SUMMARY

The following summarizes information from the Interstate Bridge Replacement (IBR) Program Draft Supplemental Environmental Impact Statement (SEIS), including Program background, the transportation problems the Program seeks to fix, the Modified Locally Preferred Alternative (LPA), and the key benefits and impacts. It concludes with a brief discussion of the next steps and methods by which the public can continue to be involved in the Program.

What is the IBR Program?

The IBR Program updates and supplements the Interstate 5 (I-5) Columbia River Crossing (CRC) project (approved in 2011) and focuses on a 5-mile corridor that includes bridge, transit, active transportation, and highway improvements to address safety and mobility in the I-5 corridor between Portland, Oregon, and Vancouver, Washington (Figure 1).

I-5 is the main, and only continuous, north-south interstate highway on the west coast, linking the United States, Canada, and Mexico. In the Vancouver-Portland metropolitan region, I-5 and I-205 are the only two roadway crossings of the Columbia River and the major north-south highways that provide interstate connectivity and mobility. While the I-205 crossing provides important connectivity for the region, I-5 directly connects the central cities of Vancouver and Portland.

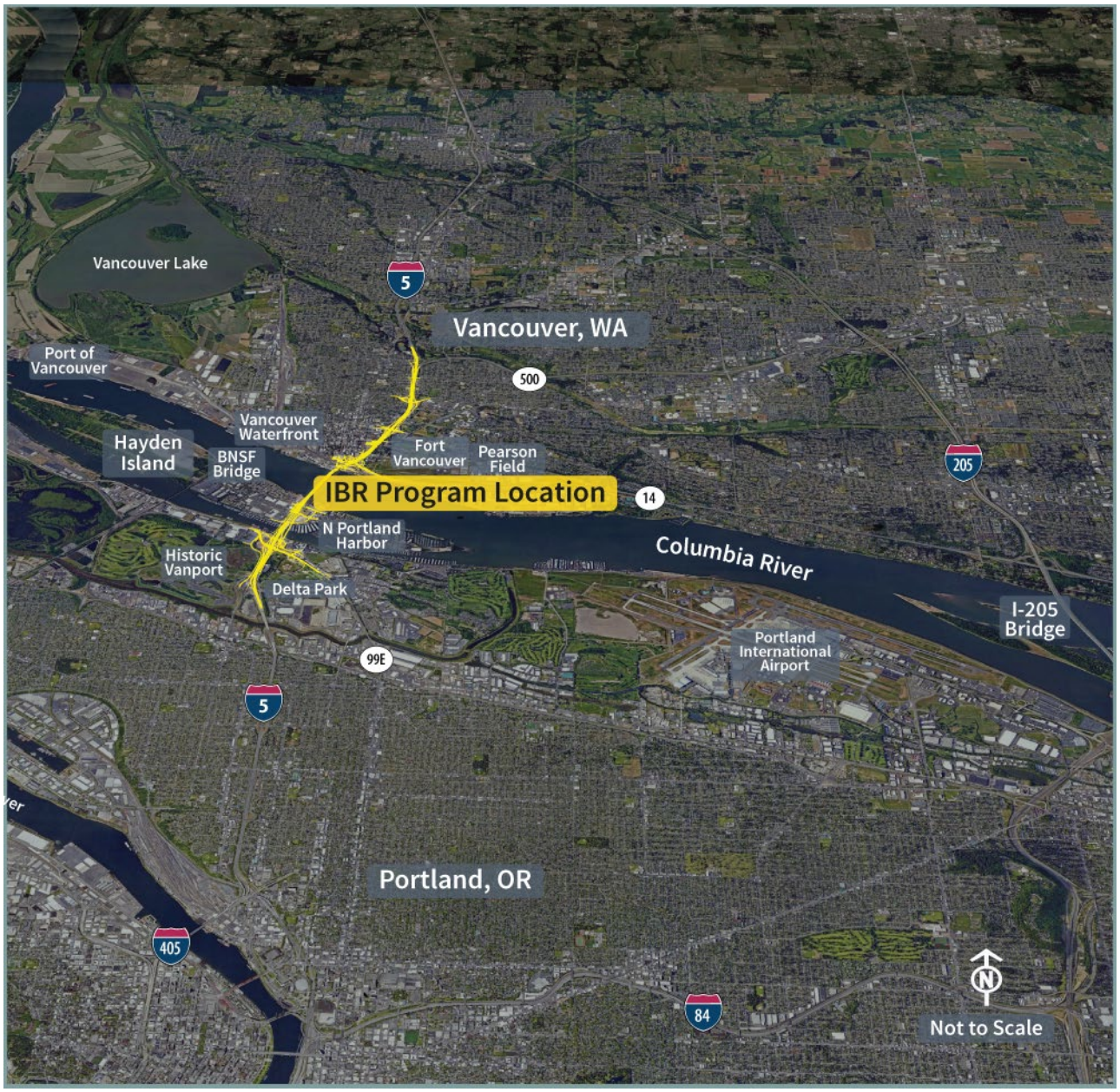
The 5-mile section of I-5 between State Route (SR) 500/39th Street in Vancouver and Columbia Boulevard in Portland heavily influences the traffic conditions of I-5 crossing over the Columbia River. This section includes seven interchanges that connect three state highways and several major arterial roadways. These interchanges serve a variety of land uses and provide access to downtown Vancouver, two international marine ports, industrial centers, residential neighborhoods, retail centers, and recreational areas.

Highway users and transit service within the IBR Program study area are currently constrained by outdated, substandard highway design features, traffic congestion that increases travel times, and the frequency of crashes that reduce reliability for vehicles and buses traveling between Vancouver and Portland. Additionally, to access light-rail transit (LRT), users traveling to Portland from Hayden Island or Vancouver have to transfer from buses, or walk, bike or drive to nearby park and rides/transit centers at Expo or Delta Park.

Who is leading the IBR Program?

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) are the federal lead agencies. Both agencies must comply with the National Environmental Policy Act (NEPA), including the publication of this Draft SEIS, as well as a Final SEIS, before they approve or provide funding to construct the improvements. Following the Final SEIS, FTA and FHWA will sign a Record of Decision (ROD) that will identify the preferred modified design of the selected alternative. The ROD for the Program will supplement the existing ROD for the CRC project that was signed in 2011 (CRC 2011a). The ROD will describe the measures needed to mitigate unavoidable environmental effects, as well as a monitoring and enforcement program to ensure that the mitigation measures are carried out effectively. By signing the ROD, FTA and FHWA are affirming that federal regulations have been met, thereby allowing the Program to proceed with property acquisitions and the final design of the selected alternative.

Figure 1. IBR Program Area Map



State transportation agencies and local governments in the Vancouver–Portland region have joined to develop a strategy for addressing highway, freight, transit, bicycle, and pedestrian needs, and to understand the importance of marine navigation on the Columbia River and North Portland Harbor and protected airspace for Pearson Field and Portland International Airport. The nonfederal joint lead agencies include the Oregon Department of Transportation (ODOT); Washington State Department of Transportation (WSDOT); local transit agencies Tri-County Metropolitan Transportation District (TriMet) and Clark County Public Transportation Benefit Area (C-TRAN); and regional metropolitan planning organizations Oregon Metro (Metro) and the Southwest Washington Regional Transportation Council (RTC). These nonfederal joint lead agencies, together with the Cities of Vancouver and Portland and Ports of Vancouver and Portland, comprise the state and local partner agencies that make-up an Executive Steering Group leading the Program. WSDOT also serves as the lead agency for the Washington State Environmental Policy Act review process.

WSDOT and ODOT are leading the preliminary highway design and Program management according to their respective Federal-State Stewardship & Oversight agreements with FHWA. TriMet and C-TRAN are leading the preliminary transit design and would operate the transit elements of the Program. Metro and RTC maintain the regional and metropolitan transportation plans that would include the Modified LPA for the IBR Program. The Program improvements are within the city limits of both Portland and Vancouver[1] and would connect to the local street networks in both cities. Therefore, the Cities of Portland and Vancouver have special expertise on city facilities and operations as well as local permitting authority over some elements of the Program. The Ports of Portland and Vancouver provide special expertise on regional and local freight movement, in particular, along Marine Drive, Mill Plain Boulevard, and Fourth Plain Boulevard.

Other state and federal agencies, tribes, and community partners are also participating in technical, regulatory, or advisory roles and government-to-government consultation.

The Program has worked with many other local, state, and federal agencies and tribes as well as many private and public community partners during the planning and development of this Program. Details on agency coordination and public involvement can be found in Appendices A and B.

How does the IBR Program build on prior studies and the CRC project?

Regional leaders identified the need to address the I-5 corridor, including the Interstate Bridge, through previous bistate, long-range planning studies. Transportation deficiencies in the IBR Program corridor have been evaluated for more than two decades. Prior studies identified a variety of transportation mobility and safety problems (for additional details on this work, see the CRC Final Environmental Impact Statement (EIS) [CRC 2011b]). For additional details on prior studies and their findings, as well as the development of the Purpose and Need statement, see Chapter 1 of the *Interstate 5 Columbia River Crossing Project Final Environmental Impact Statement and Final Section 4(f) Evaluation* (CRC 2011b).

The CRC project was active between 2005 and 2014. The Purpose and Need statement for the CRC project was developed by the CRC Task Force[2] and the joint lead agencies.[3] During the screening process for the CRC project, over 70 transportation components were screened to identify those that could meet the Purpose and Need. The components that passed the screening were packaged into a range of alternatives and were evaluated in the CRC Draft EIS, with an LPA identified and evaluated in the 2011 Final EIS and selected in the 2011 ROD. Subsequently, the selected alternative was modified by two signed re-evaluations (one in 2012 that raised the maximum vertical navigation clearance of the bridge from 95 feet to 116 feet and a second in 2013 that evaluated a phased construction approach). The CRC Selected Alternative identified in the 2011 ROD, as revised by the 2012 and 2013 re-evaluations, is referred to as the "CRC LPA." While the CRC project successfully completed the NEPA environmental review process when FHWA and FTA issued the ROD in 2011 it did not secure adequate state funding to advance to construction and was discontinued in 2014.

Recognizing that regional transportation issues and necessary improvements to the Interstate Bridge remained unaddressed, on November 18, 2019, Oregon Governor Kate Brown and Washington Governor Jay Inslee signed the Oregon-Washington Memorandum of Intent on Replacing the I-5 Bridge over the Columbia River to express interest in restarting the project. Also in 2019, a bistate legislative committee requested that ODOT and WSDOT restart the CRC project, now called the IBR Program.

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[1] Improvements at the Ruby Junction Maintenance Facility would be located in the City of Gresham.

[2] The CRC Task Force was a 39-member group formed in 2005 comprising leaders that represented a broad cross section of Washington and Oregon communities. Public agencies, businesses, civic organizations, maritime industries, neighborhoods, and freight, commuter, and environmental groups were represented on the task force. The group met 23 times over the course of the project development phase to advise the CRC project team and provide guidance and recommendations at key decision points. The task force concluded its work in summer 2008 after making its recommendation on the locally preferred alternative.

[3] FHWA, FTA, ODOT, WSDOT, Metro, RTC, TriMet, and C-TRAN.

As part of the NEPA process, in early 2021 the IBR Program began working with regional and local partner agencies and the public to review the Purpose and Need that was adopted for the CRC project. The IBR Program brought the Purpose and Need statement to partner agencies and the Program's three advisory groups to discuss the transportation needs identified for the CRC project. These transportation needs were also brought to the public for comment during an online open house, virtual community briefings, and an online survey. In mid-2021, the Program announced that these efforts validated that the six transportation needs identified in the CRC Purpose and Need statement still exist today, and that the values identified in the Vision and Values document remain community values. **Thus, the Purpose and Need statement for the IBR Program remains the same as documented in the 2011 Final EIS and 2011 ROD for the CRC project.**

Using the CRC LPA as its the baseline, or starting point, the IBR Program restarted and began evaluating whether past design assumptions still addressed today's changed conditions, including physical environment, community priorities, and regulations, or whether updates would be needed. In 2021, the IBR Program prepared a NEPA re-evaluation to assess the extent of changes in conditions and determine whether the previously approved Final EIS and ROD are still valid for a federal action or need to be updated with current conditions and changes in design. FHWA and FTA determined a Supplemental EIS (SEIS) should be prepared to identify and disclose new adverse impacts and mitigation associated with changes in conditions that occurred since 2013 (IBR 2021).

What problems does the IBR Program seek to fix?

As noted above, the Purpose and Need statement for the IBR Program, provided below, remains the same as documented in the 2011 Final EIS and 2011 ROD for the CRC project.

The text of the Purpose and Need has not been edited from its original wording, except for references to the name of the Program. More recent data and supplemental information are provided in sidebars and footnotes.[4]

In 2005, 280,000 vehicle trips crossed the Columbia River daily (northbound and southbound) in the Portland-Vancouver metropolitan region, of which 134,000 used the Interstate Bridge. By 2019, the total number of vehicle trips that crossed the Columbia River had increased to 313,000 per day, of which 143,400 used the Interstate Bridge.

Vehicle trips include those made in single-occupancy vehicles, high-occupancy vehicles, trucks, and transit vehicles (buses).

The **purpose** of the proposed action is to improve I-5 corridor mobility by addressing present and future travel demand and mobility needs in the Program area. The Program area extends from approximately Columbia Boulevard in the south to SR 500 in the north. Relative to the No-Build Alternative, the proposed action of the IBR Program is intended to achieve the following objectives: (a) improve travel safety and traffic operations on the I-5 river crossing and associated interchanges; (b) improve connectivity, reliability, travel times, and operations of public transportation modal alternatives in the Program area; (c) improve highway freight mobility and address interstate travel and commerce needs in the Program area; and (d) improve the I-5 river crossing's structural integrity (seismic stability).

The specific **needs** to be addressed by the proposed action of the IBR Program are addressed in the following subsections.

[4] Transportation data provided in the sidebars are from the IBR Transportation Technical Report. Due to the influence of the COVID-19 pandemic on travel patterns between 2020 and 2023, the IBR Program is following industry standards and using 2019 as the baseline year for the existing conditions section of this SEIS. The exception to using 2019 data is outputs from the Metro/RTC regional travel demand model which are from 2015. Metro and RTC had not yet updated their base-year model from 2015 to 2020 when this analysis was completed.

Growing travel demand and congestion

The duration of congestion on the Interstate Bridge roughly doubled from 2005 to 2019. In 2019, the I-5 corridor experienced heavy congestion and delay in both directions lasting up to almost 12 hours daily (compared with 4 to 6 hours daily in 2005).

Daily traffic demand over the I-5 Interstate Bridge is projected to increase by more than 25% by 2045.

Existing travel demand exceeds capacity in the Interstate Bridge and associated interchanges. This corridor experiences heavy congestion and delay lasting 4 to 6 hours daily[5] during the morning and afternoon peak travel periods and when traffic crashes, vehicle breakdowns, or bridge lifts occur. Due to excess travel demand and congestion in the I-5 corridor, many trips take the longer, alternative I-205 route across the Columbia River. Spillover traffic from I-5 onto parallel arterials such as Martin Luther King Jr. Boulevard and Interstate Avenue increases local congestion. In 2005, the two crossings[6] carried 280,000 vehicle trips across the Columbia River daily. Daily traffic demand over the Interstate Bridge is projected to increase by more than 35% during the next 20 years, with stop-and-go conditions increasing to approximately 15 hours daily if no improvements are made.

Impaired freight movement

I-5 is part of the National Truck Network, and the most important freight highway on the West Coast, linking international, national, and regional markets in Canada, Mexico, and the Pacific Rim with destinations throughout the western United States. In the center of the Program area, I-5 crosses over the Columbia River's deep-water shipping and barging channels and two river-level, transcontinental rail lines. The Interstate Bridge provides direct and important highway connections to the Port of Vancouver and Port of Portland facilities located on the Columbia River, as well as the majority of the area's freight consolidation facilities and distribution terminals. Freight volumes moved by truck to and from the area are projected to more than double over the next 25 years. Vehicle-hours of delay on truck routes in the Portland-Vancouver area are projected to increase by more than 90% over the next 20 years. Growing demand and congestion will result in increasing delay, costs, and uncertainty for all businesses that rely on this corridor for freight movement.

In 2019, more than 14,000 freight trips carrying over $132 million in commodities traveled across the I-5 Interstate Bridge each weekday. Freight volumes moved by truck, to and from the area, are projected to increase by 50 to 75% by year 2045.

Deficiencies such as narrow lanes and shoulders, as well as short merging, diverging, and weaving distances, reduce the efficiency and safety of freight truck movement.

[5] The hours of congestion refers to the total number of hours that the corridor experiences congestion. During the CRC project, congestion was defined as occurring when travel speeds were below 35 mph. ODOT and WSDOT are in the process of refining the definition of congestion with congestion occurring when speeds are below 45 miles per hour and severe congestion when speeds are below 35 miles per hour. Therefore, the IBR Program has defined congestion as speeds below 45 miles per hour.

[6] The two crossings are the I-5 Interstate Bridge and the I-205 Glenn Jackson bridge.

Limited public transportation operation, connectivity, and reliability

Due to limited public transportation options, a number of transportation markets are not well served. The key transit markets include trips between Portland Central City and the city of Vancouver and Clark County, trips between north/northeast Portland and the city of Vancouver and Clark County, and trips connecting the city of Vancouver and Clark County with the regional transit system in Oregon. Current congestion in the corridor adversely impacts public transportation service reliability and travel speed. Southbound bus travel times across the bridge are currently up to three times longer during parts of the AM peak compared to off-peak. Travel times for public transit using general purpose lanes on I-5 in the Program area are expected to increase substantially by 2030.

In 2005, southbound bus travel times across the bridges were up to three times longer during parts of the AM peak (i.e., morning high traffic period) than during off-peak times. As of 2019, bus travel times were four times longer during the AM peak.

If the bridges are not replaced, travel times for public transit using general-purpose lanes on southbound I-5 during the AM peak are expected to increase by 2045 because of increased congestion.

Safety and vulnerability to incidents

The Interstate Bridge and its approach sections experience crash rates more than two times higher than statewide averages for comparable facilities. Incident evaluations generally attribute these crashes to traffic congestion and weaving movements associated with closely spaced interchanges and short merge distances. Without breakdown lanes or shoulders, even minor traffic accidents or stalls cause severe delay or more serious accidents (Figure 2).

In 2005, the Interstate Bridge and its approach sections experienced crash rates more than two times higher than statewide averages for comparable facilities. As of 2019, crash rates were three times higher than statewide averages for comparable facilities. Crashes in the IBR Program area could increase by almost 30% by 2045 if no improvements are made.

