

3.4 Land Use and Economic Activity

Jurisdictions in the Portland-Vancouver region integrate transportation and land use planning to help ensure that major transportation improvements do not create unintended or unforeseen effects on land use patterns and the economy. Both Oregon and Washington have growth management laws to regulate land use and growth. The Modified LPA has been designed to accommodate the travel needs of existing land uses and support the region's anticipated growth and economic development. This section evaluates the potential effects of the Modified LPA on the region's land use planning goals and economic activity.

The information in this section is based on data in the Land Use and Economics Technical Reports (Appendix H), which contain greater detail and analysis of the information that follows.

3.4.1 Changes or New Information Since 2013

The Columbia River Crossing (CRC) Selected Alternative identified in the 2011 Record of Decision (ROD), as revised by the 2012 and 2013 re-evaluations, is referred to as the CRC Locally Preferred Alternative (CRC LPA). Over the past 10+ years since the CRC LPA was identified, the physical environment in the study area, community priorities, and regulations have changed, which necessitated design revisions and resulted in the IBR Modified LPA (see Section 2.5.2). Evaluation of potential impacts associated with land use and economic activity has been updated in this Draft SEIS to include:

- Updates to land use plans, policies, and regulations at the federal, state, regional, and local levels; updated zoning regulations for the Cities of Vancouver and Portland; updated environmental guidance for ODOT and WSDOT.
- Changes in businesses (e.g., closure of Safeway grocery store on Hayden Island).
- Land use changes in the study area, including development at the Vancouver Waterfront, changes in planned uses on Hayden Island, and recently constructed, altered, or removed buildings.
- Changes in the project footprint necessitated by changed conditions resulted in shifting the light-rail transit alignment and modifying interchange designs.

Table 3.4-1 compares the impacts and benefits of the CRC LPA to those of the IBR Modified LPA. There are no impacts from the Modified LPA that would differ substantially from those of the CRC LPA.

Table 3.4-1. Comparison of CRC LPA Effects and Modified LPA Effects

Technical Considerations	CRC Effects Identified in the 2011 Final EIS	Modified LPA Effects	Explanation of Differences
Direct land use impacts (conversion of a land use to a transportation use)	Approximately 90 acres total (approximately 70 acres in Oregon and 20 acres in Washington).	Approximately 47 acres total (approximately 37 acres in Oregon and approximately 10 acres in Washington, including approximately 4 acres of subsurface easements). Totals would vary slightly among the Modified LPA design options, primarily in downtown Vancouver.	The reduction is due to both changes in land uses and design modifications necessitated by changes in land uses and other changed conditions, including replacing the full interchange on Hayden Island with a partial interchange and moving the light-rail transit alignment along I-5 (removing the proposed couplet in downtown Vancouver).
Consistency with land use plans and policies	Consistent.	Consistent.	N/A
Business displacements	Approximately 70 businesses and 900 employees displaced.	Between 35 and 39 businesses (depending on design option) and up to 758 employees displaced.	The reduction in business displacements and decrease in employee displacement are due to changes in existing businesses as well as design modifications necessitated by changes in land uses and other changed conditions, including replacing the full interchange on Hayden Island with a partial interchange and moving the light-rail transit alignment along I-5 (removing the proposed couplet in downtown Vancouver).
Regional economy	The CRC LPA was determined to be highly beneficial to the regional economy. Some larger vessels would no longer be able to pass under the proposed fixed-span configuration; however, the CRC project worked with those river users to develop measures to avoid economic impacts. With the suspension of the CRC	The Modified LPA would result in benefits to the trucking industry by reducing labor costs, improving safety, potentially improving vehicle operating costs, and reducing scheduling uncertainty. New transit connections in downtown Vancouver would improve travel time accessibility and broaden the pool of labor available along the corridor and in the region. For the Modified LPA with any of the three bridge configurations, marine commerce would be slightly improved for many vessels because	Although the terminology is different, the findings are generally consistent between the CRC LPA and the Modified LPA.

Technical Considerations	CRC Effects Identified in the 2011 Final EIS	Modified LPA Effects	Explanation of Differences
	project, these measures were cancelled.	<p>the new Columbia River bridges would allow most vessels to pass without timing restrictions, providing more flexibility in operating schedules and reducing wait times.</p> <p>Passage of vessels or cargo that require more than 116 feet of vertical navigation clearance would be permanently eliminated under either of the two fixed-span configurations. The IBR Program is coordinating with these existing river users to develop measures to avoid economic impacts through vessel or cargo modifications and other accommodations.</p> <p>No permanent, adverse effects to vessels and cargo shipments would occur with the movable-span configuration.</p> <p>Potential economic effects to businesses and river users that could be constrained by the new Columbia River bridges' height could include increased costs from changes to production, additional freight shipment costs, increased assembly costs, and lost potential for future revenue from projects.</p>	
Estimated reduction in property tax due to business displacement	<p>Approximately \$255,300 in Oregon (approximately \$326,000 in 2022 dollars ^a).</p> <p>Approximately \$12,100 in Vancouver (approximately \$21,800 in 2022 dollars ^a).</p>	<p>Approximately \$646,200 in Portland in 2022 dollars.</p> <p>Approximately \$217,100 in Vancouver in 2022 dollars.</p>	Property values and property tax revenues have increased across the region; hence, the estimated reduction in property tax revenues is larger for the Modified LPA even though fewer properties would be acquired.

Technical Considerations	CRC Effects Identified in the 2011 Final EIS	Modified LPA Effects	Explanation of Differences
Tolling	Variable-rate tolls would range from \$1.00 to \$2.00 in 2006 dollars. Tolling would likely be beneficial for freight-dependent businesses and businesses that rely on just-in-time deliveries because the predictability of travel times would improve. The collection of tolls would reduce the demand for vehicular capacity.	Variable-rate tolls would range from \$1.50 to \$3.15 in 2025 dollars/Fiscal Year 2026 dollars (Scenario B – Lower Tolls). Similar to CRC, tolling is expected to be beneficial for freight-dependent businesses and to result in an overall reduction in bridge crossings.	The Scenario B toll rates being evaluated for the Modified LPA are generally comparable to the Scenario 1 toll rates from the 2011 Final EIS after considering the effects of inflation.

a 2022 dollars were estimated using the Bureau of Labor Statistics Consumer Price Index inflation calculator.
CRC = Columbia River Crossing; EIS = final environmental impact statement; LPA = locally preferred alternative

3.4.2 Existing Conditions

Study Areas

Oregon's Statewide Planning Goals and Washington's Growth Management Act agree on general principles of compact urban form, preservation of rural areas, use of urban growth boundaries, and multimodal transportation systems. Regional plans tailor these goals for the Portland-Vancouver region, and local plans further refine these goals and implement them through zoning and development regulations.

The Portland-Vancouver region is located at the confluence of two navigable rivers—the Columbia and the Willamette—and is served by BNSF Railway and Union Pacific Railroad transcontinental rail lines, Portland International Airport, and marine terminals at the ports of Portland and Vancouver. The region's economic competitiveness depends in large part on its role as a gateway and distribution center for domestic and international markets.

The land use analysis considered primary and secondary study areas, shown in

Figure 3.4-1. The primary study area represents the area that would experience direct impacts from construction and operation of the Modified LPA. Because major transportation projects can affect regional growth trends and patterns, the secondary study area was identified to evaluate where indirect effects (e.g., traffic and development changes) could occur. The secondary study area extends from the I-5/I-84 interchange in the south to approximately where I-5 and I-205 meet in the north.

The potential for land use changes that could affect marine commerce is evaluated in the Navigation Impact Report. Appendix A of the Navigation Impact Report assesses existing commercial and industrial development and land uses along the Columbia River upstream of the Interstate Bridge to evaluate the potential for future development that could result in different vessels using the waterway. The appendix identifies properties along the Columbia River that currently have marine facilities available or have the potential for future development of such facilities. It concludes that there are few opportunities for new or expanded commercial and industrial development that would require the use of vessels too large to pass beneath the proposed new

Columbia River bridges. Section 3.4.5, Indirect Effects, provides more information on the potential for upriver marine facility development.

Figure 3.4-1. Land Use Primary and Secondary Study Areas and Existing Land Uses



Like the land use analysis, the economics analysis also considered two study areas (Figure 3.4-2). The primary study area is the same as the land use study area, while the secondary study area is composed of the seven-county Portland-Vancouver Primary Metropolitan Statistical Area (PMSA), which includes the counties of Clackamas, Columbia, Multnomah, Washington, and Yamhill in Oregon, and Clark and Skamania Counties in Washington. This larger area allowed the analysis to consider the potential regional economic effects of the Modified LPA.

Land Use

Oregon

The primary study area is largely composed of commercial land uses with smaller amounts of vacant land, multifamily residential, and parks/open space. The Oregon portion of the secondary study area is largely residential, with commercial activity on the major transportation corridors such as Interstate Avenue and Martin Luther King Jr. Boulevard. The southern portion of the secondary study area (Figure 3.4-3) includes the Lloyd District, which is a mix of residential and commercial land uses and includes regional facilities such as the Moda Center, the Veterans Memorial Coliseum, and the Oregon Convention Center. This area is a major employment center for the region, with several large office buildings housing the Bonneville Power Administration, State of Oregon, Metro and TriMet offices, the Lloyd Center Mall, and various small businesses.

The area of North Portland between N Columbia Boulevard and the Columbia River (Figure 3.4-4) is primarily industrial and commercial uses, but also includes multifamily housing, parks, public facilities, and open space. Some regionally important land uses in this area are the Portland International Raceway, the Expo Center, and an Amazon delivery facility that occupies the site of the former Portland Meadows horse racing track. This area includes the Columbia Slough, Hayden Island, and Delta Park, which contains large wetlands west of I-5 as well as a variety of recreational facilities. Currently, the TriMet MAX light-rail line ends at the Expo Center, just south of the Columbia River. Historically, the city of Vanport was located south of the Expo Center (see Section 3.8, Cultural Resources).

Hayden Island is only accessible via I-5, and N Hayden Island Drive is the main road within the island. The primary land use within this portion of the study area is commercial and includes the Jantzen Beach Center shopping mall and surrounding retailers. Residential land uses on Hayden Island include multifamily residential developments, manufactured homes, and floating homes in small marinas. The Columbia River, the boundary between Oregon and Washington, is lined on both sides by marinas, homes, hotels, restaurants, and public facilities.

The Land Use Technical Report contains a list with additional detail on recent and pending development within the Oregon primary study area. Since publication of the CRC Final EIS, six developments have been completed within the Oregon primary study area, while three are proposed and in various early stages of development permit review. Projects consist of retail commercial, multifamily residential, light industrial, and hotel uses.

