

FINAL



I-5 ROSE QUARTER
IMPROVEMENT PROJECT

Socioeconomics Technical Report

I-5 Rose Quarter Improvement Project

Oregon Department of Transportation

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Acronyms and Abbreviations

ACS	American Community Survey
API	Area of Potential Impact
EB	eastbound
FHWA	Federal Highway Administration
GDP	gross domestic product
GIS	geographic information system
I-405	Interstate 405
I-5	Interstate 5
I-84	Interstate 84
ICURA	Interstate Corridor Urban Renewal Area
MSA	Metropolitan Statistical Area
mvmt	million vehicle miles travelled
NB	northbound
NEPA	National Environmental Policy Act
OCCURA	Oregon Convention Center Urban Renewal Area
ODOT	Oregon Department of Transportation
OED	Oregon Employment Department
Project	I-5 Rose Quarter Improvement Project
ROW	right of way
SAC	Stakeholder Advisory Committee
SB	southbound
SPIS	Safety Priority Index System
TIF	tax increment funds
URAs	Urban Renewal Areas
WB	westbound

Executive Summary

The I-5 Rose Quarter Improvement Project (Project) is located in Portland, Oregon, along the 1.7-mile segment of Interstate 5 (I-5) between Interstate 405 to the north and Interstate 84 to the south. The Project also includes the interchange of I-5 and N Broadway and NE Weidler Street (Broadway/Weidler interchange) and the surrounding transportation network from approximately N/NE Hancock Street to the north, N Benton Avenue to the west, N/NE Multnomah Street to the south, and NE 2nd Avenue to the east.

Socio-economic characteristics of the Area of Potential Impact (API) around I-5 and the Broadway/Weidler interchange were identified, and the No-Build and Build Alternatives were reviewed for their potential effects on those socio-economic characteristics. The Build Alternative would implement improvements identified in regional plans that would support economic development goals for the API. The Build Alternative would have short-term direct socio-economic impacts during construction and long-term direct impacts on businesses (four businesses are proposed to be relocated for right of way or construction staging area). The Build Alternative would have long-term indirect socio-economic benefits by supporting the movement of goods and people and economic development goals of adopted plans and policies. Mitigation measures implemented during construction would minimize direct impacts in the API.

1 Introduction

1.1 Project Location

The I-5 Rose Quarter Improvement Project (Project) is located in Portland, Oregon, along the 1.7-mile segment of Interstate 5 (I-5) between Interstate 405 (I-405) to the north (milepost 303.2) and Interstate 84 (I-84) to the south (milepost 301.5). The Project also includes the interchange of I-5 and N Broadway and NE Weidler Street (Broadway/Weidler interchange) and the surrounding transportation network, from approximately N/NE Hancock Street to the north, N Benton Avenue to the west, N/NE Multnomah Street to the south, and NE 2nd Avenue to the east.

Figure 1 illustrates the Project Area in which the proposed improvements are located. The Project Area represents the estimated area within which improvements are proposed, including where permanent modifications to adjacent parcels may occur and where potential temporary impacts from construction activities could result.

1.2 Project Purpose

The purpose of the Project is to improve the safety and operations on I-5 between I-405 and I-84, of the Broadway/Weidler interchange, and on adjacent surface streets in the vicinity of the Broadway/Weidler interchange and to enhance multimodal facilities in the Project Area.

In achieving the purpose, the Project would also support improved local connectivity and multimodal access in the vicinity of the Broadway/Weidler interchange and improve multimodal connections between neighborhoods located east and west of I-5.

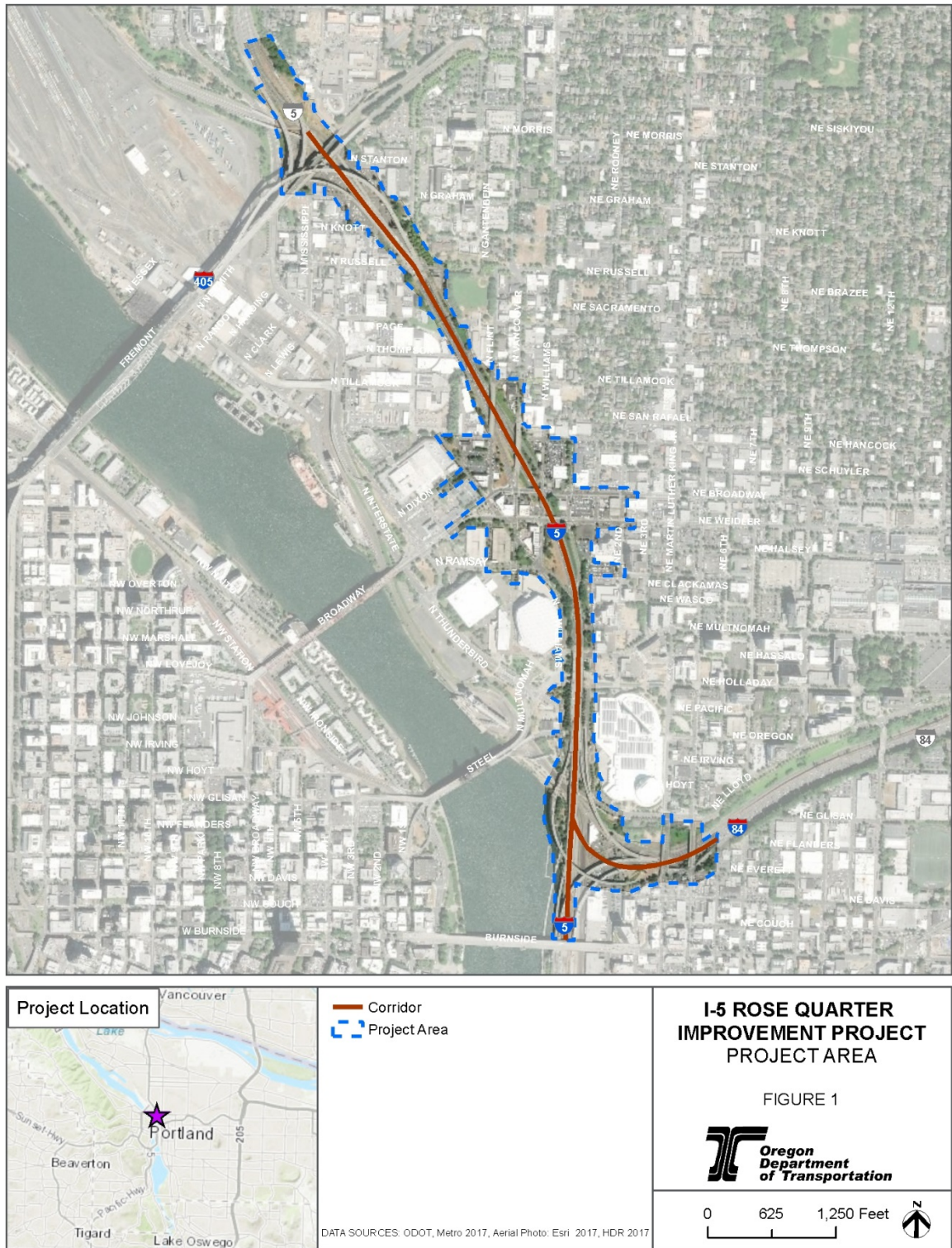
1.3 Project Need

The Project would address the following primary needs:

- **I-5 Safety:** I-5 between I-405 and I-84 has the highest crash rate on urban interstates in Oregon. Crash data from 2011 to 2015 indicate that I-5 between I-84 and the merge point from the N Broadway ramp on to I-5 had a crash rate (for all types of crashes²) that was approximately 3.5 times higher than the statewide average for comparable urban interstate facilities (ODOT 2015a).

² Motor vehicle crashes are reported and classified by whether they involve property damage, injury, or death.

Figure 1. Project Area



- Seventy-five percent of crashes occurred on southbound (SB) I-5, and 79 percent of all the crashes were rear-end collisions. Crashes during this 5-year period included one fatality, which was a pedestrian fatality. A total of seven crashes resulted in serious injury.
- The Safety Priority Index System (SPIS) is the systematic scoring method used by the Oregon Department of Transportation (ODOT) for identifying potential safety problems on state highways based on the frequency, rate, and severity of crashes (ODOT 2015b). The 2015 SPIS shows two SB sites in the top 5 percent and two northbound (NB) sites in the top 10 percent of the SPIS list.
- The 2015 crash rate on the I-5 segment between I-84 and the Broadway ramp on to I-5 is 2.70 crashes per million vehicle miles. The statewide average for comparable urban highway facilities is 0.77 crashes per million vehicle miles travelled (mvmt).
- The existing short weaving distances and lack of shoulders for accident/incident recovery in this segment of I-5 are physical factors that may contribute to the high number of crashes and safety problems.
- **I-5 Operations:** The Project Area is at the crossroads of three regionally significant freight and commuter routes: I-5, I-84, and I-405. As a result, I-5 in the vicinity of the Broadway/Weidler interchange experiences some of the highest traffic volumes in the State of Oregon, carrying approximately 121,400 vehicles each day (ODOT 2017a), and experiences 12 hours of congestion each day (ODOT 2012a). The following factors affect I-5 operations:
 - Close spacing of multiple interchange ramps results in short weaving segments where traffic merging on and off I-5 has limited space to complete movements, thus becoming congested. There are five on-ramps (two NB and three SB) and six off-ramps (three NB and three SB) in this short stretch of highway. Weaving segments on I-5 NB between the I-84 westbound (WB) on-ramp and the NE Weidler off-ramp, and on I-5 SB between the N Wheeler Avenue on-ramp and I-84 eastbound (EB) off-ramp, currently perform at a failing level-of-service during the morning and afternoon peak periods.
 - The high crash rate within the Project Area can periodically contribute to congestion on this segment of the highway. As noted with respect to safety, the absence of shoulders on I-5 contributes to congestion because vehicles involved in crashes cannot get out of the travel lanes.
 - Future (2045) traffic estimates indicate that the I-5 SB section between the N Wheeler on-ramp and EB I-84 off-ramp is projected to have the most critical congestion in the Project Area, with capacity and geometric constraints that result in severe queuing.
- **Broadway/Weidler Interchange Operations:** The complexity and congestion at the I-5 Broadway/Weidler interchange configuration is difficult to navigate for vehicles (including transit vehicles), bicyclists, and pedestrians, which impacts

access to and from I-5 as well as to and from local streets. The high volumes of traffic on I-5 and Broadway/Weidler in this area contribute to congestion and safety issues (for all modes) at the interchange ramps, the Broadway and Weidler overcrossings of I-5, and on local streets in the vicinity of the interchange.

