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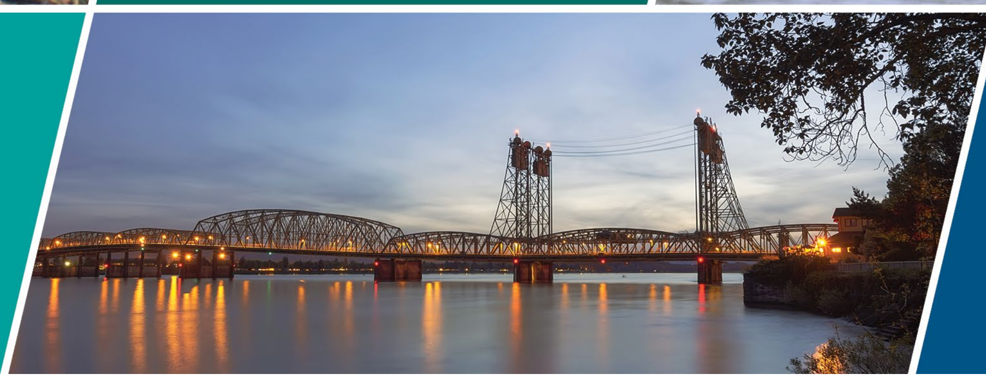

Wetlands and Other Waters Technical Report

March 2026

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Wetlands and Other Waters Technical Report

CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials
BMP	best management practice
BRT	bus rapid transit
CCFS projects	Columbia Corridor Flood Safety projects
C-D	collector-distributor
CIA	contributing impervious area
CPC	City of Portland Code
CRC	Columbia River Crossing
CTR	Commute Trip Reduction
C-TRAN	Clark County Public Transit Benefit Area Authority
CWA	Clean Water Act
DEQ	Oregon Department of Environmental Quality
DSL	Oregon Department of State Lands
Ecology	Washington State Department of Ecology
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAC	facultative
FACU	facultative upland
FACW	facultative wetland
GMA	Growth Management Act
GPS	global positioning system
HGM	hydrogeomorphic

Acronym/Abbreviation	Definition
I-5	Interstate 5
IBR	Interstate Bridge Replacement
LPA	Locally Preferred Alternative
LRT	light-rail transit
LRV	light-rail vehicle
MAX	Metropolitan Area Express
NAVD 88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOL	not on list
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRMP	Natural resource management plan
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rules
OBL	obligate
ODFW	Oregon Department of Fish and Wildlife
OHWM	ordinary high water mark
OMF	Operations and Maintenance Facility
ORS	Oregon Revised Statutes
ORWAP	Oregon Rapid Wetland Assessment Protocol
OTC	Oregon Transportation Commission
PEM	palustrine emergent
PEMA	palustrine emergent, temporarily flooded

Acronym/Abbreviation	Definition
PEMC	palustrine emergent, seasonally flooded
PEMCx	palustrine emergent, seasonally flooded, excavated
PFO/SS/EM	palustrine forested/scrub-shrub/emergent
PFO/SS/EMHx	palustrine, forested/scrub-shrub/emergent, permanently flooded, excavated
PFOC	palustrine, forested, seasonally flooded
PJWA	potentially jurisdictional water area
PMLS	Portland Metro Levee System
PNCD	Preliminary Navigation Clearance Determination
PRM	permittee responsible mitigation
PUBHh	palustrine, unconsolidated bottom, permanently flooded, diked/impounded
PUBHx	palustrine, unconsolidated bottom, permanently flooded, excavated
PUSCx	palustrine unconsolidated shore, seasonally flooded, excavated
R2UBH	riverine, lower perennial, unconsolidated bottom, permanent flooded
RCW	Revised Code of Washington
redox	oxidation-reduction
RM	river mile
ROD	Record of Decision
SEIS	Supplemental Environmental Impact Statement
SEPA	Washington State Environmental Policy Act
SFAM	stream functional assessment method
SMA	Shoreline Management Act
SOV	single-occupancy vehicle

Acronym/Abbreviation	Definition
SR	State Route
TriMet	Tri-County Metropolitan Transportation District of Oregon
UFSWQD	Urban Flood Safety and Water Quality District
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
VMC	Vancouver Municipal Code
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSTC	Washington State Transportation Commission

1. PROGRAM OVERVIEW

This technical report identifies, describes, and evaluates temporary, long-term, and indirect effects on wetlands and other water resources from the Interstate Bridge Replacement (IBR) program's Modified Locally Preferred Alternative (LPA). The construction and operation of transportation infrastructure can have temporary and permanent effects on wetland resources, including wetland buffers, and other waters. The Modified LPA would be designed to avoid and/or minimize these effects on the greatest extent possible. This report provides mitigation measures for potential effects on these resources when avoidance is not feasible.

The purpose of this report is to satisfy applicable portions of the National Environmental Policy Act (NEPA) 42 United States Code (U.S.C.) 4321 "to promote efforts which will prevent or eliminate damage to the environment." Information and potential environmental consequences described in this technical report will be used to support the Final Supplemental Environmental Impact Statement (SEIS) for the IBR Program pursuant to 42 U.S.C. 4332.

The objectives of this report are to:

- Define the study area and the methods of data collection and evaluation used for the analysis (Chapter 2).
- Describe existing wetlands and other waters within the study area (Chapter 3).
- Discuss potential long-term, temporary, and indirect effects on wetlands and other waters resulting from construction and operation of the Modified LPA in comparison to the No-Build Alternative (Chapters 4 and 5).
- Provide proposed avoidance and mitigation measures to help prevent, eliminate, or minimize environmental consequences from the Modified LPA (Chapter 6).
- Identify federal, state, and local permits that would be required (Chapter 7).

The 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

1.1 Components of the Modified LPA

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

- A new pair of Columbia River bridges—one for northbound and one for southbound travel—built west of the existing bridge. The new bridges would each include three through lanes, safety shoulders, and one auxiliary lane in each direction. When all highway, transit, and active transportation would be moved to the new Columbia River bridges, the existing

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

Interstate Bridge (both spans) would be removed.[2] The primary navigation channel would be relocated approximately 500 feet south (measured by the channel centerline) of its existing location near the Vancouver shoreline.

- A 1.9-mile light-rail transit (LRT) extension of the current Metropolitan Area Express (MAX) Yellow Line from the Expo Center MAX Station in North Portland, where it currently ends, to a terminus near Evergreen Boulevard in Vancouver. Improvements would include new stations at Hayden Island, downtown Vancouver (Waterfront Station), and near Evergreen Boulevard (Evergreen Station), as well as reconstruction of the existing Expo Center MAX Station. The Tri-County Metropolitan Transportation District of Oregon (TriMet), which operates the MAX system, would also operate the Yellow Line extension.
- Associated LRT improvements such as traction power substations (TPSS),[3] an overhead catenary system, signal and communications support facilities, an overnight light-rail vehicle (LRV) facility at the Expo Center, 19 new LRVs, and an expanded maintenance facility at TriMet's existing Ruby Junction Light-Rail Operations and Maintenance Facility (OMF).
- Connections to local bus transit service, including bus rapid transit (BRT) and express bus routes, in collaboration with the Clark County Public Transit Benefit Area Authority (C-TRAN), in addition to the proposed new LRT service.
- Shoulders on I-5 from Interstate Avenue/Victory Boulevard to SR 500/39th Street to accommodate express bus-on-shoulder service in each direction.
- Associated bus transit service improvements, including three additional bus bays for new buses at the existing C-TRAN OMF (see Section 1.1.7, Transit Operating Characteristics, for more information about this service).
- Improvements to seven I-5 interchanges and I-5 mainline improvements between Interstate Avenue/ Victory Boulevard in Portland and SR 500/39th Street in Vancouver. Some adjacent local streets would be reconfigured to complement the new interchange designs and improve local east-west connections.
- Six new adjacent bridges across North Portland Harbor: one on the east side of the existing I-5 North Portland Harbor bridge and five on the west side or overlapping with the existing bridge (which would be removed). The bridges would carry (from west to east) LRT tracks, southbound I-5 off-ramp to Marine Drive, southbound I-5 mainline, northbound I-5 mainline, northbound I-5 on-ramp from Marine Drive, and an arterial bridge for local traffic to Hayden Island with a shared-use path for pedestrians and bicyclists.
- A variety of improvements for people who walk, bike, and roll throughout the study area, including a system of shared-use paths, bicycle lanes, sidewalks, enhanced wayfinding, and facility improvements to comply with the Americans with Disabilities Act. These are referred to in this document as "active transportation improvements."

[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.

- Variable-rate tolling, including signage and equipment, for motorists using the river crossing as a demand-management and financing tool.

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

- **Auxiliary Lanes.** Options for one or two auxiliary lanes. Auxiliary lanes are ramp-to-ramp connections on the highway that improve interchange safety by providing drivers with more space and time to merge, diverge, and weave at highway access points.
  - The one auxiliary lane design option would extend across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange.
  - The two auxiliary lane design option would extend a second auxiliary lane in each direction of I-5 in addition to the one auxiliary lane included in the Modified LPA. The second auxiliary lane would also extend across the Columbia River bridges in addition to and in combination with the existing auxiliary lanes from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street.
- **Bridge Configurations.** Three bridge configurations are under consideration.
  - Double-deck fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
  - Single-level fixed-span bridges: 116 feet of vertical navigation clearance over the primary navigation channel.
  - Single-level movable-span bridges: with the movable spans over the primary navigation channel: 178 feet of vertical navigation clearance in the open position and 90 feet in the closed position (the north barge channel would have 99 feet of vertical navigation clearance and the south barge channel would have 90 feet of vertical navigation clearance).
- **C Street Ramps.** Options that retain or eliminate the existing C Street ramps in downtown Vancouver.
- **I-5 Alignment in Downtown Vancouver.** Options that maintain the I-5 mainline at its current location or shift the I-5 mainline up to 40 feet westward in downtown Vancouver between the SR 14 interchange and Mill Plain Boulevard interchange.
- **Park and Rides.** Options to provide parking capacity to accommodate 1,270 vehicles at designated park and rides near the Waterfront Station and Evergreen Station to serve LRT riders.

Table 1-1. Modified LPA Design Options

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

Notes:

* Recommended Design Options are in bold.

[a] Depending on final design considerations, the decision may be made to use fewer than the five sites. The analysis assumes all five sites as it encompasses all physical impacts.

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

Section 1.1.1, Interstate 5 Mainline, describes the overall configuration of the I-5 mainline through the study area, and Sections 1.1.2, Portland Mainland and Hayden Island (Subarea A), through Section 1.1.5, Upper Vancouver (Subarea D), provide additional detail on four geographic subareas (A through

D), which are shown on Figure 1-3. In each subarea, improvements to I-5, its interchanges, and the local roadways are described first, followed by transit and active transportation improvements. Design options are described under separate headings in the subareas in which they would be located. The description of the Modified LPA and design options are based on conceptual design and are subject to refinement as the design is finalized. The IBR Program will continue to consult with regulatory agencies, local agencies with jurisdiction, and tribes to seek opportunities for improvements and avoidance and minimization of impacts.

Figure 1-2. Modified LPA Components

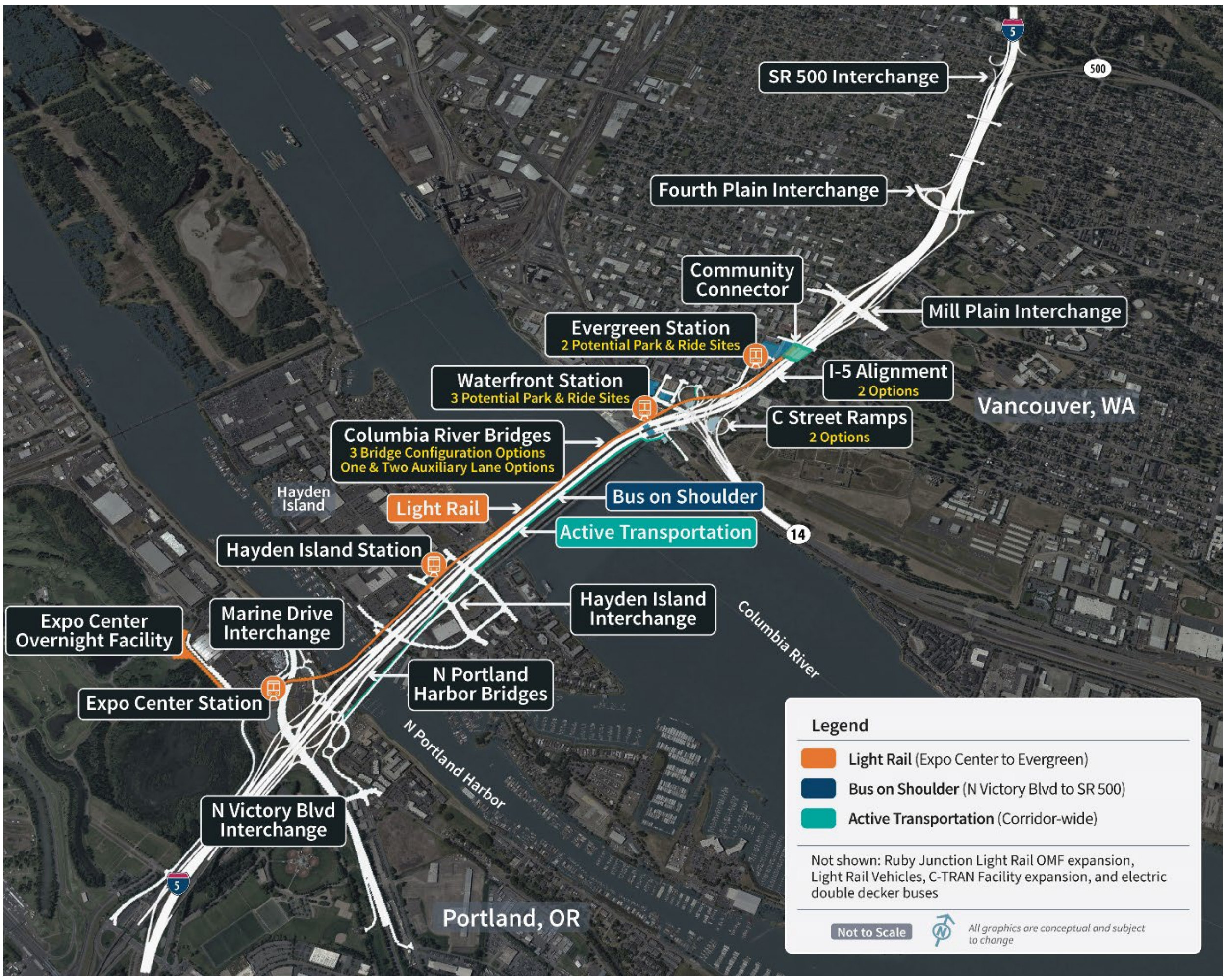


Figure 1-3. Modified LPA – Geographic Subareas

1.1.1 Interstate 5 Mainline

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

The Modified LPA would include three 12-foot through lanes from Interstate Avenue/Victory Boulevard to SR 500/39th Street and one or two 12-foot auxiliary lanes, as detailed below and shown on Figure 1-4. Many of the existing auxiliary lanes on I-5 between the SR 14 and Main Street interchanges in Vancouver would remain, although they would be reconfigured. The existing auxiliary lanes between the Victory Boulevard and Hayden Island interchanges would be replaced with changes to on- and off-ramps and interchange reconfigurations. The existing Interstate Bridge over the Columbia River does not have auxiliary lanes; the Modified LPA would add one or two auxiliary lanes in each direction across the new Columbia River bridges.

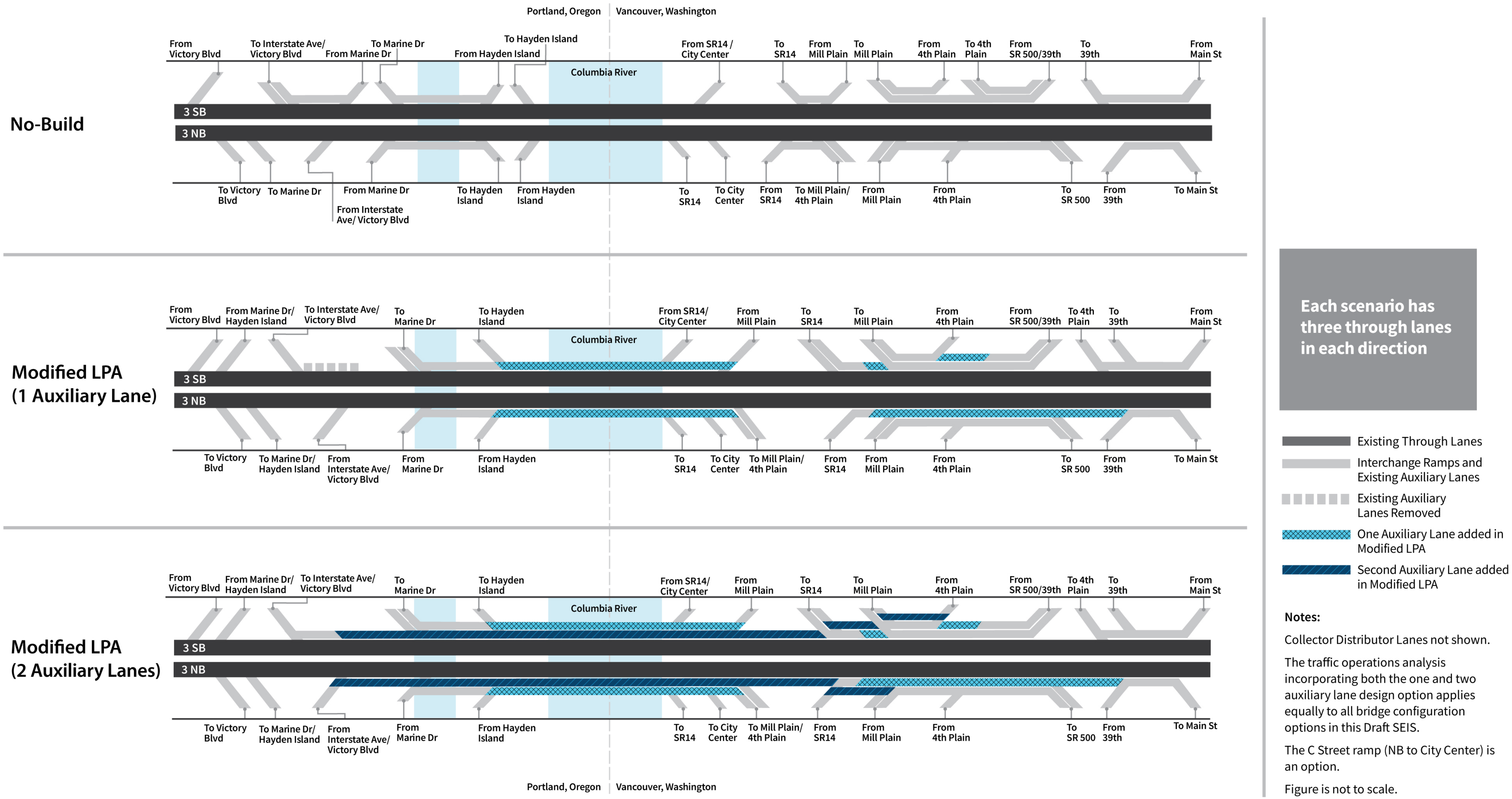
The Modified LPA would also include shoulders (11- to 14-foot inside shoulders and 10- to 14-foot outside shoulders) to be consistent with the design standards of the Oregon Department of Transportation (ODOT) and Washington State Department of Transportation (WSDOT). The inside shoulder would be used by express bus service to bypass mainline congestion, known as “bus on shoulder” (refer to Section 1.1.7, Transit Operating Characteristics). The shoulder would be available for express bus service when general-purpose speeds are below 35 miles per hour).

1.1.1.1 Auxiliary Lane Design Options

The Modified LPA includes design options for one auxiliary lane in each direction or two auxiliary lanes in each direction across the Columbia River bridges in addition to and in combination with existing auxiliary lanes in the area. The one auxiliary lane design option would include an auxiliary lane in each direction across the Columbia River bridges between the Marine Drive interchange and the Mill Plain Boulevard interchange. The two auxiliary lane design option would include a second auxiliary lane from the Interstate Avenue/Victory Boulevard interchange and the SR 500/39th Street interchange, including on the Columbia River bridges (see Figure 1-4). This section provides an overview of the one auxiliary lane and the two auxiliary lane design options.

Figure 1-5, which shows a single-level fixed-span bridge configuration for comparison purposes, shows that the scale of the physical impacts (footprint, or the limits of permanent improvements) would be similar for the Modified LPA with one auxiliary lane design option and the Modified LPA with two auxiliary lanes design option, except over the Columbia River and in downtown Vancouver. For all bridge configuration design options, the two auxiliary lane design option would add a net of approximately 16 feet (8 feet in each direction) in total roadway width to the Columbia River bridges compared to the one auxiliary lane design option.

Figure 1-4. Auxiliary Lane Configurations



Notes:

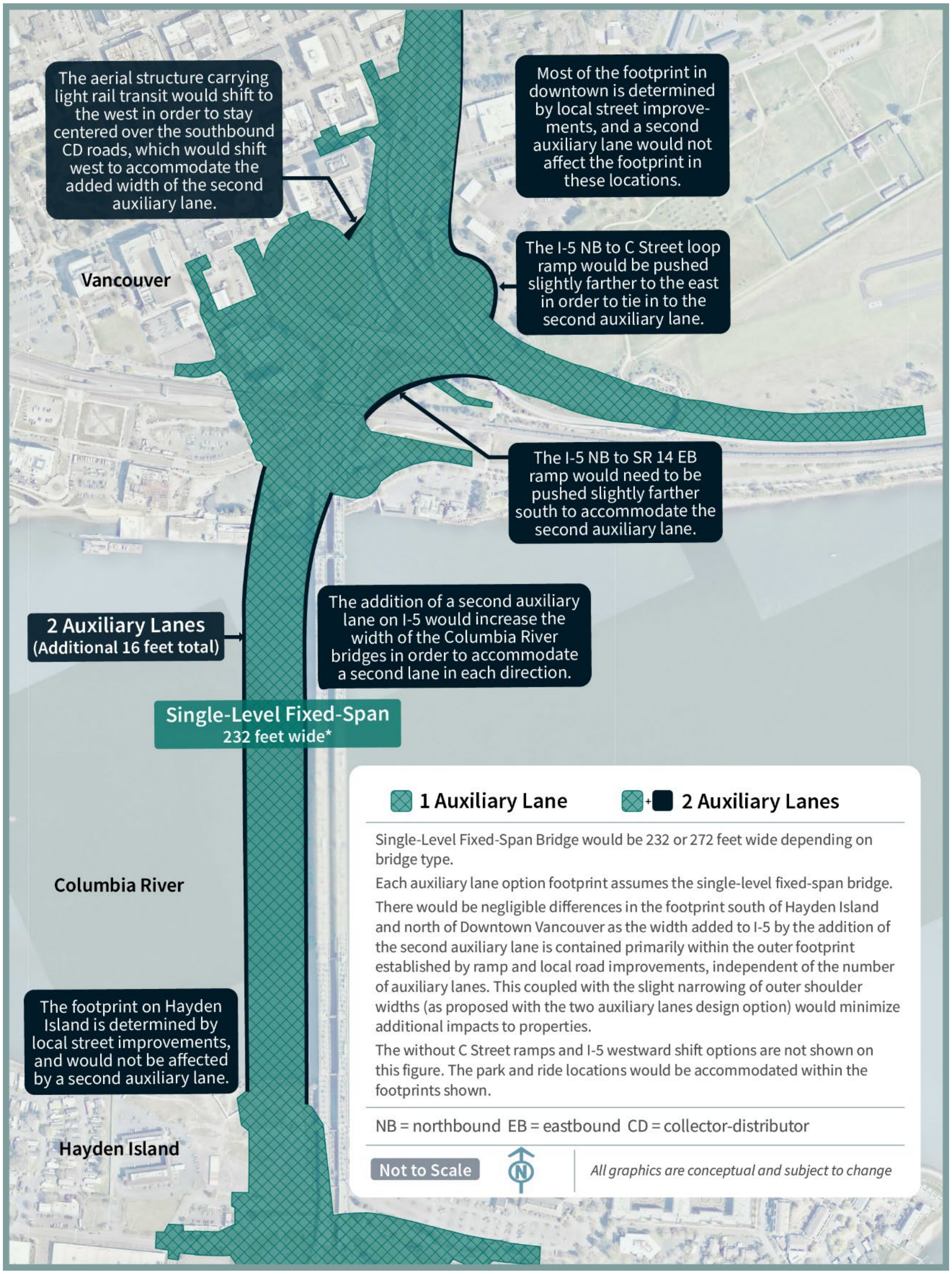
Collector Distributor Lanes not shown.

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 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.

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.

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

TWO AUXILIARY LANE DESIGN OPTION

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

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

On southbound I-5, the two existing auxiliary lanes between SR 500/39th Street and Mill Plain Boulevard would remain, with some reconfiguration because of the braided ramps between the SR 500/39th Street and Fourth Plain Boulevard interchanges. In addition, there would be a third auxiliary lane between the Fourth Plain Boulevard on-ramp and the Mill Plain Boulevard off-ramp to improve operations and safety between these two closely spaced ramps. The existing auxiliary lane between the SR 500/39th Street on-ramp would extend to the SR 14 collector-distributor off-ramp. This auxiliary lane would then continue across the Columbia River bridge to the Interstate Avenue/Victory Boulevard off-ramp. The outside auxiliary lane would extend from the Mill Plain on-ramp across the Columbia River bridge to connect to the existing auxiliary lane between Hayden Island and the Marine Drive off-ramp.

1.1.2 Portland Mainland and Hayden Island (Subarea A)

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

1.1.2.1 Levee System Improvements

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

- The Oregon Slough segment of the Peninsula Drainage District Number 1 levee (PEN 1).
- The Oregon Slough segment of the Peninsula Drainage District Number 2 levee (PEN 2).
- The PEN1/PEN2 Cross Levee segment of the PEN 1 levee (Cross Levee).

The levee systems are shown on Figure 1-7, and intersections with Modified LPA components are described throughout this section (Section 1.1.2, Portland Mainland and Hayden Island (Subarea A)), where appropriate. Within Subarea A, the IBR Program study area intersects with PEN 1 to the west of I-5 and with PEN 2 to the east of I-5. PEN 1 and PEN 2 include a main levee along the south side of North Portland Harbor and are part of a combination of levees and floodwalls. PEN 1 and PEN 2 are separated by the Cross Levee that is intended to isolate the two districts if one of them were to fail. The Cross Levee is located along the I-5 mainline embankment, except in the Marine Drive interchange area, where it is located on the west edge of the existing ramp from Marine Drive to southbound I-5.[4]

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

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

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

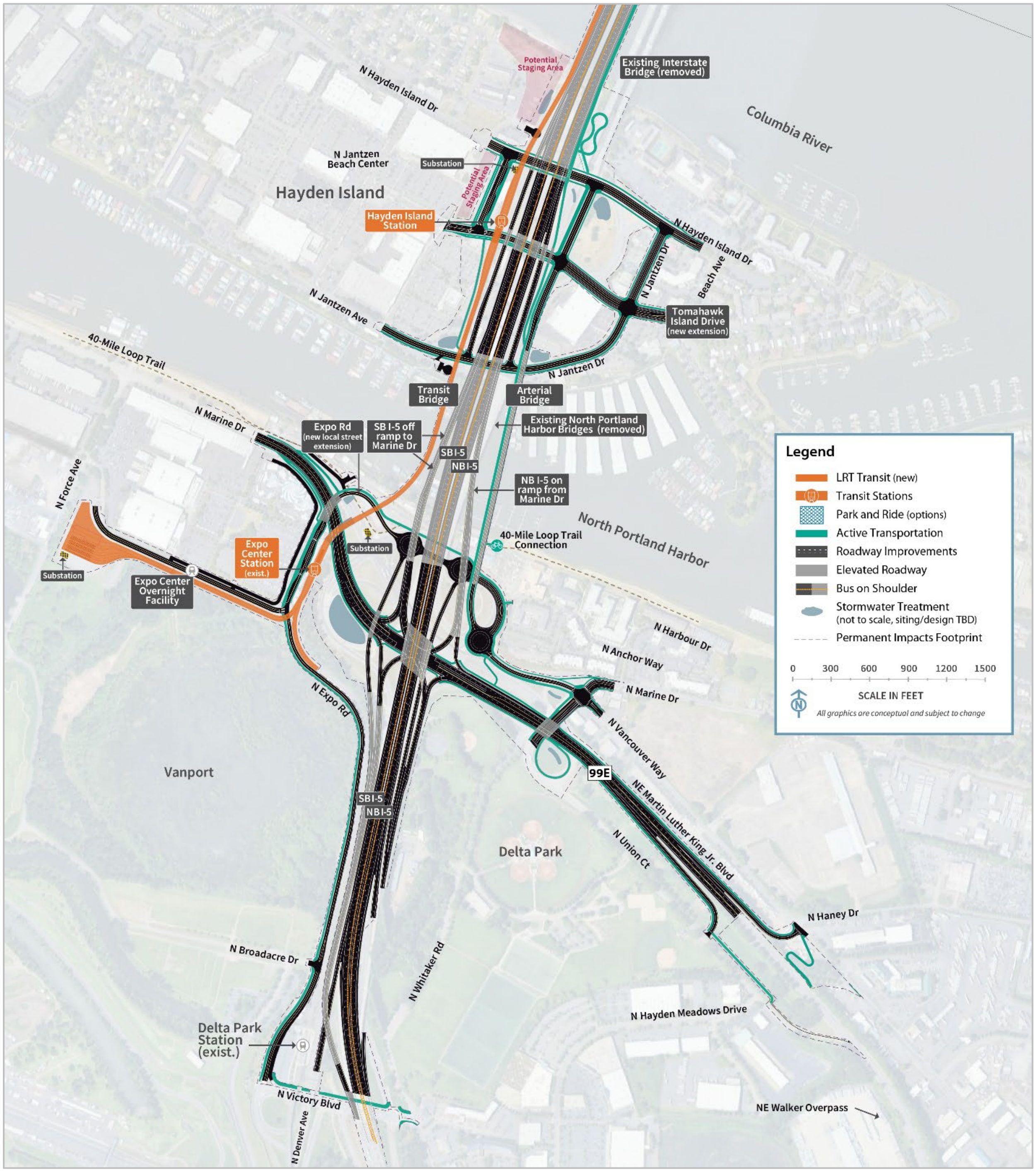
The Urban Flood Safety and Water Quality District (UFSWQD)[5] is working in partnership with the USACE on the PMLS project, which includes improvements at PEN 1 and PEN 2 (e.g., raising these levees to elevation 38.2 feet for earthen levees and 39.2 feet for flood walls North American Vertical Datum of 1988 [NAVD 88]).[6] Additionally, as part of the CCFS projects, UFSWQD has identified the need to raise a low spot in the Cross Levee on the southwest side of the Marine Drive interchange.

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

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

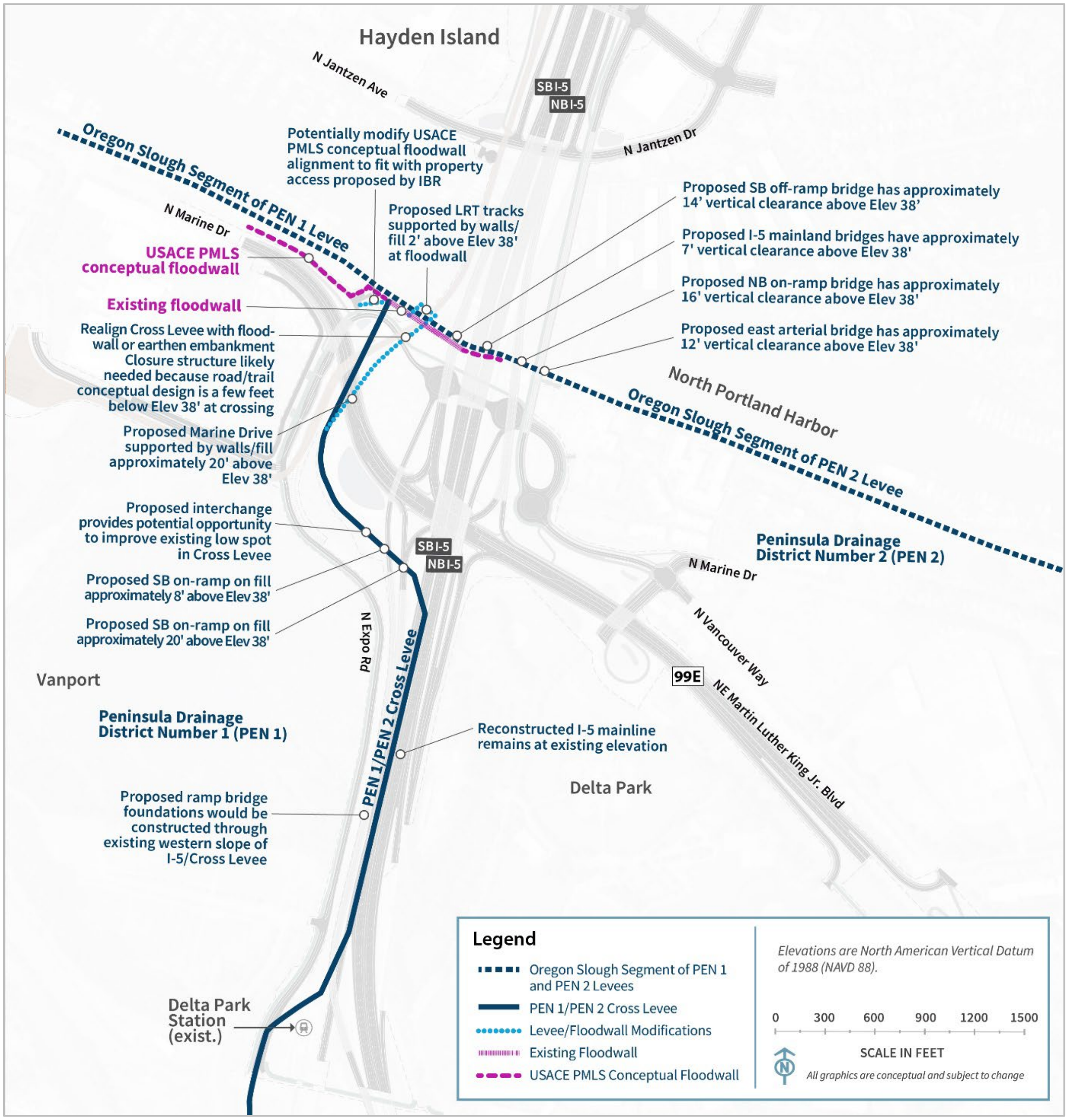
[6] NAVD 88 is a vertical control datum (reference point) used by federal agencies for surveying.

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



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

Figure 1-7. Levee Systems in Subarea A



1.1.2.2 Highways, Interchanges, and Local Roadways

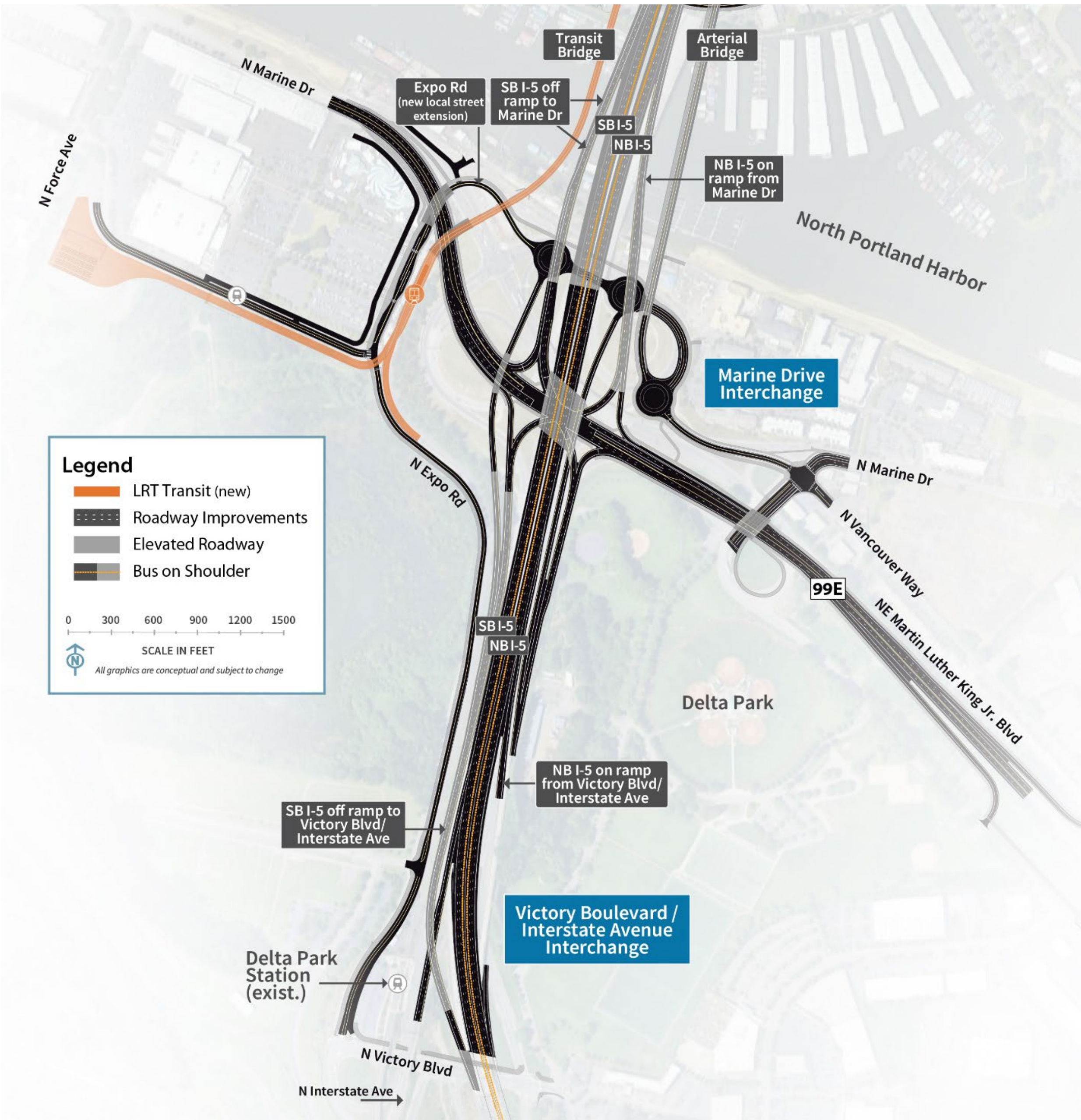
VICTORY BOULEVARD/INTERSTATE AVENUE INTERCHANGE AREA

The southern extent of the Modified LPA would improve two ramps at the Victory Boulevard/Interstate Avenue interchange (see Figure 1-6 and Figure 1-8). The first ramp improvement would be the southbound I-5 off-ramp to Victory Boulevard/Interstate Avenue; this off-ramp would be braided below (i.e., grade separated or pass below) the Marine Drive to the I-5 southbound on-ramp (see the

Marine Drive Interchange Area section below). The other ramp improvement would lengthen the merge distance for northbound traffic entering I-5 from Victory Boulevard and from Interstate Avenue.

The existing I-5 mainline between Victory Boulevard/Interstate Avenue and Marine Drive is part of the Cross Levee (see Figure 1-7). The Modified LPA would require some pavement reconstruction of the mainline in this area; however, the improvements would mostly consist of pavement overlay, and the profile and footprint would be similar to existing conditions.

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



MARINE DRIVE INTERCHANGE AREA

The next interchange north of the Victory Boulevard/Interstate Avenue interchange is at Marine Drive. All movements within this interchange would be reconfigured to improve safety and operations for motorists entering and exiting I-5, and all active transportation users accessing areas in the vicinity of the interchange. In addition, Marine Drive would be raised over the proposed LRT extension to separate motorist and transit users. The proposed Marine Drive interchange configuration would be a single-point urban interchange. Figure 1-8 shows Marine Drive interchange's layout and construction footprint.

Martin Luther King Jr. Boulevard would have new more direct connections to I-5. The new interchange configuration would change the westbound Marine Drive and westbound Vancouver Way connections to Martin Luther King Jr. Boulevard. An improved connection farther east of the interchange (near Haney Drive) would provide access to westbound Martin Luther King Jr. Boulevard for these two streets. The existing access to westbound Martin Luther King Jr. Boulevard from Vancouver Way east of Haney Drive would be closed. For eastbound travelers on Martin Luther King Jr. Boulevard exiting to Union Court, the existing loop connection would be replaced with a new connection farther east (between the access to the East Delta Park Owens Sports Complex and N Hayden Meadows Drive).

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

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

From Hayden Island, motorists traveling south to Portland via Martin Luther King Jr. Boulevard would turn onto the arterial bridge southbound and travel straight through the intersection onto Vancouver Way. At the intersection of Vancouver Way and Marine Drive, motorists would turn right onto Union Court and follow the existing road southeast to the existing on-ramp onto Martin Luther King Jr. Boulevard.

The conceptual floodwall alignment from the proposed USACE PMLS project is located on the north side of Marine Drive, near two industrial properties, with three proposed closure structures[7] for property access. The Modified LPA would realign Marine Drive to the south to maintain traffic on existing Marine Drive during construction. The Modified LPA would provide access to the two industrial properties via the new local road extension from Expo Road. Therefore, the change in

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

access for the two industrial properties could require small modifications to the floodwall alignment (a potential shift of approximately 5 to 10 feet to the south) and closure structure locations. The IBR Program is coordinating with USACE PMLS and the UFSWQD on modifications to the floodwall alignment.

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

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

NORTH PORTLAND HARBOR BRIDGES

To the north of the Marine Drive interchange is the Hayden Island interchange area, which is shown in Figure 1-6. I-5 crosses over the North Portland Harbor when traveling between these two interchanges. The Modified LPA proposes to replace the existing I-5 bridge spanning North Portland Harbor to improve seismic resilience.

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

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

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

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

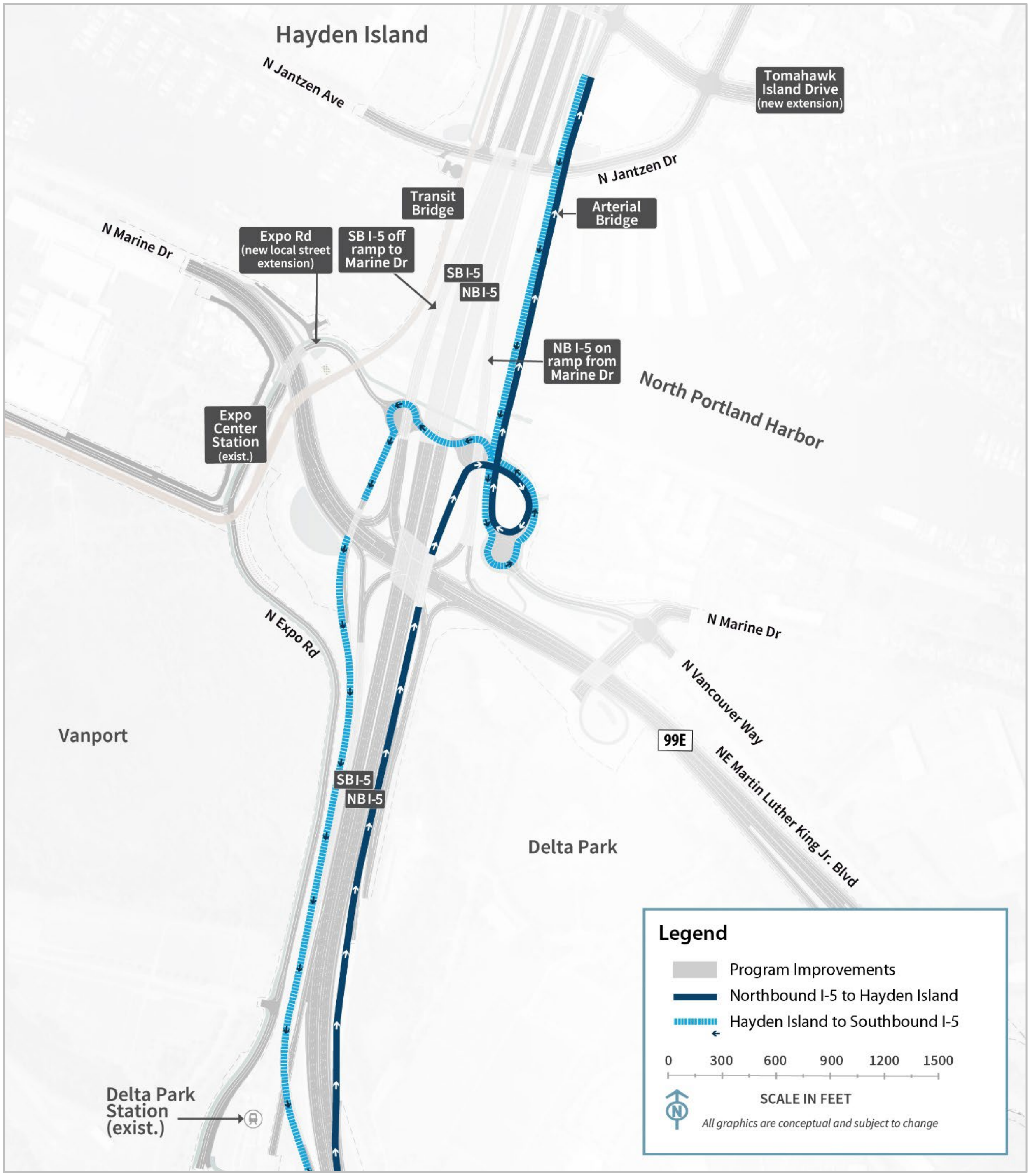
HAYDEN ISLAND INTERCHANGE AREA

All traffic movements for the Hayden Island interchange would be reconfigured. Figure 1-6 shows the layout and construction footprint of the Hayden Island interchange. A partial interchange would be built on Hayden Island with a northbound I-5 on-ramp from Jantzen Drive and a southbound I-5 off-ramp to Jantzen Drive. This would improve ramp lengths to provide sufficient merging/diverging areas compared to the existing substandard ramps that require acceleration and deceleration in a short distance. The I-5 mainline would be partially located on fill across the island and partially elevated to provide east–west connections on Hayden Island.

There would not be a southbound I-5 on-ramp or northbound I-5 off-ramp located on Hayden Island. Connections to Hayden Island for those movements would be via the local access (i.e., arterial) bridge connecting North Portland to Hayden Island (Figure 1-9). Vehicles traveling northbound on I-5 wanting to access Hayden Island would exit with traffic going to the Marine Drive interchange, cross under Martin Luther King Jr. Boulevard to the new intersection at the Expo Road local street extension, and use the arterial bridge to cross North Portland Harbor. Vehicles on Hayden Island looking to enter I-5 southbound would use the arterial bridge to cross North Portland Harbor, cross under I-5 using the new Expo Road local street extension to the westernmost intersection, cross under Marine Drive, merge with the Marine Drive southbound on-ramp, and merge with I-5 southbound south of Victory Boulevard.