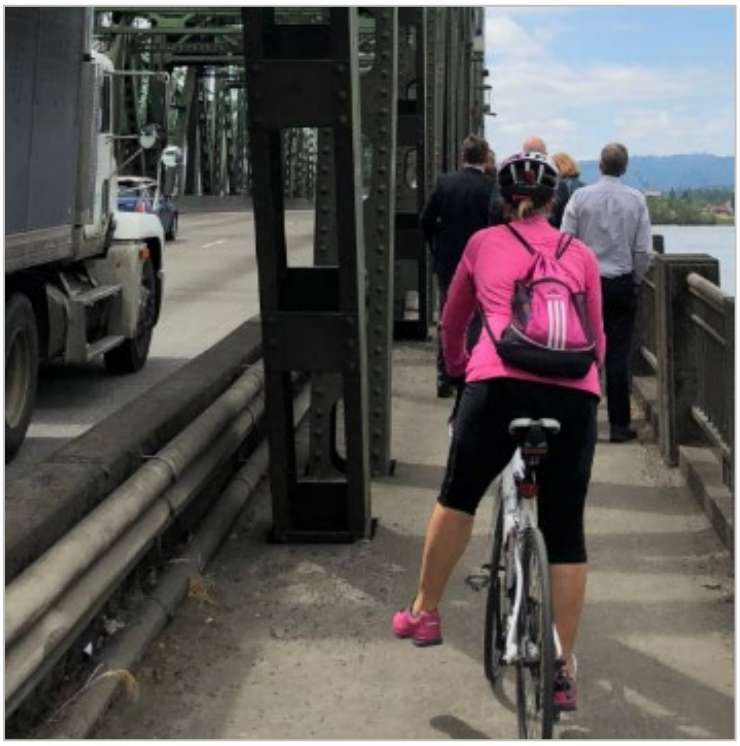
There were seven fatal crashes in the Program area between 2015 and 2019.

Figure 2. Crash Blocking the Interstate Bridge

Substandard bicycle and pedestrian facilities

The bicycle/pedestrian lanes on the Interstate Bridge are about 3.5 to 4 feet wide, narrower than the 10-foot standard, and are located extremely close to traffic lanes, thus impacting safety for pedestrians and bicyclists (Figure 3). Direct pedestrian and bicycle connectivity are poor in the Program area.

Figure 3. Bicycle and Pedestrian Path on the Interstate Bridge



Compliance with the Americans with Disabilities Act (ADA) varies for the existing shared-use paths. The paths comply with the maximum gradient (4.7%) and there are no objects that overhang or protrude into the paths. However, the paths do not comply with guidelines for curb ramps (both in number and design), width, passing spaces, cross slope, or railing height (FHWA 2001; U.S. Access Board 2013). The paths are also near traffic lanes; this increases bicyclist and pedestrian exposure to vehicular traffic, noise, and emissions.

Seismic vulnerability

The existing Interstate Bridge is located in a seismically active zone. It does not meet current seismic standards and is vulnerable to failure in an earthquake.

All new federally funded highway bridges are required to be designed to the current edition of the American Association of State Highway and Transportation Officials Guide Specifications for Load-and-Resistance Factor Design (LRFD) Seismic Bridge Design (AASHTO 2022). In addition, State Departments of Transportation (DOTs) typically adopt local practices to address potential regional geologic hazards (e.g., the Cascadia Subduction Zone). State DOTs may also prescribe elevated levels of seismic performance based on the importance of the structure as it relates to public safety, national defense, and economic investment, as is the case for the Interstate Bridge.

The existing bridges were designed before modern seismic design codes were established. The foundations are likely to displace during a strong earthquake, resulting in the collapse of the bridge spans into the Columbia River. In addition, the movable span lift towers will be overstressed due to the inertia of the concrete counterweights and will collapse onto the bridge, causing the adjacent spans to fail. This collapse potential is due to the fact that hundreds of timber bridge support piles sit within loose sand that can liquefy during an earthquake.

How is the community engaged?

ODOT and WSDOT convened the 12-member Executive Steering Group to provide regional leadership recommendations on key program issues of importance to the community. Members of the Executive Steering Group include representatives from the 10 bistate partner agencies with a direct delivery or operational role in the integrated, multimodal transportation system around the Interstate Bridge, as well as a community representative from each state who serves on the Community Advisory Group.

The IBR Program has been engaging with partner agencies, tribal governments, local communities and organizations, and the public since late 2020 and has been conducting formal, targeted community engagement since February 2021. Targeted engagement has included user-specific outreach to representatives from the following groups: residents; commuters; transit users; business and freight industry; neighborhood associations and community groups; minorities and limited English speakers; tribal governments; elected officials; and the maritime industry. The IBR Program considers all comments received across these engagement efforts and incorporates recommendations as appropriate. In effect, this engagement has helped shape the communications strategy and implementation, the environmental review process, and the design options that are part of the Modified LPA. More information about the IBR Program's public involvement efforts can be found in Appendix B.

Program staff record and consider all comments received at events and by phone, email, or mail. Summaries or copies of these comments were provided to advisory leadership groups, such as the Executive Steering Group, for their reference in making recommendations. In the fall of 2021, the IBR Program shared design options with the public and sought feedback. The Community Engagement Report summarizes input received from more than 9,600 survey responses and 1,700 survey comments, community briefings, listening sessions, advisory groups, community working groups, and public comments (IBR Program 2021). While the Program cannot report consensus on preferences for specific design options, community feedback confirms a preference for design options that improve travel times, relieve congestion, improve safety, and mitigate negative impacts to people and the environment. Additional comment themes from the community engagement include:

- Number of auxiliary lanes
- Where on- and off-ramps are located
- Equitable implementation of tolling
- Integration of high-capacity transit
- Improved bicycle and pedestrian facilities
- LRT expansion into Vancouver
- Bridge replacement alternatives
- Funding details, including federal and state funding commitments
- Traffic flow disruptions during bridge construction
- Environmental impact mitigation
- Increased freight traffic capacity
- Future Maritime Transportation System navigation capability
- Equity considerations
- Workforce opportunities
- Considerations for services for those impacted by construction

What is the Modified LPA?

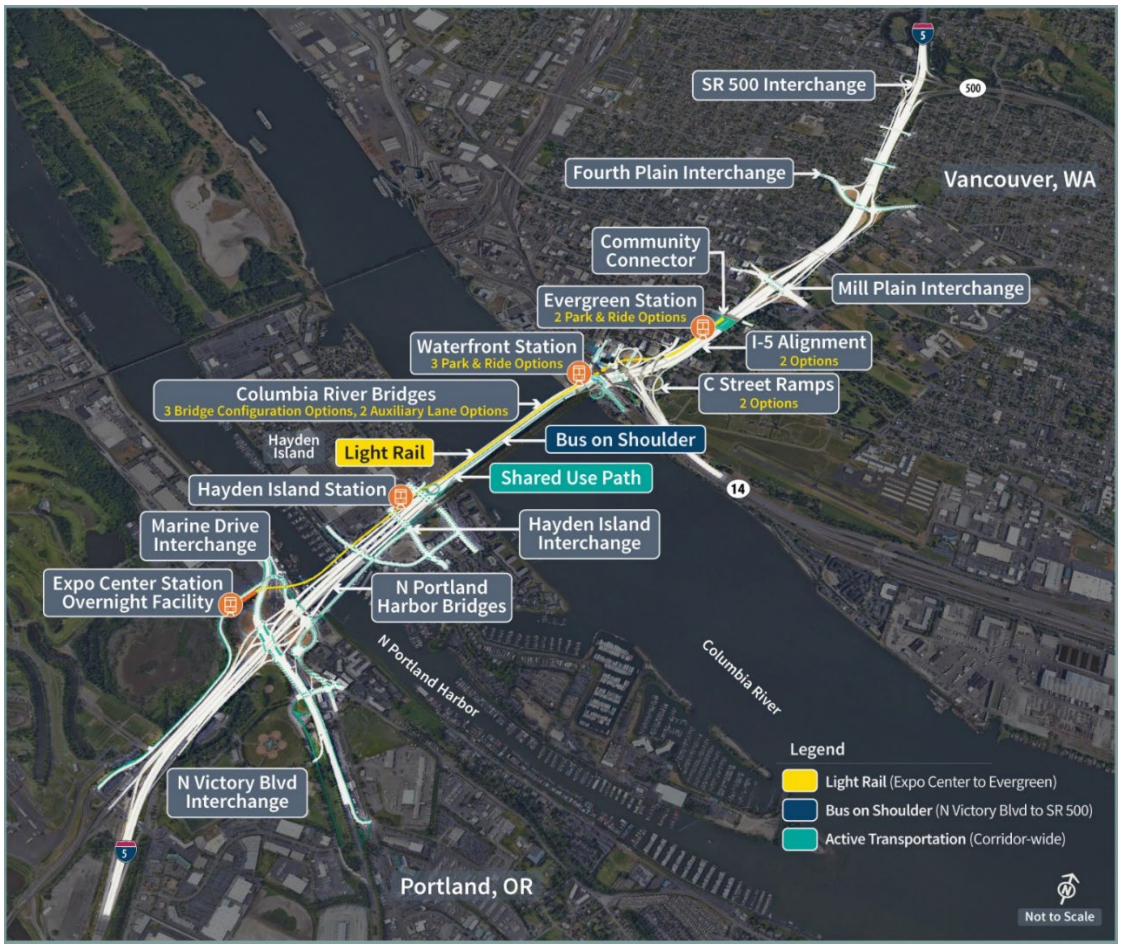
The CRC LPA was updated in close coordination with federal, tribal, regional, and local partners to establish the Modified LPA, which was endorsed by WSDOT, ODOT, and all eight local partner agencies in summer 2022. The Modified LPA includes a variety of transportation improvements throughout the 5-mile corridor. Chapter 2, Description of Alternatives, contains a detailed IBR Program description. The basic components of the CRC LPA as revised by the Modified LPA 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 (a ramp-to-ramp connection on the highway that improves interchange safety by providing drivers with more space and time to merge, diverge, and weave) in each direction. When all highway, transit, and active transportation would be moved to the new Columbia River bridges, the existing Interstate Bridge (both spans) would be removed.
  - Three bridge configurations are under consideration: (1) double-deck truss bridges with fixed spans, (2) single-level bridges with fixed spans, and (3) single-level bridges with movable spans over the primary navigation channel. The fixed-span configurations would provide up to 116 feet of vertical navigation clearance, and the movable-span configuration would provide 178 feet of vertical navigation clearance in the open position. The primary navigation channel would be relocated approximately 500 feet south (measured by channel centerline) of its existing location near the Vancouver shoreline.
  - A two auxiliary lane design option (two ramp-to-ramp lanes connecting interchanges) across the Columbia River is also being evaluated. The second auxiliary lane in each direction of I-5 would be added from approximately Interstate Avenue/Victory Boulevard to SR 500/39th Street.
- 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 revisions to the existing Expo Center MAX Station. Park and rides to serve LRT riders in Vancouver could be included near the Waterfront Station and Evergreen Station. The Tri-County Metropolitan Transportation District of Oregon (TriMet), which operates the MAX system, would also operate the Yellow Line extension.
  - Potential site options for park and rides include three sites near the Waterfront Station and two near the Evergreen Station (up to one park and ride could be built for each station location in Vancouver).
- Associated LRT improvements such as traction power substations, 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 Ruby Junction.
- Integration of local bus transit service, including bus rapid transit (BRT) and express bus routes, in addition to the proposed new LRT service.
- Wider 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 would include three additional bus bays for eight new electric double-decker buses at the Clark County Public Transit Benefit Area Authority (C-TRAN) operations and maintenance facility (see Section 2.2.7, Transit Operating Characteristics, for more information about this service).

- Improvements to seven I-5 interchanges and I-5 mainline improvements between Interstate Avenue/ Victory Boulevard in Portland and SR 500/39th Street in Vancouver. Some adjacent local streets would be reconfigured to complement the new interchange designs, and improve local east-west connections.
  - An option that shifts the I-5 mainline up to 40 feet westward in downtown Vancouver between the SR 14 interchange and Mill Plain Boulevard interchange is being evaluated.
  - An option that eliminates the existing C Street ramps in downtown Vancouver is being evaluated.
- 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 with a shared-use path for pedestrians and bicyclists.
- A variety of improvements for people who walk, bike, and roll throughout the study area, including a system of shared-use paths, bicycle lanes, sidewalks, enhanced wayfinding, and facility improvements to comply with the Americans with Disabilities Act. These are referred to in this document as *active transportation* improvements.
- Variable-rate tolling for motorists using the river crossing as a demand-management and financing tool.

The transportation improvements proposed for the Modified LPA and design options are shown in Figure 4. Additional details (including differences between the IBR Modified LPA and the CRC LPA) are available in Chapter 2.

Figure 4. Modified LPA Components



How would the Modified LPA be constructed?

The construction of bridges over the Columbia River sets the sequencing for other Program components. Accordingly, construction of the Columbia River bridges and the immediately adjacent highway connections and improvement elements would be timed early to aid the construction of other components. Demolition of the existing Interstate Bridge would take place after the new Columbia River bridges were opened to traffic.

Construction activities would require at least one large off-site location to stage equipment and materials. In addition, a large casting yard for fabricating elements of the bridges would likely be needed. Potential off-site locations have been evaluated and are described in detail in Chapter 2.

Electronic tolling infrastructure would be constructed and operational on the existing Interstate Bridge by the start of construction on the new Columbia River bridges. The toll rates and policies for tolling (including pre-completion tolling) would be determined after a more robust analysis and public process by the Oregon Transportation Commission and Washington State Transportation Commission.

Table 1 provides the estimated construction durations and additional information of Modified LPA components. The estimated durations are shown as ranges to reflect the potential for Program funding to be phased 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 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 construction, active transportation facilities and three lanes in each direction on I-5 (accommodating personal vehicles, freight, and buses) would remain open during peak hours, except for short intermittent restrictions and/or closures. Advanced coordination and public notice would be given for restrictions, intermittent closures, and detours for highway, local roadway, transit, and active transportation users (refer to Section 3.1, Transportation, for additional information). At least one navigation channel would remain open throughout construction. Advanced coordination and notice would be given for restrictions or intermittent closures to navigation channels as required (refer to Section 3.2, Navigation, for additional information).

Table 1. Construction Activities and Estimated Duration

Component	Estimated Duration	Notes
Columbia River bridges	4 to 7 years	• Construction would likely begin with the main river bridges. • General sequence would include initial preparation and installation of foundation piles, shaft caps, pier columns, superstructure, and deck.
North Portland Harbor bridges	4 to 10 years	• Construction duration for North Portland Harbor bridges is estimated to be similar to the duration for Hayden Island Interchange construction. The existing North Portland Harbor bridge would be demolished in phases to accommodate traffic during construction of the new bridges.

Component	Estimated Duration	Notes
Hayden Island interchange	4 to 10 years	• Interchange construction duration would not necessarily entail continuous active construction. Hayden Island work could be broken into several contracts, which could spread work over a longer duration.
Marine Drive interchange	4 to 6 years	• Construction would need to be coordinated with construction of the North Portland Harbor bridges.
SR 14 interchange	4 to 6 years	• Interchange would be partially constructed before any traffic could be transferred to the new Columbia River bridges.
Demolition of the existing Interstate Bridge	1.5 to 2 years	• Demolition of the existing Interstate Bridge could begin only after traffic is rerouted to the new Columbia River bridges.
Three interchanges north of SR 14	3 to 4 years for all three	• Construction of these interchanges could be independent from each other and from construction of the Program components to the south. • More aggressive and costly staging could shorten this timeframe.
Light-rail	4 to 6 years	• The light-rail crossing would be built with the Columbia River bridges. Light-rail construction includes all the infrastructure associated with LRT (e.g., overhead catenary system, tracks, stations, park and rides).
Total construction timeline	9 to 15 years	• Funding, as well as contractor schedules, regulatory restrictions on in-water work and river navigation considerations, permits and approvals, weather, materials, and equipment, could all influence construction duration.

What are the effects of the Modified LPA and how do they compare to the No-Build Alternative?

This section highlights how the Modified LPA compares to the No-Build Alternative in terms of transportation performance and community and environmental effects. Table 2 and Table 3 summarize the key performance and impact differences.[7] Mitigation measures proposed for the effects are identified in Table 4. Chapter 3, Existing Conditions and Environmental Consequences, provides more detail on performance, impacts, and mitigation.

[7] All projections and forecasts in Tables 2 and 3 are for the design year of 2045 unless otherwise stated. The description of effects under the Modified LPA design options are in comparison to the Modified LPA with double-deck fixed-span Configuration, one auxiliary Lane, C Street ramps, and centered I-5.

Table 2. Summary of Transportation Effects or the No-Build Alternative and Modified LPA and Design Options [a]

1 Transportation Area	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Shifted West	6 Modified LPA with Single-Level Fixed-Span Configuration,[b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5[c]	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Hours of congestion/day at Interstate Bridge	SB: 16 hours. NB: 14 hours.	SB: 4.75 hours (70% reduction). NB: 9 hours (36% reduction).	SB: 4.5 hours (72% reduction). NB: 6 hours (57% reduction).	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Southbound weekday peak 2-hour average travel times from I-205 to I-405 in North Portland	AM: 58 minutes. PM: 29 minutes.	AM: 54 minutes (7% reduction). PM: 14 minutes (52% reduction).	AM: 50 minutes (14% reduction). PM: Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Northbound weekday peak 2-hour average travel times from I-405 in North Portland to I-205	AM: 18 minutes. PM: 42 minutes.	AM: 13 minutes (28% reduction). PM: 26 minutes (38% reduction).	AM: Same as effects listed in Column 3. PM: 14 minutes (67% reduction).	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	AM: Same as effects listed in Column 3. PM: 25 minutes (40% reduction).	Same as effects listed in Column 3.
Persons crossing over the Interstate Bridge per day	241,900 total: • 196,600 via general-purpose vehicles. • 30,100 via truck. • 14,800 via transit. • 400 via active transportation.	251,100 total: • 191,200 via general purpose vehicles. • 29,200 via truck. • 29,100 via transit. • 740 to 1,600 via active transportation.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Vehicle trips over the I-5 bridge/day	180,000 (+26% compared to existing conditions).	175,000 (-3% compared to No-Build Alternative).	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Bridge trips by active transportation (walk, bicycle, roll)	400 trips per day (similar to existing conditions). No improvement to facilities or connections.	Between 740 and 1,600 trips per day. Improved capacity, access, safety, and user experience for trips across the bridge as well as along connecting facilities.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Total travel time by transit between downtown Vancouver and Hayden Island [d]	AM SB: 36 minutes. [e] PM NB: 21 minutes.	AM SB: 17 minutes. PM NB: 17 minutes.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Transportation Area	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Shifted West	6 Modified LPA with Single-Level Fixed-Span Configuration,[b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5[c]	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Total travel time by transit between downtown Vancouver and Lombard Transit Center [d]	AM SB: 43 minutes. [f] PM NB: 41 minutes. [f]	AM SB: 25 minutes. [g] PM NB: 25 minutes. [g]	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Total travel time by transit between downtown Vancouver and Rose Quarter [d, h]	Express Bus, AM SB: 43 minutes. Express Bus, PM NB: 62 minutes LRT: Service not available.	Express Bus, AM SB: 52 minutes. Express Bus, PM NB: 38 minutes. LRT: 37 minutes (both AM SB and PM NB).	Express Bus, AM SB: 52 minutes. Express Bus, PM NB: 26 minutes. LRT: No change in effects.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Total travel time by transit between downtown Vancouver and Pioneer Square [d, h, i]	Express Bus AM SB: 48 minutes Express Bus PM NB: 67 minutes LRT: Service not available.	Express Bus, AM SB: 59 minutes. Express Bus, PM NB: 45 minutes. LRT: 47 minutes (both AM SB and PM NB).	Express Bus, AM SB: 59 minutes. Express Bus, PM NB: 33 minutes. LRT: No change in effects.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Freight mobility and access	No improvement.	Improved access, mobility, and safety with wider lanes and shoulders on the bridge and improved design at critical port access points at Mill Plain and Marine Drive.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Traffic safety	Crashes forecast to increase 28% for I-5 mainline, ramps, and ramp terminal intersections compared to existing conditions.	Crashes forecast to decrease 13% for I-5 mainline, ramps, and ramp terminal intersections compared to No-Build Alternative.	Crashes forecast to decrease 4% for I-5 mainline, ramps, and ramp terminal intersections compared to Modified LPA.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	The movable span configuration would perform worse (experience more crashes) than the fixed-span configurations but better (experience fewer crashes) than the No-Build Alternative.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Arterial and local street intersections operating below standards (AM/PM peaks)	9 intersections.	8 intersections.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	14 intersections.	Same as effects listed in Column 3.