- The Broadway/Weidler couplet provides east-west connectivity for multiple modes throughout the Project Area, including automobiles, freight, people walking and biking, and Portland Streetcar and TriMet buses. The highest volumes of vehicle traffic on the local street network in the Project Area occur on NE Broadway and NE Weidler in the vicinity of I-5. The N Vancouver Avenue/N Williams couplet, which forms a critical north-south link and is a Major City Bikeway within the Project Area with over 5,000 bicycle users during the peak season, crosses Broadway/Weidler in the immediate vicinity of the I-5 interchange.
- The entire length of N/NE Broadway is included in the Portland High Crash Network—streets designated by the City of Portland for the high number of deadly crashes involving pedestrians, bicyclists, and vehicles.³
- The SB on-ramp from N Wheeler and SB off-ramp to N Broadway experienced a relatively high number of crashes per mile (50-70 crashes per mile) compared to other ramps in the Project Area during years 2011-2015. Most collisions on these ramps were rear-end collisions.
- Of all I-5 highway segments in the corridor, those that included weaving maneuvers to/from the Broadway/Weidler ramps tend to experience the highest crash rates:
 - SB I-5 between the on-ramp from N Wheeler and the off-ramp to I-84 (SB-S5) has the highest crash rate (15.71 crashes/mvmt).
 - NB I-5 between the I-84 on-ramp and off-ramp to NE Weidler (NB-S5) has the second highest crash rate (5.66 crashes/mvmt).
 - SB I-5 between the on-ramp from I-405 and the off-ramp to NE Broadway (SB-S3) has the third highest crash rate (4.94 crashes/mvmt).
- **Travel Reliability on the Transportation Network:** Travel reliability on the transportation network decreases as congestion increases and safety issues expand. The most unreliable travel times tend to occur at the end of congested areas and on the shoulders of the peak periods. Due to these problems, reliability has decreased on I-5 between I-84 and I-405 for most of the day. Periods of congested conditions on I-5 in the Project Area have grown over time from morning and afternoon peak periods to longer periods throughout the day.

³ Information on the City of Portland's High Crash Network is available at <https://www.portlandoregon.gov/transportation/54892>.

1.4 Project Goals and Objectives

In addition to the purpose and need, which focus on the state's transportation system, the Project includes related goals and objectives developed through the joint ODOT and City of Portland N/NE Quadrant and I-5 Broadway/Weidler Interchange Plan process, which included extensive coordination with other public agencies and citizen outreach. The following goals and objectives may be carried forward beyond the National Environmental Policy Act (NEPA) process to help guide final design and construction of the Project:

- Enhance pedestrian and bicycle safety and mobility in the vicinity of the Broadway/Weidler interchange.
- Address congestion and improve safety for all modes on the transportation network connected to the Broadway/Weidler interchange and I-5 crossings.
- Support and integrate the land use and urban design elements of the Adopted N/NE Quadrant Plan (City of Portland et al. 2012) related to I-5 and the Broadway/Weidler interchange, which include the following:
 - Diverse mix of commercial, cultural, entertainment, industrial, recreational, and residential uses, including affordable housing
 - Infrastructure that supports economic development
 - Infrastructure for healthy, safe, and vibrant communities that respects and complements adjacent neighborhoods
 - A multimodal transportation system that addresses present and future needs, both locally and on the highway system
 - An improved local circulation system for safe access for all modes
 - Equitable access to community amenities and economic opportunities
 - Protected and enhanced cultural heritage of the area
 - Improved urban design conditions
- Improve freight reliability.
- Provide multimodal transportation facilities to support planned development in the Rose Quarter, Lower Albina, and Lloyd.
- Improve connectivity across I-5 for all modes.

2 Project Alternatives

This technical report describes the potential effects of no action (No-Build Alternative) and the proposed action (Build Alternative).

2.1 No-Build Alternative

NEPA regulations require an evaluation of the No-Build Alternative to provide a baseline for comparison with the potential impacts of the proposed action. The No-Build Alternative consists of existing conditions and any planned actions with committed funding in the Project Area.

I-5 is the primary north-south highway serving the West Coast of the United States from Mexico to Canada. At the northern portion of the Project Area, I-5 connects with I-405 and the Fremont Bridge; I-405 provides the downtown highway loop on the western edge of downtown Portland. At the southern end of the Project Area, I-5 connects with the western terminus of I-84, which is the east-west highway for the State of Oregon. Because the Project Area includes the crossroads of three regionally significant freight and commuter routes, the highway interchanges within the Project Area experience some of the highest traffic volumes found in the state (approximately 121,400 average annual daily trips). The existing lane configurations consist primarily of two through lanes (NB and SB), with one auxiliary lane between interchanges. I-5 SB between I-405 and Broadway includes two auxiliary lanes.

I-5 is part of the National Truck Network, which designates highways (including most of the Interstate Highway System) for use by large trucks. In the Portland-Vancouver area, I-5 is the most critical component of this national network because it provides access to the transcontinental rail system, deep-water shipping and barge traffic on the Columbia River, and connections to the ports of Vancouver and Portland, as well as to most of the area's freight consolidation facilities and distribution terminals. Congestion on I-5 throughout the Project Area delays the movement of freight both within the Portland metropolitan area and on the I-5 corridor. I-5 through the Rose Quarter is ranked as one of the 50 worst freight bottlenecks in the United States (ATRI 2017).

Within the approximately 1.5 miles that I-5 runs through the Project Area, I-5 NB connects with five on- and off-ramps, and I-5 SB connects with six on- and off-ramps. Drivers entering and exiting I-5 at these closely spaced intervals, coupled with high traffic volumes, slow traffic and increase the potential for crashes. Table 1 presents the I-5 on- and off-ramps in the Project Area. Table 2 shows distances of the weaving areas between the on- and off-ramps on I-5 in the Project Area. Each of the distances noted for these weave transitions is less than adequate per current highway design standards (ODOT 2012b). In the shortest weave section, only 1,075 feet is available for drivers to merge onto I-5 from NE Broadway NB in the same area where drivers are exiting from I-5 onto I-405 and the Fremont Bridge.

Table 1. I-5 Ramps in the Project Area

I-5 Travel Direction	On-Ramps From	Off-Ramps To
Northbound	<ul style="list-style-type: none"> I-84 N Broadway/N Williams Avenue 	<ul style="list-style-type: none"> NE Weidler Street/NE Victoria Avenue I-405 N Greeley Avenue
Southbound	<ul style="list-style-type: none"> N Greeley Avenue I-405 N Wheeler Avenue/N Ramsay Way 	<ul style="list-style-type: none"> N Broadway/N Vancouver Avenue I-84 Morrison Bridge/Highway 99E

Notes: I = Interstate

Table 2. Weave Distances within the Project Area

I-5 Travel Direction	Weave Section	Weave Distance
Northbound	I-84 to NE Weidler Street/NE Victoria Avenue	1,360 feet
Northbound	N Broadway/N Williams Avenue to I-405	1,075 feet
Southbound	I-405 to N Broadway	2,060 feet
Southbound	N Wheeler Avenue/N Ramsay Way to I-84	1,300 feet

Notes: I = Interstate

As described in Section 1.3, the high volumes, closely spaced interchanges, and weaving movements result in operational and safety issues, which are compounded by the lack of standard highway shoulders on I-5 throughout much of the Project Area.

Under the No-Build Alternative, I-5 and the Broadway/Weidler interchange and most of the local transportation network in the Project Area would remain in its current configuration, with the exception of those actions included in the Metro 2014 *Regional Transportation Plan* financially constrained project list (Metro 2014).⁴ One of these actions includes improvements to the local street network on the Broadway/Weidler corridor within the Project Area. The proposed improvements include changes to N/NE Broadway and N/NE Weidler from the Broadway Bridge to NE 7th Avenue. The current design concept would remove and reallocate one travel lane on both N/NE Broadway and N/NE Weidler to establish protected bike lanes and reduce pedestrian crossing distances. Proposed improvements also include

⁴ Metro Regional Transportation Plan ID 11646. Available at: https://www.oregonmetro.gov/sites/default/files/Appendix%201.1%20Final%202014%20RTP%20%20Project%20List%208.5x11%20for%20webpage_1.xls

changes to turn lanes and transitions to minimize pedestrian exposure and improve safety. The improvements are expected to enhance safety for people walking, bicycling, and driving through the Project Area. Implementation is expected in 2018-2027.

2.2 Build Alternative

The Project alternatives development process was completed during the ODOT and City of Portland 2010-2012 N/NE Quadrant and I-5 Broadway/Weidler Interchange planning process. A series of concept alternatives were considered following the definition of Project purpose and need and consideration of a range of transportation-related problems and issues that the Project is intended to address.

In conjunction with the Stakeholder Advisory Committee (SAC) and the public during this multi-year process, ODOT and the City of Portland studied more than 70 design concepts, including the Build Alternative, via public design workshops and extensive agency and stakeholder input. Existing conditions, issues, opportunities, and constraints were reviewed for the highway and the local transportation network. A total of 19 full SAC meetings and 13 subcommittee meetings were held; each was open to the public and provided opportunity for public comment. Another 10 public events were held, with over 100 attendees at the Project open houses providing input on the design process. Of the 70 design concepts, 13 concepts advanced for further study based on SAC, agency, and public input, with six concepts passing into final consideration.

