Appendix Q I-205 Toll Project Cumulative Impacts Technical Report

I-205 Toll Project

Cumulative Impacts Technical Report

February 2023

Urban Mobility STRATEGY

Oregon Department of Transportation

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Cumulative Impacts Technical Report

February 2023

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Oregon Department of Transportation

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
2018 CE	2018 Categorical Exclusion for the I-205 Improvements Project
AASHTO	American Association of State Highway and Transportation Officials
APE	area of potential effect
API	area of potential impact
BMP	best management practice
CAA	Clean Air Act
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
C.F.R.	Code of Federal Regulations
CO_2	carbon dioxide
CO_2 equivalent	carbon dioxide equivalent
dBA	A-weighted decibels
DEQ	Oregon Department of Environmental Quality
EA	Environmental Assessment
EBT	electronic benefit transfer
EFC	Equity Framework Communities
FHWA	Federal Highway Administration
GHG	greenhouse gas
I-	Interstate
IBR program	Interstate Bridge Replacement program
L_{eq}	equivalent sound level
LTS	level of traffic stress
mmBtu	million British thermal units
MSAT	mobile source air toxics
MT	metric tons
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
ODOT	Oregon Department of Transportation
OR	Oregon Route
Project	Variable rate tolls on the Abernethy and Tualatin River Bridges and the toll-funded I-205 improvements between Stafford Road and OR 213
RFFA	reasonably foreseeable future action
RMPP	Regional Mobility Pricing Project
RTP	Regional Transportation Plan
TriMet	Tri-County Metropolitan Transportation District
VMT	vehicle miles traveled
U.S. EIA	U.S. Energy Information Administration
USEPA	U.S. Environmental Protection Agency
USGCRP	U.S. Global Change Research Program

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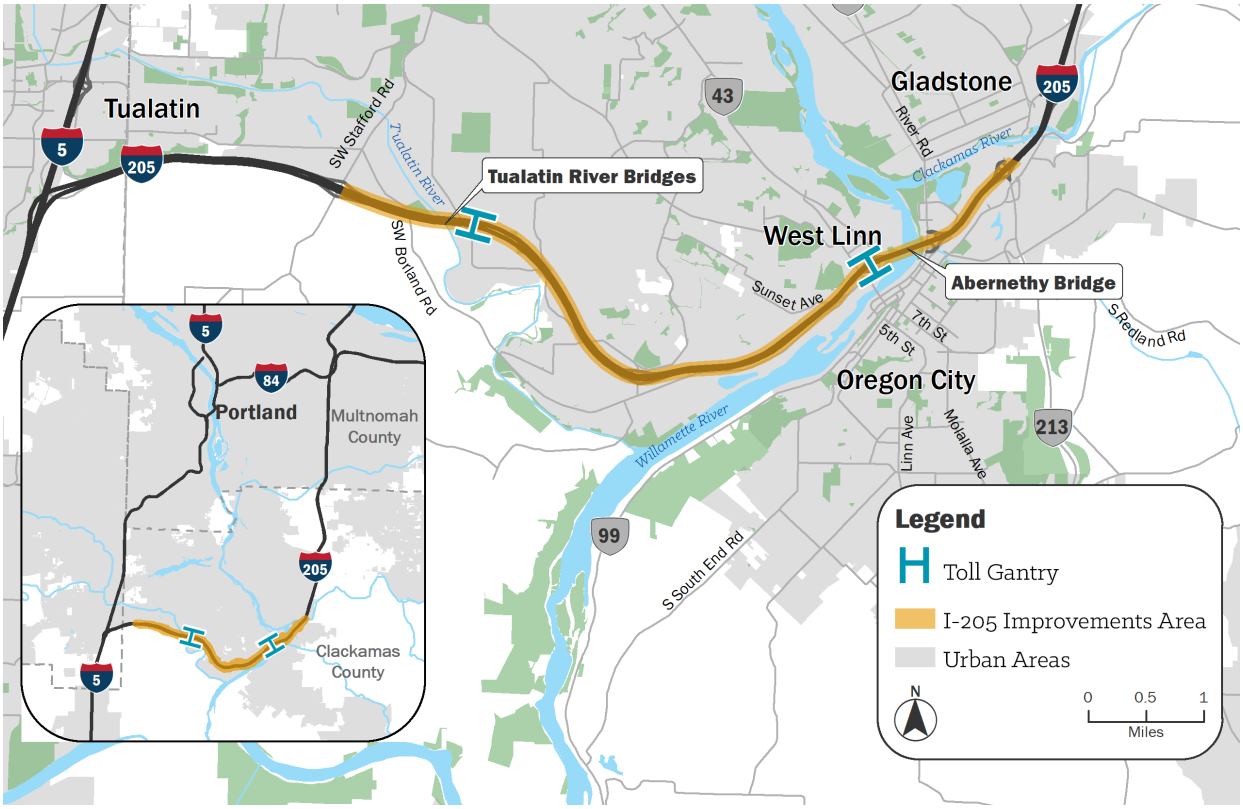
1 Introduction

This technical report supports the I-205 Toll Project Environmental Assessment developed by the Oregon Department of Transportation (ODOT) in partnership with the Federal Highway Administration (FHWA). ODOT proposes to use variable-rate tolls[1] on the Interstate 205 (I-205) Abernethy Bridge and Tualatin River Bridges to raise revenue for construction of planned improvements to I-205 from Stafford Road to Oregon Route (OR) 213, including seismic upgrades and widening, and to manage congestion. The environmental assessment evaluates the effects of variable rate tolls and the toll-funded I-205 improvements (together, the "Project") on the human and natural environment in accordance with the National Environmental Policy Act (NEPA). Figure 1-1 illustrates the Project area.

Figure 1-1. Project Area



Cumulative impacts are defined as the effects on the environment that result from the incremental effects of the proposed action when added to the effects of other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions (Council on Environmental Quality 2022).

This technical report identifies past, present, and reasonably foreseeable future actions (RFFAs) affecting the same resources affected by the Project; discusses the Project's contribution to cumulative impacts

[1] Variable-rate tolls are fees charged to use a road or bridge that vary based on time of day and that can be used as a strategy to shift demand to less congested times of day.

and benefits on environmental resources, and identifies measures to avoid, minimize, and/or mitigate cumulative impacts. In cumulative effects analysis, the term “resources” is often used to refer to various facets of the economic, social, natural and physical environment. As such, the term “resources” may be used in this report to refer to topics not typically considered a resource (e.g., noise). The information contained in this technical analysis supports the Project’s Environmental Assessment.

2 Project Alternatives

ODOT evaluated two alternatives in the I-205 Toll Project Environmental Assessment and this technical report:

- No Build Alternative
- Build Alternative

Section 2.1 describes the previous environmental review that led up to the Environmental Assessment and associated technical analyses, and Sections 2.2 and 2.3 describe the alternatives in more detail.

2.1 Project Background and Environmental Review

Oregon House Bill 2017 identified improvements on I-205 as a priority project, known as the I-205: Stafford Road to OR 213 Improvements Project (I-205 Improvements Project). The purpose of the improvements was reducing congestion; improving mobility, travel time reliability, and safety; and providing seismic resiliency for I-205 to function effectively as a statewide north-south lifeline route after a major earthquake by widening I-205 and seismically upgrading or replacing 13 bridges. In 2018, ODOT and FHWA determined that, with respect to FHWA regulations implementing NEPA, the I-205 Improvements Project qualified as a categorical exclusion (CE) (Code of Federal Regulations [CFR] 23 771.117[d][13]). In December 2018, FHWA signed a CE Closeout Document (2018 CE) for the I-205 Improvements Project, which demonstrated that it would not involve significant environmental impacts. At that time, the potential locations for tolling on I-205 had not been determined, and tolling of I-205 was not included in any adopted long-term transportation plan;[2] therefore, tolling was not considered part of the I-205 Improvements Project nor analyzed in the 2018 CE.

After FHWA approved the 2018 CE, ODOT advanced elements of the I-205 Improvements Project as multiple phased construction packages; however, efforts to secure construction funding for the entirety of the project were unsuccessful. In 2021, Oregon House Bill 3055 provided financing options that allowed the first phase of the I-205 Improvements Project to be constructed without toll revenue[3]. This first phase, referred to as the I-205: Phase 1A Project (Phase 1A), includes reconstruction of the Abernethy Bridge with added auxiliary lanes and improvements to the adjacent interchanges at OR 43 and OR 99E. ODOT determined that toll revenue would be needed to complete the remaining construction phases of the I-205 Improvements Project as described in the 2018 CE (i.e. those not included in Phase 1A).

In May 2022, FHWA and ODOT reduced the scope of the project to include only Phase 1A and completed a NEPA re-evaluation that reduced the scope of the 2018 CE decision for the scaled back project (ODOT 2022a). Construction of Phase 1A began in summer 2022 and is estimated to be complete in 2025. The toll-funded improvements were removed from the I-205 Improvements Project and accompanying 2018 CE decision and are now included in the I-205 Toll Project. The environmental

[2] Federal regulations require that transportation projects be formally included in state and/or regional long-term transportation plans before they receive NEPA approvals.

[3] If tolling is approved upon completion of environmental review of the I-205 Toll Project, tolls could be used to pay back loans for Phase 1A.

effects of the toll-funded improvements are analyzed in the Environmental Assessment and associated technical analyses.

2.2 No Build Alternative

NEPA regulations require an evaluation of a No Build Alternative to provide a baseline to compare with the potential effects of a Build Alternative. The No Build Alternative consists of existing transportation infrastructure and any planned improvements that would occur regardless of the Project. The No Build Alternative includes the I-205: Phase 1A Project (reconstruction of the Abernethy Bridge with added auxiliary lanes and improvements to the adjacent interchanges at OR 43 and OR 99E) as a previously approved project that would be constructed by 2025. Under the No Build Alternative, tolling would not be implemented and the toll-funded widening and seismic improvements on I-205 between Stafford Road and OR 213 would not be constructed.

2.3 Build Alternative

Under the Build Alternative, drivers of vehicles on I-205 would be assessed a toll for crossing the Abernethy Bridge (between OR 43 and OR 99E) and for crossing the Tualatin River Bridges (between Stafford Road and 10th Street). The Build Alternative includes construction of a third through lane in each direction of I-205 between the Stafford Road interchange and the OR 43 interchange, a northbound auxiliary lane between OR 99E and OR 213, toll gantries and supporting infrastructure, as well as replacement of or seismic upgrades to multiple bridges along I-205 (shown schematically in Figure 2-1).

The following sections provide a more detailed description of the Build Alternative.

2.3.1 Bridge Tolls – Abernethy and Tualatin River Bridges

Two toll gantry areas have been identified for placement of the toll gantries and supporting infrastructure, as shown in Figure 2-2. The gantries and supporting infrastructure would be located entirely within the existing I-205 right-of-way.

Figure 2-1. Schematic Diagrams of No Build and Build Alternatives

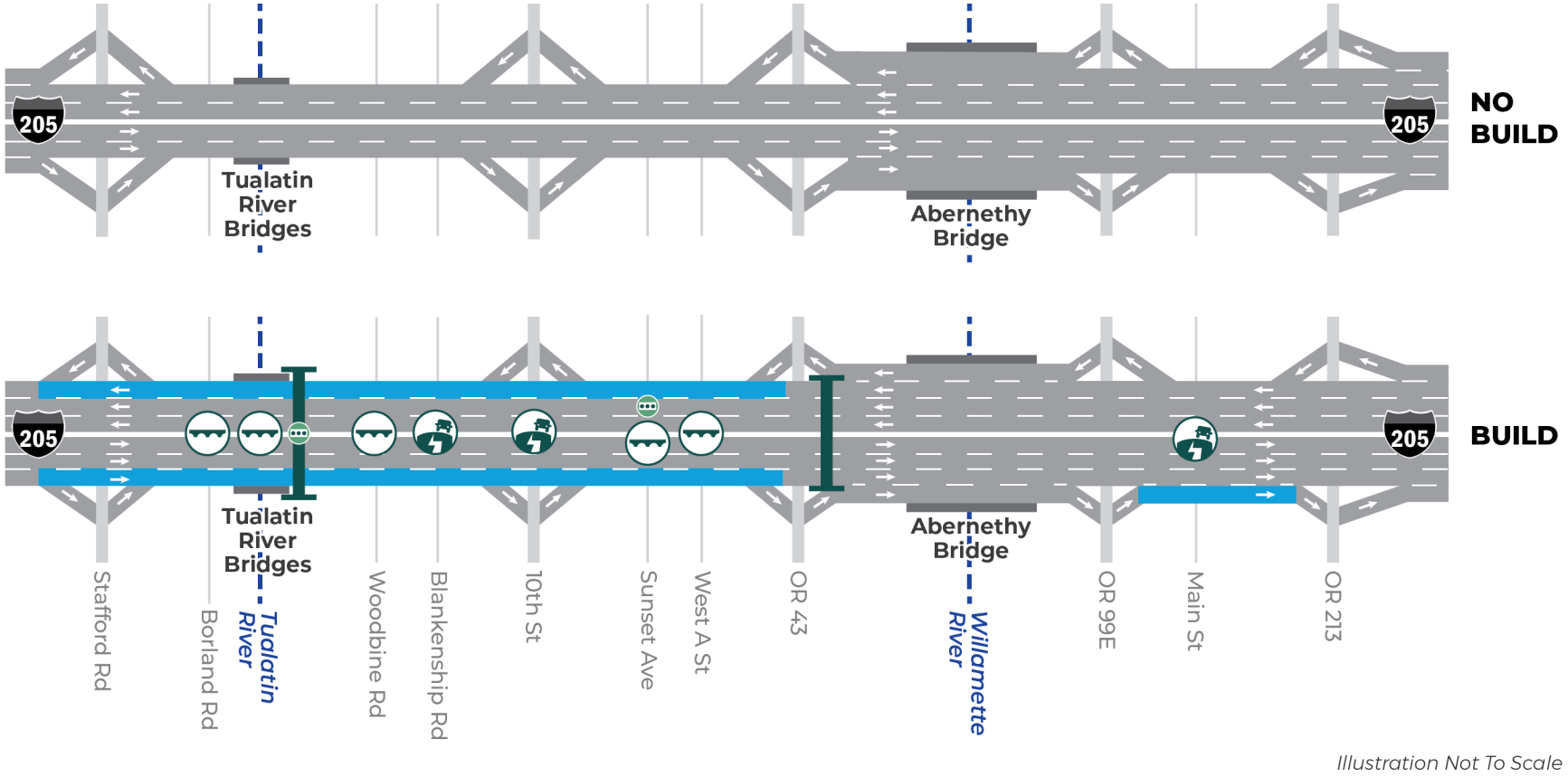
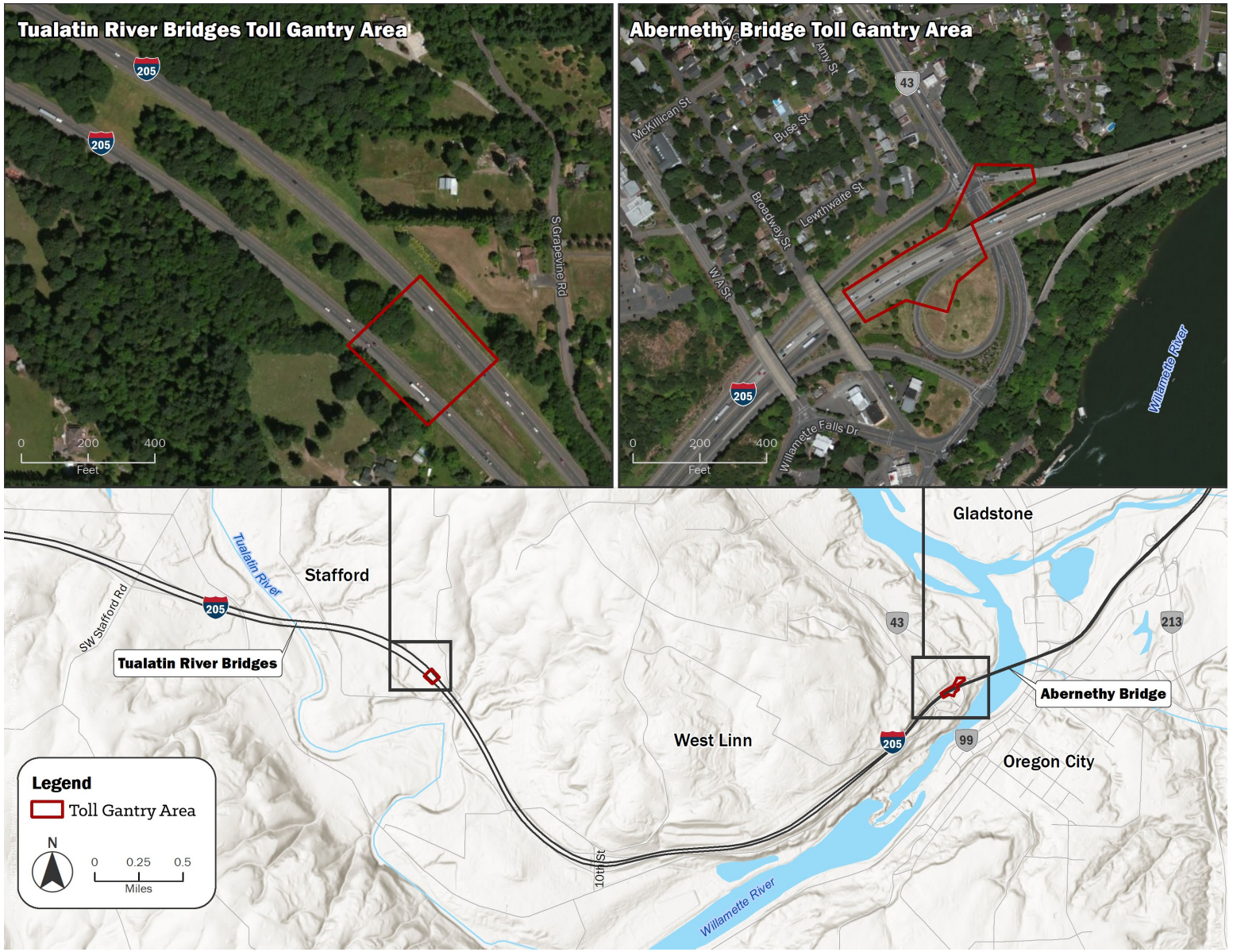


Figure 2-2. Build Alternative: Bridge Tolls – Abernethy Bridge and Tualatin River Bridges



Tolling Technology

Under the Build Alternative, tolling would consist of an all-electronic system that would automatically collect tolls from vehicles traveling on the highway, as shown in Figure 2-3. There would be no toll booths requiring drivers to stop. Rather, antennae, cameras, lights, and other sensors would be mounted on the toll gantries spanning the roadway and would either (1) read a driver's toll account transponder (a small sticker placed on the windshield), or (2) capture a picture of a vehicle's license plate and send an invoice to the registered owner of the vehicle.

Figure 2-3. Electronic Toll System

How electronic tolling works. An all-electronic system would automatically collect tolls from vehicles traveling on the highway. A transponder (a small sticker placed on the windshield) is read and connected to a prepaid account. If a vehicle doesn't have a transponder, a camera captures the car's license plate, and the registered owner is billed. This keeps traffic flowing without stopping to pay tolls.

Tolling Infrastructure

Toll gantries would consist of vertical columns on the outside of the travel lanes and a horizontal structure that would span the travel lanes to which the electronic tolling equipment would be attached. Toll gantries would be constructed of a metal framework with metal or concrete support structures. Gantries and supporting infrastructure would be designed to ensure consistency with other improvements to I-205 included in the Project. The final structure type and design would be determined during the preliminary design of the gantries and would be based on cost, aesthetics, and ease of construction. The toll gantry areas would include paved parking for service vehicles, which would typically be protected by a safety barrier or guard rail.

In addition to the toll technology mounted overhead on the gantries themselves, the gantries would require some additional toll system equipment for data processing, storage, and network operations. This equipment is generally enclosed within a small, access-controlled concrete structure, from which connections to existing ODOT data fiber and commercial power would be routed. ODOT currently operates a fiber data network with a 48-strand fiber-optic cable along the north side of I-205, to which the toll system equipment would be connected. A backup generator (typically fueled by diesel or natural gas) would be provided so the toll equipment would function during power outages. No relocation of existing utilities to accommodate construction of the gantries or any supporting infrastructure is expected.

The Abernethy Bridge toll gantry area would include three toll gantries: a mainline gantry structure that spans all highway lanes, and gantries over the northbound on-ramp and the southbound off-ramp. Each toll gantry would include a single gantry structure. The on-ramp and off-ramp gantries would likely be cantilevered structures. The Tualatin River Bridges toll gantry area would include two toll gantries: one over the mainline northbound travel lanes and one over the mainline southbound travel lanes. Each toll gantry would include a single gantry structure.

Toll Implementation

As Oregon's toll authority, the Oregon Transportation Commission will set toll rates, policies (including discounts and exemptions), and price escalation. If tolling is approved, the Oregon Transportation Commission would ultimately set toll rates at levels sufficient to meet all financial commitments, fund

Project construction and maintenance, and manage congestion. The Oregon Transportation Commission is expected to finalize toll rates in 2024. ODOT could begin tolling as early as December 2024, before the completion of construction of Project improvements to I-205 under the Build Alternative.

Toll Rate Assumptions

Toll rates have not been determined and will be set by the Oregon Transportation Commission if tolling is approved. For environmental analysis and financial planning purposes, a baseline weekday variable-rate toll schedule was identified that balances the objectives of revenue generation sufficient to meet the funding target for capital construction of the I-205 improvements, and alleviating congestion on I-205 during peak travel times. The identified toll rates would provide a sustainable source of revenue for ongoing corridor operations and maintenance and for periodic repair and replacement costs. For environmental analysis and financial planning purposes, the identified baseline toll rate schedule for the year of opening varies as follows:

- During off-peak hours, toll rates are assumed to be lowest, ranging from $0.55 overnight (from 11 p.m. to 5 a.m.) to $0.65 in the midday and evening (from 10 a.m. to 1 p.m. and 8 p.m. to 11 p.m.) to cross a single bridge.
- During peak hours (6 a.m. to 9 a.m. and 3 p.m. to 7 p.m.), toll rates are assumed to be highest during peak hours, varying from $1.65 to $2.20 to cross a single bridge depending on which weekday peak hour.
- During the shoulder period hours just before and after the peak periods (5 a.m. to 6 a.m., 9 a.m. to 10 a.m., 1 p.m. to 3 p.m., 7 p.m. to 8 p.m.), toll rates are assumed to be $1.00 to cross a single bridge.

These assumed rates would apply to each bridge crossing. The rates for a through trip (i.e., crossing both the Abernethy and Tualatin River bridges) would be double the assumed toll rate for only crossing one bridge. The assumed toll rates are provided in state fiscal year (FY) 2025 dollars, indicative of the year of opening, and are assumed to escalate annually with general price inflation, conservatively assumed to be 2.15% per year.

