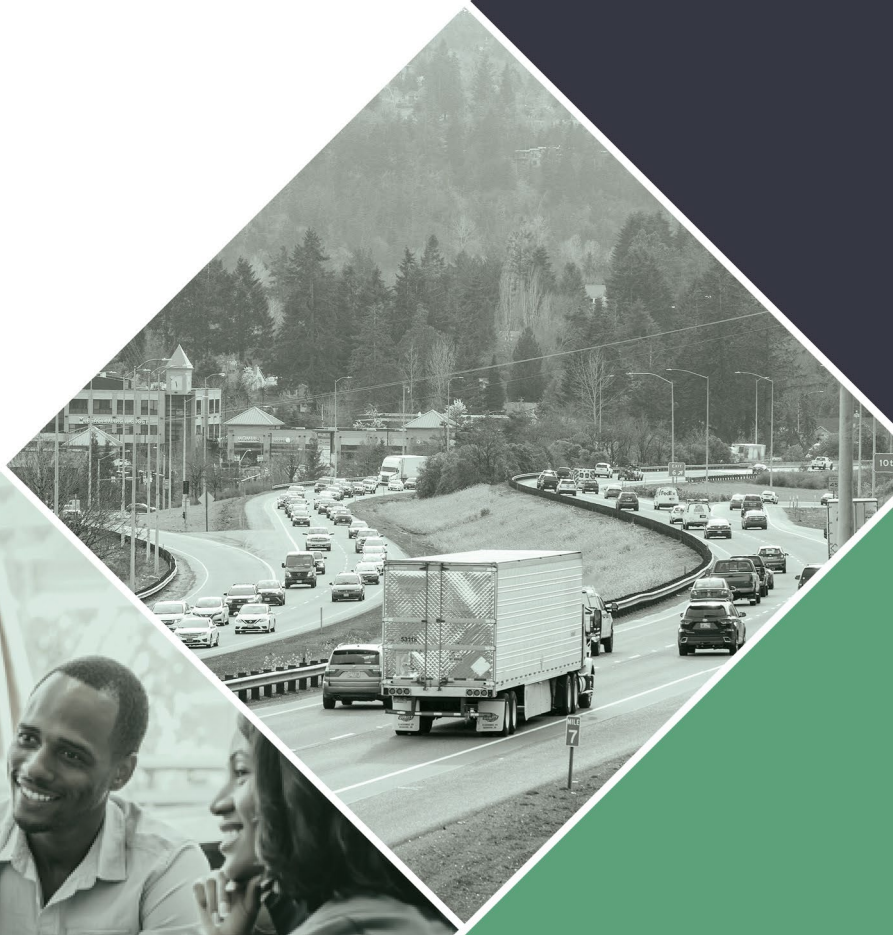
I-205 Toll Project

Environmental Assessment

February 2023



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I-205 Toll Project

ODOT Key Number: 21371

Environmental Assessment

Submitted Pursuant to 42 U.S.C. 4332 (2)(c) and where applicable, 49 U.S.C. 303
by U.S. Department of Transportation, Federal Highway Administration and
Oregon Department of Transportation

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February 14, 2023

Mandy Putney, Strategic Initiatives Director, Oregon Department of Transportation, Urban Mobility Office

Date of Approval

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Abstract:

The Oregon Department of Transportation (ODOT) is proposing to implement tolls on the Interstate 205 (I-205) Abernethy Bridge and Tualatin River Bridges to raise revenue for construction of planned improvements to I-205, including seismic upgrades and widening, and to manage congestion. This Environmental Assessment, developed by ODOT in partnership with the Federal Highway Administration, presents an evaluation of the effects of tolls and the toll-funded I-205 improvements on the human and natural environment in accordance with the National Environmental Policy Act.

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These documents are also available on the I-205 Toll Project website: https://www.oregon.gov/ODOT/tolling/Pages/I-205-Tolling.aspx.

How to Submit Comments

Written comments on the Environmental Assessment can be submitted during the public comment period (February 21, 2023, to April 7, 2023) by email to I205TollEA@odot.oregon.gov or by regular mail to:

Mandy Putney
ODOT Urban Mobility Office
18277 SW Boones Ferry Road
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Comments also can be submitted in writing through a form accessible via the project website (https://www.oregon.gov/ODOT/tolling/Pages/I-205-Tolling.aspx) and orally at a public hearing for the Environmental Assessment. Details on the public hearing date, time, and location can be accessed online at: https://www.oregon.gov/ODOT/tolling/Pages/I-205-Tolling.aspx.

Comments may also be submitted by leaving a voice message on the I-205 Toll Project's comment line at 503-837-3536 during the comment period. Except for voice messages and oral testimony at the virtual public hearing, which will be transcribed, comments must be submitted in writing.

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Acronyms and Abbreviations

Acronym/Abbreviation	Definition
2018 CE	2018 Categorical Exclusion Closeout Document
ACM	asbestos-containing material
API	area of potential impact
BLTS	bicycle level of traffic stress
BMPs	best management practices
CE	categorical exclusion
CFR	Code of Federal Regulations
CRBG	Columbia River Basalt Group
dBA	A-weighted decibels
DEQ	Oregon Department of Environmental Quality
DSL	Oregon Department of State Lands
EA	Environmental Assessment
EFC	Equity Framework Communities
EO	Executive Order
ESH	Essential Salmonid Habitat
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GHG	greenhouse gases
HCA	Habitat Conservation Area
HMCS	Hazardous Materials Corridor Study
I-	Interstate
I-205 Improvements Project	I-205 Improvements: Stafford Road to OR 213 Project
IPaC	Information for Planning and Consultation
L_{eq}	equivalent sound level
LOS	level of service
LTS	level of traffic stress
mmBtu	million British thermal units
MMLOS	multimodal level of service
MP	mile post
MSA	Metropolitan Statistical Area
MSAT	mobile source air toxics
MT	metric tons
NAAC	Noise Abatement Approach Criteria
NAAQS	National Ambient Air Quality Standards
n.d.	no date
NEPA	National Environmental Policy Act
NMFS	National Oceanic and Atmospheric Administration National Marine Fisheries Service
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OHWM	Ordinary high water mark
OR	Oregon Route
PM	Particulate Matter
PM_{10}	particulate matter 10 microns or less in size
$PM_{2.5}$	particulate matter 2.5 microns or less in size
Phase 1A	I-205: Phase 1A Project
Portland MSA	Portland-Vancouver-Hillsboro metropolitan statistical area

Acronym/Abbreviation	Definition
FAHP Programmatic	Endangered Species Act Programmatic Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Response for the Federal-Aid Highway Program in the State of Oregon
Project	Variable rate tolls on the Abernethy and Tualatin River Bridges and the toll-funded I-205 improvements between Stafford Road and OR 213
R1ACT	Region 1 Area Commission on Transportation
RBC	Risk Based Concentration
RFFA	reasonably foreseeable future action;
RTP	Regional Transportation Plan
SHPO	State Historic Preservation Office
TriMet	Tri-County Metropolitan Transportation District of Oregon
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
Value Pricing Feasibility Analysis	Portland Metro Area Value Pricing Feasibility Analysis
v/c	volume-to-capacity
VHT	vehicle hours traveled
VMT	vehicle miles traveled

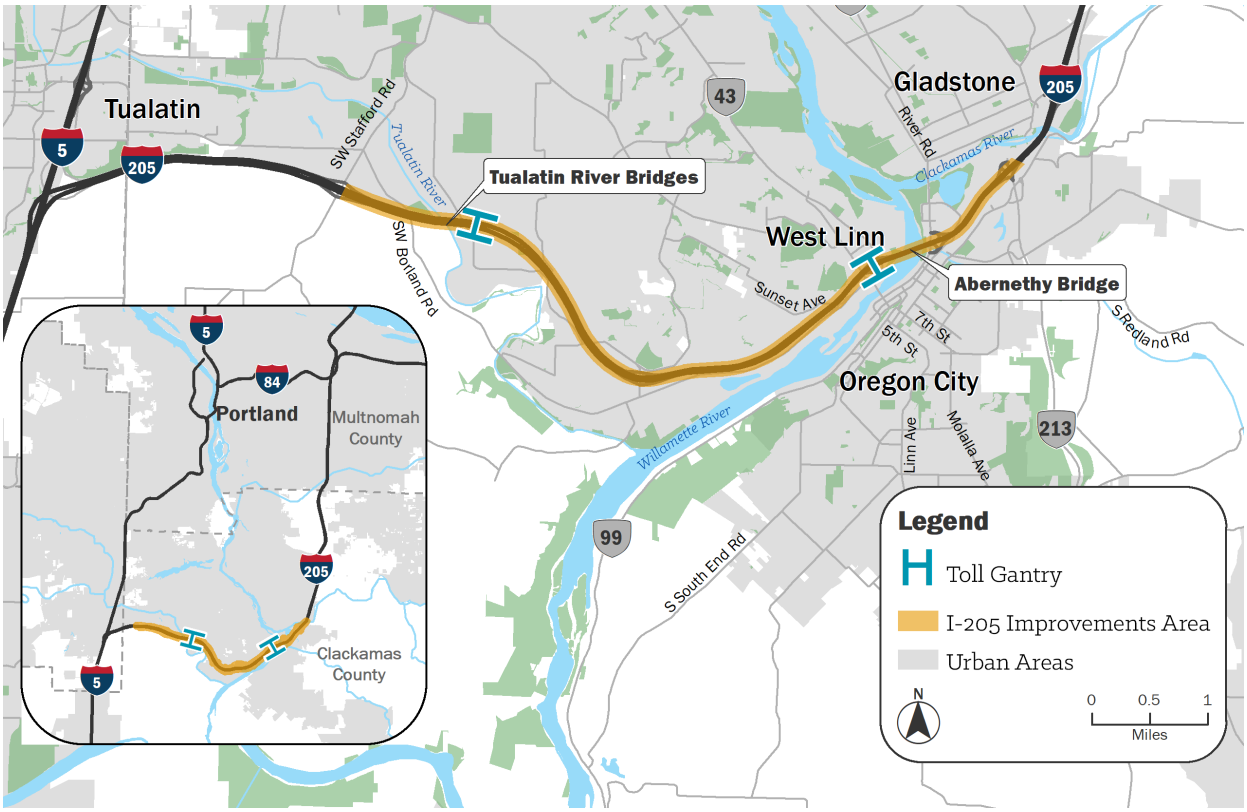
1 Introduction

The Oregon Department of Transportation (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, including seismic upgrades and widening, and to manage congestion. This Environmental Assessment, developed by ODOT in partnership with the Federal Highway Administration (FHWA), presents an evaluation of 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).

1.1 Location

The Project is located approximately 5 miles south of Portland, Oregon, and crosses through the jurisdictions of Oregon City, West Linn, and Clackamas County. The Project area is the segment of I-205 between Stafford Road and Oregon Route (OR) 213, as shown in Figure 1-1.

Figure 1-1. I-205 Toll Project Area



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

1.2 Background and Context

In 2016, the Oregon Governor's Transportation Vision Panel held regional forums across the state to better understand how the transportation system affects local economies. Participants consistently identified the negative effects of traffic congestion and the need for seismic preparedness as key issues in the Portland metropolitan area. Traffic congestion in the Portland metropolitan area creates challenges for commuters and businesses, and makes it difficult for producers across the state to move their goods into and through Portland in a predictable, reliable, and timely fashion (Transportation Vision Panel 2016). In addition, the region's aging roadway and bridge system makes it particularly vulnerable to the impacts of a major seismic event (Transportation Vision Panel 2016).

In 2017, the Oregon Legislature passed Oregon House Bill 2017, known as "Keep Oregon Moving." Oregon House Bill 2017 committed hundreds of millions of dollars to fund bottleneck relief highway projects, seismic improvements, freight rail enhancements, transit improvements, and upgrades to biking and walking facilities. The legislation also directed the Oregon Transportation Commission to pursue and implement value pricing[2] on I-5 and I-205 in the Portland metropolitan area to help manage traffic congestion. Oregon House Bill 3055, which the Oregon Legislature passed in 2021, further supported implementation of the Oregon Toll Program and related toll projects to manage congestion and raise revenue.

As directed by Oregon House Bill 2017 and the Oregon Transportation Commission, ODOT prepared the Portland Metro Area Value Pricing Feasibility Analysis (Value Pricing Feasibility Analysis) (ODOT 2018a), which determined that tolls could be used to help improve travel on I-5 and I-205 during peak times and raise revenue for congestion-relief projects. In December 2018, the Oregon Transportation Commission submitted a proposal to FHWA seeking approval to continue the process of implementing tolls on I-5 and I-205 (ODOT 2018a). The Oregon Transportation Commission then directed ODOT to meet the Oregon Legislature's directive and proceed with the NEPA process for tolling on I-5 and I-205 while addressing three priority issues identified during the public involvement process for the Value Pricing Feasibility Analysis:

- Impacts of tolling on communities experiencing low income
- The need for improved transit and other transportation choices
- The potential for highway pricing to cause traffic to divert to local streets

Consistent with this direction, ODOT is developing a statewide tolling program, the Oregon Toll Program, to manage congestion and raise revenue, starting with two toll projects: the I-205 Toll Project and the Regional Mobility Pricing Project. The I-205 Toll Project is the first of ODOT's toll projects to advance into the NEPA process and is seeking funding approval under the federal tolling authorization program codified in 23 U.S. Code Section 129 (Section 129).[3] The Regional Mobility Pricing Project is a separate

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[2] Value pricing, sometimes known as congestion pricing or variable rate tolling, is a strategy that charges higher fees to use roads or bridges during "rush hour" in an effort to shift trips to less congested times of day.

[3] The Section 129 General Tolling Program allows public agencies to impose new tolls on federal-aid highways for initial construction of a new highway, bridge or tunnel; initial construction of new lanes added to existing highways as long as the number of toll-free lanes is not reduced; and on the reconstruction or replacement of bridges, tunnels, and highways (FHWA n.d.-a).

toll project that would require authorization under the federal Value Pricing Pilot Program.[4] As part of the Oregon Toll Program, ODOT will deliver a recommendation to the Oregon Transportation Commission that addresses program-level strategies to promote equity and mobility. The Oregon Toll Program will also establish a toll collection system in accordance with nationally adopted interoperable protocols and procedures to process transactions, manage accounts, and provide services for customer relationship management and toll enforcement, as well as to support financial management, accounting, reporting, and auditing.

In addition to tolling, 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.[5]

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) (23 CFR 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.[6] 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.[7] 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 effects of the toll-funded

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4 Established in 1991, the Value Pricing Pilot Program is a federal program designed to demonstrate whether and to what extent roadway congestion may be reduced through congestion pricing strategies, and how these strategies may affect driver behavior, traffic volumes, transit ridership, air quality, and availability of funds for transportation programs. More information is available at https://ops.fhwa.dot.gov/congestionpricing/value_pricing/.

5 More details about design alternatives considered for each component of the improvements can be found in the *Proof of Concept Report* (HDR 2017) and the *Cost-to-Complete Report for the Combined Interstate 205 Abernethy Bridge and Widening Projects* (HDR 2018a).

6 Federal regulations require that transportation projects be formally included in state and/or regional long-term transportation plans prior to receiving NEPA approvals.

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

improvements are analyzed in this EA. Section 2.1.2, Build Alternative, provides a more detailed description of these toll-funded improvements to I-205.

1.3 Purpose

The purpose of the Project is to use variable-rate tolls on the I-205 Abernethy Bridge and Tualatin River Bridges to raise revenue for construction of planned improvements on I-205 from Stafford Road to OR 213 and to manage congestion.

1.4 Need

1.4.1 Critical Projects Need Construction Funding

Toll revenue is needed to fund construction of critical projects.[8] Available funding for transportation has not kept pace with the cost of maintaining the transportation system or the cost of construction of new transportation and congestion-relief projects. ODOT's transportation funding originates from a mix of state (approximately 77%) and federal (approximately 23%) sources (ODOT 2022a). The State Highway Fund relies on a three-pronged approach: the gas tax, weight-mile tax, and driver and motor vehicle fees. The Federal Highway Trust Fund is funded primarily by federal fuel taxes. These state and federal funding sources have not been adjusted to reflect increasing construction costs, rising inflation, a more fuel-efficient vehicle fleet, and growing transportation infrastructure demand. Despite recent federal investments in transportation infrastructure, including the Infrastructure Investment and Jobs Act of 2021, federal funding has not kept pace with rising transportation costs over the last several decades (Congressional Budget Office 2020). The federal gas tax has not been adjusted since October 1993, and federal funds have been supplemented by increasing state-based contributions including from sources outside of state fuel taxes (Oregon Legislative Revenue Office 2022). At the state level, escalating expenditures to maintain aging infrastructure, the need to perform seismic upgrades for Oregon's bridges, and rising construction costs have increased financial needs. ODOT must explore every possible method for getting the most out of its existing infrastructure, funding projects to ease congestion, and planning for increased earthquake resiliency.

1.4.2 Traffic Congestion Results in Unreliable Travel

On I-205, daily vehicle hours of delay increased by 25% in each direction from 2015 to 2017, indicating that the extent and duration of congestion on I-205 continues to increase and that travel continues to become less and less reliable (ODOT 2018b). Congestion conditions contribute to travel-time predictability issues, which result in significant delays to passenger and freight traffic. I-205 northbound has one of the lowest operating speeds in the region, one of the largest deteriorations of speed during peak hours, and the most congested conditions during the PM peak period. This additional traffic and congestion make it more challenging for travelers to get to work and other appointments on time (HDR 2018b).

In 2018, on average, more than 100,000 vehicles used the section of I-205 between Stafford Road and OR 213 each day (ODOT 2019). For most of its 26.5-mile length, I-205 is six lanes (three through lanes in each direction). The only remaining four-lane section is from Stafford Road to OR 99E. The transition from a six-lane to a four-lane section creates a bottleneck, which results in congestion and causes crashes (ODOT 2013a; HDR 2018a). Northbound I-205 from I-5 to the Abernethy Bridge has been

[8] The Oregon Constitution (Article IX, Section 3a) specifies that revenues collected from the use or operation of motor vehicles is to be spent on roadway projects, which could include construction or reconstruction of travel lanes, as well as bicycle and pedestrian facilities or transit improvements in or along the roadway.

identified as one of the region's top recurring bottlenecks during the evening commute. In 2017, this section of I-205 experienced 3.5 hours of congestion in the evening, from 2:45 p.m. to 6:15 p.m. Southbound I-205 from OR 213 to the Abernethy Bridge experienced over 3 hours of congestion in the morning, from 6 a.m. to 9:15 a.m. (ODOT 2018b). In total, the section of I-205 between Stafford Road and OR 213 experienced approximately 6.75 hours of congestion daily.

The coronavirus pandemic (COVID-19) dramatically altered traffic levels in 2020 as this Environmental Assessment analysis was starting, but pre-COVID-19 pandemic traffic congestion has largely returned (ODOT 2021a). The existing and future traffic conditions analyzed in this Environmental Assessment reflect adjustments for pre-COVID-19 pandemic conditions, as described in Appendix C, *I-205 Toll Project Transportation Technical Report*.

The population of the Portland metropolitan area is expected to grow from 2.5 million residents in 2018 to over 3 million in 2040 (23%) and over 3.5 million in 2060 (43%), further exacerbating existing congestion problems (Census Reporter 2018; Metro 2016).

1.4.3 Traffic Congestion Affects Freight Movement

Movement of people and goods is critical to support a growing economy. Freight tonnage in the Portland metropolitan area is expected to double by 2040, with 75% of total freight tonnage moved by truck (Metro 2018a). I-205 is a designated north–south interstate freight route in a roadway network that links Canada, Mexico, and major ports along the Pacific coast. Trucks represent 6% to 9% of total traffic on I-205 (ODOT 2018b).

Congestion on I-205 affects the ability to deliver goods on time, which results in increased costs and uncertainty for businesses. The cost of congestion on I-205 increased by 24% between 2015 and 2017, increasing to nearly half a million dollars each day in 2017 (ODOT 2018b). Increasing congestion and demand for goods will result in more delay, costs, and uncertainty for all businesses that rely on I-205 for freight movement.

1.4.4 Traffic Congestion Affects Safety

The majority of crashes on I-205 result from congestion (70 percent related to rear-end crashes and another 18 percent related to sideswipe and/or overtaking). Most of these crashes occurred during peak commute periods (HDR 2018b). I-205 in the Project area has numerous sites that rank in the top 5 or 10 percent of sites according to 2019 data from the Safety Priority Index System (SPIS), ODOT's systematic scoring method for identifying potential safety problems on state highways based on the frequency, rate, and severity of crashes (ODOT n.d.-a). This ranking means that those sites have higher than typical crash histories and are considered priorities for potential safety improvement projects.

1.4.5 Traffic Congestion Contributes to Climate Change

Greenhouse gas emissions from cars and trucks represented 39% of total statewide emissions in 2016 (Oregon Global Warming Commission 2018). Idling vehicles in congested conditions contribute to these emissions (U.S. Department of Energy 2015). Combined idling from heavy-duty and light-duty vehicles consumes about 6 billion gallons of fuel annually in the United States, generating about 30 million tons of carbon dioxide emissions each year from personal vehicles (U.S. Department of Energy 2015). In March 2020, the Governor of Oregon signed an executive order to reduce greenhouse gas emissions 45% below 1990 levels by 2035 and 80% below 1990 levels by 2050 (State of Oregon 2020a).

1.4.6 Oregon's Highway System is Not Seismically Resilient

There is a 30% chance that a Magnitude 8.0+ earthquake will occur in Oregon within the next 50 years. Most bridges in western Oregon will suffer serious damage or destruction in such a major seismic event because they were built before the existence of modern seismic codes (ODOT 2014). Transportation infrastructure resilience is one of the primary components required for an effective recovery following a major natural disaster. ODOT has designated I-205 as a statewide north-south lifeline route, which means it must be operational quickly after a disaster renders other roadways unusable or impassable. As a lifeline route, I-205 could be the only connection between Oregon and Washington in the event of an earthquake and would serve as a critical route to provide supplies and services to the region. The I-205: Phase 1A Project, currently under construction, includes reconstruction of the Abernethy Bridge to achieve seismic design requirements to withstand the Cascadia Seismic Event. However, eight additional bridges on I-205 in the Project area do not meet current seismic design criteria and could collapse in a significant seismic event.

1.5 Goals and Objectives

The Project's goals and objectives are desirable outcomes beyond its purpose and need. The following goals and objectives reflect input collected during summer-fall 2020 engagement for the tolling aspects of the Project and from the Value Pricing Feasibility Analysis Policy Advisory Committee, partner agencies, the Equity and Mobility Advisory Committee, and other Project stakeholders (see Chapter 4 for more information on engagement with these groups).

Past land use and transportation investments have resulted in negative cultural, health, and economic effects on local communities and populations, and have disproportionately affected historically and currently excluded and underserved communities.[9] Additionally, these communities are often left out of transportation planning and decision-making processes. These practices, along with more recent gentrification in Portland and surrounding cities, have resulted in a mismatch between job locations and housing in areas with few transportation options. ODOT will continue to engage communities who use or live near the segment of I-205 between Stafford Road and OR 213, especially those that have been historically and are currently excluded and underserved, in participation throughout the Project design, development, implementation, monitoring, and evaluation processes.

With input from the Equity and Mobility Advisory Committee, ODOT is prioritizing equity throughout the Project development process. The goals and objectives listed below reflect this priority:

- **Goal: Provide benefits for historically and currently excluded and underserved communities.**
  - Maximize benefits and minimize burdens associated with implementation of the Project.
  - Support equitable and reliable access to job centers and other important community places, such as grocery stores, schools, and gathering places.
  - Support equitable and reliable access to health-promoting activities (e.g., parks, trails, recreation areas) and health care clinics and facilities.
  - Design the toll system to support travel options for people experiencing low incomes.

[9] As defined in the Oregon Toll Program's Equity Framework (ODOT 2020c), these communities include people experiencing low-income or economic disadvantage; Black, Indigenous and people of color; older adults and children; persons who speak non-English languages, especially those with limited English proficiency; persons experiencing a disability; and other populations and communities historically excluded from and underserved by transportation projects.

- **Goal: Limit additional traffic diversion from tolls on I-205 to adjacent roads and neighborhoods.**
  - Design the toll system to limit rerouting from tolling.
  - Design the toll system to minimize impacts on quality of life factors, such as health, noise, safety, job access, travel costs, and environmental quality for local communities from traffic rerouting.
- **Goal: Support safe travel regardless of mode of transportation.**
  - Enhance vehicle safety on I-205 by reducing congested conditions.
  - Support safe multimodal travel options (e.g., pedestrians, bicycles, transit, automobiles) on roadways affected by tolling.
- **Goal: Contribute to regional improvements in air quality and support the State's climate change efforts.**
  - Support reduced vehicle air pollutants and greenhouse gas emissions in the Portland metropolitan area through reducing congestion, resulting in more consistent vehicle speeds, less vehicle idling, and fewer overall motor vehicle emission hours on I-205 and on local roadways affected by tolling.
  - Reduce localized air pollutants through reduced congestion and improved travel efficiency, particularly in community areas where pollutants may be concentrated due to traffic congestion.
- **Goal: Support multimodal transportation choices**.
  - Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (e.g., transit, walk, bike, telework).
  - Collaborate with transit providers to support availability and enhancements of transit and other transportation services along I-205, especially for historically and currently excluded and underserved communities.
- **Goal: Support regional economic growth**.
  - Provide for reliable and efficient regional movement of goods and people along I-205.
  - Provide for reliable and efficient movement of goods and people on local roadways affected by tolling.
  - Improve regional access to jobs and employment centers, especially for historically and currently excluded and underserved communities.
- **Goal: Support management of congestion and travel demand.**
  - Design the toll system to improve efficient use of roadway infrastructure and improve travel reliability.
- **Goal: Maximize integration with future toll systems.**
  - Design a toll system that can be expanded in scale, integrated with tolling on other regional roadways, or adapted to future toll system applications.
- **Goal: Maximize interoperability with other transportation systems.**
  - Design a toll system that is interoperable with other transportation systems in the region.

1.6 Next Steps

The following are next steps for the Project:

- Public and agency review of this Environmental Assessment during the public comment period from February 21, 2023 to April 7, 2023 (45 days).
- Preparation of a Revised Environmental Assessment that includes FHWA's and ODOT's responses to public and agency comments on the Environmental Assessment, additional environmental studies to address comments (if needed), and refinement of environmental commitments to mitigate Project impacts.

- FHWA determination of whether the Project would have significant adverse effects on the human and natural environment and whether additional environmental analysis in an Environmental Impact Statement is needed; or the Project's effects (considering mitigation commitments) warrant a Finding of No Significant Impact (FONSI). If a FONSI is issued, it would include FHWA's conclusion that the Project would not create significant adverse effects and would identify ODOT's mitigation commitments.
- Rulemaking process to implement Oregon Transportation Commission toll policy decisions. Oregon Transportation Commission will set toll rates about 6 months prior to toll implementation.
- Final design, construction, and implementation of the Project, following completion of the NEPA process.

2 Project Alternatives

2.1 Alternatives Assessed in this Environmental Assessment

ODOT evaluated two alternatives in this Environmental Assessment:

- No Build Alternative
- Build Alternative

Figure 2-1 depicts the proposed lane configuration of I-205 through the Project area, and major elements to be constructed under the No Build Alternative and Build Alternative.

2.1.1 No Build Alternative

National Environmental Policy Act 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.

2.1.2 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 (shown in Figure 2-2 and Figure 2-3), and replacement of or seismic upgrades to multiple bridges along I-205.

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

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

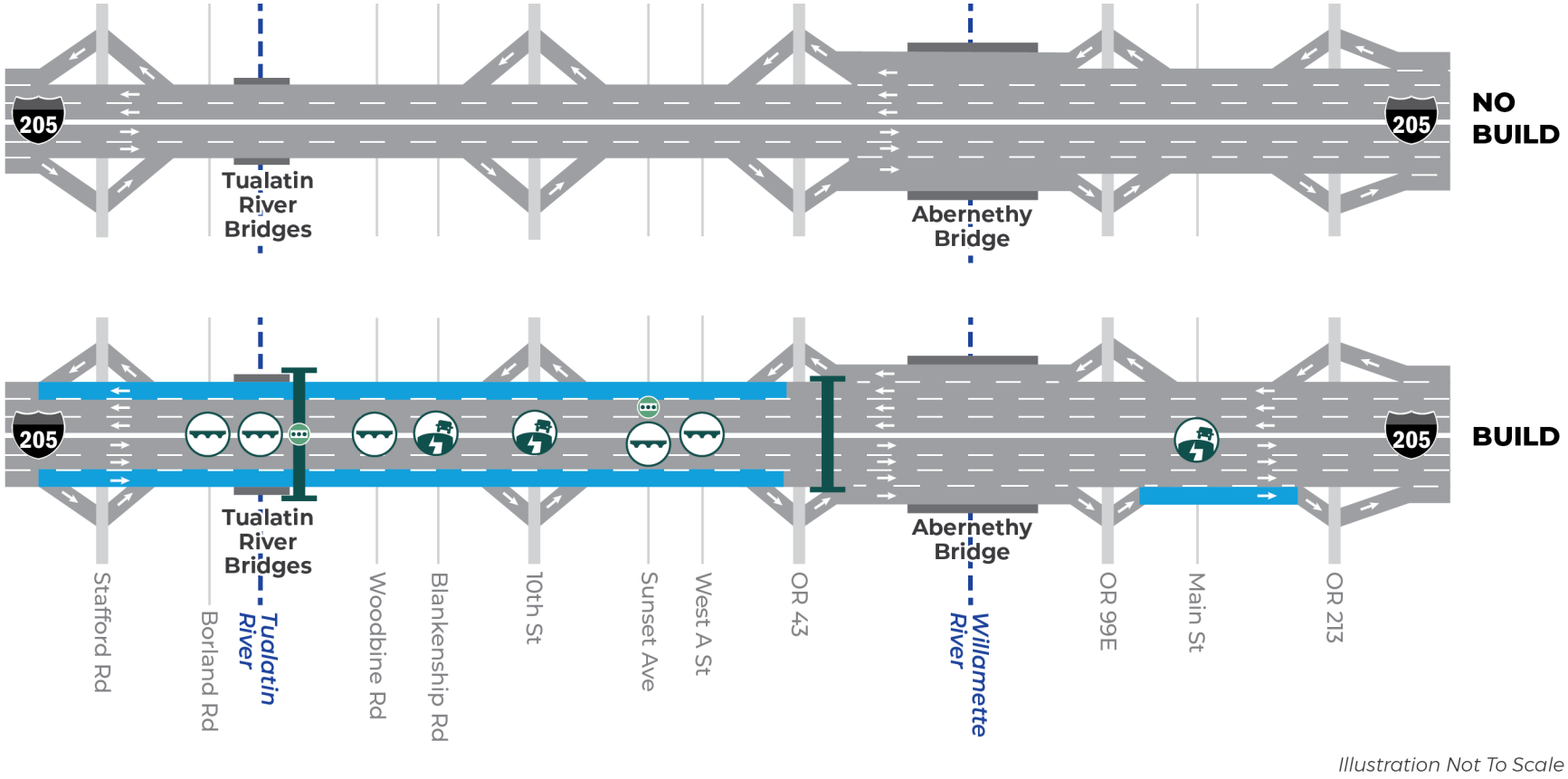
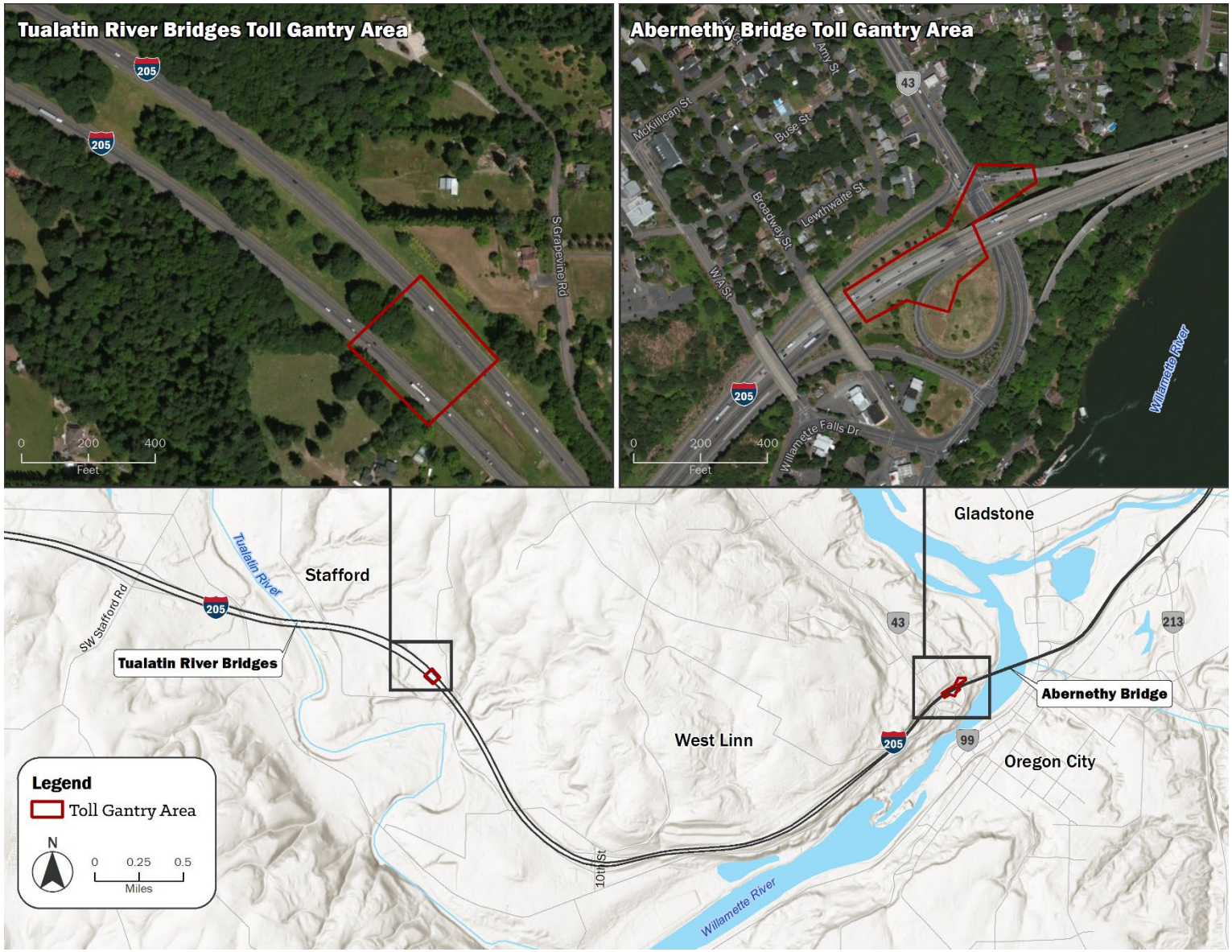


Figure 2-2. Build Alternative: Bridge Tolls – Abernethy Bridge and Tualatin River Bridges



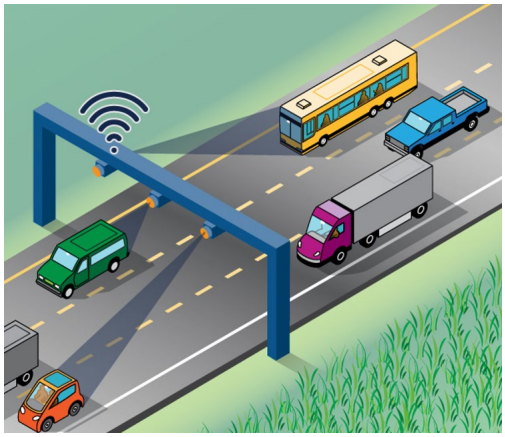
Bridge Tolls – Abernethy and Tualatin River Bridges

Two areas have been identified for placement of the toll gantries and supporting infrastructure (see Figure 2-2). The gantries and supporting infrastructure would be located entirely within the existing I-205 right-of-way.

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.

The I-205 toll system would be designed to be nationally interoperable. Transponders for tolling systems elsewhere in the country could be used to collect tolls on I-205, and drivers with an Oregon Toll Program transponder could use their transponder and associated account to pay tolls in other states. Owners of vehicles with out-of-state license plates and no transponder would receive an invoice for tolls on I-205 in the same way as those with Oregon plates.

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 be consistent with other improvements to I-205 included in the Project. The final structure type and design would be determined during 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 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 the 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 also provide a sustainable source of revenue for ongoing corridor operations and maintenance as well as 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.

The effects analysis presented in this Environmental Assessment assumes that all vehicles would be charged the same toll rate. However, because some effects could be sensitive to the mix of vehicle types (i.e., volumes of passenger vehicles and trucks), analysts examined the effects of a higher toll rate for medium and heavy trucks on traffic and how it could affect air quality, energy consumption and greenhouse gas emissions, and economic effects.[10] Appendix C2, *I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Transportation Effects*; Appendix D2, *I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Air Quality Effects;* Appendix E1, *I-205 Toll Project Truck Toll Multiplier Sensitivity*

[10] Medium trucks are defined as single-unit trucks (i.e., no trailer) weighing 14,001 to 33,000 pounds. Heavy trucks are defined as those pulling one or more trailers and weighing more than 33,000 pounds. These definitions come from the Oregon Metro Regional Transportation Demand Model (Metro 2020) based on FHWA vehicle classifications.

Analysis – Energy and Greenhouse Gas Effects; and Appendix F1, *I-205 Toll Project Truck Toll Multiplier Sensitivity Analysis – Economics Effects*, provide the results of these analyses.

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).

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

Reconstructed and replaced bridges would be designed to remain operational after the anticipated Magnitude 8+ Cascadia Subduction Zone Earthquake and to avoid collapse after a 1,000-year return period earthquake (ODOT 2018b).

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 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.[11]

- 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

[11] Originally, seismic upgrading (reconstruction) was considered for all 13 of the I-205 bridges; however, during the preliminary analysis process, it was determined that widening I-205 would require rebuilding replacement of the West A Street and Sunset Avenue bridges due to column conflicts with the location of the new lanes. In addition, replacements would be less costly than seismic upgrading retrofitting and widening the Borland Road, Tualatin River, and Woodbine Road bridges due to the cost of foundation retrofits upgrades and long-term maintenance (ODOT 2018b).

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-205would be removed to enhance the function of the OR 43 interchange.

Traveler Information Signs (Active Traffic Management Improvements)

Traveler information signs would be constructed as a part of the Project. A variable message sign would be installed on I-205 northbound at M.P. 4.26, just south of the Johnson Road bridge over I-205 on a new cantilever sign structure, and three variable advisory speed signs would be mounted on each side of the realigned Sunset Ave bridge over I-205.

Additional Improvements

The Build Alternative could result in traffic rerouting from I-205 with the implementation of tolling. Chapter 3 describes potential mitigation measures that would reduce the effects of rerouting. These measures could become part of the Build Alternative. ODOT will continue to coordinate with partner agencies to determine appropriate mitigation measures in the affected communities. Through this coordination effort and public comment on this Environmental Assessment, ODOT will finalize and present its mitigation commitments in the Revised Environmental Assessment.

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.

In-water work would be required to replace the bridges over the Tualatin River. Temporary piles in the Tualatin River would be required to support work bridges and would occupy approximately 3,000 square feet. The piles would be removed after bridge construction, and the area would be expected to return to pre-construction conditions. Installation of drilled shafts would be needed for the new bridge piers. Drilled shafts would be constructed using fully cased excavations. Other areas of excavation performed within the Tualatin River would likely be contained within a cofferdam during construction.

Widening activities would require removal of additional rock along a portion of the existing rock slope adjacent to northbound I-205 in West Linn from the Broadway Bridge (MP 8.69) to southwest of the Sunset Avenue Bridge (MP 8.38). Blasting would be required to move the rock cut face 35 to 40 feet south of the existing rock face for a total length of approximately 2,565 feet.

Anticipated Permits and Approvals

Table 2-1 lists the anticipated local, state, and federal environmental permits, clearances, and approvals for Project construction.

Table 2-1. List of Anticipated Environmental Permits and Approvals

Permit or Approval	Required	Description
City of West Linn Water Resource Area (WRA) Permit	Yes	Required for any development in WRAs. WRAs include wetlands, streams, and Significant Riparian Corridors.
City of West Linn Habitat Conservation Area (HCA) Review	Yes	Required for any disturbance to HCAs. HCAs are associated with wetlands, waters, and upland habitats.
Clackamas County Noise Variance	To be determined	Required for nighttime construction per Clackamas County Code Chapter 6.05 Noise Control (Clackamas County 2000).
Clackamas County Water Environment Services Wetland and Stream Buffer Variance	Yes	Required for any disturbance to wetlands and streams and their associated buffers. Wetland and streams are mapped along and across I-205. Buffers are determined during land use permitting.
Clackamas County Water Environment Services HCA Development Permit	Yes	Required for any disturbance to HCAs. HCAs are mapped along and across I-205 and are associated with wetlands, waters, and upland habitats.
Clackamas County Water Environment Services Floodplain Development Permit	Yes	Required for development within the Tualatin River floodplain.
National Marine Fisheries Service/U.S. Fish and Wildlife Service Section 7/Endangered Species Act	Yes	Required for impacts on Endangered Species Act listed salmonid species.
Oregon Department of Fish and Wildlife Fish Passage Plan	Yes	Required to comply with OAR 635-412-005 for the replacement of the I-205 bridges over the Tualatin River.
Oregon State Historic Preservation Office Section 106 Review	Yes	Required when a federal action has the potential to affect historic resources listed, eligible for listing, or potentially eligible for listing on the National Register of Historic Places, in compliance with the National Historic Preservation Act.
US Army Corps of Engineers Section 404 Permit; Oregon Department of State Lands Removal-Fill Permit; Oregon Department of Environmental Quality 401 Water Quality Certification	Yes	Required for impacts on jurisdictional wetlands and waters.

HCA = Habitat Conservation Area; I- = Interstate; OAR = Oregon Administrative Rule; OR = Oregon Route; WRA = Water Resource Area

2.2 Alternatives Considered but Not Advanced

In 2020, ODOT identified and evaluated five alternatives for tolling I-205 between the Stafford Road and OR 213 interchanges to manage congestion and raise revenue for congestion-relief projects. These alternatives—identified as Alternatives 1, 2, 3, 4, and 5—represented location options where tolls would be charged (toll gantries) and different methods for assessing tolls (e.g., single point, segment-based, and zonal). ODOT evaluated each tolling alternative based on the alternative's ability to manage demand on I-205 and limit rerouting to nearby roadways while generating revenue. Each of the alternatives assumed completion of the planned I-205 improvements.

Sections 2.2.1 through 2.2.4 summarize the alternatives for tolling that were initially considered but not advanced for study in this Environmental Assessment (identified as Alternatives 1, 2, 4, and 5 in Appendix A, *Comparison of I-205 Screening Alternatives Technical Report*) and the reasons ODOT did not move forward with these alternatives.

Appendix A provides a more detailed analysis of tolling alternatives.

2.2.1 Alternative 1: Abernethy Bridge Toll

Under Alternative 1, vehicles would be assessed a toll to cross the Abernethy Bridge in any direction at a single toll gantry on I-205 (Figure 2-4). Toll-funded improvements to I-205 would be the same under Alternative 1 as the Build Alternative. Because Alternative 1 would toll trips at one location, it would be less effective at managing broader traffic congestion on I-205 between Stafford Road and OR 213 and generating revenue to fund improvements. Having a single toll point on the Abernethy Bridge would also result in substantially higher traffic volumes throughout the day near Oregon City due to traffic rerouting to avoid the toll. For these reasons, ODOT did not advance Alternative 1 for further study.

Figure 2-4. Alternative 1: Abernethy Bridge Toll

2.2.2 Alternative 2: Abernethy Bridge Toll with Off-Bridge Gantries

Representing a refinement of Alternative 1, Alternative 2 would charge drivers a single toll for crossing the Abernethy Bridge. However, this alternative would include tolling points both on approaches to the Abernethy Bridge (south of OR 43 and north of OR 99E) and on the bridge itself (Figure 2-5). Vehicles would not be assessed separate tolls upon passing each gantry; rather, the additional gantries located on the approaches would determine if a vehicle has traversed the bridge or made a trip that would have otherwise occurred on the bridge (i.e., the vehicle exited I-205 at OR 43 or OR 99E, crossed the Oregon City Arch Bridge, and then re-entered I-205 on the other side of the Willamette River). Toll-funded improvements to I-205 would be the same under Alternative 2 as the Build Alternative.

As with Alternative 1, because Alternative 2 would only toll trips at one general location (on or near the Abernathy Bridge), it would be less effective at managing broader traffic congestion on I-205 between Stafford Road and OR 213 and generating revenue to fund improvements compared to alternatives that would toll trips at more than one general location. Although the multiple toll points could somewhat reduce rerouting compared to Alternative 1, Alternative 2 would also result in substantially higher traffic volumes throughout the day near Oregon City due to traffic rerouting to avoid the toll. For these reasons, ODOT did not advance Alternative 2 for further study.

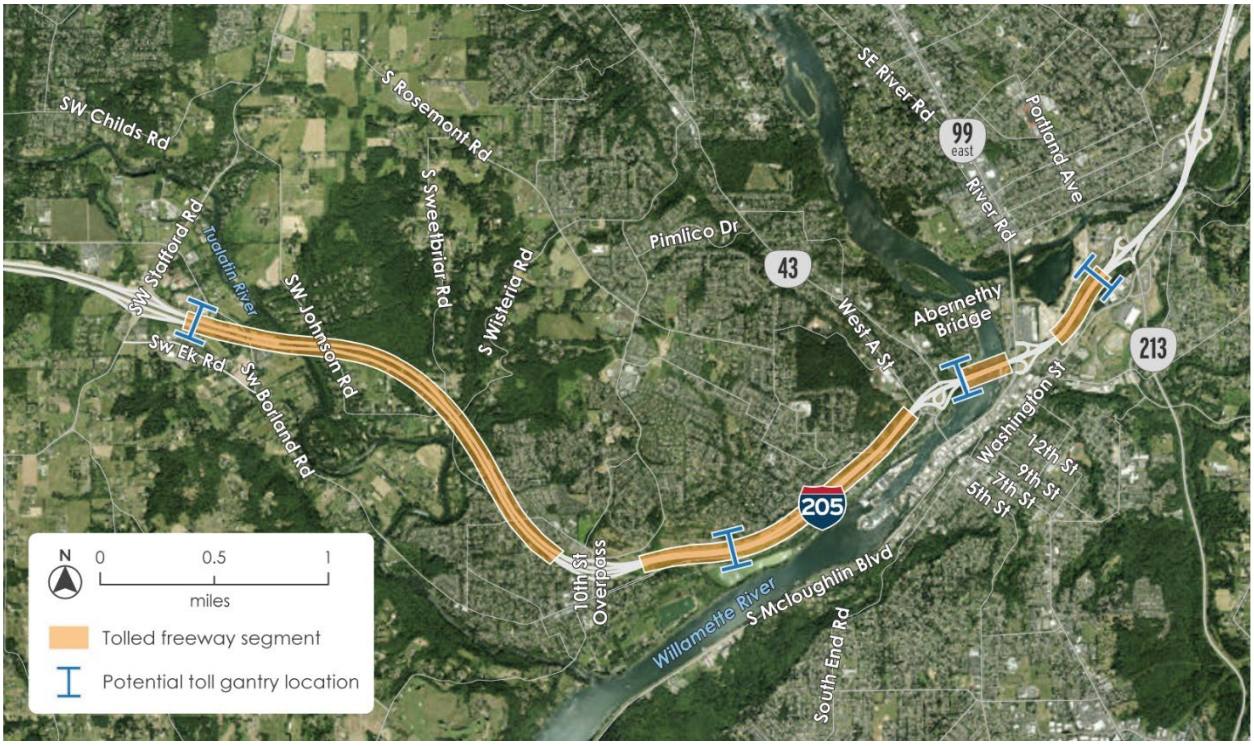
Figure 2-5. Alternative 2: Abernethy Bridge Toll with Off-Bridge Gantries

2.2.3 Alternative 4: Segment-Based Tolls – Between Stafford Road and OR 213

Alternative 4 would toll four segments of I-205: between Stafford Road and 10th Street, 10th Street and OR 43, the Abernethy Bridge (between OR 43 and OR 99E), and OR 99E to OR 213 (Figure 2-6). Vehicles would be assessed a toll for each segment traveled for a total of up to four segments. This alternative would rely on mainline toll gantries and distribute the total toll assessed for trips over multiple tolling points. Toll-funded improvements to I-205 would be the same under Alternative 4 as the Build Alternative.

After the screening process in March 2021, ODOT recommended moving forward with both Alternatives 3 and 4 for evaluation in this Environmental Assessment. Subsequently, ODOT decided not to advance Alternative 4 because, unlike Alternative 3, it is not eligible for funding approval under the federal tolling authorization program codified in 23 U.S. Code Section 129 (Section 129). Section 129 clearly defines requirements for federal approval that yield a proven, expeditious, and predictable process under which ODOT may rely upon the outcome – an important factor given that toll revenue is required to fund construction of the planned improvements to I-205 included in the Build Alternative. Alternative 4 would not be eligible for funding approval under Section 129 because all of the mainline toll gantries would be associated with I-205 roadway segments and would not be associated with construction or reconstruction of bridges along I-205. Therefore, Alternative 4 would not meet the requirements under Section 129.

Figure 2-6. Alternative 4: Segment-Based Tolls – Between Stafford Road and OR 213



2.2.4 Alternative 5: Single-Zone Toll – Between Stafford Road and OR 213

Alternative 5 would use a single-zone toll structure, where any vehicles entering the tolled zone on I-205 between Stafford Road and OR 213 would be assessed the full amount of the toll regardless of distance traveled (Figure 2-7). Alternative 5 could include mainline toll gantries as well as ramp-based gantries, such that the gantries would be at each entry point within the toll zone. This alternative would minimize undesirable rerouting patterns by removing the financial incentive for some vehicles to exit I-205 earlier (or enter later) in their trip than they otherwise might with a toll in place. The toll-funded improvements on I-205 under Alternative 5 would be the same as the Build Alternative.

ODOT did not advance this alternative for further study because the single-zone toll structure would provide limited flexibility in managing traffic congestion, leading to a greater concentration of rerouted traffic east of Stafford Road and in Gladstone, and would be more challenging to scale to other segments of I-205 or other state highways. Net toll revenues for Alternative 5 would be lower than any alternative except Alternative 1. Furthermore, Alternative 5 would not likely be eligible for funding approval under the federal tolling authorization program codified in Section 129 because all of the proposed mainline toll gantries would not be associated with construction or reconstruction of bridges along I-205.