1 Transportation Area	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Shifted West	6 Modified LPA with Single-Level Fixed-Span Configuration,[b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5[c]	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Transit safety and security	No improvement.	Light-rail stations provide a higher level of visibility and lighting than on-street bus stops. Stations would have additional safety measures incorporated into design.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Effect on river navigation	• No improvement. • Provides 263 feet of horizontal clearance and 178 feet of vertical clearance. • Continue risk to navigation from potential earthquake events, including the potential for the bridge failing and blocking or obstructing the navigation channels.	• Reduces the need for and severity of the S-curve maneuver and reduces number of piers. • Increases horizontal clearance to 400 feet and reduces vertical clearance to 116 feet. • Shifts the Upper Vancouver Turning Basin to the west by approximately 300-350 feet. • Navigation Safety: Constructs the new bridges west of the existing Interstate Bridge, reducing the available distance for vessels to align with the openings of the Columbia River bridges and the BNSF Railway Bridge. However, ship pilots and tug masters conducting ship simulations described the Modified LPA as improving navigation safety by providing more space to maneuver due to fewer bridge piers in the water and greater distance between the piers. Provides greater horizontal navigation and reduces the number of direction changes to transit the Interstate Bridge and position for passage through the BNSF bridge.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, except: • 178 feet vertical navigation clearance in the open position. • Higher maximum vertical navigation clearance in the closed position compared to No-Build. • Improved navigation due to wider navigation channel openings. • Movable-span operations, and thus river navigation operations, may need increased restrictions on timing of bridge openings. • Would increase need for additional construction time, materials, and equipment.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Transportation Area	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Shifted West	6 Modified LPA with Single-Level Fixed-Span Configuration,[b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5[c]	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
		• Improved navigation for most users due to wider navigation channel openings; some current users would not be able to pass under the bridges due to height unless accommodations are made. • Introduces a permanent and complete obstruction to navigation upstream of the new Columbia River bridges for vessels or cargo loads with vertical clearance requirements greater than 116 feet. • Improved navigation through increased seismic resiliency in event of potential earthquake by reduction in the risk of bridge failure or collapse and blocking or obstructing the navigation channels.						
Effect on aviation safety	No improvement.	Less intrusion into Pearson Field protected airspace as compared to the No-Build Alternative. Reduced potential for bird nesting and roosting.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Less intrusion into Pearson Field protected airspace.	More intrusion into Pearson Field protected airspace than effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

a All projections and forecasts are for the design year of 2045 unless otherwise stated. The description of effects under the Modified LPA design options (Columns 4 through 9) are in comparison to the modified LPA with double-deck fixed-span Configuration, one auxiliary lane, C Street ramps, and Centered I-5, as described under Column 3.
b The effects associated with the single-level fixed-span configuration would be the same for all bridge type options, unless otherwise specified.
c The SR 14 interchange without C Street ramps design option would require express bus transit to be rerouted to access downtown Vancouver via Mill Plain Boulevard. This would add more travel time for express bus transit trips in and out of downtown Vancouver on express bus because of added distance and congestion on the mainline.
d Total transit travel times include 10 minutes of walk access (1/4 mile walk on either end of the trip at 3 mph average walk speed) in addition to initial and transfer (if applicable) wait time. Wait times are based on half the headway.
e Route 60 does not stop at Hayden Island southbound, so a trip from Vancouver to Hayden Island travels south to Delta Park and then back north to stop on Hayden Island.
f Route includes 60 Vancouver – Delta Park with transfer to Yellow Line LRT.
g Travel time is on Yellow Line LRT.
h Express Bus includes Route 101 from downtown Vancouver – Rose Quarter or Pioneer Square.
i Express Bus includes two stops between downtown Vancouver and Pioneer Square. LRT includes 16 stops between downtown Vancouver and Pioneer Square.
I- = Interstate; LRT = light-rail transit; LPA = Locally Preferred Alternative; NB = northbound; SB = southbound; SR = State Route

Table 3. Summary of Community and Environmental Effects for the No-Build Alternative and the Modified LPA [a]

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Acquisitions and displacements	None.	Approximately 47 acres of property acquired and displacement of: • 43 residential units. [c] • 36 businesses. [d] • 1 public use sites.	Similar to Column 3, with an additional 0.1 acres of property acquired.	Additional 0.9 acre of property acquired, and an additional 33 residential units and 3 businesses displaced.	Additional 0.2 acres of property acquired.	Same as effects listed in Column 6.	Same as effects listed in Column 3.	**Waterfront locations:** • Site 1: no acquisition or displacement. • Site 2: 0.1 acres acquired, no displacement. • Site 3: 1.5 acres acquired, 1 business displaced. **Evergreen locations:** • Site 1: 3.16 acres acquired, no displacement. • Site 2: no acquisition or displacement.
Land use and economics	• Existing land uses would remain vulnerable to high levels of congestion, unsafe conditions, and potential earthquake-induced failure. • No high-capacity transit, which is inconsistent with the stated policies and goals of regional transportation plans. • Congestion would impair freight movement and reduce area productivity, which could indirectly impact the implementation of land use plans and goals for economic development. • Loss in job growth could lead to decreased housing	• Converts approximately 47 acres of land to transportation use; currently primarily zoned industrial or commercial, with some land zoned residential. • High-capacity transit is consistent with state, regional, and local plans and policies. • Higher toll rates during peak periods would support regional and local policies for congestion and are not expected to change land use patterns. • Property tax revenues would be reduced compared to the No-Build Alternative. • Business displacements have the potential to impact 616 employees; affected businesses would be provided relocation assistance. • Bridge height would exclude up to eight existing users/vessels that require more than 116 feet of vertical clearance from passage	Similar to effects listed in Column 3, except: • Slightly more acquisition of property at the Fort Vancouver National Historic Site. • Improved traffic operations (shorter duration and length of congestion, reduced travel times, and improved mobility options) compared to design options with a single auxiliary lane would result in improved mobility and access for freight and employment.	Similar to effects listed in Column 3, except: • Larger areas of properties would be permanently acquired. • Additional 1 acre of permanent acquisition. • Additional three business displacements. • Potential to impact 142 additional employees.	Similar to effects listed in Column 3, except: • Lower maximum bridge height and reduced highway grade would benefit freight vehicle speed compared to double-deck configuration, with corresponding economic benefits.	Similar to effects listed in Column 3, except: • Bridge openings could interrupt vehicle and truck highway travel, transit service, and active transportation across the new Columbia River bridges. • No existing or future maritime vessels or cargo freight would be excluded from passage. • Lower bridge height compared to fixed-span configurations would allow fewer existing marine users/vessels to pass without a bridge opening. Movable-span operations, and thus river navigation operations, may have increased restrictions on bridge openings, which could impact marine commerce by restricting the	Similar to effects listed in Column 3, except: • Removal of the C Street ramps would result in traffic delay and increased travel times near the Mill Plain Boulevard interchange and in downtown Vancouver, which would have an economic impact on local businesses.	Same as effects listed in Column 3, plus: **Waterfront locations:** • Site 1: no acquisition or displacement. • Site 2: 0.1 acres acquired, no displacement. • Site 3: 1.5 acres acquired, 1 business displaced, 53 additional employees. **Evergreen locations:** • Site 1: 3.16 acres acquired, no displacement. • Site 2: no acquisition or displacement.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
	prices, increased commercial vacancies, and reduced demand for downtown revitalization.	underneath the new Columbia River bridges.				times of day for large vessel movements.		
Neighborhoods	• No change to existing neighborhoods, community facilities, or social resources. Future development might not be fully consistent with goals that assume improved mobility and expanded transit access. Neighborhoods would not benefit from reduced congestion, improved mobility, and access to employment.	• Would not adversely affect community cohesion in neighborhoods, except for Hayden Island. Could increase cohesion in neighborhoods near the Community Connector. • Would affect the Hayden Island neighborhood's community cohesion, including displacement of floating homes and changes to views. Fourteen businesses would be displaced. However, neighborhood cohesion would be improved by a more continuous street system, improved pedestrian and bicycle facilities, and transit that increases connections for residents. • Construction-related impacts such as traffic diversion noise, temporary reductions in air quality, and sidewalk disruptions.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but with potential residential displacements in Esther Short neighborhood.	Similar to effects listed in Column 3, except: • May help to maintain or improve neighborhood cohesion by providing additional transit station location options on Hayden Island, which would provide more opportunities for connection to residences and development.	Similar to the effects listed in Column 6, except: • Bridge openings would cause backups during non-peak commuting hours that would reduce reliability for vehicles, active transportation, similar to the No-Build Alternative, which may negatively affect neighborhood cohesion.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Equity	• Equity priority communities would not benefit from increased mobility and accessibility. • Would avoid short- and long-term displacement of residents and businesses. • Would avoid construction-related impacts such as traffic diversion, noise, temporary reductions in air quality, and cost burdens of tolling.	• Increased access to high-capacity transit, increased availability of active transportation, and highway and driving travel time reductions. The degree of benefits would vary by equity priority community. • Increase in job access for all demographic groups due to faster travel times. • Potential displacement of encampments of houseless populations, residential displacements, and additional transportation cost from tolling. • Construction-related impacts such as traffic diversion, noise, temporary reductions in air quality, and cost burdens of tolling. • Tolling would place a burden on low-income travelers.	Similar to effects listed in Column 3, but: • Would reduce delay and congestion on the Columbia River bridges to a greater extent, which would improve travel times for motorists, express bus riders, and emergency vehicles; slightly greater increase in jobs access for all demographic groups.	Similar to effects listed in Column 3, except: • More residential displacements.	Similar to effects listed in Column 3, except: • Active transportation users would experience shorter distance to cross the bridge. • Users may feel safer due to the extra security from visibility from passing vehicles.	Similar to effects listed in Column 6, except: • There may be travel delays for transit and active transportation users due to openings of the movable span.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Environmental justice	• No displacement of residents, businesses, community resources, or jobs. • Travel times would increase by approximately 50% compared to existing times. Would not bring high-capacity transit to Hayden Island or downtown Vancouver. • Environmental conditions under the No-Build Alternative would affect EJ populations the same as the general population. Therefore, no disproportionately high and adverse effects have been identified.	• Increased access to high-capacity transit and active transportation, and reductions in vehicle travel time. Impacts to EJ populations would be the same as to the general public. • Increase in job access due to faster travel times. Because faster times would result from tolling, tolling would result in disproportionately high and adverse effects on EJ populations. • Residential and business displacements. Displacements in high-priority and meaningfully greater EJ areas such as the Esther Short neighborhood in Vancouver and the Rockwood neighborhood in Gresham would result in disproportionately high and adverse effects on EJ populations.	Same as effects listed in Column 3.	• Similar to effects listed in Column 3, but would increase residential and business displacements. • Additional displacement of the Normandy Apartments in the Esther Short neighborhood as a result of the I-5 westward shift would result in disproportionately high and adverse effects on EJ populations.	Similar to effects listed in Column 3, except: • Shared-use path users would have more exposure to noise. • Users would experience shorter distance to walk across the bridge. • Users may feel safer due to the extra security from visibility from passing vehicles. • Noise and visual impacts to EJ populations would be the same as to the general population.	Similar to effects listed in Column 3, except: • There may be travel delays for transit and active transportation users due to openings of the movable span. • Delays to transit and active transportation users as a result of bridge openings could also contribute to adverse effects on EJ populations.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
		• Increased traffic and noise impacts from construction. • Improved air quality. • Some adverse impacts to community cohesion.						
Public services and utilities	• Increased congestion on I-5 would increase delays in emergency response.	• Emergency service response time would be reduced with improved traffic conditions. • Utilities would be relocated or protected in place during construction and restored to full service following construction.	Similar to effects listed in Column 3, but further reduced congestion and multimodal operations would lead to improved response times.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but response times to transit and shared-use path incidents could improve because emergency vehicles would have better access to transit and active transportation facilities.	Delays and disruptions to emergency response due to bridge openings would continue, but with less frequency than the No-Build Alternative.	Same as effects listed in Column 3.	Utilities at the park-and-ride locations at W 4th Street and W 3rd Street could require relocation or replacement.
Total acres of park and recreation resources acquired (approximate)	0 acres.	1.3 acres	1.3 acres (+1,500 square feet compared to area of acquisitions stated in Column 3)	1.3 acres (-200 square feet compared to area of acquisitions stated in Column 3)	1.3 acres (+760 square feet compared to area of acquisitions stated in Column 3)	1.3 acres (+760 square feet compared to area of acquisitions stated in Column 3)	Same as effects listed in Column 3.	N/A
Linear feet of trails to be reconstructed and/or permanently realigned (approximate)	0 feet.	5,800 feet.	6,000 feet	5,800 feet	6,000 feet	6,000 feet	5,700 feet	N/A
Anticipated transit access to park and recreation resources in the study area	No change.	Would improve access to some large regional parks.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Visual quality (changes to visual resources)	Constructed elements within the Area of Visual Effect (AVE) would not change. Project environment coherence would be negatively affected by increased traffic and congestion. Compatibility with the natural and cultural environments would stay the same.	New visual elements could alter the existing visual character and quality in the AVE (e.g., new bridges across the Columbia River). Landscape units where the effect to visual quality are beneficial or neutral would have a natural, cultural, and project environment that is compatible with existing visual conditions. Adverse effects to visual quality would result from blocking views of the natural environment and changes in visual experience from elevated bridge structures, such as to viewers in the floating homes at the North Portland Harbor bridges.	Additional width would contribute to a slightly increased visual mass for viewers in close proximity or beneath the structures in the Columbia River landscape unit.	Would include an improvement in the perceived visual quality by shifting project elements slightly farther from sensitive viewers at Kanaka Village and other views from Fort Vancouver National Historic Site in the Greater Central Park landscape unit.	May become a beneficial feature from nearby views in the Columbia River landscape unit depending on the chosen architectural design.	In the closed position, the lower height of the bridge decks would be similar, or less visible, than the existing Interstate bridge. Some components of a movable span could protrude higher into the skyline and be visible from the Vancouver, Fort Vancouver, and Hayden Island areas. In an open position, which would be intermittent and limited, the increased visibility of the bridge deck may obstruct additional views and skylines, and likely intensify visual impacts, especially for sensitive recreational viewers. The overall bridge deck would be higher and more visible than the existing bridge deck.	Would eliminate project environment elements associated with the C Street Ramps that would be visible for sensitive recreational viewers in the Greater Central Park landscape unit.	Potential site specific changes in the cultural visual environment in the Vancouver Downtown landscape unit.
Number of NRHP-listed or NRHP-eligible historic built environment resources affected	0	12	12	12	12	12	12	12
Number of archaeological sites affected	0	12	12	12	12	12	12	12
VMT in MSAT study area	3,537,900 VMT in 2045 (66% increase compared to existing conditions).	3,455,400 VMT in 2045 (62% increase compared to existing conditions).	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Changes in air pollutant emissions	Future regional emissions would be substantially lower than existing emissions for all MSAT, CO, NO_X, and $PM_{2.5}$. Future regional emissions of SO_2, VOC would be up to 25% higher than existing conditions due to increased VMT.	Similar to No-Build Alternative (slightly lower emissions due to reduced VMT).	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but may slightly reduce operational emissions due to the lower profile grade, which would reduce acceleration and braking of vehicles crossing the bridges.	Similar to effects listed in Column 6, except for a minor increase in air quality pollutants due to vehicles idling during bridge openings. There would be fewer bridge openings than with the No-Build Alternative.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Changes in MSATs emissions (2045)	• 1,3-Butadiene: 100% reduction • Acetaldehyde: 82% reduction • Acrolein: 89% reduction • Benzene: 69% reduction • Diesel Particulate Matter: 86% reduction • Ethylbenzene: 29% reduction • Formaldehyde: 86% reduction • Naphthalene: 93% reduction • Polycyclic Organic Matter: 93% reduction	• 1,3-Butadiene: 100% reduction • Acetaldehyde: 85% reduction • Acrolein: 90% reduction • Benzene: 70% reduction • Diesel Particulate Matter: 88% reduction • Ethylbenzene: 29% reduction • Formaldehyde: 88% reduction • Naphthalene: 94% reduction • Polycyclic Organic Matter: 96% reduction	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but may slightly reduce operational emissions due to the lower profile grade, which would reduce acceleration and braking of vehicles crossing the bridges.	Similar to effects listed in Column 6, except for a minor increase in air pollutants due to vehicles idling during bridge openings. There would be fewer bridge openings than with the No-Build Alternative.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Changes in regional criteria pollutant emissions	• Carbon Monoxide: 61% reduction • Nitrogen Dioxide: 75% reduction • Sulfur Dioxide: 16% increase • Volatile Organic Compounds: 26% increase • Total PM_{10}: 46% increase • Total $PM_{2.5}$: 39% reduction	• Carbon Monoxide: 63% reduction • Nitrogen Dioxide: 79% reduction • Sulfur Dioxide: 9% increase • Volatile Organic Compounds: 25% increase • Total PM_{10}: 21% increase • Total $PM_{2.5}$: 48% reduction	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but may slightly reduce operational emissions due to the lower profile grade, which would reduce acceleration and braking of vehicles crossing the bridges.	Similar to effects listed in Column 6, except for a minor increase in air quality pollutants due to vehicles idling during bridge openings. There would be fewer bridge openings than with the No-Build Alternative.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Number of receptors that exceed highway noise thresholds [e]	215	198	Similar to effects listed in Column 3, except: • Highway noise impacts, before and after mitigation, would be slightly different because traffic lanes would be slightly closer to noise-sensitive land uses. • No change to peak-hour traffic volumes, posted speed limit, or vehicle mix.	Similar to effects listed in Column 3, except for a barely perceptible increase in traffic noise west of I-5 near the southbound mainline and ramps.	Similar to effects listed in Column 3, except this option would result in a slight increase in highway noise impacts east and west of the bridge due to the wider bridge span (99 feet wider) and lower roadway deck (29 feet lower).	Similar to effects listed in Column 6.	Similar to effects listed in Column 3, except with minor changes to noise impacts at a level near or below perceptible range.	Same as effects listed in Column 3.
Number of receptors with moderate transit noise impact levels [e]	0	12 [f]	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Number of receptors with severe transit noise impact levels [e]	0	0	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Number of receptors with transit vibration impacts [e]	No vibration impacts without extension of light-rail.	12 residences and 1 theater	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Total Regional Transportation Energy Consumption (mmBtu/day)	• 271,933 in 2045 without electric vehicles • 190,771 in 2045 with electric vehicles	• 271,187 in 2045 without electric vehicles (-0.27% compared to No-Build Alternative) • 190,302 in 2045 with electric vehicles (-0.25% compared to No-Build Alternative)	Similar to effects listed in Column 3. Modeling results estimate a non-statistically significant difference of less than 0.1%.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but would slightly reduce operational emissions due to the reduced profile grade of the new Columbia River bridges.	Similar to effects listed in Column 6, except it would increase energy consumption due to the electricity required to open the bridge and as a result of idling by queued vehicles on the freeway during bridge openings.	Similar to effects listed in Column 3, but would create additional congestion on local streets, which would decrease vehicle efficiency, resulting in increased energy consumption.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
EMF	No change.	Similar to effects listed in Column 2. EMF emissions would increase slightly at certain locations but would remain well below exposure guidelines.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Water Quality and Stormwater Management	No change. Stormwater within the area would remain untreated until addressed according to state prioritization and available funding.	• Beneficial effect on receiving water quality (due to best management practices [BMPs] to remove pollutants). • Could cause changes in peak flows and stormwater runoff volumes.	• Beneficial effect on receiving water quality (due to BMPs to remove pollutants) with slight increase to pollutant loads. • Could cause changes in peak flows and stormwater runoff volumes.	Same as effects listed in Column 3.	• Beneficial effect on receiving water quality (due to BMPs to remove pollutants). • Could cause changes in peak flows and stormwater runoff volumes.	Potential for additional and accidental minor spills of materials and pollutants used for maintenance and operation of the movable-span configuration.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Contributing Impervious Area	178 acres total: • 0 acres treated • 21 acres infiltrated • 157 acres untreated	207 acres total: • 190 acres treated • 17 acres infiltrated • 0 acres untreated	211 acres total: • 194 acres treated. • 17 acres infiltrated. • 0 acres untreated.	Same as effects listed in Column 3.	210 acres total: • 193 acres treated. • 17 acres infiltrated. • 0 acres untreated.	214 acres total: • 197 acres treated. • 17 acres infiltrated. • 0 acres untreated.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Total Suspended Solids	120,272 lb/year.	16,720 lb/year.	17,072 lb/year.	Same as effects listed in Column 3.	16,984 lb/year.	17,336 ls/year.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Hydrology	No change (continued release of stormwater with degraded quality into receiving waters).	• Potential to cause long-term hydrologic effects to waterbodies due to an increase of 30 acres of contributing impervious area. • Could result in a small net rise to the base flood elevation. Measures would be analyzed to compensate for reductions to existing flood storage.	• Potential to cause long-term hydrologic effects due to an increase of 34 acres of contributing impervious area.	Same as effects listed in Column 3.	• Potential to cause long-term hydrologic effects due to an increase of 33 acres of contributing impervious area.	• Potential to cause long-term hydrologic effects due to an increase of 37 acres of contributing impervious area.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Wetland and Other Waters impacts	No change.	• 0.58 acres wetland fill. • 7.39 acres wetland buffer fill. • 0.13 acres net *restoration* of Columbia River/North Portland Harbor.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	0.03 acres net loss of Columbia River/North Portland Harbor. No change in effects to wetlands or wetland buffers listed in Column 3.	0.07 acres net loss of Columbia River/North Portland Harbor. No change in effects to wetlands or wetland buffers listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Ecosystem - aquatic resources	• Continued impacts from untreated stormwater from approximately 156.4 acres of existing CIA. • Potential for injury and habitat degradation in the case of a bridge failure.	• Benthic habitat impact: 0.13 acres net restoration. • Additional Overwater Shading (Water Surface Level): 1.04 acres. • Additional Overwater Shading (Elevated Deck Level): 8.22 acres. • Beneficial effect of stormwater treatment for all post-project CIA, including approximately 156.4 acres of existing impervious area that is currently untreated.	• Similar to effects listed in Column 3, except would result in a greater amount of elevated overwater shading. • Overwater Shading (Elevated Deck): +13.02 acres.	Same as effects listed in Column 3.	• Benthic habitat impact: 0.03 acres net reduction. • Additional Overwater Shading (Water Surface Level): 1.41 acres. • Additional Overwater Shading (Elevated Deck Level): 10.78 acres.	• Benthic habitat impact: 0.07 acres net reduction. • Additional Overwater Shading (Water Surface Level): 1.58 acres to 2.16 acres. • Additional Overwater Shading (Elevated Deck Level): 10.78 acres.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Ecosystems - permanent loss of sensitive terrestrial habitat in Oregon (acres)	• Potential for injury and habitat degradation in the case of a bridge failure.	• “High” wildlife/riparian value: 1.12 • “Medium” wildlife/riparian value: 6.20 • Wetlands: 0.58 • Wetland Buffers: 7.39	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, except would slightly reduce impervious surface.	Same as effects listed in Column 3.
Ecosystems - permanent loss of sensitive terrestrial habitat in Washington (acres)	Potential for injury and habitat degradation in the case of a bridge failure	• Riparian buffers: 0.79 • Biodiversity Areas: 0.15 • Oak Woodlands: <0.01 • Wetlands: 0 • Wetland Buffers: 0.06	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Geology/Groundwater	No change (seismic deficiencies remain, would not affect geologic resources, would sustain existing impacts to degradation of the groundwater quality).	• Improved public safety, minimizing damage to infrastructure, and limiting economic disruption due to seismic improvements. • Slight potential for increased use of materials that could spur expansion and/or opening of surface mines. • Benefits to groundwater as a result of stormwater management and treatment.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.	Similar to effects listed in Column 3.	Same as effects listed in Column 3.	Same as effects listed in Column 3.

