being developed to outline mitigation measures to address potential effects on these resources when avoidance is not feasible.

The purpose of this report is to satisfy the NEPA (42 United States Code [U.S.C.] 4321) goal "to promote efforts which will prevent or eliminate damage to the environment" and Section 106 of the National Historic Preservation Act (NHPA), which requires "Federal agencies to take into account the effects of their undertakings on historic properties and afford the Council a reasonable opportunity to comment on such undertakings" (36 Code of Regulations [CFR] Part 800). Information and potential effects on historic properties described in this technical report will be used in the SEIS for the IBR Program to comply with NHPA and NEPA, pursuant to 42 U.S.C. 4332, which directs federal agencies to coordinate environmental review through multiple regulations.

Historic Property:

As defined in 36 CFR Part 800 of the NHPA regulations, "'historic property' means any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in, the National Register of Historic Places . . . This term includes artifacts, records, and remains that are related to and located within such properties." Also included are properties of traditional religious and cultural importance.

Archaeological Site:

Archaeological site is defined as "a location that contains the physical evidence of past human behavior that allows for its interpretation" (Little et al. 2000). If an archaeological site is eligible for or listed on the National Register it is considered a "historic property" as defined above.

The objectives of this report are to:

- Describe the area of potential effects (APE) and the research design, including methods of identification, data collection, and NRHP evaluation (Chapter 2).
- Describe the setting and characteristics of the APE (Chapter 3).

- Describe existing archaeological resources within the APE (Chapter 4).
- Summarize the PA that will outline assessment of effects and mitigation measures (Chapter 5).

The IBR Program is a continuation of the previously suspended 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 1-1.

Figure 1-1. IBR Program Location Overview

1.1 Components of the Modified LPA

The basic proposed components of the Modified LPA[1] include:

- 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.[2] 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),[3] 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.
- Associated bus transit service improvements, including three additional bus bays for new buses at the existing C-TRAN OMF (see Section 1.1.7, 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.

[1] All transportation facilities would be designed to current AASHTO, WSDOT, and ODOT specifications.
[2] For purposes of this report, 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."
[3] Each TPSS would be approximately 75 feet by 50 feet, including parking and access areas.

- 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 1-1.

- **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 1-1. Modified LPA Design Options

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.

The transportation improvements proposed for the Modified LPA and the design options are shown in Figure 1-2. The Modified LPA includes all of the components listed above. If there are differences in environmental effects or benefits between the design options, they are identified in the sections below.

Section 1.1.1, Interstate 5 Mainline, describes the overall configuration of the I-5 mainline through the study area, and Sections 1.1.2, Portland Mainland and Hayden Island (Subarea A), through Section 1.1.5, Upper Vancouver (Subarea D), provide additional detail on four geographic subareas (A through D), which are shown on Figure 1-3. 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 1-2. Modified LPA Components

Figure 1-3. Modified LPA – Geographic Subareas

1.1.1 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 1-4. 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 the design standards of the Oregon Department of Transportation (ODOT) and Washington State Department of Transportation (WSDOT). The inside shoulder would be used by express bus service to bypass mainline congestion, known as "bus on shoulder" (refer to Section 1.1.7, Transit Operating Characteristics). The shoulder would be available for express bus service when general-purpose speeds are below 35 miles per hour (mph).

1.1.1.1 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 1-4). This section provides an overview of the one auxiliary lane and the two auxiliary lane design options.

Figure 1-5, 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 1-4. Auxiliary Lane Configurations

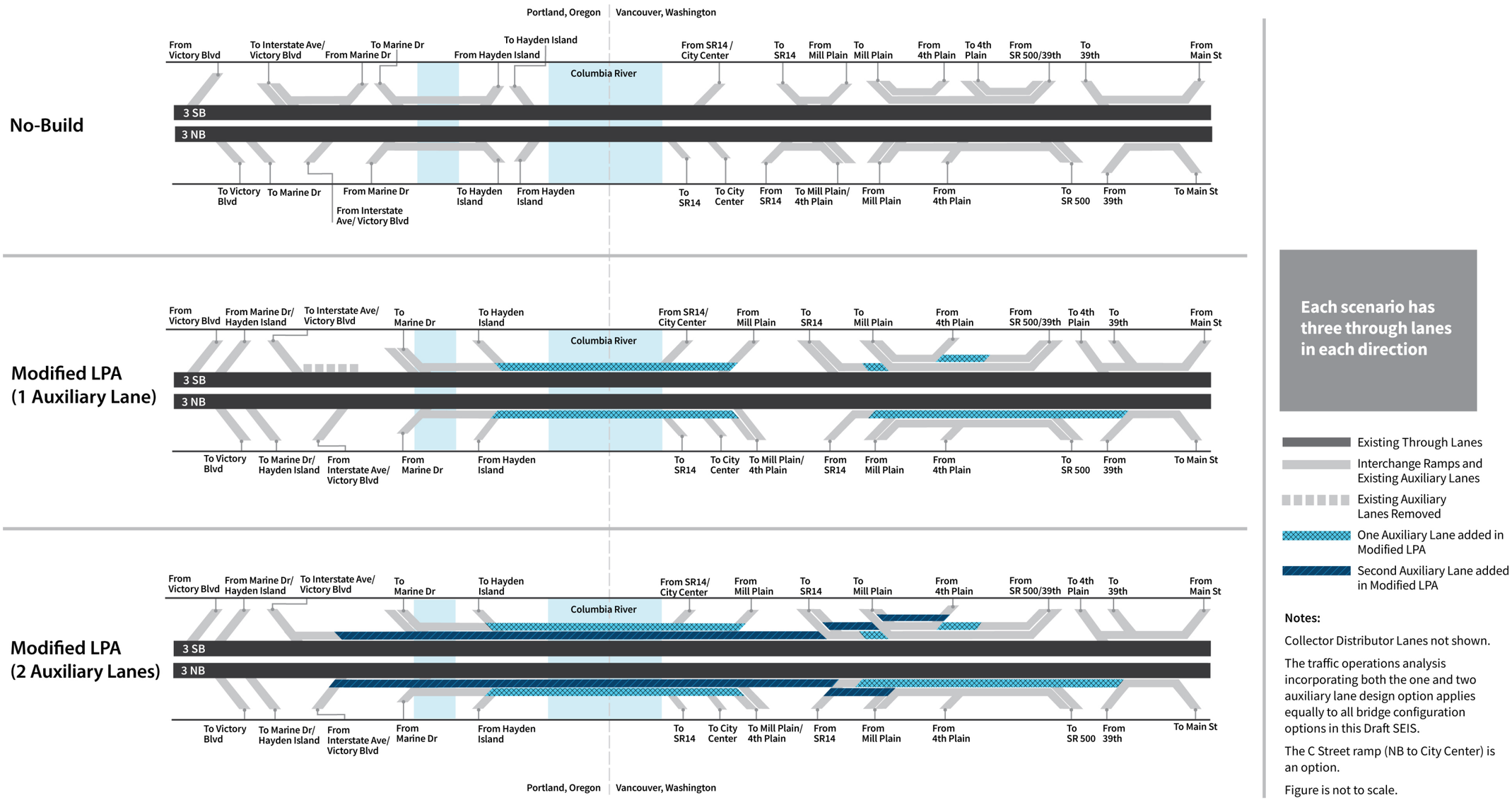

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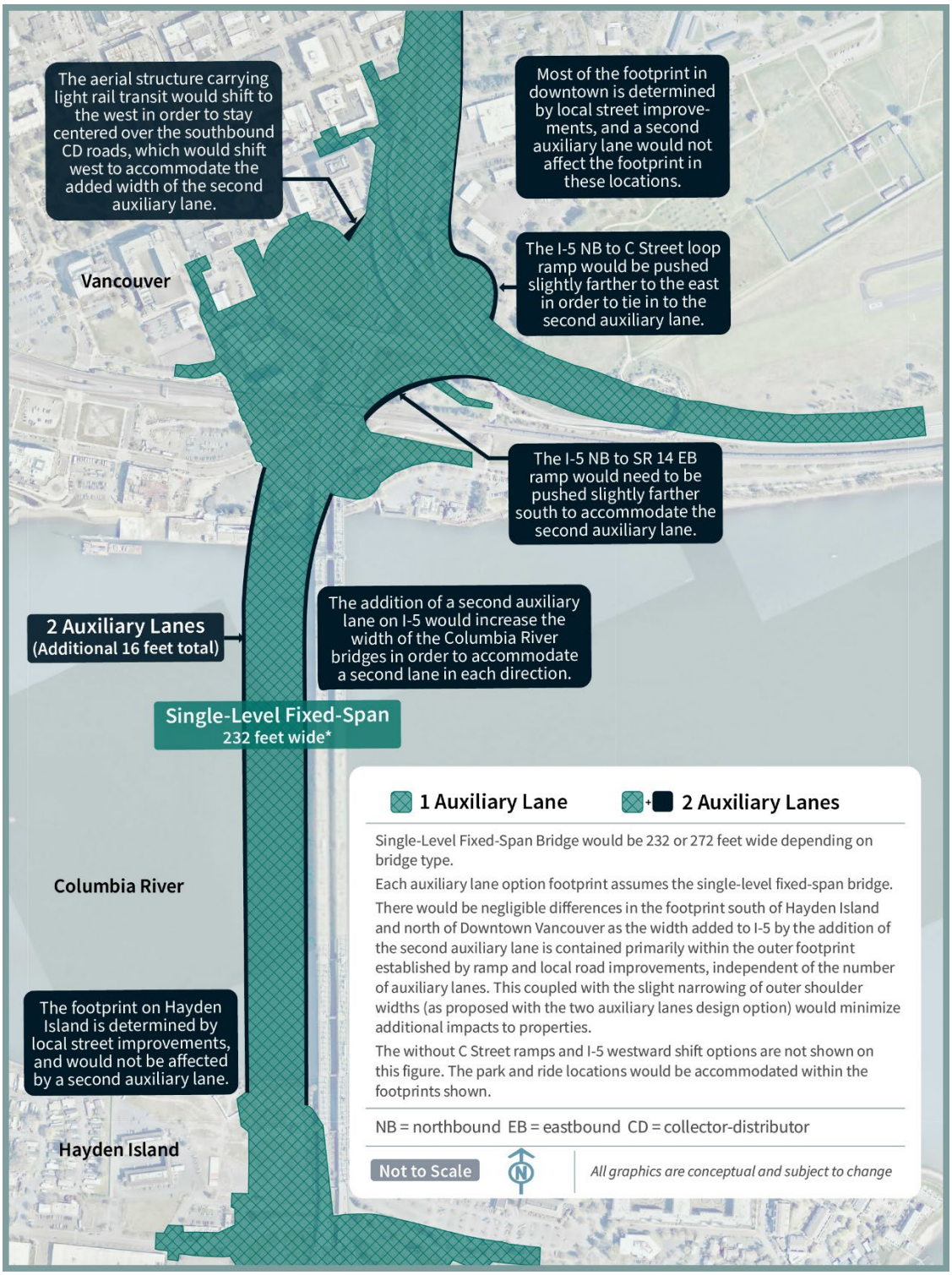
Figure 1-5. Auxiliary Lane Configuration Footprint Differences



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 1-4). 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.

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 because of 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.

1.1.2 Portland Mainland and Hayden Island (Subarea A)

This section discusses the geographic Subarea A (Figure 1-3 provides an overview of the geographic subareas). Figure 1-6 shows highway and interchange improvements in Subarea A, including the North Portland Harbor bridges.

1.1.2.1 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 1-7, and intersections with Modified LPA components are described throughout this section (Section 1.1.2, 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.[4]

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”).

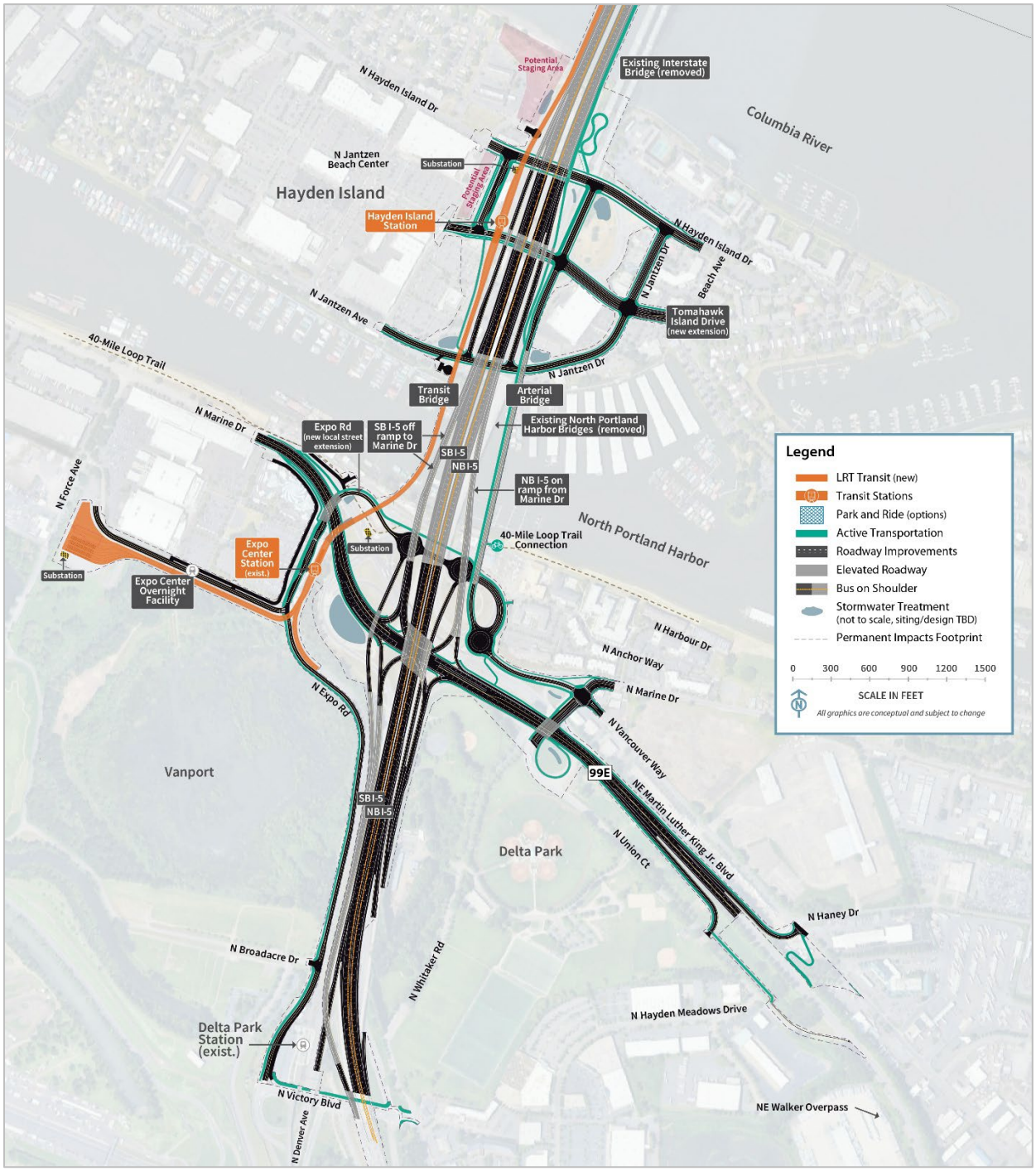
[4] The portion of the original Denver Avenue levee alignment within the Marine Drive interchange area is no longer considered part of the levee system by UFSWQD.

The Urban Flood Safety and Water Quality District (UFSWQD)[5] 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]).[6] 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.

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.

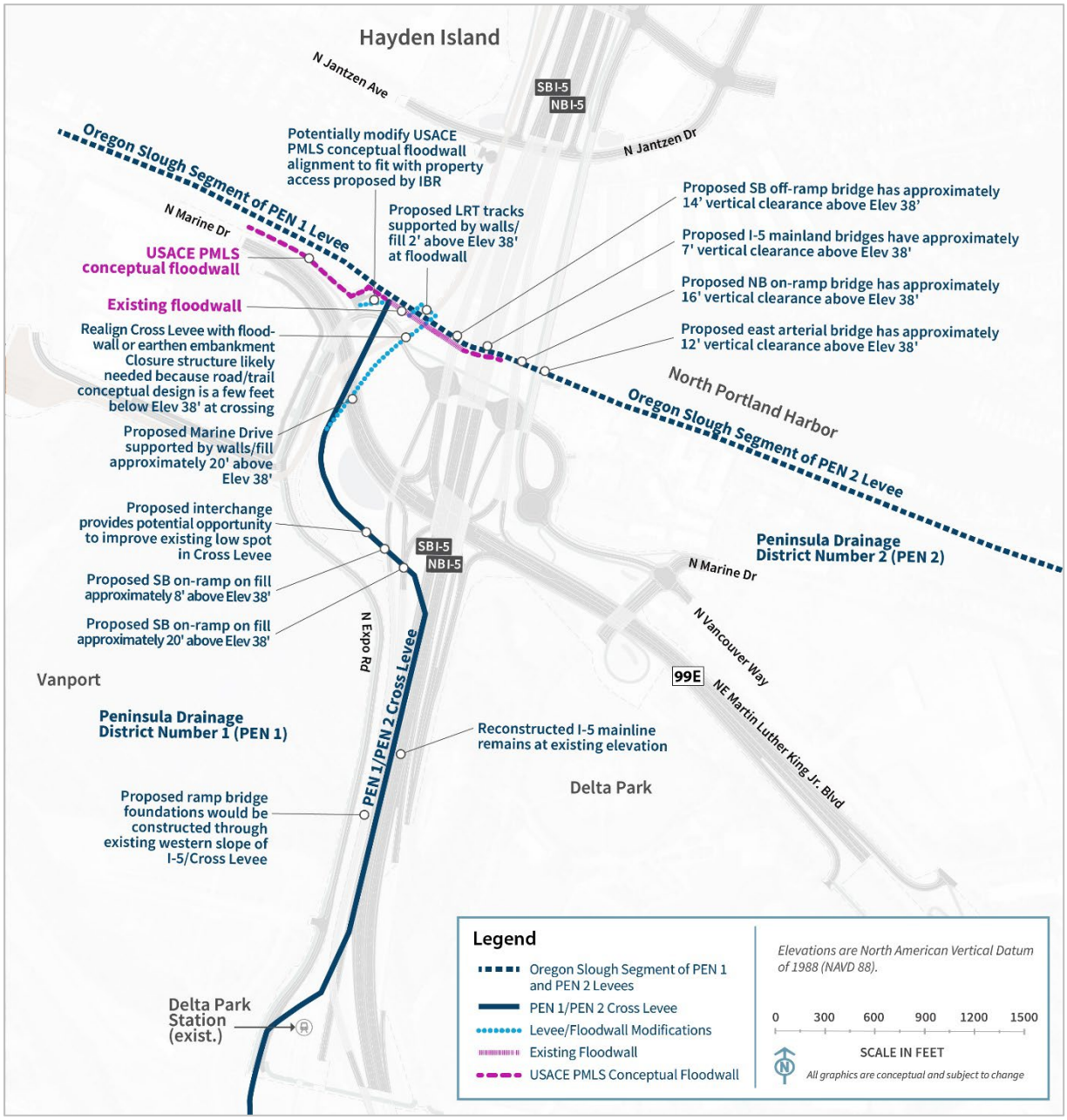
[5] UFSWQD includes PEN 1 and PEN 2, Urban Flood Safety and Water Quality District No. 1, and the Sandy Drainage Improvement Company.
[6] NAVD 88 is a vertical control datum (reference point) used by federal agencies for surveying.

Figure 1-6. Portland Mainland and Hayden Island (Subarea A)



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

Figure 1-7. Levee Systems in Subarea A



1.1.2.2 Highways, Interchanges, and Local Roadways

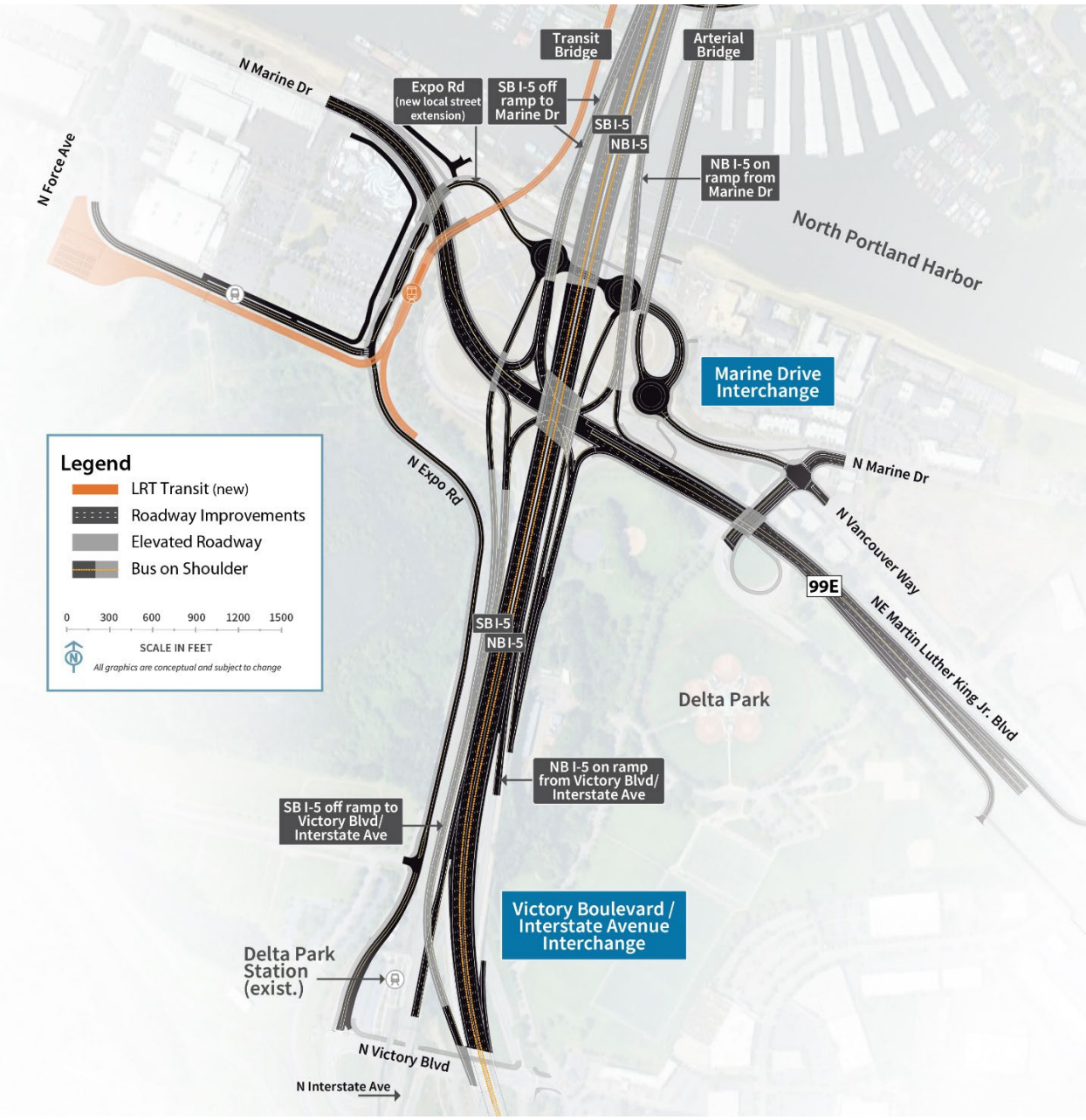
VICTORY BOULEVARD/INTERSTATE AVENUE INTERCHANGE AREA

The southern extent of the Modified LPA would improve two ramps at the Victory Boulevard/Interstate Avenue interchange (see Figure 1-6 and Figure 1-8). 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 1-7). 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.

Figure 1-8. Transit and Roadway Improvements in North Portland



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 1-8 shows Marine Drive interchange's layout and construction footprint.

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

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[7] 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

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

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 1-6. 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.

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

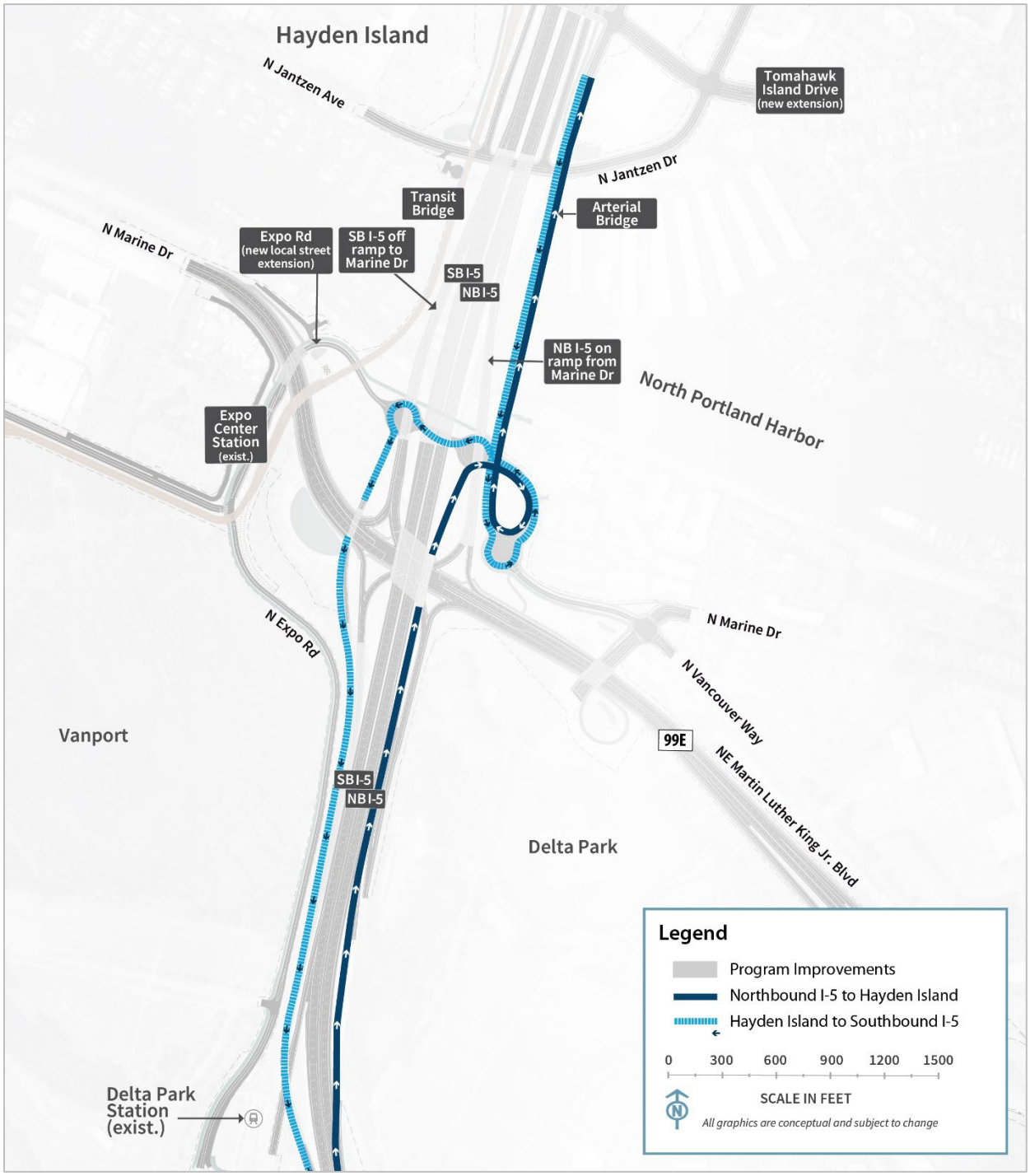
All traffic movements for the Hayden Island interchange would be reconfigured. Figure 1-6 shows the layout and construction footprint of the Hayden Island interchange. A partial interchange would be built on Hayden Island with a northbound I-5 on-ramp from Jantzen Drive and a southbound I-5 off-ramp 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 1-9). 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.

Figure 1-9. Vehicle Circulation between Hayden Island and the Portland Mainland



NB = northbound; SB = southbound

1.1.2.3 Transit

A new light-rail alignment for northbound and southbound trains would be constructed within Subarea A (Figure 1-6) 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 1-6) to provide storage for trains during hours when the MAX is not in service. This facility is described in Section 1.1.6, 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 1-7). 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.