A recent financial analysis confirmed that under the assumed baseline toll rates, there would be sufficient net toll revenues to leverage bonds that would meet the toll funding contribution target for construction of the planned I-205 improvements (ODOT 2022b).

2.3.2 Improvements to I-205

Under the Build Alternative, a 7-mile portion of I-205 would be widened between Stafford Road and OR 213, with added through lanes between Stafford Road and OR 43, and a northbound auxiliary lane from OR 99E to OR 213. Eight bridges between Stafford Road and OR 213 would be replaced or reconstructed to withstand a major seismic event. New drainage facilities would be installed in both directions of I-205.

Bridge Reconstructions and Replacements

The following bridges would be reconstructed with foundation improvements and substructure upgrades for seismic resiliency but would not be replaced:

- Northbound I-205 bridge over Blankenship Road – Mile Post (MP) 5.84
- Southbound I-205 bridge over Blankenship Road – MP 5.90
- Northbound I-205 bridge over 10th Street (West Linn) – MP 6.40
- Southbound I-205 bridge over 10th Street (West Linn) – MP 6.42
- I-205 bridge over Main Street (Oregon City) – MP 9.51

The following bridges would be replaced to meet seismic design standards and to facilitate the widening of I-205:

- Northbound I-205 bridge over SW Borland Road – MP 3.82
- Southbound I-205 bridge over SW Borland Road – MP 3.81
- Northbound I-205 bridge over the Tualatin River – MP 4.1
- Southbound I-205 bridge over the Tualatin River – MP 4.08
- Northbound I-205 bridge over Woodbine Road – MP 5.14
- Southbound I-205 bridge over Woodbine Road – MP 5.19
- Sunset Avenue (West Linn) bridge over I-205 – MP 8.28
- West A Street (West Linn) bridge over I-205 – MP 8.64

The I-205 bridges over 10th Street and Blankenship Road would be widened and raised to meet the proposed new highway grade. The I-205 bridges over the Tualatin River and SW Borland Road would be replaced on a new alignment between the existing northbound and southbound directions to accommodate construction. The I-205 bridges over Woodbine Road would be replaced on the existing alignment and raised to meet the proposed new highway grade. The Broadway Street Bridge over I-205 would be removed to enhance the function of the OR 43 interchange.

2.3.3 Construction

Construction of the Build Alternative is expected to last approximately 4 years, beginning in late 2023 with construction of toll gantries and toll-related infrastructure and continuing from 2024 through 2027 with construction of I-205 widening and seismic improvements. Most toll-related construction would be conducted alongside I-205 within the existing right-of-way. For highway widening, it is anticipated that construction would be sequenced to widen one direction of I-205 at a time, enabling traffic to be moved to a temporary alignment while the remaining widening work is completed. Construction activities would include adding temporary crossover lanes to enable access to the temporary traffic configurations during roadway widening. Staging areas for construction equipment and supplies for the Build Alternative would be located primarily in the median of I-205 in ODOT right-of-way.

3 Regulatory Framework

The following is a list of federal laws, policies, and guidance documents that were used to guide or inform the assessment of cumulative impacts:

- ODOT Environmental Impact Statement Annotated Template, Chapter 4: Cumulative Impacts (ODOT 2010)
- FHWA NEPA-implementing regulations, Environmental Impact and Related Procedures (23 C.F.R. Part 771)
- American Association of State Highway and Transportation Officials (AASHTO), *Practitioner's Handbook: Assessing Indirect Effects and Cumulative Impacts Under NEPA* (AASHTO 2016)
- Council on Environmental Quality (CEQ) regulations (40 C.F.R. Parts 1500–1508)[4]
- CEQ, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005)
- CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997)

The Environmental Review Toolkit website maintained by FHWA provides additional guidance on cumulative impact analysis (FHWA 2022).

[4] The CEQ is currently reviewing a 2020 rule that removed the separate definition for cumulative effects. The current FHWA environmental impact regulations still include cumulative effects, and legal precedents remain in effect.

4 Methodology

4.1 General Approach

The Project team used the following eight-step process to develop and write the Project's cumulative impacts analysis (ODOT 2010):

1. Identify the resources[5] that may have cumulative effects to consider in the analysis.
2. Define the geographic and temporal area of potential impact (API) for each affected resource.
3. Describe the current health and historical context for each affected resource, including recent growth trends and projections.
4. Identify direct and indirect impacts of the Project that may contribute to a cumulative impact.
5. Identify other present and future actions that may affect resources.
6. Assess potential cumulative effects on each resource; determine timing, magnitude and significance and note any differences in the Project's contribution between alternatives.
7. Document the results.
8. Assess and discuss potential mitigation measures for all adverse impacts.

The cumulative impact analysis should address resources that the proposed action is anticipated to affect (CEQ 1997). The resources that would most likely experience direct and indirect impacts from the Build Alternative are those that would be affected by changes in traffic patterns or socioeconomic conditions from implementing tolling and resources concerned with the physical impacts associated with the construction of the third lane and bridge reconstruction or replacement. Based on the direct and indirect impacts identified in the resource-specific technical analyses, the Project Team determined that the Project may contribute to cumulative effects related to the following resources:

- Air quality
- Climate
- Economics
- Environmental justice populations
- Geology and soils
- Hazardous materials
- Historic and archaeological resources
- Land use
- Noise
- Social resources and communities
- Transportation
- Vegetation and wildlife
- Visual quality

[5] As noted in the introduction, the term "resources" is used in cumulative effects analyses to refer to various environmental topics (e.g., air quality, economics, noise).

4.2 Area of Potential Impact

Cumulative impacts are considered within both geographic and temporal (i.e., timeframe) boundaries. Because the geographic boundaries of an impact analysis are specific to the resource, the Project's cumulative impacts assessment uses the API identified for individual environmental resources. For example, when evaluating cumulative impacts on environmental justice populations, the analysis considers the API established in the *I-205 Toll Project Environmental Justice Technical Report*. Attachment A provides figures of the APIs for each resource.

The purpose of the temporal boundary is to capture what has happened to a specific resource in the past and to provide sufficient context for its current condition and what is likely to happen to that resource as a result of the Project and other RFFAs. The timeframe considered for all environmental resources in this analysis is the late 1970s/early 1980s (when I-205 was built) through 2045 (the design year for the Project).

Table 4-1 identifies the geographic APIs for each environmental resource.

Table 4-1. Geographic Boundaries

Environmental Resource	Geographic Boundary (API)
Transportation	Generally extends south–north along I-205 from the I-5 interchange near Tualatin to the 82nd Drive interchange near Gladstone and continues south along OR 99E about 10 miles to Aurora. The API includes I-205 interchange ramp terminal intersections, key intersections, and key corridors in the I-205 vicinity that would be affected by traffic volume changes in 2045 under the No Build and Build Alternatives.
Air Quality	The area that encompasses I-205 and other roadways that could experience a 5% or greater increase or decrease in annual average daily traffic volumes between the 2045 No Build and Build Alternatives.
Climate	The area that encompasses I-205 and other roadways that could experience a 5% or greater increase or decrease in annual average daily traffic volumes between the 2045 No Build and Build Alternatives. *Note: While climate change is a global issue being addressed at the regional, state, and national levels, the API for the Project's GHG emissions analysis was used because it provides a geographic boundary within which to evaluate the Project's contribution to cumulative effects.*
Economics	The area that encompasses I-205 and other roadways that could experience a 5% or greater increase or decrease in annual average daily traffic volumes between the 2045 No Build and Build Alternatives. Some economic impacts were evaluated at larger regional levels and at the state level.
Noise	Within 500 feet of the I-205 right-of-way between the SW Stafford Road and OR 213 interchanges, and along roadways that may experience rerouting as a result of the 2045 Build Alternative.
Visual Quality	Within 0.5 mile of the I-205 right-of-way between the SW Stafford Road and OR 213 interchanges.
Social Resources and Communities	The area that encompasses I-205 and other roadways that could experience a 5% or greater increase or decrease in annual average daily traffic volumes between the 2045 No Build and Build Alternatives.
Environmental Justice Populations	The area that encompasses I-205 and other roadways that could experience a 5% or greater increase or decrease in annual average daily traffic volumes between the 2045 No Build and Build Alternatives.

Environmental Resource	Geographic Boundary (API)
Land Use	Within 100 feet of the I-205 right-of-way between the SW Stafford Road and OR 213 interchanges.
Geology and Soils	
Hazardous Materials	
Vegetation and Wildlife	
Wetlands and Water Resources	
Historic and Archaeological Resources	The parcels along I-205 that have the potential to be directly affected by the proposed improvements to I-205.

APE = area of potential effect; GHG = greenhouse gas; I- = Interstate; OR = Oregon Route

4.3 Describing the Affected Environment

4.3.1 Existing Conditions

"Existing conditions" refers to the overall conditions, stability, or vitality of a particular environmental resource, as well as any trends that may be affecting it (ODOT 2010). The description of the existing conditions of each resource relies on the environmental baseline conditions documented in the Project's Environmental Assessment sections and supporting technical documentation.

4.3.2 Historical Context and Past Actions

The purpose of the historical context is to provide a general understanding of how an environmental resource got to its existing conditions, which includes identifying past activities that have influenced the resource (ODOT 2010). The understanding and description of the historical context of the area relies on the following sources:

- U.S. Census Bureau data
- Historical maps
- Aerial photographs
- Historic information available online (e.g., websites for the cities, counties, states, and local chambers of commerce)
- Municipal planning documents

4.4 Present and Future Actions

Under CEQ guidance, the present and future actions considered in a cumulative impact analysis should have some influence on the same environmental resources affected by the proposed action (CEQ 1997). Proximity to the proposed action is not the sole deciding factor for inclusion because a project may be physically close without an overlap in impacts. Actions can be excluded if they are outside the geographic or temporal boundaries, would not affect the same resources as the Project, or if their inclusion would be arbitrary to the cumulative impacts analysis. Because all impacts on a particular resource could be considered cumulative, CEQ guidance encourages focusing the analysis on important issues of national, regional, or local significance (CEQ 1997).

Present actions were identified as those that are ongoing in nature, such as maintenance of the transportation system and ongoing safety improvements. The present actions and RFFAs included in this analysis were developed through review of Metro's *2018 Regional Transportation Plan* (RTP) (Metro 2018a) and discussions with partner agencies using the following criteria:

- The action is of a regional scale and Metro's RTP includes it on the financially constrained project list.
- The action has a primary purpose of congestion management on the I-205 or I-5 corridors, and Metro's RTP includes it on the financially constrained project list.
- The action anticipates changing vehicle or multimodal travel patterns in the vicinity of the Project, and Metro's RTP includes it on the financially constrained project list.
- The action is within one or more of the resource area APIs concerned with physical impacts,[6] would have a physical impact on the same resource areas that are physically affected by the Build Alternative, and is listed on the financially constrained project list in Metro's RTP.

It should be noted that while non-transportation projects are not included in the RFFA list (Attachment B) because they are not identified in Metro's RTP, the effects of anticipated future development are captured in the regional growth modeling and was therefore included in the Project analyses for air quality, greenhouse gas (GHG) emissions and climate change, noise, and transportation.

The Project Team developed a preliminary list of RFFAs by reviewing Metro's 2018 RTP database and through prior discussions with partner agencies. The Project Team then presented the list of actions to the Clackamas County Coordinating Committee Technical Advisory Committee on October 26 and November 16, 2021, to solicit input on the list of projects. The committee members present included representatives from Clackamas County, Oregon City, City of West Linn, and Metro, among others. The committee did not recommend adding or removing any actions from the list.

4.4.1 Reasonably Foreseeable Future Actions

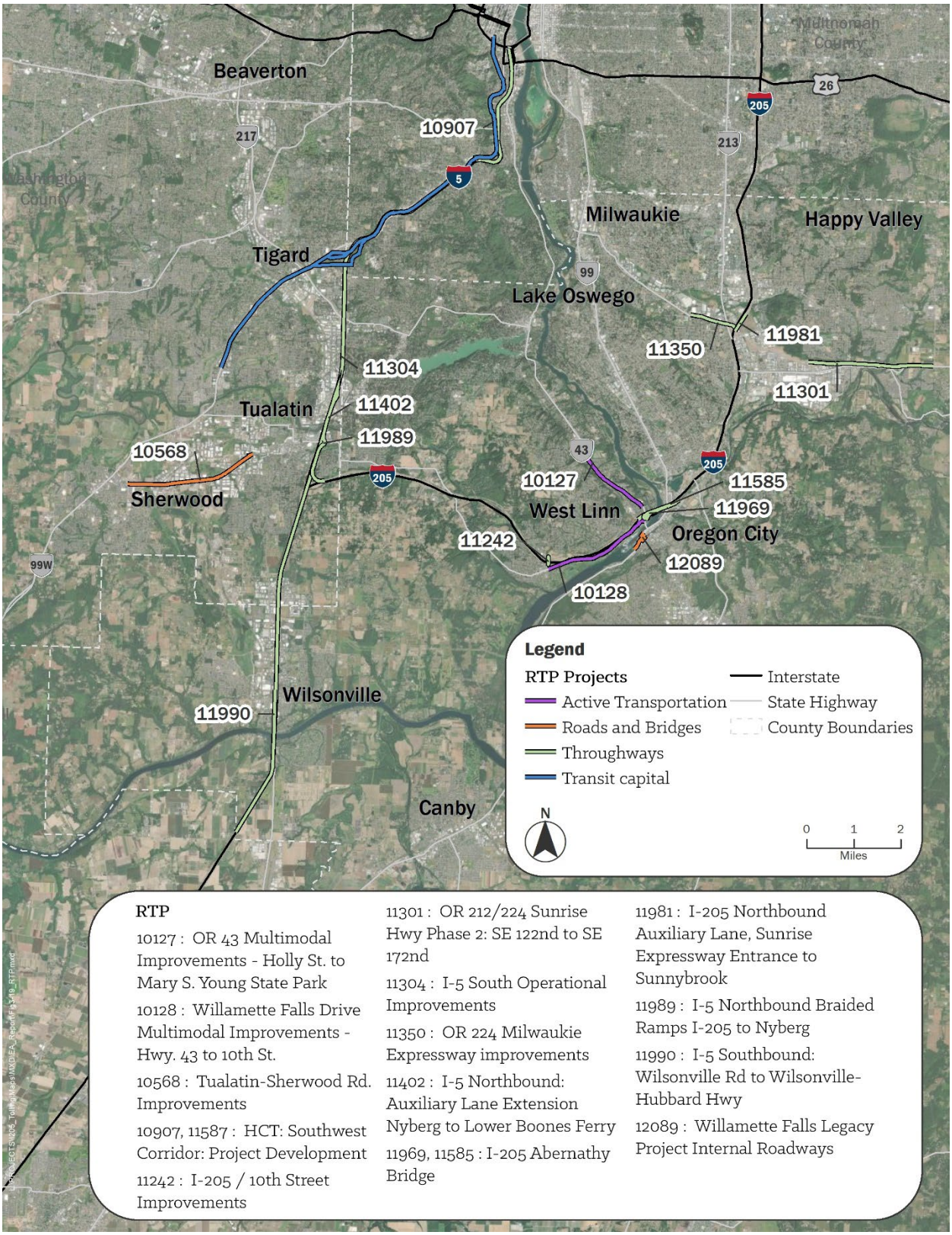
Figure 4-1 identifies the RFFAs that could affect the same environmental and community resources as the Build Alternative, and Attachment B provides a detailed list of the actions. This list contains actions identified as (1) meeting the criteria in Section 4.4 and (2) having the potential to have an impact on the same resources as the Build Alternative (as identified in Section 4.1). The RFFA list is not an exhaustive list of all actions included in the modeling used to develop the technical analyses for air quality, energy and GHGs, noise, or transportation. Some of the actions included were to be funded by a Metro ballot measure (#26-218) that failed to pass in November 2020; these actions are on hold until funding is identified. Because significant planning and coordination have gone into these actions, they are included on the RFFA list. Several projects from the RTP were identified as having been constructed since its publication and are not included on the list.

[6] The resource areas concerned with physical impacts from the Build Alternative include land use, geology and soils, hazardous materials, historic and archeological resources, vegetation and wildlife, and wetlands and water resources.

The three actions listed below are regionally or locally important but do not meet the Project's criteria for an RFFA for the following reasons:

- **Regional Mobility Pricing Project (RMPP):** The RMPP will evaluate congestion pricing in the Portland metropolitan region as a mechanism to manage congestion and raise revenue to help fund construction of approved congestion-relief transportation projects. The planning process is under way, with the formal environmental review beginning in late 2022. Because key details about the RMPP are unknown (e.g., starting and ending points for tolling, potential toll rates), impacts cannot be reliably qualified or quantified at this time. The RMPP is also not currently included in Metro's RTP. The cumulative impacts analysis for the RMPP will include the Project.
- **Interstate Bridge Replacement (IBR) Program:** The IBR program, which is in the environmental review phase, would replace the existing Interstate Bridge across the Columbia River between Vancouver, Washington, and Portland, Oregon. Because the IBR program is outside of the API for the Project, the IBR program does not meet the identified criteria for an RFFA. However, the Project Team included the bridge replacement in the transportation model used for the Project (i.e., the model assumes the bridge replacement will be constructed); therefore, this action is accounted for in several technical analyses, including transportation, noise, air quality, and GHGs and climate change. ODOT also anticipates that the IBR program will be included in the cumulative impacts analysis for the RMPP.
- **I-5 Rose Quarter Improvement Project:** This project, which is in the supplemental environmental review and design phase, would add auxiliary lanes and shoulders on I-5 in Portland. Because the Rose Quarter Improvement Project is outside of the APIs for the Project, it does not meet the criteria for an RFFA. However, as with the IBR program, the Project Team included the Rose Quarter Improvement Project in the transportation model (i.e., the model assumes the Rose Quarter project will be constructed); therefore, this action is accounted for in several technical analyses (transportation, noise, air quality, GHG and climate change). ODOT also anticipates that the Rose Quarter Improvement Project will be included in the cumulative impacts analysis for the RMPP.

Figure 4-1. Present and Reasonably Foreseeable Future Actions



RTP

10127 : OR 43 Multimodal Improvements - Holly St. to Mary S. Young State Park

10128 : Willamette Falls Drive Multimodal Improvements - Hwy. 43 to 10th St.

10568 : Tualatin-Sherwood Rd. Improvements

10907, 11587 : HCT: Southwest Corridor: Project Development

11242 : I-205 / 10th Street Improvements

11301 : OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd

11304 : I-5 South Operational Improvements

11350 : OR 224 Milwaukie Expressway improvements

11402 : I-5 Northbound: Auxiliary Lane Extension Nyberg to Lower Boones Ferry

11969, 11585 : I-205 Abernathy Bridge

11981 : I-205 Northbound Auxiliary Lane, Sunrise Expressway Entrance to Sunnybrook

11989 : I-5 Northbound Braided Ramps I-205 to Nyberg

11990 : I-5 Southbound: Wilsonville Rd to Wilsonville-Hubbard Hwy

12089 : Willamette Falls Legacy Project Internal Roadways

4.5 Impact Assessment Methods

The Project Team relied on the technical analyses for the *I-205 Toll Project Environmental Assessment* to identify the direct and indirect impacts that the Build Alternative would have on a particular resource. To identify cumulative effects on those resources from other present and RFFAs, the Project team looked at studies or planning documents prepared for the other actions (where available), reviewed best available science or literature, and worked with subject matter experts to understand the current trends and predicted future conditions of various resources.

Where feasible, the cumulative impacts analysis is quantitative, such as the projected levels of pollutant emissions included in the *I-205 Toll Project Air Quality Technical Report* (the emissions modeling was inclusive of other actions, in addition to the Project). Where quantitative data was not available, the cumulative analysis is qualitative and provides a comprehensive understanding of the resource and how it would be affected.

4.6 Mitigation Approach

As described in the referenced technical reports and summarized in Section 6, the Build Alternative would avoid and/or mitigate most anticipated direct and indirect impacts. Because direct and indirect adverse impacts would be mitigated, the Build Alternative would have a minimal (or no) contribution to adverse cumulative impacts. Therefore, no additional mitigation for cumulative impacts is proposed.

5 Affected Environment

This section describes the historical context and past actions in the APIs (see Table 4-1 and Attachment B), regional growth and development trends, and other present actions and RFFAs. More specific analysis of the affected environment (current conditions) of individual resources is provided in Section 6.1.

5.1 Historical Context and Past Actions

5.1.1 Early History

The Portland metropolitan region sits at the confluence of the Columbia and Willamette Rivers. The lowlands surrounding these rivers form the Portland Basin. Archaeological research shows the region has been inhabited for the last 11,000 years. The earliest inhabitants were the Chinookan-speaking peoples, including the Clackamas, Kathlamet, Multnomah, and Tualatin peoples. By the 16th century, dozens of bands of people lived in what is now Oregon, with populations along the Columbia River, the western valleys, and the coastal regions (Oregon Historical Society 2018).

Important for its abundant natural resources and plentiful fish and game, the region is also home to Willamette Falls, located between what is now Oregon City and West Linn. Willamette Falls was a historically important trading center in the Pacific Northwest and played an important role in the oral histories and stories of original peoples, including the Chinookans and Kalapuyans (Willamette Falls Legacy Project 2014).

Change came in the first half of the 19th century with the arrival of Euro-American explorers, fur-trappers, and traders (MacColl and Stein 1988:6; Roulette et al. 2004). The new settlers to the area brought with them diseases such as smallpox and measles, which led to epidemics that decimated these first peoples in the region, with many Chinookan villages losing between 50% and 90% of their populations (Oregon Historical Society 2018).

5.1.2 Early Industry and Growth

The Oregon Trail led to a major influx of white settlement in the region beginning in 1841. The rapid growth of San Francisco following the Gold Rush of 1849 created a heavy dependency on Oregon's timber, and the Portland region—with its ideal location along deep waters—became the center for California trade (MacColl and Stein 1988:12; Roulette et al. 2004). Willamette Valley was among the first areas to be cleared for agriculture (Clackamas County 2001). From the earliest days, the value of strategic location for various uses of the land was recognized and exploited for human benefit. Portland's rapid development in the 1850s was also attributed to the many businessmen, merchant capitalists, and real estate and land speculators who were attracted to the area's growing opportunities (Roulette et al. 2004).

From the 19th century onward, the region grew both in population and diversity of industry. The timber industry took root as a critical facet of the state's economy and helped create secondary supporting industries in the area as well. Willamette Falls once again played a critical role because it was one of the first industrial sites in the area and provided both hydroelectric power for the region and power for the state's first paper mill (City of Milwaukie 2020).

5.1.3 Early Transportation

As the region grew between the mid-19th and 20th centuries, its need for transporting people and goods and services grew as well. Interurban railways were laid down throughout the region, connecting cities as far west as Forest Grove and south to Oregon City along the Willamette River. These railways thrived and helped to establish commercial areas that remain integral to the urban fabric of these communities (City of Milwaukie 2020).

The rise of the automobile brought changes to these streetscapes. The era of the multilane highways in the region began in the 1930s with the construction of Barbur Boulevard and McLoughlin Boulevard, which follow the former alignment of Native American trails through the Willamette Valley. These roads became state highways 99E and 99W (Engeman 2005).