Figure 2-7. Alternative 5: Single-Zone Toll – Between Stafford Road and OR 213

3 Affected Environment, Environmental Consequences, and Mitigation

This chapter describes the environmental features and resources that would be affected by the Build Alternative. Sections 3.1 through 3.14 include descriptions of the area of potential impact (API) for each resource topic, existing environmental conditions (Affected Environment), the short-term and long-term impacts and benefits of the Build Alternative compared to the No Build Alternative (Environmental Consequences), and the actions ODOT would take to avoid, minimize, or mitigate Project impacts (Avoidance, Minimization and/or Mitigation Measures). Section 3.15 presents the cumulative impacts that would result from implementation of the Build Alternative when considered with other past, present, and reasonably foreseeable future actions.

The information in this chapter is derived from the technical reports and memorandums presented in Appendices C through Q of this Environmental Assessment. For information on the methods of analysis, relevant regulations and guidance, data sources, model results, and other details of the analyses, please refer to Appendices C through Q as cited in Sections 3.1 through 3.15.

3.1 Transportation

3.1.1 Affected Environment

The transportation API, shown in Figure 3-1, generally extends along I-205 from the I-5 interchange[12] near Tualatin to the SE 82nd Drive interchange near Gladstone and extends south along OR 99E about 10 miles to Aurora. The analysis focuses on key roadways, referred to in this Environmental Assessment as study corridors, in the I-205 vicinity and 50 study intersections that would potentially experience differences in AM or PM peak-hour traffic volumes under the Build Alternative compared to the No Build Alternative. Chapter 3 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides a more detailed description of the API and methodology used for the analysis.

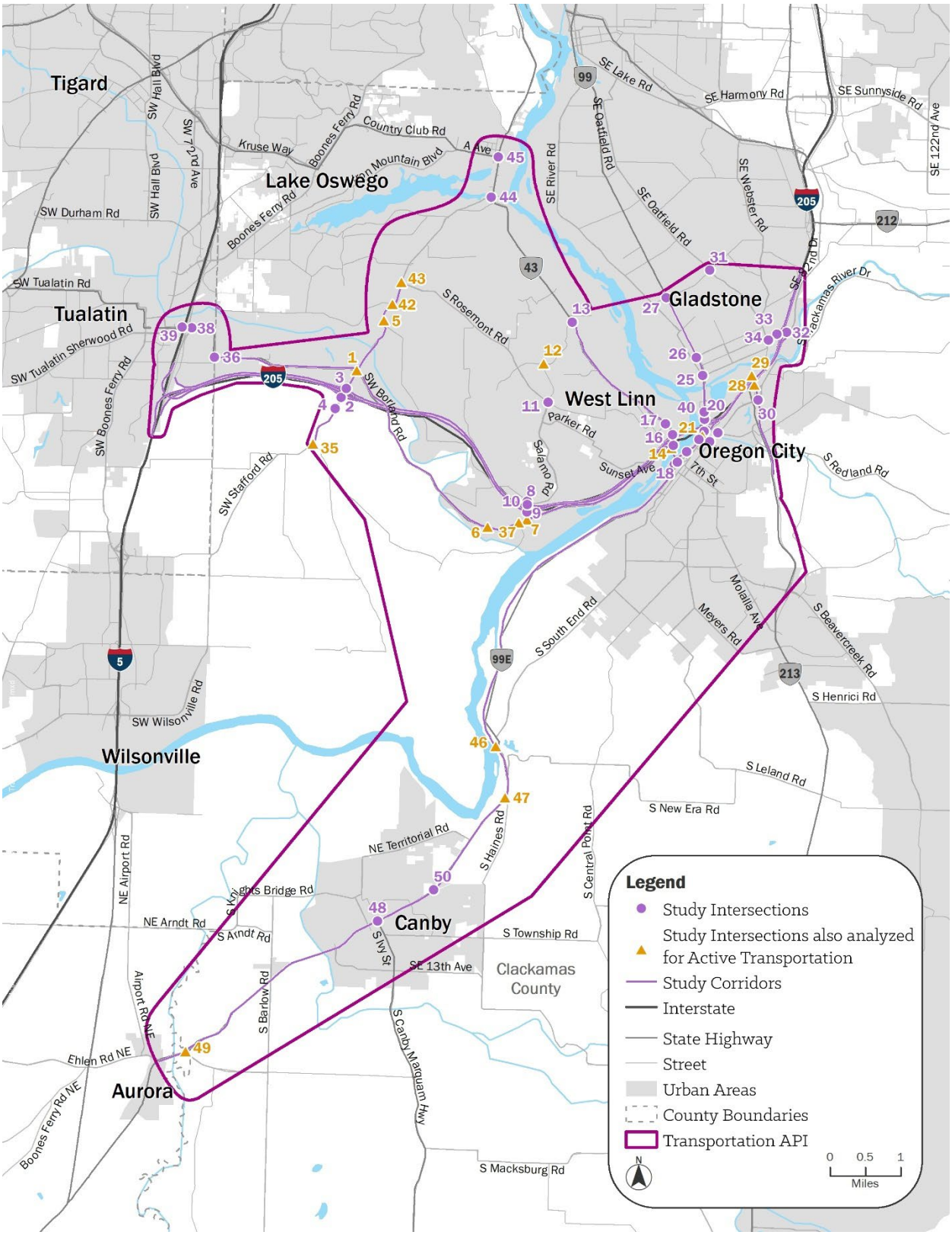
Existing Travel Patterns

Most I-205 travelers in the API currently originate from the nearby areas of Gladstone (12%), West Linn (10%), Oregon City (8%), and Clackamas (8%). Fewer travelers come from areas farther away, including approximately 3% from Clark County, Washington. About 25% of I-205 trips in the API are through trips, and about 75% are local trips, meaning they enter and/or exit I-205 at one of the five interchanges in the API.

When there is traffic congestion on I-205, some travelers currently reroute to local roads to avoid traffic. For example, an estimated 20% to 30% of travelers using northbound I-205 to get to the Oregon City Arch Bridge take alternative roads during the PM peak period (4 p.m. to 6 p.m.) to reach the bridge. The proportion of travelers who reroute from I-205 to local routes may be greater than 50% for some travel patterns. The most frequent rerouting routes include SW Borland Road, Willamette Falls Drive, SW Stafford Road, and OR 99E.

[12] A relatively small portion of I-5 was included within the API because most sections of I-5 would not experience substantial differences in traffic volumes between the No Build and Build Alternatives, as detailed in the *I-205 Toll Project Transportation Technical Report*.

Figure 3-1. Transportation Area of Potential Impact



Traffic Volumes

Figure 3-2 presents the 2019 (pre-pandemic year) average weekday (Tuesday, Wednesday, and Thursday) daily traffic volumes for I-205 and surrounding roadways in the API. I-5, OR 43, OR 213, and OR 99E carry the highest daily traffic volumes in the API aside from I-205. Both northbound and southbound I-205 in the API generally experience their highest weekday traffic volumes between approximately 7 a.m. and 9 a.m. and 4 p.m. and 6 p.m., but the peak volumes vary by direction and location. For example, at the Abernethy Bridge, the southbound direction (headed toward the I-5 interchange) has higher volumes in the AM peak period, while the northbound direction (headed toward Oregon City) has higher volumes in the PM peak period. Most of the 50 study intersections have peak traffic volumes from 7:45 a.m. to 8:45 a.m. and 5 p.m. to 6 p.m.

Traffic Operations

I-205 Operations

Analysts evaluated existing traffic operations using metrics such as volume-to-capacity (v/c) ratios,[13] level of service (LOS),[14] travel times, and reliability. Although all segments[15] on northbound and southbound I-205 in the API meet the ODOT v/c mobility standard during the AM peak hour and PM peak hour under existing year (2021) conditions, the following I-205 segments operate at LOS E or F (meaning highest congestion levels and delays):

- AM peak hour: Northbound I-205 between OR 213 and SE 82nd Drive.
- PM peak hour: Northbound I-205 from the 10th Street off-ramp to the on-ramp from SE 82nd Drive; southbound I-205 in areas where vehicles frequently change lanes (between OR 213 and OR 99E, and the merge from the OR 43 on-ramp).

Average weekday travel times for northbound I-205 between I-5 and SE 82nd Drive were approximately 8 minutes during the AM peak period (7 a.m. to 9 a.m.) and 18 minutes during the PM peak period (4 p.m. to 6 p.m.), based on recorded regional travel time data for June 2019. For southbound I-205 in the same location, travel times were approximately 18 minutes during the AM peak period and 13 minutes during the PM peak period. For reference, a trip at the speed limit between I-5 and SE 82nd Drive in either direction should take about 9 to 11 minutes.

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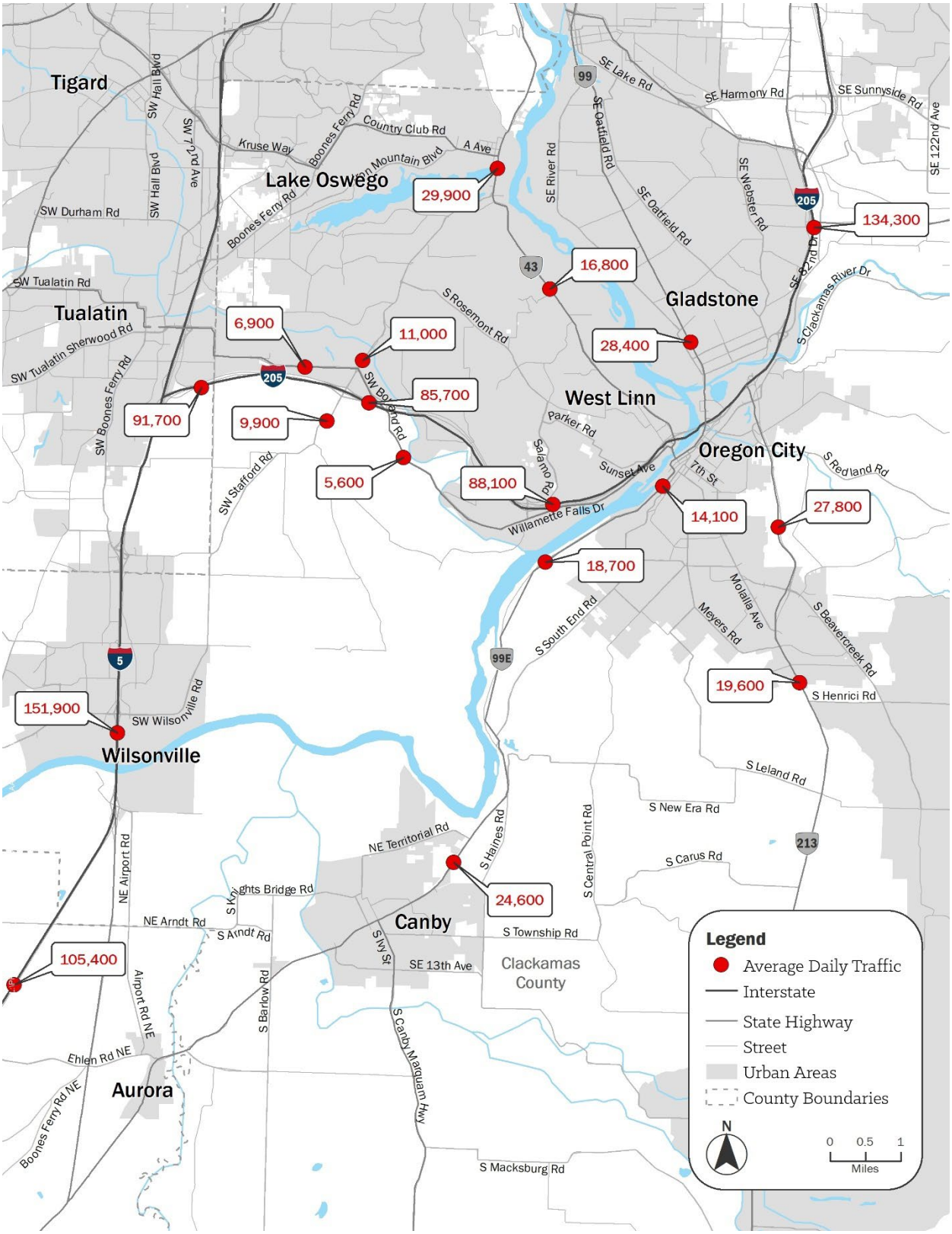
[13] Volume-to-capacity (v/c) ratios measure the level of congestion on a roadway or intersection by dividing the volume of traffic by the capacity of the facility in question. In general, a low v/c ratio indicates smooth operations and minimal delays. As the ratio approaches 1.0, congestion increases, and operational performance is reduced. At 1.0, the capacity is fully utilized (ODOT 2020d). ODOT and many local jurisdictions use v/c ratios to measure operational performance and set a mobility standard within which they want all of their relevant facilities to operate.

[14] Level of service (LOS) is a qualitative measure used to relate the quality of traffic flow on a roadway based on factors like vehicle speed and congestion. LOS uses letter "grades" of A through F, representing little to no delay and very high delays, respectively.

[15] Segment refers to particular portions of I-205 and other roadways studied in this analysis.

Figure 3-2. Pre-pandemic Year (2019) Average Weekday Daily Traffic Volumes in Area of Potential Impact and Surrounding Roadways



Source: Metro Regional Travel Demand Model

Analysts measured reliability of travel based on a buffer time analysis, which considers the time added to travel when conditions are uncertain.[16] On northbound I-205, average AM peak-period travel times were found to be highly reliable, whereas average PM peak-period travel times were found to be moderately reliable. On southbound I-205, although average AM peak-period travel times were longer than average PM peak-period travel times, the AM peak-period travel times were more reliable because they had less variation.

Intersection Operations

Analysts measured intersection performance based on existing mobility standards, which vary by jurisdiction, with some measured as v/c ratios and others measured as LOS. Of the 50 study intersections, 45 operate within identified mobility standards under existing year (2021) conditions during the AM peak hour and 40 operate within identified mobility standards under existing conditions during the PM peak hour. The following intersections currently fail to meet mobility standards:

- **AM Peak Hour**
  - The stop-controlled intersection at OR 43 and Willamette Falls Drive (No. 14 on Figure 3-1)
  - The stop-controlled intersection at OR 213 and I-205 southbound ramps (No. 29 on Figure 3-1)
  - The signalized intersection at OR 43 and McVey Avenue (No. 44 on Figure 3-1)
  - The stop-controlled intersection at OR 99E and S South End Road (No. 46 on Figure 3-1)
  - The stop-controlled intersection at OR 99E and S Lone Elder Road (No. 49 on Figure 3-1)
- **PM Peak Hour**
  - The stop-controlled intersection at OR 43 and Willamette Falls Drive (No. 14 on Figure 3-1)
  - The signalized intersection at OR 99E and I-205 southbound ramps (No. 20 on Figure 3-1)
  - The stop-controlled intersection at OR 213 and I-205 southbound ramps (No. 29 on Figure 3-1)
  - The signalized intersection at SE 82nd Drive and I-205 northbound ramps (No. 32 on Figure 3-1)
  - The signalized intersection at SE 82nd Drive and I-205 southbound ramps (No. 33 on Figure 3-1)
  - The stop-controlled intersection at 12th Street and Willamette Falls Drive (No. 37 on Figure 3-1)
  - The signalized intersection at McLoughlin Boulevard and 14th Street (No. 41 on Figure 3-1)
  - The stop-controlled intersection at SW Stafford Road and SW Childs Road (No. 42 on Figure 3-1)
  - The stop-controlled intersection at OR 99E and S South End Road (No. 46 on Figure 3-1)
  - The stop-controlled intersection at OR 99E and S Lone Elder Road (No. 49 on Figure 3-1)

Transit

Transit providers in the API include the Tri-County Metropolitan Transportation District of Oregon (TriMet), Canby Area Transit, South Clackamas Transportation District, and South Metro Area Transit. In addition, Clackamas Community College operates a shuttle service between its Oregon City campus and Clackamas Town Center. There are three park-and-ride lots in the API.

[16] Travel time reliability considers the range of potential travel times roadway users may experience, the consistency of travel times, and the ability of roadway conditions to provide a desired travel time. Buffer time is the additional travel time drivers would need to allocate beyond the average travel time to account for unexpected delays and to be on time 95% of the time. A highly reliable travel time means that travelers would not need to add time beyond the average travel time. A moderately reliable travel time means that travelers would need to add about 50% more time beyond the average travel time (e.g., for a 20-minute average travel time, a traveler should budget an additional 10 minutes). Reliability is particularly important for roadway users who need to ensure that they arrive at their destinations by a given time (e.g., needing to be at work by a certain time, or for truck freight haulers who need to deliver their goods by a certain time).

The eastern portion of the API (Oregon City and Gladstone) contains more transit coverage than the western portion (West Linn). I-205 has no transit service west of OR 43. Ten transit lines operate in the API. Three provide 15-minute or better weekday peak service and seven operate every 30 to 60 minutes during the peak periods. Five TriMet lines operate on Saturday and Sunday, and Canby Area Transit Line 99X runs on Saturday.

There are bus routes on portions of I-205, OR 43, OR 99E, OR 213, and Willamette Falls Drive, although there are no bus stops on I-205 and OR 213. Based on a multimodal level of service (MMLOS) analysis[17] for roadways with bus stops in the API, Willamette Falls Drive has an overall transit LOS of F because it has one low-frequency bus route. OR 43 has an overall transit LOS of B because it has one bus route that offers high-frequency service. Transit LOS on OR 99E ranges from A to E but averages LOS C overall because it is a long roadway that spans multiple cities and has varying transit conditions.

Active Transportation

Pedestrians and bicyclists are prohibited on I-205 north of the OR 43 interchange. Pedestrian facilities, such as sidewalks and marked or signalized crossings, and bicycle facilities, such as bicycle lanes and local multiuse pathways, generally exist within the API in downtown Oregon City and Lake Oswego and the historical areas of West Linn and Gladstone. However, there is limited pedestrian and bicycle connectivity between cities. There are no protected bicycle lanes within the API, but a few off-street trails and local shared-use pathways are provided. Other areas of the API generally do not have pedestrian and bicycle facilities.

Sixteen unsignalized intersections in the API were analyzed for level of traffic stress (LTS)[18] to pedestrians and bicyclists (locations shown in Figure 3-1). Analysts focused on unsignalized intersections because, in general, pedestrians and bicyclists experience the greatest stress at this type of intersection. Three of the 16 intersections experience the highest LTS for pedestrians (LTS 4), and 10 intersections experience LTS 4 for bicycles. To determine the potential effects of changes in traffic volumes, bicycle LTS and pedestrian LOS were also analyzed on segments of SW Stafford Road, SW Borland Road, Willamette Falls Drive, OR 43, OR 213, and OR 99E in the API. The highest overall bicycle LTS in the API occurs on segments of SW Stafford Road, SW Borland Road, OR 213, and OR 99E. Pedestrian LOS varies by roadway, ranging from OR 43 at level B or C, to OR 213 with results at level E or F.

Truck Freight Mobility

The truck freight network within the API includes two national highway truck freight routes (I-5 and I-205) and two connector truck freight routes (OR 99E and OR 213). These truck freight routes connect and serve the industrial areas within the Portland metropolitan area that are vital to the regional economy. I-5 and I-205 are essential truck freight routes that serve a substantial volume of trucks within the API. I-205 carries the second highest truck volume (after I-5) in the Portland region, with a daily volume of up to 14,000 trucks, which accounts for about 8% of total traffic on I-205. Truck volumes peak around 9 a.m. in the southbound direction and around 11 a.m. in the northbound direction. However, high truck volumes

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[17] MMLOS can be used to measure the performance of bicycle, pedestrian, and transit facilities. Transit LOS analysis quantifies user perception of quality of transit service based on various transit and roadway characteristics, including transit speed, frequency, estimated ridership, and on-time performance. Similar to vehicle LOS, LOS A is the best or most suitable level and LOS F is the worst or least suitable level.

[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.

occur from approximately 8 a.m. to 3 p.m. in both directions, ranging from 400 to 450 trucks per hour southbound and from 600 to 700 trucks per hour northbound (ODOT 2021b). There is a major truck freight hub that attracts a high volume of truck freight traffic south of OR 212 and east of I-205. Many of the truck trips associated with this facility use I-205 between Stafford Road and OR 213.

On major truck freight routes in the API, buffer times are now consistently higher during midday period than during the AM peak period, indicating ongoing issues with truck freight delivery reliability to and through the Portland region throughout the day. Many business owners have reported changing to staggered shifts, adding evening and overnight operations, and increasing operations during off-peak hours, with some delivery shifts now starting as early as 2 a.m. (ODOT 2021b).

Transportation Safety

Between 2015 and 2019, 3,540 crashes were recorded along study corridors in the API and, separately, about 58 crashes were recorded at study intersections outside of those study corridors in the API. In general, the average number of crashes per year has decreased over time, except for an increase in 2016 (ODOT no date [n.d.]-a). However, there may be an artificial reduction in the number of crashes recorded by ODOT because of a change in reporting requirements in early 2018.

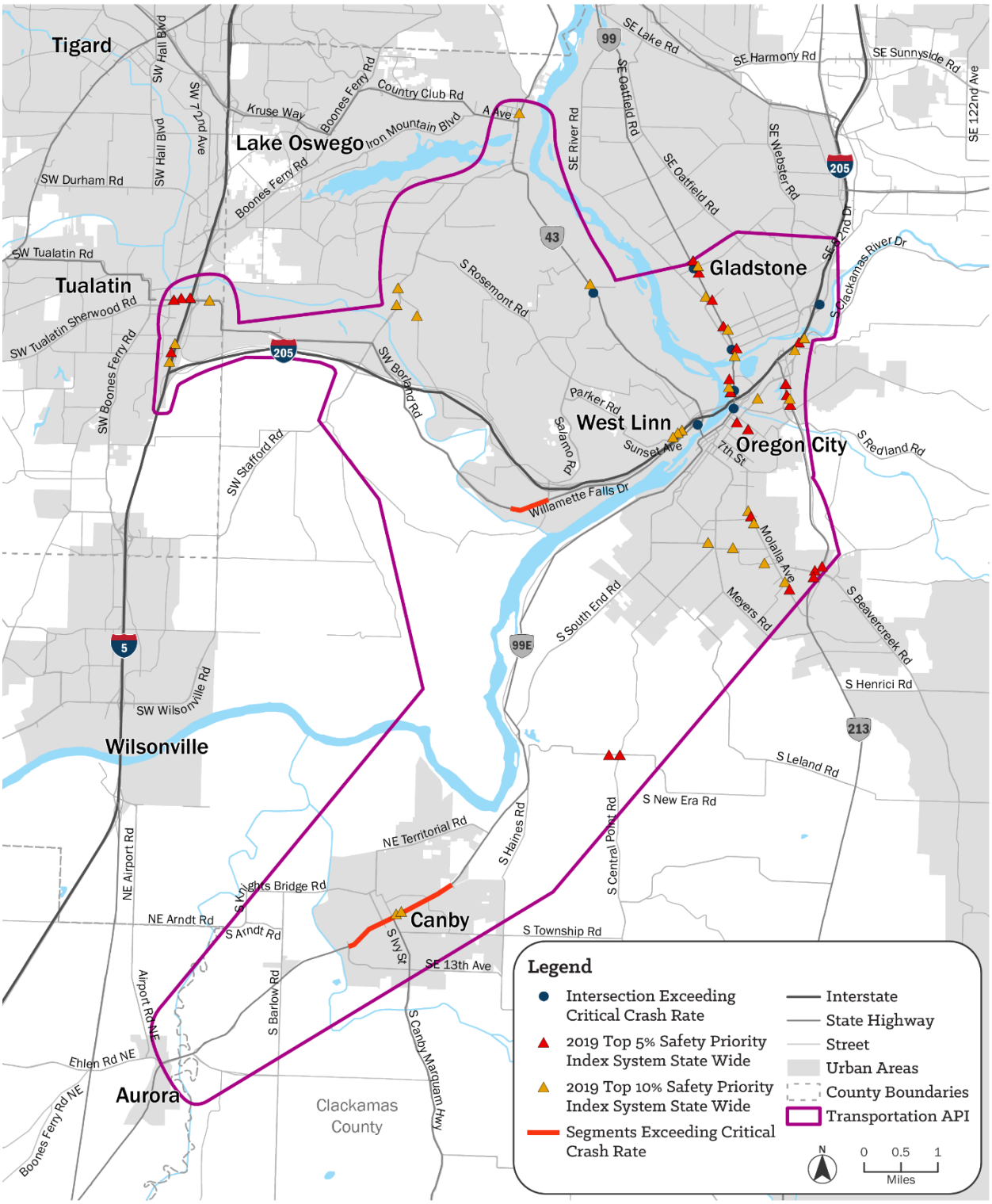
Most crashes along the study corridors resulted in injury or property damage only. Nine of the total reported crashes resulted in fatalities. The largest share of crashes was attributed to motorists failing to avoid the vehicle ahead (36%) (ODOT n.d.-a). A total of 38 crashes involved pedestrians and 27 crashes involved bicyclists. Most crashes involving pedestrians and bicyclists occurred on OR 99E, followed by OR 43.

The intersection crash rate and critical crash rate[19] were calculated at the 50 study intersections, for 6 study corridor segments, and for I-205. Nine of the 50 study intersections had above-average crash rates compared to other similar intersections within the API. Study corridor segment crash rates were also compared to that of similar segments within the region. The segment crash rate calculation involves volumes, segment length, and total crashes within a 5-year period (2015 to 2019). The segment crash analysis found that most corridors—including on I-205—currently have segments that exceed the critical crash rate.

ODOT uses a Safety Priority Index System, which is a method to identify potential safety issues on state highways by identifying state highway segments with higher than typical crash histories. State highway segments with Safety Priority Index System values that rank in the top 5% by ODOT are considered priorities for potential safety improvement projects. Figure 3-3 shows the Safety Priority Index System locations identified within the API.

[19] The intersection crash rate is the total number of crashes occurring at an intersection in proportion to the vehicles entering the intersection. The critical crash rate compares the intersection crash rates of the 50 study intersections to other intersections with similar characteristics within the region.

Figure 3-3. Existing Year (2021) High Crash Locations and Safety Priority Index System Locations (2015 through 2019)



Source: ODOT Crash Reporting Unit: https://tvc.odot.state.or.us/tvc/ (ODOT n.d.-a)

3.1.2 Environmental Consequences

This section summarizes the short-term and long-term transportation effects of the No Build and Build Alternatives. Chapter 5 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about these effects and how they were modeled. Short-term effects are discussed only for the Build Alternative because they relate to construction and tolling prior to the completion of roadway improvements. The long-term effects section discusses both the No Build and Build Alternatives relative to one another. The long-term effects analysis focuses primarily on operations in 2045, except for the intersection analysis, which also considers operations in 2027 to represent an interim year after the start of tolling.

Short-Term Effects

The same number of through lanes and speed of traffic would generally be maintained on I-205 throughout construction of the Build Alternative during daytime hours. Night-time lane closures of I-205, SW Borland Road, and Woodbine Road, in accordance with *Oregon Standard Specifications for Construction* (ODOT 2021c), would be necessary during demolition of existing structures and erection of new bridge beams. A full closure of all I-205 lanes would be required during the demolition of the bridges at West A Street, Sunset Avenue, and Broadway Street. Detours would be provided during these full closures and would generally use I-5, I-84, OR 99E, and OR 224. Rolling slowdowns would occur during rock blasting on northbound I-205 between Sunset Avenue and West A Street, which would be timed to coincide with the lowest traffic volumes during times of day when blasting can be done safely. Approximately 15 to 20 days of blasting is anticipated from summer to fall of the first year of construction.

The West A Street and Sunset Avenue underpasses would be replaced throughout a period of 2 years. On West A Street, traffic would be maintained with one lane in each direction, except for an approximately 6-month period where only northbound traffic would be allowed. Southbound traffic would be detoured to Broadway Street. On Sunset Avenue, one lane in each direction would remain open with periodic single-lane two-way flagging operations. Flagging operations would likely be restricted to certain hours, including off-peak daytime hours.

Construction of overhead toll gantries would occur during bridge construction periods and require one full I-205 closure, which would be limited to brief overnight periods (less than 2 hours), for each gantry location. Short-term detours with temporary signage would be used for the roadway closures. Additional lane closures would be required to complete toll equipment work over the lanes, but most of these closures would be limited to short periods of time. Full construction closure details, including durations and frequency of closures, would be determined once the construction contractor is selected.

Tolling During Construction of Roadway Improvements

ODOT would begin tolling I-205 as early as 2024 prior to completing construction of the I-205 roadway improvements in the Build Alternative. Traffic volumes were modeled for two pre-completion tolling scenarios based on projected 2027 traffic volume demand:[20] (1) tolling across the Abernethy Bridge during its construction and (2) tolling across the Abernethy and Tualatin River Bridges during their construction. Both scenarios would have two through lanes in each direction of I-205 between Stafford Road and OR 213, which is the same as existing conditions, because the third through lane would not yet be complete.

[20] 2027 volumes were used for the pre-completion tolling scenarios because 2027 volumes represent the highest volumes that would be anticipated throughout the pre-completion tolling period.

Compared with the No Build Alternative in 2027, tolling only the Abernethy Bridge prior to its completion would result in 10% to 15% lower total average daily traffic volumes on I-205 in the API, with the highest reduction on the Abernethy Bridge. Tolling both the Abernethy Bridge and Tualatin River Bridges prior to their completion would result in 20% to 30% lower average weekday traffic volumes on I-205 in the API, with the largest reductions occurring between OR 99E and OR 43, and between 10th Street and SW Stafford Road). Similarly, compared to the No Build Alternative in 2027, traffic volumes would generally be higher on segments of SW Borland Road, SW Stafford Road, OR 99E, OR 213, and OR 43 if both bridges are tolled during the pre-completion period. The largest differences are expected on SW Borland Road east of SW Stafford Road near Stafford Hamlet in unincorporated Clackamas County and on OR 99E west of Lone Elder Road just south of Canby, where volumes may be 5% to 10% higher. Any effects resulting from the pre-completion tolling scenarios would last for 2 to 3 years and would be comparable to effects under the Build Alternative in 2027, which are discussed in the Long-Term Effects subsection of Section 3.1.2. Chapter 5 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed analysis of the pre-completion tolling scenarios as compared with the 2027 Build Alternative.

Long-Term Effects

Transportation System Measures

Analysts examined transportation system performance measures such as VMT, VHT, and changes in modes of travel to assess the effects of the proposed Build Alternative as compared to the No Build Alternative from a systemwide perspective covering the entire Portland metropolitan area.

Regional daily VMT and VHT would be slightly lower overall and for highways under the Build Alternative compared to the No Build Alternative, as shown in Table 3-1. Daily VMT and VHT would be slightly higher for non-highway routes under the Build Alternative compared to the No Build Alternative. This difference reflects the number of trips that would reroute from I-205 to arterial roadways or change their mode of travel to avoid tolls under the Build Alternative.

Table 3-1. Difference in Daily Regional Vehicle Miles Traveled and Vehicle Hours Traveled in 2045: Build Alternative Minus No Build Alternative

	Build Minus No Build			
Roadway Type	Difference in Regional Vehicle Miles Traveled	% Difference in Regional Vehicle Miles Traveled	Difference in Regional Vehicle Hours Traveled	% Difference in Regional Vehicle Hours Traveled
Highways	-229,231	-1.1%	-14,393	-2.9%
Non-Highway	99,836	0.3%	3,710	0.3%
Total	**-129,395**	**-0.2%**	**-10,683**	**-0.7%**

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.1)

Section 5.3.1 of Appendix C, *I-205 Toll Transportation Technical Report,* provides more detailed information about changes in VMT and VHT by time of day. VMT and VHT would primarily be lower under the Build Alternative compared to the No Build Alternative during the peak-traffic periods when toll rates would be highest. The number of highway trips would be lower in almost every hour of the day under the Build Alternative compared to the No Build Alternative. Total VMT and VHT on both highway and arterial roadway routes would be higher during the hours immediately before and after peak-traffic periods with the highest expected tolls, indicating that some travelers would change the time of day that they make their trips to avoid the highest tolls.

The Build Alternative is projected to have a relatively small effect on travel mode choice in the region, with the trend indicating slightly fewer single-occupancy vehicle trips and slightly more high-occupancy vehicle, transit, and active transportation trips, as shown in Table 3-2. These changes in mode would likely be due to the lower travel costs compared to one person in a car paying the full toll.

Table 3-2. Comparison of Trips by Travel Mode in 2045: Build Alternative to No Build Alternative

Travel Mode	No Build Trips	Build Trips	Difference (Build minus No Build)
Single-Occupancy Vehicle	5,248,000	5,245,000	-3,000
High-Occupancy Vehicle	4,307,000	4,309,000	+2,000
Transit	696,500	697,300	+800
Active	1,276,600	1,276,800	+200
Total	**11,528,100**	**11,528,100**	**0**

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.1)

Analysts also assessed the potential for induced and latent demand under the Build Alternative. Induced demand occurs when a road project results in increased use of the transportation network due to unplanned changes to land use. Latent demand occurs when a lower perceived "cost" of driving (in time/convenience or money) results in people choosing to drive more often, drive farther, or choose driving over another mode such as walking or rolling, biking, carpooling, or using public transit. Induced demand and latent demand can lead to an increase of VMT and potential increase in vehicle emissions.

The travel demand modeling for the Build Alternative included rerunning trip distribution, mode choice, and traffic assignment (vehicle trip routing) to capture any changes in future travel patterns that may occur based on the addition of the Build Alternative to the transportation network. Therefore, the modeling accounts for potential effects related to the improved I-205 facility attracting more trips and the potential for induced or latent demand.

Analysts compared travel demand patterns throughout the API under the No Build Alternative and Build Alternative. As shown in Table 3-1, modeled regional VMT showed minimal differences between the No Build Alternative and Build Alternative, indicating that the Build Alternative would not result in substantial induced or latent demand. The following factors contribute to this conclusion:

- Adding a third lane to I-205 between Stafford Road and OR 213 would be a "lane continuity" project. The Build Alternative would widen the 7-mile section of I-205 from two through lanes to three through lanes to match the number of through lanes on the adjacent portions of I-205. Although induced or latent demand could occur, it would likely be limited to localized trips in the widened area—i.e., those who are currently diverting away from I-205 due to congestion but would return to I-205 because conditions under the Build Alternative would be less congested.
- Congestion pricing has been shown to counteract demand on roadways (Garcia-López et al 2020). The cost of the tolls and the application of a variable toll rate schedule under the Build Alternative would help to manage demand and discourage higher peak-hour vehicle demand. Thus, to some degree, the toll costs would balance or offset the potential for induced or latent demand due to increased capacity.
- Induced demand is less likely to occur from road projects in Oregon because of the state's strong land use laws which restrict unplanned changes to land use. Section 3.9 and the *I-205 Toll Project Land Use Technical Memorandum* provide more information about applicable state and local land use policies.

Traffic Volumes and Potential Rerouting

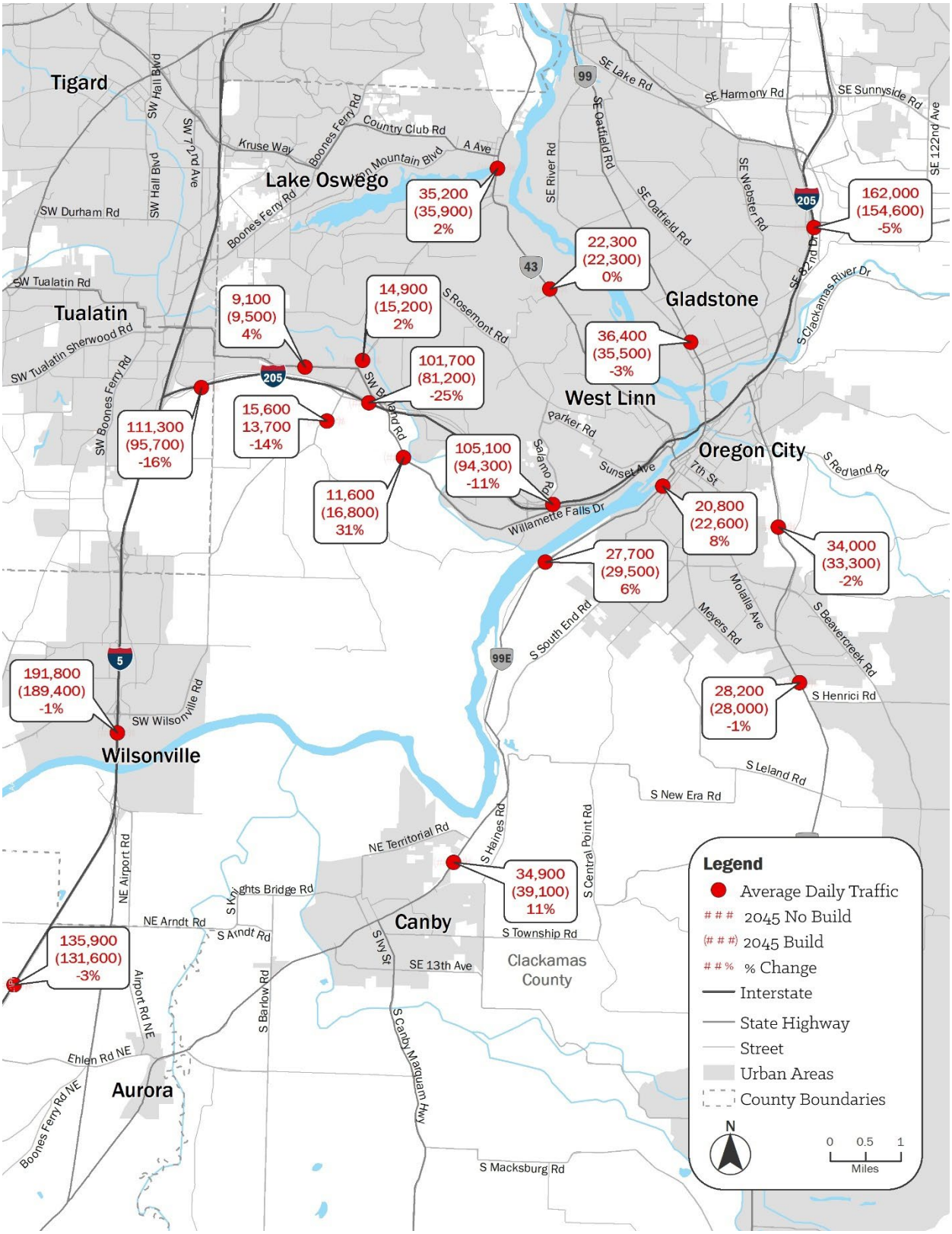
Daily Traffic Volumes

Figure 3-4 shows projected differences in average daily traffic within the API between the No Build Alternative and Build Alternative in 2045. Most of these locations would experience relatively small changes in traffic volumes at a daily level under the Build Alternative compared to the No Build Alternative.

Section 5.3.2 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information and maps showing changes in daily volumes by location. For the most part, differences in daily traffic volumes on local roadways would be largest closest to the tolled bridges. Parallel routes to I-205, including SW Borland Road and Willamette Falls Drive, could experience 30% to 100% higher daily volumes under the Build Alternative compared to the No Build Alternative because some drivers would choose to reroute to these roadways to avoid tolls. By contrast, some of the surrounding roads between 10th Street and OR 43 would experience lower volumes (by up to 30% under the Build Alternative compared to the No Build Alternative). Because the I-205 segment between 10th Street and OR 43 would not include a toll gantry and would have an additional lane of capacity in both directions with the Build Alternative, traffic performance on I-205 is expected to improve, which could attract more traffic back to I-205 and away from local streets.

Near the Abernethy Bridge, traffic volumes would range from 5% to 50% higher in downtown Oregon City and across the Arch Bridge under the Build Alternative because some travelers would reroute their trips to avoid the toll on the Abernethy Bridge. Much of this difference would occur during off-peak travel times when alternative routes are less congested and provide a trip that is not much slower than taking I-205. There would be generally higher daily traffic volumes in and around Canby, with about 20% higher traffic volumes on OR 99E in Canby, under the Build Alternative compared to the No Build Alternative.

Figure 3-4. Projected 2045 No Build and Build Alternative Daily Traffic Volumes in Area of Potential Impact and along Key Study Corridors



Source: Metro Regional Travel Demand Model

Peak-Hour Volumes

During the AM peak hour in 2045,[21] Build Alternative volumes would be lower than No Build Alternative volumes on both northbound and southbound I-205 in the API. The largest difference in northbound volumes would be on I-205 at the Abernethy Bridge, which would be about 11% lower under the Build Alternative. The largest difference in southbound volumes would be the segment between SW Stafford Road and I-5, where volumes would be almost 24% lower under the Build Alternative compared to the No Build Alternative. While some of this difference can be attributed to travelers shifting their trips out of the peak periods due to the higher tolls during this time, more of the difference likely would result from rerouting related to avoiding the toll point located on the Tualatin River Bridges, as well as the existence of reasonably close and less congested southbound alternate roadways.

During the PM peak hour, northbound I-205 in the API would experience 8% to 35% higher traffic volumes under the Build Alternative compared to the No Build Alternative. These differences would occur primarily because of the improvement in northbound travel times due to added capacity and the projected congestion on alternative routes to I-205 in the PM peak hour. These factors would result in travel benefits for I-205 users that would likely offset the cost of the toll and attract users away from alternate northbound routes and to I-205 during the PM peak hour. However, southbound I-205 would experience lower traffic volumes under the Build Alternative compared to the No Build Alternative because of rerouting related to avoiding the toll and the availability of reasonably close and less congested southbound alternative roadways. These differences would be comparable to the AM peak-hour projections, with the largest difference between SW Stafford Road and I-5. Table 3-3 compares peak-hour volumes on I-205 segments in the API for the No Build and Build Alternatives.

Table 3-3. Projected Peak-Hour Volumes on I-205 Segments in 2045: No Build and Build Alternatives

I-205 Segment	No Build		Build		% Difference (Build minus No Build)	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Northbound						
Between I-5 and SW Stafford Rd	3,470	3,835	3,475	5,185	0.1%	35.2%
Between SW Stafford Rd and 10th St (Tualatin River Bridges)	3,820	3,360	3,575	4,335	-6.4%	29.0%
Between 10th St and OR 43	4,000	3,925	3,825	4,840	-4.4%	23.3%
Between OR 43 and OR 99E (Abernethy Bridge)	4,470	4,975	3,985	5,435	-10.9%	9.2%
Between OR 99E and OR 213	5,080	5,885	4,820	6,375	-5.1%	8.3%
Southbound						
Between OR 213 and OR 99E	3,730	6,100	3,970	6,055	6.4%	-0.7%
Between OR 99E and OR 43 (Abernethy Bridge)	3,405	5,480	3,500	5,515	2.8%	0.6%
Between OR 43 and 10th St	4,000	4,725	4,055	4,295	1.4%	-9.1%
Between 10th St and SW Stafford Rd (Tualatin River Bridges)	3,400	4,270	3,435	3,765	1.0%	-11.8%
Between SW Stafford Rd and I-5	3,495	4,045	2,660	3,010	-23.9%	-25.6%

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.2)

[21] For future conditions, the peak hour is assumed to be sometime within the 2-hour peak periods of 7 a.m. to 9 a.m. (AM peak) and 4 p.m. to 6 p.m. (PM peak).

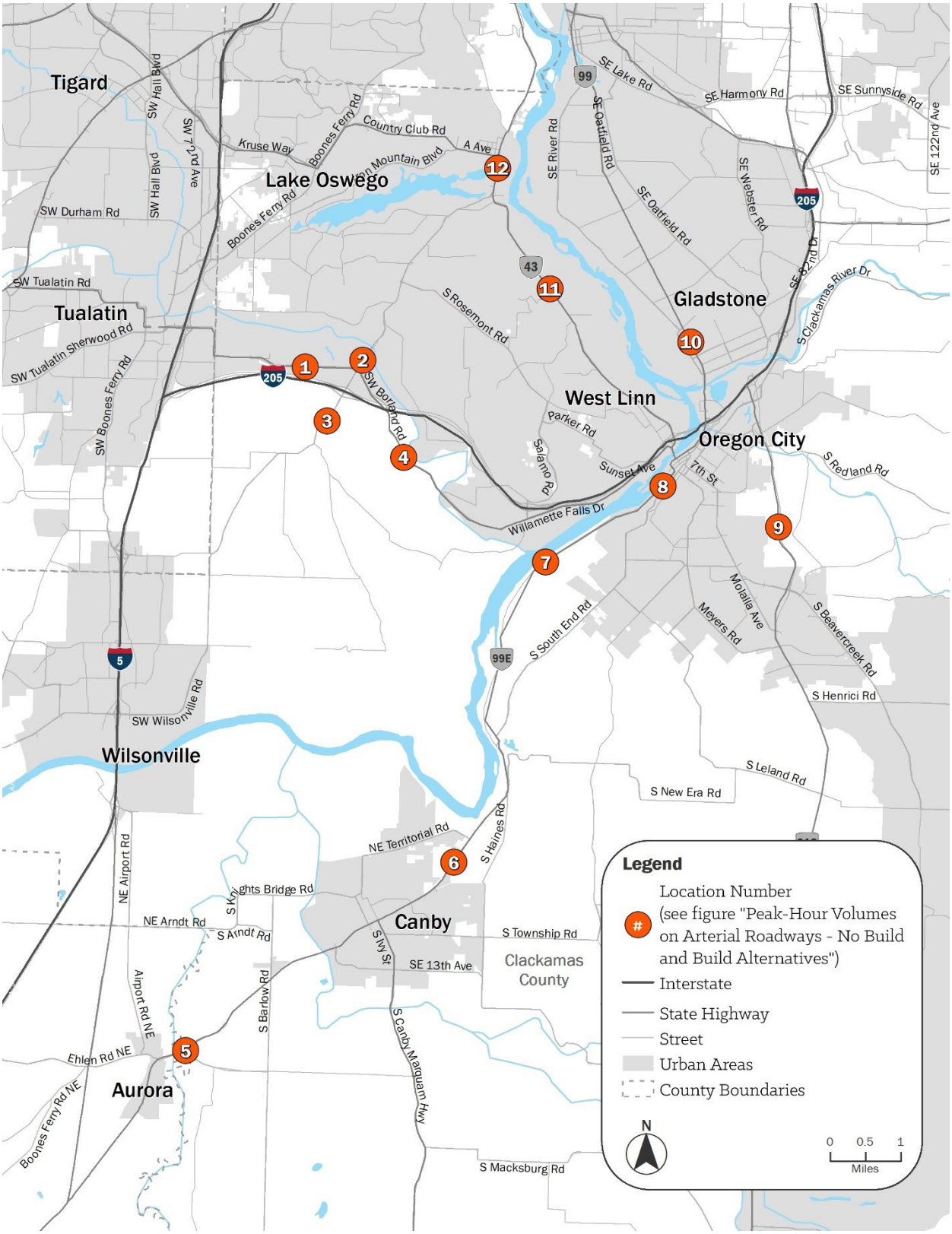
Figure 3-5 identifies the key roadways in the API that are summarized in Table 3-4. Table 3-4 compares average peak-hour volumes at these selected key roadway locations under the No Build and Build Alternatives for each direction of travel. A positive number in Table 3-4 indicates higher volumes under the Build Alternative compared to the No Build Alternative, while a negative number in Table 3-4 indicates lower volumes. The largest differences in local roadway volumes would occur closer to the tolled bridges and along OR 99E. SW Borland Road and Willamette Falls Drive are parallel routes that would experience greater PM peak-hour volumes, especially in the westbound direction under the Build Alternative compared to the No Build Alternative. This difference in volumes would occur because of changes in how local drivers access I-205 under the Build Alternative. Peak-hour traffic volumes would also be higher on OR 99E, particularly in Oregon City, as some travelers would reroute their trips to avoid the toll on the Abernethy Bridge.

Table 3-4. Peak-Hour Volumes on Key Roadways – No Build and Build Alternatives

Arterial Location	Direction	AM Peak Hour			PM Peak Hour		
		2045 No Build	2045 Build	Percent Change	2045 No Build	2045 Build	Percent Change
1. SW Borland Rd west of SW Stafford Rd	NB/EB	380	330	-13%	635	460	-28%
	SB/WB	720	730	1%	610	530	-13%
2. SW Stafford Rd north of SW Borland Rd	NB/EB	860	665	-23%	870	950	9%
	SB/WB	845	985	17%	955	1,380	45%
3. SW Stafford Rd south of SW Borland Rd	NB/EB	1,140	805	-29%	550	740	35%
	SB/WB	475	340	-28%	1,055	1,380	31%
4. SW Borland Rd east of SW Stafford Rd	NB/EB	415	420	1%	850	925	9%
	SB/WB	340	670	97%	440	635	44%
5. OR 99E west of Lone Elder Rd	NB/EB	505	520	3%	765	750	-2%
	SB/WB	755	920	22%	1,000	1,090	9%
6. OR 99E east of Redwood S	NB/EB	665	690	4%	890	915	3%
	SB/WB	575	530	-8%	1,255	1,380	10%
7. OR 99E north of S South End Rd	NB/EB	865	1,145	32%	950	910	-4%
	SB/WB	580	560	-3%	1,640	1,845	13%
8. OR 99E west of 10th St	NB/EB	930	1,025	10%	1,180	1,095	-7%
	SB/WB	755	690	-9%	1,955	2,415	24%
9. OR 213 south of Washington St	NB/EB	2,405	2,340	-3%	2,695	2,520	-6%
	SB/WB	2,190	2,115	-3%	2,450	2,670	9%
10. OR 99E north of Gloucester St	NB/EB	1,200	1,180	-2%	1,325	1,280	-3%
	SB/WB	1,340	1,360	1%	2,015	1,990	-1%
11. OR 43 north of Hidden Springs Rd	NB/EB	1,170	1,235	6%	1,110	1,185	7%
	SB/WB	745	730	-2%	1,155	955	-17%
12. OR 43 south of A Ave	NB/EB	1,470	1,570	7%	1,225	1,350	10%
	SB/WB	1,410	1,385	-2%	1,950	1,700	-13%

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.2)
Note: Arterial location numbers in the first column correspond to the numbered locations in Figure 3-5.
EB = eastbound; NB = northbound; SB = southbound; WB = westbound

Figure 3-5. Projected Build and No Build Peak-Hour Volumes Percent Change on Key Roadways in 2045



Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.2)

Traffic Operations

I-205 Operations

Under the No Build Alternative, all segments of northbound I-205 and southbound I-205 in the API would meet ODOT's v/c mobility standard during the AM peak hour and PM peak hour, except for the I-205 on-ramp from OR 213 during the PM peak hour. Despite meeting the mobility standard, during the AM peak hour, the segments of northbound I-205 between SW Stafford Road and OR 43 and between OR 213 and SE 82nd Drive, and the segment of southbound I-205 between OR 99E and SW Stafford Road, are projected to operate at LOS F. In addition, during the PM peak hour, all segments of northbound and southbound I-205 between SW Stafford Road and SE 82nd Drive are projected to operate at LOS F.