Figure 3.4-2. Economic Analysis Primary and Secondary Study Areas

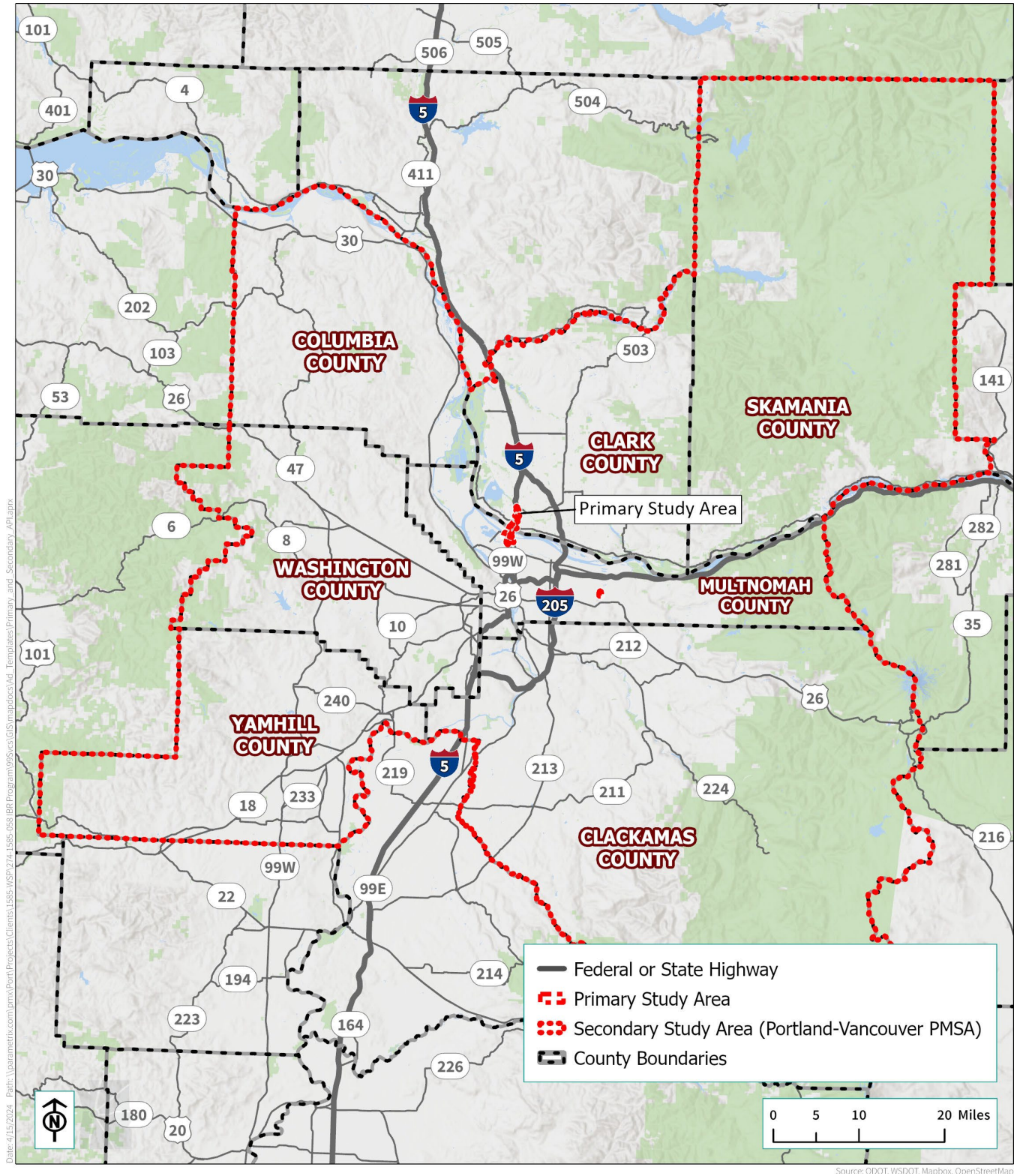


Figure 3.4-3. Existing Land Uses – Southern Portion of the Secondary Study Area

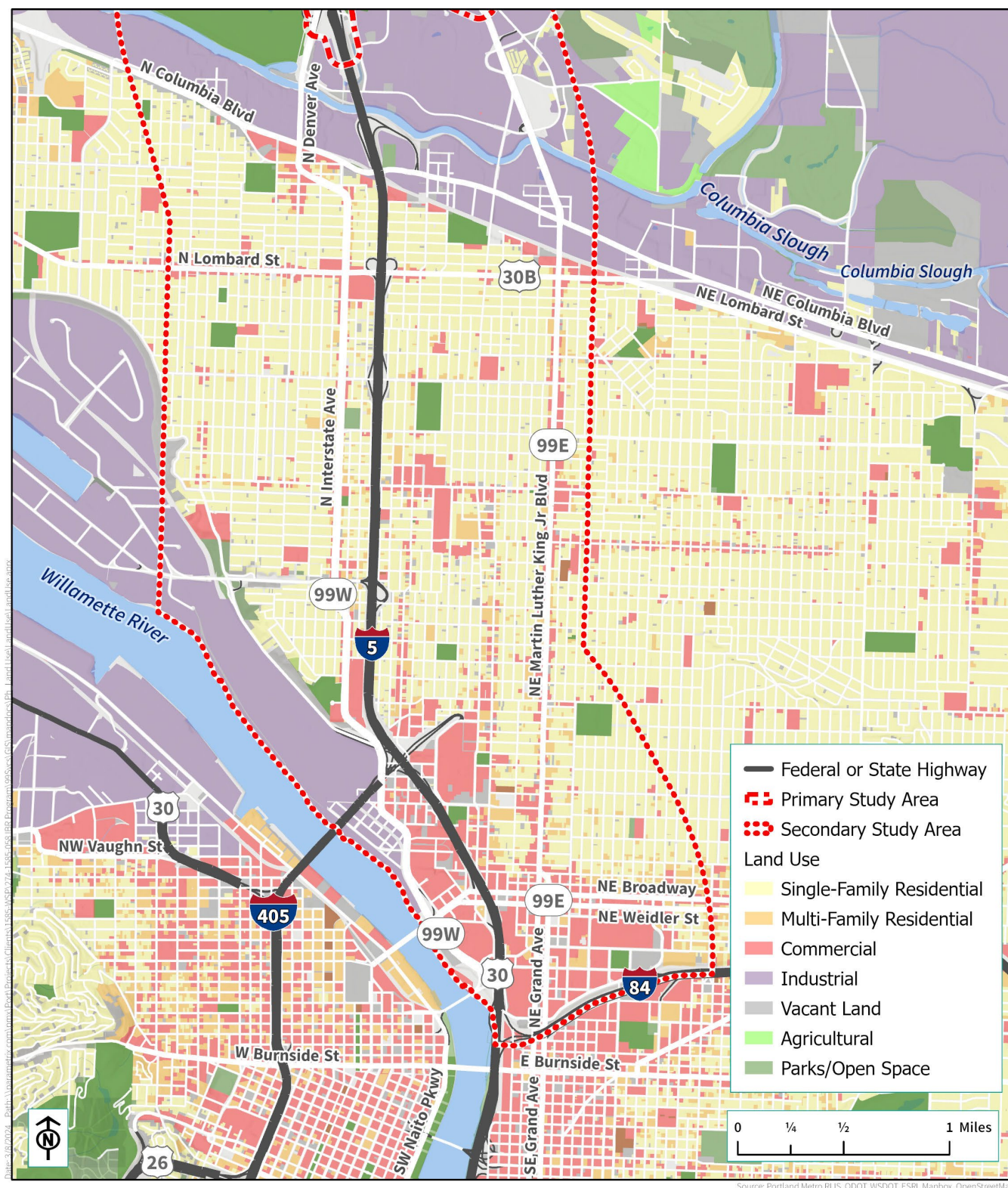
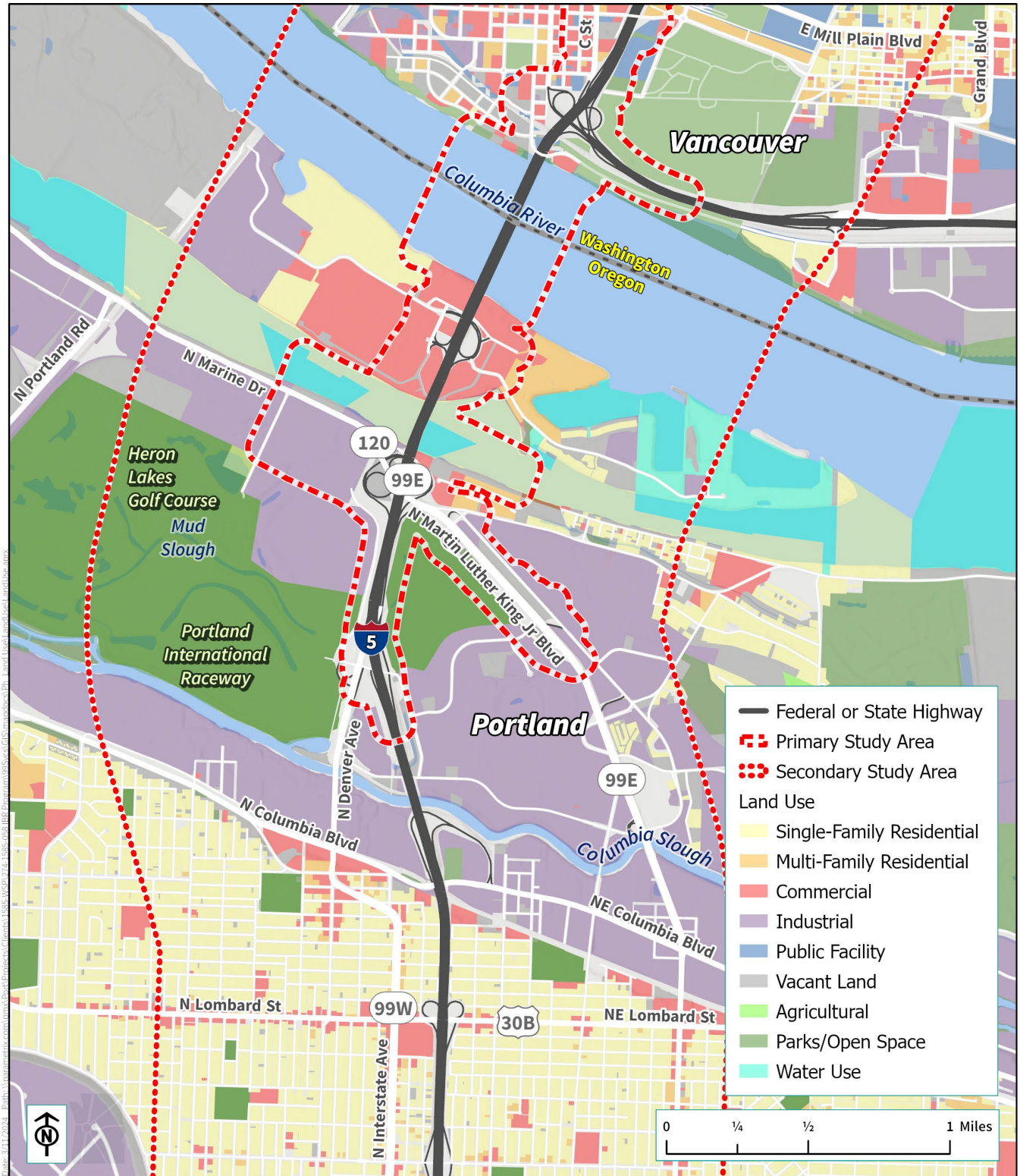


Figure 3.4-4. Existing Land Uses in North Portland, Hayden Island, and the Columbia River



Washington

The Washington portion of the study area includes downtown Vancouver, residential areas, and the National Park Service property and the Vancouver National Historic Reserve (see Figure 3.4-5). Land uses are primarily commercial (including retail, offices, industrial, governmental) and residential. Community facilities include an Amtrak train station, C-TRAN bus rapid transit facilities (including Turtle Place Transit Station), Esther Short Park, the Vancouver Waterfront, and various government offices. The current I-5 corridor divides the downtown area, with the commercial/office center on the west and the Vancouver National Historic Reserve and Clark College on the east. E Evergreen Boulevard and E Mill Plain Boulevard provide east-west connections across I-5.

North of the central city, commercial development is centered on I-5 and Highway 99 (Figure 3.4-6). East and west of I-5, much of the secondary study area is single-family residential with some multifamily districts along major roadways. Public facilities, parks, and open spaces are located throughout the secondary study area. The Vancouver urban growth boundary is just north of the secondary study area, at the intersection of I-5 and approximately 209th Street.

The uptown commercial district (between Mill Plain and Fourth Plain Boulevards on Main Street) is a transitional area between downtown and the lower-density land to the north. The area contains primarily residential uses, with major transportation corridors supporting commercial uses. The current municipal boundary of the City of Vancouver is roughly along 63rd Street.

North of 63rd Street, and south of Salmon Creek and 119th Street, residential areas consist of large-lot single-family uses. The commercial areas (along Highway 99 and Hazel Dell Avenue) have frequent bus service but are primarily auto-oriented. Infill development of single housing units and very small subdivisions is being built on lots previously used as farmland. Commercial areas along 134th Street and Highway 99 are auto-oriented. This area includes a number of regional facilities: the Clark County Fairgrounds, the Clark County Amphitheater, and Legacy Salmon Creek Hospital. The Washington State University Vancouver campus is located just outside the secondary study area. I-5 and I-205 come together in this area, as do 134th Street, Salmon Creek Avenue, and Highway 99. Congestion from these major roadways has twice led to development moratoria in the area.

The Columbia Business Center is an industrial park located approximately 1.2 miles upriver from the Interstate Bridge. It was once the location of the Henry J. Kaiser Vancouver Shipyard established in 1942 as an emergency shipyard to build vessels for World War II. The last ship was delivered in 1946 and the shipyard was closed thereafter. The Columbia Business Center includes approximately 2.3 million square feet of space in 27 buildings and approximately 1.0 million square feet of leasable space. The Columbia Business Center provides both barge and rail access. The BNSF Railway mainline borders the north side of the property. The East Barge Slip is used to receive and ship fabricated steel products, construction materials, and supplies. The West Barge Slip is not active and as of 2021 there were no plans to improve it. There is a dock located just to the west of the West Slip, which is used by a marine shipyard services company.

The Land Use Technical Report contains additional detail on recent and pending development within the Washington primary study area. Since publication of the CRC Final EIS, 10 or more projects have been completed within the Washington primary study area, while 5 are under construction and 3 are proposed or in various stages of development permit review. These projects consist of several multifamily residential and mixed-use multifamily residential/commercial developments, along with commercial office, hotel, and public projects including a library and an elementary school.