5.1.4 Highway Era

The next era of transportation in the area began with the building of the interstate highway system. After the completion of I-5, the plan for a secondary highway in the region emerged in the U.S. Department of Transportation's 1955 Freeway and Expressway System Report. Building on the 1948 highway plan by Robert Moses, an outer loop alignment was suggested. Two routes in eastern Multnomah County were proposed to connect with Vancouver, Washington, across the Columbia River: an inner route along 52nd Avenue or an outer route along 96th Avenue. At this point, the southern terminus had not been determined, but it was intended to connect to I-5 and to the proposed Mt. Hood Freeway along Division Street and Powell Boulevard in Portland. The Oregon State Highway Department began refining and determining routes, planning highway connections across the region (ODOT 1974).

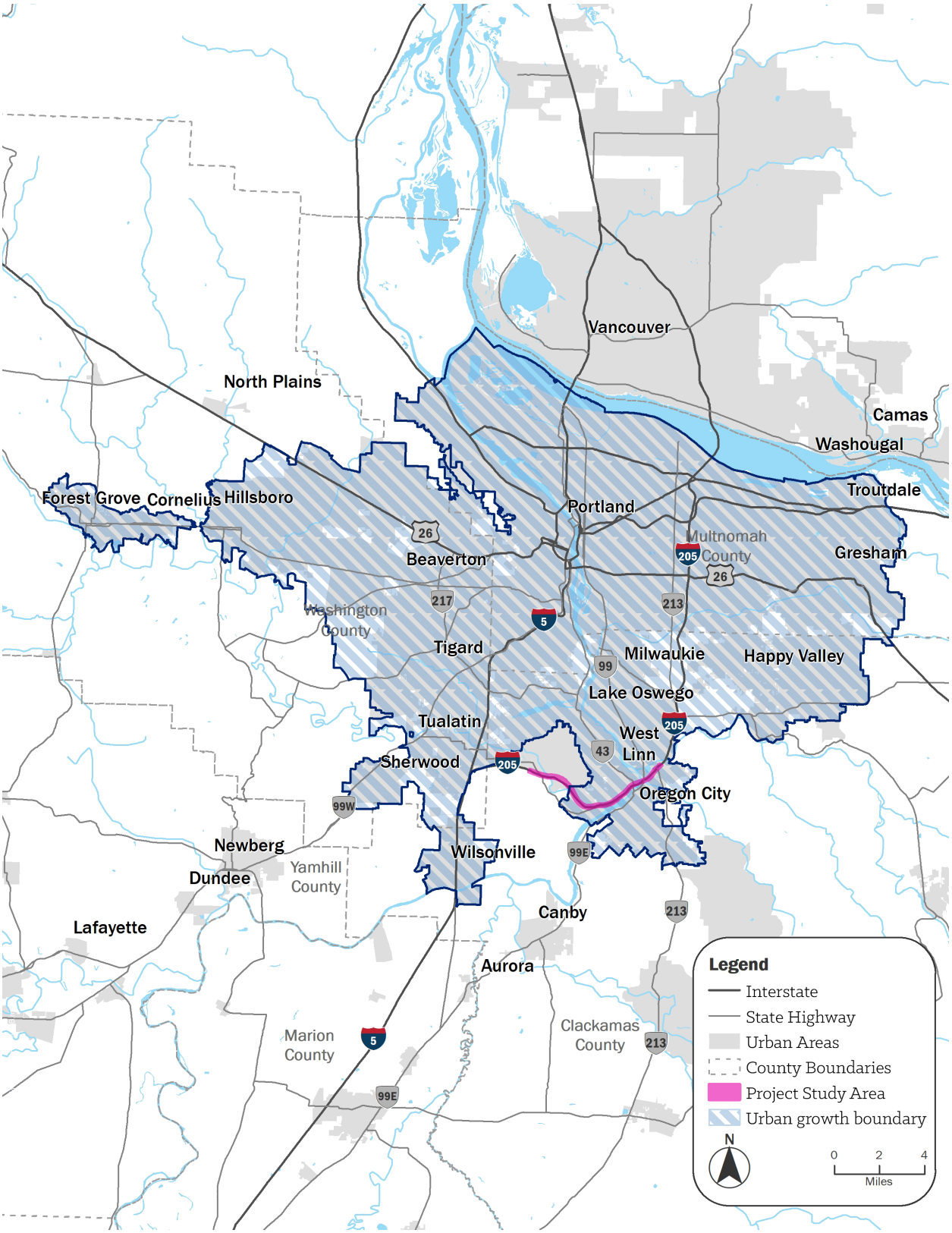
The proposed alignments placed the new highway through Lake Oswego. Adjacent jurisdictions and neighborhood groups opposed constructing the highway through their communities, resulting in a modified highway alignment to a more southern route between West Linn and Oregon City (The Oregonian 1965a, 1965b). The first section of I-205, from West Linn to Oregon City, opened to traffic in 1970, while facing unsuccessful legal challenges throughout the early 1970s. Construction of I-205 in its current configuration was officially completed in 1982.

5.2 Regional Growth, Development Trends, and Present Actions

In 1973, Oregon enacted Senate Bill 100, which established the Comprehensive Growth Management Program. Under the program, each city in Oregon must have an Urban Growth Boundary to designate where a city expects to grow over the next 20 years. Figure 5-1 shows the Urban Growth Boundaries in relation to the Project.

The intention of the Urban Growth Boundary is to (1) direct growth toward cities and contain suburban sprawl and (2) preserve agriculture, forest, and open space (Department of Land Conservation and Development 2021). The intended result is more pressure for urban development and densification in cities than in unincorporated areas.

Figure 5-1. Urban Growth Boundary



In 1978, Clackamas County, Washington County, and Multnomah County voted to establish Metro, a metropolitan commission form of government.[7] Metro used its newly granted power to create land use planning regulations as required by the state's new Land Conservation and Development Commission. By 1992, Metro implemented additional comprehensive planning and suburban zoning requirements that extended over the three counties and 24 cities that compose Metro's service area, including the municipalities in which the Project is located, which has had ongoing implications for land use in the area (Toll 2003).

Table 5-1 shows past and projected population growth for Oregon and the counties in which the APIs are included for the individual resources. From 2000 to 2020, Washington County experienced a growth rate that was notably higher than Oregon as a whole, while growth rates in Clackamas, Marion, and Multnomah Counties were similar to the statewide rate. Population projections for 2045 estimate that Washington County will continue to be the fastest growing in the region, with a projected growth rate of 10% higher than Oregon.

Table 5-1. Past and Projected County Population Growth

Jurisdiction	2000	2020	2045 (projected)	2000 to 2020 Growth Rate	2020 to 2045 Growth Rate
Oregon State	3,421,436	4,268,055	5,251,721	25%	23%
Clackamas County	338,391	426,515	526,837	26%	24%
Marion County	284,838	349,120	416,327	23%	19%
Multnomah County	660,486	829,560	970,485	26%	17%
Washington County	445,342	620,080	823,985	39%	33%

Sources: Metro 2021 (Multnomah County 2045 forecast); Population Research Center, Portland State University 2020 and 2021 (all others)

Today, land uses and industries in the Portland metropolitan area vary widely. The region's economy is highly diverse with various industrial, retail, and service businesses that employ and serve a large metropolitan population. In Oregon City, land uses adjacent to the segment of I-205 where the Project would be located include a mix of residential uses, light industry, parks and recreational areas along the Willamette River, and a variety of commercial uses that include a shopping center, restaurants, and a hotel. West Linn includes a predominance of low-density residential uses north of the I-205 right-of-way and vegetated areas, road infrastructure, and low-density residential south of it. Unincorporated areas of Clackamas County include primarily undeveloped, low-density residential, agriculture lands, and sparse commercial uses. Rural and agricultural lands predominate the areas east and south of I-205; these areas have traditionally supported timber- or agricultural-based economies (Clackamas County 2001).

Present actions include the ongoing operation and maintenance of existing infrastructure and land uses described above, including the following:

- Local and regional transportation system maintenance
- Ongoing infrastructure improvements for active transportation
- Utility maintenance

[7] The Columbia Region Association of Governments was the regional planning agency for Multnomah, Washington, and Clackamas Counties from 1966 to 1978. A 1978 vote merged the functions of Columbia Region Association of Governments into a new enhanced metropolitan service district with a directly elected council: Metro (Abbott 2018).

6 Potential Cumulative Impacts

6.1 Cumulative Impacts

The following sections describe potential cumulative impacts related to the environmental resources assessed in the Environmental Assessment. Information regarding the condition of a resource or anticipated Project impacts comes from the resource-specific technical report or technical memorandum (included as appendices to the Environmental Assessment), unless another reference or citation is provided.

6.1.1 Air Quality

Air quality is measured and assessed through federal and state protocols. Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (USEPA) established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for six common air pollutants, known as criteria pollutants.[8] The USEPA also regulates mobile source air toxics (MSAT), which are pollutants known or suspected to cause cancer or other serious health effects;[9] however, USEPA does not specify maximum concentrations for these pollutants. The Oregon Department of Environmental Quality (DEQ) developed ambient benchmark concentrations for air toxics, which are not standards but are used as goals based on concentration levels that protect the health of the state's most sensitive individuals.

Recent air quality conditions in the API reflect the development in the region, with emissions primarily from transportation networks and residential, commercial, and industrial development. In 1978 the USEPA classified the region as a non-attainment area for carbon monoxide and ozone because pollutant concentrations in the area exceeded the NAAQS. Over several decades, efforts to reduce emissions of carbon monoxide and ozone precursors included a combination of federal, state, and local emission control strategies. In 1996, monitoring data demonstrated that the area achieved the carbon monoxide air quality standard and was eligible for redesignation to attainment. As part of this process, the Portland metropolitan area was subject to a Carbon Monoxide Maintenance Plan. As of October 2, 2017, the 20-year planning period associated with the area's Carbon Monoxide Maintenance Plan expired (USEPA 2021), and the area is classified as an attainment area for all criteria pollutants. The area is no longer required to demonstrate transportation conformity, but the area must remain in compliance with all measures and requirements contained in the Carbon Monoxide Maintenance Plan until the USEPA approves a revision to the state plan. There have been exceedances of the standards for ozone, particulate matter less than 2.5 microns in size, and carbon monoxide in recent years, but these are not considered violations, as described in the *I-205 Toll Project Air Quality Technical Report*.

Air quality in the region has improved over the past few decades (DEQ 2021). FHWA anticipates that emissions of MSAT will continue to decline through 2050, despite increased vehicle use (measured as vehicle miles traveled [VMT]) due to the implementation of fuel and engine regulations (FHWA 2016). The Portland region currently meets all NAAQS. However, according to DEQ, the Portland region has the

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[8] The six criteria pollutants designated under the CAA are ground-level ozone, particulate matter, carbon monoxide, lead, sulfur dioxide and nitrogen dioxide.

[9] There are 189 air toxics identified by USEPA, 52 of which DEQ has established benchmarks for, including diesel soot, polycyclic aromatic hydrocarbons, and various metals.

highest risk to the population from air toxics compared to other areas in the state due to business and population density, with levels of air toxics that could cause adverse health effects (DEQ 2021).

The air quality modeling for the Project, presented in the *I-205 Toll Project Air Quality Technical Report*, includes outputs from the traffic modeling, which considers future population and employment growth, expected changes in land use, and future transportation projects, including the assumption that the RFFAs in Attachment B would be built, regardless of whether the Build Alternative is constructed. The emissions modeling analysis, therefore, accounts for the cumulative effects of the No Build and Build Alternatives with other RFFAs. The air quality analysis includes areas within the API expected to experience a meaningful change in MSAT emissions, defined as a difference of 10% between the future No Build and Build Alternatives (FHWA 2016).

As detailed in the *I-205 Toll Project Air Quality Technical Report*, air pollutant emissions in the API are projected to be much lower in the future compared to current conditions due to improvements in vehicle technology and implementation of stricter emissions standards. The MSAT modeling demonstrates an overall reduction in MSAT emissions and VMT within the API under the Build Alternative relative to the No Build Alternative. Air quality modeling under the Build Alternative shows a net decrease in MSAT emissions, compared to existing conditions and the No Build Alternative (see Table 6-7 in the *I-205 Toll Project Air Quality Technical Report*). Several of the RFFAs identify “reduce emissions” as a project objective, including OR 43 Multimodal Improvements, the Southwest Corridor Light Rail Project, and the Willamette Falls Drive Multimodal Improvements. Therefore, there would be a cumulative reduction in pollutant emissions under the Build Alternative, in combination with the RFFAs.

While overall air quality continues to improve, wildfires in the region have resulted in short periods in which air quality in the API exceeds standards. As further discussed in Section 6.1.2, it is anticipated that frequency of wildfires in the region will increase in the future due to climate change, which may result in more days per year reaching unhealthy air quality. It is still anticipated that overall air quality in the API would improve under the Build Alternative as compared to current conditions and the No Build Alternative.

The anticipated improvement in air pollutant emissions under the Build Alternative compared to current conditions is consistent with national trends, and attributable to more stringent regulations and improvements in technology. As emissions of all air pollutants are anticipated to be lower under the Build Alternative (compared to both existing conditions and the No Build Alternative), the Build Alternative would not contribute to a cumulative impact on air quality. No mitigation for cumulative impacts on air quality is warranted or proposed.

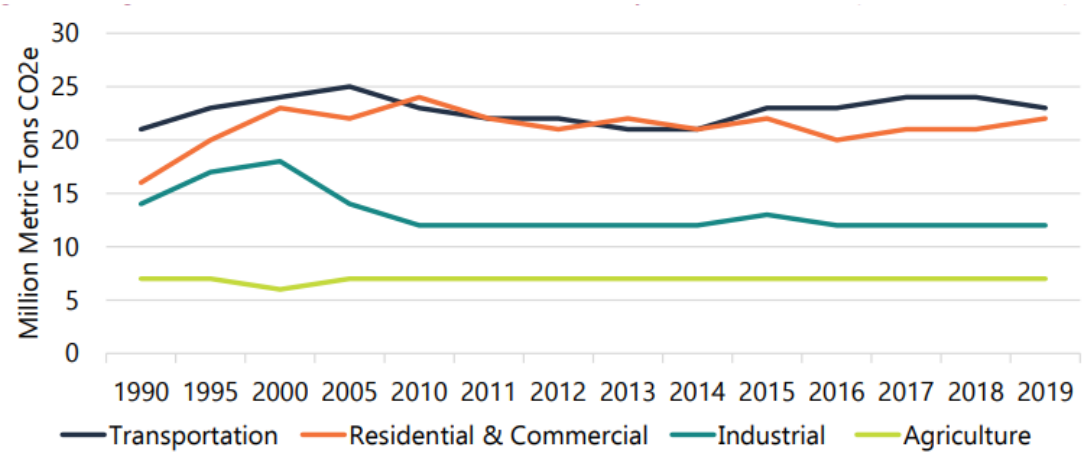
6.1.2 Climate

Climate change is defined by the U.S. Global Change Research Program (USGCRP) as “changes in average weather conditions that persist over multiple decades or longer. Climate change encompasses both increases and decreases in temperature, as well as shifts in precipitation, changing risk of certain types of severe weather events, and changes to other features of the climate system” (USGCRP n.d.-a). In the Pacific Northwest, climate change is expected to contribute to extreme weather events and adverse impacts on natural resources and the economy (including industries such as recreation and agriculture). Extreme weather events, such as major storm events and heat waves, can lead to flooding, landslides, drought, and wildfire, all of which can have a negative effect on water, transportation, and energy infrastructure (May et al. 2018).

GHGs are gases that absorb heat near the earth's surface, trapping that heat in the atmosphere and increasing global temperatures, which leads to climate change. The atmospheric concentration of carbon

dioxide (CO_2), a GHG that is the largest contributor to human-caused global warming, has increased by about 40% over the industrial era (USGCRP n.d.-b). Consistent with national trends, transportation (including highway, rail, and air transport) is the greatest contributor to GHG emissions in Oregon (Oregon Global Warming Commission 2020), as shown in Figure 6-1. GHGs from transportation primarily consist of fuel emissions, and petroleum (e.g., gasoline, diesel fuel, jet fuel) is the predominant source of transportation fuel consumption (approximately 98%) (U.S. EIA 2021) that leads to these emissions. Regional GHG emissions from transportation sources increase as vehicle travel increases and decrease as emissions standards and new technology are implemented.

Figure 6-1. Oregon Greenhouse Gas Emission Trends by End-Use Sector



Source: Oregon Global Warming Commission 2020
Note: Carbon dioxide equivalent (CO_2e) is a unit of measurement that is used to standardize the climate effects of various GHGs. CO_2e converts amounts of other gases to the equivalent amount of CO_2 with the same effect on climate.

The emissions modeling analysis conducted for the *I-205 Toll Project Energy and Greenhouse Gas Technical Report* incorporates output from the traffic modeling for the I-205 Toll Project, which includes anticipated regional growth and the actions on the RFFA list. Therefore, the fuel consumption and GHG emissions analysis in the *I-205 Toll Project Energy and Greenhouse Gas Technical Report* reflects cumulative impacts on annual GHG emissions in the API. Because GHG emissions are trapped in the atmosphere, these annual emissions will continue to affect earth's climate for decades and even centuries. The Project Team used annual GHG emissions for 2015, 2027, and 2045 to evaluate the Build Alternative's contribution to cumulative effects on the climate.

Construction and operation of the Build Alternative, along with the RFFAs, would contribute to statewide GHG emissions. However, as detailed in the *I-205 Toll Project Energy and Greenhouse Gas Technical Report,* while VMT would increase, annual fuel consumption and GHG emissions in the API are projected to be lower in 2045 than existing conditions due to improvements in vehicle technology, implementation of stricter emissions standards, and increased availability and popularity of alternative fuel options. Table 6-1 summarizes the modeled fuel use and emissions in 2045 for the two alternatives, as compared to existing conditions. Under the Build Alternative, energy consumption and GHG emissions would be approximately 11% lower in 2045 as compared to existing conditions. Under the No Build Alternative, total emissions would be approximately 7% lower in 2045 as compared to existing conditions. Therefore, emissions under the Build Alternative would be 4% less than emissions under the No Build Alternative (see the *I-205 Toll Project Air Quality Technical Report*).

Table 6-1. Emissions under 2045 No Build Alternative and 2045 Build Alternative Compared to Current Conditions

Parameter	2015	2045 No Build Alternative		2045 Build Alternative		Build Alternative Compared to No Build Alternative
	Emissions and Fuel Use	Emissions and Fuel Use	Percentage Change from 2015	Emissions and Fuel Use	Percentage Change from 2015	
Annual Vehicle-Miles Traveled	893,462,632	1,222,083,927	37%	1,162,440,219	30%	-7%
Direct Tailpipe CO_{2e} Emissions (MT)	393,312	364,684	-7%	349,473	-11%	-4%
Indirect Fuel Cycle CO_{2e} Emissions (MT)	106,194	98,465	-7%	94,358	-11%	-4%
Total CO_{2e} Emissions (MT)	**499,506**	**463,149**	**-7%**	**443,831**	**-11%**	**-4%**

Source: ODOT 2021a
CO2e = carbon dioxide equivalent; mmBtu = million British thermal units; MT = metric tons; VMT = vehicle-miles traveled

Tolling can encourage mode shifts away from single-occupant vehicles and a shift in travel time, which can reduce emissions associated with congestion and vehicle idling. The *I-205 Toll Project Transportation Technical Report* reported that the Build Alternative is projected to have a relatively small effect on choice of travel mode in the region. The trend indicates a slight reduction in single-occupancy vehicle trips and a slight increase in high-occupancy vehicle, transit, and active transportation modes under the Build Alternative compared to the No Build Alternative.

Within the context of the modeling results described in this section, individual RFFAs may increase or decrease fuel consumption and GHG emissions within the API, depending on the action. Actions that increase VMT or involve the construction or expansion of roads may increase fuel consumption or emissions. Conversely, actions that promote transit and active transportation (and therefore support a mode shift away from single-occupancy vehicles) or reduce congestion, VMT, or vehicle idling may reduce consumption and emissions. Several of the RFFAs identify “reduce emissions” as a project objective, including OR 43 Multimodal Improvements, the Southwest Corridor Light Rail Project, and the Willamette Falls Drive Multimodal Improvements. These actions also identify providing travel options or alternatives to driving alone as an objective. Overall, the modeling results show that, while GHG emissions would still occur, the cumulative effects of the RFFAs would result in lower emissions with the Build Alternative than with the No Build Alternative, and both alternatives would have lower GHG emissions than current conditions.

In addition, various federal, state, and local policies are either in place or are being developed to reduce national, regional, and local GHG emissions. As described in the *I-205 Toll Project Energy and Greenhouse Gas Technical Report,* the Build Alternative and RFFAs would reduce emissions by 11% compared to current conditions. Therefore, the Build Alternative in conjunction with the RFFAs would help meet the GHG reduction targets outlined in federal, state, and local policies.

In addition to GHG emissions, other considerations for cumulative effects on the climate include direct or indirect impacts on “urban resilience,” which refers to the ability of the infrastructure serving the API (e.g., energy, transportation, stormwater) to withstand extreme weather events (Maxwell et al. 2018). The anticipated cumulative impacts include a reduction in fuel use in the API, which may improve the

resiliency of energy infrastructure, and multiple improvements to the transportation network from the Build Alternative and RFFAs. For example, the Southwest Corridor Light Rail Project and the Willamette Falls Drive Multimodal Improvements would provide alternative transportation options in the event of a road closure due to a wildfire or flooding. Other projects, such as the Tualatin-Sherwood Road Improvements, include improvements to stormwater facilities in the API, which would improve the resiliency of stormwater infrastructure. Because new infrastructure is held to stricter standards for stormwater runoff, future planned projects generally provide more effective stormwater detention and treatment compared to older infrastructure.

When considered with the RFFAs, the Build Alternative would contribute to lower GHG emissions than current conditions and the No Build Alternative; therefore, no mitigation for cumulative impacts is proposed.

6.1.3 Economics

Development of I-205 helped shape the economic environment of the region, including facilitating commuter vehicle trips into and out of the Portland metropolitan area and connecting freight traffic to the interstate highway system. I-205 also enables producers located outside of the region to access trade markets within the region. Past actions in the economics API have resulted in the development of neighborhoods, infrastructure, public facilities and services, and the business and economic environment that exists near the I-205 corridor where the Build Alternative would be located.

The Build Alternative would contribute to minor cumulative impacts and benefits to the economy. The benefits would be related to improved travel times, freight reliability, and vehicle operating cost savings, as well as additional business revenues and employment in nearby commercial areas resulting from projected changes in traffic volumes due to vehicles rerouting off I-205. The impacts would be higher transportation costs as a share of budget for households and wholesale traders; however, those impacts are projected to be minor.