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

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



NB = northbound; SB = southbound

1.1.2.3 Transit

A new light-rail alignment for northbound and southbound trains would be constructed within Subarea A (Figure 1-6) to extend from the existing Expo Center MAX Station over North Portland Harbor to a new station at Hayden Island. An overnight LRV facility would be constructed on the southwest corner of the Expo Center property (Figure 1-6) to provide storage for trains during hours when the MAX is not in service. This facility is described in Section 1.1.6, Transit Support Facilities. The existing Expo Center MAX Station would be modified to remove the westernmost track and platform. Other platform modifications, including track realignment and regrading the station, are anticipated to transition to the extension alignment. This could require reconstruction of the operator break facility, signal/communication buildings, and TPSSs. The existing TPSS at the end of TriMet's MAX Yellow Line would be decommissioned. A new TPSS would be constructed to the east of the LRT tracks and south of Expo Road, as well as at the overnight LRV facility, east of N Force Avenue. Immediately north of the Expo Center MAX Station, the LRT alignment would curve east toward I-5, pass beneath an elevated Marine Drive, cross the proposed Expo Road local street extension and the 40-Mile Loop Trail at grade, then rise over the existing levee onto a light-rail bridge to cross North Portland Harbor.

After crossing the new Expo Road extension, the new light-rail track would cross over the main levee (Figure 1-7). The light-rail profile is anticipated to provide sufficient clearance above the improved levees at the existing floodwall (and improved floodwall), and the tracks would be constructed on fill supported by retaining walls above the floodwall. North of the floodwall, the light-rail tracks would continue onto the new light-rail bridge over North Portland Harbor.

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

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

1.1.2.4 Active Transportation

In the Victory Boulevard interchange area (Figure 1-6), active transportation facilities would be provided on Victory Boulevard beneath I-5 and Interstate Avenue between Expo Road and the northbound on/off-ramp terminal east of I-5. Active transportation facilities would also be provided along Expo Road between Victory Boulevard and the Expo Center. These facilities would provide direct connections between the Victory Boulevard and Marine Drive interchange areas, as well as links to the Delta Park and Expo Center MAX Stations.

New shared-use path connections throughout the Marine Drive interchange area would provide access between the Bridgeton neighborhood (on the east side of I-5), Hayden Island, and the Expo Center MAX Station. There would also be connections to the existing portions of the 40-Mile Loop Trail, which runs north of Marine Drive under I-5 through the interchange area. The path would continue along the extension of Expo Road under the interchange to the intersection of Marine Drive and Vancouver Way, where it would connect under Martin Luther King Jr. Boulevard to Delta Park.

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

The new arterial bridge over North Portland Harbor would include a shared-use path for pedestrians and bicyclists (Figure 1-6). On Hayden Island, active transportation facilities would be provided on Jantzen Avenue, Hayden Island Drive, and Tomahawk Island Drive and would connect to the Hayden Island Station. The shared-use path on the arterial bridge would continue along the arterial bridge to the south side of Tomahawk Island Drive. A parallel, elevated path from the arterial bridge would continue adjacent to I-5 across Hayden Island and cross above Tomahawk Island Drive and Hayden Island Drive to connect to the outer edge of the new single-level, or lower level of the double-deck eastern bridge over the Columbia River. A ramp down to the north side of Hayden Island Drive would be provided from the elevated path.

1.1.3 Columbia River Bridges (Subarea B)

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

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

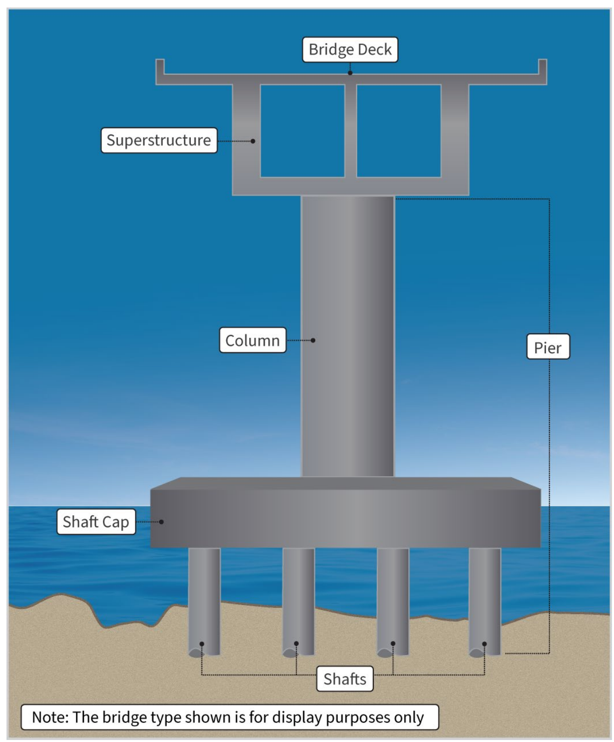
1.1.3.1 Highways, Interchanges, and Local Roadways

The two existing parallel northbound and southbound I-5 bridges that cross the Columbia River were constructed in 1917 and 1958, respectively. When the 1958 bridge was constructed, pier 5 of the 1917 bridge was removed and the profile was raised to match the new bridge. For the IBR Program, the two existing bridges would be replaced by two new parallel bridges, located west of the existing bridges (Figure 1-10). The new bridges would be designed to current American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design Bridge Design Specifications and AASHTO Seismic Guide Specifications and in compliance with ODOT and WSDOT design criteria. With all bridge configuration design options, the new eastern bridge would accommodate northbound highway traffic and a shared-use path. The new western bridge would carry southbound traffic and light-rail tracks. Whereas the existing bridges each have three lanes with no shoulders, each of the two new bridges would accommodate three through lanes, one or two auxiliary lanes, and shoulders on both sides of the highway. Lanes and shoulders would be built to full design standards.

As with the existing bridge (Figure 1-12), the new Columbia River bridges would provide three navigation channels: a primary navigation channel and two barge channels (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

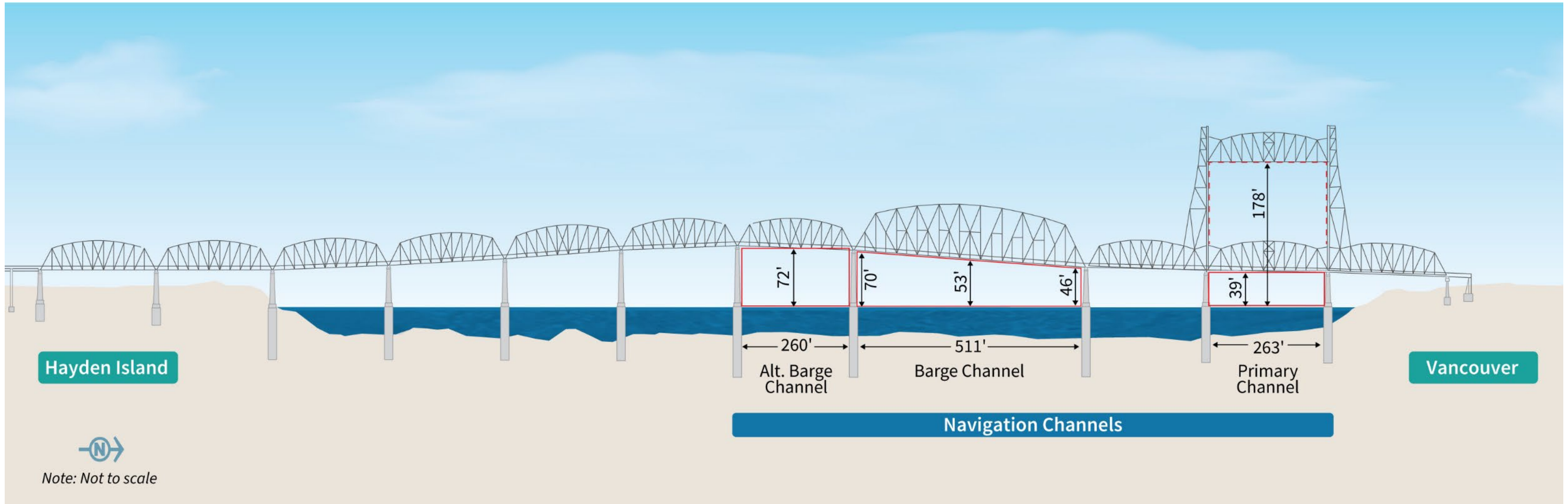
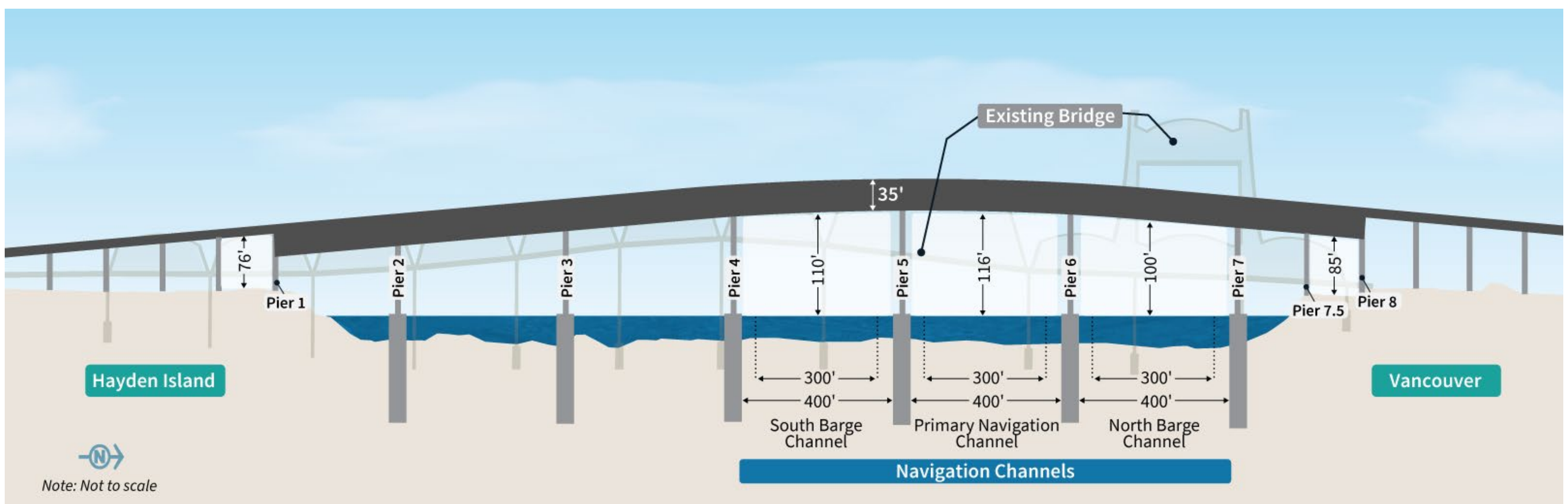


Figure 1-13. Navigation Clearances and Proposed Profile of the Modified LPA Columbia River Bridges with a Double-Deck Fixed-Span Configuration



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]

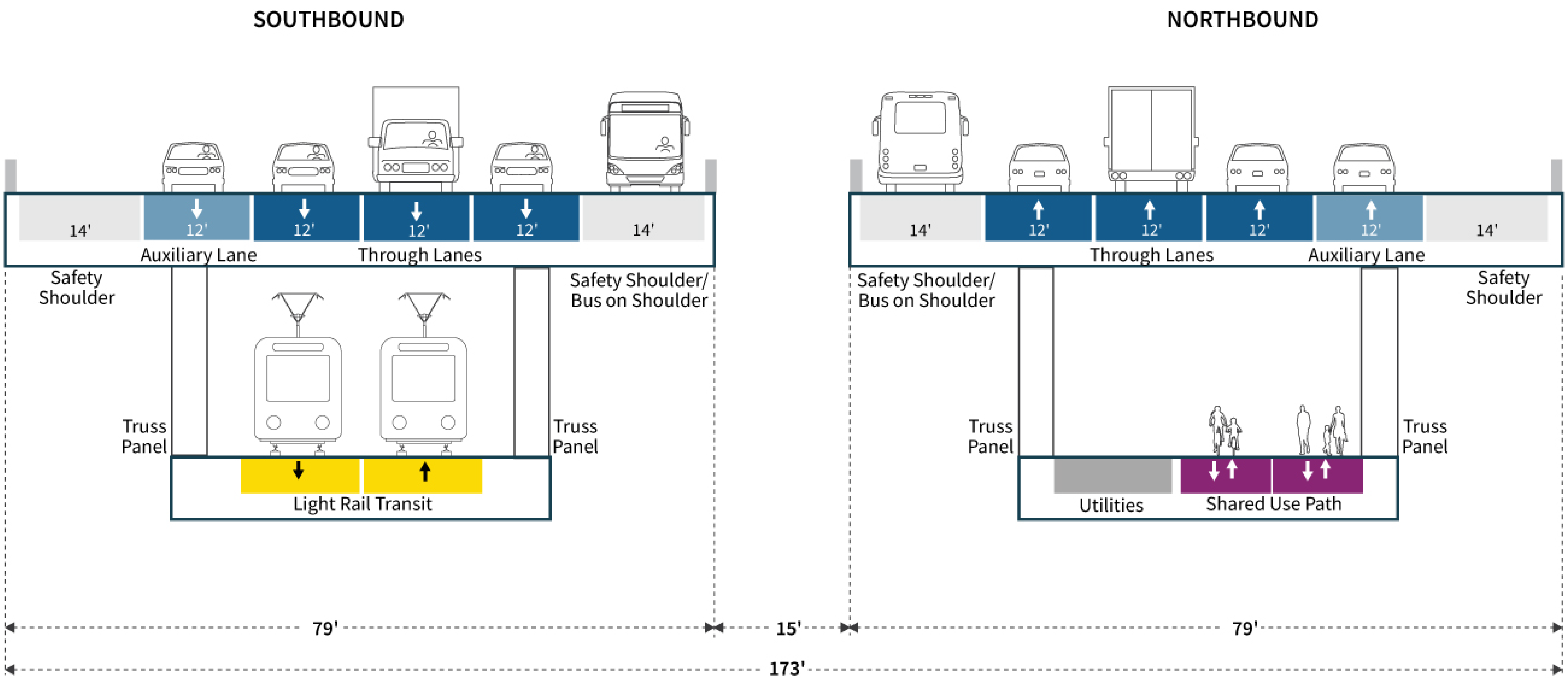
Figure 1-14. Conceptual Drawing of a Double-Deck Fixed-Span Configuration

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



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

Single-Level Fixed-Span Configuration – Recommended Design Option

The 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.

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-

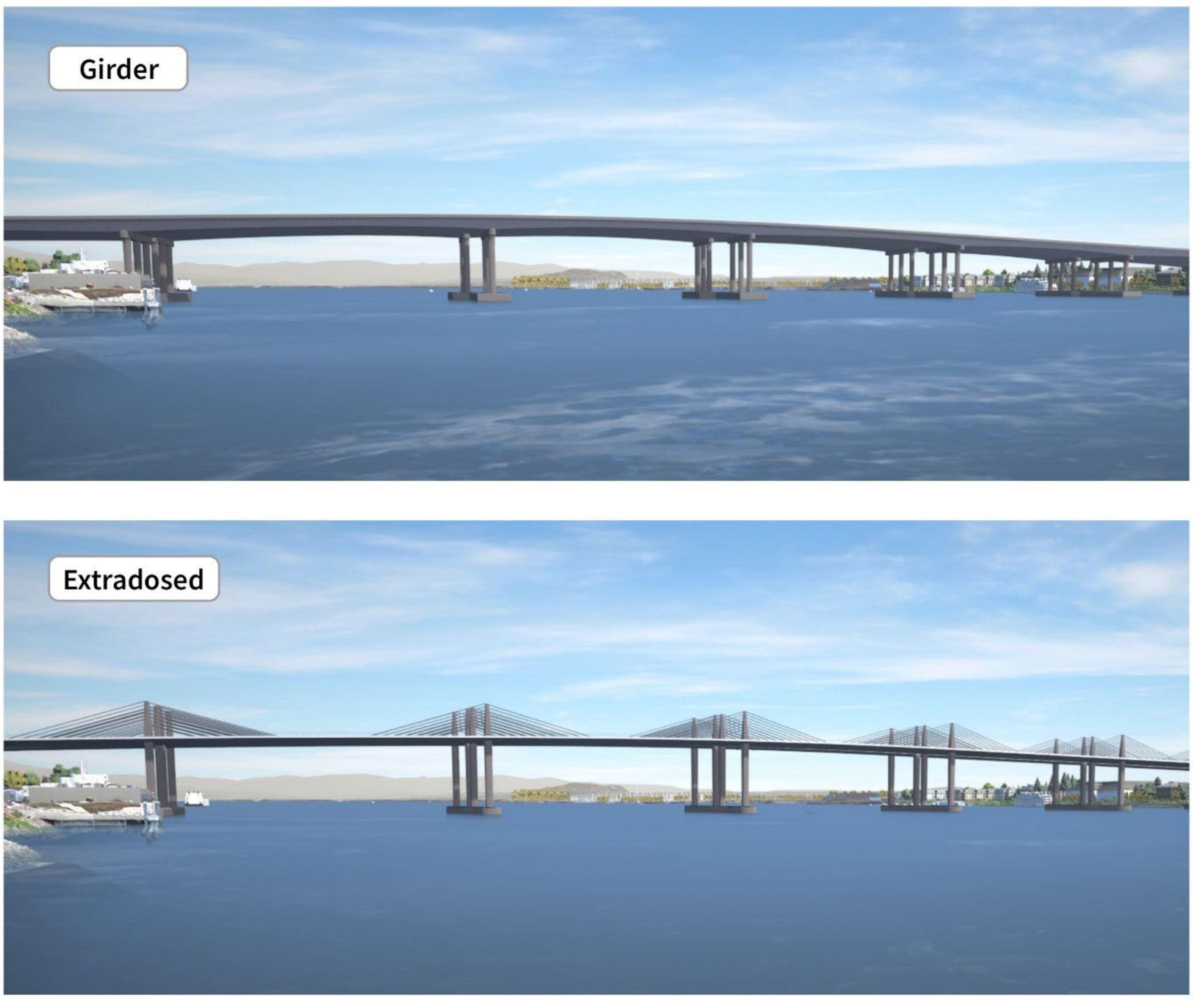
[10] The Draft SEIS also included a finback as a single-level fixed-span bridge type. As the design of the various bridge types progressed, it was determined that the finback would have higher risks associated with increased cost and construction schedule because this bridge type is less common and applying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

level configuration with an extradosed bridge as shown by the 10-foot-wide bridge columns. Figure 1-18 shows a 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.

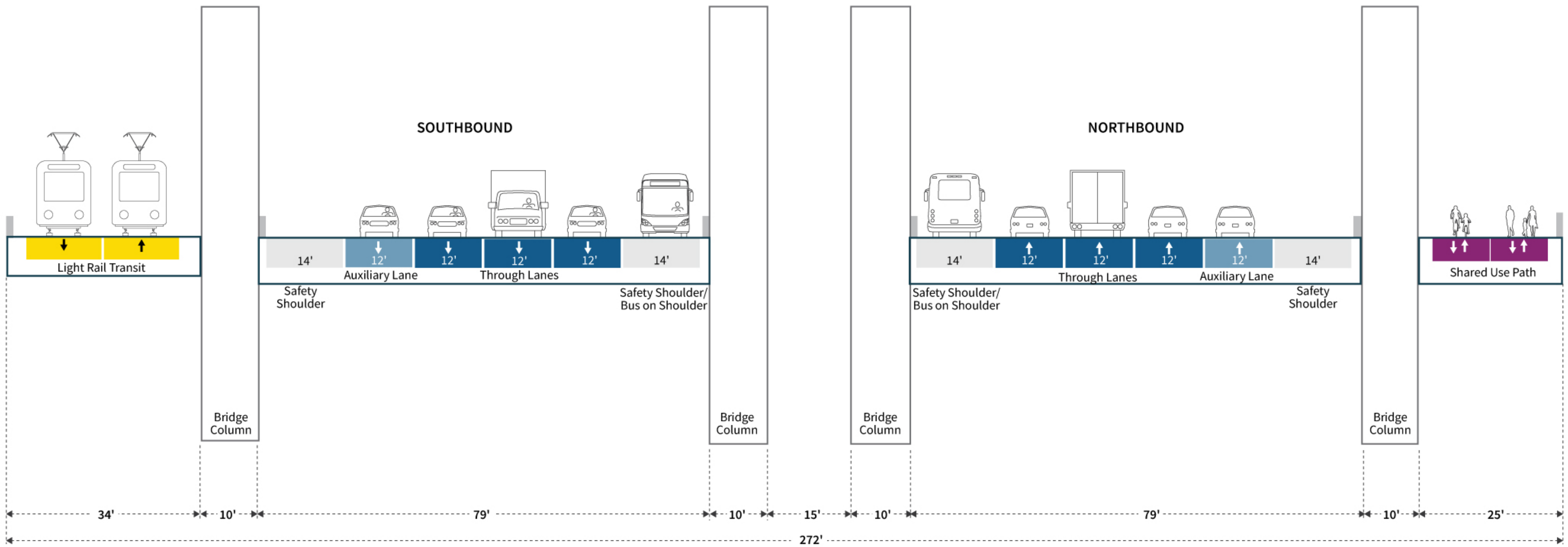
This bridge configuration would be expected to have an approximate grade of 3% on both the Oregon and Washington sides of the bridge. All vertical profiles would follow AASHTO, WSDOT, and ODOT design standards.

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



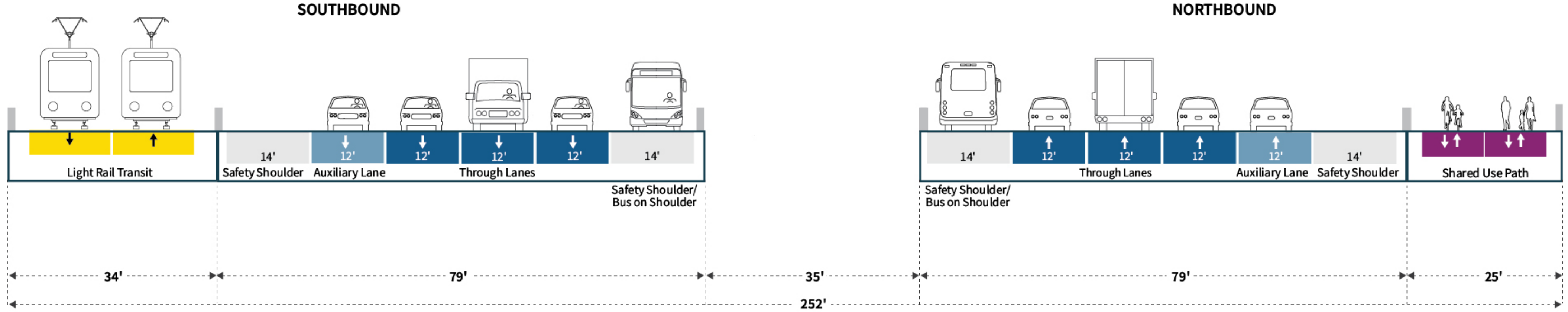
Note: Visualizations are for illustrative purposes only. They do not reflect property impacts or represent final design. Visualization is looking southeast from Vancouver.

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



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

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



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

Single-Level Movable-Span Configuration

The single-level movable-span configuration would have two side-by-side, single-level steel girder bridges with movable spans between Piers 5 and 6. For the purpose of this 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).

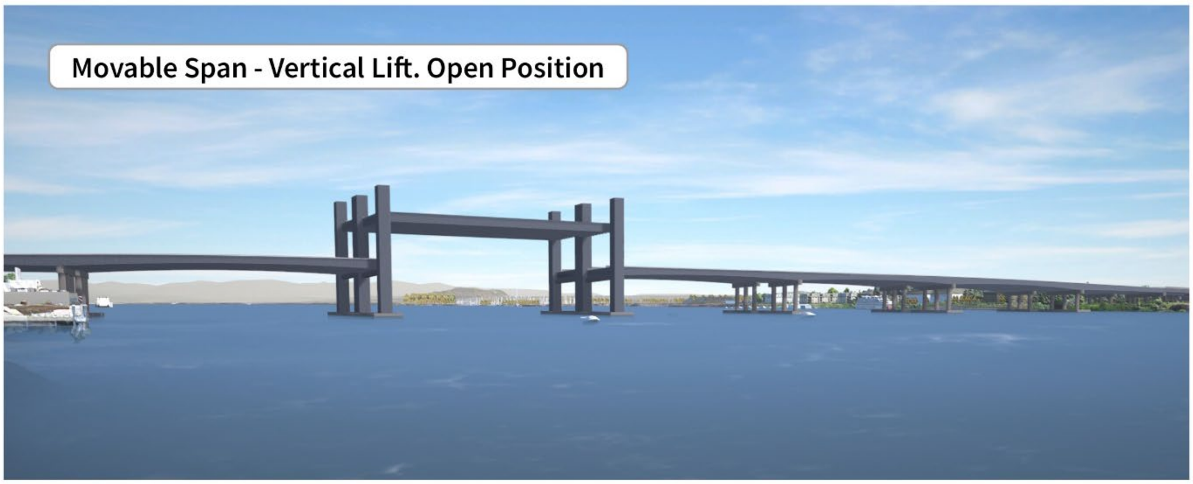
In the open position, the movable span would provide 178 feet of vertical navigation clearance over the proposed relocated primary navigation channel. Similar to the fixed-span configurations, the movable span would provide 400 feet of horizontal navigation clearance for the primary navigation channel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

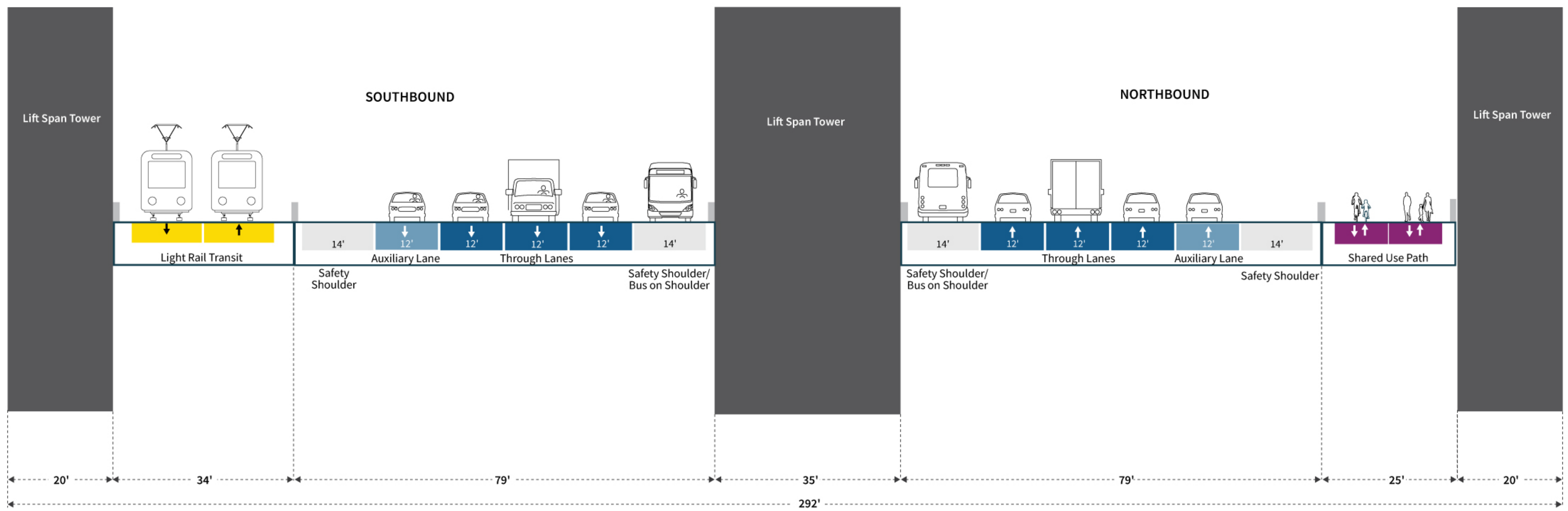


Visualizations are for illustration purposes only. They do not reflect property impacts or represent final design.

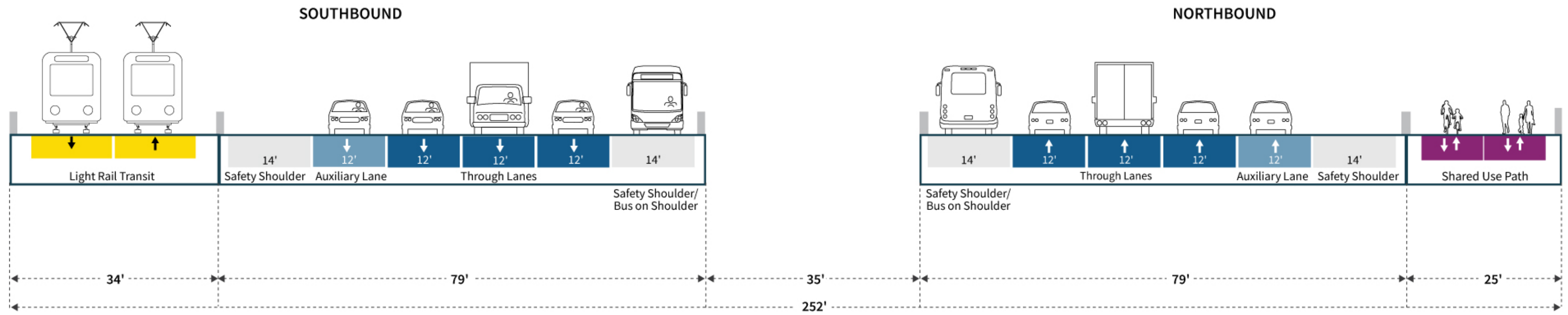
Note: Visualization is looking southeast (upstream) from Vancouver.

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)



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

Bridge Configuration Comparison

This section summarizes and compares each of the bridge configurations. Table 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

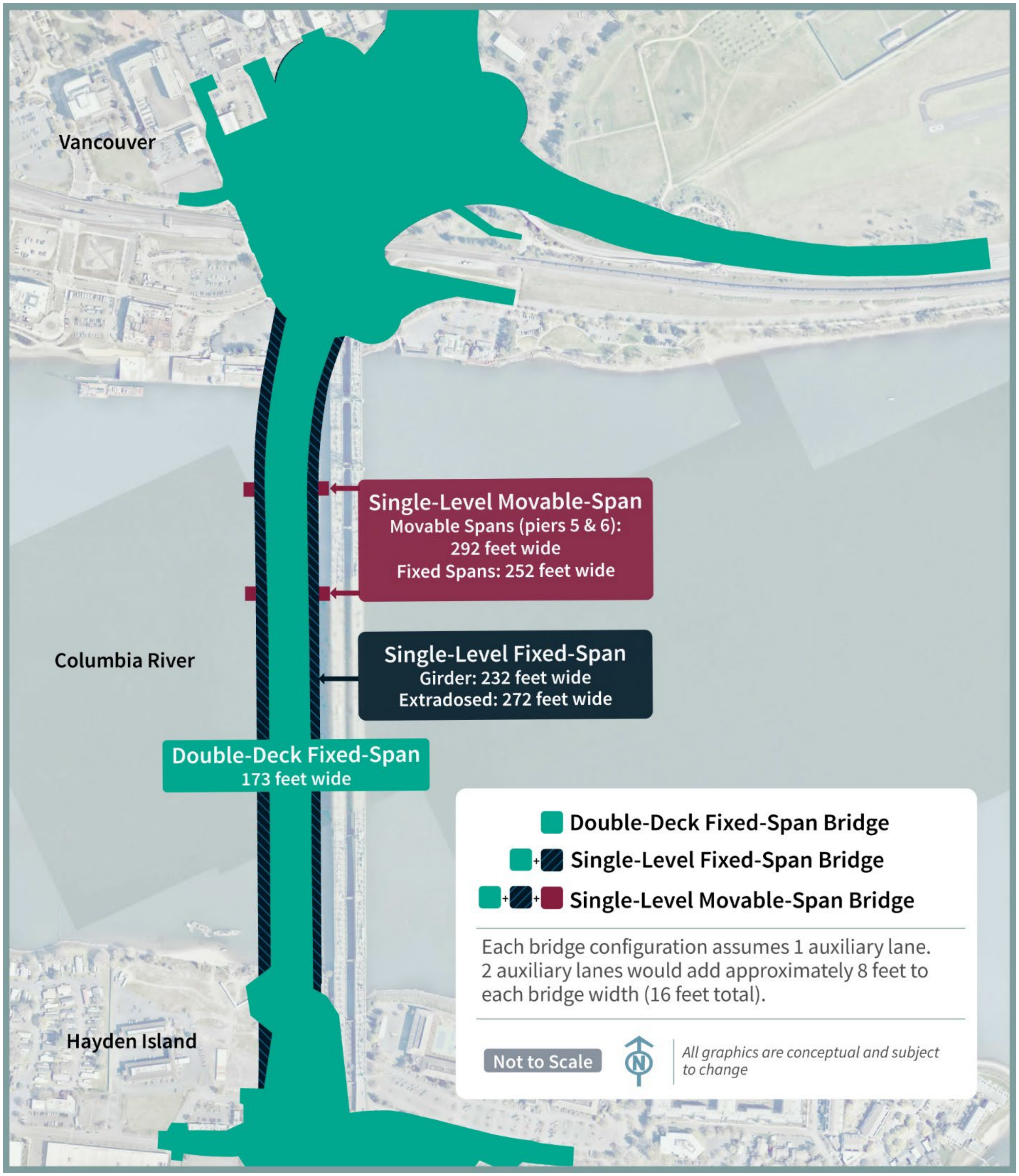
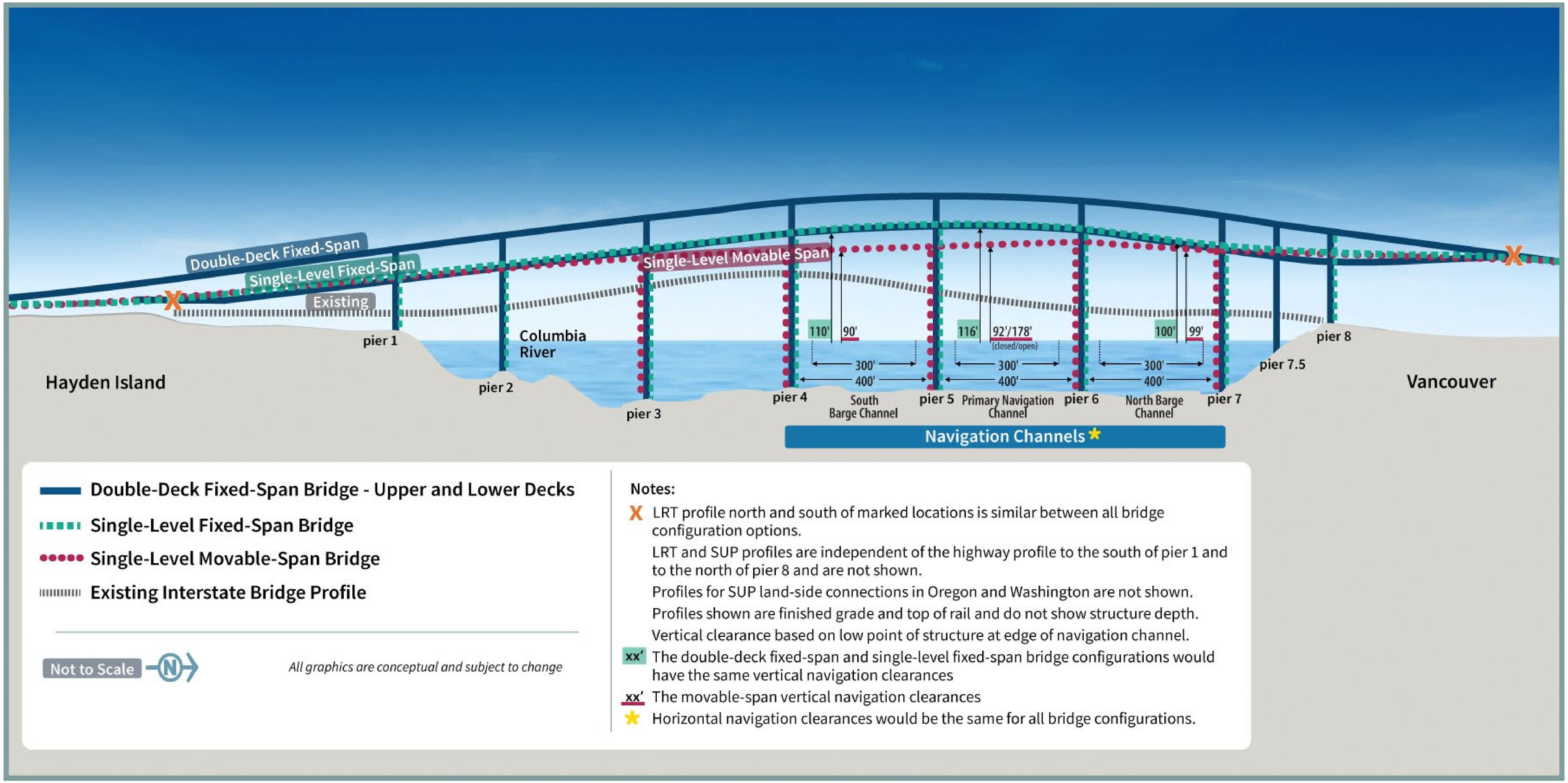


Figure 1-22. Bridge Configuration Profile Comparison



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

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
				openings outside of morning, midday, and evening peak hours when vehicle and transit demand is high in order to improve LRT on-time performance and system reliability and reduce highway congestion. Changes to bridge opening restrictions would require future federal rulemaking process and authorization by USCG (beyond the assumed No-Build Alternative bridge restrictions for peak AM and PM highway travel periods). [b] • Typical opening durations are assumed to be 9 to 18 minutes [c] for the purposes of impact analysis but would ultimately depend on various operational considerations related to vessel traffic and river and 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
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)

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
Maximum height of bridge component (elevation relative to NAVD 88) [e]	247 feet at top of lift tower	~166 feet	Girder: ~137 feet. Extradosed: ~179 feet at top of pylons	~243 feet at top of lift tower
Movable span length (from center of pier to center of pier)	278 feet	N/A	N/A	450 feet
Number of in-water pier sets	Nine	Six	Six	Six
Number of in-water drilled shafts	N/A	72	96	108
Shaft cap sizes	N/A	50 feet by 85 feet	50 feet by 230 feet	• Piers 2, 3, 4, and 7: 50 feet by 230 feet • Piers 5 and 6: 50 feet by 312 feet (one combined footing at each location to house tower/equipment for the lift span)
Conceptual vertical grade [f]	4.8%	~4% on the Washington side ~4% on the Oregon side	~3% on the Washington side ~3% on the Oregon side	~1.5% on the Washington side. ~3% on the Oregon side

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
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

1.1.4 Downtown Vancouver (Subarea C)

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

1.1.4.1 Highways, Interchanges, and Local Roadways

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

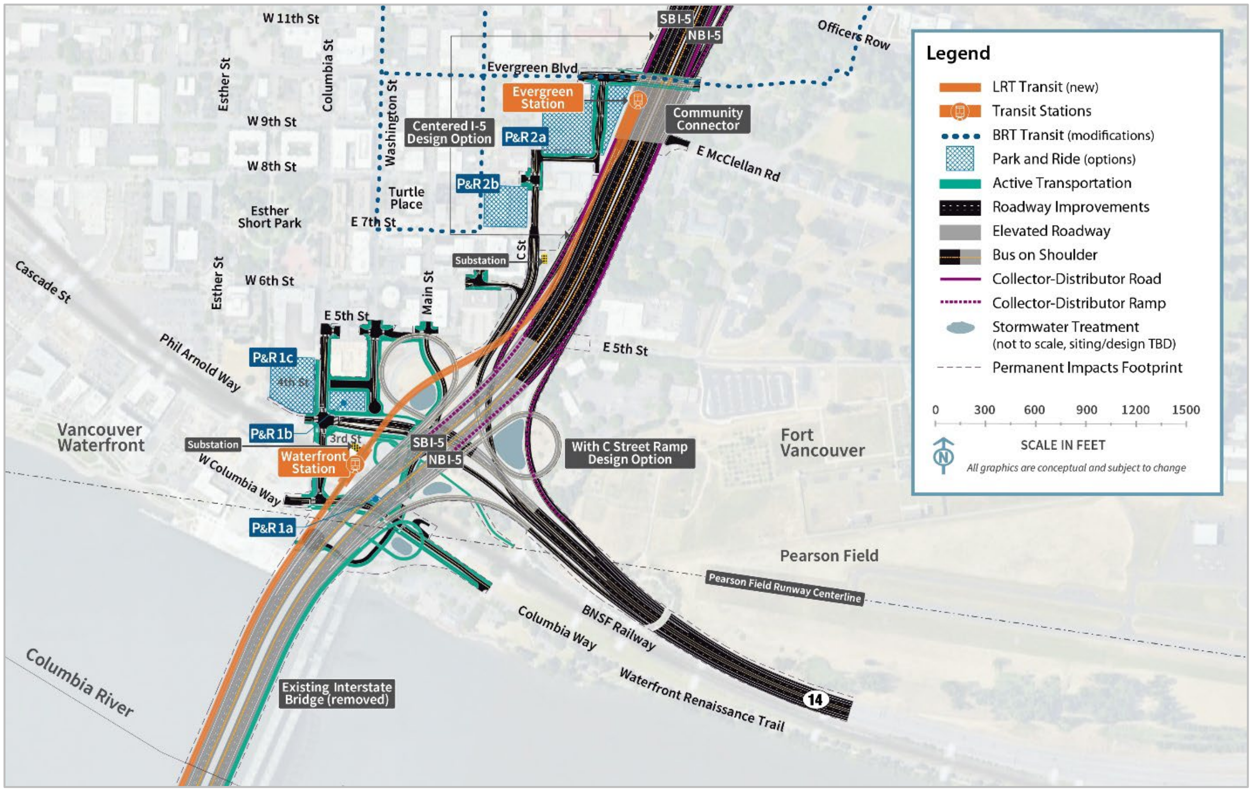
SR 14 INTERCHANGE/DOWNTOWN VANCOUVER

The new Columbia River bridges would touch down just north of the SR 14 interchange (Figure 1-23). The function of the SR 14 interchange configuration would remain essentially the same as it is now, but the interchange would be elevated to meet the new Columbia River bridges that cross over the BNSF Railway tracks. Direct connections between I-5 and SR 14 would be rebuilt. Access to and from downtown Vancouver would be provided as it is today, but the connection points would be relocated. Access from downtown Vancouver to eastbound SR 14 would be relocated from the Washington Street and W 5th Street intersection to a new intersection at Columbia Street and W 3rd Street. Access from westbound SR 14 would also be shifted from C Street to the new Columbia Street and W 3rd Street intersection. Access from downtown Vancouver to southbound I-5 would be relocated from the Washington Street and W 5th Street intersection to C Street. Access from northbound I-5 to downtown Vancouver would remain at C Street. Connections to downtown Vancouver would vary under the two design options under consideration for this area (with C Street ramps and without C Street ramps), as detailed below.

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

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

Figure 1-23. Downtown Vancouver (Subarea C)



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

C Street Ramp Design Options

With C Street Ramps – Recommended Design Option

The design option with C Street ramps would provide access to and from downtown Vancouver similar to existing conditions but with some of the connection points relocated. Access from northbound I-5 to downtown Vancouver would be rebuilt in the same location as the current connection. Downtown Vancouver I-5 access to and from the south would be consolidated at C Street with SR 14 connections to and from downtown at Columbia Street/W 3rd Street (Figure 1-24).

Without C Street Ramps

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

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.

I-5 Alignment Design Options

Centered I-5 – Recommended Design Option

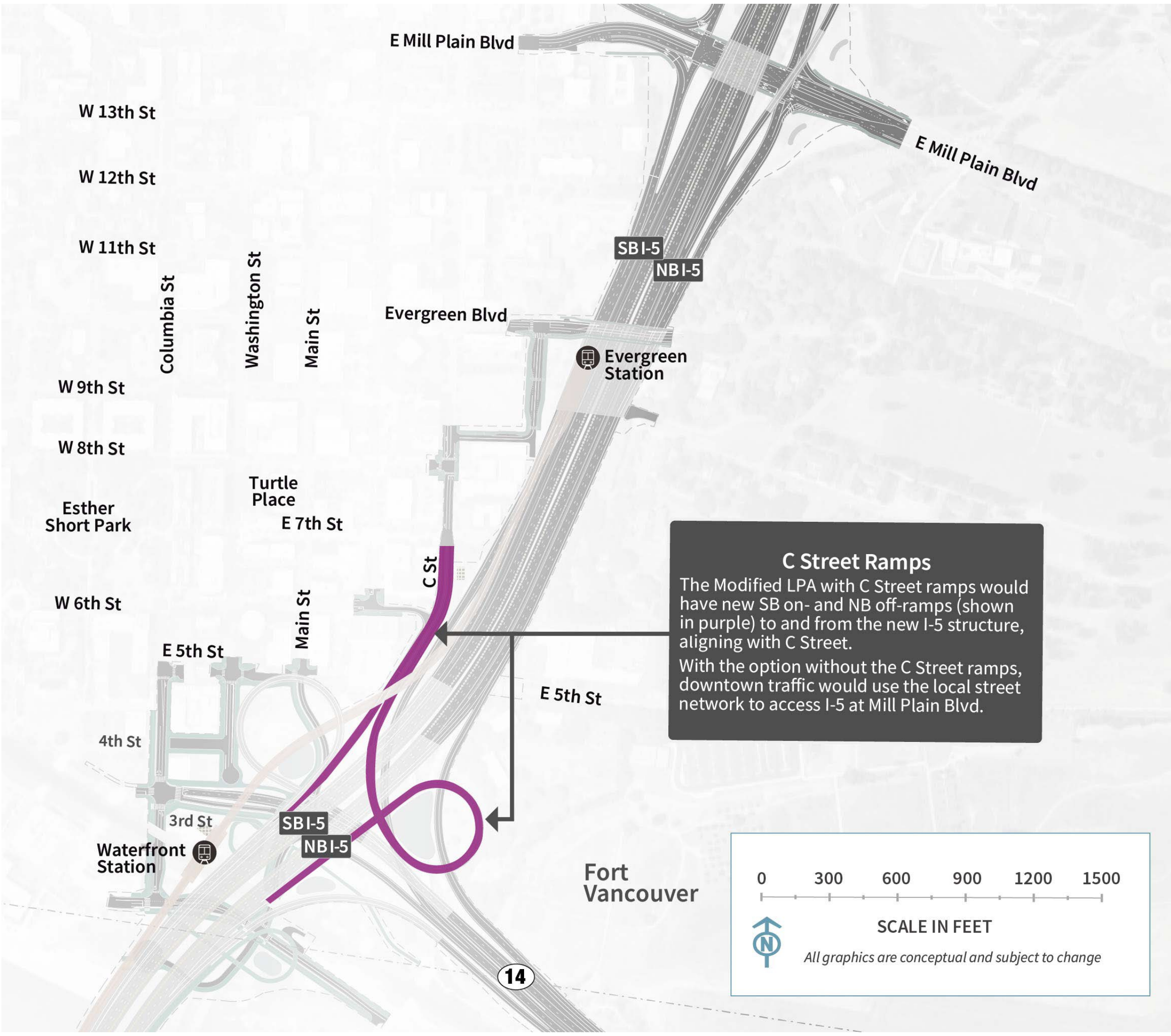
This design option would maintain the location of the existing I-5 mainline alignment through downtown Vancouver between the SR 14 interchange and the Mill Plain Boulevard interchange.