Under the Build Alternative, the segments of northbound I-205 between OR 213 and SE 82nd Drive would exceed ODOT's v/c mobility standard during the AM and PM peak hours. One southbound segment in the AM peak hour (between OR 99E and OR 43) and five southbound segments in the PM peak hour (between north of SE 82nd Drive and the off-ramp to OR 99E) would not meet ODOT's v/c mobility standard. However, these northbound and southbound I-205 segments would operate with higher speeds and improved travel times (generally at LOS D, with one segment between SE 82nd Drive and OR 213 operating at LOS E) under the Build Alternative than the No Build Alternative.

Under the Build Alternative, there would be less congestion on northbound I-205 during the AM peak period and substantially less congestion during the PM peak period than there would be under the No Build Alternative. There would be less congestion on southbound I-205 from OR 212 to OR 213 during the AM peak and PM peak periods, and traffic is expected to travel at much faster speeds south of OR 213, than with the No Build Alternative.

Overall, the additional highway capacity and the value pricing strategy under the Build Alternative would result in substantially fewer daily hours of congestion at most locations on both northbound and southbound I-205 compared to the No Build Alternative in 2045, as shown in Table 3-5.

Table 3-5. Build versus No Build Daily Hours of Congestion on I-205 in 2045

Alternative	Level of Congestion	Hours of Congestion by I-205 Segment							
		SW Stafford Rd – 10th St		10th St – OR 43		Abernethy Bridge		OR 99E – OR 213	
		NB	SB	NB	SB	NB	SB	NB	SB
No Build	Heavy	5	8	8	8	0	0	2	2
	Moderate	13	14	13	13	1	2	9	4
Build	Heavy	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	2

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.3)
NB = northbound; SB = southbound

With the added capacity in both directions and congestion pricing on I-205, the Build Alternative would improve I-205 travel times in the API by a range of about 4 minutes to more than 14 minutes during the AM and PM peak periods compared to the No Build Alternative, as shown in Table 3-6. The Build Alternative would provide the most substantial benefits to northbound I-205 travelers between the I-5 ramps and SE 82nd Drive in the PM peak period.

Table 3-6. No Build and Build Alternative Average Peak-Hour Travel Times on I-205 between I-5 and SE 82nd Drive (minutes) in 2045

Direction of Travel	From	To	Build		No Build		Difference		% Difference	
			7-9 AM	4-6 PM	7-9 AM	4-6 PM	7-9 AM	4-6 PM	7-9 AM	4-6 PM
I-205 NB	I-5 ramps	SE 82nd Drive	10.7	12.7	14.9	27.2	-4.2	-14.5	-28%	-53%
I-205 SB	SE 82nd Drive	I-5 ramps	10.7	10.5	14.5	14.2	-3.8	-3.7	-26%	-26%

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.3)
NB = northbound; SB = southbound

Travel times along I-205 in the AM and PM peak periods would experience less variation and be more reliable under the Build Alternative in both the northbound and southbound directions compared to the No Build Alternative. The largest difference in reliability would occur on northbound I-205 during the PM peak period. While the No Build Alternative would experience large variations, with travel times ranging between 21 and 36 minutes depending on the time of the trip, the Build Alternative would experience improved travel times ranging between 11 and 19 minutes, which represents up to a 75% improvement in reliability.

Key Roadway Operations

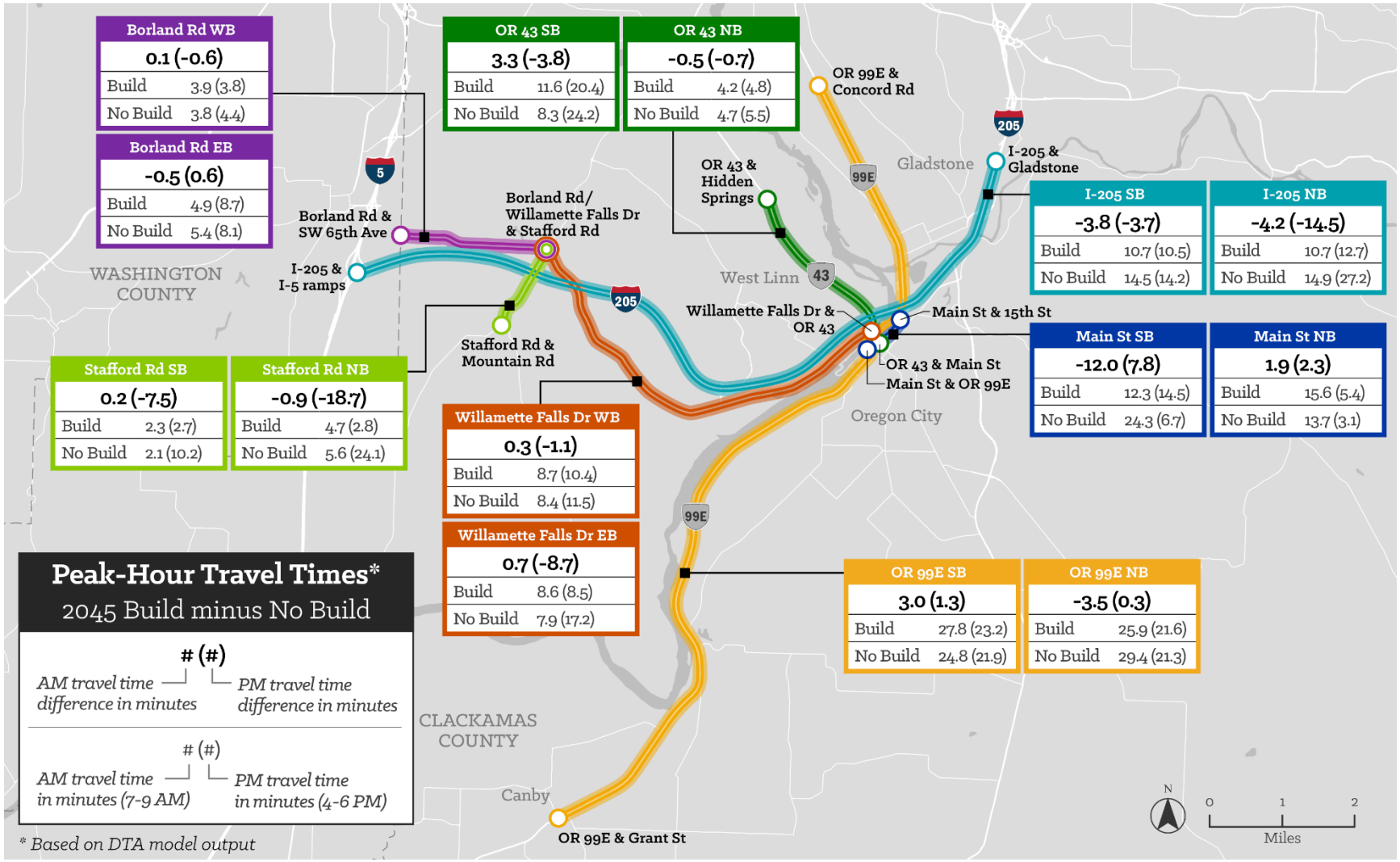
Analysts modeled travel times under the No Build and Build Alternatives in 2045 along SW Borland Road, SW Stafford Road, Willamette Falls Drive, OR 43, Main Street in Oregon City, and OR 99E in the API. Figure 3-6 shows a comparison of travel times for the entire length of the roadways studied. Section 5.3.3 of Appendix C, *I-205 Toll Project Transportation Technical Report,* provides additional maps showing more detailed analysis of travel time differences for individual segments of these roadways. In general, travel times on roadways used to access I-205 that are farther from the tolled bridges (e.g., SW Borland Road, SW Stafford Road, and Willamette Falls Drive) would be longer under the No Build Alternative than the Build Alternative because of ongoing I-205 congestion, which would result in a continuation of the rerouting observed under existing conditions, as described in Section 3.1.1. Travel times would be similar or slightly longer on roadway segments near downtown Oregon City (e.g., portions of OR 43, Main Street, and OR 99E) under the Build Alternative, depending on direction of travel and time of day, because of additional rerouting related to vehicles avoiding the tolled bridges.

Major findings of this analysis include:

- On the segment of SW Borland Road between SW 65th Avenue and SW Stafford Road, there would be minimal travel time differences (less than 1 minute) between the Build and No Build Alternatives for each direction in both the AM and PM peak hours.
- On SW Stafford Road, the largest travel time differences would occur in the PM peak hour for traffic traveling toward the I-205 interchange. The additional capacity and congestion pricing strategy proposed under the Build Alternative are expected to result in better I-205 northbound operations in the PM peak hour than the No Build Alternative, which would in turn free up northbound on-ramp traffic and greatly reduce congestion along SW Stafford Road leading to the interchange. On southbound SW Stafford Road from SW Borland Road to the I-205 northbound ramps, travel times would be nearly 8 minutes shorter under the Build Alternative than the No Build Alternative. On northbound SW Stafford Road between SW Mountain Road and the I-205 northbound ramps, travel times would be about 19 minutes shorter under the Build Alternative than the No Build Alternative.

- On SW Borland Road/Willamette Falls Drive, projected travel-time differences between the No Build and Build Alternatives would be relatively minor, except for during PM peak hour in the eastbound direction from SW Stafford Road to 10th Street. Travel times in this segment would be nearly 9 minutes shorter under the Build Alternative than the No Build Alternative because the added I-205 capacity under the Build Alternative would result in less rerouting to SW Borland Road and Willamette Falls Drive.
- On OR 43, projected travel-time differences between the Build and No Build Alternatives across both segments in the northbound direction would be minimal in both the AM and PM peak periods. In the southbound direction, however, AM peak-hour travel times would be 2.5 minutes longer under the Build Alternative than the No Build Alternative between Hidden Springs Road and McKillican Street, most likely due to an increase in volumes destined for the Arch Bridge. PM peak-hour travel time on this same segment would be 7 minutes shorter under the Build Alternative than the No Build Alternative because some southbound OR 43 trips would reroute to southbound I-205 south of the OR 43 interchange. For the McKillican Street to Main Street segment that crosses the Arch Bridge into downtown Oregon City, although the projected AM peak-period travel time would be similar under the No Build and Build Alternatives, the PM peak-hour travel time would be about 3 minutes longer under the Build Alternative than the No Build Alternative due primarily due to backups from increased congestion in downtown Oregon City.
- On the Main Street corridor in downtown Oregon City, there would be relatively large travel-time differences in the southbound direction, with travel times projected to be 12 minutes shorter under the Build Alternative during the AM peak hour and nearly 8 minutes longer during the PM peak hour compared to the No Build Alternative. For the southbound direction, most of the difference in the AM peak hour would occur on the southern half of the corridor between 10th Street and OR 99E, while in the PM peak hour the differences would be more evenly split between the northern and southern segments of the corridor. In the northbound direction, travel times under the Build Alternative would be roughly 2 minutes longer than the No Build Alternative in both the AM and PM peak hours.
- On OR 99E, overall northbound travel times are projected to be 3.5 minutes shorter during the AM peak hour under the Build Alternative compared to the No Build Alternative, with most of this travel time difference (2.6 minutes) occurring in the southern segment between Canby and Oregon City. There would be minimal differences in northbound travel times during the PM peak hour. Overall southbound travel times would be about 3 minutes longer during the AM peak period and about 1 minute longer during the PM peak hour. The segment through Oregon City is expected to experience most of this difference (2.8 minutes in the AM peak hour and 1.3 minutes in the PM peak hour) due to additional traffic rerouting through Oregon City and across the Arch Bridge, causing congestion that would back up onto OR 99E and cause additional delay.

Figure 3-6. 2045 No Build vs. Build (Build minus No Build) Peak-Hour Travel Times for Key Roadways



Intersection Operations

As noted in the introduction to Section 3.1.2, the intersection analysis considers operations in 2027 to represent an interim year after the start of tolling, in addition to operations in 2045. Intersection mobility standards vary by jurisdiction, with some measured as v/c ratios and others measured as LOS.[22] Most of the 50 study intersections would meet standards under both the No Build and Build Alternatives in both 2027 and 2045.

Section 5.3.3 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about projected operations at each study intersection in 2027 and 2045 during the AM and PM peak hours. The greatest impacts would occur at intersections that are projected to meet standards under the No Build Alternative but would not meet those standards under the Build Alternative. Figure 3-7 and Figure 3-8 show the intersections that would experience differences in intersection operations under the Build Alternative relative to the No Build Alternative. The symbols presented on the figures are intended to represent the most negative scenario at each location; for example, if an intersection would meet standards during the AM peak period but would not meet standards during the PM peak period in a given analysis year, it would be represented by the symbol indicating that it does not meet standards during that year.

In 2027, one intersection would not meet standards under the No Build Alternative and would meet standards under the Build Alternative during the AM peak hour (i.e., the Build Alternative would result in better operations at these locations):

- The signalized intersection at OR 43 and I-205 southbound ramps

In 2045, one intersection would not meet standards under the No Build Alternative and would meet standards under the Build Alternative during the PM peak hour (i.e., the Build Alternative would have better operations at this location):

- The stop-controlled intersection at Hidden Springs Road and Santa Anita Drive

In 2027, five intersections would meet standards under the No Build Alternative but would not meet them under the Build Alternative during the AM and/or PM peak hour (i.e., the Build Alternative would have worse operations at this location):

- The signalized intersection at 7th Street and Main Street
- The signalized intersection at OR 99E and W Arlington Street
- The signalized intersection at the I-5 northbound ramps and Nyberg Street
- The signalized intersection at the I-5 southbound ramps and Nyberg Street
- The roundabout intersection of SW Stafford Road and SW Rosemont Road

In 2045, three intersections would meet standards under the No Build Alternative but would not meet them under the Build Alternative in 2045 during the AM and/or PM peak hour (i.e., the Build Alternative would have worse operations at this location):

- The stop-controlled intersection at OR 99E and 15th Street

[22] The v/c ratio standard is different for the Build Alternative than it is for the No Build Alternative. The Build Alternative is required to comply with the v/c standard as outlined in the ODOT (2012) Highway Design Manual (generally a v/c ratio of 0.75), whereas the No Build Alternative is required to comply with the v/c standards defined in the Oregon Highway Plan (ODOT 1999), which is generally a v/c ratio 0.99 for the mainline and 0.85 for intersections (ODOT 2012). This dual standard applies to the mainline sections of I-205 between Stafford Road and OR 213, as well as the ramp termini intersections along that segment and at the Nyberg Street/I-5 interchange.

- The signalized intersection at OR 99E and 10th Street
- The signalized intersection at SW Borland Road and SW 65th Avenue

In 2027, 15 intersections would not meet standards under both the No Build and Build Alternatives during the AM and/or PM peak hours. Of those intersections, the following 9 would experience comparatively worse[23] conditions under the Build Alternative during the AM and/or PM peak hour:

- The signalized intersection at OR 99E and the I-205 southbound ramps
- The signalized intersection at OR 99E and I-205 northbound ramps
- The signalized intersection at McLoughlin Boulevard (OR 99E) and 14th Street
- The signalized intersection at OR 43 and McVey Avenue
- The stop-controlled intersection OR 99E and New Era Road
- The stop-controlled intersection at OR 99E and South End Road
- The signalized intersection at OR 99E and Ivy Street
- The stop-controlled intersection of OR 99E and Lone Elder Road
- The stop-controlled intersection of SW Stafford Road and SW Mountain Road

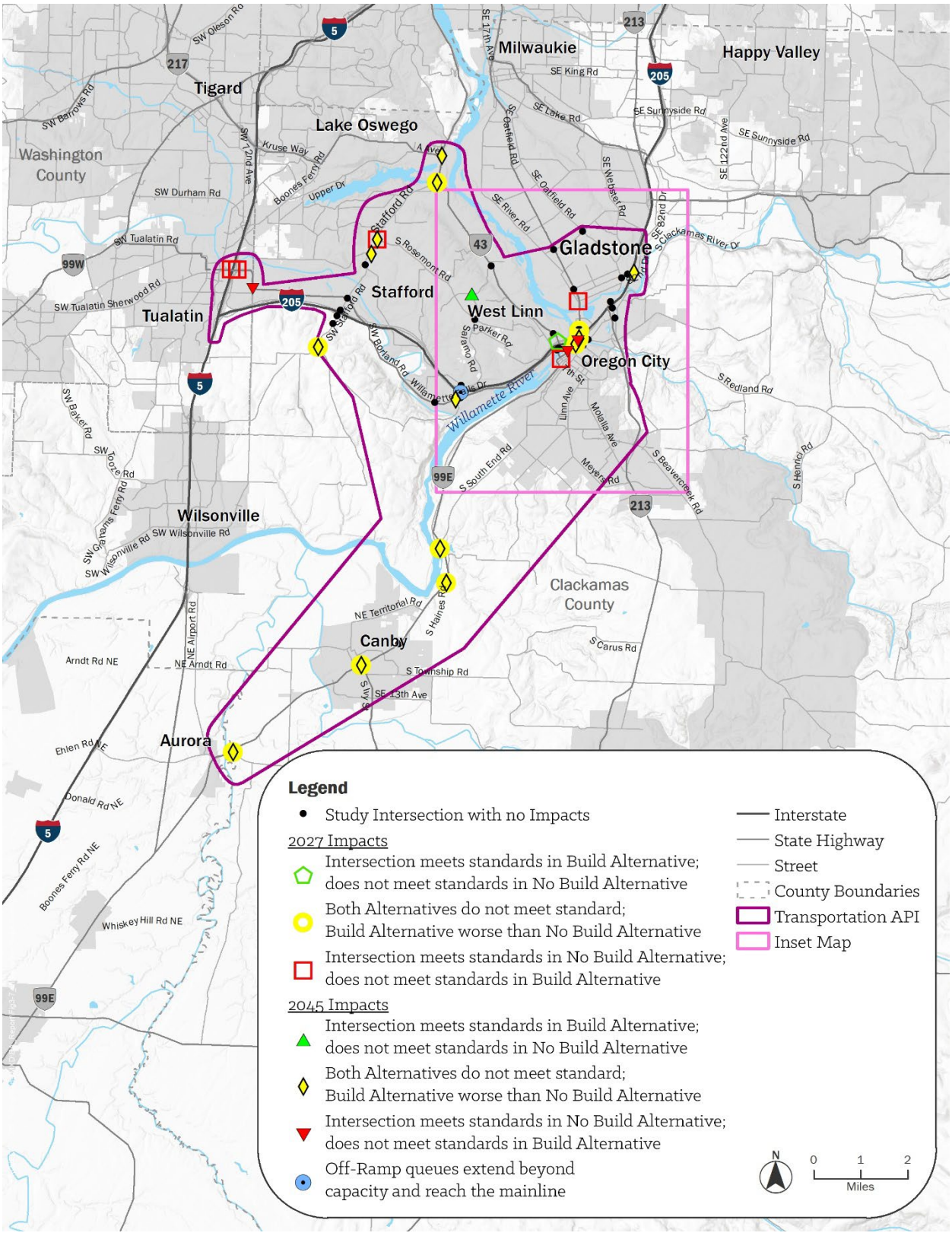
In 2045, 23 intersections would not meet standards under both the No Build and Build Alternatives during the AM and/or PM peak hours. Of those intersections, the following 13 would experience comparatively worse conditions under the Build Alternative during the AM and/or PM peak hour:

- The signalized intersection at OR 99E and the I-205 northbound ramps
- The signalized intersection at OR 99E and 14th Street
- The signalized intersection at SE 82nd Drive and the I-205 northbound ramps
- The stop-controlled intersection of SW Stafford Road and SW Mountain Road
- The stop-controlled intersection at 12th Street and Willamette Falls Drive
- The signalized intersection at OR 43 and McVey Avenue
- The signalized intersection at OR 43 and A Avenue
- The roundabout intersection of SW Stafford Road and SW Childs Road
- The roundabout intersection of SW Stafford Road and Rosemont Road
- The stop-controlled intersection at OR 99E and South End Road
- The stop-controlled intersection OR 99E and New Era Road
- The signalized intersection of OR 99E and Ivy Street
- The stop-controlled intersection at OR 99E and Lone Elder Road

Under the Build Alternative, one off-ramp termini intersection, 10th Street and the I-205 southbound off-ramps, would experience off-ramp queues that would spill back onto the I-205 mainline, causing negative effects on mainline operations during the AM peak hour only. Table 3-7 lists the intersections where there would be impacts. It includes whether the impact was identified as part of the 2027 or 2045 analysis, or both, and whether the intersection would meet standards under the No Build Alternative but not the Build Alternative, or if it would fail under both alternatives but be comparatively worse under the Build Alternative.

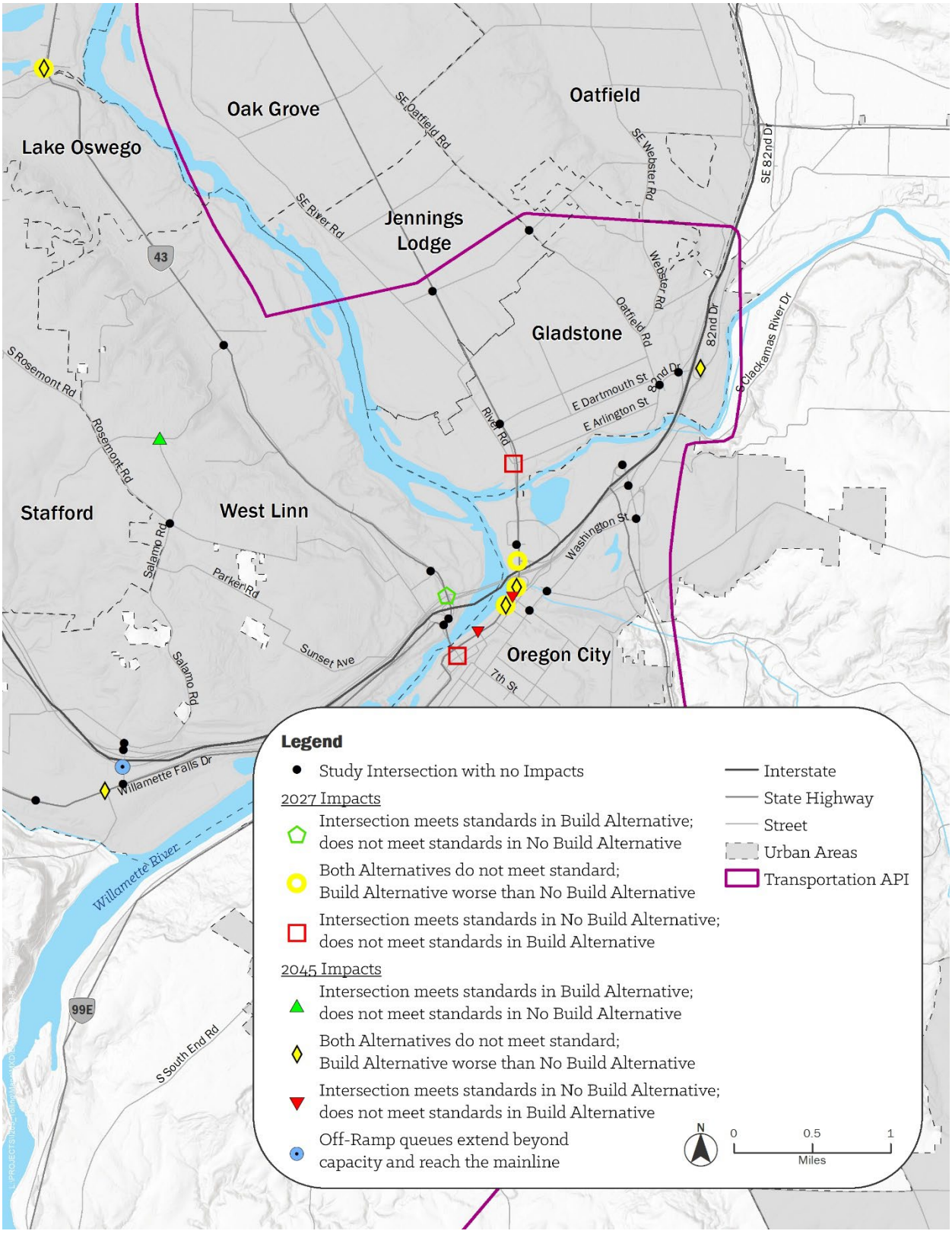
[23] An intersection is considered comparatively worse if the calculated v/c ratio in the Build Alternative is at least 0.05 greater than in the No Build Alternative, or the increase in average delay at the intersection is at least 10 seconds greater based on the jurisdictional mobility measure.

Figure 3-7. Summary of Intersection Effects in 2027 and 2045 in the Area of Potential Impact



Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.3)

Figure 3-8. Summary of Intersection Effects in 2027 and 2045 the Area of Potential Impact within Oregon City, West Linn, Gladstone



Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.3)

Table 3-7. Summary of Intersection Impacts

ID[1]	Intersection	Traffic Control	Meets Standards with No Build, but Not with Build		Does Not Meet Standards in No Build, Worsens in Build	
			2027	2045	2027	2045
18	7th St and Main St	Signalized	X			
19	OR 99E and I-205 Northbound Ramps	Signalized			X	X
20	OR 99E and I-205 Southbound Ramps	Signalized			X	
21	OR 99E and 15th St	Stop Controlled		X		
23	OR 99E and 10th St	Signalized		X		
25	OR 99E and Arlington St	Signalized	X			
32	SE 82nd Dr and I-205 Northbound Ramps	Signalized				X
35	SW Stafford Rd and SW Mountain Rd	Stop Controlled			X	X
36	SW Borland Rd and SW 65th Ave	Signalized		X		
37	12th St and Willamette Falls Dr	All-Way Stop Controlled				X
38	I-5 Northbound Ramps and Nyberg St	Signalized	X			
39	I-5 Southbound Ramps and Nyberg St	Signalized	X			
41	McLoughlin Blvd (OR 99E) and 14th St	Signalized			X	X
42	SW Stafford Rd and SW Childs Rd	Roundabout				X
43	SW Stafford Rd and SW Rosemont Rd	Roundabout	X			X
44	OR 43 and McVey Ave	Signalized			X	X
45	OR 43 and A Ave	Signalized				X
46	OR 99E and South End Rd	Signalized			X	X
47	OR 99E and New Era Rd	Stop Controlled			X	X
48	OR 99E and Ivy St	Signalized			X	X
49	OR 99E and Lone Elder Rd	Stop Controlled			X	X

[1] Each intersection ID number corresponds to the location numbers identified in Figure 3-1.

Of the 50 study intersections, the majority would not experience new impacts under the Build Alternative compared to the No Build Alternative in 2027 or 2045. As shown in Figure 3-7, Figure 3-8, and Table 3-7, 4 intersections would experience impacts only in 2027; 7 intersections would experience impacts only in 2045; and 10 intersections would experience impacts in both 2027 and 2045 under the Build Alternative compared to the No Build Alternative. Section 3.1.4 describes potential mitigation strategies for these impacts.

Transit

Analysts modeled future transit conditions in the API by projecting travel times on key roadways, MMLOS, and ridership. Section 5.3.4 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about projected transit operations.

Transit travel times in 2045 would differ between the No Build and Build Alternatives depending on location and time of day. In general, the Build Alternative would have:

- Shorter travel times than the No Build Alternative in the I-205, OR 213, SW Stafford Road, and SW Borland Road corridors during both the AM and PM peak periods.
- Longer travel times than the No Build Alternative in the Willamette Falls Drive, OR 43, and OR 99E corridors, although certain segments would experience shorter travel times during the AM and/or PM peak periods.

- Longer travel times than the No Build Alternative on southbound Main Street in downtown Oregon City from 14th Street to OR 99E during the PM peak period, and longer travel times to a lesser degree on northbound Main Street between 11th Street and 15th Street during the AM peak period.

Analysts modeled transit MMLOS only for OR 43, Willamette Falls Drive, and OR 99E because I-205, OR 213, SW Stafford Road, and SW Borland Road in the API do not currently have transit stops, so the MMLOS analysis is not applicable. There would be better overall MMLOS on OR 43 under the Build Alternative (MMLOS A) than the No Build Alternative (MMLOS B). Overall transit MMLOS would be the same under both alternatives in 2045 for Willamette Falls Drive (MMLOS E) and OR 99E (MMLOS C). However, for OR 99E, transit MMLOS would differ by segment. In the southbound direction between 11th Street and Main Street, transit MMLOS would be worse under the Build Alternative (MMLOS E) than the No Build Alternative (MMLOS D). In the northbound direction south of the Railroad Avenue intersection, transit MMLOS would be worse under the Build Alternative (MMLOS D) than the No Build Alternative (MMLOS C).

Future transit ridership levels in the API would be similar between the No Build Alternative and the Build Alternative. For transit routes that use I-205, the number of transit boardings would be less than 2% higher under the Build Alternative than under the No Build Alternative. For transit routes that do not use I-205, the number of transit boardings would be less than 1% higher for the Build Alternative compared to the No Build Alternative. Routes that use I-205 would benefit from improved I-205 travel times under the Build Alternative.

Active Transportation

All of the study intersections would have the same pedestrian LTS under both alternatives in 2045 except for the all-way stop intersection at 12th Street and Willamette Falls Drive, which would have a worse pedestrian LTS under the Build Alternative (pedestrian LTS 3) than the No Build Alternative (pedestrian LTS 2) because there would be more traffic volume under the Build Alternative.

Most pedestrian study corridors would experience no differences in MMLOS between the No Build and Build Alternatives, except in two areas:

- Westbound SW Borland Road from Ek Road to SW Stafford Road would experience worse pedestrian MMLOS under the Build Alternative than the No Build Alternative (change from a range of MMLOS C to E to MMLOS E). This one-mile section of rural roadway has little pedestrian activity and limited pedestrian facilities; however, conditions for the pedestrians that do use portions of this roadway segment would worsen somewhat due to an overall increase in traffic under the Build Alternative.
- Southbound OR 99E from 11th Street to Main Street in downtown Oregon City would experience worse pedestrian MMLOS under the Build Alternative than the No Build Alternative (change from MMLOS C to MMLOS E). This 0.4 mile section of roadway has sidewalks (about 5 feet wide) with no buffer from moving traffic for most of its length.

There would be no difference in bicycle LTS between the No Build Alternative and Build Alternative. Section 5.3.5 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about projected active transportation operations.

Truck Freight Mobility

Most of the truck freight routes within the API would experience shorter travel times or no substantial changes in travel times under the Build Alternative compared to the No Build Alternative, as shown in

Table 3-8. Section 5.3.6 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about projected freight operations.

Travel times on I-205 would be 26% to 53% shorter under the Build Alternative than the No Build Alternative, depending on the peak period and direction. Northbound I-5 travel times would be shorter in both the AM and PM peak periods compared to the No Build Alternative. Southbound I-5 (from the OR 217 interchange to Boone Bridge) travel times would vary, with the AM peak period generally experiencing longer travel times and the PM peak period generally experiencing shorter travel times.

Northbound OR 99E would experience overall shorter travel times between Canby and Gladstone in the AM peak period, with the greatest differences occurring between Canby and S 2nd Street. Southbound OR 99E would experience slightly longer overall travel times in both the AM and PM peak periods, with the largest difference of nearly 3 minutes occurring through Oregon City between W Arlington Street and S 2nd Street during the AM peak period.

Table 3-8. Truck Freight Corridor Travel Times for 2045 Build and No Build Alternatives (minutes)

Corridor	From	To	Build		No Build		% Difference	
			7-9 AM	4-6 PM	7-9 AM	4-6 PM	7-9 AM	4-6 PM
I-205 NB	**I-5 ramps**	**SE 82nd Drive**	**10.7**	**12.7**	**14.9**	**27.2**	**-28%†**	**-53%†**
I-205 SB	**SE 82nd Drive**	**I-5 ramps**	**10.7**	**10.5**	**14.5**	**14.2**	**-26%†**	**-26%†**
OR 213 NB	**Glen Oak Rd**	**I-205 Interchange**	**8**	**6.2**	**9.7**	**6.5**	**-18%†**	**-5%†**
OR 213 SB	**I-205 Interchange**	**Glen Oak Rd**	**5.8**	**6.1**	**6**	**6.1**	**-3%†**	**0%**
I-5 NB	**Boone Bridge**	**OR 217 interchange**	**18.5**	**13.5**	**22.4**	**14.1**	**-17%†**	**-4%†**
I-5 NB 1	*Boone Bridge*	*I-205 NB off-ramp*	*7.1*	*8.1*	*9.3*	*8.2*	*-24%†*	*0%*
I-5 NB 2	*I-205 NB off-ramp*	*OR 217 interchange*	*11.4*	*5.4*	*13.1*	*6.0*	*-13%†*	*-10%†*
I-5 SB	**OR 217 interchange**	**Willamette River Bridge**	**11.7**	**12.7**	**10.8**	**14.8**	**8%***	**-14%†**
I-5 SB 1	*OR 217 interchange*	*I-205 SB off-ramp*	*5.8*	*6.3*	*4.9*	*6.2*	*18%**	*2%**
I-5 SB 2	*I-205 SB off-ramp*	*Willamette River Bridge*	*5.9*	*6.4*	*5.9*	*8.6*	0%	*-26%†*
OR 99E NB	**Grant St (Canby)**	**Concord Rd**	**25.9**	**21.6**	**29.4**	**21.3**	**-12%†**	**1%**
OR 99E NB 1	*Grant St (Canby)*	*S 2nd Street*	*11.2*	*11.3*	*13.8*	*11.2*	*-19%†*	*1%*
OR 99E NB 2	*S 2nd Street*	*W Arlington St*	*9.9*	*5.5*	*10.7*	*5.3*	*-7%†*	*4%**
OR 99E NB 3	*W Arlington St*	*Concord Rd*	*4.8*	*4.8*	*4.9*	*4.8*	*-2%*	*0%*
OR 99E SB	**Concord Rd**	**Grant St (Canby)**	**27.8**	**23.2**	**24.8**	**21.9**	**12%***	**6%***
OR 99E SB 1	*Concord Rd*	*W Arlington St*	*4.8*	*4.7*	*4.9*	*4.8*	*-2%*	*-2%*
OR 99E SB 2	*W Arlington St*	*S 2nd Street*	*11.7*	*7.4*	*8.9*	*6.1*	*31%**	*21%**
OR 99E SB 3	*S 2nd Street*	*Grant St (Canby)*	*11.3*	*11.1*	*11.0*	*11.0*	*3%**	*1%*

Source: Appendix C, *I-205 Toll Project Transportation Technical Report* (Section 5.3.6)

Notes: Values shaded green† indicate a better travel time under the Build Alternative compared to the No Build Alternative, and values shaded red* indicate a worse travel time under the Build Alternative compared to the No Build Alternative. Changes of 2% or less were considered negligible and are not marked.

NB = northbound; SB = southbound

Transportation Safety

The safety analysis for 2027 and 2045 conditions included calculating predicted crash frequencies (number of crashes) for the study intersections, key study roadways, and I-205. The analysis estimates predicted average crash frequency as a function of traffic volume and roadway characteristics (e.g., number of lanes, median type, intersection control, number of approach legs). Section 5.3.7 of Appendix C, *I-205 Toll Project Transportation Technical Report*, provides more detailed information about projected transportation safety.

Study Intersection Predictive Analysis

The number of predictive crashes would vary between the Build Alternative and No Build Alternative in both 2027 and 2045 due to local traffic volume differences related to rerouting of I-205 traffic to avoid tolls. In 2027, the largest intersection differences would occur at the intersection of OR 99E and the I-205 southbound ramps, where there would be about three more predictive crashes under the Build Alternative, and at the OR 213 and I-205 northbound ramps, where there would be about six fewer predictive crashes under the Build Alternative compared to the No Build Alternative. In 2045, the largest intersection differences would occur at the intersections of 10th Street and at the I-205 southbound ramps, where there would be about three more predictive crashes under the Build Alternative, and at the OR 43 and I-205 northbound ramps intersection, where there would be about four fewer predictive crashes.

Study Roadway Predictive Analysis

The number of predictive crashes would be similar under both the No Build and Build Alternatives in both 2027 and 2045 for most study roadway segments. In 2027, the largest differences would occur along OR 99E, where there would be about 36 more predictive crashes under the Build Alternative compared to the No Build Alternative, and on OR 213, where there would be about 2 fewer predictive crashes under the Build Alternative compared to the No Build Alternative. In 2045, the largest differences would occur along Willamette Falls Drive and OR 99E, where there would be about seven and five more predictive crashes on each roadway respectively under the Build Alternative compared to the No Build Alternative. There would be about two fewer predictive crashes on OR 43 under the Build Alternative compared to the No Build Alternative.

I-205 Predictive Analysis

In 2045, there would be about 26% fewer predictive crashes (representing 144 total crashes) along I-205 in the API under the Build Alternative compared to the No Build Alternative due to lower traffic volumes associated with tolling and lane configuration changes associated with the Build Alternative. The predictive number of crashes at I-205 ramps would be similar (about four fewer crashes under the Build Alternative) between both alternatives.

Safety Impacts

Analysts identified safety impacts at intersections and key roadways segments under the Build Alternative based on predictive 2027 and 2045 crash data and whether they met primary or secondary criteria[24] for differences in safety performance, as described in more detail in Section 5.4.4 of Appendix C, *I-205 Toll Project Transportation Technical Report*. When an intersection or segment would meet one or more of the primary criteria, even if it would not meet any secondary criteria, mitigation would be considered. When an intersection or segment would not meet the primary criteria but would meet one or more of the secondary criteria, conditions would be monitored to determine if mitigation should be considered. Table 3-9 and Table 3-10 show intersections and roadway segments that would meet the primary and/or secondary criteria under the Build Alternative in 2027 and 2045.

Table 3-9. Intersections with Safety Impacts under Build Alternative Based on Criteria Evaluation

ID[1]	Intersection	2027		2045	
		Primary Criteria	Secondary Criteria	Primary Criteria	Secondary Criteria
18	7th Street and Main St		X		
27	OR 99E and Jennings Ave	X	X		
35	SW Stafford Rd and SW Mountain Rd		X		X
38	I-5 Northbound ramps and SW Nyberg St	X	X		
39	I-5 Southbound ramps and SW Nyberg St	X	X		
42	SW Stafford Rd and SW Childs Rd		X		
43	SW Stafford Rd and SW Rosemont Rd		X		
48	OR 99E and S Ivy Street	X	X		X
49	OR 99E and S Lone Elder Rd				X

[1] See Figure 3-1 for intersection location by number.

Table 3-10. Key Roadway Segments with Safety Impacts under Build Alternative Based on Criteria Evaluation

Roadway	Roadway Segment Limits	2027		2045	
		Primary Criteria	Secondary Criteria	Primary Criteria	Secondary Criteria
OR 99E	SE Glen Echo Ave to Main St (overcrossing)	X			
OR 99E	W Gloucester Street to W Dartmouth St	X			
OR 99E	W Arlington Street to Main Street	X			
OR 99E	N Redwood St to Ivy St	X	X		X
SW Stafford Rd	SW Johnson Rd to SW Childs Rd	X			

MP = mile post

[24] **Primary Criteria:** When the total fatality/severe injury crashes would increase by 0.05 crash per year (equivalent to one fatality/severe injury crash every 20 years), and/or if the intersection or segment is identified as a Safety Priority Index System location and the total fatality/severe injury crashes would increase by 0.01 crash per year (equivalent to one fatality/severe injury crash every 100 years).

Secondary Criteria: If the intersection exceeds the critical crash rate under existing conditions and if the total fatality/severe injury crashes would increase by any amount; if the segment is classified as a safety corridor and if the total fatality/severe injury crashes increase by any amount; and/or if the intersection does not meet the mobility standard and would worsen with the Project, and if the total fatality/severe injury crashes would increase by any amount.

3.1.3 Summary of Effects

Table 3-11 provides a comparison of all anticipated transportation impacts and benefits by alternative.

Table 3-11. Summary of Transportation Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term Effects	• None	• The number and speed of I-205 through lanes would generally be maintained throughout construction of the Project. • Nighttime lane closures of I-205, SW Borland Road, and Woodbine Road in accordance with *Oregon Standard Specifications for Construction* would be necessary during demolition of existing structures and erection of new bridge beams. • Limited full I-205 roadway closures would be required, with short-term detours in place as needed. • Transportation effects resulting from implementation of tolling before completion of the I-205 improvements would be comparable to those caused by the Build Alternative in 2027 and would last for 2 to 3 years starting in approximately 2024.
Direct Impacts and Benefits– 2027 Analysis Results	• 16 of 50 study intersections would not meet jurisdictional mobility standards during the AM and/or PM peak hour.	• 1 of 50 study intersections that would not meet standards under the No Build Alternative would meet standards under the Build Alternative during the AM peak hour. • 5 of 50 intersections that would meet standards under the No Build Alternative would not meet standards under the Build Alternative during the AM and/or PM peak hours. • 15 of 50 intersections would not meet mobility standards in the AM and/or PM peak hour under both alternatives. Of those, 9 intersections would get comparatively worse under the Build Alternative. • Based on the predictive safety analysis, 4 of the 50 intersections were identified to experience impacts under the Build Alternative. • Based on the predictive safety analysis, 4 segments along OR 99E and 1 segment along SW Stafford Road were identified to experience impacts under the Build Alternative.
Direct Impacts and Benefits – 2045 Analysis Results	• 24 of 50 study intersections would not meet jurisdictional mobility standards during the AM and/or PM peak hour. • All of the northbound I-205 segments except the on-ramp segment from OR 213 would meet the mobility standard of a v/c ratio of 0.99 during the AM and PM peak hours. • All of the southbound I-205 segments except the segment after the on-ramp from OR 213 would meet the mobility standard of a v/c ratio of 0.99 during the PM peak hour.	• 1 of 50 study intersections that would not meet standards under the No Build Alternative would meet standards under the Build Alternative during the PM peak hour. • 3 of 50 intersections that would meet standards under the No Build Alternative would not meet standards under the Build Alternative during the AM and/or PM peak hours. • 23 of 50 intersections would not meet mobility standards in the AM and/or PM peak hour under both alternatives. Of those, 13 intersections would get comparatively worse under the Build Alternative. • Travel times and operating LOS would improve on I-205 in the AM and PM peak hours in both directions. • All of the northbound I-205 segments would meet the HDM v/c ratio mobility standard of 0.75 except for 3 segments in the AM peak hour and 2 segments in the PM peak hour. • All of the southbound I-205 segments would meet the HDM v/c ratio mobility standard of 0.75 except for 1 segment in the AM peak hour and 5 segments in the PM peak hour. • The 10th Street and southbound I-205 off-ramp termini intersection would experience off-ramp queues that would spill back onto I-205, causing impacts on mainline operations (AM peak hour only).

Effects	No Build Alternative	Build Alternative
	• Pedestrian LTS at the intersection of 12th Street and Willamette Falls Drive would be better than under the Build Alternative.	• Travel-time reliability along I-205 in the peak periods would improve compared to the No Build Alternative. During the PM peak period in the northbound direction, travel time variability over the 2-hour time period would be 47% lower, and travel-time variability during any single point in time would be 75% lower. • Overall, transit MMLOS would be better under the Build Alternative than the No Build Alternative. Two transit roadway segments would experience lower MMLOS under the Build Alternative. • Peak-period travel times along Main Street in Oregon City would be longer under the Build Alternative. • Two roadway segments would experience lower pedestrian MMLOS, and 1 intersection would experience worse pedestrian LTS. • Expected crash frequencies would be 26% lower on I-205.
Indirect Impacts and Benefits	• Rerouting to other roadways due to congestion on I-205 would occur under the No Build Alternative.	• Due to tolling, slight changes in mode choice away from single-occupancy vehicles would occur. • Vehicle users may avoid peak-period travel to avoid paying tolls. • For transit routes in the API, transit ridership would be slightly higher under the Build Alternative than under the No Build Alternative.

API = area of potential impact; LOS = level of service; LTS = level of traffic stress; HDM = Highway Design Manual; MMLOS = multimodal level of service; ODOT = Oregon Department of Transportation; v/c = volume-to-capacity

3.1.4 Avoidance, Minimization, and/or Mitigation Measures

This section describes potential mitigation strategies to avoid, minimize, or mitigate roadway, transit, active transportation, and safety impacts identified in Section 3.1.2. The impacts and potential mitigation strategies are categorized as near-term (related to 2027 impacts) and longer-term (related to 2045 impacts). ODOT will identify final mitigation strategies in coordination with the local jurisdictions and with input from comments on this Environmental Assessment. The Revised Environmental Assessment will include ODOT's final mitigation commitments and their potential environmental effects.

Roadway Mitigation

One of the first actions that ODOT would take is to set up a transportation system monitoring program to be in place prior to the initial implementation of tolls on I-205. This program would track conditions on roadways in the API, as agreed upon with local jurisdictions, to assess the extent of rerouting and its effect on the system. This program would be used to identify impacts of tolling prior to and after the construction of the planned I-205 improvements. Based on this data ODOT would have the ability to identify and implement new mitigation requirements and/or move up mitigation planned for a later date. In addition, ODOT may establish a group consisting of local leaders, staff, and/or elected officials to meet with ODOT staff immediately after tolling is implemented to be a direct line of communication with ODOT to address rerouting concerns. Any mitigation proposed to address near-term impacts that is determined to also help alleviate pre-completion tolling impacts could be implemented before tolling begins.

Implementation of mitigation strategies may cause secondary impacts at adjacent intersections or roadways. Secondary impacts from implementing mitigation measures may require additional avoidance, minimization, or mitigation measures. An assessment of the effects associated with mitigation will be included in the Revised EA.

The summaries of potential roadway mitigation measures for intersections and roadway segments are grouped into following geographic areas:

- OR 99E/Oregon City/Gladstone area (Table 3-12)
- OR 99E/Canby area (Table 3-13)
- Willamette Falls Drive/West Linn area (Table 3-14)
- SW Stafford Road and SW Borland Road area (Table 3-15)
- OR 43/Lake Oswego area (Table 3-16)
- Tualatin area (Table 3-17)

Table 3-12. Proposed Mitigation for OR 99E/Gladstone/Oregon City Area

Impact Location	Mitigation Type					Analysis Year	
			Active Transportation				
	Traffic	Transit	Pedestrian	Bike	Safety	2027	2045
OR 99E/ Jennings Ave	None proposed	None proposed	None proposed	None proposed	Rear end and angle type crashes were predominant. Add 3-inch yellow reflective sheeting to signal backplates.	X	
OR 99E between SE Jennings Avenue and SE Glen Echo Avenue	None proposed	None proposed	None proposed	None proposed	Install a raised median and trees alongside the roadway.	X	
OR 99E/ Gloucester St	None proposed	None proposed	None proposed	None proposed	Rear end and angle type crashes were predominant. Add 3-inch yellow reflective sheeting to signal backplates	X	
OR 99E between SE Glen Echo Avenue and W Dartmouth Street	None proposed	None proposed	None proposed	None proposed	Crash patterns involved pedestrians that resulted in a fatality or severe injury; two of those crashes occurred during dusk/dark. Install a raised median, trees alongside the roadway, amid-block crossing, and lighting on roadway.	X	
OR 99E/ Arlington St	Reconfigure the east leg approach to include a separate left-turn lane with protected phasing and a shared through-right-turn lane and reconfigure the west leg to be one-way eastbound with right-turn only.	Transit signal priority (pending agreement on acceptable technology)	Modify the signal timing to provide leading pedestrian intervals at all protected pedestrian crossings	None proposed	Reconfigure intersection	X	

Impact Location	Mitigation Type					Analysis Year	
	Traffic	Transit	Active Transportation		Safety	2027	2045
			Pedestrian	Bike			
OR 99E between W Arlington Street and Main Street	None proposed	None proposed	None proposed	None proposed	Crash patterns involved pedestrians that resulted in a fatality or severe injury; two of those crashes occurred during dusk/dark. Install a raised median, trees alongside the roadway, a mid-block crossing, and lighting on roadway.	X	
OR 99E North of Dunes Dr	None proposed	Widen to provide southbound transit queue jump space (i.e., an area that allows transit to "jump" ahead of cars with an advance green light) just north of Dunes Dr	None proposed	Improve signing and striping for cyclists to use northbound ramp from bike lane to sidewalk before it reaches the Clackamas River Bridge	None proposed	X	
OR 99E/ Dunes Dr	None proposed	Transit signal priority (pending agreement on acceptable technology)	None proposed	None proposed	None proposed	X	
OR 99E/ I-205 Southbound Ramps	Provide transit lane bypass of on-ramp meter on southbound on-ramp.	Transit signal priority (pending agreement on technology) Provide northbound bus pocket at intersection and implement advance green light	None proposed	None proposed	Rear end and angle type crashes were predominant. Add 3-inch yellow reflective sheeting to signal backplates.	X	

Impact Location	Mitigation Type					Analysis Year	
	Traffic	Transit	Active Transportation		Safety	2027	2045
			Pedestrian	Bike			
OR 99E/ I-205 Northbound Ramps	Provide southbound dual left-turn lanes; westbound dual left-turn lanes; northbound dual right-turn lanes (starting at 15th St); allow northbound permitted turns (i.e., allow a left turn on a flashing yellow arrow signal when there is a safe gap in opposing traffic) plus an overlap phase (i.e., allow a left-turn movement from one street at the same time as a right-turn movement from the intersecting street).	Transit signal priority (pending agreement on technology), advance green for southbound transit	None proposed	None proposed	Rear end and angle type crashes were predominant. Add 3-inch yellow reflective sheeting to signal backplates.	X	
OR 99E/ 15th St	Convert 15th St to one-way westbound between Main St and OR 99E; start a fourth northbound lane on OR 99E north of 15th St that becomes the second northbound right-turn lane at the intersection of OR 99E and I-205 northbound ramps.	None Proposed	Provide pedestrian refuge island between the 2 right-turn lanes on 15th St, include RRFB for pedestrian crossing safety	None proposed	None proposed		X
OR 99E/ 14th St	Start third northbound lane just north of 14th St, which becomes one of two right-turn lanes to the I-205 northbound on-ramp.	Transit signal priority (pending agreement on technology)	None proposed	None proposed	None proposed	X	
OR 99E/ 12th St	None proposed	Transit signal priority (pending agreement on technology)	None proposed	None proposed	None proposed	X	
OR 99E/ 10th St	Extend southbound left-turn lane to 12th St; monitor to assess the effects of the improvement over time and determine if additional long-term mitigation would be required.	None proposed	Widen/Improve southbound sidewalk on OR 99E between 10th Street and Railroad Avenue	None proposed	Sidewalk improvements between 10th St and Railroad Ave are expected to improve pedestrian safety.		X

Impact Location	Mitigation Type					Analysis Year	
	Traffic	Transit	Active Transportation		Safety	2027	2045
			Pedestrian	Bike			
OR 99E from 10th St. to Railroad Ave	None proposed	None proposed	Coordinate with the City of Oregon City to implement the OR 99E Bike and Pedestrian Improvements Project, which would improve active transportation facilities on the southbound side of OR 99E.		Install coordination or adaptive signal timing or urban traffic signals. Install speed feedback sign.	X	X
Main St/ 7th St	None proposed	None proposed	Implement pedestrian improvements, as noted for OR 99E from 10th St to Railroad Ave above to improve overall mobility in the area.		None proposed	X	
Main St/ 10th St	Add traffic signal (pending completion of additional analysis)	Transit signal priority for southbound left turns (pending agreement on acceptable technology)	Signal provides protected crossing; include pedestrian signal and leading pedestrian interval	None proposed	None proposed	X	
SE 82nd Dr and I-205 northbound ramps[1]	Add an additional westbound through lane that extends through the SE 82nd Dr and the I-205 southbound ramps and a left-turn lane on the northbound off-ramp onto SE 82nd Dr. These lane additions could be accommodated by restriping the westbound approach and widening the roadway onto the shoulder and by restriping the northbound approach.	None proposed	None proposed	None proposed	None proposed		X

RRFB = rectangular rapid flashing beacon

[1] Due to uncertainty regarding the projected traffic volumes, ODOT proposes to monitor this location and only implement the proposed mitigation if the actual conditions warrant it.