One recommended design concept, the Build Alternative, was selected for development as a result of the final screening and evaluation process. The final I-5 Broadway/Weidler Facility Plan (ODOT 2012a) and recommended design concept, herein referred to as the Build Alternative, were supported by the SAC and unanimously adopted in 2012 by the Oregon Transportation Commission and the Portland City Council.⁵ The features of the Build Alternative are described below.

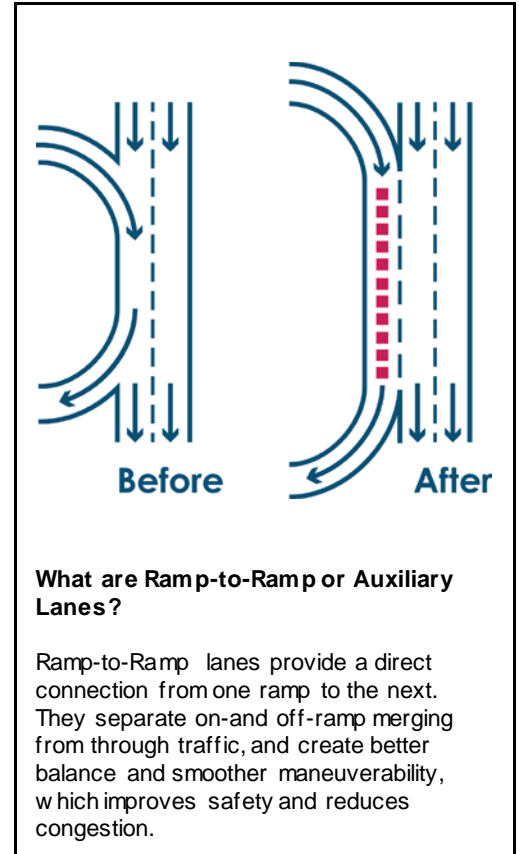
The Build Alternative includes I-5 mainline improvements and multimodal improvements to the surface street network in the vicinity of the Broadway/Weidler interchange. The proposed I-5 mainline improvements include the construction of auxiliary lanes (also referred to as ramp-to-ramp lanes) and full shoulders between I-84 to the south and I-405 to the north, in both the NB and SB directions. See Section 2.2.1 for more detail.

Construction of the I-5 mainline improvements would require the rebuilding of the N/NE Weidler, N/NE Broadway, N Williams, and N Vancouver structures over I-5.

⁵ Resolution No. 36972, adopted by City Council October 25, 2012. Available at: <https://www.portlandoregon.gov/citycode/article/422365>

With the Build Alternative, the existing N/NE Weidler, N/NE Broadway, and N Williams overcrossings would be removed and rebuilt as a single highway cover structure over I-5 (see Section 2.2.2). The existing N Vancouver structure would be removed and rebuilt as a second highway cover, including a new roadway crossing connecting N/NE Hancock and N Dixon Streets. The existing N Flint Avenue structure over I-5 would be removed. The I-5 SB on-ramp at N Wheeler would also be relocated to N/NE Weidler at N Williams, via the new Weidler/Broadway/Williams highway cover. A new bicycle and pedestrian bridge over I-5 would be constructed at NE Clackamas Street, connecting Lloyd with the Rose Quarter (see Section 2.2.4.3).

Surface street improvements are also proposed, including upgrades to existing bicycle and pedestrian facilities and a new center-median bicycle and pedestrian path on N Williams between N/NE Weidler and N/NE Broadway (see Section 2.2.4.4).



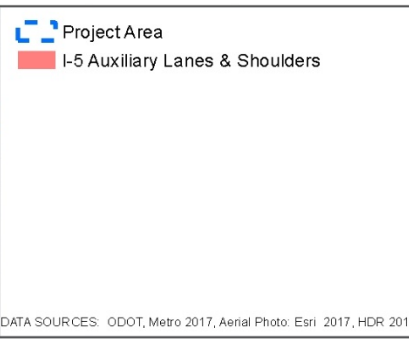
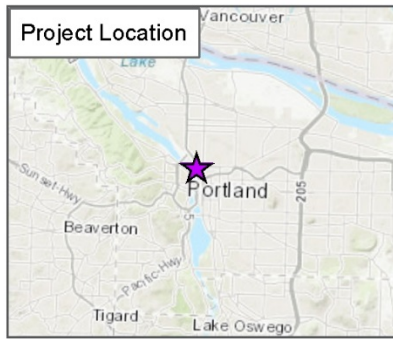
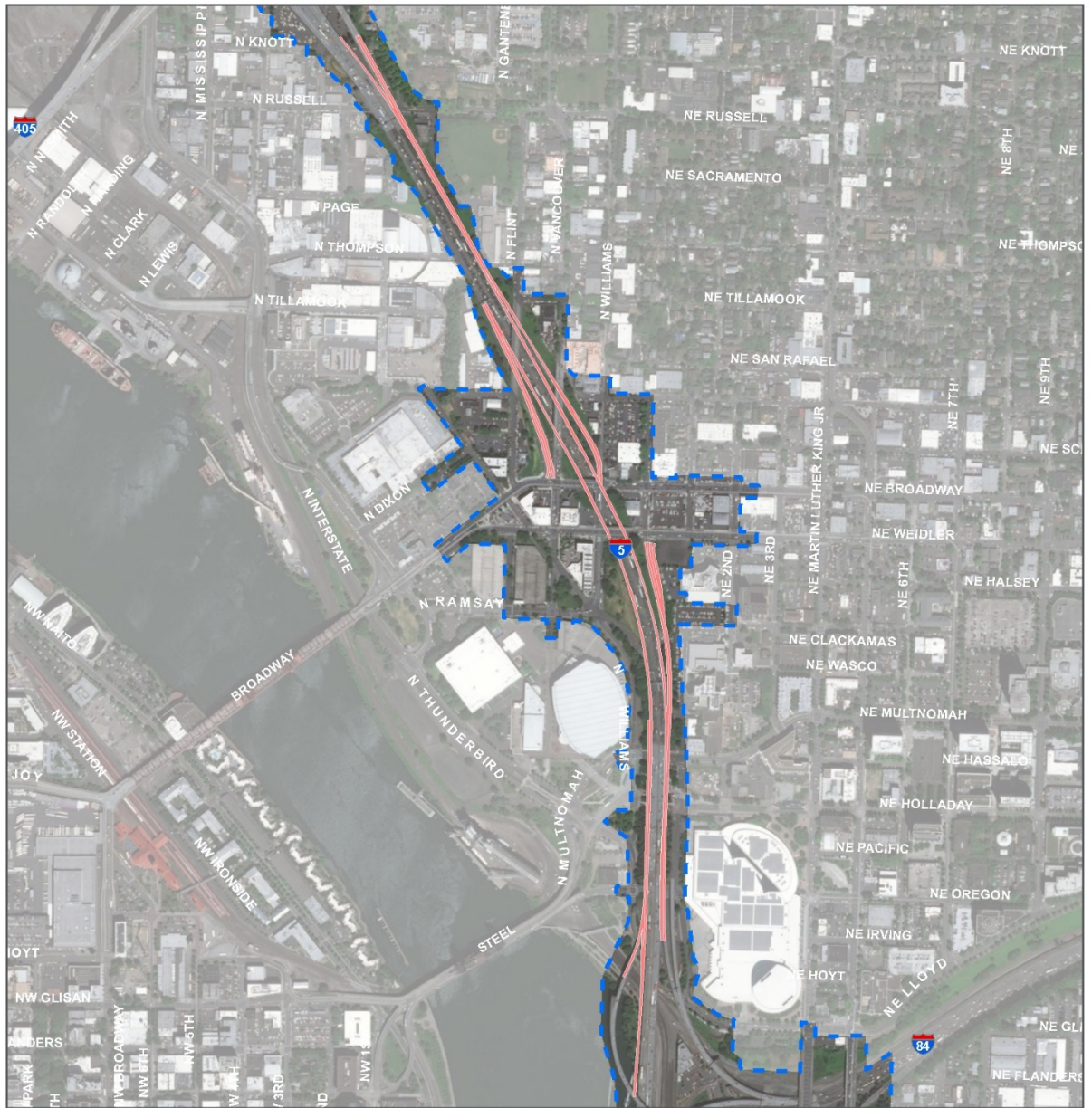
2.2.1 I-5 Mainline Improvements

The Build Alternative would modify I-5 between I-84 and I-405 by adding safety and operational improvements. The Build Alternative would extend the existing auxiliary lanes approximately 4,300 feet in both NB and SB directions and add 12-foot shoulders (both inside and outside) in both directions in the areas where the auxiliary lane would be extended. Figure 2 illustrates the location of the proposed auxiliary lanes. Figure 3 illustrates the auxiliary lane configuration, showing the proposed improvements in relation to the existing conditions. Figure 4 provides a cross section comparison of existing and proposed conditions, including the location of through lanes, auxiliary lanes, and highway shoulders.

A new NB auxiliary lane would be added to connect the I-84 WB on-ramp to the N Greeley off-ramp. The existing auxiliary lane on I-5 NB from the I-84 WB on-ramp to the NE Weidler off-ramp and from the N Broadway on-ramp to the I-405 off-ramp would remain.

The new SB auxiliary lane would extend the existing auxiliary lane that enters I-5 SB from the N Greeley on-ramp. The existing SB auxiliary lane currently ends just south of the N Broadway off-ramp, in the vicinity of the Broadway overcrossing structure.