1 Community and Environmental Effect	2 No-Build Alternative	3 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	4 Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	5 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Mainline Westward Shift	6 Modified LPA with Single-Level Fixed-Span Configuration, [b] One Auxiliary Lane, C Street Ramps, Centered I-5	7 Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	8 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Without C Street Ramps, Centered I-5	9 Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
Hazardous materials	• No potential for adverse effects from acquisition of contaminated sites. • No beneficial effects from the cleanup of contaminated sites. • Untreated stormwater would continue to enter surface waterbodies and groundwater. • No improvement in existing spill risks from traffic congestion and collisions.	• Moderate potential for increased liability for property owners (ODOT and WSDOT) from the acquisition of contaminated sites. • Beneficial effects on human health and safety and surface and groundwater quality from cleanup and remediation of contaminated areas on acquired sites and limiting the possible off-site migration of contamination. • If residual contamination remains on acquired sites after cleanup, moderate potential for adverse effects on human health and safety if encountered during construction or with the possible off-site migration of contamination. • Beneficial effects from updates in stormwater conveyance and treatment. • Reduction in spill risk due to reduced traffic congestion and collisions.	Same as effects listed in Column 3, except would require the acquisition of a slightly larger area of property with a potential source of contamination.	Same as effects listed in Column 3.	• Requires the acquisition of a slightly larger area of property with a potential source of contamination. • Requires an increased area of in-water work due to larger bridge foundations, which could result in a comparatively greater potential risk of mobilizing hazardous materials in river sediments.	Same as effects listed in Column 3, except would require the acquisition of a slightly larger area of property with a potential source of contamination.	Same as effects listed in Column 3.	Same as effects listed in Column 3.
Climate Change	• Substantially lower energy consumption and greenhouse gas (GHG) emissions in 2045 due to increased electric vehicles in fleet and decarbonized electricity sources.	• Lower energy consumption and GHG emissions in 2045 similar to No-Build Alternative. • Increased mode share of low and no emissions modes (transit, active transportation). • Improvements in climate resilience with materials and design.	Similar to effects listed in Column 3, but would slightly reduce emissions due to improved congestion.	Same as effects listed in Column 3.	Similar to effects listed in Column 3, but would slightly reduce operational emissions due to the reduced profile grade of the new Columbia River bridges.	Similar to effects listed in Column 3, but would increase energy consumption due to the longer construction duration, additional materials required for the larger bridge foundations, and electricity required to raise and lower the bridge and as a result of idling during bridge closures.	Similar to effects listed in Column 3, but additional congestion and idling would decrease vehicle efficiency, resulting in increased GHG emissions.	Same as effects listed in Column 3.

Notes:
a All projections and forecasts are for the design year of 2045 unless otherwise stated. The description of effects under the Modified LPA design options (Columns 4 through 9) are in comparisons to the Modified LPA with double-deck fixed-span configuration, one auxiliary Lane, C Street ramps, and centered I-5, as described in Column 3.
b The effects associated with the single-level fixed-span configuration would be the same for all bridge type options, unless otherwise specified.
c Does not include the displacement of houseless individuals.
d Does not include the displacement of a billboard and cellular phone tower.
e Information represents noise impacts without mitigation.
f Does not include noise impacts at a hotel within range.
Key: AVE = Area of Visual Effect; EMF = electric and magnetic fields; GHG = greenhouse gas; I- = Interstate; lb = pounds; LPA = Locally Preferred Alternative; mmBtu = one million British thermal units; MSAT = mobile source air toxics; N/A = not applicable; NRHP = National Register of Historic Places; ODOT = Oregon Department of Transportation; PM10 = particulate matter less than or equal to 10 microns in diameter; VMT = vehicle miles traveled; WSDOT = Washington Department of Transportation

What mitigation or compensation is proposed for unavoidable adverse impacts?

This section summarizes the mitigation measures proposed for the community and environmental effects that would occur as a result of the Modified LPA. Mitigation and compensation would be adjusted as needed for differences in effects associated with the design options. As possible mitigations are identified and considered, the IBR Program will determine whether additional environmental analysis is necessary. The IBR Program would comply with all environmental laws and obtain necessary permits that outline protections for local air quality, water quality, fish and wildlife, and community livability (e.g., noise levels, light and glare, dust, etc.) during construction. Table 4 highlights the mitigation or compensation measures proposed for the effects described in Table 3. Chapter 3, Existing Conditions and Environmental Consequences, provides more detail on proposed mitigation or compensation measures.

Table 4. Summary of Mitigation or Compensation for Community and Environmental Effects

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
Transportation	**Long-Term Effects** ***Program-Specific Mitigation*** *I-5 Operations* Potential mitigation to meet ODOT's and/or WSDOT's performance standards on I-5 are summarized below. *Modified LPA* • Providing an additional auxiliary lane northbound and southbound within the IBR Program limits, and/or the program and partners could implement more intensive demand reduction and system management strategies beyond what the IBR Program already includes (variable-rate tolling, improved transit and active transportation systems, and enhanced transportation demand management (TDM) and transportation system management (TSM) systems). *Modified LPA and Design Options* • ODOT will continue to work with partners to study the downstream bottleneck at the I-5/I-405 split in North Portland. This downstream bottleneck is a separate project that ODOT is looking into understanding causes and potential solutions. • The southbound C-D roadway would be impacted by congestion spilling back from I-5 during the AM peak period, but even during the PM peak period when no downstream congestion is present, the CD roadway would not meet WSDOT's mobility standards. Potential mitigation measures could include braiding the Mill Plain on-ramp and SR 14 off-ramp and possibly providing a slip lane to continue providing access for trips traveling from the Mill Plain interchange to SR 14. *Bridge Openings* Measures to minimize disruptions to I-5 operations, transit service, and active transportation associated with bridge openings and gate closures under the Modified LPA with a single-level movable-span configuration could include: • Establish new bridge opening and gate closure timing limitations, which could include scheduled days and/or times that avoid peak periods for passenger vehicles and trucks, in coordination with the USCG. • Incorporate bridge opening and gate closure limitations into transit service schedules.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• Disseminate information concerning bridge openings and gate closures to the public, businesses, travel organizations, freight industry, and mariners. *Arterials and Local Streets* • *Modified LPA without C Street ramps:* Six intersections in the Modified LPA design option without C Street ramps may require mitigation improvements and are summarized below. The impacts are caused by the additional traffic volumes accessing the Mill Plain Boulevard/15th Street east-west couplet due to the elimination of I-5 access via the C Street ramps. – Mill Plain Boulevard and Franklin Street – 15th Street and Washington Street – 15th Street and Main Street – Mill Plain Boulevard and Columbia Street – Mill Plain Boulevard and Broadway Street – Mill Plain Boulevard and I-5 northbound on-/off-ramps • Mitigation of this congestion could include retaining the C Street ramps. As part of final design, additional traffic analysis would be conducted to confirm the SEIS analysis and refine mitigation measures as needed. Final mitigation would be determined and agreed upon by the IBR Program and the affected agency. *Transit Reliability* In the course of considering mitigation, an updated on-time performance analysis in the Rose Quarter may be completed. Final mitigation measures will be determined and agreed upon with the appropriate agency partners as needed. The IBR Program could contribute a proportionate share toward identified mitigation to improve on-time performance at the Rose Quarter. **Temporary Effects** ***Regulatory Mitigation*** • Construction activities would comply with ODOT and WSDOT requirements for maintenance of traffic. More specific measures related to maintenance of traffic are discussed in the Program-Specific Mitigation section below. The Transportation Technical Report identifies additional potential mitigation measures and best practices such as for signage, traffic plans and control, access, communications, and safety. ***Program-Specific Mitigation*** *Study-Area Travel* • Develop Work Zone Transportation Management Plan (TMP) and a maintenance of traffic plans to address affected facilities and their mode of transportation. *Freight Mobility and Access* • Mitigation for freight and mobility would be an element of the Work Zone TMP identified above. In addition, the IBR Program would coordinate with all facility owners to notify them of facility or access closures. Construction information would be provided to affected local jurisdictions. Similar information would be provided to WSDOT and ODOT for use in the states' freight notification systems. The IBR Program would provide information in formats required by WSDOT and ODOT. • To minimize impacts to freight rail operations, the Program would coordinate with the railroad owners and rail operators and would obtain all applicable required permits. Construction would be limited to the times approved and coordinated with freight rail operators.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	Bridge Openings • During IBR construction, the IBR Program would coordinate with the U.S. Coast Guard, the ports, and other jurisdictions to minimize bridge openings and gate closures to minimize the impact to vehicles, active transportation, and transit. The work zone TMP would include coordination and communication with agencies, mariners, and the public for bridge openings and gate closures. *Arterials and Local Streets* • All minimization measures associated with constructing the Modified LPA would comply with local regulations governing construction traffic control and construction truck routing. The IBR Program would finalize detailed work zone TMPs in close coordination with local jurisdictions during the final design and permitting phases of the Program. *Transit Operations* • Transit service and facility modifications would be coordinated with TriMet and C-TRAN to minimize temporary impacts and disruptions to bus and light-rail facilities and service during construction. Detailed work zone TMPs and coordination/communication plans would be developed. This would include support for public information and communication throughout the construction period, including for periods where alternative routes, facilities, or services would be needed to maintain service. *Active Transportation* • The work zone TMP would include specific measures to maintain access to active transportation facilities and users. The Transportation Technical Report has additional detail on potential measures for construction areas, signage, lighting, communications, safety and maintenance. *Safety* • The IBR Program would implement the latest safety technology during construction (e.g., lane striping, Advanced Traffic Management System, Variable Message Signs, crash barriers, speed warning, etc.). *Transportation Demand Management and Transportation System Management* • The IBR Program would work with partner agencies on adapting and implementing TDM and TSM treatments during construction. Potential strategies could include: – Expanded transit service. – Vanpool/carpool program. – Telecommuting options. – Compressed work week/flexible work schedules. – Active transportation improvements and enhancements. *Tolling and Diversion* • The IBR Program would work with partner agencies to develop a detailed program and schedule for pre-completion tolling and any diversion impacts during construction. • Diversion impacts during construction will be evaluated and potential mitigation will be discussed with partner agencies to offset any impacts.
Aviation	**Long-Term Effects** ***Regulatory Requirements*** • Standards and regulatory measures have been evaluated and screened. These measures have been incorporated during the development of the Modified LPA to the extent possible and will continue to be refined as the design progresses.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• During final design, the IBR Program would comply with the FAA's findings in response to the Program's Form 7460-1. The FAA would issue a finding of "hazard to aviation" or "no hazard to aviation" upon completion of the aeronautical review. In addition, the FAA would have requirements for marking obstacles; this would likely include marking according to FAA AC 70/7460-1M "Obstruction Marking and Lighting" using equipment specified in AC 150/5345-43J "Specification for Obstruction Lighting Equipment." *Program-Specific Mitigation* • Provide obstruction marking and lighting to make the river crossing structures visible to aircraft. Design roadway or accent lighting on the bridges and surrounding interchanges to limit light or glare that could affect aviation at Pearson Field or Portland International Airport. • Place wire mesh or other deterrents over the top of temporary stormwater detention ponds to conceal open water when they are full to prevent birds from landing on open water. • Incorporate designs of proposed structures and features of the Program that minimize locations for birds to roost or nest. **Temporary Effects** *Regulatory Requirements* • To protect and minimize temporary effects on aviation during construction, standard and regulatory mitigation measures such as BMPs would be implemented. Construction BMPs applicable to the Modified LPA are discussed in Section 3.14, Water Quality and Hydrology. • Standard and regulatory mitigation measures for aviation include: – In the area of demolition of the Interstate Bridge and construction activities for the Columbia River bridges and the SR 14 interchange, FAA would review and approve the location and height of tall construction equipment proposed by the contractor. Equipment would be marked following the FAA's Obstruction Marking and Lighting Standards described in Advisory Circular 70/460-1M. – Apply dust control measures, such as watering exposed soil and using gravel surfacing on temporary construction roads, to mitigate potential reduction and visibility to aviation from construction activities in the SR 14 area. Section 3.10.6, Air Quality lists dust control requirements in both Oregon and Washington. Manage construction materials and activities to minimize glare and smoke. *Program-Specific Mitigation* • Construction specifications for contractors working near Pearson Field would include a condition that any electronic devices used for communication or other purposes cannot interfere with equipment required for air navigation and communication. • Place wire mesh or other deterrents over the top of temporary stormwater ponds to prevent birds from landing on open water. • Provide public involvement throughout construction to provide information to pilots and the public.
Navigation	**Long-Term Effects** *Regulatory Requirements* • Standards and regulatory measures have been evaluated and screened. These measures have been incorporated during the development of the Modified LPA to the extent possible and will continue to be refined as the design progresses. *Avoidance Measures*