Figure 3.4-5. Existing Land Uses in Downtown Vancouver

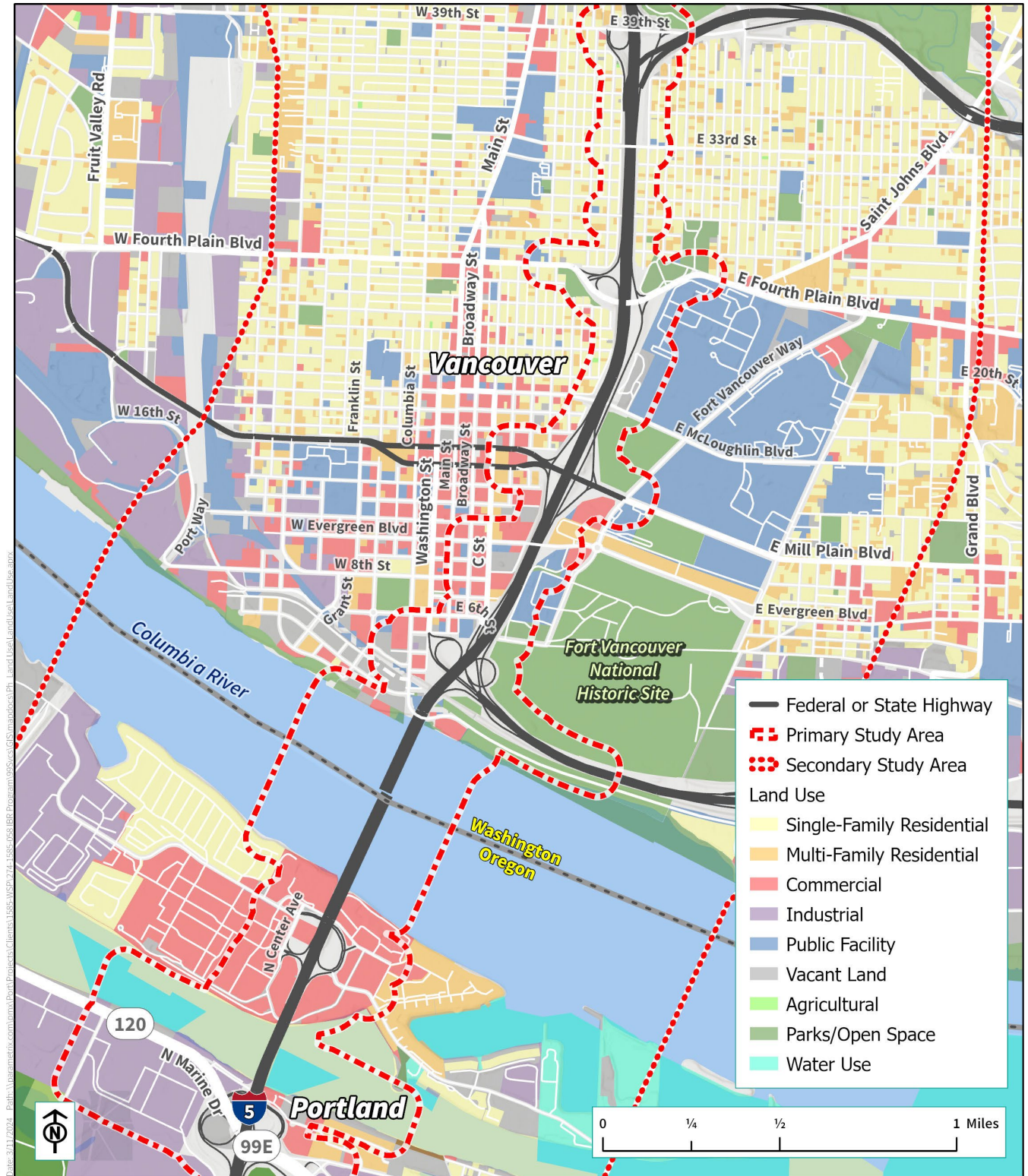
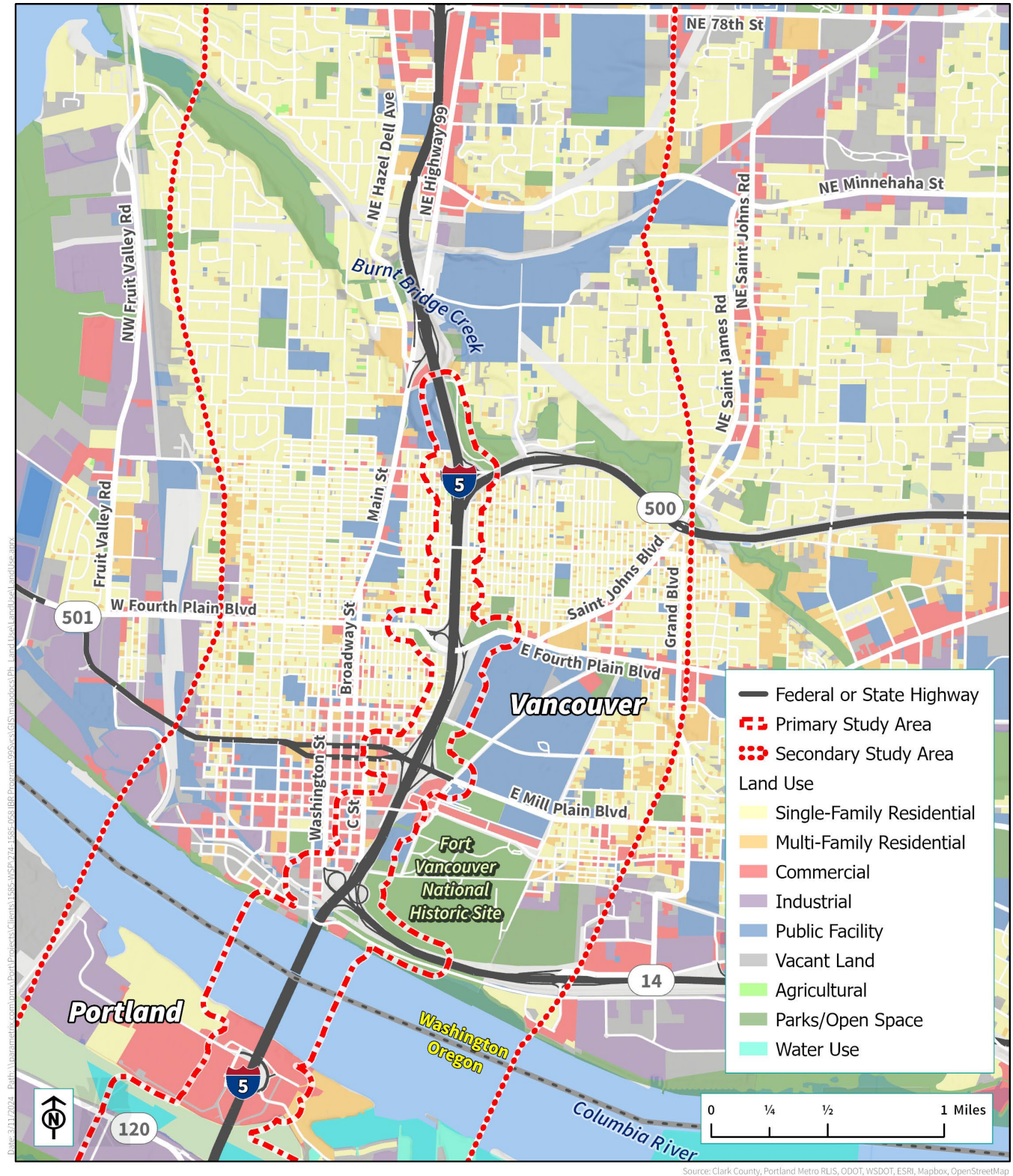


Figure 3.4-6. Existing Land Uses in North Vancouver and Clark County



Economics

Regional Conditions

Many of the region's industries, including private marine facilities, depend on the movement of freight and reliable freight access to stay competitive locally and internationally.

From 2015 to 2020, the unemployment rate for the Portland-Vancouver PMSA, which includes Clark, Clackamas, Multnomah, Yamhill, Columbia, and Skamania Counties, trended lower than overall rates in Washington, Oregon, and the nation (BLS 2021). Unemployment spikes in 2009 to 2011 and in 2020 were caused by the economic recession and the pandemic, respectively. The most recent unemployment information (2021) shows a positive trend of economic recovery from the COVID-19 pandemic. Data on unemployment rates show 3.9% for the region, 4.7% for Oregon, 4.9% for Washington, and 4.8% nationally.

The number of jobs in the Portland-Vancouver PMSA increased by 301,160 (or 33.5%) between 2002 and 2019 (U.S. Census Bureau 2019); the largest increases were in health care and social assistance (3.2% increase) and professional, scientific, and technical services (1.5% increase). In the same time period, the largest decreases in employment share were in manufacturing (2.9% decrease) and retail trade (1.3% decrease). Of the Interstate Bridge commuters, 79% are residents of Clark County who work in the Oregon PMSA counties, and 21% are Oregon PMSA residents working in Clark County (U.S. Census Bureau 2018).

Table 3.4-2 lists the 10 largest employers in the Portland-Vancouver Metropolitan Statistical Area (MSA), which includes Clackamas, Multnomah, Washington, and Clark counties (as of September 2023). Each of these businesses depends on the region's transportation system to provide reliable movement of goods and services, and on the I-5 corridor to connect to Mexico, California, and Canada.

Table 3.4-2. Largest Employers in the Portland-Vancouver Metropolitan Statistical Area

Rank	Employer	No. of Employees
1	Providence Health System	23,100
2	Intel Corp.	22,328
3	Oregon Health & Science University	19,603
4	Nike, Inc.	15,522
5	Legacy Health System	13,087
6	Kaiser Permanente	12,514
7	Fred Meyer Stores	9,000
8	Portland Public Schools	7,111
9	City of Portland	6,753
10	Multnomah County	6,317

Source: Portland Business Journal 2023

In the Portland-Vancouver MSA, the median household income increased from \$56,000 in 2010 to \$75,000 in 2019, below the Washington median of \$78,687 but above the Oregon and national medians, \$67,058 and \$65,712 respectively.

In 2012, the most recent year for available data, retail sales totaled \$40.4 billion per year in the Portland-Vancouver MSA (U.S. Census Bureau 2012).

The ports of Portland and Vancouver are critical to the economic growth and prosperity of the region. The total annual tonnage moving through the two ports is expected to double from approximately 300 million tons in 2007 to almost 600 million tons in 2040 (Cambridge Systematics 2015). Commodities moved by trucks are expected to grow from about 200 million tons to about 400 million tons, though the percentage of total freight transported by truck is expected to remain roughly the same at 67%.

Approximately \$133 million in commodity value was transported by trucks daily across the Interstate Bridge in 2019. The projected growth in truck traffic, along with passenger travel, has implications for the roadway network and capacity needs, as efficient and safe movement of products to and from the ports is needed to maintain their competitiveness. See the Economics Technical Report for more detail on the transport of commodities by mode through the Port of Portland and the Transportation Technical Report for more detail on freight moved by truck. Commodity transport by ship and tug/tow is also important to the regional economy. Inland navigation along the 360-mile Columbia Snake River System, Portland/Vancouver to Lewiston, Idaho, carried over 8.3 million tons of commercial cargo in 2020 (PNWA 2024). Recreational vessels, such as sailboats, powerboats, personal watercraft, and yachts modestly contribute to the regional economy.

As described in Chapter 2, the existing Interstate Bridge provides a maximum vertical clearance of 72 feet when closed and a maximum vertical clearance of 178 feet when the lift span is opened. Apart from a small number of specialized vessels that use the river infrequently, the majority of vessels require vertical clearances of less than 90 feet from the surface of the water to the bottom of the bridge deck. Required openings of the Interstate Bridge have declined from an average of 289 per year between 1997 and 2011 to 157 per year between 2012 and 2020. Approximately 58% of the bridge openings were for tugs, 17% were for sailboats, and the remainder were other vessel types. These openings are required for 5% to 7% of the total river traffic, based on openings of the BNSF Railway Bridge just downstream of the Interstate Bridge and use of the locks at the Bonneville Dam. Currently, bridge openings are restricted to non-peak commute hours to minimize stopping traffic on I-5.

Because the Portland-Vancouver region depends on the distribution of goods to broader regional, national and global markets, it is susceptible to long-term economic losses from traffic congestion.

