Environmental Justice Technical Report

This technical report on environmental justice (EJ) is included in accordance with agency policy direction and as recommended in the Washington State Department of Ecology's State Environmental Policy Act Handbook. Inclusion of this technical report does not constitute a continuing WSDOT policy. EJ is included here to adapt to changes to federal policy that occurred during advanced stages of the IBR Program's National Environmental Policy Act (NEPA) process and to provide analysis originally completed under NEPA to the public.

May 2026

Oregon

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Environmental Justice Technical Report

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials
ACS	American Community Survey
ADA	Americans with Disabilities Act
BLTS	bicycle level of traffic stress
BMP	best management practice
BRT	bus rapid transit
CAG	Community Advisory Group
CCFS	Columbia Corridor Flood Safety
C-D	collector-distributor
CRC	Columbia River Crossing
CTR	Commute Trip Reduction
C-TRAN	Clark County Public Transit Benefit Area Authority
dBA	A-weighted decibels
EAG	Equity Advisory Group
EJ	environmental justice
EO	Executive Order
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HCT	high-capacity transit
HHS	U.S. Department of Health and Human Services
I-5	Interstate 5
I-84	Interstate 84
I-205	Interstate 205
I-405	Interstate 405
IBR	Interstate Bridge Replacement
LOS	level of service
LPA	Locally Preferred Alternative
LRFD	Load and Resistance Factor Design
LRT	light-rail transit
LRV	light-rail vehicle
MAX	Metropolitan Area Express
Metro	Oregon Metro

Acronym/Abbreviation	Definition
MOU	memorandum of understanding
MSA	metropolitan statistical area
NAC	Noise Abatement Criteria
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
ODOT	Oregon Department of Transportation
OMF	Operations and Maintenance Facility
ORS	Oregon Revised Statutes
OTC	Oregon Transportation Commission
PMLS	Portland Metro Levee System
PNCD	Preliminary Navigation Clearance Determination
ROD	Record of Decision
RTC	Southwest Washington Regional Transportation Commission
RTP	Regional Transportation Plan
SEIS	supplemental environmental impact statement
SEPA	State Environmental Policy Act
SME	Subject Matter Expert
SOV	single-occupancy vehicle
SR	State Route
TPSS	traction power substation
TriMet	Tri-County Metropolitan Transportation District
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
USDOT	U.S. Department of Transportation
VHD	vehicle hours of delay
VHT	vehicle hours of travel
VMT	vehicle miles traveled
VNHR	Vancouver National Historic Reserve
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission

1. PROGRAM OVERVIEW

1.1 Introduction

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

Figure 1-1. IBR Program Location Overview

1.2 Components of the Modified LPA

The basic proposed components of the Modified Locally Preferred Alternative (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 1.2.7, Transit Operating Characteristics, for more information about this service).
- Improvements to seven I-5 interchanges and I-5 mainline improvements between Interstate Avenue/ Victory Boulevard in Portland and SR 500/39th Street in Vancouver. Some adjacent local streets would be reconfigured to complement the new interchange designs and improve local east–west connections.
- Six new adjacent bridges across North Portland Harbor: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping with the existing bridge (which would be removed). The bridges would carry (from west to east) LRT tracks, southbound I-5 off-ramp to Marine Drive, southbound I-5 mainline, northbound I-5 mainline,

[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.

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 (ADA). 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 1.2.1, Interstate 5 Mainline, describes the overall configuration of the I-5 mainline through the study area, and Sections 1.2.2, Portland Mainland and Hayden Island (Subarea A), through Section 1.2.5, 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

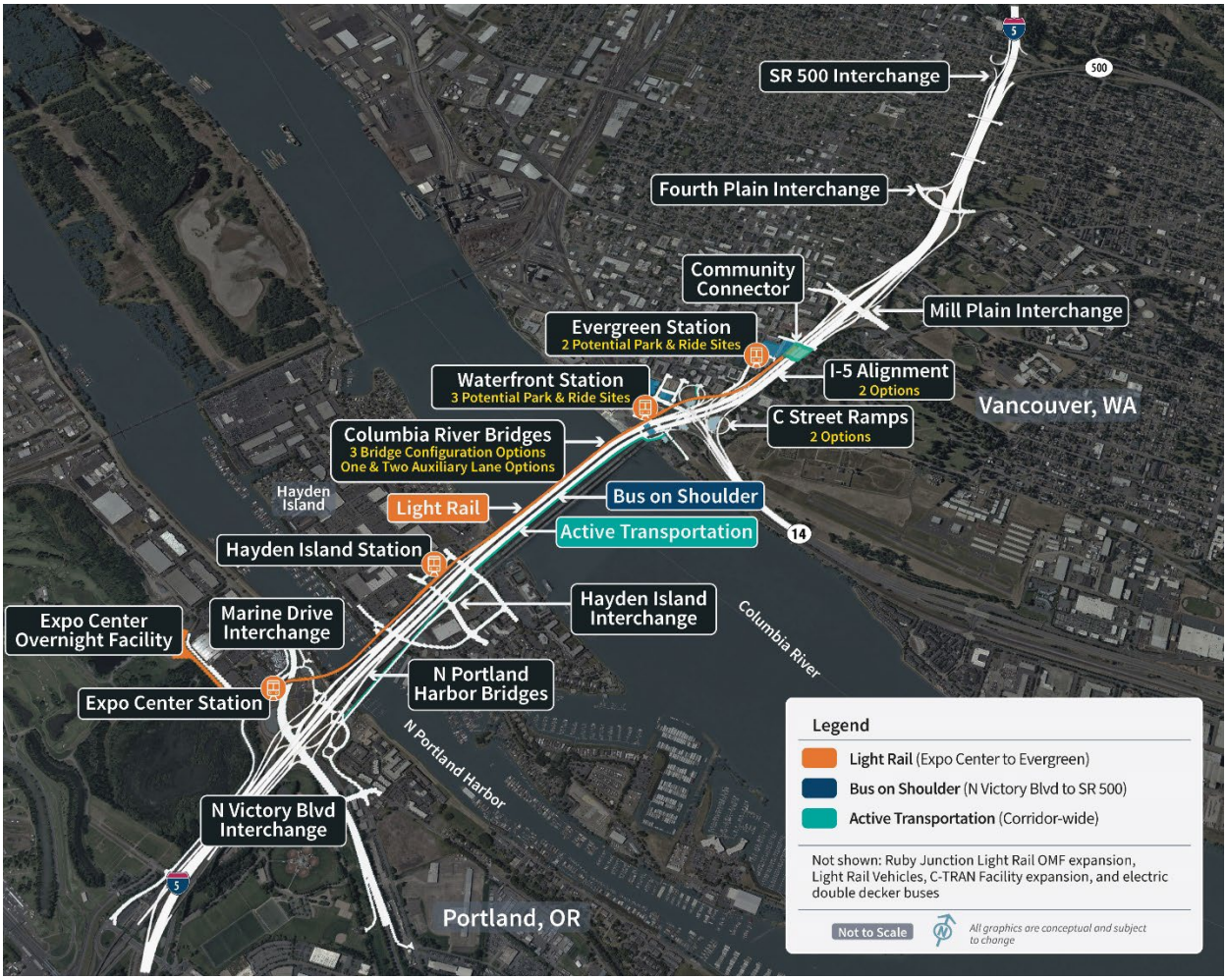


Figure 1-3. Modified LPA – Geographic Subareas

1.2.1 Interstate 5 Mainline

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

The Modified LPA would include three 12-foot through lanes from Interstate Avenue/Victory Boulevard to SR 500/39th Street and one or two 12-foot auxiliary lanes, as detailed below and shown on Figure 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.

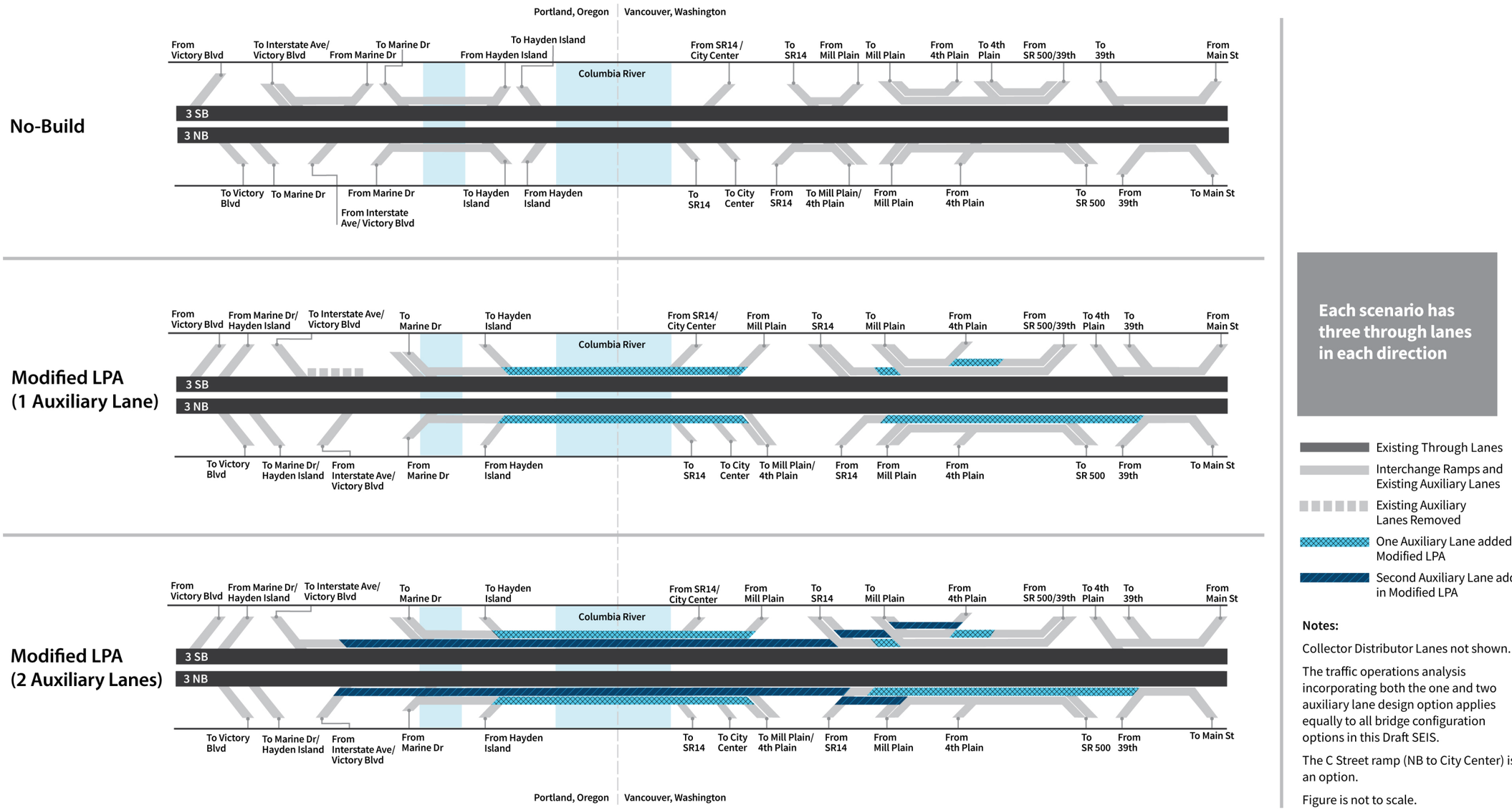
The Modified LPA would also include shoulders (11- to 14-foot inside shoulders and 10- to 14-foot outside shoulders) to be consistent with the design standards of the Oregon Department of Transportation (ODOT) and Washington State Department of Transportation (WSDOT). The inside shoulder would be used by express bus service to bypass mainline congestion, known as "bus on shoulder" (refer to Section 1.2.7, Transit Operating Characteristics). The shoulder would be available for express bus service when general-purpose speeds are below 35 miles per hour.

1.2.1.1 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



Each scenario has three through lanes in each direction

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

Notes:

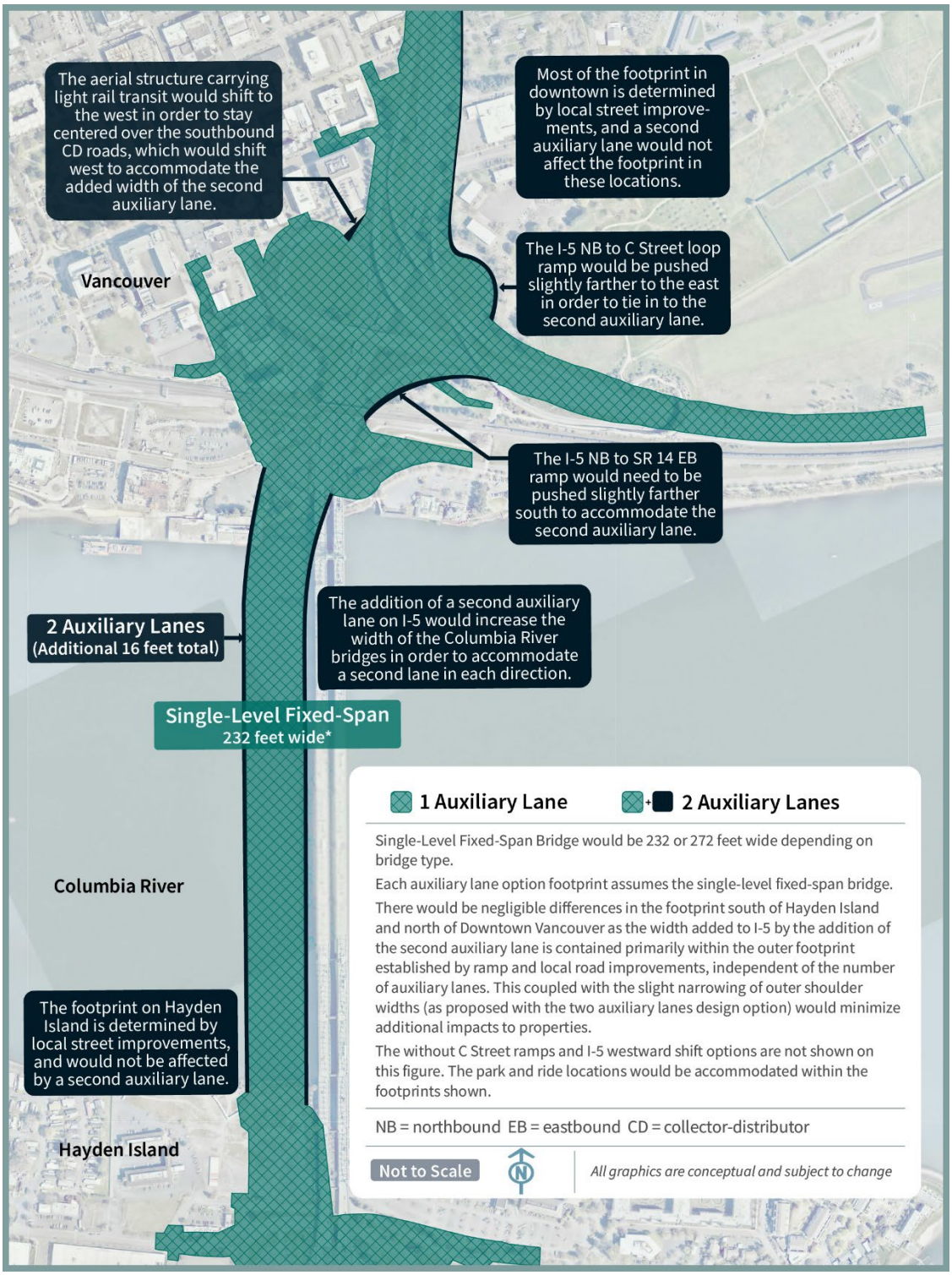
Collector Distributor Lanes not shown.

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

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

Figure is not to scale.

Figure 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.

1.2.2 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.

1.2.2.1 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).

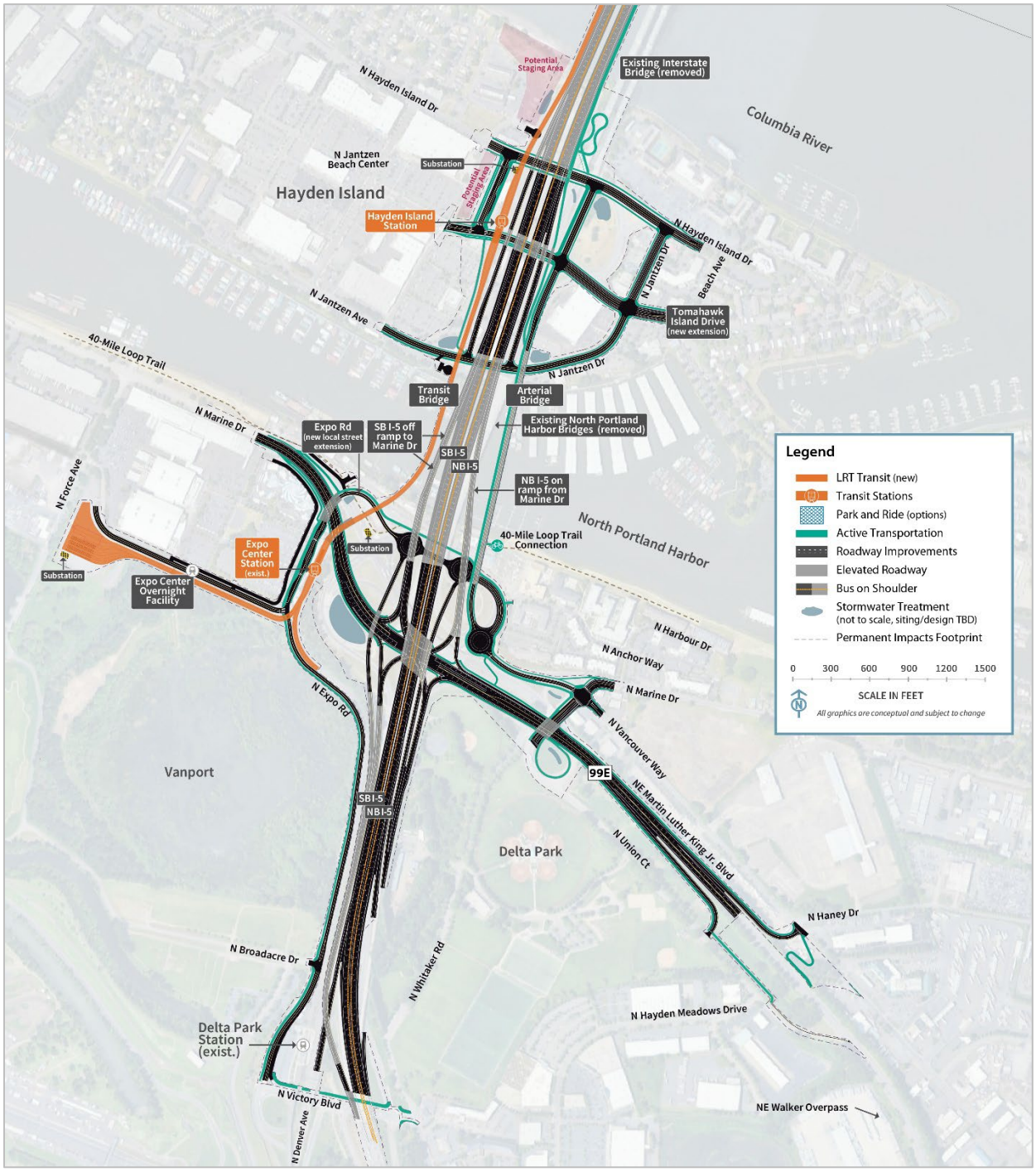
The levee systems are shown on Figure 1-7, and intersections with Modified LPA components are described throughout this section (Section 1.2.2, Portland Mainland and Hayden Island (Subarea A)), where appropriate. Within Subarea A, the IBR Program study area intersects with PEN 1 to the west of I-5 and with PEN 2 to the east of I-5. PEN 1 and PEN 2 include a main levee along the south side of North Portland Harbor and are part of a combination of levees and floodwalls. PEN 1 and PEN 2 are separated by the Cross Levee that is intended to isolate the two districts if one of them were to fail. The Cross Levee is located along the I-5 mainline embankment, except in the Marine Drive interchange area, where it is located on the west edge of the existing ramp from Marine Drive to southbound I-5.[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”).

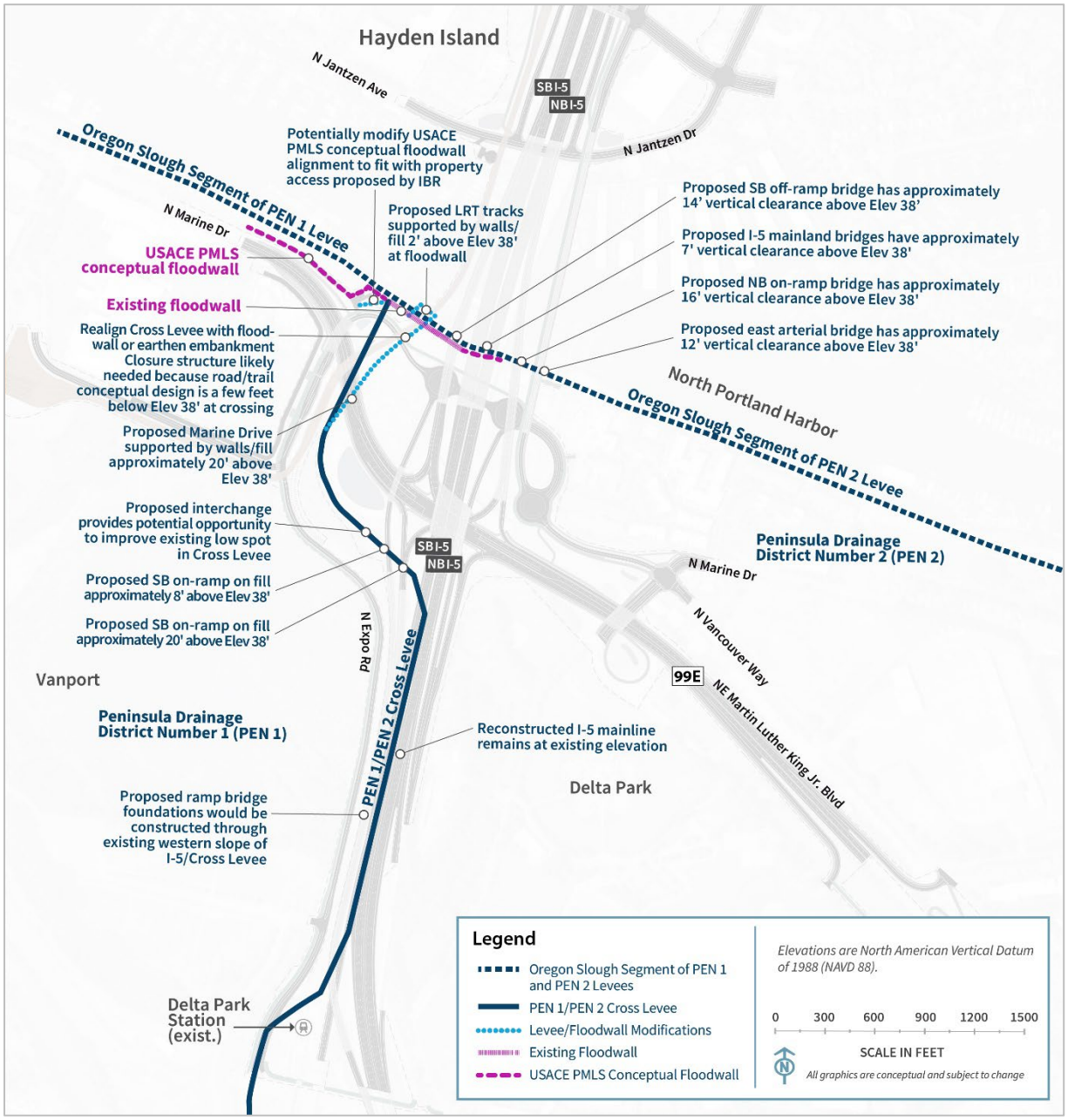
[4] The portion of the original Denver Avenue levee alignment within the Marine Drive interchange area is no longer considered part of the levee system by UFSWQD.

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



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.

1.2.2.2 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.

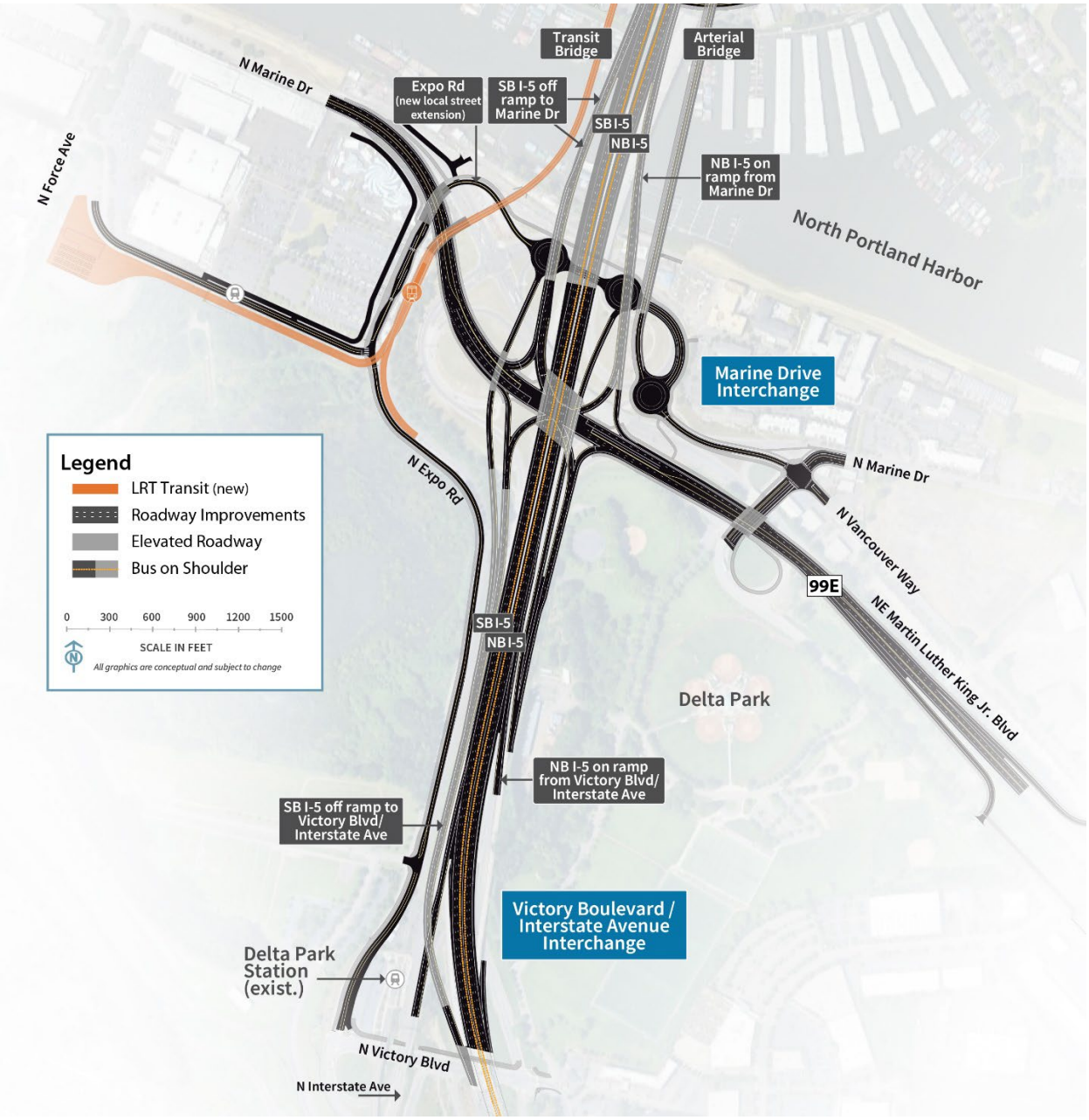
MARINE DRIVE INTERCHANGE AREA

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.

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



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 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.

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

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

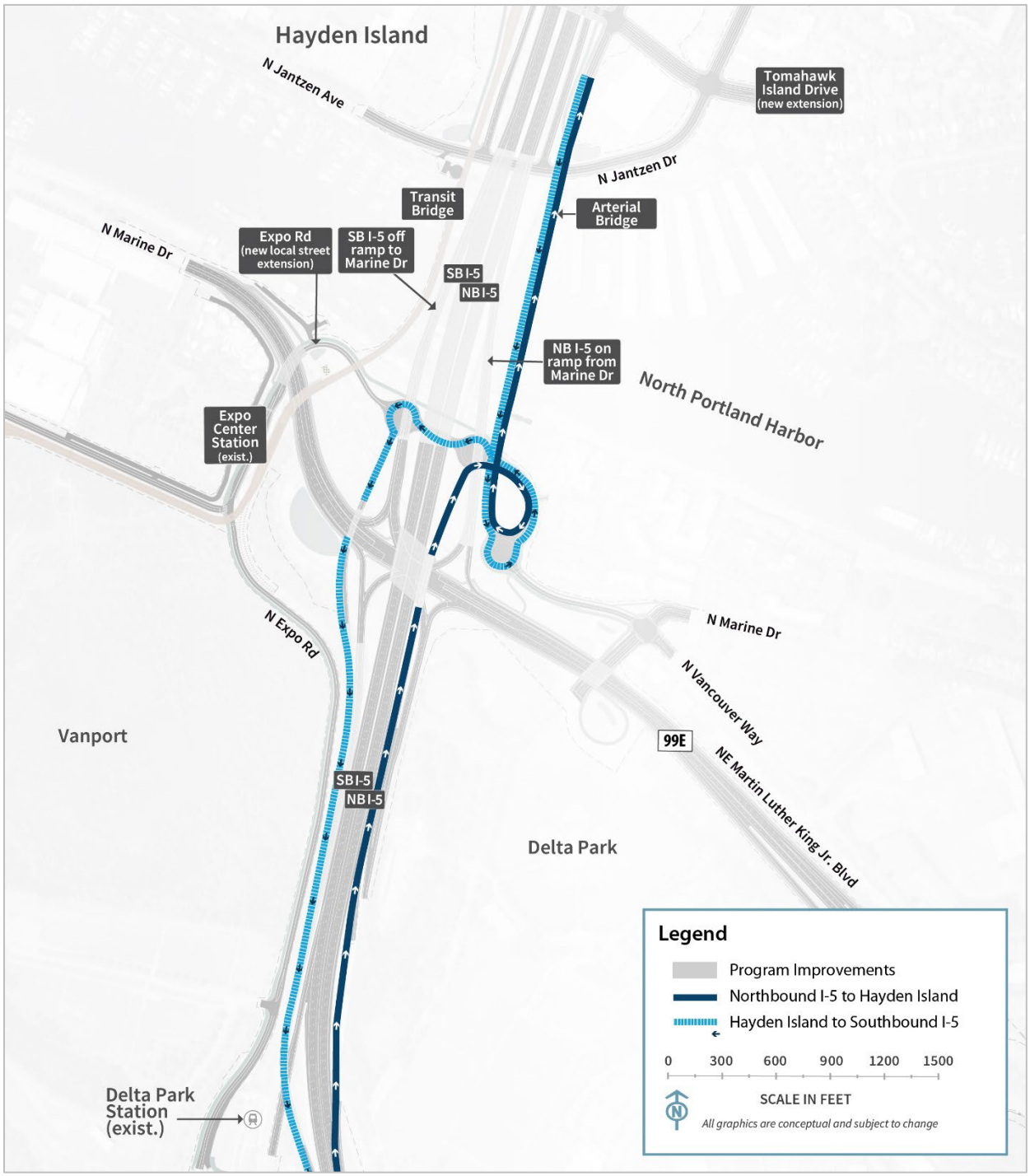
All traffic movements for the Hayden Island interchange would be reconfigured. Figure 1-6 shows the layout and construction footprint of the Hayden Island interchange. A partial interchange would be built on Hayden Island with a northbound I-5 on-ramp from Jantzen Drive and a southbound I-5 off-ramp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

1.2.2.3 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 1.2.6, Transit Support Facilities. The existing Expo Center MAX Station would be modified to remove the westernmost track and platform. Other platform modifications, including track realignment and regrading the station, are anticipated to transition to the extension alignment. This could require reconstruction of the operator break facility, signal/communication buildings, and TPSSs. The existing TPSS at the end of TriMet's MAX Yellow Line would be decommissioned. A new TPSS would be constructed to the east of the LRT tracks and south of Expo Road, as well as at the overnight LRV facility, east of N Force Avenue. Immediately north of the Expo Center MAX Station, the LRT alignment would curve east toward I-5, pass beneath an elevated Marine Drive, cross the proposed Expo Road local street extension and the 40-Mile Loop Trail at grade, then rise over the existing levee onto a light-rail bridge to cross North Portland Harbor.

After crossing the new Expo Road extension, the new light-rail track would cross over the main levee (Figure 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.

1.2.2.4 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.

1.2.3 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)

1.2.3.1 Highways, Interchanges, and Local Roadways

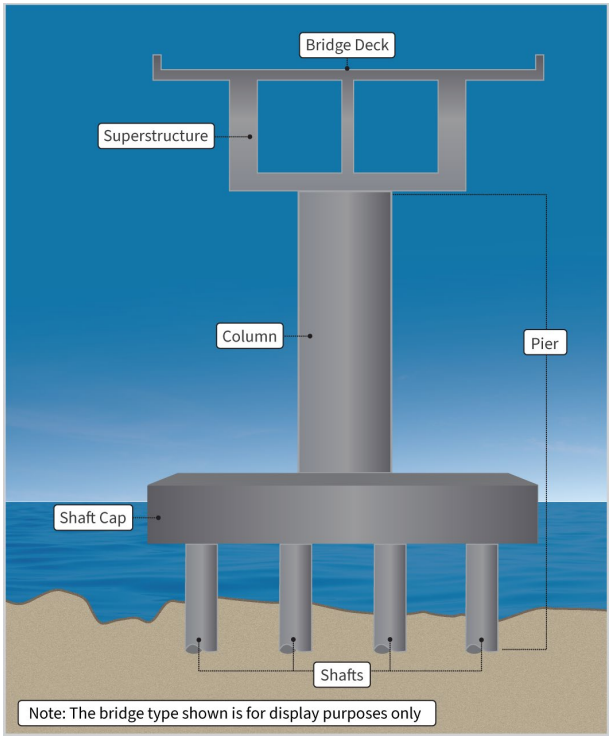
The two existing parallel northbound and southbound I-5 bridges that cross the Columbia River were constructed in 1917 and 1958, respectively. When the 1958 bridge was constructed, pier 5 of the 1917 bridge was removed and the profile was raised to match the new bridge. For the IBR Program, the two existing 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 (LRFD) Bridge Design Specifications and AASHTO Seismic Guide Specifications and in compliance with ODOT and WSDOT

design criteria. With all bridge configuration design options, the new eastern bridge would accommodate northbound highway traffic and a shared-use path. The new western bridge would carry southbound traffic and light-rail tracks. Whereas the existing bridges each have three lanes with no shoulders, each of the two new bridges would accommodate three through lanes, one or two auxiliary lanes, and shoulders on both sides of the highway. Lanes and shoulders would be built to full design standards.