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• The Modified LPA with a fixed-span configuration would have long-term effects to marine-based operations currently operating on the Columbia River, including five vessels and three upstream fabricators when shipping large cargo requiring vertical navigation clearance over 116 feet. Under the double-deck and single-level fixed-span configurations, these vessels and cargo shipments would be unable to transit beneath the new Columbia River bridges in either some conditions when river levels approach or exceed ordinary high water levels or be permanently precluded from transiting the bridge. The IBR Program would continue to coordinate with the affected vessel owners and river users to reach mutually acceptable decisions and agreements to avoid impacts through adjustments to vessels or business operations prior to publication of the Final SEIS. *Program-Specific Mitigation* • Provide obstruction marking and lighting to make the river crossing structures visible to river traffic. Design roadway or accent lighting on the bridges and surrounding interchanges to limit light or glare that could affect river navigation. • Update navigation charts and other navigation publications to reflect changes to VNC and HNC for future river users. **Temporary Effects** *Regulatory Requirements* • Develop construction phasing and staging plans to help ensure that construction activities would be planned to maintain a minimum channel for navigation. The Construction Staging Plan would be reviewed and approved by the USCG Captain of the Port prior to construction. Coordination and approval by the USCG Captain of the Port would occur for changes to the three navigation channels at each of the different times bridge pier sets would be constructed. Closures or restrictions on river traffic would be communicated in advance, enabling river users to accommodate their schedules, tug and barge configurations, requirements for assist tugs, shipping marine freight by other modes (e.g., truck, rail), use of different vessels with lower vertical clearance, and other options during construction activities that disrupt navigation and enable USACE to fulfill its navigation missions. • Provide Local Notice to Mariners throughout construction to provide information to tug operators, pilots, and the public. *Program-Specific Mitigation* • Make available an assist tug(s) to support safe navigation when vertical or horizontal clearances are reduced and assistance is needed to safely navigate the restricted channel. • Conduct outreach to inform the navigation community, recreational boaters, and other river users of waterway restrictions and other construction activities that may restrict or otherwise change local navigation conditions. • Provide information via local maritime publications, social media, local media, and other similar platforms. • Provide signage and notices at boat ramps, water access points, marinas, and other locations frequented by river users to inform them of the construction activities and where additional information can be found on the Program. • Notify individual vessel owners where information indicates they could be specifically impacted during construction. • Require all construction barges to have active AIS signals and construction channel lines be updated on the published navigation charts. • Modify the USACE Dredge *Yaquina* to have a lowerable mast or other feature to enable passage of the Interstate Bridge during construction.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
Property Acquisitions and Displacements	**Long-Term Effects** *Regulatory Requirements* • Purchase property at fair market value and provide relocation assistance per the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act). *Program-Specific Mitigation* No Program-specific mitigation measures are proposed for long-term effects related to property acquisitions and displacements. **Temporary Effects** *Regulatory Requirements* There are no specific regulatory requirements for mitigation of temporary property impacts. *Program-Specific Mitigation* As project design progresses, the IBR Program would develop approaches to managing temporary construction easements as part of the overall project right-of-way plan. The plan would identify measures that would be taken by contractors to avoid, minimize, and mitigate impacts to property temporarily used for construction. Program-specific measures that may be included in the plan to minimize and mitigate for temporary effects related to property acquisition and displacements include: • Mitigation for construction easements could include payment to property owners in exchange for the use of their property during construction. For example, one method for compensation would be to pay the equivalent of a rental based on the property valuation. Site impacts from temporary construction uses would be restored or compensated according to fair market or contributory value. • Mitigation may be needed in areas where construction of the Modified LPA could block or impede access to residences or businesses. Continued access to properties during construction would be maintained to the extent possible. Specific provisions may include signage to let the public know that businesses are open and conducting construction during non-peak business hours.
Land Use and Economic Activity	**Long-Term Effects** *Regulatory Requirements* • Purchase property at fair market value and provide relocation assistance per the Uniform Act. *Program-Specific Mitigation* • The Land Use Technical Report identifies several measures which, although they are not specifically land use mitigation, support the Modified LPA's compatibility with existing land uses: – The use of interchange area management plans to guide development within the vicinity of interchanges. – Mitigation for effects to historic resources, including demolition of the existing Interstate Bridge. – Avoidance of potential land use conflicts by planning and design efforts to support integration of park-and-ride facilities with current and planned land uses in downtown Vancouver.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	Temporary Effects *Regulatory Requirements* • Construction BMPs would be used to avoid or minimize indirect construction effects on land use and economics, such as dust, noise, and aesthetic impacts. These measures are discussed in Section 3.10, Air Quality; Section 3.11, Noise and Vibration; and Section 3.9, Visual Quality. *Program-Specific Mitigation* *Land Use* • Monitor noise levels on a regular basis during construction near noise-sensitive receptors located closest to construction activities to reduce disturbance to nearby land uses and confirm compliance with noise thresholds set by local jurisdictions as well as the conditions of any noise variances obtained. • Schedule and manage work activities to minimize community disruption to the greatest extent feasible. • Implement mitigation measures for temporary impacts on residents as discussed in Section 3.3, Property Acquisitions and Displacements. • Carefully plan construction of the Modified LPA to phase work in such a way that reduces or avoids complete closure of affected roadways and access points to nearby businesses. Necessary detours would be routed to reduce travel times and signed to reduce confusion. Construction would be planned to keep business access points open as much as possible and would be well signed. A construction communication plan could be developed to inform travelers about detours and road closures and would direct them to businesses. *Economics* • Reduce impacts to local businesses by implementing a phased construction schedule that avoids complete closures of roads and access points to local businesses. A construction communication plan could be developed to inform travelers about detours and road closures and would direct them to businesses. • Design construction schedules to minimize temporary impacts to BNSF Railway lines and service frequency. • Provide outreach to businesses affected by construction and use assistance programs to help mitigate potential negative construction-related effects. • Coordinate with the Ports of Portland and Vancouver and associated businesses to identify ways to minimize delays for commercial freight vehicles during construction. • To keep freight moving during construction, the IBR Program would conduct outreach to businesses in areas with high volumes of freight traffic to determine access and site circulation needs and maintain access as needed.
Neighborhoods and Equity	**Long-Term Effects** *Regulatory Requirements* • Comply with the Uniform Relocation Act. When displacement cannot be avoided, federal and state regulations require property to be purchased at fair market value and all displaced residents to be provided with replacement housing and relocation assistance. Federal regulations, such as the Uniform Relocation Act, and state statutes determine the standards and procedures for providing such replacement housing, based on the characteristics of individual households. Relocation benefit packages usually include replacement housing for owners and renters, moving costs, and assistance in locating replacement housing.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	Relocation benefits for businesses can include moving costs, site search expenses, and business reestablishment expenses. ***Program-Specific Mitigation*** *Neighborhoods* • Work with residents and community members to understand impacts and avoid, minimize, or mitigate overall neutral effect on visual quality in study area neighborhoods. • Strategies to minimize impacts to neighborhood cohesion could include providing additional community gathering spaces such as pedestrian and bicycle facilities. *Equity* • Work with residents and community members to understand impacts and avoid, minimize, or mitigate those impacts. • Develop a package of community benefits, which may be captured in a variety of documents, including contract specifications, environmental documents, a potential workforce agreement and either a community benefits plan or report. Community benefits are likely to include a variety of investments and strategies to ensure workforce and contracting equity, enhance the local community, and offset burdens associated with construction and operation. **Temporary Effects** ***Regulatory Requirements*** • Construction BMPs would reduce impacts to neighborhoods and equity priority communities. These measures are used to address construction effects such as temporary easements, noise, dust, emissions from construction vehicles, and visual clutter. BMPs applicable to the potential impacts described above in Section 3.5.5 are discussed in Section 3.3, Acquisitions and Displacements; Section 3.09, Visual Quality; Section 3.10, Air Quality; and Section 3.11, Noise and Vibration. ***Program-Specific Mitigation*** • Where feasible, implement nighttime construction schedules and shield nighttime lighting. • Hold community meetings before construction starts to inform residents of the construction timeline, relevant staging plans, ramp and road closures, and detour plans. • Use temporary signage, including variable message signs, to inform drivers of traffic delays because of construction and/or heavy equipment entering or leaving the highway. • Provide signs for local business assistance alerting customers of continued operation and a hotline for construction information. • Conduct regional outreach activities to provide information on construction impacts and detours that include communications to businesses, agencies, and community-based organizations within the greater Portland and Vancouver area. Traffic advisories and updates would be made available to the public to help make travel choices. • Place communication and signage for temporary routes for pedestrians and biking well in advance of the detour areas. Wayfinding signage would be accessible, consistent, thorough, and maintained. • Coordinate with affected property owners to minimize potential impacts to structures and access points during construction. • Coordinate with local jurisdictions and other organizations offering services to people experiencing unsheltered houselessness in areas directly affected by construction activities. Services would be provided in advance of construction and could include harm reduction, access to health services, and emergency shelter or alternate housing options.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• Restore removed landscaping on properties following construction or as otherwise agreed within the property rights process. • Pay property owners in exchange for the use of their property during construction.
Public Services and Utilities	**Long-Term Effects** *Regulatory Requirements* • Oregon Administrative Rules Database Chapter 660, Division 11: Public Facilities Planning. Governing bodies are directed to avoid, minimize, and mitigate impacts to public services if possible. • Growth Management Act (GMA) Revised Code of Washington 36.70A.030(33) defines public services. GMA directs local governments to avoid, minimize, and mitigate impacts to public services. • For utilities, the IBR Program would develop or modify existing agreements with affected utility owners to specify the locations of utilities within the right of way, access, and maintenance requirements, etc. *Program-Specific Mitigation* • Implement feasible mitigation strategies for increased travel times along emergency services routes as described in Section 3.1, Transportation, of this Draft SEIS. **Temporary Effects** *Regulatory Requirements* • Incorporate measures to maintain traffic flow and access during construction and to avoid and minimize temporary utility service disruptions into contract specifications. • Comply with current federal Dig Once laws (23 Code of Federal Regulations [CFR] 645.307) and associated state regulations and guidelines, which require advanced coordination with the broadband/fiber industry to invite these providers to participate in highway improvement projects. *Program-Specific Mitigation* • Protect utilities in place where feasible and cost effective. • Work with utility providers to relocate utilities when protection in place is not feasible, with the goal of relocating facilities only once to reduce service disruptions. • Work with service providers and the public to minimize temporary effects to the extent practicable. Advance communication with the impacted public services would be conducted to inform dispatchers and responders about planned road closures and detours. A preconstruction communication plan would be developed with affected emergency response groups and other public service agencies detailing how detour and road closure information would be provided to the services. • Evaluate the need for backup on-call emergency services to transport patients during bridge construction to mitigate highway delays. • Conduct public outreach campaigns before construction to ensure that detours and traffic rerouting plans during construction are available to public service providers and the communities they service. Provide detour signs on routes typically used and signed to access public service locations. • Coordinate closely with utility owners during project design to identify temporary facility needs and minimize temporary construction disruptions.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
Parks and Recreation	**Long-Term Effects** *Regulatory Requirements* • If tree removal is unavoidable, replace trees on site and in kind at appropriate replacement ratios in compliance with applicable requirements of Portland and Vancouver city code. • Evaluate the feasibility and reasonableness of noise mitigation in accordance with WSDOT or ODOT criteria to shield park visitors and trail users from increased noise levels. *Program-Specific Mitigation* • If the acquired park land includes play equipment or other amenities, replace those features either in the same park or at one nearby. • Coordinate specific tree removal permitting processes and tree replanting requirements (location and type) for each park with the appropriate jurisdictions. • Screen portions of the transportation improvements from view with trees, vegetation, or built screens. • Explore retaining wall façade treatments to improve the visual quality, where feasible. **Temporary Effects** *Regulatory Requirements* • In compliance with the Cities of Vancouver and Portland's tree conservation requirements and codes, protect trees on park property that would be close to construction activities from adverse impacts as directed by the agency managing the park land (the cities of Vancouver, Portland, and Gresham, National Park Service (NPS), and the Vancouver Public School District). • Employ BMPs, including those outlined in WSDOT and ODOT construction manuals, to minimize increased levels of noise, vibration, glare from construction lights, emissions from construction vehicles, or dust from demolition of existing structures. • Comply with local ordinance requirements to provide additional protection for park users. *Program- Specific Mitigation* • Restore landscaping to its original condition and select plants that are resilient or adaptive to future climate conditions for new landscaping once construction is complete. • Protect trees on park property that would be close to construction activities but not removed, as agreed to with the appropriate jurisdiction. Restore landscaping to its original condition once construction is complete. • Restore landscaping to as close as possible to its original condition once construction is complete. • Establish detour routes based on work zone TMP. • Schedule construction-related closures at public parks and recreation facilities to minimize effects on large events, as feasible. • Provide notice to users of the recreational trails of the temporary limits on recreation in the Columbia River. • Notify recreational anglers of temporary access restrictions to fishing areas and consider other coordination efforts, including working with WDFW/ODFW to share closure information and distribute this information at locations that serve the fishing community.
Cultural Resources	Identification of the mitigation for adverse effects to historic properties assessed under NEPA will be completed through the National Historic Protection Act Section 106 process. FHWA and FTA, in coordination with WSDOT and ODOT, and in consultation with Oregon State Historic

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	Preservation Office, Washington Department of Archaeology and Historic Preservation, consulting tribes, and other consulting parties, have chosen to complete the Section 106 process and resolve adverse effects on historic properties through the development of a Programmatic Agreement (PA) pursuant to 36 CFR 800.14(b). A Draft PA, with redactions for sensitive information as deemed appropriate by FHWA and FTA in consultation with consulting tribes and other consulting parties, is currently undergoing consultation and will be made available to the public prior to publication of the Final SEIS, as required by 36 CFR 800.14(b)(2)(ii). The Final PA will be executed prior to the issuance of the ROD and will be included as an appendix to the ROD.
Visual Quality	**Long-Term Effects** ***Regulatory Requirements*** • Meet the design standards of the Cities of Vancouver and Portland, TriMet, and C-TRAN for visual quality, including street furniture and transit stations. • Restore impacted roadsides in interchange and corridor areas in accordance with applicable vegetation and tree mitigation requirements. ***Program-Specific Mitigation*** *Mitigation Common to All Landscape Units, as feasible* • For local streets and transit stations, restore damaged landscapes, replant street trees, and provide enhanced landscapes to integrate the facilities into the community. • Shield station and facility lighting. • Minimize structural bulk, such as for ramps and columns. • Design architectural features to blend with the surrounding community. • Design gateways in coordination with applicable local plans including designs for landscaping, wall treatments, and other Program improvements. *Mitigation for Transit Stops and Stations, as feasible* • Design transit structural and architectural elements to be context-sensitive, and system-related signage and transit patron cues to be consistent with other transit system elements within respective systems. • Design the signal pole color, location, and style in accordance with the lighting district standards of the jurisdiction where the poles would be located (Portland or Vancouver). • Integrate transit facilities into the design of the community connector. *Place-Specific Mitigation, as feasible* • Transit Stations and Park and Rides – Conduct public design charrettes during the final design phases to refine the plans for each station area and park and ride. • Columbia River Landscape Unit – North Portland Harbor Crossings ▪ Preserve views of Mount Hood, to the extent practicable, for all users. – Hayden Island ▪ Integrate transit stations with the ground level, such as with landscaping. ▪ Evaluate surrounding views from the transit platform. ▪ Consult with the federally recognized tribes in the design process and provide opportunities to include cultural features such as, public art, historic education, plazas, or indigenous canoe watercraft landing and taking off locations. – Hayden Island Bridgehead

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	▪ Separate structures to admit daylight, if feasible. Maintain the separation between bridge structures across the island to ensure daylight and viable landscape at ground level, if feasible. ▪ Explore the incorporation of preserved bridgehead character into final design. ▪ Consult with the federally recognized tribes in the design process and provide opportunities to include public art, historic education, plazas, water access, or other cultural features. ▪ Explore public art opportunities on Hayden Island to announce arrival in Oregon, including pylons, piers, and other structures. – Columbia River Spans ▪ Design the active transportation on the Columbia River bridges for as low-stress an environment as possible ▪ Use art and landscaping to build anticipation of the river crossing in those approaching the main span, as feasible. ▪ Include lighting that would give expression to the architecture after dark, as feasible. – North Bank ▪ Incorporate a destination public open space under the bridge area as feasible. ▪ Consult with the federally recognized tribes in the design process and provide opportunities to include cultural features such as public art, historic education, plazas, or water access. ▪ Encourage creating or enhancing spaces, events, or initiatives that activate open spaces and urban environments along the Main Street extension to the river. Enhancements may include public art, street furniture, bike and pedestrian facilities, popup markets and public events, or other measures. ▪ Activate open spaces and screen structures with landscaping. ▪ Use architecture or public art to mark entry and departure from each bridge. • Vancouver Downtown Landscape Unit – Transit Structure “Landing” in Vancouver ▪ Provide landscaping, public art, or other façade treatments for the walls of the light-rail landing structure, as feasible. ▪ Coordinate and design transit structures and facilities in conjunction with the Community Connector. – Park-and-Ride Facilities ▪ Incorporate design guidelines and consider input from downtown interested parties and the general public. ▪ Buffer the park and ride from adjacent uses, mainly with landscaping but potentially with public art, fencing, or other elements, as feasible. ▪ Comply with City of Vancouver Design Standards and have them reviewed by the Vancouver Design Review Committee. ▪ To the extent feasible, eliminate potential glare from the park-and-ride structure components. ▪ Incorporate public art reflective of the unique context at each park-and-ride facility. – McLoughlin Boulevard Crossing ▪ Coordinate lighting under structures with city and I-5 lighting. ▪ Keep the spaces beneath freeway structures clear of unauthorized uses to the extent possible. • Greater Central Park Landscape Unit

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	– SR 14 Interchange ▪ Maintain existing vegetation wherever possible, particularly between the Kanaka Village and SR 14 ramps. Landscape plans should include plantings as visual screens. Replacement trees should be as large caliper trees as practical to replace screening value as quickly as possible. ▪ Provide visual and physical connections between under-bridge structures. Connect the Vancouver Land Bridge and Old Apple Tree Park with downtown Vancouver by combining improved sight lines, improved access, and integrated landscape design. ▪ Use Vancouver Land Bridge landscaping in new landscaped areas as feasible. ▪ Activate open spaces and screen structures with landscaping. Use landscape to organize the diversity and extent of open spaces associated with the interchanges and to screen the railroad berm. • Burnt Bridge Creek Landscape Unit – Ensure compatibility of overpass approaches with neighborhoods with input from the neighborhood facing each end of the bridges, as feasible. – Identify a local design theme for overpasses. **Temporary Effects** *Regulatory Requirements* • There are no regulatory requirements for temporary effects to visual quality, specifically. The Program would meet federal, state, and local design standards for light and glare. *Program-Specific Mitigation* • Follow standard construction specifications regarding the reduction of light and glare. • Shield construction site lighting to reduce spillover light onto nearby residences and businesses, as feasible. • Minimize visual obtrusiveness by locating construction equipment and stockpiling materials in less visually sensitive areas, when feasible, and in areas not visible from the road or to residents and businesses. • Provide, as feasible, public areas to observe the construction and demolition processes, using them as an opportunity for public education.
Air Quality	**Long-Term Effects** *Regulatory Requirements* • There are no regulatory requirements that would be directly implemented by the IBR Program. *Program-Specific Mitigation* • No mitigation proposed as long-term air quality impacts are not expected. **Temporary Effects** *Regulatory Requirements - Oregon* • Comply with Division 208 of Oregon Administrative Rule (OAR) 340. • Comply with ODOT Standard Specifications Section 290. • Comply with the Clean Diesel Construction Standard (OAR-731-005-0800). • Comply with Oregon House Bill 2007, known as the “Clean Diesel Bill."