1.1.2.4 Active Transportation

In the Victory Boulevard interchange area (Figure 1-6), 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.

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 1-6). 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.

1.1.3 Columbia River Bridges (Subarea B)

This section discusses the geographic Subarea B (Figure 1-3 provides an overview of the geographic subareas). Figure 1-10 shows highway and interchange improvements in Subarea B.

Figure 1-10. Columbia River Bridges (Subarea B)

1.1.3.1 Highways, Interchanges, and Local Roadways

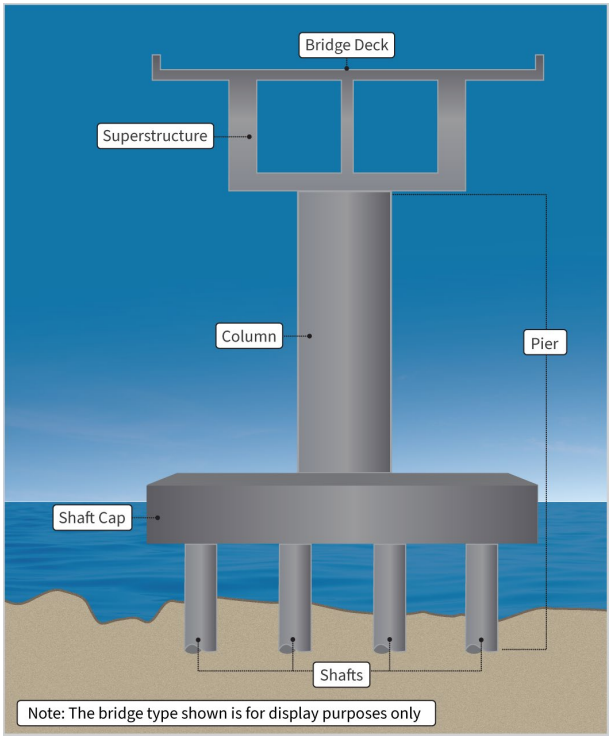
The two existing parallel northbound and southbound I-5 bridges that cross the Columbia River were constructed in 1917 and 1958, respectively. When the 1958 bridge was constructed, pier 5 of the 1917 bridge was removed and the profile was raised to match the new bridge. For the IBR Program, the two existing bridges would be replaced by two new parallel bridges, located west of the existing bridges (Figure 1-10). The new bridges would be designed to current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design 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 1-12), the new Columbia River bridges would provide three navigation channels: a primary navigation channel (Figure 1-13). 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.

The existing Interstate Bridge has nine in-water pier sets[8] and four pier sets on land (pier locations are shown on Figure 1-12). 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 1-13). 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 1-11).

Figure 1-11. 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-

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

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).

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 Supplemental Environmental Impact Statement (SEIS). Each of the bridge configuration design options provides at least 116 feet of vertical navigation clearance 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, of the Final SEIS.

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.

Figure 1-12. Existing Navigation Clearances of the Interstate Bridge

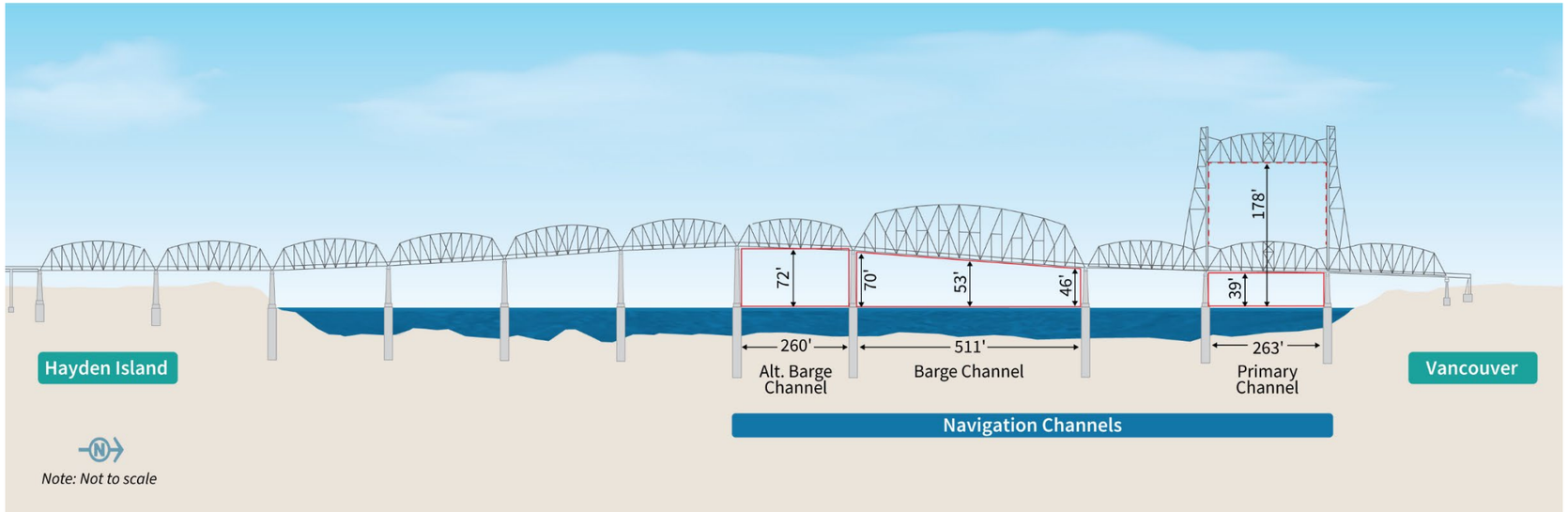
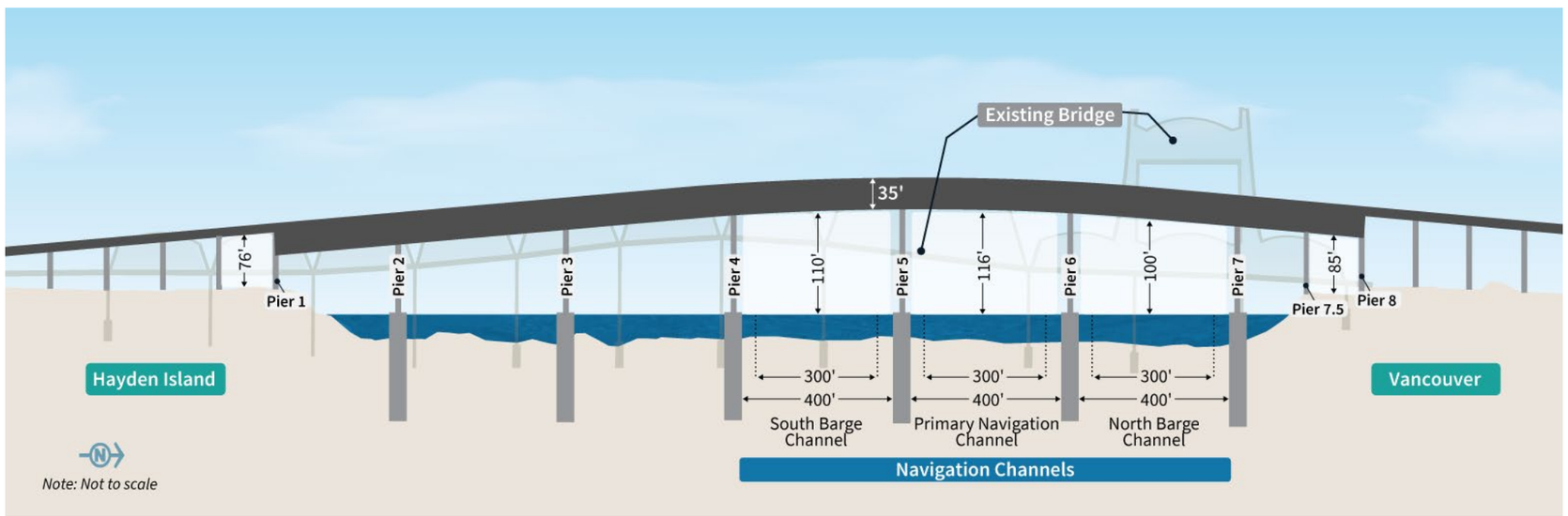


Figure 1-13. Navigation Clearances and Proposed Profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration



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.

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 1-14 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.

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.[9]

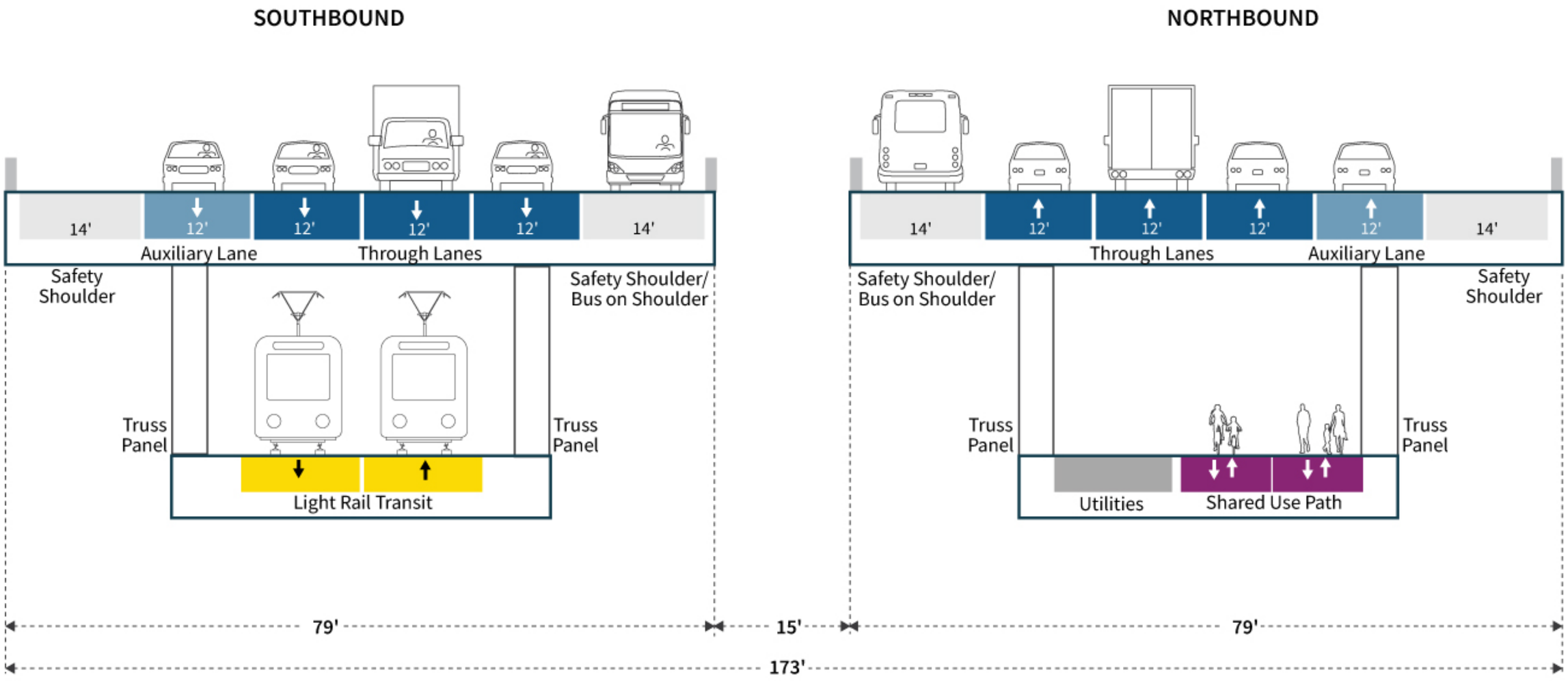
Figure 1-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration

Note: Visualization is looking southeast from Vancouver.

Figure 1-15 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.

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

Figure 1-15. Typical Cross Section of the Double-Deck Fixed-Span Configuration



Note: 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 report considers two single-level fixed-span bridge type options: a girder (steel or concrete segmental) bridge and an extradosed bridge.[10] The description in this section applies to both bridge types (unless otherwise indicated). Conceptual examples of both options are shown on Figure 1-16. 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 1-17 shows a typical cross section of the single-level configuration with an extradosed bridge as shown by the 10-foot-wide bridge columns. Figure 1-18 shows a

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.

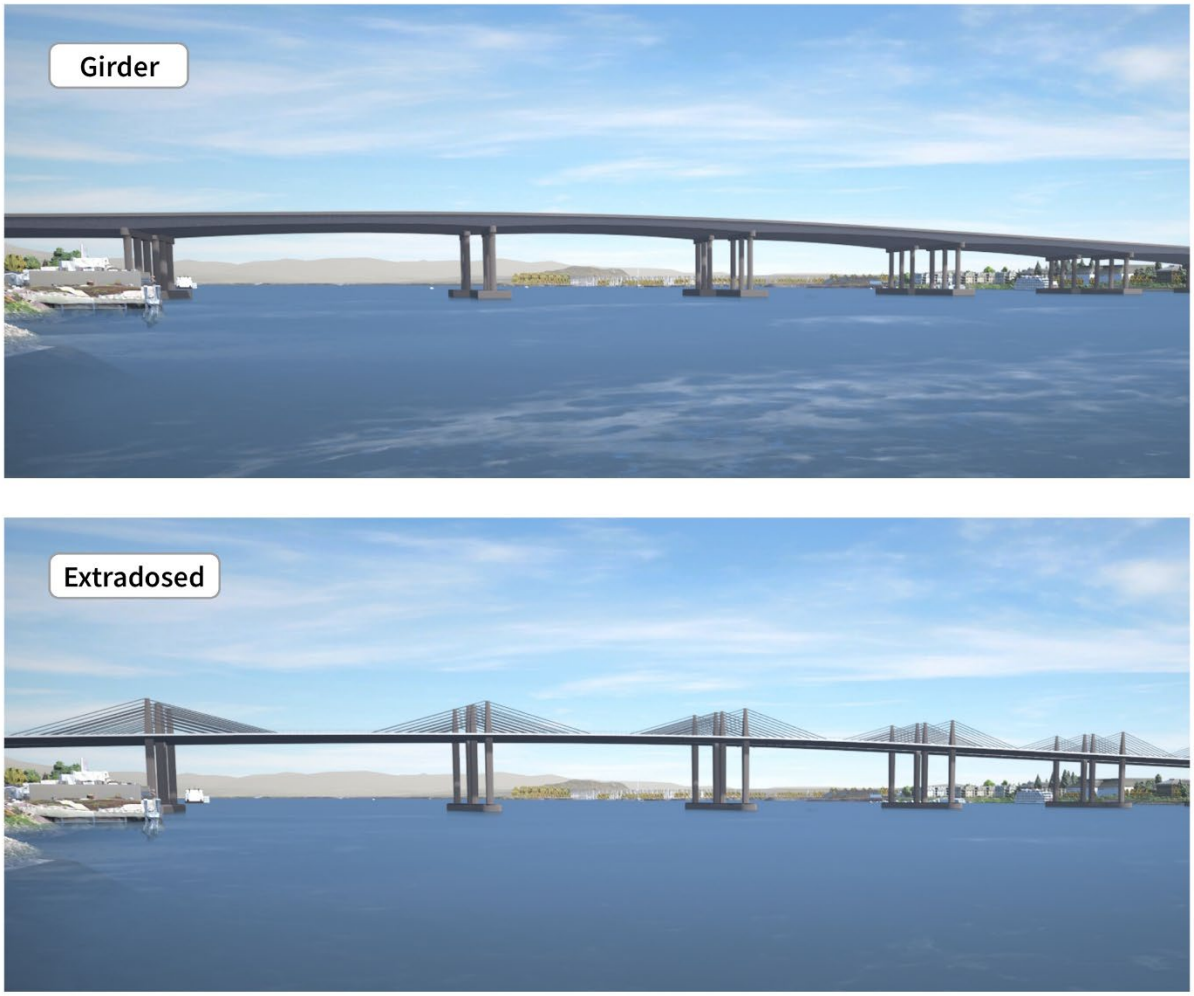
[10] The Draft SEIS also included a finback as a single-level fixed-span bridge type. As the design of the various bridge types progressed, it was determined that the finback would have higher risks associated with increased cost and construction schedule because this bridge type is less common and applying 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 or extradosed, would have fewer risks and would be a more suitable for this location. As a result, the finback bridge type was dropped from further consideration.

typical cross section with a girder bridge, which would not have the 10-foot-wide bridge columns shown on Figure 1-17.

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.

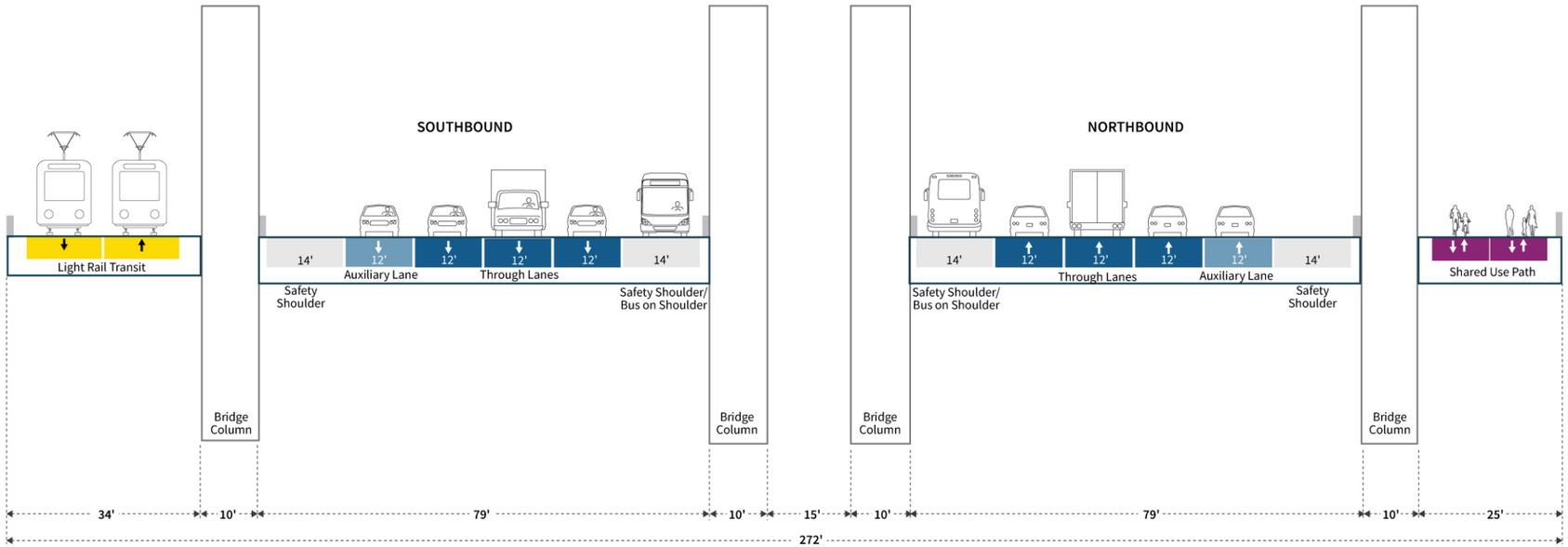
This bridge configuration would be expected to have an approximate grade of 3% on both the Oregon and Washington sides of the bridge. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

Figure 1-16. Conceptual Drawings of Single-Level Fixed-Span Bridge Types



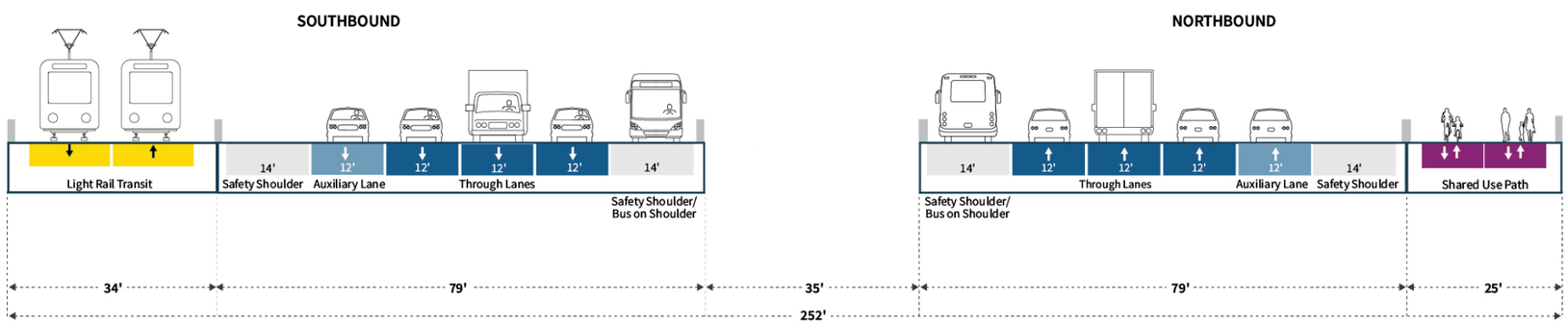
Note: Visualizations are for illustrative purposes only. They do not reflect property impacts or represent final design. Visualization is looking southeast from Vancouver.

Figure 1-17. Typical Cross Section of the Single-Level Fixed-Span Configuration (Extradosed Type)



Note: 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 1-18. Typical Cross Section of the Single-Level Fixed-Span Configuration (Girder Type)



Note: 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 report, 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 to the Final SEIS. A conceptual example of a vertical lift-span bridge is shown in Figure 1-19. 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 1-20; 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 be expected to 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.

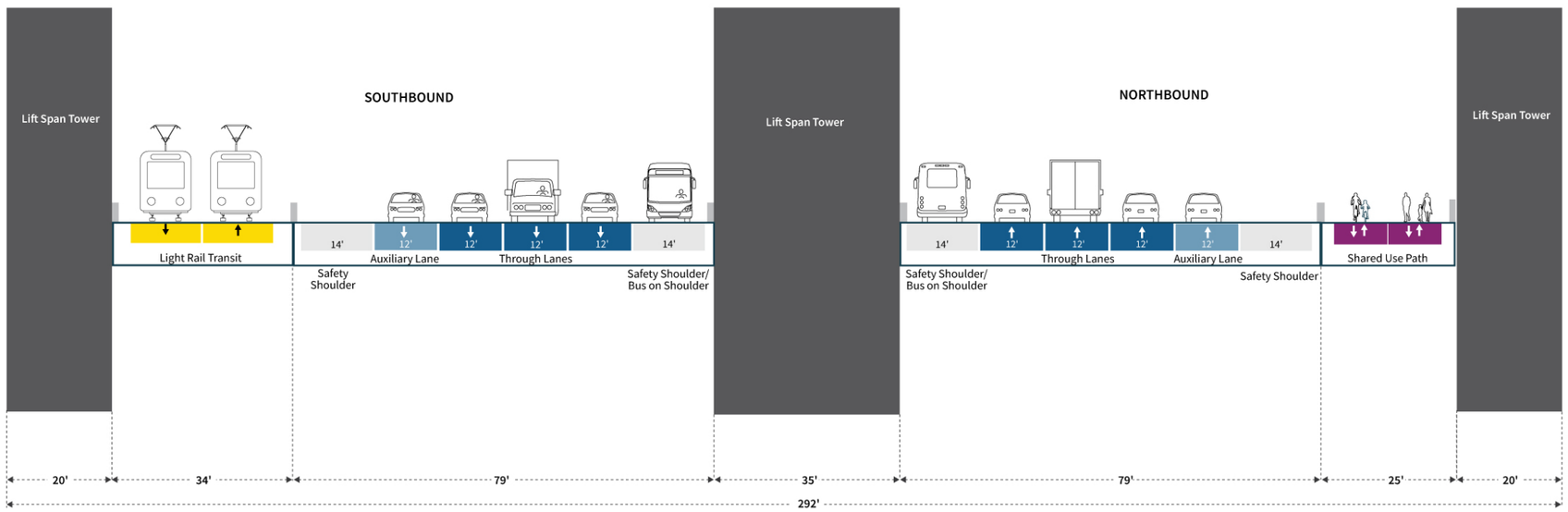
Figure 1-19. Conceptual Drawings of Single-Level Movable-Span Configurations in the Closed and Open Positions

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

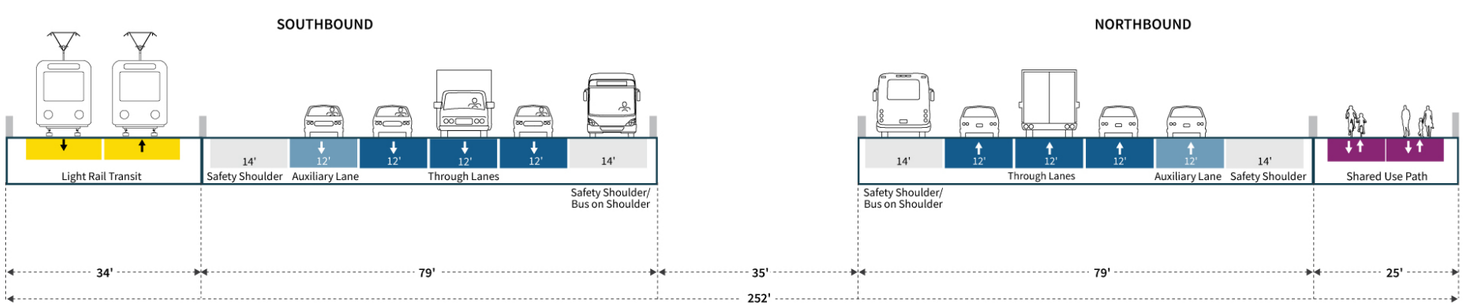
Note: Visualization is looking southeast (upstream) from Vancouver.