As with the existing bridge (Figure 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

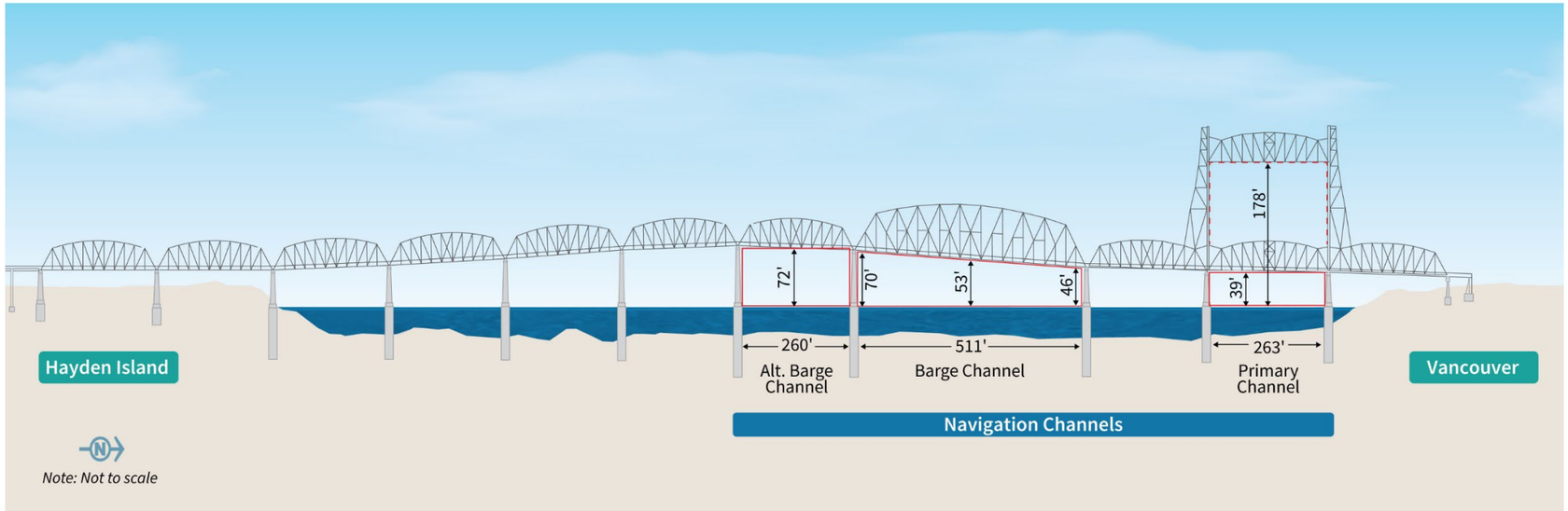
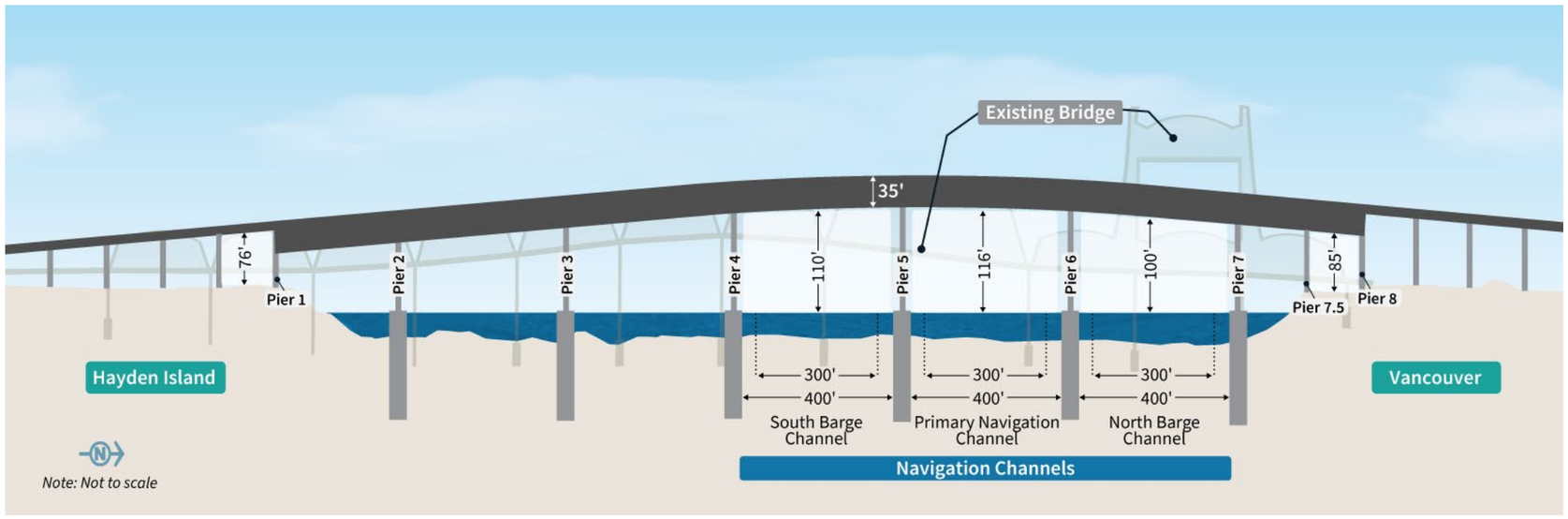


Figure 1-13. Navigation Clearances and Proposed Profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration



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]

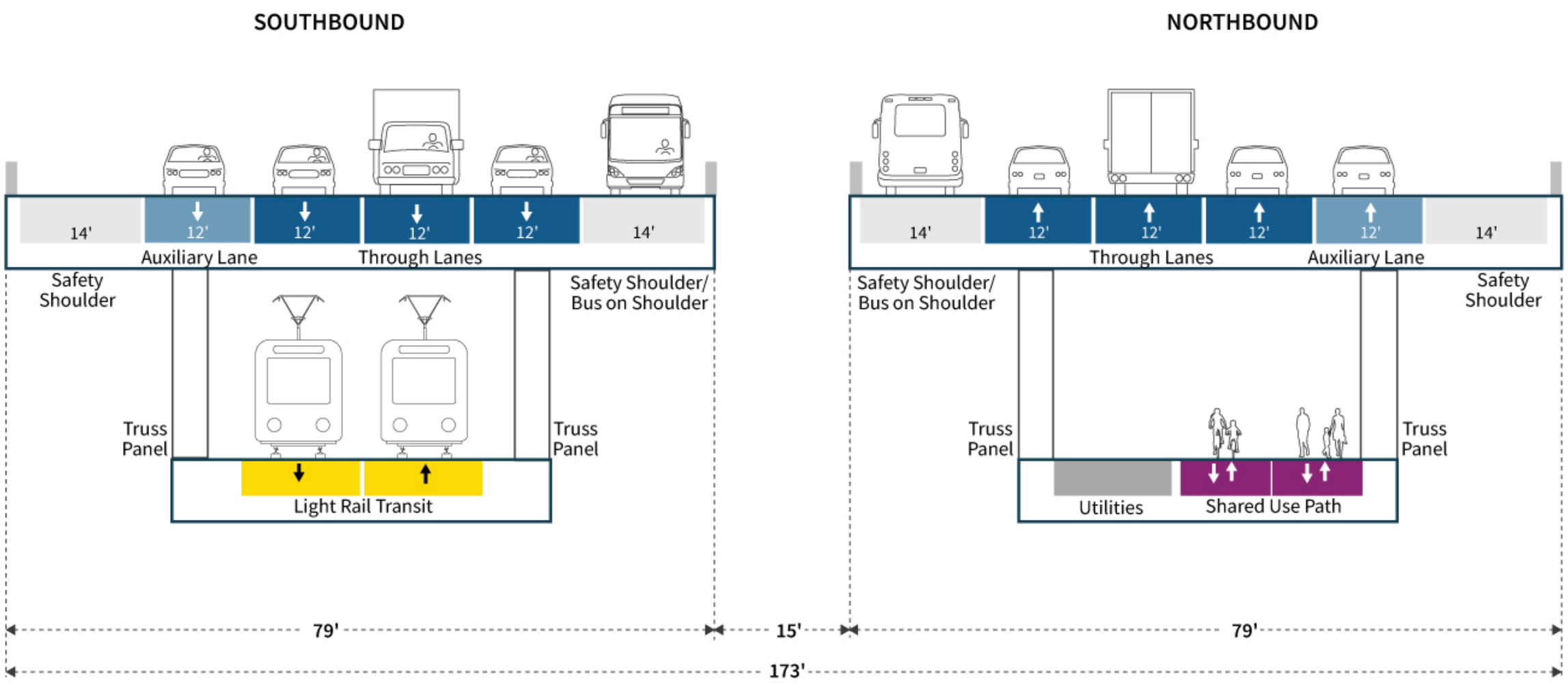
Figure 1-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration

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.

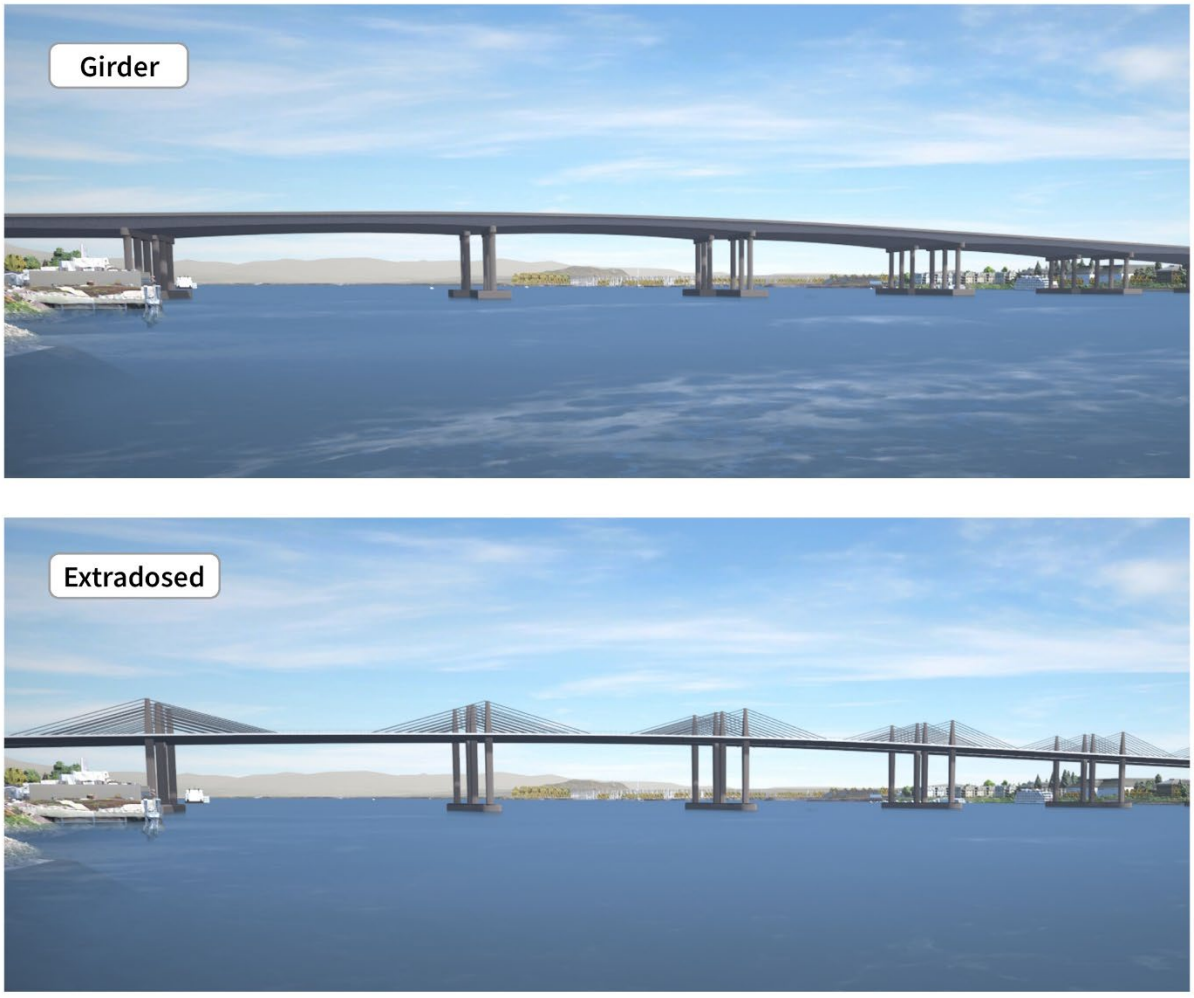
[10] The Draft SEIS also included a finback as a single-level fixed-span bridge type. As the design of the various bridge types progressed, it was determined that the finback would have higher risks associated with increased cost and construction schedule because this bridge type is less common and applying 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.

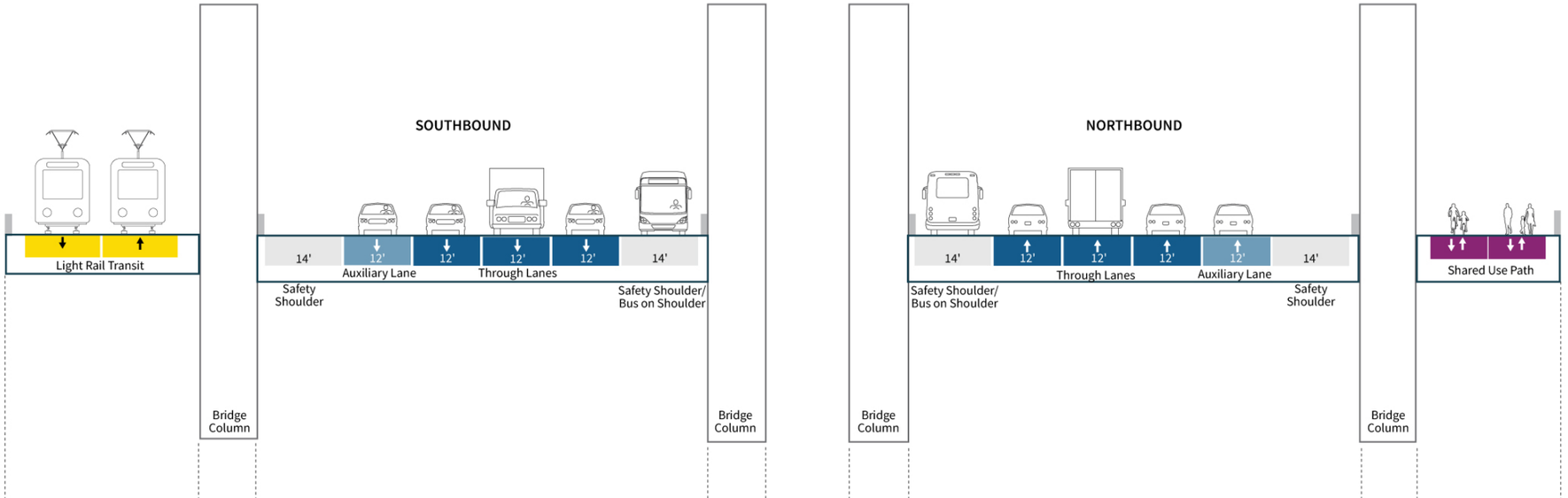
This bridge configuration would be expected to have an approximate grade of 3% on both the Oregon and Washington sides of the bridge. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

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



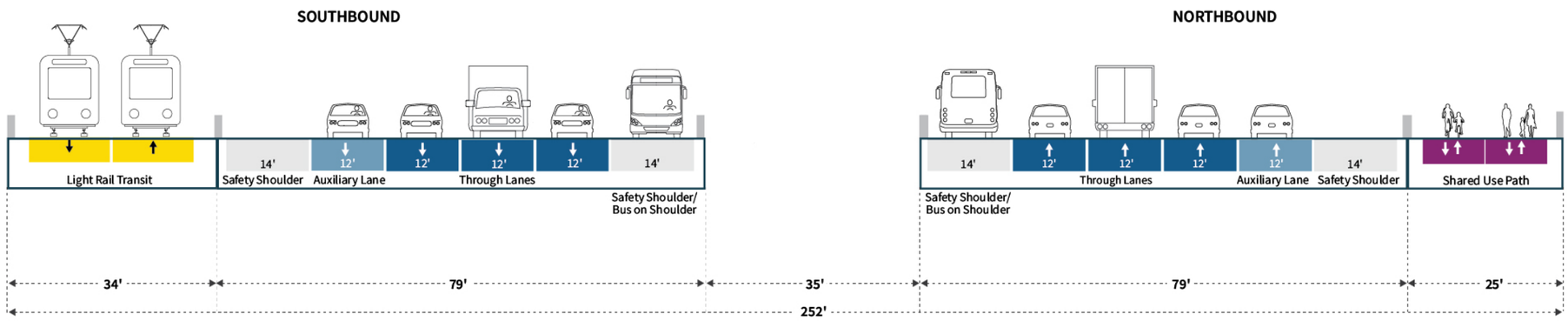
Note: Visualizations are for illustrative purposes only. They do not reflect property impacts or represent final design. Visualization is looking southeast from Vancouver.

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).

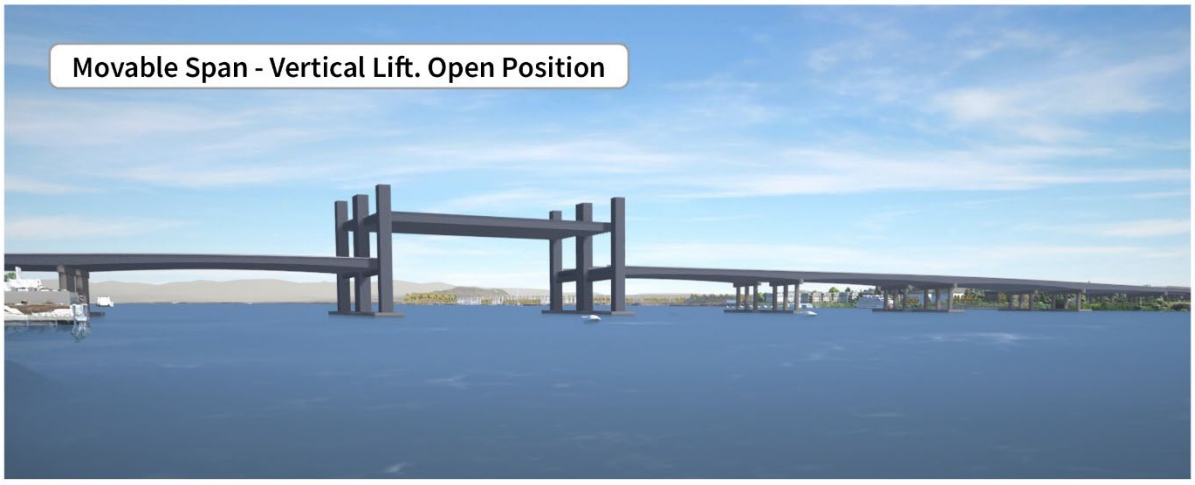
In the open position, the movable span would provide 178 feet of vertical navigation clearance over the proposed relocated primary navigation channel. Similar to the fixed-span configurations, the movable span would provide 400 feet of horizontal navigation clearance for the primary navigation channel 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

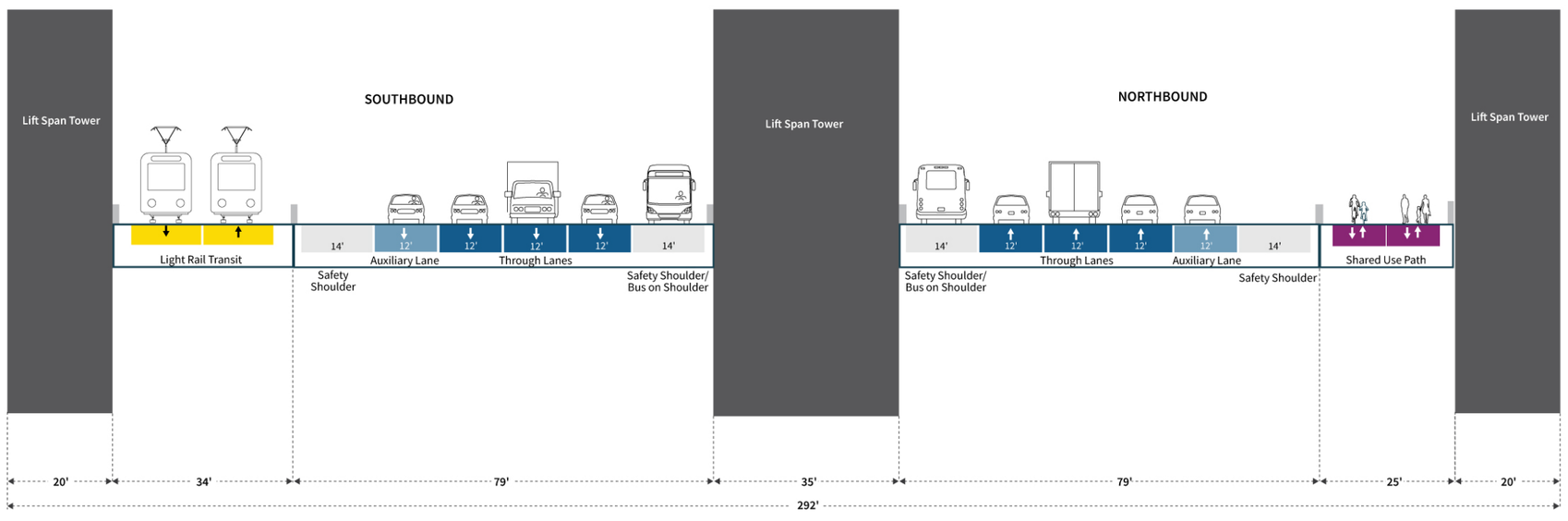


Visualizations are for illustration purposes only. They do not reflect property impacts or represent final design.

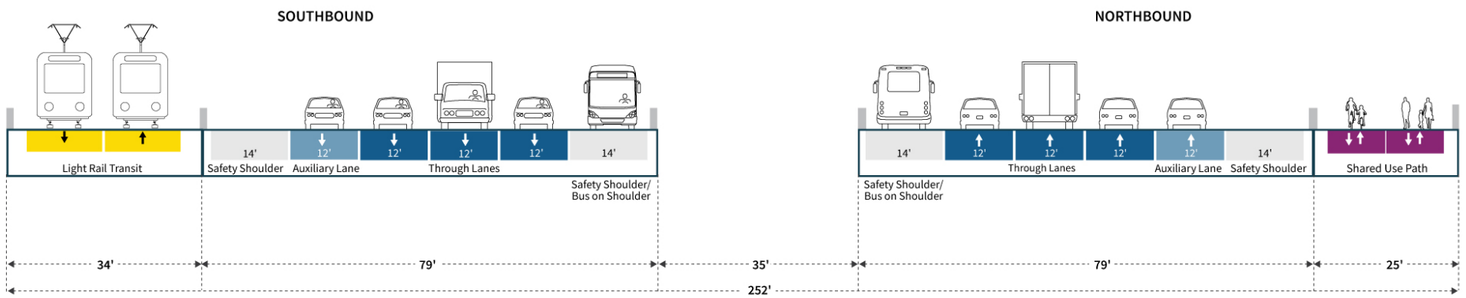
Note: Visualization is looking southeast (upstream) from Vancouver.

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

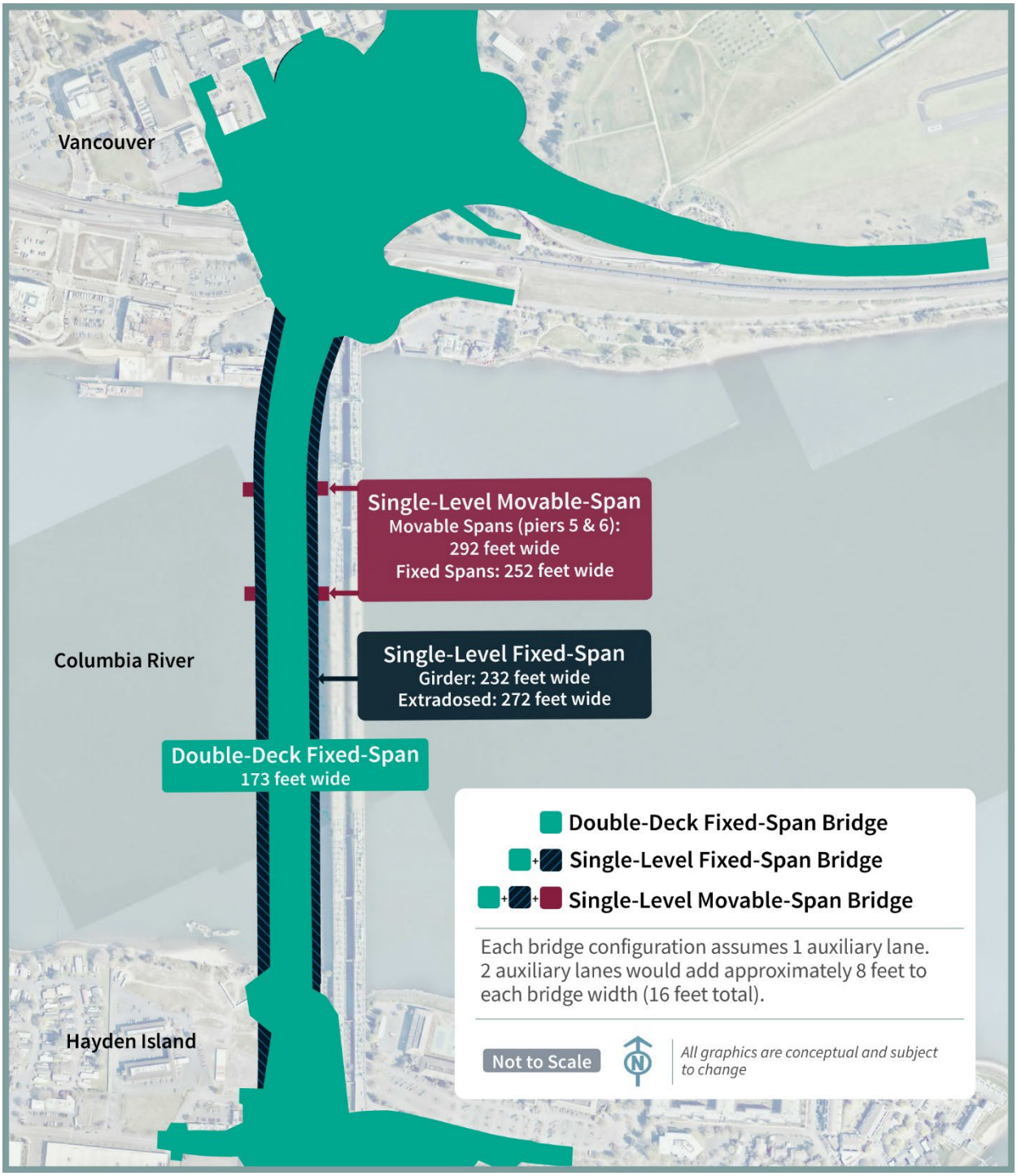
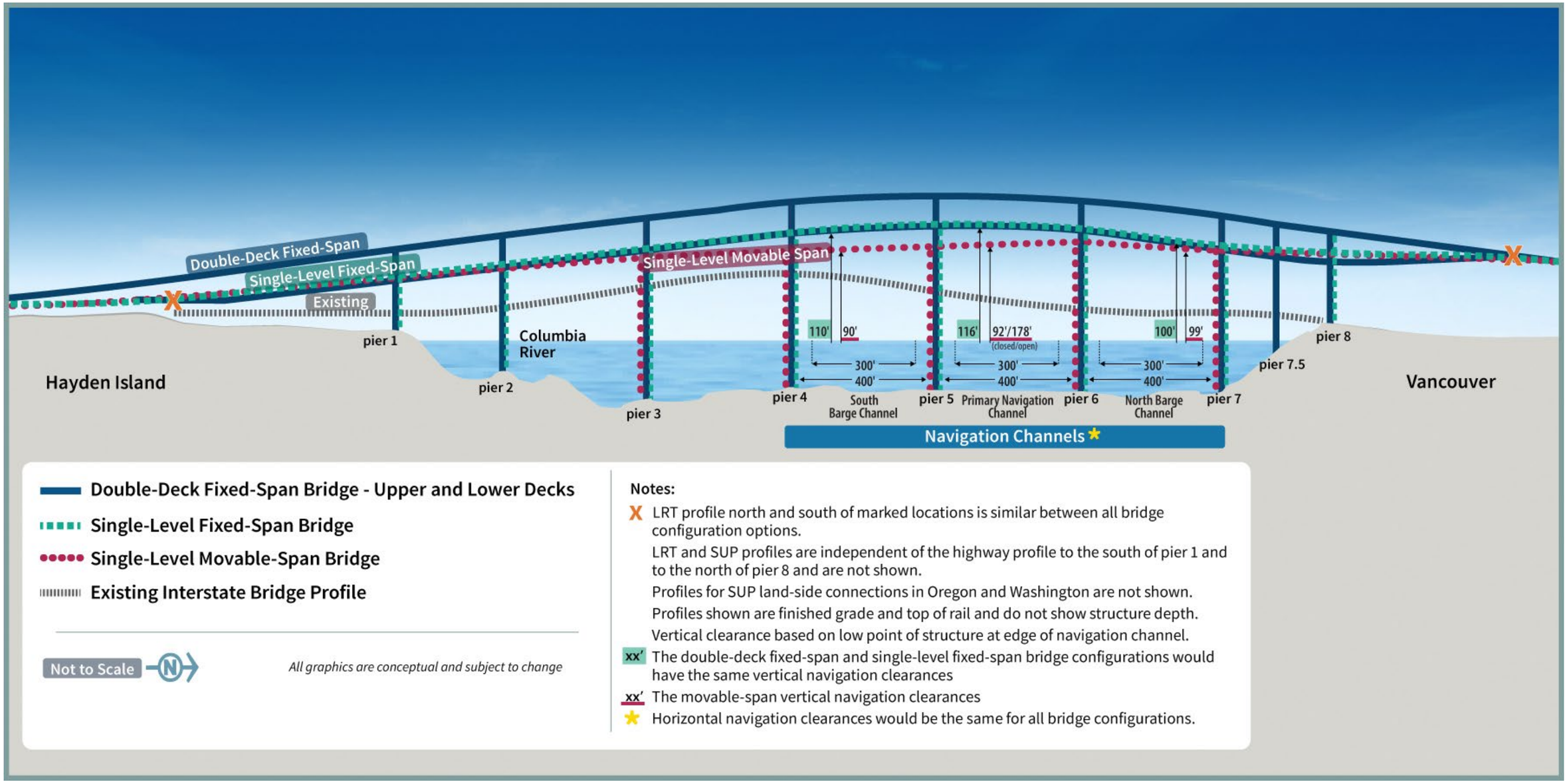


Figure 1-22. Bridge Configuration Profile Comparison



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 2024, there was an average of 152 lifts per year (IBR 2025).	N/A	N/A	• Considering 2007–2024 trends in vessels transiting under the Interstate Bridge, there would be fewer bridge lifts compared to the No-Build Alternative due to increased vertical navigation clearance in the closed position (99 feet compared to 72 feet). • Additional restrictions to daytime bridge openings would be requested to consolidate fewer bridge openings outside of

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
				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 weather conditions. Additional time would also be required to stop traffic prior to opening 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
				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

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
				house tower/equipment for the lift span)
Conceptual vertical grade [f]	4.8%	~4% on the Washington side ~4% on the Oregon side	~3% on the Washington side ~3% on the Oregon side	~1.5% on the Washington side. ~3% on the Oregon side
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

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

1.2.4 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.

1.2.4.1 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).

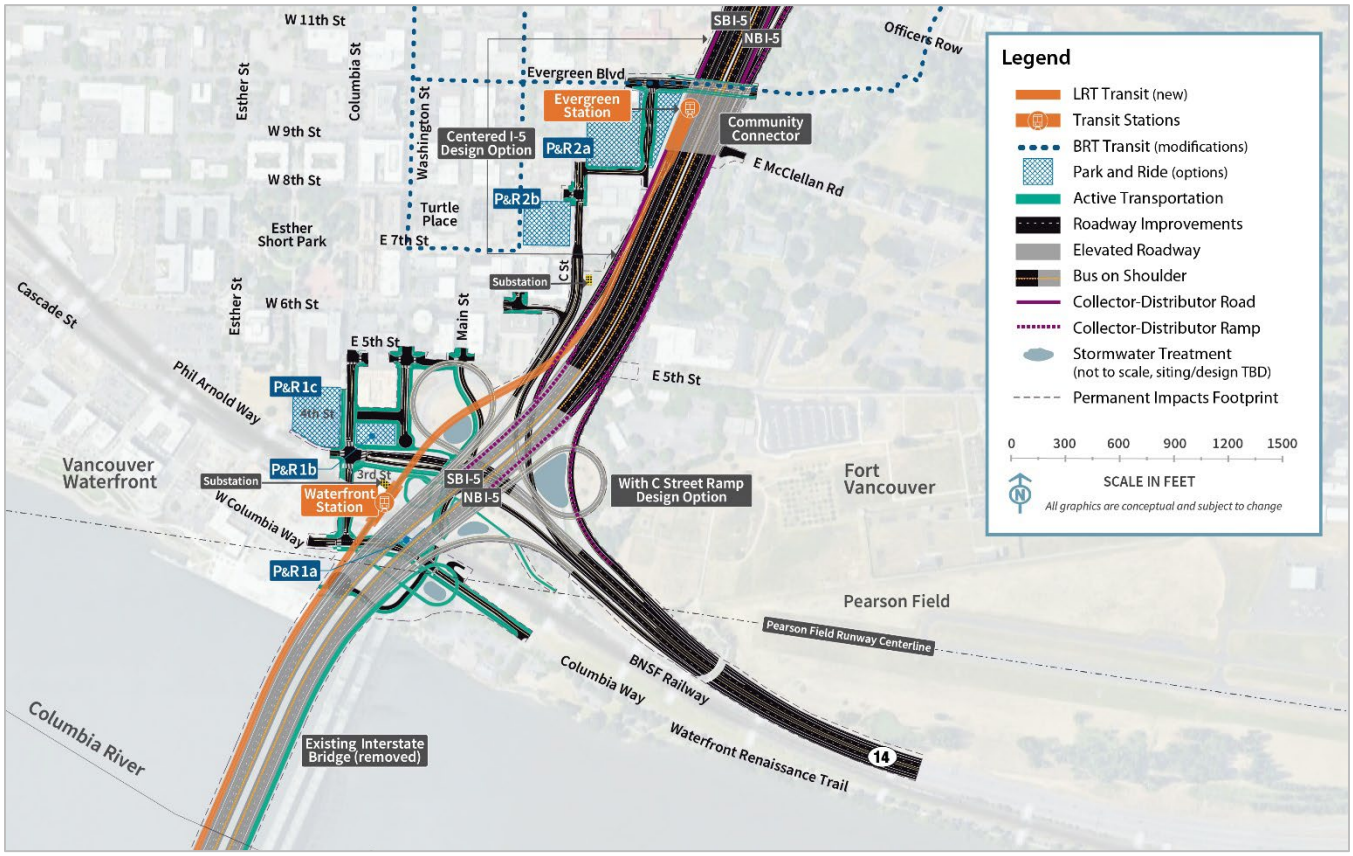
SR 14 INTERCHANGE/DOWNTOWN VANCOUVER

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.

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.

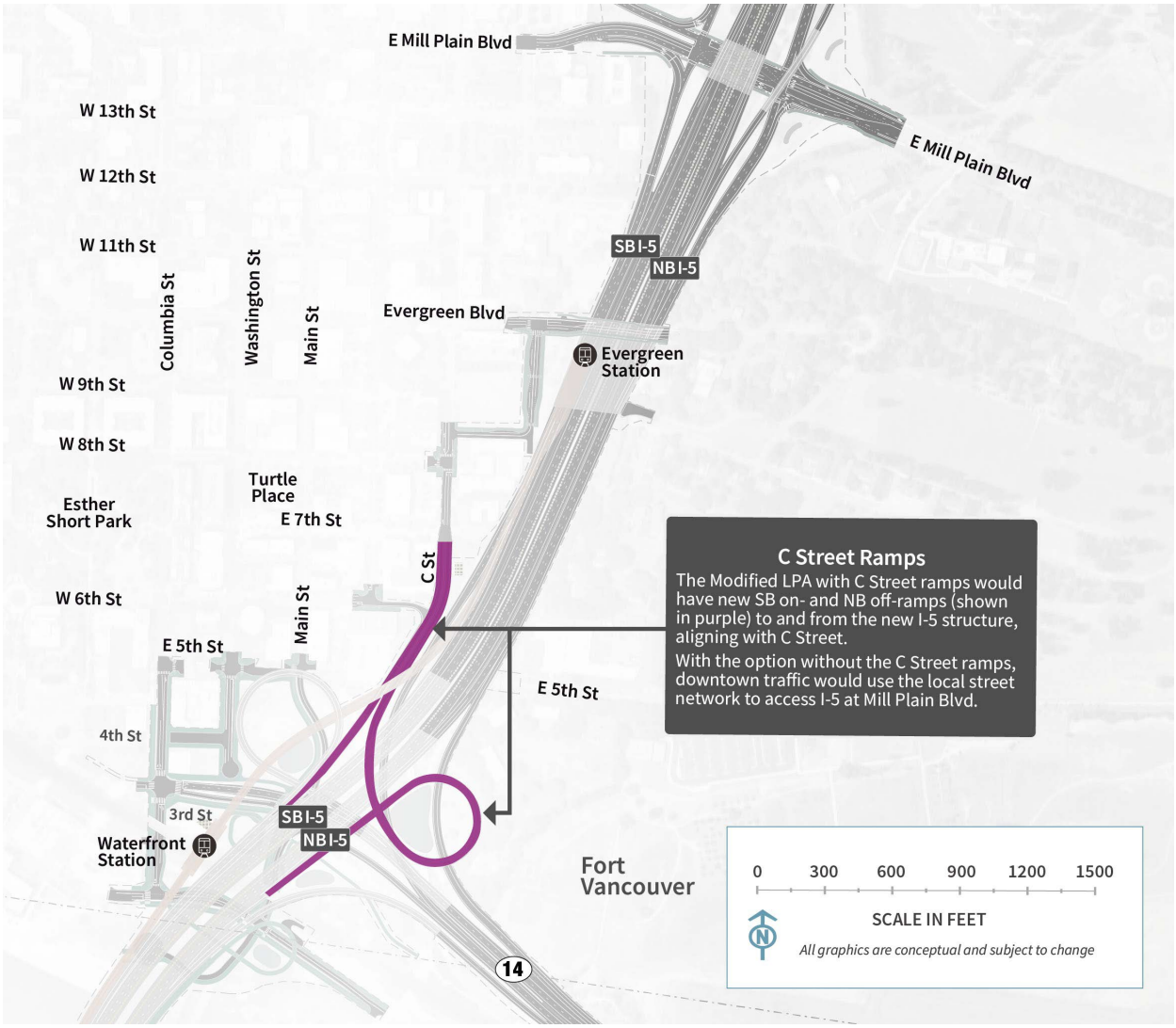
I-5 Shifted West

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

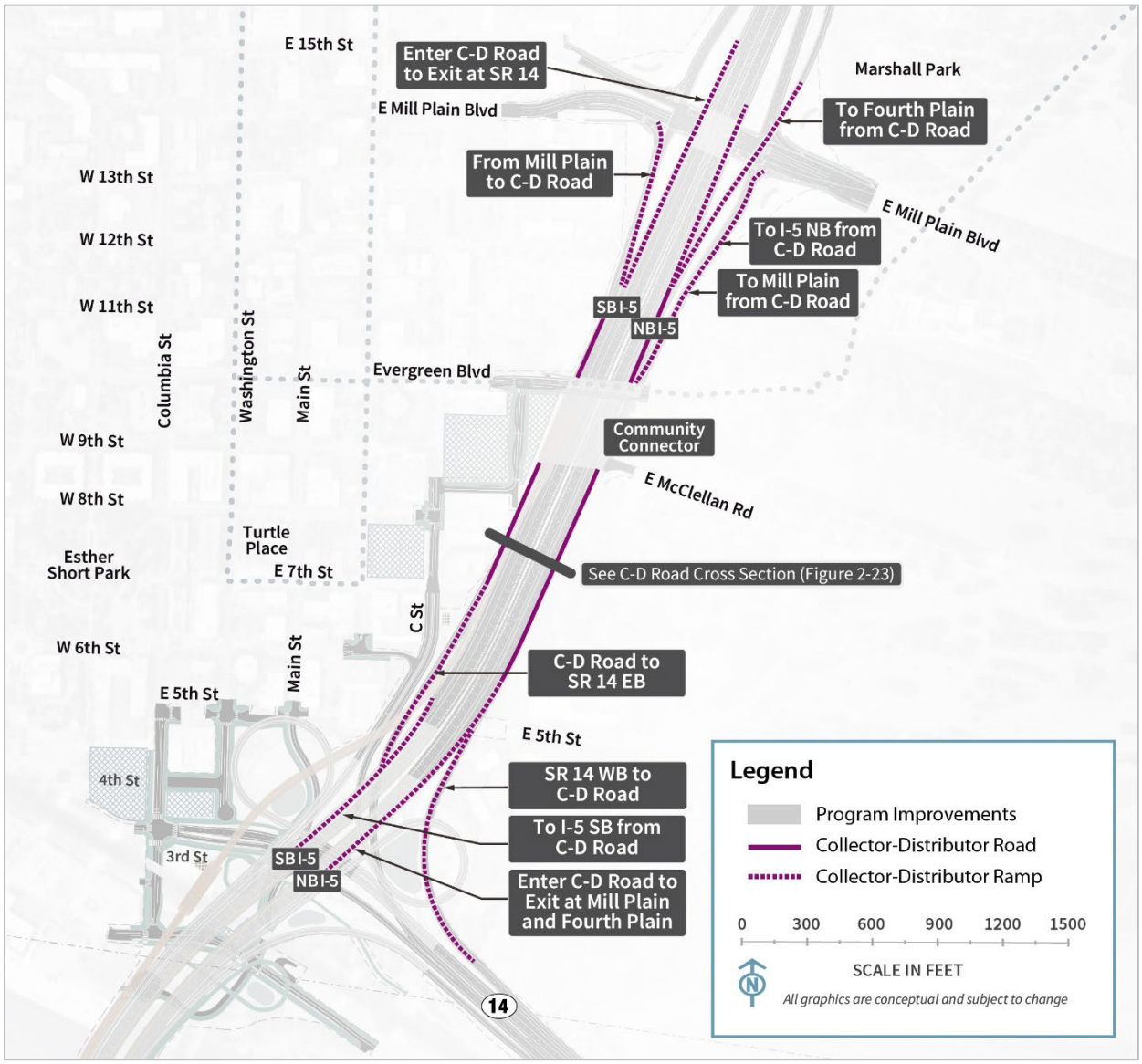
Figure 1-25 shows the location of the collector-distributor (C-D)[11] roadways in downtown Vancouver, and Figure 1-26 shows a typical cross section of the C-D roadways.