Construction of some of the RFFAs may occur simultaneously, such as the I-205/10th Street Improvements or I-5 South Operational Improvements, which would lead to a cumulative economic benefit in spending for design and construction services, as well as increased employment. Potential cumulative impacts from simultaneous construction of multiple projects could include freight and consumer access and congestion issues; however, state and local jurisdictions would be required to develop traffic management and control plans that would address construction access issues and minimize these impacts.

Present actions and RFFAs, which consist mainly of road capacity and multimodal improvement projects, would enhance economic conditions in the API. As shown in the RFFA list in Attachment B, the primary and secondary objective for many of these projects include congestion relief, increasing access to jobs, and improving freight access to industries; all of which would be beneficial to the local and regional economy. Some of the RFFAs, such as the Willamette Falls Legacy Project Internal Roadways project, directly support larger economic development activities that would increase jobs and services within the API. Bicycle and pedestrian RFFAs would also support economic development. For example, the Willamette Falls Drive Multimodal Improvements project would provide a multimodal connection between the downtown areas of West Linn and Oregon City. Investments in bicycle and pedestrian infrastructure in or near business districts have been shown to improve economic conditions in those districts (National Institute for Transportation and Communities 2020).

As detailed in the *I-205 Toll Project Economics Technical Report,* the Build Alternative would have local and regional economic benefits, and economic impacts to households and wholesale traders would be minimal. When considered with the other present actions and RFFAs, the Build Alternative is expected to have cumulative economic benefits; therefore, no mitigation for cumulative economic impacts is warranted or proposed.

6.1.4 Environmental Justice Populations

The Project's environmental justice analysis identifies and examines all potential impacts on low-income[10] and minority[11] populations to determine whether the Build Alternative would result in disproportionately high and adverse effects on low-income and/or minority populations[12] in accordance with Executive Order 12898.[13] The Oregon Toll Program at ODOT published an Equity Framework (ODOT 2020) to help identify the impacts and benefits of tolling and provide a process for determining how to equitably distribute those impacts and benefits from the Build Alternative.

In the past, construction of I-205 and other major transportation corridors fractured and isolated communities, often disproportionately affecting minority and low-income populations (ODOT 2020). Large-scale urban renewal projects and land use planning further contributed to adverse effects on these populations (City of Portland Bureau of Planning and Sustainability 2019). In addition, a historic lack of transportation improvements and investments in these communities has led to increased traffic safety risks, including greater risk of a traffic fatality and limited access to transit and active transportation networks (Oregon Walks 2021; Cohen and Hoffman 2019).

Due in part to rapid population growth, low-income neighborhoods have also been subject to gentrification and displacement (Bates 2013). As the cost of housing grows in response to increased demand, some households are choosing to move farther from the more developed areas of the API. These moves may

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[10] The Project defines low-income using the U.S. Department of Health and Human Services poverty guidelines and 200% the poverty level set by the U.S. Department of Health and Human Services to be consistent with U.S. Census Data, to align with regional and stakeholder definitions of low-income (TriMet and Metro), and to be more inclusive of the costs of living. For a family of four, the poverty level set by the U.S. Department of Health and Human Services is $26,200 per year; 200% of this amount is $52,400 per year (U.S. Department of Health and Human Services 2020).

[11] A minority is a person who is Black, Hispanic or Latino (regardless of race), Asian American, American Indian and Alaskan Native, or Native Hawaiian or Other Pacific Islander (U.S. Department of Transportation 2021). This analysis also included people who identified as two or more of these categories.

[12] The term "low-income and/or minority" populations is used because someone could identify with multiple communities at once, while also being categorized as different demographic populations simultaneously. For example, a person could be categorized as a minority and low-income, as well as the other populations like seniors or limited English proficiency. As people can have and experience multiple identities, there is complexity in adequately aggregating and disaggregating demographic data to adequately and meaningfully describe people's identities and communities.

[13] Executive Order 12898 directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.

decrease housing costs but often increase the cost of transportation as individuals and households must travel farther to reach jobs and services.

The following sections summarize potential cumulative impacts on environmental justice populations as a result of the Build Alternative and RFFAs. Overall, the Build Alternative would have beneficial or neutral[14] effects on environmental justice populations related to access to social resources and travel times, air quality, noise, roadway safety, and travel mode shift. The Build Alternative would also have impacts on environmental justice populations, such as increased transportation costs for households at or below the federal poverty level, rerouting traffic to local streets, and potential technological barriers. However, with the implementation of mitigation measures, summarized below and detailed in the *I-205 Toll Project Environmental Justice Technical Report*, no disproportionately high and adverse effects on environmental justice populations would occur under the Build Alternative. The RFFAs would also be required to mitigate any disproportionally high and adverse effects on environmental justice populations.

Access to Social Resources and Travel Time

The Project Team used Metro's regional travel demand model to conduct an accessibility analysis and travel-time analysis.[15] When compared with general population households in the API, environmental justice communities would generally experience the same or improved access to jobs, community places,[16] and medical facilities, depending on the time of day and mode of travel. The travel-time analysis found that, based on representative scenarios,[17] the general population and environmental justice communities would experience the same or shorter travel times from their homes to representative activity locations when traveling on routes that include the toll bridges under the Build Alternative relative to existing conditions and the No Build Alternative.

Because the regional travel demand model includes the RFFAs, the results of this analysis reflect cumulative effects of the Build Alternative and RFFAs, demonstrating a long-term beneficial cumulative effect on environmental justice populations related to accessibility and travel time.

In the short-term, it is possible that construction of the Build Alternative and RFFAs could overlap, leading to detours or travel-time delays for people accessing social resources. The general population and

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[14] A neutral effect means that the anticipated positive and negative effects on a specific resource would balance each other out such that, when considered as a whole, the effects on that resource would not be considered positive or negative.

[15] The accessibility analysis determines the number of social resources a household can get to (by automobile or transit) within certain conditions (peak hour, non-peak hour). Travel time is the length/duration of time it takes to get from a starting point to an end point.

[16] For the accessibility analysis, community places are defined as places that provide services or items including but not limited to libraries, grocery stores, credit unions, and medical facilities as defined in the Metro *2018 Regional Transportation Plan,* Appendix E: Transportation Equity Evaluation (Metro 2018). For this analysis, medical facilities were analyzed separately from community places.

[17] There were 16 representative scenarios to estimate potential travel-time impacts on Equity Framework Communities (EFC) and the general population. Representative scenarios included trips that started in an EFC and ended at a social resource such as a park, hospital, library, large employment center, or retail location. Representative scenarios do not include all possible trips that would be taken in the region but serve as a snapshot of potential travel time savings.

environmental justice populations would all experience these detours and delays; however, because these impacts are expected to be minor and planned for in traffic control plans, access to social resources would be maintained and there would be no disproportionate adverse effects on environmental justice populations.

Roadway Safety

The total number of annual predictive crashes at intersections and roadway segments in the API would vary by location but would generally be similar under the Build Alternative as compared to the No Build Alternative in 2045. OR 99E, which has segments that cross through areas in Canby and Gladstone with higher percentages of environmental justice populations than Clackamas County as a whole, is projected to experience more crashes under the Build Alternative as compared to the No Build Alternative. The additional crashes would affect all communities, including environmental justice populations, living in and traveling through the area, and mitigation is proposed to address safety impacts (see the *I-205 Toll Project Transportation Technical Report*).

The number of crashes on I-205 in the API, including crashes resulting in fatalities and injuries, is expected to be 21% lower (representing about 550 crashes) under the Build Alternative than under the No Build Alternative due to the proposed improvements on I-205, as described in the I-205 Toll Project Environmental Justice Technical Report. The lower number of I-205 crashes would benefit all populations, including environmental justice populations.

Several RFFAs, such as the Tualatin-Sherwood Road Improvements Project, I-5 South Operational Improvements, and I-205 Abernethy Bridge, include secondary objectives to “reduce fatal and severe injury crashes.” Pedestrian and bicycle RFFAs, such as the Willamette Falls Drive Multimodal Improvements, aim to improve safety for pedestrians and bicyclists by separating these modes from vehicle traffic and constructing safe facilities. It is expected that these benefits would extend to environmental justice populations who live and travel through these project areas. Therefore, when considered with past and present actions and RFFAs, the Build Alternative is expected to have positive to neutral cumulative effects on environmental justice populations related to roadway safety.

Cost of Tolls

The cost of the toll would present a potential disproportionately high and adverse effect on households living at or below the federal poverty level. However, ODOT is committed to providing a low-income toll program that is expected to address the disproportionate burden of the toll on low-income populations. Potential actions such as exemptions, credits, and/or discounted rates would be implemented under the toll program (see the *I-205 Toll Project Environmental Justice Technical Report).* It is not anticipated that the other RFFAs would increase transportation costs or employ tolling. Therefore, when considered with the other present actions and RFFAs, the Build Alternative is expected to have neutral cumulative effects on environmental justice populations related to transportation costs.

Rerouting Traffic to Local Streets

Under the Build Alternative, some traffic would reroute to local streets in order to avoid tolls, resulting in potential impacts on areas with higher concentrations of environmental justice populations in Canby and Tualatin, as well as for environmental justice populations traveling to hubs of social resources in Oregon City. The *I-205 Toll Project Environmental Justice Technical Report*, provides maps showing the locations of these affected intersections in relationship to areas with higher concentrations of environmental justice populations.

Intersection impacts related to rerouting would occur throughout the API, and most impacts would occur outside of high concentrations of environmental justice populations. Two intersections in areas with higher percentages of environmental justice populations than the county as a whole (I-5 southbound ramps and Nyberg Road in Tualatin, and OR 99E and Ivy Street in Canby) would have worse operations under the Build Alternative than the No Build Alternative in 2027. Oregon City has a concentration of social resources that provide assistance to low-income and/or minority populations, such as the Clackamas City Court House, City Hall, a community center, religious organizations, nursing homes, and parks. Longer delays at these intersections under the Build Alternative would have an impact on environmental justice populations traveling to access social resources in Oregon City. Transit travel times would experience the largest differences between the Build and No Build Alternatives in downtown Oregon City and the SW Stafford Road area in 2045. One intersection in West Linn would experience a higher level of traffic stress (LTS)[18] for pedestrians, and two roadway segments (in Oregon City and Stafford hamlet) would experience worse pedestrian level of service under the Build Alternative than under the No Build Alternative in 2045.

Transportation mitigation measures such as intersection improvements proposed in the *I-205 Toll Project Transportation Technical Report* are expected to avoid and minimize impacts related to rerouting traffic to local streets. All populations, including environmental justice populations, in the API are expected to experience impacts from rerouting as well as the benefits associated with the mitigation to the same degree.

None of the RFFAs include tolling or roadway pricing; therefore, long-term changes in vehicle traffic patterns are not expected to occur under the RFFAs. In addition, most of the RFFAs, including improvements on I-205, I-5, OR 43, OR 212, and OR 224, include congestion relief and system efficiency as primary or secondary objectives. When considered with past and present actions and RFFAs, the Build Alternative is not expected to have negative cumulative effects on environmental justice populations related to rerouting traffic to local streets.

Technological Barriers

The tolling system would rely on electronic, cashless technology. The electronic toll system could create barriers for the unbanked population[19] and for those who do not have access to conventional financial services; this could include members of environmental justice communities. Putting down a deposit to set up an account may also create a barrier for drivers who are experiencing low-income. The lack of a cash payment option may make it difficult for the unbanked or other people experiencing low-income to purchase a transponder or to pay invoices and could discourage them from using the tolled segment of I-205. However, with the proposed mitigation included in the *I-205 Toll Project Social Resources and Communities Technical Report*, effects related to having a cashless, electronic toll system would be minimized or avoided.

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[18] LTS is an analysis method used to rate multimodal conditions by estimating the perceived safety of bicycle and pedestrian infrastructure. Higher average daily traffic, higher speeds, and higher numbers of vehicle lanes increase stress levels for both pedestrians and bicyclists. The LTS analysis provides scores of 1 through 4 for each mode, with level 1 representing little or no traffic stress and level 4 representing high stress.

[19] Unbanked households are those where no one in the household has a checking or savings account at a bank or credit union (FDIC 2019).

While none of the RFFAs would involve a toll facility or tolling technology, the actions were evaluated to determine whether they could contribute to other technological barriers facing low-income and minority populations. Of the RFFAs, the Southwest Corridor Light Rail Project is the only action that may involve a change in technology over current conditions for travelers who shift to light rail from another mode. Riders on Tri-County Metropolitan Transportation District (TriMet) services (including light rail) often purchase their fare through Hop, which involves payment through a physical Hop card or a smart phone app. While the app requires a debit or credit card, the physical card can be purchased and reloaded at ticket kiosks located at TriMet stations. The kiosks accept electronic payments and cash for the Hop card as well for as single-use tickets. Therefore, unbanked populations and those who are not proficient with technology will be able to pay for ticket fares without the use of a smart phone, credit card, or bank account. When considered with the other present actions and RFFAs, the Build Alternative is expected to have neutral cumulative effects on environmental justice populations related to technology and barriers.

Cumulative Effects on Environmental Justice Populations Determination

In summary, impacts on environmental justice populations from the Build Alternative would be mitigated and, when combined with present and RFFAs, the Build Alternative would have positive or neutral cumulative effects on environmental justice populations. No mitigation for cumulative impacts is warranted or proposed.

6.1.5 Geology and Soils

Current soil and geologic conditions in the region have been influenced by past natural events, such as flooding and earthquakes, and ground-disturbing activities from development and infrastructure projects over time. These events and activities can increase the potential for erosion and the contribution of sediments to waterbodies. In addition, as existing infrastructure ages, it becomes more susceptible to damage from geologic and natural events.

As detailed in the *I-205 Toll Project Geology and Soils Technical Memorandum*, construction of the Build Alternative would include ground disturbances that could cause erosion and increased sediment in stormwater runoff. It is unlikely that the Build Alternative, considered with present actions and RFFAs, would represent a greater potential for erosion and contribution of sediments to rivers in the region during construction because the projects are mostly geographically dispersed and, for projects that are within the same area, it is unlikely that the projects would be constructed simultaneously. Furthermore, with the implementation of appropriate erosion, sediment control, and stormwater measures, the individual impacts of the Build Alternative and the present actions and RFFAs would be minimized, and as a result the overall negative cumulative effects would be minimal. Therefore, no additional mitigation for cumulative impacts related to erosion of soils is warranted.

The Build Alternative would retrofit or replace various bridges along I-205 to withstand a Cascadia Subduction Zone earthquake. Present actions and RFFAs that also include redevelopment of existing infrastructure such as roads or bridges would be required to meet current seismic design standards. For example, I-205 Abernethy Bridge would retrofit the Abernethy Bridge, and I-5 Southbound – Wilsonville Road to Wilsonville Hubbard Highway would replace the Boone Bridge; both bridges would be built to withstand a Cascadia Subduction Zone earthquake. Therefore, the Build Alternative, when considered with past and present actions and RFFAs, would have a positive cumulative effect on seismic resiliency in the region, and no additional mitigation for cumulative impacts is warranted.

6.1.6 Hazardous Materials

Hazardous materials investigations identified two sites of concern within the API (HDR 2018; 2020a, 2020b; Reynolds Engineering 2020); however, these sites would not be affected by the Build Alternative (see the *I-205 Toll Project Hazardous Materials Technical Memorandum*). In addition, I-205 is an active automobile and truck travel corridor where unknown spills and releases of hazardous materials may have occurred. During construction of the Build Alternative and present actions and RFFAs, spills of hazardous materials could occur; however, spill prevention plans would be required that include best management practices (BMPs) to reduce the risk of accidental spills and to account for unforeseen spills of hazardous materials. All asbestos-containing materials and lead-based paint encountered during construction of the Build Alternative would be disposed of at an approved disposal site, leading to an improvement in the presence of hazardous materials in the API.

The Build Alternative would include ground disturbance and grading for construction, which could expose existing contaminated materials. Exposure to contaminated materials under the Build Alternative would be mitigated by proper handling and disposal of these materials in accordance with DEQ and ODOT regulations. Taken together with present actions and RFFAs in the API, there is a greater potential for contaminated material exposure; however, all projects would be required to implement proper handling and disposal of hazardous materials in accordance with state and local regulations, thereby reducing the overall potential for negative cumulative effects. If contaminated materials are encountered during construction of the Build Alternative or present actions and RFFAs, there would be an incremental improvement in environmental quality when the contamination is removed or remediated according to current applicable regulatory standards. This removal or remediation could prevent potential migration of hazardous materials through soil and groundwater over time. Therefore, when considered with past and present actions and RFFAs, the Build Alternative would have a positive cumulative effect on hazardous materials conditions, and no additional mitigation for cumulative impacts is warranted.

6.1.7 Historic and Archaeological Resources

Archaeological research shows the Portland region has been inhabited for the last 11,000 years. The earliest inhabitants were the Chinookan-speaking peoples, including the Clackamas, Kathlamet, Multnomah, and Tualatin peoples. By the 16th century, dozens of bands of people lived in what is now Oregon, with populations along the Columbia River, the western valleys, and the coastal regions (Oregon Historical Society 2018). Important for its abundant natural resources and plentiful fish and game, the region is also home to Willamette Falls, located between what is now Oregon City and West Linn. Willamette Falls was a historically important trading center in the Pacific Northwest and played an important role in the oral histories and stories of original peoples, including the Chinookans and Kalapuyans (Willamette Falls Legacy Project 2014).

The Build Alternative, present actions, and RFFAs would all include some level of ground disturbance and/or grading for construction. Construction of the Build Alternative along with the present actions and RFFAs would result in an incremental increase in the risk of encountering or disturbing unknown archaeological resources. However, inadvertent discovery plans would be required to be prepared prior to the construction of the Build Alternative, present actions, and RFFAs. These plans would identify measures to address any archaeological resources encountered during construction to minimize impacts on these resources. Therefore, when considered with past and present actions and RFFAs, the Build Alternative is not expected to have negative cumulative effects on archaeological resources.

Five historic resources were identified in the Project's area of potential effect; however, these resources would not be affected by the Build Alternative, as described in the *I-205 Toll Project Historic and Archaeological Resources Technical Memorandum*. Some RFFAs may be determined to have an effect on historic resources and would be required to prepare a mitigation plan to resolve those effects in compliance with Section 106 of the National Historic Preservation Act. Therefore, when considered with past and present actions and RFFAs, the Build Alternative would not have negative cumulative effects on historic resources, and no additional mitigation for cumulative effects is warranted.

6.1.8 Land Use

Transportation infrastructure such as I-5 and I-205 have supported population and job growth throughout the Portland metropolitan area, leading to a concentration of land development around these transportation networks. Land use planning and urban growth boundaries, which direct growth toward urban areas to contain suburban sprawl and preserve agricultural and forest lands, has also influenced how and where land development has occurred. In Oregon City, land uses adjacent to the segment of I-205 where the Build Alternative would be located include a mix of residential uses, light industry, parks and recreational areas along the Willamette River, and a variety of commercial uses such as a shopping center, restaurants, and a hotel. West Linn includes a predominance of low-density residential uses north of the I-205 right-of-way and vegetated areas, road infrastructure, and low-density residential uses south of it. Unincorporated areas of Clackamas County adjacent to I-205 include primarily undeveloped, low-density residential, agriculture lands, and sparse commercial uses.

The Build Alternative would result in a minor conversion (415 square feet) of private vacant land to transportation use in West Linn, as described in the *I-205 Toll Project Land Use Technical Memorandum*. However, there is a sufficient amount of land in the API to absorb the small reduction, so no long-term effects on land use would occur under the Build Alternative. RFFAs that include roadway widening or the addition of new lanes, such as Tualatin-Sherwood Road Improvements and OR 224 Milwaukie Expressway Improvements, may also require right-of-way acquisition; however, local jurisdictions would review these projects to ensure that there is sufficient residential, commercial, and industrial zoned land to meet future demand, and that projects comply with local land use plans and state land use goals. The Build Alternative, along with various present actions and RFFAs, would reduce congestion, address system deficiencies, and provide new or enhanced multimodal options to facilitate increased vehicle, pedestrian, and bicycle access to residential, commercial, recreational, and institutional land uses in the region. Improved truck freight access under the Build Alternative and some of the present actions and RFFAs would benefit industrial and commercial land uses in the region. Therefore, when considered with other past and present actions and RFFAs, the Build Alternative would have a neutral cumulative effect on land uses, and no mitigation for cumulative impacts is warranted.

6.1.9 Noise

The development of the areas adjacent to and near I-205, along with increased traffic on I-205 and on nearby roadways, has led to an overall increase in ambient noise levels in the API since completion of I-205 in the early 1980s. As residential uses and traffic levels have increased in the API, the number of residences negatively affected by road noise has increased.

Construction activities from the Build Alternative and RFFAs would generate temporary noise during the construction period, and contractors would be required to comply with noise control measures. When considered with the present actions and RFFAs, the Build Alternative is not expected to have negative cumulative effects related to construction noise because the project construction areas would be mostly

geographically dispersed and, for projects that are within the same area, it is unlikely that the projects would be constructed simultaneously.

The long-term noise analysis for the Build Alternative was based on transportation models, which assumed the present actions and RFFAs would be built; the traffic model accounts for increased demand on the transportation system from future population, housing and land use changes, and growth. Therefore, the noise analysis is inherently an analysis of cumulative impacts. Under the Build Alternative, no roadways would experience a substantial increase in noise levels in 2045.[20] However, predicted traffic noise levels under the Build Alternative would range from 44 A-weighted decibels of equivalent sound level (dBA L_{eq})[21] to 74 dBA L_{eq} and would exceed ODOT's Noise Abatement Approach Criteria at various residences, an outdoor pool at an apartment building, a church/preschool/daycare, a park, and a school; to mitigate these noise exceedances under the Build Alternative, three noise walls are recommended for consideration along I-205 (see the *I-205 Toll Project Noise Technical Report*). For present actions and RFFAs that are managed by ODOT, if any of the projects result in a substantial increase in noise levels or exceed ODOT's Noise Abatement Approach Criteria, noise abatement would also be required, which would reduce the potential for negative cumulative effects. For present actions and RFFAs that are managed by other jurisdictions, those projects would be required to adhere to local noise standards and ordinances.

Therefore, when considered with past and present actions and RFFAs, the Build Alternative would not have negative cumulative effects related to noise, and no additional mitigation for cumulative impacts is warranted or proposed.

6.1.10 Social Resources and Communities

Population growth in the Portland metropolitan area has led to an increase in social resources throughout the API to serve various needs of the population. Each city and some unincorporated areas in the API provide a variety of social resources, including social services providers, public service providers (defined as police and fire services, libraries, museums, and community centers), religious organizations, schools, parks and recreational facilities, and medical facilities. The *I-205 Toll Project Social Resources and Communities Technical Report* includes more detailed descriptions and maps of social resources within the API.

Communities were defined both demographically and geographically. Demographic communities include the general population, which is all individuals and households who live within the API, and historically and currently excluded and underserved communities, known as Equity Framework Communities (EFC).[22] Geographic communities were identified using projections of future intersection traffic conditions from the *I-205 Toll Project Transportation Technical Report*.

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[20] A *substantial* increase is defined by Oregon state regulations as an increase of 10 dBA or more (ODOT 2011).