Local Conditions

Table 3.4-3 presents Metro’s recent and forecast population data for the primary study area, by state and for the four-county Portland-Vancouver Standard Metropolitan Statistical Area (SMSA).¹ Between 2015 and 2045, Metro forecasts that Portland-Vancouver SMSA will grow by an annual 1.4%, lower than the projected 2.7% growth for the Oregon portion of the study area, but slightly higher than the 1.1% forecast for the Washington portion.

Table 3.4-3. Population Forecast in the Primary Study Area

Area	2015	2045	Average Annual Growth Rate
Oregon (study area only)	61,362	110,128	2.7%
Washington (study area only)	60,228	80,323	1.1%
Portland-Vancouver SMSA	2,006,417	2,850,534	1.4%

Source: Metro 2021

¹ Forecast data provided by Metro includes the four-county SMSA, which includes Clark, Clackamas, Multnomah and Washington counties. The PMSA includes these four counties and also includes Yamhill and Columbia Counties in Oregon and Skamania County in Washington.

Between 2015 and 2045, the number of households in the Portland-Vancouver SMSA is forecast to grow approximately 1.5% per year; this is lower than the 2.7% projected for Oregon but higher than the 1.2% projected for Washington. Forecast household growth in the Portland-Vancouver SMSA is similar to population. However, the Metro forecast predicts a slight decrease in persons per household, declining from 2.36 in 2015 to 2.32 in 2045 (assuming no change in housing vacancy rates). Table 3.4-4 presents recent and forecast household data.

Table 3.4-4. Household Forecast in the Primary Study Area

Area	2015	2045	Average Annual Growth Rate
Oregon (study area only)	26,023	47,469	2.7%
Washington (study area only)	25,542	34,622	1.2%
Portland-Vancouver SMSA	850,898	1,228,679	1.5%

Source: Metro 2021

Table 3.4-5 presents employment forecast data for the Oregon and Washington portions of the primary study area and the Portland-Vancouver SMSA. Between 2015 and 2045, Metro forecasts total employment in the SMSA to grow by approximately 1.6% per year, slightly higher than the 1.1% forecast for Oregon and the 1.0% forecast for Washington.

Table 3.4-5. Employment Forecast in the Primary Study Area

Area	2015	2045	Average Annual Growth Rate
Oregon (study area only)	55,251	73,186	1.1%
Washington (study area only)	36,647	47,914	1.0%
Portland-Vancouver SMSA	1,072,925	1,592,290	1.6%

Source: Metro 2021

Both the City of Portland and the City of Vancouver rely on tax revenues to fund general services. Portland's largest source of revenue is property taxes (49%), as Oregon does not have a sales tax. In Vancouver, the largest source of revenue is business and occupation taxes (32%), followed by property tax and then sales tax.

Marine Commerce

The Columbia River has been a commerce route from time immemorial for Native Americans. European and European American contact with the Columbia River occurred around 1800 and prompted further exploration, trade, and settlement activities. The Interstate Bridge (existing northbound span) was built and opened in 1917, replacing a ferry system to transport people and goods across the river. The original bridge included a lift span to accommodate navigation for vessels and cargo with heights up to 178 feet. In 1958, a second bridge (existing southbound span) was completed and opened for traffic; this bridge was designed as a twin to the original bridge, including a lift span to accommodate navigation. For over 100 years, the Interstate Bridge has supported navigation on the Columbia River for commerce, recreation, and government agency missions.

Commercial vessels on the Columbia River include cruise vessels, tugs, tows, barges, and marine contractors' vessels. Several passenger cruise lines host tours up and down the Columbia and Snake Rivers and require frequent passage under the Interstate Bridge during the cruise season. Commercial tugs and barges have the highest share of river usage and transit year-round and accounted for approximately 54% of the bridge opening events across a 35-year study period. Tugs and barges are usually able to use the barge channel or alternate barge channel unless river and weather conditions are a factor or cargo requires additional vertical clearance. Tugs and barges will request an opening of the Interstate Bridge to provide sufficient vertical clearance or minimize safety hazards between the Interstate Bridge and the BNSF Railway Bridge downstream.

Marine contractors use vessels such as crane barges, dredges, and other construction equipment transported on the Columbia River. Transits of the Interstate Bridge are not limited to a particular time of year or frequency, as construction work is typically performed on an as-needed or contract basis. Whether the transport of construction equipment requires a bridge opening event depends upon the contractor's location and the location of the construction project. Construction equipment used by marine contractors accounted for an average of 17% of bridge opening events, ranging from no lifts (2013) to a high of 32% (1989 and 2000).

Existing horizontal and vertical obstructions limit the size of vessels on the Columbia River upriver of the Interstate Bridge. The BNSF Railway Bridge at Celilo Falls, located 95 miles upstream of the Interstate Bridge, has a vertical clearance of 79 feet in the raised position. Upstream from Celilo, several bridges and other obstructions such as power cables further limit the vertical clearance on the river to less than 79 feet. In addition, the Bonneville Locks and all other locks on the Columbia/Snake River system constrain navigation uses to a maximum width of 86 feet, which prohibits passage by ocean-going barges.

3.4.3 Long-Term Benefits and Effects

Table 3.4-6 summarizes the effects of the No-Build Alternative and the Modified LPA, and its design options, on land use and economics. Effects were evaluated for the Program analysis year of 2045. Additional information on the effects is provided in the sections that follow.

No-Build Alternative

Land Use

The No-Build Alternative would not address current deficiencies in the Interstate Bridge structure, design, or capacity. Existing land uses that rely on I-5 to travel within the region would remain vulnerable to high levels of congestion, unsafe conditions, and potential earthquake-induced failure. There would also be no high-capacity transit service to connect the regional centers of downtown Vancouver and downtown Portland, which would be inconsistent with the stated policies and goals of applicable regional transportation plans.

Under the No-Build Alternative, increased growth in the region by 2045 would result in traffic congestion that would impair road-based freight movement and reduce the region's productivity. This could indirectly impede the effective implementation of land use plans and hinder goals for economic development. A loss in the growth of local jobs could have impacts such as decreased property values, increased commercial vacancies, and reduced demand for downtown revitalization. Refer to Section 3.1, Transportation, of this Draft SEIS for more information on the No-Build Alternative traffic conditions.

Table 3.4-6. Summary of No-Build Alternative and Modified LPA Effects on Land Use and Economics

1	2	3	4	5	6	7	8
No-Build Alternative	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Westward Shift	Modified LPA with Single-Level Fixed-Span Configuration, ^a One Auxiliary Lane, C Street Ramps, Centered I-5	Modified LPA with Single-Level Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, without C Street Ramps, Centered I-5	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Park-and-Ride Site Options
<ul style="list-style-type: none"> 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 prices, increased commercial vacancies, and reduced demand for downtown revitalization. 	<ul style="list-style-type: none"> 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 underneath the new Columbia River bridges. 	<p>Similar to Column 2, except:</p> <ul style="list-style-type: none"> 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. 	<p>Similar to Column 2, except:</p> <ul style="list-style-type: none"> Larger areas of properties would be permanently acquired. Additional 1 acre of permanent acquisition. Additional three business displacements. Potential to impact 142 additional employees. 	<p>Similar to Column 2, except:</p> <ul style="list-style-type: none"> Lower maximum bridge height and reduced highway grade would benefit freight vehicle speed compared to double-deck bridge, with corresponding economic benefits. 	<p>Similar to Column 2, except:</p> <ul style="list-style-type: none"> 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 times of day for large vessel movements. 	<p>Similar to Column 2, except:</p> <ul style="list-style-type: none"> 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. 	<p>Similar to Column 2, except:</p> <p>Waterfront Station Locations:</p> <ul style="list-style-type: none"> Site1: Additional 0.1 acres acquired. Site 3: Additional 1.5 acres of permanent acquisition; Potential to impact 53 additional employees. <p>Evergreen locations:</p> <ul style="list-style-type: none"> Site 1: Additional 3.16 acres acquired, no displacement. Site 2: No acquisition or displacement.

^a The effects associated with the single-level fixed-span configuration would be the same for all bridge type options.

Economics

The No-Build Alternative would retain the existing Interstate Bridge and would only make minor preservation improvements to I-5 within the study area. Several local road projects are planned to improve freight mobility, access, and safety in the study area, and those would continue. The Interstate Bridge would increasingly serve as a bottleneck for southbound traffic, including freight traffic. Traffic operations forecasts indicate that congestion on the bridge on weekdays would last from 5 a.m. to 9 p.m., a total of 16 hours. In the northbound direction, congestion on the bridge would last 14 hours, from 7 a.m. until 9 p.m.

Under the No-Build Alternative, no businesses in Oregon or Washington would be displaced by right-of-way acquisition, and there would be no resulting decrease in property or sales tax revenues or jobs. However, increasing congestion on I-5 could result in significant economic effects, as planned economic development may occur more slowly with business owners reluctant to locate in an area with poor access and mobility for employees and customers. Freight reliability would decrease as congestion would continue to spread throughout the day. Customers could elect to shop in areas with better access and mobility.

Modified LPA

Most long-term effects on land use and economics would not differ among the Modified LPA design options. Where differences would occur, they are described in the subsections below.

Land Use

Long-term direct land use impacts are defined as converting land from its existing use to a transportation use. This analysis of direct impacts is based on acquisition data developed for the Modified LPA, as described in Section 3.3, Property Acquisitions and Displacements.

Approximately 47 acres of property would be permanently acquired for the construction and long-term operation and maintenance of the Modified LPA. The exact total would vary between approximately 47.1 acres and 47.5 acres, depending on the design option; variations in acquisition among the design options would occur only in the Washington portion of the study area. All design options would include approximately 4.3 acres in permanent subsurface easements, which are required for the potential installation of tie-back anchors associated with retaining walls.

Most of the land that would be acquired is currently zoned industrial or commercial, with some land zoned residential in upper Vancouver. Although these conversions would reduce the area of land available for non-transportation uses, they would comprise only a small portion of the total land in the Portland-Vancouver area and would not be substantial in a regional context. The acquisition of new right of way, displacement of active land uses, and other impacts would not lead to a significant change in the mix of land uses, land use patterns, zoning, or land use plans in the study area.

The transportation infrastructure associated with the Modified LPA, such as the extension of light-rail transit, would be consistent with the goals and policies of adopted land use plans as described in the “Consistency with Plans and Policies” section below and summarized in Table 3.4-10. Consistency with applicable land use plans and policies is also detailed in the Land Use Technical Report.

Oregon

Table 3.4-7 shows the change in land use from acquisitions in Oregon by zoning designation. The extent of direct land use impacts from property acquisitions would be the same for all of the design options. A total of 68 parcels, comprising over 37 acres, would be affected; 25 of these parcels would be fully acquired and 43 would be partially acquired. Partial acquisitions may not require the acquisition of buildings or affect the current use of the property. Partially acquired properties which require displacement of buildings or businesses may still leave a portion of the parcel available for redevelopment.

As described in Chapter 2, the construction activities associated with the Modified LPA would likely require both temporary and permanent modifications to portions of the Portland Metro Levee System, which is a system of federal flood control levees located along the south bank of the Columbia River/North Portland Harbor within the primary study area. Modifications may include activities to restore temporarily disturbed portions of the levees, permanent modifications where proposed infrastructure would intersect with the existing levees, or changes in access to the levees as a result of roadway reconfiguration. Modifications or improvements would be coordinated for consistency with the planned future condition of the levees under the Columbia Corridor Drainage Districts Joint Contracting Authority's Levee Ready Columbia project. The assessment of long-term effects to land use and economics associated with the Modified LPA presented in this section includes those associated with potential modifications to the federal levee system.

Table 3.4-7. Oregon Right-of-Way Acquisitions by Zoning Designation

Area	Zoning ^a	Acquisition Type	Parcel Count	Total Permanent Land Use Acquired (acres)
Oregon Mainland	CE	Full	1	1.59
	CM2	Partial	3	0.06
	IG2	Full	1	1.02
	IG2	Partial	13	7.42
	OS	Partial	4	2.13
Subtotal (Oregon Mainland)	N/A	N/A	22	12.22
Ruby Junction	HI	Full	4	4.41
	HI	Partial	2	0.26
	SC-RJ	Partial	1	0.31
Subtotal (Ruby Junction)	N/A	N/A	7	4.98
Hayden Island	CE	Full	17	10.88
	CE	Partial	11	7.26
	CM1	Full	2	0.27
	CM1	Partial	9	1.47
Subtotal (Hayden Island)	N/A	N/A	39	19.88
Totals	N/A	N/A	68	37.08

^a Zoning designations shown for Ruby Junction are City of Gresham zoning designations; Oregon Mainland and Hayden Island are City of Portland designations.