I-5 Shifted West

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

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

Figure 1-24. Modified LPA With C Street Ramps



COLLECTOR-DISTRIBUTOR ROADWAYS

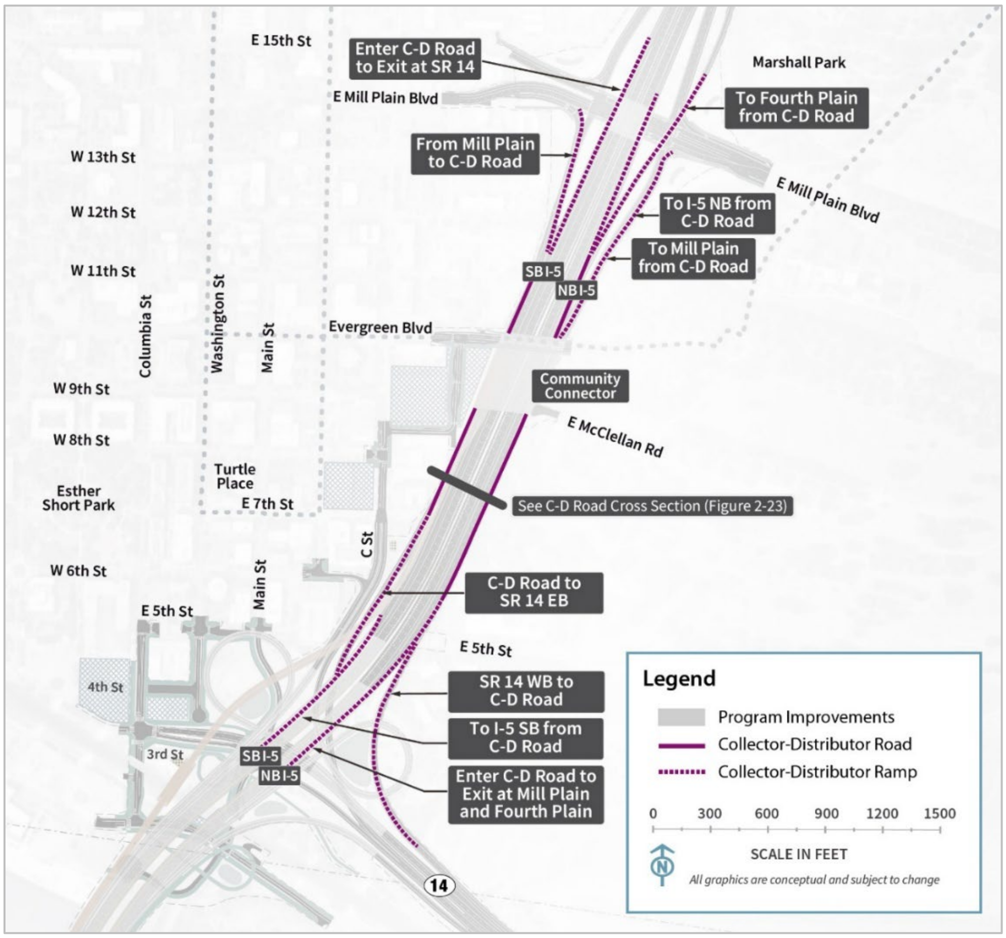
Figure 1-25 shows the location of the collector-distributor (C-D)[11] roadways in downtown Vancouver, and Figure 1-26 shows a typical cross section of the C-D roadways.

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

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

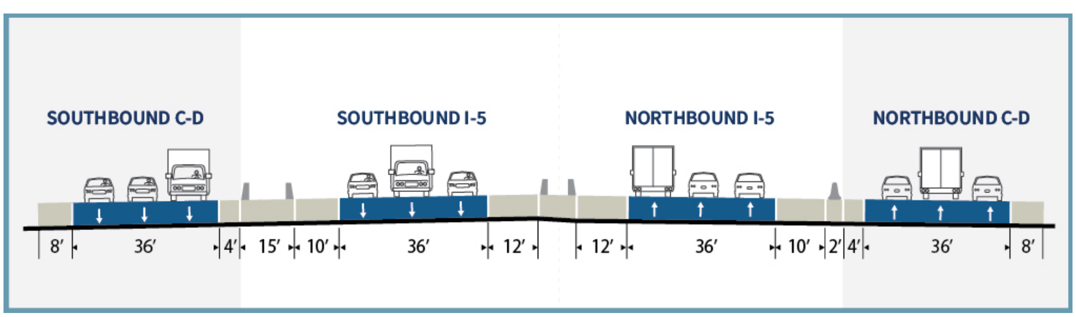
On southbound I-5, the off-ramp to SR 14 would join the southbound I-5 on-ramp from Mill Plain Boulevard to form a C-D roadway. The C-D roadway would provide access from southbound I-5 to the off-ramp to eastbound SR 14 and from Mill Plain Boulevard to the off-ramp to eastbound SR 14 and the on-ramp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

Figure 1-25. Collector-Distributor Roadways



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

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



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

1.1.4.2 Transit

LIGHT-RAIL ALIGNMENT AND STATIONS

Under the Modified LPA, the light-rail tracks would exit the highway bridge and be on their own bridge along the west side of the I-5 mainline after crossing the Columbia River (see Figure 1-23). The light-rail bridge would cross over the BNSF Railway tracks. An elevated light-rail station near the Vancouver waterfront (Waterfront Station) would be situated near the overcrossing of the BNSF tracks between Columbia Way and 3rd Street. Access to the elevated station would be primarily by elevator because the station would be situated approximately 90 feet above existing ground level. A stairwell(s) would be provided for emergency egress. The number of elevators and stairwells provided would be based on the ultimate platform configuration, station location relative to the BNSF trackway, projected ridership, and fire and life safety requirements. Passenger drop-off facilities would be located at ground level and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Waterfront Station. A new TPSS would be constructed north of the transit platform. The elevated light-rail tracks would continue north, cross over the westbound SR 14 on-ramp and the C Street/6th Street on-ramp to southbound I-5, and- then straddle the southbound I-5 C-D roadway. Transit components in the downtown Vancouver area would be similar between the C Street ramp and I-5 westward shift design options discussed above.

North of the Waterfront Station, the light-rail tracks would continue to the Evergreen Station, which would be the terminus of the light-rail extension (Figure 1-23). The light-rail tracks from downtown Vancouver to the terminus would be entirely on an elevated structure supported by single columns, where feasible, or by straddle bents[12] on either side of the roadway where needed. The Evergreen Station would be located at the same elevation as Evergreen Boulevard and the proposed Community Connector, and it would provide connections to the existing C-TRAN BRT system. Passenger drop-off facilities would be near the station and would be coordinated with the C-TRAN bus service at this location. Active transportation facilities, described below, would connect to the new Evergreen 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.

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

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.

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.

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.

Evergreen Station Park and Rides

Studies included in Appendix D to the Final SEIS have shown the need for park and rides to accommodate 700 vehicles in the vicinity of the Evergreen Station. Two possible sites are analyzed in this technical report (see Figure 1-23):

- 2a. Library Square. This 3.2-acre site could be developed as a new underground three- to four-level structure east of C Street and south of Evergreen Boulevard. It could accommodate approximately 400 parking spaces. To provide all 700 parking spaces at this site, the structure would require seven or more levels below ground.[13] This site could be combined with Site 2b to provide a total of 700 spaces.

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

1.1.4.3 Active Transportation

Within the downtown Vancouver area, the shared-use path on the northbound (or eastern) bridge would exit the bridge at the SR 14 interchange, loop down on the east side of I-5 via a vertical helix path, cross back below I-5 to the west side of I-5, run beneath the elevated light-rail crossing over BNSF, and then loop down to connect to the Main Street extension at the intersection underneath I-5 with connections to the Waterfront Station from the active transportation facilities. Connections to the Waterfront Renaissance Trail would be made by facilities along Main Street and Columbia Way (Figure 1-23). Access would be provided across state right of way beneath the new bridges to provide a connection between the recreational areas along the city's Columbia River waterfront east of the bridges and existing and future waterfront uses west of the bridges.

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

As part of the Modified LPA, a Community Connector is proposed to be built over I-5 just south of Evergreen Boulevard and east of the Evergreen Station (Figure 1-23). The structure is proposed to include off-street pathways for active transportation modes including pedestrians, bicyclists, and other micro-mobility modes, and public space and amenities to support the active transportation facilities with connections to the Evergreen Station from the active transportation facilities. The primary intent of the Community Connector is to improve connections between downtown Vancouver on the west side of I-5 and the Vancouver National Historic Reserve on the east side.

1.1.5 Upper Vancouver (Subarea D)

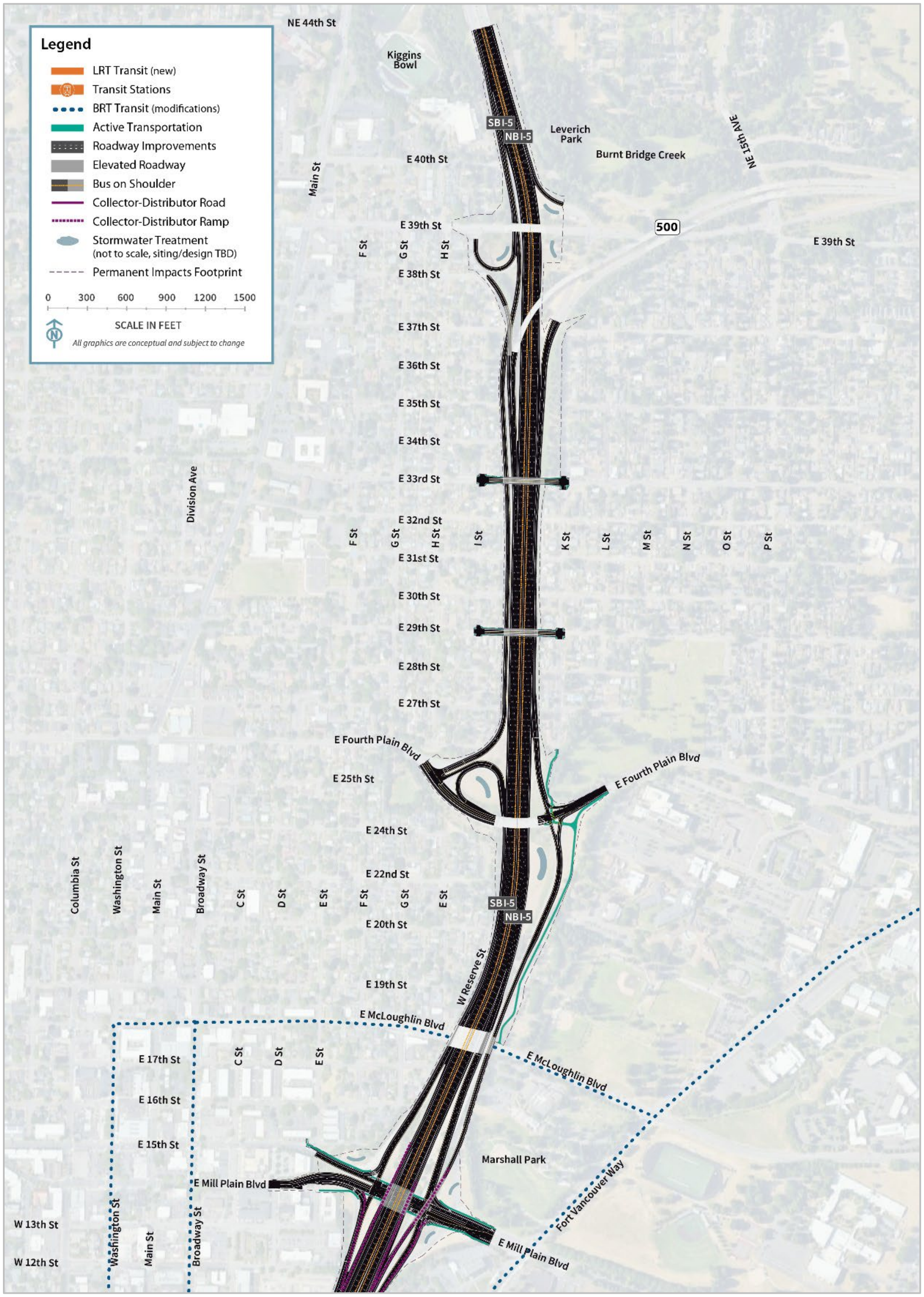
This section discusses the geographic Subarea D (Figure 1-3 shows an overview of the geographic subareas). Figure 1-27 shows all highway and interchange improvements in Subarea D.

1.1.5.1 Highways, Interchanges, and Local Roadways

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

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

Figure 1-27. Upper Vancouver (Subarea D)



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

MILL PLAIN BOULEVARD INTERCHANGE

The Mill Plain Boulevard interchange is north of the SR 14 interchange (Figure 1-27). This interchange would be reconstructed as a tight-diamond configuration but would otherwise remain similar in function and footprint to the existing interchange. The ramp terminal intersections would be sized to accommodate high, wide, heavy freight vehicles that travel between the Port of Vancouver and I-5. The off-ramp from I-5 northbound to Mill Plain Boulevard would diverge from the C-D road that would continue north, crossing over Mill Plain Boulevard, to provide access to Fourth Plain Boulevard via a C-D roadway. The off-ramp to Fourth Plain Boulevard would be reconstructed and would cross over Mill Plain Boulevard east of I-5, similar to the way it functions today.

FOURTH PLAIN BOULEVARD INTERCHANGE

At the Fourth Plain Boulevard interchange (Figure 1-27), improvements would include reconstruction of the I-5 ramp terminal intersections. The existing bridge for Fourth Plain Boulevard over I-5 would be retained. Northbound I-5 traffic exiting to Fourth Plain Boulevard would first exit to the northbound C-D roadway, which provides off-ramp access to Fourth Plain Boulevard and Mill Plain Boulevard. The westbound SR 14 to northbound I-5 on-ramp also joins the northbound C-D roadway before continuing north past the Fourth Plain Boulevard and Mill Plain Boulevard off-ramps as an auxiliary lane. The southbound I-5 off-ramp to Fourth Plain Boulevard would be braided below the 39th Street on-ramp to southbound I-5. This change would eliminate the existing nonstandard weave between the SR 500 interchange and the off-ramp to Fourth Plain Boulevard. It would also eliminate the existing westbound SR 500 to Fourth Plain Boulevard off-ramp connection. The existing overcrossing of I-5 at 29th Street would be reconstructed to accommodate a widened I-5, provide adequate vertical clearance over I-5, and provide pedestrian and bicycle facilities.

SR 500/39TH STREET INTERCHANGE AREA

The northern terminus of the I-5 improvements would be in the SR 500 interchange area (Figure 1-27). The improvements would primarily be to connect the Modified LPA to existing ramps. The off-ramp from I-5 southbound to 39th Street would be reconstructed to establish the beginning of the braided ramp to Fourth Plain Boulevard and restore the loop ramp to 39th Street. Ramps from existing I-5 northbound to SR 500 eastbound and from 39th Street to I-5 northbound would be partially reconstructed. The existing bridges for 39th Street over I-5 and SR 500 westbound to I-5 southbound would be retained. The 39th Street to I-5 southbound on-ramp would be reconstructed and braided over (i.e., grade separated or pass over) the new I-5 southbound off-ramp to Fourth Plain Boulevard.

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

1.1.5.2 Transit

There would be no LRT facilities in upper Vancouver. Proposed operational changes to bus service, including I-5 bus-on-shoulder service, are described in Section 1.1.7, Transit Operating Characteristics.

1.1.5.3 Active Transportation

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

1.1.6 Transit Support Facilities

1.1.6.1 Ruby Junction Light-Rail OMF Expansion

The TriMet Ruby Junction Light-Rail OMF in Gresham, Oregon, would be expanded to accommodate the additional LRVs associated with the Modified LPA's LRT service (the Ruby Junction location relative to the study area is shown in Figure 1-28). Improvements would include additional storage tracks for LRVs and maintenance materials and supplies; expanded LRV maintenance bays; expanded parking and employee support areas for additional personnel; an additional maintenance building for daily cleaning and periodic weather-dependent treatments for LRV maintenance, demolition, and relocation of a maintenance building (Ruby West); tenant improvements and new structures for affected operations; and a third lead track at the northern entrance to the Ruby Junction Light-Rail OMF. Adjacent parcels would be acquired to accommodate maintenance and storage needs required for or impacted by the Modified LPA. Figure 1-28 shows the proposed footprint of the expansion.

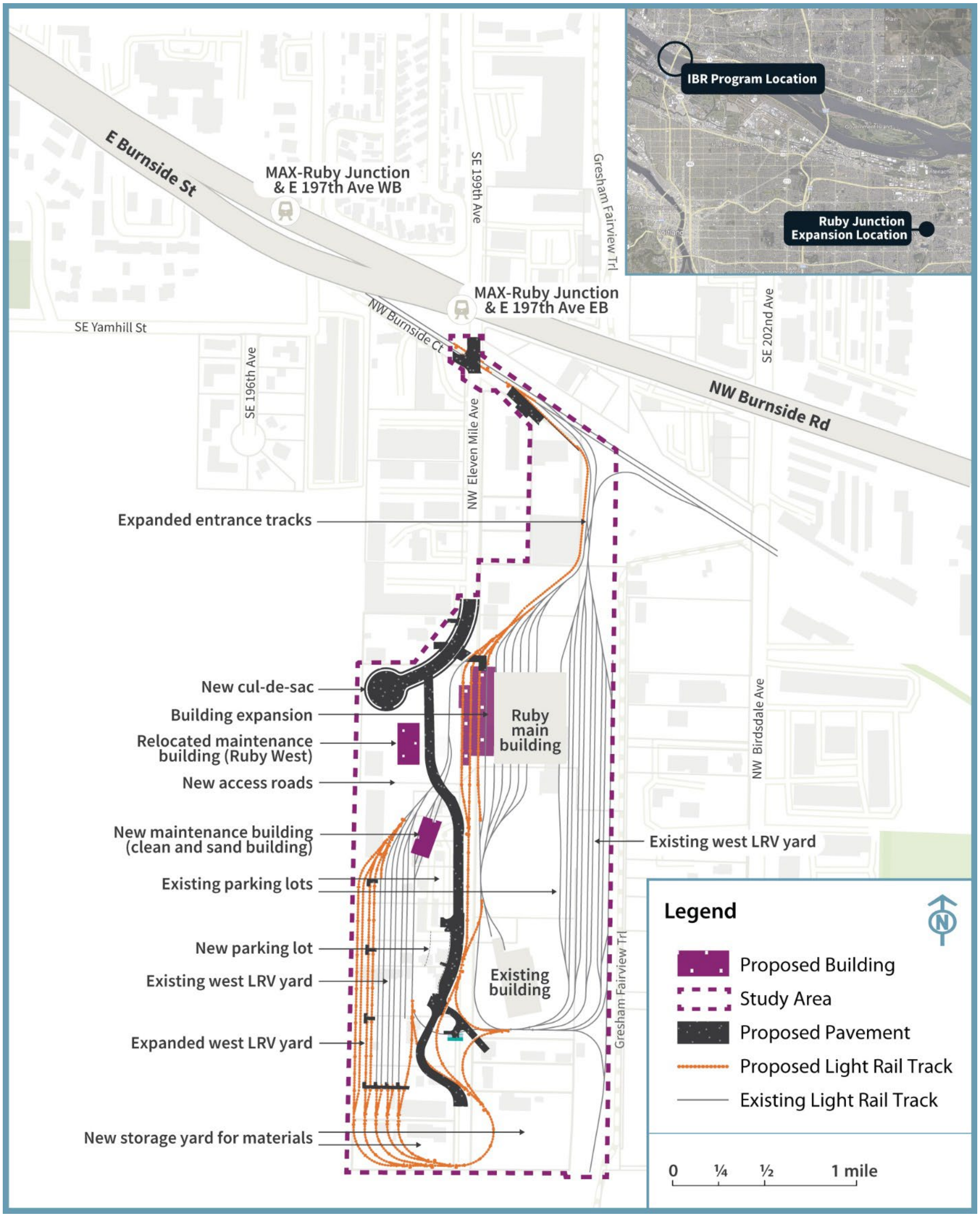
The existing main building would be expanded west to provide additional maintenance bays. Today, Eleven Mile Avenue extends from NW Burnside Road and dead ends at the southern limits of the existing OMF. To make space for the building expansion, the existing Eleven Mile Avenue public right of way would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

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

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

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

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



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

1.1.6.2 Expo Center Overnight LRV Facility

An overnight facility for LRVs would be constructed on the southwest corner of the Expo Center property (as shown on Figure 1-29). The inclusion of the Expo Overnight Facility allows TriMet the ability to maintain current service and maintenance operations on their Blue Line system and reduce deadheading between Ruby Junction and the northern terminus of the MAX Yellow Line extension. Deadheading occurs when LRVs travel without paying passengers to move the vehicles to and from service. Currently, Blue Line is maintained through a limited nighttime work window. With the inclusion of the Expo Overnight Facility, trains originating service at Evergreen have substantially less deadhead time, reducing Yellow Line operating costs, and Blue Line maintenance windows are retained.

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

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

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

Three bus bays would be added to the existing C-TRAN OMF located at 2425 NE 65th Avenue in Vancouver. These additional bus bays, which would not require the acquisition of any new property, would provide maintenance capacity for the additional express bus service on I-5 (Section 1.1.7, Transit Operating Characteristics). Modifications to the facility would accommodate new vehicles as well as maintenance equipment.

Figure 1-29. Expo Center Overnight LRV Facility

1.1.7 Transit Operating Characteristics

1.1.7.1 LRT Operations

Nineteen new LRVs would be purchased to operate the extension of the MAX Yellow Line. These vehicles would be similar to those currently used for the TriMet MAX system. With the Modified LPA including all design options, LRT service in the new and existing portions of the Yellow Line in 2045 would operate with 6.7-minute average headways[14] during the 2-hour morning peak period. Midday and evening headways would be 15 minutes, and late-night headways would be 30 minutes. LRT service would operate between the hours of approximately 5 a.m. (first southbound train leaving Evergreen Station) and 1 a.m. (last northbound train arriving at the station), which is consistent with current service on the Yellow Line. LRVs would be deadheaded at Evergreen Station before beginning service each day. A third track at this northern terminus would accommodate layovers.

1.1.7.2 Express Bus Service and Bus on Shoulder

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

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

Two other existing C-TRAN express bus service routes would remain unchanged after completion of the Modified LPA. C-TRAN Route 190 would continue to provide service from the Andresen Park and Ride in Vancouver to Marquam Hill in Portland. This route would continue to operate on SR 500 and I-5 within the study area. Route headways would be 10 minutes in the peak periods with no off-peak service. C-TRAN Route 164 would continue to provide service from the Fisher's Landing Transit Center to downtown Portland. This route would continue to operate within the study area only in the northbound direction during PM service to use the I-5 northbound high-occupancy vehicle lane in Oregon before exiting to eastbound SR 14 in Washington. Route headways would be 10 minutes during the peak and 30 minutes during the off-peak. These two routes provide the same routing and frequencies in both the No-Build Alternative and the proposed Modified LPA.

C-TRAN express bus Routes 105 and 190 are currently permitted to use the existing southbound inside shoulder of I-5 from 99th Street to the Interstate Bridge in Vancouver. However, the existing shoulders are too narrow for bus-on-shoulder use in the rest of the I-5 corridor in the study area. The Modified LPA would include inside shoulders on I-5 that would be wide enough (approximately 14 feet on the Columbia River bridges and 11.5 to 12 feet elsewhere on I-5) to allow northbound and southbound buses to operate on the shoulder, except where I-5 would have to taper to match existing inside

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

shoulder widths at the north and south ends of the corridor. Figure 1-6, Figure 1-10, Figure 1-23, and Figure 1-27 show the potential bus-on-shoulder use over the Columbia River bridges. Bus on shoulder could operate on any of the Modified LPA bridge configurations and bridge types. Additional approvals (including a continuing control agreement), in coordination with ODOT, may be needed for buses to operate on the shoulder on the Oregon portion of I-5.

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

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

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

1.1.7.3 Local Bus Route Changes

Two TriMet bus routes would be adjusted to accommodate the transit improvements associated with the Modified LPA. TriMet Line 6 bus route would be changed to terminate at the Expo Center MAX Station instead of Hayden Island, where it terminates currently and in the No-Build Alternative. The new Line 6 route would require passengers to transfer to the new LRT connection to access Hayden Island. TriMet Line 6 is anticipated to travel from Delta Park MAX Station north along Expo Road to the Expo Center MAX Station. Table 1-3 shows the existing service and anticipated future changes to TriMet Line 6. In addition to Line 6, TriMet Route 11 could require slight modifications to maintain transfers to the Expo Center MAX Station, depending on the final design of the station and surrounding area.

As part of the Modified LPA, several local C-TRAN bus routes would be changed to better complement the new light-rail extension. Most of these changes would reroute existing bus lines to provide a transfer opportunity at the proposed new Evergreen Station. Table 1-3 shows existing service and anticipated future changes to C-TRAN bus routes. In addition to the changes noted in Table 1-3, other local bus route modifications may move service from Broadway to C Street.

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

Table 1-3. Proposed TriMet and C-TRAN Bus Route Changes

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

Bus Route	Existing Route	Changes with Modified LPA
C-TRAN #30 Burton	Connects the Fisher's Landing Transit Center with downtown Vancouver via 164th/162nd Avenues and 18th, 25th, 28th, and 39th Streets. Within the study area, service currently runs along McLoughlin Boulevard and on Washington and Broadway Streets between 8th and 15th Streets.	Route would be modified to begin/end near C Street and 9th Street in downtown Vancouver.
C-TRAN #60 Delta Park Regional	Connects the Delta Park MAX Station in Portland with downtown Vancouver via I-5. Within the study area, service currently runs along I-5, Mill Plain Boulevard, and Broadway Street.	Route would be discontinued.

1.1.8 Tolling

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

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.

1.1.8.1 Tolling Authority

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

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 memorandum, the two states plan to enter into a separate agreement guiding the sharing and uses of toll revenues, including the order of uses (flow of funds) for bridge construction, debt service, and other required expenditures. WSDOT and ODOT also plan to enter into one or more agreements addressing implementation logistics, toll collection, and operations and maintenance for tolling the bi-state facility.

1.1.8.2 Tolling Operations

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

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

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

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

There would be two separate "toll zones," which are the area in which the tolling system would detect and classify passing vehicles and then transmit pertinent information to the toll zone controller (Figure 1-30). There would be one zone for northbound traffic and one zone for southbound traffic. During pre-completion tolling, the toll zones would be located on I-5 in Vancouver, between the Interstate Bridge and the BNSF Railway. The location of the post-completion toll zones would be determined at a later date, but it is anticipated that both toll zones would remain in Vancouver.

Figure 1-30. Toll Zone

One gantry (i.e., overheard structure) would be located in each toll zone (Figure 1-30). Generators and equipment cabinets would be located nearby, which would house various equipment needed to support toll operations. Additional equipment cabinets would be placed throughout the Program area to support tolling operations, such as near the toll rate signage (see below).

As previously noted, a key element of tolling would be variable-rate pricing, where toll rates would differ based on the time of day a vehicle uses the bridge. To accomplish this, toll rate signs would be installed at route decision points on local roads, I-5 on-ramps, and on I-5, including locations north and south of the bridges where drivers make informed route decisions (e.g., I-5/Interstate 205 junction and I-5/Interstate 84 junction). The intent of the toll rate signs is to provide both static and variable pricing information. The static sign would contain details such as direction, wayfinding, or other information. These signs would also include a variable message sign panel that would show toll rate(s) in effect at that time.

1.1.9 Transportation System- and Demand-Management Measures

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

State Laws to Reduce Commute Trips

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

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

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

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

- Replacement or expanded variable message signs in the primary study area. These signs alert drivers to incidents and events, allowing them to seek alternate routes or plan to limit travel during periods of congestion.
- Replacement or expanded traveler information systems with additional traffic monitoring equipment and cameras.
- Expanded incident response capabilities, which help traffic congestion to clear more quickly following accidents, spills, or other incidents.

- Queue jumps or bypass lanes for transit vehicles where multilane approaches are provided at ramp signals for on-ramps. Locations for these features will be determined during the detailed design phase.
- Active traffic management strategies including ramp metering and dynamic speed limits. These strategies are intended to manage congestion by controlling traffic flow.

1.1.10 Off-site Mitigation Sites

The IBR Program will provide off-site mitigation for unavoidable impacts to natural resources, including fish and wildlife species and their habitats, wetlands, surface waters, floodplains, and other regulated habitat features (refer to the Final SEIS, Sections 3.14, Water Quality and Hydrology; 3.15, Wetlands; and 3.16, Ecosystems).[15] Applicable federal, state, and local regulatory frameworks require mitigation sequencing that includes avoidance and minimization of impacts, and compensatory mitigation to achieve “no net loss” of the resource or its functions. Mitigation must fully offset the impacts of the Modified LPA and achieve this “no net loss” standard. The Modified LPA would result in unavoidable impacts to natural resources, which would require mitigation under one or more regulatory frameworks. Mitigation plans and mitigation bank use plans will be prepared to provide compensation for any such unavoidable impacts to regulated resources (wetlands, waters, floodplain, sensitive habitats) and to demonstrate that the IBR Program will achieve “no net loss” of function of these resources. The IBR Program is preparing functional assessments and coordinating with regulatory agencies to quantify the amount and type of compensatory mitigation required to offset Program impacts and achieve “no net loss.”

It is anticipated that compensatory mitigation for unavoidable impacts to aquatic and terrestrial habitats and species in Washington will be provided through the purchase of credits from the proposed Wapato Valley Mitigation and Conservation Bank (Figure 1-31). The bank is approximately 876 acres and is located in the Columbia River floodplain at the mouth of the Lewis River, approximately 19 river miles downstream of the Interstate Bridge. Approval of the bank is expected in 2026.

It is anticipated that compensatory mitigation for unavoidable impacts to wetlands, and aquatic and terrestrial habitats and species in Oregon will be provided partially through the purchase of advance mitigation credits at ODOT’s proposed Columbia Bottomlands Advance Mitigation/Conservation Site, and partially through the purchase and protection under conservation easement of a site on West Hayden Island (shown on Figure 1-31). The Columbia Bottomlands Advanced Mitigation/Conservation site is located in Scappoose Bay, a slough of Multnomah Channel, in Columbia County, Oregon. The site is located approximately 1 mile upstream of where the Multnomah Channel meets the Columbia River and approximately 20 river miles downstream of the Interstate Bridge. The site has been designed to provide advance mitigation credits for impacts to wetlands and aquatic and terrestrial habitats and species for future ODOT projects. All impacted wetlands and other water features would be mitigated in accordance with current USACE mitigation policies, and the conditions of the Section 404 Permit. All compensatory mitigation plans would be developed in coordination with the USACE

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

and other appropriate agencies as part of the Section 404 permitting process. The USACE and other appropriate agencies would determine the appropriate level of mitigation based upon the functions lost or adversely affected as a result of impacts to aquatic resources.

The proposed site on West Hayden Island is approximately 65 acres in size and is located approximately 2.5 river miles downstream of the Interstate Bridge, on the south side of the island adjacent to North Portland Harbor. The site is currently owned by the Oregon Department of State Lands, but ODOT has proposed to purchase this site and place it under a conservation easement. One or more compensatory mitigation projects may also be conducted on the site. The specific activities to be conducted at this site would be developed in coordination with the applicable regulatory agencies for each of the various permit applications.

In addition to the compensatory wetland and habitat mitigation described above, the IBR Program may need to excavate material from within the 100-year floodplain to address the compensatory excavation requirements of the City of Portland's recently updated floodplain ordinance. If such activity is required, it is anticipated that this material would be removed from upland portions of the 65-acre parcel on West Hayden Island described above or from aquatic areas adjacent to this parcel. If such excavation activities are conducted, excavated materials will be disposed of at a location approved to receive that type of material.

Figure 1-31. Potential Compensatory Mitigation Sites

1.2 Modified LPA Construction

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

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

Electronic tolling infrastructure for the existing Interstate Bridge would be constructed and operational near the start of construction on the new Columbia River bridges and would be constructed and operational for the new Columbia River bridges in time for their opening. The toll rates and policies for tolling (including pre-completion tolling) would be determined by the OTC and WSTC (refer to Section 1.1.8, Tolling).

1.2.1 Construction Components, Packaging Plan, and Duration

Table 1-4 lists the main construction components of the Modified LPA along with the estimated construction durations and descriptions of the associated work. Construction packages are also listed in Table 1-4 and illustrated in Figure 1-32. These main construction components would be defined by some functional improvement to the Program corridor; for example, construction of the new bridges would be coordinated with the construction of the connections to the existing I-5, enabling use of the new bridges while other components of the Program are constructed. Each listed component would require multiple construction packages—small and large, general and specialty. As construction progresses, interim connections may be in place while subsequent components are built and final connections and finishes are completed. This preliminary construction plan may change as the Program advances toward construction. Construction packages may further be combined or separated throughout delivery of the Program. Construction of all components identified in the Program could last more than 10 years.

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

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

Table 1-4. Preliminary Construction Packaging Plan

Component and General Location	Estimated Duration	Description	Construction Packages
Columbia River bridges, approaches, and demolition of Interstate Bridge *Hayden Island to Evergreen Boulevard*	6 to 8 years	• General sequence for new bridges would include initial preparation and installation of foundation piles, shaft caps, pier columns, superstructure, and deck elements, followed by systems and finish work. • SR 14 interchange would be constructed in a separate construction package and must be completed before all traffic could be transferred to the new Columbia River bridges. • Demolition of the existing Interstate Bridge could begin only after traffic is transferred to the new Columbia River bridges.	• Columbia River Bridges [a] • Approaches [a] • Pre-completion Tolling Signage and Equipment Installation • SR 14 A • Evergreen Bridge • Interstate Bridge Demolition
Light-rail and bus-on-shoulder transit *Expo Station to Evergreen Station; Ruby Junction*	4 to 7 years	• The light-rail alignment would be partially supported by the southbound Columbia River bridge and approach structure guideways. • Light-rail construction would include all infrastructure associated with light-rail elements of the Transit Packages construction package (e.g., overhead catenary system, tracks, stations, and park and rides). • Bus on shoulder would include corresponding bus elements of the Transit Packages construction package.	• North Portland Harbor Transit Bridge • Marine Drive A (supports transit improvements) • Hayden Island A (supports transit improvements) • Light-rail Overnight Facility • Transit Packages • Ruby Junction

Component and General Location	Estimated Duration	Description	Construction Packages
Marine Drive and Hayden Island interchanges and North Portland Harbor bridges *Marine Drive to Hayden Island*	4 to 10 years	• Hayden Island interchange construction duration would not necessarily entail continuous active construction. • The North Portland Harbor bridges could include sequenced construction of southbound bridges, northbound bridges, and demolition of the existing North Portland Harbor bridge to maintain traffic mobility during construction. • Hayden Island and Marine Drive interchanges could be broken into several contracts, which could spread work over a longer duration.	• Hayden Island Surface Streets • Hayden Island Interchange • North Portland Harbor Bridges • Oregon I-5 Southbound • Oregon I-5 Northbound • North Portland Harbor Bridge Removal • Marine Drive Interchange • North Expo Road
Mill Plain Boulevard, Fourth Plain Boulevard, and SR 500/39th Street interchanges *Mill Plain Boulevard to SR 500*	3 to 4 years	• Construction of these interchanges could be independent from each other.	• Mill Plain Boulevard Interchange • Washington North

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

Figure 1-32. Preliminary Construction Packages

1.2.2 Potential Staging Sites and Casting Yards

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

Two potential major staging sites have been identified (see Figure 1-6). Both sites are located on Hayden Island on the west side of I-5. A large portion of both parcels would be required for new right of way for the Modified LPA. Other staging sites may be identified during the design process or by the contractor. Following construction of the Modified LPA, the staging sites could be converted to other uses.

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

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

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

1.3 No-Build Alternative

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

Regional transportation projects included in the No-Build Alternative are those in the financially constrained 2018 *Regional Transportation Plan* (RTP) adopted in December 2018 by the Metro Council (Metro 2018) and in March 2019 (RTC 2019) by the Southwest Washington Regional Transportation Council (RTC) Board of Directors (referred to collectively as the 2018 RTP in this report).[16] The 2018 RTP has a planning horizon year of 2040 and includes projects from state and local plans necessary to meet transportation needs over this time period; financially constrained means these projects have identified funding sources. The Transportation Technical Report lists the projects included in the financially constrained 2018 RTP.

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

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

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

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

2. METHODS

This chapter describes the methods used to conduct the analysis of wetlands and other waters. It includes a description of the study area, relevant laws and regulations, and methods for collecting data, assessing impacts, and evaluating possible mitigation measures. The analysis is designed to comply with NEPA and relevant federal, state, and local laws.

All wetlands and other waters identified in this report are assumed to be subject to federal, state, and/or local regulatory jurisdiction control of these agencies. A jurisdictional determination will be conducted during the permitting process to determine which wetlands or other waters are subject to regulatory control.

This chapter addresses the following questions:

- How was the study area defined?
- What methods and data were used to determine the location and function of wetlands and other waters within the study area?
- How were potential short- and long-term impacts on wetlands and other waters identified and analyzed, and what constitutes a significant impact?
- How was mitigation identified and analyzed?

Since the CRC ROD and re-evaluations, the methods discussed in this chapter have been updated as follows:

- Conducting wetland delineations in accordance with the current version of the Regional Supplement to the USACE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (USACE 2010), in addition to the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory 1987).
- Using the updated *National Wetland Plant List* (USACE 2020) developed by the USACE, or current version.
- Conducting wetland functional assessments using the revised rating system in Washington (Hruby 2014) and the current version of the Oregon Rapid Wetland Assessment Protocol (ORWAP) as described in Adamus et al. (2020).
- Developing compensatory mitigation in accordance with the 2008 Mitigation Rule that prioritizes wetland mitigation using mitigation banks and in-lieu fee opportunities, while also considering on-site and off-site mitigation options where appropriate (USACE and EPA 2008).
- Using the *Wetland Mitigation in Washington State: Part 1 – Agency Policies and Guidance (Version 2)* guidance document to develop wetland mitigation in Washington (Ecology et al. 2021).
- Using the Oregon Department of State Lands (DSL) *Aquatic Resources Mitigation Framework* implemented in 2019, or as updated, to develop wetland and stream mitigation in Oregon.

- Assessing stream functions in Oregon using the current version of the Stream Functional Assessment Method (SFAM), if applicable, to the project and waterway. If not applicable, best professional judgment methodology must be used and include, at a minimum, the group-level functions and values of the SFAM.
- Determining proposed mitigation for wetland and wetland buffers to reflect current guidance.
- Updated determination of waters of the U.S. based on the recent Sackett v. US EPA, 598 U.S. (2023) decision from the U.S. Supreme Court. This case held that "the Clean Water Act's use of 'waters'… refers only to 'geographic[al] features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes' and to adjacent wetlands that are 'indistinguishable' from those bodies of water due to a continuous surface connection."
- Changes to the design of the CRC project's LPA to develop a Modified LPA, including design options, and the resulting effects on wetlands and other waters.

2.1 Study Area

The study area is in northwestern Oregon and southwestern Washington and is bisected by the Columbia River, which also includes the Oregon Slough (also known as the North Portland Harbor). The study area encompasses portions of the Columbia Slough watershed, the Columbia River/Columbia Slope watershed, and the Burnt Bridge Creek watershed.

Figure 2-1 shows the wetlands and other waters study area for the Modified LPA, which includes a 5-mile segment of I-5, approximately between the SR 500 interchange in Washington and the I-5/Columbia Boulevard interchange in Oregon, and the area around TriMet's existing Ruby Junction Light-Rail OMF in Gresham, Oregon. The study area includes temporary construction easements that would be established directly adjacent to proposed construction areas and the potential locations of larger staging areas and casting yards. Direct physical changes in the landscape would be limited to the study area, though mitigation measures could be applied outside of it.

Figure 2-1. Wetlands and Other Waters Study Area

Source: USGS, ODOT, WSDOT, Mapbox, OpenStreetMap

2.2 Effects Guidelines

The following describes how potential short- and long-term impacts to wetlands and other waters were evaluated and analyzed. The IBR Program team will coordinate with federal, state, and local resource agencies to determine the significance of impacts to wetlands and other waters.

- Modification of hydrologic regimes and/or excavation, grading, or discharge of fill material in wetlands and other waters that results in:
  - A significant adverse change in function of the wetland, waterbody, or its designated buffer.
  - Significant degradation in the quality of the wetland, other water, or its designated buffer.
- Substantial disturbance within a wetland, other water, or designated buffer.
- Loss of a substantial portion of the total area of wetlands and other waters within the study area.
- Conversion of wetlands (e.g., forested to emergent).
- Impacts on a wetland, waterbody, or its designated buffer that cannot be minimized or avoided.
- Net loss of wetland or other water function.

2.3 Data Collection Methods

The data collected to identify wetlands and other waters within the study area, and characterize their conditions, included a review of existing maps and literature. Wetlands that were identified in 2008 for the CRC project, the City of Portland's Wetland Inventory Project, and wetland boundaries confirmed through field delineations as described in Section 2.3.1, are used as wetland boundaries for purposes of analysis in this SEIS. Additional field delineations were conducted in 2023 and 2024, and will be completed in 2025, as described in Section 2.3.2. Once the field delineations are completed, wetland and other waters delineation reports, showing present day wetland and other water boundaries within the study area, will be prepared.

2.3.1 2008 Wetlands and Other Waters Delineations

The CRC project delineated boundaries of wetlands and other waters within the study area using methods suitable for delineating wetlands and other waters in both Oregon and Washington (Environmental Laboratory 1987). Waters were determined to the ordinary high water mark (OHWM). Wetland and other water boundaries were recorded with a high-accuracy (sub-meter) global positioning system (GPS) receiver. Wetlands and other waters in both states were classified using the Cowardin classification method (Cowardin et al. 1979) and the hydrogeomorphic (HGM)-based classification system (Adamus 2001). The indicator status of vegetation within sample areas was determined using the *National Wetland Plant List* (developed by the USACE. Wetlands and other waters extending outside of the study area boundary were considered in their entirety for the purposes of functional assessments.

In the summer of 2008, a wetland and other waters delineation report for the Oregon portion of the CRC project was submitted to the DSL for concurrence. It received concurrence in September 2008 (DSL #WD 2008-0205). The DSL concurrence letter is included in Appendix A.

2.3.2 Wetlands and Other Waters Delineations

Because the 2008 wetlands and other waters delineations have expired, the IBR Program reviewed current literature and data on wetland resources and conducted field delineation to determine wetland and water conditions. To identify wetland boundaries within the study area, the IBR Program team has reviewed wetland data from the City of Portland's Wetland Inventory Project and conducted field visits in 2023, 2024, and 2025. The following sections describe the additional field delineation efforts conducted by year.

2.3.2.1 2023 Delineations

In 2023, additional field delineation efforts were completed for the portion of the study area on West Hayden Island in Oregon. In Washington, additional field delineations were completed in the portion of the study area from the state line north to the Evergreen Street overpass and east on SR 14 in the area west of I-5. In both states, the OHWM of the Columbia River and North Portland Harbor were established using the elevations established by the USACE at river mile 106. In Oregon, the Columbia River was assessed using the best professional judgement methodology of the stream functional assessment method (SFAM). In Washington, the OHWM of the Columbia River was also identified using the methods described in the *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* document (Anderson et al. 2016).

An updated wetland and waterbodies delineation report was prepared for the portion of the study area on West Hayden Island to the state line in Oregon (Appendix B). A separate wetland and waterbodies delineation report was prepared for the portion of the study area from the Washington State line north to the Evergreen Street overpass and east on SR 14 (Appendix C). The updated wetland and other waters delineation reports will be submitted to federal and state agencies in 2025 for concurrence.

2.3.2.2 2024 Delineations

In 2024, the IBR Program team conducted additional field delineations to verify wetland boundaries and identify new wetland boundaries to complete wetland and other waters delineations. In Oregon, the IBR Program team conducted additional field delineations in the portions of the study area west of I-5 in the mainland of Oregon, and the parcel located north of N Hanely Drive and east of N Vancouver Way. In Washington, additional field delineations were completed at the north end of the study area, west of I-5, in the Kiggins Bowl area. Wetland and other waters functional assessments will be performed using the Washington rating system as described in Hruby (2014) and the Oregon system, ORWAP, as described in Adamus et al. (2020), or the most recent version. The wetland functional assessments in Washington will be completed in 2025, the ORWAP system in Oregon will be completed during the permitting process associated with impacts to the wetlands on the Oregon mainland.

2.3.2.3 2025 Delineations

The IBR Program team plans to conduct additional field surveys in 2025 to complete wetland and other waters delineations on the parcels east of I-5 at the north end of the study area in Washington and east of I-5 in mainland Oregon once access has been granted. Wetland and other waters functional assessments will be performed using the Washington rating system as described in Hruby (2014) at the time of the additional field work and the Oregon system, ORWAP, as described in Adamus et al. (2020), or the most recent version, will be completed during the permitting process associated with impacts to those identified wetlands. Final wetland and other waters delineation reports will be prepared and submitted to federal and state agencies for concurrence.

2.4 Analysis Methods

2.4.1 Identifying Regional Long-term Effects

Long-term impacts are considered impacts that occur when an alternative results in removal or fill within jurisdictional wetlands, regulated wetland buffers, or other waters of the state or U.S. The following process has been used to determine long-term operational impacts on wetlands and other waters:

- Map project impacts to wetlands and other waters and their buffers.
- Evaluate impacts to the functions of wetlands and other waters.
- Quantify the area of wetlands, other waters, and designated buffers affected.

Once these steps have been completed, consultation with local, state, and federal biologists to discuss potential impacts will occur.

2.4.2 Identifying Temporary Effects

Temporary impacts are considered impacts to wetlands and other waters of the state and U.S. that would occur in areas where construction activities would take place, but with functions returning to pre-impact performance after a duration of time. This period of time varies by agency and can be as long as two years or as short as six months. The following process has been used to determine short-term temporary construction impacts on wetlands and other waters:

- Map temporary project impacts to wetlands and other waters and their buffers.
- Evaluate impacts to the functions of wetlands and other waters.
- Establish duration of project impacts to wetlands and other waters and their buffers.
- Quantify the area of wetlands, other waters, and designated buffers affected by temporary impacts.

Once these steps have been completed, consultation with local, state, and federal biologists to discuss potential impacts will occur.

2.4.3 Identifying Avoidance, Minimization, and Compensatory Mitigation Measures

To develop a broad and successful mitigation approach for impacts to wetlands and other waters, the IBR Program has:

- Evaluated design alternatives to avoid project impacts.
- Identified and evaluated ways to minimize impacts.
- Identified, evaluated, and ranked potential mitigation banks and sites. Input from local, state, and federal agencies has been and will continue to be obtained.
- Developed restoration and mitigation concepts for temporary impacts.