Figure 1-20. Typical Cross Section of the Single-Level Movable-Span Bridge Type

Single-level Bridge with Movable Span - Vertical Lift Span Cross-section (Piers 5 and 6)



Single-level Bridge with Movable Span - Fixed Spans Cross-section (Piers 2, 3, 4, and 7)



Note: 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 1-2 lists the key considerations for each bridge configuration. Figure 1-21 compares each of the three bridge configurations' footprints with the one auxiliary lane design option (refer to Figure 1-5 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 1-22 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 1-21. Bridge Configuration Footprint Comparison

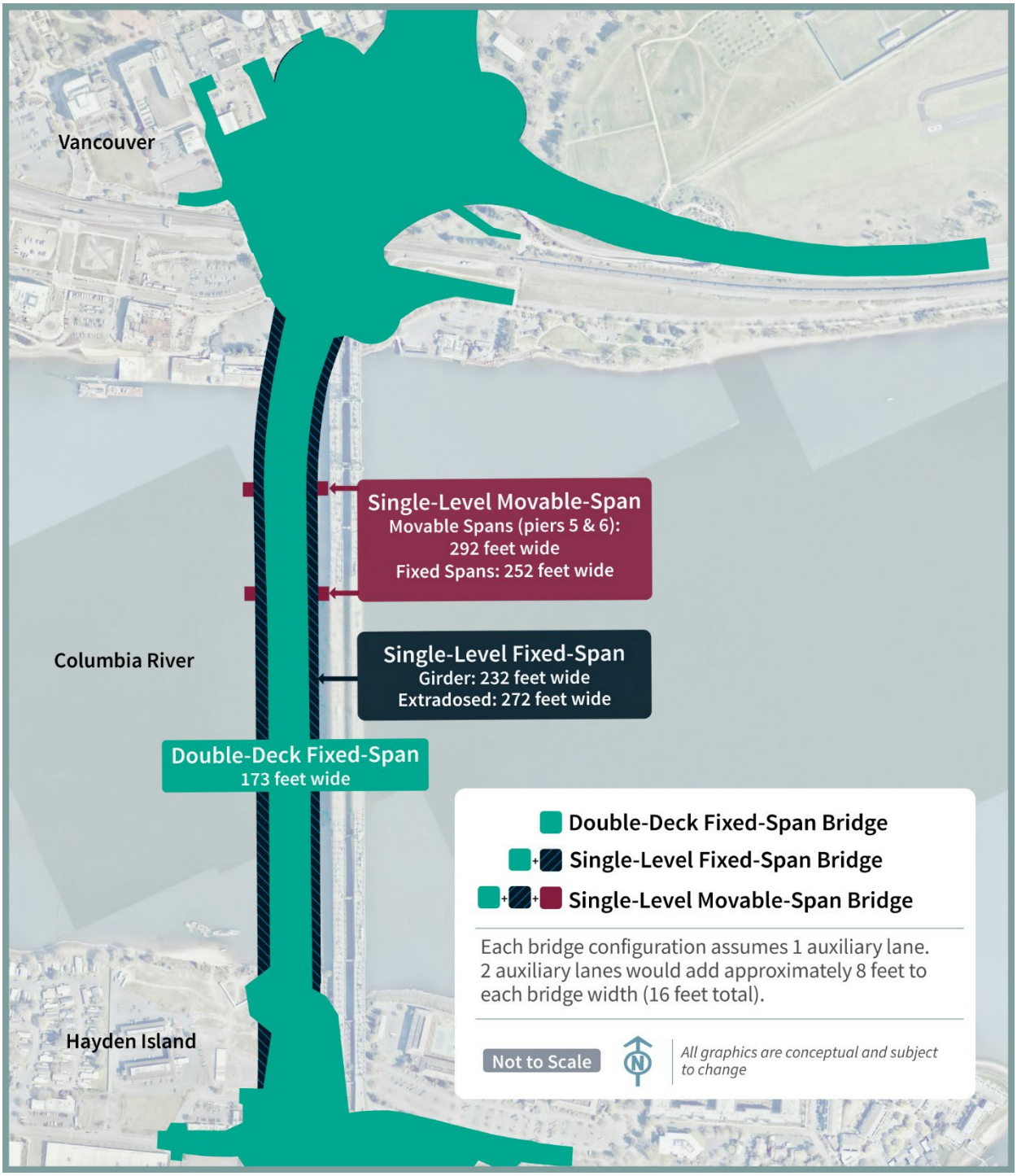
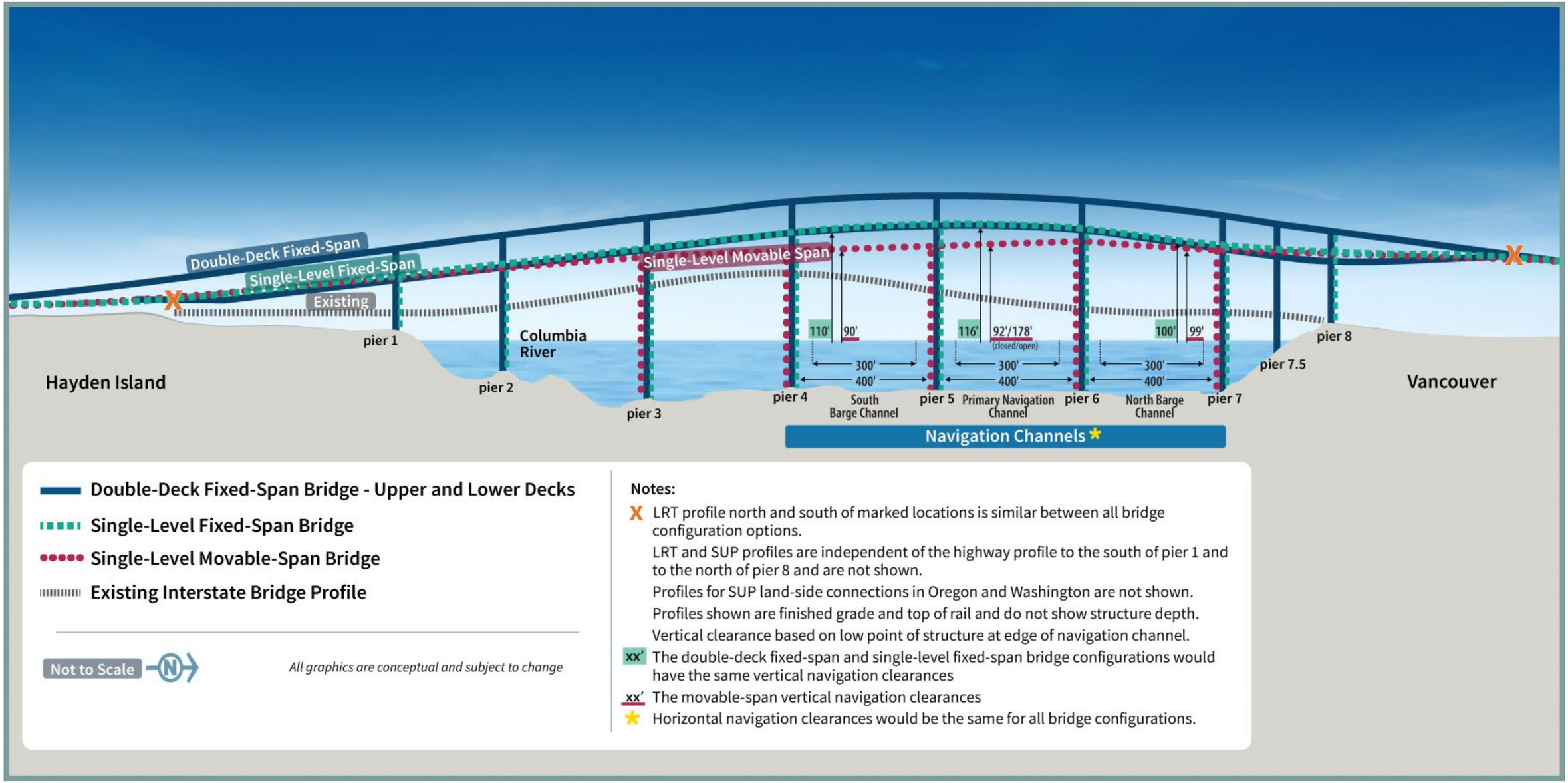


Figure 1-22. Bridge Configuration Profile Comparison



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

Table 1-2. 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	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
	2024, there was an average of 152 lifts per year (IBR 2025).			• 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] 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

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
				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	~3% on the Washington side	~1.5% on the Washington side.

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
		~4% on the Oregon side	~3% on the Oregon side	~3% on the Oregon side
LRT 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
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

Notes: All dimensions and quantities are approximate.

a When different bridge types are not mentioned, data apply 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 the Final SEIS (Section 3.1, Transportation of the Final SEIS), 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

1.1.4 Downtown Vancouver (Subarea C)

This section discusses the geographic Subarea C (Figure 1-3 shows an overview of the geographic subareas). Figure 1-23 shows all highway and interchange improvements in Subarea C.

1.1.4.1 Highways, Interchanges, and Local Roadways

North of the Columbia River bridges in downtown Vancouver, improvements are proposed to the SR 14 interchange (Figure 1-23).

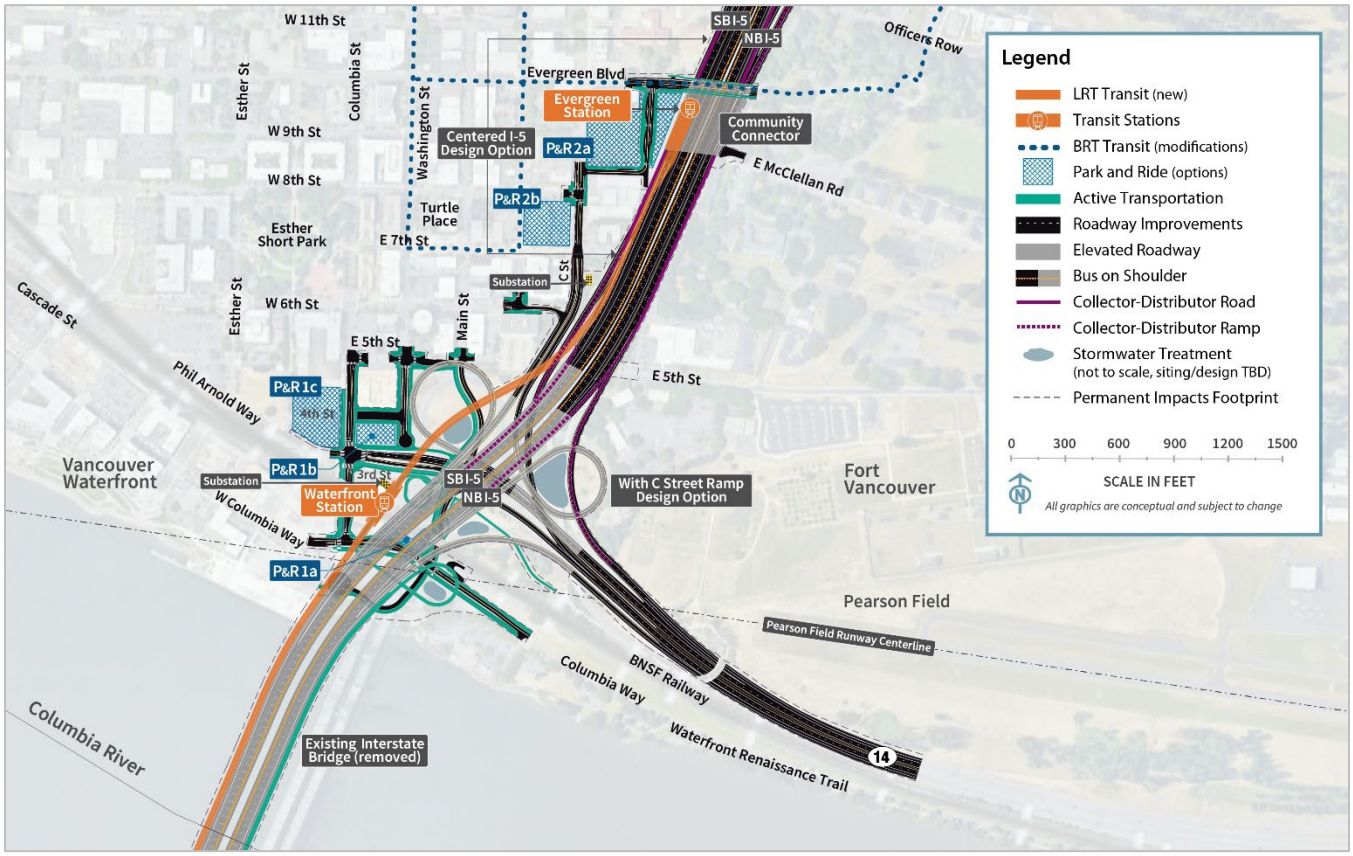
SR 14 INTERCHANGE/DOWNTOWN VANCOUVER

The new Columbia River bridges would touch down just north of the SR 14 interchange (Figure 1-23). 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.

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.

Figure 1-23. Downtown Vancouver (Subarea C)



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

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 1-24).

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.

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.

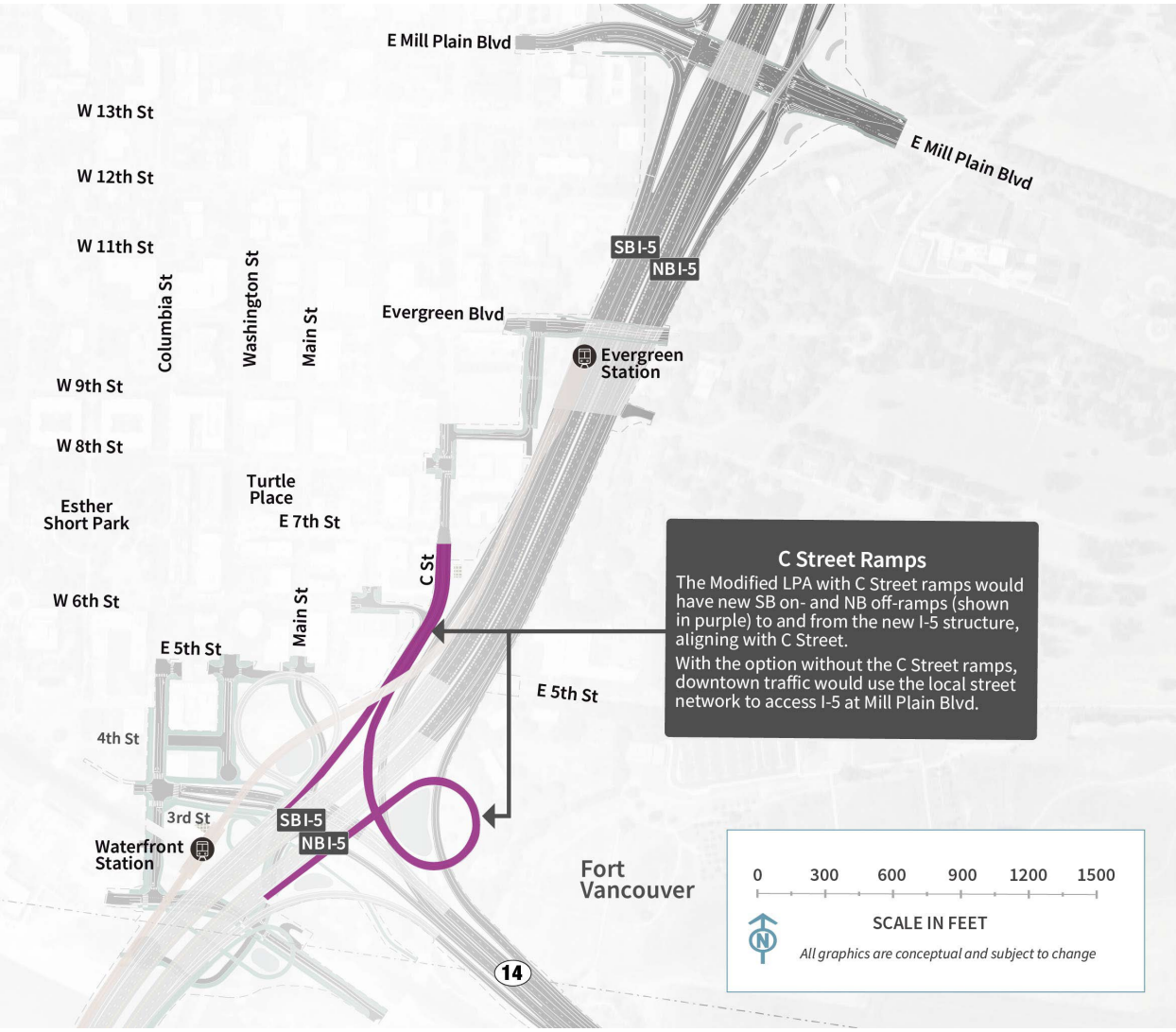
I-5 Shifted West

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 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.

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 National Historic Site). 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.

Figure 1-24. Modified LPA with C Street Ramps



COLLECTOR-DISTRIBUTOR ROADWAYS

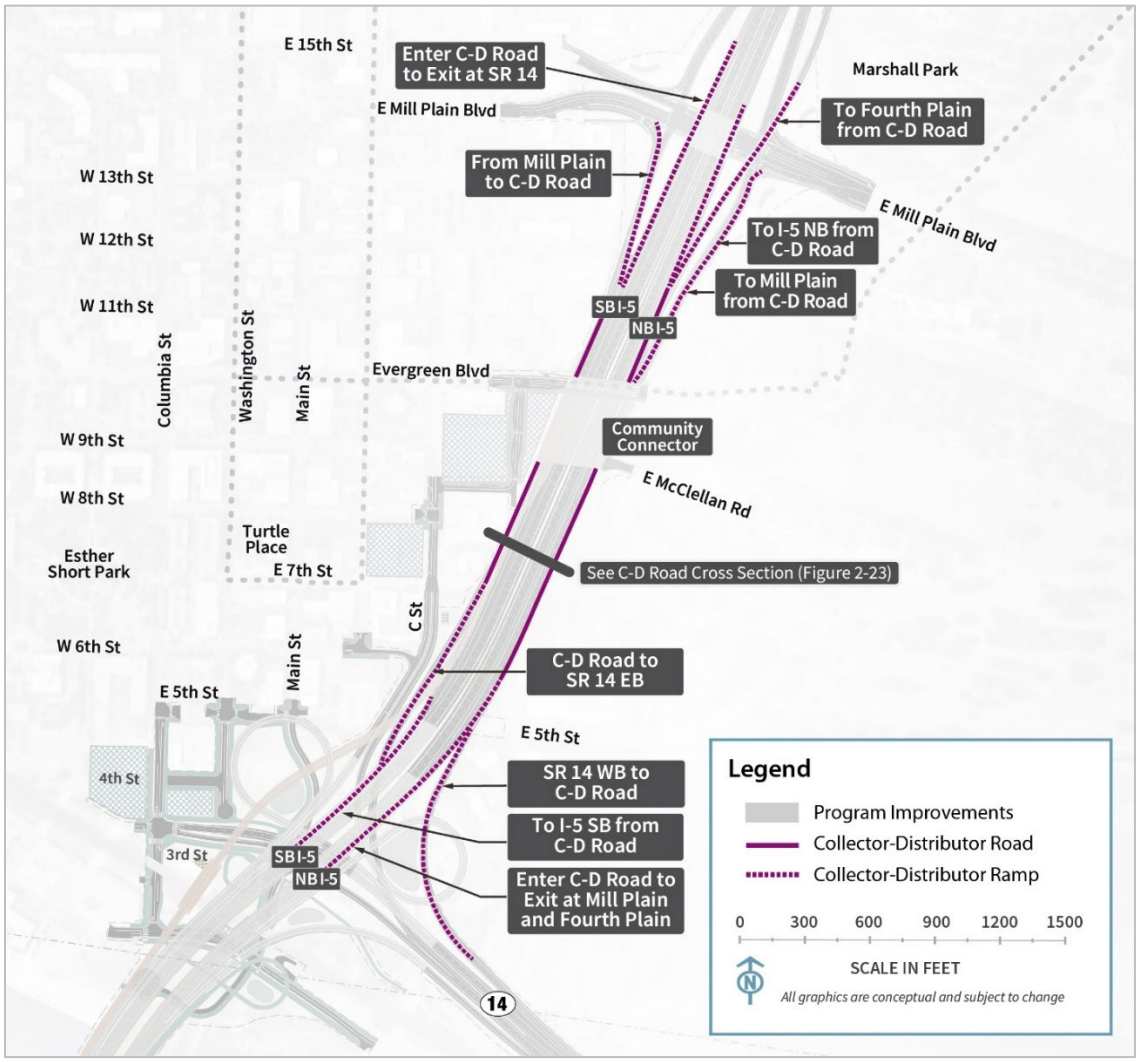
Figure 1-25 shows the location of the collector-distributor (C-D)[11] roadways in downtown Vancouver, and Figure 1-26 shows a typical cross section of the C-D roadways.

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 westbound SR 14 to the off-ramps at Mill Plain Boulevard and Fourth Plain Boulevard, and to the on-ramp to northbound I-5.

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

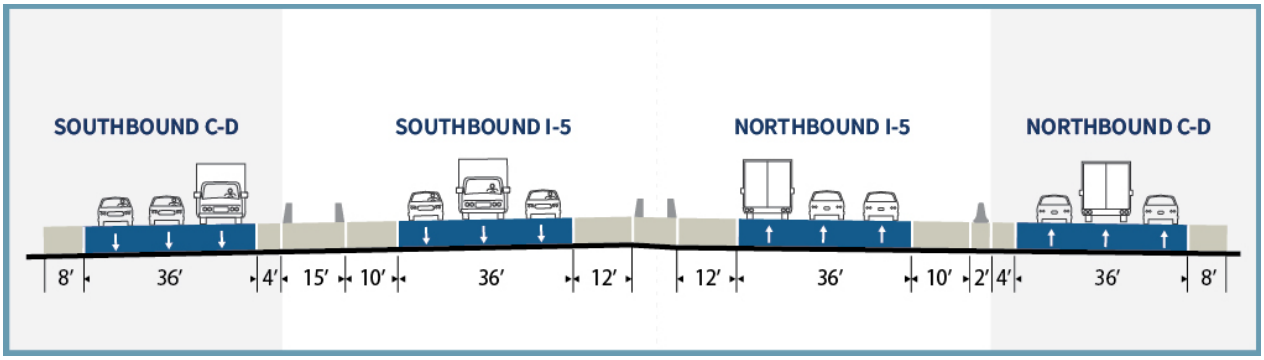
On southbound I-5, the off-ramp to SR 14 would join the southbound I-5 on-ramp from Mill Plain Boulevard to form a C-D roadway. The C-D roadway would provide access from southbound I-5 to the off-ramp to eastbound SR 14 and from Mill Plain Boulevard to the off-ramp to eastbound SR 14 and the on-ramp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

Figure 1-25. Collector-Distributor Roadways



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

Figure 1-26. Typical Cross Section of the Collector-Distributor Roadways



The location of this cross section is shown on Figure 1-25.

1.1.4.2 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 (see Figure 1-23). 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.

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 1-23). 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[12] 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

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

Station. A new TPSS would be located on the south side of 7th Street, approximately 750 feet south of Evergreen Station.

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 1-23) 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.

> 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.

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 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 this report.

Waterfront Station Park and Rides

Studies included in Appendix D to the Final SEIS 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 (Figure 1-23):

- 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.

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 to the Final SEIS) 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.

Evergreen Station Park and Rides

Studies included in Appendix D to the Final SEIS 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 technical report (see Figure 1-23):

- 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.[13] This site could be combined with Site 2b to provide a total of 700 spaces.

- 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 above ground. 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.

1.1.4.3 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 1-23). 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 1-23). 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.

1.1.5 Upper Vancouver (Subarea D)

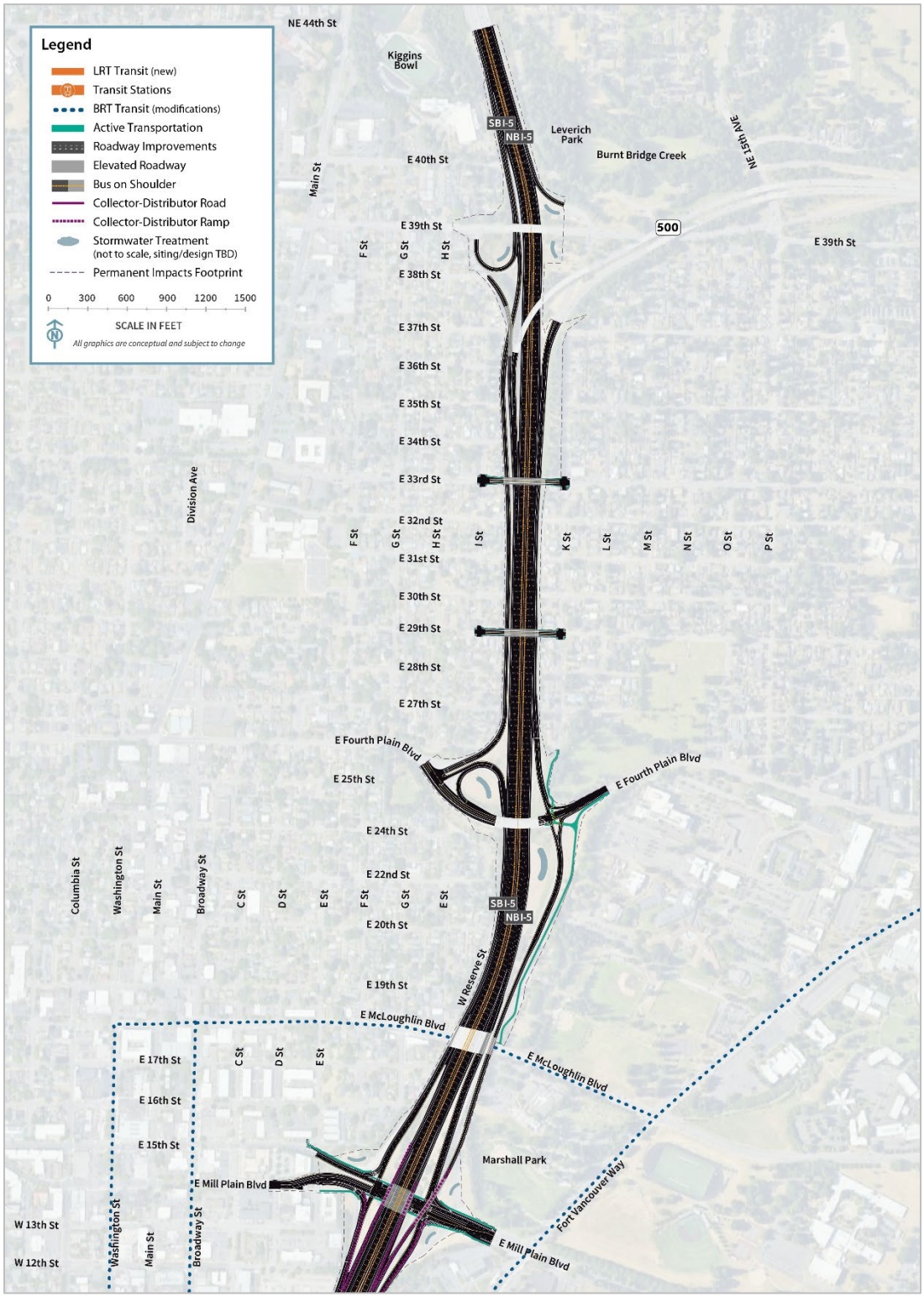
This section discusses the geographic Subarea D (Figure 1-3 shows an overview of the geographic subareas). Figure 1-27 shows all highway and interchange improvements in Subarea D.

1.1.5.1 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.

[13] 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 because of engineering and environmental constraints.

Figure 1-27. Upper Vancouver (Subarea D)



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

MILL PLAIN BOULEVARD INTERCHANGE

The Mill Plain Boulevard interchange is north of the SR 14 interchange (Figure 1-27). 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.

FOURTH PLAIN BOULEVARD INTERCHANGE

At the Fourth Plain Boulevard interchange (Figure 1-27), 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 C-D 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 1-27). 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.

1.1.5.2 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 1.1.7, Transit Operating Characteristics.

1.1.5.3 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.

1.1.6 Transit Support Facilities

1.1.6.1 Ruby Junction Light-Rail Operations and Maintenance Facility 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 1-28). 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 1-28 shows the proposed footprint of the expansion.

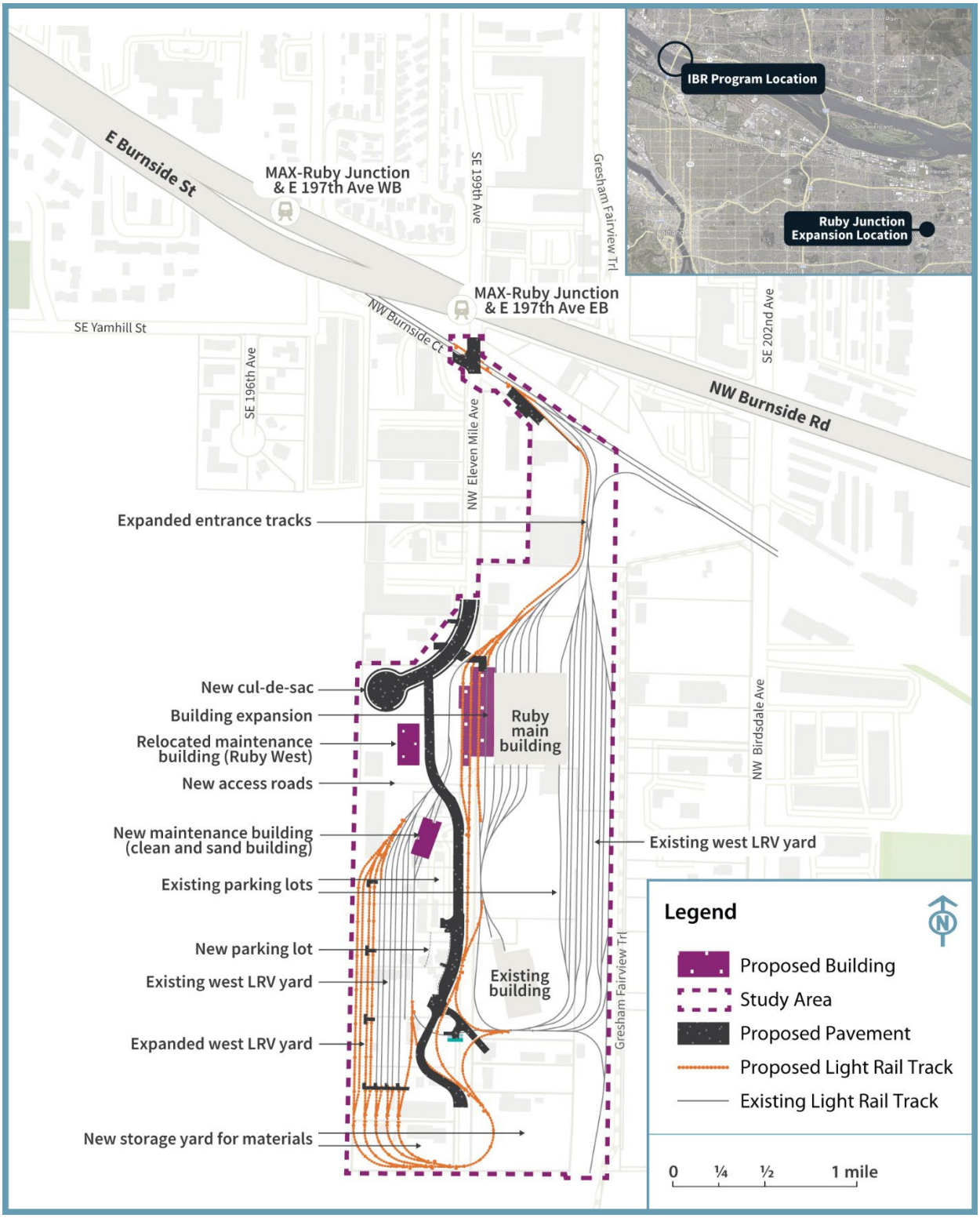
The existing main building would be expanded west to provide additional maintenance bays. Today, Eleven Mile Avenue extends from NW Burnside Road and dead ends at the southern limits of the existing OMF. To make space for the building expansion, the existing Eleven Mile Avenue public right of way would 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/nonpublic 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.