[21] When a noise varies over time, the L_{eq} is the average sound level over a period of measurement.

[22] The public engagement process identified EFCs, which consist of environmental justice populations (low-income and racial/ethnic minorities), seniors, children, persons with a disability, limited English proficiency populations, and households with no vehicle access.

The following sections summarize potential cumulative effects on social resources and demographic and geographic communities as a result of the 2045 Build Alternative and RFFAs. While low-income populations and minority populations are considered EFCs, cumulative effects on these populations are specifically addressed in Section 6.1.4, Environmental Justice Populations.

Overall, the Build Alternative would have beneficial or neutral effects on social resources and communities related to access to social resources and travel times, air quality, noise, roadway safety, and travel mode shift. The Build Alternative would also have impacts on social resources and communities, such as rerouting traffic to local streets and potential language barriers. However, mitigation measures would offset these impacts. As described below, when considered with the other present actions and RFFAs, the cumulative effects of the Build Alternative are generally expected to have beneficial to neutral effects on social resources and communities.

Access to Social Resources and Travel Time

The Project Team used Metro's regional travel demand model to conduct an accessibility analysis and travel-time analysis for households in the general population and EFCs. The accessibility analysis found that the Build Alternative would result in the same or improved access to social resources for households in the API during peak and off-peak periods, compared to the No Build Alternative. When compared with general population households in the API, EFC households would generally experience the same or improved access to jobs, community places, and medical facilities, depending on the time of day and mode of travel. The travel-time analysis found that, based on representative scenarios, the general population and EFCs would experience the same or shorter travel times from their homes to representative activity locations when traveling on routes that include the tolled bridges under the Build Alternative relative to existing conditions and the No Build Alternative, as described in the I-205 Toll Project Social Resources and Communities Technical Report. Because the regional travel demand model includes the RFFAs, these results reflect cumulative effects of the Build Alternative and RFFAs and demonstrate a long-term beneficial cumulative effect on social resources and communities related to accessibility and travel time.

In the short-term, it is possible that the construction of the Build Alternative and RFFAs could overlap, leading to detours or travel-time delays for people accessing social resources and communities. The general population and EFCs would all experience these detours and delays; however, because these effects are expected to be minor and planned for in traffic control plans, access to social resources and communities would be maintained.

Roadway Safety

All communities in the API would benefit from 21% fewer crashes (representing about 550 fewer crashes) on I-205 in the API, including crashes resulting in fatalities and injuries, under the Build Alternative as compared to the No Build Alternative.

The total number of annual predictive crashes at local intersections and roadway segments in the API would vary by location but would generally be similar under the Build Alternative as compared to the No Build Alternative in 2045. Segments of OR 99E, OR 213, and Willamette Falls Drive in the API would experience more crashes in 2045 under the Build Alternative compared to the No Build Alternative because of changes in traffic volumes in those areas, and mitigation is proposed to address these safety impacts (see the *I-205 Toll Project Transportation Technical Report*). Therefore, the Build Alternative would generally have no adverse effects on safety on local roadways and intersections. Several RFFAs, including I-205 and I-5 projects and the Tualatin-Sherwood Road Improvements Project, include secondary objectives to "reduce fatal and severe injury crashes." When considered with the other present

actions and RFFAs, the Build Alternative is expected to have beneficial to neutral cumulative effects on social resources and communities related to roadway safety.

Cost of Tolls

Social and public service providers and households, including EFCs, could experience increased costs as a percentage of their operating or household transportation budgets if they choose to use the tolled bridges, as described in in the I-205 Toll Project Economics Technical Report. Overall, the improved I-205 traffic performance under the Build Alternative compared to the No Build Alternative is expected to lead to benefits such as lower vehicle emissions, shorter travel times, vehicle operating cost savings, and fewer vehicle incidents that reduce costs for social resource providers and community members (as described in the *I-205 Toll Project Economics Technical Report*). It is not anticipated that the other present actions and RFFAs would increase transportation costs or employ tolling. Therefore, when considered with past and present actions and RFFAs, the Build Alternative is expected to have neutral cumulative effects on social resources and communities related to transportation costs.

Rerouting Traffic to Local Streets

Under the Build Alternative, some traffic would reroute to local streets in order to avoid tolls, resulting in potential impacts on access to nearby social resources in Canby, Gladstone, Lake Oswego, Oregon City, Tualatin, West Linn, and unincorporated Clackamas County (near Stafford Hamlet and Canby). The *I-205 Toll Project Social Resources and Communities Technical Report* provides maps showing the locations of these affected intersections in relationship to areas with higher concentrations of EFCs.

Under the Build Alternative in 2045, one intersection would experience better operations (i.e., meet jurisdictional mobility standards), and four intersections would experience worse operations (i.e., fail to meet jurisdictional mobility standards) under the Build Alternative as compared to the No Build Alternative. Twelve intersections would not meet jurisdictional mobility standards under both alternatives during the AM and/or PM peak hour and would have worse operations under the Build Alternative compared to the No Build Alternative.

Transit travel times would experience the largest differences between the Build and No Build Alternatives in downtown Oregon City and the SW Stafford Road area in 2045. One intersection in West Linn would experience a higher LTS for pedestrians and two roadway segments (in Oregon City and Stafford hamlet) would experience worse pedestrian level of service under the Build Alternative compared to the No Build Alternative in 2045. No other intersections would experience large differences between the Build and No Build Alternatives in 2045 related to LTS for bicyclists and pedestrians.

Mitigation measures such as intersection improvements proposed in the *I-205 Toll Project Transportation Technical Report* are expected to avoid and minimize impacts related to rerouting traffic to local streets. Most of the RFFAs, including improvements on I-205, I-5, OR 43, OR 212, and OR 224, include congestion relief and system efficiency as primary or secondary objectives. Therefore, when considered with the other present actions and RFFAs, the Build Alternative is expected to have beneficial to neutral cumulative effects on social resources and communities related to rerouting.

Ability to Understand and Use the Toll System

In addition to technological barriers for unbanked populations related to payment methods (discussed under Environmental Justice Populations in Section 6.1.4), the Build Alternative has the potential to create barriers to using and understanding the toll system for persons with limited English proficiency and people who are less proficient with technology. Because roadway signage will be in English, the tolling system could introduce challenges for persons with limited English proficiency in the API. ODOT is

proposing to implement various measures, as detailed in the *I-205 Toll Project Social Resources and Communities Technical Report*, that would address language and technological barriers to understanding the toll system. People who are less proficient with technology may have difficultly registering for an account, purchasing a transponder, and paying bills online.

Other RFFAs, such as the expansion of light rail or actions that create new or modified routes, could increase barriers for populations that have limited English proficiency. Common transportation barriers for people with limited English proficiency include signage, verbal or written instructions, and communications with agency staff (e.g., bus drivers). ODOT, Metro, and TriMet (the key transportation providers within the API) have existing programs in place to provide language assistance to travelers. These include ODOT's *Limited English Proficiency Plan* (ODOT n.d.-a), Metro's *Limited English Proficiency Plan* (Metro 2018b), and *TriMet's Language Access Plan* (TriMet 2019). Each of these three plans evaluate translation needs specific to that agency's services and identify how each agency will ensure its information is translated into languages that users may need. When considered with the other present actions and RFFAs, the Build Alternative is expected to have neutral cumulative effects on social resources and communities related to technology and language barriers.

6.1.11 Transportation

Population growth and development have led to an increase in the number of vehicles on both the highways and local roads in the Portland metropolitan region, with subsequent increases in the number of hours of congestion, the severity of congestion, and the number of vehicle collisions. A report by the Portland Business Alliance found that 5% of travel time in the region took place in congested conditions in 2010, which was expected to triple to 15% by 2040 (Portland Business Alliance 2014). The I-205 corridor currently experiences 6.75 hours of congestion per day (ODOT n.d.-b). As documented in the *I-205 Toll Project Transportation Technical Report*, roadways within the API experienced 3,540 crashes along study segments and 58 crashes at study intersections between 2015 and 2019.

The traffic modeling for the transportation technical analysis assumes the construction of the RFFAs and is therefore cumulative. The actions on the RFFA list would have beneficial effects on the transportation system because their primary purpose is to improve transportation conditions. Attachment B identifies the "Primary Purpose" of each action, most of which are to improve system efficiency and/or to relieve current congestion.

The following sections summarize potential cumulative impacts on transportation in the API. Overall, the Build Alternative and RFFAs would contribute to beneficial effects, including improved travel times and traffic operations, fewer freeway crashes on I-205, slight changes in mode choice (away from single-occupant vehicles), and slightly higher transit ridership than in the No Build Alternative. Anticipated impacts include some intersections that would exceed mobility standards and an increase in pedestrian level of traffic stress at the all-way stop intersection of 12th Street and Willamette Falls Drive due to additional traffic resulting from the Build Alternative and RFFAs.

Active Transportation

Most of the 16 unsignalized intersections studied in the API would experience no change in pedestrian LTS[23] or bicycle level of traffic stress under the No Build Alternative compared to the Build Alternative, as described in the I-205 Toll Project Transportation Technical Report. One West Linn intersection, the 12th Street and Willamette Falls Drive intersection, would experience a higher (worse) level of pedestrian level of traffic stress under the 2045 Build Alternative compared to the 2045 No Build Alternative based on increased traffic volumes.

Some RFFAs, such as the OR 43 Multimodal Improvements and the Willamette Falls Drive Multimodal Improvements, focus on enhancing active transportation networks in the API. In addition, various RFFAs include constructing/reconstructing sidewalks and bicycle lanes as components of the project, further enhancing these networks in the API.

Freight Mobility

The Build Alternative would substantially improve freight travel times within the API. Most of the freight corridor roadway segments within the API (I-205, OR 213, I-5, OR 99E) would experience improvements in travel time under the Build Alternative (as compared with the No Build Alternative). Some sections of I-205 southbound and OR 99E southbound would experience an increase in travel times under the Build Alternative. Travel times on I-205, a major truck route, would improve substantially in both the northbound and southbound directions under the Build Alternative as compared with the No Build Alternative—decreasing by between 26 to 53 percent depending on the peak period and direction. RFFAs that would contribute to improvements in freight mobility include the Tualatin-Sherwood Road Improvements and the OR 224 Milwaukie Expressway Improvements, among others. Eight of the RFFAs listed in Attachment B identify “improve freight access” as a secondary objective.

Roadway Safety

According to the *I-205 Toll Project Transportation Technical Report,* due to the proposed improvements on I-205, the number of crashes, including crashes resulting in fatalities and injuries, is expected to be 21% lower under the Build Alternative as compared to the No Build Alternative. On local streets, the total number of annual predictive crashes would vary by location but would generally be similar at intersections (i.e., a difference of less than one crash at each intersection analyzed in the API) under the 2045 Build Alternative compared to the 2045 No Build Alternative. The predictive number of crashes, including fatality and injury crashes, would also be similar on most roadway segments analyzed in the API. There would be more crashes on segments of OR 99E, OR 213, and Willamette Falls Drive in the API under the Build Alternative compared to the No Build Alternative, but most of the additional crashes would involve property damage only. Several RFFAs, including various I-205 and I-5 projects, as well as the Tualatin-Sherwood Road Improvements Project, include secondary objectives to “reduce fatal and severe injury crashes.” Therefore, when considered with the other present actions and RFFAs, the Build Alternative is expected to have neutral to beneficial effects on transportation related to roadway safety.

Transit Operations

The cumulative effects of the Build Alternative and RFFAs would affect transit travel times, multimodal level of service, and transit ridership. The Build Alternative and RFFAs would contribute to improved

[23] LTS stress is an analysis method used to quantify multimodal conditions by estimating the perceived safety of bicycle and pedestrian infrastructure. The LTS analysis provides scores of 1 through 4 for each mode, with level 1 representing little or no traffic stress and level 4 representing high stress.

travel times and operating LOS on I-205 in the AM and PM peak periods in both directions, improved transit multimodal level of service, and slightly higher transit ridership (compared to the No Build Alternative).

Vehicle Mobility

Mobility refers to the ability to easily move between different locations. The traffic analysis evaluated several factors that contribute to and affect mobility, including regional daily VMT and vehicle hours of delay, daily and peak-hour traffic volumes, and traffic operations. A change in VMT is an indicator of how much regional travel would change. A reduction may mean that travelers are switching modes to high-occupancy vehicles or transit, or taking shorter or fewer trips. A change in vehicle hours of delay is an indicator of overall change in congestion. A reduction in vehicle hours of delay indicates that traffic congestion has decreased and mobility is improved.

Overall, the additional highway capacity under the Build Alternative as compared to the No Build Alternative would provide substantial reductions in daily hours of congestion at most locations on both northbound and southbound I-205, as described in the *I-205 Toll Project Transportation Technical Report*. Therefore, the cumulative effects of the Build Alternative and RFFAs would result in an improvement in vehicle mobility in the API.

6.1.12 Vegetation and Wildlife

As the region has developed over time, native vegetation has been reduced and altered; terrestrial habitats have become fragmented; and aquatic habitats have been degraded by in-water activities and structures as well as increasing pollution runoff. A large portion of the Portland metropolitan area has been disturbed by the development of buildings, roads, infrastructure, and other impervious surfaces. Most of the API for vegetation and wildlife is paved or unvegetated, consisting mostly of I-205 and supporting infrastructure. Most of the RFFAs would include new or expanded infrastructure along existing transportation corridors through urban environments with limited native vegetation and/or fragmented terrestrial habitats.

Under the Build Alternative, roughly 20 acres of vegetated areas or areas of pervious soil would be converted to roadway, resulting in a direct loss of vegetation and available habitat for terrestrial species. However, much of the vegetation that would be removed under the Build Alternative consists of invasive species, as described in the *I-205 Toll Project Vegetation and Wildlife Technical Memorandum*. The removal of invasive species and replanting of areas with non-invasive species would improve the quality of the existing habitat in the API. Construction of the present actions and RFFAs may also result in the removal of invasive species, resulting in a positive cumulative effect on the quality of existing habitat in the long-term.

Some of the effects on vegetation under the Build Alternative would occur in locally designated habitat conservation areas, which would be regulated through local land use processes and may also require mitigation/offsetting of non-invasive vegetation that is removed. Cumulative negative effects on non-invasive vegetation and habitat during construction of the present actions and RFFAs would be expected to be minimized through adherence to local development codes that require compliance with landscape planting standards and offsetting vegetation removal with new plantings, as well as adherence to local regulations pertaining to habitat conservation.

The Build Alternative would require in-water construction work in the Tualatin River that could disturb, injure, or result in the direct mortality to fish. Some of the RFFAs, such as Southwest Corridor Light Rail and I-5 Southbound – Wilsonville Road to Wilsonville Hubbard Highway would also require in-water work.

However, the potential for negative cumulative effects on fish from in-water work is unlikely because only a few of the projects would require in-water work; projects would be geographically dispersed; and for in-water work projects that are close to each other (such as the Build Alternative and I-205 Abernethy Bridge), it is unlikely that they would have the same in-water work window. Furthermore, projects with in-water work would be required to secure permits from federal, state, and/or local jurisdictions that include commitments to avoid or minimize impacts on fish. The Build Alternative would have no effect on Endangered Species Act-listed species, as described in the *I-205 Toll Project Vegetation and Wildlife Technical Memorandum*, and therefore would not contribute to a cumulative effect on Endangered Species Act-listed species because construction would comply with the FAHP Programmatic (NMFS 2021), the design standards from the FAHP Programmatic User Guide (ODOT and FHWA 2016), and the *Oregon Standard Specifications for Construction* (ODOT 2021b). ODOT and FHWA are in the process of obtaining FAHP Programmatic approval from the National Marine Fisheries Service for the Build Alternative.

The Build Alternative and most of the present actions and RFFAs would increase the amount of impervious surface area, which could increase the quantity of stormwater runoff to nearby waterbodies and potentially affect aquatic species. However, all projects would be subject to stormwater management regulations that would reduce runoff-related risks to wildlife. In addition, the Build Alternative would create a net benefit to the water quality of nearby waterbodies because it would treat more stormwater than existing conditions (see the *I-205 Toll Project Vegetation and Wildlife Technical Memorandum*). Some RFFAs, such as the I-205 Abernethy Bridge, Tualatin-Sherwood Road Improvements, and OR 43 Multimodal Improvements, include stormwater upgrades that would potentially have positive cumulative effects on water quality and aquatic species.

Therefore, when considered with the past and present actions and RFFAs, the Build Alternative would have positive cumulative effects on vegetation and wildlife, and no mitigation for cumulative effects is warranted.

6.1.13 Visual Quality

The visual resources API includes a mixture of natural elements, such as native vegetation, rock cliffs, and waterbodies, and human-made elements from past actions. These human-made elements include I-205 and the supporting infrastructure, as well as the residences, businesses, recreational facilities, and utilities that are located adjacent to I-205. Construction of the Build Alternative would require the removal of trees and vegetation and the presence of signage, construction vehicles and equipment, and staging areas. These temporary visual elements would be present within existing I-205 right-of-way, which is adjacent to various residential and commercial uses. However, views of the right-of-way from these uses are mostly screened by trees, vegetation, and/or slope that would remain, which would also mostly screen construction activities on the Build Alternative, as described in the *I-205 Toll Project Abbreviated Visual Impact Assessment*. When considered with past and present actions and RFFAs, the Build Alternative is not expected to have negative cumulative effects on visual quality during construction because the projects would be mostly geographically dispersed and, for projects that are within the same area, it is unlikely that the projects would be constructed simultaneously.

The addition of a third through lane along I-205 and toll gantries under the Build Alternative would not substantially change the long-term visual environment in the area, which currently contains the existing highway and supporting infrastructure. Although vegetation removal to accommodate the expanded highway would occur in the right-of-way, views of I-205 from residential and commercial uses adjacent to I-205 that are currently screened would mostly remain screened, as described in the *I-205 Toll Project Abbreviated Visual Impact Assessment*. The visual elements associated with the present actions and

RFFAs would mostly consist of horizontal elements (e.g., roads, rail lines, sidewalks, bicycle lanes) and would be built along existing transportation corridors through urban environments of varying densities, and therefore they would not result in substantial changes to the existing visual landscape. Therefore, when considered with past and present actions and RFFAs, the Build Alternative is expected to have neutral cumulative effects related to visual quality, and no additional mitigation for cumulative impacts is warranted or proposed.

6.1.14 Wetlands and Water Resources

Numerous water resources exist in the Portland region, including rivers, lakes, creeks, streams, ditches, and wetlands. Over time, increased development on and adjacent to water resources, as well as an increase in pollution runoff to water resources, has reduced the quality of these resources for humans and animals. Water resources in the API include the Tualatin River, Willamette River, McLean Creek, Abernethy Creek, Athey Creek, Tanner Creek, Wilson Creek, wetlands, and several unnamed streams and ditches. Various wetlands in the API are isolated from (i.e., not connected to) nearby larger waterbodies due to past development, specifically the development of I-205, as described in the *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*.

The Build Alternative would result in temporary wetland fill during construction, and it would permanently fill approximately 1.2 acres of wetlands from widening I-205, as detailed in the *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*. Construction of some of the present actions and RFFAs may also require the temporary or permanent filling of wetlands. However, because most of the present actions and RFFAs would include new or expanded infrastructure along existing transportation corridors through urban environments, the presence of substantial high-quality wetland areas within the project footprints is unlikely. The Build Alternative and present actions and RFFAs would be subject to federal, state, and local requirements regarding wetland impacts, including providing compensatory mitigation on-site or by the purchase of wetland mitigation credits. Wetland impact mitigation would provide opportunities to improve existing wetlands along I-205 that have been affected by past development in the area or would create new wetlands in protected areas. Therefore, when considered with present actions and RFFAs, the Build Alternative would have neutral cumulative effects on wetlands.

The Build Alternative and present actions and RFFAs would require ground disturbance and/or grading during construction that could increase the amount of sediment in stormwater runoff that reaches nearby waterbodies. Increased sediment can lead to a decrease in water quality. However, construction contractors for the Build Alternative, present actions, and RFFAs would be required to implement BMPs to manage stormwater runoff, thereby minimizing negative cumulative effects on water quality.

The Build Alternative would require in-water construction work in the Tualatin River that could increase turbidity and sediment transport in waterways, as described in the *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*. Some of the RFFAs, such as Southwest Corridor Light Rail and I-5 Southbound – Wilsonville Road to Wilsonville Hubbard Highway, would also require in-water work. However, the potential for negative cumulative effects on water quality from turbidity and sediment transport is unlikely because only a few projects would require in-water work, projects would be geographically dispersed, and for in-water work projects that are close to each other (such as the Build Alternative and I-205 Abernethy Bridge), it is unlikely that they would have the same in-water work window. Furthermore, the Build Alternative and present actions and RFFAs would be required to implement BMPs during construction and to secure permits and approvals that include commitments to minimizing water quality impacts, which would result in minimal negative cumulative effects on water resources.

The Build Alternative and most of the present actions and RFFAs would add new impervious surface area, which could increase the quantity of stormwater runoff to nearby waterbodies and potentially have an impact on water quality. However, all projects would be subject to stormwater management regulations that would reduce the potential for negative cumulative effects on water quality. In addition, the Build Alternative would create a net benefit to the water quality of nearby waterbodies by treating a greater volume of stormwater than existing conditions (see the *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*). Some RFFAs, such as I-205 Abernethy Bridge, Tualatin-Sherwood Road Improvements, and OR 43 Multimodal Improvements, include stormwater upgrades that would potentially result in a cumulative benefit to water quality. Therefore, when considered with past and present actions and RFFAs, the Build Alternative would result in positive cumulative effects on water resources, and no mitigation for cumulative impacts is warranted.

6.2 Summary of Cumulative Impacts by Resource

Table 6-2 provides a summary of cumulative benefits and impacts by resource area and proposed mitigation measures.

Table 6-2. Build Alternative Contribution to Cumulative Impacts by Resource and Recommended Mitigation

Resource	Build Alternative Contribution to Cumulative Impacts	Recommended Mitigation for Cumulative Impacts
Air Quality	The Build Alternative would **not contribute to cumulative impacts** on air quality because air quality is anticipated to improve compared with existing conditions.	No mitigation is recommended.
Climate	The Build Alternative would **not contribute to cumulative impacts** on the climate because it would not result in greater fuel consumption or GHG emissions compared with the No Build Alternative.	No mitigation is recommended.
Economy	The Build Alternative would **contribute to minor cumulative benefits** for economic conditions related to: • Improved travel times • Freight reliability • Vehicle operating cost savings • Additional business revenues and employment in nearby commercial areas resulting from projected changes in traffic patterns The Build Alternative would **contribute to cumulative economic impacts** related to: • Increased transportation costs on households and wholesale traders	For cumulative impacts, ODOT and other agencies should coordinate RFFA construction schedules to minimize overlap impacts. No additional mitigation is recommended because the Build Alternative would have local and regional economic benefits, and economic impacts on households and wholesale traders would be minimal. When considered with the other present actions and RFFAs, the cumulative effects of the Build Alternative are expected to enhance economic conditions.