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.

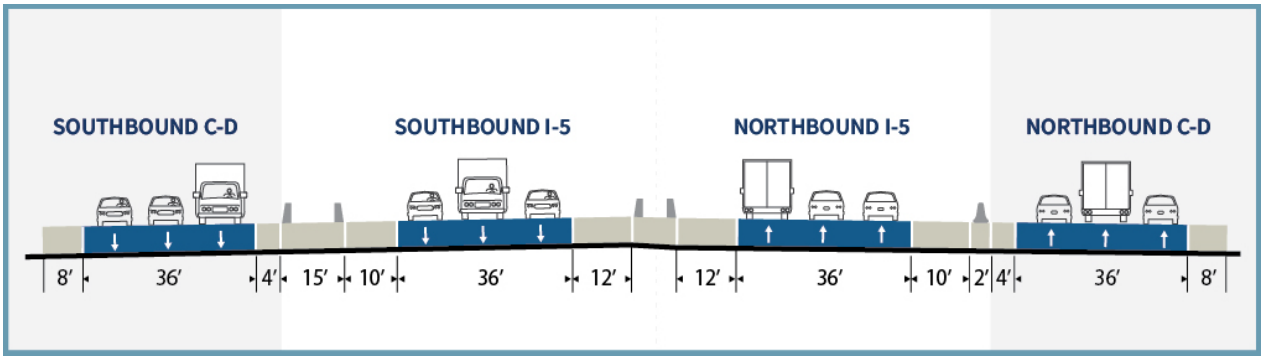
On southbound I-5, the off-ramp to SR 14 would join the southbound I-5 on-ramp from Mill Plain Boulevard to form a C-D roadway. The C-D roadway would provide access from southbound I-5 to the off-ramp to eastbound SR 14 and from Mill Plain Boulevard to the off-ramp to eastbound SR 14 and the on-ramp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

1.2.4.2 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.

1.2.4.3 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.

1.2.5 Upper Vancouver (Subarea D)

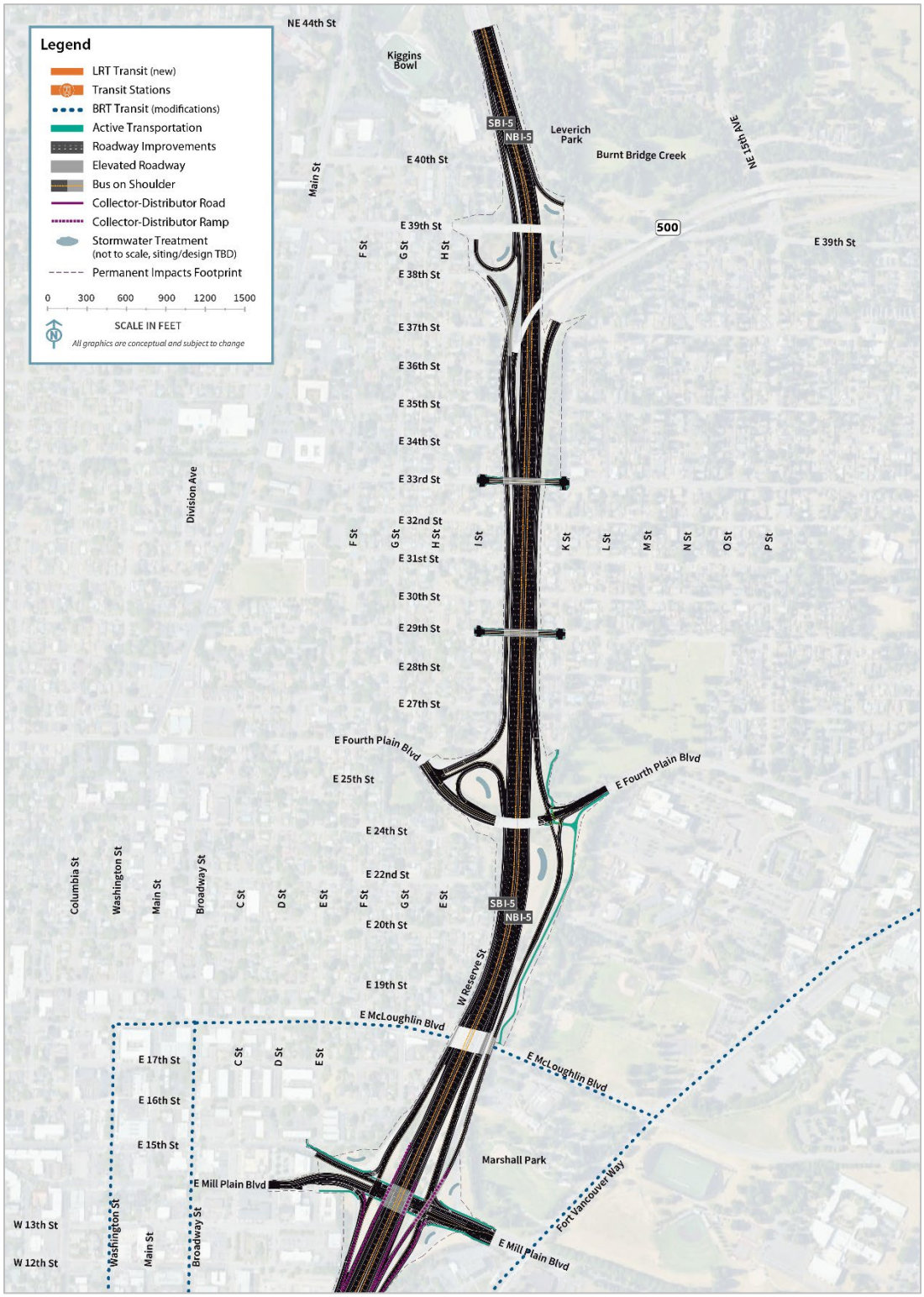
This section discusses the geographic Subarea D (Figure 1-3 shows an overview of the geographic subareas). Figure 1-27 shows all highway and interchange improvements in Subarea D.

1.2.5.1 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.

1.2.5.2 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 1.2.7, Transit Operating Characteristics.

1.2.5.3 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.

1.2.6 Transit Support Facilities

1.2.6.1 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.

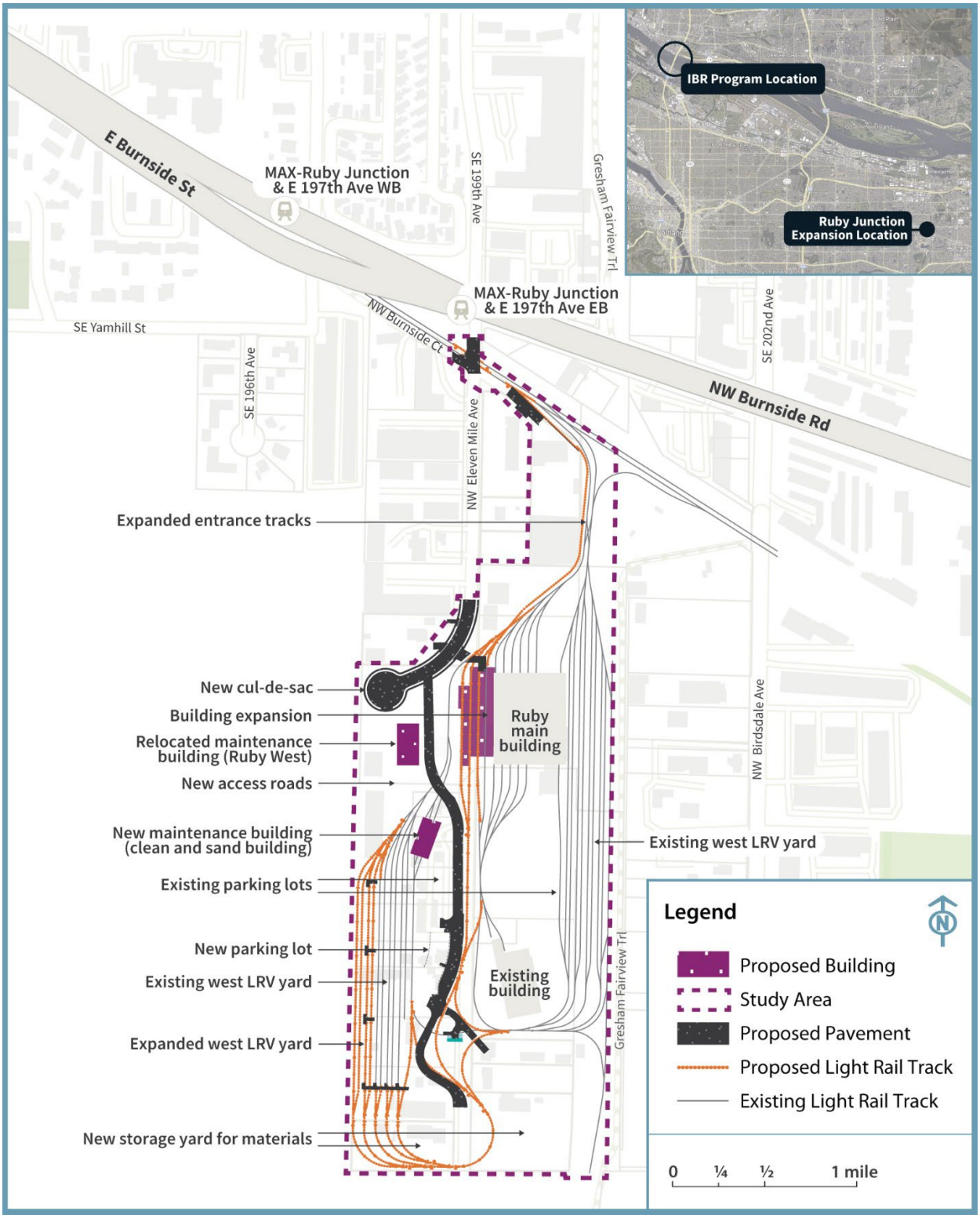
The existing main building would be expanded west to provide additional maintenance bays. Today, Eleven Mile Avenue extends from NW Burnside Road and dead ends at the southern limits of the existing OMF. To make space for the building expansion, the existing Eleven Mile Avenue public right of way would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

1.2.6.2 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.

1.2.6.3 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 1.2.7, Transit Operating Characteristics). Modifications to the facility would accommodate new vehicles as well as maintenance equipment.

Figure 1-29. Expo Center Overnight LRV Facility

1.2.7 Transit Operating Characteristics

1.2.7.1 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.

1.2.7.2 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.

1.2.7.3 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.

1.2.8 Tolling

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

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

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

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

1.2.8.2 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 (ROD) 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."

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.

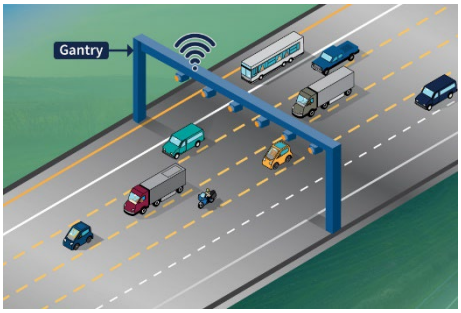
Digital Video Audit System: Various types of cameras monitor traffic flow and equipment locations.

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

1.2.9 Transportation System- and Demand-Management Measures

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

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.

1.2.10 Off-Site Mitigation Sites

The IBR Program will provide off-site mitigation for unavoidable impacts to natural resources, including fish and wildlife species and their habitats, wetlands, surface waters, floodplains, and other regulated habitat features (refer to 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

1.3 Modified LPA Construction

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

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 1.2.8, Tolling).

1.3.1 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

1.3.2 Potential Staging Sites and Casting Yards

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

Two potential major staging sites have been identified (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.

1.4 No-Build Alternative

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

Regional transportation projects included in the No-Build Alternative are those in the financially constrained 2018 *Regional Transportation Plan* (RTP) adopted in December 2018 by the Metro Council (Metro 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 Code of Federal Regulations § 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.

1.5 Changes or New Information Since 2013

The CRC Selected Alternative identified in the 2011 ROD, as revised by the 2012 and 2013 re-evaluations, is referred to as the CRC LPA (CRC 2011, 2012, 2013). Over the past 10+ years since the CRC LPA was identified, the physical environment in the study area, community priorities, and regulations have changed, which necessitated design revisions and resulted in the IBR Program Modified LPA (see Section 2.5.2 of the NEPA/SEPA Final SEIS).

Due to changes in federal policy, the evaluation of potential impacts on EJ populations (originally prepared for the NEPA/SEPA Draft SEIS published in September 2024) is no longer required by NEPA and is not included in the Final SEIS. However, the IBR Program has provided executive direction to include the EJ analysis as supplemental information within the SEPA Addendum to the Final SEIS.

Changes to the EJ analysis that have been made since the 2013 CRC LPA are described below. Note that the methods and terminology used in this analysis, including references to "Environmental Justice," "low-income/minority populations," "meaningfully greater/high-priority EJ areas," and other terms associated with rescinded federal guidance and requirements, were used in the Draft SEIS EJ analysis and are consistent with accepted practices for EJ analysis at that time.

- Updated project information consistent with the IBR Program Modified LPA
- Updated demographic information based on the most recent publicly available U.S. Census data (American Communities Survey 5-Year Estimates, 2019-2023; U.S. Census Bureau 2022)
- Updated EJ analysis methodology to identify "meaningfully greater" and high-priority EJ areas. This methodology is described, and terms are defined, in more detail in Section 2.2.3, below.
- Updated demographic information to identify low-income and minority populations within the study area.
- Evaluated changes in the project footprint necessitated by changed conditions that resulted in shifting the light-rail transit alignment and stations.
- Evaluated design modifications that would reduce residential and commercial property acquisitions.
- Updated analysis of effects on low-income and minority populations resulting from the Modified LPA.
- Updated discussion of the effects on EJ populations that would result from a future IBR Program tolling program.

2. METHODS

This chapter describes the methods used to assess direct, indirect, temporary, long-term and cumulative environmental impacts of the IBR Program on EJ populations. The assessment of environmental impacts to EJ populations is referred to broadly as the "EJ analysis." The Environmental Justice analysis was originally conducted as part of the NEPA/SEPA Draft SEIS in accordance with federal requirements current at the time that document was published. Due to changes in federal guidance, the evaluation of EJ impacts is not currently required under either NEPA or SEPA. However, the IBR Program has provided executive direction to include the EJ analysis as supplemental information within the SEPA Addendum to the Final SEIS.

Per the SEPA Handbook (2025), published by the Washington State Department of Ecology, there is no specific requirement to conduct an environmental justice analysis. However, the handbook recommends considering communities that may already experience higher environmental burdens (e.g., proximity to pollution sources, cleanup sites, industrial facilities, or poor air quality). These communities often face disproportionate environmental burdens relative to the general population and may have fewer resources to offset those effects, contributing to health disparities and lower quality of life (Ecology 2025).

Consistent with the analysis in the Draft SEIS, the EJ analysis in this Technical Report evaluates potential impacts on low-income and minority populations. While the identification of low-income and minority populations is not required by SEPA, the methodology and analysis in the NEPA/SEPA Draft SEIS were developed according to the best practices in use at the time for EJ and have been reviewed and commented on by agencies and the public. Accordingly, the Draft SEIS analysis has been retained in this document to the extent possible while continuing to comply with SEPA requirements.

The following sections describe relevant laws and regulations; methods for collecting data, assessing impacts, and evaluating possible mitigation measures for the Modified LPA; and the EJ study area. These methods are an update to those developed for the CRC project, which completed the NEPA process with a signed ROD in 2011.

2.1 Relevant Laws, Regulations, and Guidance

As noted above, EJ analysis is not required under SEPA, but has been included as supplemental information in the SEPA Addendum at the direction of IBR executive leadership. While there is no current regulatory framework for EJ analysis, various federal, state, and local laws, regulations, and guidance documents provide protections for minority and low-income populations. These references are cited for consistency with prior analyses.

Prior to January 2025, many actions taken or authorized by federal agencies required the evaluation of impacts to environmental justice (EJ populations—defined as minority and low-income populations—as part of compliance with NEPA. In the 30+ years during which EJ analysis was required under NEPA, federal agencies developed a substantial body of regulations and guidance for these

analyses. SEPA, although it requires evaluation of some social and public health effects, does not mandate EJ analysis and provides no specific standards or guidance in this regard.[17]

In January 2025, the two major federal executive orders (EOs) pertaining to EJ, listed below, were revoked; federal agency regulations and guidance implementing those orders were subsequently rescinded. As a result, the EJ analysis was removed from the IBR Program Final SEIS. However, WSDOT decided to include an evaluation of impacts to EJ populations in this separate SEPA analysis conducted for the IBR Program. Accordingly, the methodology used for the EJ analysis in the Draft SEIS was retained for the SEPA evaluation, because it represents an established analytical framework developed over more than 30 years of EJ practice.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued on February 11, 1994, and rescinded on January 21, 2025. EO 12898 required federal agencies to analyze the "disproportionately high and adverse" environmental effects resulting from federal actions on minority and low-income populations. EO 12898 also called for the fair treatment and meaningful involvement of all people, which referred to proactive efforts to increase low-income and minority participation.

On April 21, 2023, the Biden Administration signed EO 14096, Revitalizing Our Nation's Commitment to Environmental Justice for All, which was rescinded on January 21, 2025. EO 14096 directed the federal government to build upon and strengthen its commitment to deliver EJ through an updated definition of EJ, a change in the standard for what constitutes an EJ effect, and an expansion of EJ populations.

Per U.S. Department of Transportation (USDOT) Order 5610.2C (withdrawn on February 3, 2025), determination of a "disproportionately high and adverse effect" depends on whether that effect is (1) predominantly borne by an EJ population, or (2) will be suffered by the EJ population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-EJ population. Determination of disproportionately high and adverse effects considers the mitigation and enhancement measures that are planned for the proposed action.

2.1.1 Federal

Federal civil rights and nondiscrimination regulations are applicable to populations that include low-income and minority individuals. These include:

- **Title VI of the Civil Rights Act of 1964** – Prohibits discrimination on the basis of race, color, or national origin in programs and activities receiving federal financial assistance. This includes the requirement to provide meaningful access to individuals with limited English proficiency.
- **Americans with Disabilities Act of 1990 (ADA)** – Requires public entities and transportation systems to ensure that individuals with disabilities have equal access to services, programs, and activities, including infrastructure and communications.

[17] The State Environmental Policy Act (SEPA) (Chapter 43.21C Revised Code of Washington) and the SEPA Rules (Chapter 197-11 Washington Administrative Code) do not mandate the analysis of impacts to people or communities in specific demographic categories, such as low-income and minority populations. However, the Washington State Department of Ecology's SEPA Handbook encourages the consideration of environmental justice in state-led projects and programs. (Ecology 2025)

- **Section 504 of the Rehabilitation Act of 1973** – Prohibits discrimination on the basis of disability under any program or activity receiving federal financial assistance. This includes requirements for accessible public involvement processes and communications.
- **Title 42 United States Code (U.S.C.) Section 4601**, Uniform Relocation Assistance and Real Property Acquisition Policies for Federal and Federally Assisted Programs (1970)–ensures fair treatment of persons displaced as a result of federally funded projects.

2.1.2 State

There is no legal framework for EJ analysis under SEPA. The IBR Program is not subject to the requirements of the Washington Healthy Environment for All (HEAL) Act, which is intended to address environmental and health disparities among communities of color and low-income households. However, the approach used for the analysis in this Technical Report is generally consistent with how agencies in Washington consider environmental justice in their own policy frameworks. The following Washington State policies and regulations are relevant to the analysis of impacts to low-income and minority populations.

2.1.2.1 Washington

- **Washington's State Environmental Policy Act (SEPA)** requires disclosure and consideration of environmental impacts with attention to impacts that are likely, not merely speculative (Washington Administrative Code 197-11-060). EJ analysis is not required under SEPA; furthermore, SEPA does not define EJ populations nor a methodology for identifying them. However, impacts evaluated under SEPA include social and community effects, which can encompass impacts to EJ populations. The SEPA Handbook (2025), published by the Washington State Department of Ecology, notes that there is no specific requirement to conduct an environmental justice analysis under SEPA, but recommends the consideration of communities that may already experience higher environmental burdens (e.g., proximity to pollution sources, cleanup sites, industrial facilities, or poor air quality) (Ecology 2025).
- **Washington State Growth Management Act, Chapter 36.70A, Revised Code of Washington** – Encourages comprehensive planning that considers environmental health and sustainable economic development. While the Growth Management Act does not explicitly require EJ analysis, it supports the Program's consideration of potential impacts to those communities as part of broader community and environmental health objectives.
- **WSDOT Environmental Policy Statement, 1018.04** – Provides direction on meeting agency responsibilities on environmental and human health, including enhancing decision-making processes to advance environmental justice and reduce disparities between communities (WSDOT 2024). While the HEAL Act is not applicable to the IBR Program, this policy provides agency-level guidance for considering EJ in WSDOT projects and programs, including those not strictly subject to HEAL Act requirements.

2.1.2.2 Oregon

While not applicable to SEPA in Washington, the following Oregon policies are cited as context given the bi-state nature of the IBR Program:

- **Oregon Senate Bill 420 (2007)** – Established a statewide EJ program and framework to address disproportionate impacts on minority and low-income populations through coordination with the Oregon Department of Environmental Quality and other agencies.
- **Oregon Department of Environmental Quality Environmental Justice Policy (DEQ 1997)** – Guides agency efforts to incorporate EJ principles into permitting, planning, and public involvement.

2.1.3 Local

Local comprehensive plans and policy commitments in Portland and Vancouver further reinforce IBR Program direction to consider EJ populations in this supplemental analysis. These documents help guide local decision-making and provide context for community-specific equity priorities:

2.1.3.1 Washington

- City of Vancouver 2011–2030 Comprehensive Plan – Policy IM-13 Diversity. Adopted 2011 (City of Vancouver 2011).
- City of Vancouver 2020 Statement Regarding Racial Equity and Racial Justice. Adopted July 6, 2020 (City of Vancouver 2020).
- RTC Equity Planning Considerations and Framework. September 2023 (RTC 2023).

2.1.3.2 Oregon

- City of Portland 2035 Comprehensive Plan – Policy 2.3, Policy 2.4, Policy 8.32 (Equity and Environmental Justice). Adopted 2018, Amended March 2020 (City of Portland 2018).
- City of Portland's 2022–2025 Climate Emergency Workplan (City of Portland 2022).
- Portland Bureau of Transportation Equity Framework (PBOT 2017).
- Multnomah County Equity & Empowerment Lens. Adopted 2017 (Multnomah County 2015).
- Metro Regional Equity Atlas and Title VI Nondiscrimination Policy. Adopted 2015, updated 2020 (Metro 2020).

2.2 Defining Environmental Justice Populations

EO 12898 instructed federal agencies and recipients of federal funds to integrate EJ into agency missions and to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on low-income and minority populations. Hence, the EJ analysis contained in the NEPA/SEPA Draft SEIS considered all potential impacts of the Modified LPA to determine whether the IBR Program would result in disproportionately high and adverse effects on low-income and minority populations, which are defined as EJ populations.

EJ analysis conducted for the IBR Program defines low-income populations consistent with Federal Highway Administration (FHWA) EJ guidance and the definition established in (now-rescinded) USDOT Order 5610.2C, which stated that a low-income person is an individual whose median household income is at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines (USDOT 2021). The 2025 HHS poverty guideline for a household of four persons is $32,150; however, these guidelines are national and do not reflect distinct state and local economic conditions. Therefore, in previous EJ analyses under the now-rescinded federal EOs and regulations, FHWA allowed localities to adapt poverty thresholds to local standards per the FHWA Environmental Justice Reference Guide (FHWA 2015). This approach was used for the IBR Program EJ analysis.

The first step of the EJ analysis was to identify all EJ populations within the study area using best practices and methods consistent with then-current FHWA guidance (FHWA 2011) and guidance sourced from the publication *Promising Practices for EJ Methodologies in NEPA* (EJ IWG 2016), a compilation of agency approaches for incorporating EJ into environmental reviews published by the Environmental Justice Interagency Working Group. Per this guidance, meaningfully greater analysis uses reasonable, subjective thresholds (e.g., 10% to 20% greater than the reference community) (EJ IWG 2016). To identify EJ populations within the EJ study area, the IBR Program used 2019–2023 American Community Survey (ACS) data at the Census block group level.[18] A threshold-based approach was applied, consistent with methodologies used by federal, state, and regional agencies for similar environmental reviews. The threshold analysis was used to assess concentrations of low-income and minority populations that are meaningfully greater than regional averages (within the Portland-Vancouver metro region). For this analysis:

- Block groups with population shares **1.5 times higher** than the regional average were considered **meaningfully greater**; and

[18] **Block groups** are statistical divisions of census tracts used by the U.S. Census Bureau, consisting of clusters of blocks within the same census tract. Block groups are generally defined to contain between 600 and 3,000 people and are used to present data and control block numbering.

- Block groups with shares **2.0 times higher** than the regional average, or where either population made up more than 50% of the block group total, were considered **high-priority** EJ areas.[19,20]

The purpose of identifying meaningfully greater and high-priority EJ areas is to provide a baseline reference for the relative concentration of where minority and low-income populations are present, and where disproportionately high and adverse effects could occur. Determining meaningfully greater and high-priority EJ areas also provides a reference for where there could be a need for additional outreach and analysis as part of the IBR Program. Although demographic data from the census provide a valuable screening tool, EJ analyses are not based solely on population statistics. The type, magnitude, severity, and proximity of potential impacts are also evaluated to assess whether impacts would be disproportionately high and adverse to EJ populations.

2.2.1 Minority Populations

Minority populations include individuals who identify as part of the following groups:

- Black or African American: a person having origins in any of the black racial groups of Africa.
- Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
- Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent.
- American Indian and Alaskan Native: a person having origins in any of the original people of North America or South America (including Central America).[21]

Tribal governments (federally recognized tribes) are sovereign nations as recognized by the U.S. government, and consultation with federally recognized tribes occurs through a government-to-government consultation process separate and distinct from public and community outreach and comment.

[19] The meaningfully greater thresholds of 1.5 and 2 times the corresponding county or regional average were selected based on the regional significance of the IBR Program, such that the determination of meaningfully greater and high-priority EJ areas was relative to the broader region. These specific thresholds were also used in the Southwest Corridor Light Rail Environmental Impact Statement, another regionally significant program (Metro n.d.).

[20] For the purposes of the IBR Program, the 1.5 and 2 times thresholds were developed based on an interpretation of the FHWA Environmental Justice Reference Guide that allowed localities to adapt poverty thresholds to appropriate local standards (FHWA 2015). As described in Section 2.2 Defining Environmental Justice Populations, TriMet and Metro accept the regional poverty threshold to be 200% of the federal poverty level to better reflect regional living costs and standards (Metro 2015; TriMet 2019). Meaningfully greater block groups indicate areas that are substantially impoverished relative to the Portland-Vancouver region—150%, or 1.5 times, below the "low-income" threshold established for the Program. Block groups 200% or two times below are essentially the lowest-income block groups in the region. The same multipliers were applied to minority populations. Understanding these regional disparities served as one critical component for understanding the potential for disproportionately high and adverse impacts as part of the IBR Program.

[21] Not all American Indian and/or Native American populations are appropriately represented in U.S. Census data because of a history of termination, removal, and assimilation. Furthermore, tribal affiliation, citizenship, and/or sovereignty does not

- Native Hawaiian and other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

2.2.2 Low-Income Populations

EJ analysis conducted for the IBR Program defines low-income populations consistent with FHWA EJ guidance and the definition established in (now-rescinded) USDOT Order 5610.2C, which stated that a low-income person is an individual whose median household income is at or below the HHS poverty guidelines (USDOT 2021). The 2025 HHS poverty guideline for a household of four persons is $32,150; however, these guidelines are national and do not reflect distinct state and local economic conditions. Therefore, in previous EJ analyses under the now-rescinded federal EOs and regulations, FHWA allowed localities to adapt poverty thresholds to local standards per the FHWA Environmental Justice Reference Guide (FHWA 2015). This approach was used for the IBR Program EJ analysis.

In studies similar to this one, agencies have adapted federal poverty thresholds to reflect the local and regional cost of living. As such, TriMet and Oregon Metro (Metro) have established the regional poverty threshold at 200% of the federal poverty level (Metro 2015). Under these regionally accepted standards, a household of four persons making $64,300 or less would be considered low-income in 2025, as shown in Table 2-1.[22]

Table 2-1. Low-Income Populations as Defined for the IBR Program EJ Analysis

Low-Income Guideline	Household of Four	Individual
Federal Poverty Level	$32,150	$15,650
Low-Income (200% of Federal Poverty Level)	$64,300	$31,300

Source: U.S. Department of Health and Human Services Poverty Guidelines (HHS 2025a)
EJ = environmental justice; IBR = Interstate Bridge

For the purposes of the EJ analysis, “low-income populations” refers to any readily identifiable group of low-income persons, as defined above and may include other populations, such as houseless individuals and families, who would also be similarly impacted by the IBR Program.[23]

For additional context, the analysis incorporates low-income housing locations and eligibility for free and subsidized school lunch programs to better characterize low-income populations within the study area.

imply tribal ethnicity and cultural affiliation, and vice versa. Therefore, the EJ analysis recognizes that the demographic analysis based on U.S. Census data is not fully representative of American Indian and/or Native American populations within the EJ study area.

[22] The average size of household in the Portland-Vancouver region is approximately 2.5. Household sizes of one and four were reported based on other recently completed EJ analyses in the region. For the purposes of this analysis, the federal poverty guideline for a four-person household is used.

[23] The EJ analysis limits discussion to low-income and minority populations but acknowledges that other communities, such as houseless populations or limited-English proficiency populations, may also belong to the EJ population. The Equity Technical Report discusses populations not explicitly defined as low-income or minority.

2.2.3 Meaningfully Greater Analyses

For the purposes of this EJ assessment, a "meaningfully greater" analysis was conducted to provide a baseline reference for the relative concentration of where minority and low-income populations exist, and where disproportionately high and adverse effects could occur. Determination of "meaningfully greater" and "high-priority" EJ areas also provides guidance for where additional outreach and more detailed analysis may be warranted as part of the IBR Program.

Evaluating Effects on EJ Populations

Minority and low-income populations with concentrations 1.5 times greater than the corresponding regional average are classified as "meaningfully greater."

Populations 2.0 times or more the regional average are classified as "high-priority."

For the purposes of this analysis, minority and low-income populations with concentrations 1.5 times greater than the corresponding regional average are considered to be "meaningfully greater," while populations 2.0 times or more the regional average are classified as "high-priority." These thresholds were assessed at the block group level using a "proportional split" method to provide consistency in identifying EJ areas of concern and potential disproportionately high and adverse effects.[24]

Table 2-2 defines these values for the Portland-Vancouver-Hillsboro metropolitan area as defined by the U.S. Census.

Table 2-2. High-Priority and Meaningfully Greater Reference Values for EJ Areas in the Portland-Vancouver-Hillsboro Metropolitan Area

Reference Value	Low-Income (200% of Federal Poverty Level)	Minority
Portland-Vancouver-Hillsboro Metropolitan Average	22.3%	30.7%
Meaningfully Greater (1.5x)	33.5%	46.1%
High-Priority (2x)	46.6%	61.4%

Source: American Community Survey 5-Year Estimates 2019–2023 (U.S. Census Bureau 2022)
EJ = environmental justice

Complete findings for the demographic analysis, including the identification of meaningfully and high-priority EJ areas are summarized in Chapter 3, Affected Environment.

[24] A "proportional split" method refers to the GIS technique used to estimate neighborhood-level percentages of meaningfully greater and high-priority EJ populations. Census block group data were allocated to neighborhood boundaries based on the share of each block group's land area within a neighborhood boundary, and the allocated values were aggregated to produce neighborhood-level estimates.

2.2.4 Other Populations

The following populations are not considered EJ populations for purposes of this analysis, but may include some members of EJ populations:

- **Unhoused populations:** According to the U.S. Department of Housing and Urban Development, houseless populations are defined as individuals or families that lack a fixed, regular, and adequate nighttime residence; who have a primary nighttime residence that is in a public or private place that is not designated for regular sleeping accommodations; or who are living in a supervised publicly or privately operated shelter designated to provide temporary living arrangements (42 U.S.C. § 11302). Though houseless populations are not explicitly considered to be low-income populations, it is reasonable to assume that there is an overlap between the two.
- **Limited English Proficiency Populations:** According to HHS, individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English can be considered "limited English proficiency" populations (HHS 2025b). Though limited English proficiency populations are not explicitly considered to be minority populations, it is reasonable to assume that there is overlap between the two.
- **Tribal and Native American Populations:** Minority populations include American Indian and Alaskan persons having origins in any of the original people of North America or South America (including Central America). These populations may also belong to a federally recognized tribes, referring to American Indian or Alaska Native tribal entities recognized as having a government-to-government relationship with the U.S., with the responsibilities, powers, limitations, and obligations attached to that designation, and that are eligible for funding and services from the Bureau of Indian Affairs (BIA 2023). Federally recognized tribes are recognized as possessing certain inherent rights of self-governance (i.e., tribal sovereignty) and are entitled to receive certain federal benefits, services, and protections because of their special relationship with the U.S.

2.3 Study Area

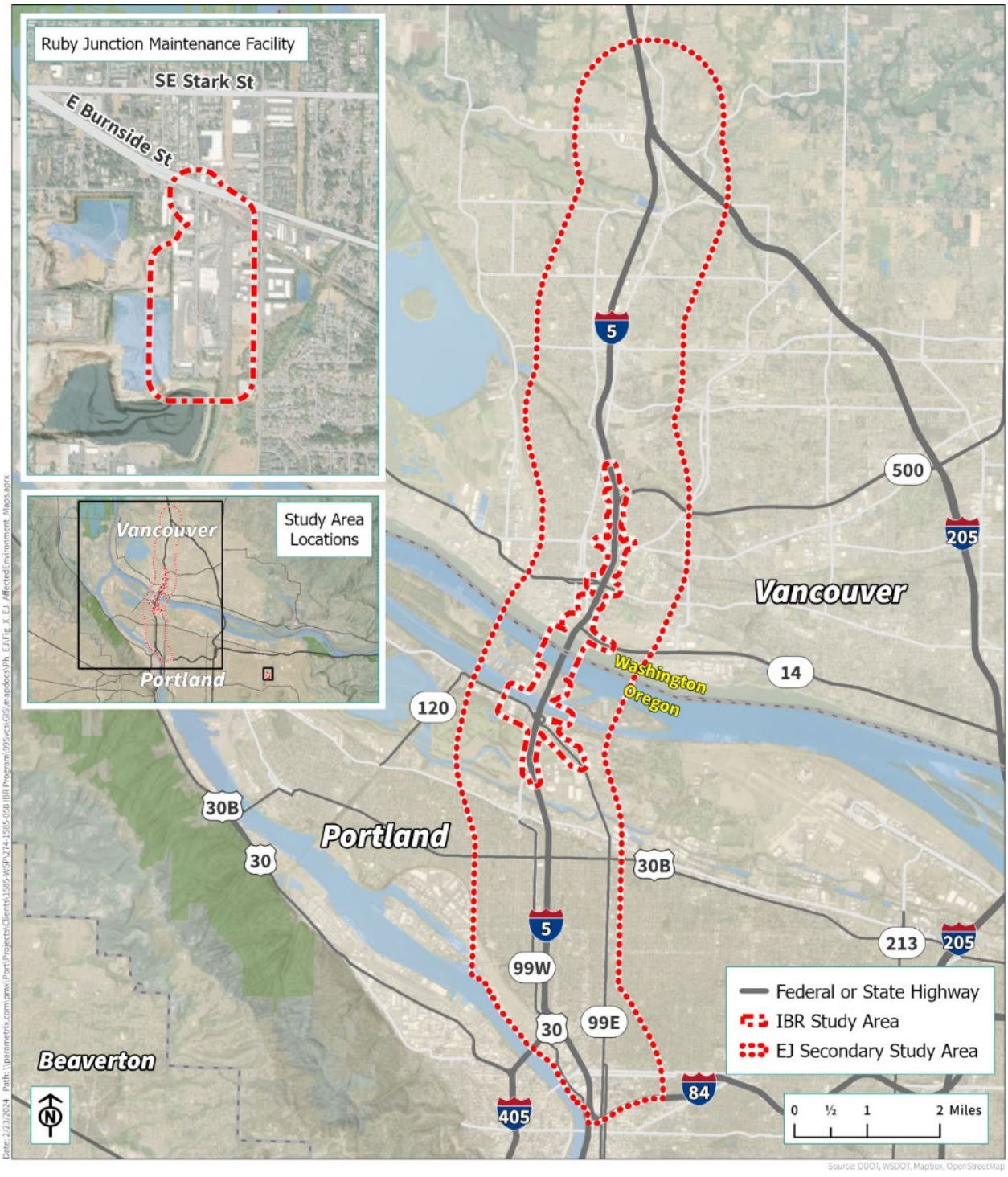
The IBR Program study area, also referred to as the "primary study area," is a 5-mile segment of I-5 approximately between the SR 500 interchange in Washington and the I-5/Columbia Boulevard interchange in Oregon, as well as the Ruby Junction Light-Rail OMF in Gresham, Oregon.