Compensation for unavoidable impacts was evaluated consistent with the USACE, DSL, Oregon Department of Environmental Quality (DEQ), Washington State Department of Ecology (Ecology), Clark County, City of Portland, and City of Vancouver rules for wetland and other waters mitigation. In choosing among the mitigation options, regulatory requirements, ecological uplift, watershed benefits, temporal loss, likelihood for success, practicability of long-term monitoring and maintenance, and relative costs were evaluated. The mitigation goal is to replace the functions and values of impacted wetland and other waters within the Lower Columbia River Basin.

2.5 Coordination

The IBR Program team has begun, and will continue, coordination with the USACE, DSL, DEQ, Ecology, Washington Department of Fish and Wildlife (WDFW), Clark County, and the Cities of Portland and Vancouver to determine the jurisdiction of wetlands, other waters, and their buffers within the study area and develop appropriate mitigation for unavoidable impacts.

3. AFFECTED ENVIRONMENT

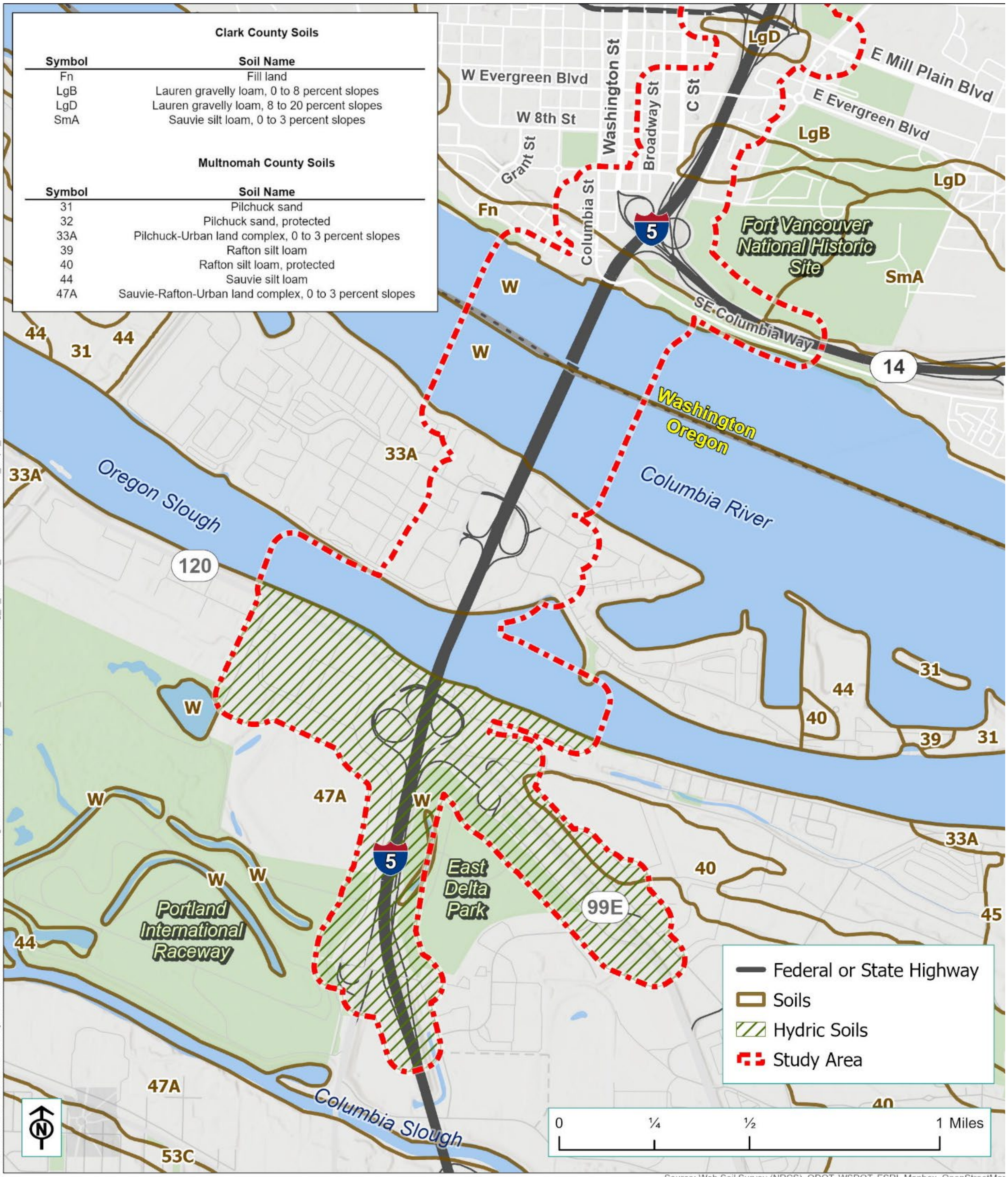
This chapter presents the existing wetlands and other waters conditions within the study area. As noted in Section 2.3.1, the identified wetlands and other waters of the state and U.S. discussed in the following sections were originally delineated in 2008 as part of the CRC project analysis (CRC-FEIS 2011). Since those data are more than five years old, new wetland delineations and assessments were completed in 2023. Some additional field work was completed in 2024 and more field work will be completed in 2025. New wetland delineation and assessment reports will be completed in 2025. The following descriptions of existing wetlands and other waters in the study area is based on information identified in the CRC Final EIS, the City of Portland's Wetland Inventory Project, the two 2023 wetland delineation and other waters reports, and field work completed in 2024.

The study area is highly urbanized, with some remnant wetlands and other waters. The Natural Resources Conservation Service (NRCS) soils map in Figure 3-1 shows areas of hydric soils in mainland Oregon. No hydric soils are mapped in Washington within the study area (Figure 3-2). The National Wetlands Inventory (NWI) maps identify wetlands throughout the region (Figure 3-3 and Figure 3-4).

3.1 Regional Conditions

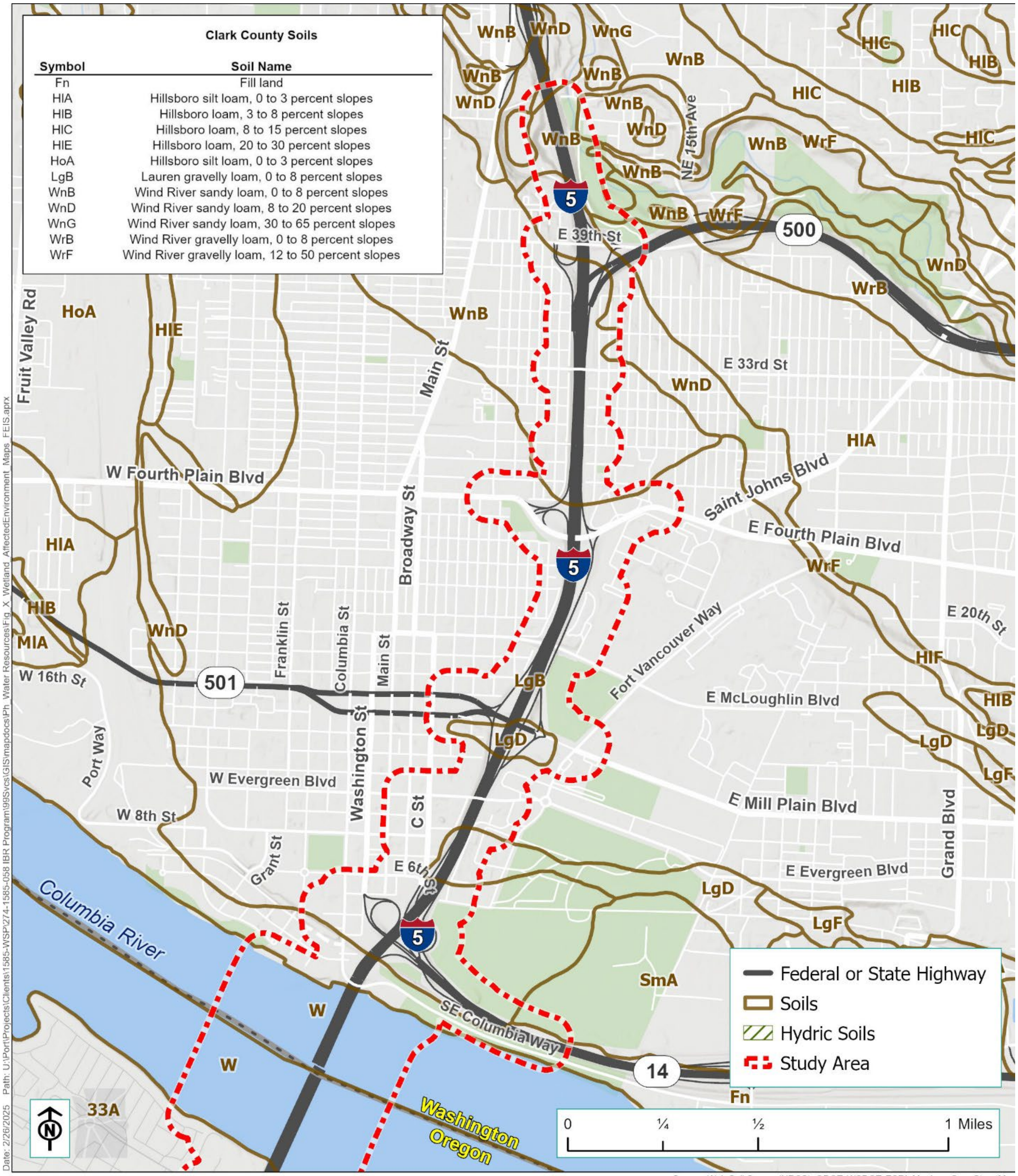
East and west of the study area, these are large wetland systems, including the Columbia Slough, Vapor wetland, Force Lake, Smith and Bybee Lakes, West Hayden Island wetlands, and Vancouver Lake wetlands. Southeast of the study area, the Columbia Slough watershed includes scattered wetlands and other waters present within the urban matrix. The Salmon Creek watershed, north of the study area, has similar characteristics. These large systems are remnants of the historical system of wetlands, sloughs, and marshes that once occupied most of the study area. Although they are now somewhat cut off from each other and the larger Columbia River system due to urbanization of the area, they perform many functions and have a high value due to their rarity and ability to support wildlife.

Figure 3-1. Mapped Soil Series – Oregon



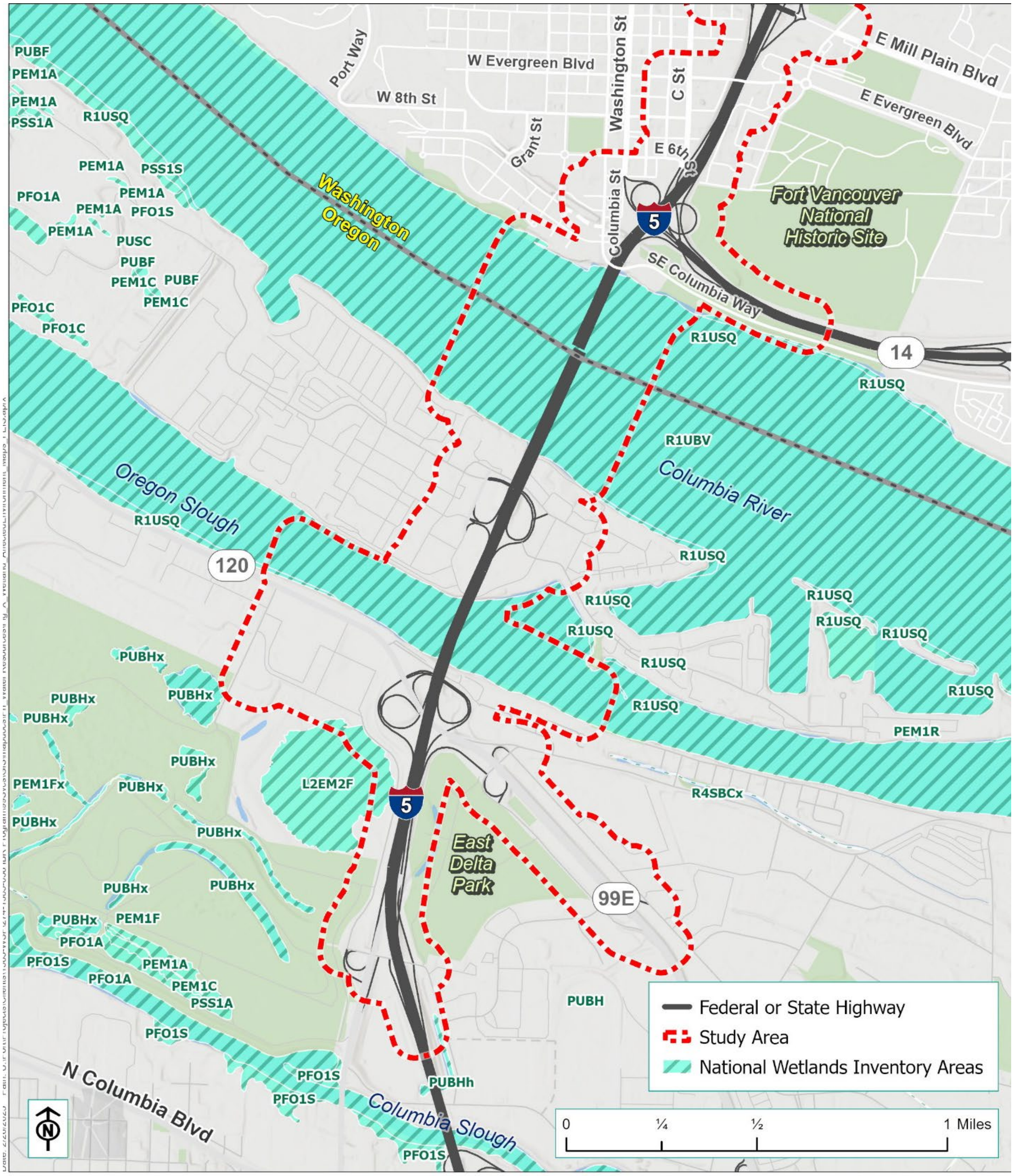
Source: Web Soil Survey (NRCS), ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

Figure 3-2. Mapped Soil Series – Washington



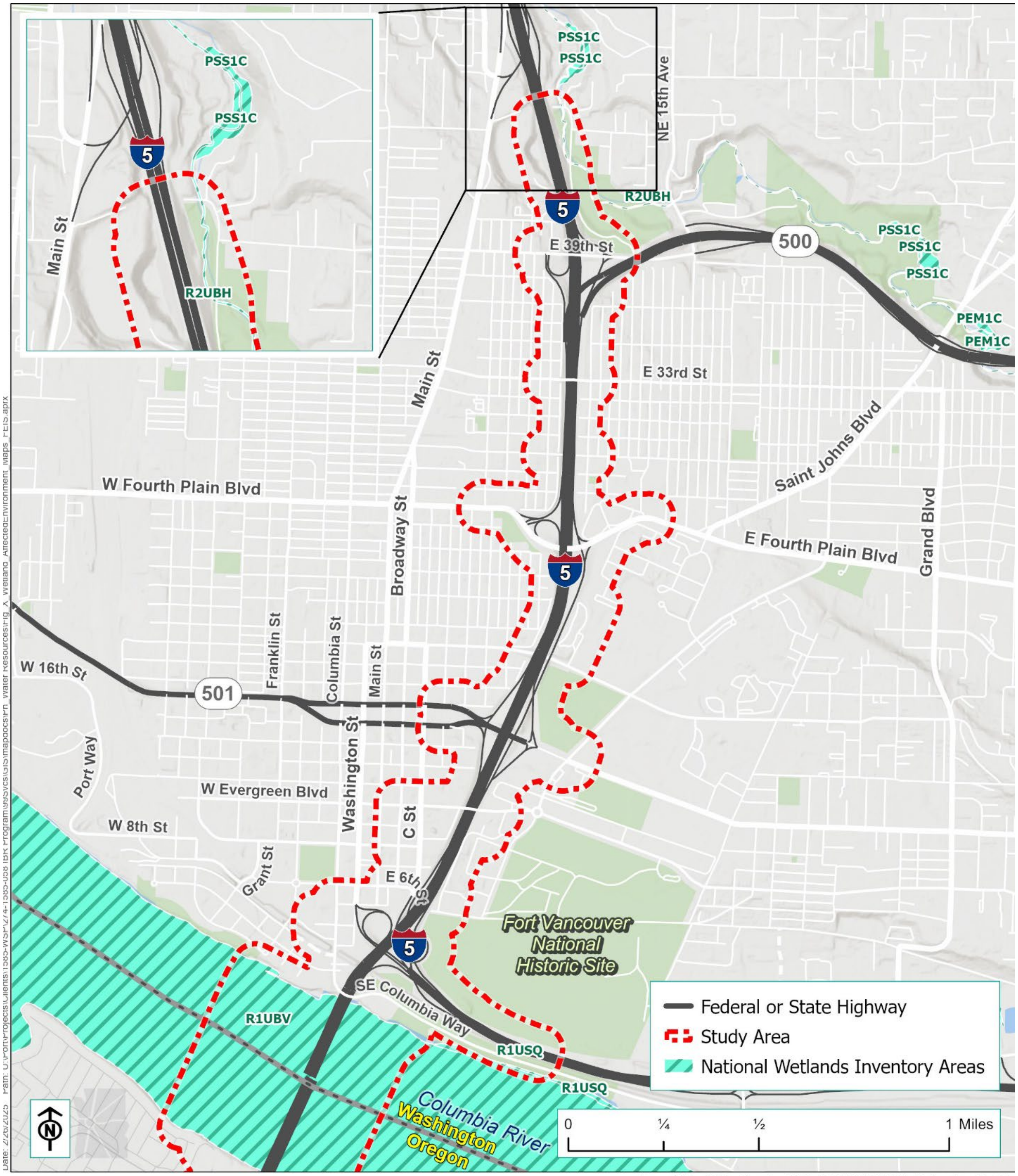
Source: Web Soil Survey (NRCS), ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

Figure 3-3. National Wetlands Inventory Areas – Oregon



Note: The Oregon Slough is also called the North Portland Harbor

Figure 3-4. National Wetlands Inventory Areas – Washington



Source: National Wetland Inventory (NWI), ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

3.2 Columbia Slough Watershed

The study area intersects approximately 69.51 acres of the Columbia Slough watershed. The Columbia Slough watershed drains approximately 37,741 acres in portions of Portland, Troutdale, Fairview, Gresham, Maywood Park, Wood Village, and Multnomah County (unincorporated areas) and is separated into lower, middle, and upper Columbia Slough. Near the study area, the predominant land use in the Columbia Slough watershed is light industrial, with some residential.

The Columbia Slough, located to the south of the study area, is a slow-moving, low-gradient drainage canal running nearly 19 miles from Fairview Lake in the east to the Willamette River in the west. Running roughly parallel to the Columbia River, the slough is a remnant of the historical system of lakes, wetlands, and channels that dominated the south floodplain of the Columbia River. The eastern sections of the Columbia Slough are intensively managed to provide drainage and flood control with dikes, pumps, weirs, and levees (FHWA and ODOT 2005). The western section of the Columbia Slough has a free and open connection to the Willamette River and is tidally influenced.

3.2.1 Mapped Soils

In the Columbia Slough watershed in Oregon, mapped soils include Rafton silt loam, protected (40); Sauvie-Rafton-Urban land complex, 0% to 3% slopes (47A); and water (W) (Figure 3-1) (Green 1983). Rafton silt loam, protected and Sauvie-Rafton-Urban land complex, 0% to 3% slopes are hydric soils or a mixture of hydric and non-hydric soils, which are more likely to support wetlands versus non-hydric soils (USDA NRCS 2019).

3.2.2 Mapped Wetlands

Available NWI data indicate one lacustrine, one riverine, and one palustrine wetland within the intersection of the study area and the Columbia Slough watershed (Figure 3-3 and Figure 3-4) (USFWS 2021). The Vanport wetland, located south of N Marine Drive and west of I-5, is mapped as a lacustrine, littoral, emergent, non-persistent, semi-permanently flooded (L2EM2F) wetland. One small linear riverine, intermittent, streambed, seasonally flooded, excavated (R4SBCx) wetland is mapped north of N Marine Drive and east of I-5. A palustrine unconsolidated bottom, permanently flooded, excavated (PUBHx) wetland is mapped primarily east of I-5 along N Whitaker Road between N Victory Boulevard and N Schmeer Road. This wetland extends west under I-5, just north of N Schmeer Road.

3.2.3 Identified Wetlands and Other Waters

Within the Columbia Slough watershed there are 14 wetlands and a potentially jurisdictional ditch that intersect the study area (Figure 3-5).

3.2.3.1 Other Waters

A potentially jurisdictional ditch is adjacent to Wetland System L/M, within the City of Portland. The ditch enters the wetland system from the north and the south and is conducted to the Vanport wetland through two culverts that pass under N Expo Road. The ditch is located at the toe of slope from the existing roadway prism; it receives stormwater from the prism slope and the existing TriMet light-rail tracks. In 2008, this ditch was not considered a jurisdictional resource by DSL. In January 2023, the U.S. Environmental Protection Agency (EPA) and USACE published new guidance defining "waters of the U.S." under the Clean Water Act (CWA). Potentially jurisdictional as a water of the state and United States. Regulatory agencies will formally determine the jurisdictional status of waterway during their review of permit applications for the project.

3.2.3.2 Wetlands

Wetland areas are identified alphabetically, in the order in which they were identified in the field or using off-site data. As property access permission was not obtained sequentially, wetland areas are not named sequentially. Figure 3-5 shows the locations of these features.

WETLANDS L/M

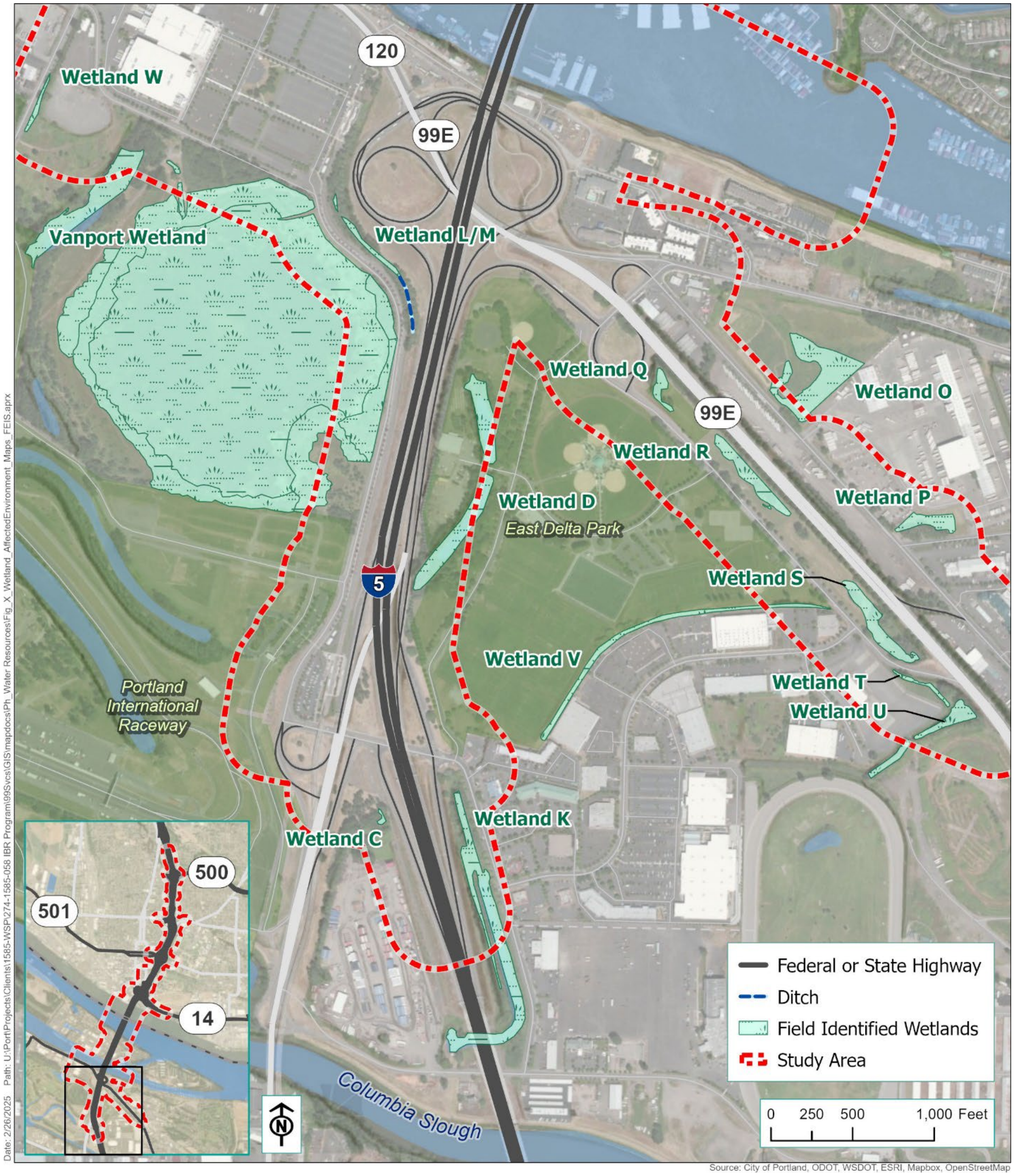
Wetland System L/M is a set of two palustrine, forested, seasonally flooded (PFOC) wetlands approximately 0.34 acres in size (Figure 3-5). It is within a City of Portland environmental zone. The HGM classification is depressional.

Wetland System L/M is southwest of the southbound I-5 on-ramp at N Marine Drive and northeast of the existing TriMet light-rail tracks at the Expo Center. The NWI does not map a wetland in the vicinity of Wetland System L/M. The wetland, as identified in 2008 and confirmed during a 2023 field survey, appears to be part of a stormwater system and has two stormwater culverts for overflow from the wetland, one at the northwestern end and one at the southern end of the wetland system. Both culverts appear to drain to the Vanport wetland, west of this area. A potentially jurisdictional stormwater ditch enters Wetland System L/M from the north and the south. See Section 3.2.3.1 for further details.

The boundary of Wetland System L/M was determined by topography and a change in vegetation from wetland to upland species. Wetland System L/M is dominated by Pacific willow (*Salix lasiandra* – facultative wetland [FACW]), fringed willowherb (*Epilobium ciliatum* spp. *ciliatum* - FACW), Himalayan blackberry (*Rubus armeniacus* – facultative [FAC]), and reed canary grass (*Phalaris arundinacea* - FACW). Indicators of wetland hydrology present at the time of survey include watermarks, water-stained leaves, and surface organic pan. Soils are sandy (no color assessment), with oxidation-reduction (redox) concentrations and an organic pan.

The upland areas around Wetland System L/M are dominated by fringed willowherb (FACW) and Himalayan blackberry (FAC). No indicators of wetland hydrology were present at the time of the 2008 survey and confirmed during the 2023 field survey. Soils are sandy, without redox concentrations or an organic pan.

Figure 3-5. Field Identified Wetlands and Other Waters – Oregon



Source: CRC Wetland Data (2011); City of Portland (2023); field verified.

VANPORT WETLANDS

The Vanport Wetlands are a grouping of several wetlands located on Port of Portland property on the west side of I-5, west and south of N Expo Road (Figure 3-5). This wetland complex consists of several wetlands and swales that are connected to the North Slough, the Columbia Slough, and ultimately the Willamette River. The main wetland within the study area is a palustrine forested/scrub-shrub/emergent (PFO/SS/EM) wetland managed as a mitigation site by the Port of Portland, and is mapped by the NWI as a palustrine emergent, seasonally flooded (PEMC) wetland. It is located within a City of Portland environmental zone. The wetland has been delineated by the Port of Portland and confirmed by DSL. The boundaries shown in Figure 3-5 are from a 2024 field survey along the northern boundary adjacent to N Expo Road and supplemented by the City of Portland's Wetland Inventory Project in areas not field verified.

In 2024, the northern boundary of the wetland was determined by topography (toe of slope), a shift from the presence of wetland hydrological indicators to the absence of indicators, and a change in vegetation from wetland to upland species. There is an excavated ditch that runs parallel to a portion of N Expo Road, and then the ditch turns 45 degrees and runs in a northeast to southwest direction.

The northern portion of the wetland is dominated by awl-fruited sedge (*Carex stipata* – OBL), soft rush (*Juncus effusus* – FACW), and reed canarygrass (FACW), with balsam poplar (FAC) saplings. Indicators of wetland hydrology include surface water, high water table, and soil saturation at the surface. Soils exhibit glayed chroma colors (10G 2.5/1) or low chroma colors (10YR 4/1) with redox concentrations.

The upland areas adjacent to the wetland are dominated by balsam poplar (FAC), Himalayan blackberry (FAC), teasle (*Dipsacus fullonum* – FAC), and tall false rye grass (*Schedonorus arundinaceus* - FAC). There are no indicators of wetland hydrology in upland areas. Soils exhibit low chroma colors (10YR 3/3 and 10YR 4/3) with no redox concentrations.

WETLAND C

Wetland C is a small palustrine, emergent wetland (PEM) and occupies approximately 0.07 acres within the study area. It is west of I-5 and near the southbound highway on-ramp at N Victory Boulevard. In 2008, the boundary of Wetland C was determined by a shift from the presence of wetland hydrological indicators to the absence of indicators and a change in vegetation from wetland to upland species. The HGM classification is depressional closed, non-permanent.

Wetland C is dominated by reed canary grass (FACW), field horsetail (*Equisetum arvense* – FAC), and Himalayan blackberry (FAC). Indicators of wetland hydrology include sediment deposits, cracked soils, and drainage patterns. Soils exhibit low chroma colors (10YR 3/1 and 10YR 4/1) with redox concentrations.

The upland areas adjacent to Wetland C are dominated by fringed willowherb (FACW), balsam poplar (*Populus balsamifera* - FAC), Himalayan blackberry (FAC), and tall false rye grass (FAC). There are no indicators of wetland hydrology in upland areas. Soils exhibit low chroma colors (10YR 3/1 and 10YR 4/1) with redox concentrations.

WETLAND D

Wetland D is a palustrine, forested/scrub-shrub/emergent, permanently flooded, excavated (PFO/SS/EMHx) wetland approximately 2.67 acres in size (Figure 3-5). It is in the northeast corner of the Oregon portion of the study area within Delta Park (Portland). It is within a City of Portland environmental zone. Wetland D is a remnant slough channel identified as Walker Slough. It consists of two smaller, oblong ponds connected by a culvert under a City of Portland Parks and Recreation access road.

The wetland receives stormwater from a culvert on the north end and from overland flow. Wetland D drains to Schmeer Slough through a storm drainpipe at the south end of the wetland. The HGM classification is depressional. The boundary of Wetland D was determined by topography and a change in vegetation from wetland to upland species. This boundary will be confirmed during a field survey in 2025.

Wetland D is dominated by Oregon ash (*Fraxinus latifolia* - FACW), fringed willowherb (FACW), coastal willow (*Salix hookeriana* - FACW), Sitka willow (*Salix sitchensis* - FACW), slough sedge (*Carex obnupta* – obligate [OBL]), nodding bur-marigold (*Bidens cernua* - FACW), and reed canary grass (FACW). Wetland hydrology is demonstrated by free water and saturation in the upper 12 inches of soil, watermarks, and drift lines. The soils exhibit low chroma colors (10YR 2/1 and 10YR 3/1) with redox concentrations.

The upland areas adjacent to Wetland D were characterized by red alder (*Alnus rubra* - FAC), Oregon ash (FACW), fringed willowherb (FACW), choke cherry (*Prunus virginiana* - facultative upland [FACU]), vine maple (*Acer circinatum* - FAC), Himalayan blackberry (FAC), snowberry (*Symphoricarpos albus* - FACU), and reed canary grass (FACW). No indicators of wetland hydrology were present at the time of the 2008 survey. Soils in upland plots are very dark brown and very dark grayish brown (10YR 2/2 and 10YR 3/2) without redox concentrations.

WETLAND K

Wetland K is mapped by the NWI as a palustrine, unconsolidated bottom, permanently flooded, diked/impounded (PUBHh) wetland and is a deep excavated ditch with water levels managed by the Urban Flood Safety & Water Quality District. This wetland historically has been dredged by the Urban Flood Safety & Water Quality District. Wetland K is located east of I-5 with a portion wrapping under the highway overpass at N Schmeer Road. It is within a City of Portland environmental zone. In 2008, the boundary of Wetland K was determined by topography (toe of slope), a shift from the presence of wetland hydrological indicators to the absence of indicators, and a change in vegetation from wetland to upland species.

Wetland K is dominated by fringed willowherb (FACW), Pacific willow (FACW), trailing blackberry (*Rubus ursinus* - FACU), California brome (*Bromus carinatus* -not on list [NOL]), blue wildrye (*Elymus glaucus* - FACU), reed canary grass (FACW), meadow barley (*Hordeum brachyantherum* - FACW), and field horsetail (FAC), with plantings of Oregon ash (FACW) and *Ribes* sp. (assumed FAC) contributing to the understory. The water level within Schmeer Slough is controlled between 2.0 and 2.5 feet (National Geodetic Vertical Datum). Indicators of wetland hydrology in higher elevation portions of Wetland K include drainage patterns and sediment deposits. Wetland indicators in lower elevations, near the OHWM of Schmeer Slough, include soil saturation at the surface, watermarks, drift lines, and sediment deposits. Soils exhibit low chroma colors (10YR 5/1 and 10YR 4/1) with redox concentrations.

The upland areas around Wetland K are dominated by fringed willowherb (FACW), red elderberry (*Sambucus racemosa* - FACU), Himalayan blackberry (FAC), field horsetail (FAC), California brome (NOL), blue wildrye (FACU), and reed canary grass (FACW). No indicators of wetland hydrology were present in upland areas at the time of the 2008 survey and 2023 survey.

WETLAND O

Wetland O was previously identified as a potentially jurisdictional water area (PJWA) in 2008 and has since been delineated and confirmed by DSL. The boundaries shown in Figure 3-5 are from the City of Portland's Wetland Inventory Project. This is a PEM wetland, approximately 2.63 acres in size. It is east of I-5, and north of N Vancouver Way. The HGM classification is depressional closed, non-permanent.

WETLAND P

Wetland P was previously identified as a PJWA and has since been identified by the City of Portland Wetland Inventory Project and confirmed during a 2024 field survey. Wetland P is a PEM wetland, approximately 0.61 acres in size. It lies east of I-5, and north of N Vancouver Way near the intersection with North Hanley Drive. The HGM classification is depressional closed, non-permanent.

In 2024, the boundary of Wetland P was determined by evaluating topography, wetland hydrologic indicators, and vegetation composition (such as a change in vegetation from wetland to upland species).

Wetland P is dominated by tall false rye grass (FAC), common velvet grass (*Holcus lanatus* – FAC), and spreading bent grass (*Agrostis stolonifera* – FAC). Indicators of wetland hydrology include soil saturation at the surface. Soils exhibit low chroma colors (10YR 3/2 and 10YR 4/1) with redox concentrations.

The upland areas adjacent to Wetland P are dominated by balsam poplar (FAC), Himalayan blackberry (FAC), tall false rye grass (FAC), common velvet grass (FAC), spreading bent grass (FAC), and hairy cat's ear (*Hypochaeris radicata* – FACU). There are no indicators of wetland hydrology in upland areas. Soils exhibit low chroma colors (10YR 3/2 and 10YR 4/2) with no redox concentrations.

WETLAND Q

Wetland Q was identified by the City of Portland Wetland Inventory Project and visually confirmed during the 2023 field survey through the observation of standing water and wetland vegetation. It is a PEM wetland approximately 0.30 acres in size. It is located east of I-5, between NE Martin Luther King Jr. Boulevard and N Union Court. The HGM classification is depressional closed, non-permanent.

WETLAND R

Wetland R was identified by the City of Portland Wetland Inventory Project and confirmed during the 2023 field survey through the visual confirmation of wetland vegetation and standing water. It is a PEM wetland approximately 0.97 acres in size. It is located east of I-5, between NE Martin Luther King

Jr. Boulevard and N Union Court, just north of N Denver Avenue The HGM classification is depressional closed, non-permanent.

WETLAND S

Wetland S was identified by the City of Portland Wetland Inventory Project and visually confirmed during the 2023 field survey through the observation of standing water and wetland vegetation. It is a PEM approximately 1.10 acres in size. It is located east of I-5, between NE Martin Luther King Jr. Boulevard and N Union Court, just west of where the two roads intersect. It is located within the City of Portland environmental zone designation. The HGM classification is depressional closed, non-permanent.

WETLAND T

Wetland T was identified by the City of Portland Wetland Inventory Project and visually confirmed during the 2023 field survey. It is a PEM wetland approximately 0.18 acres in size. It is located east of I-5, south of N Union Court, just east of where N Union Court intersects with NE Martin Luther King Jr. Boulevard. It is located within the City of Portland environmental zone designation. The HGM classification is depressional flow-through, non-permanent.

WETLAND U

Wetland U was identified by the City of Portland Wetland Inventory Project and visually confirmed during the 2023 field survey. The wetland is a slough feature that contains standing water and is lined with balsam poplar (FAC) trees. It is located east of I-5, south of N Union Court, just south of the intersection of N Union Court and NE Martin Luther King Jr. Boulevard. It is located within the City of Portland environmental zone designation. It is a PEM wetland approximately 0.55 acres in size. The HGM classification is depressional flow-through, permanent.

WETLAND V

Wetland V was identified by the City of Portland Wetland Inventory Project and visually confirmed during the 2023 field survey. It is a long, linear PEM wetland approximately 1.18 acres in size. It is located east of I-5, south of N Union Court, south and east of Delta Park. The HGM classification is depressional flow-through, non-permanent.

WETLAND W

Wetland W was identified during a 2024 wetland delineation field survey. The wetland is a long, linear PEM/FO wetland approximately 0.18 acres in size. It is located east of N Force Road in a roadside ditch, and water drains to Force Lake through a culvert. The HGM classification is depressional flow-through, non-permanent.

Wetland W vegetation is dominated by Pacific willow (FACW), reed canary grass (FACW), tall false ryegrass (FAC), and field horsetail (FAC). Indicators of wetland hydrology include soil saturation at the surface, dark stained leaves, water marks on trees, and sparsely vegetated concave surfaces. Soils exhibit low chroma colors (10YR 3/1 and 10YR 3/2) with redox concentrations.

The upland areas adjacent to Wetland W are dominated by poison hemlock (*Conium maculatum* – FAC), teasle (FAC), Himalayan blackberry (FAC), and tall false rye grass (FAC). There are no indicators of wetland hydrology in upland areas. Soils exhibit low chroma colors (10YR 3/2) with no redox concentrations.

3.3 Ruby Junction Light-Rail Operations and Maintenance Facility

The Ruby Junction Light-Rail OMF is in Gresham, Oregon, and provides repair and maintenance for LRVs. The Ruby Junction site is included in the analysis below.

3.3.1 Mapped Soils

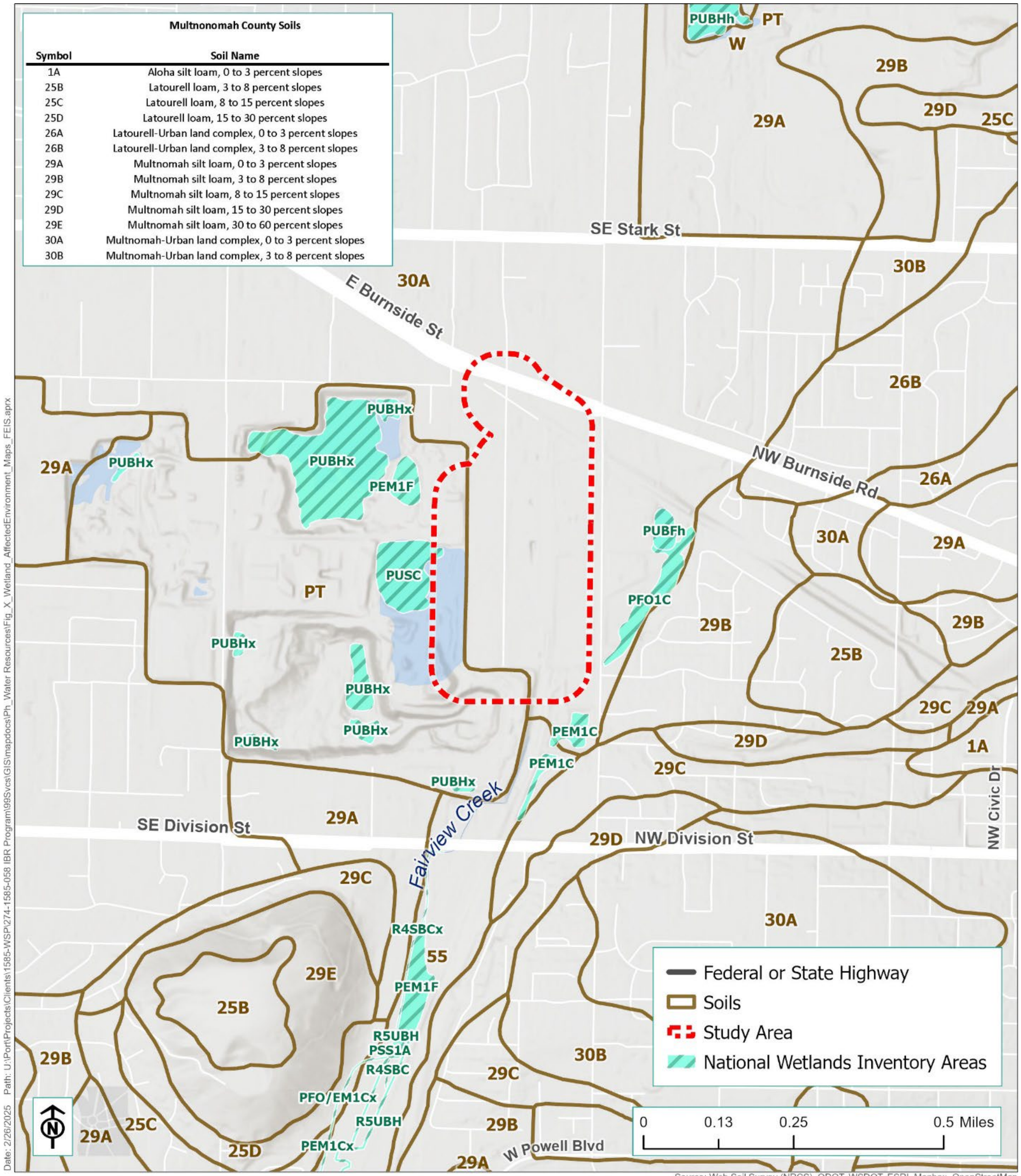
Soils mapped within the vicinity of the Ruby Junction Light-Rail OMF (Figure 3-6) include Multnomah silt loam, 0% to 3% slopes (29A), Multnomah silt loam, 3% to 8% slopes (29B), Multnomah silt loam, 8% to 15% slopes (29C), Multnomah silt loam, 15% to 30% slopes (29D), Multnomah-Urban land complex, 0% to 3% slopes (30A), Pits (PT), and Wapato silt loam (55) (USDA NRCS 2019). Wapato silt loam is the only soil listed as a hydric soil but is located outside of the study area.

3.3.2 Mapped Wetlands and Other Waters

The NWI (USFWS 2021) mapped several PUBHx wetlands; two palustrine unconsolidated shore, seasonally flooded, excavated (PUSCx) wetlands; and one palustrine emergent, seasonally flooded, excavated (PEMCx) wetland west and southwest of the Ruby Junction area (Figure 3-6).

The NWI and U.S. Geological Survey mapped Fairview Creek in the vicinity of the Ruby Junction Light-Rail OMF. Fairview Creek flows generally from southwest to northwest, passing south of the Ruby Junction Light-Rail OMF. It connects to the Columbia River through Osborn Creek and the Columbia Slough.

Figure 3-6. Mapped Soils and National Wetlands Inventory Areas – Ruby Junction



Source: Web Soil Survey (NRCS), ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

3.3.3 Identified Wetlands and Other Waters

Hydric soils are mapped under a portion of the Ruby Junction Light-Rail OMF (USDA NRCS 2019). Examination of aerial photographs confirmed the presence of several permanent wetland features west and southwest of the Ruby Junction Light-Rail OMF and of Fairview Creek (CRC-FEIS 2011). The wetlands appear to be excavated quarries. Fairview Creek was also identified on the aerial photographs and appears to be highly constrained by the surrounding urban landscape. The wetlands and creek are both outside the Ruby Junction study area. Table 3-1 summarizes wetlands, and their characteristics, identified in the study area in Oregon.

Table 3-1. Wetlands Identified within the Study Area in Oregon

Wetland	Size (acres)	Cowardin Class	HGM Class	Connected to Other Wetlands and Other Waters
Wetland C	0.07	PEM	Depressional	Isolated
Wetland D	2.67	PFO/SS/EMHx	Depressional	Connects to Wetland K and Columbia Slough
Wetland K	3.0	PUBHh	Depressional	Connects to Columbia Slough
Wetlands L/M	0.34	PFOC	Depressional	Connect to Vanport Wetlands
Wetland O	2.63	PEM	Depressional	Isolated
Wetland P	0.61	PEM	Depressional	Isolated
Wetland Q	0.30	PEM	Depressional	Isolated
Wetland R	0.97	PEM	Depressional	Isolated
Wetland S	1.10	PEM	Depressional	Connects to wetlands T and U, and Columbia Slough
Wetland T	0.18	PEM	Depressional	Connects to Wetland U and Columbia Slough
Wetland U	0.55	PEM	Depressional	Connects to Columbia Slough
Wetland V	1.18	PEM	Depressional	Connects to Columbia Slough
Wetland W	0.18	PEM/FO	Depressional	Connects to Force Lake
Vanport Wetlands	67.7	PFO/SS/EM	Depressional	Connects to Columbia Slough

HGM = hydrogeomorphic; PEM = palustrine emergent; PFOC = palustrine, forested, seasonally flooded; PFO/SS/EM = palustrine forested/scrub-shrub/emergent; PEM/FO = palustrine emergent/forested; PFO/SS/EMHx = palustrine, forested/scrub-shrub/emergent, permanently flooded, excavated; PUBHh = palustrine, unconsolidated bottom, permanently flooded, diked/impounded

3.4 Columbia River/Columbia Slope Watershed

The study area intersects approximately 146.48 acres of the Columbia River/Columbia Slope watershed. The Interstate Bridge is located at RM 106 of the Columbia River. Ten bridge footings are currently located below the OHWM.

The Columbia River within the study area is highly altered by human disturbance. Urbanization extends up to the shoreline. There has been extensive removal of historical streamside forests and wetlands. Riparian areas have been further degraded by the construction of dikes and levees and the placement of stream bank armoring. For several decades, industrial, residential, and upstream agricultural sources have contributed to profound water quality degradation in the Columbia River. Additionally, it receives high levels of disturbance in the form of heavy barge traffic.