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.

Figure 1-28. Ruby Junction Light-Rail Operations and Maintenance Facility Study Area



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

1.1.6.2 Expo Center Overnight Light-Rail Vehicle Facility

An overnight facility for LRVs would be constructed on the southwest corner of the Expo Center property (as shown on Figure 1-29). The inclusion of the Expo Overnight Facility allows TriMet the ability to 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.

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.

1.1.6.3 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 1.1.7, Transit Operating Characteristics). Modifications to the facility would accommodate new vehicles as well as maintenance equipment.

Figure 1-29. Expo Center Overnight LRV Facility

1.1.7 Transit Operating Characteristics

1.1.7.1 Light-Rail Transit 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[14] 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.

1.1.7.2 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 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 during the peak and 30 minutes during 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

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

shoulder widths at the north and south ends of the corridor. Figure 1-6, Figure 1-10, Figure 1-23, and Figure 1-27 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 because 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.

1.1.7.3 Local Bus Route Changes

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 1-3 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 1-3 shows existing service and anticipated future changes to C-TRAN bus routes. In addition to the changes noted in Table 1-3, 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 1-3. 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.

Bus Route	Existing Route	Changes with Modified LPA
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.

1.1.8 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.

1.1.8.1 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.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.

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 (e.g., 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.

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 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 memorandum, 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.

1.1.8.2 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 National Environmental Policy Act (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."

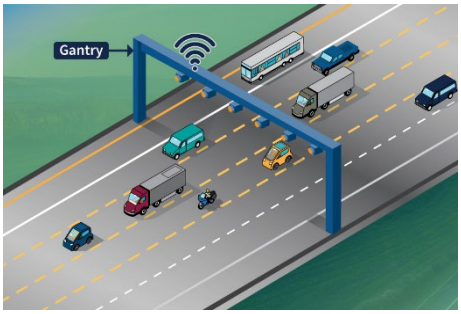
The start dates for pre-completion tolling would be determined based on the IBR Program environmental and construction timelines; placeholders for tolling start dates were used in this NEPA

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 1-30). 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.

Figure 1-30. Toll Zone



One gantry (i.e., overheard structure) would be located in each toll zone (Figure 1-30). 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/Interstate 205 junction and I-5/Interstate 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.

1.1.9 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).

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.

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.
- 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.

1.1.10 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 the Final SEIS, Sections 3.14, Water Quality and Hydrology; 3.15, Wetlands; and 3.16, Ecosystems).[15] 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 1-31). 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.

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 1-31). 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.

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

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.

Figure 1-31. Potential Compensatory Mitigation Sites

1.2 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).

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 1.1.8, Tolling).

1.2.1 Construction Components, Packaging Plan, and Duration

Table 1-4 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 1-4 and illustrated in Figure 1-32. 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 the Final SEIS, 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 the Final SEIS Section 3.2, Navigation, for additional information).

Table 1-4. 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
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

Component and General Location	Estimated Duration	Description	Construction Packages
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 1-32. Preliminary Construction Packages

1.2.2 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 (see Figure 1-6). 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 to the Final SEIS 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 to the Final SEIS. 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.

1.3 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 2018) 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 report).[16] 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.

[16] 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.

2. METHODS

To date, the archaeological identification and significance evaluation for the IBR Program has primarily involved reviewing previous field investigations conducted within and adjacent to the APE, including those conducted for the CRC project. Investigations for the CRC project were conducted by Heritage Research Associates, Inc. on nonfederal lands, by the National Park Service (NPS) on federal lands in the Vancouver National Historic Reserve (VNHR) (Minor et al. 2007), and by Environmental Science Associates in underwater areas (Marcotte and Marken 2011). A number of other organizations have conducted investigations for unrelated projects within and adjacent to the APE. To date, the IBR Program has conducted limited field investigations in accessible areas in the northernmost portions of the APE (Taylor 2024), as well as noninvasive investigations on select parcels between the north bank of the Columbia River and Fourth Plain Boulevard (Brewer and Arnold 2023; Rogers et al. 2024). Additional archaeological survey will be conducted after the Section 106 Programmatic Agreement (PA) is executed as access is provided.

2.1 Area of Potential Effects

Under Section 106 of the NHPA, the lead federal agency is responsible for defining the APE for an undertaking.

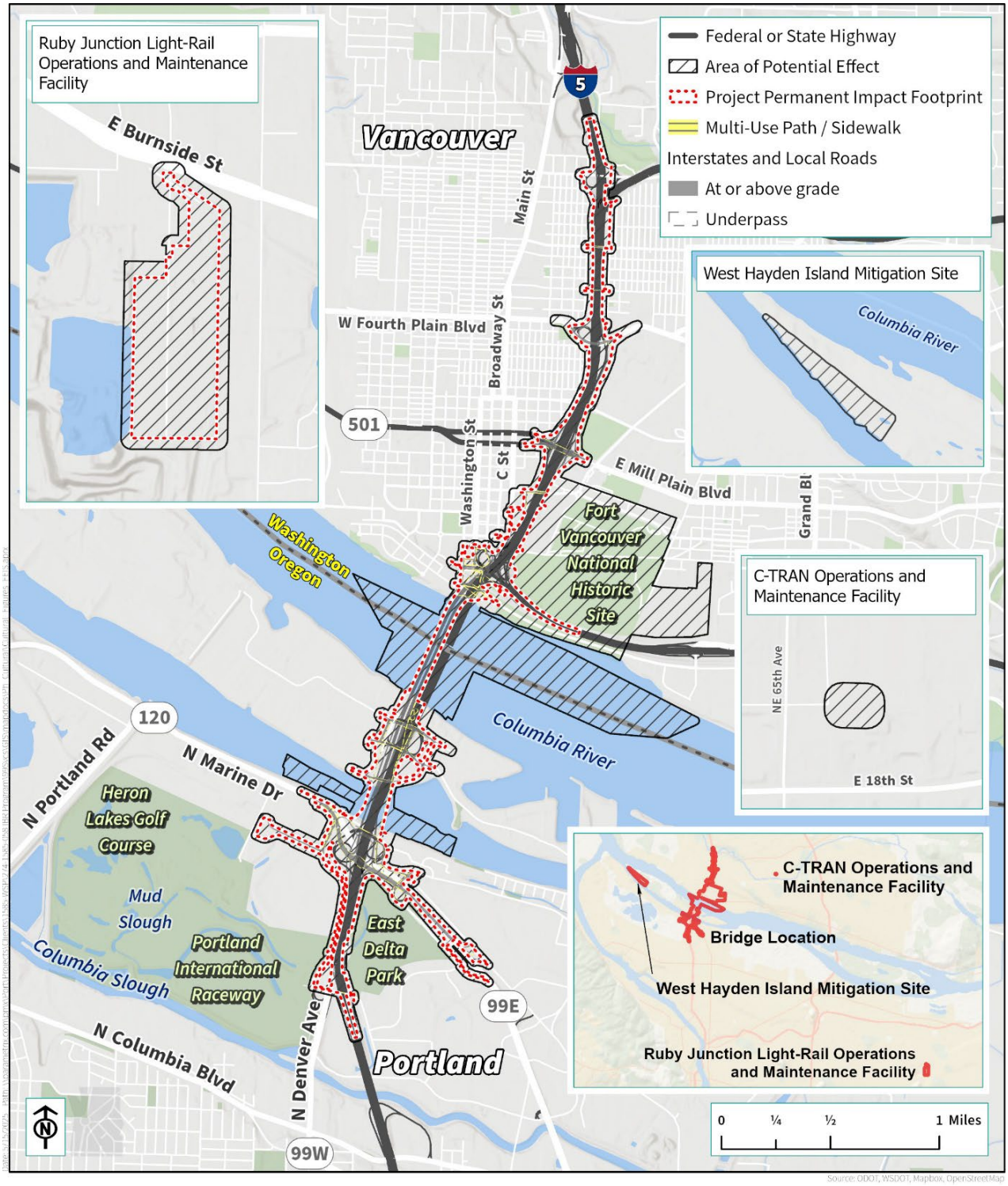
On February 7, 2023, the IBR Program's co-lead federal agencies—the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA)—defined the IBR Program APE as follows:

> *The proposed APE for the IBR Program generally encompasses an approximately 100-foot buffer area around the project construction footprint to account for potential project effects and extends from just south of the I-5 and North Victory Boulevard interchange in Oregon at the southern project terminus, to just north of the I-5 and State Route (SR) 500 interchange in Washington at the northern project terminus. The APE also includes a noncontiguous polygon around the Ruby Junction Rail Operations Facility in Gresham, Oregon, approximately 13 miles southeast of the I-5 bridges across the Columbia River, to account for project activities at this location.* (FHWA and FTA 2023)

The Oregon State Historic Preservation Office (SHPO) concurred on the APE on March 7, 2023. The Washington Department of Archaeology and Historic Preservation (DAHP) concurred on the APE on March 10, 2023.

The APE extends along a 5-mile segment of the I-5 corridor in Oregon and Washington (Figure 2-1). From Victory Boulevard in North Portland, Oregon, the APE stretches northward across the Columbia River floodplain and through the Marine Drive interchange, before crossing the Oregon Slough to Hayden Island. Except for the Vanport Wetlands on the west side south of Marine Drive, the margins of the I-5 corridor in the APE are highly developed with commercial, industrial, and recreational land uses; roadways; and above- and below-ground utilities.

Figure 2-1. IBR Area of Potential Effect



From Hayden Island, the APE continues north via the existing Interstate Bridge, which extends across the Columbia River to Vancouver, Washington. Immediately north of the Columbia River, I-5 proceeds under an overpass for the Burlington Northern Railroad and through the SR 14 interchange. I-5 then continues northward, adjacent to an intensively developed business district and residential neighborhoods.

In addition to the area associated with replacing the Interstate Bridge and improving the I-5 interchange, the IBR APE includes areas associated with seven elements outside of the I-5 corridor:

- Adding an Expo Center overnight light-rail vehicles facility (included in contiguous IBR APE).
- Adding large casting/staging yards (two options included in contiguous IBR APE).
- Expanding the Ruby Junction Maintenance Facility in Gresham (noncontiguous IBR APE).
- C-TRAN Operations and Maintenance Facility in Vancouver, WA (noncontiguous IBR APE).
- Modification to the Federal Navigation Channel and Vancouver Turning Basin.
- West Hayden Island Mitigation Site (noncontiguous IBR APE)
- North Portland Harbor in-water temporary construction easement areas (included in contiguous IBR APE).

2.2 Literature Review

The results of numerous archaeological and cultural resources studies conducted both for the CRC project and related to other development projects remain relevant to the APE. As a means of establishing the pre- and post-contact contexts of the APE, the precontact archaeology, ethnography, ethnohistory, history, and post-contact archaeology were reviewed (Thomas and Freidenburg 1998; Engum 2009; McDonald 2009; Whipple 2009; Boyd 2010; O'Rourke et al. 2010; Marcotte and Marken 2011; Minor et al. 2007; Minor 2011). A synthesis of the geology and geoarchaeology of the APE establishes that evidence of precontact occupation could extend to 12,000 years before present (BP) (DeVore 2009; Minor et al. 2012a, 2012b; Peterson 2011a, 2011b, 2011c). This is addressed in greater detail in Section 3.1, Geological and Geomorphic Setting.

2.3 Previous Archaeological Investigations: Columbia River Crossing

Extensive archaeological investigations were conducted as part of the CRC project. Because the IBR Program is a continuation of the CRC project, a brief description of those investigations and how they influence the IBR Program's methodology is provided below.

2.3.1 Washington

Cultural resource investigations were conducted for the CRC project between 2006 and 2012. CRC archaeologists used ground-penetrating radar (GPR), mechanical trenching (monitored backhoe excavation), and manual excavation techniques that included round-shovel probing, 50-by-50-centimeter (cm) (19.7- by 19.7-inch), and 1-by-1-meter (3.3- by 3.3-foot) units, and trenches.

Simultaneously, NPS was conducting archaeological investigations at the VNHR for CRC in five subareas. NPS archaeologists conducted GPR survey, magnetometer survey, mechanical trenching (monitored backhoe excavation), and manual excavation techniques that included round-shovel probing, 50- by 50-cm, and 1- by 1-meter units and trenches.

2.3.2 Oregon

Investigations in Oregon for the CRC project were geoarchaeological in nature, limited to GPR and rotary-sonic coring, and neither identified archaeological deposits. Due to the geomorphology of the southern bank of the Columbia River (e.g., shifting channels and frequent flooding prior to urban development), no prior archaeological investigations within or immediately adjacent to the Oregon portion of the IBR APE have identified any evidence of archaeological deposits.

2.4 IBR Program Archaeological Investigations

Archaeological methods that were employed in the CRC investigations have been and will be employed during the IBR investigations, including the use of GPR, mechanical trenching (monitored backhoe excavation) and manual excavation techniques, including round-shovel probing, 50- by 50-cm, 1- by 1-meter units, and trenches. The type of method employed at any given place or time in the IBR APE will depend on the conditions of the area being investigated and the types of archaeological/cultural deposits expected. The methods will be determined in consultation with DAHP, SHPO, NPS as applicable, the tribes, and other consulting parties as outlined in the PA. Prior to any fieldwork, IBR developed a Work Plan that outlined the methods that will be used (IBR 2021). In Oregon, a permit from SHPO will also be submitted.

2.4.1 Noninvasive Survey

Noninvasive methods, including, but not limited to, GPR and underwater multibeam and side-scan sonar, were used as a first phase of field investigations in the IBR APE in 2023 (Rogers et al. 2024; IBR 2024). GPR was conducted in terrestrial areas of the IBR APE, determined in consultation with tribes and NPS. Underwater multibeam and side-scan sonar results were reviewed by maritime archaeologists as part of a gaps analysis; the methods to be used during the next phase of underwater investigations, if appropriate, will be developed after execution of the PA. Consultation, analysis, and reporting on noninvasive methods are ongoing.

2.4.2 Pedestrian and Shovel Probe Survey

In March 2023, the IBR Program conducted a windshield survey of previously unsurveyed portions of the IBR APE to identify accessible, unpaved survey locations. In April, the IBR Program offered the opportunity for similar windshield surveys with consulting tribes and conducted similar windshield surveys with representatives from the Cowlitz Indian Tribe and the Confederated Tribes of the Grand Ronde to discuss proposed survey areas. Following discussions with consulting tribes, the IBR Program produced detailed work plans for preliminary pedestrian and shovel probe survey of targeted areas on both the Oregon and Washington sides of the IBR APE. The work plans identified designated areas for proposed investigations and outlined field methodology.

2.4.2.1 Survey in Washington

Between May 15 and May 30, 2023, IBR Program archaeologists conducted pedestrian and shovel probe surveys of the following six properties: Discovery Middle School, Leverich Park, WSDOT area south of E 26th Street, K Street between E 37th and E 33rd Streets, Veterans Affairs Complex, and Arnada Park and Annex (Figure 2-2) (Taylor 2024). Pedestrian transects were spaced no more than 10 meters (32.8 feet) apart across all accessible survey areas, and a total of 100 round shovel probes were excavated. Shovel probes were excavated up to 1 meter (3.3 feet) below surface using a shovel, and up to an additional 1 meter below surface with a 20-cm (7.9-inch) diameter bucket auger. Archaeologists documented all excavations in detailed notes and photographs. All shovel probes were recorded with a GPS unit capable of sub-meter accuracy. All soils were screened through 1/4-inch mesh, until any resources were identified or to the end of the excavation unit. Upon identification of cultural resources, the screen size was changed to 1/8-inch mesh, as outlined in the work plan.

Additional archaeological investigations will be conducted after execution of the Section 106 Programmatic Agreement (PA). The PA will include a work plan for data recovery at applicable archaeological sites in the IBR APE in Washington, and for survey in portions of the APE that have not been fully surveyed.

2.4.2.2 Survey in Oregon

Pedestrian and shovel probe survey in Oregon is anticipated to begin in the ODOT-owned portions of the APE after execution of the PA. Survey on portions of the APE under non-ODOT ownership will be conducted as rights of entry are received. This work will be conducted under excavation permits from SHPO. A technical report will be distributed following completion of fieldwork.

2.4.3 Preconstruction Geotechnical Investigations

The IBR Program conducted in-water geotechnical investigations consisting of eight borings in November and December 2023 (Taylor and Daniels 2024). Upland geotechnical investigations are anticipated prior to execution of the PA.

Figure 2-2. [redacted]

[redacted]

2.5 Consultation and Coordination with Consulting Parties and the Public

2.5.1 Section 106 Consultation

Although the IBR Program has the same Purpose and Need as the CRC Project, this undertaking includes IBR Program design options and changes to the CRC design not included in earlier evaluations. Additional consulting parties and tribes, in addition to those that participated in the consultation for the CRC Project, were identified and invited to consult on the IBR Program. Appendix A contains a list of consulting parties, including NPS, certified local governments, tribes, and organizations with demonstrated interest in the undertaking. Pursuant to 36 Code of Federal Regulations (CFR) § 800.6 and § 800.14, the Advisory Council on Historic Preservation (ACHP) was also invited to consult and has accepted that invitation.

Section 106 consultation has included the following:

- In September 2020, FHWA and FTA contacted 21 tribes and Native Hawaiian organizations that were originally consulted during the CRC Project and reinitiated government-to-government consultation. In February 2022, as a result of consultation with NPS, outreach included an additional 17 federally recognized tribes. Through that effort, 10 federally recognized tribes expressed an interest in consultation on the IBR Program.
- In March 2022, FHWA and FTA communicated with 48 points of contact from governments and organizations, sending information about the IBR Program and issuing an invitation to be a consulting party to the NHPA Section 106 review of the IBR Program. Appendix A contains the list of governments and organizations contacted. The IBR Program invited all of the 10 federally recognized tribes that expressed an interest in consultation to participate as Section 106 consulting parties.
- In February 2023, FHWA and FTA distributed consultation correspondence to consulting parties and tribes. The letter stated that the IBR Program would be treated as a new undertaking under Section 106 and its implementing regulations at 36 CFR § 800. The letter also delineated the APE and initiated consultation on the PA. The Oregon State Historic Preservation Office (SHPO) agreed with the definition of the APE in correspondence dated March 7, 2023, and the Washington Department of Archaeology and Historic Preservation (DAHP) agreed with the definition of the APE in correspondence dated March 10, 2023.
- In December 2023, FHWA and FTA distributed consultation correspondence to consulting parties and tribes. The letter stated that the IBR Program was amending the APE in response to various Program design changes and an evolving understanding of the Program's potential for effects. The Oregon SHPO concurred with the amended APE in correspondence dated February 9, 2024, and the Washington DAHP concurred with the amended APE in correspondence dated January 16, 2024.

- In June 2024, FHWA and FTA distributed consultation correspondence to consulting parties and tribes. The letter stated that the IBR Program was amending the APE in response to various Program design changes and an evolving understanding of the Program's potential for effects. The Washington DAHP concurred with the third amended APE in correspondence dated July 9, 2024, and Oregon SHPO did not provide comment.
- In May 2025, FHWA and FTA distributed consultation correspondence to consulting parties and tribes. The letter stated that the IBR Program was amending the APE in response to various Program design changes and an evolving understanding of the Program's potential for effects. The Washington DAHP concurred with the fourth amended APE on June 10, 2025 and the Oregon SHPO concurred with the amended APE in correspondence dated June 16, 2025.
- In September 2025, FHWA and FTA distributed consultation correspondence to consulting parties and tribes. The letter stated that the IBR Program was amending the APE in response to design changes. The Washington DAHP and the Oregon SHPO did not comment on the fifth APE amendment.

FHWA and FTA sought input and concurrence on determinations of eligibility (DOEs) and findings of effect (FOEs) for historic built environment resources from Oregon SHPO and Washington DAHP through written consultation correspondence. Consulting parties were copied on these correspondences and offered opportunities to provide input. DOEs and FOEs prepared for historic built environment resources in Oregon or interstate were submitted to Oregon SHPO on September 14, 2023, February 6, 2024, March 19, 2024, May 8, 2024, and July 18, 2025.

Oregon SHPO responded with comments or concurrence on October 16, 2023, March 19, 2024, March 18, 2024, May 31, 2024, and September 4, 2025. In addition, on September 19, 2024, FHWA and FTA submitted correspondence to Oregon SHPO, which provided a summary of all previously submitted historic built environment resources FOEs and stated the FHWA and FTA Section 106 finding for the undertaking: the IBR Program will result in adverse effects to historic properties. Oregon SHPO provided concurrence with the finding on September 23, 2024. DOEs and FOEs prepared for historic built environment resources in Washington or interstate were submitted to Washington DAHP on September 14, 2023, February 6, 2024, March 26, 2024, and July 18, 2025. Washington DAHP responded with comments or concurrence on October 13, 2023, February 14, 2024, March 28, 2024, and August 7, 2025. In addition, on September 19, 2024, FHWA and FTA submitted correspondence to Washington DAHP, which provided a summary of all previously submitted historic built environment resources FOEs and stated the FHWA and FTA Section 106 finding for the undertaking: the IBR Program will result in adverse effects to historic properties. Washington DAHP provided concurrence with the finding on September 23, 2024.

FHWA and FTA re-evaluated the National Register of Historic Places (NRHP) eligibility status of several previously recorded Washington archaeological sites in the APE and sought concurrence from Washington DAHP on February 6, 2024, and July 11, 2024. Washington DAHP provided concurrence on February 22, 2024, and July 24, 2024.

Section 106 consultation included development of a PA. This type of Section 106 agreement is used when effects on historic properties cannot be fully determined prior to approval for the undertaking, as allowed under 36 CFR § 800.14(b)(1)(ii), and where other circumstances warrant a departure from the normal Section 106 process as allowed under 36 CFR § 800.14(b)(1)(v). Given the complexities of the IBR Program and the anticipated mix of construction contract delivery

methods, a PA was selected instead of a Memorandum of Agreement for this undertaking. The PA consultation process included:

- In September 2023, FHWA and FTA distributed a concept draft of the PA to consulting parties and tribes.
- In April 2024, FHWA and FTA distributed the first formal draft of the PA to consulting parties and tribes.
- In August 2024, FHWA and FTA distributed the second formal draft of the PA to consulting parties and tribes, which incorporated revisions based on their input, where appropriate. At this time, FHWA and FTA also provided responses to consulting party comments on the first formal draft.
- In January 2025, FHWA and FTA distributed the third formal draft of the PA to consulting parties and tribes, which incorporated revisions based on their input, where appropriate. At this time, FHWA and FTA also provided responses to consulting party comments on the second formal draft.
- In January and February 2025, FHWA and FTA conducted separate meetings with those consulting parties and tribes who accepted the offer to resolve outstanding comments on the PA.
- In May 2025, FHWA and FTA notified consulting parties that the final formal draft PA was available to the public for review.
- In February 2026, FHWA and FTA requested signatories to sign the Final PA.
- In March 2026, FHWA and FTA filed the agreement with ACHP, and authorized the agreement to be included as an appendix to the amended ROD.
- FHWA, FTA, and IBR Program staff have and will continue to meet regularly with SHPO, DAHP, consulting parties, and tribes to consult on Section 106 activities related to the IBR Program.

2.5.2 Coordination and Public Engagement

The IBR Program has engaged with partner agencies, tribal governments, and other interested parties since late 2020, and it has conducted formal, targeted community engagement since February 2021. This engagement has used existing NEPA public engagement forums when possible; however, Section 106 consultation has remained its own independent effort. The IBR Program has offered multiple opportunities for the public to provide input and feedback on the Section 106 process. Methods used to share information and solicit feedback have included online open houses, digital surveys, listening sessions, community briefings, community working groups, and public comments submitted by email, phone, or in person. These opportunities have been advertised via the IBR Program website, social media, mailed postcards, media advisories, in-person canvassing, multilingual community liaison outreach, Program newsletters, and partnerships with local community-based organizations.[17]

The IBR Program maintains a website at https://www.interstatebridge.org/. The website provides Program information, newsletters, fact sheets, advisory group meeting schedules and materials, and

[17] IBR, "Appendix B: Public Involvement," in "Draft Supplemental Environmental Impact Statement," B-1.

schedules of public events. It also allows the public to provide the IBR Program team with feedback through digital surveys and online open houses. A cultural resources online open house, focused specifically on the Program's efforts to research and identify historic and archaeological resources near the IBR Program, was live from April 17 through May 18, 2023.[18] A second cultural resources online open house, focused on providing the public the opportunity to review and comment on identification, evaluation, and effects documents, was live from October 18, 2024 through November 18, 2024. A final cultural resources online open house to provide the public the opportunity to review and comment on the PA was live from May 9, 2025, through June 8, 2025. The NEPA process and publication of the Draft SEIS have also provided an opportunity for the public to review information on historic properties.

Documentation that includes sensitive information exempt from disclosure under federal or state public records laws will not be made available for public review, pursuant to Section 304 of NHPA and other applicable federal and state laws (Oregon Revised Statue 192.345(11) and Revised Code of Washington 42.56.300).

2.6 Regulatory Setting

2.6.1 Federal

As an undertaking seeking federal funds, the IBR Program must comply with the NHPA, NEPA, and Section 4(f) requirements. 23 CFR § 774 commonly referred to as Section 4(f), codified in 49 U.S.C. § 303 and 23 U.S.C. § 138, provides for historic sites to be considered during federal transportation project development. Section 4(f) properties include any publicly or privately owned historic sites listed or eligible for listing on the NRHP (FHWA and FTA 2008). Before approving a project that uses Section 4(f) property, FHWA and FTA must determine that there is no feasible and prudent alternative that avoids the Section 4(f) properties and that the project includes all possible planning to minimize harm to the Section 4(f) properties; or, FHWA and FTA makes a finding that the project has a de minimis impact on the Section 4(f) property.

The NHPA, as amended, requires that federal agencies follow regulations of Section 106 to identify and assess the effects of federally assisted undertakings on historic properties and consult with others, such as the SHPO, tribes, Section 106 consulting parties, the public, etc., to identify ways to avoid, minimize, or mitigate adverse effects.

Under the Archaeological Resources Protection Act of 1979 (ARPA; 16 U.S.C. § 470), archaeological investigations on federal or tribal lands require a permit from the federal land manager. This act will apply to any IBR investigations within the Fort Vancouver National Historic Site (NHS) and the FHWA Western Federal Lands properties within the VNHR and on Veterans Affairs property.

On federal lands, if Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered, the Native American Graves Protection and Repatriation Act (NAGPRA; 25 U.S.C. § 3001-3013), and its implementing regulations at 43 CFR § 10, applies. NAGPRA requires the responsible federal agency to consult with tribes and Native Hawaiian organizations to

[18] IBR, "Appendix B: Public Involvement," B-4.

ensure that the disposition of the human remains, funeral objects, sacred objects, or objects of cultural patrimony is carried out according to the regulations.

2.6.2 State

In addition to federal laws, implementation of the Modified LPA is also subject to laws regarding the identification and protection of archaeological resources promulgated by each state. In Oregon, these statutes include Archaeological Objects and Sites (ORS 358.905 to 358.961), Permit and Conditions for Excavation or Removal of Archaeological or Historical Material on Public Lands (ORS 390.235), and Indian Graves and Protected Objects (ORS 97.740-97.760). In Washington, these laws include Archaeological Sites and Resources (Revised Code of Washington [RCW] 27.53), Indian Graves and Records (RCW 27.44), and Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60).