2.3.1 EJ Study Area

Impacts to EJ populations can extend beyond a project's limits. Therefore, this report uses the IBR Program "secondary study area" as the basis for the EJ analysis. The IBR Program secondary study area extends from approximately 1 mile north of the I-5/I-205 interchange in Vancouver, south to the I-5/I-84 interchange, and 1 mile both east and west of I-5. **Therefore, for the purposes of this EJ analysis, references to the "EJ study area" refer to the secondary study area unless noted otherwise.** The EJ study area captures the area where both direct impacts and most indirect impacts

(e.g., traffic and development changes) could occur (Figure 2-1). The EJ study area aims to account for all EJ populations that could be directly and indirectly affected by the Modified LPA.

Figure 2-1. IBR Program Study Area



2.4 Data Collection Methods

The following sections list the data used to determine and describe the existing conditions for EJ populations and to develop a demographic profile for populations that reside within and that travel through the EJ study area.

2.4.1 Demographic Data

U.S. Census data from the ACS 5-Year Estimates, 2019–2023, provided the basis for understanding EJ populations and demographic characteristics within the EJ study area (U.S. Census Bureau 2022). These data were supplemented with other state and local data sources, including the following:

- Free and reduced lunch eligibility data for EJ study area schools from the Oregon Department of Education (ODE 2025) and from the Washington Office of Superintendent of Public Instruction (OSPI 2025).
- Regional population and employment growth information from the Metropolitan Portland Regional Travel Demand Model (Metro 2022).

2.4.2 Spatial Data

Spatial data detailing existing, planned, and future community features (e.g., street and roadway network, geographic boundaries, parks, waterbodies, and community destinations) were used to understand the community context within the EJ study area. The EJ analysis used data published by the Metro Regional Land Inventory System, ODOT TransGIS, the WSDOT GeoData Distribution Catalog, and local agency information from Clark County Public Transit Benefit Area Authority (C-TRAN), TriMet, the City of Vancouver, the City of Portland, and other sources.

2.5 Engagement and Coordination

The IBR Program team is engaged in an ongoing public outreach campaign that offers a wide range of opportunities for public involvement throughout the environmental review process. Engagement and coordination efforts with EJ populations conducted as part of the IBR Program are summarized in the subsections below.

2.5.1 Community Advisory Group, Community Benefits Advisory Group, and Equity Advisory Group

The IBR Program has four advisory groups: the Community Advisory Group (CAG), Equity Advisory Group (EAG), Community Benefits Advisory Group, and Executive Steering Group. The majority of CAG and EAG membership consists of regional community members and partners who were identified and appointed to represent a diverse range of perspectives, including those of low-income and minority populations, as well as representatives from local agencies and community-at-large members. A minority of the members were selected through a public and competitive application process.

The CAG provides input and feedback that reflect community needs, issues, and concerns to influence Program outcomes, including concerns voiced by EJ communities. The EAG provides insight and input on the Program's processes, approaches, and decisions that may affect historically underserved and underrepresented communities, which include EJ communities. Both advisory groups have shaped the screening process that led to the selection of the Modified LPA.

The advisory bodies are involved in a systematic approach for continuous feedback and communication between community members and Program administrators. Input from both the CAG and EAG has informed this report.

2.5.2 Community Engagement Activities

The IBR Program has engaged extensively with partner agencies, tribal governments, and community-based organizations since late 2020 and has been conducting more formal community engagement since January 2021. Through its engagement and outreach activities, the Program team has gathered feedback from residents, community-based organizations, and businesses within the EJ study area and the larger metropolitan area to learn more about the communities impacted by the IBR Program. These efforts included outreach to low-income and minority populations to understand key issues within the EJ study area. The Program team also offered translated materials and interpreter services to engage limited English proficiency populations, including during the Draft SEIS comment period. More information on community engagement can be found in Appendix B, Public Involvement, of the NEPA/SEPA Final SEIS.

The IBR Program is consulting with 10 federally recognized tribes. Federally recognized tribes are sovereign nations as recognized by the U.S. government, and consultation with federally recognized tribes occurs through a government-to-government consultation process separate and distinct from public and community outreach and comment. The government-to-government consultation goals and process are documented in Appendix A, Agency and Tribal Coordination, of the NEPA/SEPA Final SEIS. Additional discussion of federally recognized tribes is included in Section 3.5, Neighborhoods and Communities, of the NEPA/SEPA Final SEIS.

2.5.3 Incorporating Community Feedback

Community input has played a central role in assessing human and environmental impacts and in shaping the development of the Modified LPA, along with guidance from partner agencies, traffic modeling, and other technical expertise. The Program team has incorporated feedback through multiple opportunities for engagement, ensuring that community concerns are considered in design refinements, mitigation strategies, and project enhancements.

In spring 2022, the Modified LPA was submitted to partner agency boards and councils and reviewed by the bi-state legislative committee. The IBR Program technical reports and SEIS provided a detailed analysis of the Modified LPA in compliance with federal environmental review requirements. This review documents the Program's environmental impacts, benefits, and mitigation measures. Community concerns identified through this process have directly informed design refinements, mitigation strategies, and Program enhancements. Key areas of focus have included the following:

- Subsidized and/or low-income tolling policies.
- Investments in high-capacity transit (HCT) and stations in Vancouver.
- Expanding active transportation options across the Columbia River to support transit, walking, and bicycling options.
- Opportunities to improve travel times across the river for both vehicles and transit.
- Employment and workforce development opportunities to help all people, including low-income and minority populations, access jobs that result from construction of the IBR Program improvements.

Ongoing opportunities for community engagement will continue throughout all stages of the IBR Program, ensuring that community input continues to shape planning and decision-making.

2.6 Analysis Methods

2.6.1 Long-Term Impact Assessment Methods

Long-term impacts were evaluated by considering where and how environmental effects from the Modified LPA would occur in areas with identified EJ populations. The analysis specifically examined whether these impacts would be disproportionately high and adverse for EJ populations compared with the general population.

The impact analysis incorporated impact findings derived from several technical reports in the NEPA/SEPA Final SEIS: Acquisitions and Displacements, Neighborhoods and Communities, Land Use, Economics, Visual Quality, Air Quality, Noise and Vibration, and Transportation.

The EJ analysis followed a structured process for evaluating potential impacts to EJ populations:

- **Initial Subject Matter Expert (SME) Review and Consultation:** An initial review of relevant technical reports and consultations with SMEs were conducted to assess whether impacts from the Modified LPA had the potential to affect EJ populations differently than the general population, considering potential disproportionate effects, greater magnitude, or longer duration.
- **Identification of EJ Populations:** Technical analyses from each environmental resource discipline were compared to the locations of EJ populations at the Census block group level, focusing on areas with “meaningfully greater” and “high-priority” concentrations of EJ populations. These block groups were flagged for additional study to gain a deeper understanding of potential impacts. Additional consultations were conducted with SMEs to explore potential avoidance, minimization, and mitigation strategies. Environmental resource topics unlikely to result in significant, adverse, and disproportionate impacts under the Modified LPA were not studied further.
- **Assessment of Impacts:** Identified impacts within meaningfully greater and high-priority EJ areas were studied further to qualitatively determine whether low-income and minority populations would experience a greater share of environmental burdens compared to the general population, after accounting for potential avoidance, minimization, and mitigation

strategies. The analysis also accounted for potential benefits the IBR Program could bring to EJ populations, such as improved seismic resilience, multimodal access, and accessibility upgrades within the EJ study area.

- **Focused Review:** High-priority areas were further evaluated with SMEs to better understand potential disproportionate impacts and identify potential minimization or mitigation strategies.

Table 2-3 summarizes relevant IBR Program environmental resource topics for the EJ analysis.

Table 2-3. IBR Program Environmental Resource Topics – Potential Effects on EJ Populations

Environmental Resource Topic	IBR Program Reference	Relevant to EJ Populations?
Acquisitions and Displacements	Property Acquisitions and Displacements Technical Report	**Yes**; acquisitions and displacements can result in disproportionately high and adverse effects to low-income and minority populations.
Air Quality	Air Quality Technical Report	**Yes**; air quality effects can result in disproportionately high and adverse effects to low-income and minority populations.
Archaeology	Archaeological Resources Technical Report	**Yes**; effects on archaeological resources can result in disproportionately high and adverse effects to tribal and Native American populations.
Aviation	Aviation Technical Report	**No**; effects evaluated were focused on impacts to protected airspace and air navigation hazards.
Climate Change	Climate Change Technical Report	**No**; the analysis focused on regional greenhouse gas emissions and was not designed to assess impacts at the block-group or neighborhood scale used for EJ populations.
Ecosystems	Ecosystems Technical Report	**No**; this analysis evaluated effects on fish, wildlife and plants.
Energy	Energy Technical Report	**No**; this is a larger-scale analysis of energy usage that is not scalable to EJ population areas.
Electromagnetic Fields	Electromagnetic Fields Technical Report	**No**; this is a larger-scale analysis of electromagnetic fields that is not scalable to EJ population areas.
Geologic Hazards	Geologic Hazards Technical Report	**No**; this is a larger-scale analysis of geological hazards that is not scalable to EJ population areas.

Environmental Resource Topic	IBR Program Reference	Relevant to EJ Populations?
Hazardous Materials	Hazardous Materials Technical Report	**No**; effects evaluated were site-specific, whereas EJ population areas were evaluated at a neighborhood level.
Historic Resources	Historic Built Environment Technical Report	**No**; this analysis evaluated historic resources within the context of historical significance under the National Historic Preservation Act Section 106.
Land Use and Economics	Land Use and Economics Technical Reports	**Yes**; land use and economic impacts of the Modified LPA were evaluated to determine whether low-income and minority populations could experience disproportionately high and adverse effects related to changes in land use, access to economic opportunities, or consistency with local development patterns.
Noise and Vibration	Noise and Vibration Technical Report	**Yes**; noise and vibration modeling were assessed to determine whether construction or operations-related noise or vibration would result in disproportionately high and adverse effects on EJ populations.
Social and Community Effects	Neighborhoods and Populations Technical Report	**Yes**; the analysis assessed community cohesion, connectivity, access to services, and other social factors to evaluate whether EJ populations could face disproportionately high and adverse effects compared to non-EJ populations.
Public Services	Public Services Technical Report	**No**; this analysis evaluated effects limited to public services without decreases in services to general and EJ populations.
Transportation	Transportation Technical Report	**Yes**; the analysis evaluated changes in travel patterns, accessibility, and mobility to determine whether EJ populations would experience disproportionately high and adverse effects.
Tolling	Economics Technical Report; Tolling Traffic and Revenue Study	**Yes**; tolling analysis considered potential financial burdens on low-income and minority populations to assess whether disproportionately high and adverse effects would occur.
Utilities	Utilities Technical Report	**No**; this analysis evaluated effects limited to utilities and potential utility relocations without impacts to service.

Environmental Resource Topic	IBR Program Reference	Relevant to EJ Populations?
Visual Resources	Visual Quality Technical Report	**Yes**; the analysis considered whether changes to visual character or viewsheds would result in disproportionately high and adverse effects on EJ populations, particularly in residential areas and community gathering spaces.
Water Quality and Hydrology	Water Quality and Hydrology Technical Report	**No**; this is a larger-scale analysis of water quality, and proposed changes would result in benefits to general and EJ populations.
Wetlands and Jurisdictional Waters	Wetlands and Other Waters Technical Report	**No**; this analysis evaluated wetlands and jurisdictional waters within the context of Clean Water Act Sections 401 and 404, as well as applicable state and local regulations.

EJ = environmental justice; LPA = Locally Preferred Alternative

The long-term impact assessment methods for each of the environmental topics relevant to the EJ analysis are summarized below:

- **Acquisitions and displacements.** The EJ analysis reviews proposed property acquisitions and displacements within census block groups and neighborhoods in the EJ study area to determine impacts to EJ populations. The analysis assesses whether displaced property owners belong to EJ populations and whether EJ populations within the EJ study area would experience disproportionately high and adverse effects compared to the general population.
- **Air quality.** The EJ analysis reviews changes to air quality resulting from the Modified LPA to determine whether EJ populations would be adversely and disproportionately affected by airborne pollutants compared to the general population. The analysis was conducted for the EJ study area and region and reviewed the six criteria pollutants regulated under the National Ambient Air Quality Standards: carbon monoxide, lead, particulate matter, nitrogen dioxide, ozone, and sulfur dioxide.
- **Archaeology.** Construction of the Modified LPA could damage or destroy portions of up to 11 archaeological sites known to be eligible for listing on the National Register of Historic Places. These sites are culturally significant to Native American populations, which are identified minority populations for EJ analysis. An adverse effect on such sites could, therefore, constitute a disproportionately high and adverse effect. An Archaeological Resources Identification, Monitoring, and Treatment Plan has been prepared to address these impacts as part of the IBR Program's Programmatic Agreement under Section 106 of the National Historic Preservation Act. The Program will continue to work with tribes and other consulting parties under the terms of the Programmatic Agreement to evaluate the cultural significance of the sites and provide appropriate mitigation.
- **Land use and economics.** The EJ analysis reviews the economic impact of the Program on low-income and minority populations within the EJ study area by reviewing several economic

factors, such as the potential effects of business and employee displacements, changes to land uses in block groups with high concentrations of EJ populations, and the impact of tolling.

- **Noise and vibration.** Noise impacts were evaluated in block groups with high concentrations of EJ populations within the EJ study area. The noise and vibration analysis uses noise sample location data and noise modeling to compare existing and future noise and vibration levels. Adverse noise impacts were evaluated to determine whether they would be disproportionately high and adverse compared to the general population. Noise impacts were identified in the Hayden Island, Rose Village, Arnada, Shumway, and Esther Short neighborhoods.
- **Social and community effects.** The EJ analysis evaluates the potential for displacement of community resources, community organizations, and service providers and impacts on community cohesion in block groups with high concentrations of EJ populations within the EJ study area. The analysis evaluates whether adverse impacts to community resources or community cohesion caused by the Program could be predominantly borne by EJ populations compared to the general population. The EJ analysis also considers potential impacts and access changes to facilities and services used by EJ populations, including healthcare centers, community facilities, and social service providers that serve low-income and minority populations.
- **Transportation.** The EJ analysis reviews adverse long-term transportation impacts resulting from implementation of the Program. A range of impacts were considered, including long-term changes to access, traffic impacts, public transportation impacts, and impacts to the nonmotorized transportation system. The analysis assesses whether these adverse transportation impacts would disproportionately burden block groups with high concentrations of EJ populations in the EJ study area.
- **Tolling.** The EJ analysis evaluates two potential I-5 corridor pricing scenarios—a typical commuter trip profile, and toll costs as a percentage of median household income—to assess whether tolling impacts would result in disproportionately high and adverse effects on EJ populations in the EJ study area.
- **Visual resources.** The EJ analysis evaluates adverse impacts to views and visual resources to determine whether they could cause disproportionately high and adverse effects on block groups with high concentrations of EJ populations.

The long-term impact assessment methods also account for potential benefits the IBR Program could bring to EJ communities, such as improved seismic resilience, multimodal access, and accessibility upgrades within the EJ study area.

2.6.2 Temporary Impact Assessment Methods

Temporary impacts refer to direct, one-time or short-term effects limited to the duration of construction and staging activities. Construction impacts were referenced from other SEIS technical reports (listed above) and were used to determine impacts to EJ populations. Key environmental resource topics that were evaluated as part of the temporary impact assessment are summarized below:

- **Acquisitions and displacements.** The EJ analysis reviews construction-related, temporary impacts to properties within the EJ study area including temporary construction easements and staging impacts. The analysis determines whether adverse property impacts would disproportionately burden block groups with high concentrations of EJ populations compared to the general population.
- **Access impacts.** The EJ analysis reviews construction-related impacts to business and residential access for all modes of transportation. The analysis determines whether temporary access impacts would disproportionately burden block groups with high concentrations of EJ populations within the EJ study area.
- **Detours and rerouting.** The EJ analysis reviews construction-related detours and rerouting impacts within the EJ study area. The analysis determines whether temporary detours and rerouting impacts would disproportionately burden block groups with high concentrations of EJ populations compared to the general population.
- **Noise and vibration.** The EJ analysis reviews construction-related, temporary noise impacts in block groups with high concentrations of EJ populations within the EJ study area. The analysis uses similar methods to the long-term impacts analysis and relies on noise sample data and modeling to determine whether construction-related impacts would disproportionately burden EJ populations compared to the general population.

The temporary impact assessment followed the same structured process for evaluating potential impacts to EJ populations described in Section 2.6.1.

2.6.3 Indirect Impact Assessment Methods

Indirect impacts include potential growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, along with related effects on air, water, and other natural systems that may result in disproportionate impacts to low-income and minority populations. Indirect impacts are described in Chapter 6, Indirect Effects.

The indirect impact assessment followed the same structured process for evaluating potential impacts to EJ populations described in Section 2.6.1.

2.6.4 Cumulative Impacts

The Washington SEPA Handbook defines cumulative effects (also known as cumulative impacts) as impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (or projects) (Ecology 2025). Review of

cumulative effects includes consideration of the existing environment plus the impacts of the proposed project, including any future project phases. As described in the Cumulative Effects Technical Report, past transportation projects have directly and adversely affected EJ populations in the I-5 corridor, most notably the widespread residential and business displacements associated with the 1960 construction of I-5 through North Portland. Please refer to the Cumulative Effects Technical Report for details on the cumulative effects of the IBR Program.

3. AFFECTED ENVIRONMENT

This chapter describes current physical and social conditions in the area where the Program may directly or indirectly affect EJ populations:

- *Direct effects* are those caused by the Program that occur at the same time and place.
- *Indirect effects* happen farther from the bridge construction area or later in time, such as changes in traffic or economic conditions that may affect EJ populations and other communities.

As noted in Section 2.3, the EJ study area for the analysis is broad, encompassing both direct and indirect effect areas. The EJ study area includes the areas from the Lloyd District/I-84 in Portland, north to where the I-5 and I-205 highways merge in Washington. Given the diffuse nature of some impacts (e.g. air quality, regional traffic impacts, etc.), the analysis considers regional effects where relevant. Section 3.1, Regional Conditions, reviews existing conditions in the Portland-Vancouver region. Section 3.2, Study Area Conditions focuses on existing conditions within the EJ study area.

3.1 Regional Conditions

The Portland-Vancouver region refers to the six-county metropolitan statistical area (MSA) composed of Multnomah, Washington, Clackamas, and Yamhill Counties in Oregon, and Clark and Skamania Counties in Washington. The following sections describe regional conditions for the Portland-Vancouver MSA.

3.1.1 Populations, Households, and Employment

The Portland-Vancouver metropolitan area has experienced years of rapid growth and is expected to continue growing. Table 3-1 shows historical population, household, and employment data for the Portland-Vancouver metropolitan area. As of 2023, approximately 2.5 million people live in the six-county region, representing an increase of about 640,000 people between 2000 and 2023. Assuming the average rate of population growth in this period, the regional population is expected to grow to approximately 3.3 million by 2040. However, the population is projected to grow at a slightly slower rate than it has in recent years.[25] Under the same assumptions, the region will grow to 1.6 million households and 1.8 million jobs over the next 20 years (Metro 2015).

[25] The population forecast described in this section assumes a simple annual growth rate of 1.6% projected over 21 years from the base year of 2019 for discussion purposes only. The IBR Program will conduct more rigorous population forecasting and regional modeling outside of the scope of this technical report.

Table 3-1. Population, Employment, and Housing

Parameter	2000	2023	2040	Change (2000–2023)	Average Growth Per Year (2000–2019)
Population	1,874,500	2,510,529	3,267,537	33.9%	1.6%
Households	575,000	1,000,418	1,589,128	74.0%	3.3%
Employment [a]	958,000	1,297,840	1,779,783	35.5%	1.8%

Source: U.S. Census Bureau, Tables P1, B03002, and DP03 (U.S. Census Bureau 2000, 2022)
a Employment is total salary and wage employment.

3.1.1.1 Employment

The economy of the Portland-Vancouver region has steadily grown over the last two decades. Table 3-2 summarizes historical and projected employment in the Portland-Vancouver region by industry sector for 2002, 2019, and 2040. Total jobs in the area increased from 897,741 jobs in 2002 to approximately 1,192,662 jobs in 2022. Assuming the same average growth rate per year between 2002 and 2019, the greater Portland-Vancouver metropolitan area is expected to employ over 1.5 million individuals by 2040 (BLS 2024).

From 2002 to 2022, all major industry sectors in the region experienced positive growth except Mining, Quarrying, Oil and Gas Extraction, Finance and Insurance, and Manufacturing. Management of Companies and Enterprises; Professional, Scientific, and Technical Services; and Health Care and Social Assistance experienced the largest annual growth rates in the region. Average annual growth rates are expected to slow between 2019 and 2040 compared to the growth experienced between 2000 and 2022. The Transportation and Warehousing industry—an industry that would directly benefit from improved regional connectivity resulting from the IBR Program—increased 63.3% from 2002 to 2022 and is expected to grow from 54,635 jobs in 2022 to 85746 jobs in 2040 (BLS 2024).

Table 3-2. Employment by Industry

Industry	Actual 2002	Actual 2022	Change 2002–2022	Average Growth Per Year 2002–2022	Forecast 2040
Agriculture, Forestry, Fishing and Hunting	12,531	15,850	26.5%	1.3%	19,628
Mining, Quarrying, and Oil and Gas Extraction	858	605	-29.5%	-1.5%	444
Utilities	3,902	6,262	60.5%	3.0%	9,671
Construction	48,511	77,077	58.9%	2.9%	117,926
Manufacturing	118,675	116,947	-1.5%	-0.1%	115,414
Wholesale Trade	53,315	55,840	4.7%	0.2%	58,220

Industry	Actual 2002	Actual 2022	Change 2002–2022	Average Growth Per Year 2002–2022	Forecast 2040
Retail Trade	98,537	116,420	18.1%	0.9%	135,436
Transportation and Warehousing	33,463	54,635	63.3%	3.2%	85,746
Information	25,109	32,010	27.5%	1.4%	39,928
Finance and Insurance	41,573	41,218	-0.9%	0.0%	40,901
Real Estate and Rental and Leasing	18,254	21,027	15.2%	0.8%	23,902
Professional, Scientific, and Technical Services	46,341	86,980	87.7%	4.4%	155,630
Management of Companies and Enterprises	19,321	40,951	112.0%	5.6%	82,211
Administration & Support, Waste Management and Remediation	52,881	73,814	39.6%	2.0%	100,111
Educational Services	74,537	93,350	25.2%	1.3%	114,555
Health Care and Social Assistance	94,474	170,865	80.9%	4.0%	295,209
Arts, Entertainment, and Recreation	13,731	18,080	31.7%	1.6%	23,234
Accommodation and Food Services	69,627	91,788	31.8%	1.6%	118,081
Other Services (Excluding Public Administration)	35,856	41,796	16.6%	0.8%	48,028
Public Administration	36,245	37,147	2.5%	0.1%	37,979
Total Employment	**897,741**	**1,192,662**	**32.9%**	**1.6%**	**1,545,288**

Source: BLS 2024

According to the labor force statistics published by the U.S. Bureau of Labor Statistics, minority workers account for approximately 24% of the total U.S. labor force across all industries (BLS 2024). The largest share of minority workers are employed in the health care and social assistance, retail trade, and manufacturing industries, accounting for approximately 37% of all minority workers in the U.S. There are also high concentrations of minority workers in specific occupations in the retail trade, manufacturing, and service industries. For example, minority workers account for more than 40% of workers employed in nail salons and other personal care services, taxi and limousine services, bus service, and urban transit occupations.

3.1.1.2 Unemployment

Table 3-3 summarizes unemployment rates for the Portland-Vancouver region compared to statewide rates for Oregon and Washington, and the U.S. over the most recent 20-year period for which data are available (2005 through 2025), in 5-year increments. From 2005 to 2025, the average unemployment rate in the Portland-Vancouver MSA (5.8%) was roughly the same as in the U.S. (6.2%), but lower than in Washington (6.0%) and in Oregon (6.1%). During the same period, the Portland-Vancouver MSA unemployment rate trended the same or higher than in Washington and the nation, but lower than in Oregon. By 2015, the regional unemployment rate was lower than rates in each state and nation, aside from 2020, when unemployment in the Portland-Vancouver MSA jumped higher than the unemployment rate in Oregon. The economic recession (2008) and global pandemic (2020) likely contributed to the unemployment spikes seen in 2010 and 2020, respectively. Since 2020, unemployment rates in the region, states, and nation have sharply reduced. These trends are consistent for the region, states, and nation.

Table 3-3. Comparison of Unemployment Rates within the Portland-Vancouver Region

Year	Portland-Vancouver MSA	Washington	Oregon	U.S.
2005	5.9%	5.6%	6.2%	5.1%
2010	10.1%	9.1%	10.7%	9.6%
2015	5.1%	5.4%	5.5%	5.3%
2020	7.8%	8.4%	7.6%	8.1%
2025	4.8%	4.5%	4.9%	4.2%
20-Year Average (2005–2025)	5.8%	6.0%	6.1%	5.8%

Source: BLS 2024
MSA = metropolitan statistical area

The most recent unemployment information (July 2025) shows a 4.8% unemployment rate for the region, a 4.8% unemployment rate for Oregon, and a 4.5% unemployment rate for Washington. The nation's unemployment rate for this period is 4.2%.

3.1.1.3 Median Household Income

Table 3-4 compares median household incomes for the Portland-Vancouver region to the states of Oregon, Washington, and the U.S. between 2016 and 2023. In 2016, the median household income of the region was approximately $69,000—higher than Oregon, Washington, and the nation. By 2023, median household income in the Portland-Vancouver region rose to approximately $95,000, which is higher than Oregon and the nation, but roughly the same as Washington. During the 7-year period from 2016 to 2023, median income in the region, Oregon, and Washington increased by 51%, while the national median income increased by 42%.

Table 3-4. Median Household Income within the Portland-Vancouver Region

Area	2016	2021	2023	Change 2016–2023
Portland-Vancouver MSA	$62,772	$82,901	$94,573	+51%
Oregon	$53,270	$70,084	$80,426	+51%
Washington	$62,848	$82,400	$94,952	+51%
U.S.	$55,322	$69,021	$78,538	+42%

Sources: U.S. Census Bureau, 2016, 2021, 2023. American Community Survey, 5-Year Estimates, Table S1901
MSA = metropolitan statistical area

3.1.1.4 Poverty

Following the Office of Management and Budget's Statistical Policy Directive 14, the U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty (U.S. Census Bureau 2025). If a family's total income is less than the family's threshold, then that family and every individual in it are considered to be in poverty. The likelihood that a household earns below the federal poverty level increases with household size.

HHS updates poverty thresholds annually. Table 3-5 summarizes the most recent federal poverty thresholds. According to these thresholds, a one-person household earning $16,650 or less is considered in poverty (HHS 2025a).

Table 3-5. Federal Poverty Level – 2025 Thresholds

Number in Household	Poverty Threshold
1	$15,650
2	$21,150
3	$26,650
4	$32,150
5	$37,650

Source: HHS 2025a

3.1.1.5 Low-Income Populations

Eligibility for federal programs is often determined by using a multiplier of the federal poverty level. For the purposes of the EJ analysis, "low-income populations" refer to households at 200% or less of the federal poverty level, consistent with analysis practices set by TriMet and Metro to reflect regional living costs and standards (Metro 2015). Table 3-6 summarizes low-income populations within the Portland-Vancouver region compared to Oregon and Washington as a whole. The percentage of low-income populations in the region (22.3%) is lower than in Washington (22.8%) and in Oregon (27.6%) (U.S. Census Bureau 2022).

Table 3-6. Low-Income Populations within the Portland-Vancouver Region

Area	Low-Income Population	Low-Income Percentage
Portland-Vancouver MSA	553,421	22.3%
Oregon	1,146,463	27.6%
Washington	1,732,800	22.8%

Source: American Community Survey 5-Year Estimates, 2019–2023, Table C17002 (U.S. Census Bureau 2022)
MSA = metropolitan statistical area

3.1.1.6 Minority Populations

Table 3-7 summarizes minority populations within the Portland-Vancouver region compared to Oregon and Washington as a whole. The percentage of minority populations is higher in the Portland-Vancouver region (30.7%) than in Oregon (27.7%) but lower than in Washington (35.7%) (U.S. Census Bureau 2022).

Table 3-7. Minority Populations within the Portland-Vancouver Region

Area	Minority Population	Minority Percentage
Portland-Vancouver MSA	771,867	30.7%
Oregon	1,173,103	27.7%
Washington	2,765,055	35.7%

Source: American Community Survey 5-Year Estimates, 2019–2023, Table B03002 (U.S. Census Bureau 2022)
MSA = metropolitan statistical area

Table 3-8 summarizes Portland-Vancouver region minority populations by racial and ethnic category compared to Oregon and Washington as a whole.

Table 3-8. Portland-Vancouver Metropolitan Statistical Area Population by Race

Area	White Alone (Race)	Black or African American Alone (Race)	American Indian and Alaska Native Alone (Race)	Asian Alone (Race)	Native Hawaiian and Other Pacific Islander Alone (Race)	Some Other Race Alone (Race)	Two or More Races	Hispanic or Latino (Ethnicity)
Portland-Vancouver MSA	69.3%	2.9%	0.4%	6.9%	0.5%	0.5%	6.1%	13.5%
Oregon	73.3%	1.8%	0.7%	4.4%	0.4%	0.5%	5.6%	14.3%
Washington	64.3%	3.8%	0.8%	9.3%	0.7%	0.5%	6.5%	14.1%

Source: American Community Survey 5-Year Estimates, 2019–2023, B03002 (U.S. Census Bureau 2022)
MSA = metropolitan statistical area

The Portland-Vancouver region, Oregon, and Washington have similar racial and ethnic proportions. Generally, the racial proportions of the Portland-Vancouver region fall between the racial and ethnic makeup of Oregon and Washington, though the region contains a lower percentage of Hispanic or Latino residents and American Indian and Alaska Native residents than both Oregon and Washington.

3.1.2 Transportation Characteristics

Table 3-9 shows the means of transportation used to work in the Portland-Vancouver region. The majority of the working population in the region drove to work (70.4%), including people who drove alone or carpooled. This is followed by people who worked from home (20.4%) and used public transport (3.7%). Active transportation commuters, such as cyclists and walkers, make up 4.5% of the commuter transportation mode share (U.S. Census Bureau 2022).

Table 3-9. Means of Transportation to Work in the Portland-Vancouver Metropolitan Statistical Area

Means of Transportation to Work	Mode Share
Car/Truck/Van (Alone)	62.7%
Car/Truck/Van (Carpool)	7.7%
Public Transport	3.7%
Bicycle	1.4%
Walked	3.1%
Worked from Home	20.4%
Taxicab, Motorcycle, or Other Means	1.2%

Source: American Community Survey 5-Year Estimates 2019–2023, Table S0801 (U.S. Census Bureau 2022)

3.2 Study Area Conditions

The following sections describe concentrations of EJ populations within the EJ study area.

3.2.1 Minority Populations

Table 3-10 summarizes non-white, minority populations living in U.S. Census block groups within the contiguous portion of the EJ study area, which does not include Gresham (U.S. Census Bureau 2024). Minority populations account for approximately 31.4% of the population within the EJ study area, representing approximately 56,000 people, which is comparable to the percentage of minority populations in the Portland-Vancouver region as a whole (30.7%, Table3-7). Within the EJ study area, Portland block groups have a higher percentage of minority residents (33.0%) than block groups in Vancouver (30.4%).

Table 3-10. Minority Populations in the EJ Study Area

Area	Minority Population	Percentage Minority
Portland Block Groups	25,191	33.0%
Vancouver Block Groups	30,344	30.4%
EJ Study Area Total	**56,147**	**31.4%**

Source: American Community Survey 5-Year Estimates, 2019–2023, Table B03002 (U.S. Census Bureau 2024)

Table 3-11 summarizes minority populations within the Rockwood neighborhood in Gresham. Demographics for Gresham are reported separately to account for its distance from the EJ study area adjacent to the Interstate Bridge, distinct community characteristics, and separate but related set of improvements under the Modified LPA (Ruby Junction Light-Rail OMF).

Table 3-11. Minority Populations in the Ruby Junction Portion of the EJ Study Area (Gresham)

Area	Minority Population	Percentage Minority
Gresham Block Groups (Rockwood)	7,964	58.6%

Source: American Community Survey 5-Year Estimates, 2019–2023, Table B03002 (U.S. Census Bureau 2024)
EJ = environmental justice

Figure 3-1 and Figure 3-2 map the percentage of minority populations living within EJ study area block groups for Portland and Vancouver, respectively.

Table 3-12 summarizes minority populations in the contiguous EJ study area by race and ethnicity (U.S. Census Bureau 2024). White residents make up the largest share (68.6%) of the total population within the EJ study area. The second-largest racial group in the EJ study area are Hispanic or Latino populations (13.4%), followed by two or more races populations (6.7%) and Black or African American populations (5.6%). Table 3-13 reports minority populations by race and ethnicity in the Rockwood neighborhood in Gresham.

A comparison of block groups in Portland and Vancouver shows that the EJ Study Area in Portland is more racially diverse than the EJ Study Area in Vancouver. . Portland block groups in the EJ study area have higher concentrations of Black or African American, Native Hawaiian and other Pacific Islander, and two or more races. However, Vancouver block groups have higher concentrations of Hispanic or Latino populations and Asian populations in the EJ study area compared to Portland. Concentrations of American Indian and Alaska Native are roughly equal in Portland and Vancouver block groups within the EJ study area.