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	• Comply with City of Portland Clean Air Construction Program that to reduce diesel emissions by implementing a standard set of idle reduction and diesel equipment requirements on job sites. *Regulatory Requirements - Washington* • Comply with WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, Section 1.07.5(4). • Comply with fugitive dust control BMPs set forth in the Associated General Contractors of Washington Education Foundation and Fugitive Dust Task Force Pamphlet, "Guide to Handling Fugitive Dust From Construction Projects." *Program-Specific Mitigation* • Through contract specifications, encourage all contractors to minimize impacts to surrounding communities such as using newer low-emitting construction equipment and electric equipment, and avoiding haul routes through residential areas.
Noise and Vibration	**Long-Term Effects** *Highway Traffic Noise Mitigation* Mitigation related to highway traffic noise include mitigation (abatement) measures that meet ODOT's and WSDOT's feasibility and reasonableness criteria may be recommended for inclusion in the Modified LPA. Feasibility primarily deals with engineering considerations such as whether substantial noise level reductions can be achieved or whether there would be a negative effect on property access resulting from the placement of noise walls for example. Reasonableness includes three factors: (1) if abatement is cost-effective; (2) if abatement can achieve the design goal; (3) and if the abatement is desired by benefiting receptors. The complete list of potential traffic noise abatement measures can be found in Section 7 of the Noise and Vibration Technical Report. Under ODOT and WSDOT policies, the following noise abatement measures must be considered: • Traffic management measures (for example, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive land designations). • Highway design measures (for example, alteration of horizontal/vertical alignments). • Acquisition of property rights (either in fee or lesser interest) for construction of noise barriers. • Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise. • Sound insulation of all Activity Category D land uses, including public use or nonprofit institutional structures. • Construction of sound barriers (including landscaping for aesthetic purposes), whether within or outside the highway right of way. Interstate construction funds may not participate in landscaping. Noise mitigation was evaluated at all locations where traffic noise impacts were predicted. Noise walls were evaluated to mitigate noise impacts at 16 locations in Washington and 3 in Oregon. Of those evaluated, 11 noise walls were determined to be feasible and reasonable by ODOT and WSDOT criteria (10 in Washington, 1 in Oregon). *Light-Rail Noise Mitigation in Downtown Vancouver*

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	• Install tall safety barriers or sound barriers along the elevated structure to mitigate the noise impacts at site LRT-1, which represents the Normandy Apartments located at E 7th Street and E C Street in downtown Vancouver. A 3- to 4-foot acoustical absorbent wall or 6-foot reflective wall would reduce noise levels at this location by 7 to 10 dBA. • Equip all light-rail track curves with a radius of less than 300 feet with wayside lubricators. After construction of the alignment, during the initial testing, if additional curves are identified with wheel squeal, install wayside track lubricators, as necessary. Light-rail noise mitigation was determined not to be needed in Portland. *Light-Rail Vibration Mitigation in Vancouver* • Use resilient rail fasteners to mitigate for vibration impacts located along direct fixation track way. Resilient rail fasteners typically reduce vibration levels by 5 vibration in decibels (VdB), which would not reduce all the predicted vibration levels to below the FTA 72 VdB criteria for residential land uses. Receivers LRV-1 and LRV-2, with predicted levels of 77 VdB and 81 VdB, respectively, would be the only locations where there is still a potential for vibration impact following mitigation. • Perform additional testing to ensure that the vibration levels at LRV-1 and LRV-2 would be below the 72 VdB criteria (Section 3.11, Figure 3.11-9). No vibration impacts are predicted in the Portland segment; therefore, no mitigation is needed. **Temporary Effects** Construction noise and vibration BMPs applicable to the Modified LPA with any design option are discussed below. ***Construction Noise*** *Regulatory Requirements* • Comply with ODOT construction noise abatement measures (§ 00290.32 Noise Control) at the time of construction. • If a specific noise impact complaint occurs during the construction of the Modified LPA, implement noise mitigation measures outlined in Section 3.11.6 as directed by the engineer. Although WSDOT does not have noise control provisions, WSDOT would voluntarily comply with § 00290.32 for work completed in Washington. *Program-Specific Mitigation* In addition to § 00290.32, ODOT and WSDOT would also implement additional noise abatement methods, including: • Limit activities that produce the highest noise levels (such as hauling, loading spoils, jack hammering, and using other demolition equipment) to 7:00 a.m. to 7:00 p.m. Maximum noise levels associated with pile driving could reach 105 dBA at distances of 50 feet. Mitigation of the noise associated with pile driving would, when possible, include drilled shafts or auguring rather than driving piles (however, using an auger is not likely to be feasible or practical for all locations) or limiting the times the activity could take place. Other less effective methods of reducing noise from pile driving include coating the piles, using pile pads, or using piston mufflers. If pile driving exceeds the limits set forth in Table 3.11-4 in Section 3.11, Noise and Vibration, a noise variance would be requested from the local jurisdiction. • Keep a construction log for each of the construction staging areas. The log would contain general construction information such as the time an activity took place, type of equipment used, and other information that might help with potential noise effects. • Establish a complaint hotline to investigate noise complaints and compare them to the construction logs. A construction monitoring and complaint program would help to ensure

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	that all equipment meets state, local, and any manufacturer's specifications for noise emissions. Equipment not meeting the standards would be removed from service until proper repairs were made and the equipment retested for compliance. This procedure would apply to all haul trucks, loaders, excavators, and other equipment that would be used extensively at the construction sites and that would contribute to potential noise effects. • Use equipment complying with pertinent equipment noise standards of the EPA. *Construction Vibration* *Regulatory Requirements* • Monitor all activities that might produce vibration levels at or above 0.5 inches per second if structures are near the construction activity, in compliance with WSDOT and ODOT requirements. This would include pile driving, vibratory sheet installation, soil compacting, and other construction activities with the potential to cause high levels of vibration. • For historic built properties within 500 feet of construction, monitor construction activities where construction-related vibration would exceed 0.2 inches per second for transient vibrations and 0.1 inches per second for continuous vibrations. Additional vibration mitigation measures intended to protect marine life are described in Section 3.16, Ecosystems. Additional mitigation measures related to built historic resources are described in Section 3.8. *Program-Specific Mitigation* No specific mitigation measures are proposed for vibration levels during construction.
Energy	**Long-Term Effects** *Regulatory Requirements* State-level legislation and policy in Oregon and Washington support reducing emissions from transportation to minimize contributions to climate change; However, there are no specific requirements for mitigation actions in federal, state, or local regulations. The Program supports state, regional, and local goals to reduce greenhouse gas emissions. To help facilitate a shift from single-occupancy vehicles, the Program would improve multimodal transportation options including: • Extended light-rail. • Expanded active transportation facilities. • Demand management (e.g., variable-rate tolling). • Operation and maintenance efficiencies. *Program-Specific Mitigation* • Use energy-efficient electrical systems for transit stations and other electrical needs to decrease energy consumption. **Temporary Effects** *Regulatory Requirements* • In Oregon, comply with ODOT Standard Specifications Section 290. • In Washington, company with WSDOT Standard Specifications Division 1-07. *Program-Specific Mitigation* • All work in Washington and Oregon will follow the WSDOT Environmental Manual, Chapter 425: Air Quality, Energy, and Greenhouse Gases, including: – Minimize delays to traffic during peak travel times. – Minimize unnecessary idling of on-site diesel construction equipment.

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	– Educate vehicle operators to shut off equipment when not in active use to reduce emissions from idling. – Prepare a traffic control plan with detours and strategic construction timing (e.g., night work) to move traffic through the area and reduce backups and delays to the traveling public to the extent practicable. • Continue to consider advances in energy-reducing and/or energy-saving materials and methods.
Water Quality and Hydrology	**Long-Term Effects** *Regulatory Requirements* • As design progresses, conduct a detailed hydraulic analysis of the affected floodplains. If a rise in the base flood elevation is predicted, assess mitigation through floodplain excavation (cut/fill balance) activities within the footprint of the Modified LPA and determine whether additional land may be required to accomplish the required mitigation. Conduct a Location Hydraulic Study to document the impacts, mitigation measures, evaluation of alternatives, and findings in accordance with the provisions of 23 CFR 650A. • Work with the City of Portland to ensure flood storage compensation does not jeopardize threatened and endangered species and their habitat (revised Floodplain Development Code Chapter 24.50 Flood Hazard Areas). • Comply with ODOT and WSDOT stormwater management requirements and the Cities of Portland and Vancouver regulations for the portions of the Modified LPA along City-managed roads during construction and for the long-term treatment of stormwater runoff prior to discharge into receiving waters. • Select and design water quality BMPs to ensure compliance with all federal, state, and local regulatory requirements, construction and municipal stormwater permit requirements issued through CWA section 401, to reduce suspended solids, particulates, and dissolved metals; to reflect the latest climate models; and to treat newly identified pollutants like 6PPD-quinone. • Construct flow control facilities to infiltrate or reduce the flow rates of all study area runoff, pursuant to local regulatory requirements. Mitigation for increased runoff to the Columbia Slough or the Columbia River would not be required because these water bodies are exempt from stormwater quantity management. However, the effects of increased runoff would be reduced using stormwater infiltration. This would allow groundwater recharge to continue and minimize the increase in runoff volumes and peak discharges. *Program-Specific Mitigation* *Hydrology* • Offset potential rise in the base flood elevation through floodplain excavation (cut/fill balance) activities as determined through a Location Hydraulic Study. • In the Burnt Bridge Creek watershed, construct infiltration facilities to provide complete infiltration of all Program-related runoff, such as providing underground injection control requirements, to the extent practicable, for the wellhead protection zone present in the watershed to manage stormwater volumes. As design progresses, select site-specific BMP facilities. • Prepare stormwater monitoring plan(s) to evaluate the long-term performance and effectiveness of the updated stormwater conveyance and treatment systems. Based on the findings, complete modifications or enhancements to the system(s) to meet discharge performance criteria.

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	• Compensate for additional fill in floodplains to achieve a no net loss of floodplain as a result of removal of materials within the City of Portland Floodplain Hazard Areas. *Water Quality* Where applicable in the project area, the following proposed water quality treatment facilities would be used to treat stormwater runoff and mitigate the increase in contributing impervious surfaces. Definitions of these treatment facility types are presented in Section 7.2.2 of the Water Quality and Hydrology Technical Report. • Treat stormwater runoff through bioretention ponds/planters, biofiltration swales, bioslopes (Oregon), and/or media filter drains (Washington) that provide water quality treatment via infiltration through a phosphorus-free, compost-amended soil medium and/or vegetation. Vegetation also provides uptake of some water. • Water quality treatment facilities that have demonstrated effectiveness for advanced treatment would be designed according to each jurisdiction's specifications such as according to Ecology's Technology Assessment Protocol program (Washington), the 2020 Stormwater Management Manual (Portland), and Vancouver's Surface Water Management Program. **Temporary Effects** *Regulatory Requirements* • Regulatory requirements for temporary effects of stormwater runoff during construction would include compliance with ODOT, WSDOT, Portland, and Vancouver's regulations including the preparation of a spill prevention, control, countermeasure (SPCC) plan and pollution control plan (PCP), and temporary erosion and sediment control. In addition, all federal, state, and local permits related to water quality and hydrology would be obtained. See Section 8 in the Water Quality and Hydrology Technical Report for a complete list of required federal, state, and local permits. *Spill Prevention/Pollution Control Measures* • Require the contractor to prepare an SPCC plan and PCP prior to beginning construction. These plans would be provided to the National Oceanic and Atmospheric Administration Marine Fisheries Service (NOAA Fisheries) for review and approval. The SPCC plan and PCP would identify the appropriate spill containment materials, as well as the means and methods of implementation, response, and reporting, in the event of a spill. All elements of the SPCC plan and PCP would be available at the project site at all times. For additional details, consult ODOT Standard Specification 00290.00 to 00290.90 and WSDOT Standard Specification 1-07.15. *Site Erosion/Sediment Control Measures* • Require the contractor to prepare and implement a temporary erosion and sediment control plan (TESCP) to minimize impacts associated with clearing, vegetation removal, grading, filling, compaction, or excavation. The BMPs identified in the TESCP would be used to control sediments in areas impacted by vegetation removal or ground-disturbing activities. Additional temporary control measures may be required beyond those described in the TESCP if it appears pollution or erosion may result from weather, nature of the materials or progress on the construction. For additional details, consult ODOT Standard Specifications 00280.00 to 00280.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02. • Stabilize all exposed soils as directed in measures prescribed in the TESCP. Hydro-seed all bare soil areas following grading activities and revegetate all temporarily disturbed areas with native vegetation indigenous to the location. For additional details, consult ODOT

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	Standard Specifications 01030.00 to 01030.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02. • Where site conditions support vegetative growth, plant native vegetation indigenous to the location in areas temporarily disturbed by construction activities. Trees would be planted when consistent with highway safety standards. Riparian vegetation would be replanted with species native to geographic region. Planted vegetation would be maintained and monitored to meet regulatory permit requirements. For additional details, consult ODOT Standard Specifications 01040.00 to 01040.90 and WSDOT Temporary Erosion and Sediment Control Manual M3109.02. ***Program-Specific Mitigation*** *Hydrology* • Minimize changes to groundwater hydrology by limiting groundwater pumping to areas where it cannot be avoided. *Water Quality* • Study, test, and remediate sites with existing soil or groundwater contamination near construction areas before any construction. See Section 3.18, Hazardous Materials for specific mitigation actions. • Conduct in-water work during approved periods for the Columbia River, as approved by Washington Department of Fish & Wildlife (WDFW), Oregon Department of Fish & Wildlife (ODFW), NOAA Fisheries, and U.S. Fish and Wildlife Service (USFWS). See Section 3.16, Ecosystems for specific mitigation measures. • Stage construction equipment used for in-water work activities above the ordinary high water mark (OHWM). Only the operational portion of construction equipment would enter the active stream channel (below the OHWM). • If in-water dredging is required outside of a cofferdam, use a clamshell bucket within the established in water work windows. Dredging, handling, and disposal of dredged materials shall be conducted consistent with the requirements and conditions of the regulatory permits issued for the Modified LPA. • If required, monitor turbidity and provide a "rest" period to allow turbidity, if any, to dissipate between in-water work activities.
Wetlands	**Long-Term Effects** ***Regulatory Requirements*** • Develop 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 U.S. and state. • 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 resources. ***Program-Specific Mitigation*** • Continue to evaluate mitigation to offset losses of wetland and waters functions and values, including wetland buffers, as the Modified LPA design progresses. • In cooperation with federal, state, and local agencies, tribes, and conservation groups, identify agency-approved compensatory mitigation banks and potential permittee responsible mitigation sites in both Oregon and Washington to fulfill the compensatory requirements for permanent, temporary, and indirect impacts.