Table 3-13. Proposed Mitigation for OR 99E/Canby Area

Location	Improvement Type					Analysis Year Impact	
			Active Transportation		Safety	2027	2045
	Traffic	Transit	Pedestrian	Bike			
OR 99E and South End Rd	Signalize intersection; add southbound through lane and northbound right-turn lane. Reduce the lane widths to account for physical constraints and include advanced warning for signal.	None proposed	None proposed	None proposed	None proposed	X	
OR 99E between South End Rd and Haines Rd	Advance warning signing/ flashers for new signal at South End Rd (northbound).	None proposed	None proposed	None proposed	Crash patterns along this segment of the corridor were primarily rear end. Adding lighting and speed feedback sign is expected to improve safety.	X	
OR 99E and Haines/New Era Rd	Provide a roundabout;	Provide the following transit-related improvements: • Landing pads at bus stops (i.e., paved area at the bus stop where passengers board or exit the bus) • Crosswalks with RRFB to facilitate crossing of OR 99E • Extend sidewalks to New Era Rd	Install crosswalks and RRFBs to improve pedestrian access to bus stops and safety for crossing	None proposed	Converting the current stop-controlled intersection to a roundabout is expected to improve safety.	X	
OR 99E between N Redwood St and SE Berg Pkwy	None proposed	None proposed	None proposed	None proposed	Crash patterns along this segment of the corridor were primarily angle and turning type crashes. Install coordination or adaptive signal timing or urban traffic signals. Install mid-block crossing. Install speed-feedback sign. Traffic signal Improvements along signalized intersections within this segment are expected to improve traffic safety.	X	

Location	Improvement Type					Analysis Year Impact	
			Active Transportation		Safety	2027	2045
	Traffic	Transit	Pedestrian	Bike			
OR 99E and Ivy St	Consider operational improvements at OR 99E and Pine St to facilitate more traffic use of that intersection to reach downtown Canby, thereby alleviating some traffic impact at Ivy St.	None proposed	Provide more prominent crosswalk markings	Add green dashed bike crossing markings across OR 99E.	Angle type crashes were predominant at this intersection. Add 3-inch yellow reflective sheeting to signal backplates. Left-turning traffic calming treatment (e.g., hardened centerline) and traffic signal Improvements at this location are expected to improve traffic safety.	X	
OR 99E and Lone Elder Rd	Square up existing skewed approach and provide southbound refuge lane for westbound left turns	None proposed	None proposed	None proposed	Traffic operations improvements listed for this location are expected to improve traffic safety.	X	

mph = miles per hour; RRFB = rectangular rapid flashing beacon

Table 3-14. Proposed Mitigation for Willamette Falls Drive/West Linn Area

Location	Improvement Type					Analysis Year Impact	
			Active Transportation				
	Traffic	Transit	Pedestrian	Bike	Safety	2027	2045
Willamette Falls Dr/ 12th St	None proposed	None proposed	To improve crosswalk visibility/prominence, install solar panel stop signs with red-edge light features	None proposed	The pedestrian mobility improvements listed for this location are also proposed as safety improvements.		X
12th St between Willamette Falls Dr and Tualatin Ave	None proposed	None proposed	Potential improvements include add RRFB for crosswalk at school (at 12th St and 5th St.), add "school zone" sign with 20-mph speed limit when flashing (advanced warning); add another prominent crosswalk (6th Ave), extend Willamette Falls Dr streetscape down 12th St to the school, including adding curb extensions	Add bicycle lane along 12th St from Willamette Falls Dr to Tualatin Ave to facilitate safe routes to school as well as access to Willamette Park.	The pedestrian and bicycle mobility improvements listed for this location are also proposed as safety improvements.		X
I-205 ramps at 10th St[1]	I-205 off-ramp queues could potentially extend beyond capacity and affect I-205 mainline operations by 2045 at the 10th Street and I-205 southbound off-ramps intersection during the AM peak hour. Monitor this area to determine when or if mitigation is needed.	None proposed	None proposed	None proposed	None proposed		X

mph = miles per hour; RRFB = rectangular rapid flashing beacon

[1] Due to uncertainty regarding the projected traffic volumes, ODOT proposes to monitor this location and only implement mitigation if the actual conditions warrant it.

Table 3-15. Proposed Mitigation for SW Stafford Road and SW Borland Road Area

Location	Improvement Type					Analysis Year Impact	
			Active Transportation				
	Traffic	Transit	Pedestrian	Bike	Safety	2027	2045
SW Stafford Rd/ SW Rosemont Rd	None proposed	None proposed	Install RRFB on east and north legs of the roundabout, improve lighting for pedestrians, install raised crosswalks around intersection, improve lighting	None proposed	The pedestrian and bicycle mobility improvements listed for this location are also proposed as safety improvements.	X	
SW Stafford Rd/ SW Mountain Rd	Convert to a roundabout	None proposed	None proposed	None proposed	Converting the current stop-controlled intersection to a roundabout is expected to improve safety.	X	
SW Borland Rd between SW 65th Ave and SW Stafford Rd	None proposed	None proposed	Contribute to RTP Constrained Project: *65th Ave, Tualatin River to I-205 (RTP ID 11428):*	None proposed	None proposed		X
SW Borland Rd/ Ek Rd	Install an all-way stop or roundabout pending further analysis	None proposed	None proposed	None proposed	The traffic improvements proposed for this location are also expected to improve safety.		X
SW Borland Rd between SW Stafford Rd and Tualatin River Bridge	None proposed	None proposed	Contribute to RTP Strategic/Clackamas County Transportation System Plan*: Borland Rd, Stafford Rd to West Linn city limits (RTP/CC TSP 1082):* Add paved shoulders in accordance with the active transportation plan	Contribute to RTP Strategic/Clackamas County Transportation System Plan*: Borland Rd, Stafford Rd to West Linn city limits (RTP/CC TSP 1082):* Add paved shoulders in accordance with the active transportation plan	The pedestrian and bicycle mobility improvements listed for this location are expected to improve safety for active transportation modes.		X

Table 3-16. Proposed Mitigation for OR 43/Lake Oswego Area

Location	Improvement Type					Analysis Year Impact	
			Active Transportation				
	Traffic	Transit	Pedestrian	Bike	Safety	2027	2045
OR 43 between A Ave and McVey Ave, including intersections of OR 43/A Ave and OR 43/ McVey Ave	Signal coordination (or adaptive signal control) on OR 43 at the three signals between and including A Ave and McVey Ave (at Foothills Rd, Northshore Rd, and Middlecrest Rd/Wilbur St). Coordination with railroad would be required to implement the proposed improvements.	None proposed	None proposed	None proposed	None proposed		X
OR 43/McVey Ave	None proposed	None proposed	Improve pedestrian crossings, including completing crosswalks and pedestrian signals around the intersection if feasible, and also adding LPI (contingent on benefit analysis approved by ODOT); enhance signing for motorist awareness of pedestrians and signalize currently unprotected crossing of the southbound right-turn lane from OR 43 to McVey Ave. Signalizing the southbound to westbound slip lane will be considered for better pedestrian safety.	None proposed	The pedestrian and mobility improvements listed for this location are expected to improve safety for active transportation modes.	X	

LPI = leading pedestrian interval; RRFB = rectangular rapid-flashing beacon

Table 3-17. Proposed Mitigation for the Tualatin Area

Location	Improvement Type					Analysis Year Impact	
	Traffic	Transit	Active Transportation		Safety	2027	2045
			Pedestrian	Bike			
Nyberg St/ I-5 Southbound Ramps	Potential traffic impact identified in 2027 but not 2045. City of Tualatin is reconfiguring this intersection. Recommend monitoring subsequently to identify if mitigation is needed.	None proposed	Monitor conditions to assess need for future improvements.	None proposed	Rear end and angle type crashes were predominant at this location. Add 3-inch yellow reflective sheeting to signal backplates.	X	
Nyberg St/ I-5 Northbound Ramps	Potential traffic impact identified in 2027 but not 2045. Recommend monitoring subsequently to identify if mitigation is needed.	None proposed	Monitor conditions to assess need for future improvements.	None proposed	Rear end and angle type crashes were predominant at this location. Add 3-inch yellow reflective sheeting to signal backplates.	X	
SW 65th Ave/ SW Borland Rd	Monitor for need for potential long-term mitigation, including restriping the westbound approach as one left-turn lane and one shared through/right-turn lane and adding an exclusive northbound right-turn lane. Additional changes to signal phasing/timings would be required. This improvement would likely require some sliver right-of-way acquisitions.	None proposed	Complete crosswalks and pedestrian signals around the intersection if feasible, and LPI (contingent on benefit analysis approved by ODOT).	None proposed	None proposed		X

LPI = leading pedestrian interval

Transit Mitigation

Multiple factors affect transit MMLOS, including transit speed and reliability, and the ability for pedestrians to safely access transit stops. Implementing transit priority treatments and improving pedestrian facilities along the following transit corridor segments would improve transit MMLOS:

- **OR 99E from 11th Street to Main Street (southbound direction) (2027 impact):** Currently, the only TriMet route using this stretch of roadway is Route 33. However, TriMet is planning to revise the route and remove it from this portion of OR 99E. Nonetheless, transit MMLOS and pedestrian access would be improved along this stretch by improving sidewalks (see Table 3-12).
- **OR 99E from Railroad Avenue to MP 12.74 (northbound direction):** Currently, the only TriMet route using this stretch of roadway is Route 33. However, TriMet is planning to revise the route and remove it from this portion of OR 99E. The removal of this route from this portion of OR 99E would remove any transit-related impact from the Project.

Active Transportation Mitigation

Potential pedestrian impacts were identified along the roadway segments listed below (associated improvements are also contained in the mitigation measures summarized in Tables 3-12, 3-13, and 3-15, as noted):

- Consider paving the shoulders on SW Borland Road between SW Stafford Road and Ek Road (extent to be determined through ODOT coordination with local jurisdictions) (see Table 3-15).
- Improve pedestrian conditions at OR 99E from 11th Street to Main Street as identified above in the Transit Mitigation section to improve transit MMLOS (see Table 3-12).
- Due to geometric and other constraints, active transportation mitigation opportunities may potentially be assessed at the following intersections to improve overall operations for all modes:
  - SW Stafford Road and SW Rosemont Road (see Table 3-15)
  - Main Street and 7th Street
  - McLoughlin Boulevard and 10th Street (see Table 3-12)
  - OR 99E and Ivy Street (see Table 3-13)

Safety Mitigation

Potential safety impacts under the Build Alternative in 2027 were identified at the intersections and roadway segments listed in the Safety Impacts subsection of Section 3.1.2. Safety impacts identified for the year 2045 were also documented, and those locations will be monitored to determine if they require mitigation in the longer-term.

Based on the criteria presented in the Safety Impacts subsection of Section 3.1.2 and presented in more detail in Section 5.4.4, Safety Effects, of Appendix C, *I-205 Toll Project Transportation Technical Report*, several locations were identified for evaluation of safety-specific mitigation based on the 2027 safety analysis. Some of these locations were also identified as needing operational mitigation, as well as operational improvements. For these locations, the Project Team conducted a follow-up safety analysis incorporating the recommended operational improvements. For some locations, the operational improvements positively affected safety to the extent that the location no longer met either of the primary safety criteria. These locations included the following intersections, which were therefore not analyzed for further safety mitigation:

- OR 99E and Arlington Street
- SW Stafford Road and Rosemont Road

For the other intersections and segments, the Project Team reviewed existing crash data to identify crash patterns that would indicate a roadway or intersection safety deficiency. Potential mitigation strategies were selected from ODOT's *Highway Safety Improvements Program Countermeasures and Crash Reductions Factor*, which outlines a list of crash reduction factors that have been recognized as effective countermeasures by ODOT (ODOT 2022d).

The following sections list treatments that could be implemented to improve safety at locations identified as meeting the primary safety criteria under 2027 Build Alternative conditions. These are preliminary safety mitigation measures, and a feasibility analysis would need to be conducted to assess the viability of implementing these measures and to confirm consistency with other planned projects. Safety mitigation measures are also listed in Table 3-12 through Table 3-17.

Proposed Safety Treatments

Add 3-inch Yellow Retroreflective Sheeting to Signal Backplates

Adding 3-inch yellow retroreflective sheeting to signal backplates could reduce all crashes by 15 percent. This treatment enhances signal visibility during daytime and nighttime conditions, and it may alert drivers of the signalized intersection during a power outage (ODOT 2022d). A signal backplate is a metal piece that frames the signals and can be installed with a reflective border to improve the visibility of traffic lights, especially in bright conditions.

Improve Signal Hardware: Lenses, Reflectorized Back plates, Size, and Number

Signal improvements consist of treatments such as twelve-inch signal lenses, LED lenses on all signals, reflectorized back plates on all signal heads, supplemental signal heads, remove night flashing operations, signal timing adjustments and adding right turn lane signal to reduce right-turn conflicts. Implementing three to four of these treatments can reduce all crashes by 25 percent. All these treatments can reduce crashes by increasing signal visibility and improving operations (ODOT 2022d).

Add Street Trees

Adding infill trees alongside the roadway where there is space available could reduce crashes of all severities by up to 10 percent. Trees provide traffic calming and narrow a driver's visual field, providing distinct roadway edges, which help drivers guide their movements and assess their speed (ODOT 2022d).

Install Rectangular Rapid Flashing Beacon

Installing a mid-block pedestrian crossing with a Rectangular Rapid Flashing Beacon (RRFB) (3-lane or wider roadway) could reduce pedestrian and bicycle crashes of all severities by 10 percent. RRFBs enhance safety by increasing driver awareness of potential pedestrian conflicts (ODOT 2022d)

Install Lighting on a Roadway Segment

Installing lighting on the roadway segment could reduce night crashes of all severities by 28 percent. Lighting allows for greater visibility to the driver of potential conflicts (ODOT 2022d).

Provide a Raised Median, Urban Multi-Lane Road

Installing a raised median on an urban multi-lane road could reduce crashes of all severities by 22 percent. Medians can reduce the frequency and magnitude of conflict points at driveways and intersections (ODOT 2022d).

Speed Feedback Signs

Installing a speed feedback sign would reduce all crashes of all severities by 10 percent. Speed feedback signs enhance safety by managing speeds and reducing the risk of speed related crashes (ODOT 2022d).

Install Coordination or Adaptive Signal Timing of Urban Traffic Signals

Installing coordination or adaptive signal timing or urban traffic signals could reduce crashes of all severities and types by 17 percent. Coordinated signals produce vehicle platoons keeping traffic at a constant speed, which reduce rear-end conflicts. Vehicle platooning also allows for larger gaps for drivers making permitted turning maneuvers (ODOT 2022d).

3.2 Air Quality

3.2.1 Affected Environment

The air quality API, shown in Figure 3-9, includes the roadway segments that could experience changes in congestion (e.g., traffic volumes and speeds) under the Build Alternative, as described in Section 3.1.2. Per FHWA guidance, the air quality analysis includes areas within the API expected to experience a meaningful change[25] in a type of hazardous air pollutants called Mobile Source Air Toxics (MSAT)[26] (FHWA 2016). The API is designated as an attainment area for all criteria pollutants under the Clean Air Act.[27] However, ODOT conducted an analysis of criteria pollutant emissions to better understand the effects of the Build Alternative. Chapter 4 of Appendix D, *I-205 Toll Project Air Quality Technical Report*, and Appendix D1, *I-205 Toll Project Criteria Pollutant Emissions Memorandum,* provide a detailed description of the methodology used for the analysis.

MSAT emissions have typically been decreasing over time due to the implementation of vehicle standards, improved technology, and vehicle turnover. At the two monitoring sites within and closest to the API (shown on Figure 3-9), criteria pollutants did not exceed federal air quality standard levels in 2020, although there were elevated concentrations of carbon monoxide, ozone, and particulate matter 2.5 microns or less in size ($PM_{2.5}$), which the Oregon Department of Environmental Quality (DEQ) determined were due to wildfire smoke (DEQ 2021). Chapter 5 of Appendix D and Appendix D1 provide a more detailed description of existing air quality conditions in the API.

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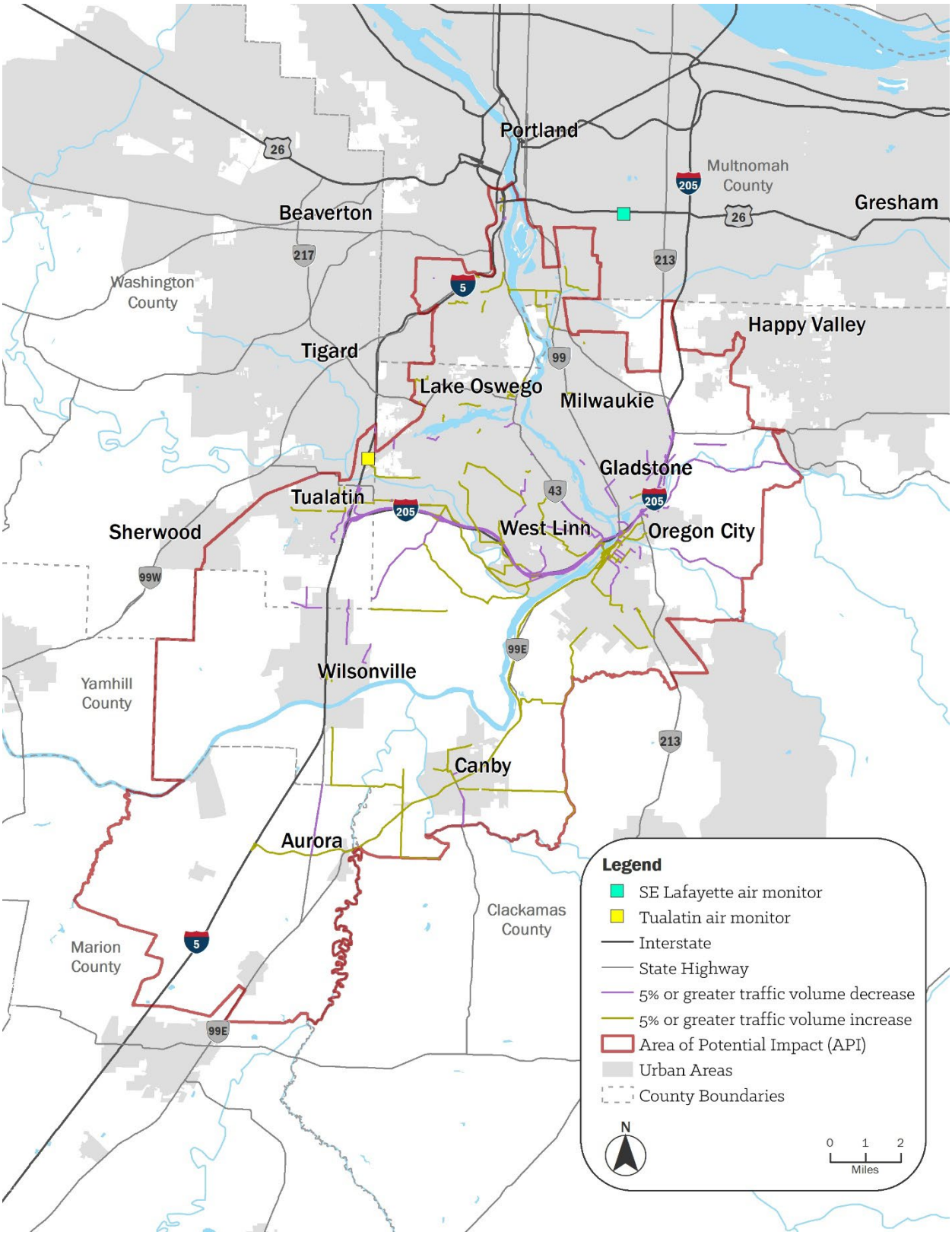
[25] The FHWA guidance defines *meaningful change* in emissions as approximately plus or minus 10% between the future No Build Alternative and Build Alternative.

[26] MSATs are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter.

[27] Under the Clean Air Act, the U.S. Environmental Protection Agency has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide, particulate matter 10 microns or less in size (PM_{10}), particulate matter 2.5 microns or less in size ($PM_{2.5}$), ozone, sulfur dioxide, lead, and nitrogen dioxide. These pollutants are referred to as *criteria pollutants*. Highway projects in attainment areas are considered to be in conformity with the Clean Air Act and are not required to perform detailed analysis to demonstrate compliance with the NAAQS.

Figure 3-9. Air Quality Area of Potential Impact



Source: Metro Regional Travel Demand Model

3.2.2 Environmental Consequences

The air quality impact analysis evaluated the projected MSAT emissions from the Build Alternative as compared to the projected emissions from the No Build Alternative in both the interim year (2027) and design year (2045) to provide details about expected emissions changes over time.

No Build Alternative

Under the No Build Alternative, MSAT emissions in 2045 would be lower than 2027 and existing emissions. Although VMT in 2045 in the API would be over 16% higher than it would be in 2027, MSAT emissions would decrease due to the implementation of vehicle standards, improved technology, and vehicle turnover. Modeled criteria pollutant emissions would also generally be lower in 2045 than in 2027 and under existing conditions. The one exception would be PM_{10}, for which average summer day emissions would be higher in 2045 and 2027 than under existing conditions.

Build Alternative

Short-Term Effects

Construction activities would cause temporary increases in particulate matter in the form of fugitive dust (from ground clearing and preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of construction materials), as well as exhaust emissions of criteria pollutants from material delivery trucks, construction equipment, and workers' private vehicles during the construction period of approximately 4 years. Construction contractors for the Project would be required to comply with Division 208 of OAR 340, which places limits on fugitive dust that causes a nuisance or violates other regulations. In addition, contractors would be required to comply with *Oregon Standard Specifications for Construction* (ODOT 2021c) for air quality (Section 290.30) and to implement air pollution control measures that include vehicle and equipment idling limitations and that minimize vehicle track-out and fugitive dust (ODOT 2021c).

Long-Term Effects

As shown in Table 3-18, the overall MSAT emissions would be lower under the Build Alternative in 2027 and 2045 than the No Build Alternative because of lower VMT under the Build Alternative compared to No Build Alternative.

Table 3-18. MSAT Emissions (tons per year)

Pollutant	2027 No Build	2027 Build	Percentage Difference 2027 No Build to Build	2045 No Build	2045 Build	Percentage Difference 2045 No Build to Build
Annual VMT[1]	1,051,694,624	965,576,193	-8%	1,222,083,927	1,162,440,219	-5%
1,3-Butadiene	0.033	0.030	-8%	0.000	0.000	0%
Acetaldehyde	0.379	0.357	-6%	0.328	0.298	-9%
Acrolein	0.038	0.036	-5%	0.022	0.020	-8%
Benzene	0.985	0.899	-9%	0.707	0.647	-8%
Diesel Particulate Matter	2.084	2.029	-3%	1.246	1.156	-7%
Ethylbenzene	0.710	0.647	-9%	0.602	0.543	-10%
Formaldehyde	0.616	0.577	-6%	0.410	0.373	-9%
Naphthalene	0.062	0.058	-7%	0.027	0.025	-8%
Polycyclic Organic Matter	0.027	0.025	-7%	0.011	0.010	-7%

Source: Appendix D, *I-205 Toll Project Air Quality Technical Report* (Section 6.2.2)

[1] Annual VMT for the No Build Alternative and Build Alternative was estimated based on roadways within the air quality API with modeled traffic volume changes. By contrast, VMT in the transportation analysis (Table 3-1) is based on the entire Portland region's roadway network to provide a systemwide analysis of transportation behavior. Evaluating the entire regional roadway network for the air quality analysis would result in emissions estimates for many roadways not affected by the Project, diluting the results of the analysis, and not allowing for a meaningful comparison between alternatives.

To determine the effects of traffic rerouting on MSAT emissions after construction of the Build Alternative, analysts modeled emissions of benzene and diesel particulate matter, the pollutants with the greatest emissions in all scenarios analyzed, by roadway type and vehicle type in 2027.[28] Table 3-19 shows daily VMT by roadway type and vehicle type for No Build and Build Alternatives in 2027. While the Build Alternative would have higher total non-highway VMT compared to the No Build Alternative, the higher non-highway VMT would be more than offset by lower total highway VMT. In addition, the higher non-highway VMT would be primarily from passenger vehicles. Non-highway VMT from heavy trucks, which generally produce higher emissions, would be lower.

Table 3-19. 2027 Daily Vehicle Miles Traveled Changes within Area of Potential Impact

Vehicle Type	2027 No Build Highway	2027 No Build Non-Highway	2027 No Build Total	2027 Build Highway	2027 Build Non-Highway	2027 Build Total
Passenger	1,553,978	1,190,246	2,744,224	1,160,118	1,332,361	2,492,479
Medium	29,453	10,546	39,999	31,214	9,924	41,139
Heavy	71,564	25,565	97,129	87,873	23,927	111,799
All	**1,654,995**	**1,226,357**	**2,881,352**	**1,279,205**	**1,366,212**	**2,645,417**

Source: Appendix D, *I-205 Toll Project Air Quality Technical Report* (Section 6.2.2)

[28] 2027 data only was used for this portion of the analysis because the emissions would be greater in 2027 than in 2045, making it more feasible to show the distribution of vehicle and roadway types.

As shown in Table 3-20 and Table 3-21, total benzene and diesel particulate matter emissions for all vehicle types on all roadway types under the Build Alternative would be lower than or equal to the No Build Alternative in 2027. Although heavy truck VMT on highways would be approximately 22% higher under the Build Alternative, the diesel particulate emissions from heavy trucks on highways would be only 2% higher because of the less congested conditions (U.S. Department of Energy 2015). Non-highway emissions in 2027 would be slightly higher under the Build Alternative than the No Build Alternative primarily because of the higher VMT for passenger vehicles on these roads.

Table 3-20. 2027 Benzene Emission Details (tons)

Vehicle Type	2027 No Build Highway	2027 No Build Non-Highway	2027 No Build Total	2027 Build Highway	2027 Build Non-Highway	2027 Build Total
Passenger	0.460	0.454	0.914	0.318	0.514	0.832
Medium	0.029	0.014	0.043	0.025	0.013	0.038
Heavy	0.020	0.009	0.029	0.019	0.009	0.028
All	**0.508**	**0.477**	**0.985**	**0.363**	**0.536**	**0.899**

Source: Appendix D, *I-205 Toll Project Air Quality Technical Report* (Section 6.2.2)

Table 3-21. 2027 Diesel Particulate Matter Emission Details (tons)

Vehicle Type	2027 No Build Highway	2027 No Build Non-Highway	2027 No Build Total	2027 Build Highway	2027 Build Non-Highway	2027 Build Total
Passenger	0.24	0.23	0.46	0.16	0.26	0.42
Medium	0.11	0.05	0.16	0.10	0.05	0.15
Heavy	1.02	0.44	1.46	1.04	0.41	1.46
All	**1.37**	**0.71**	**2.08**	**1.31**	**0.72**	**2.03**

Source: Appendix D, *I-205 Toll Project Air Quality Technical Report* (Section 6.2.2)

There may be localized areas where ambient concentrations of MSAT could be different under the Build Alternative compared to the No Build Alternative. The localized changes in MSAT concentrations would likely be most pronounced on roadways where traffic volumes would be higher under the Build Alternative relative to the No Build Alternative due to rerouted trips. However, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT concentrations and related health impacts.

Modeled criteria pollutant emissions would also be 0.3% to 7% lower under the Build Alternative compared to the No Build Alternative in 2027 and 0.3% to 12% lower in 2045, as shown in Table 3-22. Appendix D1 provides detailed emissions estimates for criteria pollutants by season. Localized increases in air pollutant emissions can occur where traffic volumes increase or where vehicles spend more time idling at signalized intersections. Increased delay or degraded LOS at an intersection may cause elevated air pollutant concentrations in these vicinities; however, localized pollutant concentrations were not modeled because it is not required for projects located in attainment areas and because it is unlikely that emissions from an individual project would exceed the NAAQs.

Table 3-22. Annual Modeled Criteria Pollutant Emissions

Pollutant	2027			2045		
	No Build Alternative (tons per year)	Build Alternative (tons per year)	Percent Change from No Build	No Build Alternative (tons per year)	Build Alternative (tons per year)	Percent Change from No Build
Carbon Monoxide (CO)	11,120	10,988	-1%	7,150	7,082	-1%
Oxides of Nitrogen (NOx)	966	956	-1%	813	786	-3%
Sulfur Dioxide (SO_2)	4	4	-5%	4	4	-4%
Volatile Organic Compounds (VOC)	2,243	2,237	-0.3%	1,594	1,589	-0.3%
Total PM_{10}[1]	94	88	-7%	98	86	-12%
Total $PM_{2.5}$[2]	48	47	-2%	37	36	-4%

Source: Appendix D1, *I-205 Toll Project Criteria Pollutant Emissions Memorandum*
[1] Total PM_{10} emissions are the sum of PM_{10} exhaust, PM_{10} brakewear, and PM_{10} tirewear
[2] Total $PM_{2.5}$ emissions are the sum of $PM_{2.5}$ exhaust, $PM_{2.5}$ brakewear, and $PM_{2.5}$ tirewear
$PM_{2.5}$ = particulate matter 2.5 microns or less in size; PM_{10} = particulate matter 10 microns or less in size

3.2.3 Summary of Effects

Table 3-23 provides a comparison of anticipated air quality impacts and benefits by alternative.

Table 3-23. Summary of Air Quality Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term Effects	• None	• Short-term impacts from higher levels of fugitive dust and exhaust emissions during construction.
Long-Term Effects	• None	• 2027: Net MSAT emissions would range from 3% to 9% lower than the No Build Alternative. Highway emissions would range from 4% to 30% lower than the No Build Alternative, and non-highway emissions would range from 1% to 13% higher than the No Build Alternative. Estimated modeled criteria pollutant emissions would be 0.3% to 7% lower than the No Build Alternative. • 2045: Net MSAT emissions would range from 7% to 10% lower than the No Build Alternative. Highway emissions would range from 6% to 27% lower than the No Build Alternative, and non-highway emissions would be up to 8% higher than the No Build Alternative. Estimated modeled criteria pollutant emissions would be 0.3% to 12% lower than the No Build Alternative.

MSAT = mobile source air toxic

3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to comply with federal, state, and local regulations and implement best management practices (BMPs) to manage and reduce vehicle emissions and fugitive dust. No additional mitigation for construction is required. To reduce the impact of construction delays on traffic flow and resultant emissions, road or lane closures will be restricted to non-peak traffic periods when possible.

Estimated air pollutant concentrations from the Build Alternative would not have an adverse effect on air quality and are projected to be lower than the No Build Alternative; therefore, no mitigation is proposed for long-term Project operations.

3.3 Climate Change

3.3.1 Affected Environment

Global climate change is the observed century-scale rise in the average temperature of the Earth's climate system and its related effects, including rising sea levels, drought, changes in local weather patterns, and increased extreme storm events. In the Pacific Northwest, climate change has adverse effects on the economy, including industries such as recreation and agriculture, and natural resources. Extreme weather events can lead to flooding, landslides, drought, and wildfire, all of which can have a negative effect on air quality, water, transportation, and energy infrastructure (May et al. 2018).

Greenhouse gases (GHG) absorb heat near the earth's surface and trap that heat in the atmosphere, increasing global temperatures. GHG emissions from human activity such as the burning of fossil fuels, which increases the concentration of atmospheric carbon dioxide (CO_2), are a primary cause of climate change.

Vehicles that run on fossil fuels emit a variety of gases during their operation, some of which are GHGs. The GHGs associated with transportation are CO_2, methane, and nitrous oxide, and they are often reported as carbon dioxide equivalent (CO_2e). CO_2e is a unit that provides a common scale for measuring the climate effects of different gases based on their global warming potential. The most recent Oregon Global Warming Commission report indicates that transportation (including highway, rail, and air transport) is the greatest contributor to GHG emissions in Oregon, followed by the residential and commercial sectors (Oregon Global Warming Commission 2020).

Efforts to combat climate change typically occur programmatically at national, state, or regional levels. These efforts include policies, plans, and mandates designed to help reduce GHG emissions. Although climate change is a global issue being addressed at the regional, state, and national levels, analysts used the same API as the air quality analysis, shown in Section 3.2, to evaluate GHG emissions associated with the alternatives. Chapter 4 of Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report,* provides more detailed information about the API and methodology for this analysis.

3.3.2 Environmental Consequences

There is no recognized scientific methodology for attributing specific climatological changes to the emissions resulting from a particular transportation project. This analysis therefore measures potential climate change effects in terms of potential changes in GHG emissions between existing conditions and the No Build and Build Alternatives.

No Build Alternative

Energy consumption and GHG emissions were estimated for maintenance of the existing roadway (No Build Alternative) and construction and maintenance of the Build Alternative using the FHWA Infrastructure Carbon Estimator.[29] Table 3-24 shows the yearly energy use and GHG emissions associated with maintenance of the No Build Alternative. Maintenance calculations include the exhaust and energy from vehicles performing routine maintenance activities such as sweeping, striping, landscaping, and litter pickup, as well as periodic rehabilitation and resurfacing.

Table 3-24. No Build Alternative Annualized Maintenance Energy Use and GHG Emissions

Energy Source	Energy Use (mmBtu/year)	GHG Emissions (MT CO_2e/year)
Direct Energy • Maintenance	2,391	233

Source: Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report* (Section 6.2.1)
mmBtu = million British thermal units; $MTCO_2e$ = metric tons carbon dioxide equivalent

Table 3-25 presents emissions, reported as CO_2e, for the No Build Alternative in 2027 and 2045, existing (2015) conditions,[30] and annual VMT for context. Overall, future CO_2e emissions would be lower than existing emissions, but the emissions in 2045 would be higher than 2027 levels because by 2045, the impacts on emissions from higher VMT would surpass the projected fuel economy benefits expected from stricter vehicle standards.

Table 3-25. No Build Alternative CO_2e Emissions

Parameter	Existing (2015)	2027 No Build	2045 No Build
Annual VMT	893,462,632	1,051,694,624	1,222,083,927
Direct Tailpipe CO_2e emissions (MT)	393,312	348,397	364,684
Indirect Fuel Cycle CO_2e emissions (MT)[1]	106,194	94,067	98,465
Total CO_2e emissions (MT)	**499,506**	**442,464**	**463,149**

Source: Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report* (Section 6.2.1)
[1] Indirect fuel cycle emissions refers to emissions released during fuel extraction, refining, and transport prior to use by vehicles.
CO_2e = carbon dioxide equivalent; MT = metric tons; VMT = vehicle miles traveled

Build Alternative

Short-Term Effects

Table 3-26 shows the annualized energy and GHG emissions estimates during construction of the Build Alternative.

[29] FHWA's Infrastructure Carbon Estimator is a tool that estimates the lifecycle energy and GHG emissions from the construction and maintenance of transportation facilities based on details about the project type and size. The tool provides a planning-level analysis based on a nationwide database of construction bid documents, data collected from state departments of transportation, and consultation with transportation engineers and lifecycle analysis experts (FHWA 2022).

[30] 2015 was used for existing conditions because it is the base year for the version of the Portland Metro regional travel demand model that was used for the analysis, and a more current base year was not available.

Table 3-26. Build Alternative Annualized Construction Energy Use and GHG Emissions

Energy Source	Energy Use (mmBtu/year)	GHG Emissions (MT CO2e/year)
Upstream Energy		
• Materials	1,479	168
Direct Energy		
• Construction equipment	907	89
• Transportation	180	18
• Construction impacts on vehicle delay	13,916	1,062
Total	**16,482**	**1,337**

Source: Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report* (Section 6.2.2)
mmBtu = million British thermal units; MT CO_2e = metric tons carbon dioxide equivalent

Long-Term Effects

Table 3-27 shows the annualized energy use and GHG emissions estimates for long-term maintenance of the Build Alternative. The maintenance impacts from the Build Alternative would be higher than the No Build Alternative due to the additional lane miles that must be maintained.

Table 3-27. Build Alternative Annualized Maintenance Energy Use and GHG Emissions

Energy Source	Energy Use (mmBtu/year)	GHG Emissions (MT CO_2e/year)
Direct Energy		
• Maintenance	3,834	374

Source: Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report* (Section 6.2.2)
mmBtu = million British thermal units; MT CO_2e = metric tons carbon dioxide equivalent

Table 3-28 compares CO_2e emissions for the Build Alternative to the No Build Alternative in 2027 and 2045. Under the Build Alternative, CO_2e emissions would be approximately 6% lower in 2027 and 4% lower in 2045 compared to the No Build Alternative. These differences are consistent with the projected differences in VMT for each analysis year.

Table 3-28. Build Alternative CO_2e Emissions

Parameter	2027 No Build	2027 Build	Percent Difference 2027 No Build to Build	2045 No Build	2045 Build	Percent Difference 2045 No Build to Build
Annual VMT	1,051,694,624	965,576,193	-8%	1,222,083,927	1,162,440,219	-5%
Direct Tailpipe CO_2e emissions (MT)	348,397	326,604	-6%	364,684	349,473	-4%
Indirect Fuel Cycle CO_2e emissions (MT)	94,067	88,183	-6%	98,465	94,358	-4%
Total CO_2e emissions (MT)	**442,464**	**414,787**	**-6%**	**463,149**	**443,831**	**-4%**

Source: Appendix E, *I-205 Toll Project Energy and Greenhouse Gas Technical Report* (Section 6.2.2)
Notes: CO_2e = carbon dioxide equivalent; MT = metric tons; VMT = vehicle miles traveled

Vehicles typically run less efficiently on non-highway roads because travel on those roadways involves slower speeds and more stop-and-go activity. Therefore, trips rerouted from highway to non-highway roads could lead to higher GHG emissions. Section 3.2.2 summarizes the differences in projected VMT for passenger, medium, and heavy vehicles in the API. Although there would be higher non-highway VMT under the Build Alternative, this higher VMT would be more than offset by lower highway VMT. In addition, the higher non-highway VMT would be primarily from passenger vehicles. Non-highway VMT from heavy trucks, which emit GHG at a higher rate, would be lower under the Build Alternative.

Overall, the Build Alternative would have net lower GHG emissions and VMT, which would contribute to ODOT's efforts to reduce GHG emissions and meet climate change goals, consistent with the *Oregon Statewide Transportation Strategy* (ODOT 2013b) and ODOT's Climate Action Plan (ODOT 2021d). The lower predicted emissions can be attributed to lower congestion levels on I-205.

3.3.3 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to comply with federal, state, and local regulations and implement BMPs to reduce energy consumption and GHG emissions. No additional mitigation related to climate change is proposed for short-term effects. GHG emissions from the Build Alternative would be lower than from the No Build Alternative; therefore, no mitigation related to climate change is proposed for long-term operations effects.

3.4 Economics

3.4.1 Affected Environment

The economics API includes roadways forecasted to experience differences in traffic volumes of plus or minus 5% or greater between the No Build and Build Alternatives, as shown on Figure 3-10. Analysts evaluated some economic effects at larger regional levels and calculated others based on all users of the Project, regardless of geography. Chapter 4 of Appendix F, *I-205 Toll Project Economics Technical Report*, provides a more detailed description of the API and methodology used for the analysis.

Employment

From 2012 to 2018,[31] the API experienced a faster annual rate of employment growth (3.10%) than the Portland-Vancouver-Hillsboro metropolitan statistical area (Portland MSA) (2.77%) and the state (2.64%) (U.S. Bureau of Labor Statistics 2021). Manufacturing, health care and social assistance, and retail trade were the three largest industry sectors in the API for total employment in 2018. Across the state, in the Portland MSA, and in the API, the construction industry sector had the highest percentage growth rate between 2012 and 2018.

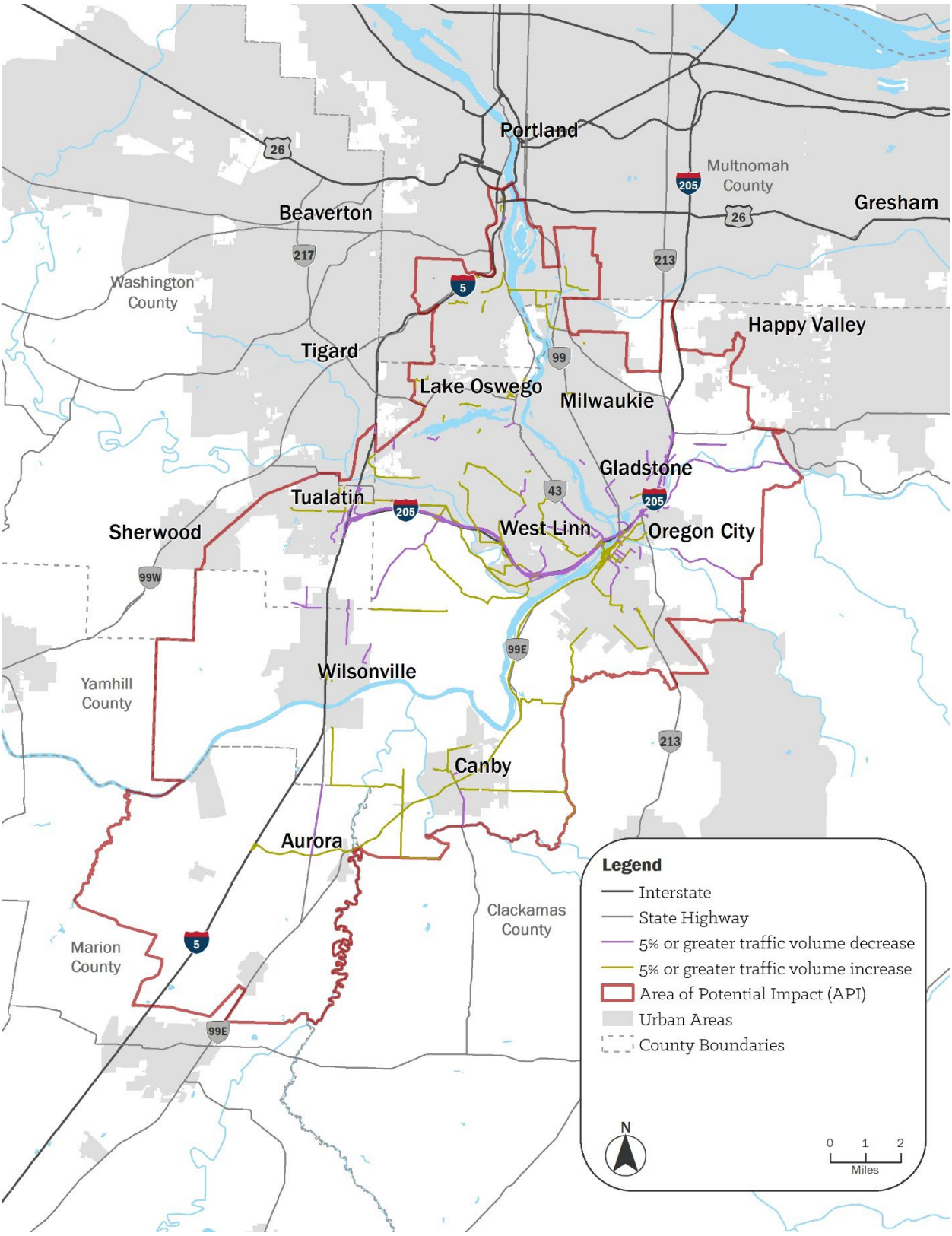
Since early 2020, economic shutdowns related to the COVID-19 pandemic public health mandates have affected employment growth in some state and regional industries. As of 2021, employment levels in the manufacturing, leisure and hospitality, educational services, government services, and retail trade sectors remained below pre-pandemic levels. The transportation and warehousing, professional services, and construction sectors have recovered to equal or surpass pre-pandemic employment levels.

Households

From 2012 to 2018, annual growth in the number of households in the API (1.12%) slightly outpaced that of the Portland MSA (1.06%) (U.S. Census Bureau n.d.-a). Both the API and Portland MSA showed a higher rate of growth in the number of households than the state as a whole (0.75%). Median household income within the API ($81,875) was higher than the Portland MSA ($70,724) and state ($59,393) in 2018. Annual median household income growth in the API was the same as the Portland MSA, with an annualized growth rate of 2.9% from 2012 to 2018 (U.S. Census Bureau n.d.-b). For the median household in the API, transportation costs made up 7.9% of the total household budget (approximately $7,000 per year) in 2021. Transportation costs include vehicle ownership costs (68%) and vehicle operating costs (32%).

[31] Employment data for the state of Oregon and the Portland MSA is from the U.S. Bureau of Labor Statistics. Data for the customized API boundary was generated from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics data, which is available through 2018.

Figure 3-10. Economics Area of Potential Impact



Source: Metro Regional Travel Demand Model

Truck Freight

Truck freight movement depends on a well-functioning roadway network with consistent reliability throughout the day, and good connectivity between producers and markets. As delays in the transportation of goods accumulate in the supply chain, a cascade of additional costs affects the abilities of producers, suppliers, and retailers to operate cost-effectively and on schedule. For businesses in the supply chain affected by the reliability of truck service on I-205 in the API, existing traffic delays and other trip disruptions exert a cost on the transportation of goods. The value of time for truck freight transportation is estimated at $160 per hour (Guerrero et al. 2019).

The Portland MSA experienced steady growth in the general freight trucking sector and very strong growth in the warehousing sector between 2012 and 2020 (U.S. Bureau of Labor Statistics 2021). Growth in the warehousing sector has resulted from the steady increase in e-commerce activity over the last decade, with an additional increase during the COVID-19 pandemic.

Local Traffic-Dependent Businesses

Analysts identified three commercial areas within the API that may be sensitive to changes in traffic volumes: OR 99E in Canby, Main Street in Oregon City, and Willamette Falls Drive in West Linn. A business's sensitivity to differences in traffic volumes can depend on whether the business is destination oriented (establishments to which consumers plan to travel in advance) or traffic-exposure oriented (establishments to which consumers do not plan to travel in advance; also known as "opportunity" trips). In the API, community or regional businesses, such as large grocery and "big box" stores, shopping centers, banks, and other professional services, serve the highest share of destination-oriented trips, whereas small specialty goods stores (such as hardware and sporting goods), gas stations, convenience grocery stores, fast food restaurants, and auto dealerships serve the largest percentage of opportunity trips.

3.4.2 Environmental Consequences

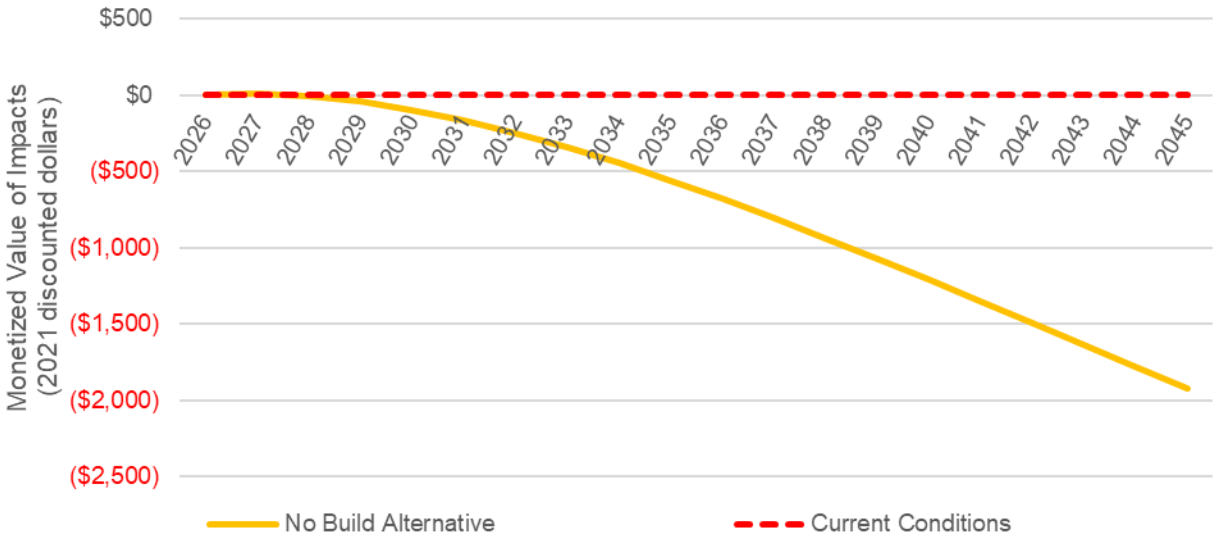
This section addresses the short-term, long-term, and indirect economic effects of the No Build and Build Alternatives on local businesses, residents, and truck freight transport. Short-term effects, applicable only to the Build Alternative, comprise the regional economic effect of construction and other capital activities related to the implementation of the Project. Long-term effects comprise the differences in user and social effects between the No Build Alternative and the Build Alternative. Indirect effects comprise the economic effect of changes in household spending on transportation costs under the Build Alternative compared to the No Build Alternative and public investment related to the Project.

No Build Alternative

<u>Long-Term Effects</u>

The No Build Alternative would result in increasingly longer travel times and increased congestion for travelers on this segment of I-205 compared with current conditions (see Section 3.1.2). Over time, projected increases in vehicle trips, traffic congestion, and deteriorating system performance would accrue as additional costs, including longer travel times, additional vehicle operating and maintenance costs and vehicle emissions, lower truck travel-time reliability, and increases in crashes between roadway vehicles. Figure 3-11 illustrates the monetized value of these impacts related to the No Build Alternative from 2027 to 2045. The graph shows the current conditions in the API as the baseline for comparison to the No Build Alternative.

Figure 3-11. Monetized Value of the Effects of Increasing Traffic Volumes over Time, Comparing the No Build Alternative to Current Conditions (in discounted millions 2021$)



Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.1.2)
Note: Discounted rates allows for comparison of today's valuation of a dollar to a future dollar valuation.