Resource	Build Alternative Contribution to Cumulative Impacts	Recommended Mitigation for Cumulative Impacts
Environmental Justice Populations	The Build Alternative would **contribute to the following cumulative benefits:** • Similar or greater access to jobs and services • Similar or shorter travel times on I-205 and to representative destinations • Improvements in traffic congestion and roadway safety on I-205 • User and social benefits associated with improved I-205 traffic performance (e.g., reduced emissions, shorter travel times, vehicle operation cost savings, fewer vehicle incidents) The Build Alternative would **contribute to the following cumulative impacts:** • Rerouting of some I-205 traffic to local streets, which could have an impact on access to social resources in some geographic communities • Higher transportation costs associated with tolling, which could burden low-income populations at or below the federal poverty level • Higher numbers of roadway crashes at some locations • Potential technological barriers related to the tolling system	The *I-205 Toll Project Environmental Justice Technical Report* provides a complete list of minimization and mitigation measures that would address potential impacts on environmental justice populations under the Build Alternative. No additional mitigation for cumulative impacts is recommended.
Geology and Soils	The Build Alternative would **not contribute to cumulative impacts** on geology and soils because erosion, sediment, and stormwater control measures would be employed during construction. The Build Alternative would **contribute to cumulative benefits** on seismic resiliency in the region.	No mitigation is recommended.
Hazardous Materials	The Build Alternative would **not contribute to cumulative impacts** on hazardous materials because no sites of known hazardous concern would be affected during construction and a spill prevention plan would be required to be employed to reduce the risk of accidental spills and account for unforeseen spills of hazardous materials. The Build Alternative may **contribute to cumulative** benefits to environmental quality if there is an exposure to contaminated materials during construction and materials are disposed of.	No mitigation is recommended.
Historic and Archaeological Resources	The Build Alternative would **not contribute to cumulative impacts** on historic and archeological resources because no historic resources or known archaeological resources would be affected and an inadvertent discovery plan would be required to be prepared prior to construction to account for any unknown archaeological resources encountered during construction.	No mitigation is recommended.

Resource	Build Alternative Contribution to Cumulative Impacts	Recommended Mitigation for Cumulative Impacts
Land Use	The Build Alternative would **not contribute to cumulative impacts** on land use because there is sufficient land in the API to absorb the minor property conversion that would occur and the Build Alternative would comply with local land use plans and state land use goals.	No mitigation is recommended.
Noise	The Build Alternative would **contribute to minor cumulative noise impacts** on sensitive noise receptors along I-205 and alternative roadways from vehicles rerouting to avoid paying tolls.	To mitigate increased noise to sensitive receptors along I-205 under the Build Alternative, three noise walls are recommended for consideration (see the *I-205 Toll Project Noise Technical Report*). No additional mitigation for cumulative impacts is recommended. No mitigation is recommended for increased vehicle noise along roadways experiencing rerouting due to the Build Alternative because noise differences would be minimal.
Social Resources and Communities	The Build Alternative would **contribute to the following cumulative benefits:** • Similar or greater access to jobs and services • Similar or shorter travel times on I-205 and to representative destinations • Improvements in traffic congestion and roadway safety on I-205 • User and social benefits associated with improved I-205 traffic performance (e.g., reduced emissions, shorter travel times, vehicle operation cost savings, fewer vehicle incidents) The Build Alternative would **contribute to the following cumulative impacts:** • Rerouting of some I-205 traffic to local streets, which could have an impact on access to social resources in some geographic communities • Higher numbers of roadway crashes at some locations • Potential language and technological barriers related to the tolling system	The *I-205 Toll Project Social Resources and Communities Technical Report* provides a complete list of minimization and mitigation measures that would address potential impacts on social resources and communities under the Build Alternative. No additional mitigation for cumulative impacts is recommended.

Resource	Build Alternative Contribution to Cumulative Impacts	Recommended Mitigation for Cumulative Impacts
Transportation	The Build Alternative would **contribute to the following cumulative benefits:** • Improved travel times • Improved traffic operations • Fewer crashes on I-205 • Slight changes in mode choice (away from single-occupancy vehicles) • Slightly higher transit ridership The Build Alternative would **contribute to the following cumulative impacts:** • Several intersections would exceed mobility standards • Increase in pedestrian level of traffic stress at one intersection	The *I-205 Toll Project Transportation Technical Report* provides a complete list of minimization and mitigation measures for the Project. For cumulative impacts, ODOT and other agencies should coordinate the RFFA construction schedules to minimize potential impacts from overlapping activities.
Vegetation and Wildlife	The Build Alternative would **not contribute to minor cumulative impacts** on aquatic wildlife because in-water work would be required to secure permits from federal, state, and/or local jurisdictions that include commitments to avoid or minimize impacts on fish. The Build Alternative would **contribute to cumulative** benefits to vegetation and terrestrial habitat by removing invasive species and replanting with non-invasive species, and benefits to fish from water quality improvements of nearby waterbodies by treating more stormwater in the API than is treated under existing conditions.	No mitigation is recommended.
Visual Quality	The Build Alternative would **not contribute to cumulative impacts** on visual quality because temporary visual elements during construction and new long-term visual elements would be located in existing ODOT right-of-way and mostly screened from adjacent uses by trees, vegetation, and/or slope.	No mitigation is recommended.
Wetlands and Water Resources	The Build Alternative would **not contribute to cumulative impacts** on wetlands and water resources because in-water work would require implementing BMPs during construction and securing permits that include commitments to minimizing water quality impacts, and wetland impacts would be subject to federal, state, and local permit requirements, including providing compensatory mitigation on-site or by the purchase of wetland mitigation credits. The Build Alternative would **contribute to cumulative** benefits to water quality of nearby waterbodies by treating more stormwater in the API than is treated under existing conditions.	No mitigation is recommended.

API = Area of Potential Impact; BMP = best management practice; GHG = greenhouse gas; I- = Interstate; ODOT = Oregon Department of Transportation; RFFA = reasonably foreseeable future action

7 Preparers

Table 7-1 identifies the individuals involved in preparing this *Cumulative Impacts Technical Report*.

Table 7-1. List of Preparers

Name	Role	Education	Years of Experience
Emma Johnson, AICP, LEED Green Associate	Cumulative Technical Lead and Author	Master of City Planning BS, Urban and Regional Studies	10
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Chris Wilhelm	Economics Section Reviewer	BS, Environmental Economics BS, Business Management	5
Patrick Romero, INCE, ENV SP	Noise Section Reviewer	MS Environmental Policy and Management, BS Environmental Science	23
Rebecca Frohning	Air Quality and Climate Sections Reviewer	BS, Earth and Atmospheric Science	21
Jeff Crisafulli	Technical Report Editorial Reviewer	BA, English	25

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Attachment A Geographic Boundaries/Areas of Potential Impacts

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Figure A-1. Air Quality Area of Potential Impact