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	• For unavoidable impacts to Vanport wetlands, increased mitigation ratios would be required because it is an existing wetland mitigation site. **Temporary Effects** *Regulatory Requirements* • Implement appropriate high visibility/exclusionary fencing around avoided wetlands and other waters prior to the start of construction. • Implement appropriate sediment and erosion control procedures during construction activities. • Replace vegetation temporarily cleared for construction activity in accordance with local regulatory guidance. • Avoid working outside of the in-water work window without first seeking an exception. • Offset unavoidable temporary impacts that cannot be minimized through BMPs through the purchase of credits from a mitigation bank or permittee responsible mitigation, similar to the mitigation used for certain long-term effects. *Program-Specific Mitigation* • Avoid and minimize short-term impacts to wetland resources in final design to the extent practicable. • Restore temporarily disturbed wetland and wetland buffer habitats consistent with applicable regulatory requirements.
Ecosystems	**Long-Term Effects** *Regulatory Requirements* • Provide stormwater quality and quantity treatment that meets or exceeds applicable regulatory requirements for all post-project contributing impervious areas. *Program-Specific Mitigation* • Avoid and minimize long-term impacts to ecosystem resources in final design to the extent practicable. • Provide compensatory mitigation for unavoidable impacts to ecosystem resources, consistent with applicable federal, state, and local regulatory requirements. • Prepare a compensatory mitigation plan that satisfies applicable federal, state, and local regulatory requirements, and that demonstrates no net loss of function of ecosystem resources. • Provide an alternate nesting structure, either on the new Columbia River bridges or within the vicinity, to offset removal of an existing peregrine falcon nest from demolition of the existing Interstate Bridge. **Temporary Effects** *Regulatory Requirements* *General Measures and Conditions* • Perform all work according to the requirements and conditions of the regulatory permits that are issued for the Modified LPA. • Require contractor to prepare a Water Quality Protection and Monitoring Plan (WQPMP) to satisfy the monitoring and reporting requirements of the 401 Water Quality Certifications that are ultimately issued for the project. The WQPMP would be provided to NOAA Fisheries for review and approval prior to implementation. The WQPMP would identify the timing and methodology for water-quality sampling during construction of the Modified LPA, as well as

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	methods of implementation and reporting. If, in the future, a standard water-quality monitoring plan is adopted by ODOT and/or WSDOT, this plan, with the agreement of NOAA Fisheries, may replace the contractor plan. • In compliance with ODOT and WSDOT policy and construction administration practice in Oregon and Washington, have one or more department of transportation inspectors on site during construction. The role of the inspector(s) would be to monitor compliance with contract and permit requirements. • If in-water dredging is required outside of a cofferdam, use a clamshell bucket. Dredging and handling and disposal of dredged materials shall be conducted consistent with the requirements and conditions of the regulatory permits issued for the Modified LPA. • Prohibit work barges from grounding out. • Dispose of excess or waste materials in an appropriate manner consistent with applicable local, state, and federal regulations; do not dispose of or abandon waste materials waterward of the OHWM or allow them to enter waters of the state. • All pumps must employ a fish screen that meets the following specifications: – An automated cleaning device with a minimum effective surface area of 2.5 square feet per cubic foot per second and a nominal maximum approach velocity of 0.4 feet per second, or no automated cleaning device, a minimum effective surface area of 1 square foot per cubic foot per second and a nominal maximum approach rate of 0.2 feet per second; and – A round or square screen mesh that is no larger than 0.094 inches (2.38 millimeters [mm]) in the narrow dimension, or any other shape that is no larger than 0.069 inches (1.75 mm) in the narrow dimension; and – Each fish screen must be installed, operated, and maintained according to NOAA Fisheries fish screen criteria. *Spill Prevention/Pollution Control Measures* • Require contractor to prepare an SPCC plan and PCP prior to beginning construction. These plans would be provided to NOAA Fisheries for review and approval. The SPCC plan and PCP would identify the appropriate spill containment materials; as well as the means and methods of implementation, response, and reporting. All elements of the SPCC plan and PCP would be available at the project site at all times. For additional detail, consult ODOT Standard Specification 00290.00 to 00290.90. • Require contractor to designate at least one employee as the erosion and spill control (ESC) lead. The ESC lead would be responsible for the implementation of the SPCC plan and PCP. • Maintain applicable spill response equipment and material designated in the SPCC plan and PCP at the job site. • With the exception of barges and stationary large equipment (cranes, oscillators) operating from barges or work platforms, fuel and maintain equipment at least 150 feet from the OHWM of any waterbody using secondary containment to minimize potential for spills or leaks entering the waterway. • Clean and inspect all equipment to be used for construction activities prior to arriving at the project site, to ensure no potentially hazardous materials are exposed, no leaks are present, free of noxious weeds, and the equipment is functioning properly. Daily inspection and cleanup procedures would be identified. • Should a leak be detected on heavy equipment used for the project, immediately remove the equipment from the area, and do not use again until adequately repaired. Where off-site repair is not practicable, the SPCC plan and PCP would document measures to be implemented to prevent and/or contain accidental spills in the work/repair area to ensure no

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	contaminants escape containment to surface waters and cause a violation of applicable water-quality standards. • Operate construction equipment from on top of floating barges, from the decks of temporary work bridges and platforms, the decks of the existing or replacement bridges, or from portions of the streambank above the OHWM. Barges and support vessels would be operated in the water. • Provide suitable containment measures for all equipment (including barges, work decks, stationary power equipment, and storage facilities) in the SPCC plan and PCP to prevent and/or contain accidental spills to ensure that no contaminants escape containment to surface waters and cause a violation of applicable water-quality standards. • Design and install temporary work bridges and platforms, cofferdams, and drilled shaft isolation casings consistent with the ODOT Hydraulics Manual, which establishes criteria to avoid these structures being overtopped during high water events. • Process water generated on site from construction, demolition or washing activities would be contained and treated to meet applicable water-quality standards before entering or re-entering surface waters. • Do not conduct paving, chip sealing, or stripe painting activities during periods of rain or wet weather. • In the SPCC plan and PCP, establish a concrete truck chute cleanout area to properly contain wet concrete as part of ODOT Standard Specification 00290.30(a). *Site Erosion/Sediment Control Measures* • Require contractor prepare and implement a TESCP to minimize impacts associated with clearing, vegetation removal, grading, filling, compaction, or excavation. The BMPs identified in the TESCP would be used to control sediments from all vegetation removal or ground-disturbing activities. Additional temporary control measures may be required beyond those described in the TESCP if it appears pollution or erosion may result from weather, nature of the materials or progress on the work. For additional detail, consult ODOT Standard Specifications 00280.00 to 00280.90. • As part of the TESCP, delineate clearing limits with orange barrier fencing wherever clearing is proposed in or adjacent to a stream/wetland or its buffer and install perimeter protection/silt fence as needed to protect surface waters and other critical areas. Location would be specified in the field, based upon site conditions and the TESCP. For additional silt fence detail, consult ODOT Standard Specification 00280.16(c). • Require contractor to designate at least one employee as the ESC lead. The ESC lead would be responsible for the implementation of the SPCC plan and PCP and would also be responsible for ensuring compliance with all local, state, and federal erosion and sediment control requirements. • All TESCP measures would be inspected and maintained as required by applicable permit requirements. Contractor would also conduct maintenance and repair of TESCP measures as described in ODOT Standard Specifications 00280.60 to 00280.70. • For landward construction and demolition, locate project staging and material storage areas a minimum of 150 feet from surface waters, in currently developed areas such as parking lots or managed fields, unless determined by an ODOT/WSDOT biologist that the topographic features or other site characteristics allow for site use closer to the edge of surface waters. • Complete excavation activities under dry or dewatered conditions where practicable. All surface water flowing toward the excavation would be diverted through utilization of cofferdams and/or berms. Cofferdams and berms must be constructed of sandbags, clean rock, steel sheeting, or other non-erodible material.

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	• Limit bank shaping to the extent as shown on the approved grading plans. Minor adjustments made in the field would occur only after engineer's review and approval. • Install biodegradable erosion control blankets on areas of ground-disturbing activities on steep slopes (1V:3H or steeper) that are susceptible to erosion and within 150 feet of surface waters. Areas of ground-disturbing activities that do not fit the above criteria would implement erosion control measures as identified in the approved TESCP. For additional erosion control blanket detail, consult ODOT Standard Specification 00280.14I. • Cover erodible materials (material capable of being displaced and transported by rain, wind or surface water runoff) temporarily stored or stockpiled for use in project activities to prevent sediments from being washed from the storage area to surface waters. Temporary storage or stockpiles must follow measures as described in ODOT Standard Specification 00280.42. • Stabilize all exposed soils as directed in measures prescribed in the TESCP. Hydro-seed all bare soil areas following grading activities and revegetate all temporarily disturbed areas with native vegetation indigenous to the location. For additional details, consult ODOT Standard Specifications 01030.00 to 01030.90. • Where site conditions support vegetative growth, plant native vegetation indigenous to the location in areas temporarily disturbed by construction activities. Revegetation of construction easements and other areas would occur after the project is completed. Trees would be planted when consistent with highway safety standards. Riparian vegetation would be replanted with species native to geographic region. Planted vegetation would be maintained and monitored to meet regulatory permit requirements. For additional detail, consult ODOT Standard Specifications 01040.00 to 01040.90. *Pile Installation and Removal BMPs* • Use a vibratory hammer to drive steel piles to the maximum extent practicable, to minimize noise levels. • Conduct impact pile driving below the OHWM between September 15 and April 15. Vibratory pile installation and removal (as well as certain other in-water construction activities) may occur on a year-round basis, provided they are conducted in compliance with all regulatory approvals. • No more than two impact pile drivers would be operated simultaneously within the same waterbody channel. • Employ a bubble curtain or other similarly effective noise attenuation device during all impact pile driving conducted in water depths greater than 2 feet (0.67 meters). • Develop and implement a hydroacoustic monitoring plan, based on the template developed by the Fisheries Hydroacoustic Working Group, in coordination with FHWA and FTA to confirm the effectiveness of the noise attenuation devices and that predicted noise levels adequately capture the area of the potential onset of injury. • Prepare a marine mammal monitoring plan, and establish injury protection zones for marine mammals. • Install cones or other anti-perching devices on open-ended pipe piles to discourage perching by piscivorous birds. • Remove temporary piles with a vibratory hammer, or by direct pulling, and prohibit intentionally breaking by twisting or bending. • If a temporary pile cannot be removed, cut or press the pile 3 feet below the mudline. At locations where hazardous materials are present or adjacent to utilities, temporary piles may be cut off at the mud line with underwater torches, if such activity would not conflict with navigation elements. *Work Area Isolation and Fish Salvage BMPs*

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	• Develop a temporary water management plan, consistent with the requirements of ODOT Special Provision Section 00245.03, and provide to NOAA Fisheries for review and approval prior to any work area isolation of fish salvage activities. • Install cofferdams and isolation casings in a manner that minimizes fish entrapment. Sheet piles would be installed from upstream to downstream, lowered slowly until contact with the substrate. • Screen drilled shaft isolation casings at the bottom, to minimize potential for fish entrapment during installation. Screen shall have maximum openings of approximately 3/32 inch (2.38 mm) measured on a diagonal (NOAA Fisheries 2022). • Conduct fish salvage according to the best practices established in the biological opinion for ODOT's Federal Aid Highway Programmatic consultation. • Have a qualified fishery biologist conduct and supervise fish capture and release activity to minimize risk of injury to fish. • Prepare a fish salvage report and submit to NOAA Fisheries, USFWS, ODFW, and WDFW following project completion. • Make a reasonable effort to capture Endangered Species Act-listed fish known or likely to be present in an in-water isolated work area using methods that minimize the risk of injury. Attempts to seine and/or net fish would precede the use of electrofishing equipment. • If electrofishing must be used, conduct consistent with NOAA Fisheries "Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act" (NOAA Fisheries 2000), or most recent version. *Work Area Lighting BMPs* • Conduct construction activities consistent with local, state and federal permit restrictions for allowable work hours. If work occurs at night, temporary lighting may be required to provide better visibility for driver and worker safety. If temporary lighting is required, contractor would use directional lighting with shielded luminaries to control glare and direct light onto work area, not surface waters. ***Program-Specific Mitigation*** • Avoid and minimize short-term impacts to ecosystem resources in final design to the extent practicable. • Restore temporarily disturbed terrestrial habitats consistent with applicable regulatory requirements. • Provide compensatory mitigation for unavoidable impacts to ecosystem resources, consistent with applicable federal, state, and local regulatory requirements. • Conduct activities with the potential to impact nesting migratory birds, such as nest removal, consistent with the provisions of the Migratory Bird Treaty Act, which requires nests of migratory birds to be removed only at times when nests are inactive.
Geology and Groundwater	**Long-Term Effects** ***Regulatory Requirements*** • Design structures to comply with federal, state, and city building seismic codes and standards and apply advancements in earthquake science and construction materials and updates in the conceptual model. • Design systems to minimize contamination of groundwater resources in compliance with Vancouver Municipal Code Chapter 14.26 Water and Sewers – Water Resources Protection and Portland City Code Title 21.35, Well Head Protection, and any applicable Washington and Oregon regulations.

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	Program-Specific Mitigation • Design structures to consider stormwater infiltration or other changed conditions near shallow footings, retaining walls, and other structures that could increase the potential for soil liquefication during a future seismic event. • Design the Modified LPA to accommodate a range of future conditions resulting from climate change to provide resilience for geologic concerns, such as increased erosion and scour, as feasible. • Conduct site-specific assessments of existing geologic hazards such as, but not limited to, faults, ancient landslides, steep cut slopes, non-seismic settlements, and soil liquefaction during design of the Modified LPA, as feasible. Site-specific assessments should include the use of geotechnical drilling, test pitting, material testing, geophysical techniques, subsurface displacement monitoring (inclinometers) and monitoring well installation, as feasible. Assessment would include recommended options for avoiding or mitigating geologic hazards. • Consider the use of light weight fills or geoform in areas adjacent to existing flood control levees and structures to minimize the potential for settlements. • Assess soil stabilization techniques to minimize the potential for soil liquefaction and non-seismic settlements during design of the Modified LPA. Stabilization techniques may include, but are not limited to, the use of soil mixing, compaction grouting, jet grouting, and stone columns. • Locate stormwater treatment facilities, to the extent possible, away from City of Vancouver well head protection zones for WS-1 and WS-3, and the Cascade Expansion groundwater protection area in Gresham for the Ruby Junction location. **Temporary Effects** *Regulatory Requirements* • Prepare and implement erosion control and stormwater pollution prevention plans and grading plans during construction. Plans would adhere to ODOT and WSDOT guidelines. • Prepare and implement stormwater discharge permits for construction. • Conduct inspection and observation monitoring of all Modified LPA elements during construction and long-term operations to ensure that appropriate construction and maintenance measures are being taken. *Program-Specific Mitigation* • Evaluate local geologic resources for future material needs. • Recycle or reuse aggregate, quarry rock, asphalt, and concrete materials to the extent practical.
Hazardous Materials	**Long-Term Effects** *Regulatory Requirements* In accordance with FTA and FHWA standard procedures, the IBR Program has prepared Phase I ESAs to identify existing environmental issues on properties to be acquired. The results and recommendations of the Phase I ESAs have been incorporated into this Draft SEIS. • Prepare Phase II ESAs for properties where identified recognized environmental conditions (RECs) indicate that a subsurface investigation is necessary to confirm the nature and extent of contamination and define the specific measures and applicable regulatory agency approvals needed to address the contamination. Incorporate the Phase II results into the

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	Final SEIS and ROD to provide decision-makers with a more detailed understanding of cleanup obligations and costs. • Develop detailed hazardous management plans during the final design and as part of the property acquisition process. Obtain necessary regulatory approvals to address areas where cleanup and remediation are needed. The remediation or cleanup of hazardous material sites affected by the Modified LPA would be required prior to construction. • In accordance with Safety Standards for Construction Work: Lead (Washington Administrative Code [WAC] 296-155) and General Occupational Health Standards: Asbestos (WAC 296-62 Part I-1), conduct hazardous building material surveys on structures proposed for demolition, prior to demolition, to identify any asbestos-containing materials, lead-based paint, and other hazardous materials. Based on the survey results, conduct necessary abatement prior to demolition. Dispose lead-based paint, asbestos-containing materials, and other hazardous materials at facilities permitted to receive these materials in accordance with federal, state, and local agency regulations. • Prepare a Program-wide construction health and safety plan, as required by federal Occupational Safety and Health Act regulations and state regulations, to minimize the potential for exposure of construction workers to hazardous materials and the risk to human health and the environment. • Prepare a site-specific contaminated media management plan to ensure proper characterization, management, storage, disposal, and reporting of contaminated materials encountered during construction activities. The plan would outline the roles and responsibilities of personnel; health and safety requirements; methods and procedures for characterizing, managing, storing, and disposing of waste; and reporting requirements. *Program-Specific Mitigation* • No Program-specific mitigation measures are proposed for long-term effects related to hazardous materials. **Temporary Effects** *Regulatory Requirements* • Construction BMPs applicable to the Modified LPA are discussed in Section 3.14, Water Quality and Hydrology and adherence to program SPCC Plan. Other required measures to reduce the risk of spills, leaks, or other releases during construction activities include: – Conduct fueling, maintenance, and cleaning in areas that are contained by berms or other containment. – Minimize the production or generation of hazardous materials, both upland and during demolition and replacement of over water spans. – Label and store hazardous waste according to federal regulations. – Locate hazardous waste (including contaminated spoils) storage away from storm drains or surface water. – Recycle materials such as used motor oil and water-based paint as appropriate. – Handle potential spills of hazardous materials in conformance with applicable regulatory requirements and adhere to the Program spill prevention, control, and countermeasure plan. *Program-Specific Mitigation* No Program-specific mitigation measures are proposed for temporary effects related to hazardous materials.

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Climate Change	**Regulatory Requirements** State-level legislation and policy in Oregon and Washington support reducing emissions from transportation to minimize contributions to climate change. There are no specific requirements for mitigation actions in federal, state, or local regulations. **Program-Specific Mitigation** As noted above, there are no specific requirements for mitigation actions in federal, state, or local regulations. However, the Program supports state, regional, and local goals to reduce greenhouse gas emissions. The Program is improving and adding multimodal transportation options (to facilitate mode shift), including the extension of light-rail, and the expansion of active transportation facilities; implementing demand management (e.g., variable-rate tolling); and implementing operation and maintenance efficiencies (e.g., using renewable energy for bridge operation needs, using zero-emission transit vehicles). *Long-Term Effects* The IBR Program would reduce GHG emissions in support of local, regional, and state goals. This section outlines concepts to further reduce or minimize GHG emissions associated with the construction or operations and maintenance of the Modified LPA. In developing these concepts, the IBR Program collaborated with ODOT, WSDOT, and the eight local agency partners. The IBR Program team will continue to consider and incorporate mitigation and minimization measures during the development of the EIS and through final design and construction. • User Emissions and User Experience: Design and Implementation Considerations – To increase resiliency, the design will consider future conditions, including more frequent and severe winter storms, lower low water conditions in the dry season, and an increase in the number and intensity of hot days during summer months. – In consideration of the effects of changing future climate conditions on users of the transportation system, the design considers the provision of shade and other treatments, with a focus on active transportation and transit users. • Operations and Maintenance – Minimizing energy use (e.g., LED lights) and using green energy sources. – Providing energy storage on the bridges for operations if power is interrupted. – Maximizing the renewable electricity supply for operations (lights, signs, transit, toll collection) toward 100% as soon as practical. – Exploring potential for wind generation, solar panels for energy needs, or piezoelectric energy harvesters to generate energy from traffic vibration. – Using an all-electric or hydrogen maintenance fleet (anticipated by 2045). – Establishing guidelines for replacement equipment, alternative fuel use, and materials standards. *Construction Effects* Strategies to reduce the energy consumed by the construction of the Modified LPA would include a range of options. Oregon and Washington have standard specifications that would reduce GHG emissions during construction, including: • ODOT Standard Specifications Section 290, which has requirements for environmental protection, and include air pollution control measures. These control measures include vehicle and equipment idling limitations, which would also reduce energy usage and GHG emissions. • Many of WSDOT's standards specifications to minimize air quality impacts would also reduce energy use and GHG emissions, including:

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	– Minimizing delays to traffic during peak travel times. – Minimizing unnecessary idling of on-site diesel construction equipment. – Educating vehicle operators to shut off equipment when not in active use to reduce emissions from idling. – Preparing a traffic control plan with detours and strategic construction timing (such as night work) to continue moving traffic through the area and reduce backups and delays to the traveling public, to the extent possible. As construction packages and plans are developed, the IBR Program will evaluate the potential to further reduce GHGs associated with construction. This could be implemented through construction bid document specifications or performance requirements, and could include: • Construction materials. – Design specifications for materials to reduce embodied emissions; use Environmental Product Declarations to evaluate various material choices and options. – Minimize lengthy supply chains for materials by using local sources where possible while still maintaining acceptable quality levels for materials. – Use cleaner production methods for cement and concrete (e.g., consider different mixes, fuel specifications for kiln and manufacture), and if found viable, incorporate into material specifications. – Maximize inclusion of recycled material to reduce virgin material production and inclusion. This would include recycling existing concrete and asphalt pavements within Program limits to be used as aggregate base, subbase, backfill materials, etc. – Consider prioritizing suppliers that document accountability to their sustainable practices, such as by participating and reporting to the EPA ENERGY STAR Challenge for Industry. • Fuel and energy use. – Specify emissions targets for contractors and encourage use of renewable fuels and electric equipment. – Specify improved diesel emissions standards for construction and vehicles. – Use renewable diesel, renewable propane, or other lower-carbon fuels in construction equipment and transport of materials. – Select specified electrical equipment (e.g., lighting) to maximize for energy efficiency, as long as the equipment meets safety and other project needs and requirements. – Seek to prioritize the use of battery-powered equipment and limit the use of diesel equipment operating under less stringent emissions standards than EPA's Tier 4.[8] • Waste reduction. – Minimize construction waste. – Consider adopting or establishing a zero-waste demolition plan, including a recycling plan, to maximize the recycling or reuse of old bridge components. • Traffic management during construction.[9] • Support and encourage alternative modes during construction, such as transit subsidies or elimination of fares during construction period. • Other approaches as suggested by interested parties, agencies, and the public.