To maintain consistency of the output values with the input values and standardized factors and to account for the value of money over time, the future values are discounted at an annual rate of 7%[32] and reported in constant 2021 dollars. Discounting future values allows for comparison to today's valuation of a dollar and accounts for unknown future risks, including variability in the value of money and the forecasted operational conditions. Effectively, the discounted rate illustrates a conservative evaluation of future effects. The average annualized value of the costs incurred by users between 2027 and 2045 would be about $468.1 million in current 2021 dollars (or $143.7 million in discounted 2021 dollars).

Under the No Build Alternative, I-205 in the API would be maintained by the dedicated Highway Trust Fund;[33] therefore, the value of direct transportation costs to households within the API or wholesale retail businesses in the region would not change. Without tolls, transportation costs as a percentage of household income (7.9%) would remain the same under the No Build Alternative as under existing conditions.

[32] ODOT uses a standard annual discount rate of 7% for all economic analyses, which is also consistent with USDOT discounting guidelines.

[33] The Highway Trust Fund finances most federal government spending for highways. Revenues for the trust fund come from transportation-related excise taxes, primarily federal taxes on gasoline and diesel fuel (Tax Policy Center 2020).

Indirect Effects

The costs of truck freight transportation would increase because of the projected increase in traffic congestion on I-205 in the API. Traffic delays would result in an average of $9.4 million (in 2021 dollars; $3.7 million in discounted 2021 dollars) in higher costs per year for the retailers, vendors, and suppliers in the supply chain, compared to the Build Alternative. Because businesses typically pass on transportation costs to consumers, those changes in traffic conditions could manifest as higher per-unit costs and lower total retail revenues on goods transported through I-205 in the API, if the increased cost results in reduced demand.

Build Alternative

Short-Term Effects

Project construction would generate short term economic benefits in the Portland MSA through the purchase of supplies and materials, and through employment of construction workers. Table 3-29 shows the economic effects of construction activities for the Build Alternative related to employment, labor income, and economic output (total value of goods and services). These economic benefits are classified into direct effects (industry spending on labor and materials), indirect effects (household spending on consumer goods), and induced effects (the increased personal income in the regional economy resulting from the direct and indirect effects).

Table 3-29. Total Economic Effects Related to Toll System Construction (2024-2027)

Effect Categories	Employment (Job-Years)[1]	Labor Income (2021$)	Economic Output (2021$)
Direct Effects	1,044	$285,281,000	$750,000,000
Indirect Effects	4,050	$93,427,000	$307,151,000
Induced Effects	2,890	$129,990,000	$433,613,000
Total Effects	**7,985**	**$508,699,000**	**$1,490,764,000**

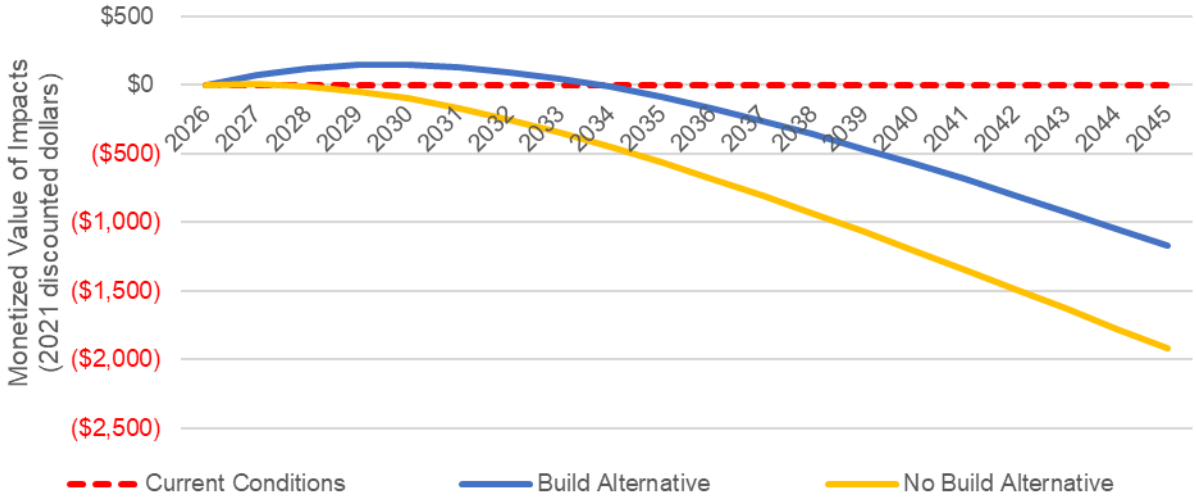
Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.1)

[1] Job-years refers to the equivalent of an employee working full-time for 2,080 hours in a year. For example, a full-time employee working for 3 years would be equal to three job-years, while three part-time employees working a total of 2,080 hours in a year would be equivalent to one job-year.

Long-Term Effects

Changes in regional travel behavior under the Build Alternative (see Section 3.1.2) would result in user and social benefits, including reduced emissions, shorter travel times, improved truck on-time reliability, vehicle operating cost savings, fewer crashes, and prevention of pavement damage. Figure 3-12 illustrates the monetized value of the effects of traffic over time under the Build Alternative from 2027 to 2045 as compared to the No Build Alternative, with the current conditions in the API serving as the baseline. The average annualized value of the benefits incurred by users between 2027 and 2045 would be about $104.9 million in current 2021 dollars (or $41.2 million in discounted 2021 dollars).

Figure 3-12. Monetized Value of the Effects of Increasing Traffic Volumes over Time, Comparing the Build Alternative to the No Build Alternative and Current Conditions (in discounted millions 2021$)



Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.2)

Under the Build Alternative, there would be higher levels of opportunity (traffic exposure-oriented) consumer spending in three commercial districts because of projected higher traffic volumes compared to the No Build Alternative: OR 99E in Canby, Main Street in Oregon City, and Willamette Falls Drive in West Linn. This additional consumer spending would translate into increased employment, labor income, and economic output in these areas under the Build Alternative compared to the No Build Alternative, as shown in Table 3-30.

Table 3-30. Annualized Economic Benefits Related to Consumer Spending under the Build Alternative Relative to No Build Alternative (2027 to 2045)

Effect Category	Employment (Job-Years)	Labor Income (2021$)	Economic Output (2021$)
Direct Effects	2.0	$57,000	$157,000
Indirect Effects	0.4	$23,000	$73,000
Induced Effects	0.6	$28,000	$84,000
Total Effects	**3.0**	**$108,000**	**$313,000**

Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.2)

Table 3-31 shows the effects of the additional toll payments on household costs in the API, based on the average number of weekday vehicle-trips per household on I-205 and average cost of toll payments. The calculated average annual toll payment is based on numerous variables, including the average weekday vehicle-trips per household, distribution of trips on I-205 and alternative routes, forecasted traffic on I-205 by vehicle class, projected gross toll revenues by vehicle class, and projected regional cost inflation. As a result, it should not be considered demonstrative of the actual toll payments in any particular year but rather an average converted to current-year dollars to allow for comparison to current median household spending.

Table 3-31. Household Effects Related to Toll Revenue Operations

Metric	Values
Households in API with One or More Vehicles	113,140
Average Total Annual Weekday Vehicle-Trips per Household in API	1,285
Average Annual Weekday Vehicle-Trips on I-205 per Household in API	206
Estimated Average Annual Weekday Toll Fees per Household in Opening Year (in 2021 dollars)*	$575

Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.2)

* The projected toll revenues include assumptions about population growth and other factors related to the forecasted traffic conditions, developed as part of the Project's toll revenue forecast. The values are in constant 2021 dollars based on the forecasted toll rate for the project opening in 2027.

API = area of potential impact

Table 3-32 shows the estimated change in annual transportation costs for the average household in the API under the No Build Alternative and the Build Alternative. Transportation costs as a percentage of the total budget for households at the median income level would be 7.9% under the No Build Alternative compared to 8.6% under the Build Alternative. This 0.7 percentage point difference represents approximately 9% higher transportation costs for a median household in the API under the Build Alternative compared to the No Build Alternative.

Table 3-32. Comparison of Median Household Budget and Transportation Costs in the Area of Potential Impact under the No Build Alternative and Build Alternative (in 2021$, rounded)

Alternative	Median Household Budget in API	Average Annual Household Transportation Costs	Average Annual Toll Payments	Total Annual Household Transportation Costs	Transportation Costs as Percentage of Total Household Budget
No Build Alternative	$88,400	$7,000	—	$7,000	7.9%
Build Alternative	$88,400	$7,000	$600	$7,600	8.6%

Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.2)

Note: Total annual household transportation costs and average annual toll payments shown in the table may be affected by rounding.

API = area of potential impact

Indirect Effects

Table 3-33 shows estimated changes in spending related to toll operations under the Build Alternative by ODOT, households, and wholesale traders between 2027 and 2045. The ODOT spending category shows estimated expenditures of toll revenues related to government administration, construction, and professional services. The household spending category indicates that because regional households would spend an additional portion of their transportation budget on toll payments, they would in turn reduce their spending in other categories, such as retail, entertainment and recreation, and restaurants and food services. The wholesale trade spending category indicates that the industry would experience a reduction in revenues because commercial vehicles would pass on the cost of tolls to these wholesale traders.

Table 3-33. Change in Estimated Annualized Spending by Industry (2027 to 2045)

Source of Spending	Gross Toll Revenues (millions 2021$)	Toll Payments[1] (millions 2021$)
Total ODOT Spending	**$131.7**	**—**
ODOT Government Enterprises[2]	*$26.3*	—
ODOT Road and Bridge Construction	*$92.2*	—
ODOT Professional Services	*$13.2*	—
Total Household Spending	**—**	**($93.2)**
Household Retail Purchases	—	*($32.6)*
Household Entertainment and Recreation	—	*($18.6)*
Household Restaurant and Food Services	—	*($41.9)*
Total Wholesale Trade Spending	**—**	**($38.5)**
Annual Net Change in Spending	**$131.7**	**($131.7)**

Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.3)

[1] The estimated toll payments by households and the wholesale trade sector are based on the forecasted toll rates for the multiple vehicle classes and forecasted traffic volumes. They are an annualized estimate used for the purposes of the analysis to evaluate the transfer of payments from the toll payees to ODOT and are not indicative of future revenues or toll rates in any particular year.

[2] "Government Enterprises" are defined by the Bureau of Economic Analysis as the government agencies responsible for administering, overseeing, and managing public programs within a given area; the RIMS II multipliers evaluate the regional spending patterns related the performance of these activities. The classification is equivalent to Sector 92 Public Administration under the 2017 North American Industry Classification System.

ODOT = Oregon Department of Transportation

ODOT's collection of toll revenue from households and truck freight operators and subsequent investment of this revenue into the transportation network represents a shift in economic activity. Table 3-34 summarizes the changes in public and private spending as reflected in employment, labor income, and total economic output in the Portland MSA. The total net change in economic output and labor income would be minimal. There would be a negative effect on job-years supported, largely because of projected lower household spending in the retail, entertainment, and food services sectors and higher expenditures in the transportation and professional services sectors. The values for households and wholesale trade represent only the effect of the increased costs in transportation: they do not include the improvements in I-205 traffic performance that are expected to increase the value for users and the region. Additionally, while the employment effects on the wholesale retail sector would be distributed beyond the region, decreased congestion and improved on-time reliability are expected to increase demand in the warehousing and wholesale trade sectors, benefiting businesses throughout the supply chain.

Table 3-34. Summary of Annualized Economic Effects related to Toll Revenue Operations (2027 to 2045)

Effect Category	Employment (Job-Years)	Labor Income (millions 2021$)	Economic Output (millions 2021$)
ODOT Investment of Revenue	1,249	$75.5	$262.9
Household Spending	-1,699	-$59.1	-$190.1
Wholesale Trade Spending	-313	-$29.6	-$70.3
Annual Net Change	**-763**	**-$3.2**	**$2.4**

Source: Appendix F, *I-205 Toll Project Economics Technical Report* (Section 6.2.3)

Note: The change in employment assumes a linear change in employment in the industries supported by household spending (Retail, Entertainment and Food Services). These impacts are spread across the API and, therefore, represent the aggregated total job-years, not individual FTEs, and their related labor income.

FTE = full-time equivalent; ODOT = Oregon Department of Transportation

3.4.3 Summary of Effects

Table 3-35 provides a comparison of anticipated positive and negative economic effects by alternative. Under the No Build Alternative, the values represent the baseline conditions in the future without the implementation of the Project. Under the Build Alternative, the values represent the differences resulting from the implementation of the Project relative to the No Build Alternative.

Table 3-35. Summary of Economics Effects by Alternative

Effects	No Build Alternative	Build Alternative[1]
Short-Term Effects	None	**Toll System Implementation Economic Benefits** • Total employment: 7,985 job-years • Total labor income: $508.7 million • Total economic output: $1,490.8 million
Long-Term Effects	**Traffic Impacts on Users and Society** • Annual undiscounted net costs: $468.1 million • Annual discounted net costs: $143.7 million **Truck Freight Impacts** • Annual undiscounted additional costs for less reliable truck freight service: $9.4 million • Annual discounted additional costs for less reliable truck freight service: $3.7 million **Household Impacts** • No change in transportation costs as a percentage of median household income under the No Build Alternative compared to existing conditions	**Toll Operations Economic Benefits on Users and Society** • Annual undiscounted net benefits: $104.9 million • Annual discounted net benefits: $41.2 million **Consumer Spending Economic Benefits** • Annual employment change: 3 job-years • Annual labor income: $0.1 million • Annual economic output: $0.3 million **Truck Freight Benefits from Toll Operations** • Annual undiscounted additional cost savings for more reliable truck freight service: $9.9 million • Annual discounted additional cost savings for more reliable truck freight service: $3.9 million **Household Impacts from Toll Operations** • Additional average (rounded) annual spending on transportation costs: $600 • Change in transportation costs as a percentage of median household income (as of 2018): 0.7% higher • Percent change in annual median household transportation costs: About 9% higher
Indirect Effects	None	**Toll Revenue Operations Economic Benefits** • Annual employment: (763 job-years) • Annual labor income: ($3.2 million) • Annual economic output: $2.4 million

[1] All dollar values are in 2021 dollars and discounted where noted.

3.4.4 Avoidance, Minimization, and/or Mitigation Measures

With the mitigation measures proposed in Sections 3.1.4 (Transportation), 3.7.4 (Social Resources and Communities), and 3.8.4 (Environmental Justice) of the Environmental Assessment relating to transportation access and household costs, no additional mitigation measures for economics are warranted.

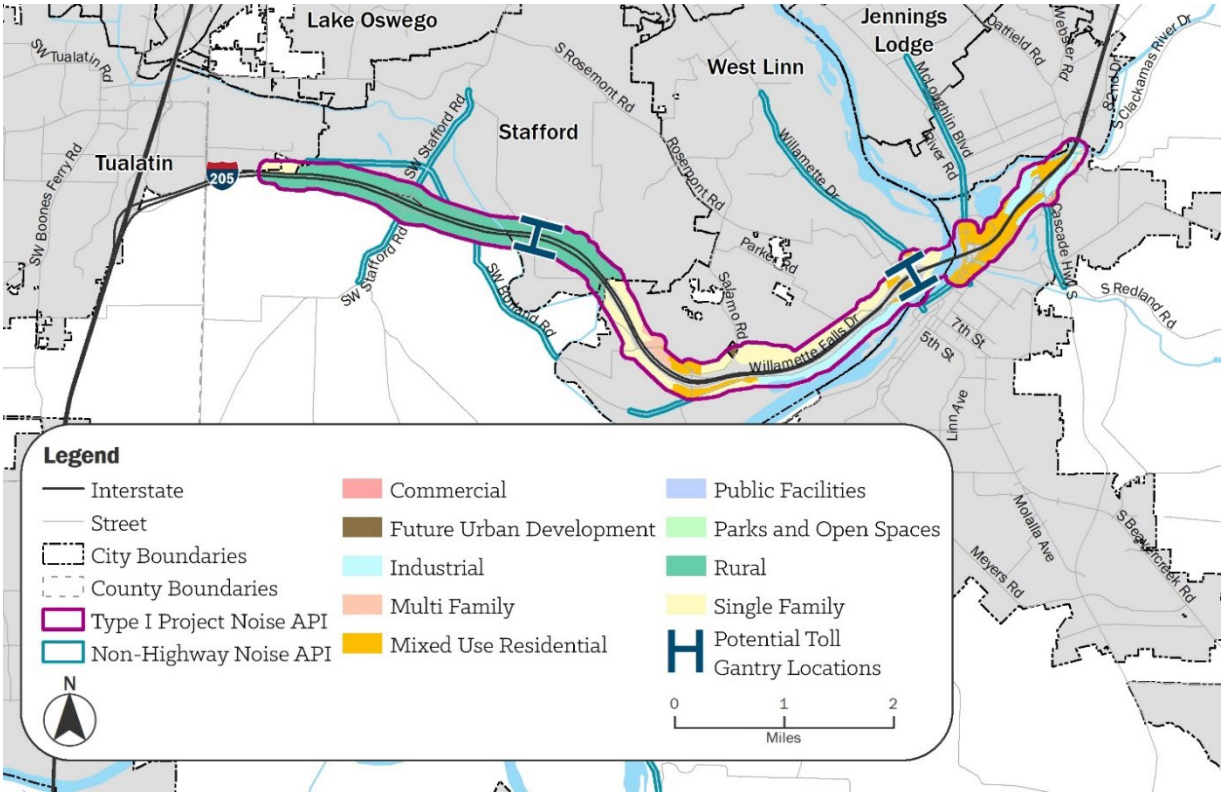
3.5 Noise

3.5.1 Affected Environment

The Project meets the definition of a Type I project as established in 23 CFR 772 and defined in the ODOT Noise Manual (ODOT 2011) because Project improvements include the construction of new through lanes. Therefore, the Project is required to analyze traffic noise and any associated effects along I-205, as well as noise abatement measures to address impacts.

The noise API includes the I-205 right-of-way and a 500-foot buffer from the right-of-way between the SW Stafford Road and OR 213 interchanges to account for any noise impacts that would occur from Project improvements. In addition, the noise API includes non-highway roads that would receive rerouted traffic under the Build Alternative. In accordance with 23 CFR 772, the Type I noise analysis and potential noise abatement only apply to improvements along I-205 and the associated noise impacts on adjacent land uses and not the roadways expected to experience rerouting because of the Project. Figure 3-13 shows the API and its zoning, which is generally reflective of existing land uses. Existing land uses in the API consist primarily of single- and multifamily residences and community and recreational facilities (including one park, one school, and one church/preschool/daycare facility), as well as one hotel and one retirement home. Land uses such as residences and community facilities are considered noise sensitive.[34] Chapter 4 of Appendix G, *I-205 Toll Project Noise Technical Report*, provides a more detailed description of the API and methodology used for the analysis.

Figure 3-13. Noise Area of Potential Impact



Source: Metro Regional Land Information System

[34] Properties where frequent exterior human use occurs and where a lowered noise level would be beneficial are noise-sensitive land uses (FHWA 2006).

Existing (2017) peak truck hour traffic data was used to model the loudest-hour noise levels at all noise-sensitive land uses adjacent to I-205 in the noise API. Existing traffic noise levels range from 44 A-weighted decibels equivalent sound level (dBA L_{eq})[35] to 74 dBA L_{eq}. The highest traffic noise levels occur at outdoor land uses located closest to I-205.

3.5.2 Environmental Consequences

To predict future noise levels under the No Build Alternative and Build Alternative, analysts used noise models developed for the 2018 Categorical Exclusion for the I-205 Improvements Project and 2045 traffic volumes, speeds, and vehicle mix presented in Appendix C, *I-205 Toll Project Transportation Technical Report*. Chapter 6 of Appendix G, *I-205 Toll Project Noise Technical Report*, provides more detailed analysis about projected future noise levels under the alternatives.

No Build Alternative

Under the No Build Alternative in 2045, predicted traffic noise levels would range from 44 dBA L_{eq} to 74 dBA L_{eq}. When compared to existing conditions, changes in noise levels would range from a decrease of 6 dBA L_{eq} to an increase of 4 dBA L_{eq}[36] depending on location. The increases generally would occur because of higher projected traffic volumes near those locations. The decreases would occur because of a new noise wall constructed as part of the I-205: Phase 1A Project.

Along non-highway roads in the noise API, changes in traffic noise levels would range from a decrease of 2 dBA to an increase of 5 dBA relative to existing noise levels. At most locations, the difference in noise levels would range from no change to an increase of 2 dB relative to existing conditions. The largest reduction in No Build Alternative noise levels (2 dBA decrease) would occur along the segment of SW Borland Road north of the I-205 Tualatin River Bridges, and the largest increase (5 dbA) would occur along the segment of SW Borland Road north of Ek Road because of projected differences in traffic volumes on these segments.

Build Alternative

Short-Term Effects

Construction activities such as clearing vegetation, grading, paving, pile driving, bridge reconstruction, excavation, rock blasting, and setting toll gantry foundations would generate noise during the approximately 4-year construction period. Construction of the Project may result in elevated noise levels at noise-sensitive land uses such as residences or schools that are adjacent to the right-of-way. Construction noise levels would depend on the type, amount, and location of these activities. Approximately 15 to 20 days of rock blasting on northbound I-205 between Sunset Avenue and West A Street in West Linn is anticipated to occur during summer and fall of the first year of construction and would be scheduled during daytime hours.

Maximum noise levels from construction equipment would range from 69 dBA to 105 dBA at 50 feet. However, because various pieces of equipment would be turned off, idling, or operating at less than full power at any time, and because construction machinery is typically used to complete short-term tasks at any given location, average noise levels during the day would be less than those maximum noise levels.

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[35] dBA is an expression of the loudness of sounds in an environment as perceived by the human ear. When a noise varies over time, the L_{eq} is the average sound level over a period of measurement.

[36] The human ear can barely perceive a 3-dBA increase, while a 5-dBA or 6-dBA increase is readily noticeable and perceived by as if the noise were about 1.5 times as loud. A 10-dBA increase appears to be a doubling in noise level to most listeners.

Construction noise at locations farther away would decrease at a rate of 6 dBA per doubling of distance from the source.

To avoid and minimize noise impacts during construction of the Project, the construction contractor would be required to comply with local noise ordinances, ORS Chapter 467, OAR Chapter 340 - Division 035, and *Oregon Standard Specifications for Construction* (ODOT 2021c) for noise control (Section 290.32). In addition, construction equipment would comply with pertinent equipment noise standards of the U.S. Environmental Protection Agency. A blasting plan for the rock blasting would be implemented to limit the timing, sequence, and force of each blast.

Long-Term Effects

According to the ODOT Noise Manual, a noise impact occurs when the future noise level for a project results in any exceedance of ODOT's Noise Abatement Approach Criteria (NAAC) at a noise-sensitive land use (e.g., residences, parks, schools) or results in a substantial increase[37] in noise levels over existing noise levels (ODOT 2011). Exceedances of the ODOT NAAC or substantial increases in noise levels are evaluated for noise abatement.

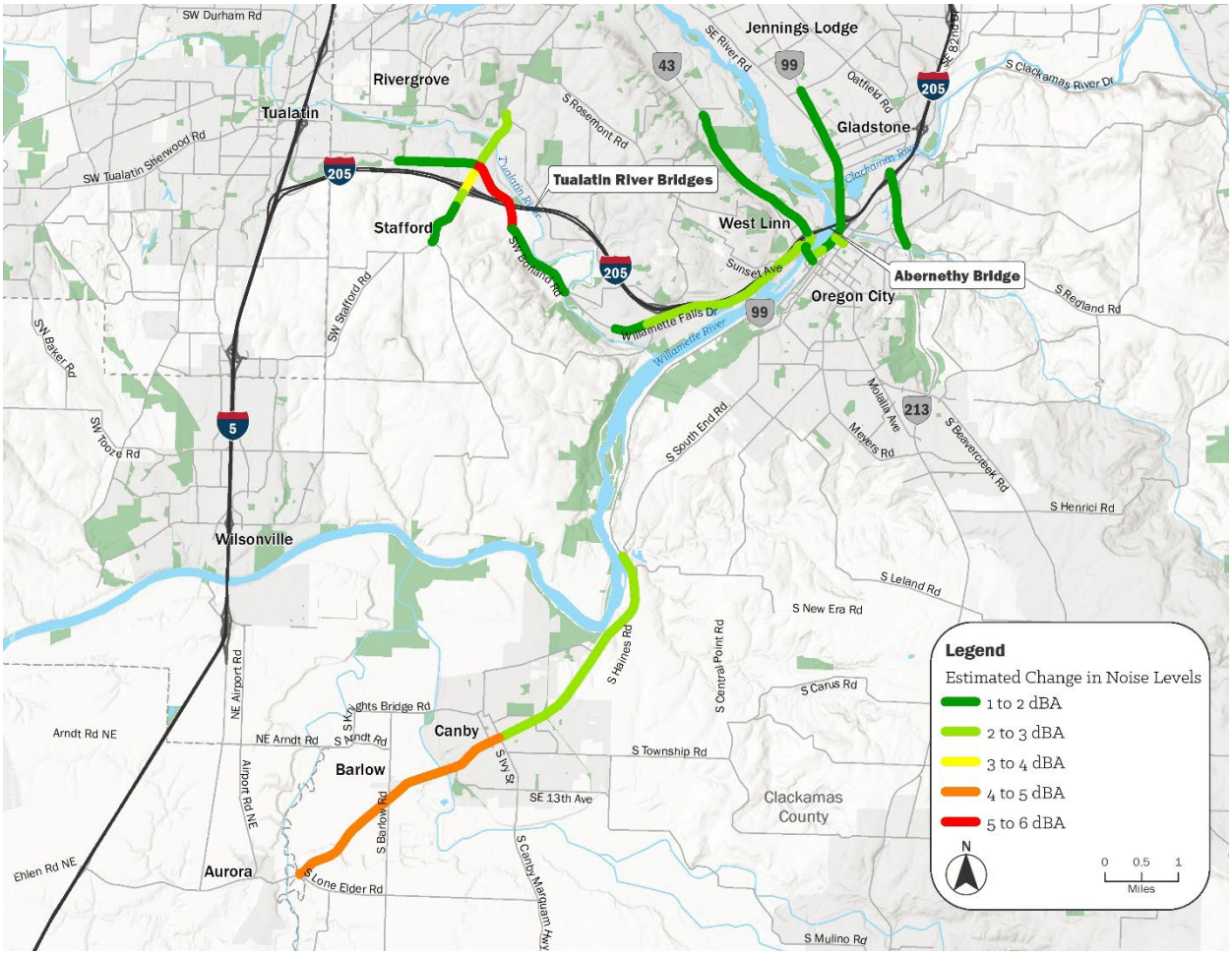
Predicted traffic noise levels under the Build Alternative in 2045 would range from 44 dBA L_{eq} to 75 dBA L_{eq} and would exceed ODOT's NAAC at various residences, an outdoor pool at an apartment building, a church/preschool/daycare, a park, and a school; therefore, noise abatement must be considered with the Project (see Section 3.5.3).

Under the Build Alternative in 2045, no roadways would experience a substantial increase in noise. Along I-205, Build Alternative noise levels would range from 6 dBA lower to 6 dBA higher than existing noise levels, and 3 dBA L_{eq} lower to 5 dBA L_{eq} higher than the No Build Alternative, depending on location.

Along non-highway roads in the API, changes in traffic noise levels under the Build Alternative would range from 6 dBA lower to 6 dBA higher than existing noise levels because of changes in traffic volumes. The largest reduction in noise levels would occur along the segment of Willamette Falls Drive east of 19th Street, where traffic volumes would be lower than under the No Build Alternative, and the largest increase would occur along the segment of SW Borland Road east of SW Stafford Road, where traffic volumes would be higher than under the No Build Alternative. Figure 3-14 shows the estimated increases in traffic noise levels on non-highway roads under the Build Alternative as compared to existing conditions. Most locations would experience 0 to 3 dB higher noise levels under the Build Alternative compared to the No Build Alternative, which would be barely perceptible to the human ear.

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

Figure 3-14. Estimated Change in Future Non-Highway Traffic Noise Levels – Existing Conditions to 2045 Build Alternative



Source: Appendix G, *I-205 Toll Project Noise Technical Report* (Section 6.3)

3.5.3 Avoidance, Minimization, and/or Mitigation Measures

Per 23 CFR 772, noise abatement must be considered and evaluated for feasibility and reasonableness where there would be noise impacts from a Type I project. At a minimum, ODOT is required to consider noise abatement in the form of a noise wall. Because of the Build Alternative's long-term noise effects, three noise walls are recommended for consideration, as described in detail in Section 7.2 of Appendix G, *I-205 Toll Project Noise Technical Report*:

- Noise Wall 2: Along the north side of southbound I-205 lanes north of Blankenship Road
- Noise Wall 3: Along the south side of northbound I-205 lanes south of where I-205 crosses Blankenship Road
- Noise Wall 4: Along the north side of the southbound I-205 lanes south of Blankenship Road.

If conditions have changed substantially during final design of the Build Alternative, the noise walls may no longer be feasible and reasonable and therefore would not be constructed. A final decision about the noise walls will be made upon the completion of the Build Alternative's final design, a cost-estimating process, and the public involvement process.

3.6 Visual Quality

3.6.1 Affected Environment

The study area for visual quality, called the area of visual effect, is the area that neighbors, including people who live and/or engage in recreational activities nearby, see in the landscape looking toward Project elements and the area that travelers see while driving past Project elements. Based on the physical environment (landforms, land cover, atmospheric conditions) and the limits of human sight, the Project area of visual effect is the area within 0.5 mile from the edge of the existing I-205 right-of way between SW Stafford Road and OR 213. Chapters 3 and 4 of Appendix G*, I-205 Toll Project Abbreviated Visual Impact Assessment*, provides a more detailed description of the area of visual effect and methodology used for the analysis.

The area of visual effect is characterized by a mix of residential areas of varying density, commercial and industrial areas, and open spaces, including the Willamette River, public parks, and river access points. Neighbors and travelers have different viewing experiences depending on where they are in the area of visual effect. For residential and recreational neighbors in the area, existing mature trees and vegetation block most views of I-205. Travelers on I-205 in the area of visual effect currently view a combination of human-made features, including numerous ramps, bridges, lighting, fencing, and signage, and more natural elements, such as water, vegetation, rock, agricultural fields, open grass areas, and mature trees.

Within the area of visual effect, I-205 is designated as a rural scenic roadway by Clackamas County (Clackamas County 2020). The rural scenic roadway program strives to “promote the protection of recreation values, scenic features and an open, uncluttered character along designated scenic roads” (Clackamas County 2020). No roadway within the area of visual effect is designated as a National or Oregon Scenic Byway.

A scenic viewpoint is located along the south side of I-205 in West Linn near MP 7.5. The viewpoint is accessed by an I-205 off-ramp to a road and parking area south of I-205 that serve the viewpoint. The viewpoint looks downward at the Willamette Falls, located roughly 1/3 mile east. Vehicles traveling along I-205 cannot see the Willamette Falls due to the angle of the slope between the roadway and the Willamette Falls and/or the existing vegetation adjacent to the roadway.

3.6.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, the visual environment would remain similar to existing conditions, and the visual quality of the area of visual effect would not be affected.

Build Alternative

Effects on visual quality from the Build Alternative would be based on the viewer’s sensitivity to changes resulting from the new project elements, including the widening of I-205 to three lanes, reconstruction and/or removal of existing bridges, the addition of traveler information signs, and the new toll gantries and

supporting infrastructure. Using FHWA's visual impact assessment guidelines, analysts categorized the visual effects as beneficial, adverse, or neutral (FHWA 2015).[38]

Short-Term Effects

Construction of the Build Alternative would change the visual landscape surrounding I-205 in the area of visual effect because of removal of trees and vegetation and because of the presence and use of construction vehicles and equipment, nighttime lighting, signage, and construction staging areas. These visual elements would be present within the existing I-205 right-of-way during construction and would change the visual environment for travelers with a view of the construction area. Detours, traffic shifts, and roadway reconfigurations would require greater traveler attention and potentially distract from typical views along portions of I-205 during active construction. However, remaining trees, vegetation, and/or slope would block most views of construction activities for neighbors.

Most additional nighttime construction lighting would be considered negligible in the context of existing I-205 lighting, except in the portions of I-205 that pass through more rural areas, such as those west of West Linn, where existing nighttime lighting is more limited. With the implementation of measures discussed in Section 3.6.3, short-term visual effects would be neutral for I-205 travelers and neighbors.

No effects on the scenic viewpoint would occur under the Build Alternative during construction. Construction activities would occur north of the viewpoint; access and the parking area would be maintained; and the view of the Willamette Falls from the viewpoint would not be altered during construction.

Long-Term Effects

The Build Alternative would not substantially change the visual character of the area of visual effect, which currently contains the existing highway and supporting infrastructure such as signage and lighting. Because roadway infrastructure would be constructed with materials, forms, and colors that are similar to existing elements within the area of visual effect, the Build Alternative would be compatible with the existing environment for travelers along I-205. Therefore, the overall long-term visual effects would be neutral for I-205 travelers.

Although vegetation removal to accommodate the expanded highway, toll gantries, and supporting infrastructure would occur in the I-205 right-of-way, views of I-205 from adjacent residential and commercial areas that are currently screened would remain screened under the Build Alternative for most neighbors. The mitigation measures in Section 3.6.3 would help to reduce adverse effects for a small number of residential neighbors who may see additional human-made visual elements associated with the Build Alternative, including nighttime lighting. In general, the Build Alternative would be consistent and compatible with the existing visual environment for most neighbors. Therefore, the overall long-term visual effects would be neutral for I-205 neighbors.

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[38] *Beneficial* changes are where visual quality is improved by enhancing visual elements or where experiences are improved by the creation of new or improved views of resources.
Adverse changes can result when visual quality is degraded through incompatible visual elements or by blocking or altering views in a negative manner that can be perceived as inharmonious, disorderly, and incoherent.
Neutral changes are those that are compatible with the existing visual environment, reflecting little change, and which neighbors perceive as harmonious, orderly, and coherent with the existing visual environment.

The Build Alternative would have no long-term effects on the scenic viewpoint. The widening of I-205 would occur north of the existing roadway, and the access and parking supporting the viewpoint would remain. No changes to the view of Willamette Falls from the viewpoint would occur.

Improvements to I-205 under the Build Alternative would be developed in accordance with applicable standards of Clackamas County's rural scenic roadway program.

3.6.3 Avoidance, Minimization, and/or Mitigation Measures

ODOT would implement the following actions to minimize impacts on visual quality during construction:

- Preserve existing vegetation where possible and minimize the clearing of mature trees.
- Direct work and safety lighting toward work areas and away from residential areas where nighttime construction is necessary. Shield light sources to avoid light spillover.
- Screen views of construction equipment and materials from pedestrians and residential areas, as practical.

ODOT would implement the following actions to minimize long-term impacts on visual quality:

- Design materials, colors, forms, heights, and shapes of the roadway infrastructure to blend in with the existing human-made structures and conform to the appropriate land use designation.
- Minimize artificial lighting where practical.
- Shield and direct gantry lighting downward to minimize light spill to adjacent areas.

3.7 Social Resources and Communities

3.7.1 Affected Environment

The API for social resources and communities, shown in Figure 3-15, encompasses the largest resource API (used for the air quality and economics analyses) to assess the full range of potential effects on the human environment. The API extends from the southern part of Portland along I-205 through Gladstone, West Linn, and Oregon City and includes areas in Milwaukie and Happy Valley; along OR 99E through Canby; and along I-5 near Lake Oswego, Tigard, Tualatin, and Wilsonville. Chapter 4 of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, provides more detailed information about the API and methodology for the social resources and communities analysis.

Social Resources

Each city and some unincorporated areas in the API provide a variety of social resources, including social services providers, public service providers (defined in this analysis as police and fire services, libraries, museums, and community centers), religious organizations, schools, parks and recreational facilities, and medical facilities. Chapter 5 of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, includes more detailed descriptions and maps of social resources within the API.

Communities

Table 3-36 summarizes demographic data for the API in comparison to Clackamas County, Multnomah County, Washington County, Marion County, the Portland MSA, and Oregon and Washington states. The table identifies percentages of historically excluded and underserved populations, referred to in this

analysis as Equity Framework Communities (EFC),[39] which include adults (age 65+), children (age 18 and under), people experiencing a disability, people with limited English proficiency, and households with no vehicle access. Although EFCs are located through the API, Figure 3-15 shows the geographic areas in the API that have larger percentages of EFCs than their respective counties as a whole. Section 3.8 discusses a subset of EFCs called environmental justice populations, which include low-income populations and racial and ethnic minority populations.

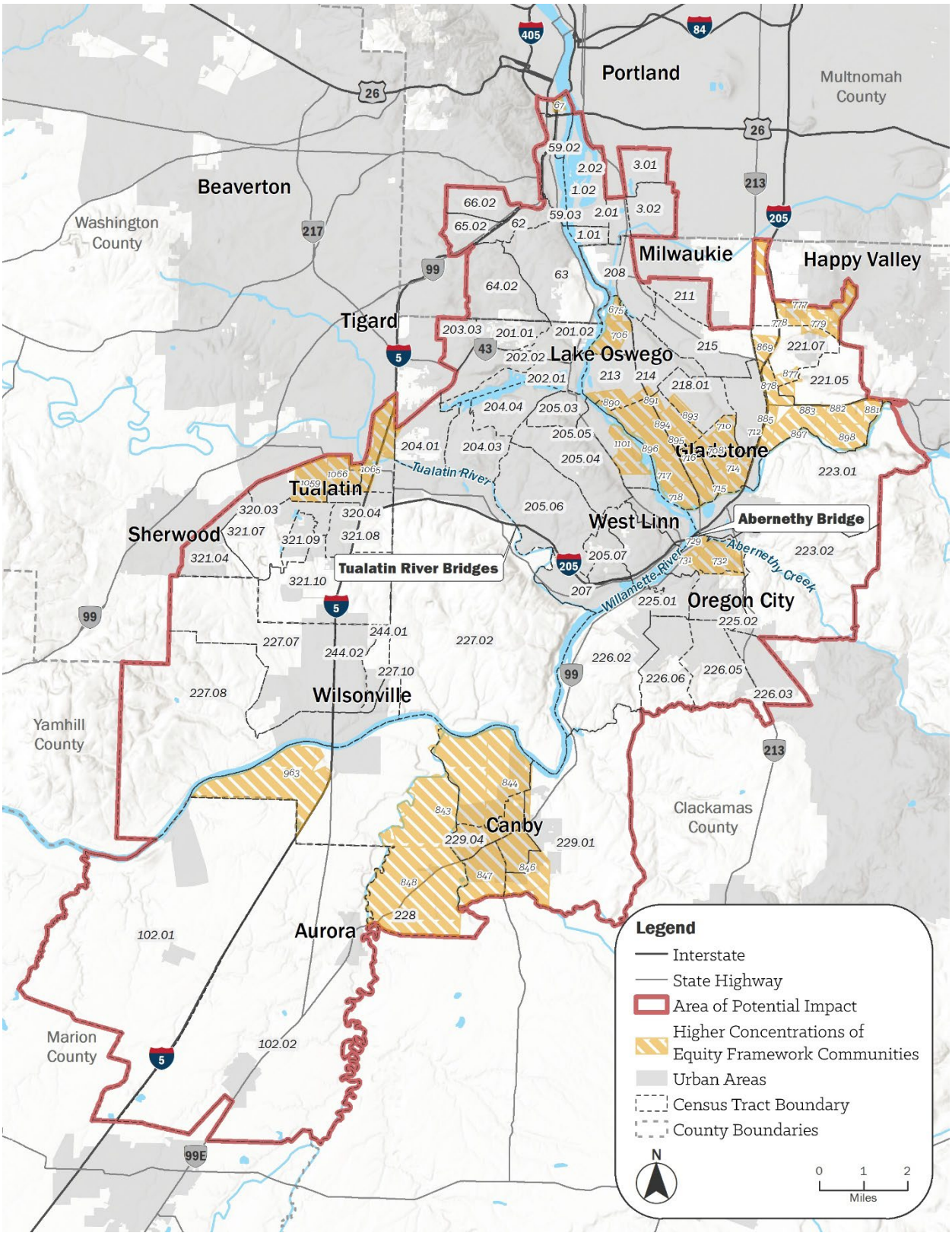
In general, the population in the API has similar or lower percentages of all EFCs, than the four counties, Portland MSA, and Oregon and Washington State as a whole. Chapter 5 of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, provides more information and maps showing where these populations are concentrated geographically in the API.

Analysts also identified the following geographic communities in the API that could experience effects on social resources and communities based on projections of future intersection traffic conditions, as described in Section 3.1.2:

- Canby is a small city in Clackamas County with a land area of approximately 4 square miles and a population of about 18,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with a walkable downtown business district along OR 99E and a cluster of manufacturing and industrial businesses in the southwest corner (City of Canby 2019).
- Gladstone is a small suburban city in Clackamas County with a land area of approximately 3 square miles and a population of about 12,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with commercial districts along McLoughlin Boulevard (OR 99E) and near the I-205 and 82nd Drive interchange (City of Gladstone 2014).
- Lake Oswego is a small suburban city adjacent to the southwest boundary of Portland primarily in Clackamas County (with portions extending into Multnomah and Washington Counties), with a land area of approximately 11 square miles and a population of about 40,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with a mixed-use, walkable downtown district featuring businesses and offices along OR 43 (City of Lake Oswego 2019).
- Oregon City is the county seat for Clackamas County with a land area of approximately 9 square miles and a population of about 36,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with a mix of businesses, museums, government buildings, a transit center, and social services clustered near the walkable historic downtown district along the eastern city boundary and the Willamette River (City of Oregon City 2020).
- Tualatin is a small suburban city in Washington County with a land area of approximately 8 square miles and a population of about 28,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with commercial areas clustered near I-5 and a large manufacturing district on the west side (City of Tualatin 2022).

[39] The Oregon Toll Program at ODOT published an Equity Framework in December 2020, which discusses communities and populations that are currently or have historically been disproportionately affected by local transportation projects (ODOT 2020c).

Figure 3-15. Social Resources and Communities Area of Potential Impact



Sources: ESRI 2018; U.S. Census Bureau 2021

Table 3-36. Demographic Groups in the Area of Potential Impact

Population	API	Clackamas County	Multnomah County	Washington County	Marion County	Portland MSA[1]	Oregon State	Washington State
Total Population	**344,280**	**410,463**	**804,606**	**589,481**	**339,641**	**2,445,761**	**4,129,803**	**7,404,107**
Total Households	**136,786**	**157,408**	**326,229**	**219,053**	**118,038**	**938,646**	**1,611,982**	**2,848,396**
People Experiencing a Disability	11%	12%	12%	10%	14%	12%	14%	13%
Older Adults (65+)	17%	18%	13%	13%	15%	15%	17%	15%
Children (18 and under)	21%	22%	19%	23%	25%	22%	21%	23%
Limited English Proficiency	2%	2%	4%	4%	5%	3%	3%	4%
Households with No Vehicle Access[2]	7%	5%	13%	6%	6%	8%	7%	7%

Source: U.S. Census Bureau, American Community Survey 2015 to 2019
[1] Portland MSA refers to the Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area.
[2] Percentages of Households with No Vehicle Access based on number of households.
API = area of potential impact; MSA = Metropolitan Statistical Area

- Unincorporated Clackamas County includes non-urban lands, with primarily residential and forested lands in the Stafford area and agricultural and residential lands east and west of Canby on OR 99E within the API (Clackamas County 2022a). The Stafford area of unincorporated Clackamas County is located north of I-205 and east of West Linn. This area is a primarily residential rural community, classified as a hamlet.
- West Linn is a small city in Clackamas County with a land area of approximately 7 square miles and a population of about 27,000 (U.S. Census Bureau 2021, 2022). Residential communities make up most of the city, with commercial areas clustered near the two I-205 interchanges in the city and on OR 43 near the northern city limits, an industrial area along the Willamette River on the southern edge of the city, and many parks throughout the city (City of West Linn 2015).

3.7.2 Environmental Consequences

This section summarizes the effects of the No Build and Build Alternatives on social resources and communities within the API. The effects discussions focus on elements related to projected differences in local traffic patterns between the alternatives (access to social resources, travel time scenarios, rerouting traffic to local streets, and roadway safety) and on elements related to tolling (cost of tolls, ability to understand and use the electronic toll system). Chapter 4 of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, provides more detailed information about the methodology used to determine these effects, and Chapter 6 of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, provides additional information about the analyses described in this section.

No Build Alternative

Access to Social Resources

The Project Team used Metro's regional travel demand model to determine the average number of jobs and social resources (community places[40] and medical facilities) that households would be able to access by automobile or transit during peak hours or non-peak hours under existing conditions to allow for a comparison to the No Build and Build Alternatives in 2045. Access is measured by calculating a regional average number of resources that can be reached within a given travel-time from home locations in the region and API.

When comparing the No Build Alternative to existing conditions, the model accounted for the expected future growth in land use and transportation system investments consistent with the adopted 2018 Regional Transportation Plan. A more detailed description of the methodology and results of the accessibility analysis is included in Attachment B of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report.*

[40] *Community places* are defined as places that provide services or items including but not limited to libraries, grocery stores, credit unions, and medical facilities (Metro 2018c). For this analysis, medical facilities were analyzed separately from community places.

Under the No Build Alternative in 2045 compared to existing conditions:

- During peak hours, all households in the API would experience access to more high-paying jobs and access to similar or fewer low- and medium-paying jobs[41] within a 30-minute drive. Compared with the general population, EFC households would experience access to slightly fewer low- and medium-paying jobs.
- During off-peak hours, all households, including EFC households, in the API would experience access to more jobs of all pay levels within a 30-minute drive.
- During both peak and off-peak hours, all households, including EFC households, in the API would experience access to fewer community places and medical facilities within a 20-minute drive.
- All households, including EFC households, in the API would experience access to more job centers, community places, and medical facilities within a 30- or 45-minute transit trip during both peak and off-peak hours.

Consistent with Metro's approved long-range planning documents (i.e., Regional Transportation Plan), the future scenario modeling assumes that regional population and employment growth would continue over time, which would result in more jobs, community places, and medical facilities throughout the API in 2045, as detailed in Attachment B of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*. Growth in the number of jobs and community resources can improve accessibility; however, the population and employment growth are also expected to result in higher demand for travel across modes, which would challenge the transportation system and can result in longer delays that would affect accessibility.

Travel-Time Scenarios

The Project Team determined the shortest travel time for 16 representative trips under existing conditions and the No Build Alternative in 2045. Representative scenarios included trips that started in areas with higher concentrations of EFCs and ended in areas with social resources such as parks, hospitals, libraries, large employment centers, or retail locations in a variety of geographic areas within the API, including Canby, Gladstone, Lake Oswego, Oregon City, Tualatin, and West Linn. 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.

Analysts used Google Maps to identify the shortest trip path from start point (home) to end point (activity destinations) that would include the proposed tolled bridges on I-205 (Abernethy and Tualatin River Bridges), referred to as the Toll Path. It was assumed that the Toll Path in the No Build Alternative would not have tolling but would involve traveling on I-205 where the tolled bridges are proposed under the Build Alternative. Analysts also used baseline conditions from the Metro Regional Travel Demand Model to identify the shortest path that would not include traveling on I-205 where the tolled bridges are proposed, referred to as the Toll-Free Path. A more detailed description of the methodology and results of the Travel-Time Analysis is included in Attachment C of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*.

[41] Low-wage jobs pay between $0 and $39,999 annually, medium-wage jobs pay between $40,000 and $65,000 annually, and high-wage jobs pay over $65,000 annually (Metro 2018c).

Under the No Build Alternative in 2045, travel times for the general population and EFCs in the API between their homes and the 16 representative activity locations would be similar to or longer than travel times under existing conditions on both the Toll Path and Toll-Free Path. Similar to the Access to Social Resources analysis, these changes would occur because of projected population and employment growth and increased congestion on I-205 and connecting roadways in 2045 compared to existing conditions, as described further in Section 3.1.2.

Rerouting Traffic to Local Streets

AM and PM peak-period travel times on both directions of I-205 between I-5 and 82nd Drive would be longer under the No Build Alternative in 2045 compared to existing conditions (as discussed in Section 3.1.2), which would have impacts on access to social resources and communities for people using I-205. As a result, local communities would continue to experience rerouting to other roadways as drivers attempt to avoid higher congestion levels on I-205 under the No Build Alternative.

Under existing conditions, 5 intersections (in Lake Oswego, Oregon City, unincorporated Clackamas County, and West Linn) fail to meet jurisdictional mobility standards[42] for intersection performance during the AM peak hour, and 10 intersections (in Gladstone, Oregon City, unincorporated Clackamas County, and West Linn) fail to meet mobility standards during the PM peak hour. Most of those intersections would continue to fail to meet local standards, and some intersections would experience worse congestion under the No Build Alternative than existing conditions in both 2027 and 2045. This congestion would result in continued impacts on all people traveling to nearby social resources and communities.

Roadway Safety

The number of crashes on the portion of I-205 and local roadways studied in the API is generally expected to be slightly higher under the No Build Alternative in 2045 compared to existing conditions because of the anticipated higher traffic volumes. The No Build Alternative could have impacts on health and safety for all populations related to the use of these roadways to access social resources and communities.

Build Alternative

Short-Term Effects

Construction would require short-term lane and roadway closures on I-205 and some nearby local roadways, typically during nighttime hours, as described in Section 3.1.2. Full roadway closures would be scheduled during overnight periods when many social resources are closed to the public. Short-term detours would be in place during the closures, and access to all social resources and geographic communities, including emergency services, would be maintained. ODOT would prepare a temporary traffic management plan to minimize construction impacts that would affect nearby social resources and communities.

[42] Mobility standards for intersections vary by jurisdiction, with most measured as volume-to-capacity ratios and others as level of service, which are defined in Section 3.1.1.

Construction activities would temporarily increase noise levels and dust in and near construction areas; however, any impacts on nearby social resources and geographic communities (such as Stafford and West Linn) are expected to be minor because contractors would be required to comply with ODOT regulations regarding noise and air pollution, as discussed further in Sections 3.2.2 and 3.5.2.

Because limited temporary construction easements would be required for the Build Alternative, as described in Section 3.9.2, there would be minimal physical impacts on neighboring communities. No relocations of businesses or residences would be required.

Tolling During Construction of Roadway Improvements

ODOT anticipates starting tolling on the Abernethy Bridge and possibly tolling on the Tualatin River Bridges for 2 to 3 years (between 2024 and 2027) while completing construction of the Build Alternative, as discussed in Section 3.1.2. Compared with the 2027 No Build Alternative, traffic volumes would generally be higher on segments of SW Borland Road, SW Stafford Road, OR 99E, OR 213, and OR 43 if both bridges are tolled during the pre-completion period, with the largest differences expected on SW Borland Road east of SW Stafford Road near Stafford Hamlet in unincorporated Clackamas County and on OR 99E west of Lone Elder Road just south of Canby. These changes could affect people traveling to social resources in these areas, which primarily include religious institutions and schools. The area that includes the segment of 99E west of Lone Elder Road has a higher percentage of EFCs (older adults) than Clackamas County as a whole.