The Columbia River is a highly managed stream that now resembles a series of slack water lakes upstream of the study area due to existing dams, rather than its original free-flowing state. Within the study area, the Columbia River is more free-flowing because it is below Bonneville Dam; however, the upstream dams are a major factor in downstream water discharge and quality. The major second factor regulating stream flow in the study area is tidal influence from the Pacific Ocean. Although the saltwater wedge does not extend into the study area, high tide events affect flow and stage in the Columbia River up to Bonneville Dam at RM 146.1.

3.4.1 Mapped Soils

In the Columbia River/Columbia Slope watershed, mapped soils include Pilchuck-urban land complex, 0% to 3% slopes (33A); Fill land (Fn); Lauren gravelly loam, 0% to 8% slopes (LgB); Lauren gravelly loam, 8% to 20% slopes (LgD); Wind River sandy loam, 0% to 8% slopes (WnB); Sauvie silt loam, 0% to 3% slopes (SmA); and Water (W) (Figure 3-1) (McGee 1972; USDA NRCS 2019). None of these soils are mapped as hydric soils.

3.4.2 Mapped Wetlands

The NWI maps the Columbia River (including North Portland Harbor) as a riverine tidal, unconsolidated bottom, permanent-tidal (R1UBV) wetland (USFWS 2021) (Figure 3-3 and Figure 3-4). The Clark County Potential Wetland Presence maps the Columbia River as a wetland area (Clark County 2022).

3.4.3 Identified Wetlands and Other Waters

In the Columbia River/Columbia Slope watershed the Columbia River is the one regulated waterway of the state and U.S. within the study area.

3.4.3.1 Columbia River

The Columbia River (including North Portland Harbor between the Oregon mainland and Hayden Island) flows from east to west through the study area. It is considered a traditional navigable water. It is the primary hydrologic feature of the study area. For more detailed discussion of this water of the state and U.S., refer to both the IBR Program's Ecosystems Technical Report and the Water Quality and Hydrology Technical Report. The City of Portland includes the Columbia River in its environmental overlay zone. The City of Vancouver/State of Washington considers the Columbia River a critical area and a shoreline of the state.

3.5 Burnt Bridge Creek Watershed

The study area intersects approximately 25.51 acres of the Burnt Bridge Creek watershed.

Burnt Bridge Creek is a small perennial tributary to the lower Columbia River. It originates within the northeastern limits of the City of Vancouver, Washington, and flows west (roughly paralleling SR 500 for approximately 5 miles) to its outlet at Vancouver Lake. The lake drains to the lower Columbia River via Lake River. I-5 crosses Burnt Bridge Creek at approximately RM 2.

3.5.1 Mapped Soils

In the Burnt Bridge Creek watershed, mapped soils within the study area include Lauren gravelly loam, 0% to 8% slopes (LgB); Hillsboro loam, 0% to 3% slopes (HIA); Wind River sandy loam, 0% to 8% slopes (WnB); Wind River sandy loam, 8% to 20% slopes (WnD); Wind River sandy loam, 30% to 65% slopes (WnG); Wind River gravelly loam, 0% to 8% slopes (WrB); and Wind River gravelly loam, 12% to 50% slopes (WrF) (Figure 3-2) (McGee 1972; USDA NRCS 2019). None of these soils are mapped as hydric soils.

3.5.2 Mapped Wetlands

The NWI maps one wetland feature within the portion of the Burnt Bridge Creek watershed in the study area (Figure 3-3) (USFWS 2021). Burnt Bridge Creek, a perennial stream, is mapped as a riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH) wetland.

The Clark County Potential Wetland Presence mapped wetlands in the northeastern portion of the study area within the Burnt Bridge Creek watershed (Clark County 2022). Two additional wetlands are mapped southeast of the I-5/SR 500 interchange, one at the northern terminus of M Street and one at the northern terminus of N Street, by the Clark County Potential Wetland Presence (Clark County 2022).

3.5.3 Identified Wetlands and Other Waters

There are two delineated wetland systems within the Burnt Bridge Creek watershed within the study area. These features are shown in Figure 3-7.

3.5.3.1 Other Waters of the State and U.S.

BURNT BRIDGE CREEK

The portion of Burnt Bridge Creek within the study area includes a reach that flows through Arnold Park and Leverich Park, north of SR 500, and then crosses under NE Leverich Park Way flowing north

(Figure 3-7). Downstream of Leverich Park, Burnt Bridge Creek passes through a series of culverts and short channelized sections as it flows north along the east side of I-5. Habitat condition and function in this portion of the creek are moderate. Burnt Bridge Creek is then conveyed under I-5 via a concrete box culvert near the northern end of the study area. The western OHWM of Burnt Bridge Creek was identified west of NE Leverich Park Way to the northern terminus of NE Leverich Park Way, where the stream continues north, outside of the study area. For further discussion of this water of the state and U.S., refer to both the IBR Program's Ecosystems Technical Report and the Water Quality and Hydrology Technical Report.

3.5.3.2 Wetlands

WETLAND H

Wetland H is a palustrine emergent, temporarily flooded (PEMA) wetland and is approximately 0.12 acres in size (Figure 3-7). The HGM classification is riverine impounding. Wetland H is northwest of Leverich Park, on the west side of Burnt Bridge Creek, east of I-5. The NWI does not map a wetland in the vicinity of Wetland H. In 2008, the boundary of Wetland H was determined by a shift from the presence of wetland hydrological indicators to the absence of indicators. The wetland receives water from a stormwater culvert passing under I-5 and from the adjacent Burnt Bridge Creek.

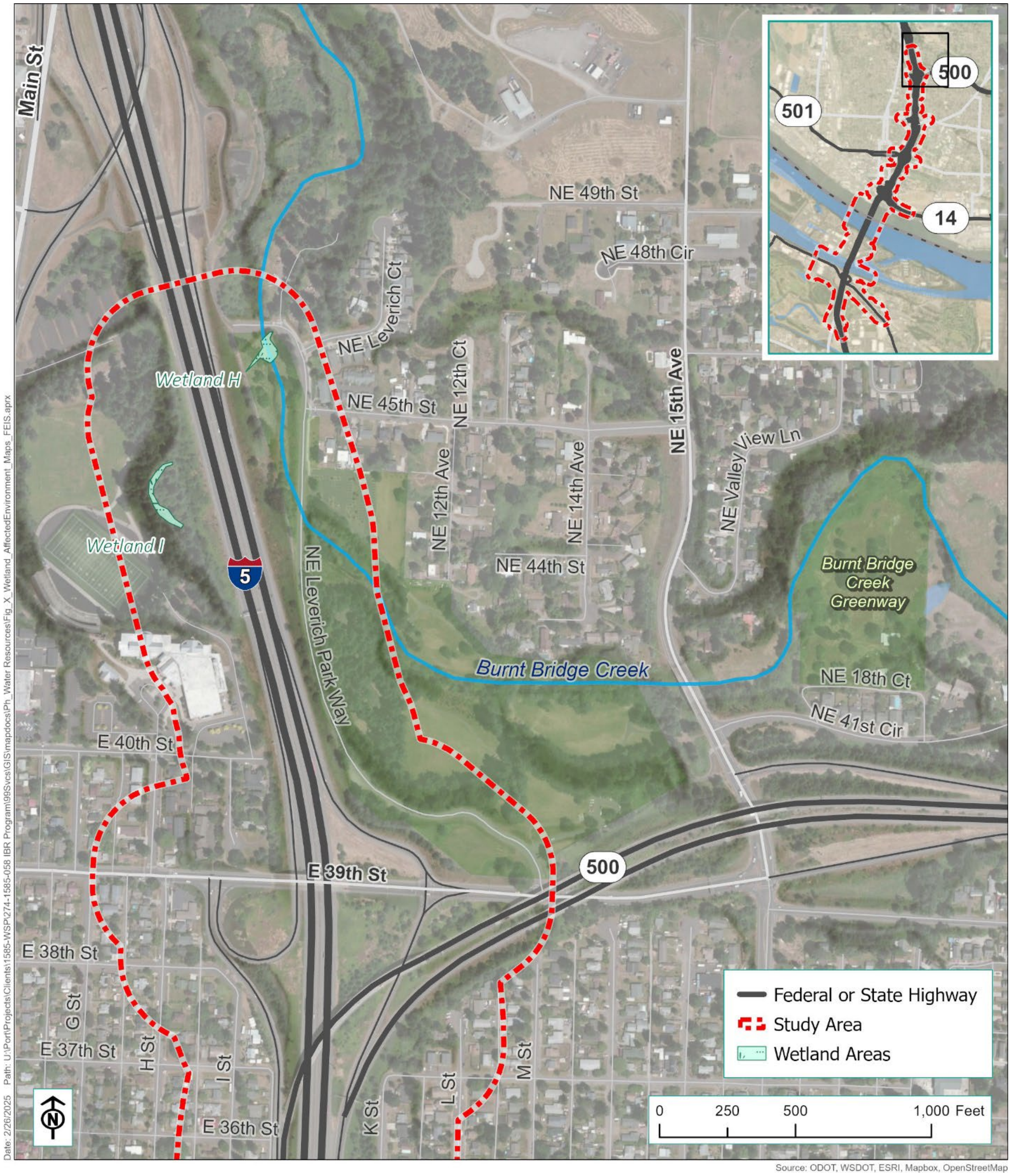
Wetland H is dominated by reed canary grass (FACW), mild water-pepper (*Persicaria hydropiper* - OBL), and spotted lady's-thumb (*Persicaria maculosa* - FACW). Indicators of wetland hydrology present at the time of the 2008 survey include saturation in the upper 12 inches of soil, watermarks, and drainage patterns. Soils exhibit low chroma colors (10YR 3/2) with redox concentrations.

The adjacent upland areas are dominated by red-osier dogwood (*Cornus alba* - FACW), beaked hazelnut (*Corylus cornuta* - FACU), Himalayan blackberry (FAC), and reed canary grass (FACW). No indicators of wetland hydrology were present at the time of the 2008 survey. Soils are very dark grayish brown (10YR 3/2) with redox concentrations.

WETLAND I

Wetland I is in the Kiggins Bowl area immediately west of I-5, north of 39th Street, on Vancouver School District property (Figure 3-7). Wetland I, which is approximately 0.29 acres in size, appears to be a relic channel of Burnt Bridge Creek.

Figure 3-7. Field Identified Wetlands and Other Waters – Washington



Source: CRC Wetland Data (2011); field verified

Wetland I is at the convergence of two steep topographic grades: one associated with the I-5 roadway prism and the other with a natural grade starting at the edge of the school grounds. The resulting low area runs parallel to I-5. Wetland I receives stormwater from the surrounding area, including I-5 and the school grounds. There is an additional discharge culvert on the southwest side of Wetland I. It is unclear where this culvert initiates. The 2024 surveyed sample point is in the lowest topographic point in the area, near a culvert passing under I-5 and presumably draining into Wetland H. There is no defined drainage channel in the area; however, the base of the natural grade from the school grounds forms an arching linear depression. The area is dominated by soft rush (FACW) and reed canary grass (FACW). Soils are dark brown (10YR 3/1) sand with redox concentrations and oxidized rhizospheres. Standing water was the primary indicator of wetland hydrology at the time of the 2024 survey. The adjacent upland areas are dominated by beaked hazelnut (FACU), common snowberry (*Symphoricarpos albus* – FACU), Himalayan blackberry (FAC), and English ivy (*Hedera helix* - FACU). No indicators of wetland hydrology were present at the time of the 2024 survey. Soils are dark brown (10YR 3/3) with no redox concentrations.

3.6 Staging and Casting Yards/Sites

The staging and casting yards/sites, that have been identified and are within the study area, have not been subject to field study. The following information is based on NWI (USFWS 2021) and soils maps (USDA NRCS 2019) and should, therefore, be considered preliminary. The extent of wetlands shown on NWI maps of these areas should be treated cautiously given the high degree of historical site manipulation and changes to base conditions caused by levees, excavation, and flood control measures. In many areas, the extent of wetlands shown on NWI maps is likely greater than the extent of jurisdictional wetlands if studied and measured by field verification (Figure 3-8).

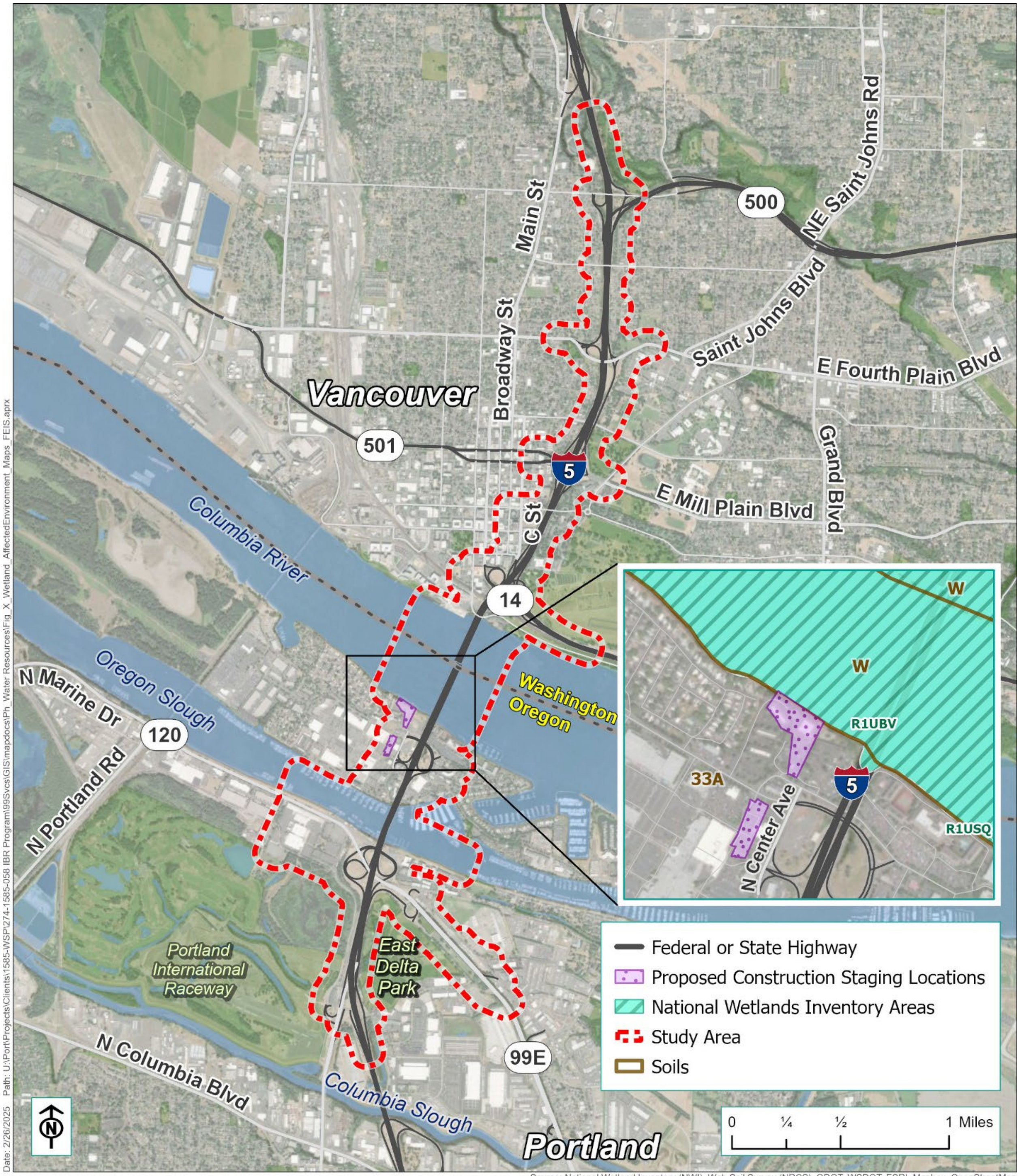
3.6.1 Thunderbird Hotel Site

There are no wetlands and no hydric soils mapped at the Thunderbird Hotel site (USDA NRCS 2019; USFWS 2021). The area consists entirely of paved surfaces, buildings and infrastructure, and landscaped vegetation (Figure 3-8).

3.6.2 Former Park and Ride, Downtown Vancouver, East of I-5 Site

There are no wetlands and no hydric soils mapped at the downtown Vancouver, east of I-5 site (USDA NRCS 2019; USFWS 2021). The area consists entirely of paved surfaces and landscaped vegetation (Figure 3-8).

Figure 3-8. Mapped Soil Series and NWI Areas - Staging and Casting Areas



Source: National Wetland Inventory (NWI), Web Soil Survey (NRCS), ODOT, WSDOT, ESRI, Mapbox, OpenStreetMap

4. LONG-TERM DIRECT AND INDIRECT EFFECTS

This section describes both the long-term impacts and indirect impacts from the No-Build Alternative and the Modified LPA. Long-term impacts occur when an alternative results in removal or fill within jurisdictional wetlands, regulated wetland buffers, or other waters of the state or U.S. These impacts are quantifiable and are discussed in units of area and volume where that information is available. In addition, long-term impacts to wetlands are discussed in terms of their specific wetland functions and values (DSL) and ratings (Ecology).

Less easily quantifiable direct impacts to wetlands and other waters would potentially occur where:

- The Modified LPA comes within the buffer area of existing wetlands (usually between 25 and 300 feet), disturbing natural resources and vegetation cover.
- Permanent bridge piers alter flow patterns.

Indirect impacts to wetlands and other waters of the state and U.S. would potentially occur where:

- Increased urbanization and improved public access to wetland areas may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.
- There is a decrease in vegetation cover or an increase in impervious surfaces (without associated stormwater treatment) in the immediate vicinity of existing wetlands.

A vegetated area immediately surrounding a wetland provides a buffer from detrimental land uses. Vegetated buffers can provide water quality, hydrological, and wildlife habitat benefits. Adequate wetland buffer zones are highly dependent upon wetland quality, local topography, and other landscape features such as permeability and/or existing development. Wetland buffer widths shown in Figure 4-1 and Figure 4-2 are the widths that were established during CRC project based on the wetland rating determinations for wetlands in Washington at that time. For the IBR Program, these wetlands have not yet been rated to determine current buffer width requirements. Wetland categories in Washington, functions and values assessment in Oregon, buffer widths, impacts, and subsequent mitigation would be determined during the permitting process.

4.1 No-Build Alternative

The No-Build Alternative would not result in the filling or reduction of wetlands or wetland buffers. Under the No-Build Alternative, untreated stormwater would continue to be discharged into wetlands and other waters in the study area. The No-Build Alternative would include development that would continue to occur along roadways in the study area, which would increase impervious surfaces.

4.2 Modified Locally Preferred Alternative

4.2.1 Regional

Anticipated filling or reduction of wetlands and other waters and their buffers, as a result of the Modified LPA, are mapped in Figure 4-1 and Figure 4-2. For both the Modified LPA and the No-Build Alternative, the anticipated impacts are listed in Table 4-1, Table 4-2, and Table 4-3.

The Modified LPA would affect corridor and regional impacts to wetlands and other waters. The Modified LPA would result in a direct increase in impervious surface areas associated with new or improved roadways and infrastructure.

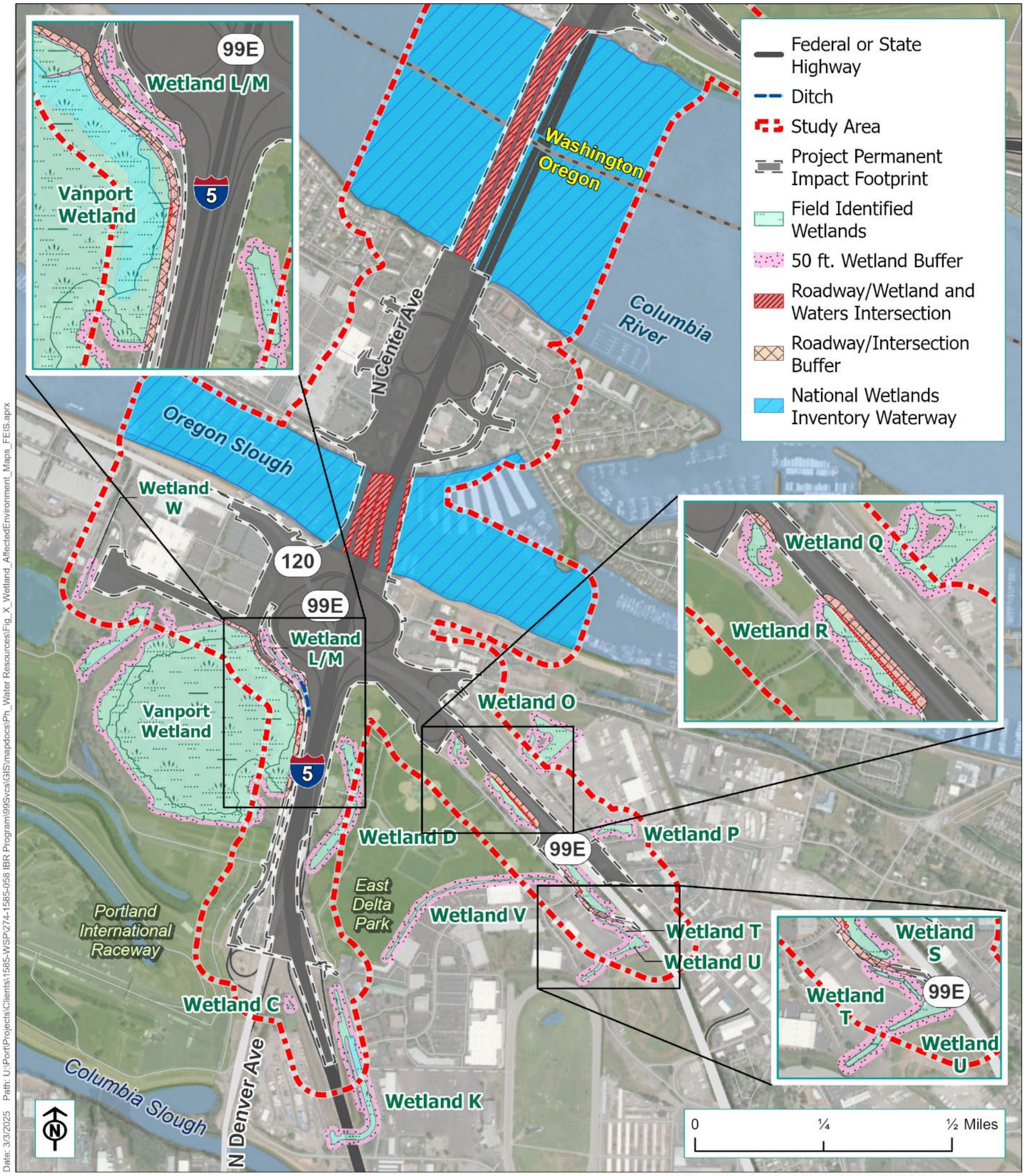
The Modified LPA could result in an indirect increase in impervious surface areas because of increased urbanization from other developments, such as transit-oriented development, not proposed as part of the Modified LPA. In most cases, new development would be required to provide stormwater treatment. However, stormwater runoff or other contaminants could reach wetlands if the increased contributing impervious area (CIA) is near the wetland area. In addition, increased traffic volumes or changes in traffic patterns are likely to occur with the alternatives because of non-IBR construction activities and/or population growth. Increases in traffic volume or trip time in the vicinity of wetlands could result in increased contaminant load in stormwater runoff.

The Modified LPA may result in increased public access to wetland areas because of nearby transit stations, park and rides, and other developments in the vicinity of wetlands. Increased public access may result in disruptions to normal wildlife activity, greater volumes of trash within and around wetland areas, introduction of nuisance plant species and non-native seeds, and damage to vegetation and substrates.

The Modified LPA may also alter flow patterns and aquatic wildlife activity from permanent bridge piers within the Columbia River. For more details regarding these indirect impacts, refer to both the IBR Program's Ecosystems Technical Report and the Water Quality and Hydrology Technical Report.

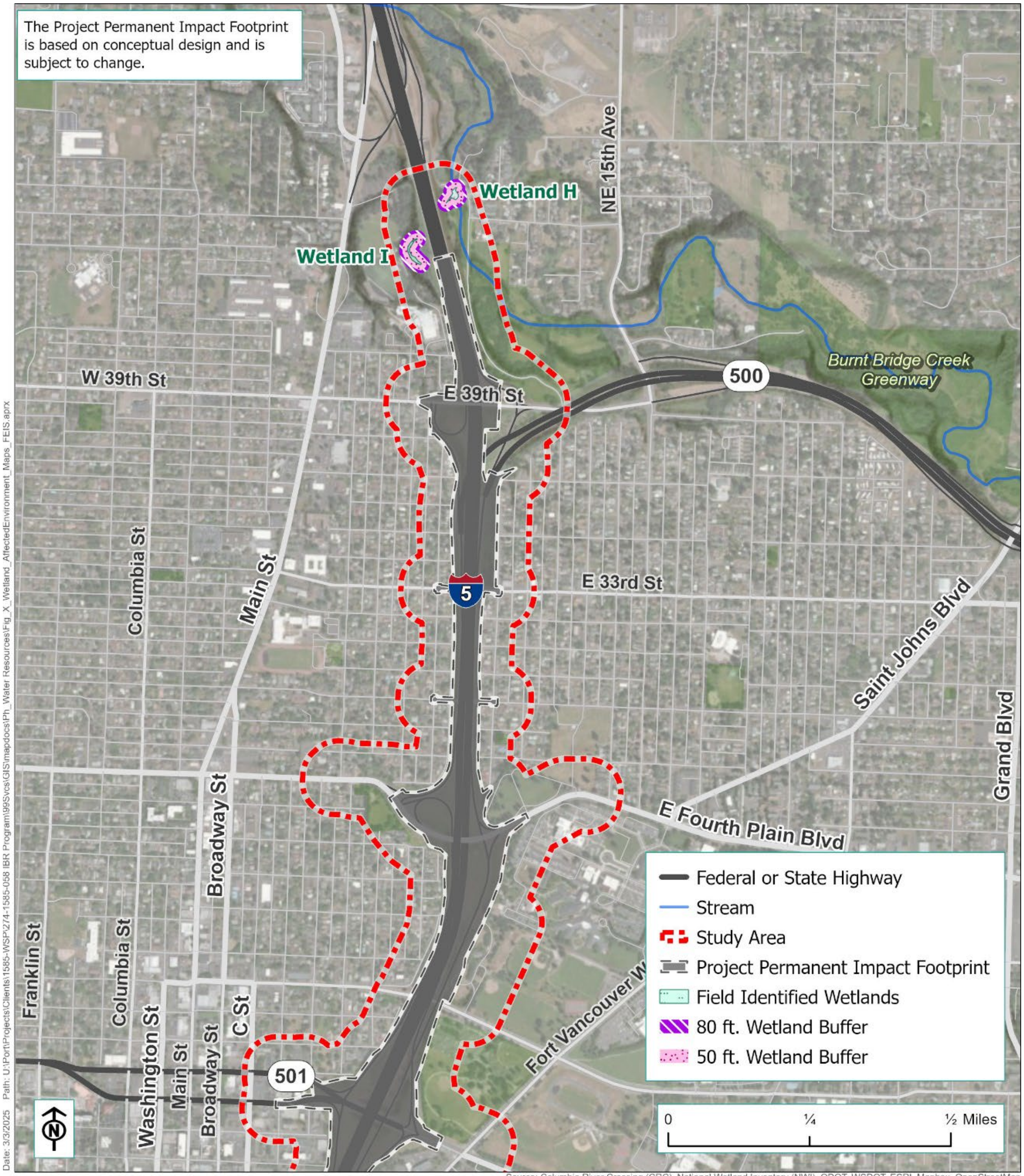
Activities associated with the Modified LPA would likely require both temporary and permanent modifications to portions of the Portland Metro Levee System, which is a system of federal flood control levees along the south bank of the Columbia River/North Portland Harbor. Modifications may include activities to restore temporarily disturbed portions of the levees, permanent modifications where proposed infrastructure would intersect with the existing levees, or where access to the levees would change as a result of reconfigured roadways. Modifications may also include improvements to existing levee function, if such improvements are requested or required. Modifications or improvements would be coordinated with USACE and Urban Flood Safety and Water Quality District for consistency with the planned future condition of the levees. The assessment of long-term effects to wetlands and other waters presented below includes those associated with potential modifications to the federal levee system.

Figure 4-1. Modified LPA Filling or Reduction of Wetlands and Other Waters - Oregon



Source: CRC Wetland Data (2011); City of Portland (2023); field verified.

Figure 4-2. Modified LPA Filling or Reduction of Wetlands and Other Waters - Washington



Source: CRC Wetland Data (2011); field verified.

Table 4-1. Long-Term Direct Impacts to Wetlands and Other Waters from the Modified LPA and the No-Build Alternative

Wetlands or Other Waters	Affected Resources	Modified LPA Wetland Fill and Other Waters Fill/Restoration (acres)	No-Build Alternative Wetland Fill and Other Waters Fill/Restoration (acres)
WETLANDS	C	0	0
	D	0	0
	H	0	0
	K	0	0
	L/M Expo Road wetlands	0	0
	O	0	0
	P	0	0
	Q	0	0
	R	0.18	0
	S	0.02	0
	T	0	0
	U	0	0
	V	0	0
	W	0	0
	I	0	0
	Vanport Wetlands	0.05	0
	Total wetlands impact	**0.25** [a]	**0**
WETLAND BUFFERS	C	0	0
	D	0	0
	H	0	0
	K	0	0
	L/M	0.3	0

Wetlands or Other Waters	Affected Resources	Modified LPA Wetland Fill and Other Waters Fill/Restoration (acres)	No-Build Alternative Wetland Fill and Other Waters Fill/Restoration (acres)
WETLAND BUFFERS	O	0	0
(continued)	P	0	0
	Q	0.14	0
	R	0.86	0
	S	0.50	0
	T	0.13	0
	U	0.004	0
	V	0	0
	W	0	0
	I	0	0
	Vanport Wetlands buffers	3.76	0
	Total wetland buffer impact	**5.694** [a]	**0**
OTHER WATERS	Columbia River/North Portland Harbor fill (bridge piers)	0.83	0
	Columbia River/North Portland Harbor removal (existing bridge piers)	-1.04	0

a Quantity of impacts may change based on additional wetlands or other waters identified during the additional wetland and other waters delineations.

LPA = Locally Preferred Alternative

Table 4-2. Long-Term Indirect Impacts to Wetlands from the Modified LPA and the No-Build Alternative

Wetland	Modified LPA [a] Indirect Impacts	No-Build Alternative Indirect Impacts
C	Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands. Potential improvement in stormwater runoff.	Continued discharge of untreated stormwater.
D	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
H	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
I	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
K	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
L/M	Long-term, temporary change in vegetation structure during construction. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
O	Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.

Wetland	Modified LPA [a] Indirect Impacts	No-Build Alternative Indirect Impacts
P	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
Q	Wetland functions lost from project impacts.	Continued discharge of untreated stormwater.
R	Loss of wetland functions at impact site. Remaining wetland indirectly impacted from loss of buffer. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
S	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
T	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
U	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
V	Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
W	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.

Wetland	Modified LPA [a] Indirect Impacts	No-Build Alternative Indirect Impacts
Vanport Wetlands	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.

a Modified LPA with the double-deck fixed-span bridge configuration

LPA = Locally Preferred Alternative; PJWA = Potential Jurisdictional Water/Wetland Area

Table 4-3. Long-Term Indirect Impacts to Other Waters from the Modified LPA and the No-Build Alternative

Other Waters	Modified LPA [a] Indirect Impacts	No-Build Alternative Indirect Impacts
Columbia River	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts. Increased urbanization and public access to wetland areas, which may introduce nuisance plant species and disrupt wildlife activity and other functions performed by existing wetlands.	Continued discharge of untreated stormwater.
Burnt Bridge Creek	Potential stormwater improvement, but nearby footprint may result in temporary water quality impacts.	Continued discharge of untreated stormwater.

a Modified LPA with the double-deck fixed-span bridge configuration

LPA = Locally Preferred Alternative

4.2.2 Columbia Slough Watershed

The Modified LPA would result in long-term direct effects (i.e., fill) to wetlands or other waters of the state and U.S. in the Columbia Slough watershed. Potential direct and indirect effects are discussed below.

4.2.2.1 Wetlands

The Modified LPA, including each of the design options, would permanently excavate or fill approximately 0.25 acres of wetlands and 5.69 acres of wetland buffer. This fill and reduction in wetland size would result in a loss of wetland functions. In addition, the Modified LPA would increase the area of impervious surface in the vicinity of wetlands and decrease the distance between wetlands and roadway traffic, which could have an indirect effect on wetlands through the potential for increased stormwater flow and pollutants from stormwater. It should be noted that the buffer impacts in Oregon were calculated using the City of Portland’s environmental zone, which requires the inclusion of existing impervious surfaces.

The Modified LPA would provide stormwater detention and treatment facilities that would meet current standards and requirements for not only all new CIA, but also for portions of existing CIA that is currently untreated, which would be expected to result in a net beneficial effect to water quality and a beneficial indirect effect to wetlands by reducing pollutant loading and increasing their habitat value.

Other potential indirect effects on wetlands could occur from decreased vegetation cover in areas of new impervious surface and in portions of forested wetlands that are temporarily impacted, which may also result in water quality and habitat impacts, and the closer proximity of traffic that may disrupt wildlife activities associated with wetlands. For more information, refer to both the IBR Program's Ecosystems Technical Report and Water Quality and Hydrology Technical Report.

4.2.2.2 Other Waters of the State and U.S.

The Modified LPA would not result in long-term direct impacts to other waters of the state and U.S. in the Columbia Slough watershed. Indirect effects may result from the Modified LPA due to increased impervious surface area, which could result in a greater quantity of stormwater into the Columbia River (including North Portland Harbor), especially during large rain events.

However, as noted in Section 4.2.3.2, the Modified LPA would provide stormwater detention and treatment facilities that would meet current standards and requirements for all new CIA and for portions of existing CIA that is currently untreated, which would be expected to result in a net beneficial indirect effect on waters.

4.2.3 Ruby Junction Light-Rail Operations and Maintenance Facility

4.2.3.1 Wetlands

During a preliminary survey of the Ruby Junction Light-Rail OMF and the surrounding properties, no wetlands were identified. However, right-of-entry for the properties was not obtained, and the study area could not be thoroughly examined. Prior to initiation of project activities, further wetland investigations would be conducted.

4.2.3.2 Other Waters of the State and U.S.

The Modified LPA would not result in long-term direct impacts to other waters of the state and U.S. in the Ruby Junction Light-Rail OMF study area.

The Modified LPA would provide stormwater treatment in compliance with the City of Gresham's stormwater requirements, which may be an improvement to existing stormwater quality and an indirect benefit to waters.

4.2.4 Columbia River/Columbia Slope Watershed

Under the Modified LPA, there would be no long-term direct effects on wetlands in the Columbia River/Columbia Slope Watershed. Potential direct and indirect impacts to the Columbia River are discussed in this section.

4.2.4.1 Wetlands

No wetlands were identified within the study area in the Columbia River/Columbia Slope Watershed.

4.2.4.2 Other Waters of the State and U.S.

The Modified LPA would construct new-in water permanent bridge piers in the Columbia River (including North Portland Harbor) for replacement bridges, with an additional area totaling 36,155 square feet (0. 83 acres) impacting the benthic habitat. Demolition of existing bridge piers would remove 45,302 square feet (1.04 acres) of structures affecting the benthic habitat. As such, the construction of the Modified LPA with the double-deck fixed-span configuration would result in a net restoration of approximately 9,148 square feet (0. 21 acres) of benthic habitat in other waters.

With the Modified LPA, permanent bridge piers in the Columbia River (including North Portland Harbor) for replacement bridges would affect flow patterns and travel for wildlife activity, which would be an indirect effect to waters. In addition, the Modified LPA would result in the mobilization of sediments during the installation of permanent bridge piers and removal of the existing bridge. This may result in the transfer of contaminated sediments downstream and exposure to aquatic species. However, sediment characterization will be completed during the permitting process to identify any potential contamination and develop project-specific mitigation measures to eliminate indirect effects to the extent practicable. For further discussion refer to both the IBR Program’s Ecosystems Technical Report and the Water Quality and Hydrology Technical Report.

The Modified LPA would provide more congestion relief than the No-Build Alternative and, with the addition of stormwater facilities, is most likely to result in improved water quality associated with vehicular traffic. Greater stormwater quantity into the Columbia River (including North Portland Harbor), especially during large rain events, may result in from the Modified LPA. However, the Modified LPA would provide a high level of water quality treatment. The Modified LPA would provide treatment for not only all new CIA, but also for portions of existing CIA that are currently untreated. This would be expected to result in a net beneficial effect to water quality, which would be a beneficial indirect effect to waters.

4.2.5 Burnt Bridge Creek Watershed

4.2.5.1 Wetlands

The Modified LPA would not result in long-term direct impacts to wetlands in the Burnt Bridge Creek watershed. There would be no long-term direct impacts to Wetland I or Wetland H.

Indirect effects may result from the Modified LPA due to the larger area of impervious surface in the vicinity of project wetlands and the closer proximity of traffic. However, the Modified LPA would provide stormwater detention and treatment facilities that would meet current standards and requirements for not only all new CIA, but also for portions of existing CIA that is currently untreated, which would be expected to result in a net beneficial effect to water quality and a beneficial indirect effect to wetlands. See Section 4.2.2.1 for additional information.

4.2.5.2 Other Waters of the State and U.S.

The Modified LPA would not result in long-term direct impacts to other waters of the state and U.S. in the Burnt Bridge Creek watershed. There would be no long-term direct impacts to Burnt Bridge Creek.

Potential indirect effects from the Modified LPA would be the same as in the Columbia Slough watershed. See Section 4.2.2.2.

4.2.6 Staging and Casting Yards/Sites

The Modified LPA would not result in long-term direct impacts from the temporary use of the two potential staging and casting yards/sites during construction. The identified sites have previously been disturbed from past development.

Other major staging/casting/bridge assembly sites may be identified as design progresses or by the contractor. They are likely to be adjacent to the Columbia River, Willamette River, or other waterbody in the region. As discussed in Section 5.2, the development and operations of a staging/casting yard would be subject to the same federal and state environmental regulations that apply to other aspects of construction (depending on which state it is in). Before a site is selected, a thorough, site-specific environmental analysis would be conducted, and all necessary permits would be secured.

4.2.7 Design Options

The Modified LPA with two auxiliary lanes would have the same or similar effect on wetlands and other waters as the Modified LPA with one auxiliary lane.

The Modified LPA with single-level fixed-span bridge configuration would have the same or similar effects on wetlands and other waters as the Modified LPA with double-deck fixed-span bridge configuration except that the single-level fixed-span bridge configuration would have a slightly larger permanent benthic footprint. The single-level fixed-span bridge configuration would require approximately 0.88 acres of benthic habitat displacement to construct the proposed Columbia River and North Portland Harbor bridge foundations. This would result in a net gain of approximately 0.16 acres of benthic habitat, which is slightly less than the net gain of 0.21 acres with the double-level fixed-span bridge configuration.

The Modified LPA with single-level movable-span bridge configuration would have the same or similar effects on wetlands as the Modified LPA with the double-deck fixed-span or single-level fixed-span bridge configurations. However, the Modified LPA with the single-level movable-span bridge configuration would have more drilled shafts than the fixed-span configurations for a slightly larger permanent benthic footprint and a net loss of benthic habitat. Approximately 1.11 acres of benthic habitat displacement would be required to construct the proposed Columbia River and North Portland Harbor bridge foundations of the Modified LPA with the single-level movable-span bridge configuration, for a net loss of approximately 0.07 acres of benthic habitat. The single-level movable-span bridge configuration would also have the potential for additional minor long-term water quality impacts associated with the maintenance and operation. These long-term water quality impacts are associated with the potential accidental discharge of chemicals from hydraulic and lubricating fluids associated with the single-level movable-span bridge configuration.

The Modified LPA with the I-5 mainline centered or shifted west, with the SR 14 interchange with or without the C Street ramps, and the park-and-ride design options would have the same effects on wetlands and other waters because there are no wetlands or other waters in these locations.

When comparing the No-Build Alternative and the Modified LPA, including all design options and bridge configurations, the Modified LPA has more wetland and wetland buffer impacts (see Table 4-4). Compared to the No-Build Alternative the Modified LPA with the different bridge configurations would have different levels of impacts to other waters, as shown in Table 4-4 and discussed above. When comparing the Modified LPA with different bridge configurations, all of them have the same level of direct, temporary, or indirect wetland and wetland buffer impacts.

Table 4-4. Long-Term Effects Comparison of Alternatives and Bridge Configurations

Alternative and Bridge Configuration	Wetland Fill (acres)	Wetland Buffer Fill (acres)	Other Waters Fill (acres)	Other Waters – Net Change in Fill (acres)
No-Build Alternative	0	0	0	0
Modified LPA with Double-Deck Fixed-Span Configuration [a]	0.25	5.69	0.83 (fill) -1.04 (removal)	-0.21 (restoration)
Modified LPA with Single-Level Fixed-Span Configuration [a]	0.25	5.69	0.88 (fill) -1.04 (removal)	-0.16 (restoration)
Modified LPA with Single-Level, Movable-Span Configuration [a]	0.25	5.69	1.11 (fill) -1.04 (removal)	0.07 (loss)

Notes: Data are approximate and have been rounded.

a Effects would be the same with one or two auxiliary lanes.

5. TEMPORARY EFFECTS

Temporary direct impacts to wetlands and other waters of the state and U.S. would occur in areas where construction activities would take place, but with functions returning to pre-impact performance after a duration of time. During construction, temporary disturbances to vegetation, wildlife activity, hydrology, and water quality would be avoided as much as possible using BMPs such as silt fences, construction fencing, and wildlife exclusionary netting. For this analysis, temporary impacts included both short-term and long-term temporary impacts as defined in the joint guidance developed by the EPA, USACE, and Ecology for wetland mitigation in Washington (Ecology et al. 2021). Short-term temporary impacts are those that last for a limited time with functions returning to pre-impact performance within about one year or one growing season of the impact. Short-term temporary impacts may include temporary disturbances to herbaceous wetland vegetation and soils during construction but are restored upon completion. Long-term temporary impacts affect functions that will eventually be restored or recover over time, but not within a year or more, and carry a risk of permanent loss due to the duration of the impact. Long-term temporary impacts may include the removal of woody vegetation within a wetland that cannot be replaced within a year.

Temporary direct impacts to the Columbia River would be anticipated due to the in-water work required to construct the new bridge structures and then deconstruct the existing bridge structures. For more details, refer to both the IBR Program's Ecosystems Technical Report and Water Quality and Hydrology Technical Report.

5.1 No-Build Alternative

The No-Build Alternative would not result in temporary effects on wetlands or other waters.

5.2 Modified Locally Preferred Alternative

5.2.1 Regional Temporary Effects

Construction of the Modified LPA would not result in temporary effects on regional wetlands or other waters.

5.2.2 Columbia Slough Watershed Temporary Effects

Within Columbia Slough watershed, temporary impacts to wetlands, wetland buffers, and other waters would occur in areas that would be disturbed during construction of the Modified LPA. During construction, temporary disturbances to wetland vegetation, hydrology, and water quality would be avoided as much as possible with BMPs such as silt fences and construction fencing.

5.2.2.1 Wetlands

Wetland System L/M, Wetland Q, Wetland R, Wetland S, Wetland T, Wetland U, and the Vanport Wetlands would undergo approximately 1.67 acres of temporary direct impacts due to construction activities (i.e., disturbances to vegetation and soil, temporary placement of fill) and proximity, resulting in a temporary disturbance to wetland vegetation. Additionally, approximately 4.44 acres of wetland buffer would also undergo temporary direct impacts due to construction activities.

5.2.2.2 Other Waters of the State and U.S.

There would be no temporary impacts to other waters of the state and U.S. in the Columbia Slough watershed portion of the study area.

5.2.3 Ruby Junction Light-Rail Operations and Maintenance Facility

No wetlands or other waters of the state or U.S. were identified in the Ruby Junction Light-Rail OMF area; therefore, no temporary impacts would occur.

5.2.4 Columbia River/Columbia Slope Watershed Temporary Effects

5.2.4.1 Wetlands

There are no wetlands identified in the Columbia River/Columbia Slope watershed portion of the study area, and therefore no temporary impacts would occur.

5.2.4.2 Other Waters of the State and U.S.

The analysis of temporary effects to other waters is based on the estimated quantity of benthic habitat that would be temporarily displaced during construction. In the Columbia River and North Portland Harbor, temporary displacement of benthic habitat would result from the installation of temporary work platforms, bridges and piers, temporary isolation systems, cofferdams, casings, barges, and temporary piles associated with these structures. These temporary features are necessary to support construction and would be designed by a contractor after a contract is awarded. See the Ecosystems Technical Report for additional information.

In general, temporary fill would result from temporary piles to support work platforms and temporary cofferdams used during construction and demolition of the existing bridge in North Portland Harbor and the Columbia River. In North Portland Harbor, approximately 0.40 acre of benthic habitat would be temporarily displaced, with approximately 60% of these effects resulting from drilled shaft isolation casings. In the Columbia River, approximately 1.44 acres of benthic habitat would be temporarily affected, with about 85% of these effects resulting from the use of cofferdams during construction and demolition.

No wetlands or other waters of the state or U.S. were identified in the downtown Vancouver portion of this watershed, and therefore no temporary impacts would occur. During construction, temporary disturbances to vegetation, wildlife activity, hydrology, and water quality would be avoided as much as possible with BMPs, including the use of silt fences, construction fencing, and wildlife exclusionary netting. Further details are provided in the IBR Program's Ecosystems Technical Report.

5.2.5 Burnt Bridge Creek Watershed Temporary Effects

5.2.5.1 Wetlands

The Modified LPA permanent footprint and temporary construction footprint would not encroach on identified wetlands or wetland buffers.

5.2.5.2 Other Waters of the State and U.S.

Temporary impacts to the Burnt Bridge Creek riparian area may occur during construction of the Modified LPA based on the specific construction methods employed; however, no direct temporary impacts to Burnt Bridge Creek would occur. Further details are provided in the IBR Program's Ecosystems Technical Report.

5.2.6 Staging and Casting Yards/Sites

No temporary impacts are anticipated from staging and casting yards/sites identified for the Modified LPA. Both the Thunderbird Hotel site on Hayden Island and the site on the east side of I-5 have been disturbed by past development and do not have wetlands or waters on the site. Other major staging/casting sites may be identified as design progresses or by the contractor.

As discussed in Section 4.2.6, the development and operation of any staging/casting yard would be subject to the same federal and state environmental regulations that apply to other aspects of project construction (depending on which state it is in). Before any site is selected, a thorough, site-specific environmental impact analysis would be conducted. All necessary permits would be secured prior to site development and construction activities.

5.2.7 Design Options

The Modified LPA would be constructed within the same temporary construction footprint under all design options. For this reason, short-term effects to wetlands and wetland buffers associated with the Modified LPA would be the same under all design options.

The bridge configuration design options being evaluated as part of the Modified LPA would result in slightly different levels of short-term effects to waters and these design options are discussed in the sections below. The other design options being considered for the Modified LPA (i.e., the addition of a second auxiliary lane, the C-Street ramp design option, I-5 mainline design option, and the park and rides) would be constructed within the same temporary construction footprint, and as such would not result in different levels or types of short-term effects to waters. The Modified LPA with two auxiliary lanes and with one auxiliary lane would have the same or similar temporary effects on wetlands and other waters.