CE = commercial employment; CM1 = commercial mixed use 1; CM2 = commercial mixed use 2; HI = heavy industrial; IG2 = general industrial 2; N/A = not applicable; OS = open space; SC-RJ = Ruby Junction Station Center – Ruby Junction Overlay; sq ft = square feet

Washington

Table 3.4-8 shows land use changes that would result from acquisitions in Washington according to zoning designation and design option. Each of the Modified LPA design options would affect approximately

110 parcels in Washington, but the number of acres acquired would vary by design option. Totals for each design option are shown below, with more detail provided in Table 3.4-8. See Section 3.3, Acquisitions, and the Acquisitions Technical Report for information on the locations of acquired properties.

- The Modified LPA with double-deck fixed-span configuration, one auxiliary lane, C Street ramps, and centered I-5 and the Modified LPA without C Street ramps would each acquire 10.6 acres of property, including 21 full acquisitions, 48 partial acquisitions, and 41 subsurface easements.
- The two auxiliary lane design option would have the same number of full and partial acquisitions and subsurface easements, but would require an additional 0.1 acres of property east of I-5 for a total of 10.7 acres of acquisition.
- The Modified LPA with any of the single-level bridge configurations or bridge types would also have 21 full and 48 partial acquisitions and 41 subsurface easements, but would require a total of 10.9 acres of acquisition to accommodate wider bridge abutments on the Vancouver shoreline.
- The Modified LPA with mainline westward shift would require 23 full acquisitions and 45 partial acquisitions as well as 41 subsurface easements. The total acquisition area would be 10.9 acres.

Up to two proposed park-and-ride facilities could be added to the Modified LPA in downtown Vancouver: one would be near Waterfront Station and one would be near Evergreen Station. Three sites are being considered for the Waterfront Station and two sites for Evergreen Station. Table 3.4-9 illustrates the potential land use changes by site option based on the acquisitions that would be required for each proposed park-and-ride facility.

Table 3.4-8. Washington Right-of-Way Acquisitions by Zone and Design Option

Zone ^c	Acquisition Type	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Centered I-5, Without C Street Ramps, ^a Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Westward Shift, Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5, Parcels (Acres)	Modified LPA with Single-Level Fixed-Span ^b or Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Parcels (Acres)
CPX (Downtown Vancouver)	Full	0 (0)	0 (0)	0 (0)	0(0)	0 (0)
	Partial	7 (1.3)	7 (1.3)	7 (0.7)	7 (1.4)	7 (1.4)
CX (Downtown Vancouver)	Full	14 (2.4)	14 (2.4)	16 (3.7)	14 (2.4)	14 (2.4)
	Partial	20 (0.4)	20 (0.4)	18 (0.7)	20 (0.4)	20 (0.5)
	Subsurface Easement ^d	2 (1.2)	2 (1.2)	2 (0.6)	2 (0.6)	2 (0.6)
Park (Downtown Vancouver)	Partial	1 (0.08)	1 (0.08)	0 (0)	1 (0.1)	1 (0.1)
Water (Downtown Vancouver)	Partial	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.3)	1 (0.4)
Subtotal (Downtown Vancouver)	Full	14 (2.4)	14 (2.4)	16 (3.7)	14 (2.4)	14 (2.4)
	Partial	29 (2.1)	29 (2.1)	26 (1.7)	29 (2.2)	29 (2.4)
	Subsurface Easement	2 (1.2)	2 (1.2)	2 (0.6)	2 (1.2)	2 (1.2)
	Subtotal	45 (5.7)	45 (5.7)	44 (6.0)	45 (5.8)	45 (6.0)
R-22 (Upper Vancouver) ^e	Full	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Partial	1 (>0.1)	1 (>0.1)	1 (>0.1)	1 (>0.1)	1 (>0.1)
	Subsurface Easement	4 (0.5)	4 (0.5)	4 (0.5)	4 (0.5)	4 (0.5)
R-9 (Upper Vancouver)	Full	7 (0.8)	7 (0.8)	7 (0.8)	7 (0.8)	7 (0.8)
	Partial	18 (0.1)	18 (0.1)	18 (0.1)	18 (0.1)	18 (0.1)
	Subsurface Easement	35 (2.5)	35 (2.5)	35 (2.5)	35 (2.5)	35 (2.5)

Zone ^c	Acquisition Type	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, Centered I-5, Without C Street Ramps, ^a Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, One Auxiliary Lane, C Street Ramps, I-5 Westward Shift, Parcels (Acres)	Modified LPA with Double-Deck Fixed-Span Configuration, Two Auxiliary Lanes, C Street Ramps, Centered I-5, Parcels (Acres)	Modified LPA with Single-Level Fixed-Span ^b or Movable-Span Configuration, One Auxiliary Lane, C Street Ramps, Centered I-5, Parcels (Acres)
Subtotal (Upper Vancouver)	Full	7 (0.8)	7 (0.8)	7 (0.8)	7 (0.8)	7 (0.8)
	Partial	19 (0.1)	19 (0.1)	19 (0.1)	19 (0.1)	19 (0.1)
	Subsurface Easement	39 (3.0)	39 (3.0)	39 (3.0)	39 (3.0)	39 (3.0)
	Subtotal	65 (3.9)	65 (3.9)	65 (3.9)	65 (3.9)	65 (3.9)
Totals	Full Acquisitions	21 (3.2)	21 (3.2)	23 (4.5)	21 (3.2)	21 (3.2)
	Partial Acquisitions	48 (2.2)	48 (2.2)	45 (1.8)	48 (2.3)	48 (2.5)
	Total Permanent Acquisitions	69 (5.4)	69 (5.4)	68 (6.3)	69 (5.5)	69 (5.7)
	Subsurface Easement	41 (4.2)	41 (4.2)	41 (3.6)	41 (4.2)	41 (4.2)
	Air Space	0 (1)	0 (1)	0 (1)	0 (1)	0 (1)
	Total Permanent Acquisitions and Easements	110 (10.6)	110 (10.6)	109 (10.9)	110 (10.7)	110 (10.9)

- a Modified LPA with and without C Street Ramps would have the same impacts. The footprint removed by removing the C Street Ramp is entirely within existing right of way.
- b The Washington right-of-way acquisitions associated with the single-level fixed-span configuration would be the same for all bridge type options.
- c (CPX) Central Park Mixed-Use; (CX) City Center; (R-9) Low-Density Residential District; (R-22) Higher-Density Residential District.
- d A subsurface easement is a right given a party to use space underground, such as for buried electrical, cable, water or sewage line.
- e For Upper Vancouver, all design options have the same impacts.

Table 3.4-9. Acquisition Impacts by Park-and-Ride Option

Property Acquisitions	Type	Waterfront Site 1 ^{a, b}	Waterfront Site 2 ^a	Waterfront Site 3 ^a	Evergreen Site 1 ^{a, c}	Evergreen Site 2 ^{a, d}
Parcels (count)	Full	0	1	4	5	0
	Partial	0	0	0	0	0
	Total	0	1	4	5	0
Area Acquired (acres)		0	0.1	1.5	3.16	0
Permanent Easements	Property Easements ^{e, f}	0	0	0	0	0
Total of Permanent Acquisitions and Easements		0 acres	0.1 acres	1.5 acres	3.16 acres	0 acres

a Does not include WSDOT-owned property or right of way or City-owned right of way.

b Properties associated with Waterfront Site 1 would be affected by IBR Program roadway and pedestrian improvements regardless of whether the site is developed as a park and ride.

c Properties associated with Evergreen Site 1 would be developed as a joint venture between the IBR Program and the City of Vancouver.

d The existing parking structure (Evergreen Site 2) would be used via lease with the existing owner.

e Subsurface easement requirements are preliminary and will be updated prior to construction.

f Airspace easements have not been determined but will be identified prior to construction.

Consistency with Plans and Policies

The Modified LPA's implementation of high-capacity transit would be consistent with state, regional, and local plans and policies and would help the region achieve anticipated development without expanding urban growth areas. In Oregon, state law requires ODOT to involve planning officials from affected jurisdictions in planning for transportation projects that require an environmental assessment or EIS. The Oregon Transportation Commission must also adopt a finding that the project is compatible with applicable comprehensive plans before the project design can be approved. Washington state law, while not explicitly requiring a consistency finding from the state's transportation commission, requires WSDOT to cooperate with city and county governments, planning agencies, transit agencies, and other appropriate local planning entities when planning improvements to highways of statewide significance, including the Interstate system. Appendix A, Agency and Tribal Coordination, provides detail on how the IBR Program has coordinated and collaborated with planning and regulatory agencies as part of the NEPA process. Table 3.4-10 summarizes relevant land use and transportation plans and policies that would apply to the IBR Program and discusses their compatibility with the Program. See the Land Use Technical Report for additional details on compatibility with applicable land use and transportation plans and policies.

Table 3.4-10. IBR Program Consistency with Relevant Land Use and Transportation Plans

	Plan	Description	IBR Program Consistency
State	Statewide Planning Goals (Oregon)	Directs all Oregon cities and counties to implement comprehensive land use plans that comply with statewide goals and guidelines.	<p>Consistent with Goal 12, Transportation, which requires cities, counties, and the state to create a transportation system plan that addresses mass transit, air, water, rail, highway, bicycle, and pedestrian transportation. Among other objectives of Goal 12, the Modified LPA would:</p> <ul style="list-style-type: none"> • Serve statewide, regional, and local transportation needs. • Serve the mobility and access needs of those who cannot drive and other underserved populations. • Provide for affordable, accessible and convenient transit, pedestrian, and bicycle access and circulation, with improved connectivity. • Help to reduce pollution from transportation to meet statewide goals to reduce climate pollution. • Facilitate the safe flow of freight, goods, and services within regions and throughout the state.
	Growth Management Act (Washington)	Requires local jurisdictions to implement a land use policy framework that reduces conversion of rural land to urban development.	<p>Supports stated goals pertaining to transportation and infrastructure, including encouraging efficient multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.</p> <p>Also consistent with the Act's goals for providing infrastructure to urban areas and for directing high-density growth to urbanized locations.</p>
Regional	2040 Growth Concept (Metro)	Defines regional growth and development in the Portland metropolitan region. Policies encourage efficient use of land, protection of farmland and natural resources, a balanced transportation system, a healthy economy, and diverse housing options.	Supports Metro's stated policy goals of providing a balanced transportation system and contributing to a healthy economy.

	Plan	Description	IBR Program Consistency
	Regional Framework Plan (Metro)	Identifies regional policies to implement the 2040 Growth Concept. Provides overall guidance for more detailed policies regarding several topics including regional transportation and mass transit systems, and coordination, to the extent feasible, of Metro growth management and land use planning policies with those of Clark County.	Includes IBR-related goals of developing a connected region through an integrated system of thoroughways, arterial streets, freight routes and intermodal facilities, transit services and bicycle and pedestrian facilities.
	2018 Regional Transportation Plan (Metro)	Establishes policies and priorities for all forms of transportation and anticipates the region's current and future transportation needs. Focuses on ensuring the region's transportation system works effectively, recognizing the importance of the movement of goods and services for the regional economy. The RTP adopted by Metro in December 2018 includes the same land uses and transportation projects as the RTP adopted by Clark County in March 2019 (as described below). ²	The "I-5 Replacement project" is included on the financially constrained project list. This is earlier terminology used to reference the project now known as the IBR Program.
	Climate Smart Strategy (Metro)	States a regional strategy to realize local visions for land use and transportation while also reducing greenhouse gas emissions.	Seek opportunities to advance local and regional projects that best combine the most effective greenhouse gas emissions reduction strategies.
	Transportation Improvement Plan (TriMet)	Establishes transit improvement priorities and possible funding allocations. Includes a 5-year roadmap for the rollout of future services and programs to improve service in low-income communities.	Expands public transportation services with the extension of light-rail transit to Hayden Island and Vancouver, improved bus transit service, and station infrastructure improvements.
	20-Year Transit Development Plan (C-TRAN)	Plans for transit services in Clark County. Includes high-capacity transit planning, capital and technology improvements, and a financial plan.	Includes the IBR elements of light-rail transit and bus rapid transit improvements.

² The financially constrained *Regional Transportation Plan* adopted by the Metro Council in December 2018 ([Metro 2018a](#)) and adopted by the Southwest Washington Regional Transportation Council (RTC) Board of Directors in March 2019 is referred to as the "2018 RTP."