Figure 2. Auxiliary Lane/Shoulder Improvements



**I-5 ROSE QUARTER
 IMPROVEMENT PROJECT
 AUXILIARY LANE/SHOULDER
 IMPROVEMENTS
 FIGURE 2**

ODOT
 Oregon
 Department
 of Transportation

0 500 1,000 Feet

Figure 3. I-5 Auxiliary (Ramp-to-Ramp) Lanes – Existing Conditions and Proposed Improvements

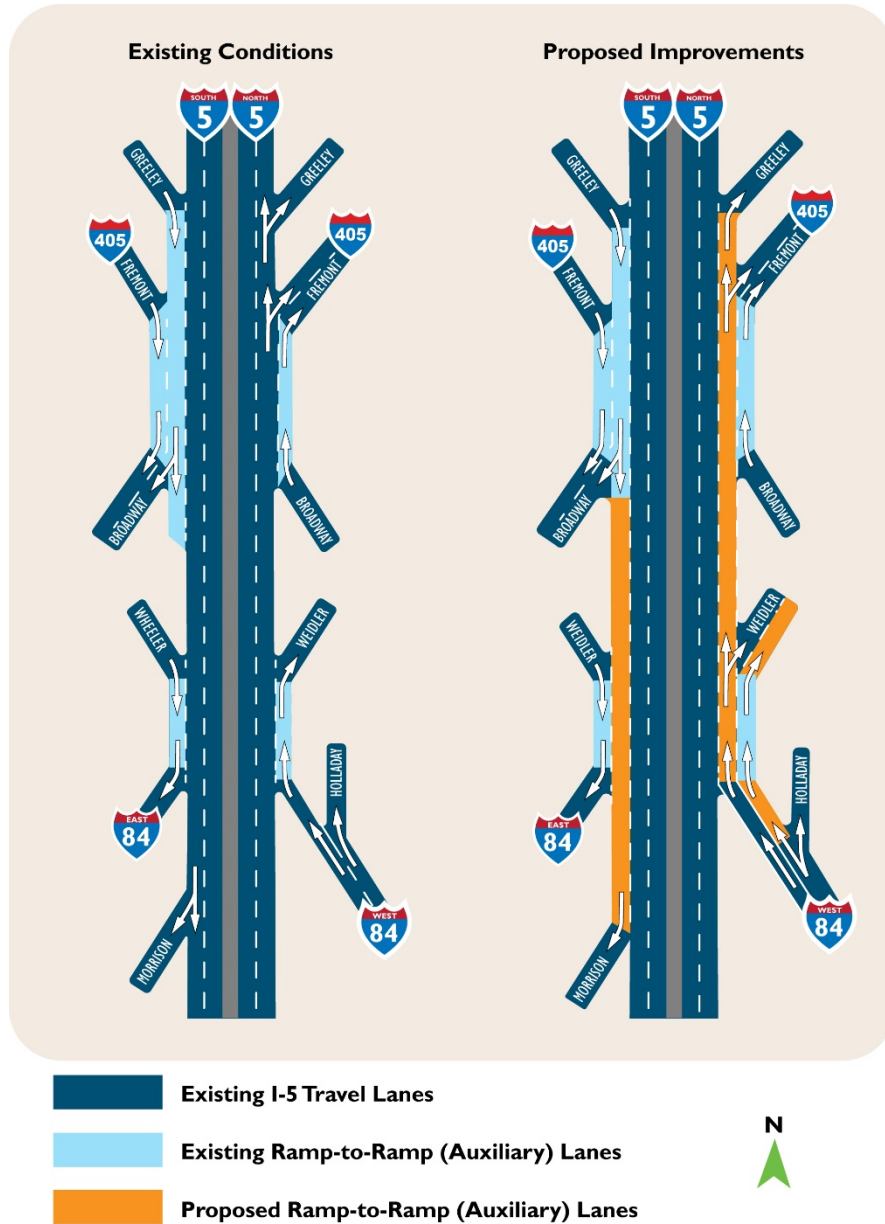
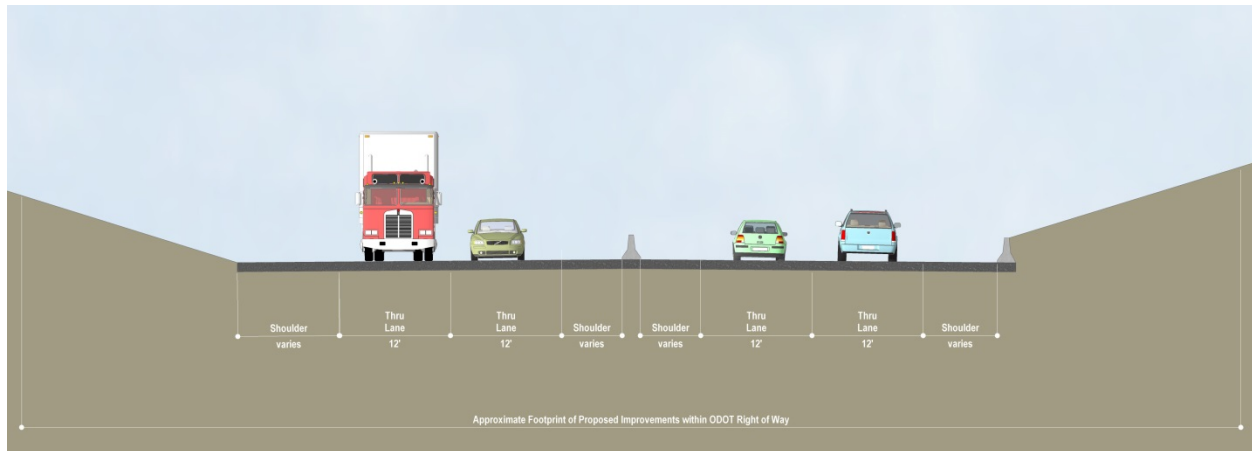
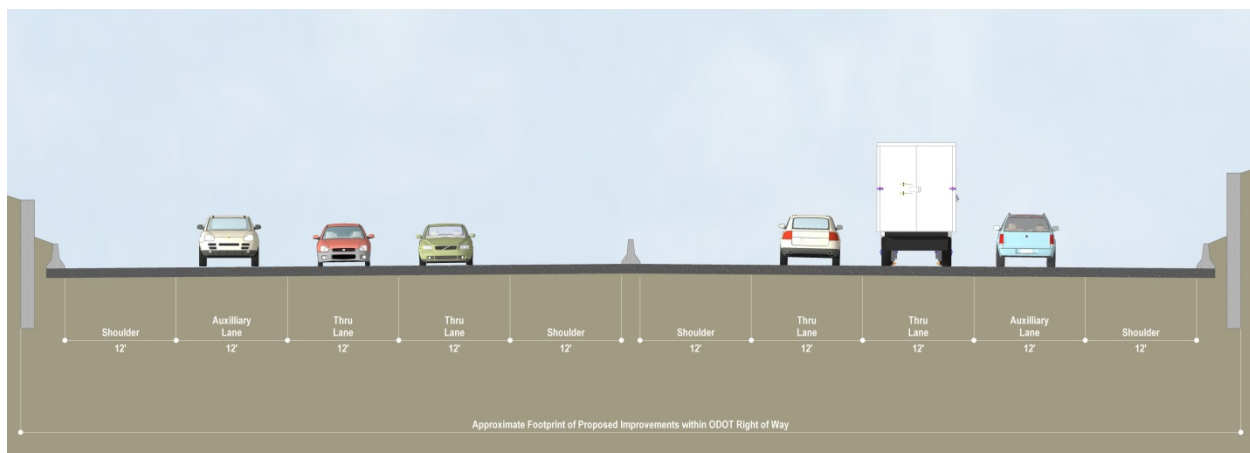


Figure 4. I-5 Cross Section (N/NE Weidler Overcrossing) – Existing Conditions and Proposed Improvements



Existing Lane Configuration



Proposed Lane Configuration

Under the Build Alternative, the SB auxiliary lane would be extended as a continuous auxiliary lane from N Greeley to the Morrison Bridge and the SE Portland/Oregon Museum of Science and Industry off-ramp. Figure 4 presents a representative cross section of I-5 (south of the N/NE Weidler overcrossing within the Broadway/Weidler interchange area), with the proposed auxiliary lanes and shoulder, to provide a comparison with the existing cross section.

The addition of 12-foot shoulders (both inside and outside) in both directions in the areas where the auxiliary lanes would be extended would provide more space to allow vehicles that are stalled or involved in a crash to move out of the travel lanes. New shoulders would also provide space for emergency response vehicles to use to access an incident within or beyond the Project Area.

No new through lanes would be added to I-5 as part of the Build Alternative; I-5 would maintain the existing two through lanes in both the NB and SB directions.

2.2.2 Highway Covers

2.2.2.1 Broadway/Weidler/Williams Highway Cover

To complete the proposed I-5 mainline improvements, the existing structures crossing over I-5 must be removed, including the roads and the columns that support the structures. The Build Alternative would remove the existing N/NE Broadway, N/NE Weidler, and N Williams structures over I-5 to accommodate the auxiliary lane extension and new shoulders described in Section 2.2.1.

The structure replacement would be in the form of the Broadway/Weidler/Williams highway cover (Figure 5). The highway cover would be a wide bridge that spans east-west across I-5, extending from immediately south of N/NE Weidler to immediately north of N/NE Broadway to accommodate passage of the Broadway/Weidler couplet. The highway cover would include design upgrades to make the structure more resilient in the event of an earthquake.

Figure 5. Broadway/Weidler/Williams and Vancouver/Hancock Highway Covers



The highway cover would connect both sides of I-5, reducing the physical barrier of I-5 between neighborhoods to the east and west of the highway while providing additional surface area above I-5. The added surface space would provide an opportunity for new and modern bicycle and pedestrian facilities and public spaces when construction is complete, making the area more connected, walkable, and bike friendly.

2.2.2.2 N Vancouver/N Hancock Highway Cover

The Build Alternative would remove and rebuild the existing N Vancouver structure over I-5 as a highway cover (Figure 5). The Vancouver/Hancock highway cover would be a concrete or steel platform that spans east-west across I-5 and to the north and south of N/NE Hancock. Like the Broadway/Weidler/Williams highway cover, this highway cover would provide additional surface area above I-5. The highway cover would provide an opportunity for public space and a new connection across I-5 for all modes of travel. A new roadway connecting neighborhoods to the east with the Lower Albina area and connecting N/NE Hancock to N Dixon would be added to the Vancouver/Hancock highway cover (see element “A” in Figure 6).

2.2.3 Broadway/Weidler Interchange Improvements

Improvements to the Broadway/Weidler interchange to address connections between I-5, the interchange, and the local street network are described in the following subsections and illustrated in Figure 6.