Long-Term Effects

Access to Social Resources

In general, households in the API would experience the same or improved access to jobs, community places, and medical facilities, depending on the time of day and mode of travel, under the Build Alternative compared to the No Build Alternative in 2045. In addition, EFC households would experience slightly greater accessibility to most job types, community places, and medical resources compared with general population households within the API and Portland MSA.

In general, these changes in accessibility under the Build Alternative would occur because of lower levels of traffic congestion on I-205 and some neighboring roadways, as described in Section 3.1.2. The model also accounts for regional growth in population and employment through 2045. The transportation improvements included in the Build Alternative would enable households to access similar or greater numbers of jobs and social resources within a given travel time during peak and off-peak hours compared to the No Build Alternative.

A more detailed description of the methodology and results of the accessibility analysis is included in Attachment B of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report.*

Travel-Time Scenarios

With the added capacity in both directions and tolling on I-205, the Build Alternative would result in faster I-205 highway travel times in 2045 in both the AM and PM peak periods compared to the No Build Alternative. These improved travel times could facilitate faster access to social resources and communities for travelers using I-205 under the Build Alternative.

All populations, including EFCs, in the API would experience the same or shorter travel times for trips on the Toll Path (routes that include the proposed tolled bridges on I-205) from their homes via private vehicle or transit to 16 representative activity locations, such as parks, job sites, medical offices, and religious organizations, under the Build Alternative as compared to the No Build Alternative in 2045. Because there would be less congestion on I-205 and some roadways used to access I-205 under the Build Alternative, most of the representative trips on I-205 would take similar or less time compared to the No Build Alternative, as described in Section 3.1.2. Travelers would experience longer travel times for 3 of the 16 scenarios on the Toll-Free Path (routes that do not include the proposed tolled bridges on I-205) under the Build Alternative compared to the No Build Alternative. Most of the scenarios focus on travel by private vehicle, but for comparison, three scenarios were evaluated for transit travel times based on existing fixed transit routes for the representative trip. It is assumed that the transit trips would not use the Toll Path based on existing transit routing.

A more detailed description of the methodology and results of the Travel-Time Analysis is included in Attachment C of Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*.

Rerouting Traffic to Local Streets

Under the Build Alternative in 2027 and 2045, some traffic would reroute to local streets in order to avoid tolls, resulting in potential changes in access to nearby social resources in Canby, Gladstone, Lake Oswego, Oregon City, Tualatin, West Linn, and unincorporated Clackamas County (near Stafford Hamlet and Canby) during the AM and PM peak hours compared to the No Build Alternative.

Most of the 50 study intersections would meet local jurisdictional mobility standards under both the No Build and Build Alternatives in the future, as described further in Section 3.1.2. Areas of Oregon City and unincorporated Clackamas County near I-205 and portions of OR 99E near Canby would have the largest numbers of intersections with worse operations under the Build Alternative as compared to the No Build Alternative in 2027 and/or 2045. The subsections below summarize the rerouting effects on access to social resources for each geographic community in the API, including a discussion of transit and active transportation effects where there were differences between the alternatives. Appendix I, *I-205 Toll Project Social Resources and Communities Technical Report*, provides more detailed descriptions of the affected intersections and maps showing the locations of these affected intersections in relationship to areas with higher concentrations of EFCs.

Canby. In central Canby, the OR 99E and Ivy Street intersection would not meet standards in both alternatives and would have worse traffic operations under the Build Alternative than the No Build Alternative during the PM peak hour in 2027 and 2045. Although severe congestion[43] would occur under both alternatives at this intersection, the Build Alternative would have longer delays (by more than 2 minutes in 2027 and about 40 seconds in 2045) compared to the No Build Alternative. These longer delays would have impacts on people and public service providers, such as emergency vehicles, traveling to nearby social resources, which currently include retail stores and restaurants, medical clinics, parks, religious organizations, a fire station, and schools. There are EFCs with a higher percentage of people experiencing a disability, older adults, people with LEP, and children than in Clackamas County as whole near this intersection.

[43] The term severe congestion refers to intersections that do not meet local mobility standards and generally have Level of Service of E or F according to the *I-205 Toll Project Transportation Technical Report*.

Gladstone. One Gladstone intersection, the OR 99E and W Arlington Street intersection, would not meet standards under the Build Alternative and would meet standards under the No Build Alternative during the PM peak hour in 2027. Although severe congestion would occur at this intersection under both alternatives in 2027, the Build Alternative would have longer delays (by about 30 seconds) than the No Build Alternative. This difference would have impacts on people traveling to nearby social resources, which currently include religious institutions, schools, and a nursing home. A second Gladstone intersection, the 82nd Drive and I-205 northbound ramps intersection, would not meet standards under both alternatives in 2027 and 2045 during the PM peak hour and would have worse operations under the Build Alternative than the No Build Alternative during the PM peak hour in 2045. Although moderate[44] to severe congestion would occur at this intersection under both alternatives, the Build Alternative would have longer delays (by about 40 seconds) in 2045. This difference would have impacts on people traveling to nearby social resources, which currently include a sports club. These intersections are not located in a geographic area with higher percentages of EFCs than Clackamas County as a whole.

Lake Oswego. One Lake Oswego intersection, OR 43 and McVey Avenue, would not meet standards in both alternatives and would be worse under the Build Alternative than the No Build Alternative during the AM peak hour in 2027 and 2045. A second Lake Oswego intersection, OR 43 and A Avenue, would meet local mobility standards under the No Build Alternative but would not meet those standards under the Build Alternative during the AM peak hour in 2027. By 2045, that intersection would not meet local mobility standards under both alternatives and would be worse under the Build Alternative than the No Build Alternative during the AM peak hour. Although moderate to severe congestion would occur at these intersections under both alternatives, the Build Alternative would have longer delays (by less than 30 seconds) compared to the No Build Alternative. These differences would have an impact on people traveling to nearby social resources, which include shopping centers, restaurants, an arts center, and offices. Neither intersection is in a geographic area with a higher percentage of EFCs than Clackamas County as a whole.

Oregon City. In the downtown area of Oregon City, four intersections would have worse traffic operations under the Build Alternative compared to the No Build Alternative:

- **7th Street and Main Street intersection:** In 2027, this intersection would not meet standards under the Build Alternative and would meet standards under the No Build Alternative during the PM peak hour, and moderate congestion would occur.
- **OR 99E and 10th Street intersection:** In 2045, this intersection would not meet standards under the Build Alternative and would meet standards under the No Build Alternative during the PM peak hour, with slightly longer delays (less than 5 seconds).
- **OR 99E (McLoughlin Boulevard) and 14th Street intersection:** In 2027, this intersection would not meet standards under both alternatives during the PM peak hour. Delays would be longer (by more than 1 minute) and congestion would be more severe under the Build Alternative compared with the No Build Alternative. In 2045, this intersection would not meet standards under both alternatives during the AM and PM peak hours, and there would be longer delays (by up to about 20 seconds) under the Build Alternative compared to the No Build Alternative.

[44] The term moderate congestion refers to intersections that do not meet local mobility standards and generally have Level of Service D according to the *I-205 Toll Project Transportation Technical Report.*

- **OR 99E and 15th Street intersection**: During the AM peak hour in 2045, this intersection would not meet standards under the Build Alternative and meet standards under the No Build Alternative, and longer delays (by nearly 3 minutes) would occur under the Build Alternative. During the PM peak hour in 2045, this intersection would have severe congestion and would not meet standards under both alternatives, but there would be longer delays (by about 1 minute) under the Build Alternative compared to the No Build Alternative.

Two additional intersections just outside of the downtown area would not meet standards under both alternatives and would experience worse traffic operations under the Build Alternative:

- **OR 99E and I-205 northbound ramps:** Although moderate to severe congestion would occur under both alternatives during the PM peak hour in 2027, there would be worse congestion under the Build Alternative during the PM peak hour compared with the No Build Alternative, which would have impacts on people traveling to nearby social resources, including shopping centers, restaurants, and parks. Although severe congestion would continue to occur under both alternatives at this intersection in 2045, the Build Alternative would have worse congestion and delays (by about 25 seconds during the AM peak hour) than the No Build Alternative.
- **OR 99E and I-205 southbound ramps:** Although congestion would be moderate to severe under both alternatives during the 2027 PM peak hour, delays would be worse (by about 1 minute) under the Build Alternative compared to the No Build Alternative during the PM peak hour and would have an impact on people traveling to nearby social resources, including shopping centers, restaurants, and parks.

Worsening traffic performance under the Build Alternative would have an impact on people traveling to nearby social resources, which currently include shops, restaurants, the Clackamas County Court House, City Hall, a community center, religious organizations, nursing homes, and parks.

Transit travel times along OR 99E near these affected intersections would be similar under the Build and No Build Alternatives in 2045. However, transit MMLOS would be lower under the Build Alternative as compared to the No Build Alternative on southbound OR 99E from 11th Street to Main Street and on northbound OR 99E from Railroad Avenue to MP 12.74 in downtown Oregon City. Additionally, there would be longer travel times under the Build Alternative compared to the No Build Alternative on northbound Main Street from 11th Street to 15th Street during the AM peak hour and on southbound Main Street from 14th Street to OR 99E during the PM peak hour in 2045. These travel-time delays would have an impact on transit access to social resources in the downtown Oregon City area during those times. One segment of the OR 99E corridor, 11th Street to Main Street in Oregon City, would experience worse pedestrian level of service under the Build Alternative than under the No Build Alternative in 2045 because of increasing traffic volumes.

None of the downtown Oregon City intersections are in a geographic area with a higher percentage of EFCs than Clackamas County as a whole. However, adjacent areas have a higher proportion of people experiencing a disability than Clackamas County as a whole. Because of the larger concentration of social services in Oregon City compared to the rest of the API, it is expected that EFC populations would regularly travel through this area and may experience impacts from higher congestion levels under the Build Alternative.

Tualatin. Two Tualatin intersections (I-5 northbound ramps and Nyberg Street and I-5 southbound ramps and Nyberg Street) would meet standards under the No Build Alternative and not meet standards under the Build Alternative during the PM peak hour in 2027. The Build Alternative would have longer delays (by less than 10 seconds at the I-5 northbound ramps and about 20 seconds at the I-5 southbound ramps)

than the No Build Alternative. These differences could have an impact on people and public service providers, such as emergency vehicles, traveling to nearby social resources, including medical facilities, parks, and shopping centers. The southbound ramps intersection is in a geographic area with a higher percentage of low-income populations, minority populations, and people experiencing a disability than Clackamas County as a whole. Effects specific to low-income populations and minority populations are discussed in Section 3.8.2.

One other Tualatin intersection, the SW Borland Road and SW 65th Avenue intersection, would meet standards during the AM peak hour under the No Build Alternative and would not meet mobility standards under the Build Alternative in 2045. Although severe congestion would occur at this intersection under both alternatives, the Build Alternative would have longer delays (by about 20 seconds) in 2045. This difference would have impacts on people or public service providers, such as emergency vehicles, traveling to nearby social resources, which currently include a medical center, schools, an assisted living facility, and parks. This intersection is not in a geographic area with a higher percentage of EFCs than Clackamas County as a whole.

West Linn. Two West Linn intersections would have better operations under the Build Alternative than the No Build Alternative. The OR 43 and I-205 southbound ramps intersection would have shorter delays in 2027 during the AM peak hour (by about 15 seconds) and in 2045 during the PM peak hour (by almost 1 minute). These shorter delays would provide benefits for people traveling to nearby social resources, which currently include parks, schools, religious organizations, and shopping centers. The Hidden Springs Road and Santa Anita Drive intersection would have shorter delays (by about 10 seconds) in 2045 during the PM peak hour. This difference would provide benefits for people and public service providers, such as emergency vehicles, traveling to nearby social resources, which currently include a fire station, parks, and schools.

One West Linn intersection (12th Street and Willamette Falls Drive) would not meet standards under both alternatives and would have comparatively worse traffic operations under the Build Alternative than the No Build Alternative during the PM peak hour in 2045. Although severe congestion would occur under both alternatives at this intersection during the PM peak hour, the Build Alternative would have longer delays (by about 2 minutes) than the No Build Alternative. This difference would have an impact on people or public service providers, such as emergency vehicles, traveling to nearby social resources, which currently include a fire station, a school, religious organizations, medical offices, and restaurants. In addition, the 12th Street and Willamette Falls Drive intersection would experience a higher level of pedestrian traffic stress under the Build Alternative compared to the No Build Alternative in 2045 because of higher traffic volumes, which would potentially impact people walking to nearby social resources. This intersection is not in a geographic area with a higher percentage of EFCs than Clackamas County as a whole.

Unincorporated Clackamas County. In unincorporated Clackamas County in the Canby area, three intersections on OR 99E outside of the city limits would not meet standards in both alternatives and would have comparatively worse traffic operations under the Build Alternative:

- **OR 99E and South End Road intersection**: Although severe congestion would occur under both alternatives at this intersection during the AM and PM peak hours in 2027 and 2045, the Build Alternative would have more congestion than the No Build Alternative and would have an impact on people traveling to nearby social resources, which currently include religious organizations.

- **OR 99E and New Era Road intersection**: Although severe congestion would occur under both alternatives at this intersection during the PM peak hour in 2027 and 2045, the Build Alternative would have more congestion than the No Build Alternative and would have an impact on people traveling to nearby social resources, which currently include religious organizations.
- **OR 99E and Lone Elder Road**: Although severe congestion would occur under both alternatives at this intersection during the AM and PM peak hours in 2027 and 2045, the Build Alternative would have more congestion during the 2027 and 2045 AM peak hours than the No Build Alternative. There are limited social resources near this rural intersection. However, the greater congestion levels could have an impact on people traveling to social resources in nearby Aurora or Canby. The area surrounding this intersection has a higher percentage of older adults than Clackamas County as a whole.

In the Stafford Hamlet area, three intersections on SW Stafford Road would have worse traffic operations under the Build Alternative than the No Build Alternative:.

- **SW Stafford Road and SW Mountain Road intersection**: During the PM peak hour in 2045, this intersection would meet standards under the Build Alternative and not meet standards under the No Build Alternative. However, during the AM peak hour in 2027 and 2045, this intersection would not meet standards under both alternatives. Although severe congestion would occur under both alternatives at this intersection, the Build Alternative would have more severe congestion and longer delays (by about 20 to 40 seconds) compared to the No Build Alternative and would have an impact on people traveling to nearby social resources, which currently include schools and religious organizations. Transit travel times on both directions of Stafford Road between the Tualatin River and SW Mountain Road would be about the same under both alternatives during the AM peak hour and would improve under the Build Alternative compared to the No Build Alternative during the PM peak hour, which would benefit people traveling to social resources via transit.
- **SW Stafford Road and SW Childs Road intersection**: During the AM and PM peak hour in 2045, this intersection would not meet standards under both alternatives. Although medium to severe congestion would occur under both alternatives at this intersection, the Build Alternative would have longer delays (by less than 20 seconds) compared to the No Build Alternative and would have an impact on people traveling to nearby social resources, which currently include parks, schools, and religious organizations.
- **SW Stafford Road and SW Rosemont Road intersection**: During the AM peak hour in 2027 and the AM and PM peak hours in 2045, this intersection would not meet standards in both alternatives. Although moderate congestion would occur under both alternatives at this intersection, the Build Alternative would have longer delays (by about 10 seconds to more than 1 minute) compared to the No Build Alternative. During the PM peak hour in 2027, this intersection would not meet standards under the Build Alternative but would meet standards under the No Build Alternative. This congestion in 2027 and 2045 would have an impact on people traveling to nearby social resources, which currently include parks, schools, religious organizations, and an assisted living facility.

Pedestrians would experience a worse level of service in 2045 on southbound SW Borland Road from SW Stafford Road to Ek Road under the Build Alternative compared to the No Build Alternative, which could cause delays in their access to nearby social resources. None of the affected Stafford intersections are in geographic areas with a higher percentage of EFCs than Clackamas County as a whole.

Roadway Safety

All communities in the API would benefit from 26% lower number of crashes (representing about 144 fewer crashes) on I-205 in the API, including fewer crashes resulting in injuries, under the Build Alternative compared to the No Build Alternative, as described in the Transportation Safety subsection of Section 3.1.2.

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 2027 and/or 2045, as discussed in the Transportation Safety subsection of Section 3.1.2. Four intersections and portions of OR 99E and SW Stafford Road in Canby, Gladstone, Tualatin, unincorporated Clackamas County would experience safety impacts in 2027 that would require consideration of mitigation, according to criteria identified in Section 3.1.2. Because there would be a combination of benefits and impacts depending on location, and safety impacts would be mitigated, the Build Alternative would generally have no adverse effects on health and safety on local roadways and intersections.

Cost of Tolls

Social and public service providers and households, including EFCs, could experience higher costs as a percentage of their operating or household transportation budgets compared to the No Build Alternative if they choose to travel on the tolled I-205 bridges, as discussed in Sections 3.4.2 and 3.8.2. However, overall, the improved I-205 traffic performance under the Build Alternative is expected to lead to economic benefits that would reduce costs for social resource providers and community members. These benefits include lower vehicle emissions, shorter travel times, vehicle operating cost savings, and fewer crashes on I-205.

The cost of tolls would have impacts on low-income households, which could also include populations on a fixed income, such as older adults and people experiencing a disability. This potential impact and the proposed mitigation are discussed in Sections 3.8.2 and 3.8.4.

Effects related to the cost of tolls would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements, as discussed further in the Tolling During Construction of Roadway Improvements subsection of Short-Term Effects.)

Ability to Use Electronic Toll System

Because roadway signage will be in English, the tolling system could introduce challenges for persons with limited English proficiency in the API. Through community engagement and outreach for the Project, analysts also identified potential technological barriers related to the electronic toll system for the general population and for EFCs. People who are less proficient with technology may have difficultly registering for an account, purchasing a transponder, and paying bills online. These technological barriers could discourage use of the tolling system among all populations and contribute to rerouting from I-205 to avoid the toll system. These effects would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements, as discussed further in the Tolling During Construction of Roadway Improvements subsection of Short-Term Effects.)

3.7.3 Summary of Effects

Table 3-37 provides a comparison of anticipated social resources and communities impacts and benefits by alternative.

Table 3-37. Social Resources and Communities Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term Effects	None	• Temporary noise and dust increase in the vicinity of construction activities on I-205 but minimal construction impacts on neighboring social resources and communities • Brief I-205 roadway closures and detours, with maintenance of access to all social resources and geographic communities, including emergency services.
Long-Term Effects	Compared to existing conditions, there would be: • Differences in access (a mix of greater, less, and similar) to social resources (e.g., job centers, community places, medical facilities) for EFCs and the general population in 2045 • Similar or longer travel times to representative activity centers (e.g., parks, businesses, medical facilities) for EFCs and the general population traveling on the I-205 in the Project area in 2045 Longer travel times and more crashes on I-205, which would have an impact on access to social resources and communities in 2045	Compared to the No Build Alternative, there would be: • Similar or greater access to social resources (e.g., job centers, community places, medical facilities) for EFCs and the general population because of projected regional growth and transportation improvements related to the Build Alternative in 2045 • Similar or shorter travel times to representative activity centers (e.g., parks, businesses, medical facilities) for all populations traveling on routes with the proposed tolled bridges because of reduced traffic congestion on I-205 in 2045 • Potential higher transportation costs for social and emergency service providers, which may be offset by other user and social benefits associated with improved I-205 traffic performance (e.g., reduced emissions, shorter travel times, vehicle operation cost savings, fewer crashes) • Potential impacts from the cost of tolls on low-income households, which could include older adults and people experiencing a disability, which would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements) • Potential language and technological barriers to using and understanding the electronic toll system, which would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements) • Potential delays and longer travel times near intersections, which could affect access to social resources in Canby, Gladstone, Lake Oswego, Oregon City, Tualatin, West Linn, and unincorporated Clackamas County (near Stafford Hamlet and Canby) in 2027 and/or 2045 during the AM and/or PM peak hours • Similar numbers of crashes on most local streets in 2027 and 2045, and a lower number of crashes on I-205 in 2045. Four intersections and portions of OR 99E and SW Stafford Road in Canby, Gladstone, Tualatin, unincorporated Clackamas County would experience safety impacts in 2027 that would require consideration of mitigation.

EFC = Equity Framework Communities

3.7.4 Avoidance, Minimization, and/or Mitigation Measures

Short-Term Impacts

Construction contractors would be required to comply with federal, state, and local regulations and implement BMPs to manage and reduce construction-related impacts, including noise, air quality, and traffic control measures. No additional mitigation is required.

To facilitate use of the toll system by persons with limited English proficiency, ODOT would conduct outreach in multiple languages (e.g., Simplified and Traditional Chinese, Russian, Spanish, Vietnamese) and plain language to provide advance information about construction activities and potential effects.

Long-Term Impacts

Section 3.1.4 provides a list of potential measures to avoid, minimize, or mitigate roadway, transit, and active transportation impacts under the Build Alternative, which would also help to avoid, minimize, or mitigate impacts on social resources and communities near affected intersections in particular geographic areas.

As part of the Oregon Toll Program development, ODOT has committed to providing a low-income toll program. Section 3.8.4 provides more information about the status of development of this program.

The following additional measures would be implemented prior to and/or during tolling to avoid or minimize long-term impacts on social resources and communities:

- ODOT would continue public outreach through final design and construction to mitigate barriers to using the electronic toll system, including:
  - Conducting outreach in multiple languages (e.g., Simplified and Traditional Chinese, Russian, Spanish, Vietnamese) and plain language to provide information about the Toll Program, including how to purchase a transponder, establish an account, and use the system. This outreach would also include raising awareness about travel options in the region to help offset the cost of tolls, such as a subsidized vanpool program that reduces costs for participants and tools operated by the Get There Oregon program to match commuters with carpool opportunities.
  - Implementing an electronic toll system interface (e.g., website, mobile application, printed materials) that is simple, easy to use, uses plain language and a combination of text and simple graphics, and complies with Section 508 of the Rehabilitation Act of 1973.[45]
  - Distributing information about the I-205 Toll Project throughout toll operations, in coordination with other transportation projects (e.g., Oregon Toll Program, Regional Mobility Pricing Project) in the region via community-based organizations, public and social service offices, religious organizations, and schools.
  - Directly advertising in newspapers and radio stations that have an audience representative of limited English proficiency populations and establishing hotlines with multilingual customer service agents (e.g., Simplified and Traditional Chinese, Russian, Spanish, Vietnamese) in advance of the start of tolling.
- ODOT would establish permanent customer service centers across the region to mitigate barriers to using the electronic toll system, so drivers could:
  - Purchase transponders, establish prepaid accounts, and pay invoices in person and/or with cash.
  - Call customer service centers for assistance navigating the toll system and answer questions about how the program works.

[45] Section 508 of the federal Rehabilitation Act of 1973 includes regulations to ensure agencies provide information that is accessible to and usable by people experiencing a disability. See more at www.section508.gov.

3.8 Environmental Justice

3.8.1 Affected Environment

The API for the environmental justice analysis, shown in Figure 3-16, encompasses the largest resource API (used for the air quality and economics analyses) to assess the full range of potential effects on environmental justice populations. The environmental justice analysis identifies and examines all potential adverse effects on low-income[46] and minority[47] populations to determine whether the Build Alternative would result in disproportionately high and adverse effects on low-income and/or minority populations[48] in accordance with Executive Order 12898.[49] Chapter 4 of Appendix J, *I-205 Toll Project Environmental Justice Technical Report*, provides more detailed information about the methodology used for the environmental justice analysis.

Existing low-income populations and minority populations were identified in the API through a no-threshold approach.[50] In general, the population in the API has similar or lower percentages of environmental justice populations than the four counties, Portland MSA, and Oregon and Washington State as a whole, as shown in Table 3-38. Appendix J, *I-205 Toll Project Environmental Justice Technical Report*, provides more information and maps showing the percentage of environmental justice populations throughout the API.

In addition, analysts identified concentrations of environmental justice populations using the Meaningful Greater approach,[51] which identifies geographic areas with a higher percentage of one or more low-income populations and/or minority populations compared to the county in which they are located, as shown in Figure 3-16. Table 3-38 shows the county average percentages of low-income and minority populations. Attachment D of Appendix J, *I-205 Toll Project Environmental Justice Technical Report*, provides more information about which environmental justice populations had higher concentrations in a given area.

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46 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).

47 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 2012). This analysis also included people who identified as two or more of these categories.

48 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.

49 EO 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.

50 A *no-threshold approach* means that the identification of environmental justice populations is not limited to only census tracts that have a defined threshold percentage of low-income and/or minority persons. The no-threshold approach minimizes the possibility of inadvertently missing concentrations of low-income and/or minority persons within census tracts that do not meet a predefined threshold (U.S. Environmental Protection Agency 2016).

51 A *Meaningfully Greater* analysis considers environmental justice impacts in census tracts where levels of low-income or minority populations are "meaningfully greater" than corresponding county or regional averages—usually expressed in percentage ranges (U.S. Environmental Protection Agency 2016).

Figure 3-16. Environmental Justice Concentrations within the Area of Potential Impact

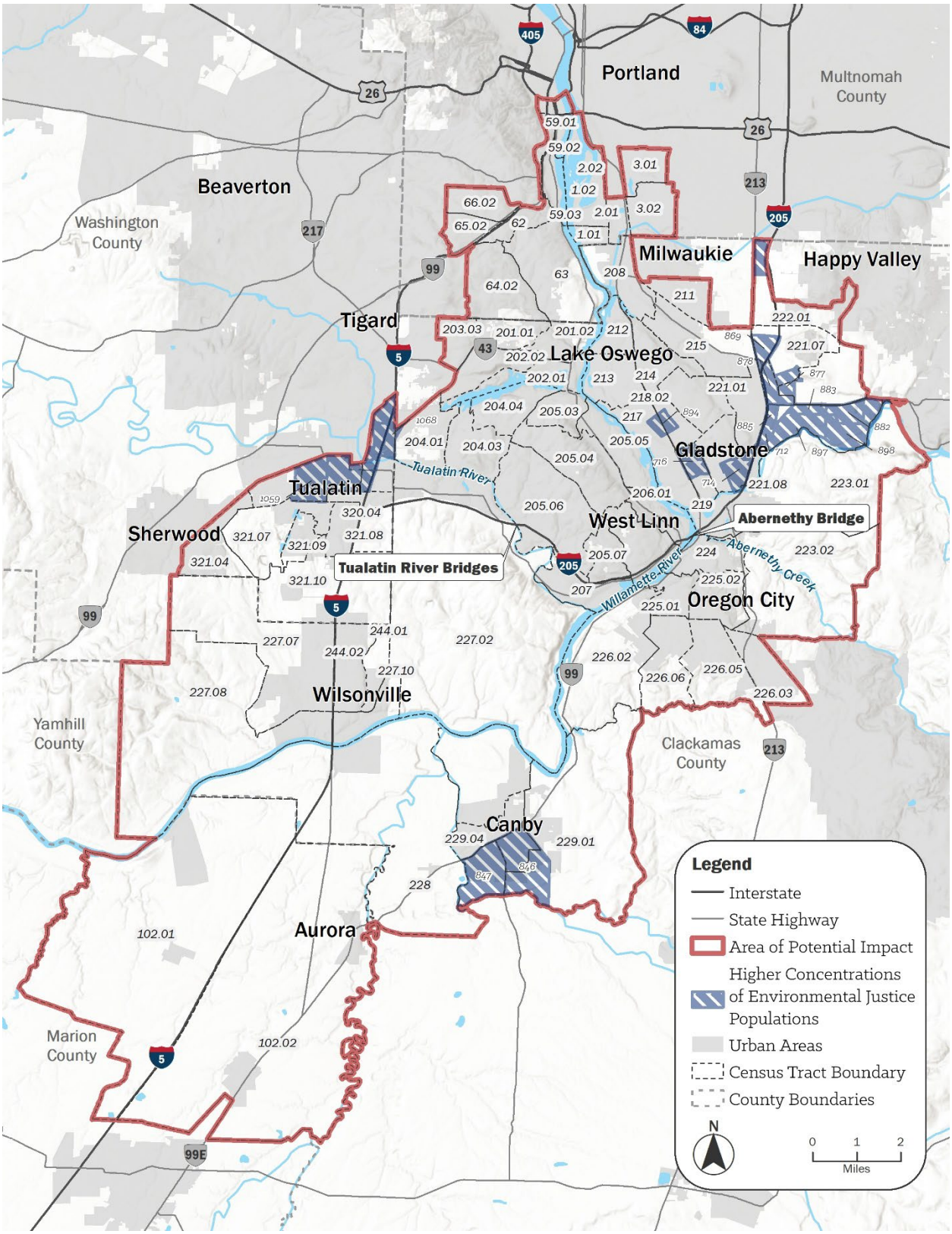


Table 3-38. Environmental Justice Demographic Groups in the Area of Potential Impact

Population	API	Clackamas County	Multnomah County	Washington County	Marion County	Portland MSA[1]	Oregon State	Washington State
Total Population	**344,280**	**410,463**	**804,606**	**589,481**	**339,641**	**2,445,761**	**4,129,803**	**7,404,107**
Total Households	**136,786**	**157,408**	**326,229**	**219,053**	**118,038**	**938,646**	**1,611,982**	**2,848,396**
Racial Minority	10%	9%	19%	18%	8%	15%	11%	19%
Ethnic Minority (Hispanic or Latino)	10%	9%	12%	17%	27%	12%	13%	13%
People Experiencing Low Income (Below 200% of Poverty Level)*	20%	19%	30%	22%	36%	25%	30%	26%
People Experiencing Low Income: Poverty Level*	8%	8%	14%	9%	14%	11%	13%	11%

Source: U.S. Census Bureau, American Community Survey 2015 to 2019
* Demographic groups that are considered environmental justice populations analysis.
[1] Portland MSA refers to the Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area.
API = area of potential impact

3.8.2 Environmental Consequences

This section describes the effects of the No Build and Build Alternatives on environmental justice populations within the API. The effects discussions focus on elements related to projected differences in local traffic patterns between the alternatives (access to social resources, travel time scenarios, rerouting traffic to local streets, and roadway safety) and on elements related to tolling (cost of tolls, ability to understand and use the electronic toll system).Effects on environmental justice populations related to noise and air quality were evaluated in Appendix J, *I-205 Toll Project Environmental Justice Technical Report.* As discussed in Sections 3.2.2 and 3.5.2 of Appendix J, there would be no adverse air quality and noise effects in the API.

The analysis of effects of tolling costs and the toll system and of overall transportation effects on I-205 and local roadways at an API level is based on the *no-threshold approach* (i.e., it considers effects on environmental justice populations regardless of location). The analysis of the effects on access, travel-time, rerouting to local streets, and safety is generally based on the *meaningfully greater approach* (i.e., considering effects on geographic areas with higher percentages of environmental justice populations than the county in which they are located).

No Build Alternative

Access to Social Resources

The Project Team used Metro's regional travel demand model to conduct an accessibility analysis, which determined the number of jobs and social resources (community places and medical facilities) that environmental justice households could access by automobile or transit during peak hours and non-peak hours under existing conditions to allow for a comparison to the No Build and Build Alternatives in 2045. Access is measured by calculating a regional average number of resources that can be reached within a given travel-time from home locations in the region and API. When comparing the No Build Alternative to existing conditions, the model accounted for the expected future growth in land use and transportation

system investments consistent with the adopted 2018 Regional Transportation Plan. A more detailed description of the methodology and results of the accessibility analysis is included in Attachment D of Appendix J, *I-205 Toll Project Environmental Justice Technical Report.*

Under the No Build Alternative in 2045 compared to existing conditions:

- During peak hours, areas with higher concentrations of environmental justice households in the API would experience access to fewer jobs of all pay levels.
- During off-peak hours, areas with higher concentrations of environmental justice populations in the API would experience access to more jobs of all pay level within a 30-minute drive.
- Areas with higher concentrations of environmental justice households in the API would experience access to more job centers, community places, and medical facilities within a 30- or 45-minute transit trip during both peak and off-peak hours under the No Build Alternative relative to existing conditions.

Consistent with Metro's approved long-range planning documents (i.e., Regional Transportation Plan), the future scenario modeling assumes that regional population and employment growth would continue to occur over time, which would result in more jobs, community places, and medical facilities throughout the API in 2045. Growth in the number of jobs and community resources can improve accessibility; however, the regional model assumes population and employment growth would result in higher demand for travel across modes, which would challenge the transportation system and could result in longer delays that would affect accessibility for environmental justice populations.

Travel-Time Scenarios

The Project Team determined the shortest travel time for 16 representative trips under existing conditions and the No Build and Build Alternatives in 2045.[52] Eight of the representative scenarios included trips that started in geographic areas with higher concentrations of environmental justice populations and ended in areas with social resources such as parks, hospitals, libraries, large employment centers, or retail locations. 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.

Analysts used Google Maps to identify the shortest trip path from start point (home) to end point (activity destinations) that would include the proposed tolled bridges on I-205 (Abernethy and Tualatin River Bridges). They used baseline conditions from the Metro Regional Travel Demand Model to identify the shortest path that would not include the proposed tolled bridges on I-205. This approach enabled a comparison of routes both with and without tolling. A detailed description of the methodology and results is included in Attachment E of Appendix J, *I-205 Toll Project Environmental Justice Technical Report*.

Under the No Build Alternative in 2045, travel times for 8 trips starting in areas with higher concentrations of environmental justice populations would be similar to or longer than under existing conditions. Similar to the Access to Social Resources analysis, these changes would occur because of projected population and employment growth. Trips would generally take more time because of increased congestion on I-205 and connecting roadways in 2045 compared to existing conditions, as described in Section 3.1.2.

[52] There were 16 representative scenarios to estimate potential travel-time effects on Equity Framework Communities, and the general population, eight of which representing low-income and/or minority populations. Representative scenarios included trips that started in environmental justice areas and ended in social resource areas such as parks, hospitals, libraries, large employment centers, retail locations, etc. 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.

Rerouting Traffic to Local Streets

AM and PM peak-period travel times on both directions of I-205 between I-5 and 82nd Drive would be longer under the No Build Alternative in 2045 compared to existing conditions (as described in Section 3.1.2), which would have adverse effects on environmental justice populations accessing social resources using I-205. Vehicles currently reroute from I-205 to other roadways during higher demand periods when traffic congestion is present.

Under existing conditions, 5 intersections (in Lake Oswego, Oregon City, unincorporated Clackamas County, and West Linn) do not meet jurisdictional mobility standards[53] for intersection performance during the AM peak hour, and 10 intersections (in Gladstone, Oregon City, unincorporated Clackamas County, and West Linn) do not meet mobility standards during the PM peak hour. One of the failing intersections, the 82nd Drive and I-205 southbound ramps intersection, is located in an area with a higher concentration of environmental justice populations. Most of those intersections would continue to fail to meet local standards, and some intersections, including the 82nd Drive and I-205 southbound ramps intersection, would experience worse congestion under the No Build Alternative than existing conditions in both 2027 and 2045.

The intersections that would fail to meet standards for intersection performance during the AM peak hour and PM peak hour under the No Build Alternative, especially the ones located in Oregon City where a concentration of social resources is present, would result in continued adverse effects on environmental justice populations traveling to nearby social resources.

Roadway Safety

The number of crashes on the portion of I-205 and local roadways studied in the API is generally expected to be slightly higher under the No Build Alternative in 2045 compared to existing conditions because of the anticipated higher traffic volumes, as discussed further in Section 3.1.2. The No Build Alternative could have adverse effects on health and safety for all populations in the API, including environmental justice populations, related to the use of these roadways.

Build Alternative

Short-Term Effects

Construction impacts such as short-term lane and roadway closures (as discussed in Section 3.1.2), minor increases in dust and noise levels (as discussed in Section 3.2.2 and 3.5.2), and minimal physical impacts on nearby properties (as described in Section 3.9.2) would be limited to the area immediately surrounding the construction work areas. No relocations of businesses or residences in environmental justice communities would be required for construction. No areas with higher concentrations of environmental justice populations were identified adjacent to the construction areas for the Build Alternative. Construction effects on environmental justice populations would be the same as for the general population.

Tolling During Construction of Roadway Improvements

ODOT anticipates starting tolling on the Abernethy Bridge and possibly tolling on the Tualatin River Bridges for 2 to 3 years (between 2024 and 2027) while completing construction of the Build Alternative, as discussed in Section 3.1.2. If both bridges are tolled during construction, traffic volumes would

[53] Mobility standards for intersections vary by jurisdiction, with most measured as volume-to-capacity ratios and others as level of service, which are defined in Section 3.1.2.

generally be higher on two segments of OR 99E that pass through areas with higher concentrations of environmental justice populations in Canby and Gladstone, as well as on SW Borland Road, SW Stafford Road, OR 213, and OR 43 compared to the No Build Alternative.

Tolling would result in higher transportation costs for low-income populations who choose to use routes with tolled bridges during construction of the roadway improvements, and would continue after the completion of the roadway improvements as discussed in the Cost of Tolls section below, which indicates an adverse effect. Other effects on environmental justice populations resulting from the pre-completion tolling scenarios would be 2 to 3 years in duration and comparable to those under the Build Alternative in 2027, as described in Section 3.1.2 and the Rerouting sub-section of Long-Term Effects.

Long-Term Effects

Access to Social Resources

Areas with higher concentrations of environmental justice populations would generally experience the same or improved access to jobs, community places, and medical facilities under the Build Alternative as compared to the No Build Alternative in 2045 because implementation of the Build Alternative would result in less congested conditions on I-205 and some neighboring roadways. The model for the accessibility analysis also accounts for regional growth in population and employment through 2045. Environmental justice populations would experience slightly greater accessibility compared with general population households within the API and Portland MSA.

The only instance where environmental justice households would experience less access under the Build Alternative as compared to the No Build Alternative and as compared to general population households in the API is in the number of medium-paying jobs within an off-peak 45-minute transit trip (less than 1% fewer jobs, representing about 100 fewer jobs, relative to the No Build Alternative). However, environmental justice households would experience greater accessibility to medium-paying jobs within a 30-minute drive (3.89% more jobs) and within a 45-minute transit trip (0.60%more jobs) during peak hours, and within a 30-minute drive (0.96% more jobs) during off-peak hours under the Build Alternative as compared to the No Build Alternative. The difference in accessibility to medium-paying jobs within an off-peak 45-minute transit trip between environmental justice households and the general population households is less than 1%, and environmental justice populations experience greater accessibility to medium-paying jobs via other travel methods. Therefore, any adverse effect would be minimized.

Overall, environmental justice households would generally experience similar or slightly improved accessibility to jobs, community places, and medical facilities as compared to general population households in the API.

A more detailed description of the methodology and results of the accessibility analysis is included in Attachment E of Appendix J, *I-205 Toll Project Environmental Justice Technical Report*.

Travel-Time Scenarios

Based on the results of the travel-time analysis described in the No Build Alternative section, environmental justice populations in the API would experience the same or shorter travel times for trips from their homes via private vehicle or transit to 8 representative activity locations under the Build Alternative as compared to the No Build Alternative in 2045. Five scenarios would result in shorter travel times on routes that include the proposed tolled bridges (Abernethy and Tualatin River Bridges) on I-205 because there would be less congestion on I-205 under the Build Alternative in 2045, as discussed in Section 3.1.2. For the other four scenarios, travel times would not change because they represent trips that are assumed not to use tolled routes in the future, including fixed transit routes.

Environmental justice populations and the general population would benefit from similar or shorter travel times on representative trips that use the proposed tolled bridges and on representative trips that use transit.

Cost of Tolls

Tolling would result in higher transportation costs as a portion of household spending. Low-income populations, as represented by households with incomes at the federal poverty level and at 200% of the poverty level, would have a greater increase in the percentage of income spent on transportation when compared to households in the API with median income, as discussed in Section 3.4.2 and shown in Table 3-39.

Table 3-39. Percentage of Income Spent on Transportation

Household Type	Income Level	Percentage of Income Spent on Transportation Without the Toll (No Build Alternative)	Percentage of Income Spent on Transportation Costs with the Toll (Build Alternative)
Median Household Income for the API[1]	$88,400	7.9%	8.6%
Poverty Threshold for a Household of 4	$26,200	17.3%	19.7%
200% Poverty (low-income) for a Household of 4	$52,400	10.6%	11.8%

[1] Median household income values were derived from the tolling impacts analysis in Appendix F, *I-205 Toll Project Economics Technical Report*, as summarized in Section 3.4.2, which measures the economic impacts of the Project.

For the purposes of the analysis, the Project Team assumed the same average number of annual weekday vehicle trips per household (206 trips) and average annual toll fees per household in nominal dollars, as described in Section 3.4.2, but did not take into consideration households changing their routes and/or changing their behaviors to avoid the toll, which would decrease the percentage of their income they would otherwise spend on tolls. The toll costs would vary depending on the route, time of day, and frequency of trips involving a toll. For some people, switching travel modes (e.g., to transit or bicycling) or traveling at off-peak hours would not be a viable option if transit service is limited or bicycle infrastructure is deficient or nonexistent; traveling by a different mode is inefficient due to longer travel times; or they need to commute to work during peak hours when toll rates would be highest.

Public engagement activities with environmental justice populations also identified fairness of toll evasion enforcement as a concern for environmental justice populations. If motorists do not pay the toll on time, or at all, the percentage of income they spend on transportation costs could be further affected with late fees or other enforcement methods. Additionally, some groups expressed concern about the potential for racial or ethnic discrimination in the enforcement of toll payment collection. Environmental justice populations could be disproportionately affected if they face greater barriers due to additional tolling-related fees and/or experience different levels of toll evasion enforcement than the general population.

Effects related to the cost of tolls would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements, as discussed further in the Tolling During Construction of Roadway Improvements subsection of Short-Term Effects.) The improved I-205 traffic performance under the Build Alternative is expected to lead to user and social benefits—such as lower vehicle emissions, shorter travel times, vehicle operating cost savings, and fewer crashes, as described in Section 3.4.2—that reduce costs for community members, including environmental justice populations. There is no FHWA or ODOT guidance on measuring transportation affordability in environmental justice

analyses. However, because the toll under the Build Alternative could result in households at or below the federal poverty level spending a higher percentage of their income on transportation than median-income households, there would be an adverse effect on low-income populations with limited alternatives to using a tolled facility. In accordance with Oregon House Bill 3055, ODOT prepared a *Low-Income Toll Report* that summarizes the engagement, analysis, and research conducted to inform the options for consideration and best practices to address potential impacts of the Oregon Toll Program on low-income populations, as discussed further in Section 3.8.4 (ODOT 2022c).

Rerouting Traffic to Local Streets

With the added capacity in both directions and tolling on I-205, the Build Alternative would result in faster travel times in 2045 in both the AM and PM peak periods compared to the No Build Alternative. These improved travel times could facilitate faster access to social resources for environmental justice populations using I-205 under the Build Alternative. However, under the Build Alternative in 2027 and 2045, some traffic would reroute to local streets in order to avoid tolls, resulting in potential adverse effects for areas with higher concentrations of environmental justice populations in Canby and Tualatin, as well as environmental justice populations traveling to a hub of social resources in Oregon City. Appendix J, *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.

Areas of Oregon City near I-205 and portions of OR 99E near Canby would have the largest numbers of intersections with worse operations under the Build Alternative as compared to the No Build Alternative in 2027 and/or 2045, as described in more detail in Sections 3.1.2 and 3.7.2. Two intersections in areas with higher percentages of environmental justice populations than the county as a whole (I-5 southbound ramps and Nyberg Street 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 and/or 2045.

Six intersections in or near the downtown area of Oregon City would have worse traffic operations under the Build Alternative as compared to the No Build Alternative in 2027 and/or 2045. Although the area containing these intersections is not in an area with higher concentrations of environmental justice populations, Oregon City has a concentration of social resources that serve low-income and/or minority populations, such as the Clackamas County Court House, City Hall, an Oregon Department of Human Services office, a community center, multiple social service providers, 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. In addition, one segment of the OR 99E corridor, 11th Street to Main Street in Oregon City, would experience worse pedestrian LOS under the Build Alternative as compared to the No Build Alternative in 2045 because of higher traffic volumes (Section 3.1.1 provides more information on these metrics).

Intersection impacts related to rerouting would occur throughout the API, as discussed above and in Section 3.1.2, and most adverse effects would occur outside of areas with high concentrations of environmental justice populations. Additionally, mitigation identified in Section 3.8.4 is expected to avoid and minimize adverse effects related to rerouting traffic to local streets. All populations, including environmental justice populations, in the API are expected to experience adverse effects to the same degree from rerouting as well as the benefits associated with the mitigation.

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 2027 and 2045, as discussed in Section 3.1.2. Three intersections in areas with higher percentages of environmental justice populations than Clackamas County as a whole would experience safety impacts: OR 99E and Jennings Avenue in Gladstone, I-5 southbound ramps and Nyberg Street in Tualatin, and OR 99E and Ivy Street in Canby. In addition, 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 in 2027 and 2045, as described in the Transportation Safety subsection of Section 3.1.2. The additional crashes would affect environmental justice populations living and traveling through the area.

The number of crashes on I-205 in the API, including crashes resulting in fatalities and injuries, is expected to be 26% lower (representing about 144 fewer crashes) under the Build Alternative as compared to the No Build Alternative due to the proposed highway improvements. The lower number of I-205 crashes would benefit all populations, including environmental justice populations.

Overall, the Build Alternative would generally lead to a reduction in crashes on I-205, resulting in benefits for all populations, including environmental justice populations, and the higher number of predictive crashes on some roadways would have an impact on both the general population and environmental justice populations to the same degree.

Ability to Use Electronic Toll System

The tolling system would rely on electronic, cashless technology. The electronic toll system could create barriers for the unbanked population[54] and for those who do not have access to conventional financial services, which 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 bridges. These effects would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements, as discussed further in the Tolling During Construction of Roadway Improvements subsection of Short-Term Effects.)

With the mitigation described in Section 3.8.4, adverse effects related to the ability to use the electronic toll system would be minimized or avoided because users would have the option to set up and pay for toll accounts with cash and without reliance on electronic systems.

3.8.3 Summary of Effects

Table 3-40 provides a comparison of anticipated environmental justice impacts and benefits by alternative.

[54] Unbanked households are those where no one in the household has a checking or savings account at a bank or credit union (Federal Deposit Insurance Corporation 2019).

Table 3-40. Environmental Justice Effects

Environmental Topic	Summary of Overall Effects	Location	Potential Adverse Effect on General Population?	Potential Adverse Effect on Environmental Justice Populations?	Environmental Justice Analysis Conclusion
Construction Effects	Short-term lane and roadway closures, temporary increases in noise levels, and temporary increase in dust in or near construction areas.	Construction areas on and near I-205 in the Environmental Justice API	Yes	Yes	Potential adverse effect on environmental justice populations. No areas with higher concentrations of environmental justice populations were identified adjacent to the construction areas, but environmental justice populations could travel through the construction area.
Access to Social Resources	Similar or greater access to most job types, community places, and medical facilities for all populations because of projected regional growth and transportation improvements under the Build Alternative compared to the No Build Alternative in 2045.	Social Resources and Communities/ Environmental Justice API	No	No	No adverse effect on environmental justice populations. Both the general population and environmental justice populations would experience similar effects under the Build Alternative compared to the No Build Alternative. In some instances, environmental justice populations would experience greater benefits than the general population, as described in the Access to Social Resources subsection of Section 3.8.2.
Travel-Time Scenarios	Similar or shorter travel times to representative activity centers (e.g., parks, businesses, medical facilities) for trips on routes using the proposed tolled bridges on I-205 because of less I-205 traffic congestion under the Build Alternative compared to the No Build Alternative in 2045.	Social Resources and Communities/ Environmental Justice API	No	No	No adverse effect on environmental justice populations. Both the general population and environmental justice populations would experience similar effects under the Build Alternative compared to the No Build Alternative, as described in the Travel-Time Scenarios subsection of Section 3.8.2.
Cost of Tolls	Higher transportation costs as a percentage of household spending for all drivers who use the tolled bridges on I-205, which would start when tolling is implemented (2 to 3 years before completing construction of the planned I-205 improvements).	Social Resources and Communities/ Environmental Justice API	Yes	Yes	Potential adverse effect on environmental justice populations. The toll and associated toll fees under the Build Alternative could result in households at or below the federal poverty level spending a higher percentage of their income on transportation than median income households. Toll evasion enforcement could affect those who cannot pay the toll fees on time by imposing additional late fees.

Environmental Topic	Summary of Overall Effects	Location	Potential Adverse Effect on General Population?	Potential Adverse Effect on Environmental Justice Populations?	Environmental Justice Analysis Conclusion
Rerouting Traffic to Local Streets	Potential delays and longer travel times near some local intersections under the Build Alternative compared to the No Build Alternative, which could affect access to social resources by all populations in 2027 and/or 2045.	Study intersections and roadways in the Transportation API	Yes	Yes	Potential adverse effect on environmental justice populations. The general population and environmental justice populations would both be affected by rerouting traffic to local streets though longer delays and longer travel times at local intersections. Two intersections in areas with a greater percentage of environmental justice populations than the county as a whole would experience worse traffic operations under the Build Alternative than under the No Build Alternative in 2027 and/or 2045. Six intersections in Oregon City would experience worse traffic operations under the Build Alternative than under the No Build Alternative in 2027 and/or 2045, as described in Section 3.1.2 and 3.7.2, which would in turn affect how environmental justice populations access social services in the downtown area of Oregon City.
Roadway Safety	Overall similar roadway safety on most local intersections and roadways and fewer crashes on I-205 under the Build Alternative compared to the No Build Alternative in 2027 and/or 2045. Safety impacts that would require considering mitigation identified at four intersections and portions of OR 99E and SW Stafford Road in 2027.	Study intersections and roadways in the Transportation API	Yes	Yes	Potential adverse effect on environmental justice populations. The lower number of I-205 crashes would benefit all populations, including environmental justice populations. Safety impacts were identified at intersections in Canby, Gladstone, and Tualatin in areas that have higher concentrations of environmental justice populations. Higher numbers of predictive crashes on segments of OR 99E in Canby and Oregon City under the Build Alternative compared to the No Build Alternative, as described in Section 3.1.2, would affect environmental justice populations living in and traveling through the area.