The extent of construction activities for the different bridge configurations are assumed to be slightly different. The Modified LPA with a single-level fixed-span bridge configuration would have the same or similar temporary effects on wetlands and other waters as the Modified LPA with a double-deck fixed-span bridge configuration, except that it would temporarily displace 0.05 acre more benthic in-water area in the Columbia River with temporary pilings or within temporary cofferdams used during construction. The amount of increased temporary displacement would be minor and not significantly different between the two configurations.

The Modified LPA with the single-level movable-span bridge configuration would have the same or similar temporary effects on wetlands and other waters as the Modified LPA with a single-level fixed-span bridge configuration, except that they would temporarily displace 0.07 acre more benthic in-water area in the Columbia River with temporary pilings and within temporary cofferdams used during construction. The amount of increased temporary displacement would be minor and not significantly different between the -single-level fixed-span or single-level movable-span bridge configurations.

The Modified LPA with the I-5 mainline centered or westward shift, with the SR 14 interchange with or without the C Street ramps, and the park-and-ride design options would have the same temporary effects on wetlands and other waters because no wetlands or other waters exist in these areas.

6. AVOIDANCE, MINIMIZATION, AND COMPENSATORY MITIGATION MEASURES

6.1 Introduction

In accordance with state and federal regulations and Executive Order 11990, the design of the Modified LPA has avoided and minimized impacts to wetlands to the extent practicable with the design of the highway and transit alignments.

Mitigation to offset losses of wetland areas, wetland buffers, and functions and values would be explored in detail. Permittee responsible mitigation (PRM) opportunities in existing or newly acquired rights of way would be explored. Off-site PRM may occur within the same watershed but not necessarily near existing wetland resources, given the constrained urban area found in the study area. Likely off-site PRM sites depend on the area needed for mitigation, current and future ownership of potential mitigation sites, and site characteristics. Off-site PRM sites would be selected based on the ability of the mitigation site to offset wetland and other waters functions and value losses, including wetland buffers.

Due to statutory requirements, impacts to wetland and other water resources in Oregon require compensation within Oregon, and impacts in Washington require compensation within Washington. The compensatory mitigation selected is based on a functional assessment of adverse effects and replacement of equivalent functional value. Mitigation for the Modified LPA would compensate for impacts so that there would be no net loss of functions and values.

Currently, the IBR Program team is working with federal, state, and local agencies; tribes; and conservation groups to identify agency-approved compensatory mitigation banks and potential PRM sites in both Oregon and Washington that would meet the program’s needs. Any PRM site selected would be able to fulfill the compensatory requirements for permanent, temporary, and indirect impacts. Specific designs for chosen PRM sites would be determined in coordination with federal, state, and local regulatory agencies.

To date, the IBR Program has identified the Wapato Valley Mitigation and Conservation Bank in Washington, the ODOT-owned Columbia Bottomlands Advanced Mitigation/Conservation Site in Oregon, and a DSL owned parcel on west Hayden Island in Oregon as potential opportunities to fulfill compensatory mitigation requirements. Additional PRM sites in both Oregon and Washington have been evaluated and could be advanced if other sites are needed.

The Wapato Valley Mitigation and Conservation Bank is located at the confluence of the Lewis River and the Columbia River in Clark County, Washington. The bank is approximately 876 acres in the Columbia River floodplain, located approximately 19 river miles downstream of the Interstate Bridge crossing. The Wapato Valley Mitigation and Conservation Bank is currently in review with the Interagency Review Team, a consortium of tribal, local, state and federal agencies, and expects to be approved in 2025. Upon approval, credits will be available to offset impacts from permitted development projects in the lower Columbia River region. The bank is expected to provide credits for impacts to wetlands and other aquatic resources authorized under the Clean Water Act as well as impacts to aquatic habitats and species in Washington State.

The ODOT-owned Columbia Bottomlands Advanced Mitigation/Conservation site is in Scappoose Bay, a slough of Multnomah Channel, and is located about 1 mile upstream of where the Multnomah Channel meets the Columbia River and 20 river miles downstream of the Interstate Bridge crossing in Columbia County, Oregon. 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 in the Lower Willamette 4th Field Hydrologic Unit Code. ODOT has applied for permits to complete the restoration and enhancement activities, with construction anticipated in the summer of 2025.

The proposed mitigation site on west Hayden Island is approximately 65 acres and is located approximately 3.5 river miles downstream of the Interstate Bridge crossing, on the south side of the island at the western end in Multnomah County, Oregon. The site is currently owned by DSL, but the IBR Program has proposed to purchase this site and place it under a conservation easement. One or more permittee-responsible 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 at the time of permit application.

Table 6-1 lists temporary avoidance and minimization measures. No long-term avoidance and minimization measures within control of the IBR Program were identified. Table 6-2 lists temporary and long-term compensatory mitigation measures.

Table 6-1. Avoidance and Minimization Measures

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Temporary	Ground disturbance in or around wetlands during construction	In accordance with local and state standards, ODOT and WSDOT will coordinate with the contractor to implement appropriate high visibility/exclusionary fencing around avoided wetlands and other waters prior to the start of construction.
Temporary	Sediment disturbance and erosion during construction	In accordance with local and state standards, ODOT and WSDOT will coordinate with the contractor to implement best management practices for sediment and erosion control procedures during construction activities.
Temporary	Vegetation removal during construction	At the end of construction, ODOT and WSDOT will coordinate with the contractor to replace vegetation temporarily cleared for construction activities in accordance with local, state regulatory guidance or property agreements.

Temporary or Long-Term	Impact Type	Avoidance and Minimization Measure
Temporary	Disturbing waters with in-water construction activities	ODOT and WSDOT will coordinate with the contractor to avoid restricted work outside of the in-water work window as identified in the Biological Opinion, and federal, state, and local permits.
Temporary	Wetland disturbance during construction	ODOT and WSDOT will avoid and minimize short-term, temporary impacts to wetland resources in final design to the extent practicable.

Table 6-2. Compensatory Mitigation Measures

Temporary or Long-Term	Impact Type	Compensatory Mitigation Measure
Temporary	Wetland disturbance during construction	ODOT and WSDOT will offset unavoidable temporary impacts that cannot be minimized through BMPs or restored on site, through the purchase of credits from a mitigation bank or Permittee Responsible Mitigation, similar to mitigation used for certain long-term effects. The total unavoidable temporary impacts and the required compensatory mitigation will be determined through the permitting process.
Temporary	Wetland and wetland buffer habitat disturbance during construction	At the end of the applicable construction activities, ODOT and WSDOT will coordinate with the contractor to restore temporarily disturbed wetland and wetland buffer habitats consistent with applicable regulatory requirements.
Long-Term	Filling or removing material in wetlands and other water of the United States and state	ODOT and WSDOT will advance the design of the Modified LPA consistent with the applicable federal, state, and local agency regulatory mitigation related to filling or removing material in wetlands and other waters of the United States and state.

Temporary or Long-Term	Impact Type	Compensatory Mitigation Measure
Long-Term	Loss of wetland and waters functions and values	ODOT and WSDOT will continue to evaluate mitigation actions to offset losses of wetland and waters functions and values, including wetland buffers, as the Modified LPA design progresses.
		ODOT and WSDOT will identify agency-approved compensatory mitigation banks and potential PRM sites in both Oregon and Washington to help fulfill the compensatory requirements for permanent, temporary, and indirect impacts.
		ODOT and WSDOT will prepare a compensatory mitigation plan that satisfies applicable federal, state, and local regulatory requirements, and that demonstrates no net loss of function and values of wetland and waters resources.
Long-Term	Loss of wetland functions at the Vanport Wetlands	ODOT and WSDOT will comply with increased wetland mitigation ratios as prescribed by the regulatory agencies during the permitting process for unavoidable impacts to Vanport Wetlands from the Expo Road improvements on mainland Oregon. Increased mitigation ratios are not known at this time, and would be dictated by the regulatory agencies during the permitting process.

7. PERMITS AND APPROVALS

The Modified LPA would be developed consistent with the regulations of applicable federal, state, and local agencies, including the USACE, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), Oregon Department of Fish and Wildlife (ODFW), Ecology, WDFW, DEQ, DSL, and the Cities of Vancouver and Portland. This section summarizes the applicable agency-specific regulatory mitigation framework of each agency related to wetlands and other waters.

7.1 Federal Permits

7.1.1 Clean Water Act. 1977. 33 USC 1251-1376, as amended

Impacts to jurisdictional wetlands or other jurisdictional waters would require a permit under Section 404 of the CWA and a CWA Section 401 certification.

Background: The CWA requires states to set water quality standards for all contaminants in surface waters based on the beneficial or designated uses for the waterbody and makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit is obtained under its provisions. It also recognizes the need to address the problems posed by nonpoint source pollution. Some of the permitting processes that fall within the purview of the CWA include National Pollutant Discharge Elimination System (NPDES) permits, Section 404 permits, and Section 401 water quality certifications.

If there are impacts to jurisdictional wetlands or other waters of the U.S. (which may include ditches), then a Section 404 CWA permit from the USACE would be required. Dredging, filling, and other activities that alter a waterway require a Section 404 permit and Section 401 certification.

Section 401 of the CWA requires an applicant for a federal license or permit, who conducts an activity that may result in a discharge to waters of the state or U.S., to obtain a certification that the activity complies with water quality requirements and standards. Applicants must submit a Section 404 application form to the appropriate state agency and the USACE, who forwards the application to the certifying state agency. The state agency then certifies that the project meets state water quality standards and does not endanger waters of the state, U.S., or wetlands. Certifications are issued by DEQ in Oregon (ORS 468, Oregon Administrative Rules [OAR] 340-041-001 to 340-041-0350) and by Ecology in Washington (Revised Code of Washington [RCW] 90.48, as amended, Washington Administrative Code [WAC] 173-201A and 173-201A-070).

7.1.2 Section 10 of the Rivers and Harbors Appropriation Act. 1899. 33 USC 403, as amended

Under the River and Harbors Appropriation Act, final plans for the Modified LPA would have to be submitted for congressional and USACE approval for construction of the bridge within navigable waters.

Background: Under the Rivers and Harbors Appropriation Act, the USACE is authorized to regulate the construction of any structure or work within navigable waters. The act prohibits the construction of any bridge over or in navigable waters of the U.S. without congressional approval and the consent of the Secretary of Transportation.

7.1.3 Fish and Wildlife Coordination Act. 1934. 16 USC 661-667e, as amended

Consultation with the USFWS, ODFW, and WDFW would be required if the Modified LPA impounds, diverts, channelizes, or otherwise controls or modifies the waters of any stream or other body of water. The agencies may place constraints on the Modified LPA to prevent damage or loss to wetlands within the study area. Currently, it is not anticipated that activities associated with the Modified LPA would have to be permitted under the Fish and Wildlife Coordination Act.

Background: The Fish and Wildlife Coordination Act requires consultation with the USFWS and the appropriate state wildlife agency when a project would impound, divert, channelize, or otherwise control or modify the waters of any stream or other body of water. Such actions would also require compliance with Section 404 of the CWA. Consideration must be given to preventing damage or loss to wildlife and to mitigating any effects caused by a federal project. The environmental assessment must include an evaluation of how the actions may affect fish and wildlife resources and must identify measures to reduce impacts to fish and wildlife.

7.1.4 Endangered Species Act. 1973. 16 USC 1531-1544, as amended

If the Modified LPA would affect listed species and/or designated critical habitat, a consultation under Section 7 of the Endangered Species Act (ESA) would be required. An incidental take permit may be required as part of a Section 7 consultation. If a Section 7 consultation is required, a biological assessment would be prepared and submitted to the USFWS or NMFS.

Background: The ESA prohibits the take of any listed species. “Take” is defined in the law to include “harass and harm.” “Harm” is further defined to include any act that actually kills or injures listed species, including acts that may modify or degrade habitat in a way that significantly impairs essential behavioral patterns of the species. Under Section 7 of the ESA, any federal agency that authorizes, funds, or carries out an action is required to ensure that the action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat.

If there is a potential for the Modified LPA to impact a listed species or its critical habitat, then a biological assessment is required. If listed species are found within the study area, an informal or formal consultation with NMFS and the USFWS under Section 7 of the ESA may be required. Informal consultations occur for projects that would not likely adversely affect listed species, whereas formal consultations occur for projects that would likely adversely affect listed species.

7.2 State Permits

7.2.1 Oregon

7.2.1.1 Oregon Administrative Rules. Removal-Fill Law. ORS 196.795-990. Salem, OR, as amended.

Any person who plans to "remove or fill" material in "waters of this state" is required to obtain a permit from DSL. Impacts to jurisdictional wetlands and other waters would require a joint permit from the USACE and DSL.

Background: If there are any impacts to jurisdictional wetlands or other waters of the state (which may include ditches), then a Removal-Fill permit from the DSL would likely be required. This regulation is often associated with Section 404 of the CWA, and Section 10 of the Rivers and Harbors Appropriation Act, under the jurisdiction of the USACE. In most cases, the preparation of a joint permit application for impacts to wetlands and other jurisdictional waters and a wetland delineation and conceptual mitigation plan are required. A wetland delineation is required if wetlands are in the study area. Compensatory mitigation (e.g., for wetland or riverine habitats) is required for any unavoidable impact to wetlands or other waters.

7.2.1.2 Oregon Administrative Rules. Water Quality Standards. ORS 468, OAR 340-041-001 to 340-041-0350. Salem, OR, as amended.

In Oregon, DEQ issues and enforces NPDES permits and authorizes Section 401 water quality certifications. Impacts to jurisdictional wetlands or other waters would require a Section 404 CWA permit and a Section 401 certification.

Background: A joint 404 permit application is submitted to the DSL and USACE (Portland Regional Office), who forward it to DEQ. DEQ reviews the project for CWA Section 401 water quality certification. Frequently, applicants are required to incorporate protective measures into their construction and operational plans, such as bank stabilization, treatment of stormwater runoff, spill protection, and fish and wildlife protection. The DEQ certification process requires a Land Use Compatibility Statement, signed by the local government land use authority, to ensure that permits affecting land use are compatible with local government comprehensive plans.

7.2.1.3 Oregon Administrative Rules. 1973. "Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces." OAR 660-15-0000 (5). Salem, OR, as amended.

Permitting may be required through local government Goal 5 ordinances.

Background: Local governments throughout Oregon have adopted programs to protect natural resources and conserve scenic, historic, and open space resources under Goal 5. Goal 5 parameters related to jurisdictional wetlands and other waters within the IBR study area include the following:

- Fish and wildlife areas and habitats should be protected and managed in accordance with the ODFW's fish and wildlife management plans.

- Stream flow and water levels should be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics, and agriculture.
- Significant natural areas that are historically, ecologically, or scientifically unique, outstanding, or important, including those identified by the State Natural Area Preserves Advisory Committee, should be inventoried and evaluated.
- Plans should provide for the preservation of natural areas consistent with an inventory of scientific, educational, ecological, and recreational needs for significant natural areas.

7.2.2 Washington

7.2.2.1 Revised Code of Washington. “State Environmental Protection Act.” 1971. RCW 43.21C, WAC 197-11, and WAC 468-12. Olympia, WA, as amended.

An EIS must be prepared when the lead agency determines that a proposed action is likely to have significant adverse environmental impacts. Approval of this EIS by state and local agencies is required.

Background: The State Environmental Quality Act (SEPA) requires all governmental agencies to consider the environmental impacts of a proposed action before making decisions. An EIS must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. RCW and WAC allow adoption of an EIS prepared in compliance with NEPA to fulfill SEPA obligations.

7.2.2.2 Revised Code of Washington. 1971. “Shoreline Management Act of 1971.” RCW 90.58. Olympia, WA, as amended.

A permit would be required from the City of Vancouver for activities occurring along the shoreline of the Columbia River or Burnt Bridge Creek. A permit would be required from Clark County for activities occurring along Salmon Creek. Ecology review and approval would be required.

Background: The goal of Washington’s Shoreline Management Act (SMA) is to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines. The SMA establishes a broad policy of shoreline protection, which includes fish and wildlife habitat, and uses a combination of policies, comprehensive planning, and zoning to create a special zoning code overlay for shorelines. Under the SMA, each city and county is required to adopt a shoreline master program that is based on state guidelines and may be tailored to the specific geographic, economic, and environmental needs of the community. Master programs provide policies and regulations addressing shoreline use and protection, as well as a permit system for administering the program.

7.2.2.3 Revised Code of Washington. 1949. State Water Pollutant Control Act. RCW 90.48, as amended, WAC 173-201A and 173-201A-070. Olympia, WA, as amended.

A permit would be required if jurisdictional wetlands and other waters are negatively impacted by the project under the Washington State Water Pollution Control Act.

Background: The State Water Pollutant Control Act gives Ecology "jurisdiction to control and prevent the pollution of streams, lakes, rivers, ponds, inland waters, salt waters, water courses, and other surface and underground waters of the state of Washington." Amendments to state water quality standards in 1997 included wetlands in the definition of surface waters. The act's definition of pollution includes impacts that typically degrade wetland function, including placing fill and discharging stormwater runoff.

The implementing standards for the act include surface water quality standards (WAC 173-201A) and an antidegradation policy (WAC 173-201A-070). The regulations allow for short-term temporary impacts to waters of the state if the degradation does not "interfere(s) with or become injurious to existing water uses or causes long-term harm to the environment." Ecology can permit alterations of wetlands, including filling, only if the net result does not result in long-term harm to the environment. With adequate mitigation that effectively offsets the impacts, Ecology can permit projects that would otherwise not comply with the regulations.

7.2.2.4 Washington Administrative Code. 2005. "National Pollutant Discharge Elimination System Permit Program (Department of Ecology)." WAC 173-220. Olympia, WA, as amended.

Impacts to jurisdictional wetlands or other waters would require a Section 404 CWA permit and a Section 401 certification.

Background: This code establishes a state individual permit program, applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state and operates under state laws as part of the NPDES created by the CWA. In the state of Washington, Ecology issues and enforces NPDES permits and authorizes Section 401 water quality certifications.

In Washington, a Joint Aquatic Resource Permits Application is submitted to both the USACE and Ecology. Ecology reviews the permit application for Section 401 water quality certification.

7.2.2.5 Revised Code of Washington. 1949. "Hydraulic Code." RCW 77.55.100 and WAC 220-110. Olympia, WA, as amended.

A Hydraulic Project Approval process would be required from WDFW for work occurring within the Columbia River.

Background: The state legislature has given WDFW the responsibility of preserving, protecting, and perpetuating all fish and shellfish resources of the state. To assist in achieving that goal, the state legislature passed a law in 1949, now known as the "Hydraulic Code." The purpose of the law is to ensure that damage or loss of fish and shellfish habitat does not result in direct loss of fish and shellfish production. The enactment of the Hydraulic Code by the state legislature served as recognition that virtually any construction within the high water area of the waters of the state has the potential to cause habitat damage. It was also an expression of a state policy to preclude that potential from occurring. The law's purpose is to ensure that required construction activities are performed in a manner to prevent damage to the state's fish, shellfish, and their habitat. By applying for and following the provisions of the Hydraulic Project Approval process from WDFW, most construction activities around water can be allowed with little or no adverse impact on fish or shellfish.

7.2.2.6 Revised Code of Washington. 1990. "Growth Management Act." RCW 36.70A. Olympia, WA, as amended.

A critical areas permit would be required from the City of Vancouver for impacts to wetlands, wetland buffers, streams, and their respective riparian habitat areas.

Background: Each county and city must adopt development regulations protecting critical areas that are required to be designated under the Growth Management Act (GMA). Counties and cities are required to periodically review and update their critical areas ordinance. The GMA defines critical areas that must be designated and protected as wetlands, critical habitat, geologic hazard areas, flood hazard areas, and critical aquifer recharge areas. The focus of the GMA is to avoid unplanned growth and conserve natural resources, while allowing for economic development. Under the GMA, counties, cities, and towns must classify, designate, and regulate critical areas through their critical areas ordinance. Any of the five types of critical areas listed above may serve as fish, wildlife, or sensitive plant habitat.

All regulated habitat and critical areas should be identified during the project development phase. Some local jurisdictions may have fish and wildlife habitat regulation inventory maps. These maps identify what types of habitats the jurisdiction has regulated, indicate where all of the inventoried habitat areas are, and identify the regulations that apply to the management and development of these areas. If available, these maps should be reviewed to help identify critical areas. Local planning departments should be contacted to determine requirements that could affect a project.

7.3 Local Permits

7.3.1 Portland

7.3.1.1 Metro. Nature in Neighborhoods. 2005. Ordinance No. 05-1077C. Portland, OR, as amended.

No permitting would be required through Metro, but implementation of Nature in Neighborhoods by the City of Portland may require permitting.

Background: The Nature in Neighborhoods ordinance is designed to help local communities meet the requirements of Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources. This ordinance amends Metro's Regional Framework Plan and is implemented by cities and counties. It relies on voluntary, incentive-based approaches for development in upland areas and includes new regulations on future urban areas. The ordinance conserves and protects fish and wildlife habitat but does not prohibit development. It uses regulation to protect the region's highest-value streamside habitat, called habitat conservation areas, while also encouraging protection of other valuable habitat through a combination of incentives and voluntary efforts.

7.3.1.2 City of Portland Code. 1994. "Environmental Zones." CPC 33.430, as amended, Portland, OR. CPC. 2002. "Streams, Springs, and Seeps." CPC 33.640. Portland, OR, as amended.

Permits are required for development or disturbance within environmental zones.

Background: The Environmental Zones Code provides for fish habitat protection through the designation of environmental protection zones and environmental conservation zones. An environmental protection zone provides the highest level of protection to the most important resources and functional values. Development is approved in an environmental protection zone only in rare and unusual circumstances. An environmental conservation zone conserves important resources and functional values in areas where these can be protected while allowing environmentally sensitive urban development.

In these zones, development and disturbances must be at least 50 feet from the boundary of any wetland. Development within these zones requires a permit application and additional information. Natural resource management plans (NRMPs) may be developed and approved and may contain regulations that supersede or supplement the environmental zone regulations. Whenever NRMP provisions conflict with other environmental zone provisions, the NRMP provisions take precedence. NRMPs within the wetlands and other waters study area include the East Columbia Neighborhood NRMP and the Peninsula Drainage District No. 1 NRMP.

These regulations apply to building permit and development permit applications for activities within the resource area of an environmental conservation zone. Activities within an environmental conservation zone are subject to the development standards of Section 33.430.110-190. These regulations do not apply to building or development permit applications for development that has been approved through environmental review.

Fish habitat is also protected in the Streams, Springs, and Seep Code. This code is applicable when there are land division actions. The standards in this chapter ensure that important streams, springs, and seeps that are not already protected by the environmental overlay zones are maintained in their natural state.

7.3.2 Vancouver

7.3.2.1 Vancouver Municipal Code. 2024. "Critical Areas Protection Ordinance." VMC 20.740. Vancouver, WA, as amended.

A Critical Areas Report and Permit would be required for activities occurring on properties containing critical areas, including wetlands, wetland buffers, waterbodies, and riparian management areas and riparian buffers.

Background: The City of Vancouver's regulations that affect wetlands, waterbodies, and their buffers are found in the Critical Areas Protection Ordinance. Adopted on February 28, 2005, with updates adopted on December 9, 2024, the ordinance combines separate permitting processes for critical areas (wetlands, frequently flooded areas, geologic hazard areas, and fish and wildlife habitat conservation areas) into a single integrated process. VMC 20.740, Critical Areas Protection, implements the goals and policies of the Vancouver Comprehensive Plan, 2011-2030, under the GMA and other related state and federal laws. Regulations related to wetlands, waterbodies, and their buffers and ordinance compliance in Chapter 20.740 are described below. Applicants must provide a Critical Areas Report with their permit applications.

VMC. 2005 "WETLANDS." VMC 20.740.140. VANCOUVER, WA.

The Wetlands code outlines the City of Vancouver's regulations related to wetlands and their buffers, and it describes which areas are designated as wetlands. Designations include, but are not limited to, swamps, marshes, bogs, and similar areas and buffers (required buffer widths vary from 50 to 300 feet for wetlands surrounded by high intensity land use).

VMC. 2005 "FISH AND WILDLIFE HABITAT CONSERVATION AREAS." VMC 20.740.110. VANCOUVER, WA.

The Fish and Wildlife Habitat Conservation Areas code designates habitat areas and requires a Critical Areas Report for activities within a riparian management area or riparian buffer. In addition, there are several performance standards that apply to habitat conservation areas, riparian management areas, and riparian buffers that need to be addressed for approval.

7.3.2.2 Vancouver Municipal Code. 2005. "Shoreline Management Area." VMC 20.760. Vancouver, WA.

Both a Substantial Development Permit and a Critical Areas Permit would be required for activities on properties containing a wetland, waterbody, or buffer in a shoreline area.

Background: The purpose of the Shoreline Management Area code is to implement the policies and procedures set forth by the SMA, as amended, and all applicable provisions contained in the WAC. The Shoreline Management Master Program (Ord. M-3231, as amended) is used to regulate uses within the Shoreline Management Area.

7.3.2.3 Vancouver Municipal Code. 2004. "SEPA Regulations." VMC 20.790.

An EIS must be prepared when the lead agency determines that a proposal is likely to have significant adverse environmental impacts. Approval of the EIS by state and local agencies would be required.

Background: This code is the adoption of Washington's SEPA law by the City of Vancouver. RCW and WAC allow adoption of an EIS prepared in compliance with NEPA to fulfill SEPA obligations.

7.3.2.4 City of Vancouver. Comprehensive Plan. 2004. Environmental Policies.

No permitting of activities would be required under the City of Vancouver's Comprehensive Plan.

Background: Vancouver's Comprehensive Plan includes the following provisions:

- Environmental protection (EN-1): Protect, sustain, and provide for healthy and diverse ecosystems.
- Habitat (EN-5): Protect riparian areas, wetlands, and other fish and wildlife habitat. Link fish and wildlife habitat areas to form contiguous networks. Support sustainable fish and wildlife populations.
- Trees and other vegetation (EN-8): Conserve and restore tree and plant cover, particularly native species, throughout Vancouver. Promote planting using native vegetation.

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Appendix A. Oregon Department of State Lands Wetland Delineation Concurrence for CRC Project Area

Oregon
Theodore R. Kulongoski, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregonstatelands.us.

September 24, 2008

Heather Gundersen
Columbia River Project Crossing Team
700 Washington Street, Suite 300
Vancouver, WA 98660

Re: Wetland Delineation Report for a Portion of the Columbia River Crossing Project, Multnomah County; T2N, R1E, Sec. 33 and 34; and T1N, R1E, Sec.3 and 4; Portions of Multiple Tax Lots; WD # 08-0205.

Dear Ms. Gundersen:

The Department of State Lands has reviewed the wetland delineation report prepared by Parametrix for the site referenced above. Please note that the study area for this report includes only the portion of the area described above as indicated on the attached maps. Based upon the information presented in the report and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in revised Figures 6a through 6d. Please replace all copies of the preliminary wetland maps with these final Department-approved maps. Within the study area, 4 wetlands, totaling 2.61 acres, portions of the Columbia River and the Oregon Slough, and 2 roadside ditches were identified. The wetlands, river, slough, and the portion of the one ditch created from Wetland L are subject to the permit requirements of the state Removal-Fill Law. A state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined). The portions of the 2 delineated roadside ditches created from uplands are exempt as per OAR 141-085-0015 (12) and are not subject to the permit requirements of the state Removal-Fill law.

In addition, the Columbia River and the Oregon Slough are state-owned waterways. Any activity encroaching within the submerged and submersible land below the line of ordinary high water may require a lease, registration, or easement to occupy state-owned land. Please contact Tami Hubert at (503) 986-5272 for more information.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter, unless new information necessitates a revision. Circumstances under which the Department may change a determination and procedures for renewal of an expired determination are found in OAR 141-090-0045 (available on our web site or upon request). The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within 60 calendar days of the date of this letter.

Thank you for having the site evaluated. Please phone me at (503) 986-5232 if you have any questions.

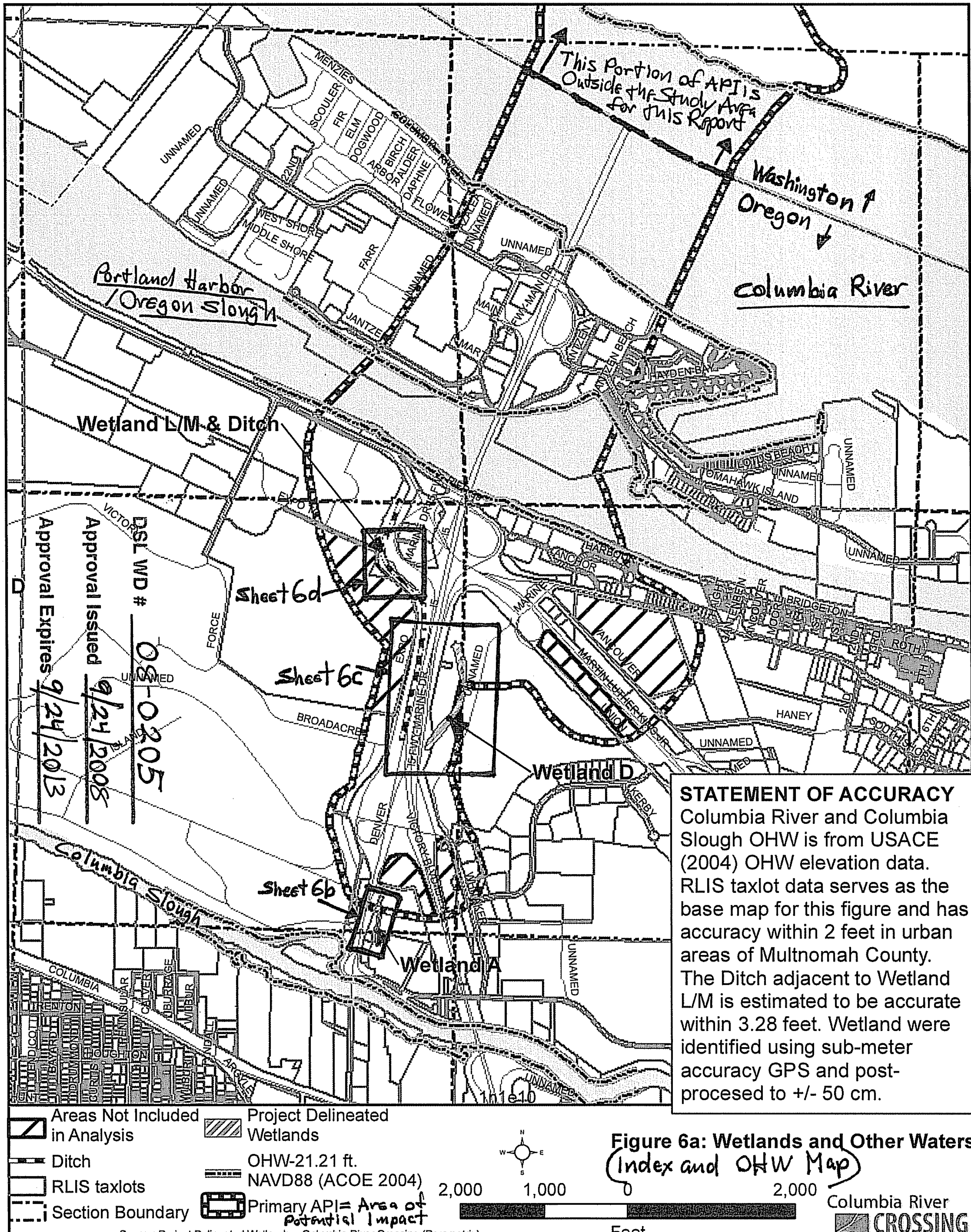
Sincerely,

Peter Ryan, PWS
Wetland Specialist

Approved by
Janet C. Morlan, PWS
Wetlands Program Manager

Enclosures

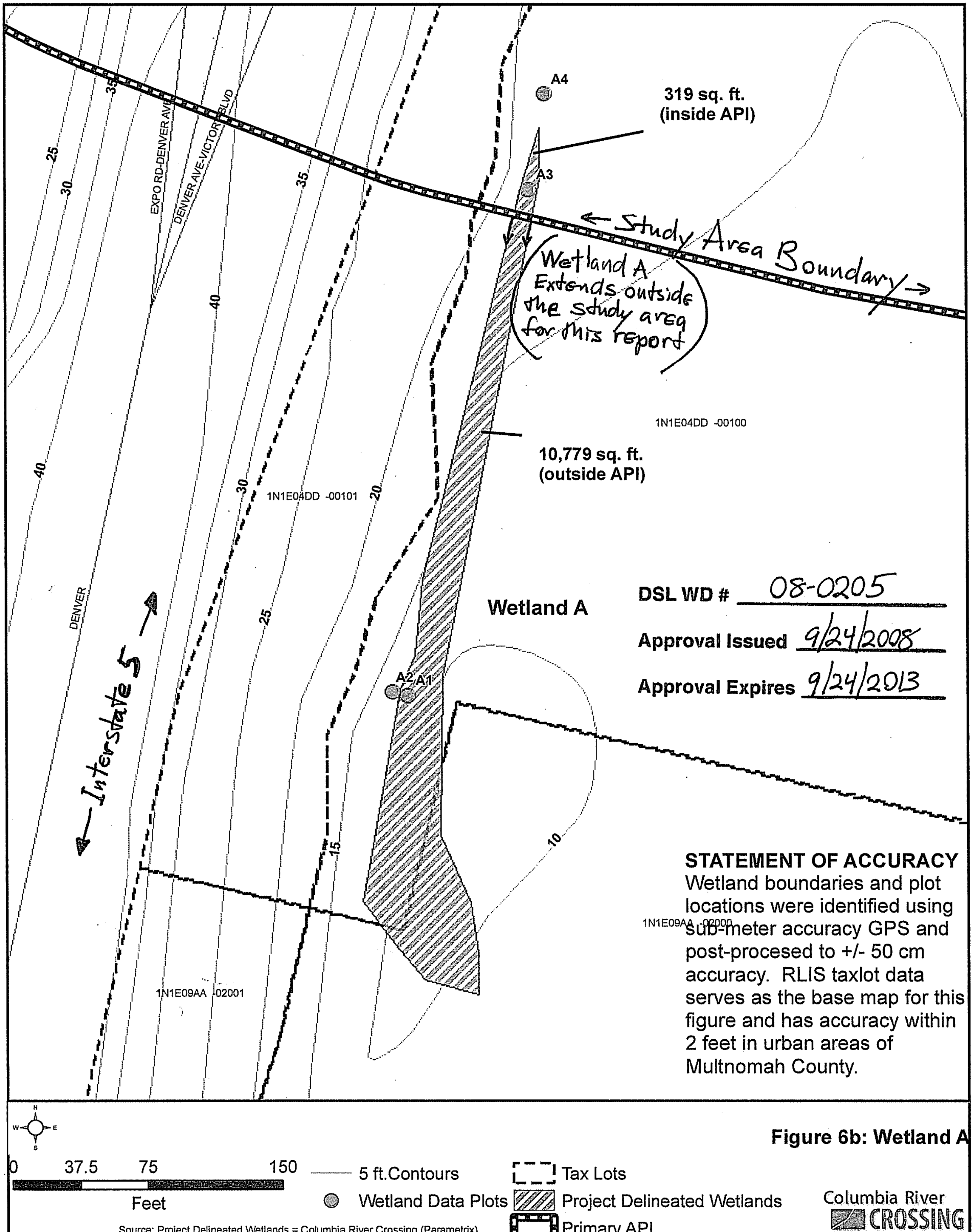
ec: Tina Farrelly, Parametrix
City of Portland Planning Department
James Holm, Corps of Engineers
Mike McCabe, DSL
Tami Hubert, DSL



STATEMENT OF ACCURACY
Columbia River and Columbia Slough OHW is from USACE (2004) OHW elevation data. RLIS taxlot data serves as the base map for this figure and has accuracy within 2 feet in urban areas of Multnomah County. The Ditch adjacent to Wetland L/M is estimated to be accurate within 3.28 feet. Wetland were identified using sub-meter accuracy GPS and post-procesed to +/- 50 cm.

Figure 6a: Wetlands and Other Waters
(Index and OHW Map)

Analysis by J. Koloszar and T. Farrelly; Analysis Date: 8/7/07; Plot Date: 9/11/08; File Name: Fig5_TF120.mxd



STATEMENT OF ACCURACY
Wetland boundaries and plot locations were identified using sub-meter accuracy GPS and post-procesed to +/- 50 cm accuracy. RLIS taxlot data serves as the base map for this figure and has accuracy within 2 feet in urban areas of Multnomah County.

Figure 6b: Wetland A

Analysis by J. Koloszar and T. Farrelly; Analysis Date: 8/7/07; Plot Date: 9/9/08; File Name: Fig5_TF120.mxd

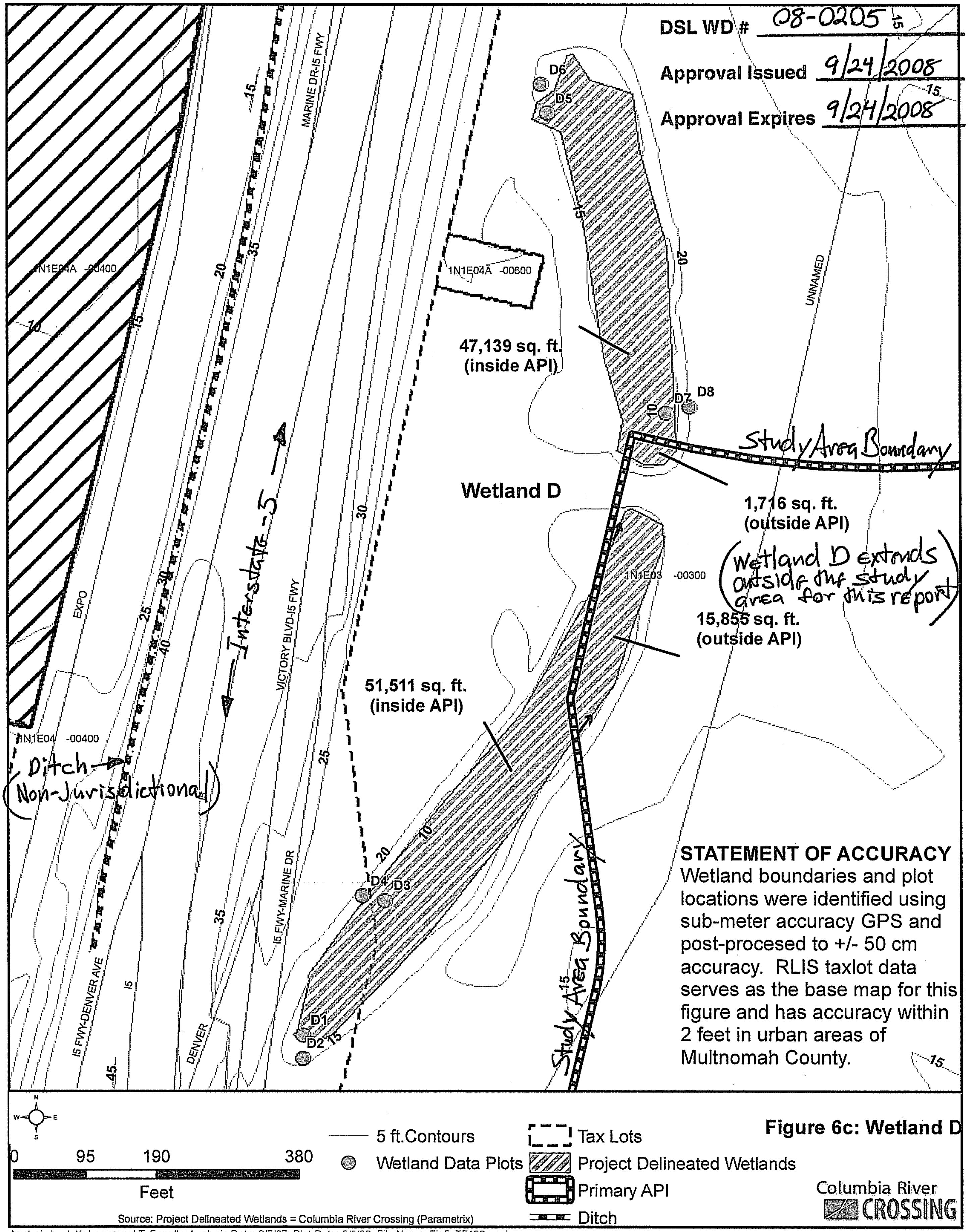


Figure 6c: Wetland D

Analysis by J. Koloszar and T. Farrelly; Analysis Date: 8/7/07; Plot Date: 9/9/08; File Name: Fig5_TF120.mxd

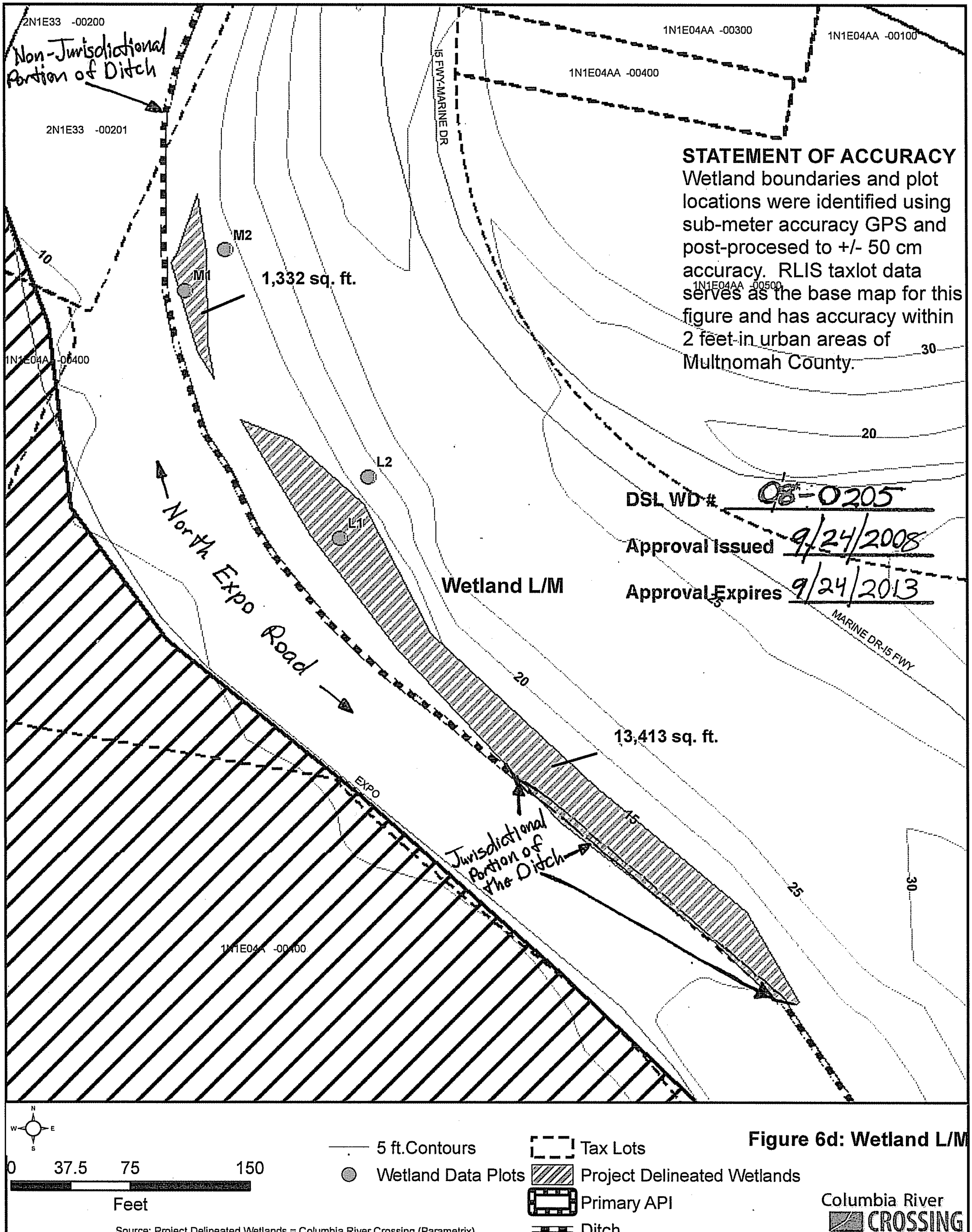


Figure 6d: Wetland L/M

Analysis by J. Koloszar and T. Farrelly; Analysis Date: 8/7/07; Plot Date: 9/9/08; File Name: Fig5_TF120.mxd

Appendix B. Columbia River Bridge Package: Wetland and Waterbodies Delineation Report – Oregon

Interstate Bridge Replacement Program Columbia River Bridge Package

Wetland and Waterbodies Delineation Report - Oregon

December 2023

FINAL

Interstate Bridge Replacement Program: Columbia River Bridge Package

Wetland and Waterbodies Delineation Report - Oregon

Prepared by:

Dustin D. Day
Senior Scientist
Professional Wetland Scientist (PWS) 2066

TABLE OF CONTENTS

TABLES

APPENDICES

ACRONYMS AND ABBREVIATIONS

CRC	Columbia River Crossing
DEQ	Oregon Department of Environmental Quality
DSL	Oregon Department of State Lands
FAC	facultative
I-5	Interstate 5
IBR	Interstate Bridge Replacement
MP	milepost
NWI	National Wetlands Inventory
ODOT	Oregon Department of Transportation
OHW	ordinary high water
R1UBV	riverine tidal, unconsolidated bottom, permanent-tidal
USACE	U.S. Army Corps of Engineers

1. INTRODUCTION

The Interstate Bridge Replacement (IBR) Program is a renewal of the previously suspended Columbia River Crossing (CRC) project. The Program would replace the aging Interstate Bridge across the Columbia River with a modern, seismically resilient multimodal structure. The proposed infrastructure improvements would be located along a 5-mile stretch of the Interstate 5 (I-5) corridor in Portland, Oregon, and Vancouver, Washington.

The IBR Program team is made up of a number of regional transportation partners, including the Oregon Department of Transportation (ODOT), Washington State Department of Transportation, Clark County Public Transportation Benefit Area (C-TRAN), Tri-County Metropolitan Transportation District (TriMet), Oregon Metro, Southwest Washington Regional Transportation Council, the Cities of Portland and Vancouver, and the Ports of Portland and Vancouver.

The IBR Program includes a series of projects within a 5-mile stretch of I-5 near milepost (MP) 306 in Oregon at the southern end, and extending north to approximately MP 2.75 in Washington. The IBR Program would implement the projects over a period of several years, starting with the construction of the Columbia River bridge crossing, referenced as Package 1. Package 1 includes a new pair of bridges over the Columbia River—one for northbound and one for southbound travel—built west of the existing Interstate Bridge. Package 1 also includes interchange improvements and connections to State Route 14 in Vancouver, Washington, and to Hayden Island in Portland, Oregon. When all highway, transit, and active transportation is moved to the new Columbia River bridges, the existing Interstate Bridge (both spans) would be removed.