	Plan	Description	IBR Program Consistency
	2019 Regional Transportation Plan for Clark County (RTP)	Identifies future regional transportation system needs and outlines transportation plans and improvements necessary to maintain mobility within and through the region and access to land uses within the region. The RTP adopted by Clark County in March 2019 includes the same land uses and transportation projects as the as RTP adopted by Metro in December 2018 (as described above).	Includes IBR-related goals of providing reliable mobility for personal travel and freight movement by addressing congestion and transportation system bottlenecks
Local (Oregon)	Multnomah County Comprehensive Plan and Transportation System Plan	Describes policies that guide decisions made by the Land Use Planning Division, as well as the relationship between Multnomah County land use decisions and the policies adopted by the Metro Council and statewide planning agencies. The Transportation System Plan guides decisions about transportation system improvements over the next 20 years or more.	Supports the plan's goals of providing a safe and efficient transportation network.
	2035 Comprehensive Plan (Portland)	Continues the commitment to linking land use and transportation decisions. Seeks to improve Portland as a place that is walkable, bikeable, and transit-friendly with active main streets. Continues Portland's commitment to compact development with active employment centers, expanded housing choice, and access to parks and open space.	The IBR Program advances multiple goals articulated by the Transportation component of the Comprehensive Plan, including: <ul style="list-style-type: none"> • Create a coordinated, efficient, more affordable multimodal transportation system. • Reduce service disparities and achieve equitable access to all types of facilities and transportation modes. • Ensure safety of the most vulnerable users (people with disabilities, young people, the elderly). • Guide the location and design of new street, pedestrian, bicycle, and trail infrastructure.
	2035 Transportation System Plan (Portland)	Guides Portland's transportation system functions and investments. Ensures that new development and allowed land uses are consistent with the identified function and capacity of, and adopted performance measures for, affected transportation facilities.	Lists the I-5 Columbia River bridge replacement and interchange improvements as a financially constrained project to be completed within 1 to 10 years.

	Plan	Description	IBR Program Consistency
	City of Portland and Multnomah County Climate Action Plan	Sets a goal of achieving a 40% reduction in carbon emissions by 2030 and an 80% reduction by 2050. Identifies objectives and actions to be completed or significantly underway in the next 5 years, focusing principally on major actions to be taken to accelerate emission reductions.	Increases public transit opportunities, which is one of the overarching carbon reduction actions referenced throughout the plan.
Neighborhood or Area-Specific (Oregon)	Hayden Island Neighborhood Plan	Addresses the unique situation of the island while considering the best plan for its future. Recommends preserving existing uses while promoting new mixed-use development to meet future needs. Developed concurrently with the CRC project and specifically incorporates guidance for the CRC project.	The Modified LPA is consistent with the plan, supporting specific goals such as: <ul style="list-style-type: none"> • Light-rail transit to, and a station on, Hayden Island. • A light-rail transit alignment adjacent to the west side of I-5 instead of a separate alignment in order to minimize the barrier effects. • Access to local street systems south of North Portland Harbor without using the freeway.
	Bridgeton Neighborhood Plan	Addresses the neighborhood development challenges. Development consists largely of houseboats, rowhouses, and detached single-family homes. Significant wetland and riparian resources exist throughout the neighborhood as well.	Supports specific recommendations in the plan, including providing access to transit and providing for connectivity within the neighborhood and to the rest of the transportation network.
	Kenton Neighborhood Plan (as amended by the Kenton Downtown Plan)	Focuses on bringing back the Denver Avenue business district as a retail corridor.	Supports transportation recommendations including increasing the extent of the neighborhood's light-rail transit connectivity.
	Portland International Raceway Plan District	Sets a goal to preserve and enhance the special character and opportunities of the area, which includes natural areas to the west and "special event" uses to the east.	IBR development taking place within the district would be consistent with Chapter 33.566 of the Portland Zoning Code.
	East Columbia Neighborhood Natural Resources Management Plan	Promotes a consistent approach to development within this environmentally sensitive area. Prioritizes preservation of wetlands and wildlife habitats.	Modified LPA design would support policies concerning water quality, protection of wetlands/natural resource areas, and buffering of resources from development.

Interstate Bridge Replacement Program

	Plan	Description	IBR Program Consistency
	Natural Resources Management Plan for Peninsula Drainage District No. 1	Promotes a consistent approach to development within the environmentally sensitive areas of the district.	Supports a MAX light-rail transit station for West Delta Park.
	Portland Interstate Corridor Urban Renewal Plan	Sets goals and objectives to improve livability, increase job opportunities, assist small businesses, and benefit from major infrastructure projects, including the Interstate MAX light-rail line.	Supports extension of light-rail.
Local (Washington)	Clark County Comprehensive Growth Management Plan	Represents the coordinated land use and transportation system plans for the county and seven cities.	Supports transportation and land use goals by providing a balance of transportation modes through the incorporation of bicycle and pedestrian facilities and high-capacity transit.
	City of Vancouver Comprehensive Plan	Guides growth for Vancouver. Encourages compact urban centers, transit, and supportive development regulations for areas along the defined high-capacity transit corridors identified along I-5 and SR 500.	Supports plan goals of connectivity, accessibility, and providing a range of transportation options.
	City of Vancouver Transportation Plan	Includes vision statements for the City's evolving transportation system emphasizing accessibility, system efficiency, connectivity, multimodalism, and a walkable community.	Increases public transit and provides greater multimodal opportunities.
	City of Vancouver Strategic Plan	Helps guide the City's decision-making and resource allocation.	Supports goals of developing and maintaining a safe, balanced, and innovative transportation system that will meet the needs of future generations.
	Vancouver City Center Vision and Subarea Plan	Divides the downtown into six planning areas with goals and guiding principles. Land use goals include focusing waterfront redevelopment on residential uses, with significant public access, recreation, cultural, hospitality, entertainment, and limited commercial uses.	Supports goals of ensuring that expansion of I-5 and Columbia River crossing improvements improve access to the city center and minimize potentially negative effects. Includes specific direction for the IBR Program, including a directive to integrate all modes of transportation, including high-capacity transit, bicycle, and pedestrian circulation, to achieve a true regional multimodal corridor.

	Plan	Description	IBR Program Consistency
	City of Vancouver Shoreline Master Program	Sets a program goal to protect natural values and functions of the shorelines while guiding and allowing appropriate development. New utility and transportation facilities must protect, enhance, and encourage development of physical and visual shoreline public access.	The IBR Program would comply with Shoreline Master Program requirements to protect shoreline ecological processes as well as preserve public access to the Columbia River shoreline.
Neighborhood or Area-Specific (Washington)	Downtown Vancouver Transportation System Plan	Addresses transportation conditions and plans from Fourth Plain Boulevard south to the Columbia River.	Includes specific directives to optimize MAX service into Vancouver, including such things as designating certain streets as transit streets.
	Central Park Plan	Calls for a unified sense of place by celebrating a shared historic landscape and emphasizing design of key features such as a “great street” network.	Includes CRC-specific language within the Plan’s vision statements that also applies to IBR: “the I-5 Columbia River Crossing improves access to Central Park from all parts of the city and region.”
	Port of Vancouver Waterfront Development Master Plan	Defines a vision for the Columbia River waterfront that is consistent with the Port’s mission to provide economic benefit to the community through leadership, stewardship, and partnership in maritime-related development.	Plan accounts for the Interstate Bridge replacement and its alignment relative to adjacent development.
	Highway 99 Sub-Area Plan	Covers the area from 63rd Street north to approximately 134th Street. serves as a guide for public investments and for Team 99, a group of business leaders in the corridor.	Notes that all planning efforts for the Highway 99 Subarea Plan will support the CRC project recommendations for high-capacity transit including light-rail or bus rapid transit. This also applies to the IBR Program.

Tolling

Tolling of cars and trucks that use the new Columbia River bridges is proposed as a method to fund the Modified LPA and encourage the use of transit and active transportation. Variable toll rates during peak periods would support regional and local policies for managing traffic congestion. Tolling is not expected to change land use patterns, because as discussed in Section 3.4.5, Indirect Effects, and the Land Use Technical Report, land use and development in the study area are governed by state land use and growth management laws, local land use plans and zoning regulations, and other controls. These require all development to be consistent with existing zoning and comprehensive planning in order to be permitted. Effective local plans and policies have been shown to control potential unplanned growth and land use changes resulting from transportation investments (CH2M Hill 2006; Tidd et al. 2013). See the Land Use Technical Report for a more detailed discussion.

Analysis using the Metro/RTC regional travel demand model showed an increase in transit mode share under the Modified LPA and design options relative to the No-Build Alternative as a result of both improved transit investment and the introduction of variable-rate tolling on the new Columbia River bridges. This shift to transit would reduce overall vehicle travel miles traveled across the Columbia River on an average weekday by approximately 1% compared to the No-Build Alternative. While tolling could divert some traffic from I-5 to I-205, the reduction in total vehicle trips because of toll and transit investments is expected to minimize any effect from diversion on traffic congestion. Therefore, tolling is not expected to induce changes in land use. See the Transportation Technical Report for a more detailed analysis of tolling effects.

Economics

Property acquisition for the Modified LPA would displace several businesses and their employees. The acquisition of taxable property for additional right of way would also decrease property tax revenues. The additional right of way acquired would include both full parcels, which would be removed from the tax rolls completely, and partial acquisitions. Business displacements and property tax revenue reductions are discussed in the subsections below.

The Modified LPA would also eliminate parking spaces, primarily at the Expo Center (386 of 2,160 existing stalls) and on Hayden Island (180 of 4,354 existing stalls). The Expo Center seldom requires the use of all 2,160 parking stalls, so no substantial reduction in parking revenue is expected. Any potential reduction in patronage during peak events due to loss of parking would likely be offset by the availability of the new light-rail transit service connecting the Expo Center with Vancouver. The parking loss on Hayden Island is a small fraction of available parking in the area; for businesses affected by parking loss, coordination with property owners would occur as the design progresses to minimize impacts to parking and site use. Overall, no significant economic impacts due to the elimination of parking are anticipated.

Business Displacements

Table 3.4-11 provides an estimate of the number of businesses, and their employees, that would be displaced due to land acquisition for the Modified LPA. See the Economics Technical Report for a description of the types of businesses affected.

Table 3.4-11. Business Displacements from the Modified LPA

Area	Businesses Displaced from Modified LPA Design Options with Centered I-5	Total Employees of Displaced Businesses from Modified LPA Design Options with Centered I-5	Businesses Displaced with I-5 Westward Shift Design Option	Total Employees of Displaced Businesses with I-5 Westward Shift Design Option
Oregon Mainland	7	41	7	41
Hayden Island	15	159	15	159
Ruby Junction	3	16	3	16
Downtown Vancouver	10	400	13	542
Upper Vancouver	0	0	0	0

Sources: IBR 2022b; Metro 2015

Compared to the Modified LPA with a centered mainline configuration, shifting the I-5 mainline west would displace an additional 3 businesses and 142 employees (in total, 13 businesses and 542 employees). Displaced employees may be impacted by longer commutes, depending on the availability of nearby space for the businesses to be relocated. None of the other design options, except park and ride sites, would have different number of business acquisitions.

If Site 3 were chosen for the Waterfront Station park and ride, an office building with approximately 53 employees would be displaced. None of the other park-and-ride sites would result in business displacements.

Property Tax Impacts

Table 3.4-12 presents the estimated reduction in property tax revenues associated with the Modified LPA. The tax effect of the partial acquisitions was calculated by multiplying the actual 2022 property tax collected for the parcel by an estimate of the percentage of the parcel taken. Estimated losses in property tax revenue are not substantial; in Multnomah County, losses attributable to the Modified LPA would account for less than 0.2% of annual revenues; estimated losses in Clark County would be between approximately 0.33% and 0.43% of annual revenues.

Table 3.4-12. Property Tax Reduction from the Modified LPA Design Options

Area	Estimated Assessed Value of Right of Way (millions) from Modified LPA	Property Tax Reductions (thousands) from Modified LPA	Percentage of 2022 County Budgeted Property Tax Revenues Lost as a Result of Modified LPA	Estimated Assessed Value of Right of Way (millions) from I-5 Westward Shift Design Option	Property Tax Reductions (thousands) from I-5 Westward Shift Design Option	Percentage of 2022 County Budgeted Property Tax Revenues Lost as a Result of I-5 Westward Shift Design Option
Oregon Mainland	\$19.0	-\$72.0	0.02%	\$19.0	-\$72.0	0.02%

Area	Estimated Assessed Value of Right of Way (millions) from Modified LPA	Property Tax Reductions (thousands) from Modified LPA	Percentage of 2022 County Budgeted Property Tax Revenues Lost as a Result of Modified LPA	Estimated Assessed Value of Right of Way (millions) from I-5 Westward Shift Design Option	Property Tax Reductions (thousands) from I-5 Westward Shift Design Option	Percentage of 2022 County Budgeted Property Tax Revenues Lost as a Result of I-5 Westward Shift Design Option
Hayden Island	\$49.8	-\$542.0	0.16%	\$49.8	-\$542.0	0.16%
Ruby Junction	\$4.3	-\$43.2	<0.01%	\$4.3	-\$43.2	<0.01%
Downtown Vancouver	\$21.6	-\$195.8	0.3%	\$32.1	-\$259.3	0.4%
Upper Vancouver	\$2.6	-\$21.3	0.03%	\$2.6	-\$21.3	0.03%

Sources: IBR 2022b; Multnomah County Tax Assessor 2022; Clark County Tax Assessor 2022

The I-5 mainline westward shift design option would only affect properties in downtown Vancouver, as shown in Table 3.4-12.