Environmental Topic	Summary of Overall Effects	Location	Potential Adverse Effect on General Population?	Potential Adverse Effect on Environmental Justice Populations?	Environmental Justice Analysis Conclusion
Active Transportation	No difference in bicycle level of stress between No Build and Build Alternatives. Higher pedestrian level of stress at one intersection and higher pedestrian LOS at two areas under the Build Alternative compared to the No Build Alternative.	Study intersections and roadways in the Transportation API	Yes	Yes	Potential adverse effect on environmental justice populations. The general population and environmental justice populations would both be affected by worsening of pedestrian conditions at a few locations under the Build Alternative compared to the No Build Alternative, as described further in Section 3.1.2. OR 99E between 11th Street and Main Street, which is in Oregon City near social resources that serve environmental justice populations, would experience worse pedestrian LOS in 2045.
Noise	Minimal noise differences would occur under the Build Alternative compared with the No Build Alternative. Three noise walls recommended for construction under the Build Alternative would result in lower highway noise levels for nearby residences in unincorporated Clackamas County and West Linn.	Noise API	No	No	No adverse effect on environmental justice populations. Both the general population and environmental justice populations would experience similar effects under the Build Alternative compared to the No Build Alternative.
Air Quality	Lower overall emissions of air pollutants in 2027 and 2045 under the Build Alternative compared to the No Build Alternative.	Air Quality API	No	No	No adverse effect on environmental justice populations. Both the general population and environmental justice populations would experience similar benefits under the Build Alternative compared to the No Build Alternative.
Ability to Use Electronic Toll System	Potential technological and financial barriers associated with an electronic, cashless toll system under the Build Alternative.	Social Resources and Communities/ Environmental Justice API	Yes	Yes	Potential adverse effect on environmental justice populations. The electronic toll system could create barriers for the unbanked population and for those who do not have access to conventional financial services, which could include members of environmental justice communities.

API = Area of Potential Impact; I-205 = Interstate 205; LOS = level of service; OR = Oregon Route

3.8.4 Avoidance, Minimization, and/or Mitigation Measures

ODOT would implement the actions summarized in Table 3-41 to avoid, minimize and/or mitigate effects on environmental justice populations.

Table 3-41. Summary of Mitigation Measures to Address Adverse Effects on Environmental Justice Populations

Effect	Mitigation Measure
The Project could increase transportation costs as a percentage of overall household spending for all drivers, which would be higher for low-income drivers, particularly those at or below the federal poverty level.	• As part of the Oregon Toll Program development, ODOT has committed to providing a low-income toll program when tolling begins. ODOT presented an approach for developing a low-income toll program in the Low-Income Toll Report submitted to the Oregon Transportation Commission and Oregon State Legislature in September 2022 (ODOT 2022c). The report presents options for consideration by the OTC, which include: (1) providing a substantial toll discount (i.e., credits, free trips, percentage discount, or tax credit) or a full exemption for households with incomes equal to or below 200% of the federal poverty level, (2) providing a smaller, more focused toll discount for households with incomes above 200% and up to 400% of the Federal Poverty Level, and (3) using a verification process that leverages existing low-income service programs or exploring self-certification to qualify for enrollment. Next steps for the low-income toll program include the following: – Continuing partner and public engagement and meetings of the Equity and Mobility Advisory Committee to inform low-income toll program development (through at least 2023). – Development of the back-office system and operations management to support a low-income toll program (through 2023). – Establishment of a Statewide Toll Rule Advisory Committee to develop recommendations for the toll rate-setting process and for the rules that apply to the low-income toll program (through the end of 2023). – Further analysis of income thresholds and discount options through final traffic and revenue studies (through 2024 for the I-205 Toll Project). – Adoption of toll rates and rules for the I-205 Toll Project by the Oregon Transportation Commission (in mid-2024). – Ongoing monitoring after tolling begins to ensure it is meeting equity and project goals (starting in 2024).
Toll evasion enforcement could affect those who cannot pay the toll fees on time by imposing additional late fees.	• ODOT would establish a toll enforcement policy that addresses equity in enforcement of toll evasion and/or late payments.
Two intersections in areas with a greater percentage of environmental justice populations than the county as a whole would experience worse traffic operations under the Build Alternative than under the No Build Alternative in 2027 and/or 2045: the I-5 southbound ramps and Nyberg Street intersection in Tualatin and the OR 99E and Ivy Street intersection in Canby.	• Transportation impacts would be mitigated as specified in Section 3.1.4.

Effect	Mitigation Measure
Six intersections in Oregon City would experience worse traffic operations under the Build Alternative than under the No Build Alternative in 2027 and/or 2045, which would in turn affect how environmental justice populations access social services in the downtown area of Oregon City.	• Impacts would be mitigated as specified in Section 3.1.4.
OR 99E between 11th Street and Main Street, which is in Oregon City near social resources that serve environmental justice populations, would experience worse pedestrian LOS in 2045.	• Impacts would be mitigated as specified in Section 3.1.4.
Three intersections in areas with higher environmental justice concentrations in Canby, Gladstone, and Tualatin would experience safety impacts in 2027 and/or 2045. OR 99E, which has segments that cross through areas in Canby and Gladstone with higher concentrations of environmental justice populations, would have more crashes under the Build Alternative in 2027 and 2045.	• Impacts would be mitigated as specified in Section 3.1.4.
Potential barriers for unbanked populations in accessing a cashless toll system and technological barriers related to the electronic toll system.	• A cash-based option for paying tolls would be established. • Permanent customer service centers would be established across the region and within environmental justice communities. These centers would be available for assistance over the phone and in-person so drivers can use cash to purchase transponders, pay invoices, and establish prepaid accounts. • Customer service centers would also provide assistance navigating the toll system and answers to questions related to how the toll system works.

ODOT = Oregon Department of Transportation; MMLOS = multimodal level of service

3.8.5 Preliminary Environmental Justice Determination

This section provides a preliminary determination of the effects of the Build Alternative on low-income and/or minority populations as described in EO 12898, consistent with the FHWA guidance memorandum on Environmental Justice and NEPA, and other U.S. Department of Transportation and FHWA orders.

Since the start of the Project, ODOT has regularly reached out to and gathered input from environmental justice populations. Chapter 4 identifies the Equity-Focused Engagement that occurred for the I-205 Toll Project and Appendix J, *I-205 Toll Project Environmental Justice Technical Report* Attachment F, includes a list of the specific outreach activities to environmental justice populations and summarizes issues and topics discussed.

There would be no physical impacts (e.g., displacements or relocations) for environmental justice populations. Any temporary increases in noise and dust in and near the construction areas would be minor and would be minimized by construction BMPs. Construction areas would not be located adjacent to areas with higher concentrations of environmental justice populations than their respective counties as a whole. For these reasons, environmental justice populations would not experience any disproportionately high and adverse construction effects.

The Build Alternative would have long-term, direct beneficial effects by reducing future congestion and delays on I-205 as compared to the No Build Alternative on a critical regional transportation corridor for the movement of people and goods. Environmental justice populations would experience slightly improved access to jobs, community places, and medical facilities as compared to the No Build Alternative and the general population. Environmental justice populations would also experience shorter travel times along routes that include the tolled bridges on I-205 as compared to the No Build Alternative.

Environmental justice populations could experience delays and higher congestion levels on some local streets that have worse operations under the Build Alternative: these effects would be addressed through proposed transportation mitigation measures listed in Table 3-41. Although the Build Alternative would result in adverse effects on households at or below the federal poverty level because of higher transportation costs with the toll, these effects would be mitigated through implementation of a statewide low-income toll program, as described in Table 3-41.

Specifically, a sizeable toll discount (e.g., credits, free trips, percentage discount or full exemption) would help alleviate the burden of choosing between paying a toll and meeting basic needs for households with incomes equal to or below the 200% federal poverty level. This option is strongly supported by the Equity and Mobility Advisory Committee and by community members who participated in the focused public engagement process (ODOT 2022c). An initial evaluation found that a monthly credit and a specific number of free trips scored the highest (compared to percentage discount and full exemption) when considering benefits for users, costs, operational impacts, and feasibility. Credits and free trips scored higher than a percent discount because these options provide a possibility that program participant accounts would not require a balance or a debit or credit card on file. These requirements can serve as major barriers to program enrollment. In addition, credits and free trips allow users to make occasional emergency or high-priority trips for free on the tolled roadway. Additional analysis and engagement are needed to assess income thresholds and identify the discount type.

After considering the totality of the Build Alternative's impacts, benefits, and associated mitigation, there has been a preliminary determination that the Build Alternative would not result in disproportionately high and adverse effects on any low-income population or minority population in accordance with the provisions of EO 12898 and the FHWA guidance memorandum on Environmental Justice and NEPA.

3.9 Land Use

3.9.1 Affected Environment

The land use API, which extends 100 feet beyond the I-205 right-of-way, includes area within the limits of the City of West Linn, the City of Oregon City, and Clackamas County. Most of the land within the API has been developed with I-205 infrastructure that includes travel lanes, shoulders, on- and off-ramps, and vegetated medians. The API within Oregon City contains land zoned mixed-use, industrial, and road. In West Linn, the right-of-way does not have a zoning designation. Outside of the right-of-way within the API in the City of West Linn there is a mix of residential, commercial, mixed-use, and industrial zones. In Clackamas County, the API has a rural zoning designation. Appendix K, *I-205 Toll Project Land Use Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

The following planning documents apply to land within the land use API:

- Applicable provisions of Oregon's Statewide Planning Program
- Oregon Highway Plan and Amendments (ODOT 1999)
- Oregon Transportation Plan (ODOT 2006)

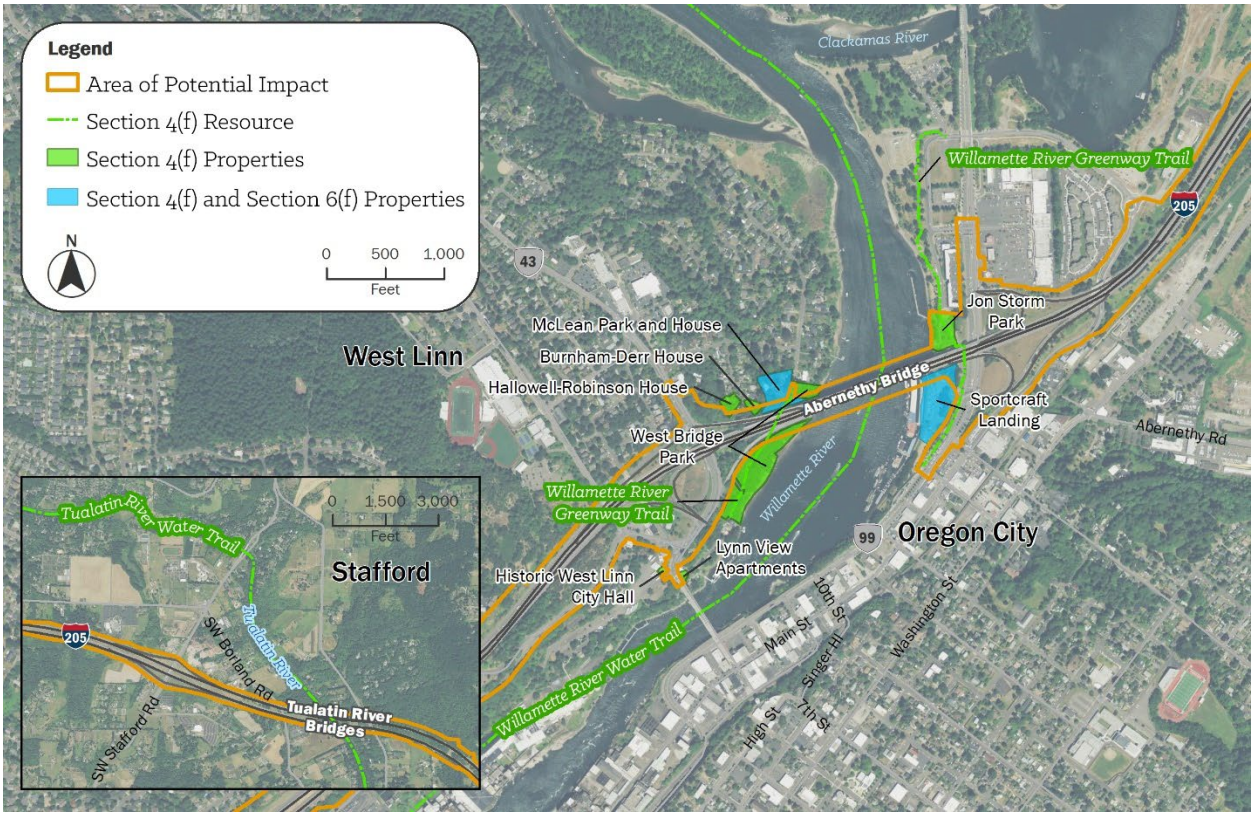
- Oregon City Comprehensive Plan (City of Oregon City 2022)
- Oregon City Transportation System Plan (City of Oregon City 2013)
- West Linn Comprehensive Plan (City of West Linn 2016a)
- West Linn Transportation System Plan (City of West Linn 2016b)
- Clackamas County Transportation System Plan (Clackamas County 2022b)
- Metro 2018 Regional Transportation Plan (Metro 2018a)
- Metro 2018 Urban Growth Management Functional Plan (Metro 2018d)
- ODOT 2021-2024 Active State Transportation Improvement Plan (ODOT 2020a)
- Stafford Hamlet Community Vision Plan (Stafford Hamlet 2020)

The API contains three parks, two school lands, one recreational area, two water trails, and three land-based trails (Metro 2022). The three parks (West Bridge Park, McLean Park and House, and Jon Storm Park), recreational area (Sportcraft Landing), two of the land-based trails (sections of the Willamette River Greenway trail system in Oregon City and West Linn), and two water trails (Willamette River Water Trail and Tualatin River Water Trail) have been designated as Section 4(f) properties,[55] and two are also considered Section 6(f) properties[56] (McLean Park and House and Sportcraft Landing). McLean Park and House is also a historic site that is individually eligible for listing on the National Register of Historic Places. In addition, there are four historic properties in the API that are Section 4(f) resources as they are eligible for listing on the National Register of Historic Places: the Historic West Linn City Hall and the Lynn View Apartments, which are eligible individually; and the Burnham-Derr House and Hallowell-Robinson House, which are eligible as part of a historic district. Section 4(f) and Section 6(f) resources and properties in the API are shown in Figure 3-17.

[55] Section 4(f) of the U.S. Department of Transportation Act of 1966 requires the consideration of the use of publicly owned park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development (FHWA n.d.-b). The U.S. Department of Interior designated the Willamette River as a National Water Trail in 2007 and the Tualatin River as a National Water Trail in 2020 (U.S. Department of the Interior 2007; City of Tualatin 2020). National Water Trails have been established to protect and restore rivers, waterways and shorelines, as well as increase access to outdoor recreation on rivers, waterways, and shorelines (National Park Service 2020). Public rivers which are designated as recreational trails are subject to the requirements of Section 4(f) (FHWA n.d.-c). Section 4(f) applies to publicly-owned, shared use paths or trails (or portions thereof) designated or functioning primarily for recreation, unless the official with jurisdiction determines that it is not significant for such purpose (FHWA n.d.-d). The primary purpose of the Willamette River greenway trails is recreation; therefore, the greenway trails in the API are considered Section 4(f) resources.

[56] Section 6(f) of the Land and Water Conservation Fund Act of 1964 requires that the conversion of lands or facilities acquired with Land and Water Conservations Funds be approved by the National Park Service (FHWA n.d.-c).

Figure 3-17. Section 4(f) and Section 6(f) Resources and Properties in the Area of Potential Impact



The API includes various environmentally sensitive areas, including wetlands, streams, rivers, and riparian areas. Under Title 13 of Metro's Urban Growth Management Functional Plan, local jurisdictions are required to designate Habitat Conservation Areas, which generally include rivers, streams, wetlands, and adjacent resource areas, as well as upland wildlife habitat patches and habitats of concern (Metro 2018d). In addition, as part of its compliance with Goal 5 of the Oregon Statewide Land Use Planning Goals,[57] West Linn has collectively designated streams, wetlands, and Significant Riparian Corridors as Water Resource Areas (City of West Linn 2014). Local jurisdictions regulate development within Habitat Conservation Areas as well as development within wetlands, streams, and rivers along with state and federal agencies. See the Appendix P, *I-205 Toll Project Wetlands and Water Resources Technical Memorandum,* and Appendix O, *I-205 Toll Project Vegetation and Wildlife Technical Memorandum,* for information on the location of these environmentally sensitive areas within the API.

[57] Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) of the Oregon Statewide Land Use Planning Goals requires local governments to develop inventories of natural resources, scenic and historic areas, and open spaces and implement plans and policies to protect these resources, areas, and spaces (DLCD 1997).

3.9.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, no activities would occur that would affect land use. The No Build Alternative would generally not be consistent with applicable state, regional, and local transportation and land use laws, plans, and policies, as described in more detail in Appendix K, *I-205 Toll Project Land Use Technical Memorandum*.

Build Alternative

Short-Term Effects

Temporary construction easements totaling 4,515 square feet would be needed for the replacement of the West A Street Bridge and removal of the Broadway Street Bridge. The easements would be on four privately owned parcels located in West Linn that are zoned general commercial and residential, as shown in Figure 3-18. Temporary construction easements would not constitute a conversion of land to transportation use because the land would be used temporarily for construction purposes and not permanently converted to right-of-way. Construction activities for the toll gantries and supporting infrastructure would occur entirely within I-205 right-of-way and would not result in a conversion of land to transportation use.

During construction, an approximately 0.1-mile portion of the Tualatin River Water Trail, a Section 4(f) resource, would be temporarily affected during the removal and replacement of the two existing northbound and southbound I-205 bridges over the Tualatin River. Construction activities for the replacement bridges would require installation of temporary work bridges, including pilings occupying a total of about 3,000 square feet in the Tualatin River. During construction, a minimum width of 30 feet of the river would remain open to recreational users except for intermittent short-term full closures of the river in the construction area. The overall duration of work in the Tualatin River would be approximately 2.5 years. During that time, there would be a total of approximately 20 weeks of full river closures, with each closure lasting 1 to 2 weeks. Compared to the full Project construction time of approximately 4 years, the cumulative river closure time of approximately 20 weeks is of short duration. Additionally, the closures would be limited to the area directly beneath and adjacent to the existing Tualatin River Bridges and would be small compared to the remaining undisturbed length of the Tualatin River Water Trail (about 38.5 miles). Upon completion of construction, any temporary changes to the physical condition of the trail resulting from construction activities would be restored.

The construction activities in the Tualatin River Water Trail would meet the criteria for a Section 4(f) *de minimis* impacts under Section 23 Code of Federal Regulations (CFR) 774.17. Use of a Section 4(f) property occurs when: (1) land is permanently incorporated into a transportation project; (2) there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or (3) there is a constructive use (a project's proximity impacts are so severe that the protected activities, features, or attributes of a property are substantially impaired) (FHWA n.d.-b). *De minimis* impacts for public parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not “adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f).” A *de minimis* impact determination is based on the degree or level of impact on a Section 4(f) property, including any avoidance, minimization, mitigation, or enhancement efforts that are included in a project to address the Section 4(f) use. The determination of a *de minimis* impact on the Tualatin River Water Trail requires concurrence from the Tualatin Riverkeepers, the official with jurisdiction. ODOT will work with the Tualatin Riverkeepers to obtain this concurrence.

With the exception of the Tualatin River Water Trail, access to all parks, school lands, recreational areas, land-based trails, and water trails within and near the API would be maintained during construction of the Build Alternative. No other Section 4(f) resources would be affected by construction. In addition, the Build Alternative would also not result in any conversion of a Section 6(f) property. No construction staging would occur on a Section 4(f) or Section 6(f) property.

The Build Alternative would have impacts on Goal 5 resources in the API, such as wetlands, streams, rivers, and riparian areas. Impacts would be regulated through local land use processes (as well as state and federal processes for impacts on wetlands, streams, and rivers) and would be mitigated as required by the jurisdiction. Therefore, no goal exception would be required as the Project would meet jurisdictional permitting requirements which allow impacts on Goal 5 resources with mitigation. See Section 3.13 and Section 3.14 for more information on these impacts and mitigation. The City of West Linn has permitted impacts on Water Resource Areas and Habitat Conservation Areas from the I-205 widening associated with Phase 1A between the area just east of OR 43 to the 10th Street intersection. Additional impacts on Water Resource Areas and Habitat Conservation Areas west of the 10th Street intersection from the widening as well as the toll gantries and supporting infrastructure would be avoided to the extent practicable and, if determined to be unavoidable as the Project design progresses, would be permitted through separate land use processes.

Long-Term Effects

As shown in Figure 3-18, the Build Alternative would require the permanent conversion of 415 square feet of land on portions of two privately owned parcels to transportation use for the replacement of the West A Street Bridge and to facilitate the I-205 widening. Both parcels are currently zoned general commercial. The land that would be converted to right-of-way is currently vacant. One 107-square-foot permanent easement would also be required from a portion of a privately owned residential parcel. The toll gantries and supporting infrastructure would be located entirely within I-205 right-of-way; therefore, no long-term effects on land use would occur from this infrastructure.

Figure 3-18. Land Use Impacts

Because the conversion of land would be relatively small and there is a sufficient amount of land in the area to absorb the reduction, no long-term effects on land use would occur under the Build Alternative. All right-of-way acquisitions would be done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Chapter 35 of the Oregon Administrative Rules – Eminent Domain; Public Acquisition of Property.

The physical components of the Build Alternative generally are consistent with applicable state, regional, and local transportation and land use laws, plans, and policies, as described in more detail in Appendix K, *I-205 Toll Project Land Use Technical Memorandum*.

Under the Build Alternative, there would be no permanent incorporation or constructive use of a Section 4(f) property, or a conversion of a Section 6(f) property to a transportation use; therefore, no long-term impacts on Section 4(f) and Section 6(f) properties would occur. FHWA guidance notes that a constructive use does not occur “when noise resulting from the project does not approach or exceed the FHWA noise abatement criteria or when it is considered a barely perceptible increase over existing levels” (FHWA n.d.-b). As documented in the *I-205 Toll Project Noise Technical Report*, noise levels in 2045 would exceed ODOT noise criteria at Jon Storm Park, a Section 4(f) resource; however, existing noise levels also exceed impact criteria, and the Project would not result in a perceptible noise increase

compared to existing conditions. A noise wall was evaluated to mitigate noise levels at and near Jon Storm Park and the Section 4(f) resources on the west side of the Willamette River but did not meet ODOT's criteria for a feasible and reasonable noise wall. Similarly, modeled noise levels would approach or exceed noise criteria at some areas within 250 feet of I-205 near Stafford Road and the Tualatin River. Noise walls at these locations were also found to be infeasible due to their proximity to I-205 and lack of other nearby noise-sensitive land uses. Modeled noise levels in 2045 at the three Section 4(f) historic sites on the west side of the Willamette River were below impact criteria.

At the Tualatin River Water Trail crossing under I-205, removal of the existing columns for the I-205 Tualatin River Bridges would open up more space closer to the banks of the river, and the new bridge piers would be located closer to the middle of the river. However, because the piers would occupy the same overall amount of space as the existing bridges, there would be no permanent changes in the amount of space in the river available for recreational uses, and the physical condition of the trail would be similar to how it was prior to construction. Trail users would benefit from having access to a single channel that is approximately 50 feet wider, depending on water levels, than existing conditions. Therefore, there would be long-term physical improvements and no adverse long-term physical impacts on the water trail.

3.9.3 Summary of Effects

Table 3-42 provides a comparison of anticipated land use effects by alternative.

Table 3-42. Summary of Land Use Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	• 4,515 square feet of temporary construction easements • *De minimis* impacts on the Tualatin River Water Trail
Long-Term	• None	• Conversion of 415 square feet of private property to right-of-way • 107-square-foot permanent easement on private property

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

No short-term or long-term impacts on land use would occur under the Build Alternative; therefore, no avoidance, minimization, and/or mitigation measures are proposed.

3.10 Geology and Soils

3.10.1 Affected Environment

The geology and soils API, which extends 100 feet beyond the I-205 right-of-way, lies within the Portland and Tualatin basins, which were formed more than 6 million years ago during the Missoula Floods (Beeson et al. 1991). The Columbia, Willamette, and Clackamas Rivers converge within the Portland Basin and, with their tributaries, have contributed to extensive alluvial and sedimentary rock that overlies basalt. Within the API, I-205 is partially located in a channel scabland eroded by the Missoula Floods (Burt et al. 2009). The exposed geologic units along the I-205 rock cuts are composed of Columbia River Basalt Group lava flows. Mapped geologic units within the API consist of fill, fine-grained Missoula Floods deposits, and sentinel bluffs Grande Ronde basalt.

Oregon is located within the Cascadia Subduction Zone, a fault line that is a source of substantial earthquakes greater than magnitude 8 about every 500 years (Atwater and Hemphill-Haley 1997); however, the last earthquake of this magnitude occurred in 1700 (Satake et al. 1996; Atwater and Hemphill-Haley 1997). Cascadia Subduction Zone seismic hazards include ground shaking, liquefaction

and its associated effects, ground surface fault rupture, and tsunami that could result in damage to or failure of the existing bridges along I-205.

Appendix L, *I-205 Toll Project Geology and Soils Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

3.10.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, without the seismic upgrades and replacements of the I-205 bridges, a Cascadia Subduction Zone earthquake would likely result in damage to the bridges and surrounding infrastructure, making this section of I-205 impassable and hindering regional emergency response immediately following the earthquake. Inadequate transportation access would prolong overall recovery from the earthquake.

Build Alternative

Short-Term Effects

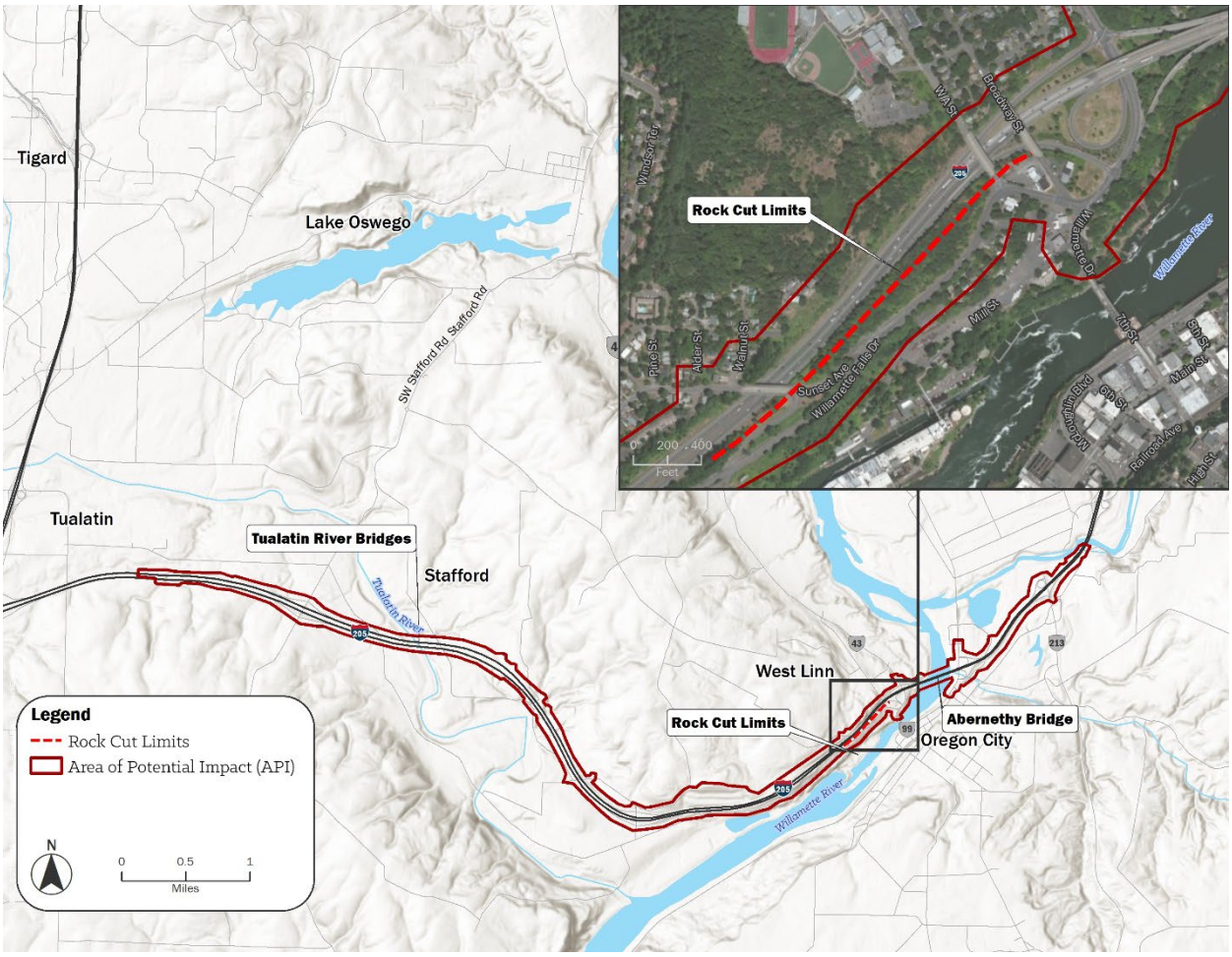
During construction, excavation of soils would be required at various bridge foundations, along the roadway, and at the tolling gantry areas. Excavated soils that are stored on site and other areas of soil disturbance could experience erosion from wind or stormwater. Soils would be compacted by machinery and storage of materials. An erosion and sediment control plan that would identify BMPs, such as installing erosion controls, temporary seeding, and delineating disturbance limits, would be implemented during construction to minimize or prevent erosion of soils.

In-water work would be required in the Tualatin River. Drilled shafts anticipated at the Tualatin River Bridges would be constructed using fully cased excavations due to the potentially expansive clay soil types at the river. Other areas of excavation performed within the Tualatin River would likely be contained within a cofferdam during construction. Both activities could mobilize sediment during construction. The placement of new piers within the Tualatin River could also modify localized scour and result in temporary sediment migration and turbidity. BMPs such as turbidity monitoring and the use of turbidity curtains or cofferdams would be implemented to minimize these effects.

A rock cut would be required along a portion of the existing rock cut adjacent to I-205 northbound, from the Broadway Bridge (I-205 MP 8.69) to southwest of the Sunset Avenue Bridge (I-205 MP 8.38). Blasting would be required to move the rock cut face 35 to 40 feet south of the existing rock face for a total length of approximately 2,565 feet (Figure 3-19). Blasting of rock creates ground vibrations that could potentially damage nearby structures such as houses and render a nearby cell tower temporarily inoperable if not properly planned. A blasting plan for the rock cut would be implemented to limit the timing, sequence, and force of each blast and minimize the possibility of damage or harm to nearby structures. Ground vibrations would be monitored to ensure maximum vibrations are not exceeded. The construction contractor would use rock fall barriers to control rock migration.

All excavation, pile driving, shaft installation, and other foundational work associated with construction of the improvements would adhere to the *Oregon Standard Specifications for Construction* (ODOT 2021c).

Figure 3-19. Rock Cut Limits



Long-Term Effects

Under the Build Alternative, bridges along I-205 in the API would be reconstructed or replaced and designed to withstand a Cascadia Subduction Zone earthquake. The expanded rock cut along I-205 northbound (on the south side of the highway) would modify the slope angles of the rock face, increasing its stability. It would also provide a catchment area sufficient for retention of 90% of all rockfall and 99% retention of free-falling rocks, thereby improving safety along the northbound corridor (Shannon & Wilson 2020).

3.10.3 Summary of Effects

Table 3-43 provides a comparison of anticipated effects on geology and soils by alternative.

Table 3-43. Summary of Geology and Soils Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	▪ Potential soil compaction and erosion during construction ▪ Disturbance of soils during excavation • Potential sediment migration and turbidity during in-water work
Long-Term	• Potential bridge failures along I-205 after a Cascadia Subduction Zone earthquake	• Improved bridges and foundations along I-205 that would reduce the potential of bridge failure after a Cascadia Subduction Zone earthquake • Improved stability of rock cut; improved safety from rock falls

3.10.4 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to develop and implement an erosion and sediment control plan with BMPs to reduce the potential for soil erosion. No additional mitigation for construction is required. There would be no long-term impacts on geology and soils under the Build Alternative, and the Build Alternative would result in long-term benefits for seismic resilience and rock stability; therefore, no avoidance, minimization, and/or mitigation measures are proposed.

3.11 Hazardous Materials

3.11.1 Affected Environment

Hazardous materials investigations identified 46 sites of concern[58] near or within the hazardous material API, which extends 100 feet beyond the I-205 right-of-way (HDR 2018c; 2020a, 2020b; Reynolds Engineering 2020). Of the 46 identified sites, only two are located in the API: they are near the Willamette Falls Drive and OR 43 intersection.

The Project is an active automobile and truck travel corridor where unknown spills and releases may have occurred. Soil sampling was completed in 2020 at the sites of concern that were identified in the Hazardous Materials Corridor Study as having a moderate risk of contamination (HDR 2020a). Most samples were within the DEQ clean fill criteria,[59] except for several detections of total metals, including copper, antimony, and lead, that exceeded clean fill criteria. Although above clean fill criteria, the sampled soils were below the DEQ Excavation Work Risk Based Concentrations and could be reused in the right-of-way away from stormwater inlets and erosional areas. Soil sampling was also completed within the upper 18 inches of unpaved shoulder areas along I-205. The investigation identified soils that would be considered clean fill, have levels of total metals above clean fill criteria, and exceed DEQ Risk Based Concentrations for total arsenic, in which potential contamination is possible.

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[58] A site of concern is defined as a site with known or suspected hazardous materials contamination that could potentially migrate to areas where construction activity or property acquisition could occur. Sites of concern have sufficient possibility of contamination to warrant additional investigations.

[59] "*Clean fill* means material consisting of soil, rock, concrete, brick, building block, tile or asphalt paving, which do not contain contaminants which could adversely impact the waters of the State or public health" (OAR 340-093-0030, Solid Waste General Provisions).

A structure survey completed in 2020 (Reynolds Engineering 2020) identified asbestos-containing materials at the Sunset Avenue, West A Street, and Broadway Street bridges. Paint containing lead was identified at all of the bridges; however, the concentrations detected are below the regulatory threshold for hazardous waste.

Appendix M, *I-205 Toll Project Hazardous Materials Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

3.11.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, no ground disturbance of existing soils nor demolition of any structures would occur to expose unknown contaminated soils or hazardous materials. Under the No Build Alternative, no cleanup of contamination of known hazardous materials would occur, and these materials would remain in the API. Additionally, because of projected higher traffic congestion levels and degraded traffic operations under the No Build Alternative, the likelihood of spills related to vehicular crashes would increase.

Build Alternative

Short-Term Effects

Under the Build Alternative, construction activities such as excavation and structure demolition could expose contaminated soils and materials. Accidental spills of hazardous materials from construction machinery would also be a risk during construction. In-water work at the Tualatin River Bridges could result in contamination of waters during construction from structure demolition and potential spills.

During construction, BMPs such as proper materials and waste management, daily inspection of heavy equipment, and preparation of hazardous waste determinations would be implemented to reduce the risk of accidental spills, prevent pollution, and protect existing wetlands and waterbodies. Hazardous materials such as asbestos-containing materials would be disposed of at an approved disposal site, while soils that contain contaminants at concentrations greater than DEQ clean fill levels, but less than DEQ's occupational risk-based concentrations, would be disposed of in the ODOT right-of-way. The contractor would prepare Project-specific plans such as a Contaminated Media Management Plan, Asbestos Abatement Plan, and Pollution Control Plan prior to construction. Hazardous materials would be handled and disposed of according to state and federal regulations, as well as the ODOT *HazMat Program Manual* (ODOT 2020b). No construction activities would occur on or near the two sites of concern in the API.

Long-Term Effects

Some surface soils down to 18 inches below ground surface contain contaminants that are above DEQ's Clean Fill Standards but below the DEQ Excavation Worker Risk Based Concentrations (HDR 2020b). These soils would be disposed of within ODOT-owned right-of-way or a regulated disposal site. Asbestos-containing materials and lead paint would be removed and properly disposed of at an approved off-site hazardous waste disposal site. This would remove hazardous materials from the API, creating a long-term net benefit in the API. In addition, under the Build Alternative, traffic operations would improve, which would likely reduce vehicular collisions and, therefore, reduce the potential for spills of hazardous materials.

3.11.3 Summary of Effects

Table 3-44 provides a comparison of anticipated hazardous materials effects by alternative.

Table 3-44. Summary of Hazardous Materials Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	• Encountering hazardous materials and risk of accidental spills during construction
Long-Term	• Potential increase in vehicular spills from worsening traffic operations on I-205	• Removal and disposal of hazardous materials • Reduction of accidental vehicular spills due to improved traffic operations along I-205

3.11.4 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to implement BMPs to minimize the potential for hazardous materials release. No additional mitigation for construction is required. There would be no long-term impacts related to hazardous materials under the Build Alternative, and the Build Alternative would result in long-term benefits related to removal and reduction of hazardous materials; therefore, no avoidance, minimization, and/or mitigation measures are proposed.

3.12 Historic and Archeological Resources

3.12.1 Affected Environment

Historic resources are buildings, structures, sites, or places older than 45 years of age and significant in history, architecture, and/or culture. Archaeological resources include the physical remains of human activity that are 50 years of age or older and that provide important information about the past. In accordance with Section 106 of the National Historic Preservation Act of 1966, FHWA and ODOT must consider the effects of the Project on these resources.

The area of potential effects for historic and archaeological resources includes the areas along I-205 that would be affected by construction activities and new structures associated with the Build Alternative. ODOT conducted a survey in 2017 that identified 34 historic resources in the Project's area of potential effects, five of which are considered eligible for the National Register of Historic Places (HDR 2018d). The five eligible resources are in West Linn.

Previous surveys documented multiple archaeological sites that lie partly within the area of potential effects; however, these sites are no longer intact or were determined to not be significant, and no other known archaeological sites are located in the area of potential effects (Connolly 2018).

Appendix N, *I-205 Toll Project Historic and Archaeological Resources Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

3.12.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, no historic resources would be affected. No ground-disturbing activities would take place, avoiding any potential impacts on unidentified archaeological resources.

Build Alternative

Short-Term Effects

The Abernethy Bridge toll gantry area would be in the same vicinity of the five eligible historic resources; however, these resources would not be affected by the construction of the Build Alternative. Construction activities for the Abernethy Bridge toll gantries and supporting infrastructure would occur entirely within

ODOT right-of-way and would not result in any physical damages or alterations to any of the eligible historic resources, or result in any temporary effects (e.g., traffic detours, noise, visual elements, emissions, or dust) that would diminish the historic significance of the eligible historic resources.

Because no intact or significant archaeological resources were identified, no effects are anticipated as a result of the Build Alternative. An inadvertent discovery plan would be developed prior to construction that would describe steps to take if cultural resources are identified during construction of the Build Alternative. If archaeological resources are encountered during construction of the Build Alternative, all work in the vicinity of the finds would cease immediately and the Oregon SHPO, ODOT, affected tribes, and other appropriate parties and agencies would be promptly notified, and Oregon Revised Statute 358.920 and 36 Code of Federal Regulations 800.13 would be consulted to ensure compliance with applicable state and federal laws.

Long-Term Effects

No long-term effects on historic and archaeological resources are anticipated from the Build Alternative. The Project used Stipulation 4C of the 2011 Section 106 Programmatic Agreement (FHWA 2011), which allows ODOT to act on behalf of FHWA during Oregon SHPO consultation and provide documentation and evaluation of historic resources. Upon evaluation of the Project effects on the five eligible historic resources in the APE, ODOT issued a Finding of No Adverse Effect (36 C.F.R. 800.5[b]) on historic resources for the Project and sent a letter to Oregon SHPO on December 22, 2022, requesting concurrence with this finding. Oregon SHPO concurred with ODOT's finding on December 23, 2022 (see Appendix N, *I-205 Toll Project Historic and Archaeological Resources Technical Memorandum*).

3.12.3 Summary of Effects

Table 3-45 provides a comparison of anticipated effects on historic and archaeological resources by alternative.

Table 3-45. Summary of Historic and Archaeological Resources Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	• Potential discovery of previously unidentified archaeological resources
Long-Term	• None	• None

3.12.4 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to prepare and implement an inadvertent discovery plan that includes prescribed actions to be taken in the event that unanticipated cultural resources are discovered. There would be no long-term impacts related to historic and archaeological resources under the Build Alternative; therefore, no avoidance, minimization, and/or mitigation measures are proposed.

3.13 Vegetation and Wildlife

3.13.1 Affected Environment

Existing vegetation in the vegetation and wildlife API, which extends 100 feet beyond the I-205 right-of-way, includes maintained herbaceous vegetation in the highway median and along the shoulders, as well as patches of deciduous forest and scrub-shrub vegetation (see Appendix O, *I-205 Toll Project Vegetation and Wildlife Technical Memorandum*). Most of the API is paved or unvegetated. Many of the plant species found throughout the API are invasive species (Oregon Department of Agriculture 2020), including Himalayan blackberry (*Rubus armeniacus*), reed canary grass (*Phalaris arundinacea*), and English ivy (*Hedera helix*).

A June 2017 plant survey identified locations of white rock larkspur (*Delphinium leucophaeum*), which is listed as a species of concern by the United States Fish and Wildlife Service (USFWS). No plant species listed as threatened or endangered under the Endangered Species Act were identified (ODOT 2017).

Some areas within the API have been designated as Habitat Conservation Areas under Metro's Urban Growth Functional Plan, Title 13 - Nature in Neighborhoods (Metro 2018d). Generally, Habitat Conservation Areas include rivers, streams, wetlands, and adjacent resource areas, as well as wildlife habitat patches and habitats of concern (City of Portland 2020). In addition, West Linn has designated Significant Riparian Corridors, several of which occur along streams in the API. Local jurisdictions regulate development in Habitat Conservation Areas and Significant Riparian Corridors.

Wildlife in the API includes both terrestrial and aquatic species. Although existing vegetation in the API is limited, it provides potential habitat for small mammals and amphibians, both native and invasive, including raccoons (*Procyon lotor*), western gray squirrels (*Sciurus griseus*), nutria (*Myocastor coypus*), brown rats (*Rattus norvegicus*), river otters (*Lutra canadensis*), opossums (*Didelphis virginiana*), American bullfrogs (*Lithobates catebeianus*), red-eared slider (*Trachemys scripta elegans*), and rough-skinned newts (*Taricha granulosa*). ODOT has determined there is no suitable habitat for Endangered Species Act-listed terrestrial species in the API (ODOT 2017).

Field investigations were conducted in November and December 2017 to evaluate the potential for migratory birds and bats listed under the Endangered Species Act to occur in the API (HDR 2018e). Several species of bats are listed as sensitive species in Oregon. No bats, roosts, or suitable habitat were identified. Bird species protected under the Migratory Bird Treaty Act are expected to be found in the API in habitat areas that are contiguous or adjacent to a larger habitat area. Species observed during the field investigations included song sparrow (*Melospiza melodia*), scrub jay (*Aphelocoma californica*), spotted towhee (*Pipilo maculatus*), and Steller's jay (*Cyanocitta stelleri*).

Multiple anadromous species of fish listed under the Endangered Species Act are found in the API within the Tualatin and Willamette Rivers, as well as essential salmonid habitat[60] and species on Oregon's sensitive species list,[61] as shown in Table 3-46.

[60] Oregon's essential salmonid habitat designation protects the waterbodies where salmonid species lay eggs and where juvenile fish grow before traveling to the ocean (DSL n.d.).

[61] To provide a proactive approach to species conservation, a "sensitive" species classification was created under Oregon's Sensitive Species Rule (OAR 635-100-0040) to prevent species from declining to the point of qualifying as threatened or endangered under the Endangered Species Act (ODFW n.d.).

Table 3-46. Anadromous Fish Species and Habitats of Concern in the Area of Potential Impact

Species	Listing
Upper Willamette River Chinook salmon	Endangered Species Act
Lower Columbia River Coho salmon	Endangered Species Act
Upper Willamette Steelhead	Endangered Species Act
Pacific lamprey	Oregon Sensitive Species List
Coastal cutthroat trout	Oregon Sensitive Species List
Winter steelhead	Oregon Essential Salmonid Habitat
Fall and spring Chinook salmon	Oregon Essential Salmonid Habitat

Sources: Endangered Species Act species: National Oceanic and Atmospheric Administration National Marine Fisheries Service endangered species list (NMFS 2022)
Oregon Sensitive Species list: Oregon Department of Fish and Wildlife Sensitive Species List FAQ's (ODFW 2021)
Essential salmonid habitat: Oregon Department of State Lands essential salmonid habitat map (DSL 2022)

Appendix O, *I-205 Toll Project Vegetation and Wildlife Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

3.13.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, no construction activities or in-water work would occur; therefore, vegetation, terrestrial species, or aquatic species would not be affected.

Build Alternative

Short-Term Effects

Construction of the Build Alternative would require in-water work to replace the bridges over the Tualatin River. Temporary piles would be required to support work bridges, causing hydroacoustic effects that can disturb, injure, or result in direct mortality of fish. Installation of drilled shafts needed for the new bridge supports could result in short-term increased turbidity. During construction, temporary piles in the Tualatin River would occupy approximately 3,000 square feet, temporarily displacing potential aquatic habitat. However, the piles would be removed after bridge construction and the area would be expected to return to pre-construction conditions.

The Build Alternative would use the *Endangered Species Act Programmatic Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Response for the Federal-Aid Highway Program in the State of Oregon* (referred to as 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 2021c) to address effects on Endangered Species Act-listed fish species and short-term water quality effects. In accordance with these documents, BMPs such as fencing off no-work zones, conducting turbidity monitoring, preventing untreated discharge water, and erosion control measures would be implemented during construction to reduce effects from in-water removal and fill activities. In-water work would adhere to the Oregon Department of Fish and Wildlife in-water work window from June 1 to September 30 to reduce effects on species listed under the Endangered Species Act, unless otherwise approved by the National Marine Fisheries Service and the Oregon Department of Fish and Wildlife. During pile driving activities, bubble curtains would be used to reduce hydroacoustic effects. Appropriate measures would be identified and implemented during permitting to minimize turbidity effects during in-water work.

Approximately 60 acres of tree and vegetation removal would occur during construction, potentially reducing nesting habitat for birds in the vegetation and wildlife API. If migratory bird nests are present, tree removal would occur outside of the nesting window (March 1 to September 1) to minimize disruption to migratory birds. After construction, trees would be replaced and vegetated areas that were disturbed would be restored or replanted. New vegetation would be planted in areas of the corridor where permanent pavement or other constructed facilities are not located. Some areas of disturbance would not be planted if the location would be difficult to access and/or maintain by mowing after construction is completed. In accordance with the FAHP Programmatic design standards, a no-work zone would be established prior to construction to prevent disturbance of white rock larkspur.

Invasive plant species could spread during construction when equipment moves onto and off of each site, importing and exporting viable seeds. Invasive species reduce available habitat for native plant species and do not provide quality resources on which birds and wildlife depend. However, plant materials would be cleaned from equipment and gear to prevent the spread of invasive species. The construction contractor would be required to comply with *Oregon Standard Specifications for Construction* (ODOT 2021c) and the FAHP Programmatic and associated design standards to provide protection to wildlife and habitat, including performing work within regulated work areas during in-water work windows, preventing equipment and pollutants from entering habitat, and fencing off no-work zones.

Construction access and traffic control would have a temporary effect on approximately 38,000 square feet (about 0.9 acre) of wetlands, temporarily reducing habitat for birds and amphibians. These areas would be restored after construction is completed. Noise and vibration effects from construction machinery and rock blasting activities could also disturb resident wildlife species that are present during construction, potentially deterring them from the API. These effects would be temporary and only occur during construction. Rock blasting is not anticipated to affect Endangered Species Act- and state-listed species.

Stormwater facilities would be designed in compliance with the FAHP Programmatic and associated design standards, which would create a net benefit to water quality by treating stormwater that is currently untreated (see Section 3.14 Wetlands and Water Resources).

ODOT and FHWA are in the process of obtaining FAHP Programmatic approval from the National Marine Fisheries Service for the Build Alternative.

Long-Term Effects

The new foundations of the Tualatin River Bridges would be constructed in different locations than the existing foundations. New structures would occupy approximately 1,350 square feet within the river that could otherwise be used as habitat. However, this habitat loss would be offset by the removal of the existing foundations that support the bridges, which would create approximately 1,350 square feet of aquatic habitat, resulting in no net change in available habitat.

Approximately 51,000 square feet (1.2 acres) of wetlands would be permanently filled to support roadway widening, reducing available wetland habitat for birds, mammals, and amphibians. Additionally, permanent loss of wetlands could reduce native plant diversity and result in lower water quality support functions such as sediment retention. Wetland impacts and proposed mitigation are discussed in Section 3.14, Wetlands and Water Resources.

Approximately 863,000 square feet (about 20 acres) of vegetated areas or areas of pervious soil would be converted to roadway under the Build Alternative. Conversion of pervious surfaces into impervious surfaces would result in a direct loss of vegetation and available habitat for terrestrial species in the API.

Because much of the vegetation in the API consists of invasive species (e.g., Himalayan blackberry, English ivy, reed canary grass), removal of invasive vegetation and the replanting of areas used temporarily during construction with non-invasive species would improve the quality of the existing habitat.

The Build Alternative would encroach upon areas designated as Habitat Conservation Areas and Significant Riparian Areas. Impacts on these areas would be regulated through local land use processes and would require mitigation based on the location and agency with jurisdiction (see Section 3.9).

3.13.3 Summary of Effects

Table 3-47 provides a comparison of anticipated effects on vegetation and wildlife by alternative.

Table 3-47. Summary of Vegetation and Wildlife Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	• Approximately 3,000 square feet of temporary aquatic habitat impacts from in-water construction piles • Approximately 0.9 acre of temporary wetland habitat impacts • Potential hydroacoustic impacts on fish from in-water work • Noise and vibration disturbance from construction activities
Long-Term	• None	• Approximately 1.2 acres of wetland habitat filled • Approximately 20 acres of vegetated areas or areas of pervious soil converted to impervious surface • Improved habitat conditions due to removal of invasive species

3.13.4 Avoidance, Minimization, and/or Mitigation Measures

Construction contractors would be required to comply with mitigation commitments in the FAHP Programmatic and meet the *Oregon Standard Specifications for Construction*, which include requirements to implement BMPs during construction to reduce impacts on vegetation and wildlife. Permanent impacts on wetlands and waters would be mitigated in accordance with federal, state, and local permits and approvals, as discussed in Section 3.14.4.

3.14 Wetlands and Water Resources

3.14.1 Affected Environment

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 (HDR 2019). Within the API, 33 wetlands, 16 waterways, and 4 ditches were determined to be under the jurisdiction of the USACE and/or Oregon DSL (HDR 2019). Wetlands, rivers, creeks, and streams in the API may also include regulatory buffers to protect the functions of the water resource. Buffer widths would vary based on the quality of the resource and surrounding conditions and would be determined during development permitting. (See also Appendix P, *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*.)

Portions of the existing Tualatin River Bridges are located within the active river channel, including two piers supporting the northbound bridge and two piers supporting the southbound bridge. Many of the wetlands in the API receive stormwater runoff from the existing roadways. Stormwater runoff from I-205 is collected through conveyance systems that outfall to the Willamette and Tualatin Rivers and their tributaries. There are three existing stormwater facilities in the API that treat runoff from a total of 1.49

acres of impervious area. This leaves runoff from approximately 43.5 acres of impervious area in the API that goes untreated.