Figure 3-1. Percentage Minority by Block Group – Portland

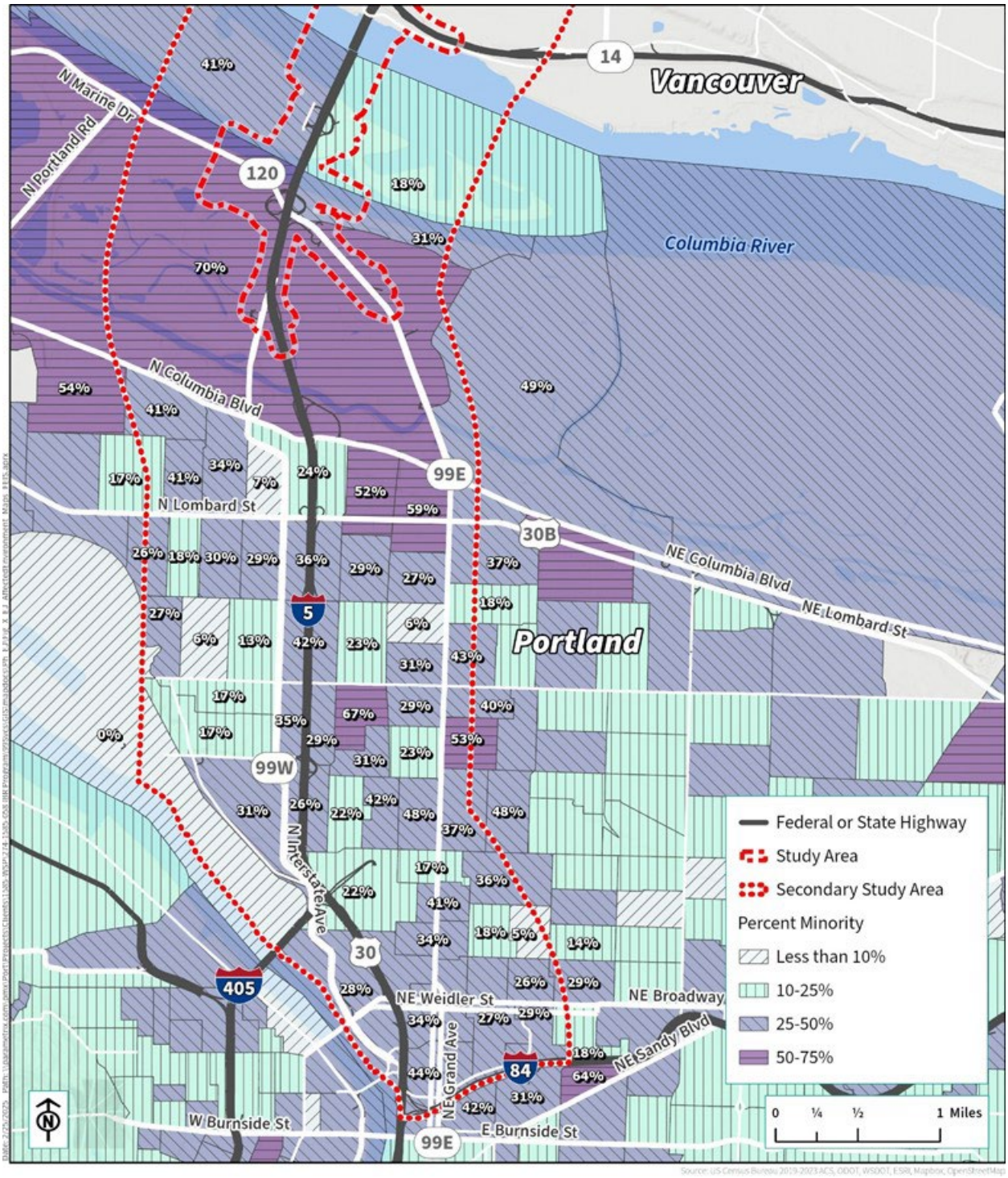


Figure 3-2. Percentage Minority by Block Group – Vancouver

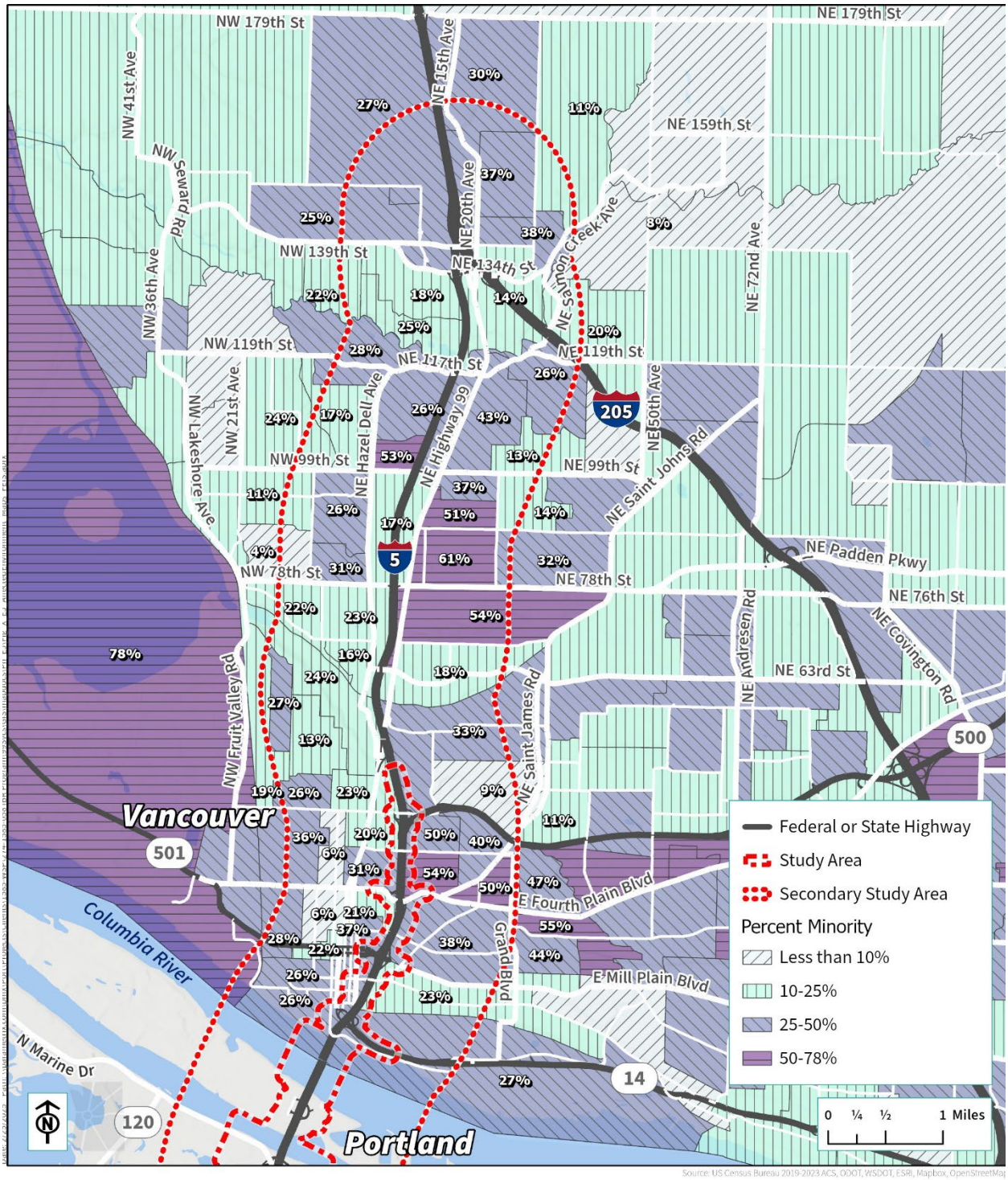


Table 3-12. Minority Populations in the EJ Study Area by Race and Ethnicity

Area	White Alone (Race)	Black or African American Alone (Race)	American Indian and Alaska Native Alone (Race)	Asian Alone (Race)	Native Hawaiian and Other Pacific Islander Alone (Race)	Some Other Race Alone (Race)	Two or More Races	Hispanic or Latino (Ethnicity)	Non-White Total
Portland Block Groups	67.0%	8.5%	0.5%	3.7%	0.6%	0.8%	7.1%	11.8%	33.0%
Vancouver Block Groups	69.6%	3.5%	0.5%	3.9%	0.5%	0.7%	6.5%	14.8%	30.4%
EJ Study Area Total	**68.6%**	**5.6%**	**0.5%**	**3.8%**	**0.5%**	**0.8%**	**6.7%**	**13.4%**	**31.4%**

Source: American Community Survey 5-Year Estimates 2019–2023, Table B03002 (U.S. Census Bureau 2024)
EJ = environmental justice

Table 3-13. Minority Populations in the EJ Study Area by Race and Ethnicity (Gresham)

EJ Study Area	White Alone (Race)	Black or African American Alone (Race)	American Indian and Alaska Native Alone (Race)	Asian Alone (Race)	Native Hawaiian and Other Pacific Islander Alone (Race)	Some Other Race Alone (Race)	Two or More Races	Hispanic or Latino (Ethnicity)	Non-white Total
Gresham Block Groups (Rockwood)	41.4%	6.8%	0.2%	8.6%	1.0%	1.1%	4.6%	36.5%	58.6 %

Source: American Community Survey 5-Year Estimates, 2019–2023, Table B03002 (U.S. Census Bureau 2024)

3.2.1.1 Meaningfully Greater and High-Priority Minority Areas

Additional analysis was done to assess block groups with meaningfully greater concentrations of minority populations compared to the Portland-Vancouver region as a whole. As discussed in Section 2.2.3, low-income and minority populations 1.5 times greater than the corresponding regional average are considered “meaningfully greater,” and low-income and minority populations with 2 times the average are considered high-priority areas in the EJ analysis. Minority populations represent 31.4% of the total population in the Portland-Vancouver region (Table 3-10); therefore, percentages above 47.1% are considered meaningfully greater, and percentages above 62.8% are considered high-priority. These block groups are shown in Figure 3-3.

As shown in Figure 3-3, more block groups with minority populations greater than the regional average are located east of the I-5 corridor. Also, more block groups with a greater-than-regional-average minority concentration are located in the areas closest to the Interstate Bridge crossing, with fewer block groups exceeding 26% minority concentration farther north and south along the I-5 corridor.

The high EJ concentration areas shown in Figure 3-3 are the areas where there could be disproportionately high and adverse effects on minority populations. Therefore, the analysis of effects on minorities in this report is focused on those areas. However, it is important to note that there still could be disproportionately high and adverse effects in census block groups that do not meet the meaningfully greater thresholds.

Figure 3-3. Minority Populations - Meaningfully Greater and High-Priority Block Groups

3.2.2 Low-Income Populations

EJ analysis conducted for the IBR Program defines low-income populations consistent with FHWA EJ guidance and the definition established in (now-rescinded) USDOT Order 5610.2C, which stated that a low-income person is an individual whose median household income is at or below the HHS poverty guidelines (USDOT 2021). The 2025 HHS poverty guideline for a household of four persons is $32,150; however, these guidelines are national and do not reflect distinct state and local economic conditions. Therefore, in previous EJ analyses under the now-rescinded federal EOs and regulations, FHWA allowed localities to adapt poverty thresholds to local standards per the FHWA Environmental Justice Reference Guide (FHWA 2015). This approach was used for the IBR EJ analysis.

In studies similar to this one, agencies have adapted federal poverty thresholds to reflect the local and regional cost of living. TriMet and Oregon Metro (Metro) have established the regional poverty threshold at 200% of the federal poverty level (Metro 2015; TriMet 2019). Under these regionally accepted standards, a household of four persons making $64,300 or less would be considered low income in 2025, as shown in Table 3-14.[26] These higher regional thresholds were used for the IBR Program EJ analysis.

Table 3-14. Low-Income Populations as Defined for the IBR Program EJ Analysis

Low-Income Guideline	Household of Four	Individual
Federal Poverty Level	$32,150	$15,650
Low-Income (200% of Federal Poverty Level)	$64,300	$31,300

Source: U.S. Department of Health and Human Services Poverty Guidelines (HHS 2025).

For the purposes of the EJ analysis, “low-income populations” refers to any readily identifiable group of low-income persons, as defined above, and may include other populations, such as houseless individuals and families

Table 3-15 summarizes low-income populations living in U.S. Census block groups within the EJ study area (U.S. Census Bureau 2024). Low-income populations account for 25.2% of the population within the EJ study area, representing a population of approximately 45,000. Within the EJ study area, Vancouver block groups have a higher percentage of low-income populations (26.1%) than block groups in Portland (24.9%), which is comparable to the percentage of low-income populations in the Portland-Vancouver region as a whole (25.2%, Table 3-6).

[26] The average size of a household in the Portland-Vancouver region is approximately 2.5 residents. Household sizes of one and four were reported based on other recently completed NEPA EJ analyses that have been performed in the region. For the purposes of this analysis, the federal poverty guideline for a four-person household are used.

Table 3-15. Low-Income Populations in the EJ Study Area

Area	Low-Income Population	Low-Income Percentage
Portland Block Groups	18,885	24.9%
Vancouver Block Groups	25,647	26.1%
EJ Study Area Total	**44,678**	**25.2%**

Source: American Community Survey 5-Year Estimates, 2019–2023, Table C17002 (U.S. Census Bureau 2022)
EJ = environmental justice

Table 3-16 summarizes low-income populations within the Rockwood neighborhood in Gresham. Demographics for Gresham are reported separately to account for its distance from the EJ study area adjacent to the Interstate Bridge, distinct community characteristics, and separate but related set of improvements under the Modified LPA (Ruby Junction Light-Rail OMF).

Table 3-16. Low-Income Populations in the EJ Study Area (Gresham)

Area	Low-Income Population	Percentage Low-Income
Gresham Block Groups (Rockwood)	5,646	41.9%

Source: ACS 5-Year Estimates, 2019–2023, Table C17002 (U.S. Census Bureau 2022)
EJ = environmental justice

Figure3-4 and Figure 3-5 map the percentage of low-income populations living within EJ study area block groups for Portland and Vancouver, respectively.

Figure 3-4. Low-Income Populations by Block Group – Portland

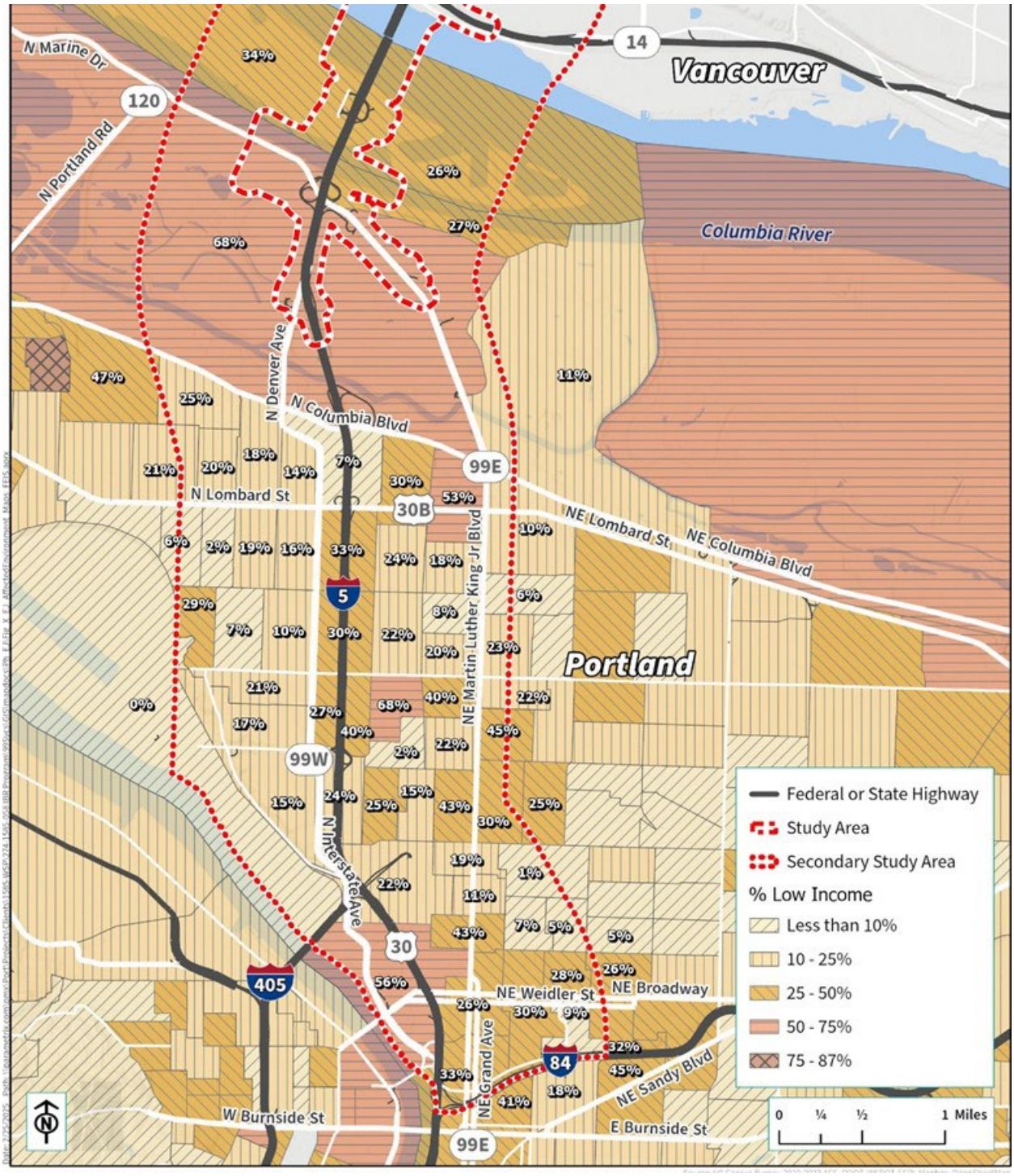


Figure 3-5. Low-Income Populations by Block Group – Vancouver

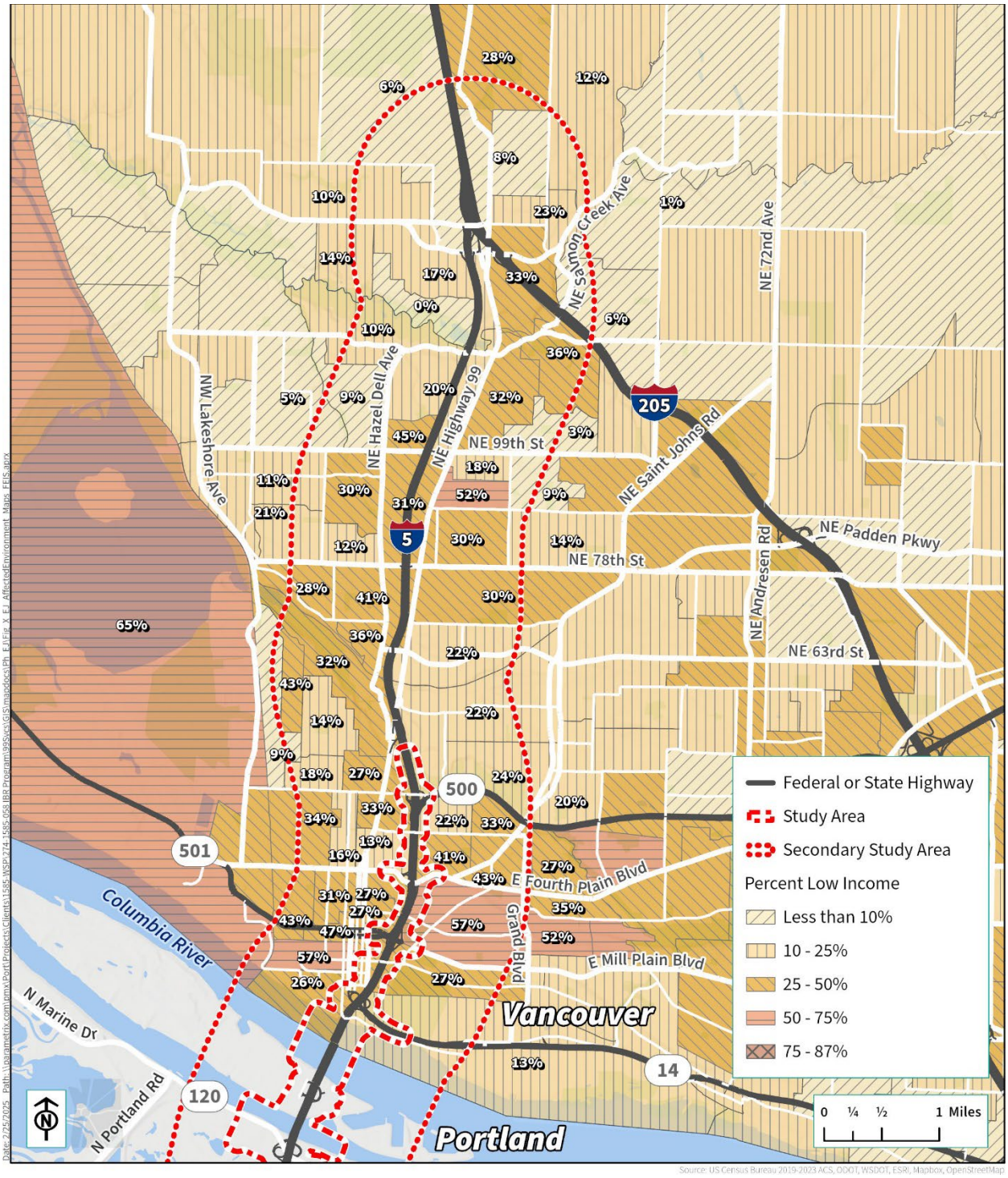


Table 3-17 shows a comparison of additional demographics for the study areas, as well as the Portland-Vancouver metro area (U.S. Census Bureau 2024). For the purpose of the EJ analysis, low-income populations refer to households earning less than 200% of the federal poverty level. The table also includes the percentage of families that earn less than 100% of the federal poverty level and median household incomes. In general, the IBR Program study area and the EJ secondary study area both have higher percentages of low-income populations than the Portland-Vancouver region.

Table 3-17. Comparison of Additional Income Demographics

Area	Families Below Federal Poverty Level	Low-Income Population	Median Household Income
IBR Primary Study Area	5.9%	32.5%	$72,307
EJ Study Area (Secondary Study Area)	7.6%	25.2%	$99,183
Portland-Vancouver MSA	6.0%	22.3%	$94,573

Source: American Community Survey 5-Year Estimates, 2019–2023, Tables B17010, C17002, S1901 (U.S. Census Bureau 2024)
EJ = environmental justice; IBR = Interstate Bridge Replacement; MSA = metropolitan statistical area

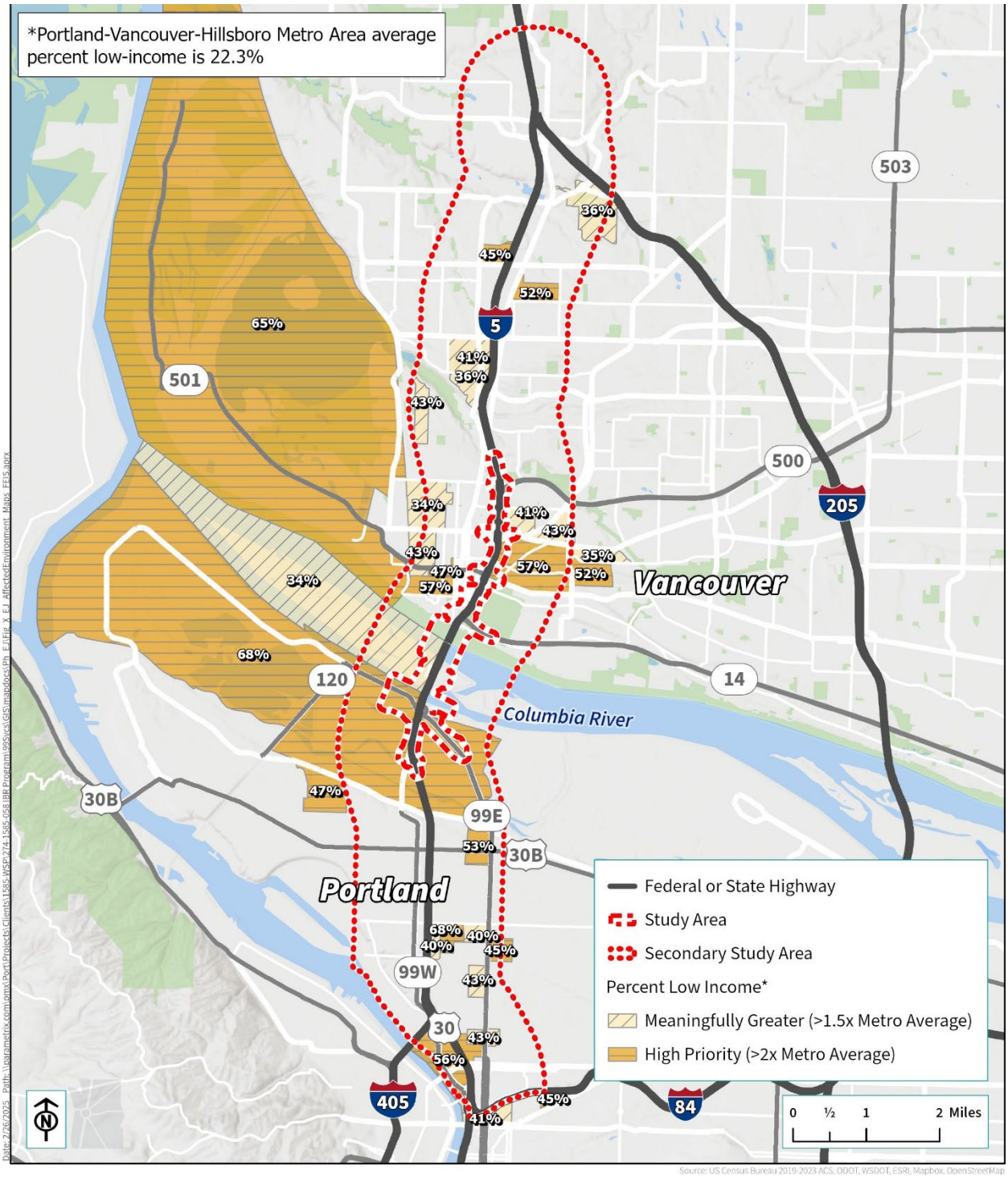
3.2.2.1 Meaningfully Greater and High-Priority Low-Income Areas

This analysis identifies block groups with higher concentrations of low-income populations compared to the Portland-Vancouver region as a whole. Low-income populations represent 22.3% of the total population (Table 3-17); therefore, block groups with low-income populations higher than 33.5% are considered meaningfully greater, and those above 44.6% are considered high-priority. These block groups are shown in Figure 3-6.

The high EJ concentration areas in Figure 3-6 are where low-income populations may face the most disproportionately high and adverse effects as a result of the IBR Program. This report focuses its analysis on those areas, though impacts could still occur in block groups below these thresholds.

This analysis also considers low-income housing locations and eligibility for free and subsidized school lunch programs, providing further insight into low-income populations.

Figure 3-6. Low-Income Populations – Meaningfully Greater and High-Priority Block Groups



3.2.2.2 Low-Income Housing

A number of subsidized housing units, public housing projects, and other low-income housing sites are located within the Vancouver side of the EJ study area, as shown in Figure 3-7. These housing sites rely upon a number of different funding sources and programs, including housing vouchers, tax credits, and others.

Three low-income housing developments are of particular interest from an EJ perspective because of their location within high-priority EJ areas in Esther Short (Figure 3-6) and their potential to be directly affected by construction activities: Smith Tower, Lewis and Clark Plaza, and Evergreen Inn. Including these sites in the analysis ensures that potential impacts on low-income populations are adequately considered.

3.2.2.3 Subsidized and Free Lunch Programs in Schools

The following section assesses eligibility in subsidized and free lunch programs at schools within the EJ study area. The Portland Public School District and Vancouver Public Schools are the two school districts that intersect the EJ study area. Eligibility data are used to supplement census data by capturing populations (such as children) who may be underestimated in 5-year census estimates.

PORTLAND SCHOOLS

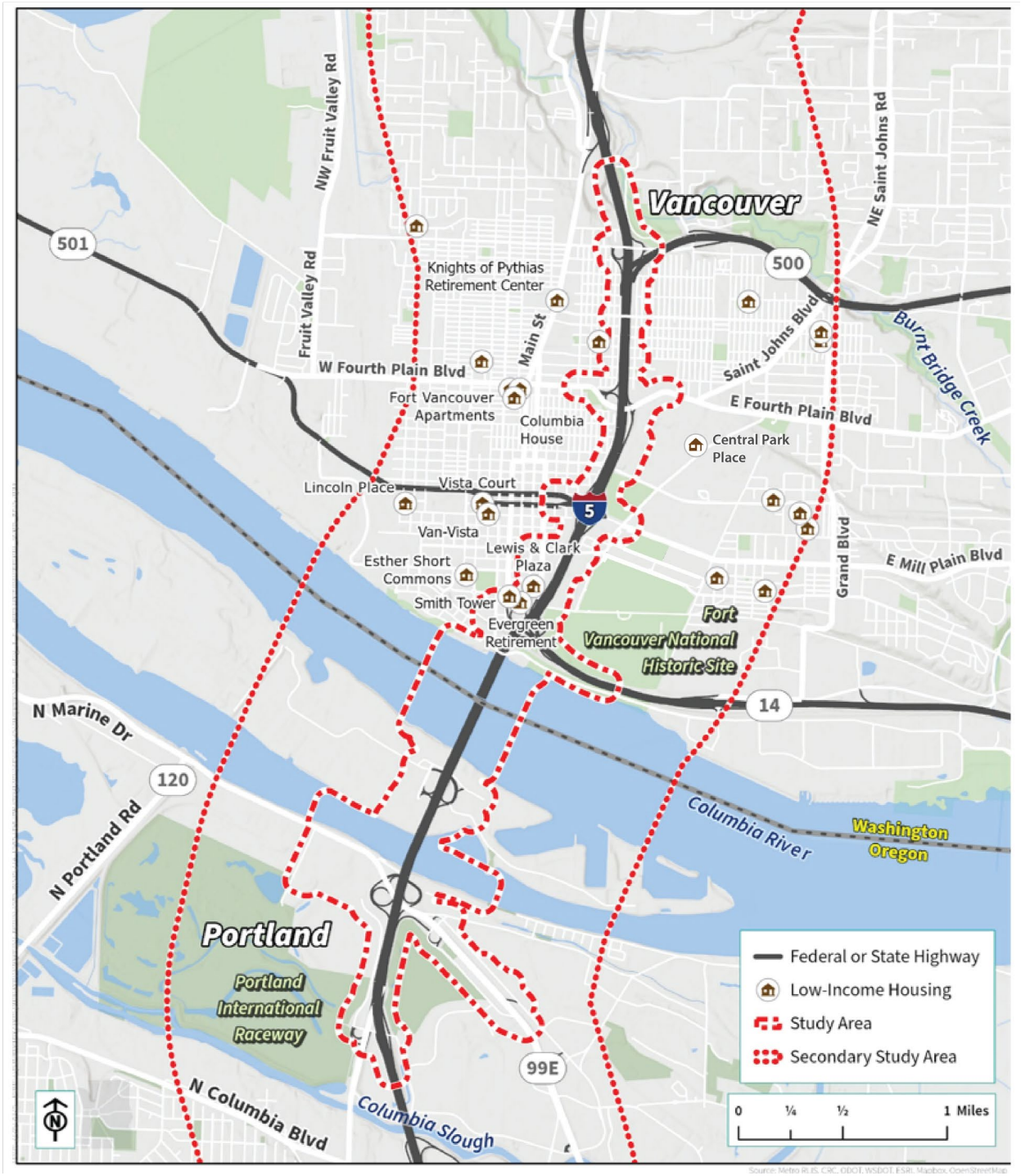
Table 3-18 summarizes the eligibility for free and reduced lunches in the Portland School District, Multnomah County, and Oregon. Oregon reports eligibility for free and reduced lunches together, so the percentage in this analysis reflects the combination of student eligibility for recipients of both free and reduced lunches. During the March 1, 2024, to February 28, 2025, school year, 31.5% of students in the Portland School District were eligible for free lunch programs (ODE 2025).

Table 3-18. Free and Reduced-Price Luch Programs, Portland Public Schools, 2024–2025

Area	Students Eligible for Free and Reduced Lunches
Portland School District	45.8%
Multnomah County	56.8%
Oregon	52.3%

Source: Free and Reduced-Price Eligibility of Oregon Public Schools, 2024-2025 School Year Data (ODE 2025)

Figure 3-7. Low-Income Housing



Several Portland schools whose student populations live partly or entirely within the EJ study area have a higher percentage of students eligible for free lunch programs than the Portland School District as a whole (45.8%). For example, nearly three out of every four (70.4%) of all students at Jefferson High School, located east of I-5 between Alberta and Killingsworth Streets, are eligible for free lunch programs. Approximately half (53.4%) of all students at Ockley Green Middle School, located just north of Ainsworth Street between Interstate Avenue and I-5, are eligible. More than half (59.5%) of all students at Woodlawn Elementary School, located east of I-5 and just south of Lombard Street, are eligible for free and reduced-price lunch.

VANCOUVER SCHOOLS

During the 2024-2025 school year, approximately 60.4% of students within the Vancouver School District were eligible for free and reduced-price lunch (OSPI 2025). As shown in Table 3-19, this percentage is higher than the Clark County average (47.4%) and the Washington State average (51.4%).

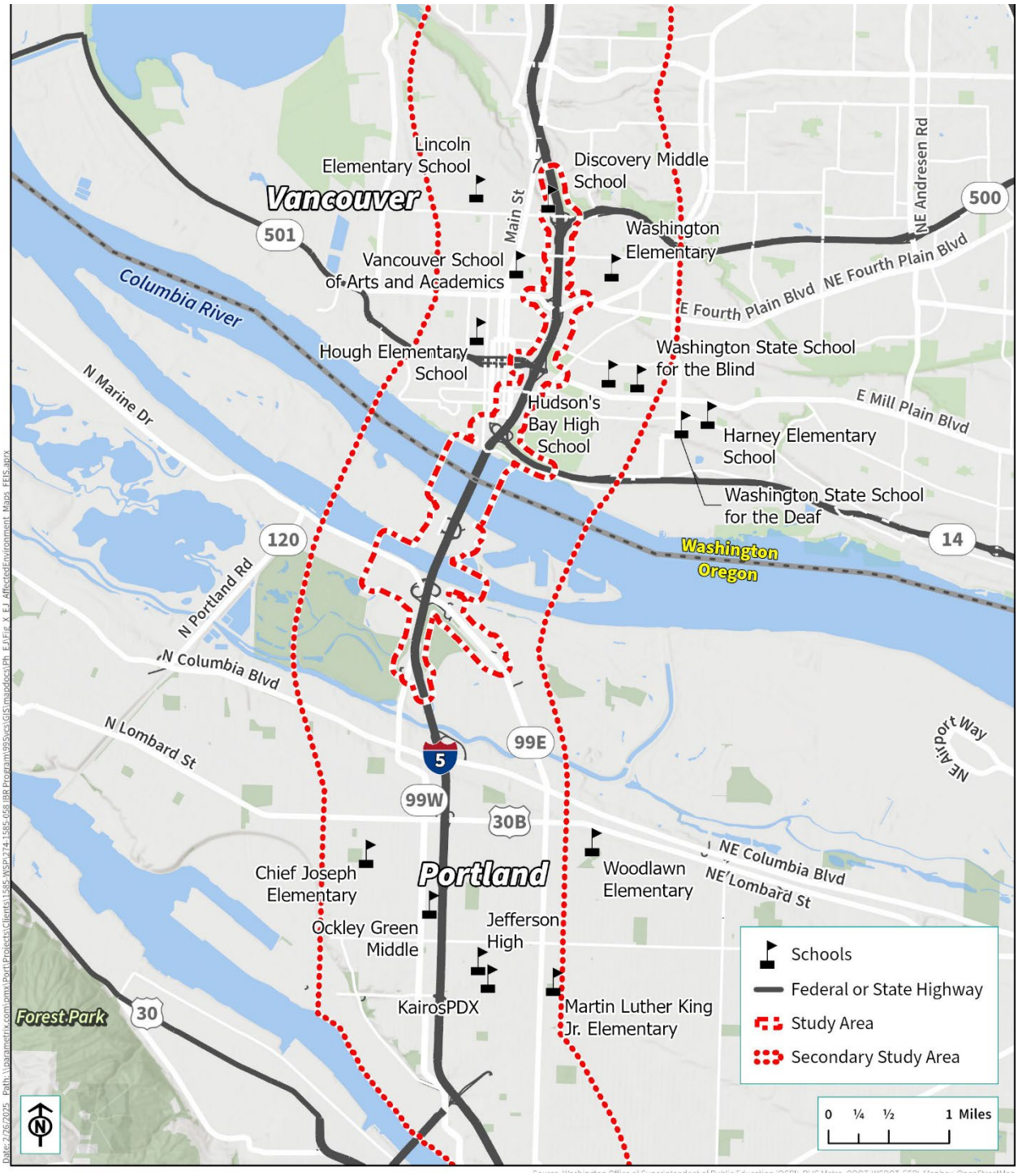
Table 3-19. Free and Reduced-Price Lunch Programs – Vancouver Public Schools, 2024-2025

Area	Students Eligible for Free and Reduced Lunches
Vancouver School District	60.4%
Clark County	47.4%
Washington	51.4%

Source: OSPI 2025

Several Vancouver schools within or intersecting the EJ study area had significantly higher percentages of students eligible for free and reduced lunch than the district average (Figure 3-8). At Washington Elementary School, located east of I-5 between Fourth Plain Boulevard and SR 500, virtually all students (>95%) are eligible for free and reduced lunch. At Harney Elementary School, east of I-5 between SR 14 and Mill Plain Boulevard, most students (84.0%) are eligible. The majority of students (89.0%) at Discovery Middle School, on 40th Street just west of I-5, are also eligible (OSPI 2025).

Figure 3-8. Schools within the EJ Study Area



3.2.3 Neighborhood Characteristics

The following section describes EJ populations by neighborhoods within the EJ study area.

As discussed in Section 2.2.3, Meaningfully Greater Analyses, low-income and minority populations 1.5 times greater than the corresponding regional average are considered "meaningfully greater," and populations with twice the average are considered high-priority areas in the EJ analysis (Table 2-2).

Of the 43 neighborhoods (shown in Table 3-20 and Table 3-21) in the EJ study area, 11 neighborhoods contain meaningfully greater or high-priority percentages of EJ populations (either low-income or minority populations). Two of these neighborhoods are in Portland, one is in Gresham, and the remaining eight are in Vancouver. These neighborhoods are:

- Central Park, Vancouver, WA
- Esther Short, Vancouver, WA
- Fourth Plain Village, Vancouver, WA
- Fruit Valley, Vancouver, WA
- Harney Heights, Vancouver, WA
- Hough, Vancouver, WA
- Maplewood, Vancouver, WA
- Rose Village, Vancouver, WA
- Rockwood, Gresham, OR
- East Columbia, Portland, OR
- Sunderland, Portland, OR

Hayden Island, while slightly below the formal thresholds for meaningfully greater populations, is considered in this analysis due to its proximity to the thresholds and the presence of project impacts in the neighborhood.

The percentage of minority residents in the EJ study area (31.4%) is higher than that of the Portland-Vancouver region (30.7%). Both the Portland and Vancouver neighborhoods have a higher percentage of low-income populations (25.2%) than the Portland-Vancouver region as a whole (22.3%).

Figure 3-9 displays neighborhood boundaries within the EJ study area. Figure 3-10 shows meaningfully greater and high-priority low-income block groups in the context of neighborhood boundaries. Figure 3-11 shows meaningfully greater and high-priority minority block groups in the context of neighborhood boundaries. Table 3-20 and Table 3-21 show the low-income and minority populations by EJ study area neighborhood in Oregon and Washington, respectively.