There is a deed restriction on the West Vancouver Barracks, which is managed by City of Vancouver. Officers Row and Old Apple Tree Park are monitored under the Federal Lands to Parks regulations within the VNHR.

3. AFFECTED ENVIRONMENT

Despite evidence of Indigenous use at and after contact, to date, no archaeological evidence of precontact Native American occupation has been identified on the Oregon shore of the Columbia River within, or in the close vicinity of, the APE. Potential reasons for this include the following:

- The APE represents a very narrow transect across the Columbia River floodplain and may not include any areas in which Native American or historic period Euro-American sites are preserved.
- Evidence of Native American occupation and activity may be present, but over time it has been buried by natural flood deposits and/or introduced fill deposits associated with 20th-century development.
- Previous archaeological surveys have been mostly limited to inspection of the existing ground surface and/or shallow probing. These efforts have not employed methods suitable for locating Native American sites buried under historic fill or within alluvium deposited over the last 12,000 years.
- Comparisons with other elongate islands in the Columbia and geoarchaeological data indicate that Hayden Island formed very recently. A major river channel migrated south to truncate the Vanport floodplain at the current southern margin of Oregon Slough between 4,000 and 2,500 years ago. Sediments changed from channel sands to muddy sand (a sand shoal) around 1,300 years ago. Vertical accretion of this sand shoal from overbank muddy sand deposition created the island proper by around 500 years ago (Minor and Peterson 2013). An examination of shorelines since 1841 indicates a slight widening and lengthening of Hayden Island and the preservation potential for historic river shorelines and adjacent floodplains on Hayden Island and near Oregon slough (Peterson 2011b).

The I-5 corridor immediately north of the Columbia River and through Vancouver is bounded on both sides by areas settled early in the historic period. East of I-5 is the site of the Hudson's Bay Company's (HBC) Fort Vancouver, established at this location in 1829, and the Vancouver Barracks, where the U.S. Army's presence dates to 1849 (Hussey 1957). This area is encompassed within the VNHR, established in 1996 and listed in the NRHP in 2007 (Owens et al. 2007). West of I-5 is the oldest portion of the city of Vancouver. This American city emerged to the west of the HBC Fort Vancouver beginning in the 1840s and 1850s.

The I-5 corridor within the APE appears to be an unlikely setting for finding archaeological resources. However, construction of I-5 and associated interchanges required earthmoving on a massive scale. Much of this activity involved cutting and removing native soils in which archaeological evidence of occupation and activity in the pre- and post-contact periods may once have been present, but in some areas fill covered and protected archaeological features. The results of the discovery and significance evaluation investigations for the CRC project underscore the potential preservation of NRHP-eligible historic properties in the IBR APE.

[redacted] Archaeological sites generally fall into three categories: terrestrial

sites associated with VNHR, terrestrial sites associated with Historic City of Vancouver (henceforth referred to as Vancouver, Washington), and underwater sites.

[redacted] these sites were assigned site numbers in the late 1970s, before establishing site boundaries through archaeological fieldwork became a fundamental requirement in cultural resource management. The boundaries of these sites tend to be based on administrative units rather than archaeological data. Three of these sites are characterized by boundaries that overlap (the implication of this is considered in Section 3.5).

[redacted]

[redacted]

3.1 Geological and Geomorphic Setting

The APE is located at Columbia River mile 106.4 in the Portland-Vancouver Basin of the Lower Columbia River Valley. This basin was formed early in the Pliocene by a gentle syncline, or downwarp, of flows of volcanic rock known collectively as Columbia River Basalt. Near the end of the Pliocene, the velocity of the Columbia River appears to have been slowed or impounded, leading to deposition of 1,500 feet (approximately 460 meters) of fine-grained Sandy River Mudstone (Trimble 1963). The Columbia River Basalt and Sandy River Mudstone are not exposed in the APE.

Before the end of the Pliocene, a change in deposition occurred: a sand and gravel delta, emanating from the west end of the Columbia Gorge, formed in the Portland-Vancouver Basin. These deposits are referred to as either Troutdale (cemented) or Pleistocene (uncemented) fluvial gravels. The upper member of the Troutdale Formation, which includes sand, cobbles, and boulders, ranges from five to two million years in age (Trimble 1963; Beeson and Tolan 1993). The younger Pleistocene gravel deposits could range from two million years in age to the last ice age 15,000 years ago. The younger Pleistocene gravels occur well above the present grade of the Columbia River, indicating changing base levels in late Pleistocene times.

Uncemented naturally stratified sand and silt deposits at elevations higher than historic flood heights or latest Holocene floods (approximately 35 feet national geodetic vertical datum of 1929 [NGVD29]) represent cataclysmic flood deposits from glacial Lake Missoula (Benito and O'Connor 2003). Multiple dam bursts from this glacial lake produced numerous sequences of fining-up beds called rhythmites, which were locally remobilized to form interbeds of loess (Lentz 1983). The youngest glacial flood deposits from Lake Missoula that inundated the lower Columbia Valley are dated to about 12,000 BP, which corresponds to the temporal boundary for the APE. The upland terraces adjacent to the north and south sides of the Columbia River in the APE are covered by the glacial flood rhythmites and loess, representing the latest-Pleistocene periglacial deposits (Beeson et al. 1991).

Around 16,000 BP, sea level was approximately 360 feet (approximately 110 meters) below what it is today. At that time, the waters of the Columbia River flowed through a deep canyon several hundred feet below the surrounding landscape. As sea level rose, the valley floor was submerged. By 12,000 BP, sea level extended upslope (landward) in the valley, approximately 230 feet (70 meters) below today's elevation. At the time of the deposition of Mazama ash from the eruption of Mount Mazama at approximately 7,700 BP, sea level in the lower Columbia Valley was approximately 41 feet (12.5 meters) below what it is today.

Sea level approached its present elevation several thousand years ago. Sea level, and the corresponding Columbia River level in the APE, have risen only 9.8 feet (approximately 3 meters) in the last 3,000 years, a rate of about 0.04 inches (25 millimeters) per year.

Prior to construction of the federal Columbia River Power System, the lower Columbia Valley area was regularly subject to inundation from seasonal floods. In 1948, the Columbia River reached a measured height in the North Portland area of +32.8 feet (approximately 10 meters) (NGVD29)—its highest flood level recorded. The flood of 1894 is reported to have had a slightly higher elevation. Other flood heights range from 17 feet (approximately 5.2 meters) for one-year freshets to 32 feet (approximately 10 meters) for 20-year floods (Kuper and Lawes 1994, 12). Elevations on the Columbia River's south shore floodplain in the APE range from 0.0 to +30 feet (0.0 to +9 meters).

In comparison, the terrain on the Columbia River's north shore in the APE ascends quickly, so that only a narrow strip of ground adjacent to the river lies at elevations of 30 feet (approximately 9 meters) or less. The terrain was subject to regular inundation and deposition of flood silts prior to modern river flow control. The rising ground north of the Columbia River is covered by relatively shallow wind-blown loess deposits overlying Pleistocene gravels. The landscape near the north end of the APE is cut by Burnt Bridge Creek, an overflow channel from the Missoula floods. The floodwaters cut a deeply incised canyon through which this small stream flows generally westward to its outlet at Vancouver Lake.

3.2 Cultural Setting

The abundant natural resources in the lower Columbia Valley supported one of the densest Native American populations in North America. At the time of contact with Euro-Americans, native peoples who spoke Chinookan languages lived along the shores of the Lower Columbia River (Ames et al. 1998). Appendix B includes geographic context statements generated by tribes of descendant communities who elected to provide this information to the IBR Program for the technical report.[19]

Although evidence of Native American occupation dating as early as 16,000 BP has been found farther upstream on the Columbia River (Davis et al. 2019), the archaeological record in the lower Columbia Valley has a much more limited time depth. Evidence of early occupation on the valley floor has been

[19] Ten federally recognized tribes and one non-federally recognized tribe consulting on the Program were invited to prepare geographic context statements in lieu of standard context statements so the tribes can share ethnographic information about the background of this region from their perspective and in their own words. Two federally recognized tribes accepted this invitation. The IBR Program recognizes that the context statements prepared may not reflect the histories of those tribes that have chosen not to participate.

submerged by rising sea levels or buried under alluvial deposits, with the result that the earliest radiocarbon-dated sites along this section date to as early as about 3,000 to 3,500 BP (Minor 2011).

The APE contains an archaeological record associated with settlement by Euro-Americans and other ethnic groups that is unmatched anywhere else in the Pacific Northwest (Wilson et al. 2020). This record begins with archaeological features, deposits, and artifacts from the HBC Fort Vancouver on the north bank of the Columbia River, east of present-day I-5. Originally established in 1825 on high ground farther east, Fort Vancouver was relocated in 1829 to the present site of the reconstructed stockade in the VNHR. An extensive multicultural settlement known historically as Kanaka Village, where most HBC employees lived, emerged along the southwest side of the fort. In 1849, the U.S. Army established Camp Vancouver on the upper plain above the HBC stockade. With the establishment of a military reservation in 1850, the name was changed to Columbia Barracks. This post expanded over the years, with another name change in 1879 to Vancouver Barracks, to become one of the most important military installations in the Pacific Northwest during the late 19th and early 20th centuries (Minor 2011).

The City of Vancouver began developing in the 1840s and 1850s on the north bank of the Columbia River immediately west of the military reserve. The original layout of Vancouver, Washington, consisting of the first platted blocks, was situated in the area that is immediately west of I-5 today. For the most part, archaeological remains in Vancouver postdate the initial HBC occupation at Fort Vancouver and relate to civilian settlement and development coterminous with the U.S. Army occupation at Vancouver Barracks. Although much less comprehensively investigated compared to the area east of I-5, recent archaeological investigations conducted during modern development projects in the oldest portions of the city have begun to shed light on the development of Vancouver's urban environment, including within the APE (Minor 2006, 2011; Solimano 2004) and for many historic city blocks outside the APE.

3.3 Defining Characteristics of the Area of Potential Effects

The APE has several defining characteristics that impact efforts to identify significant archaeological sites.

First, the I-5 corridor within the APE is a zone of intense past construction. This activity has involved earthmoving on a massive scale, including deep cuts into the native sediments and underlying gravels in some areas, and the introduction of deep fill deposits in others. Evidence of multiple instances of cut-and-fill from past construction can be found in the same local area. An additional aspect of past construction is the degree of compaction of the fill introduced along the roadway margins. As indicated by penetrometer measurements in the field, these fill deposits routinely yielded values that are too compact for manual excavations according to engineering standards. The land on the east side of I-5 in the VNHR is an exception, as it generally has not been subject to construction disturbance.

Second, the Pleistocene gravels, the geological baseline for the APE, occur at significantly different depths below the surface on either side of the Columbia River. On the Washington shore, the Pleistocene gravels are relatively accessible, often within 4 to 5 feet (1.2 to 1.5 meters) of the surface. On the Oregon shore, the Pleistocene gravels are deeply buried beneath Holocene floodplain

deposits, generally in excess of 100 feet (approximately 30.5 meters) below the surface. The widely differing depths of the target Pleistocene gravels directly affect the strategies for identifying significant archaeological sites in the APE.

Finally, the last undammed section of Columbia River bisects the APE. Natural and human impacts have modified the Columbia River since time immemorial. Substantial post-contact modifications have included dredging, levee systems, and shoaling.

3.4 Previous Investigations on the Oregon Shore

3.4.1 Geological and Geoarchaeological Studies

The objective of identifying evidence of human activity or occupation within the APE is complicated by the considerable depth of the alluvial floodplain deposits on the Oregon shore. Previous borehole drilling in the vicinity has established that alluvial deposits measuring over 100 feet (30.5 meters) in depth overlie the Pleistocene gravels.

Historically, the floodplain in the vicinity of the APE was subject to seasonal flooding by the Columbia River. Consequently, substantial fill material was imported when I-5 was constructed to raise the grade above the surrounding floodplain.

GPR surveys were conducted to establish the depth of the introduced fill on the Oregon shore (Figure 3-1). Depth of fill was first investigated by means of reviewing past GPR surveys. GPR profiling conducted in 2009 indicated the presence of artificial fill deposits extending to substantial depths in all surveyed areas. Following GPR survey, rotary-sonic coring was used to recover continuous samples of sediments from the present ground surface down to the Pleistocene gravels to identify the presence or absence of deeply buried archaeological deposits (Minor et al. 2009; Minor et al. 2012a, 2012b; Minor and Peterson 2013; Peterson 2011a).

The rotary-sonic coring served to ground-truth the findings of the earlier GPR surveys, confirming the presence of deep fill near I-5 on parcels owned by ODOT. Rotary-sonic coring identified fill deposits in the APE that range from 6.2 to 19.0 feet (1.9 to 5.8 meters) deep (Figure 3-2). The depth to the Pleistocene gravels ranged from 198.8 feet (60.6 meters) in the borehole on Hayden Island to between 111.3 and 132.6 feet (34 and 40 meters) in multiple boreholes on the Oregon mainland (Figure 3-3).

Volcanic tephra deposits, ranging from one to three layers from separate volcanic eruptions, were observed in the boreholes. The most common tephra represented is from the climactic eruption of Mount Mazama at present-day Crater Lake, with a calendrical age of 7,627 calibrated years BP (Zdanowicz et al. 1999; Bacon and Lanphere 2006). Microprobe analysis conducted at Washington State University confirmed that this tephra originated from Mount Mazama (Foit 2010). Based on depth below surface and radiocarbon dating, other tephra layers appear to correlate with two eruptions of Mount St. Helens: one deposited around 500 BP, and another between 3,900 and 3,300 BP (Mullineaux 1996).

3.4.2 Precontact Archaeology

Encountering tephra layers on the Oregon shore, as noted above, indicates the preservation of floodplain muds in some areas that have not been disturbed by erosive channel migrations over the last 7,000 years, at least, and possibly extending as far back as 9,000 to 11,000 years BP. As the APE south of the North Portland Harbor appears to have been a floodplain environment (a mosaic of sloughs, wetlands, grasslands, and riparian forest) throughout the Holocene, past human use of the area is believed to be limited to resource extraction activities and short-term processing or habitation sites, with longer-term habitation sites being located on natural levees or higher ground adjacent to the floodplain.

[redacted]

[redacted]

3.4.3 Post-Contact Archaeology

While no post-contact archaeological sites have been identified within the Oregon portion of the APE, there is a low to moderate probability for post-contact archaeological resources. This area was largely uninhabitable until drainage districts were established in 1917, and then it was mainly used for recreational purposes.

In 1942, today's Expo Center was the location of the Portland Assembly Center where Japanese Americans from Oregon and Yakima, Washington, were incarcerated prior to being transferred to concentration camps in Idaho, California, or Wyoming. [redacted]

Residential development during World War II included the temporary city of East Vanport, in today's Delta Park. Occupation of East Vanport, predominantly by African American shipyard workers, was short-lived; the housing was dismantled by 1946. [redacted]

Figure 3-1. [redacted]

[redacted]

Figure 3-2. Depth of Fill within Oregon Portions of the Area of Potential Effect

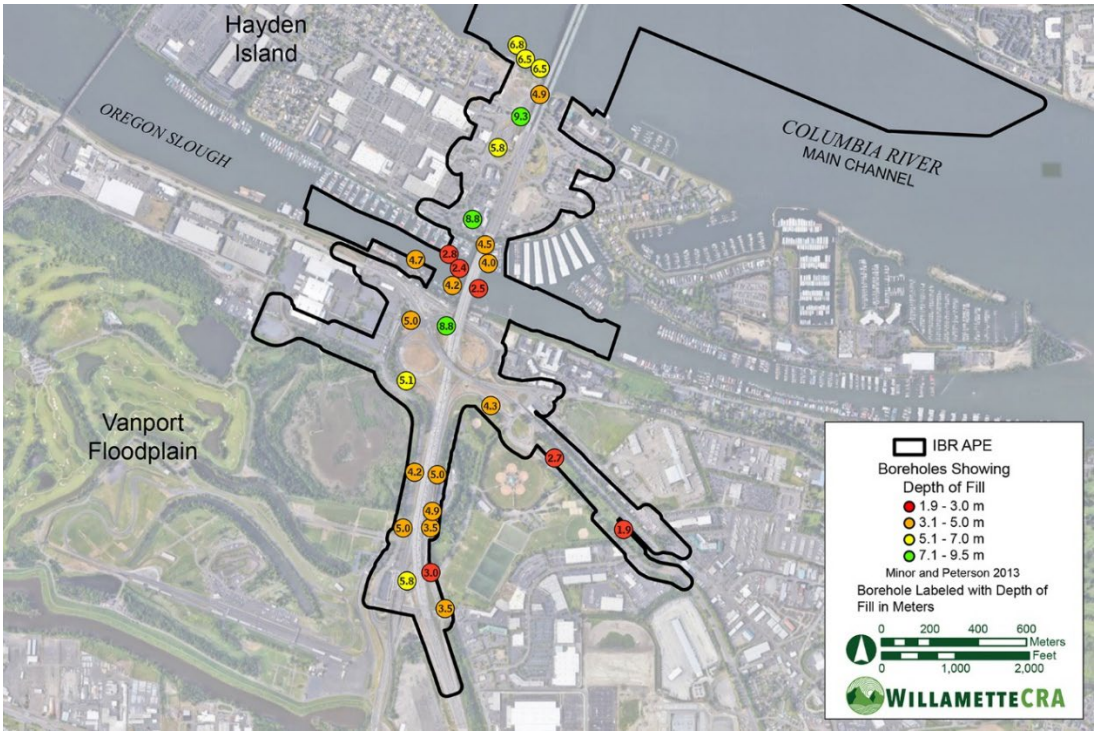
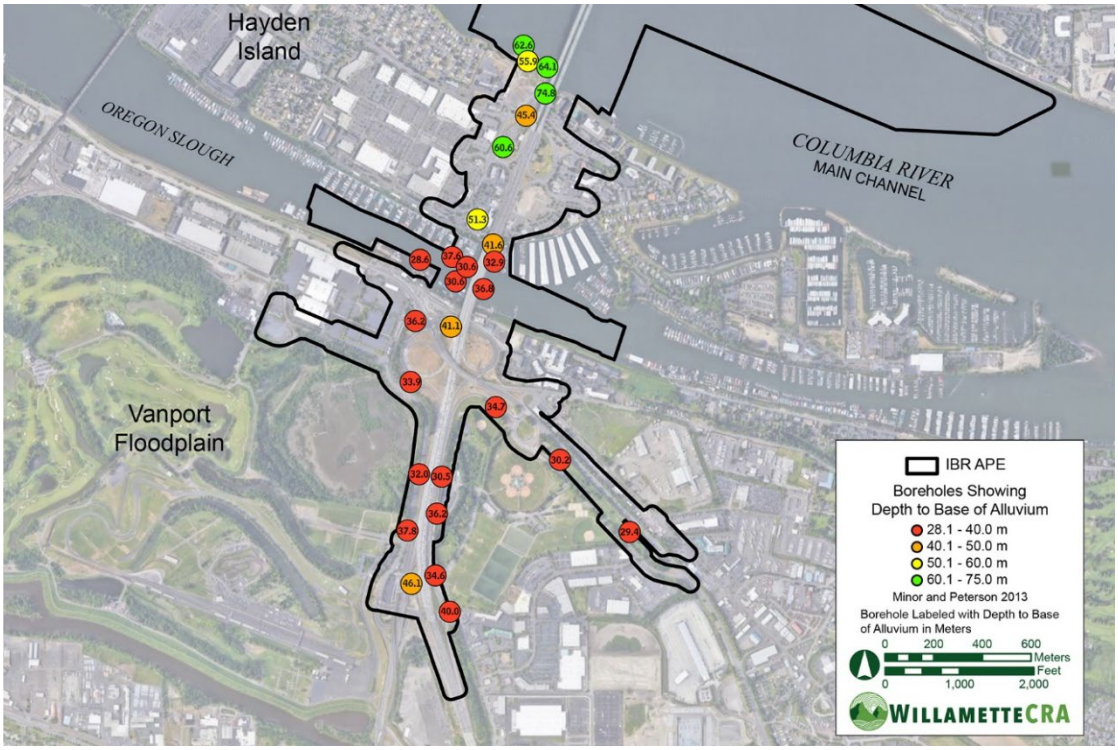


Figure 3-3. Depth of Alluvium within Oregon Portions of the Area of Potential Effect



3.5 Previous Investigations on the Washington Shore

3.5.1 Site Nomenclature

The way that archaeological sites were defined and designated years ago differs from how they are recorded today. This difference is highlighted in the designation and management of archaeological resources in the APE on the Washington shore of the Columbia River, on the east side of I-5.

[redacted]

[redacted] The VNHR includes Fort Vancouver NHS, as well as other historic properties that are not part of the National Park System. The VNHR National Historic Reserve District (DT-191) is also a Historic District listed on the NRHP in 2007. It includes the Fort Vancouver NHS and other adjacent districts and sites but does not include the entire VNHR. It is important to distinguish the VNHR as a broader congressionally created reserve from the historic property, the VNHR National Historic District.

[redacted]

Today, the recording of archaeological sites begins with identification of their location and extent, which includes the delineation of the horizontal and vertical boundaries of the archaeological deposits. This information is required for effective management of archaeological sites by property owners. One of the primary objectives of the discovery and evaluation phases of archaeological fieldwork undertaken for the CRC project was the identification of archaeological sites, including delineation of the horizontal and vertical extent of archaeological deposits, while also evaluating the interrelationships between sites and the network of environmental and depositional modifications represented (Figure 3-4).

[redacted]

[redacted]

Figure 3-4. [redacted]

[redacted]

3.5.2 Precontact Archaeology

In the reports on previous investigations, stone technologies are regularly assumed to represent evidence of activity in the precontact period. However, out of the full suite of traditional technology and evidence of human activities, stone items are most likely to be preserved, though making up a small proportion of cultural practice. Further, stone tool technology continued to be used in the post-contact period (Thomas and Hibbs 1984; Gall et al. 2011).

Previous studies classified all stone objects as the result of precontact activities, even when these materials are not temporally diagnostic and when they are found in the same excavation levels and strata with items of Euro-American manufacture associated with [redacted]

Distinguishing evidence of precontact activity from activity by Native Americans in the post-contact period is made difficult by the sedimentary context in which archaeological remains occur along the Washington shore. In comparison to the Oregon shore, little deposition of sediment occurred on the Washington shore during the Holocene. As a result, Indigenous stone technologies that are potentially precontact in age often occur in the same shallow sediments as post-contact period materials.

[redacted]

3.5.2.1 Previous Findings of Indigenous Stone Technology

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.5.3 Post-Contact Archaeology

The overwhelming majority of the archaeological evidence collected during archaeological investigations within the APE on the Washington shore relates to activity and/or occupation in the post-contact period. This evidence includes archaeological remains that span more or less the last 200 years, beginning with [redacted] The alignment of I-5 extends across lands formerly within the

city of Vancouver and U.S. Army military reservation. [redacted] In practical terms, I-5 now serves as a boundary between the VNHR on the east and Vancouver on the west. [redacted] and historical resources on the VNHR have been the subject of innumerable studies, culminating in placement of the VNHR Historic District on the NRHP in 2007 (Owens et al. 2007).

In comparison, the archaeological studies undertaken in downtown Vancouver, Washington, have been conducted as part of modern development, which sometimes constrains the extent of investigations. Settlement and development began on the bank of the Columbia River and generally spread north along Main Street and the adjacent streets to the east (Broadway Street) and west (Washington and Columbia Streets). The historically platted boundaries of Vancouver, Washington are understood to extend north from the Columbia River to 19th Street, and from West Reserve Street on the east to the area between Columbia and Esther Streets on the west within the IBR APE.

As outlined in Townsites: Historic Context and Archaeological Research Design (HARD Townsites Team 2007), towns and cities have distinctive characteristics, contexts, and research themes that encompass the age, nature, and spirit of the cultural resources associated with their settlement and development. While the [redacted] and warrants study for the information it can contribute about the Euro-American settlement and subsequent development of Vancouver.

3.5.3.1 Vancouver National Historic Reserve

[redacted]

3.5.3.2 City of Vancouver

[redacted]

4. RESOURCE IDENTIFICATION

Section 106 regulations (36 CFR § 800.4(b)(2) and 36 CFR § 800.5(a)(3)) allow a phased process that provides flexibility in how to implement efforts to identify, assess, and resolve adverse effects in order to take into account the effects of an undertaking on historic properties consistent with NHPA requirements. For the IBR Program, this phased process will be carried out in accordance with the PA, which includes stipulations regarding the process for identifying and evaluating archaeological resources. The PA includes an Archaeological Resources Identification, Monitoring, and Treatment Plan ("Treatment Plan") that describes how effects will be assessed and treated.

In several parts of the APE, access to conduct archaeological investigations to discover archaeological resources is restricted by denial of right of entry, as well as actively and intensively used urban elements such as roadways, sidewalks, parking lots, and other areas that present safety and access challenges. Additionally, some areas are out of reach of typical field techniques, such as areas with fill impenetrable by mechanical and/or manual excavation, steep slopes, and ravines, making archaeological subsurface excavations practically and logistically problematic. As project design is finalized, these areas will be investigated in a phased manner prior to or during construction, following protocols established in the Treatment Plan, which is included as an attachment to the PA.

4.1 NRHP Eligibility Criteria

Archaeological resources include the physical remains of human activity as evidenced in artifacts, remains, sites, buildings, structures, or objects. An archaeological resource is considered a historic property, and significant pursuant to 36 CFR § 800, if it is determined to be NRHP eligible. As defined in 36 CFR § 60, eligible properties generally must be at least 50 years old, possess integrity of physical characteristics, and meet at least one of the four criteria of significance:

A. *That are associated with events that have made a significant contribution to the broad patterns of our history; or*

B. *That are associated with the lives of persons significant in our past; or*

C. *That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction; or*

D. *That have yielded, or may be likely to yield, information important in prehistory or history.*

The NRHP eligibility of archaeological resources, and cultural resources in general, is based on criteria set forth in 36 CFR § 60, further referenced in 36 CFR § 800.4(c), and detailed in Treatment of Archaeological Properties: A Handbook, issued by the Advisory Council on Historic Preservation, as well as in a series of bulletins, including:

- National Register Bulletin 15 – How to Apply the National Register Criteria for Evaluation.
- National Register Bulletin 36 (Revised) – Guidelines for Evaluating and Registering Archaeological Properties.

- National Register Bulletin 38 – Guidelines for Evaluating and Documenting Traditional Cultural Properties.
- National Register Bulletin 41 – Guidelines for Evaluating and Registering Cemeteries and Burial Places.

4.2 Summary of Recorded Archaeological Resources in the IBR Area of Potential Effects

[redacted]

[redacted]

[redacted]

Table 4-1. [redacted]

[redacted]

[redacted]

[redacted]

5. PROGRAMMATIC AGREEMENT

5.1 Review, Investigation, and Mitigation to be Completed Under the Programmatic Agreement

A previous section of this report describes the efforts undertaken to date to identify eligible archaeological resources in the IBR APE. Additional work to be conducted includes preconstruction investigations in areas not already examined, phased construction fill removal, and archaeological inventory of native soils in areas currently inaccessible due to deep fill. Monitoring by an archaeologist during construction is advised in specific locations, which are identified in the PA.

Archaeological monitoring [redacted] during construction is expected to play a critical role due to the current inaccessibility of substantial portions of the APE (e.g., the existing I-5 infrastructure), and [redacted] The PA includes stipulations, including a post-review discovery plan, to ensure that appropriate measures are taken with respect to the NHPA and other applicable cultural resource protection laws and regulations.

5.1.1 Outside the I-5 Corridor in Vancouver, Washington

[redacted]

5.1.2 Casting and Staging Areas

Construction activities for the Modified LPA will require at least one large site to stage equipment and materials. Two locations have been identified as possible major staging areas: one on Hayden Island west of I-5 and north of N Hayden Island Drive, and one in Vancouver adjacent to I-5 north of McLoughlin Boulevard. A casting yard could be required for construction of the over-water bridges if a

precast concrete segmental bridge design is used. Staging areas would primarily be used for construction offices, to stage larger equipment such as cranes, and to store materials such as rebar and aggregate—activities that are unlikely to have deep subsurface impacts. Protocols established in the PA will ensure that the selected area(s) is investigated with respect to the NHPA and other applicable cultural resource protection laws and regulations.