The purpose of this delineation report is to document the presence, location, condition, and size of potentially jurisdictional wetlands and other waters of the state or U.S. within the Package 1 study area. Once verified by the U.S. Army Corp of Engineers (USACE), Oregon Department of State Lands (DSL), the Oregon Department of Environmental Quality (DEQ), and the City of Portland, this delineation will allow the IBR Program team to avoid, minimize, and/or mitigate the Program's impacts to wetlands and waters that are determined to be jurisdictional. This report focuses on the Oregon portion of the Package 1 project area; wetlands and waters identified within Washington are presented in a separate report.

Wetland delineation surveys were conducted in winter 2022/spring 2023 within areas potentially impacted by the IBR Program within ODOT rights of way and where right-of-entry permission was granted. Surveys were conducted to identify and delineate the boundaries of areas potentially under the jurisdiction of DSL, DEQ, and/or USACE. Based on the methods described below, the Columbia River was identified within the study area but no wetlands were observed. Additionally, based on visual observations from adjacent right of ways and parcels with granted right-of-entry, no additional wetlands or waterbodies were observed on parcels where right-of-entry permission was not granted.

2. LANDSCAPE SETTING AND LAND USE

The Package 1 study area is located along I-5 in northwestern Oregon and southwestern Washington and is bisected by the Columbia River. Figure 1 identifies the limits of the study area in Oregon for Package 1 (all figures are located in Appendix A unless otherwise noted).

The Columbia River dominates the landscape of the Oregon study area, which lies within the Willamette Basin (HUC 170900). In Oregon, the study area elevations vary from approximately 10 feet above mean sea level to about 20 feet above mean sea level in a relatively flat and low-lying floodplain.

Currently, the terrestrial portion of the study area in Oregon is used as a major transportation corridor and also supports both commercial and residential uses on Hayden Island. Figure 2 shows the tax lot maps of the study area.

A review of the National Wetlands Inventory (NWI) indicated that one riverine wetland is mapped within the study area (Figure 3).

- The Columbia River is mapped as a riverine tidal, unconsolidated bottom, permanent-tidal (R1UBV) system.

The portion of the study area on Hayden Island is predominantly urban, with some landscaped areas containing ornamental trees, shrubs, and herbs. Vegetation in the riparian and other undeveloped portions of the study area are dominated by Himalayan blackberry (*Rubus armeniacus* – facultative [FAC]), ornamental tree species, non-native cherry, (*Prunus* sp.), and other weedy species.

Soils mapped within the Oregon portion of the study area include Pilchuck-Urban land complex 0 to 3 percent slopes (33A), and water (W) (Figure 4).

- **Pilchuck-Urban land complex, 0 to 3 percent slopes (33A)** consists of excessively drained soil on flood plains of the Columbia and Willamette Rivers, formed in sandy alluvium or sandy dredge spoils. A typical profile in undisturbed areas (15 percent of complex) includes a surface layer of very dark grayish brown sand about 12 inches thick. The underlying material is dark grayish brown sand to a depth of 60 inches or more. About 35 percent of the complex has been influenced by 20 feet or more of sandy dredge material. About 35 percent of the complex is urban land covered by impervious surfaces. Moag, Rafton, Faloma, and Sauvie soils are included with the complex, as well as areas of cut and fill from silty or cobbly materials (up to 15 percent of the map unit). In areas where vegetation has become established, typical species include black cottonwood (*Populus balsamifera*), willow (*Salix* sp.), trailing blackberry (*Rubus ursinus*), forbs, and grasses. This soil is not classified as a hydric soil.

During the wet season, the site receives direct precipitation and overland runoff. A high groundwater table is influenced by water levels in the Columbia River. The Columbia River forms the northern border of the Oregon study area. North Portland Harbor passes south of the study area.

3. SITE ALTERATIONS

Mainstem aquatic habitat in the lower Columbia River has been substantially altered from its historic condition by a variety of factors, including basin-wide water management operations, construction, and operation of mainstem hydroelectric projects, and other human practices that have degraded water quality and habitat.

Flood control measures have been implemented that affect the entire lower river environment. Levees and river embankments were constructed in the early 1900s on both sides of the river, isolating much of the floodplain from all but the highest flows. Later, as the floodplain underwent increased development, elaborate pumping operations were implemented on the Oregon side to prevent overbank flow.

In addition, construction of the mainstem Columbia River dams, culminating in completion of the Bonneville Dam in 1938, effectively regulates flows and limits flooding events. Currently, 23 mainstem and more than 300 tributary dams regulate the flow of the Columbia River to the Pacific Ocean (Bottom et al. 2005).

Increased urbanization and land use changes in the study area over the last century have decreased the number of wetlands in the study area. Transportation corridors and other developments have fragmented historic wetland systems, leaving a few highly constrained systems located outside of the study area. The terrestrial portion of the study area in Oregon is predominantly developed with commercial and residential structures and associated parking and landscaping. The other dominant alteration is I-5, in the middle of the study area, and local surface streets on Hayden Island.

4. PRECIPITATION DATA AND ANALYSIS

Precipitation recorded at the Portland International Airport weather station on March 1 and March 22, 2023, was 0.01 and 0 inches, respectively. Approximately 1.49 inches of rain fell during the two weeks immediately preceding March 1, and approximately 2.55 inches of rain fell during the two weeks immediately preceding March 22. The total precipitation recorded for March 2023 was 5.40 inches. Total precipitation recorded for the water year through March 22 was 29.59 (NRCS 2023b).

According to the WETS table for Portland (WETS Station OR6751), the growing season in the area spans February 15 to November 29, a period of approximately 288 days. Average monthly precipitation for the month of March, based on data collected from 1991 through 2020, is approximately 4.83 inches. Average precipitation for the water year recorded during the same time period at the WETS station is 33.82 inches through March (NRCS 2023b).

Precipitation for the 2023 water year through the March 1 and March 22, 2023, site visits totaled 10.18 inches (Table 4-1). According to the National Oceanic and Atmospheric Administration, this represents 70 percent of the normal amount of rainfall for this period (NOAA NWS 2023).

Table 4-1. Yearly Precipitation for 2023 (January 1 through March 22, 2023) Portland, Oregon

Date	Precipitation for Water Year 2023 (inches)	Precipitation Previous 2 Weeks (inches)	Departure from Normal (inches)	Percent of Normal Precipitation
January 1, 2023–March 22, 2023	10.18	14.64	-4.46	70%

Source: NRCS 2023b

Table 4-2 shows the monthly precipitation data for the three months prior to the site visits using the 30 percent probability range around the average (March 1 and March 22, 2023). Precipitation was below normal for January and February 2023 and above normal for December 2022 and March 2023, and was approximately 85 percent of the average for the period. Sample plot data was interpreted with below-normal precipitation in mind.

Table 4-2. Monthly Precipitation for Three Months Prior to March 1 and March 22, 2023, Site Visit; Portland, Oregon

Date	Precipitation (inches)	Normal (inches)	Departure from Normal (inches)	Percent of Normal Precipitation
December 2022	8.62	7.35	1.27	117%
January 2023	3.71	6.36	-2.65	58%
February 2023	2.74	4.74	-2.00	58%
March 1-22, 2023	3.73	3.54	0.19	105%
Totals	18.80	21.99	-3.19	85%

Source: NRCS 2023b

During the 14-day period starting March 8, 2023, and including the March 22 site visit, precipitation was 2.55 inches, which was 0.22 inches more than the normal amount of rainfall for that period, according to the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS 2023b).

5. METHODS

The wetland delineation relied and expanded upon previous delineation efforts performed for the CRC project, including a wetland and waters delineation report that was submitted to DSL for concurrence. The CRC delineation report (CRC 2008) received concurrence from DSL in September

2008 (DSL #WD 2008-0205). Additionally, information from the City of Portland's Wetland Inventory Project was also referenced (City of Portland 2023).

Field investigations for the IBR Program were conducted on March 1 and 22, 2023. Where possible, wetland surveys were conducted on all unpaved areas within the study area. However, right-of-entry permission for digging test pits was not granted for all parcels within the study area at the time of the field surveys. Appendix B includes a figure identifying parcels for which right-of-entry permission for digging test pits had been granted and that were physically surveyed during the field surveys, as well as those for which right-of-entry was either denied or for which no response was received. Parcels with no color received right-of-entry permission to access the site but test pits were not needed because the parcels were entirely developed with impervious surfaces. Only parcels for which right-of-entry had been specifically authorized were physically accessed during the delineation field surveys.

The surface streets and parcels for which right-of-entry permission was available were walked and assessed for wetland characteristics. Parcels where access had not been granted were observed from areas either within the public right of way or from parcels that were accessible. In these cases, recent aerial photography, soils data, NWI maps, and a visual survey from accessible locations were used to determine the likely presence or absence of wetlands. In this way, it was possible to assess all areas sufficiently for the presence or absence of wetland features.

The wetland delineation field work was conducted pursuant to the parameters detailed in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the 2010 Regional Supplement (USACE 2010). The 1987 Manual and 2010 Regional Supplement require evidence of three parameters to determine that wetlands occur on a site: wetland hydrology, hydric soils, and hydrophytic vegetation. A detailed description of the 1987 Manual and Regional Supplement methods can be found on the USACE website (current URL: https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4532/).

To meet the wetland hydrology criterion, soils in the study area must be inundated or saturated to the surface for a period in the growing season that is long enough to develop anaerobic conditions (at least 5 percent of the growing season). The growing season in the Portland area is approximately 288 days (from February 15 through November 29; Green et al. 1983), so 5 percent of the growing season in the study area is equal to a period of 14 days. The early growing season is generally the best time to assess the hydrology of a study area because inundation or saturation of the surface should be present during this time if the area is a wetland. When data must be collected outside of the early growing season, other primary indicators of wetland hydrology (drainage patterns, water marks, etc.) or two or more secondary indicators of wetland hydrology (oxidized root channels, water-stained leaves) may be used to evaluate wetland hydrology.

Dominant vegetation within the study area was identified using botanical references and classified using the National List of Plant Species that Occur in Wetlands: 1988 National Summary and 1993 Supplement: Northwest (Region 9) (Reed 1988, 1993). All areas where greater than 50 percent of the vegetation was hydrophytic (FAC or wetter) (i.e., grass areas) were further examined for indicators of wetland hydrology. This wetland delineation found no areas with 50 percent or more hydrophytic vegetation, no positive indicators of wetland hydrology, and no hydric soil indicators. Sample plots detailing the conditions observed are found in Appendix C.

6. DESCRIPTION OF ALL WETLANDS AND NON-WETLAND WATERS

The following sections discuss the wetlands and non-wetland waters delineated within the study area. Figure 5 shows a recent aerial photograph of the study area. Appendix D presents ground-level photographs taken during the site visit.

6.1 Wetlands

No wetlands are mapped within the study area by the NWI, the City of Portland, or previous CRC delineations. In addition, no wetland characteristics were visually observed during the site visits or on aerial photographs. Based on the available information and visual observations, no wetlands occur within the IBR Program Package 1 study area in Oregon.

6.2 Non-Wetland Waters

The Columbia River flows from east to west through the study area. It is considered a traditional navigable water. It is the primary hydrologic feature of the study area. The City of Portland includes the Columbia River in its environmental zone overlay. The ordinary high water mark (OHWM) of the Columbia River was identified and recorded using a hand-held global positioning system (GPS) device. The OHWM was determined based on the visual observance of field indicators of ordinary high water events. During the site visits, a line established on the existing rock riprap from repeated seasonal high water elevations was observed and recorded. This physical OHWM is shown in Figures 6a through 6d.

Additionally, the USACE establishes ordinary high water elevations for the purpose of determining limits of jurisdiction under Section 10 of the Rivers and Harbors Act. The USACE-designated ordinary high water elevation for river mile 106 is 15.8 feet Columbia River Datum, 17.59 feet National Geodetic Vertical Datum of 1929, and 21.04 feet North American Vertical Datum of 1988. The USACE established ordinary high water mark of 21.04 feet for river mile 106 is shown in Figures 6a through 6d. The total area of non-wetland waters within the study area is approximately 79.28 acres as shown in Figures 6a and 6b. Table 6-1 provides a summary of the non-wetland waters (i.e., Columbia River) in the study area.

Table 6-1. Non-wetland Waters Summary

Unique Identifier Code	River Mile	Essential Fish Habitat? Yes/No	Ordinary High Water Width	Acres within the Study Area	Additional Info for Jurisdictional Determination	Access? Yes/No
Columbia River	106	N	2,630 feet	79.28	Fish presence; perennial	Yes

7. DEVIATION FROM LOCAL OR NATIONAL WETLAND INVENTORIES

Data from the NWI online mapper (USFWS 2023), from prior delineations (CRC 2008), and City of Portland Wetland Inventory Project (City of Portland 2023) were referred to for initial indicators of wetland presence within the study area. There is no officially published local wetland inventory for the study area. The results of the wetland delineation are generally consistent with the data from these sources.

The NWI mapped the Columbia River as a R1UBV wetland within the study area, which is consistent with the finding of the field survey. No other wetlands were mapped within the study area, and the results of the field investigation were consistent with this assessment.

8. MAPPING METHOD AND ESTIMATED ACCURACY

The OHWM boundaries were recorded using a sub-meter (+/- 3.28 feet) accuracy GPS device, where possible. For parcels where access permission had not been granted, the OHWM boundary was established based on a combination of topographic data and aerial photo interpretation (1-foot pixel air photographs). These hand-digitized areas have an estimated accuracy of +/- 2.99 feet. Mapping and initial cartography were completed using ArcMAP software with accuracy within 1 to 2 meters.

9. ADDITIONAL INFORMATION

The Columbia River is considered a traditionally navigable water by the USACE.

10. RESULTS AND CONCLUSIONS

The results of the wetland and waters assessment documented that no wetlands occur within the study area. A single surface water, the Columbia River, is located within the study area in Oregon. The OHWM of the Columbia River along the north bank of Hayden Island was delineated within the study area. The Columbia River is a R1UBV water and is approximately 2,630 feet across from the south bank on Hayden Island to the north bank in Washington.

11. DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon DSL in accordance with OAR 141-090-0005 through 141-090-0055.

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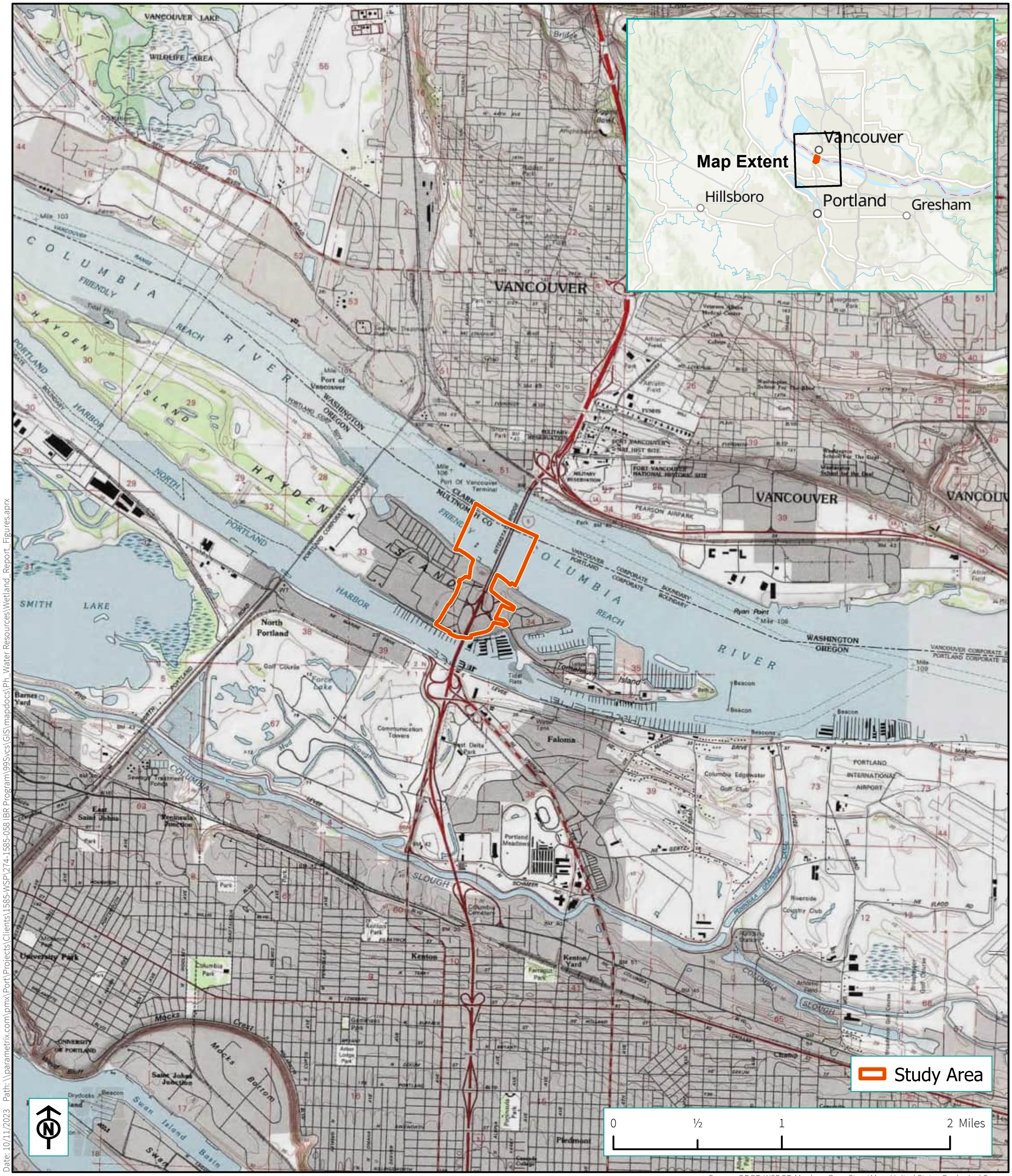
APPENDIX A. FIGURES

Figure 1
Project Location

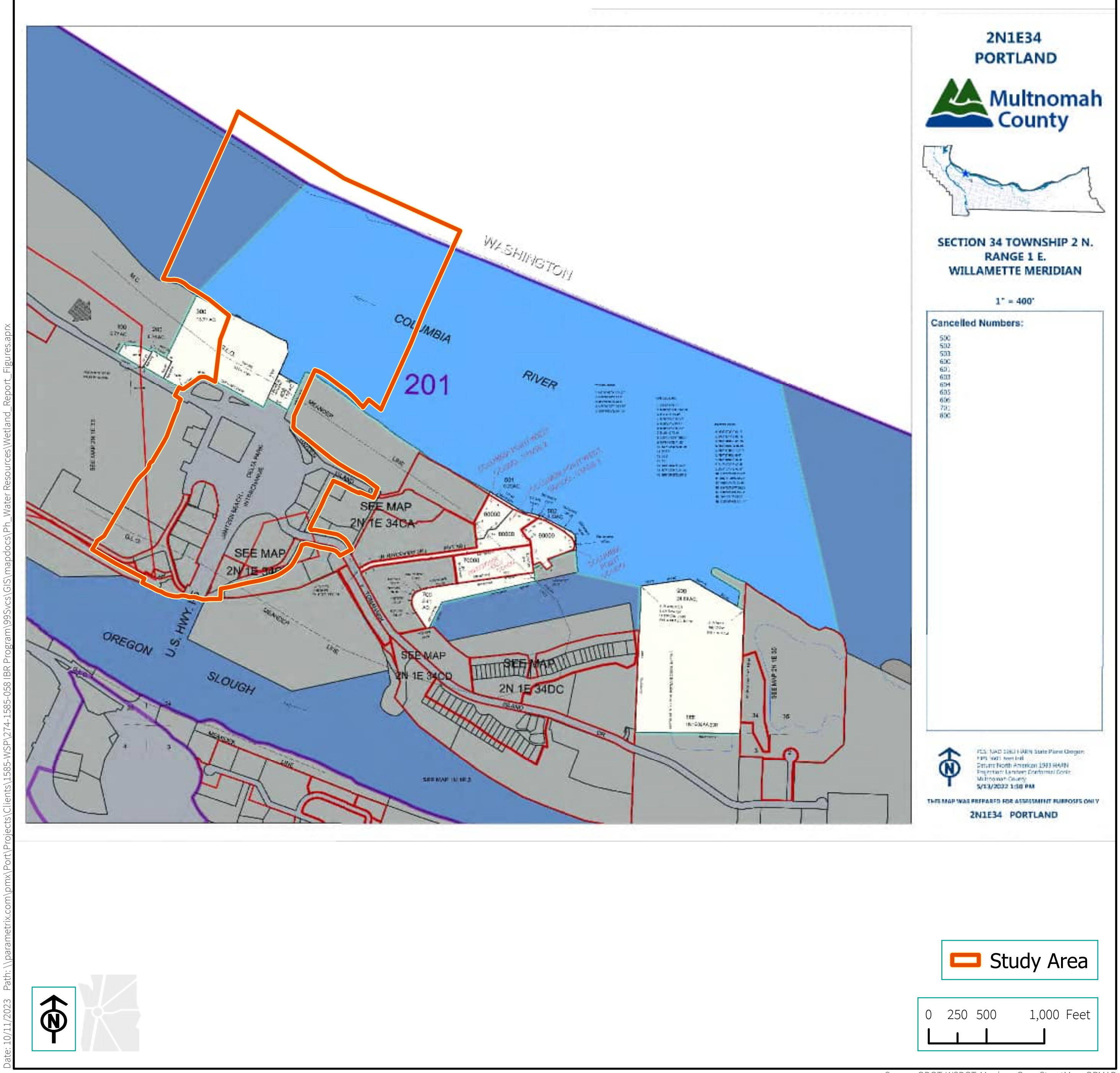


Source: ODOT, WSDOT, Mapbox, OpenStreetMap, United States Geological Survey

Date: 10/11/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

Interstate BRIDGE Replacement Program

Figure 2
Tax Lot Map

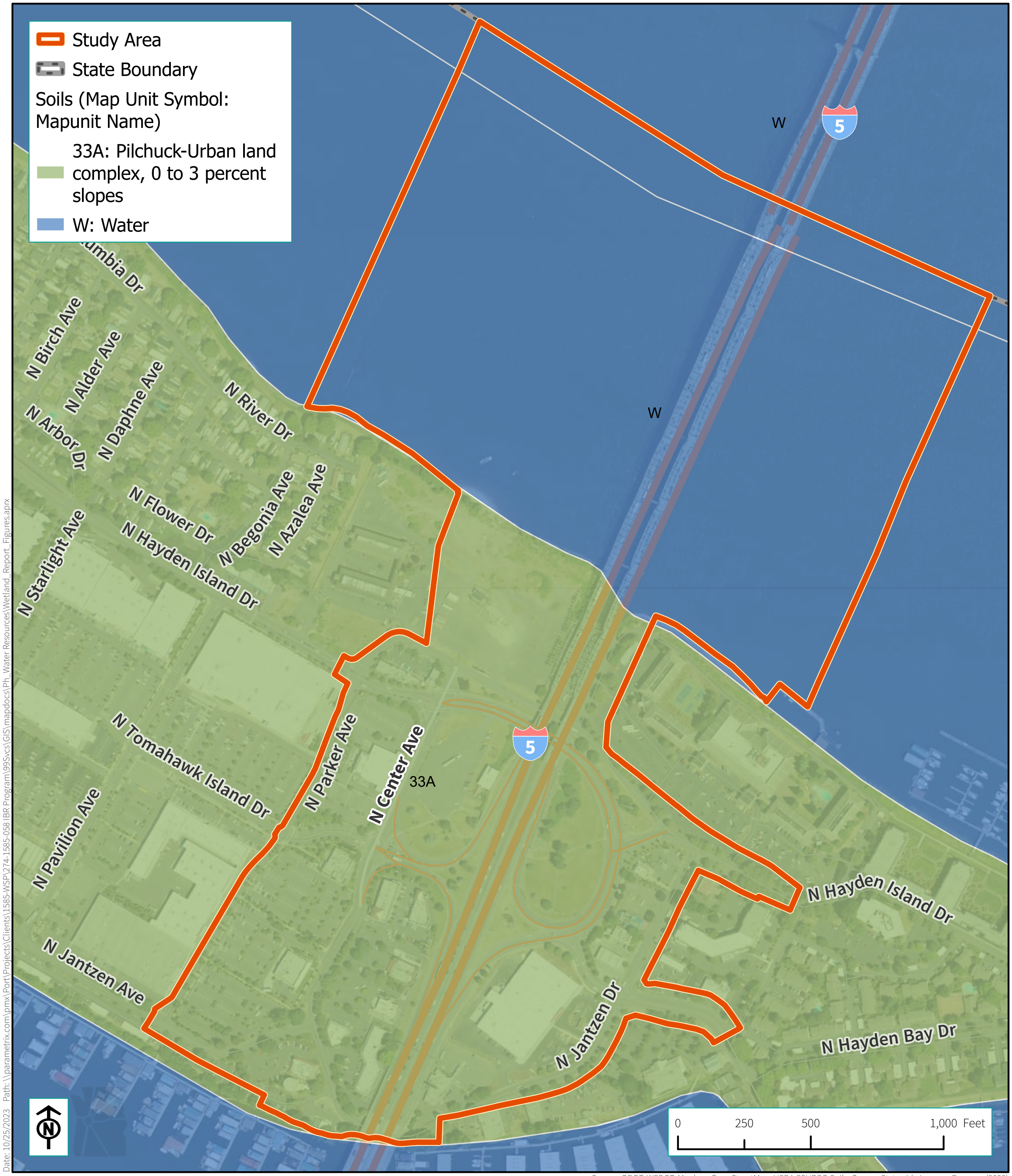


Source: ODOT, WSDOT, Mapbox, OpenStreetMap, ORMAP

Figure 3
NWI Wetlands

Source: ODOT, WSDOT, Mapbox, OpenStreetMap, US Fish & Wildlife Service, Oregon Statewide Imagery Program (2022)

Figure 4
Soils



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Source: ODOT, WSDOT, Mapbox, OpenStreetMap, USDA SSURGO Soils, Oregon Statewide Imagery Program (2022)

Figure 5
Recent Aerial (May 2023)

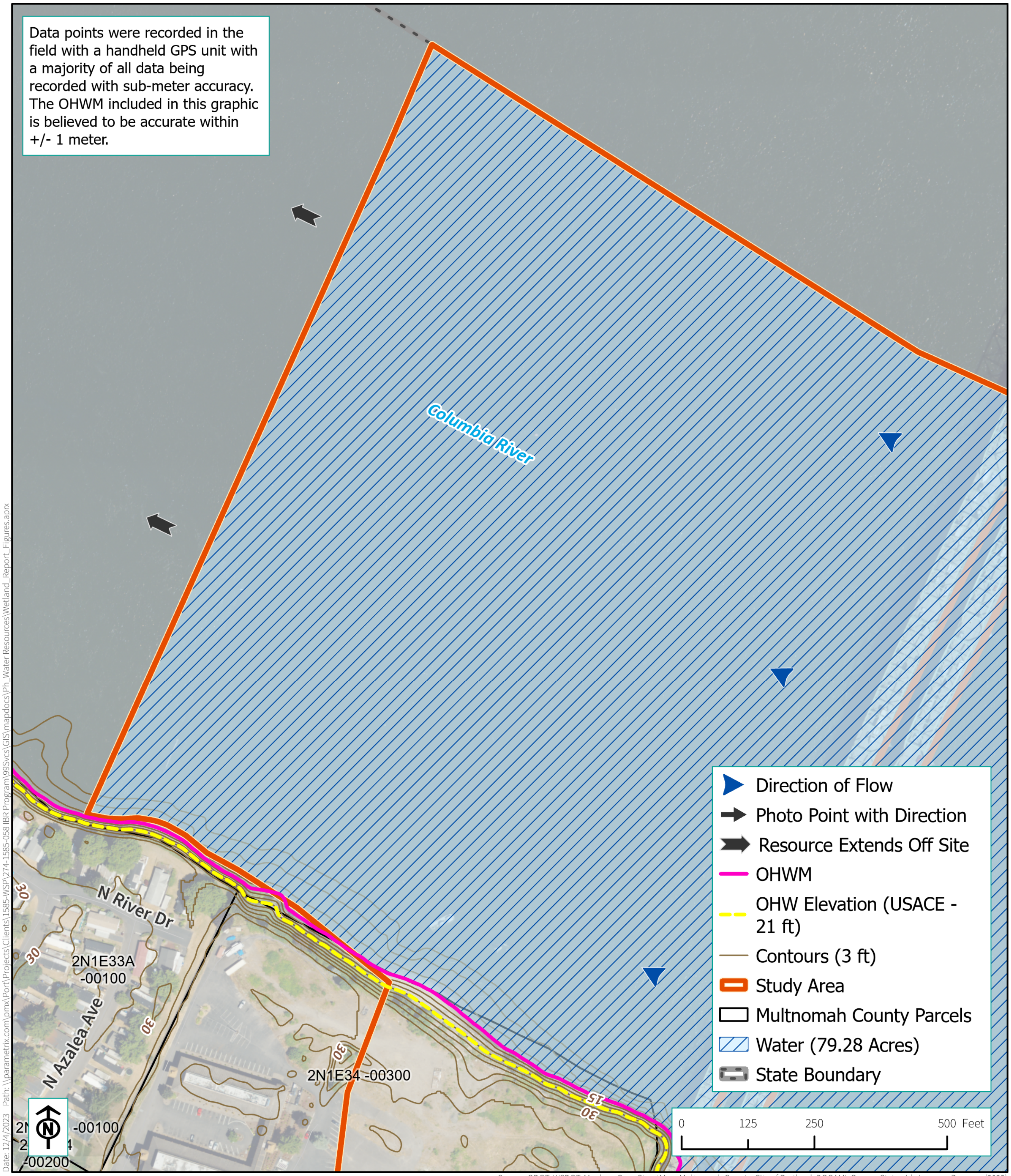
Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Google Earth Aerial Imagery (May 2023)

Figure 6
Delineated Resource Index

Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, Oregon Statewide Imagery Program (2022)

Date: 10/11/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

Figure 6a
Delineated Resources



Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, DOGAMI, Oregon Statewide Imagery Program (2022)

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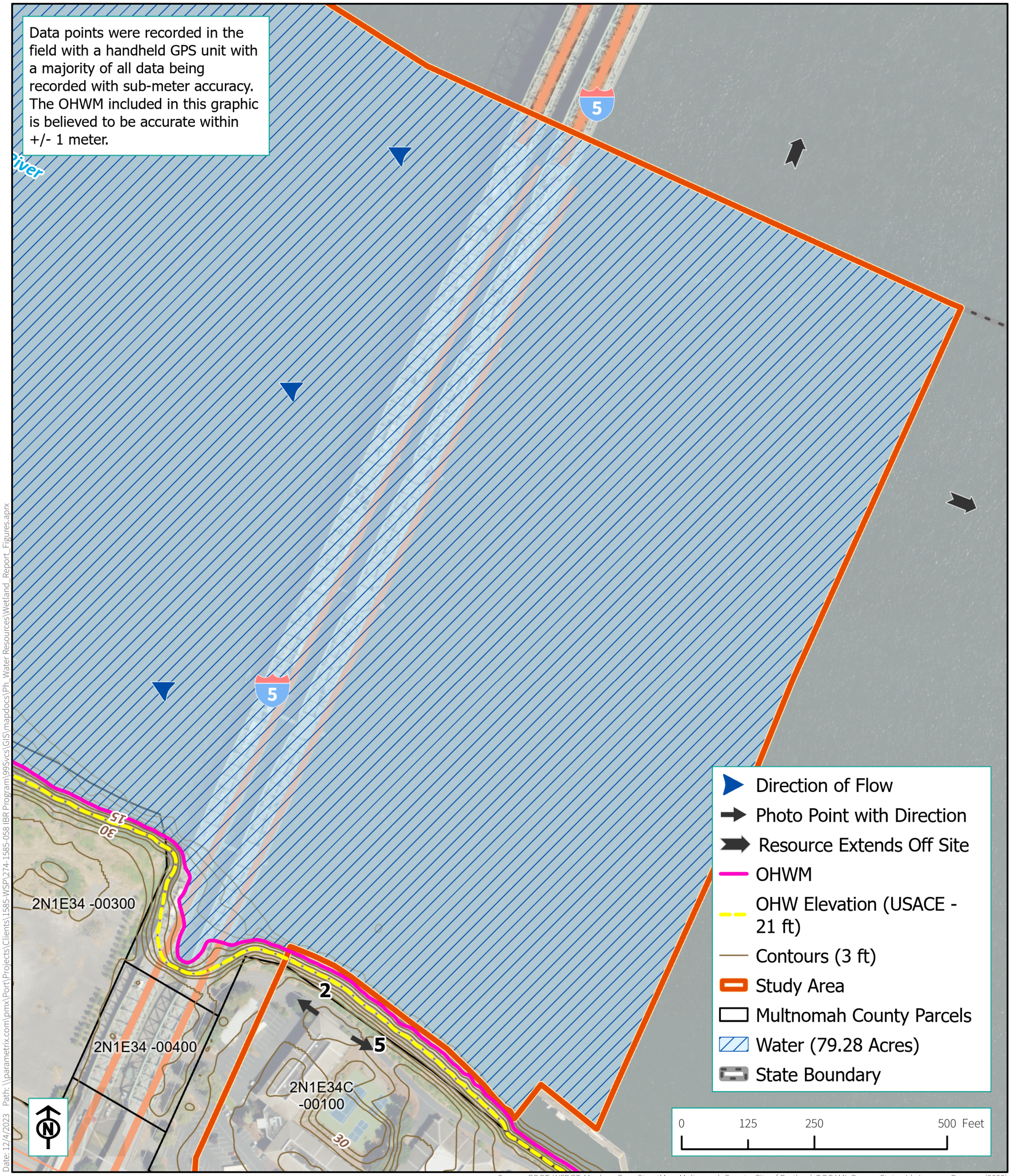
Figure 6b
Delineated Resources



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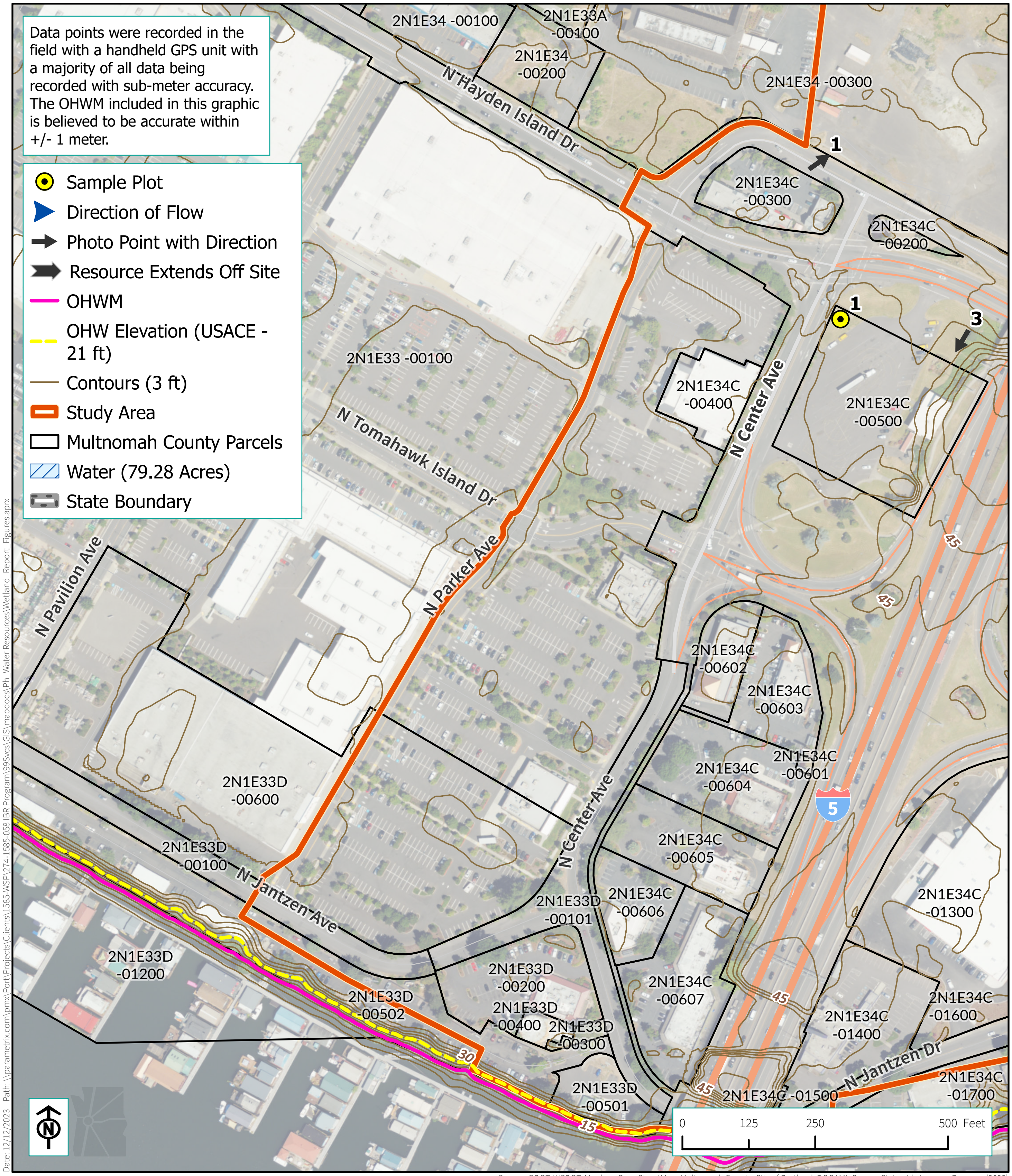
Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, DOGAMI, Oregon Statewide Imagery Program (2022)

Interstate BRIDGE Replacement Program

Figure 6c
Delineated Resources



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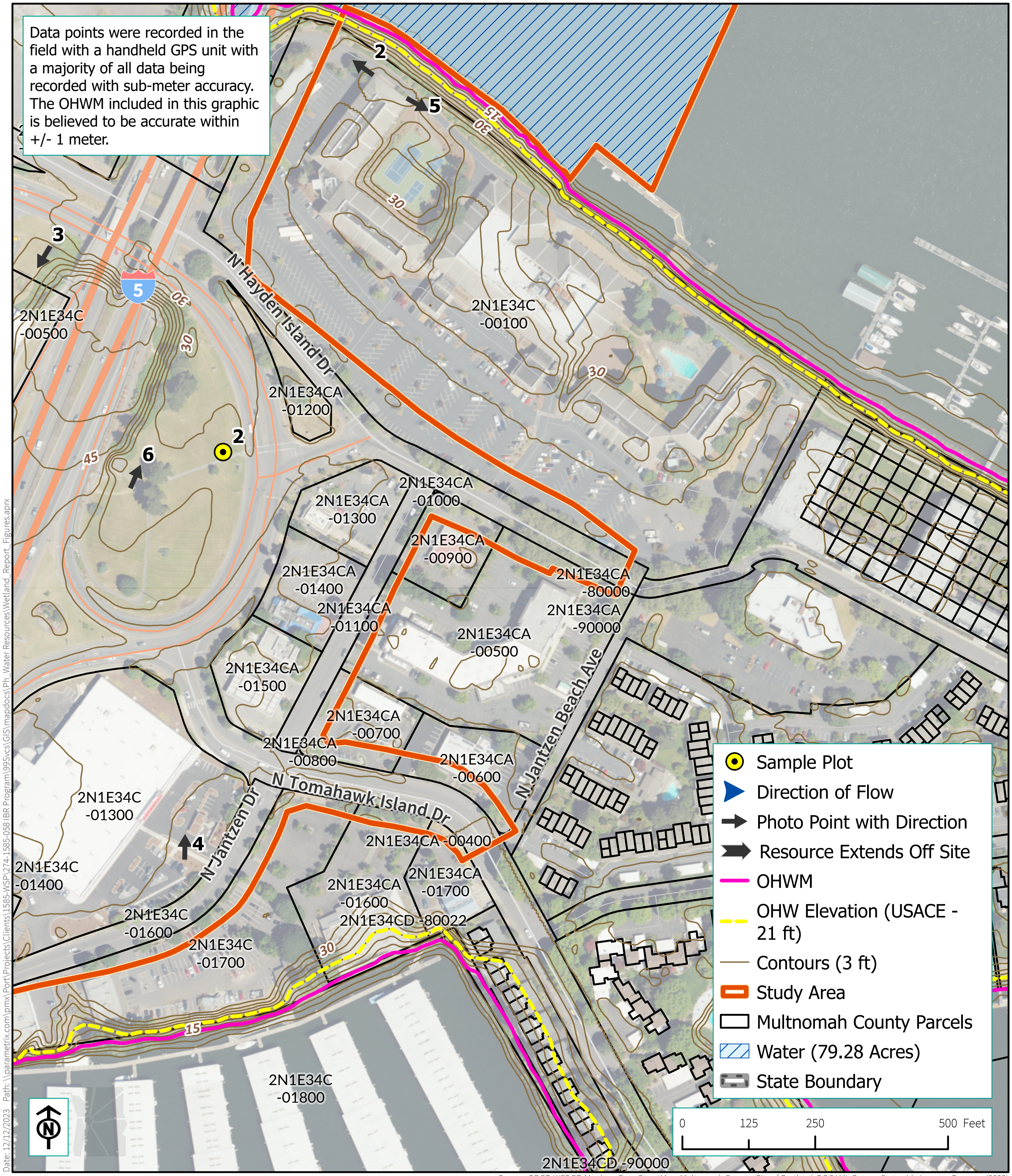
Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, DOGAMI, Oregon Statewide Imagery Program (2022)

Interstate BRIDGE Replacement Program

Figure 6d
Delineated Resources



Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, DOGAMI, Oregon Statewide Imagery Program (2022)

Date: 12/12/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

APPENDIX B. ACCESS PERMISSION FIGURE

Right of Entry Status

Source: ODOT, WSDOT, Mapbox, OpenStreetMap, US Fish & Wildlife Service, Oregon Statewide Imagery Program (2022)

Date: 12/12/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

APPENDIX C. DATA SHEETS

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region** See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: IBR Program - Columbia Bridge Bridge Prackage City/County: Portland/Multnomah Sampling Date: 3/22/2023

Applicant/Owner: Oregon Department of Transportation State: OR Sampling Point: SP-1

Investigator(s): Dustin Day and Brian Knees Section, Township, Range: Section 34, T02N, R01E W.M.

Landform (hillside, terrace, etc.): Island Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): LRR A, MLRA 2 Lat: 45.61300 N Long: 122.67984 W Datum: 4326 Lat/Long

Soil Map Unit Name: Pilchuck-Urban land complex, 0 to 3 percent slopes (33A) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:
Plot taken on west side of I-5, near intersection of N Center Ave and N Hayden Island Dr

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 10)			
1. *Poa annua*	75	Yes	FAC
2. *Daucus carota*	5	No	FACU
3. *Plantago lanceolata*	20	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	=Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		=Total Cover	
% Bare Ground in Herb Stratum ___			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	100 (A)		325 (B)
Prevalence Index = B/A =			3.25

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:
Vegetation mown consistently, throughout year.

SOIL

Sampling Point: SP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Loamy/Clayey	
2-16	10YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ 1 cm Muck (A9) **(LRR D, G)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR A, E)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Western Mountains, Valleys, and Coast Region** See ERDC/EL TR-10-3; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: IBR Program - Columbia Bridge Bridge Prackage City/County: Portland/Multnomah Sampling Date: 3/22/2023

Applicant/Owner: Oregon Department of Transportation State: OR Sampling Point: SP-2

Investigator(s): Dustin Day and Brian Knees Section, Township, Range: Section 34, T02N, R01E W.M.

Landform (hillside, terrace, etc.): island Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): LRR A, MLRA 2 Lat: 45.61201 N Long: 122.67772 W Datum: 4326 Lat/Long

Soil Map Unit Name: Pilchuck-Urban land complex, 0 to 3 percent slopes (33A) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No	
Hydrophytic Vegetation Present?	X		**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?		X	
Wetland Hydrology Present?		X	

Remarks:
Plot taken on west side of I-5, near intersection of N Center Ave and N Hayden Island Dr

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 10)			
1. *Poa annua*	75	Yes	FAC
2. *Daucus carota*	5	No	FACU
3. *Plantago lanceolata*	20	No	FACU
4. *Trifolium repens*	5	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	105 =Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	=Total Cover		
% Bare Ground in Herb Stratum ___			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column Totals:	105 (A)		340 (B)

Prevalence Index = B/A = 3.24

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:
Vegetation mown consistently, throughout year.

SOIL

Sampling Point: SP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Loamy/Clayey	
4-16	10YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ 1 cm Muck (A9) **(LRR D, G)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR A, E)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) (**MLRA 1, 2 4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX D. PHOTOLOG

Photosheet		
Photo No. 1	Date March 1, 2023	
View of the vacant portion of Parcel R323508 to the west of the Interstate Bridge on the north side of Hayden Island.		
Photo No. 2	Date March 1, 2023	
View of Parcel 32352 and the Interstate Bridge on the north side of Hayden Island.		

Photo No.	Date	
3	March 1, 2023	
View of Parcel R323515, west of the Interstate Bridge on Hayden Island and looking south.		
Photo No.	Date	
4	March 1, 2023	
View of Parcel R323529, east of the Interstate Bridge on Hayden Island.		

Photo No. 5	Date March 1, 2023	
View of Parcel 32352 on the north side of Hayden Island and east of the Interstate Bridge.		
Photo No. 6	**Date March 1, 2023**	
View of the area directly east of the Interstate Bridge on Hayden Island.		

Appendix C. Columbia River Bridge Package: Wetland and Waterbodies Delineation Report - Washington

Interstate Bridge Replacement Program

Columbia River Bridge Package

Wetland and Waterbodies Delineation Report - Washington

January 2024

Final

Interstate Bridge Replacement Program

Columbia River Bridge Package

Wetland and Waterbodies Delineation Report - Washington

Prepared by:

Dustin D. Day
Senior Scientist
Professional Wetland Scientist (PWS) 2066

EXECUTIVE SUMMARY

This report was prepared for the Interstate Bridge Replacement Program (IBR Program) care of the Washington State Department of Transportation (WSDOT) and identifies the delineated wetlands and waterbodies within the study area of the first construction package (i.e., the Columbia River Bridge Package) of the IBR Program in the state of Washington.

The IBR Program team is made up of a number of regional transportation partners, including WSDOT, the Oregon Department of Transportation (ODOT), Clark County Public Transportation Benefit Area (C-TRAN), Tri-County Metropolitan Transportation District (TriMet), Oregon Metro, Southwest Washington Regional Transportation Council, the Cities of Portland and Vancouver, and the Ports of Portland and Vancouver.

The IBR Program includes a series of projects within a 5-mile stretch of Interstate 5 near milepost (MP) 306 in Oregon at the southern end, and extending north to approximately MP 2.75 in Washington. The IBR Program would implement the projects over a period of several years, starting with the construction of the Columbia River bridge crossing, referenced as Package 1.

No wetlands were identified during the wetland delineation procedures for the first construction package within the study area. However, the Columbia River runs through the southern portion of the study area.