Figure 3-9. Neighborhoods

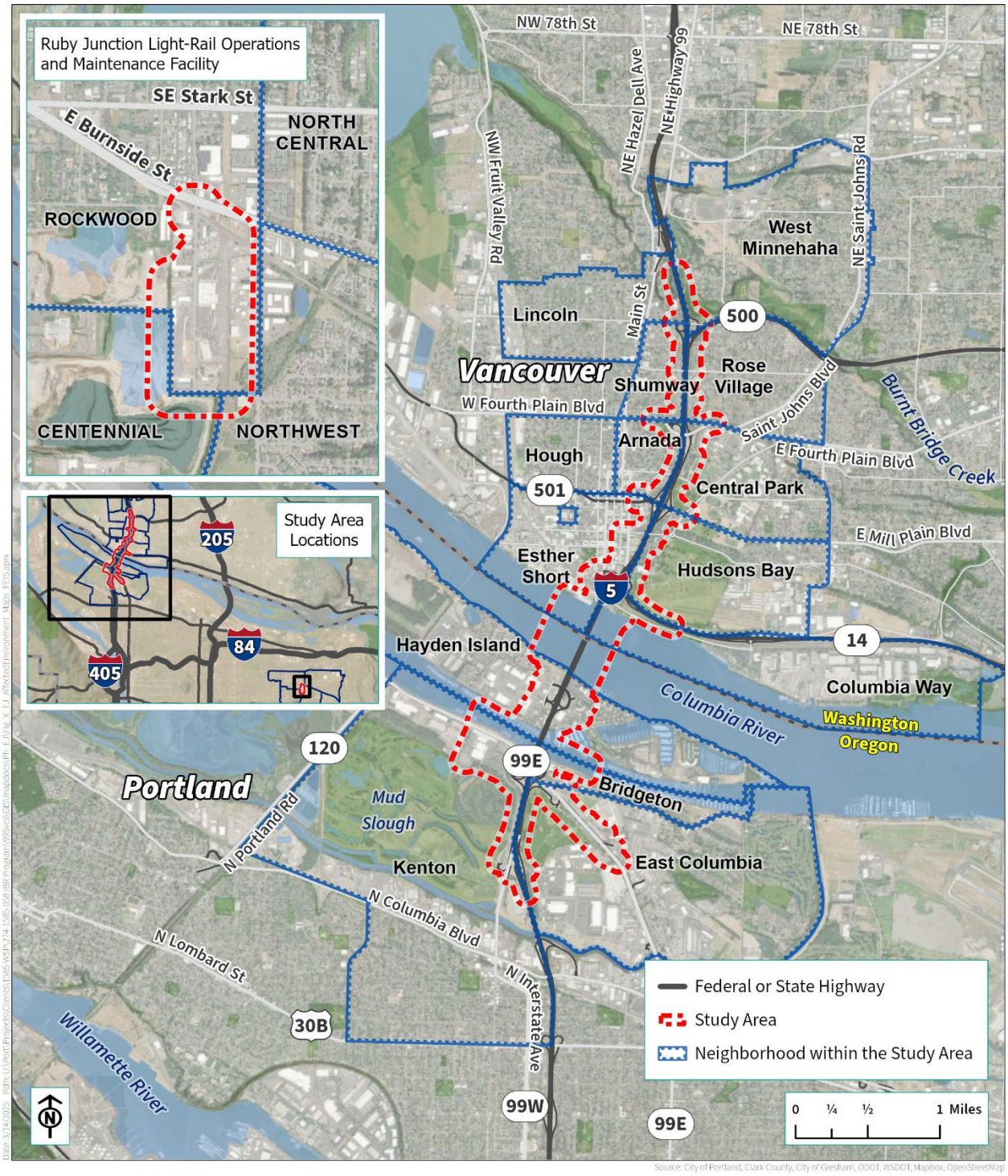


Figure 3-10. Meaningfully Greater and High-Priority Minority Block Groups and IBR Program Study Area Neighborhoods

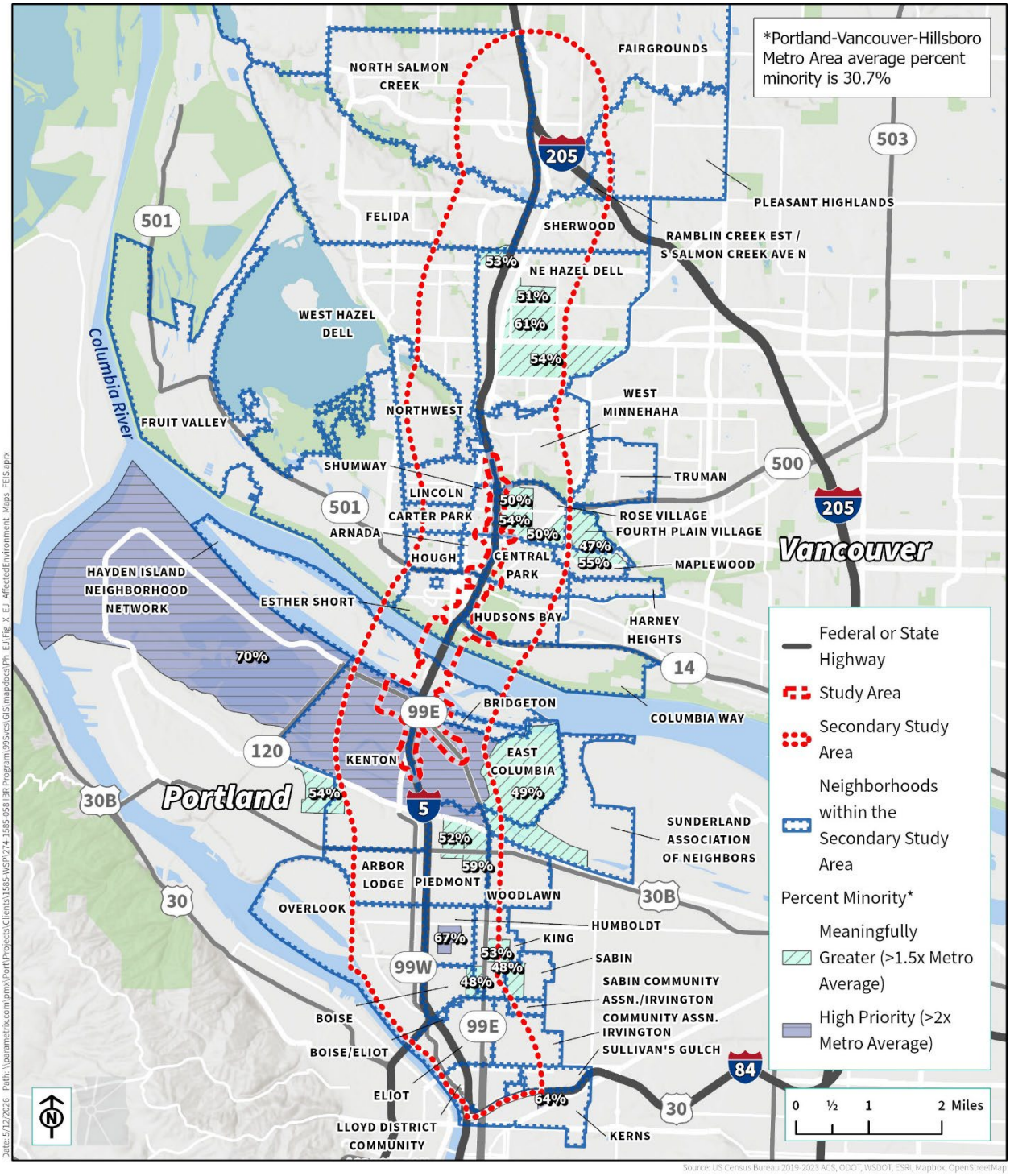


Figure 3-11. Meaningfully Greater and High-Priority Low-Income Block Groups and IBR Program Study Area Neighborhoods

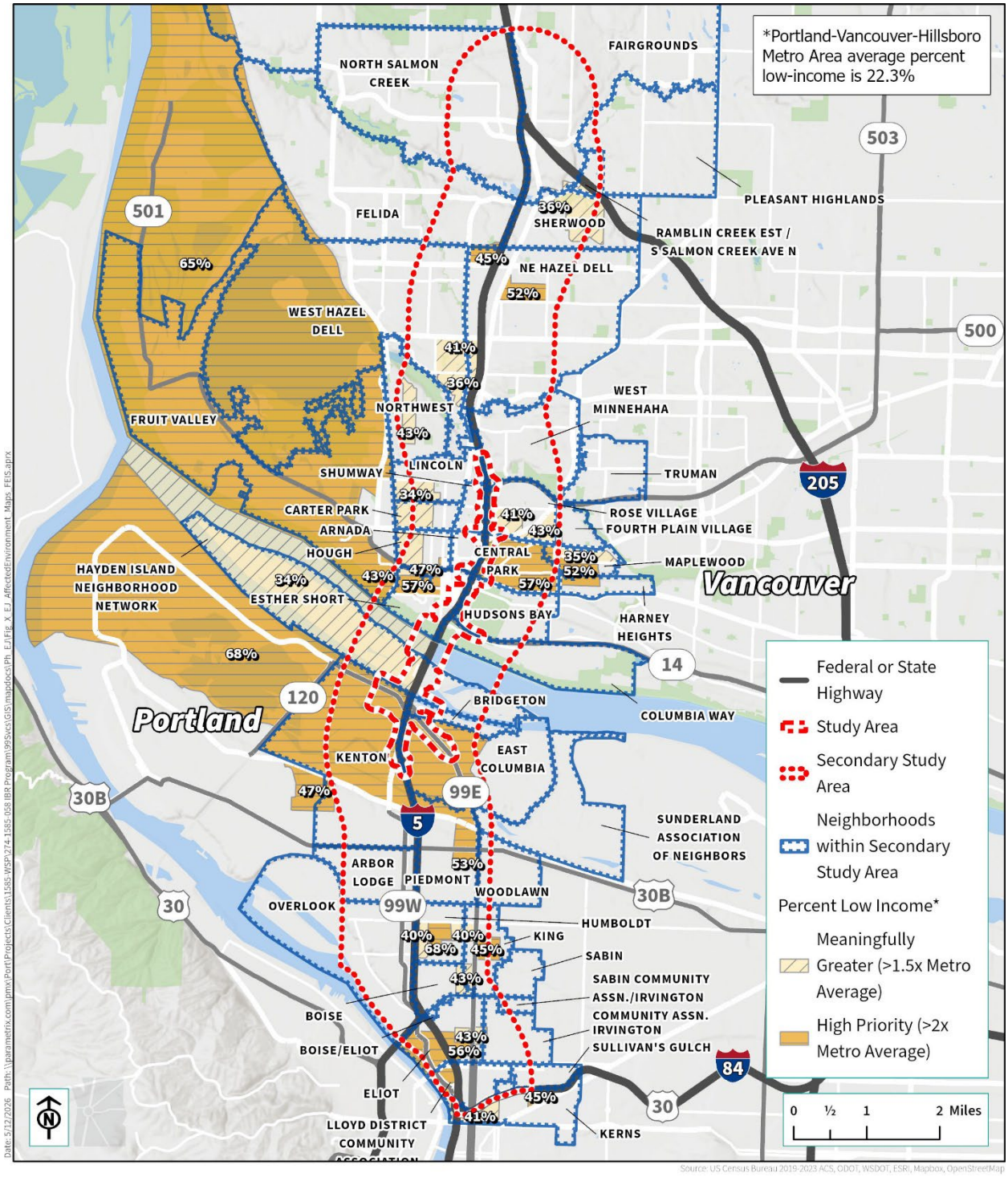


Table 3-20. EJ Populations in Portland Neighborhoods

Portland Neighborhood	Low-Income Population (<2x poverty level)	Minority (Not White Alone, Not Hispanic)	Two or More Races, Not Hispanic	Hispanic or Latino	Asian Alone, Not Hispanic	American Indian and Alaska Native Alone	Black or African American, Not Hispanic	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone
Arbor Lodge [a]	15.2%	25.8%	8.1%	7.3%	4.5%	0.2%	4.7%	1.0%	0.0%
Boise [a]	25.1%	34.8%	8.9%	13.9%	4.7%	0.5%	6.2%	0.4%	0.2%
Bridgeton [a]	27.3%	31.5%	8.9%	1.4%	3.3%	0.7%	16.3%	0.7%	0.9%
East Columbia [a]	21.3%	52.6% [b]	9.2%	14.4%	21.9%	0.7%	5.8%	0.6%	0.0%
Eliot [a]	30.2%	28.1%	4.7%	7.1%	3.5%	0.4%	11.2%	1.1%	0.0%
Hayden Island [a]	30.4%	30.7%	11.4%	14.8%	1.7%	0.5%	0.9%	0.9%	0.5%
Humboldt [a]	32.5%	36.1%	7.0%	6.3%	2.6%	0.4%	18.8%	0.0%	0.9%
Irvington Community Association [a]	14.9%	24.1%	6.2%	8.9%	3.7%	0.0%	5.2%	0.1%	0.1%
Kenton [a]	22.6%	33.3%	6.8%	15.7%	3.3%	0.4%	4.8%	1.9%	0.3%
Kerns [a]	30.5%	37.1%	9.3%	19.2%	5.1%	0.1%	2.8%	0.1%	0.0%
King [a]	30.0%	38.3%	7.4%	11.7%	3.1%	1.0%	14.4%	0.1%	0.7%
Lloyd District Community Association [a]	32.3%	37.0%	6.1%	11.7%	6.1%	0.3%	12.5%	0.4%	0.0%
Overlook [a]	18.7%	22.9%	6.2%	4.7%	3.7%	0.0%	7.7%	0.4%	0.2%
Piedmont [a]	27.5%	36.2%	6.3%	14.5%	2.0%	1.2%	8.6%	0.0%	3.5%
Rockwood [a]	41.9% [b]	58.6% [b]	4.6%	36.5%	8.6%	0.2%	6.8%	1.0%	1.1%
Sabin Community Association [a]	17.5%	33.7%	5.3%	15.1%	4.0%	0.0%	7.6%	1.7%	0.0%
Sullivan's Gulch [a]	25.1%	28.3%	6.6%	13.4%	2.0%	2.3%	3.9%	0.0%	0.0%
Sunderland [a]	19.4%	47.6% [b]	10.3%	10.1%	16.3%	0.7%	8.0%	2.0%	0.0%

Portland Neighborhood	Low-Income Population (<2x poverty level)	Minority (Not White Alone, Not Hispanic)	Two or More Races, Not Hispanic	Hispanic or Latino	Asian Alone, Not Hispanic	American Indian and Alaska Native Alone	Black or African American, Not Hispanic	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone
Woodlawn [a]	20.7%	34.0%	5.4%	7.7%	4.5%	0.2%	12.9%	0.0%	3.3%
Portland Neighborhoods	26.1%	35.7%	6.8%	14.6%	4.6%	0.4%	8.0%	0.6%	0.7%
EJ Study Area Neighborhoods	28.8%	31.4%	7.3%	15.2%	3.4%	0.7%	3.5%	1.0%	0.5%
Portland-Vancouver MSA	22.3%	30.7%	6.1%	13.5%	6.9%	0.4%	2.9%	0.5%	0.5%

Source: American Communities Survey 5-Year Estimates, 2019–2023. Tables C17002 and B03002 (U.S. Census Bureau 2024)
a Neighborhood is in the EJ study area.
b Value is 1.5 times the regional average (Portland-Vancouver metropolitan area).
c Value is 2 times the regional average (Portland-Vancouver metropolitan area).
EJ = environmental justice; MSA = metropolitan statistical area

Table 3-21. EJ Populations in Vancouver Neighborhoods

Vancouver Neighborhood	Low-Income Population (<2x poverty level)	Minority (Not White Alone Not Hispanic)	Two or More Races Not Hispanic	Hispanic or Latino	Asian Alone Not Hispanic	American Indian and Alaska Native Alone	Black or African American Not Hispanic	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone
Arnada [a]	26.6%	27.9%	3.8%	13.1%	4.7%	1.9%	3.3%	0.0%	1.1%
Carter Park [a]	26.5%	26.1%	5.0%	14.7%	1.8%	1.0%	3.6%	0.0%	0.0%
Central Park [a]	56.3% [c]	38.4%	3.4%	28.3%	0.3%	0.0%	4.8%	0.0%	1.6%
Columbia Way [a]	13.5%	26.9%	3.6%	11.0%	10.4%	1.9%	0.0%	0.0%	0.0%
Esther Short [a]	37.7% [b]	27.5%	5.9%	6.4%	5.7%	1.6%	7.2%	0.0%	0.7%

Vancouver Neighborhood	Low-Income Population (<2x poverty level)	Minority (Not White Alone Not Hispanic)	Two or More Races Not Hispanic	Hispanic or Latino	Asian Alone Not Hispanic	American Indian and Alaska Native Alone	Black or African American Not Hispanic	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone
Fairgrounds [a]	15.4%	22.3%	5.7%	8.3%	4.4%	0.2%	2.1%	0.0%	1.8%
Felida [a]	8.9%	17.7%	5.9%	6.6%	3.3%	0.0%	1.1%	0.3%	0.5%
Fourth Plain Village [a]	30.8%	47.8% [b]	3.1%	29.9%	3.3%	0.0%	9.5%	1.7%	0.4%
Fruit Valley [a]	45.6% [b]	44.7%	9.4%	30.9%	1.3%	0.0%	3.0%	0.0%	0.0%
Harney Heights [a]	43.3% [b]	37.8%	4.9%	27.3%	0.5%	0.1%	4.3%	0.1%	0.7%
Hough [a]	36.8% [b]	15.6%	9.6%	1.9%	1.1%	0.2%	2.9%	0.0%	0.0%
Hudson's Bay [a]	23.4%	24.2%	9.2%	8.4%	2.8%	0.5%	1.6%	0.0%	1.6%
Lincoln [a]	25.6%	24.7%	6.0%	12.3%	2.0%	1.4%	3.0%	0.0%	0.0%
Maplewood [a]	41.9% [b]	50.8% [b]	3.4%	31.3%	0.5%	0.2%	15.2%	0.0%	0.3%
NE Hazel Dell [a]	27.6%	35.7%	9.0%	15.7%	5.2%	0.2%	5.2%	0.3%	0.2%
North Salmon Creek [a]	10.5%	23.2%	6.4%	11.7%	3.6%	0.3%	0.0%	0.0%	1.0%
Northwest [a]	19.4%	18.6%	7.7%	5.2%	2.4%	0.4%	0.7%	2.1%	0.0%
Pleasant Highlands [a]	9.9%	17.4%	3.6%	6.0%	6.7%	0.0%	0.9%	0.0%	0.1%
Ramblin Creek Est./S Salmon Creek Ave. N [a]	14.7%	21.5%	2.6%	13.4%	5.5%	0.0%	0.0%	0.0%	0.0%
Rose Village [a]	34.2% [b]	48.2% [b]	7.2%	32.6%	3.9%	0.2%	1.3%	2.3%	0.7%

Vancouver Neighborhood	Low-Income Population (<2x poverty level)	Minority (Not White Alone Not Hispanic)	Two or More Races Not Hispanic	Hispanic or Latino	Asian Alone Not Hispanic	American Indian and Alaska Native Alone	Black or African American Not Hispanic	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone
Sherwood [a]	25.4%	28.2%	8.5%	11.8%	4.8%	0.0%	1.7%	0.4%	1.0%
Shumway [a]	21.0%	26.1%	5.0%	13.7%	3.6%	2.9%	0.9%	0.0%	0.0%
West Hazel Dell [a]	20.5%	17.8%	6.0%	6.6%	3.5%	0.2%	1.2%	0.1%	0.1%
West Minnehaha [a]	22.8%	24.5%	9.6%	9.9%	0.7%	0.3%	1.5%	2.5%	0.1%
Vancouver Neighborhoods	23.3%	28.3%	6.8%	13.3%	3.8%	0.3%	3.1%	0.4%	0.6%
EJ Study Area Neighborhoods	28.8%	31.4%	7.3%	15.2%	3.4%	0.7%	3.5%	1.0%	0.5%
Portland-Vancouver MSA	22.3%	30.7%	6.1%	13.5%	6.9%	0.4%	2.9%	0.5%	0.5%

Source: American Communities Survey 5-Year Estimates, 2019–2023. Tables C17002 and B03002 (U.S. Census Bureau 2024)
a Neighborhood is in the EJ study area.
b Value is 1.5 times the regional average (Portland-Vancouver metropolitan area).
c Value is 2 times the regional average (Portland-Vancouver metropolitan area).
MSA = metropolitan statistical area

3.2.3.1 Portland Neighborhoods

The proportion of minority populations in Portland neighborhoods (35.7%) is higher than in Vancouver neighborhoods (28.3%) and the EJ study area as a whole (31.4%). Three Portland-area neighborhoods within the study area have meaningfully greater percentages of minority populations: East Columbia (52.6%), Sunderland (47.6%), and Rockwood in Gresham (58.6%).

The proportion of low-income populations in Portland neighborhoods (26.1%) is higher than the Portland-Vancouver metro area (22.3%) and lower than the EJ study area as a whole (28.8%). Rockwood in Gresham has a meaningfully greater percentage of low-income residents (41.9%).

3.2.3.2 Vancouver Neighborhoods

The proportion of minority populations in Vancouver neighborhoods (28.3%) is lower than in Portland neighborhoods (35.7%) and the EJ study area as a whole (31.4%). Three Vancouver neighborhoods have meaningfully greater percentages of minority populations: Fourth Plain Village (47.8%), Maplewood (50.8%), and Rose Village (48.2%).

The proportion of low-income populations in Vancouver neighborhoods (23.3%) is slightly lower than in Portland neighborhoods (26.1%) and slightly above the Portland-Vancouver region (22.3%), but lower than the EJ study area (28.8%). Eight Vancouver neighborhoods have meaningfully greater percentages of low-income residents: Central Park (56.3%, high-priority); Hough (36.8%); Harney Heights (43.3%); Rose Village (34.2%); Fourth Plain Village (30.8%); Fruit Valley (45.6%); Esther Short (37.7%); and Maplewood (41.9%).

3.2.4 Community Resources

The IBR Program team developed an initial inventory of community resources, community organizations, and service providers within the EJ study area and overlaid those resources on high-priority and meaningfully greater EJ areas, as shown in Figure 3-3, Figure 3-4, Figure 3-5, and Figure 3-6. Figure 3-12 and Figure 3-13 below display the community resources within the EJ study area and high-priority and meaningfully greater EJ areas. Table 3-22 and Table 3-23 list community resources within the EJ study area that overlap with high-priority or meaningfully greater EJ areas. Additional community resources will be identified on an ongoing basis as the IBR Program moves forward. The analysis may not capture all relevant resources, as EJ populations may access resources outside of EJ focus areas. Table 3-22 focuses on resources that align with the analysis methods for meaningfully greater and high-priority EJ areas.

Table 3-22. Community Resources in High-Priority and Meaningfully Greater EJ Areas – Portland

Map ID	Resource Type	Resource Name	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
6	Natural Resource	Vanport Wetlands	**Yes**	No	**Yes**	No
7	Park	Dog Run	**Yes**	No	**Yes**	No
8	Park	Delta Park	**Yes**	No	**Yes**	No
9	Recreational	Portland International Raceway	**Yes**	No	**Yes**	No
10	Recreational	Portland Meadows	**Yes**	No	**Yes**	No
11	Recreational	Columbia Slough	**Yes**	No	**Yes**	No
12	Historical	Columbia Cemetery	**Yes**	No	**Yes**	No

EJ = environmental justice

Table 3-23. Community Resources in High-Priority and Meaningfully Greater EJ Areas – Vancouver

Map ID	Resource Type	Resource Name	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
5	Park	Leach Park	No	No	No	**Yes**
9	Educational	Clark College	**Yes**	No	No	No
10	Educational	Hudson's Bay High School	**Yes**	No	No	No
11	Community/ Recreation	Marshall and Luepke Centers	**Yes**	No	No	No
17	Historical	Hidden, Lowell M. House	**Yes**	No	No	No
18	Historical	Vancouver Telephone Exchange	**Yes**	No	No	No
19	Historical	Chumasero-Smith House	**Yes**	No	No	No
21	Historical	Langsdorf House	**Yes**	No	No	No

Map ID	Resource Type	Resource Name	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
22	Historical	Lloyd DuBois House	**Yes**	No	No	No
23	Historical	Elks Building	**Yes**	No	No	No
34	Education	Washington Elementary School	No	No	No	**Yes**
35	Healthcare	VA Medical Center	**Yes**	No	No	No
51	Community/ Recreation	Starbucks	**Yes**	No	No	No
57	Public Service	Vancouver Fire Department, #82	**Yes**	No	No	No
72	Religious Institution	Saint James Catholic Church	**Yes**	No	No	No
73	**Education**	**State School for the Blind**	**Yes**	**No**	**No**	**No**

EJ = environmental justice; VA = Veterans Administration

Figure 3-12. Community Resources – Portland

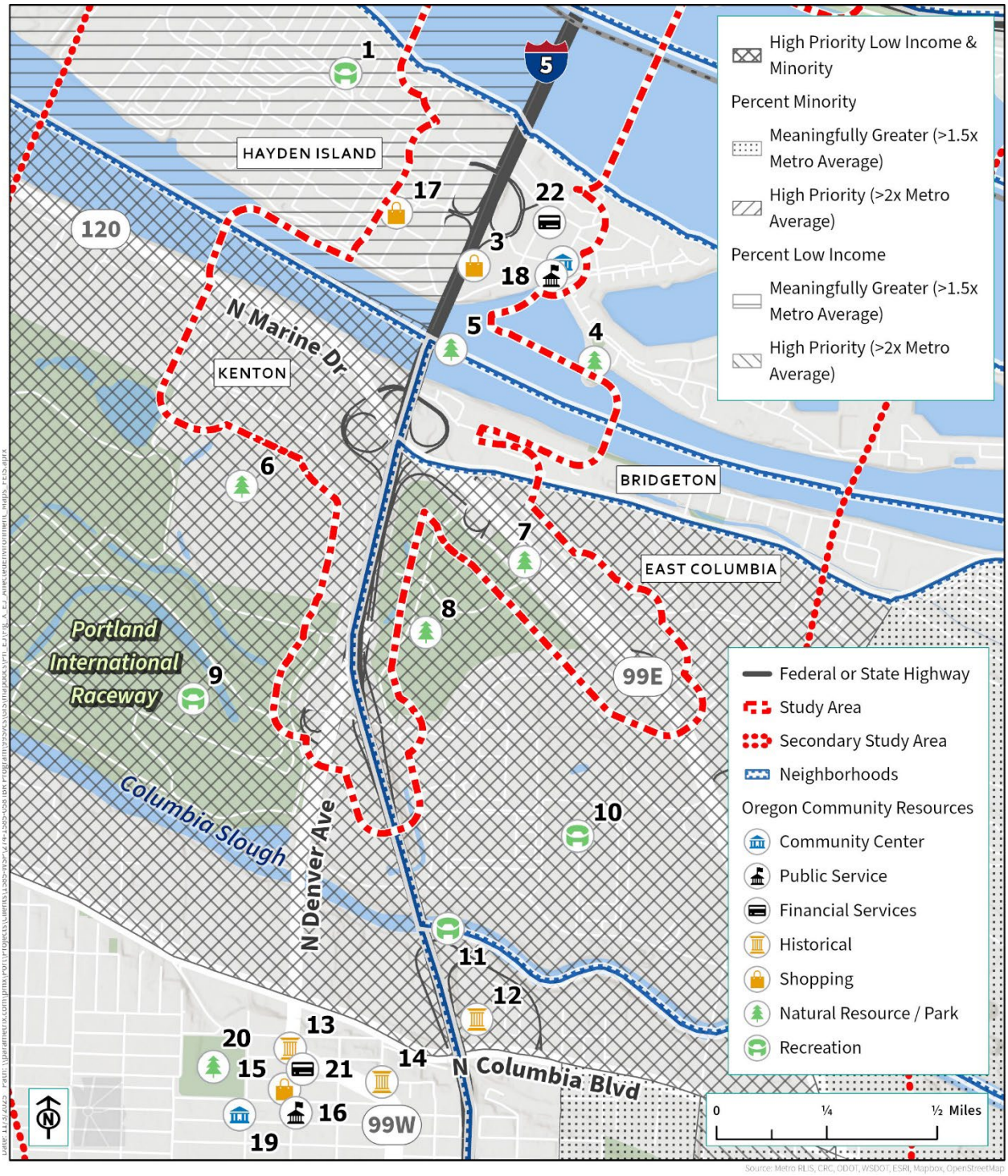
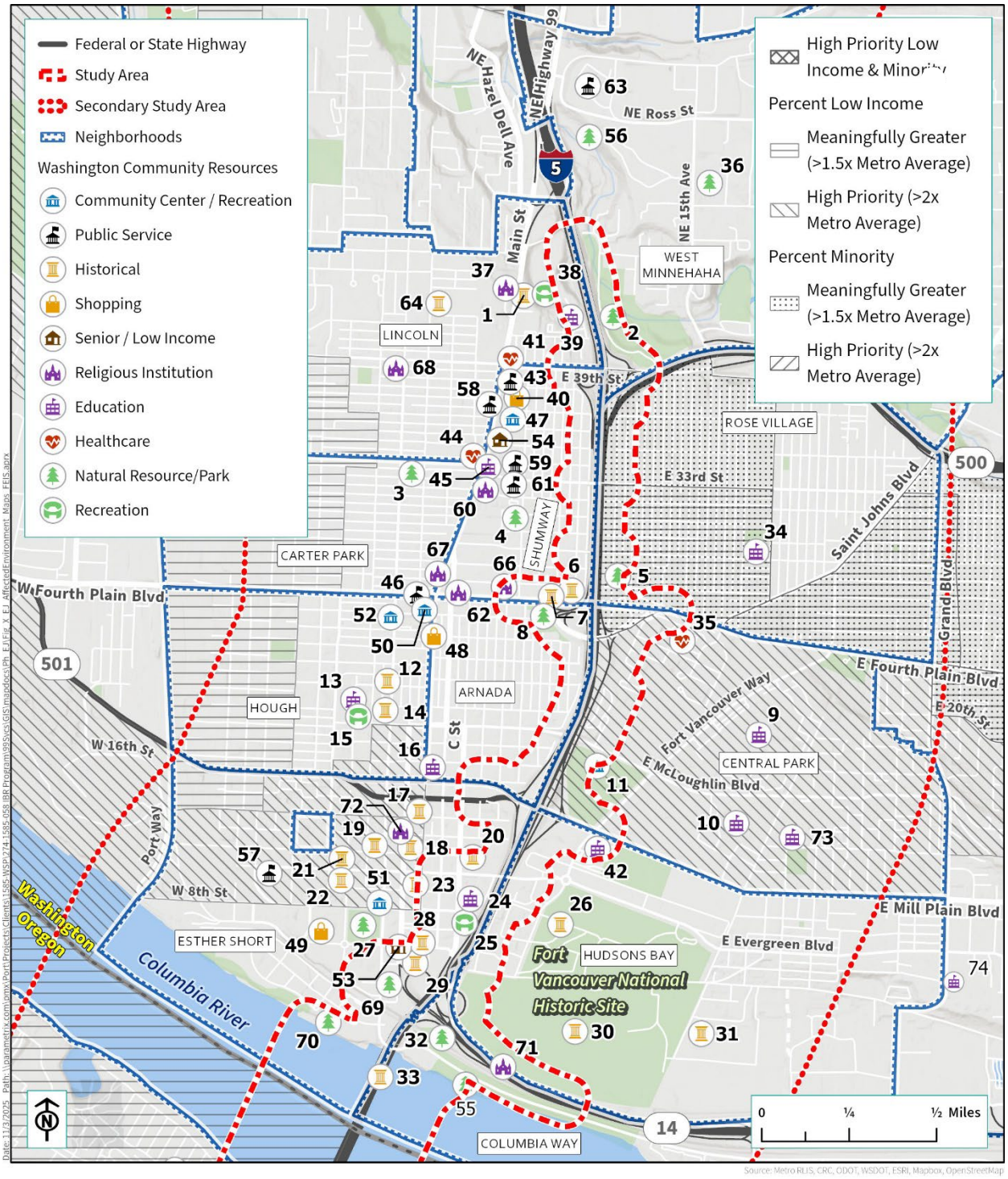


Figure 3-13. Community Resources – Vancouver



4. LONG-TERM EFFECTS

In general, long-term impacts were determined by evaluating the location and intensity of environmental impacts that would occur during operation of the Modified LPA in areas where EJ populations have been identified. In particular, the EJ analysis assessed whether effects on EJ populations would be disproportionately high and adverse compared to the general population. Given the broad nature of long-term impacts, the secondary study area described in Section 2.3.1 was used as the EJ study area. Therefore, references to the "EJ study area" in the following sections refer to the secondary study area unless otherwise noted.

The impact analysis included impacts identified in several technical reports in the NEPA/SEPA Final SEIS: Acquisitions and Displacements, Neighborhoods and Communities, Land Use, Economics, Visual Quality, Air Quality, Noise and Vibration, and Transportation. All environmental resource topics evaluated in the NEPA/SEPA Final SEIS were reviewed in coordination with SMEs to assess whether the Modified LPA had the potential to be predominantly borne by EJ populations or could be suffered by an EJ population in a manner appreciably more severe or greater in magnitude than the non-EJ population, and therefore could have a disproportionately high and adverse effect on EJ populations. Environmental resource topics with the potential to result in a disproportionately high and adverse effect on EJ populations under the Modified LPA became the focus of the EJ analysis and were studied further, as described in Table 2-3. Environmental resources that would not or were unlikely to result in disproportionately high and adverse effects under the Modified LPA were not studied further.

The long-term impact assessment methods also accounted for potential benefits the IBR Program could bring to EJ communities, such as improved seismic resilience, multimodal access, and accessibility upgrades within the EJ study area.

4.1 No-Build Alternative

Under the No-Build Alternative, there would be no direct displacement of residents, businesses, community resources, or jobs, including those affecting EJ populations. However, neighborhoods within the I-5 corridor would experience increased travel times—approximately 50% longer than existing conditions (see the Transportation Technical Report). These increased travel times could impair access to jobs and services. Travel delays are expected to affect EJ populations similarly to the general population. The No-Build Alternative would also not bring HCT service to Hayden Island or Vancouver. As a result, low-income and minority populations in those areas that rely on transit would be unable to benefit from the mobility and access improvements offered by HCT under the Modified LPA. These impacts would be similar to those experienced by the general population. Because the No-Build Alternative would not include tolling, EJ populations would avoid toll-related costs and would not need transponders for travel. This benefit would also apply to the general population. Long-term impacts associated with the No-Build Alternative are summarized in Table 4-1.

Based on the current assessment of environmental impacts, benefits, and mitigation strategies (as summarized in Appendix M of the NEPA/SEPA Final SEIS), the No-Build Alternative is not anticipated to result in disproportionately high and adverse effects on EJ populations within the EJ study area.

Increased travel times would occur broadly for all users, and other environmental conditions would remain unchanged under this alternative.

Table 4-1. Summary of Potential Long-Term Effects for the No-Build Alternative (Compared to Existing Conditions)

Type of Impact	Long-Term Impact Summary for the No-Build Alternative
Acquisitions, Displacements, and Relocations	None (Acquisitions and Displacements Technical Report).
Air Quality	The EPA has developed NAAQS for the six criteria pollutants: carbon monoxide, lead, ozone, nitrogen dioxide, sulfur dioxide, and particulate matter. No violations of the NAAQS were shown for the No-Build Alternative within the EJ study area (Air Quality Technical Report).
Economics	Under the No-Build Alternative, economic development planned for this area may occur more slowly because business owners may be more reluctant to locate in an area with poor access and mobility for employees and customers. Freight reliability decreases as congestion spreads beyond the peak hour and into times when trucks tend to travel. Customers may elect to shop in other areas with easier access and improved mobility (Economics Technical Report). Regional transportation plans, as well as the numerous plans developed by the City of Vancouver, call for HCT in Vancouver, which would not be provided by the No-Build Alternative (Economics Technical Report).
Noise and Vibration	None (Noise and Vibration Technical Report)
Social and Community Effects	None (Social and Communities Technical Report)
Tolling	None
Transportation	Over time, traffic and congestion on the Interstate Bridge are likely to increase, lengthening travel times and delay. Delays on the Interstate Bridge would also affect traffic and congestion in surrounding areas. Travel times would increase by approximately 50% compared to existing times, affecting access to jobs and services. There would be limited HCT service and no light-rail service across the Interstate Bridge under the No-Build Alternative, limiting public transportation opportunities and access for EJ populations needing to cross the bridge (Transportation Technical Report).
Visual Resources	The No-Build Alternative would not result in a change in visual character that would contrast with the existing scale, form, and materials within the area of visual effect. Other traffic and transit projects planned within the EJ study area would be expected to be compatible with the existing natural, cultural, and project environments. However, traffic and congestion on the Interstate Bridge and in the surrounding areas would reduce the overall visual coherence of the project environment, which would be a slight decrease in the existing visual quality (Visual Resources Technical Report).

Note: All data and findings in Table 4-1 are based on the relevant IBR Program technical reports for each corresponding environmental resource.

EJ = environmental justice; EPA = U.S. Environmental Protection Agency; HCT = high-capacity transit; NAAQS = National Ambient Air Quality Standards

4.2 Modified LPA Summary of Program Impacts

Table 4-2 summarizes anticipated long-term impacts under the Modified LPA and compares them to impacts and potential benefits for EJ populations, organized by environmental resource area. These impacts may change based on the final design of the bridge and highway improvements.

Table 4-2. Summary of Potential Long-Term Effects from the Modified LPA on Environmental Justice Populations[27]

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
Acquisitions, Displacements, and Relocations	Full acquisition of 62 properties and partial acquisition of 144 properties, resulting in 59 residential displacements and 66 business displacements. **Oregon Neighborhoods** • 71 total acquisitions (30 full acquisitions, 41 partial acquisitions) • 48 residential displacements • 51 business displacements Residential displacements would occur in the Kenton and Hayden Island neighborhoods. Business displacements would occur in the Bridgeton, Kenton, Hayden Island, and Rockwood neighborhoods. Additional partial acquisitions to East Delta Park would occur in the East Columbia neighborhood. No residential or business displacements would occur in the East Columbia neighborhood. **Washington Neighborhoods** • 135 total acquisitions (32 full acquisitions, 103 partial acquisitions) • 9 residential displacements	The Modified LPA would acquire properties and displace residences and businesses in the identified high-priority and meaningfully greater EJ areas. **Oregon Neighborhoods** • East Columbia: 4 partial acquisitions in East Delta Park and 1 full acquisition; no residential displacement, 1 business displacement; East Columbia contains block groups with meaningfully greater minority populations. • Rockwood: 6 total acquisitions (4 full and 2 partial); no residential displacements, 8 business displacements; Rockwood contains block groups with meaningfully greater low-income and minority populations. Rockwood acquisitions would result in disproportionately high and adverse effects on EJ populations. **Washington Neighborhoods**	None.

[27] All data and findings in Table 4-3 are based on the relevant IBR technical reports for each corresponding environmental resource.

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	• Up to 15 business displacements Residential displacements would occur in the Esther Short and Shumway neighborhoods and business displacements would occur in the Esther Short neighborhood, which contains high-priority EJ block groups. Additional acquisitions would occur to Marshall Park in the Central Park neighborhood (partial), Columbia Way (partial), Hudson's Bay (temporary), Lincoln (partial), and Rose Village (partial); none of these acquisitions would result in business or residential displacements. **Design Option Impacts:** 33 additional residential displacements and 3 business displacements would occur with the I-5 Westward Shift design option.	• Esther Short: 22 total acquisitions; no residential displacements, up to 7 business displacements; Esther Short contains high-priority EJ block groups. Esther Short acquisitions would result in disproportionately high and adverse effects on EJ populations. • Rose Village: 6 total acquisitions; no displacements; Rose Village contains block groups with meaningfully greater low-income and minority populations. • **Design Option Impacts:** The I-5 Westward Shift design option would displace the Normandy Apartments building, which includes 33 residential units. Although the Normandy Apartments are not identified by the U.S. Department of Housing and Urban Development as a low-income housing tax credit property (HUD 2023), the 33 residential displacements would occur within the Esther Short neighborhood, which contains high-priority EJ block groups. These displacements would result in disproportionately high and adverse effects on EJ populations.	