5.1.3 Submerged Shelf on Washington Shore

There is a greater potential for underwater archaeological resources to be present in the Columbia River along the Washington shore than on the Oregon shore as discussed below. [redacted]

5.1.4 Federal Navigation Channel and Vancouver Turning Basin

An underwater archaeology gaps analysis was prepared for the in-water portion of the APE. Based on these results, the IBR Program may conduct additional underwater archaeological investigations to further evaluate this portion of the APE for potential submerged resources. Depending upon the selected methods, investigations may be restricted to an available in-water work window that provides the best visibility.

5.1.5 Oregon Shore

The rotary-sonic borings undertaken in 2009 for geoarchaeological purposes have produced a substantial amount of information about the evolution of the environment in the APE on the Oregon shore over the last 12,000 years (Minor and Peterson 2013). [redacted]

[redacted]

5.2 Assessment of Effects

To date, archaeological identification and site evaluation investigations in and, in limited cases, adjacent to, the APE have been conducted where rights of entry have previously been granted, including properties owned by ODOT, WSDOT, NPS, the U.S. Army, and the City of Vancouver. [redacted]

[redacted]

The design of the Modified LPA has not been finalized, and all areas in which construction impacts may occur, such as construction staging, have not been identified. The design team has provided the limits of ground disturbance based on the current design and design options. Any adverse effects identified to archaeological resources will be resolved through the process outlined in Stipulation V of the PA and processes detailed in PA Attachment D, Archaeological Resources Identification, Monitoring, and Treatment Plan. If adverse effects to NRHP-eligible archaeological sites cannot be avoided, FHWA and FTA, in coordination with WSDOT and ODOT, as applicable, and in consultation with DAHP and Oregon SHPO, as applicable, NPS regarding the VNHR, the tribes, and other consulting parties, will determine if data recovery is an appropriate measure to resolve adverse effects on NRHP-eligible archaeological sites. If it is determined through consultation that data recovery is an appropriate measure to resolve adverse effects, WSDOT and ODOT, as applicable, will prepare a data recovery plan consistent with the standards and guidelines listed in PA Attachment D, and following the data recovery methods in section D-IV.B of PA Attachment D. A data recovery plan will be prepared for each adversely affected archaeological site or for a group of sites. In addition, PA Stipulation V indicates that, if adverse effects cannot be avoided and data recovery is not determined appropriate, through the consultation process, other mitigation approaches will be considered for resolving adverse effects to NRHP-eligible archaeological sites, if appropriate. If FHWA and FTA determine, through consultation, that the use of other mitigation is appropriate, WSDOT and ODOT, as applicable, will prepare site-specific mitigation plans, using other mitigation approaches, for each adversely affected archaeological site.

6. REFERENCES

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Appendix A. List of Consulting Parties

Listed below are all the parties that participated in and were consulted with during the Section 106 process.

Federal Agencies

- Federal Highway Administration
- Federal Transit Administration
- Department of the Army, Office of Army Cemeteries
- National Park Service
- The Advisory Council on Historic Preservation
- United States Army Corps of Engineers
- United States Coast Guard

State Agencies

- Oregon Department of Transportation
- Oregon State Historic Preservation Office
- Oregon Department of State Lands
- Oregon Legislative Commission on Indian Services
- Washington State Department of Transportation
- Washington State Department of Archaeology and Historic Preservation
- Washington State Department of Natural Resources

Federally Recognized Tribes

- Confederated Tribes of the Colville Reservation
- Confederated Tribes of Grand Ronde Community of Oregon
- Confederated Tribes of Siletz Indians of Oregon
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of Warm Springs Reservation of Oregon
- Confederated Tribes and Bands of the Yakama Nation
- Cowlitz Indian Tribe
- Nisqually Indian Tribe
- Nez Perce Tribe
- Spokane Tribe of the Spokane Reservation Indians (Spokane Tribe of Indians)

Other Agencies and Organizations

- Architectural Heritage Center
- Buena Hayden, LLC
- Chinook Indian Nation
- City of Portland
- City of Vancouver
- Clark County
- Clark County Historic Preservation Commission
- Clark County Historical Society and Museum
- Columbia River Maritime Museum
- C-TRAN
- The Historic Trust
- Hurley Development
- Jantzen Beach Moorage Inc.
- Metro
- Restore Oregon
- TriMet
- Vanport Placemarking Project
- Washington Trust for Historic Preservation

Appendix B. Geographic Context Statements

Introduction to Tribal Geographic Context Statements

The 10 federally recognized tribes, and one non-federally recognized tribe, consulting on the Program have been invited to prepare geographic and ethnographic context statements in lieu of standard context statements so the tribes can share information about the background of this region from their perspective and in their own words. Two federally recognized tribes have accepted this invitation. The IBR Program recognizes that the context statements prepared may not reflect the histories of those tribes that have chosen not to participate.

The Confederated Tribes of the Grand Ronde Community of Oregon (CTGR) and the Cowlitz Indian Tribe (CIT) submitted the following geographic context statements for inclusion as appendices in the Archaeology Technical Report. These documents are reflections of their tribal identities, relationships with their homelands since time immemorial, and their historic (and ongoing) experiences with settler colonialism within and beyond the IBR Area of Potential Effects. The statements are informed by published materials including ethnographies, ethnohistories, history studies and historic accounts; unpublished grey literature and archival documents; and tribal knowledge-keepers within their own communities, both past and present.

The CIT is a federally recognized tribe whose reservation is located in Clark County, Washington. CIT members are primarily the descendants of the Coast Salish speaking Cowlitz and the Taidnapam, who spoke a Sahaptian language. The historic homelands of present-day Cowlitz include the Cowlitz, Kalama, Lewis, and Washougal Rivers, all tributaries to the Columbia River.

The CTGR is also a federally recognized tribe with a reservation located in Grand Ronde, Oregon. Its members are the descendants of over 30 tribes and bands in western Oregon, northern California, and southwest Washington State, including the Cascades, Multnomah, and Clackamas: Chinook speaking inhabitants of the densely populated Lower Columbia River.

The Lower Columbia River was a locus of trade and thus a zone of substantial interaction between Cowlitz, Taidnapam, Chinook, and other groups with ties to the area prior to the arrival of epidemic diseases in the late eighteenth century, of fur traders and missionaries at Fort Vancouver in the early nineteenth century, and government agents in the late nineteenth century.

All of these factors make for an extremely complex cultural geography of the area. This complexity, combined with the differently situated, culturally grounded perspectives that inform each tribe's context statements will inevitably result in some differences between each tribe's report.

There are also many points of similarity between both reports. Both reports note that the practice of exogamy, or marrying outside one's group, was a common practice long before the arrival of non-Indigenous peoples to the Lower Columbia. In other words, ancestors of contemporary CTGR and CIT tribal members certainly intermarried. The reports also agree that the decimation of tribal populations beginning in the late eighteenth century resulted in demographic collapse and a reorganization of Tribal groups and their habitation sites on the Lower Columbia, most significantly

Cathlapotle at the mouth of Lewis River. Similarly, the arrival of laborers to Fort Vancouver from Canada and other locations resulted in intermarriage between these new arrivals and Grand Ronde or Cowlitz ancestors, which may have been motivated, at least in part, by the eighteenth century demographic collapse. Perhaps most importantly for this study, both context statements articulate each tribe's deep and enduring ties to the IBR project area.

Home on Lower Columbia River:
A Grand Ronde Context Statement for the Interstate Bridge Replacement Program

Authored by:
Tribal Historic Preservation Office, Cultural Resources Department
Confederated Tribes of the Grand Ronde Community of Oregon

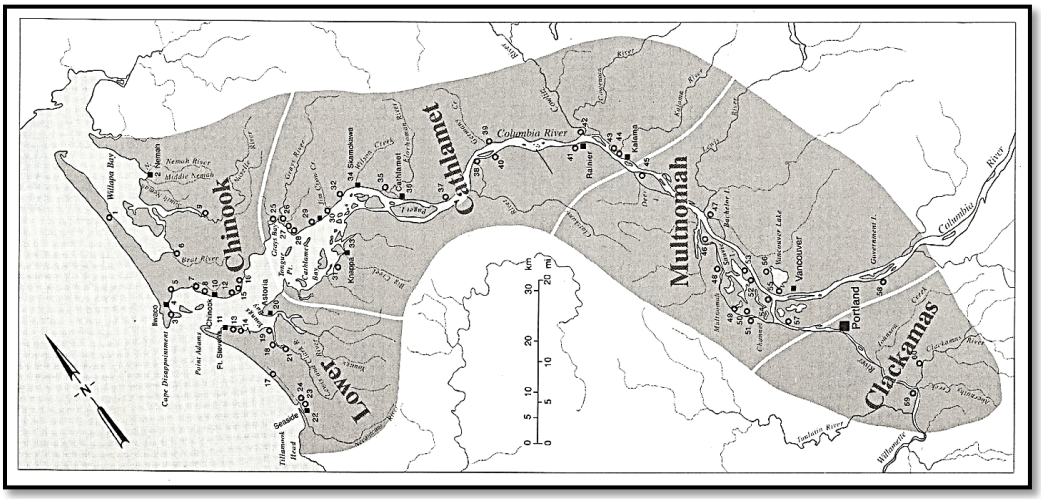
The lower reach of the Columbia River transected by the Interstate Bridge Replacement (IBR) Program and associated areas of potential effect (a.k.a. I-5 Bridge and surrounding landscape) has long been a multitribal locus, where peoples have traveled, fished, gathered, and carried out social, economic, and cultural life since the beginning of remembered time. The available record does little justice to the richness and complexity of traditional life in this place. Still, in every written account of the contact period and in the recollections of our elders and ancestors, one fact is abundantly clear: this reach is the traditional homeland of Chinookan people. This is not a matter of debate. Every published analysis of this river reach agrees on the key fact of Chinookan predominance of presence, residence, and stewardship along this reach of the river (e.g., Zenk et al. 2016; Boyd et al. 2015; Ellis 2015; Silverstein 1990; Saleeby 1983; Suphan 1974a, 1974b; Spier 1936; Berreman 1937; Hodge 1910; Gibbs 1854; see Map 1). Today, many of the descendants of these Chinookan communities are enrolled in the Confederated Tribes of Grand Ronde (CTGR).

Along the lower Columbia, populations were large—some of the densest Native populations in what is today the United States.[1] The various Chinook communities that lined the banks of the Columbia River around today's IBR crossing had interconnected kinship networks and economies, as well as shared customs and beliefs. All of these communities spoke varieties of the Chinook language. As Franchère noted, the "Chinook language is spoken by all the native tribes from the river's mouth to the rapids" (Franchère 1967:121). They are therefore properly referred to as "Chinookan"—a term that emerged in the field of linguistics and is now widely used to encompass communities that spoke all the languages and dialects of the Chinook language family, including all of the communities along the Columbia River from the Wasco and Wishram Chinook around The Dalles to the Lower Chinook ("Chinook proper") and Clatsop people living at the ocean shore.[2] These peoples were prominent and powerful. A number of observers depict the Chinookan-speaking peoples as a relatively unified cultural and demographic entity along the river "from the mouth to the falls" (Franchère 1967:109–24; Ross 1849). Lee and Frost write, "These Indians of the lower country resemble each other in person and manners, and, with some slight exceptions, in dress also, and the exceptions must be *very slight"* (Lee and Frost 1844:101). Writers of the 1830s, such as George Simpson, assert that the Chinook were the most prominent people in the Northwest and occupied the entire Columbia River waterfront from the Cascades to the sea: "The Chinook tribe is the most powerful" (Simpson 1931:95–6). Father François Blanchet likewise explained that "The Chinooks are scattered along the Columbia from this fort [Vancouver] to the Pacific Ocean. Before the year 1830 they formed the most numerous as well as the richest nation of this entire part of the continent" (Blanchet and Demers 1956:18).[3]

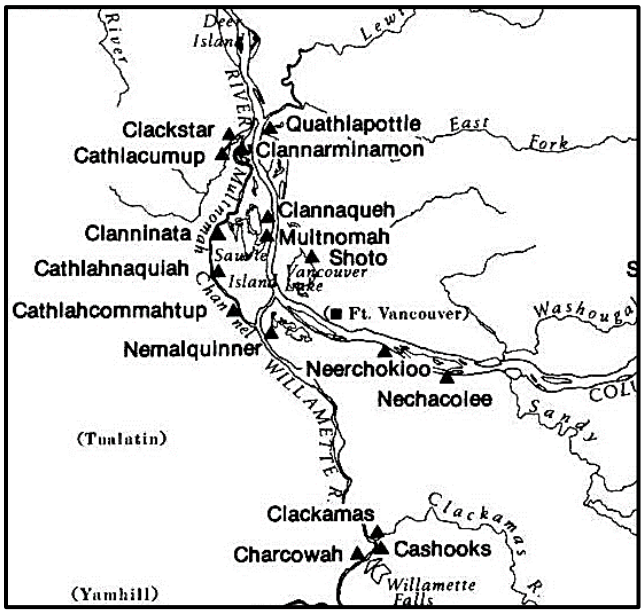
Historical sources agree Chinookan peoples were skilled traders, often serving as the middlemen in trade networks centered on the lower Columbia River linking the outer coast to the Northwest interior (Boyd et al. 2015; Silverstein 1990; Ruby and Brown 1976; Ray 1938). As Hudson's Bay Company (HBC) Governor George Simpson noted "they are without exception the…most acute and finished bargain Makers I have fallen in with"—a claim echoed by almost every non-Native fur trader to work on the lower Columbia (Simpson 1931:96). A culturally-rooted preoccupation with, and expertise in, trade is widely reported in both historical and anthropological literatures.[4] Trade gatherings associated with the major villages on the Chinookan world brought together people from tribes throughout the region—not only for commerce, but for a variety of social events, competitive gaming, ceremonial activities, and other proceedings accompanying the exchange of goods (Ross 1849:90–1).

This reach of the lower Columbia was populated with large villages of longhouses, constructed of split cedar boards, that housed extended Chinookan families.These regional communities were remarkable for their large number of "fully sedentary villages" situated especially in areas of resource abundance and

transportation access (Saleeby 1983).[5] Later sections of this statement detail those villages closest to the IBR, and the identity of their inhabitants. Also characteristic of Chinookan peoples were the numerous seasonal resource camps that served as temporary homes and processing sites for resource harvesters from these villages and beyond, infilling between the large permanent communities; thin evidence suggests such camps may have been found immediately within the IBR crossing, relating to camas harvests and other resource procurement (Kane 1859:187–88).[6] Also located in clearings along this reach were burial sites. Some sources hint at pre-contact burials on the northern end of the IBR, though the origins of this claim remain unclear (Talbot in Hine and Lettinville 1972:119).[7] With expert woodworking skills, the peoples of this reach produced large dugout cedar canoes that plied the lower Columbia and adjacent waterways, each capable of carrying large crews and freight, some even crossing the mouth of the Columbia to travel by sea.


Chinook
Cathlamet
Multnomah
Clackamas
Lower
Columbia River
Willapa Bay
Nemah River
Middle Nemah
Bear River
Cape Disappointment
Point Adams
Ft. Stevens
Astoria
Tongue Pt.
Grays Bay
Cathlamet
Wilson Creek
Elk Creek Cr.
Skamokawa
Knappa
Tenasillahe
Ft. Clatsop
Rainier
Kalama
Lewis River
Lake River
Vancouver
Vancouver Lake
Portland
Government I.
Columbia River
Sandy River
Clackamas River
Willamette River
Lewis & Clark River
Gerrit Smith
Tillamook Head
Seaside
Ft. Canby
Chinook Pt.
Multnomah Cr.
Sauvie Island
Scappoose Bay
Scappoose Cr.
Jackson Cr.
Lewis & Clark River
Youngs Bay
Youngs Bill
Ilwaco
Nemah
Kalama
Knappa
Seaside
Cathlamet
Rainier
Vancouver
Portland
Astoria
Ft. Stevens
Ft. Canby
Ft. Clatsop
Chinook Pt.
Gerrit Smith
Tongue Pt.
Grays Bay
Wilson Creek
Elk Creek Cr.
Skamokawa
Tillamook Head
Cape Disappointment
Point Adams
Willapa Bay
Bear River
Nemah River
Middle Nemah
Lewis River
Lake River
Sandy River
Clackamas River
Lewis & Clark River
Columbia River
Willamette River
Youngs Bay
Youngs Bill
Scappoose Bay
Scappoose Cr.
Jackson Cr.
Sauvie Island
Multnomah Cr.
Chinook Pt.
Government I.
Vancouver Lake
Ft. Canby
Ft. Clatsop
Ft. Stevens
Gerrit Smith

Columbia River shoreline in this general area expanded dramatically during peak resource harvests at these locations—up to three or four times its annual baseline population. The population increase was especially pronounced in spring, when salmon runs were at their peak and camas was being harvested (Boyd and Hajda 1987; Saleeby 1983).[10] Downriver people from the outer coasts of Oregon and Washington, and beyond paddled each year past the IBR site en route to the salmon fishery at the Cascades,[11] while upriver people often moved downstream past the IBR site in search of game and marsh resources.[12] The IBR area was thus located close to permanent resident communities, overwhelmingly Chinookan at the time of contact, yet in an area attracting tribal peoples from throughout the wider region. At contact, then, other tribes clearly had connections to the IBR crossing, though Chinookan peoples were the stewards and hosts of place while all others were guests. Chinookan communities provided access to resources that were abundant and allowed entrée through these lands in all directions— within the bounds of protocols overseen by Chinookan chiefs and typically known and observed by regular visitors of many other Native nations.[13]

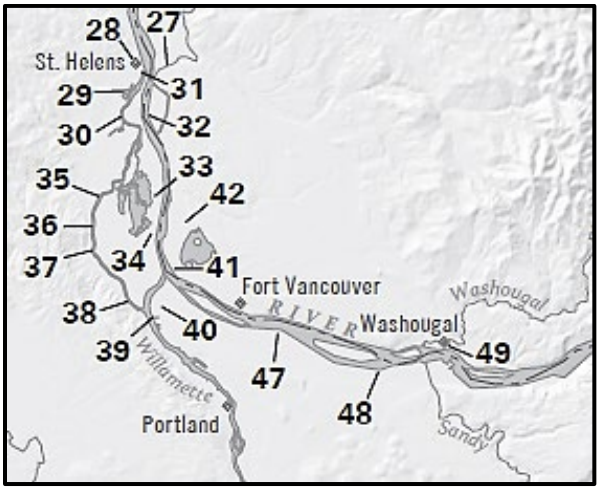


Map 2: Locations of Villages of the Portland Basin, with names largely from Lewis and Clark journals. Map indicates Fort Vancouver location adjacent to present north end of IBR.
Source: Boyd and Hajda 1987.

1. VILLAGES IN THE VICINITY OF THE IBR CROSSING

Some of the earliest writings about the lower Columbia River—including both the journals of the Vancouver expedition of 1792 and the Lewis and Clark journals of 1805–06— address the identity of villages close to the IBR crossing. The accounts of these expeditions suggest not only that the human population of this reach was dense, but the river was a locus that brought people on either side together as part of larger communities and did not serve as a divisional marker separating people, as is the case along the modern state border. These early accounts demonstrate that the IBR crossing sits at a convergence between the traditional lands of three constellations of interrelated Chinookan communities—what might be termed “Bands” of the Chinookan peoples. Specifically, the maps and written accounts in these journals make evident that the IBR sits roughly equidistant between three major villages: the village of Neerchokioo (Šáx̣latkš or “Cascades” Chinook) on the south bank of the Columbia, Nemalquinner (Multnomah Chinook) near the Willamette-Columbia confluence, and the Shoto villages (Chinookan, probably Multnomah) at Vancouver Lake (see Map 2; Deur 2012; Boyd 2011; Manby 1992:198–200; Moulton 1991; Boyd and Hajda 1987; Hajda 1984; Saleeby 1983; Barry 1926:404, 1927b; Coues 1897:248–49, 915 ff.).

Beyond these early journals are many other sources that shed light on the identity of lower Columbia River villages. This subject has been a focus of several recent, thorough, and meticulous studies—assessing the full range of archival and published sources relating to the study area. Rather than reproduce the full literature review encompassed by those studies, we provide here a summary of the major findings from their results, published in peer reviewed books and journal articles (Zenk et al. 2016; Boyd et al. 2015; Ellis 2015; Boyd and Hajda 1987). While these sources exhibit minor variations, reflecting the emergence of new source materials and analyses over time, they are remarkably consistent on the details of settlement along this river reach—depicting the river as a place where multiple Chinookan communities converged in areas of overlapping Band interest.



Map 3: Detail of map showing all identified villages. The Interstate Bridge crosses the Columbia River immediately west of the point marked as "Fort Vancouver."
Source: Zenk et al. 2016:8

Most recent among these authoritative statements is the work of Zenk et al. (2016). On the basis of an exhaustive review of available archival and published records, they produced a list of verifiable villages. The list "represents but a small subset of the total number of Chinookan villages on record. Each was identified by visitors traveling the river when the village was still populated, and/or by two or more independent mentions in later sources, notably those citing the memories of Chinookan-speaking elders" (Zenk et al. 2016:12). Their analysis comports with that of Ellis (2015) on all but a few points relating to the spelling and pronunciation of village names. Their analysis demonstrates the documented villages within approximately 10 miles of the IBR crossing are all consistently identified as "Chinookan" villages, with linguistically Chinookan names. The villages identified through that process are shown in Map 3. Excluding numbered places more than 10 miles away from the IBR, they include:

<u>Wapato Valley Villages</u>
33 - Clannahquah (Lewis & Clark—hereafter L&C)
34 - máɬnumax̣—Multnomah
38 - Cathlacommahtup (L&C)
39 - Nemalquinner (L&C)—poss. nimáɬx̣ʷinix
40 - gaɬá wakšin—Gatlawakshin
41 - gaɬá k'anasisi (wá k'anasisi)—Wakanasisi

<u>Upstreamers (šáx̣latkš—Shakhlatksh) Villages</u>
47 - Neerchokioo (L&C) (gaɬaɬála Watlala)
48 - Nechakolee, Nechercokee (L&C)—poss. ničáqʷli

The geography of these villages suggests an area of intersecting, overlapping, territorial association of three Chinookan populations within the IBR crossing: the Cascades Chinooks (Šáx̣latkš Shakhlatksh), the Multnomah Chinooks ("Wapato Valley Chinooks") and those of the closely related Clackamas Chinooks. All have overlapping claims at what is today the IBR crossing, and the area can be understood as existing within

a “communal range” shared by all three. As Berreman concluded of this reach, “[g]eographically this territory would seem to belong with that of the Multnomah or Clackamas, but the report of the explorers leads one to believe that it was claimed as hunting territory by the tribes at the Cascades; if indeed it was not a sort of communal range of several tribes for hunting and other food gathering” (Berreman 1937:18–19). Resource procurement sites sitting at intermediate places between villages in this reach, such as the camas patches, hunting sites, and potential fishing sites within the IBR footprint and immediately adjacent, were commonly utilized by members of all three Chinookan bands (Deur 2012; Boyd 2011; Hajda 1984; Saleeby 1983:52; Suphan 1974a, 1974b; Swanton 1953). In the following pages, we treat each Band separately, though these communities were significantly interrelated.

The Cascades Chinooks—Šáχlatkš

The upriver Cascades homelands, where the Columbia River runs the gap through the Cascade Range along the Columbia Gorge. Within this range are the traditional homelands of people generally referred to as the Wasco, Wishram, White Salmon, Hood River and Cascades, proper. Typically, anthropologists and historians use the term “Cascades” to refer to the population at the time of early contact (1790s–1830s), applied most narrowly to those living in major villages ranging from the greater Wind River area to downstream from the Sandy River confluence. The Cascades people, proper, are usually designated as those living at the western end of these geological features, and are the population most relevant to the IBR crossing. In Chinook, they are among the people called “Šáχlatkš” (Shakhlatksh) or “upstreamers”—referring to their upstream position relative to the many Chinookan peoples of the Columbia tidewater (Zenk et al. 2016:8; French and French 1998.).

The Cascades, proper, are often referred to as the Watlala—a term referenced, for example, in the ceded lands maps of the treaty period relating to the IBR crossing (1855). Following Lewis and Clark, many sources also refer to this population as “Shahala”—a derivation of the Chinookan “Šáχlatkš.”[14] Summarizing early sources, Hodge describes “Shahala” as “A name given by Lewis and Clark to the Chinookan tribes living on Columbia r. [sic] from Sauvies id. to the Cascades in Oregon. They estimated the number at 2,800, in 62 houses, and mention the following tribes: Neerchokioon, Clahclellah, Wahclellah, and Yehuh. Katlagakya was the native name for the Indians of this region” (Hodge 1910:519). In this interpretation, the village population of Neerchokioo, a short distance upstream from the IBR crossing, is identified as a distinct Shahala “tribe.” Likewise, Barry designates the Neerchokioo and the Cath-lath-la-las as two distinct subpopulations of the “Sha-ha-la” (Barry 1927a:54). The classification of Neerchokioo village is significant, for it is depicted as the permanent village closest to the IBR in most written accounts, with one wooden house, 24 straw houses, and roughly 200 men occupying the site at the time of Lewis and Clark. By 1838, the Hudson’s Bay Company was still identifying this as the village closest to their post at Fort Vancouver, occupied by the Cascades Chinook: “Cath-lal-thlalah Tribe—summer village columbia Cascades winter village Banks of the columbia opposite Vancouver” (HBC 1838).

In his detailed analysis of Oregon tribal distribution, Berreman places the Aboriginal territory of the “Cascade” or “Watlala” Indians in the immediate vicinity of the IBR (Berreman 1937:18–9).[15] Summarizing data from Frederick Hodge, Franz Boas, Leslie Spier, Edward Sapir, and the journals of Lewis and Clark, Berreman described the Cascade or “Watlala” Indians as including

> “*…all the villages from the mouth of the Willamette to and including the Cascades. This is the ‘Shahala nation’ of Lewis and Clark, most of the villages on the south bank, one eight miles and the other thirteen miles below the mouth of the Sandy River. The first consisted of one house and twenty-four temporary lodges. The lodges, they were informed, were occupied by ‘relatives’ of the occupants of the house, whose permanent homes were at the Cascades. They had come there only to hunt. Here were also 200 Skilloots probably on a trip up or down the river to trade. The second village was small, and reported as belonging to the ‘Nechacokee,’ [Neerchokioo] a band of the ‘Echeloot nation,’ which is the term by which they designated the Wasco and Wishram at the Dalles*” (Berreman 1937:18).

Other writers—e.g., Hodge (1910), Barry (1927a), and Hajda (1984)—confirm this interpretation of a largely contiguous Cascade occupation at least as far west as Neerchokioo, with traditional lands apparently

extending at least as far westward as Hayden Island.[16] Hajda classifies Neerchokioo as being "Shahala" or Cascades in tribal affiliation, and "upper Chinookan" in language—the "furthest downriver Shahala village" (Hajda 1984:63, 119).[17] French and French identify Neerchokioo as an "Area of [Cascades] overlap with Multnomahs" and an outpost of Cascades settlement (French and French 1998).

Sources agree the Cascades people were a significant presence at the area of the IBR crossing, used this area seasonally for hunting and other subsistence tasks, and that they "covered considerable distances in their seasonal movements" in this area (Hajda 1984:67). The river islands in this reach, apparently including Hayden Island, served as campsites for Cascades peoples. When visiting Cascades people near present-day Bonneville in September 1843, Father Blanchet noted, "They leave the summer encampments and move to winter on the Vancouver islands [the river islands opposite and above Fort Vancouver], where the cold is less rigorous and hunting more abundant" (in Munnick 1972:A-13). This implies hunting territories on the adjacent riverbanks, placing Cascades people at the full extent of the IBR crossing. So too, the north bank of the IBR crossing appears to have been an anthropogenic prairie at contact, surrounded by forest—likely burned by Cascades and other Chinookan peoples to enhance camas and other plant species and to provide ideal hunting grounds. Accordingly, the north end of the crossing, the eventual site of Fort Vancouver was an open prairie at contact, called by the Chinookan term "Sketcu'txat"—also rendered "Skit-so-toho" and "Katchutequa"—implying a prairie (Strong 1959:33; Tolmie and Dawson 1884; Kane 1859:171).