Table 3.4-13 presents the estimated property tax impacts associated with the park-and-ride sites that would result in impacts beyond those expected from the Modified LPA. Waterfront Site 3 is owned by the State of Washington, so there would be no loss of property tax associated with that potential impact. The reduction in property tax revenues from land acquired for Evergreen Station Site 1 would represent less than one-tenth of 1% of the total annual 2022 property tax revenues for Clark County.

Table 3.4-13. Clark County Property Tax Reductions

Park-and-Ride Station	Site	Estimated Assessed Value of Right of Way (millions)	Clark County Property Tax Reduction (thousands)	Clark County Budgeted 2022 Property Tax Revenues
Waterfront Station	3	\$4.5	\$0	0%
Evergreen Station	1	\$6.0	-\$58.2	0.08%

Washington Sales Tax Impacts

The displacement of businesses in Vancouver would result in a reduction of sales tax revenue. Detailed information on the amount of sales tax collected by these businesses was not available; however, it is not anticipated that the reduction would have a substantial economic impact given that most of the affected businesses would be commercial offices.

Impacts to Regional Economic Sectors

Economic Impacts of Delay

According to a study of the regional economic effects of transportation choke points (Cambridge Systematics 2003), five industries in the Portland-Vancouver region are particularly sensitive to road congestion: lumber/wood/paper, distribution/wholesale trade, transportation equipment/steel, farm and food products, and high-tech. These industries are particularly vulnerable to delay and decreased travel time reliability resulting from roadway congestion in the I-5 corridor. According to the study, congestion at the Interstate Bridge increases the cost of congestion delay to trucks. Reducing freight truck travel times by investing in transportation infrastructure improvements that increase access and decrease congestion would help maintain the efficiency of the area's freight movement on I-5. As well, travel time improvements would benefit all business and worker trips that travel through the I-5 corridor in the primary study area.

Commercial marine navigation includes similar products to those conveyed by road, which are transported under the Columbia River bridges both up and downriver. As with vehicle transportation, marine vessel transport products can be vulnerable to delays. Delays to some marine transport would occur with the single-level movable-span bridge configuration for vessels dependent upon bridge openings, as vessels may not be able to accurately time their arrival to outside the bridge opening time restrictions. No delays to marine transport would occur with either of the fixed-span configurations. However, vessels with vertical navigation clearance requirements of greater than 116 feet would permanently be unable to transit under the bridge for its 100+ year service life.

Effects of the Modified LPA on Freight Transport

Truck Transport

The Modified LPA would benefit the trucking industry by reducing travel times and increasing reliability, which in turn would reduce costs and improve efficiency for truck freight operators. As described in Section 3.1, Transportation, traffic operations on I-5 are expected to improve with the addition of one auxiliary lane and would improve even more with the addition of a second auxiliary lane. These improvements would enhance regional mobility and access, which would increase the competitiveness of the regional economy, reduce transportation costs for local businesses, and increase operational flexibility for businesses (e.g., deliveries, shipping, and business operations). However, if the C Street ramps at the SR 14 interchange were eliminated, additional traffic delay and longer travel times near the Mill Plain Boulevard interchange and in downtown Vancouver would have an adverse economic impact on local businesses in that area.

The single-level fixed-span configuration (all bridge type options) would have a lower maximum height and a reduced highway grade compared to the double-deck fixed-span configuration. The reduced grade would allow for improvements in freight vehicle speed. With the single-level movable-span configuration, the average number of bridge openings for vessels is anticipated to be less than 146 per year, which is the average number of openings for vessels over the past 12-year period (2012-2023). If future maritime use increases or decreases, the number of bridge openings may also deviate from recent historical patterns over the course of the 100+ year service life of the new Columbia River bridges. Future bridge openings would continue to cause delays and congestion for freight truck transport, with associated economic impacts that would offset the benefit provided by the reduced grade.

As described in Section 3.1, Transportation, under existing conditions, the average bridge opening and gate closure duration during the 5-year period (January 1, 2015, to December 31, 2019) was 11.6 minutes. While bridge openings are not allowed during peak highway traffic periods³ except in emergency situations, they are

³ Interstate Bridge lift openings are currently restricted to avoid weekday peak highway traffic operations between 6:30 a.m. and 9:00 a.m. and between 2:30 p.m. and 6:00 p.m., excluding emergency bridge lifts.

allowed before and after the peaks. Depending on the closure time and duration as well as traffic levels, it can take between 5 and 110 minutes for traffic to recover from a bridge opening and gate closure. An opening or closure just before the peak period can last even longer, affecting conditions throughout the peak traffic period. The single-level movable-span configuration would likely have increased restrictions on bridge openings to minimize impacts to vehicle traffic and transit compared to today's restrictions.

Marine Cargo Transport

Under the Modified LPA, each of the new Columbia River bridges would be built on six pairs of in-water piers, plus several pairs of piers on land. The new bridges under consideration in the Modified LPA include both fixed-span and movable-span configurations. As with the existing bridges, the new bridges would provide three shipping channels: a primary navigation channel and two alternate channels. Each of the three navigation channels would be 400 feet wide, which includes 50-foot maintenance buffers on each side of the navigation channels for all bridge configurations and bridge types currently under consideration. All bridge types of the fixed-span bridge configurations would provide approximately 116 feet of vertical navigation clearance over the primary navigation channel. The movable-span configuration would provide approximately 92 feet of vertical clearance in the closed position over the primary navigation channel (or 99 feet over the north barge channel) and 178 feet in the open position, compared to 72 feet in the closed position and 178 feet in the open position for the existing Interstate Bridge.

For a movable-span configuration, all current vessel traffic could pass beneath the new bridges; however, as noted above, the movable span could have more timing restrictions on bridge openings than the No-Build Alternative to minimize impacts to vehicle traffic and transit service. Construction of a fixed-span configuration with 116 feet of vertical navigation clearance would result in two vessels that currently transit under the Interstate Bridge and large cargo manufactured upstream by three industrial operations (fabricators) not being able to pass beneath the new bridges. The two vessels that would require a vertical navigation clearance greater than 116 feet include the Derrick Barge [DB] *Taylor*, which passes under the Interstate Bridge approximately 10 times per month, or 120 times per year; and, the DB *Freedom*, which makes approximately 10 trips under the bridge per year (based on 2012-2020 operations). On average during the 2012-2020 timeframe, about 2,600 commercial vessel trips occurred each year; therefore, the DB *Taylor* represents approximately 4.6% of total commercial vessel trips each year, while the DB *Freedom* represents approximately 0.3% of commercial vessel trips each year. Three additional vessels (DB *4100*, DB *General* and dredge *Yaquina*) would be restricted when the river level is at the ordinary high water level of 16 feet above Columbia River Datum, which is about 1% of days in a typical year. Each of these three vessels make approximately 12-28 trips per year. In summary, a total of five vessels and three fabricators would be adversely affected by any of the fixed-span configurations, whereas the movable-span configuration would allow passage for all current vessels and cargo. The IBR Program is committed to working with the owners and operators of these vessels to identify mutually acceptable measures to avoid or minimize economic impacts.

Vessels or cargo shipments unable to pass beneath a fixed-span configuration could result in economic impacts including increased production costs, reduced potential for future work, and reduced employment opportunities in the region. Affected fabricators could continue to seek contracts for products that exceed the bridges' vertical clearance but would require securing a downriver satellite site to complete final assembly and could incur higher costs.

Under the Modified LPA with any of the fixed-span configurations, other commercial vessels on the Columbia River such as cruise vessels and tugs/tows for the barges would continue operations. Under the Modified LPA with the movable-span configuration, all vessels currently using the Columbia River would be able to pass under the bridges, but the movable-span configuration would provide greater vertical clearance (92 feet over the primary navigation channel or 99 feet over the north barge channel) compared to the No-Build Alternative (72 feet over the alternate barge channel) when each is in the closed position, potentially allowing more

vessels to pass without requesting a bridge opening. If a bridge opening were required, these vessels would either need to revise their schedules to avoid restricted times for bridge openings or experience delay. See Section 3.2, Navigation, and the Navigation Impact Report for detailed discussion on the benefits and effects of the Modified LPA on vessel navigation.

Resulting economic benefits with the fixed-span configurations would be eliminating delays associated with the movable-span configuration and improving travel times for vehicles and transit service crossing over the river, which would no longer have interruptions from bridge openings.

The marine cargo transportation impacts listed above are a snapshot in time and represent current waterway usage. Over the 107 years of service life of the Interstate Bridge (northbound span opened in 1917 and southbound span opened in 1958), numerous bridge lifts have been conducted for mariners with large vertical navigation clearance requirements, including those requiring openings for clearances over 116 feet and up to 178 feet. It is difficult to predict maritime transportation system demands and associated needs for bridge openings for the 100+ year service life of the bridges, since vessel traffic and river-level conditions vary from year to year and economic trends for maritime commerce may change over time. Nevertheless, a fixed-span configuration with 116 feet of vertical clearance would permanently deny access under the bridges to mariners who require vertical clearances of greater than 116 feet for the 100+ year service life span of the bridges.

Rail Transport

The BNSF Railway mainline operates on an east-west alignment north of the Columbia River in Vancouver, between the river and downtown Vancouver. No long-term economic impacts to rail traffic operations would be anticipated as a result of the Modified LPA.

Other Considerations

New transit connections in downtown Vancouver would improve travel time accessibility and broaden the pool of labor available along the corridor and in the region.

Earthquakes could cause economic impacts by delaying or completely stopping the flow of freight, disrupting travel routes for employees traveling to and from work, and destroying billions of dollars in infrastructure. The Modified LPA would withstand a major seismic earthquake, minimizing these impacts to the greatest extent possible.

Tolling

The Modified LPA assumes a variable-price toll using two scenarios. These tolling scenarios are used to study the impacts of various toll rates related to Program funding and other traffic-related impacts. The IBR Program would not be setting toll rates; the Washington Transportation Commission and Oregon Transportation Commission have the authority to jointly set toll rates.

Scenario A (northbound and southbound tolls with a variable toll rate range of \$2.15 to \$3.55) estimates toll revenues, while Scenario B (a north and southbound toll with a variable toll rate range of \$1.50 to \$3.15) forecasts the impacts of tolling on traffic volumes for this NEPA analysis. The tolls are in Fiscal Year 2026 dollars and are assumed to escalate by 2.15% per year. Variable tolls are likely to be beneficial for freight-dependent businesses and businesses that rely on just-in-time deliveries because the predictability of travel would also increase. This benefit is somewhat offset by the higher toll charges truck movements would incur during peak periods; however, peak freight travel times tend to fall outside the peak periods for general-purpose traffic.

The application of a variable toll pricing scheme to the new Columbia River bridges would add an out-of-pocket cost to trips and is anticipated to result in an overall reduction in bridge crossings with the Modified LPA. With the proposed tolling scenarios, the highest annual cost of tolls for a typical driver making

an outbound and inbound trip 5 days a week, 50 weeks per year, would be approximately \$1,625 (this assumes the driver pays \$3.25 per trip under Scenario A in Fiscal Year 2022 dollars). The 2021 median household income was \$78,476 for Portland and \$67,462 for Vancouver (U.S. Census Bureau n.d.). The cost of tolls for traveling across the I-5 Columbia River bridges would constitute approximately 2% and 2.4% of the median household's income in Portland and Vancouver, respectively. According to the Consumer Expenditure Survey, administered by the Bureau of Labor Statistics, the average household spent approximately \$10,961 on transportation expenditures in 2021, which is between approximately 14% and 16% of household income for Portland and Vancouver, respectively. The addition of toll fees would increase these percentages to approximately 16% of household income for Portland and 19% for Vancouver.

3.4.4 Temporary Effects

No-Build Alternative

Under the No-Build Alternative, the existing Interstate Bridge, I-5, local roads, and associated infrastructure would remain as they are today. With no new infrastructure, there would be no temporary impacts to land use.

The No-Build Alternative would not involve construction activities, which often result in temporary economic benefits from capital expenditures, opportunities for entering the labor market through construction jobs, the purchasing of local goods and services needed for construction, and construction employees spending money in the community. The No-Build Alternative would also not result in temporary adverse economic impacts such as limiting business visibility and access, traffic delays and detours, and noise.