2.2.3.1 Relocate I-5 Southbound On-Ramp

The I-5 SB on-ramp is currently one block south of N Weidler near where N Wheeler, N Williams, and N Ramsay come together at the north end of the Moda Center. The Build Alternative would remove the N Wheeler on-ramp and relocate the I-5 SB on-ramp north to N Weidler. Figure 6 element “B” illustrates the on-ramp relocation.

2.2.3.2 Modify N Williams between Ramsay and Weidler

The Build Alternative would modify the travel circulation on N Williams between N Ramsay and N Weidler. This one-block segment of N Williams would be closed to through-travel for private motor vehicles and would only be permitted for pedestrians, bicycles, and public transit (buses) (Figures 6 and 7). Private motor vehicle and loading access to the facilities at Madrona Studios would be maintained.

2.2.3.3 Revise Traffic Flow on N Williams between Weidler and Broadway

The Build Alternative would revise the traffic flow on N Williams between N/NE Weidler and N/NE Broadway. For this one-block segment, N Williams would be converted from its current configuration as a two-lane, one-way street in the NB direction with a center NB bike lane to a reverse traffic flow two-way street with a 36-foot-wide median multi-use path for bicycles and pedestrians. These improvements are illustrated in Figures 6 and 7.

Figure 6. Broadway/Weidler Interchange Area Improvements



Figure 7. Conceptual Illustration of Proposed N Williams Multi-Use Path and Revised Traffic Flow



The revised N Williams configuration would be designed as follows:

- Two NB travel lanes along the western side of N Williams to provide access to the I-5 NB on-ramp, through movements NB on N Williams, and left-turn movements onto N Broadway.
- A 36-foot-wide center median with a multi-use path permitted only for bicycles and pedestrians. The median multi-use path would also include landscaping on both the east and west sides of the path.
- Two SB lanes along the eastern side of N Williams to provide access to the I-5 SB on-ramp or left-turn movements onto NE Weidler.

2.2.4 Related Local System Multimodal Improvements

2.2.4.1 New Hancock-Dixon Crossing

A new roadway crossing would be constructed to extend N/NE Hancock west across and over I-5, connecting it to N Dixon (see Figure 6, element “E”). The new crossing would be constructed on the Vancouver/Hancock highway cover and would provide a new east-west crossing over I-5. Traffic calming measures would be incorporated east of the intersection of N/NE Hancock and N Williams to discourage use of NE Hancock by through motor vehicle traffic. Bicycle and pedestrian through travel would be permitted (see Figure 6, element “F”).

2.2.4.2 Removal of N Flint South of N Tillamook and Addition of New Multi-Use Path

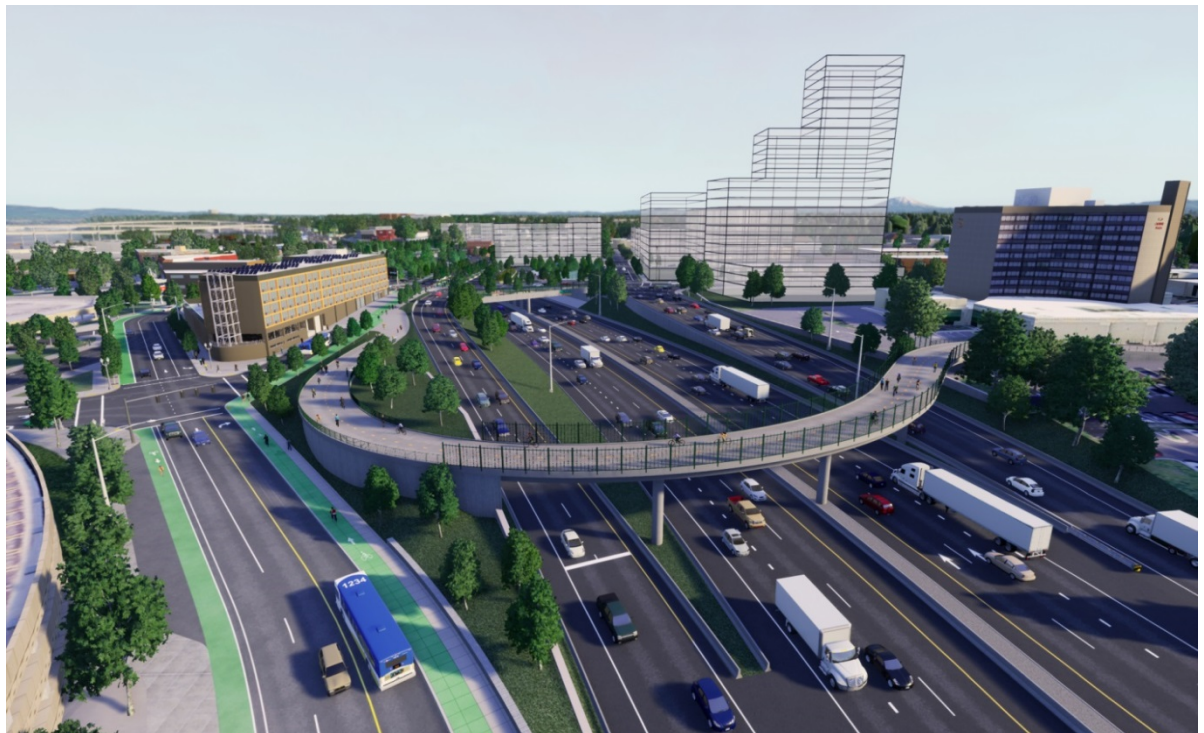
The existing N Flint structure over I-5 would be removed, and N Flint south of N Russell Street would terminate at and connect directly to N Tillamook (see Figure 6, element “G”). The portion of Flint between the existing I-5 overcrossing and Broadway would be closed as a through street for motor vehicles. Driveway access would be maintained on this portion of N Flint to maintain local access.

A new multi-use path would be added between the new Hancock-Dixon crossing and Broadway at a grade of 5 percent or less to provide an additional travel route option for people walking and biking. The new multi-use path would follow existing N Flint alignment between N Hancock and N Broadway (see Figure 6, element “G”).

2.2.4.3 Clackamas Bicycle and Pedestrian Bridge

South of N/NE Weidler, a new pedestrian- and bicycle-only bridge over I-5 would be constructed to connect NE Clackamas Street near NE 2nd Avenue to the N Williams/ N Ramsay area (see Figure 6, element “H,” and Figure 8). The Clackamas bicycle and pedestrian bridge would offer a new connection over I-5 and would provide an alternative route for people walking or riding a bike through the Broadway/Weidler interchange.

Figure 8. Clackamas Bicycle and Pedestrian Crossing



2.2.4.4 Other Local Street, Bicycle, and Pedestrian Improvements

The Build Alternative would include new widened and well-lit sidewalks, Americans with Disabilities Act-accessible ramps, high visibility and marked crosswalks, widened and improved bicycle facilities, and stormwater management on the streets connected to the Broadway/Weidler interchange.⁶

A new two-way cycle track would be implemented on N Williams between N/NE Hancock and N/NE Broadway. A two-way cycle track would allow bicycle movement in both directions and would be physically separated from motor vehicle travel lanes and sidewalks. This two-way cycle track would connect to the median multi-use path on N Williams between N/NE Broadway and N/NE Weidler.

The bicycle lane on N Vancouver would also be upgraded between N Hancock and N Broadway, including a new bicycle jug-handle at the N Vancouver and N Broadway intersection to facilitate right-turn movements for bicycles from N Vancouver to N Broadway.

Existing bicycle facilities on N/NE Broadway and N/NE Weidler within the Project Area would also be upgraded, including replacing the existing bike lanes with wider, separated bicycle lanes. New bicycle and pedestrian connections would also be made between the N Flint/N Tillamook intersection and the new Hancock-Dixon connection.

These improvements would be in addition to the new Clackamas bicycle and pedestrian bridge, upgrades to bicycle and pedestrian facilities on the new Broadway/Weidler/Williams and Vancouver/Hancock highway covers, and new median multi-use path on N Williams between N/NE Broadway and N/NE Weidler described above and illustrated in Figure 6.

⁶ Additional details on which streets are included are available at <http://i5rosequarter.org/local-street-bicycle-and-pedestrian-facilities/>

3 Regulatory Framework

NEPA requires the Federal Highway Administration (FHWA) to conduct analyses for major federal actions that may significantly affect the quality of the human environment. Socio-economic assessments included as part of NEPA reviews focus on the conditions and potential effects on elements of the human environment such as general demographic conditions (e.g., population and income, employment, etc.), public services, business, property values, and regional economic conditions.

4 Methodology and Data Sources

This report follows the FHWA Technical Advisory T6640.8A *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (1987), *Community Impact Assessment: A Quick Reference for Transportation* (1996), and guidance provided on FHWA's community impact assessment website (<https://www.fhwa.dot.gov/livability/cia/index.cfm>) in assessing socio-economic impacts.

4.1 Area of Potential Impact

The Area of Potential Impact (API) for socioeconomics is the Project Area (Figure 1). Because I-5 is an important regional transportation facility, the indirect economic and employment impacts (beneficial and adverse) were considered across the Portland-Vancouver-Hillsboro Metropolitan Statistical Area (MSA),⁷ a broader geographic area than the API.

Existing conditions and direct and indirect impacts, both adverse and beneficial, are assessed for the following socio-economic categories:

- Social environment
- Public services
- Economy
- Employment
- Business activity
- Property values
- Tax revenue

4.2 Resource Identification and Evaluation

Data sources incorporated into this assessment included the following:

- Reconnaissance survey of the API of to observe current conditions that are potentially affected by the proposed action.
- Regional, state, and federal agency demographic and economic data as described in Section 4.3.1 (Social Environment).
- Adopted plans, policies, and reports applicable to the API:

⁶ The Portland-Vancouver-Hillsboro MSA is defined by the US Office of Management and Budget and used by the Census Bureau. It includes the large jurisdictions of Multnomah, Clackamas, and Washington Counties in Oregon and Clark County in Washington, as well as the smaller jurisdictions of Columbia and Yamhill counties, Oregon and Skamania County, Washington.