[8] EPA has adopted a comprehensive national program to reduce emissions from nonroad (construction equipment) diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions. To meet these Tier 4 emission standards, engine manufacturers will produce new engines with advanced emission control technologies.

[9] Measures for minimizing the effects of construction-related traffic congestion (and thus emissions) are described in the Transportation Technical Report.

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Environmental Justice	**Long-Term Effects** *Regulatory Requirements* The applicable regulatory requirements are listed below: • Title 42 USC Section 4601, the Uniform Relocation Assistance and Real Property Policies Act (1970) • Title 23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise • ORS 467.010, Chapter 340, Division 35, Noise Control Regulations *Acquisitions and Displacements* • Compliance with Title 42 USC Section 4601, the Uniform Relocation Assistance and Real Property Policies Act (see Section 3.3, Property Acquisitions and Displacements). For low-income populations or populations with special circumstances, a relocation program could include housing assistance. *Noise* • Compliance with ODOT and WSDOT standard specifications for noise abatement that apply to highway construction activities, including noise and vibration monitoring (see Section 3.11, Noise and Vibration). Monitoring would include: – Establish a complaint hotline to investigate noise complaints during construction. A construction monitoring and complaint program would help ensure that all equipment meets state, local, and manufacturer specifications for noise emissions. Equipment not meeting the standards would be removed from service until proper repairs were made and the equipment retested for compliance. This procedure would apply to all haul trucks, loaders, excavators, and other equipment that would be used extensively at the construction sites and that would contribute to potential noise effects. – Conduct vibration monitoring of all activities that might produce vibration levels at or above 0.5 inches per second where structures are near the construction activity. This would include pile driving, vibratory sheet installation, soil compaction, and other construction activities with the potential to cause high levels of vibration. There is no effective method to completely eliminate vibration effects from construction; however, by restricting and monitoring vibration-producing activities, vibration effects from construction can be kept to a minimum. *Tolling* – No regulations are currently in place to offset the impacts of IBR Program tolls on low-income populations, although such regulations may be implemented in the future in support of a low-income tolling program or equitable tolling policy that would reduce or offset the economic burden of tolling on low-income and minority populations. Toll rates and policies implemented on the existing Interstate Bridge (pre-completion tolling) and the new Columbia River bridges under the Modified LPA (long-term tolling) would be jointly set by the Oregon Transportation Commission and the Washington State Transportation Commission. The commissions would consider possible exemptions and discounts, which may include a low-income discount program. Both commissions would work together to determine how to apply such exemptions and discounts to the IBR Program.

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	Program-Specific Mitigation *Transportation Impacts* • Monitor and adjust ramp meter rates manage travel times, delay, and other operational performance measures consistent with ODOT and WSDOT highway procedures. • Coordinate with local jurisdictions to adjust local street networks that could include the following actions: – Prohibit on-street parking during peak periods to improve vehicle flow and reduce travel delays associated with slowdowns to accommodate vehicles entering and exiting on-street parking spaces. – Add turn pockets at needed locations (e.g., a southbound right-turn lane at 15th and Columbia Streets in Vancouver) to improve vehicle flow and reduce travel delays associated with bottlenecking at intersections. – Alter traffic signal timing (e.g., for the Mill Plain Boulevard interchange signal) to maximize operational flow and reduce travel delays. *Business Displacements and Loss of Service Industry Jobs* • Provide mitigation for the loss of service industry jobs under a potential future workforce agreement and/or Project Labor Agreement. This agreement would be further defined as project design and planning progress, and would cover such topics as: – Adopting goals for involvement of minority, women-owned, emerging, and disadvantaged businesses in Program construction contracting. – Developing workforce practices to provide experience and business opportunities for disadvantaged workers and companies, such as requiring contractors to have apprentices perform a percentage of construction labor. – Providing job training and establishing preferences in contracting for local services. – Implementing a monitoring and evaluation program to track these measures through final project design, construction, and operation to help ensure that the benefits of promoting participation from minority-owned businesses are realized. *Tolling* Program-specific measures to minimize disproportionately high and adverse effects on EJ populations related to tolling are proposed as part of this EIS. As described in Section 3.20, Environmental Justice, tolling the existing Interstate Bridge and the new Columbia River bridges would result in higher transportation costs as a proportion of household spending for some EJ populations. Some of the project benefits—such as increased investments in the regional transit, walking, and bicycling network—may not be accessible or practical for EJ populations with fixed schedules and employment, school, and/or childcare commitments. Although the method of payment for a potential tolling program has not been determined, a transponder model has the potential to present a burden to low-income and minority populations due to the up-front cost and technical requirements of purchasing and setting up a transponder. Program-specific mitigation measures to address disproportionately high and adverse effects on EJ populations resulting from tolling may include: • A Low-Income and/or Equitable Tolling Program: If the OTC and WSTC choose to implement a low-income toll program on the existing Interstate Bridge (pre-completion tolling) and the new Columbia River bridges under the Modified LPA (long-term tolling), it would play a critical role in mitigating disproportionately high and adverse effects of tolling on EJ populations. Additional mitigation may be needed if I-205 is tolled in the future or if a regional tolling system is implemented. Both transportation commissions are actively studying low-income tolling programs, including how such a program could be implemented in each state. Key work done to date includes:

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	– The Oregon Tolling Program I-205 and I-5 Toll Project's Equity Framework (2023). The OTC has advanced key elements of a low-income toll program – the first of its kind in the nation – that will serve low-income travelers who cannot change their travel schedules or who travel frequently on interstate facilities. The program will balance impacts to other travelers while still achieving overall program goals to reduce traffic congestion and raise revenue for transportation improvements. Key commitments include at least a 50% discount on tolls for customers in Oregon or Washington whose household income is up to 200% of the federal poverty level and exemptions for federally recognized tribes and tribal government vehicles. – WSDOT Low-Income Toll Program Study for I-405 & SR 167 Express Toll Lanes (2021). WSDOT has developed a range of program options and evaluation metrics to assess toll discount program options to benefit equity populations. Options include percentage-based and fixed-rate discounts per trip, time-based toll credits, free toll trips, and lowering the maximum toll rate. Although this study was for the I-405 and SR 167 Express Toll Lanes in Washington and would not directly apply to the IBR Program, the study and its findings may influence future discussions and coordination between the OTC and WSTC regarding the future of a regional toll program. • Equitable Access to Technology and Information: ODOT, WSDOT, and regional partners will provide program-specific information, such as how to obtain transponders and/or how to receive transportation assistance, particularly for low-income drivers. – Locate venues for acquiring transponders near lower-income neighborhoods. The IBR Program would partner with public agencies and public service providers to identify locations that are convenient for low- or lower-income neighborhoods and that are accessible by multiple modes of travel. – Enable populations without credit cards or checking accounts to obtain transponders by paying with cash or electronic bank transfer cards. – Share information with and through other public service providers, particularly those that provide direct service to EJ populations. – Share information about existing rideshare opportunities such as local carpool and vanpool providers or work with partners to develop new programs. • Early, Inclusive, and Equitable Public Engagement: Public engagement and outreach is proposed as a critical step to ensure that transportation users can make informed travel choices when crossing the Columbia River. Public engagement should conduct specific outreach to potentially impacted EJ populations, connect these populations to assistance resources such as a future low-income and/or equitable tolling program and other travel options, and provide transparent information about the costs and impacts to their trips resulting from a future IBR tolling program. **Temporary Effects** *Acquisitions and Displacements* • Meet with property owners who would be affected by temporary acquisitions to discuss details of the acquisition, such as the duration of the acquisition and the operating schedule for construction activities. • Proposed mitigation measures are described in Section 3.3, Property Acquisitions and Displacements. *Transportation* • Proposed mitigation measures are described in Section 3.1, Transportation; Section 3.4, Land Use and Economic Activity; Section 3.5, Neighborhoods and Equity; and Section 3.6, Public Services and Utilities.

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• Maintain safe and accessible pathways, especially near public housing, senior housing, and public services. • Coordinate with TriMet to maintain paratransit service for qualifying mobility-impaired Hayden Island residents. *Noise* • Proposed mitigation measures are described in Section 3.11, Noise and Vibration. *Air Quality* • Proposed mitigation measures are described in 3.10, Air Quality.
Section 6(f) and FLP Resources	**Long-Term Effects** ***Regulatory Requirements*** This Draft SEIS identifies potentially affected Section 6(f)- and Federal Lands to Parks (FLP)-protected parkland resources, potential avoidance alternatives, and agency process requirements, early steps in a much longer process required to convert Section 6(f)- and FLP-protected properties to nonpark uses. The IBR Program has begun this process by initiating consultation with the Oregon Parks and Recreation Department (OPRD) and the City of Portland to discuss potential 6(f) impacts at East Delta Park and NPS, the City of Vancouver, and the City of Portland to discuss potential FLP impacts at Marshall Park, Old Apple Tree Park, and East Delta Park. Looking forward, the conversion process will generally include replacement property proposal and consultation. This process will consider public comment on potential conversion of Land and Water Conservation Fund (LWCF) and FLP lands identified in the Draft SEIS. The IBR Program will continue to look for ways to first avoid and then minimize effects on LWCF and FLP resources. If all practical alternatives to conversion of LWCF and FLP resources have been ruled out, the IBR Program will coordinate with the local agencies with jurisdiction over the LWCF and FLP resources, as well as a broader coordination process with the OPRD, NPS, and the GSA. ***Avoidance*** Alternatives to avoid 6(f) properties including reducing the right-of-way width of I-5 or realigning the Modified LPA farther west were developed. The Program then determined whether other impacts could result from the avoidance alternatives and whether these alternatives would meet the Program's overall Purpose and Need and specific objectives. ***Program-Specific Mitigation*** Program-specific mitigation measures for long-term effects related to LWCF resources will be developed in coordination with mitigation proposed for parks and recreation (see Section 3.7), and will be based on further consultations with the local, state, and national parks agencies throughout and beyond the NEPA process. **Temporary Effects** • Mitigation measures for temporary effects related to LWCF resources will be developed in coordination with mitigation proposed for parks and recreation (see Section 3.7), and will be based on further consultations with the local, state, and national parks agencies throughout and beyond the NEPA process.
Section 4(f) Resources	**Long-Term and Temporary Effects** ***Regulatory Requirements***

Resource Affected	Proposed Mitigation or Compensation for the Modified LPA
	• 23 CFR 774.17 directs agencies to include all reasonable measures to minimize harm or mitigate for adverse impacts and effects to Section 4(f) resources. These measures have been incorporated during the development of the Modified LPA to the extent possible and will continue to be refined as the design progresses. ***Program-Specific Mitigation*** • No program-specific mitigation measures are proposed for long-term or temporary effects related to Section 4(f) resources beyond those proposed under Parks and Recreation.

How will the IBR Program address climate in design and construction?

Climate considerations guide planning for all areas of work on the IBR Program, including design, construction, operation, and maintenance. The effort falls into three broad categories of actions: reducing GHG emissions, managing risks, and building for resiliency. Approaches to these efforts are outlined below.

- Reduce GHG impacts by implementing Program components.
  - Improve transportation options (to facilitate mode shift).
  - Implement demand management (e.g., variable-rate tolling).
  - Optimize construction approaches.
  - Implement operation and maintenance efficiencies (e.g., auxiliary lanes, ramp meters).
- Evaluate risks to determine the consequences of climate hazards in the following categories: social (people, community), environmental (contamination, destruction), and economic (cost of repair, financial losses).
- Optimize the resiliency of the infrastructure by addressing vulnerability from natural hazards.

Local partners can support further GHG reductions by implementing complementary services and policies, such as:

- Providing higher frequency mass transit and deeper investments.
- Approving land uses and building permits in patterns that reduce single occupant vehicle trips.
- Providing mobility hub options.

Questions the IBR Program would continue to address in ongoing design include:

- How would future climate affect our natural systems and infrastructure?
- How would historically vulnerable people be affected by climate change?
- How can the IBR Program lessen the climate impacts for equity priority communities?
- How can we design resilient infrastructure?

How will the IBR Program address equity through process and outcomes?

In tandem with the IBR Equity Advisory Group, the Program adopted an equity framework to guide the processes and desired outcomes in terms of furthering equity. At the core of the framework is a Program-specific equity definition and six equity objectives, which together form the basis for the analysis presented in the Draft SEIS and other Program efforts.

Definition of equity

The IBR Program defines equity in terms of both process and outcomes. Together, process equity and outcome equity contribute to addressing the harmful impacts of and removing longstanding injustices experienced by historically underserved communities.

***Process Equity** means that the Program centers and prioritizes access, influence, and decision-making power for equity priority communities throughout the Program in establishing objectives, design, implementation, and evaluation of success.*

***Outcome Equity** is the result of successful Process Equity and is demonstrated by tangible transportation, community, and economic benefits for equity priority communities.*

Equity priority communities are those who experience and/or have experienced discrimination and exclusion based on identity or status, such as:

- Black, Indigenous, and People of Color
- Tribal governments
- People with disabilities
- Communities with limited English proficiency
- Persons with lower incomes
- Houseless individuals and families
- Immigrants and refugees
- Young people
- Older adults

Equity objectives

The IBR Program has established six equity objectives:

1. **Mobility and accessibility**: Improve mobility, accessibility, and connectivity, especially for lower-income travelers, people with disabilities, and historically underserved communities who experience transportation barriers.
2. **Physical design**: Integrate equity, area history, and culture into the physical design elements of the Program including bridge aesthetics, artwork, amenities, and impacts to adjacent land uses.
3. **Community benefits**: Find opportunities for and implement local community improvements in addition to required mitigations.
4. **Workforce equity and economic opportunity**: Ensure that economic opportunities generated by the Program benefit minority- and women-owned firms; Black, Indigenous, and People of Color (BIPOC) workers; workers with disabilities; and young people.
5. **Decision-making processes**: Prioritize access, influence, and decision-making power for Equity Priority Communities throughout the Program in establishing objectives, design, implementation, and evaluation of success.

6. **Avoid further harm**: Actively seek out options with a harm-reduction priority rather than simply mitigate disproportionate impacts on historically impacted and underserved communities and populations.

What are the next steps and how will a decision be made?

The community has an opportunity to review this Draft SEIS and provide feedback during the public review and comment period. The design of the Modified LPA may be further refined based on public input and findings. Following the public comment period, and in collaboration with the joint leads, cooperating and participating agencies, and tribes, the IBR Program will determine which design options are consistent with the Vision and Values (see Chapter 1) and should be advanced to the Final SEIS and formally recommended by the Program. The design of the Modified LPA would be developed to a level of detail to allow the IBR Program to apply for permits and update cost estimates.

The IBR Program will continue to work and foster relationships with agencies, tribes, and the public through completion of the Program.

How can the public learn more about and be involved in the IBR Program?

The Program website (www.interstatebridge.org) provides more information, including background and the process that has led to the development of this Draft SEIS. The website also has information on upcoming public events, Program milestones, and how to view the Draft SEIS.

You are invited to submit your comments on the Draft SEIS between through November 18, 2024. Comments received during this time will be reviewed and considered, and responses will be published in the Final SEIS. Comments **about the Draft SEIS** can be submitted by several methods:

- **Written comments** on the Draft SEIS can be submitted through the online comment form www.interstatebridge.org/DraftSEIS**,** by email to DraftSEIS@interstatebridge.org**,** or by regular mail to the address below. Written comments should not include any hyperlinks to outside materials or information. Any materials or information the commenter wishes to have considered should be included within the comment.

  IBR Program Draft SEIS
  c/o Chris Regan
  500 Broadway Street, Suite 200
  Vancouver, WA 98660

- **Phone:** Leave a voice message on the IBR Program's comment line at (866) IBR-SEIS (866-427-7347) (toll-free). Voice messages need to explicitly say "**Draft Supplemental EIS**" or "**Draft SEIS**" for them to be identified and addressed as comments on the Draft SEIS.

- **Attend a public hearing:** Public hearings will be held in Portland and Vancouver and virtually at the dates and locations listed below.

  Tuesday, October 15, 2024
  Clark College, Gaiser Hall 150
  1933 Fort Vancouver Way
  Vancouver, WA 98663
  5:30-8:30 PM

Thursday, October 17, 2024
Portland Expo Center, Exhibit Hall E2
2060 N. Marine Drive
Portland, OR 97217
5:30-8:30 PM

Saturday, October 26, 2024
See www.interstatebridge.org for link
12:00-1:30 PM

Wednesday, October 30, 2024
See www.interstatebridge.org for link
6:00-7:30 PM