One of the names frequently used in reference to the western bands of Cascades, Cathlathlala, appears in later HBC documents as one of the principal tribal groups living in the vicinity of Fort Vancouver in 1838 (Blanchet and Demers 1956:18; Ruby and Brown 1976:265; HBC 1838). Ethnographic sources are consistent in indicating that "Cath-lal-thlalah" were a population of Chinookan "Watlala," originally living "just below the cascades" of the Columbia River (Swanton 1953; Hodge 1910). Ross indicates they were the principal Cascades group (Ross 1849). Morse reported around 500 "Cathlathlas" living "60 m. from the mouth of the Wallaumut, on the E. side" shortly before the construction of Fort Vancouver (Morse 1822:368). Stuart refers to the Cath-lath-las as well, suggesting they lived east of the confluence of the Willamette and the Columbia: "a little farther up on an Easterly Branch live the Cath-lath-las of 80 men, and along the River" (Stuart 1935:33). Of them, Spier notes, "Three villages of theirs are known on the north bank, the lowest about half a mile below the upper Castle Rock. The location of settlements on the south bank is little known" (Spier 1936:21). They were probably among the Cascades people who occupied Neerchiokoo village, either seasonally or year-round.

The Multnomah Chinooks

The people conventionally designated as "Multnomah" occupied a dense constellation of villages from the Portland area downstream to a point below Lewis River, Washington. From the beginnings of the ethnographic and historical record for the Portland Basin, the Multnomah play a prominent role, and the Oregon county now occupied by much of Portland bears their name. The demographic core of the Multnomah people was on the island at the Willamette-Columbia convergence, an area now called Sauvie Island—but also "Wapato" or "Multnomah Island" historically. In the early 1840s, Parker wrote, "This island is about eighteen miles long, and five miles wide, formed by a part of the Multnomah, branching off about six miles up the main river, running in a westerly and north-westerly direction, and uniting with the Columbia eighteen miles below the main branch. The branch which flows around and forms the island, is about fifteen rods wide, and of sufficient depth for small shipping, most of the year" (Parker 1841:150).

In the heart of Multnomah territory—the mouth of the Multnomah Channel of the Willamette, Ross reported in early decades of the 19th century, "the Indians appeared very numerous in several villages" (Ross 1849:105).[18] The villages in and around Sauvie Island were large and may have been unusually sedentary due in part to abundant marsh resources—including the edible root, wapato—alongside riverine and upland resources available to most of their surrounding kin. The original name "Wapato Island" was "so called from a nutritive root [wapato] found in the small lakes in the interior, which is much sought for by Indians as an article of food" and was here found in concentrations unlike anywhere in the region (Parker 1841:150; Darby 2005).

While early sources associate the IBR crossing with Cascades and Clackamas Chinook communities, many writers associate the area with the Multnomah. Certain early 19th century observers identify Fort Vancouver as sitting amidst Multnomah traditional lands (Gairdner 1841: 255). Contemporary authors also

frequently assert a Multnomah preeminence in this area, following the lead of the Smithsonian's Handbook of North American Indians, which places the crossing in the traditional territories of the Multnomah Chinook on grounds largely linguistic (Silverstein 1990). Lang, also reviewing the data on linguistic grounds, identifies the northern end of the crossing, at Fort Vancouver, as being in the Multnomah dialect area (Lang 2008:86). Complicating matters, Silverstein identifies Neerchokioo as "the easternmost non-Cascades village on the Columbia" (Silverstein 1990:534). He also interprets its original name as being ničáqʷli, or "stand of pines" in Multnomah Chinook. Simultaneously, it is important to note that Chief Kiesno (Cassino)—a prominent figure in Fort Vancouver trade through the period—is sometimes depicted as a Multnomah chief (Ray 1966:B-7; Spencer 1933).

The Clackamas Chinooks

The Clackamas are another Chinookan population identified in the ethnographic and historical literature. Their most prominent village sat on the confluence of the Clackamas and Willamette Rivers in what is now southeastern Portland—near the boundary between modern Gladstone and Oregon City. People identified as Clackamas occupied a constellation of villages and encampments along the lower Willamette River, perhaps the Columbia River near its Willamette River confluence, and adjacent inland areas in what is today east Portland and vicinity—including much of the Oregon County that now bears their name.

While depictions of Clackamas territory vary, early authors, such as George Gibbs, place the IBR in Clackamas territory (Gibbs 1877). In his overarching analysis of tribal distribution in the state of Washington, Leslie Spier agrees with this assessment (Spier 1936:21). Integrating additional data from Edward Curtis, Franz Boas, Frederick Hodge, and Michel LaFramboise, and Leslie Spier includes what would become the IBR program area within the Aboriginal territory of the Clackamas, which extended "on both sides of the Columbia roughly from Troutdale down to Kalama," but acknowledges the dividing line between Cascades and Clackamas areas was difficult to discern in this area (Spier 1936:21).[19] On the Washington side of the river, Spier identifies major "Clackamas" settlements both above and below the IBR crossing, noting they might be designated as lands of the Clackamas tribe, though "Possibly they should be given rank as [a] separate tribe" (Spier 1936:21). These separate populations included the "…Cathlapotle (Gā´Lap!ōlx, 'people of the Lewis [Nā´p!ōlx˙] River')… on the lower part of the Lewis river ['for five miles above its mouth'] and on the southwest side of the Columbia river in Clarke county, Washington" and the "Gahlawashúgwal (wacu′Xwal), at Washougal, Washington" (Spier 1936:21). He also alludes to a population called "Wakanasisi on the north side (whose tribal name was Gā´L!akanasisi) nearly opposite the mouth of the Willamette"—clearly Chinookan, but with unclear Clackamas affiliation (Spier 1936:21). Still, some researchers have sought to define linguistic rather than 'tribal' boundaries, placing the IBR within the Clackamas dialect area of the larger Chinookan realm (Kardas 1971:212). Others imply the IBR area was in Clackamas traditional lands, including Ruby and Brown, who note that the Clackamas "occupied about twelve villages, which were located mainly on the south bank of the lower Columbia River downstream from present-day Troutdale, Oregon" (Ruby and Brown 1986:25).

A number of sources allude to the Washougal population some 10 miles upstream from the IBR crossing, at the confluence of the Washougal and Columbia Rivers (between modern-day Camas and Washougal, Washington). However, little consensus exists regarding their affiliation, and Spier is somewhat unique in assigning them to the Clackamas. Curtis alludes to a battle between men from Alaśhíkaśh at the "site of Vancouver, Washington" in coalition with the Waśhúhwal or "Washougal" Band of Chinooks against a village at the Columbia Cascades. However, the relevance of this statement is unclear (Curtis 1911b:38). Though often described as originating from a village near modern-day Kalama, Washington, as well as from a village close to the Willamette-Columbia River confluence, the famous Chief Kiesno was often identified as Clackamas (Saleeby 1983).

2. DISPLACEMENT AND RELOCATION ON THE LOWER COLUMBIA AFTER CONTACT

The lower Columbia River experienced some of the most dramatic episodes of epidemic disease and displacement of any place in the Pacific Northwest. Epidemic diseases arrived no later than the 18th century

via early Spanish vessels and tribal trade networks spanning the North American continent (Boyd 1994). By 1792, the first non-Native ships crossed into the Columbia—the *Columbia Rediviva* captained by Robert Gray, immediately followed by the Vancouver expedition (Vancouver 1984; Gray 1941; Boit 1941). Lewis and Clark arrived 13 years later, providing the most detailed written accounts of this river reach prior to the arrival of fort-based fur traders (Moulton 1990, 1991). By 1811, the Pacific Fur Company established a fur trading post near the Columbia River mouth and by 1825, the HBC established Fort Vancouver—a preeminent locus of the 19th century fur trade—within mere steps of the IBR crossing. The resulting concentration of fur traders and ships exposed the peoples of this reach to the full effects of colonization, including new waves of epidemic disease. Chinookans continued to be central to the economies of this river reach, and disproportionately represented among the multiethnic fort community (Taylor and Erigero 1992; Blanchet 1878; Townsend 1839; HBC 1826). By 1830, a single infected individual aboard the fur trading vessel *Owyhee* at Fort Vancouver brought malaria, compounding the effects of earlier epidemics, and effectively decimating the Chinookan populations of the Portland Basin. By the end of the decade, less than 90% of the pre-contact population remained (Boyd 1999:231–61; Boyd 1990:135–48).

Entire villages of Multnomah, Clackamas, and Cascades peoples collapsed, and survivors regrouped in communities that often housed survivors from all three groups. The Cascade Chinook were among the few to retain sizable populations in the area, in part by taking in other Chinookans in the post-epidemic reconsolidation. As Hodge notes, "After the epidemic of 1829, the Watlala seem to have been the only remaining tribe, the remnants of the others probably having united under that name, though they commonly were called Cascades Indians by the whites" (Hodge 1910:922). In the early 1840s, accounts sometimes refer to a more or less cohesive "people at the Falls, the Dalles, and the Cascades, who are scattered along the banks of the Columbia from Fort Wallawalla to Fort Vancouver," apparently consisting of integrated surviving members of what were formally semiautonomous bands of Cascade Chinooks (Blanchet and Demers 1956:18; Ruby and Brown 1976:265).[20] Neerchokioo became a place where many Chinookans, from the Cascades but also from other communities, regrouped at this time. Chief Kiesno and some of his community's survivors, for example, were reportedly among tribal members reoccupying Neerchokioo village following the epidemics of the 1830s (Coues 1897:797–802).[21]

Northern tribes, formerly visitors but not permanent residents in this reach of the Columbia, became increasingly prominent, entering the vacuum created by the abrupt and apocalyptic decline of so many Chinookan communities. Among the tribes expanding along the Columbia were the Cowlitz, who spoke a Salish language without a direct linguistic relationship to Chinook. Pre-contact Cowlitz presence around the IBR crossing location, and their relationship with resident Chinookan peoples, has elicited ongoing debate.[22] Historical and anthropological sources consistently indicate the heart of Cowlitz traditional territory northwest of the IBR crossing, largely off the Columbia riverfront; early accounts indicate that they lived on the Cowlitz River a short distance upstream from its confluence with the Columbia River, with Chinookans occupying the confluence (Hajda 1984, Ray 1938, 1966; Curtis 1913; McChesney 1906; Scouler 1905; Ross 1849; Henry 1992; Franchère 1967:48–9). In a dissertation summarizing the recoverable span of Cowlitz history, Fitzpatrick summarized several of these studies identifying Cowlitz territory as being north of Lewis River, extending eastward from that point into the Cascade Range (Fitzpatrick 1986). Still, early journals do include numerous references to Cowlitz traveling the river in the vicinity of the IBR—especially to trade with Chinookans and the HBC and, following the 1830 epidemic, to participate in expanded resource harvests in places where Chinookans were in decline. They apparently also frequently passed through the area by land. For example, in 1830, George Simpson reported a Cowlitz population led by chief "Schannaway" (Scanewa) "whose track from the borders of Puget Sound strikes on the Columbia near to Bellevue Point" adjacent to Fort Vancouver (in Simpson 1931:86). Accounts of Columbia River tribes postdating the epidemics of the 1830s suggest the Cowlitz increasingly occupied the riverfront for the decade or two following these disruptions before being pushed back inland by non-Native settlement (Ray 1966).

In the wake of these epidemics, the Klickitat also became a regular presence in and around the IBR crossing. Closely related to the Yakama, the Klickitat originated just east of the Cascade Range and spoke a Sahaptin language. They had a reputation for high mobility—apparently aided by their early adoption of horses—and traditionally joined other tribes fishing on the Columbia Cascades in the vicinity of White Salmon River. Prior to the 1830 epidemic, they were seasonal visitors to the area. A mid-19th century account states, "The Click-a-tats are a large and powerful tribe, inhabiting the country east of the Cascade range. Great

numbers of them, however, as soon as the snow melts from the mountains in the spring, come over to this side of the mountains, where they frequently spend the summer, trading and gambling with the different tribes, exchanging horses for money and hyagua—a shell they are fond of decorating themselves with" (Starling 1852:171). During the 1830s and 1840s, the Klickitat presence intensified, as they provided services to Fort Vancouver and early U.S. military operations, and took over certain roles in the fur trade formerly performed by Chinookan communities. An 1845 census compiled by Warre and Vavasour identifies Klickitat as the primary tribe in the vicinity of the Fort by that date, reflecting the dramatic demographic shifts of the preceding 15 years (Warre and Vavasour 1909).

Displaced by epidemics and encroaching settlement, Chinookan leaders were party to the January 1855 Willamette Valley Treaty negotiated by Joel Palmer. Affirming the primacy of Chinookan claims to this river reach, formal negotiations included representatives of the Portland Basin Chinookan bands—Clackamas, Clowewalla and

Map 4: Detail of map showing proposed ceded lands of the Wah-lal-la as recorded in treaty negotiations, January 1855.
Source: Bureau of Indian Affairs 1856

Watlala [Cascades], and Multnomah. The U.S. treaty delegation recorded the southern end of the IBR corridor as lands formally ceded by the "Wah-lal-la" Band – the Cascades Chinook (Map 4). Chinookans taking part in these negotiations also asserted claims on lands north of the river; however, territorial Governor Isaac Stevens refused to establish treaties with southwest Washington tribes, agreeing to settle claims north of the river at a later date. No treaty negotiation was later undertaken to settle Chinookan claims in those areas. The Willamette Valley Treaty therefore provided Portland Basin Chinookans with the only clear avenue for federal acknowledgment—most of the signatory communities being removed to Grand Ronde Agency in 1856. Many prominent Chinookan families, such as the surviving family of Kiesno, were part of this forced migration, becoming part of the Grand Ronde Agency and, ultimately, the Confederated Tribes of Grand Ronde Community of Oregon (Spencer 1933). Meanwhile, U.S. Treaty negotiators did not recognize Klickitat land claims south of the Columbia River. By spring of 1855, the Oregon Superintendent of Indian Affairs, Joel Palmer, initiated the forced return of Klickitats north of the river—most being sent to Yakama—though a small number remained with Cowlitz communities in Washington, or within the Siletz and Grand Ronde communities (O'Donnell 1991; Curtis 1911a:37—40).[23]

In spite of many restrictions, certain Grand Ronde families continued to maintain homes and carry out fishing on both sides of the river. A number of "off-reservation Indians" are reported in the Cascades traditional territories upstream from the IBR crossing through the 20th century—often members of the Grand Ronde tribal community and descendants of Willamette Valley Treaty signatories (Kenoyer et al. 2017). In spite of over two centuries of cataclysmic disruption, the Chinookan presence was never extinguished. To this day, the IBR corridor remains a place of profound importance to the Chinookan descendants and families of Grand Ronde.

NOTES

[1] Tribal population on the middle and lower Columbia River is notoriously difficult to estimate, and was in flux even prior to any firsthand written accounts (Boyd 1999; Silverstein 1990; Kardas 1971:68-71). Any population estimates for this region prior to the 1850s should be viewed with skepticism, in light of seasonal mobility, the incompleteness of written surveys, and a host of other factors—and many estimates tend to be low. This being said, population densities were reportedly high, with almost unbroken settlement among some portions of the Columbia River shoreline (Simpson 1931).

[2] In the field of linguistics, the suffix "-an" is used to denote a family or subfamily of languages, consisting of several individual languages or dialects that are related—and also used to denote all of the ethnolinguistic groups who speak those languages as a unit; see Goddard and Sturtevant 2006. On the widespread and conventional use of the term "Chinookan" to refer to these many different communities of Chinook-speaking people based on their linguistic and cultural kinship, including the use of Chinook languages and dialects, see for example, Boyd et al. (2015); Zenk et al. (2016); Silverstein (1990), and Sapir (1926).

[3] Admittedly, many early writers used the term "Chinook" inexactly and without much attention to formal conventions—to denote any Indian of the region, or any Indian encountered on the Columbia River, for example (Boyd et al. 2015; Taylor 1974:119). Similarly, contemporary claims to "Chinook" affiliation are complex, sometimes denoting ties to the estuarine community of Chinooks or "Chinook, proper," enrollment in the federally unrecognized "Chinook Nation" with a membership descended from certain lower river populations, descent from Chinookan speakers of the larger Columbia River region, and so on (Hajda 1984; McChesney et al. 1906). Herbert Taylor lamented when attempting to summarize Chinook materials for the Indian Claims Commission:

> "The name Chinook has been widely and variously employed. Among other things, it denotes a warm wind, a game salmon and a *lingua franca* of the Northwest coast. It has also been used to denominate the people who lived on the north bank of the Columbia at its mouth, the people who lived along the lower Columbia generally, and the people who lived on the Columbia from the Dalles to its mouth. It has also been utilized as a name for a linguistic stock and as a generic term for Northwest coast Indian" (Taylor 1974:119).

The use of the term "Chinook" therefore requires some degree of clarification or qualification, and in this document, we are careful to distinguish which Chinookan communities are implied by the available written record.

[4] Verne Ray, for example, depicted trade as being fundamental to an understanding of Chinook social structure and organization, being key to dispute resolution and to the assignment of individual and group status:

> "[Trade] permitted them to exert a widespread influence of a sort which did not often lead to conflict. It resulted in both the group and many of its members becoming known and discussed over a wide area, whereas intervening peoples might be unknown and of no interest. It lead to a high contempt for groups that were "just poor people" (that is, had little to trade) and a consequent bolstering of their own self-confidence" (Ray 1938:99).

Intertribal and interregional relations also were defined by these trade relationships. Melville Jacobs noted:

> "The residents of poorer villages suffered from greater economic and social ambitions and traveled more often to localities of greater wealth, economic security and social prestige; the wealthier communities were almost always downstream or to the west. Along lower rivers or coastal rivers the larger food supply permitted populations denser in numbers, relatively wealthier in household goods, and enough satisfied with their own dignity and value to travel and marry within comparatively narrower radii" (Jacobs 1937:55-57).

[5] The lower Columbia River, both upstream and downstream from Fort Vancouver, was lined with numerous villages of this type:

> "In winter they live in villages, but in summer move about from place to place. Their houses are oblong, and built of broad, split cedar-planks, something in the European style, and covered with the bark of the same tree. They are sufficiently large and commodious to contain all the members of a numerous family, slaves included. At the top or ridge pole, an opening gives free passage to the smoke; they have one or more, according to the number of families in each. But I never saw more than four fires, or above eighty persons—slaves and all—in the largest house" (Ross 1849:98).

Similarly, HBC Governor George Simpson noted

> "From the Cascade Portage to the Coast they are collected into Villages of Ten to fifteen Houses and three or Four Families inhabiting the same House. They live in great comfort throughout the year, as Fish are taken at all Seasons, Roots abundant close to their Houses and Wood Animals are numerous so that they may have a variety of choice fare" (Simpson 1931:95-96).

[6] Speaking of the Fort Vancouver area, on the north end of the IBR crossing, Kane noted, "During the season the Chinooks are engaged in gathering camas and fishing, they live in lodges constructed by means of a few poles covered with mats made of rushes, which can be easily moved from place to place, but in the villages they build permanent huts of split cedar boards" (Kane 1859:187–88).

[7] Robert Hine and Savoie Lettinville, editors of the Theodore Talbot journals, make reference to a suggestion that "the post [Fort Vancouver] had been built on an Indian graveyard," though the source of their information is unclear (Talbot in Hine and Lettinville 1972:119). This would be consistent with general burial patterns in the area, however: burial sites were numerous in the Portland Basin and were often found in clearings in association with nearby human settlements, such as those villages described elsewhere in this document. While the lower Columbia River is known for its many burial islands, the number of available islands was almost surely insufficient to accommodate the large populations that existed in these constellations of large villages of the scale recorded at contact.

[8] As HBC Governor, George Simpson noted of the Chinooks, "in order to strengthen their commercial relations men of consequence or extensive traders have sometimes as many as half a Doz Wives selected from among the best Families of the Neighbouring tribes and each of those is entrusted with a small Outfit and sent on trading excursions to Her Friends & relatives and this is her constant employment" (Simpson 1931:98). Likewise, Parker noted that, "The wealth of the lower Indians is estimated by the number of wives, slaves, and canoes. Every Indian of any distinction takes as many wives as he is able to support, and his wealth is supposed to accord with the number" (Parker 1841:254–55).

Women held considerable decision-making authority within their communities and considerable influence over the economic fortunes of her household and community. Kardas, for example, noted that

> "The role of older women in governing Chinook society is well attested by the 19th Century writers, who also noted the high position held by native women in general. Not only did the

> women play an important role as traders (both by producing marriage alliances with their relatives and by preparing and collecting foodstuffs traded, or owning the slaves that performed these tasks), but women also had a voice in governing the villages" (Kardas 1971:56).

[9] Head-flattening, carried out through the application of pressure on cradle boards in infancy, was the standard among free-born Chinooks and provided emblematic distinction from the population of slaves: "none but the wretched Slaves have round heads" (Simpson 1931:96). Comments on head-flattening along the lower Columbia are numerous (e.g., Ross 1849:99-100).

[10] In the written accounts of early observers, accounts of this travel throughout the region between productive resource sites abounds—especially in reference to fishing sites. Travel linked a number of salmon fishing stations that were visited in season, but also sites for harvesting eulachon, sturgeon, and other fish. Briefly summarizing the patterns of resource use found in the Portland Basin in the early 19th century, Morse noted:

> "About 40 miles from the mouth of the Columbia river is a famous smelt and sturgeon fishery. Also abundance of Wapatoe, a species of potatoe, an excellent substitute for the real potatoe. The smelts are taken from the middle of March to the middle of April, and at no other time. They are fat and of good flavor. The Indians dry and run a stick through a number of them and use them in the place of candles. When lighted at the top, they burn to the bottom, giving a clear and bright light" (Morse 1822:375).

Assessing reported population fluctuations in the Portland Basin, Boyd and Hajda conclude that

> "some villages in the Wappato Valley [between the Sandy and Kalama Rivers] were three or four times as large in early April, at the time of important fish runs, as they were in late November…. The most likely sources for spring-season visitors are the upstream, interior locations especially subject to resource deficiencies at that time of year. The movements and shared use of resources areas…would be made possible by the numerous interlocking social networks, which not only channeled the flow of goods but which also brought distant people together for a broad range of purposes. This social system, unfamiliar to Lewis and Clark and other early observers [was] larger and more diffuse than the usual units of ethnographic research…it probably made possible the support of larger populations defined on a regional basis than would otherwise have been the case" (Boyd and Hajda 1987:321).

Some sources mention "abandoned villages" in the region (e.g., Franchère 1967:49), though this evidence lends support to the suggestion that some of these villages were abandoned only seasonally, while residents engaged in social, economic, ceremonial, and subsistence tasks in other areas. Especially beginning in the 1830s, these references likely refer to places that have been abandoned due to epidemics and associated demographic contractions.

[11] Tribal groups of the ocean coast, such as Clatsops and Tillamooks, often visited en route to fishing and trading at the Cascades (Coues 1897:858, 879). At other times, wars were reported between the Clatsop and the Cascades people, also bringing coastal peoples into the Portland Basin (Coues 1897:793).

[12] As Suphan notes, "Roots were gathered largely along the flats of the Columbia, the cascades people going downstream for wappato to the sloughs and flats opposite Vancouver, Washington" (Suphan 1974b:48).

[13] Of the role of chiefs, Samuel Parker observed:

> "The government of the Indian nations is in the hands of chiefs, whose office is hereditary, or obtained by some special merit. Their only power is influence; and this in proportion to their wisdom, benevolence, and courage. They do not exercise authority by command, but influence by persuasion, stating what in their judgment they believe to be right, and for the greatest good of their tribe or nation, or of any family or community. The chiefs have no power of levying taxes, and they are so much in the habit of contributing their own property for individual or public good, that they are not generally wealthy. Their influence, however, is great; for they rarely express an opinion or desire, which is not readily assented to and followed. Any unreasonable dissent is subdued by the common voice of the people. Probably there is no government upon earth where there is so much personal and political freedom, and at the same time so little anarchy; and I can unhesitatingly say, that I have nowhere witnessed so much subordination, peace, friendship, and confidence, as exist among the Indians in the Oregon Territory. The day may be rued, when their order and harmony shall be interrupted by any instrumentality whatever" (Parker 1841:255).

On the basis of numerous accounts, all attesting to the same basic pattern of governance, Saleeby summarizes,
"The village formed the major social and political unit in Chinook society…. Each village had its own chief whose powers were advisory and judicial…and who had the power to appropriate the property of others for personal purposes" (Saleeby 1983:24).

[14] Hodge defines the Watlala as follows:

> "A division of the Chinookan family formerly living at the cascades of Columbia r. and, at least in later times, on Dog (now Hood) r. about halfway between the cascades and the Dalles, in Wasco co., Ore. Early writers mention several tribes at or near the cascades, but as the population of that region was very changeable from the fact of its being a much frequented fishing resort, and as many of the so-called tribes were merely villages, often of small size, it is now impossible to identify them with certainty" (Hodge 1910:922).

Hajda (1984) notes that "'Shahala' was a term used only by Lewis and Clark, applied to people based at the Cascades some of whom covered considerable distances in their seasonal movements. It comes from an expression meaning 'upriver' (cf. Jargon saxli, meaning 'up' or 'high'), and it was probably used in this sense as well as in reference to Cascades people" (Hajda 1984:67).

Barry differs somewhat from other accounts, reporting "Sha-ha-la" as a different population than "Wat-la-la"—designating the former as being in the area from Hood River to the Willamette and the latter as being in the area from Hood River to the Cascades (Barry 1927a:54).

[15] In his analysis of Washington tribal distribution, Spier notes of Cascades distribution,

> "The Cascades group (iłała´la, "lake people," or wała´lidE´lxam) were located on both sides of the Columbia at the Cascades, and on the north side downstream at least to Skamania and perhaps to Cape Horn [upstream from modern-day Washougal, Washington]. These are the Watlala mentioned by Lewis:wała´la, "lake," was evidently at the head of the Cascades. A village may have been there; at any rate, it marked their easternmost point. The Cath-lath-la-las or Cathleyacheyachs (the latter mentioned by Ross at the head of the Cascades people. Three villages of theirs are known on the north bank, the lowest about half a mile below the upper Castle Rock. The location of settlements on the south bank is little known" (Spier 1936:21).

[16] Edward Curtis recounts the Cascade villages as follows:

> "Gahlahishachk, those on the north bank of the Columbia at the cascades inhabiting the following villages:

a. Wahlala, “Their Lake,” opposite Cascade Locks, Oregon.
b. Skamanyak, “Obstructed,” at the middle cascades.
c. Kihaiagilhum, “Middle Village,” a little below Skamanyak.
d. Kaiuchikhlqtih, at the lower cascades.
e. Kamigwaihat, “Upper Road,” a little below the former.” (Edward Curtis 1911b)

Suphan, meanwhile, interpreted Cascades villages as follows:

> “From the journals of Lewis and Clark we learn of three villages on the Washington shore at and about the cascades; these were Y-e-huh just above the rapids, Clah-clel-lah just below the rapids, and Wah-clel-lah at Beacon Rock a few miles above Skamania, Washington. Together these formed the explorers’ Sha-ha-la Nation. The economic activities of these Indians apparently led them downstream from the cascades rather than toward Hood River and the Dalles… “In subsequent years the Indians resident at the cascades are designated by a variety of terms: Cathlayackty, Thlameoyackoack, Cathleyacheeyachs, Cathlakaheckit, Cathlathlala; identification of one with another, or equation with Lewis and Clark’s villages, would at best be quite tenuous. It is evident, however, that one village was above the cascades on the north shore near Lakewood, Washington, at or near the site of the Yehuh village, while others were on the Oregon shore from about Cascade Locks to opposite Wind River” (Suphan 1974b:43-45).

[17] She also depicts this village as being just upstream from the much larger “Columbia Valley” villages which included Multnomahs and other Upper Chinookan speakers. Simultaneously, she appears to classify the population at Washougal, upstream from Neerchokioo, as being “Columbia Valley” in affiliation.

[18] Morse reported 500 “Mathlanobs” “At the upper end of the island above named, in the mouth of the Wallaumut” in the years immediately preceding the construction of Fort Vancouver (Morse 1822:368).

[19] Reviewing the full range of literatures available in his time, Spier described the Clackamas as follows:

> “This may be the collective name for a group of related tribes rather than a true tribal name. Properly the Clackamas were on Clackamas River in Oregon but both groups of them seem to have been on both sides of the Columbia roughly from Troutdale down to Kalama, where they adjoined the Kathlamet…. Linguistically Clackamas seems to be very close to Kathlamet, if not identical with it.” (Spier 1936:21)

[20] These integrated bands appear to have included the Cathlakaheckit, Cathlathlala, Cathlayackty, Clahclellah, Katlagakya, Yehuh, and possibly others (Blanchet and Demers 1956:18; Ruby and Brown 1976:265).