- City of Portland
 - 2035 Comprehensive Plan (adopted June 2016)
 - Central City 2035 N/NE Quadrant Plan (adopted October 2015)
 - The Portland Plan (adopted April 2012)
 - N/NE Quadrant and Broadway/Weidler Plans Project Environmental Baseline Report (Draft May 2011)
 - City of Portland Economic Opportunities Analysis, Proposed Draft (2015)
- ODOT
 - I-5: Broadway/Weidler Interchange Facility Plan (adopted December 2012)
 - Oregon Freight Plan (2011)
- Metro
 - 2014 Urban Growth Report: Investing in Our Communities 2015–2035, Revised Draft (2014)
 - Urban Growth Management Functional Plan (2012)
- Prosper Portland (previously Portland Development Commission)
 - Economic Development Strategy and Three-Year Status Report (2012)

4.3 Assessment of Impacts

4.3.1 Social Environment

The description of the community setting and geographic barriers and features were obtained from a review of available aerial photography and geographic information system (GIS) information; City of Portland, ODOT, Metro, and Prosper Portland plans noted above; information from stakeholder coordination and public involvement activities; and the Project reconnaissance survey. Assessments of effects on the community setting were qualitative.

Direct impacts to housing based on right of way (ROW) acquisition were used to determine disruptions to cohesion and connections within and among neighborhoods.

The U.S. Census Bureau 2011 to 2015 and 2006 to 2010 American Community Survey (ACS) 5-year estimates provided the following data:

- Population characteristics
 - Total population
 - Gender
 - Age

- Race and ethnicity (i.e., Hispanic/Latino)
- Education attainment
- Disabilities
- Households and housing
 - Number of households and growth rate
 - Household size
 - Number of housing units
 - Occupancy of housing units
 - Housing tenure (owner or renter)
- Income
 - Household income
 - Poverty
- Transportation
 - Means of transportation to work
 - Travel time to work
 - Vehicle availability

Data for the API were compared to Portland-Vancouver-Hillsboro MSA, Multnomah County, and state of Oregon data. This *Socioeconomics Technical Report* evaluates adverse impacts—displacements, disruptions to accessibility, isolation of a community—as well as beneficial impacts of improved accessibility and mobility.

4.3.2 Public Services

Information regarding services, facilities, capacity, and school enrollment was obtained from websites and communication with service providers, where appropriate. This report assesses direct impacts on public services from ROW acquisition, direct impacts on accessibility to and from facilities due to changes in circulation patterns, and indirect impacts on service capacity.

The following services were evaluated:

- Fire
- Police
- Schools
- Religious institutions
- Social services

4.3.3 Economy

The evaluation of economic impacts focused regionally on the Portland-Vancouver-Hillsboro MSA. The most recently published U.S. Department of Commerce Bureau of Economic Analysis gross domestic product and personal income data for the Portland-Vancouver-Hillsboro MSA and state of Oregon were evaluated to describe the local and regional economy.

The report qualitatively evaluates potential impacts and benefits to the overall economy based on how the Project investment would support or implement economic development goals and policies contained in the following regional and local economic plans and designations:

- Central City 2035 N/NE Quadrant Plan (2012)
- City of Portland Comprehensive Plan, Chapter 6: Economic Development
- Oregon Freight Plan (2011)
- Portland Development Commission Economic Development Strategy and Three-Year Status Report (2012)
- Metro 2014 Urban Growth Report, Revised Draft: Investing in our Communities 2015-2035
- Metro Regional Industrial Site Readiness: 2014 Inventory Update
- Metro Urban Growth Management Functional Plan Title 4 (2012)

4.3.4 Employment

Employment data, including number of businesses, average annual employment, and annual payroll by North American Industry Classification System code, were obtained from the Oregon Employment Department (OED) and the U.S. Census Bureau ACS. Data from the Project Area and API were compared to Multnomah County, state, and national data to provide context for the local area. Employment data were reviewed to illustrate employment characteristics of the API. Employment impacts were qualitatively assessed.

4.3.5 Business Activity

Sources used to identify business activities included Prosper Portland (Portland's economic and urban development agency), business association websites, and the Project reconnaissance. The input from business stakeholder outreach provided key information about business types and opportunities in the API. Evaluation of the existing and potential changes to business access was derived from this input from business stakeholders.

This report evaluates direct effects of displacement due to ROW acquisition, effects to access and parking during construction, and short- and long-term effects on regional business related to construction and operations with the No-Build and Build Alternatives.

4.3.6 Property Values and Tax Revenues

Multnomah County Department of County Management, Division of Assessment, Recording, and Taxation, provides market value and property tax assessment by land use and zoning. The most recent available information was obtained from Metro's Regional Land Information System 2017 update.

This report makes a qualitative evaluation of the effect of the proposed alternatives on the tax base due to taxable property removed within the API because of ROW acquisition, potential changes in property value, and potential changes in business activity. The evaluation is qualitative because specific property impacts would not be determined until final design, and market conditions and business activity may change before acquisition occurs.

4.4 Cumulative Impacts

The cumulative impacts analysis considered the Project's impacts combined with other past, present, and reasonably foreseeable future actions that would result in environmental impacts in the Project Area. A list of reasonably foreseeable future actions was developed through consultation with City of Portland and Metro staff; see Appendix A. This list included any permitted public and private projects within the Project Area and projects that are in the permit application process. The cumulative impact assessment qualitatively assessed the magnitude of impacts expected from reasonably foreseeable future actions in combination with anticipated Project impacts. This assessment also identified the contribution of the Project to overall cumulative impacts.

5 Affected Environment

Section 5 describes the existing social environment, including population characteristics, public services, economy, employment, business activity, and property values and tax revenues.

5.1 Population Characteristics

This section describes population characteristics within the API, including demographics, neighborhoods, education and income, housing and households, and transportation.

5.1.1 Demographics

ACS census data provided the most comprehensive and current demographics estimates (U.S. Census 2010, 2015). The ACS 2011-2015 demographics data (referred to herein as “2015”) were compared to ACS 2006-2010 data (referred to herein as “2010”) for the same demographics categories to characterize changes in the API between 2010 and 2015. Because the API is within Census Tract 23.03, and the portions of the API that extend north and south of the API include only ODOT ROW, data from that tract are considered representative of the demographic characteristics within the API (see Figure 9). Table 3 presents a summary of population, gender, and age for the Project Area (i.e., Census tract 23.03) and the Portland-Vancouver-Hillsboro Portland MSA, as a regional point of comparison for characteristics of the Project Area. Based on these estimates, the population in the API increased by about 14 percent, and the population in the MSA increased by about 7 percent from 2010 and 2015. The population of both the API and the MSA generally became older, with increases in people over 65 and decreases in very young children under 5 years old.