Modified LPA

Most temporary effects on land use and economics would not differ among the Modified LPA design options. Where differences would occur, they are described in the subsections below.

Land Use

Construction of the Modified LPA, including construction of the new bridges and removal of the existing bridges, is expected to take between approximately 9 and 15 years overall. In most parts of the study area, impacts would not be continuous throughout this timeframe, but would be limited to the duration of active construction on a specific component of the Modified LPA. Because construction activities would be temporary, they are unlikely to have lasting impacts on land uses, land use patterns, or compliance with land use plans and policies. However, construction-related impacts from noise, dust, lighting (for nighttime construction), and traffic delays may have secondary impacts on land uses. For example, adjacent residential uses are particularly sensitive to the impacts of construction; commercial uses may also be affected if they rely upon easy access and a pleasant driving experience. For more information, please refer to the Noise, Air Quality, Visual Quality, and Transportation Technical Reports and Sections 3.1, 3.9, 3.10, and 3.11 of this SEIS.

Bridge construction would disturb existing land uses and associated activities on Hayden Island. The existing commercial use pattern on the island is predominantly auto-oriented big-box retail. Shoppers and visitors to the area would likely face delays, detours, and other inconveniences. Noise, dust, and vibration impacts may also reduce the shopping center's attractiveness to shoppers during construction, especially when compared to similar shopping centers nearby.

Although I-5 is only one of the ways to access the area, many land uses in downtown Vancouver, particularly businesses which rely heavily on pass-by traffic, could be negatively impacted by construction activities due to detours, unclear access, noise, vibration, and dust. However, construction activities would not change the zoning designation and land use; if a business were to close due to construction impacts, similar businesses

compatible with local zoning regulations, overlay districts, and land use plans would be expected to take its place.

A total of approximately 5.6 acres of temporary construction easements would be needed along the length of the Modified LPA. These areas would be used to access construction sites, store vehicles and equipment, and for other ancillary purposes. Areas required for temporary easements would be restored to their former condition and use at the end of the construction period.

Economics

Regional Temporary Effects

Construction has the potential to cause negative economic effects by blocking visibility and access to businesses and causing traffic delays and detours that increase travel times. Traffic congestion is already a common occurrence within the study area during peak hours. Construction activities and temporary detours could extend the peak duration, negatively impacting businesses whose employees commute via I-5. Likewise, the movement of freight, goods, and services could be negatively affected if construction activities make travel times longer or less predictable.

Construction of the new Columbia River bridges would also affect marine commerce on the river. Work on the new bridges is anticipated to take place over a period of approximately 4 to 7 years, with a general sequence of activities including initial preparation, installation of foundation piles, shaft caps, pier columns, superstructure, and deck. Construction barges would be anchored in the river, and support barges traveling to and from supply points could create conflicts with freight. Some likely effects on marine commerce include:

- There would be temporary closures or changes to the three navigation channels during construction of the proposed Columbia River bridges, but it is assumed that at least one navigable channel would remain open at all times for marine traffic.
- Commercial vessels may be provided with towing assistance during times where navigation is made difficult by construction activities.
- Vertical and horizontal clearance restrictions would be in place for portions of the construction period. Such restrictions would require U.S. Coast Guard concurrence. A temporary construction navigation envelope (height and width of unobstructed clearance for navigation) would be maintained during construction with a minimum clearance of 72 feet (vertical) by 150 to 200 feet (horizontal). During times when these minimum clearances are in effect, vessels requiring more than 72 feet of vertical navigation clearance would be unable to pass under the bridges; however, potential passage with reduced width or scheduled interim short-term openings could be coordinated with the bridge construction contractor.
- Temporary river travel restrictions are anticipated as barges are used to ferry materials to and from work sites.

Construction of the Modified LPA could also result in positive economic effects through increased employment and spending during construction. The extent of these effects depends on the source of funding and the makeup of construction work crews. Funds from local or regional sources are transfers of money that could be spent by residents and businesses on other economic activities in the region, and therefore do not add to the overall supply of funding in the regional economy. Conversely, federal or state funds that are new to a region can have a measurable economic effect, resulting in employment and income gains from construction. The federal government and the states of Oregon and Washington would provide the funds for the Modified LPA, thus resulting in some economic and employment benefits in the region that would otherwise not occur.

Local Temporary Effects

Roadway closures could affect local economic activity, depending on the location and duration. There is one temporary road closure associated with the Modified LPA; a portion of Jantzen Drive east and west of I-5 would be closed for approximately 8 months to allow for road and utility work. This section of roadway does not include any direct access points for businesses not permanently displaced by the Modified LPA. Access would remain open along N Hayden Island Drive and Center Avenue, but some out-of-direction travel could be required to continue to access businesses in the immediate vicinity of the closure.

In Washington, ramp closures associated with improvements to the SR 14 interchange would primarily affect traffic from downtown Vancouver to points east and the connection between Portland and downtown Vancouver on I-5. Alternate routes would be available to travel to these areas, but they would be more difficult and less direct. This could affect businesses in downtown Vancouver by increasing delivery times for goods and making it more difficult for employees and customers to reach downtown businesses. For more detail regarding local temporary economic effects due to construction, see the Economics Technical Report.

3.4.5 Indirect Effects

Most indirect effects on land use and economics would not differ among the Modified LPA design options. Where differences would occur, they are described in the subsections below.

Land Use

Indirect Effects on Local and Regional Land Use

Indirect effects on land use are associated with (1) the potential for the Modified LPA's transportation improvements to facilitate growth and development compared to the No-Build Alternative, and (2) the consistency of such potential growth and development with local and regional land use plans. This section evaluates both topics.

As described in Section 3.4.3, Long-Term Benefits and Effects, and Table 3.4-10, both Portland and Vancouver have accounted for future anticipated growth within their planning documents and provide strategies, visions, and goals to guide this growth. The plans provide for a development strategy to accommodate growth by increasing land use density, particularly in areas that would be served by high-capacity transit if the Modified LPA is implemented. Under the No-Build Alternative, light-rail would not be extended to Vancouver and express bus service across the Columbia River would be subject to delays caused by increasing congestion. Without high-capacity transit and associated light-rail stations on Hayden Island and in downtown Vancouver, the demand for higher-density development would be less likely to materialize, and the development strategy provided for in local land use plans may not be achievable. Vehicle, express bus, and active transportation would be the only mode option for crossing the Columbia River because high-capacity transit would not be available. Because the No-Build Alternative would have fewer transportation mode options to cross the river and would not include the LRT stations proposed under the Modified LPA, it would be less likely to support the increased development density provided for under the local planning documents. The Modified LPA would provide new light-rail service and improve the reliability of bus transit, which would facilitate the development strategy provided for in local planning documents, especially on Hayden Island and in Downtown Vancouver. This would support the plan to accommodate increased population growth through higher density development. The Modified LPA would not be expected to result in urban sprawl (scattered development on the periphery of urban areas) because the transit improvements would be provided in established urban areas, the local land use planning strategy to increase density is more likely to be achievable and the Columbia River bridges would be tolled. Because tolling increases the out-of-pocket cost of commuting, individuals have an incentive to shorten their commutes by living closer to alternative transportation connections, services and where they work (Brueckner 2001). As

described in Section 3.1, the transportation analysis also shows that tolling would cause some drivers to change to transit to avoid tolls.

The CRC EIS included an analysis of the project's potential for induced land use changes. The analysis used MetroScope, Metro's integrated land use and transportation model, to predict how the proposed changes in transportation infrastructure could influence the future distribution of employment and housing throughout the region. The modeling effort, which was completed in 2010, concluded that the CRC project would not significantly induce growth or sprawl. Compared to the No-Build Alternative, the model estimated that the CRC project, with tolling, would result in a 0.03% decrease in households in north Clark County and a 0.51% increase in households in the southern, more urban, half of the county (Conder 2010). Metro reviewed these findings in January 2024 and concluded they remain relevant to the Modified LPA.

The amount and timing of land use changes in transit station areas can be affected by transit ridership levels (e.g., higher ridership would be expected to increase land use development compared to lower ridership). Thus, the amount and timing of transit-oriented development in station areas would depend to some degree on transit ridership levels and other factors such as local economic conditions. Regardless of the pace of development, transit-oriented development would be consistent with existing planning and zoning that anticipates the future availability of high-capacity transit to support planned densities.

In conclusion, while the Modified LPA is expected to have the indirect effect of facilitating growth and development within the study area, the magnitude and location of this development would be consistent with all local and regional land use plans. Conversely, the No-Build Alternative would not encourage as much dense, transit-oriented development, and congestion resulting from over-capacity transportation facilities could inhibit the region from accommodating planned levels of growth.

Indirect Land Use Effects Related to Navigation

The Navigation Impact Report (IBR 2022) evaluated the potential for future land use changes upstream of the Interstate Bridge that could affect marine commerce based on city, port, state and federal land use and other management plans, which typically have planning horizons of 10 to 20 years. The report identified properties along the Columbia River that currently have marine facilities available or have the potential for future development of such facilities. It concluded there are few opportunities for new or expanded commercial and industrial development that would require the use of vessels too large to pass beneath the proposed new fixed-span Columbia River bridges. The number of suitable properties is limited by political and geographic constraints on land along the Columbia River waterfront, which include the Columbia River Gorge Natural Scenic Area designation, parallel transportation routes (SR 14, I-84, Union Pacific Railroad, and BNSF Railway), steep topography, and existing recreational and open space uses. The types of industrial uses that currently generate or could generate marine vessel traffic in the future are located within urban areas and typically within established industrial parks (e.g., Columbia Business Center, Port of Cascade Locks Industrial Park).

Per current planning documents, there are no known planned developments within the study area that would create additional navigation activities that would be adversely affected by the new Columbia River bridges with either the double-deck or single-level fixed-span configurations. If new marine-based businesses were to develop upstream of the new Columbia River bridges over their 100+ year service life, either fixed-span bridge configuration would limit their activities to a maximum vertical navigation clearance of 116 feet. The single-level movable-span configuration would continue to provide at least 178 feet of vertical clearance, and therefore would pose no additional limitations to future activities or marine development beyond those posed by the existing Interstate Bridge.

Economics

Indirect economic impacts may result from the displacement of local businesses if remaining businesses find it difficult to attract or retain customers because complementary businesses no longer exist. The long-term

magnitude of this impact would depend on the potential to relocate displaced businesses in the same neighborhood and the extent and types of infill and redevelopment that occurs. This in turn depends on a number of factors such as regional economic trends and market conditions, the willingness of businesses to relocate, available building space for lease during the relocation process, and community and city support for redevelopment.

Improved travel times for vehicles and improved transit options would have a positive impact on workers and business trips in the project area, reducing delay and the time cost of travel.

The types of economic activity dependent on marine navigation upriver of the bridge is not anticipated to change considerably in the near future. Most of the commercial river traffic in the shallow-draft upriver section of the Columbia/Snake system would continue to be dominated by barged shipments of grain, petroleum products, wood products, and other bulk products for domestic consumption and export. It would be highly unlikely the nature or composition of upriver navigation would change as a result of the Modified LPA. River depth and other existing, permanent height and width constraints limit the size and draft of vessels capable of upriver navigation, and the availability of suitable waterfront properties for industrial development is, and is expected to remain, extremely limited for the next 20 or more years. As a result, the Modified LPA would be expected to have limited, at most, impact on future upriver economic activity.

3.4.6 Potential Avoidance, Minimization, and Mitigation Measures

Long-Term Effects

Regulatory Requirements

As described in Section 3.3, Property Acquisitions and Displacements, property acquisition and residential or business displacements would be mitigated under the provisions of the Uniform Relocation and Real Property Acquisitions Policies Act of 1970, as amended. Those affected would receive compensation and relocation assistance from ODOT or WSDOT, depending on location. Property would be purchased at fair market value, and residential occupants displaced by the Modified LPA would be provided decent, safe, and sanitary replacement housing. The Acquisitions and Displacements Technical Report includes more information on the provisions of the Uniform Act and the processes used to value properties and provide relocation assistance.

The IBR Program would continue to work with the U.S. Coast Guard and the U.S. Army Corps of Engineers to help ensure that the potential for effects on river users is addressed through the agencies' permitting processes.

Program-Specific Mitigation

The Land Use Technical Report also identifies several measures which, although they are not specifically land use mitigation, would 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 designing efforts to support integration of park-and-ride facilities with current and planned land uses in downtown Vancouver.

Temporary Effects

Regulatory Requirements

Construction best management practices 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 the analyses of air quality (Section 3.10), noise and vibration (Section 3.11), and visual quality (Section 3.9).

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 construction 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.