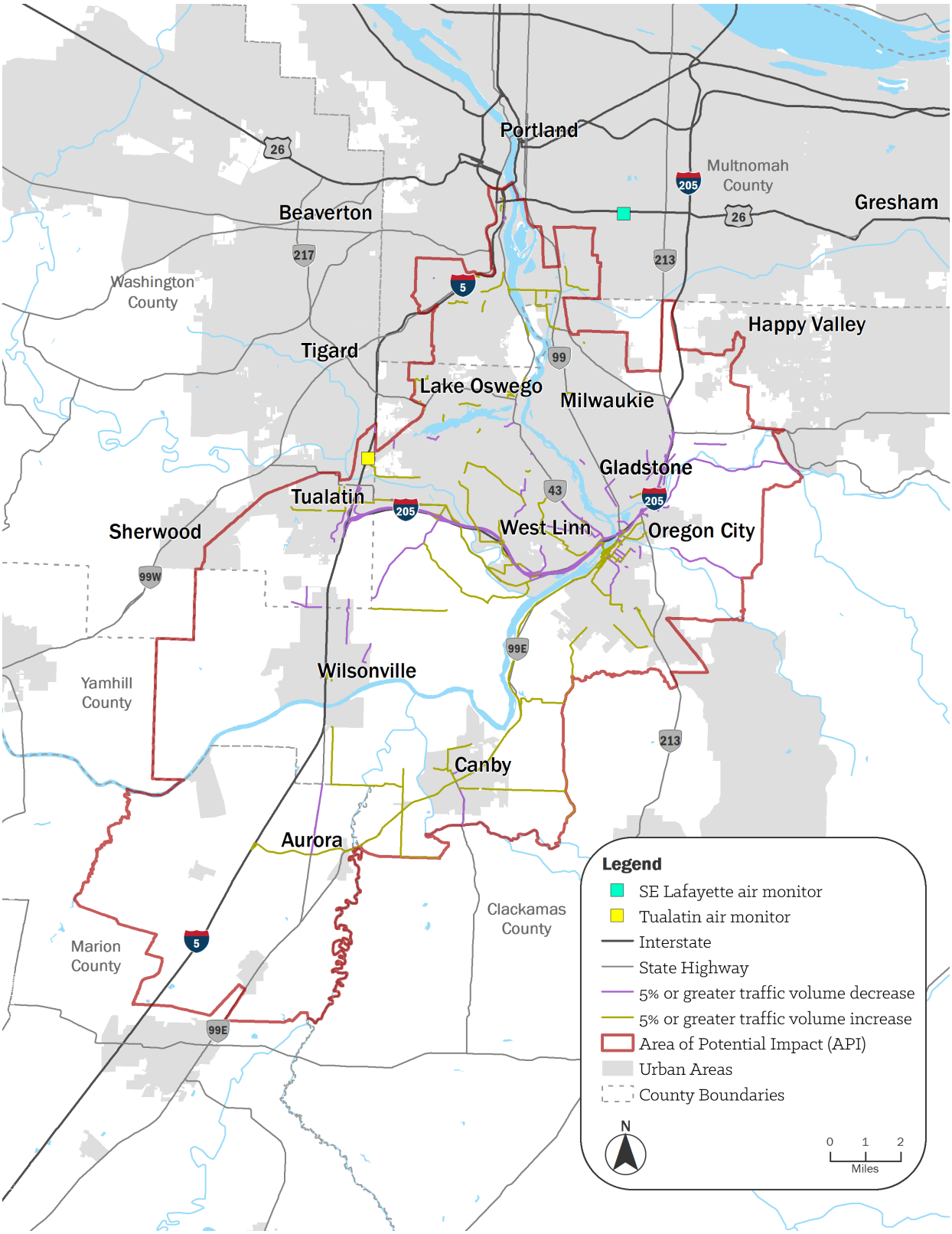


Figure A-2. Economics Area of Potential Impact

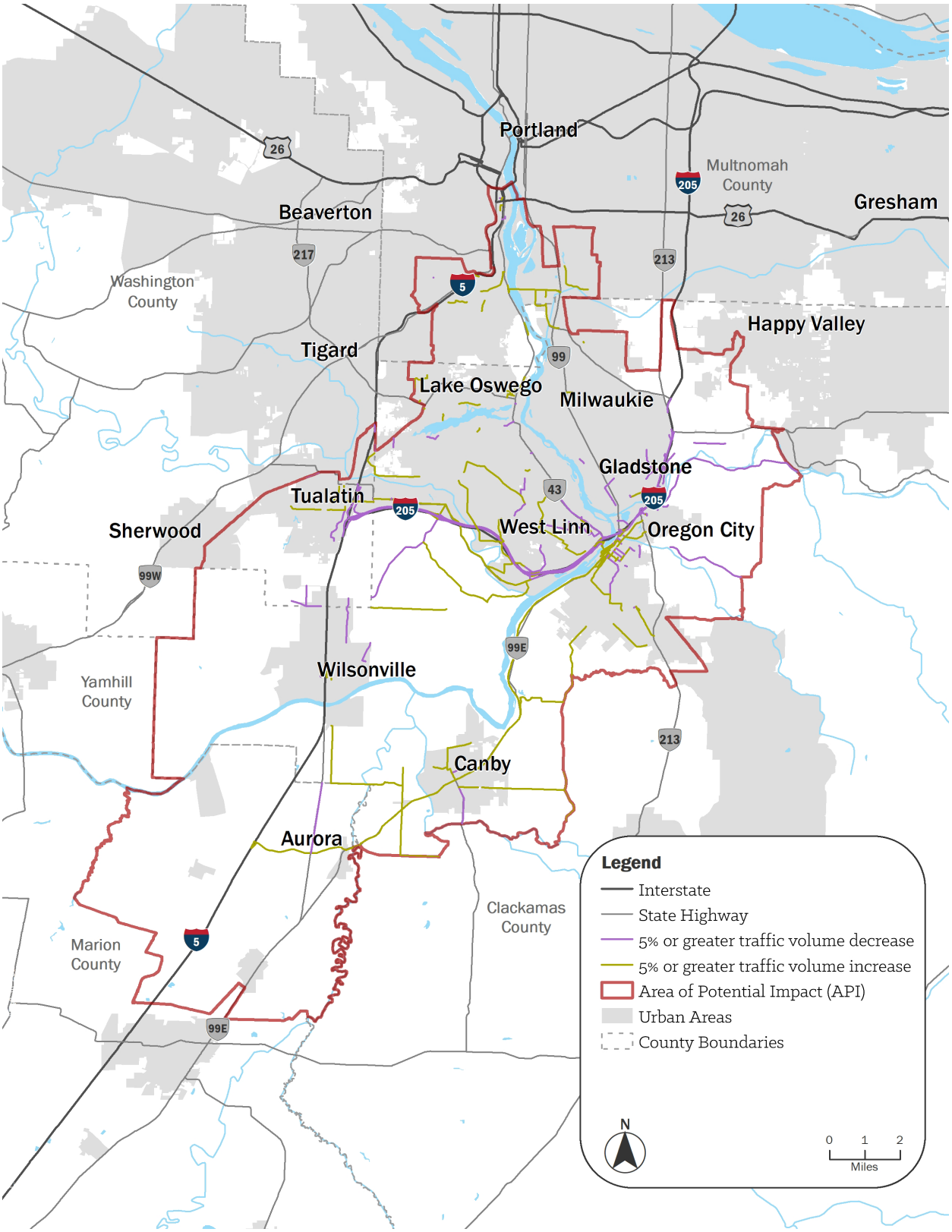


Figure A-3. Environmental Justice Area of Potential Impact

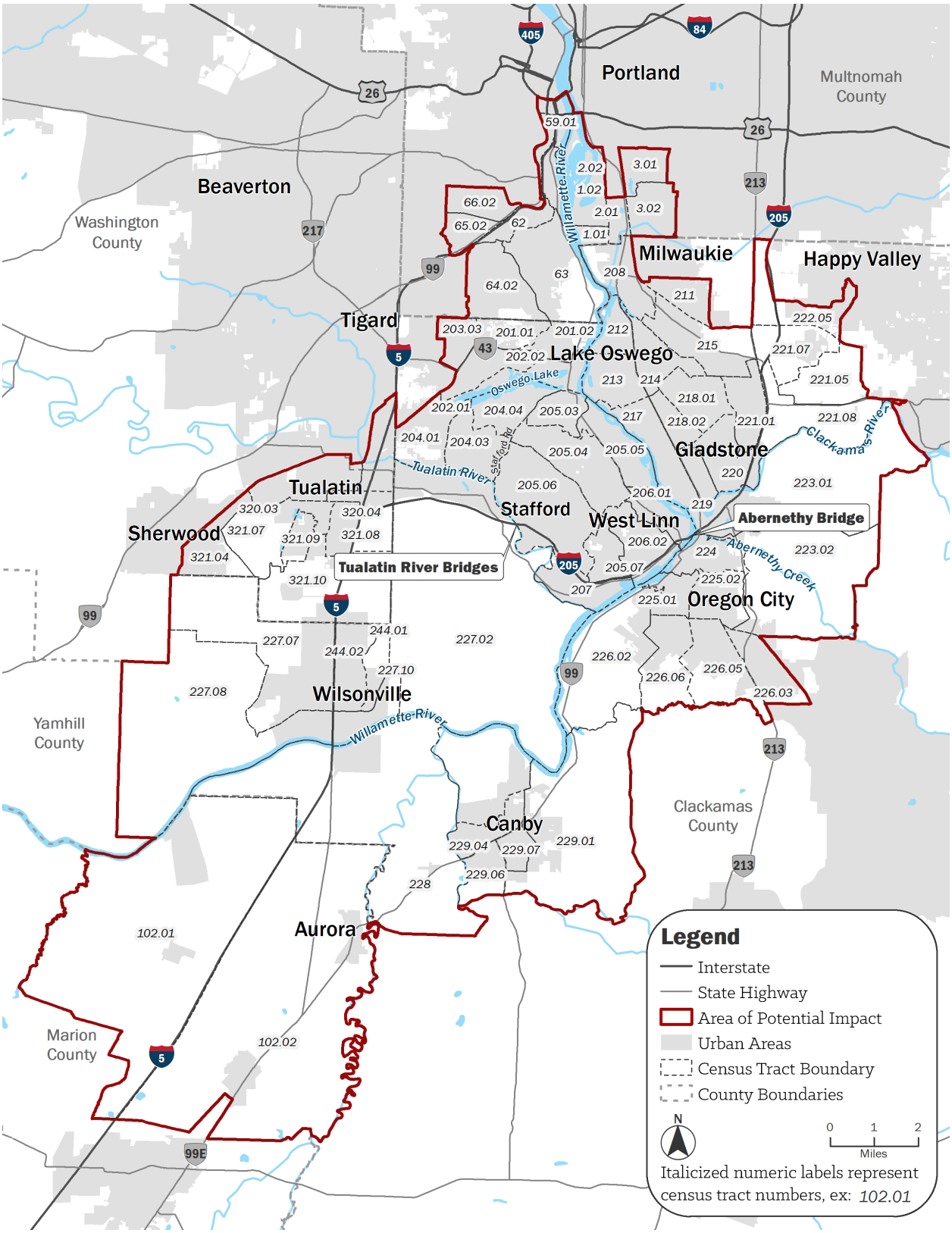


Figure A-4. Geology and Soils Area of Potential Impact

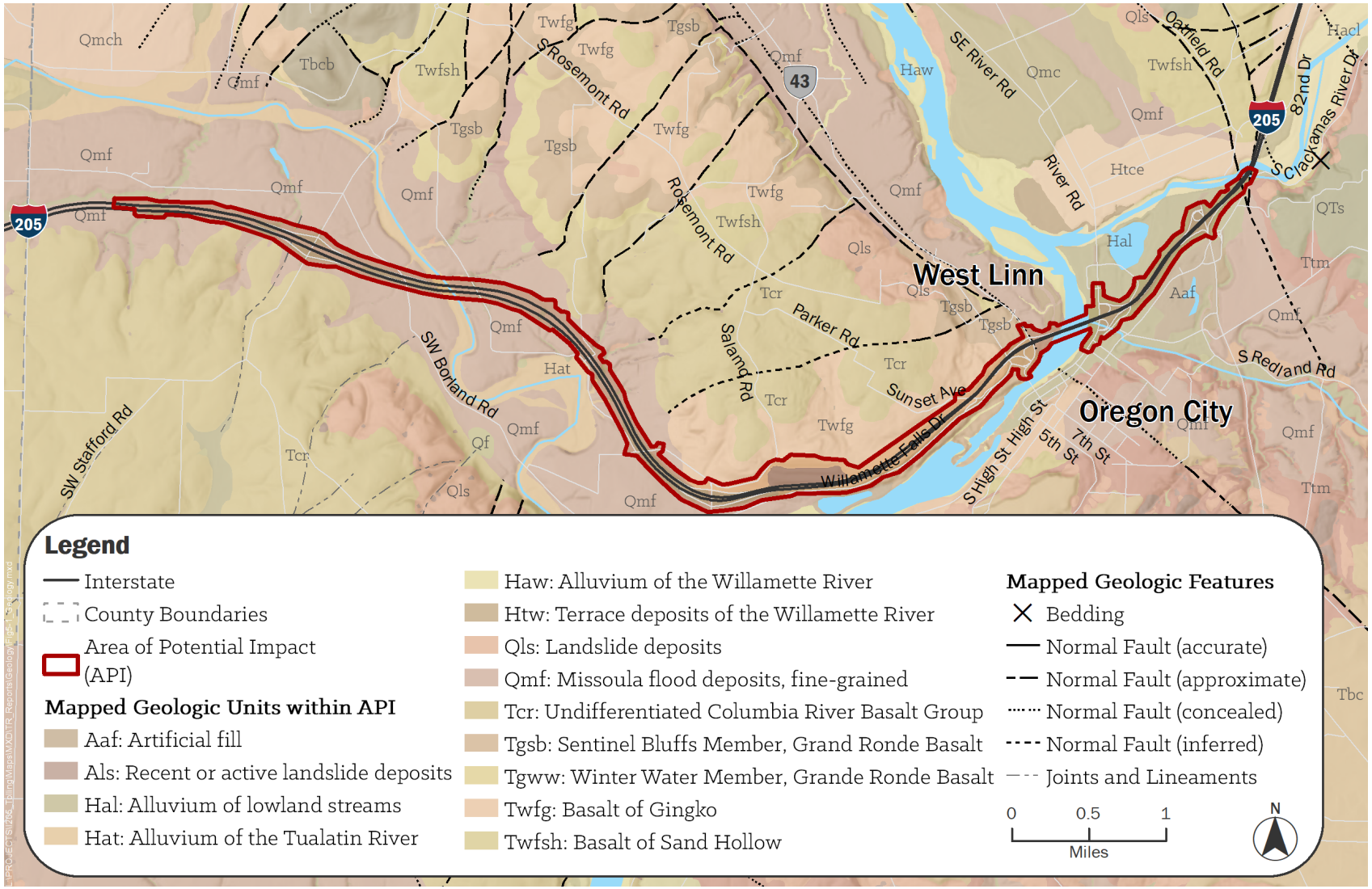


Figure A-5. Hazardous Materials Area of Potential Impact

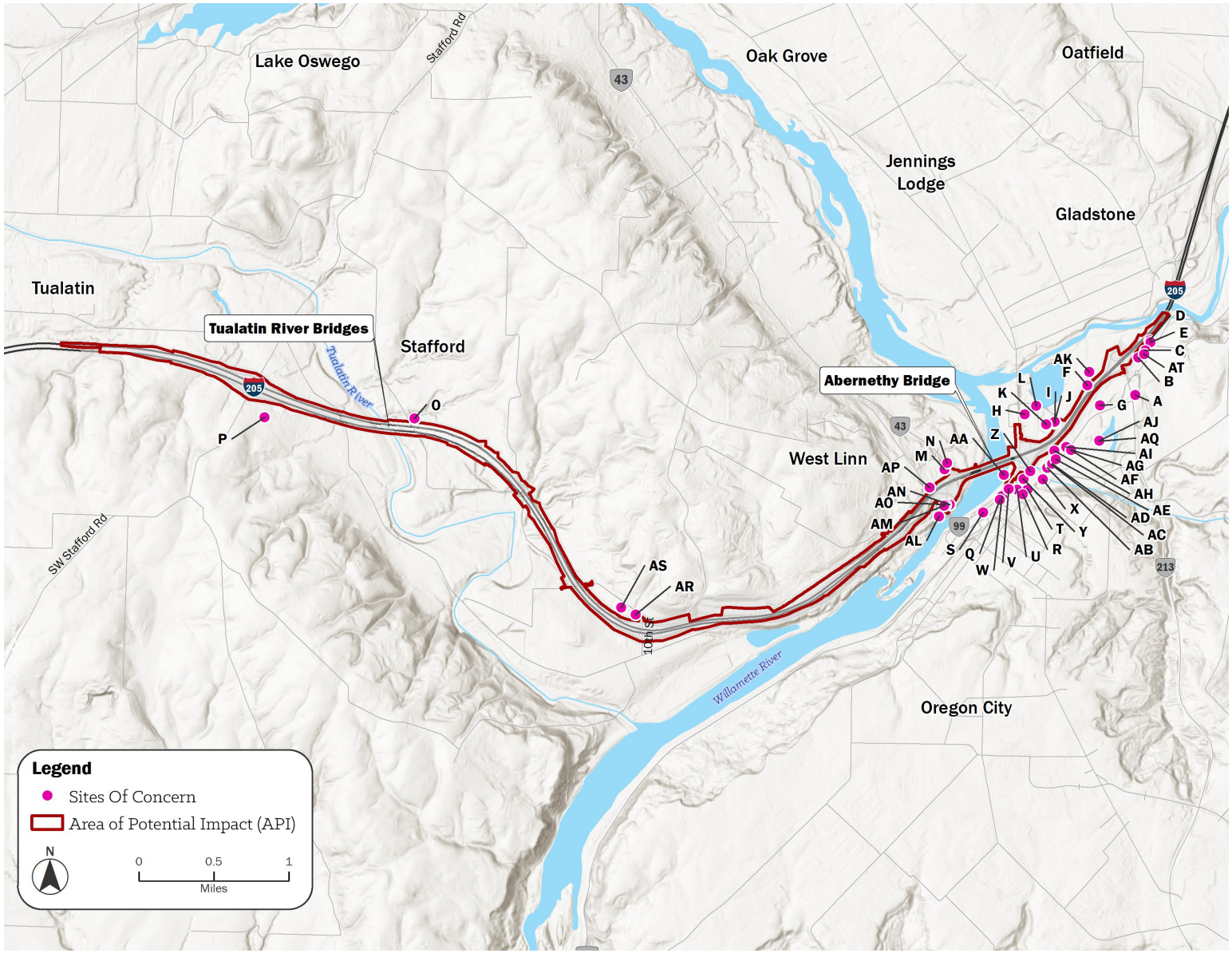


Figure A-6. Historic and Archaeological Resources Area of Potential Effects

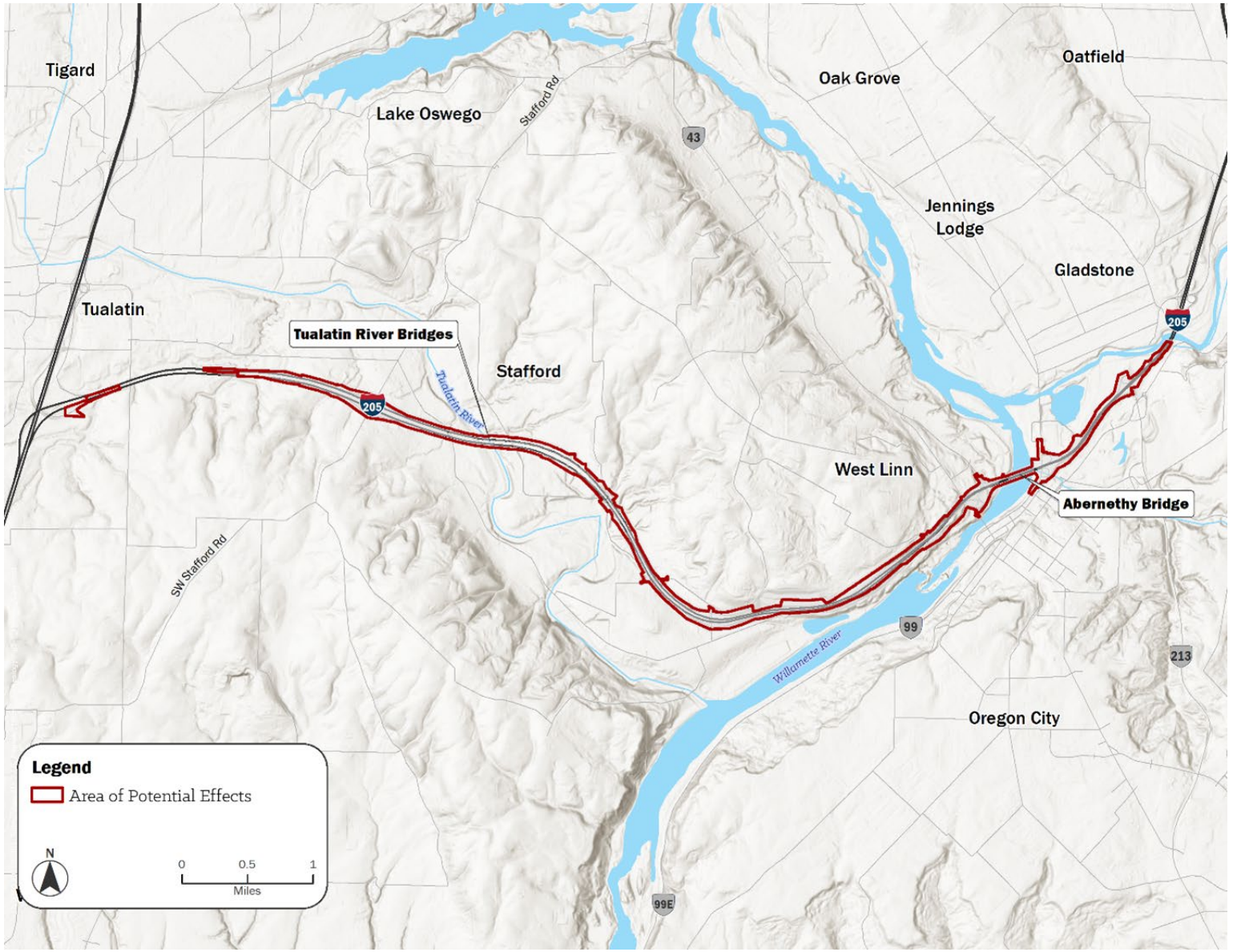


Figure A-7. Land Use Area of Potential Impact

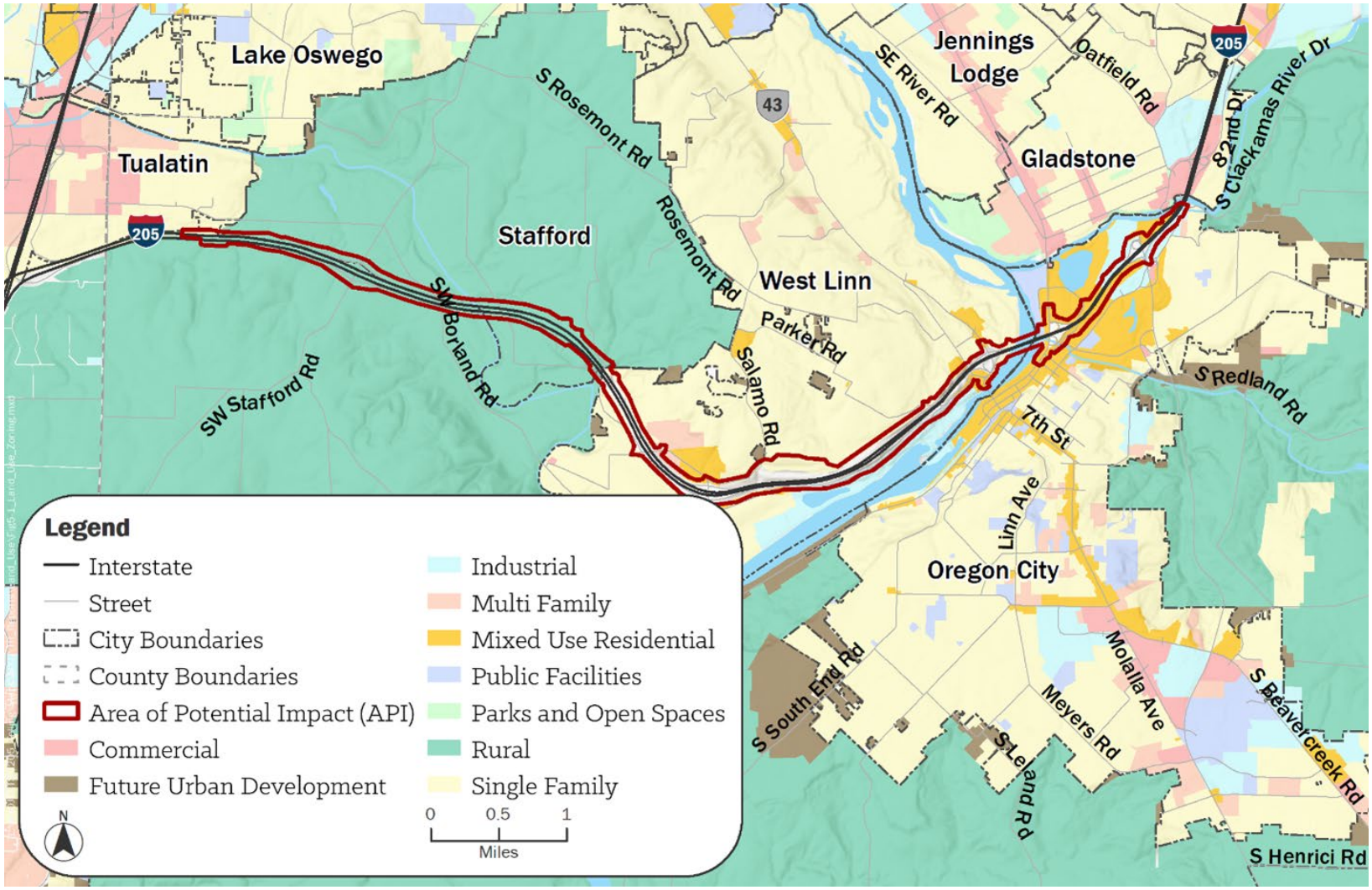


Figure A-8. Noise Area of Potential Impact

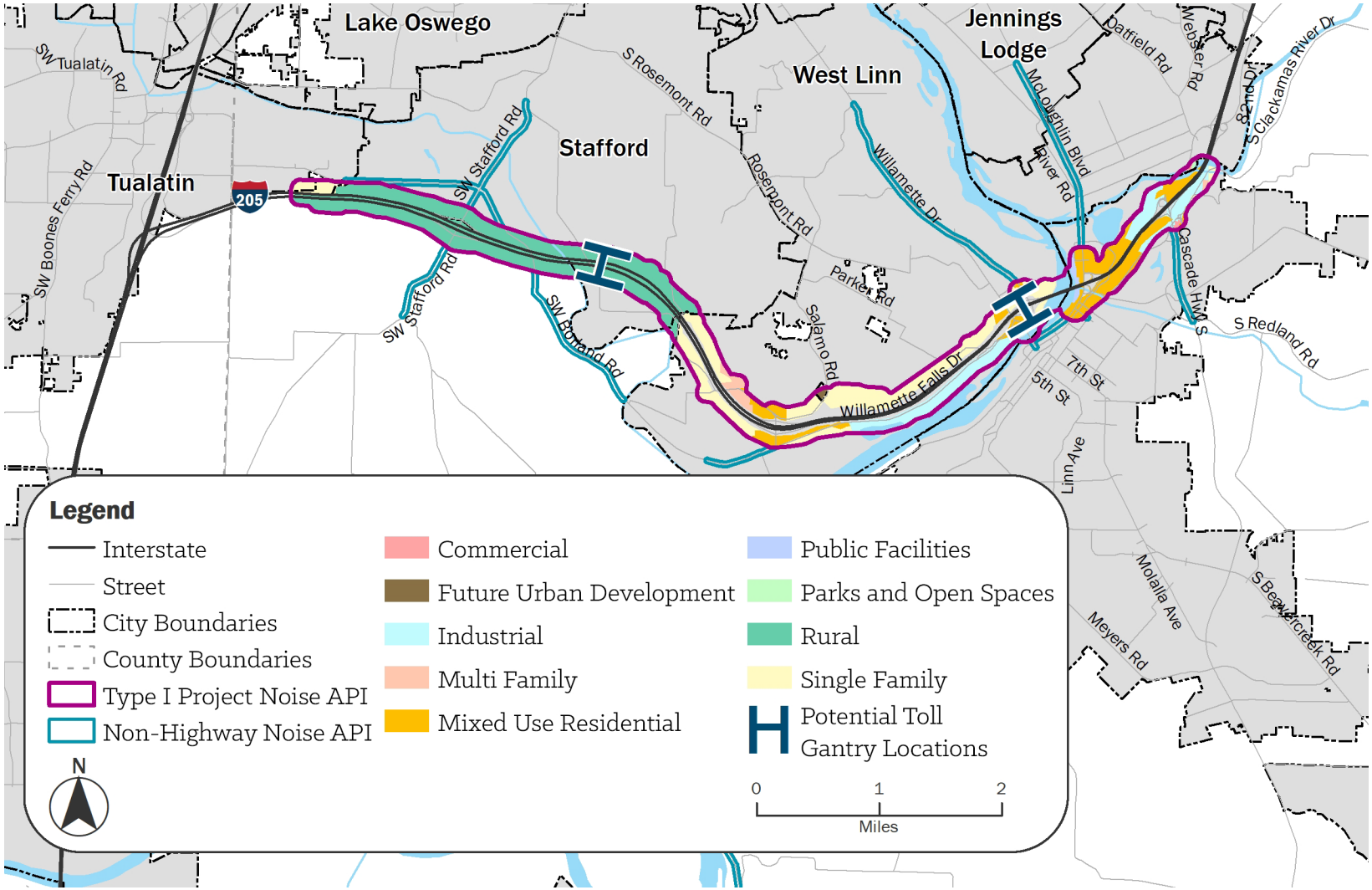


Figure A-9. Social Resources and Communities Area of Potential Impact

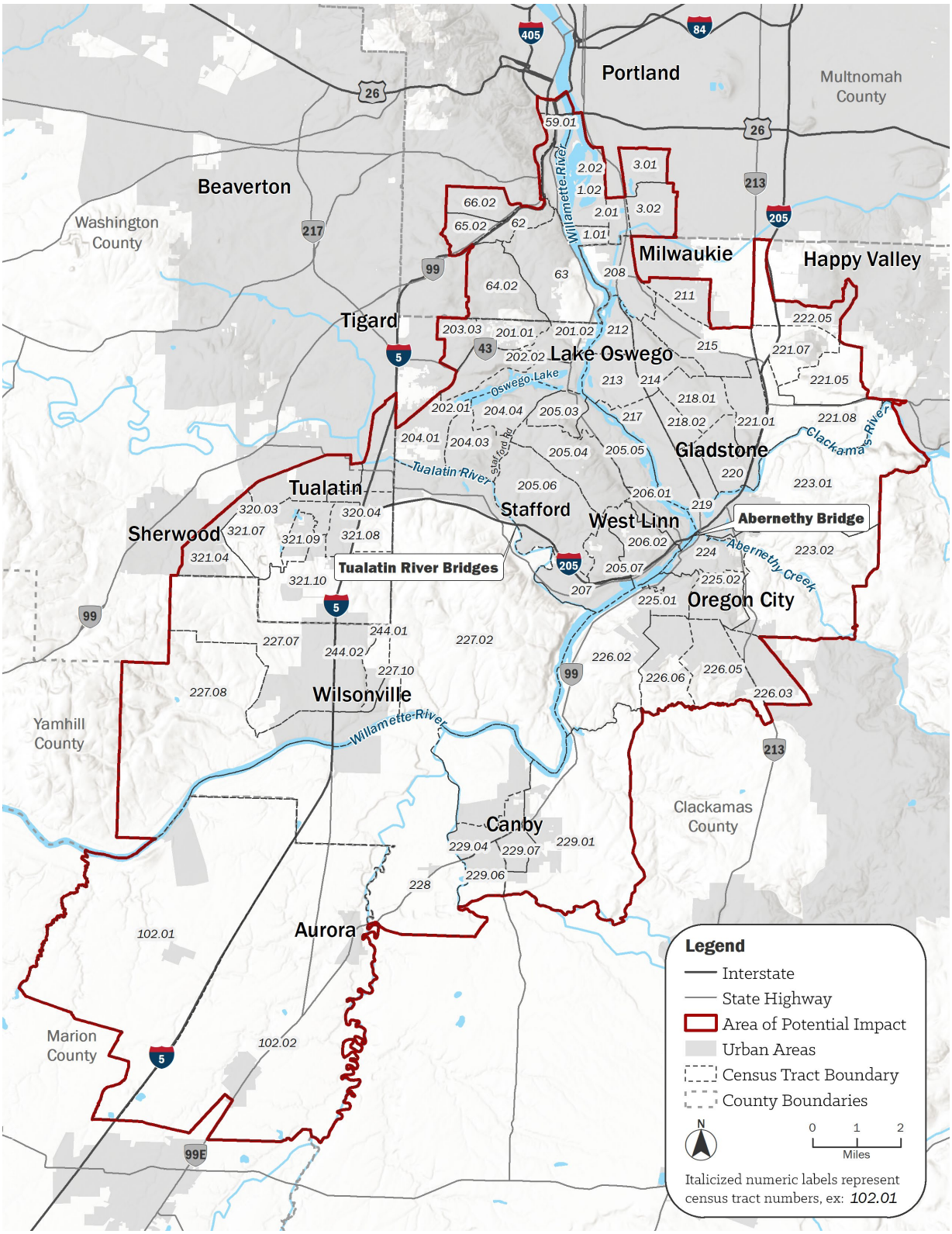


Figure A-10(a). Transportation Area of Potential Impact

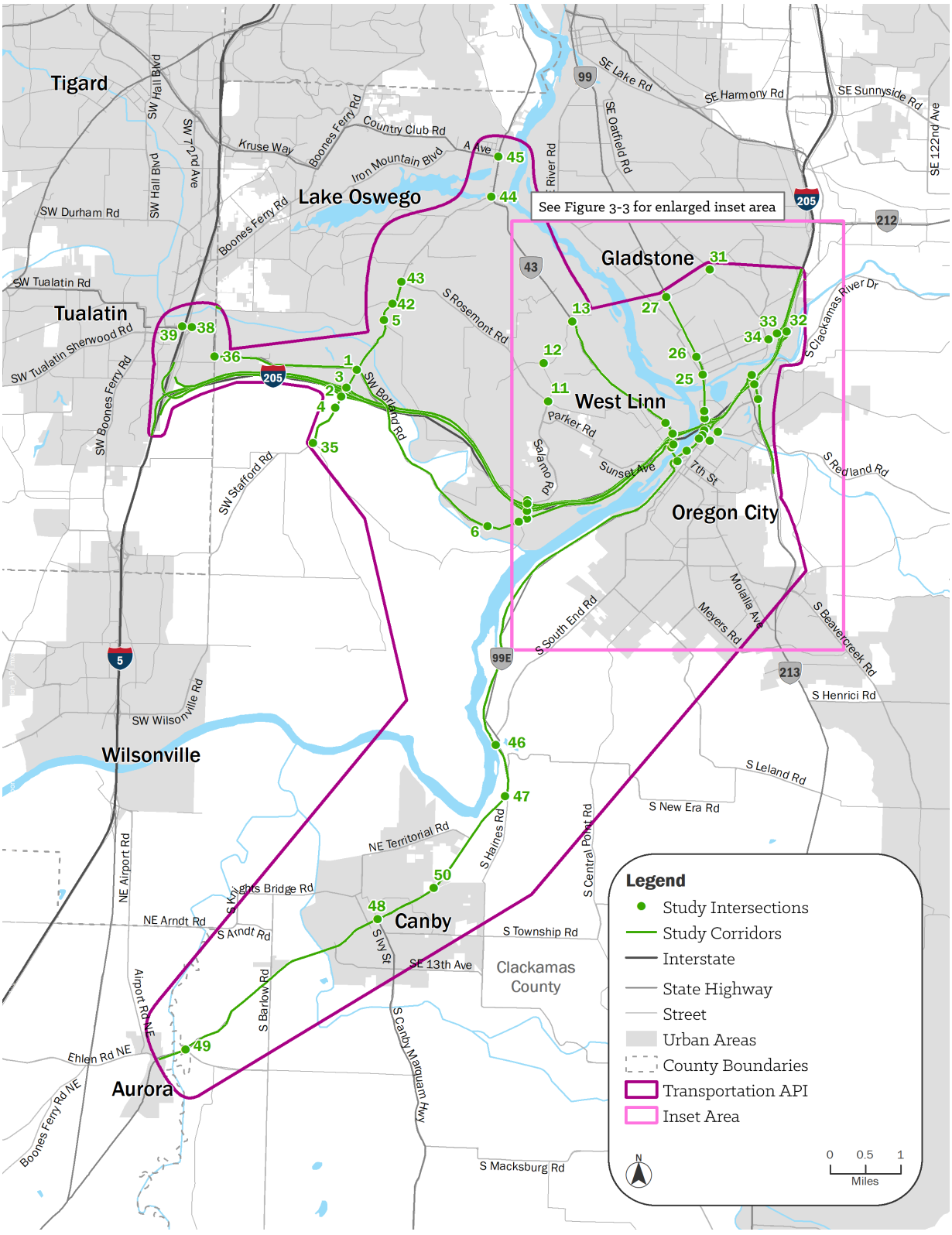


Figure A-10(b). Transportation Area of Potential Impact – Inset Area (Oregon City, West Linn, and Gladstone Focus Area)