Figure 9. Census Tracts in the Vicinity of the Area of Potential Impact

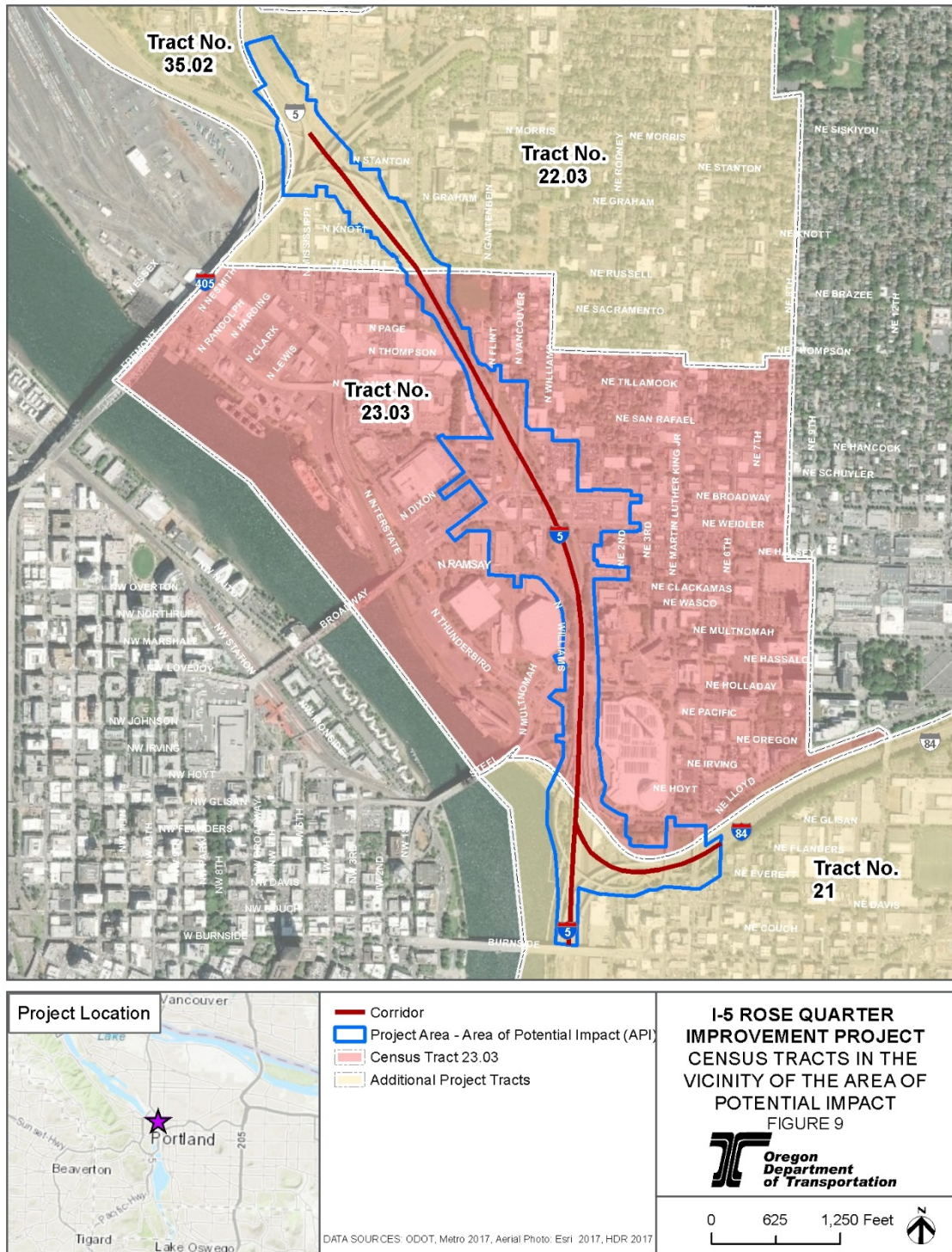




Table 3. Population: Gender and Age

Population Characteristic	API 2010 Population/ Percentage	API 2015 Population/ Percentage	MSA 2010 Population/ Percentage	MSA 2015 Population/ Percentage
Total Population	1,842	2,099	2,170,801	2,320,323
Total Female	906 / 49.2%	1,112 / 53.0%	1,098,649 / 50.6%	1,174,362 / 50.6%
Total Male	936 / 50.8%	987 / 47.0%	1,072,152 / 49.4%	1,145,961 / 49.4%
Age under 5	78 / 4.2%	56 / 2.7%	143,343 / 6.6%	142,276 / 6.1%
Age 5 to 20	185 / 10.0%	102 / 4.9%	458,231 / 21.1%	467,664 / 20.2%
Age 21 to 64	1,196 / 64.9%	1,520 / 72.4%	1,331,820 / 61.4%	1,414,629 / 61.0%
Age 65 and over	383 / 20.8%	421 / 20.1%	237,407 / 10.9%	295,754 / 12.7%

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

Table 4 presents race and Hispanic/Latino characteristics of the API and MSA. The percentages of non-white and Hispanic/Latino populations increased between 2010 to 2015 in both the API and the MSA.

5.1.2 Neighborhoods

The API is largely within the Eliot and Boise neighborhoods and includes part of or is adjacent to the Lloyd, Kerns, and Buckman neighborhoods (URS 2011). Neighborhood associations are officially designated by the City of Portland as the recognized organization for a specific geographic area. Each neighborhood association is governed by citizen-written bylaws that determine boundaries, officers, and work to reflect the issues and needs of its members (ONI 2018). Each neighborhood includes mixes of residential, commercial, industrial, and recreation uses.

5.1.3 Education and Income

More than 86 percent of API residents have achieved at least a high school education (U.S. Census Bureau 2015).

Income and poverty information is summarized in Table 5. The mean income of households in the API decreased, and households below the poverty level increased by 86 percent between 2010 and 2015, in contrast with the MSA, where household income increased and households below the poverty level increased only slightly (by about 1 percent) during that time period.

Table 4. Population: Hispanic/Latino and Race

Population Characteristic	API 2010 Population/Percentage	API 2015 Population/Percentage	MSA 2010 Population/Percentage	MSA 2015 Population/Percentage
Total	1,842	2,099	2,170,801	2,320,323
Not Hispanic/Latino	1,833 / 99.5%	2,011 / 95.8%	1,946,495 / 89.7%	2,057,476 / 88.7%
Hispanic/Latino	9 / 0.5%	88 / 4.2%	224,306 / 10.3%	262,847 / 11.3%
White	1,421 / 77.1%	1,459 / 71.9%	1,793,290 / 82.6%	1,901,910 / 82.0%
Black/African American	170 / 9.2%	270 / 12.9%	61,304 / 2.8%	65,734 / 2.8%
American Indian/Alaska Native	23 / 1.2%	8 / 0.4%	24,878 / 1.1%	18,056 / 0.8%
Asian	80 / 4.3%	121 / 5.8%	121,476 / 5.6%	141,079 / 6.1%
Native Hawaiian/Pacific Islander	0 / 0%	0 / 0%	9,141 / 0.4%	12,282 / 0.5%
Some other race	8 / 0.4%	29 / 1.4%	79,411 / 3.7%	80,254 / 3.5%
Two or more races	140 / 7.6%	162 / 7.7%	81,301 / 3.7%	101,008 / 4.4%

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

Table 5. Household Income and Poverty

Household Income ¹	API 2010	API 2015	MSA 2010	MSA 2015
Median Income	\$35,096	\$38,450	\$56,275	\$60,286
Mean Income	\$52,272	\$46,764	\$73,217	\$79,370
Households below Poverty (percent)	14.1	26.6	11.2	12.3

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

¹Income expressed in current year dollars (2010 and 2015).

5.1.4 Housing and Households

The number of households increased in the MSA from 850,849 in 2010 to 886,763 in 2015. The percentage of renters in the MSA also increased from 2010 to 2015, rising from 36.6 percent to 39.3 percent. The API has a much higher proportion of renters in comparison to the MSA and saw an increase of renters between 2010 and 2015.



(82.0 percent in 2010 and 85.9 percent in 2015). Table 6 presents housing units and occupancy figures for API and MSA.

Table 6. Housing Units and Occupancy

Housing Unit Type	API 2010 Units/ Percentage	API 2015 Units/ Percentage	MSA 2010 Units/ Percentage	MSA 2015 Units/ Percentage
Total	1,091	1,279	850,849	886,763
Owner-occupied	196 / 18.0%	180 / 14.1%	539,375 / 63.4%	538,377 / 60.7%
Renter-occupied	895 / 82.0%	1,099 / 85.9%	311,474 / 36.6%	348,386 / 39.3%

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

5.1.5 Transportation

Table 7 presents methods of travel to work for workers in the API and MSA. The API has substantially lower percentages of workers that commute alone than the MSA and substantially higher percentages of workers who commute by public transportation, bicycle, and walking than the MSA. Table 8 presents mean travel time to work for commuters in the API and MSA; travel times increased in both the API and MSA between 2010 and 2015.

Table 7. Means of Travel to Work, Workers Age 16 and Older

Means of Travel to Work	API 2010	API 2015	MSA 2010	MSA 2015
Drove alone	45.2%	34.00%	71.4%	70.5%
Carpooled	7.7%	5.20%	10.1%	9.8%
Public transportation	25.2%	19.70%	6.2%	6.4%
Bicycle	5.4%	13.10%	2.0%	2.4%
Walked	11.1%	19.00%	3.3%	3.5%
Motorcycle, taxicab, or other means	0.0%	2.40%	1.0%	1.0%
Work at home	5.5%	6.70%	6.0%	6.4%

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

Table 8. Travel Time to Work, Workers Age 16 and Older

Travel Time	API 2010	API 2015	MSA 2010	MSA 2015
Less than 10 minutes	6.3%	18.0%	12.2%	11.1%
10 to 14 minutes	28.8%	12.2%	13.4%	13.2%
15 to 19 minutes	15.8%	17.8%	15.4%	15.6%
20 to 24 minutes	12.5%	21.8%	16.5%	15.8%
25 to 29 minutes	6.1%	2.6%	7.1%	7.3%
30 to 34 minutes	13.4%	7.9%	14.7%	14.5%
35 to 44 minutes	8.7%	4.2%	7.2%	7.6%
45 to 59 minutes	4.7%	9.7%	7.3%	8.2%
60 or more minutes	3.7%	5.9%	6.1%	6.7%
Mean travel time to work (minutes)	21.4	23.4	24.8	25.7

Notes: API = Area of Potential Impact; MSA = Metropolitan Statistical Area

5.2 Public Services

The API is located within Multnomah County, Oregon. Figure 10 illustrates the public services (described in the following sections) that are located within or near the API.