Appendix P, *I-205 Toll Project Wetlands and Water Resources Technical Memorandum*, provides more detailed information about the API and methodology for this analysis.

3.14.2 Environmental Consequences

No Build Alternative

Under the No Build Alternative, the existing bridge structure within the Tualatin River would remain as is. No short-term or long-term impacts on wetlands or water resources would occur. No water quality facilities would be constructed to capture or treat additional stormwater runoff, and the existing approximately 43.5 acres of impervious area would continue to be untreated.

Build Alternative

Short-Term Effects

Under the Build Alternative, in-water work would be required below the ordinary high water mark (OHWM)[62] of the Tualatin River to replace the existing bridges. Work within the actively flowing channel would be limited. Turbidity control measures such as floating turbidity curtains may be used during construction to address temporary increases in turbidity and potential sediment transport, thereby minimizing effects on water quality. The total area occupied by temporary pile below the OHWM would be approximately 700 square feet (0.02 acre), which would be removed after bridge work is completed. The volume of temporary pile would be approximately 3,000 cubic yards below the OHWM. Widening I-205 under the Build Alternative could also encroach upon up to 7 streams and associated stream buffers that I-205 crosses or is adjacent to in the API. Most of these streams flow under I-205 in culverts and would not be affected by the widening. If ODOT identifies stream and stream buffer impacts as the Project design progresses, ODOT would obtain appropriate approvals and permits with regulatory agencies.

Approximately 38,000 square feet (0.9 acre) of temporary wetland fill is anticipated during construction to accommodate construction vehicle access and traffic control. The total volume would be approximately 1,500 cubic yards of fill. This fill could temporarily reduce functions provided by wetlands, including water storage, sediment retention, and wildlife habitat. After construction is complete, temporarily affected wetlands, streams, and buffers would be restored or enhanced in accordance with agency permits and approvals (see Section 3.14.4).

Vegetation removal and soil compaction from construction machinery, excavation, and demolition could result in temporary sediment increases in stormwater runoff. However, the following construction BMPs would be implemented during construction to avoid these actions or minimize negative effects on water quality in receiving waterbodies: creating no-work zones and installing protective measures around wetlands and other waters, turbidity curtains or cofferdams, and treating construction discharge water.

[62] The OHWM is the highest water level that a water body has reached and maintained long enough to leave visible evidence on the landscape.

Long-Term Effects

Approximately 51,000 square feet (1.2 acres) of wetlands would be permanently filled under the Build Alternative to allow for I-205 widening. The total impact volume would be approximately 5,000 cubic yards of fill. Permanent loss of wetlands can result in a decrease in water quality functions such as sediment retention and a decrease in hydrologic functions such as water storage. Other impacts from permanent wetland loss include loss of fish and wildlife habitat and decreased function in water temperature regulation.

The existing bridge piers occupy an area of approximately 1,350 square feet (0.03 acre), which would be removed and replaced with new permanent structures that would occupy the same area below the OHWM of the Tualatin River. However, the two existing piers are located closer to the banks of the river, while the new piers would be placed between the existing pier locations, closer to the middle of the river, which would change the location of available habitat area. The total volume of permanent effects below the OHWM would include 2,150 cubic yards of fill and 1,900 cubic yards of removal, resulting in a net fill of approximately 250 cubic yards. Permanent impacts on wetlands, streams, and stream buffers would be mitigated in accordance with federal, state, and local permits and approvals (see Section 3.14.4).

The total amount of impervious area contributing to stormwater runoff under the Build Alternative would be approximately 100 acres, leading to greater levels of stormwater runoff than the No Build Alternative. Any new or reconstructed impervious surfaces, as well as any ODOT-controlled impervious surface areas that drain onto the reconstructed surfaces, would require stormwater treatment. Stormwater facilities would be constructed as part of the Build Alternative to address stormwater management requirements for water quality and quantity in accordance with the FAHP Programmatic and associated design standards. These design standards require stormwater facilities, including biofiltration swales and detention ponds, that would treat stormwater runoff from approximately 80 acres of impervious areas in the API, leaving approximately 20 acres of impervious area without stormwater treatment. Therefore, the Build Alternative would provide a net benefit to water quality in receiving water bodies over the No Build Alternative.

3.14.3 Summary of Effects

Table 3-48 provides a comparison of anticipated effects on wetlands and water resources by alternative.

Table 3-48. Summary of Wetlands and Water Resources Effects by Alternative

Effects	No Build Alternative	Build Alternative
Short-Term	• None	• Potential temporary increases in turbidity and potential sediment transport in the Tualatin River during in-water work • 0.02 acre/3,000 cubic yards temporary fill in the Tualatin River from work bridge piling • 0.9 acre/1,500 cubic yards temporary wetland fill for construction access and traffic control •
Long-Term	• Continued untreated stormwater runoff from approximately 43.5 acres of impervious area	• 0.03 acre/250 cubic yards of net fill below the Tualatin River OHWM • 1.2 acre/5,000 cubic yards permanent wetland fill due to roadway widening • Untreated stormwater runoff from approximately 20 acres of impervious area

OHWM = ordinary high water mark

3.14.4 Avoidance, Minimization, and or Mitigation Measures

Construction contractors would be required to meet *Oregon Standard Specifications for Construction* as well as federal, state, and local permit requirements, all of which would require the implementation of BMPs during construction to avoid and minimize impacts on wetlands and water resources. Impacts on wetlands and waters would require permits and approvals from U.S. Army Corps of Engineers (Section 404 Permit), Oregon Department of State Lands (Removal-Fill Permit), DEQ (401 Water Quality Certification), City of West Linn, and Clackamas County. Appropriate mitigation would be specified in these permit and approval processes. Compensatory mitigation for permanent, unavoidable impacts could include the purchase of mitigation bank credits,[63] on-site restoration, or other methods as determined in the permitting process.

3.15 Cumulative Impacts

3.15.1 Affected Environment

Cumulative impacts are defined as the effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (Council on Environmental Quality 2022). This section identifies past actions, present actions, and reasonably foreseeable future actions (RFFAs) affecting the same resources affected by the Build Alternative; discusses the contribution of the Build Alternative to cumulative impacts and benefits on relevant environmental resources; and identifies measures to avoid, minimize, and/or mitigate cumulative impacts. Because the cumulative impacts analysis is based on the incremental impacts of the Build Alternative on individual resources, analysts used the geographic APIs identified for each resource topic, as described in Sections 3.1 through 3.14 of this EA.

Historical Context and Past Actions

The relevant timeframe for past actions extends back to the beginning of large-scale urban development around the Project area in the late 1970s/early 1980s with the construction of I-205. Section 5 of Appendix Q, *I-205 Toll Project Cumulative Impacts Technical Report*, provides a more detailed overview of the historical context and relevant past actions in the region and near the Project location, including the development of I-205 and the highway system in the Portland metropolitan area starting in the mid-1900s, as well as the enactment of regional governing bodies and growth management regulations.

Present Actions and Reasonably Foreseeable Future Actions

The present actions and RFFAs included in this analysis were developed through review of Metro's 2018 Regional Transportation Plan (RTP) and discussions with partner agencies using the following criteria (Metro 2018b):

- The action is of a regional scale and is listed on the financially constrained project list in Metro's RTP.[64]

[63] A wetland mitigation bank is a site where wetlands are restored, created, enhanced, or preserved for the specific purpose of providing compensatory mitigation in advance of unavoidable impacts on wetlands from a development project. Mitigation banks provide the option of purchasing credits to offset the unavoidable impacts of a project (Washington State Department of Ecology n.d.).

[64] The financially constrained project list includes projects that fit within the RTP financial forecast (i.e., projects for which funding has been committed and the projects that agencies have determined are the highest priority and can be implemented with funding assumed in the financial forecast) (Metro 2018b).

- The action has a primary purpose of congestion management on the I-205 or I-5 corridors and is listed on the financially constrained project list in Metro's RTP.
- The action is anticipated to change vehicle or multimodal travel patterns in the vicinity of the I-205 Toll Project and is listed on the financially constrained project list in Metro's RTP.
- The action is within one or more of the resource area APIs concerned with physical impacts,[65] would have a physical impact on the same resource areas that are physically impacted by the Build Alternative; and is listed on the financially constrained project list in Metro's RTP.

Effects of anticipated future land use development is captured in the regional growth modeling and was therefore included in Project analyses for air quality, GHG emissions and climate change, noise, and transportation. Therefore, this future development is inherently included in the cumulative analyses for these topic areas.

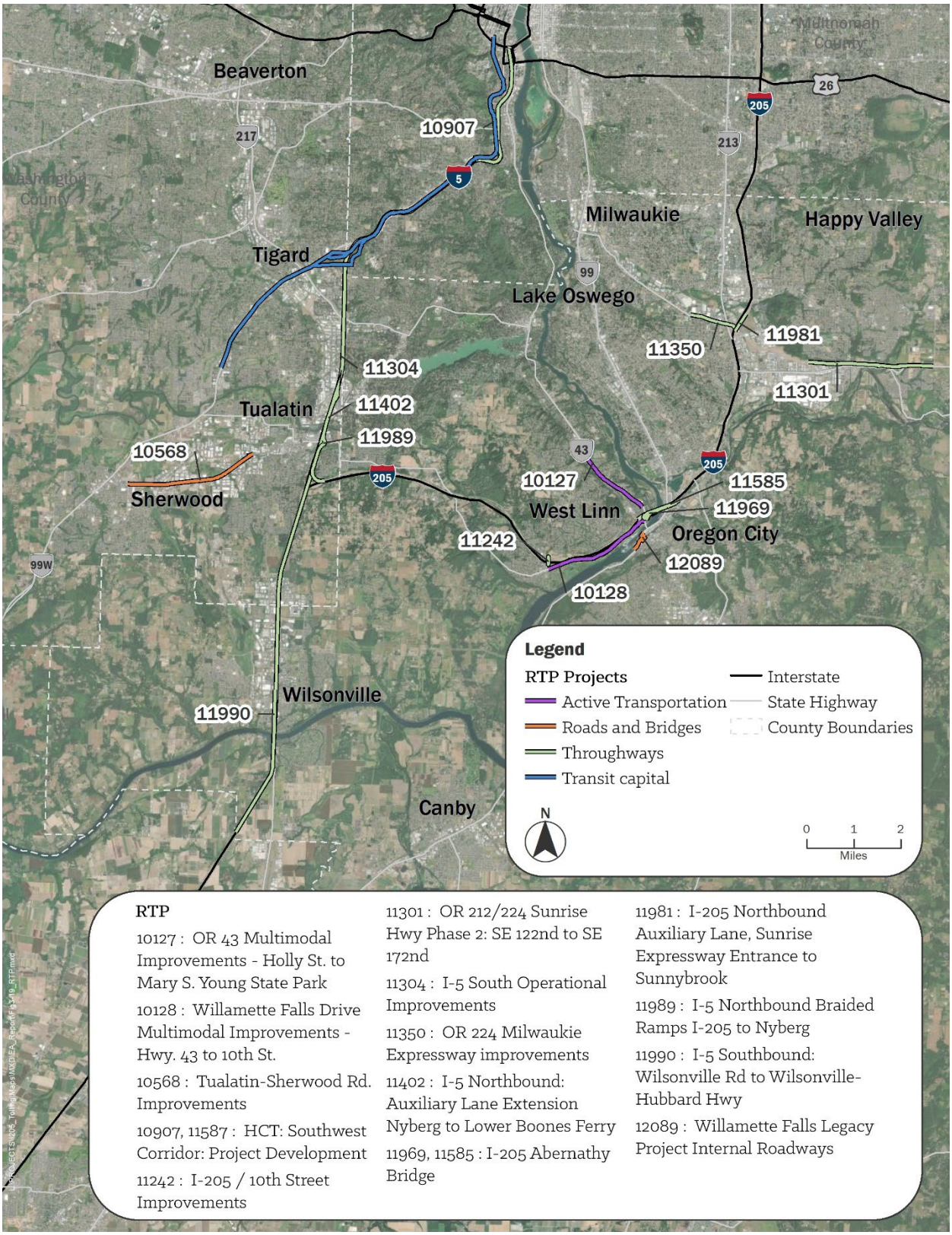
Figure 3-20 identifies 13 projects as present actions and RFFAs that, with the Build Alternative, could contribute to cumulative environmental impacts. Table 3-49 provides a brief description of each project as described in the RTP, and Appendix Q, *I-205 Toll Project Cumulative Impacts Technical Report*, provides more detailed information about those projects.

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 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 energy and GHGs. 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, and energy and GHG). ODOT also anticipates that the Rose Quarter Improvement Project will be included in the cumulative impacts analysis for the RMPP.

[65] 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.

Figure 3-20. Present Actions and Reasonably Foreseeable Future Actions



Source: Metro 2018b

Table 3-49. Present Actions and Reasonably Foreseeable Future Actions

Metro RTP ID	Metro RTP Project Name	Metro RTP Description	Metro RTP Time Period
10127	OR 43 Multimodal Improvements – Holly Street to Mary S. Young State Park	Improve roadway with widening, turn lanes, street trees, signal interconnections, cycle tracks, and sidewalks. This project is in the preliminary design phase.	2028 to 2040
10128	Willamette Falls Drive Multimodal Improvements – OR 43 to 10th Street	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.	2028 to 2040
10568	Tualatin-Sherwood Road Improvements	Widen the road from three to five lanes with added bike lanes and sidewalks.	2018 to 2027
10907, 11587	High Capacity Transit Southwest Corridor – Light Rail Project	High Capacity Transit project between Portland and Tualatin via Tigard.	2018 to 2027
11242	I-205 / 10th Street Improvements	Construct a long-term interchange improvement to provide congestion relief, address safety issues, and improve bike/ped connectivity.	2018 to 2027
11301	OR 212/224 Sunrise Highway Phase 2: SE 122nd to SE 172nd	Phase 2 of the OR 212/224 Sunrise corridor, consisting of a four-lane roadway from SE 122nd Ave to SE 172nd Ave.	2018 to 2027
11304	I-5 South Operational Improvements	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.	2018 to 2027
11350	OR 224 Milwaukie Expressway Improvements	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.	2018 to 2027
11402	I-5 Northbound: Auxiliary Lane Extension Nyberg to Lower Boones Ferry	Extend existing auxiliary lanes.	2028 to 2040
11969, 11585	I-205 Abernethy Bridge[1]	Widen both directions of the I-205 Abernethy Bridge and approaches to address recurring bottlenecks on the bridge.	2018 to 2027
11981	I-205 Northbound Auxiliary Lane, Sunrise Expressway Entrance to Sunnybrook	Provide I-205 northbound auxiliary lane between Sunrise Expressway entrance ramp and the Sunnyside Rd/Sunnybrook Blvd interchange exit ramp.	2018 to 2027
11989	I-5 Northbound – Braided Ramps I-205 to Nyberg	Replace the inside merge at I-205 entrance by constructing braided ramps.	2028 to 2040
11990	I-5 Southbound – Wilsonville Road to Wilsonville-Hubbard Highway	Add an auxiliary lane on I-5 from Wilsonville Rd to the Wilsonville-Hubbard Highway, including improvements to the Boone Bridge.	2028 to 2040
12089	Willamette Falls Legacy Project Internal Roadways	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.	2018 to 2027

[1] While referred to as the *I-205 Abernethy Bridge* in Metro's RTP, the official project name is *I-205: Phase 1A Project*.
I- = Interstate; OR = Oregon Route; RTP = Regional Transportation Plan

3.15.2 Potential Cumulative Impacts by Resource

This section summarizes the results of the cumulative impacts analysis for each of the environmental topics in Sections 3.1 through 3.14. Chapter 6 of Appendix Q, *I-205 Toll Project Cumulative Impacts Technical Report*, provides further details for each topic area.

Transportation

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). 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. 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.

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 area, with subsequent increases in the number of hours of congestion, the severity of congestion, and the number of crashes. The I-205 corridor currently experiences 6.75 hours of congestion per day (ODOT n.d.-b). Within the API, roadways experienced 3,540 crashes along study segments and 58 crashes at independent study intersections between 2015 and 2019.

The Build Alternative would contribute to positive cumulative effects on transportation, including improved travel times for truck freight on I-205 and most truck freight roadway segments in the API; reduced congestion on I-205 translating to reductions in daily hours of congestion for all travelers; improved travel times and operating LOS for transit; and fewer crashes on I-205. Negative cumulative effects from the Build Alternative could include increased congestion on some local streets because of vehicles rerouting from I-205 to avoid the toll; an increase in crashes on some non-highway routes; and worse pedestrian level of traffic stress at a few areas due to higher projected traffic volumes, as discussed in Section 3.1.2. However, ODOT is proposing measures to reduce and mitigate these impacts, as discussed in Section 3.1.4.

The Project's transportation modeling assumes the construction of the projects on the present actions and RFFA list and, therefore, the model results represent a cumulative effect. The primary objective identified in the RTP for most of the RFFAs includes improving system efficiency and/or relieving current congestion. Secondary objectives for various RFFAs include improving truck freight and other vehicle access, reducing crashes, and increasing opportunities for physical activity (via pedestrian and bicycle improvements). Three of the RFFAs—OR 43 Multimodal Improvements, Southwest Corridor Light Rail, and Willamette Falls Drive Multimodal Improvements—list increasing access to transit as a secondary objective. None of the RFFAs include actions that would contribute to vehicle rerouting in the long term.

When considered in combination with past and present actions and RFFAs, the Build Alternative, including its proposed mitigation, would have positive cumulative effects on the transportation network. Therefore, no additional mitigation for cumulative transportation impacts is warranted or proposed.

Air Quality

The current air quality conditions in the API reflect past and present regional development, with emissions from vehicles and residential, commercial, and industrial development. Air quality in the region has improved over the past few decades (DEQ 2021). FHWA anticipates that MSAT emissions will continue to

decline through 2050, despite increased vehicle use (measured as VMT) due to the implementation of fuel and engine regulations and vehicle technology improvements (FHWA 2016). The Portland region currently meets all NAAQS. However, according to DEQ, the Portland region has the 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 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 present actions and RFFAs would be built. The modeling analysis, therefore, accounts for the cumulative effects of Build Alternative with other present actions and RFFAs. Air quality modeling under the Build Alternative shows a net decrease in MSAT emissions compared to existing conditions, as well as lower emissions under the Build Alternative compared with the No Build Alternative, as described in Section 3.2.2. Several of the RFFAs identify “reduce emissions” as a project objective, including the OR 43 Multimodal Improvements, the Southwest Corridor Light Rail Project, and the Willamette Falls Drive Multimodal Improvements.

When considered in combination with other past and present actions and RFFAs, the Build Alternative would not have negative cumulative effects on air quality. Therefore, no mitigation for cumulative impacts on air quality is warranted.

Climate

GHGs from human activity are a primary cause of climate change through increased concentration of atmospheric carbon dioxide from the burning of fossil fuels. GHG emissions in the region have increased over the past century due to population growth, increased development and consumption of goods, increased number of motor vehicles, and emissions from various land uses. 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). Petroleum (e.g., gasoline, diesel fuel, jet fuel) is the predominant source of transportation fuel consumption at approximately 98% (U.S. Energy Information Administration 2021).

Although construction of the Build Alternative would cause a short-term increase GHG emissions to produce materials and operate equipment, in the long term, the Build Alternative would have net lower GHG emissions and VMT, which would contribute to ODOT’s efforts to reduce GHG emissions and meet climate change goals, consistent with the *Oregon Statewide Transportation Strategy* (ODOT 2013b) and ODOT’s Climate Action Plan (ODOT 2021c). Overall, the Build Alternative would not contribute to a cumulative climate change impact.

Economics

Development of I-205 helped shape the region’s economic environment, including facilitating commuter vehicle trips within, into, and out of the Portland metropolitan area and connecting truck freight traffic to the interstate highway system. I-205 also provides access for producers located outside of the region to 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 I-205 where the Project would be located.

The Build Alternative would contribute to positive and negative cumulative effects on the economy. The positive effects would be related to improved travel times, truck freight reliability, and vehicle operation 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 negative

effects would be higher transportation costs for households and wholesale traders; however, decreased congestion and improved on-time reliability are expected to increase demand in the warehousing and wholesale trade sectors, benefiting businesses throughout the supply chain (see Section 3.4.2), and impacts on low-income households would be mitigated (see Section 3.8.4).

Construction of some of the present actions and RFFAs may occur simultaneously with the Build Alternative, such as the I-205/10th Street Improvements or I-5 South Operational Improvements, which would lead to positive cumulative economic effects related to design and construction services, as well as growth in overall construction-related employment in the API. Potential negative cumulative effects from simultaneous construction of multiple projects could include temporary truck 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.

The primary and secondary objectives for many of the present actions and RFFAS include congestion relief, increasing access to jobs, and improving truck freight access to industries; all of which would provide benefits to the local and regional economy. Some of the RFFAs, such as the Willamette Falls Legacy Project Internal Roadways project, would directly support larger economic development activities that result in more jobs and services within the API. Bicycle and pedestrian RFFAs such as the Willamette Falls Drive Multimodal Improvements project, which will provide a multimodal connection between the downtowns of West Linn and Oregon City, would also support local economic development. Investments in bicycle and pedestrian infrastructure in/near business districts has been shown to improve economic conditions in those districts (National Institute for Transportation and Communities 2020).

Therefore, when considered with the other past and present actions and RFFAs, the Build Alternative is expected to have cumulative positive economic effects, and no mitigation for cumulative economic effects is warranted or proposed.

Noise

I-205 was completed in the early 1980s. 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. As residential uses and traffic levels have increased, the number of residences negatively affected by road noise in the API 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 the transportation modeling, 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 as defined in the ODOT Noise Manual (ODOT 2011). However, predicted traffic noise levels under the Build Alternative would range from 44 dBA L_{eq} to 74 dBA L_{eq} and would exceed ODOT’s NAAC 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 Section 3.5.3). 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 effects is warranted or proposed.

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. 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. 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 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[66] related to visual quality, and no additional mitigation for cumulative effects is warranted or proposed.

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 local communities. 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.

[66] A neutral cumulative 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.

As described in Section 3.7.2, 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 as 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 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. Because the Metro regional travel demand model includes the present actions and RFFAs, these results reflect the cumulative effects of the Build Alternative and RFFAs. Therefore, when considered with past and present actions and RFFAs, the Build Alternative would have a positive cumulative effect on social resources and communities related to accessibility and travel time.

In the short-term, it is possible that the construction areas for the Build Alternative, present actions, and RFFAs could overlap, leading to detours or travel-time delays for people accessing social resources and communities. However, it is anticipated that access to social resources and communities would be maintained and managed through coordination of traffic control plans across projects, which would reduce the potential for negative cumulative effects related to construction.

All communities in the API would benefit from 26% fewer crashes (representing about 144 fewer crashes) on I-205 in the API, including crashes resulting in injuries, under the Build Alternative as compared to the No Build Alternative. 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 safety impacts (see Section 3.1.4). Therefore, the Build Alternative would generally have no adverse effects on safety on local roadways and intersections.

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. Therefore, when considered with past and present actions and RFFAs, the Build Alternative is expected to have positive to neutral cumulative effects on social resources and communities related to roadway safety.

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 Section 3.4.2. 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. 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.

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), as detailed in Section 3.1.2. However, mitigation measures such as intersection improvements proposed in Section 3.1.4 are expected to avoid and minimize impacts related to rerouting traffic to local streets.

Long-term vehicle rerouting is not expected to occur as a result of the present actions and RFFAs because they do not include tolling or roadway pricing. In addition, most of the present actions and 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 past and present actions and RFFAs, the Build Alternative is expected to have positive to neutral cumulative effects on social resources and communities related to rerouting.

Because roadway signage would be in English, the tolling system could introduce challenges for persons with limited English proficiency in the API. ODOT proposes to implement measures, as detailed in Section 3.7.4, that would address language barriers to understanding the toll system. 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.-c), Metro's *Limited English Proficiency Plan* (Metro 2018e), 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 riders may need. 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 technology and language barriers.

Environmental Justice

In the past, construction of I-205 and other major transportation corridors fractured and isolated communities, often disproportionately affecting environmental justice populations (ODOT 2020c). Large-scale urban renewal projects and land use planning further contributed to adverse effects on environmental justice populations (City of Portland 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 decrease housing costs but often increase the cost of transportation because individuals and households must travel farther to reach jobs and services.

As described in Section 3.8.2, when compared with general population households in the API, environmental justice communities 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 described in the Travel-Time Scenarios subsection of Section 3.8.2 found that 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 tolled bridges under the Build Alternative relative to existing conditions and the No Build Alternative. Because the Metro Regional Travel Demand Model includes present actions and RFFAs, these results reflect cumulative effects of the Build Alternative and RFFAs. Therefore, when considered with past and present actions and RFFAs, the Build Alternative would have a positive cumulative effect on environmental justice populations related to accessibility and travel time.

The lower number of I-205 crashes under the Build Alternative compared to the No Build Alternative would benefit all populations, including environmental justice populations. 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 impacts (see Section 3.1.4). 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.

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. 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 Street 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. However, mitigation measures such as intersection improvements proposed in Section 3.1.4 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 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. 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 Section 3.8.4). It is not anticipated that the other RFFAs would increase transportation costs or employ tolling. Therefore, when considered with past and present actions and RFFAs, the Build Alternative with implementation of the low-income toll policy is expected to have neutral cumulative effects on environmental justice populations related to transportation costs.

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 effects is warranted or proposed.

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. 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. 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 effects is warranted.

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.

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 reconstruct 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 reconstructing roads or bridges would be required to meet current seismic design standards. For example, ODOT is reconstructing the I-205 Abernethy Bridge to withstand a Cascadia Subduction Zone earthquake. Therefore, the Build Alternative, when considered with the 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.

Hazardous Materials

Hazardous materials investigations identified two sites of concern within the API (HDR 2018b; 2020a, 2020b; Reynolds Engineering 2020). 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 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.

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 effects; however, these resources would not be affected by the Build Alternative. 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.

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, as detailed in Section 3.13, much of the vegetation that would be removed under the Build Alternative consists of invasive species. 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 impacts 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 ESA species and therefore would not contribute to a cumulative effect on ESA 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 2021c), as discussed in Section 3.13. 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 Section 3.14). 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.

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.

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. 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. Ultimately, 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 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. 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 Section 3.14). Some RFFAs, such as I-205 Abernethy Bridge, Tualatin-Sherwood Road Improvements, and OR 43 Multimodal Improvements, include stormwater upgrades, potentially resulting 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 effects is warranted.

4 Public Involvement, Agency Coordination, and Tribal Consultation

ODOT and FHWA have engaged in extensive public involvement, agency coordination, and tribal consultation to gather input throughout development of the I-205 Toll Project. Input provided to date has informed key elements of this I-205 Toll Project EA, including the purpose and need for the Project, alternatives considered, potential impacts, and possible mitigation measures.

4.1 Equity-Focused Engagement

As part of the Oregon Toll Program, ODOT created the Equity Framework to describe its commitment to minimizing burdens and maximizing benefits to historically and currently excluded and underserved communities (ODOT 2020c). Equity acknowledges that not all people, or all communities, are starting from the same place due to historical and current systems of oppression. Equity is the effort to provide different levels of support based on an individual's or group's need to achieve fairness in outcomes. Equity actionably empowers communities most affected by systemic oppression and requires the redistribution of resources, power, and opportunity to those communities (State of Oregon 2020b). The Equity Framework is consistent with Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance, as well as with ODOT's Title VI Implementation Plan (ODOT 2022e).

4.1.1 Equity and Mobility Advisory Committee

ODOT convened an Equity and Mobility Advisory Committee composed of individuals with professional or lived experience in equity and mobility. This committee advises the Oregon Transportation Commission and ODOT on how tolls, in combination with other demand-management strategies, can include benefits for communities that have been historically and are currently excluded and underserved by transportation projects.

The Equity and Mobility Advisory Committee has provided valuable input and insights on many topics, including:

- The Equity Framework for the Oregon Toll Program
- Public involvement approaches that actively and successfully encourage the meaningful participation of individuals and groups from historically excluded and underserved communities
- Project impacts on historically excluded and underserved communities
- Recommendations to the Oregon Transportation Commission on toll policies and strategies to address the availability of transit and other transportation options, potential impacts on neighborhood health and safety as a result of rerouting, and affordability

4.1.2 Historically and Currently Excluded and Underserved Communities

Impacts on historically and currently excluded and underserved communities were considered during the environmental review process. Based on the Equity Framework, people from historically and currently excluded and underserved communities include, but are not limited to, the following:

- People experiencing low-income or economic disadvantage (individuals and communities with substantially less wealth and financial resources and whose economic health and wellbeing has been impaired due to systemic barriers)
- Black, Indigenous, and People of Color communities

- Older adults and children
- People who speak languages other than English, especially those with limited English proficiency
- People experiencing a disability

ODOT worked with community engagement liaisons to connect with multilingual audiences that historically have not been engaged in planning activities for transportation projects. For example, during the summer-fall 2020 engagement, fact sheets and surveys about the Project translated into Spanish, Russian, Vietnamese, Simplified Chinese, and Traditional Chinese were provided to the liaisons who then provided the information to their communities. The liaisons also interacted with service providers, freight haulers, I-205 commuters, schools, and online Facebook groups. In November 2021, the community engagement liaisons recruited and facilitated six virtual discussion groups for in-depth engagement to understand current perceptions of traffic and transportation problems and to invite public conversations about congestion pricing on I-205 and I-5 (as part of the larger Regional Mobility Pricing Project). Through the discussion groups, members of the Vietnamese, Latin American, Chinese, Native American, Slavic, and Black/African American communities shared current experiences with using I-205, concerns surrounding the effects of congestion pricing, and support for potential mitigation measures.

ODOT translated the entire open house for the summer-fall 2020 engagement into Spanish and advertised the Spanish open house site through in-language print and digital ads in Spanish language publications (digital, print, and radio). ODOT also translated a flyer with Project information and an online survey into Spanish, Russian, Vietnamese, Simplified Chinese, and Traditional Chinese.

In an effort to reach community members who may not use ODOT's existing communication platforms, ODOT coordinated with community-based organizations and agencies to share notifications about the summer-fall 2020 engagement comment period. These outreach strategies included the following:

- Meeting with and presenting to various committees that represent historically and currently excluded and underserved communities, such as the Welcome Home Coalition, Community Alliance of Tenants, and Community in Motion
- Emailing an outreach toolkit with fact sheet, flyer, sample news article, and sample social media posts to more than 100 community groups and neighborhood organizations
- Making telephone calls to about 20 community organizations that support historically and currently excluded and underserved populations to alert them to the comment period, the toolkit, and informational resources in non-English languages
- Distributing flyers containing information about the Project and the comment period in English and Spanish to the Borland Road Free Clinic and Tualatin School House Food Pantry along I-205

Attachment 7 of Appendix J, *I-205 Toll Project Environmental Justice Technical Report*, provides comprehensive summary of engagement with historically and currently excluded and underserved communities.

4.2 Public Outreach

ODOT has conducted extensive public engagement and communications efforts throughout Project development and environmental review. ODOT sought public input to help refine the draft purpose and need, the toll alternatives to be studied, and key issues for analysis in the EA. During a focused engagement period between August 3 and October 16, 2020, ODOT received approximately 4,600 survey responses, letters, emails, and voicemails, as well as comments at meetings and briefings. A majority of respondents across all demographic groups and comment methods expressed strong

opposition to tolling in general or to the specifics of the I-205 Toll Project. Comments included concerns about financial hardship, lack of fairness, and potential rerouting onto local roadways to avoid a toll.

ODOT has participated in more than 100 briefings and presentations to local officials, committees, and councils; numerous tabling events at community gathering places such as farmers markets; and multiple online and in-person open houses to provide information about the Project. Public notification of the engagement opportunities has occurred through news releases, email newsletters ("e-News") and a dedicated Project email list, social media posts, paid advertising, and media and blog coverage. ODOT has primarily collected public input through the open houses and tabling events; coordination with community engagement liaisons, community-based organizations and agencies; and advisory committee meetings. ODOT has also interviewed a variety of interested parties, including neighborhood associations, business groups, social service groups, freight advocates, and representatives from local jurisdictions. Comments received by ODOT have generally indicated support for the Project's overall objectives but have expressed concerns about noise, tolling as a revenue source, neighborhood traffic impacts, and whether the Project would reduce congestion.

More recent examples of this outreach include:

- In September 2021, ODOT started a monthly online video series to share information on the Oregon Toll Program and the I-205 Toll Project in a way that is more widely accessible.
- In early 2022, ODOT hosted webinars to present the preliminary results of the traffic analysis conducted for the Environmental Assessment and allow members of the public and agencies to ask questions to project staff. ODOT also hosted virtual workshops with elected officials, business and community leaders, and local and regional agency staff to explore congestion pricing in the Portland metropolitan area.
- In spring 2022, ODOT launched an online survey to gather broader input on congestion pricing on I-5 and I-205 in the region and potential mitigation measures for low-income populations. The online survey received more than 12,000 responses.
- In summer 2022, ODOT shared the draft Low-Income Toll Report, which considers different options to address the impacts of tolls on people experiencing low incomes, and the draft tolling policy update to the Oregon Highway Plan for public review and comment.

ODOT will continue to conduct extensive public outreach during the environmental review process and during construction of the Build Alternative through a variety of methods, such as ongoing briefings to local community groups, engagement with committees and councils, online and in-person open houses, and tabling events at community gathering places. ODOT will continue to share information about the Project through email newsletters and the dedicated Project email list, social media posts, news releases, paid advertising, and media and blog coverage.

4.3 Agency Coordination

4.3.1 Lead Agencies

FHWA and ODOT are the lead agencies for this EA. FHWA serves as the lead federal agency because federal approval is needed, and federal funding is being used to study the impacts of tolling. Also, FHWA funds have been used for other I-205 projects, including its original construction. ODOT is the joint lead agency as the direct recipient of the Project's federal funds.

4.3.2 Cooperating Agencies

The U.S. Army Corps of Engineers (USACE) is designated as a cooperating agency for this Environmental Assessment per the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. The USACE regulates activities and/or discharges into the waters of the United States and will review the Project under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The level of the USACE participation as a cooperating agency and the authorization that may be required will depend on the final design of the Project.

4.3.3 Participating Agencies

Participating agencies are any federal, tribal, state, regional, and local agencies that have an interest in the Project. Participating agencies are responsible for the following:

- Providing comments on the purpose and need and range of alternatives
- Reviewing methodologies to address technical topics consistent with special expertise or jurisdiction of the agency
- Reviewing this Environmental Assessment for sufficiency and providing comments
- Identifying any issues of concern regarding potential project impacts
- Providing timely input on unresolved issues

Participating agencies for this Environmental Assessment include the following:

- Oregon Department of Environmental Quality
- Oregon State Historic Preservation Office
- Washington State Department of Transportation
- C-Tran
- Metro
- Port of Portland
- Port of Vancouver
- Southwest Washington Regional Transportation Council
- TriMet
- Clackamas County
- Clark County, WA
- Multnomah County
- Washington County
- City of Gladstone
- City of Gresham
- City of Happy Valley
- City of Lake Oswego
- City of Milwaukie
- City of Oregon City
- City of Portland
- City of Rivergrove
- City of Tualatin
- City of Vancouver
- City of West Linn
- City of Wilsonville

ODOT held a virtual scoping meeting for participating agencies on August 12, 2020, that provided an overview of the Project, equity considerations and the Equity and Mobility Advisory Committee, and alternatives, and offered opportunities for agency representatives to ask questions. Since the summer-fall 2020 engagement effort and scoping period, ODOT has continued to provided briefings and presentations to share information about the Oregon Toll Program with elected officials, advisory committees, and city and county councils

4.3.4 Project Working Groups and Agency Briefings

In addition to the formal invitations to serve as participating agencies, ODOT convened the following three working groups for development of the I-205 Toll Project:

- Regional Partner Agency Staff: This group is composed of agency staff representing the R1ACT,[67] Metro Joint Policy Advisory Committee on Transportation, and Southwest Washington Regional Transportation Commission. This group met in advance of R1ACT meetings to hear Project updates and to provide input on information that the R1ACT requested.
- Regional Modeling Group: This group is composed of agency staff members who have a technical understanding of transportation modeling to provide input on the modeling approach for the Project.
- Transit and Multimodal Working Group: This group is composed of agency staff members with knowledge of the local transit, pedestrian, and bicycle systems to provide input on how these elements could be affected by or incorporated into the Project.

ODOT met regularly with each of these working groups during the development of this Environmental Assessment to provide Project updates, answer questions, and encourage agencies to submit comments during the public comment period.

4.3.5 Mitigation Workshops with Local Jurisdictions

ODOT and FHWA convened a series of workshops and meetings with local jurisdictions in August and September 2022 to discuss proposed mitigation measures related to the effects of the Build Alternative. Participants included representatives from the Cities of Canby, Gladstone, Lake Oswego, Oregon City, Rivergrove, Tualatin, and West Linn; Clackamas and Washington Counties; Canby Area Transit; South Metro Area Regional Transit; and TriMet. At the workshops, the Project Team presented preliminary proposed mitigation measures for identified roadway, transit, and active transportation impacts under the Build Alternative (as described in Section 3.1.2) and received input from the jurisdictions about how to refine and modify these measures.

Key themes of the workshops included a desire to better understand the safety impacts of the Build Alternative and consideration of safety mitigations, a desire to consider multimodal mitigation options that do not increase vehicle capacity, input on local plans and projects that should be considered in the analysis, ideas for transit service and access improvements that could improve overall mobility in the Project area, and questions about how the API was selected and why certain intersections were not included in the analysis. The input received during the workshops was incorporated into mitigation measures included in this Environmental Assessment. Appendix C1, *I-205 Toll Project Mitigation Workshop Summaries,* provides a summary of each workshop.

[67] R1ACT is an advisory body composed of 31 voting members, including private industry, transit agencies, stakeholders, and elected officials, who collaborate on transportation issues affecting ODOT Region 1 (serving all of Clackamas, Multnomah, and Hood River Counties and eastern Washington County).

Follow up meetings were held with local jurisdictions in November and December 2022 to review proposed mitigation measures. ODOT incorporated some input received during the meetings into the mitigation measures included in this Environmental Assessment. Appendix C1, *I-205 Toll Project Mitigation Workshop Summaries,* provides a summary of each follow up meeting. ODOT will continue to work with local jurisdictions to address additional comments on the mitigation measures, and the Revised Environmental Assessment will provide final mitigation commitments.

4.4 Tribal Consultation

ODOT and FHWA initiated formal government-to-government consultation with the following Native American Tribes:

- Confederated Tribes of the Grand Ronde Community of Oregon
- Confederated Tribes of the Siletz Indians
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of Warm Springs Reservation of Oregon
- Confederated Tribes and Bands of the Yakama Nation
- Cowlitz Indian Tribe
- Nez Perce Tribe

These tribes were also invited to serve as participating agencies; however, none accepted the invitation.

ODOT and FHWA offered to meet with tribes at their request. The Confederated Tribes of the Grand Ronde Community of Oregon requested meetings and ODOT and FHWA met with them in summer 2021 and early 2022 to discuss the I-205 Toll Project. Tribal representatives posed questions about how toll rates would be set, what projects tolling would fund and how potential impacts on low-income populations would be mitigated. They voiced concerns about the use of tolling in general, potential congestion and business impacts related to diversion to local streets (particularly in Oregon City and near Willamette Falls), and effects from diesel emissions. ODOT and FHWA also met with the Cowlitz Indian Tribe in summer 2021 and heard concerns about the use of tolling as a congestion-management tool. ODOT and FHWA met with the Cowlitz Indian Tribe again in summer 2022 to give an update on all Oregon toll projects and answer questions related to the toll program and policies. ODOT sent letters on September 6, 2022, to all of the consulting tribes detailing the updated scope of the Environmental Assessment to include the planned I-205 improvements and recommendations for the Project's Section 106 Finding of Effect. ODOT has not received any responses from the tribes on this follow-up letter and recommendations for the Section 106 Finding of Effect to date.

Government-to-government consultation for the Project and other proposed projects with tolling is ongoing. In November 2022, ODOT and FHWA met with the Cowlitz Indian Tribe, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of the Siletz Indians, and the Nez Perce Tribe for the first quarterly inter-tribal tolling meeting. The second quarterly inter-tribal tolling meeting was held in February 2023. The meetings provide updates on all proposed tolling projects in Oregon, including the I-205 Toll Project, and offer opportunities for questions and discussion about tolling policy. In January 2023, the OTC adopted an amendment to the Oregon Highway Plan regarding tolling which, among other policies and actions, would require ensuring that rate-setting structures and fees are consistent with existing sovereignty or treaty rights and that ODOT undertakes government-to-government consultation with affected tribes for all tolling projects (ODOT 2022f).

4.5 Summary of Input Considered in this Environmental Assessment

Input from agencies and the public has shaped the scope, methodology, and analysis for this Environmental Assessment. Appendix R, *I-205 Toll Project Engagement Summary*, describes ODOT's engagement with agencies, community groups, corridor travelers, and the public August through October 2020, when it was seeking input on the Project purpose and need, goals and objectives, alternatives, and environmental impacts. ODOT had continued outreach to agencies, Tribes, and the public during the development of this Environmental Assessment, as noted in Sections 4.1 through 4.4. In July 2022, ODOT notified agencies, Tribes, and the public of the changes to the Project, i.e., adding widening and seismic improvements to the I-205 Toll Project. Examples of steps ODOT took to incorporate comments into this Environmental Assessment include:

- Updating the I-205 Toll Project goals and objectives, listed in Section 1.5 of this Environmental Assessment, to include equity and acknowledge quality of life impacts on nearby and adjacent communities, based on comments received from the public, agencies, the Equity and Mobility Advisory Committee, and specific outreach to historically and currently excluded and underserved communities.
- Adding performance measures to account for equity impacts on disadvantaged groups, such as health, safety, and accessibility.
- Increasing the number of intersections studied for potential traffic rerouting effects from 34 to 50 based on continuing coordination with local cities and counties.
- Evaluating potential environmental effects from the implementation of tolling and the resulting changes in traffic patterns across a range of topic areas beyond transportation, including environmental justice, social resources and communities, and noise.
- Proposing mitigation measures to offset projected effects on local roadways in close coordination with affected cities and counties, as described in Section 3.1.4 and Section 4.3.5.
- Expanding the number of engagement opportunities and outreach events to provide information about the I-205 Toll Project and environmental review process, including flyers distributed at local clinics and briefings.

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5 Preparers

Individuals involved in preparing this Environmental Assessment are identified in Table 5-1.

Table 5-1. List of Preparers

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7 Glossary

Term	Definition
A-weighted decibel scale (dBA)	A scale used to measure loudness of sound that is adjusted to the frequency response of the human ear.
AM peak period	The two morning hours with the highest travel volumes (7 a.m. to 9 a.m.)
Area of potential impact (API)	The geographic area within which the project may result in direct or indirect impacts. Different resource areas (e.g., land use, fish and wildlife, etc.) may have different API boundaries based on potential impacts.
Build Alternative	The Build Alternative includes tolls at the Abernethy Bridge and Tualatin River Bridges and toll-funded I-205 improvements. Future conditions under the Build Alternative would include three through lanes in each direction of I-205 between the Stafford Road interchange and the OR 213 interchange, as well as replacement of or seismic upgrades to eight bridges along I-205.
Congestion	Congestion occurs when the demand is greater than the transportation system's capacity. For highways, congestion occurs when the average speed along a section of highway or on a particular facility falls below a specified speed, generally below 30 miles per hour (mph). Recurrent congestion is caused by constant excess volume compared to capacity. Nonrecurring congestion is caused by actions such as special events and/or traffic incidents.
Congestion pricing	Congestion pricing, sometimes known as value pricing or variable rate tolling, is a strategy that charges higher fees to use roads or bridges during "rush hour" in an effort to shift trips to less congested times of day.
Corridor	A portion of a roadway, typically an arterial street or highway, studied in this EA.
Construction staging	A designated area where vehicles, supplies, and construction equipment are positioned for access and use to a construction site.
Criteria pollutants	This is a group of six common air pollutants for which the EPA has set National Ambient Air Quality Standards (NAAQS): ozone (O3), particulate matter (PM10 and PM2.5), carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO2), and lead.
Cumulative effect (cumulative impact)	The effect on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects result from individually minor but collectively significant actions taking place over a period of time.
Decibels	A unit for relative sound intensity. For highway traffic noise, an adjustment, or weighting, of the high and low-pitched sounds is made to approximate the way that an average person hears sounds. The adjusted sounds are called "A-weighted levels" (dBA).
Disabled	A person having a long-lasting condition, such as severe vision or hearing impairments, or a condition that substantially limits basic physical activities. It may also include people with conditions that make other activities such as learning, getting around inside the home, working at a job, or going places outside the home difficult.
Environmental justice	The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies. Meaningful involvement means: people have an opportunity to participate in decisions about activities that may affect their environment and/or health; the public's contribution can influence the regulatory agency's decision; community concerns will be considered in the decision-making process; and decision makers will seek out and facilitate the involvement of those potentially affected.
Hispanic/Latino	A self-designated classification for people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Caribbean, or those identifying themselves generally as Spanish, Spanish-American, etc. Origin is viewed as ancestry, nationality, or country of birth of the person or person's parents or ancestors. Hispanic/ Latino persons may be of any race, White and non-White.
Hours of Congestion	The hours of congestion for a corridor is the total number of hours that the corridor has at least one congestion location.

Term	Definition
Indirect effects	Effects are caused by the proposed action or alternative and are later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems.
Job years	Job-years is a metric in economics analyses that refers to the equivalent of an employee working for 2,080 hours in a year. For example, a full-time employee working for three years would be equal to three job-years, while three part-time employees working a total of 2,080 hours in a year would be equivalent to one job-year.
Level of service (LOS)	A qualitative measure of the effectiveness of one or more elements of transportation infrastructure. LOS is most commonly used to describe roadway performance, but can also be applied to transit, intersections, or other infrastructure elements. The AASHTO defines the following levels-of-service: A= Free flow; B=Reasonably free flow; C=Stable flow; D=Approaching unstable flow; E=Unstable flow; and F=Forced or breakdown flow.
Level of Traffic Stress (LTS)	LTS 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.
Limited English Proficiency (LEP)	Individuals who do not speak English as their primary language and who have a limited ability to read, speak, write, or understand English.
Low-income	As defined in the USDOT Updated Order on Environmental Justice, “low-income” means a person whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines (USDOT 2012). To be more inclusive and account for variability in the cost of living, the I-205 Toll Project Team adopted the definition of the low-income as 200% of the federal poverty level to be consistent with data available through the U.S. Census Bureau, to be aligned with regional and stakeholder definitions of low-income, and to be more inclusive of the costs of living.
Minority	A person who is: Black (a person having origins in any of the black racial groups of Africa); Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or the Spanish culture or origin, regardless of race); Asian/Pacific Islander (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or American Indian or Alaskan Native (a person having origins in any of the original peoples of North America, and who maintains cultural identification through tribal affiliation or community recognition).
Mitigation	A measure that could be taken to lessen the negative effects predicted for each resource. These measures may include reducing or minimizing a specific negative effect, avoiding it completely, or rectifying or compensating for the negative effect.
Mobile Source Air Toxics (MSATs)	The Clean Air Act identifies 188 air toxics, of which MSATs are the subset emitted by mobile sources. Although MSATs pose potential public health concerns, there are no established regulatory limits for relevant MSAT pollutants.
National Ambient Air Quality Standards (NAAQS)	The maximum allowable level, averaged over a specific time period, for a certain air pollutant in the outdoor air.
National Environmental Policy Act (NEPA)	The federal policy that requires agencies to incorporate environmental considerations into decision making by preparing an environmental assessment or environmental impact statement that consider the effects of proposed actions.
No Build Alternative	The No Build Alternative provides a baseline for comparing the potential impacts of the Build Alternative. The No Build Alternative consists of existing conditions and any planned actions with committed funding in the I-205 Toll Project study area.
Noise abatement criteria (NAC)	If future noise levels with a project are predicted to approach or exceed the FHWA noise criteria at a sensitive receptor, abatement is evaluated at the receptor. For residences, the criterion is 67 dBA.
Mainline	The through travel lines of a highway.

Term	Definition
Participating agency	Under 23 U.S.C. 139, a "participating agency" is any federal or nonfederal agency (federal, state, tribal, regional, or local government agency) that may have an interest in the project. This provides a method for agencies that do not have permitting or approval authority over any portion of the project to have a more formal role in the environmental review and comment process. Nongovernmental organizations and private entities cannot serve as participating agencies.
Particulate matter (PM_{10} or $PM_{2.5}$)	Naturally-occurring and man-made particles with a diameter less than 10 microns (PM_{10}) or 2.5 ($PM_{2.5}$) microns. Sources of particulate matter include sea salt, pollen, road dust, agricultural dust.
PM peak period	The two afternoon hours with the highest travel volumes (4 p.m. to 6 p.m.)
Purpose and Need	A formal statement of the objective(s) of the proposed project (Purpose) and the problem(s) that the project is intended to solve (Need). The Purpose and Need Statement is developed early in the project planning stage and serves as a guideline for future project efforts. For example, in evaluating alternatives, any alternative that does not meet the project's purpose and need will be dropped from consideration.
Section 129	A federal program under 23 U.S. Code that regulates authorization of toll roads, bridges, tunnels, and ferries.
Toll Gantry	Vertical columns on the outside of travel lanes that support a horizontal structure spanning the travel lanes in which electronic tolling equipment is attached to.
Unbanked populations	People who do not have access to conventional financial services.
Value Pricing Pilot Program	A federal program established by the U.S. Congress in 1991 that has supported projects nationwide. The intent of the projects is to demonstrate whether and to what extent roadway congestion may be reduced through congestion pricing strategies, and the magnitude of the impact of such strategies on driver behavior, traffic volumes, transit ridership, air quality and availability of funds for transportation programs.
Variable-rate tolls	Fees to use a road or bridge that vary based on time of day. It can be a strategy to shift demand to less congested times of day and is sometimes known as congestion pricing or value pricing.
Vehicle hours of delay	The number of hours that a vehicle must wait, particularly at intersections. This metric is typically measured in seconds, with hours used to show broader delay experienced over longer periods of time (e.g., annually). The amount of delay can then be used to gauge overall congestion levels based on predefined ranges and thresholds (known as Level of Service).
Vehicle miles traveled (VMT)	The total number of miles that vehicles are driven in a specified period of time for a given area or transportation facility.
Viewshed	The portion of the landscape that can be seen from within the project area and that has views of the project area. The boundaries of a viewshed are determined by the surrounding topography, vegetation, and built environment.
Visual quality	Character of the landscape, which generally gives visual value to a setting.
Volume-to-capacity ratio	Volume-to-capacity ratios measure the level of congestion on a roadway by dividing the volume of traffic by the capacity of the roadway.

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