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
Air Quality	Emissions for all Mobile Source Air Toxics and criteria pollutants are expected to be substantially lower than existing emissions, and the EJ study area would remain in attainment for National Ambient Air Quality Standards.	No disproportionately high and adverse effects on EJ populations have been identified.	Improved air quality compared to existing conditions for all communities, including EJ populations.
Land Use and Economics	Permanent conversion of approximately 39 acres to transportation use (not inclusive of temporary construction staging). This land conversion would account for a small portion of the total land in the Portland/Vancouver area and would not be substantial in a regional context. Converted land would be used for the extension of HCT, park and rides, and other transportation infrastructure, consistent with the goals and policies of adopted plans. Business/employee displacements are anticipated to reduce tax revenues in Multnomah County and Clark County by approximately 0.02% and 0.3% to 0.4%, respectively. Loss of service industry jobs: The Modified LPA's direct impacts to Hayden Island and, to a lesser extent, to Vancouver, could have a substantial effect on wage-earning opportunities for those seeking service industry employment. Some displaced businesses may choose not to relocate locally, and	Impacts to service industry workers and the conversion of property could impact low-income and minority workers in the EJ study area. However, these land use and economic impacts would affect EJ populations the same as the general population, so disproportionately high and adverse effects have been identified.	Increased jobs and economic development opportunities near I-5 and near transit stations for all communities, including EJ populations.

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	some employees would be displaced during construction.		
Noise and Vibration	**Oregon Neighborhoods** Increased noise levels (up to 10 dBA) at a sensitive receptor in Jantzen Beach RV Park. This increase would remain below ODOT's Noise Abatement Criteria. No increase in vibration levels at Jantzen Beach RV Park. **Washington Neighborhoods** Increased noise levels (up to 12 dBA) are anticipated in the Rose Village, Arnada, Esther Short, Columbia Way, Hudson's Bay, Central Park and Shumway Neighborhoods.	**Oregon Neighborhoods** None; Jantzen Beach RV Park is not located in a meaningfully greater or high-priority EJ area, and impacts to EJ populations would be the same as to the general population. Therefore, no disproportionately high and adverse effects on EJ populations have been identified. **Washington Neighborhoods** The area between E 33rd Street and E 39th Street encompasses the Rose Village neighborhood—which contains block groups with meaningfully greater low-income and minority populations. The residences that would experience a substantial noise impact may include EJ populations. Noise impacts are also predicted in the Esther Short neighborhood (high-priority EJ area).	None.
Social and Community Effects	Impacts to cohesion and separation from community resources and services could result from potential residential and business displacements, changes to travel that would affect access to community resources and impacts to the visual landscape of neighborhoods.	**Oregon Neighborhoods** Social and community effects on EJ populations include displacements in the Rockwood neighborhood, which contains block groups with meaningfully greater low-income and minority populations. These displacements would	• Improved access, reliability, connectivity, and service frequency to transit for all communities, including EJ populations. • **Improved Access to Community Destination:** Pathway enhancements to Old Apple Tree Park and other overpass/underpass improvements

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	Oregon Neighborhoods • **Displacements:** Residential and/or business displacements would occur on Hayden Island, Bridgeton, Kenton, and Rockwood in Gresham • No change to community resources • **Effects on cohesion:** Adverse impacts to community cohesion have been identified on Hayden Island due to the high number of displacements within floating home communities. **Washington Neighborhoods** • **Displacements:** Residential and/or business displacements would occur in Central Park and Esther Short neighborhoods. • Effects on community resources: None identified • Effects on cohesion: None identified	result in a disproportionately high and adverse effect on EJ populations. **Washington Neighborhoods** Social and community effects on EJ populations include displacements in the Esther Short neighborhood, which contains high-priority EJ block groups with low-income populations. These displacements would result in a disproportionately high and adverse effect on EJ populations.	along the corridor will improve access to open spaces and community resources for residents of EJ communities in Esther Short, Arnada, and Rose Village.
Tolling	Tolling on I-5, paired with other Program improvements such as increased transit and active transportation options, is expected to reduce travel times and improve travel reliability; however, tolls would result in higher transportation costs as a portion of household spending. Households in the region would expend an additional $1,600 per year on transportation, representing	The cost of tolls on the Columbia River bridges would impact low-income populations disproportionately compared to the general population. Assuming the upper range of each of the tolling scenario schedules ranging from $3.15 to $3.55, the following impacts were identified: • Households at the poverty level ($32,150 for a four-person household)	Reduced travel times and improved travel reliability, resulting in part from tolling, would benefit all communities, including EJ populations.

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	approximately 2% of annual household income in the Portland-Vancouver area. As described in this table under Transportation, the Modified LPA would not result in substantial diversion to I-205 as a result of tolling. Compared to the No-Build Alternative, changes in peak-period vehicle volumes on I-205 at any of the studied screenline locations would range from -3% to +12%, depending on the screenline. compared to the No-Build Alternative. This demonstrates that significant diversion impacts to I-205 are not expected to occur based on the screenline analysis.	would face tolls representing approximately 5.1% to 5.8% of total household income. Tolls could increase total household transportation costs to anywhere between 25% and 30% of household transportation spending for households in poverty. In comparison, tolls would comprise 2.3% to 2.6% of household transportation spending for median-income households. • Low-income households at 200% of the federal poverty level ($64,300) would face an increase in household transportation expenses ranging from approximately 2.5% to 2.9%. No disproportionately high and adverse effects from traffic diversion to I-205 are expected on EJ populations or the general population.	
Transportation	The Modified LPA would reduce regional VMT compared to the No-Build Alternative and would result in the following changes by mode and facility type: • **I-5 Highway:** Reduce key bottlenecks along segments of I-5. The Oregon segment of I-5 northbound would meet ODOT's mobility performance standards during the AM peak. The	**Arterials and Local Streets Impacts:** Changes to local traffic circulation resulting from the Evergreen and Waterfront Stations would occur in the Esther Short neighborhood, which contains high-priority EJ block groups. With the single-level movable-span configuration, disturbances to transit and active transportation resulting from bridge opening delays could negatively	The following effects are anticipated to benefit all travelers, including EJ populations, under the Modified LPA as compared with the No-Build Alternative: • **Reduced congestion and improved crossings**: Bottlenecks on some I-5 segments would be reduced during AM and PM peak periods, resulting in faster travel times between I-205 north of Vancouver and the Marquam

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	Washington segment of I-5 southbound would meet WSDOT's mobility standards during the PM peak. • **Diversion Impacts:** AM and PM peak-hour screenline volumes within the EJ study area were analyzed using the regional travel demand model to determine the relative differences in traffic volumes between the No-Build Alternative and the Modified LPA. Generally, the Modified LPA resulted in increased traffic on adjacent facilities compared to the No-Build Alternative. However, the increases are relatively minor ranging from approximately +4% to +12%. In Vancouver, most of the increased traffic would use I-5 rather than surrounding north–south facilities, because of the greater capacity on I-5 during the peak period with the Modified LPA compared to the No-Build Alternative. In Portland, traffic diversion under the Modified LPA during both peak and off-peak times shows differences of less than 50 vehicles compared to the No-Build Alternative. Compared to the No-Build Alternative, changes in peak-period vehicle volumes on I-205 at	affect EJ populations. However, a disproportionately high and adverse effect on EJ populations is not anticipated, given that the impacts would be the same for all populations traveling through the EJ study area. The removal of the C Street ramps would eliminate an access and egress point for downtown Vancouver, including the Esther Short neighborhood, and would shift between 300 and 600 vehicles per hour to the Mill Plain Boulevard ramps and roadways adjacent to Esther Short during the peak hours. Impacts to EJ populations under this design option would be the same as for the general population. Therefore, no disproportionately high and adverse effect has been identified. No adverse impacts related to I-5 highway operations, traffic diversion, freight mobility and access, transit, active transportation, or safety are expected to EJ populations or the general population.	Bridge in Portland. The single-level movable-span bridge configuration would also reduce the number of bridge openings compared with the No-Build Alternative. • **Transit and pedestrian improvements:** Enhancements at the Waterfront and Evergreen HCT stations, and the Community Connector pedestrian bridge over I-5 near Evergreen Blvd., would improve access for populations in the Esther Short neighborhood, which contains high-priority EJ block groups. • **Improved transit service and reliability:** The Modified LPA would improve overall transit service and reliability across the EJ study area, benefiting all residents, including EJ populations. Enhanced bus connections along the Vine routes to Evergreen Station would extend benefits to other EJ areas, such as Fourth Plain Village. • **Active transportation and crossings:** The shared-use path over the river and improved BLTS in Vancouver and Portland would create safer, lower-stress active transportation routes and facilitate active transportation crossings for all

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	any of the studied screenline locations would range from -3% to + 12%, depending on the screenline. This demonstrates that significant diversion impacts to I-205 are not expected to occur based on the screenline analysis. • **Freight Mobility and Access:** Improved conditions on I-5 would similarly benefit freight and trucks similarly to general-purpose traffic. • **Arterials and Local Streets Impacts:** Changes to traffic circulation, property access, and traffic control primarily around station areas. • **Transit Impacts:** Extension of HCT and Express Bus across the Columbia River. Stations would accommodate connections with C-TRAN Vine, C-TRAN and TriMet local bus, other TriMet MAX lines, nonmotorized, and park-and-ride trips. • **Active Transportation Impacts:** New shared-use path facilities would enhance safety and comfort of walking, biking, and rolling across the Columbia River along the rebuilt segments of highway and interchanges and new station areas. • **Safety Impacts:** The Modified LPA is forecast to reduce crashes by 15% to		users, including EJ populations in East Columbia, Arnada, Esther Short, Rose Village, and other neighborhoods. The Fourth Plain interchange would also be rebuilt with bicycle and pedestrian facilities and a pathway connection north to K Street, serving Rose Village and Fourth Plain Village.

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	30%, compared to the No-Build Alternative as a result of modifications to the Columbia River bridges, I-5, ramps, and ramp terminals. In Vancouver, bicycle level of traffic stress (BLTS) scores of nearly all affected streets would improve to a low-stress standing. • **Design Option Impacts:** The Modified LPA with a single-level movable-span configuration would continue to subject transit and active transportation users to delays during bridge openings, even though there would be fewer openings overall compared to the No-Build Alternative. Under the design option without C Street ramps, downtown Vancouver I-5 access would be through the Mill Plain interchange rather than C Street. The removal of the C Street ramps could cause additional congestion at the Mill Plain Boulevard ramps.		
Visual Resources	The scale, form, and materials of the Columbia River bridges and structures would not contrast with the existing visual character. New transit, bicycle, and pedestrian structures would be new visual elements similar in visual character to other proposed elements.	The downtown Vancouver and Ruby Junction landscape units include neighborhoods that contain block groups with meaningfully greater EJ populations (Esther Short and Rose Village in Vancouver and Rockwood in Gresham). Changes to visual quality in	None.

Environmental Resource	Long-Term Impact Summary for the Modified LPA	Impact Specific to Minority and Low-Income Populations	Benefit Specific to Minority and Low-Income Populations
	There would be new landscape views for those crossing the Columbia River bridges. An increase in ambient light levels may be perceptible; however, replacement lights would be designed to limit light and glare.	these areas are expected to be neutral overall, given that there is an existing bridge structure with similar visual characteristics. Changes in Ruby Junction are expected to be low because the added structures and uses are consistent with existing character and uses. Therefore, no disproportionately high and adverse effect has been identified.	

BLTS = bicycle level of traffic stress; C-TRAN = Clark County Public Transit Benefit Area Authority; dBA = A-weighted decibels; EJ = environmental justice; FHWA = Federal Highway Administration; I-5 = Interstate 5; I-205 = Interstate 205; LPA = Locally Preferred Alternative; MAX = Metropolitan Area Express; ODOT = Oregon Department of Transportation; RV = recreational vehicle; TriMet = Tri-County Metropolitan Transportation District; USDOT = U.S. Department of Transportation; VMT = vehicle miles traveled; WSDOT = Washington State Department of Transportation

4.3 Displacements and Community Resources

The data and findings in this section are based on the Acquisitions Technical Report and Neighborhoods and Communities Technical Report. Table 4-3 summarizes displacements and acquisitions within the EJ study area. The following sections describe residential, commercial, and community resource impacts by location.

Table 4-3. Summary of Displacements and Acquisitions

Location	Full Parcel Acquisitions	Partial Acquisitions	Residential Displacements	Business Displacements
Oregon Mainland	3	15	9	12
Eastern Hayden Island	21	19	39	28
West Hayden	2	5	0	0
Ruby Junction	4	2	0	8
Downtown Vancouver [a]	11	50	0	15
Upper Vancouver	9	52	9	0

a The acquisitions and displacements figures for Downtown Vancouver displayed in this table reflect the Modified LPA scenario with a centered I-5 and all five park and rides. The westward shift scenario would lead to displacement of an additional 33 residential dwelling units and three retail/service businesses. The Acquisitions Technical Report describes the acquisitions and displacements for each scenario.

4.3.1 Business Displacements and Loss of Service Industry Jobs

Implementation of the Modified LPA would result in the permanent displacement of some businesses within the Program footprint, including service industry establishments that provide employment opportunities for local residents. These displacements could lead to a reduction in available local jobs, particularly affecting positions in retail, food service, and other service-oriented sectors. Minority-, women-, and disadvantaged-owned businesses located in the affected areas may be disproportionately impacted, resulting in potential economic and employment consequences for EJ populations in the EJ study area. The loss of these businesses could also reduce access to essential services and community resources for nearby residents.

4.3.2 Oregon

4.3.2.1 Oregon Mainland

The Oregon Mainland subarea includes the Bridgeton, East Columbia, and Kenton neighborhoods. Of these neighborhoods, East Columbia and Kenton contain block groups with meaningfully greater and/or high-priority EJ populations (Table 4-4). Permanent acquisition of property would be required in this subarea to accommodate the reconstruction of the Marine Drive interchange and the extension of light-rail from its current terminus at the Portland Expo Center over North Portland Harbor.

Approximately 16.4 acres of property would need to be permanently acquired in this area; this would impact a total of 18 different parcels.

Table 4-4. Oregon Mainland Displacements and EJ Areas

Neighborhood	Residential Displacements	Business Displacements	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
Bridgeton	0	4	No	No	No	No
East Columbia	0	1	**Yes**	No	**Yes**	No
Kenton	9	3	**Yes**	No	**Yes**	No
Total Displacements	**9**	**12**	**N/A**	**N/A**	**N/A**	**N/A**

N/A = not applicable

4.3.2.2 Hayden Island

As noted in Section 3.2.3, Hayden Island is slightly below the thresholds for meaningfully greater populations. However, Hayden Island is included in this analysis due to its proximity to the thresholds and the presence of project impacts in the neighborhood. The Modified LPA would fully acquire 23 parcels and partially acquire 24 parcels on Hayden Island, resulting in 39 residential displacements and 28 business displacements (Table 4-5).

Table 4-5. Hayden Island Displacements and EJ Areas

Neighborhood	Residential Displacements	Business Displacements	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
Eastern Hayden Island	39	28	No	No	No	No
West Hayden Island	0	0	No	No	No	No

EJ = environmental justice

EASTERN HAYDEN ISLAND

Nineteen of the 39 residential displacements on Eastern Hayden Island would be floating homes located in one row of the moorage in North Portland Harbor east of I-5. The westernmost ramp access to the moorage would also be eliminated, though no floating homes would remain in this moorage following construction. The remaining 20 residential displacements on Hayden Island would also be floating homes, which are located on the four easternmost rows in the moorage located in North Portland Harbor west of I-5.

The Modified LPA would also displace 28 commercial/retail businesses on Hayden Island. Many of these businesses are restaurants and are directly adjacent to the current location of the highway. Displacing restaurants within this island community would require residents to travel off the island to eat at similar restaurants either on the Oregon mainland or in Vancouver. While not a standard category of long-term effects on a neighborhood, this reduction in restaurant availability could impact neighborhood cohesion.

The displacement of these businesses also has the potential to affect wage-earning opportunities for those seeking service industry employment on Hayden Island. Food preparation and service-related employers are more likely to offer entry level positions (e.g., dishwashers, cooks, hosts, and counter attendants). According to the U.S. Bureau of Labor Statistics (2025), the average hourly wage of food preparation and service workers within the Portland-Vancouver-Hillsboro MSA is $20.08, which is a salary of approximately $41,770 per year for a full-time employee. Some of these displaced businesses may choose to not relocate locally. Even with relocation assistance, some of the employees may be unable to retain their jobs. For example, an employee may be unable to make a longer commute or might have to accept a new job during the transition period of relocation for economic reasons. This could result in the displacement of neighborhood residents seeking employment in the food preparation and service-related industries; these residents may choose to relocate closer to employment opportunities if there are fewer opportunities on Hayden Island. This could affect neighborhood cohesion. (See Section 3.4, Land Use and Economics, of the SEPA/NEPA SEIS and the Economics Technical Report for information on the economic effects of these business closures.) In addition, bridge openings associated with the single-level movable-span configuration would cause backups that would reduce reliability for all travel modes, similar to the No-Build Alternative, which would negatively affect neighborhood cohesion on Hayden Island.

WEST HAYDEN ISLAND

Based on the current level of conceptual design, approximately 65.1 acres of property would need to be permanently acquired in the undeveloped, western portion of Hayden Island, impacting a total of seven different parcels. It is possible that the required acreage may increase and additional properties may be impacted as the mitigation design advances.

4.3.2.3 Ruby Junction Light-Rail Operations and Maintenance Facility Expansion

The potential construction of LRT into Vancouver would require an expanded maintenance station in Gresham. TriMet's existing Ruby Junction Light-Rail OMF in Gresham would be expanded to support the extra light-rail service under the Modified LPA.

The Ruby Junction Light-Rail OMF expansion would occur within an area of existing light industrial development in the Rockwood neighborhood. Six parcels would be fully or partially acquired for the expansion of the maintenance center. Within those six parcels, eight businesses would be displaced. The affected businesses are light industrial (Table 4-6). Rockwood has nearly double the average percentages of both minority and low-income residents and is considered a meaningfully greater EJ area.

Table 4-6. Ruby Junction Displacements and EJ Areas

Neighborhood	Residential Displacements	Business Displacements	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
Rockwood	0	**8**	No	**Yes**	No	**Yes**

EJ = environmental justice

The facility expansion acquisitions would impact 16 employees and decrease tax revenue by $46,000, but it would not affect public services or community resources in the area. Visually, the facility expansion would change the number of structures, rails, and light-rail vehicles entering or parked at the site, but the scale would look similar to the scale of existing elements.

4.3.3 Washington

4.3.3.1 Downtown Vancouver

Downtown Vancouver includes the Esther Short, Hudson's Bay, and Columbia Way neighborhoods. Esther Short contains high-priority EJ block groups with low-income populations. The Modified LPA would fully acquire 11 parcels and partially acquire 50 parcels in Downtown Vancouver, resulting in up to 15 business displacements (if all five park and rides are built) and no residential displacements (Table 4-7). Property impacts in Downtown Vancouver would be due in large part to realignments and improvements to local roads and the addition of transit infrastructure through the eastern portion of downtown. Although the business displacements are in EJ areas, they are not anticipated to result in disproportionately high and adverse effects on EJ populations. However, the design option that shifts I-5 westward would impact the Normandy Apartments, resulting in 33 residential displacements in Esther Short. The Normandy Apartments displacements would result in disproportionately high and adverse effects on EJ populations.

Table 4-7. Downtown Vancouver Displacements and EJ Areas – Modified LPA

Neighborhood	Residential Displacements	Business Displacements (includes park and rides)	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
Esther Short	0[a]	**14**	**Yes**	No	No	No
Hudson's Bay	0	0	No	No	No	No
Columbia Way	0	1	No	No	No	No
Total Displacements	**0**	**15**	**N/A**	**N/A**	**N/A**	**N/A**

a Under the I-5 westward shift design option, 33 residences at Normandy Apartments would be displaced, resulting in a disproportionately high and adverse effect on significant adverse impact to EJ populations.
EJ = environmental justice; I-5 = Interstate 5; LPA = Locally Preferred Alternative; N/A = not applicable

4.3.3.2 Upper Vancouver

The Modified LPA would fully acquire nine parcels and partially acquire 52 parcels in Upper Vancouver, resulting in nine residential displacements and no business displacements (Table 4-8). Permanent property impacts in Upper Vancouver would be due in large part to freeway interchange improvements and additional noise walls adjacent to I-5.

Table 4-8. Upper Vancouver Displacements and EJ Areas

Neighborhood	Residential Displacements	Business Displacements	Low-Income – High Priority	Low-Income – Meaningfully Greater	Minority – High Priority	Minority – Meaningfully Greater
Arnada	0	0	No	No	No	No
Central Park	0	0	**Yes**	No	**Yes**	No
Hough	0	0	No	**Yes**	No	No
Lincoln	0	0	No	**Yes**	No	No
Rose Village	0	0	No	**Yes**	No	**Yes**
Shumway	**7**	0	No	No	No	No
West Minnehaha	0	0	No	No	No	No
Total Displacements	**9**	**0**	**N/A**	**N/A**	**N/A**	**N/A**

EJ = environmental justice; N/A = not applicable

Most partial acquisitions would be located on residential properties on both sides of I-5 from East 26th Street to East 40th Street and are associated with noise walls and realignment of I-5 between the Fourth Plain and SR 500 interchanges. To accommodate SR 500 ramp configuration, the Modified LPA would require full acquisition and displacement of nine single-family properties between East 35th Street and East 37th Street west of the freeway. Impacts to residential parcels in this subarea would affect the neighborhoods of Shumway (west of I-5) and Rose Village (east of I-5).

Shumway has similar demographics to the Vancouver neighborhoods within the EJ study area, and it does not have meaningfully greater or high-priority percentages of EJ populations when compared to the Portland-Vancouver region as a whole. Residential displacements and partial acquisitions that would occur in this neighborhood do not represent disproportionately high and adverse effects on EJ populations.

Rose Village has block groups with meaningfully greater percentages of both low-income and minority residents, and it has more than double the percentage of Hispanic or Latino residents as compared to the Portland-Vancouver region. Because no residential displacements would occur in this neighborhood, no disproportionately high and adverse effects on EJ populations are anticipated.

No residences would be displaced in the Lincoln or West Minnehaha neighborhoods. The Modified LPA would have minor impacts to the Kiggins Sports Fields/Stadium at Discovery Middle School, but it would not displace any structures or inhibit use of this community resource.

4.4 Transportation and Traffic

Transportation and traffic impacts are based on the IBR Transportation Report, which assesses the Modified LPA against both existing conditions and the No-Build Alternative.

Year 2045 forecast traffic volumes were developed for both the No-Build Alternative and the Modified LPA. One of the Modified LPA design options—removing the C Street ramps—would affect traffic differently than any of the other design options and is expected to cause substantial traffic congestion in downtown Vancouver. Because of this, two versions of the Modified LPA (with and without the C Street ramps) were modeled separately. For the EJ analysis, transportation impacts are described generally for the Modified LPA; differences between the design options with and without the C Street ramps are noted only when they could result in disproportionately high and adverse effects on EJ populations.

Key performance measures for assessing the Modified LPA include changes to vehicle miles traveled (VMT), vehicle hours of travel (VHT), and vehicle hours of delay (VHD). Taken together, these three measures provide insight into future potential traffic volumes, speeds, and delay. These measures can also provide proxy measures to congestion given what is known about the vehicle capacity of the existing bridge.

The general findings show that the Modified LPA is expected to reduce regional VMT by approximately 91,300 miles on an average weekday compared with the No-Build Alternative. Forecast VHT is also expected to decrease by 12,100 hours per average weekday day regionally. The Modified LPA is also anticipated to reduce VHD by 7,300 hours per average weekday regionally. Table 4-9 summarizes these weekday daily performance measures under both the No-Build Alternative and Modified LPA.

Table 4-9. 2045 Weekday Daily Vehicle Miles of Travel, Vehicle Hours of Travel, and Vehicle Hours of Delay

Alternative	Area	VMT	VHT	VHD
No-Build Alternative	Portland Metropolitan Region	59,042,000	1,803,600	65,500
	EJ Study Area	14,349,500	439,600	24,900
Modified LPA	Portland Metropolitan Region	58,950,700	1,792,300	58,300
	EJ Study Area	14,270,500	428,000	17,400

Alternative	Area	VMT	VHT	VHD
Percentage Change between Modified LPA and No-Build Alternative	Regional Percentage Change	-91,300(<-1%)	-12,100 (<-1%)	-7,300 (-11%)
	EJ Study Area Percentage Change	-79,000 (<-1%)	-11,600 (-3%)	-7,500 (-30%)

Source: Metro/RTC Travel Demand Model (Metro 2022).
EJ = environmental justice; LPA = Locally Preferred Alternative; Metro = Oregon Metro; RTC = Southwest Washington Regional Transportation Commission; VHD = vehicle hours of delay; VHT = vehicle hours of travel; VMT = vehicle miles traveled

As shown in Table 4-11, the percentage changes in VMT and VHT resulting from the Modified LPA are modest due to the magnitude of the overall totals. These changes represent a slightly greater share of the total miles and hours. In contrast, the percentage change in VHD is more sizable, both regionally and within the EJ study area, partly because congestion in the EJ study area makes up a larger share of total delay within the Portland Metro region. The Modified LPA—which includes highway improvements, transit improvements, active transportation improvements, and tolling—contributes to a sizable reduction in overall vehicle trips through the EJ study area, which in turn reduces VHD by approximately 11% for the region and 30% for the EJ study area the compared to the No-Build Alternative.

The regional transportation impacts resulting from the Modified LPA are not anticipated to result in disproportionately high and adverse effects on EJ populations. Instead, the modeled reductions in vehicle miles, hours, and delay are expected to yield a net benefit to regional EJ populations traveling through the EJ study area.[28]

However, potential localized adverse effects may occur for certain populations within EJ communities. These include shift workers and others who travel primarily at night or on weekends, and transit-dependent users who rely on bus or light-rail connections that could be temporarily disrupted by construction. While these effects are not captured in the regional modeling, they may affect travel reliability and accessibility for these populations. The Program will continue to coordinate with affected communities, employers, and transit providers to communicate disruptions and implement mitigation measures, such as scheduling construction activities during off-peak periods and evaluating temporary transit accommodations.

The following sections summarize transportation and traffic impacts by transportation facilities and modes, consistent with the analysis methodology documented in the Transportation Technical Report.

[28] It is important to note that in this section, the purported travel time benefits to EJ populations under the Modified LPA are discussed independently from the simultaneous adverse impacts that would result from the proposed IBR tolling program. Some of the reductions in vehicle hours, travel times, and delay in the traffic model would be attributable to the implementation of a tolling program, which would make some populations pursue other means of transportation or avoid trips altogether. The EJ impacts of tolling are discussed further in Section 4.7.

4.4.1 Local Traffic Impacts

Average weekday daily traffic forecasts for the year 2045 were estimated for the I-5 and I-205 bridges across the Columbia River. Metro/RTC's Regional Travel Demand Model was used to calculate an annual growth rate for the total daily traffic volume crossing the Columbia River on both the I-5 and I-205 bridges combined.

Of the 86 study intersections analyzed, six intersections are projected not to meet the applicable jurisdictional level-of-service (LOS)[29] standard in either the AM or PM peak hours under the modified LPA. Of these, three intersections are in areas with meaningfully greater or high-priority EJ block groups:

- **Marine Drive/Martin Luther King Jr. Boulevard and I-5 NB/SB On-/Off-Ramps (Intersection #68) – AM, PM.** Under both the No-Build Alternative and Modified LPA, these ramps are projected to operate at LOS F during the AM peak and LOS E/F during the PM peak. However, the Modified LPA would reduce delay relative to the No-Build Alternative.
- **Columbia Boulevard and I-5 NB/SB on-/off-ramp (Intersection #78) – PM.** Future LOS is projected to remain similar to No-Build conditions, with minor differences in delay. Future (2025) PM peak-hour results show that these ramps would change from their current LOS of A to B under the Modified LPA.
- **Columbia Boulevard and N Vancouver Avenue (Intersection #79) – PM.** LOS is projected at E under the Modified LPA, representing similar or slightly improved conditions relative to No-Build. Future (2025) PM peak-hour results show that these ramps would change from their current LOS of C to E under the Modified LPA.

Although these intersections are located in areas with concentrations of EJ populations, the relative impacts of the Modified LPA are similar for all travelers using these facilities. Therefore, no disproportionately high and adverse effects on EJ populations from arterial and local street impacts are anticipated. Mitigation options to offset adverse traffic impacts resulting from changes to the arterial and local street system are described in Chapter 7.

4.4.2 Transit Impacts

The Modified LPA would implement HCT across the Columbia River, including both LRT and additional express bus service. The proposed station locations would accommodate connections with C-TRAN Vine, C-TRAN and TriMet local bus, TriMet MAX, nonmotorized devices, and automobile access trips.[30]

[29] Level of service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. Refer to the IBR Transportation Technical Report for more information.

[30] C TRAN and TriMet have identified conceptual plan or local bus service changes that could be integrated in the Modified LPA. The information provided by these agencies represents a potential condition that could meet the foreseeable transit needs of the EJ study area. It should be noted that actual changes to regional and local bus routes would require agency approval prior to implementation.

The Modified LPA would extend the existing TriMet Yellow Line from the Expo Center north to a new terminus near Evergreen Boulevard along I-5 in Vancouver. The proposed Evergreen and Waterfront LRT Stations would be located in the Esther Short neighborhood—a high-priority EJ area. An overcrossing would be built above I-5 just south of Evergreen Boulevard. The overcrossing would be constructed as a public open space (referred to as the Community Connector) with pedestrian connections between the east and west sides of I-5. The light-rail terminus at the Evergreen Station would be located just west of the Community Connector.

The Yellow Line extension would operate in an exclusive transit guideway, which includes shoulders to accommodate express bus operations within the guideway. The Yellow Line LRT between downtown Portland and the Evergreen Station in Vancouver would operate at 5- to-7-minute frequencies during the 2-hour peak period and 15-minute frequencies during off-peak periods. These transit improvements are generally anticipated to benefit low-income and minority populations residing in and around Esther Short and Downtown Vancouver.

In addition to the LRT extension, C-TRAN express bus service would be included as part of the Modified LPA with Routes 101, 105, and 190 all using bus-on-shoulder operations for the portions of their routes that run on I-5 through the EJ study area.

In Portland, one bus route would be modified with the introduction of the Yellow Line LRT extension north of the Expo Center to Vancouver in the Modified LPA. This is TriMet Route 6, which runs on Martin Luther King Jr. Boulevard with service to Hayden Island. Once LRT is extended north to Hayden Island, Route 6 would be truncated to end at the Expo Center LRT station. Hayden Island is anticipated to benefit from the proposed transit improvements. No other TriMet bus routes in Portland would be adjusted as part of the Modified LPA.

In Vancouver, there would be several routes with adjustments as part of the Modified LPA. These routes would be rerouted to have a terminus location in Downtown Vancouver along C Street near 9th Street to provide transfer opportunities to and from the Modified LPA transit services at the Evergreen Station. One route that would be changed as part of the Modified LPA is the Vine BRT, which would be rerouted in and out of Downtown Vancouver to serve the Evergreen Station via Evergreen and Fort Vancouver Way rather than via McLoughlin Boulevard. Again, these improvements would occur in and around Esther Short—a high-priority EJ area. Therefore, the proposed transit improvements are anticipated to result in a long-term benefit by increasing transit access and reliability for low-income and minority populations residing in and traveling through the EJ study area.

The Modified LPA would use Crime Prevention Through Environmental Design principles to increase public safety of transit elements including best practices for lighting, closed circuit television, fare zone enforcement, and other design standards adopted for both TriMet and C-TRAN. A fire, life, and safety committee would be assembled to review designs. Compliance would be documented through a safety and security certification process for final design and construction phases. These public safety and transit elements would benefit EJ populations throughout the EJ study area, particularly high-priority EJ neighborhoods adjacent to proposed station improvements in North Portland and Downtown Vancouver.

Improvements in transit speeds and reliability may also benefit EJ populations and contribute to offsetting the burden of the tolls. Up to 12,500 new daily transit riders would use the proposed transit elements of the Modified LPA. The increased availability and reliability of transit service would benefit EJ populations that use transit to travel through the EJ study area. No disproportionately high and adverse effects on EJ populations resulting from transit impacts have been identified under the Modified LPA.

4.4.3 Active Transportation Impacts

The Modified LPA includes bicycle and pedestrian improvements designed to serve all ages and abilities and to connect to the broader active transportation network. A shared-use path 16 to 24 feet wide would provide safe, comfortable, and direct connections, buffered from traffic, noise, debris, and stormwater, with lighting and amenities to optimize user experience. Connections to existing and proposed facilities—including new connections where none currently exist—would increase active transportation access for meaningfully greater and high-priority EJ areas such as East Columbia and Esther Short.

Active transportation improvements in Vancouver (Figure 4-1):

- The Evergreen Station light-rail terminus in the Esther Short neighborhood would include the Community Connector—a crossing over I-5 with off-street pathways, public space, and amenities to address gaps in connectivity and neighborhood cohesion. The existing Evergreen Boulevard overpass would be rebuilt with new pedestrian and bicycle facilities to connect to existing routes. These investments would enhance access between downtown Vancouver, the Vancouver National Historic Reserve, and the transit station, improving the network of public spaces in a high-priority EJ area.
- The Fourth Plain interchange would be rebuilt with bicycle and pedestrian facilities, including a pathway connection north to K Street, serving Rose Village and Fourth Plain Village, both meaningfully greater EJ areas.
- Active transportation improvements along Mill Plain and Fourth Plain would enhance connectivity for Arnada residents, supporting safer and more convenient bicycle and pedestrian travel.
- Reconstructed overcrossings at 29th Street and 33rd Street would improve access for Rose Village, enhancing pedestrian and bicycle safety and connections across I-5.

Active transportation improvements in Portland (Figure 4-2):

- In North Portland, new shared-use paths would replace the circuitous existing network with more direct connections to local streets, trails, and the proposed Expo Center light-rail station.
- The reconstructed Marine Drive interchange would provide grade-separated facilities for local streets and shared-use paths below I-5, connecting new and existing bicycle and pedestrian networks, and creating safer, clearer east–west crossings.

Figure 4-1. Proposed Active Transportation Projects in Modified LPA — Vancouver

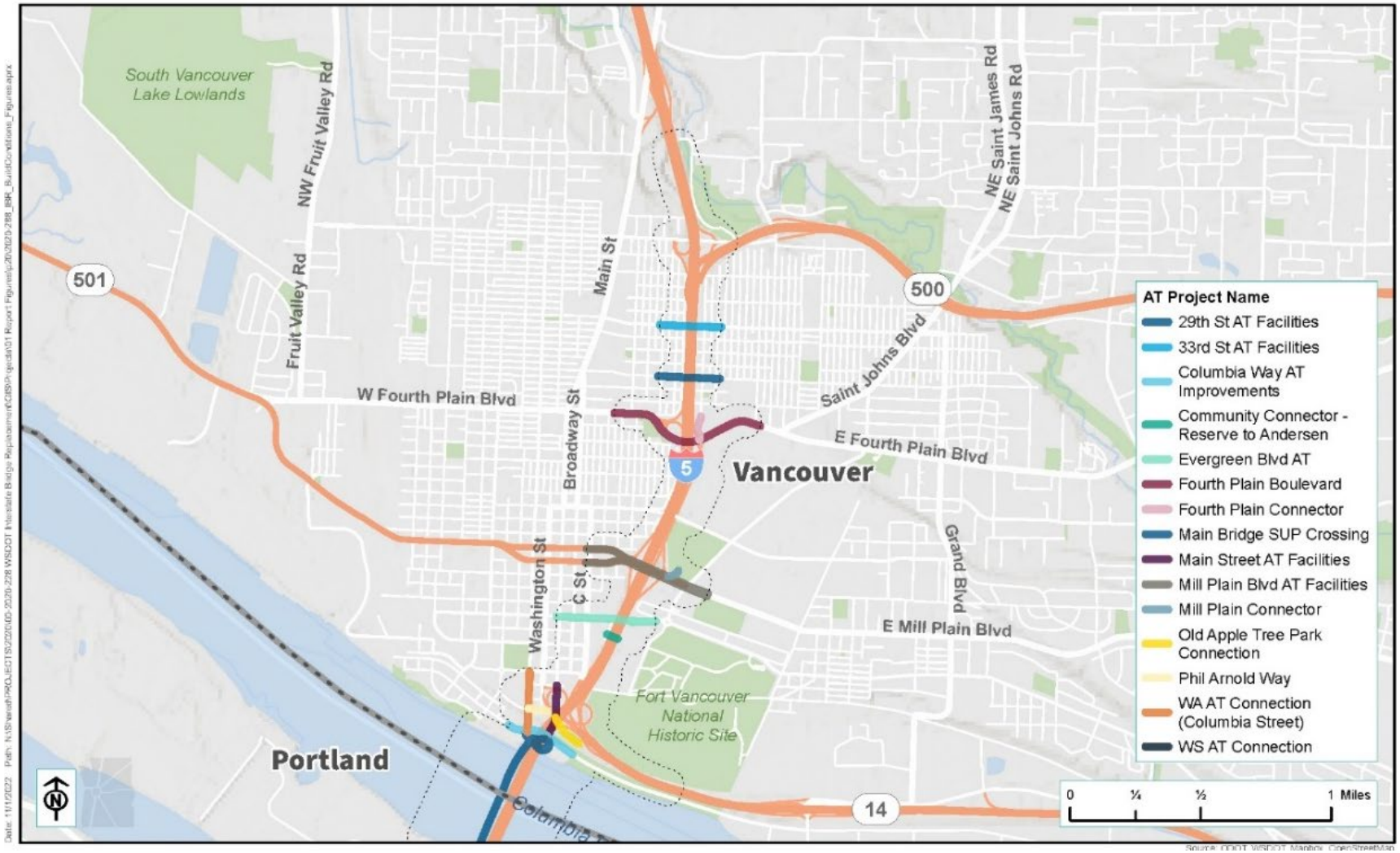


Figure 4-2. Proposed Active Transportation Projects in Modified LPA – Portland

Source: Alta 2022

The Modified LPA would also enhance bicycle facilities throughout the EJ study area by filling network gaps, widening and protecting lanes where replaced, and improving crossings and intersections for safety and comfort. Local street bicycle facilities are assumed to provide a low-stress environment, though final facility types (buffered, protected, or shared-use path) have not been defined.