TABLE OF CONTENTS

TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

CRC	Columbia River Crossing
IBR	Interstate Bridge Replacement
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
I-5	Interstate 5
MP	milepost
NAVD-88	North American Vertical Datum of 1988
NGVD-29	National Geodetic Vertical Datum of 1929
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
ODOT	Oregon Department of Transportation
OHWM	ordinary high water mark
RB	riparian buffer
RMA	Riparian Management Area
SR	state route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VMC	Vancouver Municipal Code
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

1. INTRODUCTION

The Interstate Bridge Replacement (IBR) Program is a renewal of the previously suspended Columbia River Crossing (CRC) project. The Program would replace the aging Interstate Bridge across the Columbia River with a modern, seismically resilient multimodal structure. The proposed infrastructure improvements would be located along a 5-mile stretch of the Interstate 5 (I-5) corridor in Portland, Oregon, and Vancouver, Washington.

The IBR Program team is made up of a number of regional transportation partners, including the Oregon Department of Transportation (ODOT), Washington State Department of Transportation (WSDOT), Clark County Public Transportation Benefit Area (C-TRAN), Tri-County Metropolitan Transportation District (TriMet), Oregon Metro, Southwest Washington Regional Transportation Council, the Cities of Portland and Vancouver, and the Ports of Portland and Vancouver.

The IBR Program includes a series of projects within a 5-mile stretch of I-5 near milepost (MP) 306 in Oregon at the southern end, and extending north to approximately MP 2.75 in Washington. The IBR Program would implement the projects over a period of several years, starting with the construction of the Columbia River bridge crossing, referenced as Package 1. Package 1 includes a new pair of bridges over the Columbia River—one for northbound and one for southbound travel—built west of the existing Interstate Bridge. Package 1 also includes interchange improvements and connections to State Route (SR) 14 in Vancouver, Washington, and to Hayden Island in Portland, Oregon. When all highway, transit, and active transportation is moved to the new Columbia River bridges, the existing Interstate Bridge (both spans) would be removed.

The purpose of this delineation report is to document the presence, location, condition, and size of potentially jurisdictional wetlands and other waters of the state or U.S. within the Package 1 study area. Once verified by the appropriate agencies, this delineation will allow the IBR Program team to avoid, minimize, and/or mitigate the Program's impacts to wetlands and waters that are determined to be jurisdictional. This report focuses on the Washington portion of the Package 1 project area; wetlands and waters delineated within the portion of the Package 1 study area in Oregon are presented in a separate report.

Wetland delineation surveys were conducted in spring 2023 within areas potentially impacted by the IBR Program within WSDOT rights of way and where right-of-entry permission was granted. Surveys were conducted to identify and delineate the boundaries of areas potentially under the jurisdiction of the Washington State Department of Ecology (Ecology) and/or the U.S. Army Corps of Engineers (USACE). Further study may be needed in locations where right-of-entry permission was not granted This report provides supporting documentation for potential federal, state, and local permit applications.

2. PROPOSED PROJECT

2.1 Project Location

The main project area is located along I-5 in northwestern Oregon and southwestern Washington, and is bisected by the Columbia River. Figure 1 shows the project area, including the Oregon and Washington sections (all figures are provided in Appendix A). Throughout the remainder of this report, only the Washington portion of the project area will be discussed. Wetlands and waters identified within Oregon are presented in a separate report.

The study area for Package 1 within Washington is in the city of Vancouver, in Clark County. The study area is within Sections 27 and 34 of Township 02 North, Range 01 East of the Willamette Meridian. The study aera spans south to north from I-5 MP 0 to approximately I-5 MP 0.8 and west to east on SR 14 from MP 0 to approximately MP 0.5. The study area is location is in land resource region Western Mountains, Valleys, and Coast Region. Currently, the immediate study area is used as major transportation corridors with commercial and for recreational purposes in Vancouver. Figure 2 shows the tax lot maps of the main study area.

2.2 Project Purpose and Description

The IBR program would replace the aging Interstate Bridge across the Columbia River with a modern, seismically resilient, multimodal structure, and the Program would construct associated infrastructure improvements along a 5-mile stretch of the I-5 corridor in Portland, Oregon, and Vancouver, Washington. Through a collaborative process with the federal lead agencies—the Federal Highway Administration and the Federal Transit Administration—and the local and regional agencies sponsoring the IBR program, a Modified Locally Preferred Alternative (LPA) has been developed. The Modified LPA includes the following elements:

- A new bridge built west of the existing bridges on North Portland Harbor and the Columbia River.
- Improvements to seven interchanges north and south of the Columbia River, as well as related enhancements to the local street network.
- Extension of light-rail from the Expo Center in Portland to E. Evergreen Boulevard in Vancouver, along with associated transit improvements such as transit stations and park and rides.
- Addition of one auxiliary lane in each direction and safety shoulders on the bridge.
- A variety of improvements for people who walk, bike, and roll throughout the Program area.
- Variable-rate tolling for motorists using the river crossing as a demand management and financing tool.

The IBR Program's Package 1 includes a new bridge crossing of the Columbia River and tying back into I-5 on Hayden Island in Oregon and near downtown Vancouver in Washington. This package also includes a new interchange with SR 14.

2.3 Study Area

In Washington, the study area extends from the Oregon/Washington state line in the Columbia River to approximately 0.8 miles north on I-5. North of the Columbia River, the study area expands slightly west into downtown Vancouver and approximately 0.5 miles east on SR 14. The physical changes associated with Package 1 would occur in this area in Washington. Figure 1 shows the study area in Washington.

3. METHODS

The wetland delineation relied and expanded upon previous delineation efforts performed for the CRC Project. Where possible, wetland surveys were conducted on all unpaved areas within the study area. However, right-of-entry permission was not granted for all locations and in other locations the ability to dig test pits was not granted. In these cases, recent aerial photography, soils data, National Wetlands Inventory (NWI) maps, and a visual survey from accessible locations were used to determine the likely presence or absence of wetlands.

The following data sources were reviewed for information on precipitation, topography, drainage patterns, soils, vegetation, and potential or known wetlands and streams in the project vicinity:

- Natural Resources Conservation Service (NRCS) Climate Data for Clark County, Station Vancouver Pearson AP, Washington (NRCS 2023a) (Appendix B-1 and B-2).
- U.S. Geological Survey topographic maps (USGS 2023) (Figure 3).
- NWI maps (FGDC 2013; USFWS 2017) (Figure 4).
- NRCS, Soil Survey of Clark County Washington (NRCS 2023b) and Washington State Hydric Soils (NRCS 2023c) (Figure 5).
- Clark County Wetland Inventory Map in MapsOnline (Clark County 2023).
- Scientific plant names in this report are from the USACE National Wetland Plant List, version 3.5 (USACE 2020).
- Wetlands of High Conservation Value (DNR 2023a).

The content and structure of this wetlands and stream assessment and report preparation follows WSDOT policy and guidance (WSDOT 2023). Fieldwork for this assessment was completed between March 1, 2023, and March 22, 2023, by IBR Program wetland biologists.

3.1 Wetland Delineation, Classification, Functions, and Buffers

The wetland delineation was conducted pursuant to the parameters detailed in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the 2010 Regional Supplement (USACE

2010). The 1987 Manual and Regional Supplement require evidence of three parameters in order to determine that wetlands occur on a site: wetland hydrology, hydric soils, and hydrophytic vegetation. A detailed description of the 1987 Manual and Regional Supplement methods can be found on the USACE website (current URL: https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4532/).

Data for the IBR Program's Package 1 was collected on March 1 and 22, 2023. The study area was surveyed for wetland hydrology, hydrophytic vegetation, and hydric soils when permission was granted to access parcels. In addition, the NRCS Soil Survey Report of Clark County, Washington was consulted to determine soil types potentially present within the study area (McGee 1972). It should be noted that access was provided to some parcels, but the ability to dig test pits was denied.

Dominant vegetation within the study area was identified using botanical references and classified using the National List of Plant Species That Occur in Wetlands: 1988 National Summary and 1993 Supplement: Northwest (Region 9) (Reed 1988, 1993). All areas where greater than 50 percent of the vegetation was hydrophytic (FAC or wetter) (i.e., grass areas) were further examined for indicators of wetland hydrology.

To meet the wetland hydrology criterion, soils in the study area must be inundated or saturated to the surface for a period in the growing season that is long enough to develop anaerobic conditions (at least 5 percent of the growing season). The growing season in the Portland-Vancouver metro area is approximately 288 days (from February 15 through November 29 [McGee 1972]), and 5 percent of the growing season in the study area is 14 days. The early growing season is generally the best time to assess the hydrology of a study area because inundation or saturation to the surface should be present during this time if the area is a wetland. When data must be collected outside of the early growing season, other primary indicators of wetland hydrology (drainage patterns, water marks, etc.), or two or more secondary indicators of wetland hydrology (oxidized root channels, water-stained leaves), may be used to evaluate wetland hydrology. The wetland delineation was conducted in March during the early growing season and no indicators of wetland hydrology (i.e. standing water, drainage patterns, water marks, etc.) were observed.

This wetland delineation found no areas with 50 percent or more hydrophytic vegetation with positive indicators of wetland hydrology, and no formal sample plots were recorded.

3.2 Stream Delineation, Classification, and Buffers

The ordinary high water mark (OHWM) of the Columbia River within the study area was delineated using USACE guidance for OHWM identification (USACE 2005) and Ecology guidance for OHWM identification for Shoreline Management Act Compliance (Ecology 2016). Fish presence was determined based on available Washington Department of Fish and Wildlife (WDFW) Fish Passage Inventory (WDFW 2023a) and Fish Distribution data (WDFW 2023b).

City of Vancouver stream buffers (City of Vancouver 2023) were applied to the Columbia River in the study area, in conjunction with Washington State Department of Natural Resources (DNR) Forest

Practices Rules, water type classifications (DNR 2023b). Buffer widths totaled 175 feet based on Type S riparian management area and riparian buffer area widths (City of Vancouver 2023).

3.3 Wetland and Stream Boundaries Documentation

Stream OHWM determinations were collected using Esri Field Maps software on a global positioning system (GPS) equipped tablet paired with an Arrow global navigation satellite system receiver mapping grade unit. The on-site stream boundaries extended beyond the study area. Boundaries extending outside of the study area were estimated using available mapping resources and visual observations from accessible areas.

4. EXISTING CONDITIONS

4.1 Landscape Setting

The study area is located along I-5 in southwestern Washington, adjacent to the Columbia River. Figure 1 shows the study area.

Currently, the immediate study area is used as major transportation corridors; commercial, industrial, and residential purposes; and for parks and open spaces. Figure 2 shows the tax lot maps of the study area.

4.1.1 Site Alterations

Mainstem aquatic habitat in the lower Columbia River has been substantially altered from its historic condition by a variety of factors, including basin-wide water management operations, construction, and operation of mainstem hydroelectric projects, and other human practices that have degraded water quality and habitat.

Flood-control measures have been implemented that affect the entire lower river environment. Levees and river embankments were constructed in the early 1900s on both sides of the river, isolating much of the floodplain from all but the highest flows. Later, as the floodplain underwent increased development, elaborate pumping operations were implemented on the Oregon side to prevent overbank flow.

In addition, construction of the mainstem Columbia River dams, culminating in completion of the Bonneville Dam in 1938, effectively regulates flows and limits flooding events. Currently, 23 mainstem and more than 300 tributary dams regulate the flow of the Columbia River to the Pacific Ocean (Bottom et al. 2005).

Increased urbanization and land use changes in the study area over the last century have decreased the number of wetlands in the study area. Transportation corridors and other developments have fragmented historic wetland systems, leaving a few highly constrained systems located outside of the study area. The terrestrial portion of the study area in Washington is predominantly developed with transportation infrastructure, including I-5 in the middle of the study area, SR 14 and the BNSF railroad tracks running east-west, and local surface streets in downtown Vancouver. The other dominant alterations include the commercial and residential structures and associated parking and landscaping associated with downtown Vancouver.

4.1.2 Watershed Description

The Columbia River dominates the landscape of the study area, which lies within the Columbia River watershed (HUC 10-1710030702). Study area elevations vary from approximately 10 feet above mean sea level at the Columbia River to about 60 feet above mean sea level in the northern portion of the study area (Figure 3).

Columbia River/North Slope Watershed

The Interstate Bridge is located at RM 106 of the Columbia River. The Columbia River within the study area has been highly altered by human disturbance. Urbanization extends to the shoreline. There has been extensive removal of historic streamside forests and wetlands. Riparian areas have been further degraded by the construction of dikes and levees and the placement of stream bank armoring. For several decades, industrial, residential, and upstream agricultural sources have contributed to profound water quality degradation in the Columbia River. Additionally, the river receives high levels of disturbance in the form of heavy barge traffic. The Columbia River is a highly managed stream that now resembles a series of slack water lakes upstream of the study area due to existing dams, rather than its original free-flowing state. Within the study area, the Columbia River is more free-flowing because it is below Bonneville Dam; however, the upstream dams are a major factor in downstream water discharge and quality. The second major factor regulating stream flow in the study area is tidal influence from the Pacific Ocean. Although the saltwater wedge does not extend into the study area, high tide events affect flow and stage in the Columbia River up to Bonneville Dam at RM 146.1.

4.2 Climate, Precipitation and Hydrology

4.2.1 Climate

The general climate of the area is described as oceanic, resulting from prevailing westerly air from the Pacific Ocean and the Cascade mountains acting as barriers against the extreme temperature of the interior. West of the Cascades, these features result in mild temperatures year-round with dry summers and frequent winter precipitation. Approximately 70 percent of the annual precipitation occurs from October to March.

4.2.2 Precipitation

Precipitation recorded at the Portland International Airport weather station on March 1 and March 22, 2023, was 0.01 and 0 inches, respectively. Approximately 1.49 inches of rain fell during the two weeks immediately preceding March 1, and approximately 2.55 inches of rain fell during the two weeks immediately preceding March 22. The total precipitation recorded for March 2023 was 5.40 inches. Total precipitation recorded for the water year through March 22 was 29.59 inches (NRCS 2023d).

According to the WETS table for Portland (WETS Station OR6751), average precipitation, based on data collected from 1991 through 2020, is 4.83 inches for March. Average precipitation for the water year recorded during the same time period at the WETS station is 33.82 inches through March (NRCS 2023d).

Precipitation for the year through the March 1 and March 22, 2023, site visits totaled 10.18 inches (Table 4-1). According to the National Oceanic and Atmospheric Administration, this represents 70 percent of the normal amount of rainfall for this period (NRCS 2023d).

Table 4-1. Yearly Precipitation for 2023 (January 1 to March 22, 2023)

Date	Precipitation for Water Year 2023 (inches)	Precipitation Previous 2 Weeks (inches)	Departure from Normal (inches)	Percent of Normal Precipitation
January 1, 2023, to March 22, 2023	10.18	14.64	-4.46	70%

Table 4-1 shows the monthly precipitation data for the three months prior to the site visits using the 30 percent probability range around the average (March 1 and March 22, 2023). Precipitation is below-normal for January and February, and was above-normal for December and March, and was approximately 85 percent of the average for the period. Observations of wetland hydrology were interpreted with below-normal precipitation in mind.

Table 4-2. Monthly Precipitation for Three Months Prior to March 1 and March 22, 2023, Site Visit

Date	Precipitation (inches)	Normal (inches)	Departure from Normal (inches)	Percentage of Normal Precipitation
December 2022	8.62	7.35	1.27	117%
January 2023	3.71	6.36	-2.65	58%
February 2023	2.74	4.74	-2.00	58%
March 1–22, 2023	3.73	3.54	0.19	105%
Totals	18.80	21.99	-3.19	85%

During the 14-day period starting March 8, 2023, and including the March 22 site visit, precipitation was 2.55 inches, which was 0.22 inches more than the normal amount of rainfall for that period according to the NRCS (NRCS 2023a).

4.2.3 Growing Season

According to the WETS table for Portland (WETS Station OR6751), the growing season is from February 15 until November 29, which is 288 days. The field work occurred in March 2023 and therefore was completed during the growing season.

4.3 Mapped Wetlands and Waters

The NWI identifies the Columbia River as a riverine tidal, unconsolidated bottom, permanent-tidal (R1UBV) system (Figure 4). No other wetlands or surface waters are mapped within the study area.

4.4 Mapped Soils

Soils mapped within the Washington portion of the study area include Fill land (Fn); Lauren gravelly loam, 0 to 8 percent slopes (LgB); Lauren gravelly loam, 8 to 20 percent slopes (LgD); and Water (W) (Figure 5). None of these soils are mapped as hydric soils. Below are excerpts from the Clark County Soil Survey of each mapped soil type (McGee 1972; USDA NRCS 2023b).

- **Fill Land (Fn) –** Fill land consists of nearly level areas that have been filled artificially with earth, trash, or both, and then smoothed over. It occurs most commonly in and around Vancouver, Camas, and Washougal. Large areas along the Columbia River waterfront have been filled in by dredging of sand and silt from the river. These areas do not have any clearly defined soil characteristics. Urban development is the primary use.
- **Lauren gravelly loam, 0 to 8 percent slopes (LgB) –** This soil occurs on terraces. The slopes are generally less than 4 percent and approach 8 percent only along the terrace breaks. In a typical profile, the surface layer is very dark brown gravelly and very gravelly loam about 20 inches thick. Below the surface layer is friable, dark-brown very gravelly loam about 13 inches thick. The next layer is dark-brown very gravelly coarse sandy loam about 11 inches thick. The underlying material, to a depth of 70 inches, is dark-brown very gravelly loam coarse sand. The soil is somewhat excessively drained and easily tilled. Surface runoff is slow, and erosion hazard is slight.
- **Lauren gravelly loam, 8 to 20 percent slopes (LgD) –** This soil is along edges of terraces. It is similar to Lauren gravelly loam, 0 to 8 percent slopes, except that the surface layer is 1 to 2 inches thinner. The slopes are short, surface runoff is medium, and the erosion hazard is moderate.

4.5 Vegetation

The study area in Washington includes part of downtown Vancouver, the I-5 corridor, and a portion of the SR 14 corridor east of I-5. The study area is predominantly urban, with some landscaped park areas containing ornamental trees, shrubs, and herbs. Dominant vegetation in the riparian and other landscaped areas present in the Washington portion of the study area includes cottonwood (*Populus balsamifera* - FAC), false indigo bush (*Amorpha fruticose* - FACW), tree of heaven (*Ailanthus altissima* - FACU), Douglas fir (*Pseudotsuga menziesii* - FACU), vine maple (*Acer circinatum* - FACU), Himalayan blackberry (*Rubus armeniacus* - FAC), tall fescue (*Schendonorus arundinaceus* - FAC), spreading bentgrass (*Agrostis stolonifera* - FAC), Queen Anne's lace (*Daucus carota* – UPL), Canadian thistle (*Cirsium arvense* – FAC), English ivy (*Hedera helix* – FACU), and mowed grasses.

5. RESULTS

5.1 Wetlands

During the wetland and waters delineation, no wetlands were delineated within the study area. There were no areas that demonstrated all three wetland characteristics—i.e., wetland hydrology characteristics, a dominance of hydrophytic vegetation, and hydric soil indicators. Photographs of the study area are shown in Appendix C.

5.2 Streams

5.2.1 Columbia River

During the wetlands and waters delineation, the OHWM of the Columbia River was identified and demarcated within the study area. The OHWM determination used a combination of field indicators, including a break in topography and a distinct stain line on the hardened stream bank. Above the OHWM, vegetation includes red alder (*Alnus rubra* -FAC), scouring rush (*Equisetum hyemale* - FACW), ocean spray (*Holodiscus discolor* - FACU), and swordfern (*Polystichum munitum* - FACU). Below the OHWM, vegetation includes false indigo bush. The distribution of vegetation was also used as a determining factor. Figure 6 shows the surveyed OHWM boundary within the study area. Photographs of the OHWM are shown in the Photo Log in Appendix C.

Additionally, the USACE establishes ordinary high water elevations for the purpose of determining limits of jurisdiction under Section 10 of the Rivers and Harbors Act. The ordinary high water elevation for river mile 106 is 15.8 feet Columbia River Datum, 17.59 feet National Geodetic Vertical Datum of 1929 (NGVD-29), and 21.04 feet North American Vertical Datum of 1988 (NAVD-88).

The Columbia River flows from east to west through the study area, and ultimately drains to the Pacific Ocean. It is the primary hydrologic feature of the study area and is considered a traditional navigable water. The dominant substrate within the Columbia River at this location is silt, sand, and small gravel. The riverbank has also been hardened in most locations with concrete walls, concrete rubble, and evidence of excess concrete poured over the bank during various past construction projects.

The Columbia River meets the criteria for a Type S (shoreline of the state) stream type (Washington Administrative Code [WAC] 222-16-031(3)(i)(A)) as defined by the DNR. The river is classified as permanently flooded riverine, freshwater tidally influenced, unconsolidated bottom deepwater habitat (R1UBV) system by the Cowardin system (Cowardin et al. 1979) and is a Ninth-order stream.

6. REGULATORY REVIEW

6.1.1 Streams

The USACE regulates the Columbia River at the federal level as a water of the United States, and Ecology and the WDFW regulate the river at the state level as a water of the State and shoreline of the State (Type S).

In addition, the Columbia River within the study area is subject to the City's critical areas protection ordinance (Vancouver Municipal Code [VMC] Chapter 20.740). The fish and wildlife habitat conservation section of the ordinance (VMC 20.740.110) designates, classifies, and protects fish and wildlife habitat areas. The ordinance establishes protective buffers associated with streams and specifies that certain permits or approvals be obtained for projects containing streams or their respective buffers.

Fish and wildlife habitat conservation areas are defined in Section 20.740.110(A) of the VMC as:

- Habitat used by any life stage of federally designated endangered, threatened, or sensitive fish or wildlife species
- Priority Habitats and areas associated with Priority Species as defined by WDFW
- Waterbodies, including lakes, streams, rivers, and naturally occurring ponds.
- Habitats of Local Importance—areas designated by the City to be of local significance that are not designated as state Priority Habitats.
- Riparian Management Area (RMAs) and Riparian Buffer (RB).

Accordingly, the Columbia River is classified as habitat that is used by federally designated endangered, threatened, and sensitive fish species (i.e., coho, steelhead, sturgeon, etc.), is mapped as a priority habitat by WDFW, and is a waterbody, and the land adjacent to the stream would be classified as RMA and RB by the City.

6.1.2 Riparian Management Area and Riparian Buffers

As mentioned above, the Columbia River meets the definition of a Type S (Shoreline of the state) river as mapped by DNR. VMC 20.740.110(A)(1)(e)(1) defines the RMA for Type S streams as land 100 feet from the OHWM while the RB extends an additional 75 feet landward from the RMA. The combination results in a protective buffer of 175 feet along the Columbia River. Table 6-1 summarizes the classifications, ratings, and buffer widths applicable to the Columbia River.

Table 6-1. Stream and Riparian Summary

Stream	Stream Classification	Buffer Width[d] (feet)
Columbia River	• Cowardin[a] – R1UBV • Stream Order[b] – 9 • Stream Type[c] – S	175

Notes:

a Cowardin et al. (1979) or NWI class: R1UBV = Riverine, Tidal, Unconsolidated Bottom, Permanently Flooded

b Strahler stream ordering system (Strahler 1952)

c DNR stream classification system (WAC 222-16)

d Based on VMC 20.740.110

7. LIMITATIONS

This wetland and stream delineation report documents the investigation, best professional judgment, and conclusions of the IBR Program based on the site conditions encountered at the time of this study. The wetland and stream delineation was performed in compliance with accepted standards for professional wetland biologists and applicable federal, state, and local laws and ordinances, and WSDOT policies and guidance. The information contained in this report is correct and complete to the best of our knowledge. It should be considered a preliminary jurisdictional determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities. The final determination of wetland and OHWM boundaries, classification, and other pertinent regulatory determinations will be made by local, state, and federal agencies with jurisdiction.

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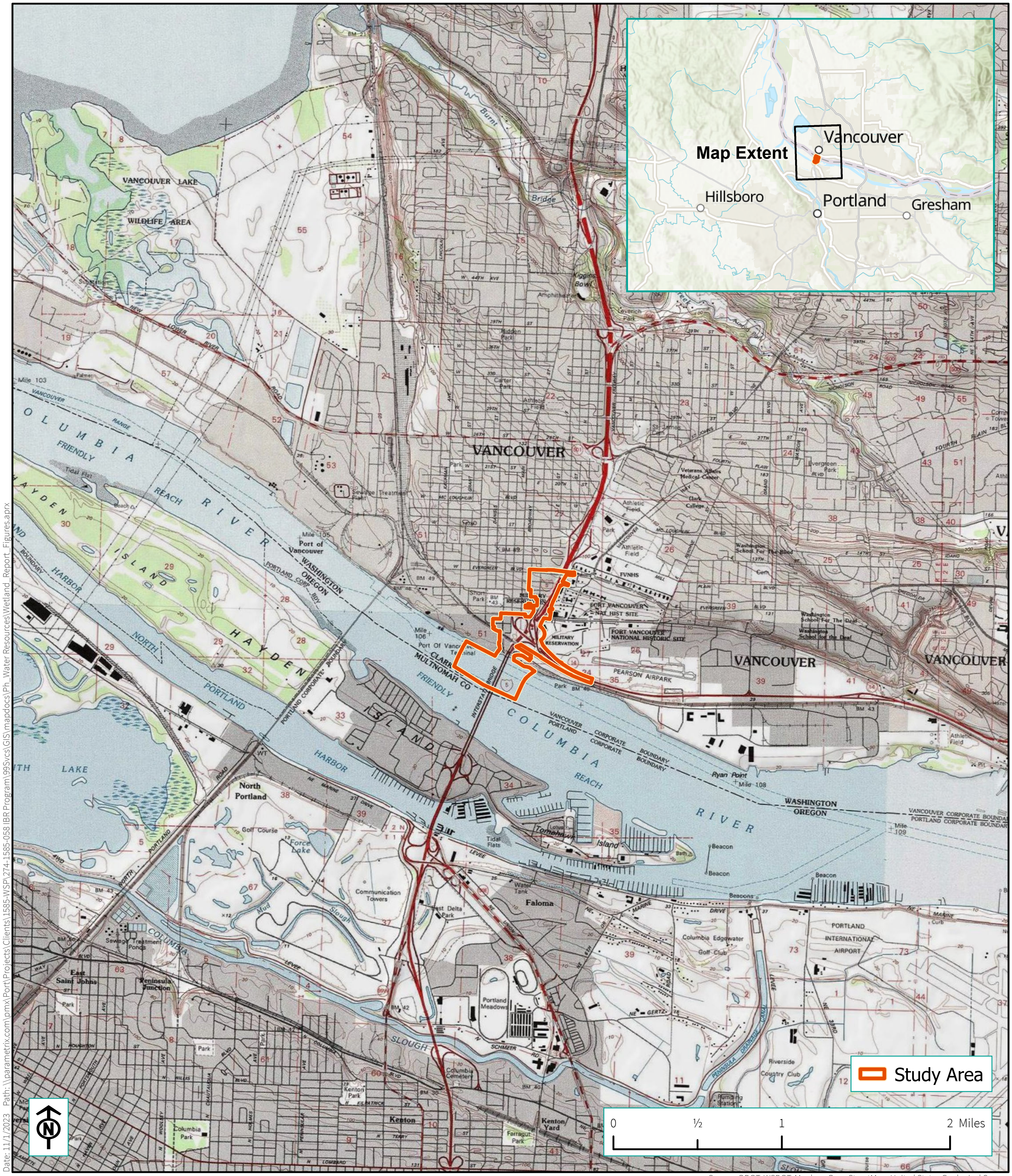
APPENDIX A. FIGURES

Interstate BRIDGE Replacement Program

Figure 1
Project Location



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Source: ODOT, WSDOT, Mapbox, OpenStreetMap, United States Geological Survey

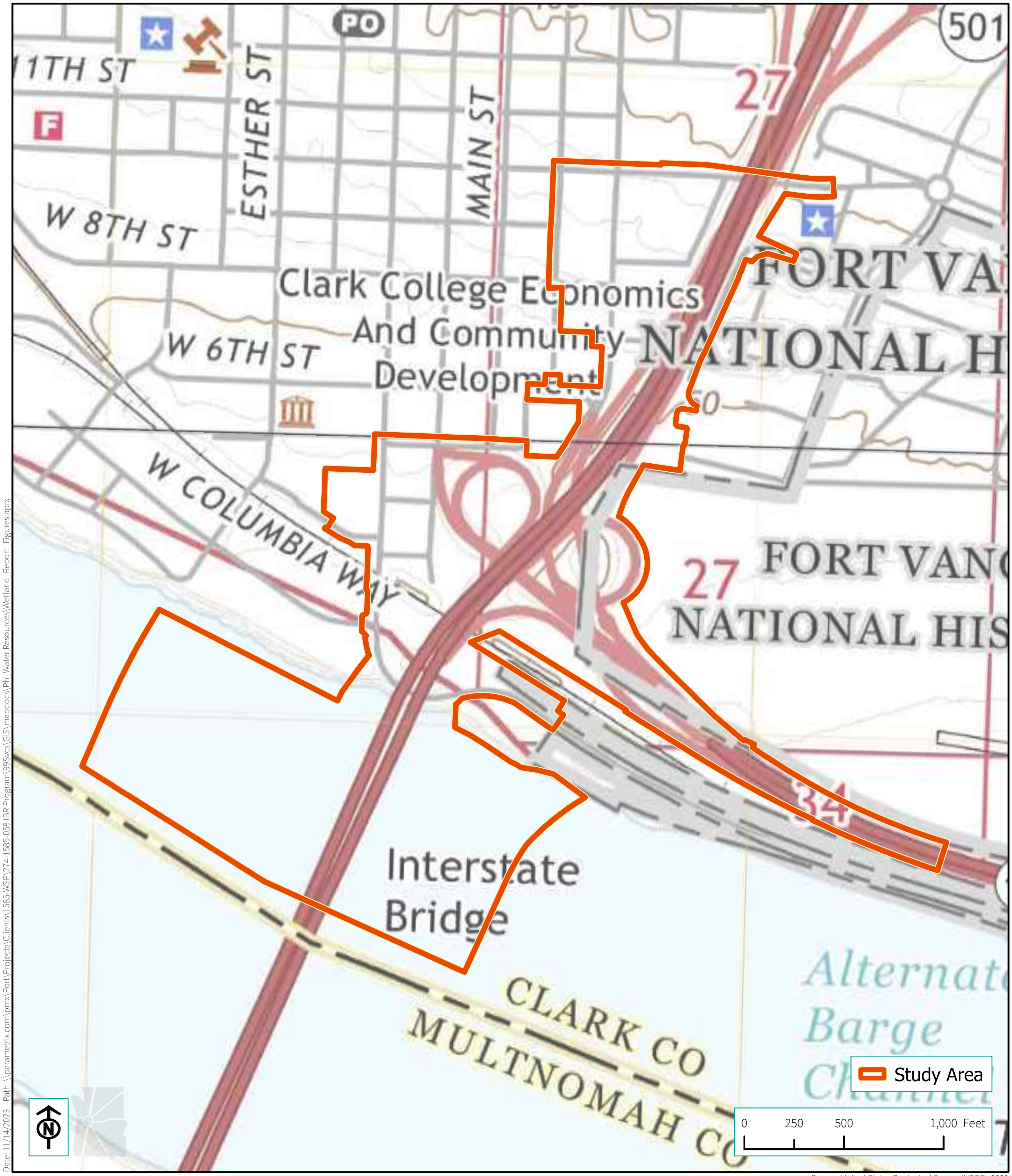
Interstate BRIDGE Replacement Program

Figure 2
Tax Lot Map

Date: 11/14/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

Source: ESRI, Clark County

Figure 3
USGS Topographic Map



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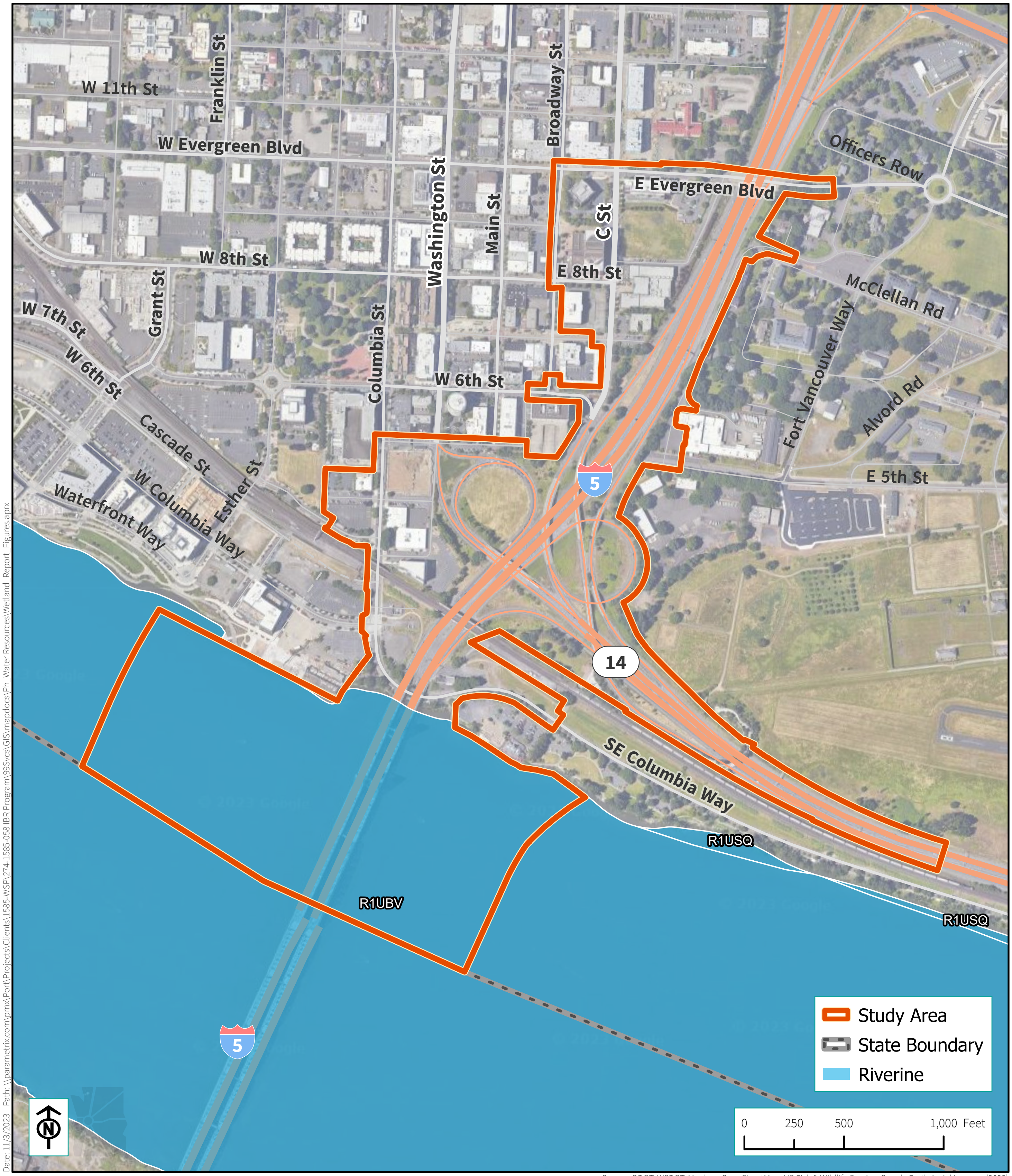
Source: United States Geological Survey (USGS), 2020

Interstate BRIDGE Replacement Program

Figure 4
NWI Wetlands



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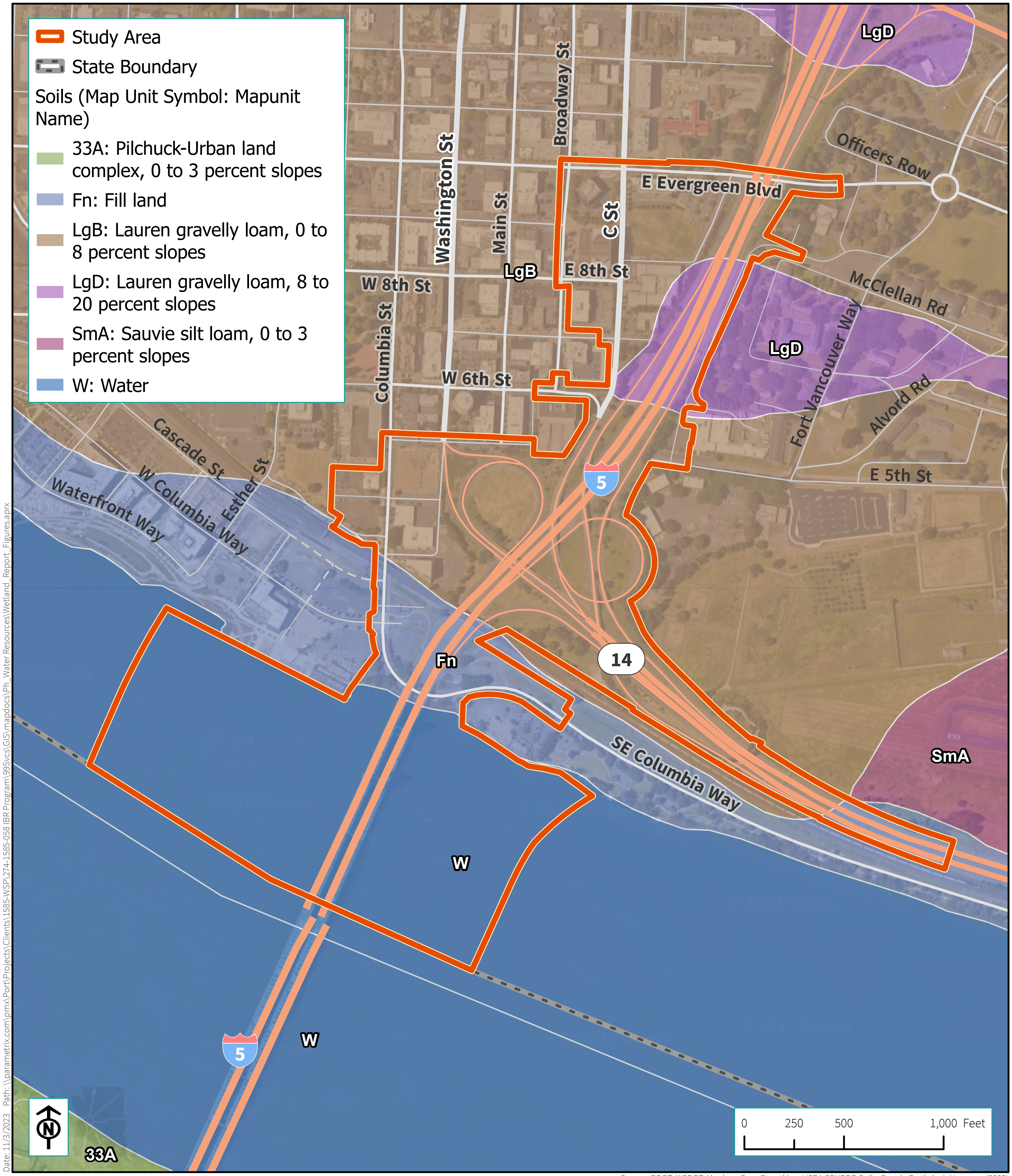
Source: ODOT, WSDOT, Mapbox, OpenStreetMap, US Fish & Wildlife Service, Google Earth Aerial Imagery (2022)

Interstate BRIDGE Replacement Program

Figure 5
Soils

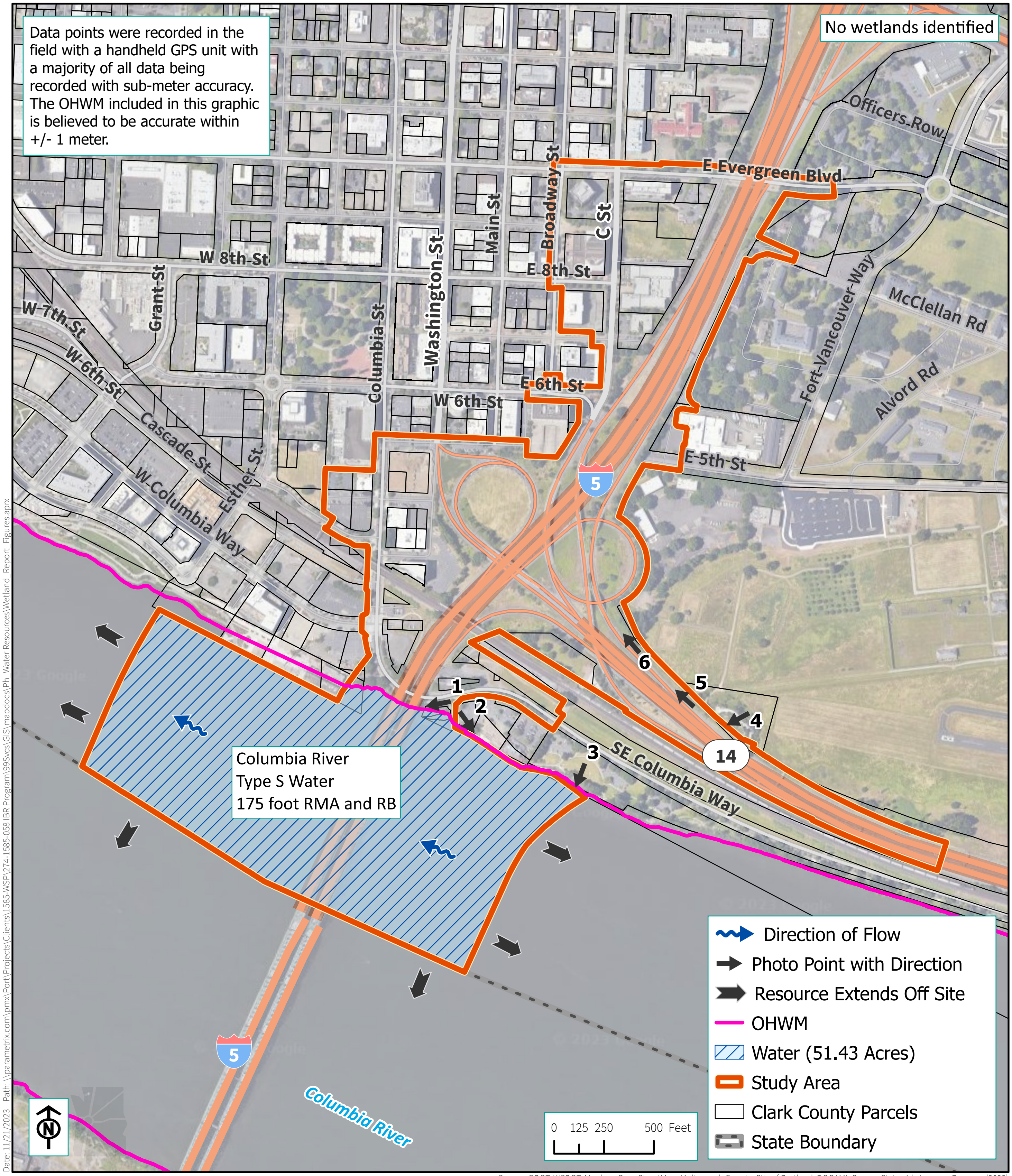


Source: ODOT, WSDOT, Mapbox, OpenStreetMap, USDA SSURGO Soils, Google Earth Aerial Imagery (2022)

Date: 11/3/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

Interstate BRIDGE Replacement Program

Figure 6
Delineated Resources



Source: ODOT, WSDOT, Mapbox, OpenStreetMap, Multnomah County, City of Portland, DOGAMI, Oregon Statewide Imagery Program (2022)

Date: 11/21/2023 Path: \\parametrix.com\pmx\Port\Projects\Clients\1585-WSP\274-1585-058 IBR Program\99Svcs\GIS\mapdocs\Ph_Water Resources\Wetland_Report_Figures.aprx

APPENDIX B. BACKGROUND INFORMATION

Appendix B-1. Comparison of Observed and Normal Precipitation

The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in Engineering Field Handbook (NRCS 2015)[1] to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. The following table shows this information.

Monthly Precipitation Data for Portland International Airport, Oregon

	Month	3 yrs. in 10 less than[a]	Average[a]	3 yrs. in 10 more than[a]	Rain fall[a]	Condition dry, wet, normal[b]	Condition Value	Month weight value	Product of previous two columns
1st prior month	February	2.50	3.73	4.47	2.49	Dry	1	3	3
2nd prior month	January	3.22	5.01	6.03	3.34	Dry	1	2	2
3rd prior month	December	4.08	5.85	6.95	7.76	Wet	3	1	3
								Sum	**8**

[a] NRCS 2023d

[b] Conditions are considered normal if they fall within the low and high range around the average.

Note: <u>If sum is</u>

If sum is		Condition value:	
6–9	then prior period has been drier than normal	Dry (D)	= 1
10–14	then period has been normal	Normal (N)	= 2
15–18	then period has been wetter than normal	Wet (W)	= 3

Conclusions: Drier than normal precipitation conditions were present prior to the March 1, 2023, field visit.

[1] Natural Resources Conservation Service (NRCS). 2015. Part 650 Engineering Field Handbook National Engineering Handbook: Chapter 19 – Hydrology tools for Wetland Identification and Analysis. 210–VI–NEH, Amend. 75, September 2015. Available: <https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=37808.wba> Accessed November 17, 2023.

Appendix B-2. Daily Precipitation for 10 Days Preceding Fieldwork, Vancouver, Washington

To determine if light, moderate, or heavy precipitation occurred in the 10 days prior to field work, the 10-day total is compared to 1/3 of the monthly average precipitation for the month evaluated (NRCS 2023d).

Daily precipitation data preceding the March 1, 2023, and March 22, 2023, field visits for Portland International Airport, Oregon

Date (2023)	Daily Precipitation (inches)[a]	Date (2023)	Daily Precipitation (inches)[a]
February 28	0.18	March 21	0.00
February 27	0.18	March 20	0.14
February 26	0.39	March 19	0.21
February 25	0.00	March 18	0.00
February 24	0.00	March 17	0.00
February 23	T	March 16	0.00
February 22	0.84	March 15	0.03
February 21	0.07	March 14	0.00
February 20	0.08	March 13	1.19
February 19	T	March 12	0.23
Sum	**1.74**	**Sum**	**1.8**

[a] NRCS 2023d

"T" values indicate a trace value was recorded.

Conclusions:

- Moderate to heavy precipitation was recorded in the 10 days preceding March 1, 2023, field work.
- Moderate to heavy precipitation was recorded in the 10 days preceding the March 22, 2023, field work.

APPENDIX C. PHOTO LOG

Photosheet		
Photo No.	Date	
1	March 1, 2023	
View of the OHWM of the Columbia River under the Interstate Bridge in Washington.		
Photo No.	Date	
2	March 1, 2023	
View of the OHWM of the Columbia River west of the Interstate Bridge.		

Interstate BRIDGE Replacement Program

Photo No.	Date
3	March 1, 2023

View of the OHWM at the east end of the study area along Columbia River.

Photo No.	Date
4	March 1, 2023

Vancouver Land Bridge over State Route 14, north of State Route 14 facing southwest.

Photo No.	Date
5	March 1, 2023

North of eastbound State Route 14, facing west.

Photo No.	Date
6	March 1, 2023

View of upland area east of Interstate 5 Exit 1B off-ramp to downtown, facing northwest.