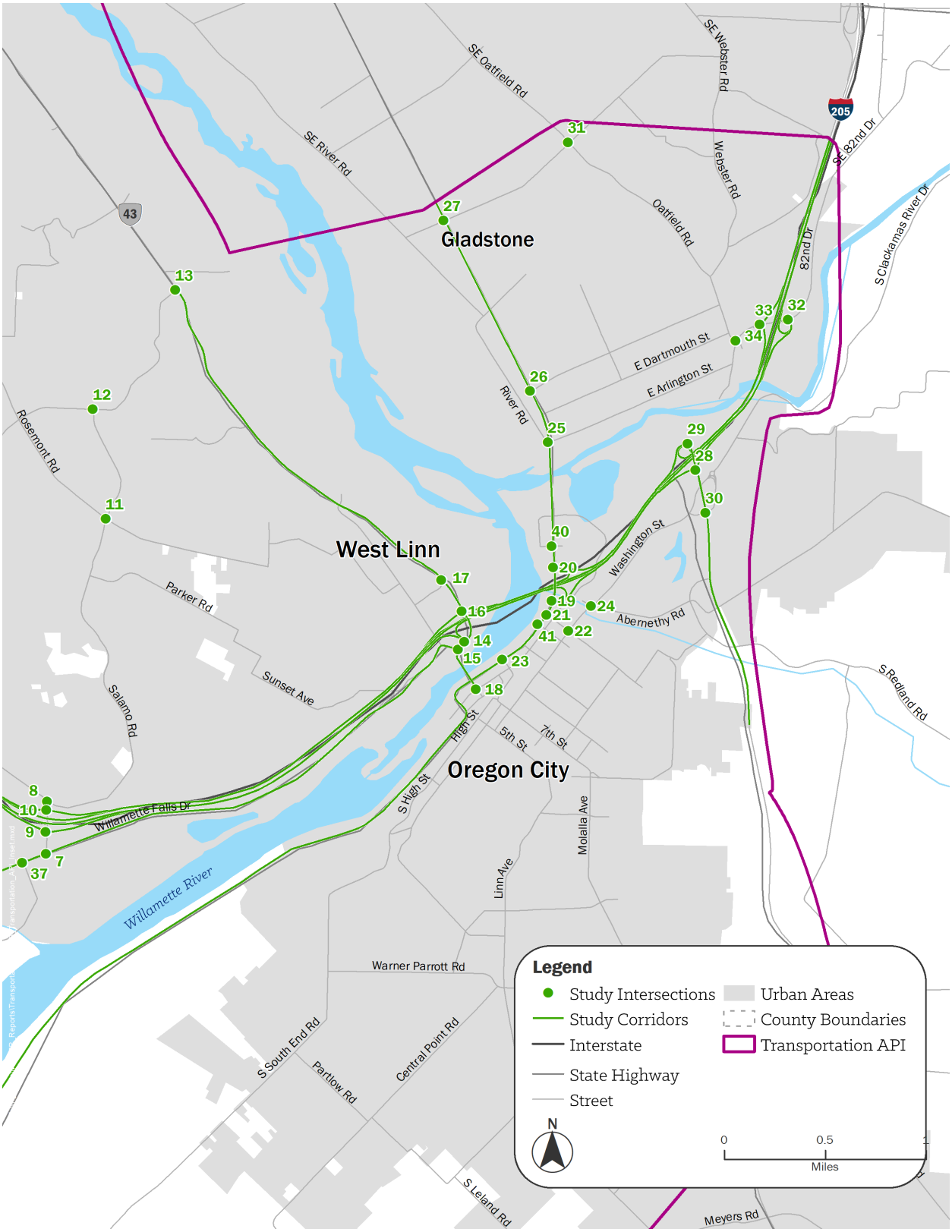


Figure A-11. Vegetation and Wildlife Area of Potential Impact

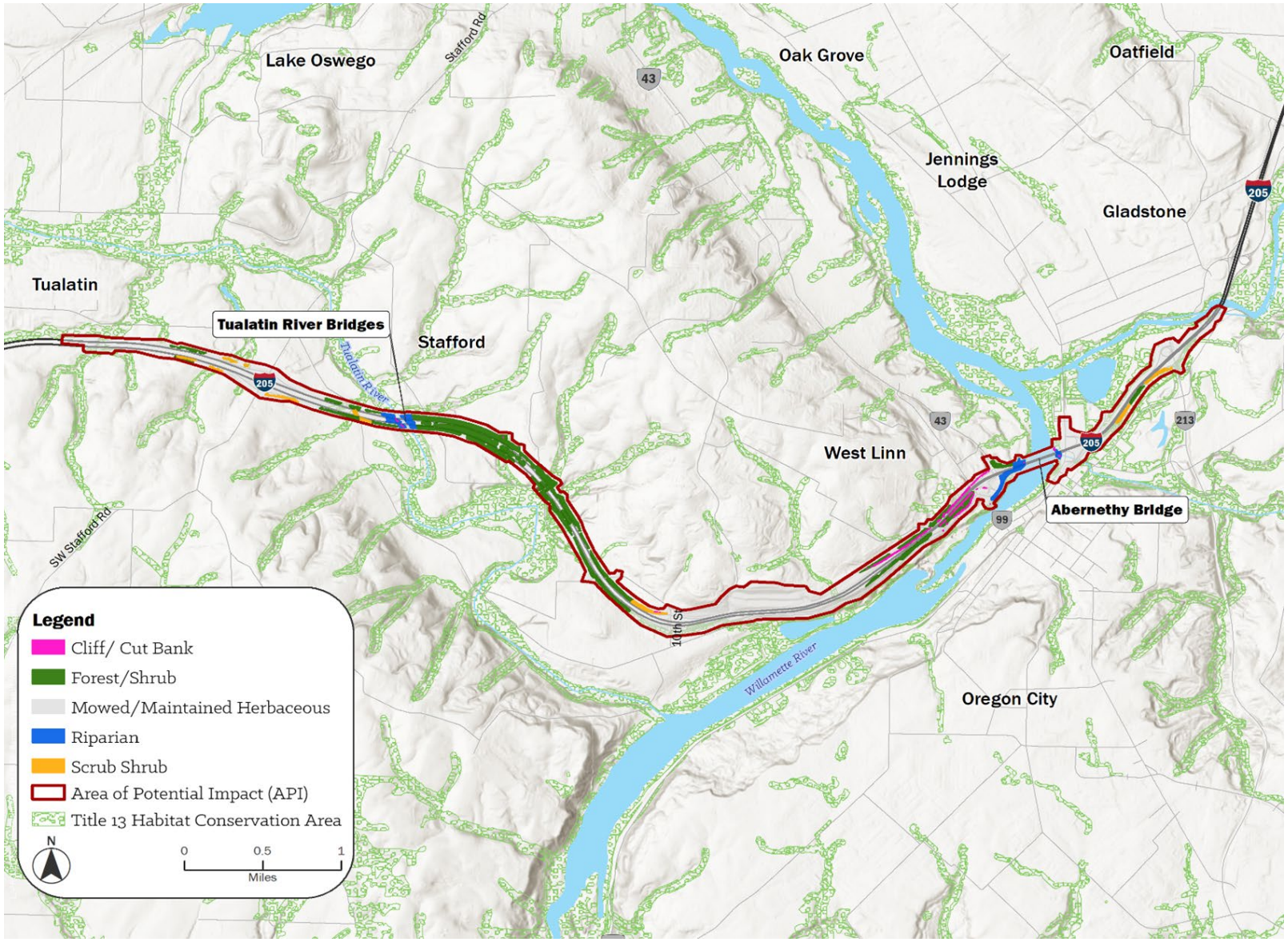


Figure A-12. Visual Quality Area of Potential Impact

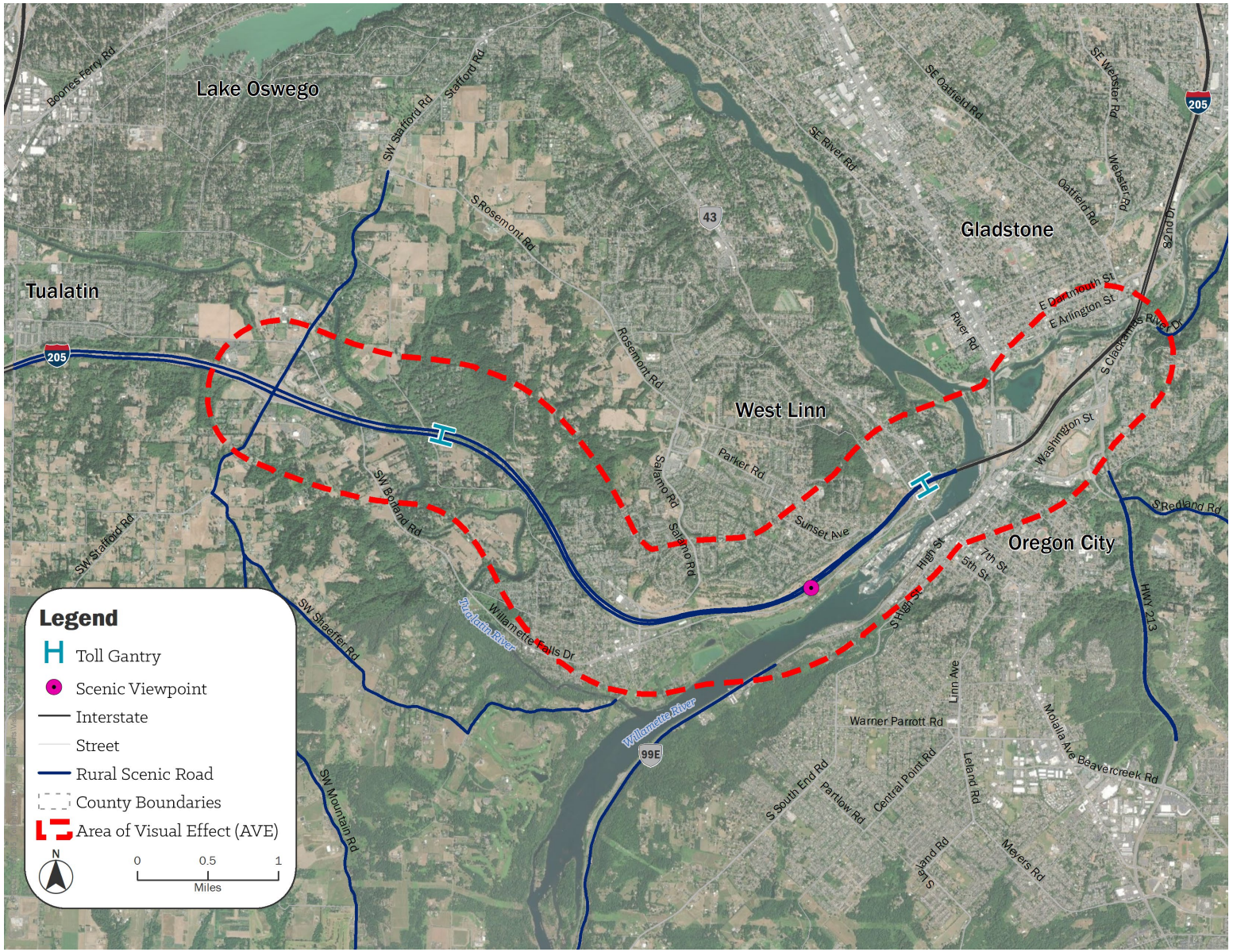
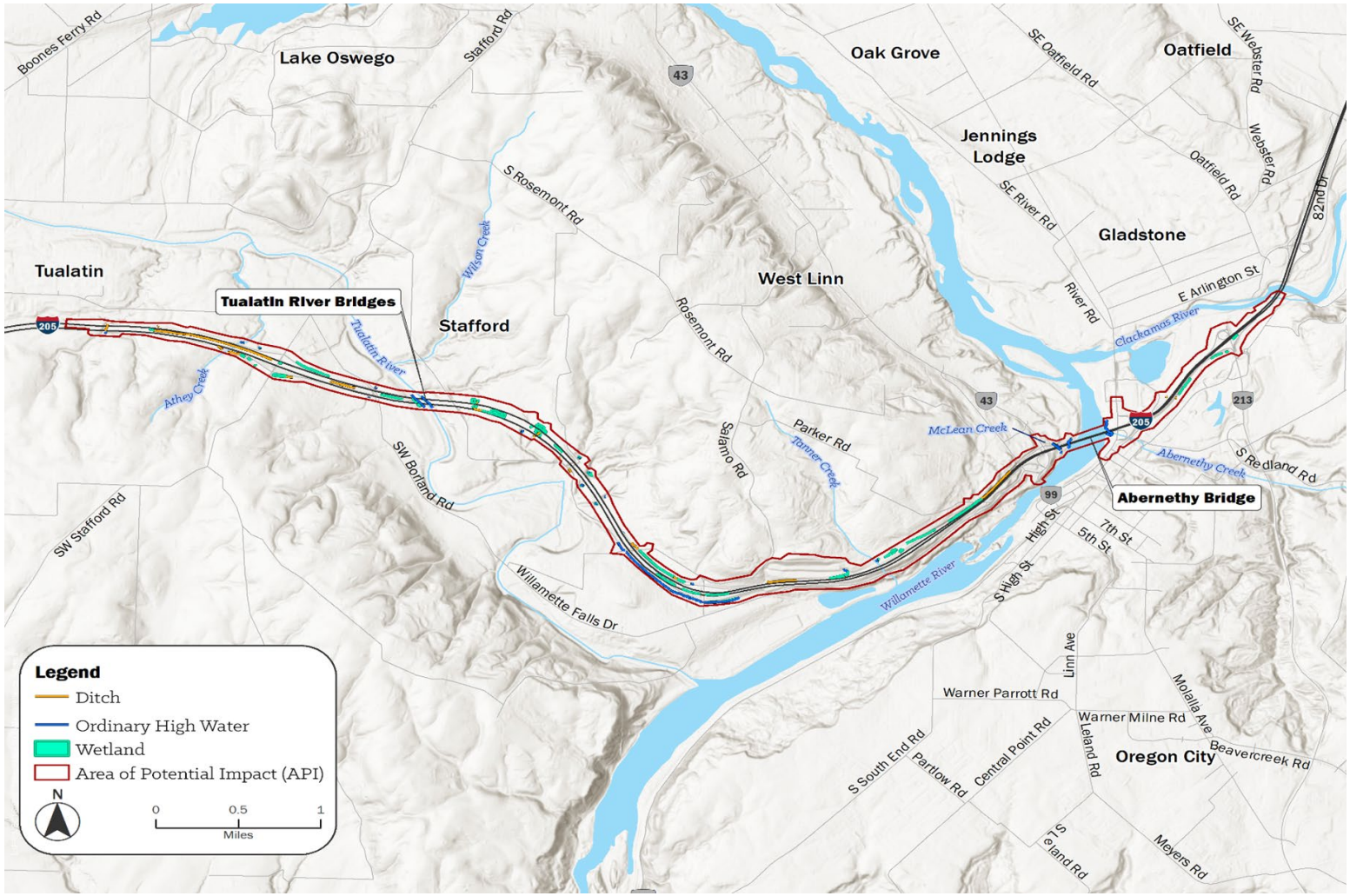


Figure A-13. Wetlands and Water Resources Area of Potential Impact



Attachment B Reasonably Foreseeable Future Actions

Note: This list contains actions identified as (1) having the potential to have an impact on the same resources as the Project (as described in Section 4.1) and (2) meeting the criteria in Section 4.4. It is not a complete list of all projects included in the modeling used to develop the technical analyses for air quality, greenhouse gases and climate, noise, and transportation. Some of the actions listed below were to be funded by a Metro ballot measure (#26-218) that failed to pass in November 2020; these actions are on hold until funding is identified. Because significant planning and coordination have gone into these actions, they are included on the reasonably foreseeable future actions (RFFA) list. Several projects from the Metro 2018 Regional Transportation Plan (RTP) were identified as having been constructed since its publication and are not included in the table below.

Italicized text (with a † symbol) denotes supplemental information from sources other than the RTP, which are identified in table notes.

Table B-1 Reasonably Foreseeable Future Actions List

Primary Owner	Project Name	RTP ID	Description	Primary Purpose	Secondary Objectives	Time Period
ODOT	I-205 Abernethy Bridge	11969, 11585	Widen both directions of the I-205 Abernethy Bridge and approaches to address recurring bottlenecks on the bridge.	Relieve current congestion	Keep system in good repair, address system deficiency, relieve future congestion, improve freight access to industry and intermodal facility, reduce fatal and severe injury crashes, improve system efficiency	2018 to 2027
ODOT	I-205 Northbound Auxiliary Lane, Sunrise Expressway Entrance to Sunnybrook	11981	Provide I-205 northbound auxiliary lane between Sunrise Expressway entrance ramp and the Sunnyside Rd/Sunnybrook Blvd interchange exit ramp.	Improve system efficiency	Relieve future congestion, improve freight access to industry and intermodal facility, increase access to jobs, reduce fatal and severe injury crashes, improve system efficiency	2018 to 2027
ODOT	I-5 Northbound – Braided Ramps I-205 to Nyberg	11989	Replace the inside merge at I-205 entrance by constructing braided ramps.	Relieve current congestion	Relieve future congestion, reduce fatal and severe injury crashes, improve system efficiency	2028 to 2040
ODOT	I-5 Northbound: Auxiliary Lane Extension Nyberg to Lower Boones Ferry	11402	Extend existing auxiliary lanes.	Improve system efficiency	Relieve current congestion, relieve future congestion, improve freight access to industry and intermodal facility, increase access to jobs, reduce minor or non-injury crashes	2028 to 2040

Primary Owner	Project Name	RTP ID	Description	Primary Purpose	Secondary Objectives	Time Period
ODOT	I-5 South Operational Improvements	11304	Construct improvements to address recurring bottlenecks on I-5 south of central city Portland. Specific improvements would be as identified in operational analysis, mobility corridor analysis, and refinement planning.	Improve system efficiency	Relieve current congestion, Relieve future congestion, Improve freight access to industry and intermodal facility, increase access to jobs, reduce fatal and severe injury crashes, improve system efficiency	2018 to 2027
ODOT	I-5 Southbound -- Wilsonville Road to Wilsonville-Hubbard Highway (Auxiliary Lane)	11990	Add an auxiliary lane on I-5 from Wilsonville Rd to the Wilsonville-Hubbard Highway, including improvements to the Boone Bridge.	Improve system efficiency	Relieve current congestion, relieve future congestion, improve freight access to industry and intermodal facility, increase access to jobs, reduce fatal and severe injury crashes, improve system efficiency	2028 to 2040
ODOT	OR 212/224 Sunrise Hwy Phase 2: SE 122nd to SE 172nd (CON)	11301	Phase 2 of the OR 212/224 Sunrise corridor, consisting of a four-lane roadway from SE 122nd Ave to SE 172nd Ave.	Relieve current congestion	Relieve future congestion, improve freight access to industry and intermodal facility, increase access to jobs, improve system efficiency	2018 to 2027
ODOT	OR 224 Milwaukie Expressway Improvements	11350	Construct a third westbound lane on OR 224 from I-205 to Rusk Rd. The project was identified in 2014 and funds have been committed.	Improve system efficiency	Relieve future congestion, improve freight access to industry and intermodal facility, increase access to jobs, improve system efficiency	2018 to 2027
ODOT	OR 43 Multimodal Improvements - Holly Street to Mary S. Young State Park	10127	Improve roadway with widening, turn lanes, street trees, signal interconnections, cycle tracks, and sidewalks. This project is in the preliminary design phase.	Improve system efficiency	Reduce emissions, address system deficiency, relieve current congestion, relieve future congestion, increase travel options/alternatives to driving alone, reduce fatal and severe injury crashes, increase access to transit, increase access to 2040 centers and corridors, increase opportunities for physical activity, improve system efficiency, increase ADA compliance, correct poor stormwater drainage	2028 to 2040
TriMet	High Capacity Transit Southwest Corridor – Light Rail Project	10907, 11587	Develop a light-rail line from downtown Portland to Tualatin. Preliminary design and the draft environmental review for the new rail line occurred from 2016 to early 2020. In November 2020, voters rejected Measure 26-218 (Get Moving 2020), which would have funded the project and other transportation projects across the region. At this time, the project is on hold until funding is identified.	Increase travel options/ alternatives to driving alone; relieve future congestion	Reduce emissions, relieve future congestion, increase travel options/alternatives to driving alone, increase access to jobs, increase access to transit, improve system efficiency, increase ADA compliance	2018 to 2027 *Design work has been paused due to the Metro ballot measure.*

Primary Owner	Project Name	RTP ID	Description	Primary Purpose	Secondary Objectives	Time Period
Washington County	Tualatin-Sherwood Road Improvements	10568	Widen the road from three to five lanes with added bike lanes and sidewalks. *This project is under way. Tualatin-Sherwood Rd, between Langer Farms Parkway and Teton Ave, will be widened from three to five lanes: two travel lanes in each direction with a center turn lane. A 12-foot multiuse path will be installed on each side of the road, with additional bike lanes at the intersections. Drainage, traffic signals and street lighting will be upgraded. The Willamette Water Supply Program will install a 66-inch drinking water pipeline in conjunction with the roadway improvements. The existing number of travel lanes will be maintained during peak hours; lane reductions during only non-peak hours (Washington County 2022)*[†].	Relieve current congestion	Relieve future congestion, improve freight access to industry and intermodal facility, reduce fatal and severe injury crashes, reduce minor or non-injury crashes	2018 to 2027 *Construction start (expected): Summer 2022* *Construction finish (expected): Fall 2025 (Washington County 2022)* [†]
West Linn	Willamette Falls Drive Multimodal Improvements - OR 43 to 10th Street	10128	Provide bike lanes/cycle tracks and sidewalks. These improvements will provide a direct multimodal connection between the downtowns of West Linn and Oregon City. This project is in the preliminary design phase.	Improve system efficiency	Reduce emissions, address system deficiency, relieve current congestion, relieve future congestion, increase travel options/alternatives to driving alone, reduce fatal and severe injury crashes, increase access to transit, increase access to 2040 centers and corridors, increase opportunities for physical activity, improve system efficiency, increase ADA compliance, correct poor stormwater drainage	2028 to 2040
West Linn	I-205 / 10th Street Improvements	11242	Construct a long-term interchange improvement to provide congestion relief, address safety issues, and improve bike/ped connectivity.	Relieve current congestion	Keep system in good repair, address system deficiency, relieve future congestion, increase travel options/alternatives to driving alone, reduce fatal and severe injury crashes, improve system efficiency	2018-2027

Primary Owner	Project Name	RTP ID	Description	Primary Purpose	Secondary Objectives	Time Period
Oregon City	Willamette Falls Legacy Project Internal Roadways	12089	Construct new roadways to support the Willamette Falls Legacy Project and Riverwalk, consisting of Main St, Water St, 4th Ave, 3rd St, and Railroad St, including sidewalks. *The Willamette Falls Legacy Project is a master-planned project that will redevelop a 22-acre former industrial waterfront area in Oregon City, approximately one-half mile south of the proposed Abernethy Bridge toll gantry area. The plan includes a mix of public spaces, retail, offices, and housing (Willamette Falls Legacy Project 2014; Rick Williams Consulting 2017†).* *Although the master plan itself is not identified in the RTP, the plan is accounted for in the cumulative impacts analysis in two ways. First, the transportation improvement project associated with the master plan (RTP ID 12089) is on the RFFA list (and included in the modeling). Second, projections for population and employment growth are accounted for in the regional travel demand model, which reflects the anticipated development at the Willamette Falls site.*	Increase access to jobs	Increase access to 2040 centers and corridors, Build complete street	2018 to 2027

Note: *Italicized* text (with a † symbol) denotes supplemental information from sources other than the RTP
Sources: Metro 2018a; Rick Williams Consulting 2017; TriMet 2020; Washington County 2022; Willamette Falls Legacy Project 2014
ADA = American with Disabilities Act; CON = construction; I- = Interstate; ODOT = Oregon Department of Transportation; OR = Oregon Route; RTP = 2018 Metro Regional Transportation Plan; TBD = to be determined; TriMet = Tri-County Metropolitan Transportation District