Bicycle level of traffic stress (BLTS) was analyzed as part of the transportation analysis to determine the long-term impacts of the proposed bicycle improvements under the Modified LPA. BLTS is an approach that quantifies the amount of discomfort that bicyclists feel when they bicycle close to traffic. A BLTS score of "1" refers to a "very low stress" environment equivalent to neighborhood streets, cycle tracks, and trails; a score of "4" refers to a "high-stress" environment, equivalent to bicycling in traffic on 40+ mile-per-hour roads. Table 4-10 and Table 4-11 summarize BLTS scores for bicycle facility and crossing improvements under the Modified LPA for Vancouver and Portland, respectively.

In Vancouver and Portland, BLTS scores of most affected streets would improve to a "low stress" standing with the Modified LPA. In other cases, the Modified LPA would create entirely new cross-river bicycle connections that do not exist today. These improvements to the bicycle system would have a major effect on the quality of local network connections across and around the I-5 corridor and access to the Interstate Bridge, and are anticipated to benefit EJ populations traveling through the EJ study area. No disproportionately high and adverse effects on EJ populations related to active transportation have been identified under the Modified LPA.

Table 4-10. BLTS Scores for No-Build Alternative and Modified LPA in Vancouver

Crossing Location	Existing	Modified LPA	No-Build BLTS Score	Modified LPA BLTS Score
E Columbia Way (Waterfront Renaissance Trail)	Shared-use path on one side of undercrossing, striped bicycle lane on the north side	Upgrades to the shared-use path on one side of undercrossing, to coincide with Columbia Way realignment.	1	1
Phil Arnold Way (extension)	N/A – Does not currently exist	New shared-use path along south side of Phil Arnold Way extension between Columbia Street and Main Street.	N/A	2
Old Apple Tree Park Path Connection	N/A – Does not currently exist	New shared-use path connection between new Phil Arnold Way extension and Old Apple Tree Park. Connects to the Vancouver Land Bridge.	N/A	1

Crossing Location	Existing	Modified LPA	No-Build BLTS Score	Modified LPA BLTS Score
Community Connector	N/A – Does not currently exist	A new structure, up to approximately 250 feet wide, would provide a pedestrian and bicycle connection between 8th/Reserve Street to Anderson Street.	N/A	1
E Evergreen Boulevard	Striped bicycle lanes, both sides of overcrossing	Buffered/protected bike lanes, on both sides of overcrossing.	2	1
Mill Plain Boulevard	Striped bicycle lanes, both sides of undercrossing	Buffered bike lanes, both sides of undercrossing.	4	2
E McLoughlin Boulevard	Striped bicycle lanes, both sides of undercrossing	No change to existing.	2	2
E Fourth Plain Boulevard	No bicycle facility	Eastbound and westbound buffered bicycle lanes.	4	2
E 29th Street	No bicycle facility	Buffered bike lanes on both sides of overcrossing.	2	1
E 33rd Street	No bicycle facility	Buffered/protected bike lanes on both sides of overcrossing.	3	1

BLTS = bicycle level of traffic stress; N/A = not applicable

Table 4-11. BLTS Scores for No-Build Alternative and Modified LPA in Portland

Crossing Location	Existing	Modified LPA	No-Build BLTS Score	Modified LPA BLTS Score
N Victory Boulevard	None	Raised two-way cycle track on north side	4	2
Marine Drive	None	Protected bike lanes through the proposed single-point urban interchange. This becomes a secondary east–west connection across I-5 in North Portland.	4	2

Crossing Location	Existing	Modified LPA	No-Build BLTS Score	Modified LPA BLTS Score
Northbound I-5 on-ramp, undercrossing of I-5	Narrow shared-use path on one side	N/A – This facility and crossing is removed in proposed interchange configuration but replaced with new N Pier 99 Street shared-use path in the build.	1	N/A
N Pier 99 Street	None	Shared-use path on north side of realigned Pier 99 Street connecting Expo Road and Vancouver Way. This becomes the primary east–west crossing of I-5 in North Portland.	2	1
N Janzen Street	None	New shared-use path on south side of Jantzen Drive.	3	1
Tomahawk Island Drive	N/A – Does not currently exist	Shared-use path or sidewalks on both sides of the street.	N/A	2
N Hayden Island Drive	Narrow striped bike lanes	Buffered/protected bike lanes or shared-use path.	1	1

BLTS = bicycle level of traffic stress; I-5 = Interstate 5; LPA = Locally Preferred Alternative; N = North; N/A = not applicable

4.4.4 Safety Impacts

The transportation analysis analyzed crash frequency of the 2045 No-Build Alternative and the Modified LPA. Given all of the geometric and volumetric changes, the Modified LPA with Recommended Design Options is predicted to experience 13% fewer total crashes overall than the No-Build Alternative.[31] In addition to anticipated changes in crash frequencies due to fewer hours when I-5 is operating at capacity, crash types, severities, and locations would likely change due to improvements made to the Columbia River bridges, I-5 mainline, ramps, and ramp terminals in the Modified LPA. The following improvements that are included in the Modified LPA are likely to influence future safety conditions:

- Removal of closures of the I-5 mainline at the Interstate Bridge due to bridge opening events.
- I-5 mainline lanes and shoulders built to full design standards.
- Ramp reconfigurations to remove nonstandard design elements, including short merge distances and ramp weaves.

[31] Refer to the IBR Transportation Technical Report for more information.

- Bicycle and pedestrian improvements along the Interstate Bridge, at ramp terminals, and across I-5, including new shared-use paths, improved crossings at ramp terminals, new connections to on-street bicycle facilities, and enhanced signage.

These changes are generally expected to improve safety for all travelers through the EJ study area, including EJ populations. No disproportionately high and adverse effects on EJ populations related to safety have been identified under the Modified LPA.

4.5 Air Quality

The air quality analysis evaluated data and information regarding the emissions of pollutants, as required by current federal regulations and state guidelines for the EJ study area. Pollutant emissions for Mobile Source Air Toxics and criteria pollutants were estimated for existing conditions (2015), the Modified LPA (2045), and No-Build Alternative (2045). These estimates were developed at a regional level; because the EJ study area is in compliance with applicable air quality standards, no air quality impact analysis was performed for smaller Census geographies.

For future conditions under the Modified LPA, Mobile Source Air Toxics and criteria pollutant emissions for the region are expected to decrease consistent with national trends. This is due to the implementation of fuel and engine regulations that would improve fuel efficiency (see the Air Quality Technical Report for more information). The Modified LPA would also result in no exceedances of National Ambient Air Quality Standards.

Under the Modified LPA, air quality would improve for the region. The level of available data precludes analysis of localized air quality impacts within smaller Census geographies, such as the meaningfully greater or high-priority EJ areas. No disproportionately high and adverse effects on EJ populations related to air quality were identified.

4.6 Noise and Vibration

Noise impacts were evaluated for sensitive receptors—including residences, schools, parks, and other locations where people may be exposed to elevated sound levels—located within approximately 500 feet of the Modified LPA footprint. This discussion focuses on noise impacts identified within EJ areas where predicted noise levels approach or exceed ODOT's Noise Abatement Criteria (NAC).

According to the Noise and Vibration Technical Report, in Portland, one or more sensitive receptors at the Jantzen Beach RV Park would experience an increase of 10 A-weighted decibels (dBA) over existing noise levels under the Modified LPA, which ODOT defines as a "substantial increase." However, noise at this location would still remain well below ODOT's NAC. Jantzen Beach RV Park is not located in a meaningfully greater or high-priority EJ area.

In Vancouver predicted noise impacts vary by neighborhood:

- **Rose Village:** Several residences east of I-5, between E 33rd Street and E 35th Street, are predicted to experience increases of up to 12 dBA under the Modified LPA. These receptors are within the Rose Village neighborhood, which contains block groups with meaningfully greater low-income and minority populations. Noise Wall 3, Noise Wall 5, and Noise Wall 7 on the east side of I-5 would mitigate these impacts.
- **Arnada:** Most noise impacts in the Arnada neighborhood are expected to be mitigated by Noise Wall 8. Arnada is not categorized as a meaningfully greater or high-priority EJ area.
- **Esther Short:** Most noise impacts in Esther Short neighborhood, which contains high-priority EJ block groups, are expected to be mitigated by Noise Wall 12.
- **Columbia Way:** Several receptors south of SR-14 would experience noise impacts under the Modified LPA. Columbia Way is not categorized as a meaningfully greater or high-priority EJ area.
- **Hudson's Bay:** Several receptors north of SR-14 would experience noise impacts under the Modified LPA. Hudson's Bay is not categorized as a meaningfully greater or high-priority EJ area.
- **Central Park:** Several receptors near Marshall Community Center would experience noise impacts under the Modified LPA. Central Park contains high-priority EJ block groups.
- **Shumway:** Noise impacts west of I-5 in the Shumway neighborhood are identified in the Noise and Vibration Technical Report. Noise walls along this area mitigate most impacts to adjacent sensitive receptors.

Noise levels under the Modified LPA in Vancouver are expected to range from approximately 50 to 76 dBA, comparable to urban residences, conversations 3 feet away, classroom chatter, and less than a freight train 100 feet away (Table 4-12). The proposed noise walls will mitigate noise effects to several EJ populations; however, remaining effects could have a disproportionately high and adverse effect on EJ populations in locations where mitigation is not feasible and reasonable.

Table 4-12. OSHA Occupational Noise Exposure Chart

Sound Level (dBA)	Example Setting
140	Threshold of pain
130	Jet taking off (200 feet away)
120	Operating heavy equipment
110	Night club (with music)
100	Construction site
90	Boiler room
80	Freight train (100 feet away)
70	Classroom chatter
60	Conversation (3 feet away)
50	Urban residence
40	Soft whisper (5 feet away)
30	North rim of Grand Canyon
20	Silent study room
10	N/A
0	Threshold of hearing (1,000 Hz)

OSHA 2023
dBA = A-weighted decibel; Hz = Hertz; N/A = not applicable; OSHA = Occupational Safety and Health Administration

4.7 Tolling

This section reviews the impact of tolling on EJ populations within the EJ study area. Toll revenue is a critical component of the IBR Program, both as a tool for managing congestion across the Columbia River and as a primary funding source for capital improvements, operations, and long-term maintenance. Toll rates and related policies, including potential low-income programs, will be determined by the OTC and WSTC following further analysis and a public process.

4.7.1 Cost of Tolling

To support financial planning, OTC and WSTC developed seven variable-price toll rate scenarios, which were consolidated into two "base-case" toll schedules under the Modified LPA for a 40-year planning horizon. These base schedules are summarized in Table 4-13.

Table 4-13. Toll Rate Scenario Schedules under the Modified LPA

North and Southbound Toll Schedule	Variable Toll Rate Range [a]
Scenario A Base Toll Schedule	$2.15 to $3.55
Scenario B Base Toll Schedule	$1.50 to $3.15

a Tolls are expressed in fiscal year 2026 (calendar year 2025) dollars and are assumed to escalate by 2.15% per year.

Both toll schedules use variable pricing, with higher rates during peak periods and lower rates during off-peak periods and weekends.

- **Scenario A Base Toll Schedule** assumes a minimum toll of $2.15 all day on weekends. Since overnight tolling is not assumed to begin until the new bridge is completed, the effective weekday minimum toll between 5 a.m. and 11 p.m. is $3.00. Once the new bridge opens, an overnight toll of $2.15 is assumed.
- **Scenario B Base Toll Schedule** assumes a minimum toll of $1.50 all day on weekends. Similarly, until overnight tolling is assumed to commence on the new bridge, the effective weekday minimum toll assumption between 5 a.m. and 11 p.m. is $2.05.

Variable pricing is intended to balance demand and reduce congestion by encouraging drivers with flexible schedules or higher price sensitivity to travel during off-peak hours, while allowing travelers with less schedule flexibility or higher value-of-time (e.g., those carrying valuable or time-sensitive goods) to pay peak tolls. Depending on specific tolling schemes and transit fare structures, some of the population most sensitive to out-of-pocket costs may shift to transit.

The toll schedules presented here are planning assumptions only and do not represent final policies or rates to be determined jointly by the OTC and WSTC. In addition to the base scenarios, ODOT and WSDOT are evaluating other policy options, including reduced toll programs for low-income households.

Implementing tolling under the Modified LPA is expected to reduce overall bridge crossings compared to the No-Build Alternative, while also affecting travel patterns and costs for travelers. A variable toll pricing scheme on I-5 would introduce an out-of-pocket cost for drivers, which is anticipated to lead some users to avoid making a river crossing, reroute to other facilities, or shift to transit. These changes are expected to reduce congestion on the tolled facility, improving travel times and reliability for those who continue to use it. For many users, the value of time saved from reduced congestion may offset the toll cost; however, others would experience increased financial burdens, longer travel times due to rerouting, or reduced access to destinations. These tradeoffs are not experienced equally: lower-income households are less able to absorb new costs or adapt travel patterns, and therefore are more likely to experience adverse effects.

4.7.2 Burden of Tolling on EJ Populations

According to the U.S. Bureau of Transportation Statistics, transportation accounts for about 15% of median household spending overall, making it the second-largest household expense after housing. However, that share can rise to nearly 30% for lower-income households (BTS n.d.).

To evaluate the potential burden of tolling on EJ populations, this analysis compares annual toll costs as a proportion of household income to assess how tolling would affect overall household transportation expenditures.

To derive annual toll costs, the analysis conservatively estimated that motorists would travel over the bridge twice a day for 262 working days per year[32] using the upper range of the variable toll rate schedules in Table 4-13, above. The estimated annual costs associated with each toll scenario are summarized in Table 4-14, below.

Table 4-14. Annual Estimated Cost of Tolling

Toll Scenario	Toll Rate	Annual Cost
Scenario A	$3.55	$1,860
Scenario B	$3.15	$1,650

Using these rates, the share of median household income represented by annual toll costs was calculated for the Portland-Vancouver MSA, the EJ study area, federal poverty, and low-income thresholds (Table 4-15).

Table 4-15. Tolling Impact as Percentage of Median Household Income

Area	Median Household Income	Scenario A Proportion of Income	Scenario B Proportion of Income
Portland-Vancouver MSA	$94,573	2.0%	1.7%
EJ Study Area	$72,307	2.6%	2.3%
Federal Poverty Level (four-member household)	$32,150	5.8%	5.1%
200% Poverty Level (Low-Income)	$64,300	2.9%	2.5%

Source: 2019–2023 American Community Survey 5-Year Estimates (U.S. Census Bureau 2024)
EJ = environmental justice; MSA = metropolitan statistical area

As shown in Table 4-15, above, the relative financial burden of tolling is highest for lower-income households, particularly those at or below the federal poverty level compared to median-income households in the Portland-Vancouver region. Under these tolling scenarios:

- **Households at the poverty level** ($32,150 for a four-person household) would face tolls representing approximately 5.1% to 5.8% of total household income. Tolls could increase total household transportation costs to anywhere between 25% and 30% for households in poverty.
- **Low-income households** at 200% of the federal poverty level ($64,300) would face an increase in household transportation expenses ranging from approximately 2.5% to 2.9%.

[32] Maximum yearly working days are based on a 1981 General Accounting Office study referenced by the U.S. Office of Personnel Management (OPM n.d.)

- **Median-income households** would experience a relatively smaller increase in household transportation spending. Within the EJ study area, households would experience an increase of approximately 2.3% to 2.6% under the tolling scenarios, compared to an increase of 1.7% to 2% in the Portland-Vancouver MSA. This indicates that the financial burden of tolling would be greater within the EJ study area than the region as a whole.

Given that current household transportation expenditures are already relatively high for lower-income households, these findings highlight that while tolls may improve congestion and reliability, the financial burden would disproportionately impact those households, and may also negatively affect access to employment, services, and other destinations. Mitigation strategies should aim to reduce disparities in the financial and travel impacts of tolling on low-income populations.

4.7.3 Method of Payment

The OTC and WSTC will also determine the method of payment for a potential tolling program across the new Columbia River bridges. As of this writing, this method has not yet been determined. Common payment systems include electronic transponders for prepaid accounts, license plate recognition for bill mailings, pay-by-play options for unregistered vehicles, and traditional toll booths.

Each of these options may creation disproportionate barriers for low-income and minority populations. For example, transponder-based systems typically require an upfront purchase, a linked bank account or credit card, and reliable internet or phone access for setup and account management—resources that are not equally accessible to all households. Similarly, mailed billing systems often include surcharges or late fees that can accumulate quickly and disproportionately impact low-income drivers.

To reduce inequities, toll payment systems could consider mitigation strategies such as the following:

- Low- or no-cost transponders for qualifying households.
- Cash-based payment options available at accessible locations (e.g., retail outlets, community centers) for users without credit or banking access.
- Fee waivers or reduced penalties for late payments to avoid compounding financial burdens.
- Multilingual customer service and materials to ensure equitable access across diverse populations.

As noted above, the OTC and WSTC are expressly authorized to design and enact such policies for a future toll payment system. Designing a toll payment system with these considerations can help reduce disproportionate burdens and ensure that EJ populations are not further disadvantaged by the structure of toll collection.

4.7.4 Tolling Conclusions and Implications for the Modified LPA

This section has discussed potential impacts for tolling the new Columbia River bridges based on an assessment of the benefits and the specific burdens of tolling on EJ populations. The adverse impacts of tolling would be counterbalanced by the Program's benefits and the options to avoid the toll, including the following:

1. There would be viable options to avoiding the toll (e.g., transit, carpooling, rerouting) for those with practicable and feasible options.
2. The benefits of improvements to trip reliability and speeds contribute to offsetting the burden of the tolls. While it is important to note that many low-income populations would benefit greatly from a faster, more reliable trip, EJ principles hold that to offset a disproportionately high and adverse effect on low-income populations, the benefit also needs to disproportionately affect low-income populations. In this case, the benefits of a faster, more reliable trip apply to all populations and not just low-income populations.
3. Revenues from tolling would contribute to the completion of the project and related investments, including improvements to regional transit, walking, and bicycling infrastructure.
4. Several tribes have preemptions from tolling per treaties with the U.S. Government. For members of tribes with those preemptions, there would be no adverse effect from tolling. Several tribes consulting on the IBR Program have requested exemption from tolling on the existing Interstate Bridge and future Columbia River bridges.

It is important to note that the project benefits and the options described above to avoid the toll are not accessible for all impacted EJ populations (or impacted members of the general population). Employment, school, and/or childcare schedules may make these alternative transportation modes impracticable for many, and some EJ populations would need to pay to drive across the bridge. Therefore, some adverse impacts would persist, and mitigation would be required.

Adverse impacts resulting from tolling can be mitigated through proactive policies, such as low-income toll policy programs and equitable tolling policies and practices. Although no specific tolling policies have been developed for the IBR Program, WSDOT and ODOT are actively engaged in work to develop and implement equitable tolling systems, including:

- The Oregon Tolling Program I-205 and I-5 Toll Project's Equity Framework (ODOT 2023). The OTC has advanced key elements of a low-income toll program—the first of its kind in the nation—that will serve low-income travelers who cannot change their travel schedules or who travel frequently on interstate facilities. The program will balance impacts to other travelers while still achieving the overall goals to reduce traffic congestion and raise revenue for transportation improvements. Key commitments include at least a 50% discount on tolls for customers in Oregon or Washington whose household income is up to 200% of the federal poverty level and exemptions for federally recognized tribes and tribal government vehicles.
- WSTC Low-Income Toll Program Study for I-405 & SR 167 Express Toll Lanes (WSTC 2021). WSDOT has developed a range of program options and evaluation metrics to assess toll discount program options to benefit equity populations. Options include percentage-based and fixed-rate discounts per trip, time-based toll credits, free toll trips, and lowering the maximum toll rate.

5. TEMPORARY EFFECTS

Because temporary effects are generally limited to the areas where construction activities, equipment, and staging would occur, the analysis for temporary effects primarily focuses on the Modified LPA construction footprint.

5.1 No-Build Alternative

There would be no temporary effects on EJ populations under the No-Build Alternative.

5.2 Modified LPA

Construction of the Modified LPA is expected to last up to 15 years, affecting all modes of transportation along I-5 and adjacent corridors. Temporary effects, including road closures, detours, and delays resulting from construction-related activities, would occur throughout the EJ study area to varying degrees.

The major construction activities and timing for the IBR Program are summarized below:

- Columbia River bridges – 4 years.
- Hayden Island and SR 14 interchanges – 1.5 to 4 years for each interchange.
- Marine Drive interchange – 3 years.
- Demolition of the existing I-5 Interstate Bridges – 1.5 years.
- Mill Plain, Fourth Plain, and SR 500/39th Street interchanges – 4 years for all three interchanges in total.
- MAX Yellow Line light-rail extension – 4 years.

Construction impacts to EJ populations could include increased congestion, reduced mobility, reduced transit service, increased response time for emergency services, and increased noise. Temporary congestion during construction may impact EJ populations in the EJ study area and the organizations that serve them.

The analysis identified a potential for disproportionately high and adverse effects on EJ populations with regard to construction noise (specifically in the East Columbia and Esther Short neighborhoods) and transportation (as a result of construction-related transit disruptions and temporary closures of cross-river bicycle and pedestrian facilities). Disproportionately high and adverse effects on EJ populations are not anticipated for the other impact categories evaluated. Table 5-1, below, summarizes these temporary impacts to minority and low-income populations associated with the Modified LPA.

Table 5-1. Summary of Potential Temporary Effects for the Modified LPA

Type of Impact	Temporary Impact Summary for the Modified LPA	Temporary Impact(s) Specific to Minority and Low-Income Populations
Acquisitions, Displacements, and Relocations	Temporary construction easements and staging areas for each subarea are: • Oregon Mainland: 8 parcels; 9 acres. • Hayden Island: 19 properties already permanently affected would require additional temporarily easements; 12.8 acres. • Downtown Vancouver: 61 parcels; 8.2 acres. • Upper Vancouver: 49 parcels; 0.3 acres. • Ruby Junction Light-Rail Operations and Maintenance Facility Expansion: None. Two sites have been identified as possible major construction staging areas that could be temporarily acquired or leased: • Vacant Thunderbird Hotel site (Hayden Island): 3.5 acres. • Former WSDOT rest area along I-5 in Vancouver: 5 acres.	Temporary construction easements would be required at two properties in downtown Vancouver identified as providing low-income housing: Evergreen Inn and Lewis and Clark Plaza. Downtown Vancouver includes the Esther Short neighborhood, a high-priority EJ area. No residential or business displacements would occur as a result of these temporary construction easements. Activities at the sites, which would consist of temporary staging for construction and equipment and other construction support activities, could result in a disproportionately high and adverse effect on EJ populations in these low-income housing facilities.
Air Quality	Temporary impacts to air quality from construction activities would occur during the construction period. Construction-related activities would result in increased particulate matter in the form of fugitive dust (from demolition, ground clearing and preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of construction materials). Dust emissions typically occur during dry weather, ground-disturbing construction activities, or high wind conditions. Air quality may also be affected by exhaust emissions from material delivery trucks, construction equipment, and workers' private vehicles.	In general, the anticipated temporary air quality impacts within the EJ study area would be similar for EJ populations and the general population. However, where construction activities occur near meaningfully greater or high-priority EJ communities, such as the East Columbia and Esther Short neighborhoods, construction air quality impacts would result in disproportionately high and adverse effects on EJ populations in these neighborhoods.

Type of Impact	Temporary Impact Summary for the Modified LPA	Temporary Impact(s) Specific to Minority and Low-Income Populations
Land Use and Economics	Construction has the potential to cause negative economic effects by blocking visibility and access to businesses, resulting in patrons choosing other locations for goods and services. Construction can also cause traffic delays and detours that increase travel times, increase the cost of deliveries, and make access to some locations difficult. Construction activities and temporary detours could extend peak-period traffic congestion, negatively impacting businesses whose employees commute using the I-5 corridor. Likewise, the movement of freight, goods, and services could be affected if construction activities make travel times longer or less predictable. In addition, the construction of up to two park-and-ride structures in the Esther Short neighborhood could have greater adverse land use and economic effects compared with other potential uses of these sites. These structures could reduce opportunities for pedestrian-oriented development and undermine the intent to maintain Downtown as a walkable, mixed-use area, potentially affecting business activity and neighborhood character.	Land use and economic impacts (excluding acquisitions and displacements) would be mitigated by measures to minimize air quality, noise, and visual effects of construction and to maintain access to homes and businesses. The remaining impacts would not be significant and would not be experienced disproportionately by meaningfully greater and high-priority EJ neighborhoods within the study area, compared to the general population. Similarly, construction traffic would impact EJ populations the same as the general population. Therefore, no disproportionately high and adverse temporary land use and economic impacts to low-income and minority populations have been identified.

Type of Impact	Temporary Impact Summary for the Modified LPA	Temporary Impact(s) Specific to Minority and Low-Income Populations
Noise and Vibration	All neighborhoods in the EJ study area could experience temporary increases in traffic, noise, and vibration from construction equipment and activities, particularly in neighborhoods adjacent to I-5. These impacts would be experienced by EJ populations similarly to the general public, except in certain specific areas, as described in the column to the right.	Although the entire EJ study area would be affected by increased noise and vibration, some areas with higher concentrations of EJ populations could be affected disproportionately. Particularly high levels of noise and vibration from pile driving activities are anticipated near the Interstate Bridge span. High noise and vibration impacts are also anticipated within the East Columbia and Esther Short neighborhoods, which are high-priority and meaningfully greater areas. Therefore, noise and vibration impacts would result in disproportionately high and adverse effects on EJ populations in these neighborhoods.
Social and Community Effects	Neighborhood quality and cohesion could be negatively affected throughout the construction period. All neighborhoods in the EJ study area could experience temporary congestion, traffic detours, noise, air quality impacts, and increases in truck traffic during construction, particularly in the areas immediately adjacent to I-5. The use of temporary construction staging would minimize some of these negative impacts. The net impact of air, traffic, noise, and construction impacts would constitute social and community effects within the EJ study area.	Neighborhood quality and cohesion impacts would be experienced throughout the EJ study area, and impacts to EJ populations are anticipated to be the same as to the general population. Furthermore, the negative impacts that have been identified would be reduced through the use of construction staging. Therefore, disproportionately high and adverse effects on EJ populations have not been identified.
Tolling	Pre-completion tolling would be implemented on the Interstate Bridge when construction begins. This tolling is expected to occur between 5 a.m. and 11 p.m.; overnight hours would not be tolled, as construction activities may reduce the number of lanes travelers could use. Pre-completion tolling would have impacts similar to those of long-term tolling for travelers except during the overnight hours.	I-5 is currently not tolled, and there are no plans to toll the bridge independently of the IBR Program. Pre-completion tolling would affect EJ populations similarly to long-term tolling. It is anticipated that pre-completion tolling would result in a slightly lower impact than long-term tolls given that pre-completion tolling would only occur between 5 a.m. and 11 p.m. EJ populations traversing the I-5 bridge during the overnight hours would not be tolled. Although the impacts resulting from pre-construction tolling would be lower than those from long-term tolling, any tolling over I-5

Type of Impact	Temporary Impact Summary for the Modified LPA	Temporary Impact(s) Specific to Minority and Low-Income Populations
		would still impact low-income populations disproportionately compared to the general public. Furthermore, it is uncertain whether a low-income or equitable tolling program would be operational during construction, or if it would not be launched until post-construction. Therefore, unless mitigation measures are proposed to address the economic effects of tolling, pre-completion tolling could result in a disproportionately high and adverse effect on EJ populations traveling on I-5 across the Columbia River during the construction period.
Transportation	Construction would result in temporary bridge closures, highway lane closures, bus stop relocations, light-rail station closures, partial or full temporary closures of park and rides, and rerouting of sidewalks and bicycle lanes. Traffic diversion during construction would lead to higher traffic volumes on detour streets, which could lead to a temporary increase in collision frequency. To minimize disruptions to peak period and daytime transportation travel on I-5, some construction activities could occur during nighttime hours and on weekends with approval by ODOT and/or WSDOT. Additional impacts to transportation include the following: • **Bus Service Impacts.** Bus service could be subject to delays from increased congestion due to potential roadway or interchange closures. Buses that travel through downtown Vancouver could encounter temporary closures and reroutes as the transit guideway is installed at the north end of the light-rail transit alignment. • **TriMet MAX Impacts.** Construction along Expo Road and the Marine Drive interchange may require temporary relocation or closure of the TriMet MAX Yellow Line	Interruptions to bus and LRT service in the EJ study area could affect EJ populations more than the general population, as low-income populations are more likely to rely on transit to get to work, school, or other essential destinations. Transit interruptions would be likely to result in detours and out-of-direction travel, particularly for cross-river trips. Temporary closures of cross-river bicycle and pedestrian facilities could result in a disproportionately high and adverse effect on EJ populations that rely on cycling or walking to cross the river. Bicycle and pedestrian facility closures on I-5 leave few options for crossing the river on foot or bicycle, as the only other option would be to cross using the facilities on I-205. The distance between I-5 and I-205 may not be a practical distance to travel for pedestrians and bicyclists, which may fully prevent nonmotorized cross-river trips during certain periods. Furthermore, low-income populations that rely on walking and cycling as their primary mode of transportation may have fewer resources and access to alternative transportation modes than the general population.

Type of Impact	Temporary Impact Summary for the Modified LPA	Temporary Impact(s) Specific to Minority and Low-Income Populations
	terminus station near Expo Center. These temporary relocations, closures, or schedule adjustments could occur for 4 years. • **Pedestrian and Bicycle Impacts.** Construction could temporarily and intermittently close or reroute sidewalks, bicycle facilities, and/or shared-use paths or reduce facility widths within construction areas. Limited opportunities would be available for active transportation crossings of I-5 and would therefore be maintained to the extent practical.	Therefore, interruptions to bus, light-rail service, and cross-river bicycle and pedestrian facilities could result in a disproportionately high and adverse effect on EJ populations.
Visual Resources	Construction is expected to last up to 15 years, during which views to and from the area of visual effects would be altered. Temporary effects on visual quality would result from visual distractions, high-visibility signage, and additional lighting during nighttime construction. Vegetation may be removed from some areas to accommodate the construction of the new bridge structures, new ramps, transit guideways, staging areas, and casting yards. Each area would be revegetated upon completion.	None. Changes in views and visual character are anticipated to be the same for EJ populations as the general population.

EJ = environmental justice; I-5 = Interstate 5; I-205 = Interstate 205; IBR = Interstate Bridge Replacement; ODOT = Oregon Department of Transportation; MAX = Metropolitan Area Express; TriMet = Tri-County Metropolitan Transportation District; WSDOT = Washington State Department of Transportation

5.2.1 Acquisitions and Displacements

Temporary construction easements would be implemented at two properties in downtown Vancouver identified as providing low-income housing: Evergreen Inn and Lewis and Clark Plaza. These properties are located in the Esther Short neighborhood, a high-priority EJ area. No residential or business displacements would occur as a result of these temporary construction easements. Activities at the sites would consist of temporary staging for construction and equipment and other construction support activities, which would not result in adverse effects. Given their location within an identified EJ area and their provision of affordable housing, temporary construction easements at these two sites are not anticipated to result in a disproportionately high and adverse effect on EJ populations.

Temporary construction easements may also occur on Hayden Island to facilitate construction of both the transit and highway alignments. The census geography comprising Hayden Island is not a meaningfully greater or high-priority EJ area. However, low-income and minority people living in the area may be affected and are considered as part of this analysis.

5.2.2 Transportation Impacts

Temporary closures of cross-river bicycle and pedestrian facilities would also result in an adverse and disproportionate effect on EJ populations that rely on cycling or walking to cross the river. Bicycle and pedestrian facility closures on I-5 leave few options for crossing the river on foot or by bicycle, as the only other option would be to cross using the facilities on I-205. The distance between I-5 and I-205 may not be practical for some pedestrians and bicyclists to travel, which may fully prevent cross-river trips during certain periods. Furthermore, low-income populations that rely on walking and cycling as their primary mode of transportation may have fewer resources and less access to alternative transportation modes than the general population. Therefore, interruptions to traffic, bus, light-rail service, and cross-river bicycle and pedestrian facilities would result in a disproportionately high and adverse effect on EJ populations. Measures to address temporary transportation impacts to EJ populations would be similar to those used to address impacts to the general population and are discussed in more detail in the Transportation Technical Report.

5.2.3 Noise and Vibration

The entire EJ study area would be impacted by increased noise and vibration, although particularly high levels of noise and vibration from pile driving activities are anticipated near the Interstate Bridge span. Areas with higher concentrations of EJ populations could be impacted disproportionately compared to the general population. Temporary noise and vibration impacts have been identified within the East Columbia and Esther Short neighborhoods, which are high-priority and meaningfully greater areas. Therefore, noise and vibration impacts in these areas would result in disproportionately high and adverse effects on EJ populations.

Residents of Hayden Island are also likely to experience noise and vibration impacts due to construction equipment, vibratory compaction equipment, and pile driving during bridge

construction. The census geography comprising Hayden Island is not a meaningfully greater or high-priority EJ area. However, low-income and minority people living in the area may be affected and are considered as part of this analysis. Residents living in floating homes may be particularly susceptible to noise and vibration impacts due to their close proximity to both the highway and transit alignments.

Construction of the Modified LPA would follow federal and state noise abatement requirements, including monitoring and enforcement to minimize potential impacts during construction. While there is no effective method to completely eliminate vibration effects, restricting and monitoring vibration-producing activities can reduce impacts within the construction zone. Proposed measures to reduce construction noise and vibration are described in more detail in the Noise and Vibration Technical Report.

5.2.4 Air Quality

Temporary air quality impacts are not expected to result in a disproportionately high and adverse effect on EJ populations because construction-related air quality impacts would be the same for EJ populations as for the general population. However, air quality may be affected on Hayden Island due to emissions from construction equipment. The census geography comprising Hayden Island is not a meaningfully greater or high-priority EJ area. However, low-income and minority people living in the area may be affected and are considered as part of this analysis. Residents living in floating homes and the mobile home park may be particularly susceptible to air quality impacts due to their close proximity to both the highway and transit alignments. Construction impacts to air quality could be minimized through measures discussed in more detail in the Air Quality Technical Report.

6. INDIRECT EFFECTS

6.1 No-Build Alternative

As described in Table 4-2 in Chapter 4, Long-Term Effects, the No-Build Alternative would not displace residents or businesses and would not affect community resources or jobs. However, traffic growth and congestion on I-5 would continue to worsen, with travel times anticipated to increase by 50% in 2045 compared to existing travel times. Increasing travel times and congestion on I-5 could have indirect negative effects on regional, national, and local freight routes; the economy; vehicle emissions; and access to key destinations and community resources in Vancouver and Portland. Furthermore, the No-Build Alternative would not bring HCT to Hayden Island or downtown Vancouver, forgoing potential benefits to EJ populations that may depend more on transit and active transportation as their primary mode of transport compared to the general population. However, most of these indirect effects would affect EJ populations the same as or similarly to the general population. Therefore, the No-Build Alternative is not anticipated to result in disproportionately high and adverse indirect effects on EJ populations.

6.2 Modified LPA

The areas with the highest potential for indirect effects from the Modified LPA are Hayden Island and downtown Vancouver, where new HCT stations could influence land use and economic patterns through transit-oriented development. Indirect effects may include changes in property values, rents, and demographic composition—processes often associated with gentrification—that could result in disproportionately high and adverse effects on low-income and minority populations, particularly within a 15-minute walk, bike, or bus ride of light rail stations.

Although Hayden Island is not identified as a meaningfully greater or high-priority EJ area, low-income and minority residents there could still be affected by indirect changes associated with transit-oriented development. The Esther Short neighborhood in downtown Vancouver is a high-priority EJ area, with a high concentration of low-income residents who may be particularly susceptible to indirect effects.

While redevelopment would not be undertaken directly by the IBR Program, transportation improvements could facilitate development anticipated in local land use plans (see the Land Use Technical Report). City of Vancouver policies and programs such as the City's Affordable Housing Fund are intended to maintain a mix of housing types and mitigate displacement risks.[33] The Program will coordinate with City of Vancouver and regional affordable housing programs and explore anti-displacement and community stabilization measures, building upon the City's equitable development policies, strategies, and community engagement models.

[33] The Land Use Technical Report concludes that adopted land use plans calling for increased population and employment density are responsible for growth – not transportation infrastructure on its own. The infrastructure proposed as part of the Modified LPA supports growth that the region has already planned to accept.

Given the time required for Program implementation and the many factors that affect land development and redevelopment—including local plans and policies, land use and zoning regulations, and regional and national economic conditions—it is not possible to predict with any specificity what types of indirect effects might occur in Hayden Island and downtown Vancouver after completion of the Modified LPA. Therefore, it is not possible to determine whether such effects would result in disproportionately high and adverse impacts to EJ populations. However, the potential for gentrification, loss of affordable housing stock, and similar effects warrants ongoing consideration in future planning and monitoring.

7. AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

No specific temporary and long-term avoidance, minimization, and mitigation measures within the control of the IBR Program were identified for EJ populations. However, avoidance, minimization, and mitigation measures for acquisitions and displacements, air quality, noise and vibration, and transportation that could potentially affect EJ populations are described in the Acquisitions and Displacements Technical Report, Air Quality Technical Report, Noise and Vibration Technical Report, and Transportation Technical Report of the NEPA/SEPA Final SEIS and are not included in this section. Those measures would also have the effect of mitigating EJ impacts. As noted in Appendix M of the NEPA/SEPA Final SEIS, all toll scenarios under consideration for the IBR Program assume a low-income discount. Refer to *Appendix B of the SEPA Addendum* to review the measures.

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