[21] Kiesno’s reported marriage to a Cascades woman may have allowed him to make this move readily; still, it is likely that he would have had access to this village site regardless as part of his chiefly position in Clackamas and/or Multnomah communities (Coues 1897:797–802).

[22] Hostile relations between the Cowlitz and certain Chinookan peoples appear to have been common at contact, though intermarriages were reported as well. Zenk et al. find evidence of “patterns of intergroup marriage that crossed both political and linguistic boundaries, resulting in extensive Chinookan-Salishan bilingualism on the lower river,” that may reflect increased integration in the wake of epidemic diseases, primarily in Cathlamet lands and downstream locations (Zenk et al. 2016:3–31).

[23] Historically, Klickitat-Cowlitz ties have been strong. After contact and increased intermarriage with Klickitat people from east of the Cascades, some Cowlitz communities apparently spoke a Sahaptin dialect instead of or in addition to their own Salish language (Ray 1966; Jacobs 1937). The Cowlitz speaking this dialect were sometimes designated as “Taidnapam.” Certain Cowlitz accounts suggest that this pattern of

intermarriage predated European contact. Nonetheless, this connection clearly intensified following epidemics of the 1830s.

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Cowlitz Indian Tribe: Geographical Context Statement for the Interstate Bridge Replacement Project

The Cowlitz Indian Tribe has just over 5,000 enrolled members and is the largest federally-recognized Tribe in southwestern Washington. The Tribe's reservation is located on the west side of Interstate Five near the crossing of Lewis River at La Center. The Tribe's administrative offices are located in Longview, Washington.

The Cowlitz Indian Tribe occupied land that today includes all or part of seven counties in present-day Washington State, as well as lands on the Oregon side of the Columbia River. The land running from the south Salish Sea to the Columbia River is also known as the Cowlitz Corridor. Trade running through this area, the foundation on which Interstate 5 rests, was heavily influenced and regulated by the Cowlitz people.

As such, the Cowlitz Indian Tribe has an enduring presence in Clark County that dates from time immemorial. In the first half of the nineteenth century the Cowlitz forged a special relationship with the Hudson's Bay Company (HBC) through its construction and operation of Fort Vancouver, 1825-1860, and through Cowlitz Farm of the Puget Sound Agricultural Company (PSAC), 1839-1854. Cowlitz Farm was a wholly-owned subsidiary of the HBC located at Cowlitz Prairie in the vicinity of nearly forty Cowlitz villages along the Cowlitz River. Cowlitz ancestors worked for the HBC and for the PSAC (Gibson 1985).

In 1839, the Hudson's Bay Company hired French-Canadian and metis families in the Red River District of Canada to move to Cowlitz Prairie and to Fort Nisqually to establish farming operations to raise livestock and cereal crops that the PSAC had contracted to sell to the Russian-American Company in Alaska. Several of the workers of the HBC and the PSAC married members of the Cowlitz Indian Tribe. Their descendant surnames perpetuate that heritage and include the following: Bouchard, Cloquet, LaDue, St. Germain, Plamondon, Sereault, Bercier, Coutenoir (Cottonware), and other lineages. Other Cowlitz families carry to the present the surnames of tribal ancestors: lyall, Kinswa, Wannassey, Satanus, Ike, and Umtux (Umtuch).

In 1838, Francois N. Blanchet and Modest Demers, Catholic priests, traveled overland from the Red River in Saskatchewan to mount missions to the Indians and Euro-Americans in the Pacific Northwest. They established St. James Mission at Fort Vancouver and St. Francis Mission on Cowlitz Prairie. The sacramental registers recorded by these priests and their successors documented the births, baptisms, marriages, and deaths of members of the Cowlitz Indian Tribe starting in 1839 and continuing to the present. On April 24, 1839, Father Blanchet baptized nine "Cowlitz infidel" children. Simon Plamondon, a metis who married Thas-emuth, daughter of Cowlitz chief Scanewa, was a witness to these rites. The following day Blanchet baptized three more Cowlitz Indians. The registers recorded the burials of Cowlitz Indians at St. Joseph's Mission, at Fort Vancouver. On December 5, 1840, Father Demers buried "Joseph Cowlitz, age about eighteen, in "the cemetery of this Mission." On December 7, 1840, he buried "Marie

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Cowlitz, "age about twenty, in "the cemetery of this Mission."

Cowlitz Indian Tribe (and others) in Clark County, Washington

In 1792, Lt. William Robert Broughton of the Vancouver Expedition explored the Columbia River estuary with oarsmen in two small boats. These British explorers ascended the river to Vancouver Point at the western entry to the Columbia Gorge. In the late eighteenth and first half of the nineteen century three Indian linguistic groups lived along the north bank of the Columbia River between the Gorge in Skamania County and downstream to the mouth of the Cowlitz River in Cowlitz County. It is important to note that there is no "Chinookan" language. Native languages contained no European words in this region. There is no "Chinookan" Tribe. There were no treaties signed by a tribe called Chinookan. There is no reservation for a tribe named Chinookan. Chinookan was an outsider's term that implied a tribal identity to otherwise unidentified Native peoples. Most of the people called Chinookan had other tribal identities and would have referred to themselves by their tribal identity. It is an early misunderstanding by the Lewis and Clark Expedition that has lived infamously as a false identification. The early Chinook people spoke Pinutian. Sahaptin and Salishan were probably the most shared languages among Salish villages. Whichever language the identified villages spoke, it was their own. Chinook was a trade language of minimal value except in trading, but it was picked up by non-Natives as the easiest way to communicate with Lower Columbia Native people because it was enough of a mix of many languages that it consisted of the easiest sounds to pass through a non-Native throat. Their band identities were Skillute, Multnomah, Clackamas, and Watlala. To the south in the Willamette Valley were the speakers of Kalapuyan and Molallan languages. Living immediately adjacent in southwestern Washington were the Cowlitz and Taidnapam, ancestors of the Cowlitz Indian Tribe. The Cowlitz spoke a Salishan language and the Taidnapam spoke a Sahaptian language. The Cowlitz and Taidnapam were extensively intermarried. They held the watersheds of the Cowlitz, Toutle, Kalama, Lewis, Salmon Creek, and Washougal rivers in present Lewis, Cowlitz and Clark counties. Since the Chehalis River Treaty County of March, 1855, the Cowlitz and Taidnapam have acted as a confederated Tribe and were so recognized by the United States and Superintendent of Indian Affairs, Isaac I. Stevens.

During their explorations of the Columbia estuary in 1805-06 the Lewis and Clark Expedition documented in its journals and manuscript maps numerous villages in the river corridor. Although the explorers did not identify a village at present Vancouver, they mapped several on Sauvie Island about five to twenty miles downstream as well as villages along the southern (Oregon) shore of the estuary upstream from the mouth of the Willamette and others in the Columbia Gorge. These explorers identified the "Hullooetell" living along the north bank of the Columbia in Clark and Cowlitz counties. The *Handbook of North American Indians* (1906), edited by Dr. Frederick Webb Hodge, noted:

> "Hullooetell. Reported to Lewis and Clark as a numerous nation living N[orth] of Columbia r[iver], on Coweliskee (Cowlitz) r[iver], above the Skilloot, and on the Chahwahnahooks (Lewis) r[iver] in 1806. It was either a Chinookan or a Salishan tribe" (Hodge 1906[1]:577).

Gary Moulton, editor in thirteen volumes of *The Journals of the Lewis Et Clark Expedition* (1983-2001), concurred with the identification of the "Hullooetell" as Cowlitz Indians. Meriwether Lewis wrote on March 27, 1806: "above the Skillutes on this river another nation by the name of the Hul-loo-et-tell reside, who are said to be numerous." On March 29, 1806, Lewis identified the Lewis River and the Indians:

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> "on the North Side of the columbia a little above the entrance of this inlet a considerable river discharges itself. this stream the natives all the *Cah-woh-na-hi-ooks.* it is 150 yards wide and at present discharges a large body of water, tho' from the information of the same people it is not navigable but a short distance in consequence of falls and rappids a tribe called the Hul-lu-et-tell reside on this river above it's entr[ance]."

William Clark wrote on this same day about reaching the mouth of the Lewis or "Chah-wah-na-hi-ooks River," the place of residency of "Several tribes of the Hul-lu-et-tell Nation." Lewis and Clark in 1806 identified the village at the confluence of Lewis River with the Columbia as "Quath lah pah tle Village," a community of fourteen plank lodges (Moulton 1991[7]:18, 26, 30).

Commencing in 1829 and continuing through the 1830s, a pandemic, probably the ravages of typhoid fever, decimated the once numerous Chinookan-speakers of the Columbia estuary and the Kalapuyan-speakers of the Willamette Valley. The demographic calamity was so severe that some entire bands, such as the Multnomah and Skillute, disappeared from the historic record. An estimated eighty to ninety percent of the Indians succumbed. In this vacuum, the Taidnapam (or Hul-lu-et-tell) moved on down Lewis River to occupy Cathlapootle, the major village at the river's mouth. The linguistic affiliation of the Hul-lu-et-tell is problematic. Linguist Michael Silverstein who wrote an article on the Chinookan-speakers for Volume 7, Northwest Coast, of the *Handbook of North American Indians* (1990), said the term was Chinookan and meant 'strange country.' Yvonne Hajda who wrote an article on the Salish of Puget Sound and the Cowlitz for Volume 7, Northwest Coast, of the *Handbook of North American Indians* (1990), claimed the Hul-lu-et-tell were Cowlitz (Silverstein 1990[7]:545; Hajda 1990[7]:503-517). Because of intermarriage over millennia, these groups were extended family in a world where family connections were valued. These relocations were cousins moving to live with cousins. We gathered food in groups. We processed and traded that food in groups. Our way life was dependent on each other in every facet of life.

The destruction and dislocation of the native population along both banks of the Columbia estuary in the 1830s created a vacuum that permitted the Taidnapam to occupy and hold key sites such as the major village at the mouth of the Lewis River and on Cedar Creek near Battle Ground in the watershed of Salmon Creek. In the 1840s and the 1850s the Taidnapam were the primary aboriginal residents of Cowlitz County in the watersheds of the Cowlitz, Kalama and Lewis rivers and in also in Clark County. Robert Boyd, ethnohistorian, explained the dynamics of population decimation and replacement in the upper part of the Columbia estuary in the first half of the nineteenth century:

> After the 'fever and ague' epidemics, the equation tipped in favor of the inlanders. Ethnographic patterns suggest how downstream replacement took place. Intermarriage persisted, and interior men may have taken advantage of the custom that allowed them to pay off the cost of a riverine wife by moving in and working for her father. Others may simply have moved downstream to claim the property of deceased in-laws. But the largest part probably occupied empty land. By the mid-1830s most midriver Chinookan villages were already abandoned, although some were still being used a seasonal campsites by interior visitors. By the early 1850s recorded villages were mostly inhabited by Sahaptins. Chinookan survivors were few and had become a minority in their own land (Boyd 1999:257).

The devastation of the Indian population living along the Columbia estuary was further addressed by Boyd. The village of Akanassisi was located on the north bank of the Columbia downstream about five miles from

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Fort Vancouver and was identified in 1841 on the map of Duflot de Mofras, a French visitor.

Between Cathlamet and the Cascades in 1854, the only surviving settlement that might be termed Chinookan was the village of Akanassisi (gala'anasisi), or 'the Fishery.' In 1838 there had been 37 Indians at this location; in 1854 there were 30. William Tappan, Indian agent for southern Washington, stated that they were a 'mixed race, nearly all the tribes are here represented' (1854). These included some '4 or 6' from the former Wappato village of Kalama. The name 'Klikitats' frequently given to the Fishery villagers indicates their hybrid nature (Boyd 1999:255).

Regarding the use of the term "Chinookan" (historical and otherwise), Mike Iyall (Cowlitz Indian Tribal Elder and Tribal Historian) states the following:

> Chinook, a person who is a member of the Chinook Tribe. Today, the Chinook Tribe lives in Pacific County, Washington.
>
> "Chinookan" originally meant a jargon language or a Native who was a jargon speaker. Chinookan would later become a cultural and linguistic grouping. Chinookans were never under the rule of the Chinook Tribe, nor was Chinookan a term that Chinook people used to refer to themselves. Chinookan was an outsider's term. Tribes had their own names and were proud of those names. Use of Chinookan replaces a Tribe's real name and writes them out of history, an unconscionable act of cruelty. You never existed, you have no place in history!

Robert Boyd uses the term "Chinookan" to refer to many villages that are Cowlitz. This usage does not make them Chinook villages. The correct terminology would be to call the Tribes along the Columbia River by their correct and individual Tribal names, instead of making up a new term that is colonial in nature – Chinookan, i.e. European. Again, while there are a people who identify as Chinook, there are no Chinookan people, and there never was a Chinookan Tribe. Mike Iyall states: "In my communication with Boyd, he was clear that Cathlapotle was not a Chinook village."

Tanna Engdahl, Cowlitz Indian Tribal Spiritual Leader, sheds light upon "outmarriage:"

> When teaching, I explain that Cathlapotle was made up of powerful trading families, mostly from Lower Columbia River Tribes. Some writers have called it a Chinook village; however, this would have been impossible. Marriage taboos practiced by all Tribes in Western Washington ensured that even mid-range cousins could not marry each other, so sons or daughters had to marry someone from other villages or other Tribes. This means that one of the marital pair had to relocate.

In 1830, George Simpson, governor of the Hudson's Bay Company, visited Fort Vancouver and reported a Cowlitz population led by chief "Schannaway" (Scanewa) "whose track from the borders of Puget Sound strikes on the Columbia near to Belle vue Point," a location on Sauvie Island a few miles from Fort Vancouver (Simpson 1931:86).

In 1854, George Gibbs (1815-1873) served as linguist and geologist to a detachment of U.S. Army soldiers exploring a route east from Fort Vancouver to the Yakima River's confluence with the Columbia River.

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Captain George B. McClellan directed the expedition to find passes for a railroad across the Cascade Mountains. In his field notes Gibbs recorded "Names of Indian Localities on the Route fr[om] Ft. Vancouver to Chequos." He enumerated the prairies north and east of Vancouver, referring to them as "5th plain, *Simsik,* 6th plain, *Man-kas,* 7th plain, *Yah-koh-tl,* also the river, 8th plain, *Cha-la-cha,* and the 1st ford, *Sp'il-yeh."* Next he wrote: **"Mouth of Lewis R. or Cathlapotel, *Wihlt-qu"*** (Gibbs 1854-55). [Emphasis supplied.] This comment and other Gibbs notations confirmed the use of three terms to identify this river: "Lewis River" (named for Meriwether Lewis); "Cathlapotel," or "KathlapiJtl," or "Cathlapootl"; and "Wihlt-qu" or "Wilt-kwu."

In December of 1855, George Gibbs served under Lt. George Derby as surveyor and cartographer for the U.S. Topographical Engineers laying out the Fort Steilacoom-Fort Vancouver Military Road. While at Fort Vancouver Gibbs interviewed Yahotowit, a Klickitat Indian. Gibbs noted: **"Wilt-kwu, the mouth of Lewis' river, where Umtuts' ranch [village] is. The name Cathlapootl he did not know, said that <u>pootl</u> was not Klikitat** (Gibbs 1855-56). [Emphasis supplied.] Gibbs sometimes used the term "ranch" or "rancheria" to refer to an Indian village, a usage based on his service in 1851 as secretary and cartographer to the California Treaty Commission. In his monograph on the Indians of Washington Territory, Gibbs wrote about two rivers flowing into the upper Columbia River in Clark County: **"The two principal branches on the north, below the Cascades, are the *Kathlalpiitl,* or Lewis River, and *Kowlitz"*** (Gibbs 1877:166). [Emphasis supplied.]

Gibbs obtained additional information from Yahotowit about the Taidnapam (Upper Cowlitz) village at the mouth of the Lewis River: **"Umtuts, or lmtuts' father was Moke-yuah. Umtuts was Taidnapam his proper country was not Wiltqu, but in the mountains at the foot of St. Helens, on the head of the Cowlitz. His people were always quarreling and he left them"** (Gibbs 1855-56). [Emphasis supplied.] The information from Yahotowit confirmed that in 1855 that *Wjhlt-qu/WUt-kwu* (or, *Cathlapotle)* was the village of Umtuch, a Taidnapam (Upper Cowlitz) chief.

The sacramental rites for Cowlitz Indians recorded between 1839 and 1855 at St. James Mission, Fort Vancouver, frequently documented their tribal affiliation and many times cited the Indian's tribal name. The presence of Cowlitz Indians within the immediate vicinity of the proposed Columbia River bridge was documented in these records:

Cowlitz baptisms:	121
Cowlitz marriages:	10

(Warner and Munnick 1972)

The Catholic sacramental records also documented Cowlitz residency on the Lewis (Cathlapootle) River in Clark County within a short distance of the Cowlitz Indian Tribe Reservation. Father James Croke wrote:

> On the 8th [18th *crossed out]* day of July 1854, we missionary priest baptized, in danger of death, **Mary (a girl 7 years old) daughter of Humptux an Indian who lives at the mouth of Lewis River Washington Territory** (Warner and Munnick 1972). [Emphasis added.] See *Catholic Church Records of the Pacific Northwest, Vancouver I and II and Stellamaris Mission* (1972), Index pp. 24-27, listing Cowlitz Indians in the registers in Vancouver, Clark County, Washington and at page 148 the baptism of Mary Humptux.

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Chief Umtuch of the Cowlitz Indian Tribe was murdered in November of 1855, at Battle Ground, a location ten miles southwest of the Cowlitz Indian Reservation in the watershed of Salmon Creek in Clark County. Thomas N. Strong, author of *Cathlamet on Columbia* (1906), was the son of Judge William Strong who settled in 1850 on the Columbia River when he was named to the Supreme Court of Oregon Territory. During the Indian war of 1855-56 the Washington Territory Volunteers, Company A, elected Judge Strong to serve as their captain stationed at Fort Vancouver. Company A deployed to a meadow subsequently known as Battle Ground in the Salmon Creek drainage. Thomas Strong devoted a chapter in his book to "Chief Umtux" and wrote:

> **The Coweliskies who lived on the Cowlitz River, when known as the Coweliskie, and along the two branches of the Lewis River in what is now known as Cowlitz and Clark Counties of the State of Washington,** were not of the pure river type of Indian, nor did they live directly on the banks of the Columbia. They had a trail extending from the Cowlitz River to the gravel plains South of Olympia, Tacoma, and Seattle (Strong 1930:111-112). [Emphasis supplied.]

Umtuts, Imtuts, Umtuchs, Umtux, and Humptux are alternate spellings of Umtuch.

In addition to the Cowlitz and Taidnapam – the aboriginal residents of Clark County – hundreds of Indians between 1826 and 1858 visited Fort Vancouver to trade. Some, such as the Klickitat from the Columbia Plateau and the watershed of the White Salmon River, found employment with the Hudson's Bay Company. Klickitat became the name used by the settlers to describe Sahaptin speakers rather than a tribal identification. Here Lewis River Cowlitz were sometimes called Klickitat. This usage by settlers confused tribal identities that continues today. These Tribes became part of the nexus of trade and exchange of this commercial enterprise based in London but operating several forts, farms, brigades, and coastal trading vessels in the Pacific Northwest. The HBC investments tapped the region's potentials. At Fort Vancouver the company had multiple operations within a short distance of the projected bridge crossing. These included a dock and landing, salmon house for salting and packing fish in barrels, a shipyard, a store, residential barracks, offices, warehouses, a bakery, and a blacksmith shop. Nearby the HBC operated a grist mill and a sawmill. The company had extensive agricultural enterprises on First, Second, Third, Fourth, Fifth and Mill Plains. In these natural meadows in Clark County the Hudson's Bay Company raised cereal crops, sheep, pigs, cattle, and horses. At the fort, it had vegetable gardens and an orchard. An estimated 300 or more employees and their families resided in the fort or surrounding it. On the west side of the post, in the immediate vicinity of the projected bridge, stood the Kanaka Village. This community, located outside the stockade, was a polyglot, multi- ethnic place of residency of Hawaiians, South Sea Islanders, and Native Americans working for the company or sojourning in the area during trading expeditions or the outfitting of brigades headed to California, Oregon Coast, Puget Sound, the Great Basin, or far up the Columbia River to the interior.

By 1855, the Klickitat Tribe had withdrawn its incursion into western Oregon and Washington. The Klickitat participated in no treaty councils with Anson Dart, Joel Palmer, or Isaac Ingalls Stevens west of the Cascades. They returned to their original homes on the north side of the Columbia Gorge and on the western part of the Columbia Plateau. In subsequent years many Klickitat were affiliated with the Yakama Reservation or self-identified as the "River People," fishers in the waters of the Columbia River.

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U.S. Army's Fort Vancouver and the Army-Civilian Cemetery

On May 15, 1849, Captain John S. Hathaway and two companies of the First Artillery arrived by sea to establish the U.S. Army's Fort Vancouver on the tableland directly north of the Hudson's Bay Company's headquarters of the same name. Initially called Columbia Barracks, the post grew in October, 1849, with the arrival of the Overland Riflemen who had crossed the Oregon Trail with wagons of supplies destined for the new military headquarters in Oregon Territory. The fort lay directly east of present Interstate 5 and the north approach to the existing interstate bridges over the Columbia River. On July 13, 1853, the post was renamed Fort Vancouver. In 1859 the government established the U.S. Arsenal at the station. The facility was renamed Vancouver Barracks on April 5, 1879 (Fraser 1965:176-177).

By 1850 the small cemetery surrounding St. James Mission on the hillside north of the HBC's stockade at Fort Vancouver was no longer deemed suitable for burials. The Army removed its fence and encroached on the church and cemetery. The last known mission burial was Rosa F. Brant on November 15, 1855. The U.S. Army and the adjacent town of Vancouver selected four acres directly west of Officers' Row for a new cemetery. The cemetery lay in part in the subsequent location of the highway crossing on the interstate bridges and, ultimately, the route of Interstate 5 constructed in the early 1950s. It is possible that this cemetery originated as a burial site for non-Catholics (Indians and Euro-Americans) in the 1830s and that it grew rapidly in the 1850s with the arrival of Army personnel and their families and civilians settling in Vancouver.

By the mid-1850s, the priests differentiated in their records between the "cemetery of this mission" or "the mission burial ground" and "in the graveyard at Fort Vancouver." In 1855 Father Jean B. Brouilliet, priest at St. James mission, noted: "On the 24th of March, 1855, we missionary priest buried in the grave yard at Fort Vancouver the body of Frederick Curts, aged about 37 years a private in the 4th Infantry stationed at this post" (Munnick & Warner 1979:153). The new Army-Civilian cemetery was located in the forest due west of Officers' Row and abutted the western margin of the Fort Vancouver Military Reserve and the eastern margin of the city of Vancouver. In 1866 the cemetery consisted of approximately four acres of ground west of the garrison. It was enclosed by a paling fence and contained about 20 graves. There was no system or order to the initial burials. The Army reported in 1866 that there were additional graves, "those of Hudsons Bay Co. Men." An observer noted: "They were unenclosed & offended the eye by their publicity."

By 1873, the cemetery had grown extensively. The chaplain at Fort Vancouver estimated the tract at four or five acres. "It contains a large number of graves besides those of soldiers and members of their families .... Many containing the remains of soldiers and citizens have never been marked by head boards or else such boards have decayed and as no record can be found reaching beyond the proximate past their identification is now impossible." The U.S. Army, however, enumerated in 1871 twenty-eight graves by name, rank, company, and date of death. In 1875 E. D. Townsend, Adjutant-General of the Military Division of the Pacific declared the site to be a National Cemetery of the Fourth Class, mandated an inspection, and requested more information. The cemetery then contained 293 burials of which 170 were unknown. By 1877 the cemetery had 123 identified burials and 170 unknown graves.

Expansion of Vancouver Barracks led to reduction of the burial area, especially with the extension westward of Officers' Row. By 1880 the Army estimated between 300 and 400 burials. In 1882 the Army and civilians commenced abandoning the cemetery, removing graves of known burials, and establishing a new cemetery one-half mile north within the military reserve. In 1883 the Army closed the Army-Civilian

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cemetery. The *Vancouver Independent,* September 6, reported: "Wm. Ginder has the contract for removal of the bodies and monuments from the old military cemetery to the new one, on the northeast [northwest] corner of the military reservation. He has a number of men at work, and the exhumations and re-burials are proceeding rapidly. All remains will be removed as soon as it can be accomplished. The remains of civilians will be removed also, having a plot set aside for them in the new military cemetery."

In 1917-18 the site of the HBC's Fort Vancouver became, during World War I, the location of the U.S. Army's Spruce Production Division sawmill employing 5,000 laborers manufacturing materials for airplanes. During World War II 200 acres on the adjacent north bank of the Columbia became the "ways" for Kaiser Shipyards employing 38,000 workers and constructing vessels for the U.S. Navy. The Cowlitz Indian Tribe was not directly involved in either of these changing uses of the land.

Findings of Fact

1. The Cowlitz Indian Tribe is the only federally-recognized Tribe in Clark County, Washington. The Tribe has a reservation located twenty-one miles north of the proposed Interstate 5 Columbia River bridge.
2. The Cowlitz Indian Tribe (Cowlitz and Taidnapam), Skillute, Multnomah, Clackamas, and Watlala lived on or adjacent to the Columbia River estuary in Clark, Cowlitz, and Skamania counties, Washington from time immemorial.

3. The Lewis & Clark Expedition identified the "Hullooetell" as a "numerous nation" living north of the Columbia River on the Coweliskee (Cowlitz) River above the Skillute and on the Chahwahnahooks (Lewis) River. Anthropologists Hodge, Hajda, Silverstein, and historian Moulton have concurred with this identification. The term Hullooetell is synonymous with Taidnapam, a term used following the Lewis & Clark explorations.

4. The Cowlitz Indian Tribe was directly involved in the economy of the Hudson's Bay Company, 1825-1860, at Fort Vancouver and in the operation of Cowlitz Farm by the Puget Sound Agricultural Company at Cowlitz Prairie, 1839-1855. Numerous employees, many of them metis, of the HBC and PSAC married members of Cowlitz Indian Tribe. Both of these HBC enterprises were located to be near the Cowlitz Indian Tribe, a vital trading partner.

5. Following the pandemic of 1829-40, the Taidnapam (Cowlitz) settled at Cathlapootle at the mouth of Lewis River. In the 1850s William H. Tappan, Indian Agent, identified this village and George Gibbs documented it as *"Wihlt-qu"* or *"Wilt- kwu."* Gibbs recorded information from Yahotowit, an informant, on the history of Chief Umtuch and his Taidnapam band.

6. Members of the Cowlitz Indian Tribe also lived at Battle Ground, Beaver Creek, and in 1870 in a village of fourteen Indian households in Clark County. **St. James Mission adjacent to Interstate 5 in Vancouver between 1839 and 1855 was the site of 121 Cowlitz baptisms and 10 marriages. No other Indian Tribe identified** in **the sacramental records had a**

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tally comparable to this count. [Emphasis supplied.]

7. The joint U.S. Army-Civilian cemetery, bisected by Interstate 5 in the 1950s, was the burial site of military families, civilians, Native Americans, and Hudson's Bay Company personnel. Identification of Cowlitz in the mission records mandates involvement of the Cowlitz Indian Tribe in cultural resource assessments and repatriations related to the proposed bridge.

8. A fully documented history of the initial U.S. Army-Civilian cemetery is critical to the on-going EIS process. The Cowlitz Indian Tribe is ready to research and report the historical context for the cemetery in the bridge approaches and to participate in repatriation of human remains. This essay confirms the Tribe's willingness and also the depth of information it can draw on to participate in the cultural resource assessments.

9. At the Vancouver Treaty Council, Territorial Governor Issac Stevens told the Cowlitz leaders, "I acknowledge your claims to these lands." He would later add, "they value Chalacha most and would part with it last." These lands became the Cowlitz Indian Tribal Reservation.

Please contact Rita Asgeirsson, Cultural Resources Director, if you have any questions or comments. Rita can be reached at rasgeirsson@cowlitz.org or (360) 575-6226. Thank you for your attention to this matter.

Sincerely,

Patty Kinswa-Gaiser

Patty Kinswa-Gaiser
Cowlitz Tribal Chairwoman

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