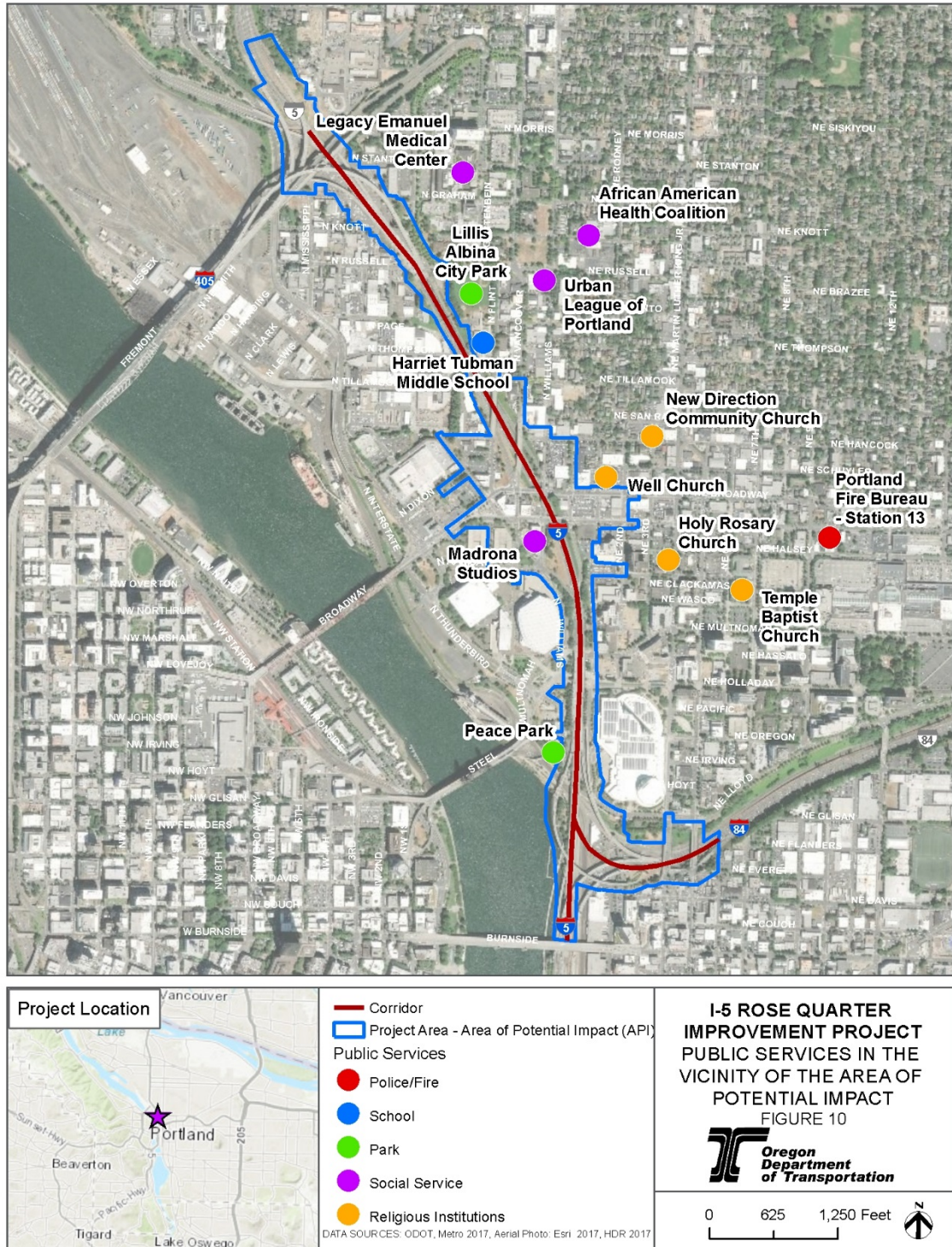
5.2.1 Police/Fire & Rescue

The Portland Police Bureau and the Oregon State Police Patrol Division provide police services in the API. The API is located in the Portland Police Bureau's North Precinct, which is located outside of the API at 449 NE Emerson Street (northeast of the API). There are no police stations within the API.

Fire and rescue services in the API are provided by the Portland Fire Bureau. The majority of the API is served by Station 13 at 926 NE Weidler; the northern portion of the API (north of the I-5 and I-405 interchange) is in the Station 24 (4515 N Maryland Street) service area. There are no fire stations within the API.

Legacy Emanuel Medical Center is a large regional medical center located just north of the API at 2801 N Gantenbein Avenue. It provides emergency care service and a wide variety of medical specialty services.

Figure 10. Public Services in the Vicinity of the Area of Potential Impact



5.2.2 Schools

Portland Public Schools provides public kindergarten through high school education services in the City of Portland. The majority of the API (i.e., the area generally north of Broadway) is within the boundary served by Boise-Eliot/Humbolt Elementary School (kindergarten through 5th grade), Harriet Tubman Middle School (6th through 8th grades), and Jefferson and Grant High Schools (9th through 12th grades). The area south of Weidler is served by Buckman Elementary School, Hosford Middle School, and Cleveland High School.

In 2017, the Board of Directors of Portland Public Schools approved a policy to provide more equitable and comprehensive middle grade education services to students in historically underserved communities in North and Northeast Portland. As a result of this policy, Harriet Tubman Middle School (located at 2231 N Flint, within the API) will open for the 2018-2019 school year (PPS 2018).

5.2.3 Parks

Lillis Albina City Park is a community park administered by Portland Parks and Recreation located in the northern portion of the API between I-5 and N Flint; it includes baseball and soccer fields and a playground. Peace Memorial Park is a public open space within the transportation ROW at the intersection of NE Oregon Street and N Interstate. The API includes the Willamette River Greenway Trail, beginning where NE Lloyd Boulevard crosses I-5 and continuing northward within the N Interstate ROW. Detailed information on parks and trails in the API (including planned facilities and effects of the Build Alternative) is presented in the *Section 4(f) Technical Report* (ODOT 2019a).

5.2.4 Social Services

Multnomah County Department of County Human Services provides social services support in Portland and Multnomah County, including the following:

- Aging, disability, and veterans' services
- Intellectual and developmental disabilities services
- Youth and family services

Public service network provider locations near the API include the Urban League of Portland located at 10 N Russell Street and the African American Health Coalition located at 77 NE Knott Street.

As documented in the *Environmental Justice Technical Report* (ODOT 2019b), low-income multifamily housing is provided in the API at Madrona Studios apartments at 10 N Weidler, a Central City Concern (a non-profit social service provider) property.

5.2.5 Churches and Religious Institutions

Churches and religious institutions within and close to the API include Well Church, New Direction Community Church, Holy Rosary Church, and Temple Baptist Church.

5.3 Economy

The economy of both Oregon and the Portland region demonstrated steady moderate growth since 2010, with generally falling unemployment and growing gross domestic product (GDP) and per capita income.

Regional GDP is a measure of economic activity of the API and MSA. The regional GDP by metropolitan area is the measure of the market value of all final goods and services produced within a metropolitan area in a particular period of time (i.e., the metropolitan area counterpart of the state or national GDP that measures overall production of states and the United States, respectively).⁸ The most recent (2016) annual regional GDP for the Portland-Vancouver-Hillsboro MSA was approximately \$164.5 billion; the 2016 annual state GDP for Oregon was approximately \$228.9 billion (BEA 2018). Total 2016 per capita personal income in 2016 was \$50,489 (BEA 2018).

Per capita income is often used as an indicator of the economic well-being of a region. Per capita personal income for Oregon grew by 4.1 percent annually between 2010 and 2016 and grew 4.2 percent annually for the MSA during that same period (BEA 2018).

The API includes the two Central City districts evaluated in the N/NE Quadrant Plan (City of Portland et al. 2012) that contribute to the local and regional economies: Lloyd and Lower Albina. The districts differ in general urban characters, development patterns, and land uses. The Lower Albina District, located west of I-5 and north of NE Broadway, is primarily industrial with a working harbor and freight rail facilities and a small mixed-use historic area along N Russell. Lloyd, located south of NE Broadway/NE Schuyler and north of I-84, is characterized by several large region-serving facilities, including the Moda Center, Oregon Convention Center, Lloyd Center shopping mall, and large office buildings (City of Portland et al. 2012).

The N/NE Quadrant and I-5 Broadway/Weidler Plans were developed collaboratively by ODOT and the City of Portland and were completed in 2012. The plans provide detailed planning for the development of the Lower Albina and Lloyd districts that includes land use, urban design, and transportation plans to help direct and manage growth for Lloyd and Lower Albina. As noted in Section 1.4, the goals of the plans include the following specifically related to the economic activity and development of the API:

- A diverse mix of commercial, cultural, entertainment, industrial, recreational, and residential uses, including affordable housing
- Infrastructure that supports economic development
- Equitable access to community amenities and economic opportunities

⁸ GDP is estimated at a regional level and not available for a small geographical unit like the Project Area.

5.4 Employment

The estimated total employment in the MSA was 1,520,613 jobs. Unemployment rates in the MSA have decreased steadily since 2010, from 10.2 percent in 2010 to 3.8 percent in 2017 (OED 2018). The largest private employment sectors in 2016 included the following:

- Trade, transportation, and utilities
- Professional and business services
- Education and health services
- Health care and social assistance
- Manufacturing
- Leisure and hospitality
- Retail

Employment in these industries represents nearly 80 percent of private-sector employment in the MSA.

The API includes portions of the Lloyd and Lower Albina districts, which are employment centers where more than 20,000 jobs were based in 2010 (City of Portland et al. 2012).

5.5 Business Activity

A variety of businesses are located along the main transportation corridors in the API, including retail, service, and industrial businesses. Business districts within and adjacent to the API include the Lloyd, Soul (North/Northeast), Mississippi, NE Broadway, and Williams districts (Venture Portland 2018).

The API also includes the region's two main sports and entertainment arenas: the Moda Center and Veterans Memorial Coliseum event centers. The Moda Center has a seating capacity of 20,000, and the Veterans Memorial Coliseum has a capacity of 12,000. Both arenas host regular sporting events (i.e., Portland Trail Blazers basketball games at Moda Center, Portland Winter Hawks hockey games at Veterans Memorial Coliseum), concerts, and other entertainment events.

The Metro Urban Growth Management Functional Plan (Metro 2016) implements regional goals and objectives by coordinating, recommending, and requiring local jurisdictions' comprehensive plans and implementing ordinances to ensure adequate employment and industrial lands in the Portland metropolitan area. The plan designates the portion of the API west of I-5, north of NE Broadway, east of I-5, and west of N Kerby Avenue as an industrial area. This designation means that City of Portland plans and policies should preserve and promote existing industrial uses in the area. The City of Portland Central City 2035 Plan includes mixed-use areas that support these goals (see the *Land Use Technical Report* [ODOT 2019c] for additional information on adopted plans and policies).

Prosper Portland is the urban renewal agency that manages Urban Renewal Areas (URAs) in Portland. Urban renewal is a state-authorized redevelopment and finance program designed to help communities improve areas that are physically deteriorated, experiencing economic stagnation, unsafe, or poorly planned. There are two URAs in the API:

- The Oregon Convention Center URA (OCCURA) is 410 acres and bounded by the Willamette River on the west, NE Broadway and NE Schuyler on the north, NE 16th Street on the east, and I-84 on the south. It includes the Rose Quarter, Oregon Convention Center, and Lloyd. The primary objectives of the OCCURA are to build employment, tourism, and housing opportunities in the district; capitalize on major public and private investments; and make transportation and related improvements key to development of the area (Prosper Portland 2018).
- The Interstate Corridor URA (ICURA) is 3,990 acres and is located along the I-5 corridor north of the OCCURA, bounded roughly by N Interstate on the west and NE Martin Luther King Jr. Boulevard on the east and extending north to the Columbia River. The ICURA has \$32 million in tax increment funds (TIF) budgeted for economic and redevelopment purposes between 2016 and 2021 (when the urban renewal area expires). The North/Northeast Community Development Initiative has the goal of determining how to spend remaining uncommitted TIF resources. In January 2017, the Portland City Council adopted the North/Northeast Community Development Initiative Action Plan with a goal to use the remaining TIF resources to foster economic prosperity among communities and individuals who have not fully participated in or benefited from economic opportunities in the Interstate Corridor URA.

I-5 through the API and the MSA is a critical transportation corridor for freight and other business-related transportation and activity. I-5 is critical to the business activity that takes place in the MSA, including trade and industrial activities associated with the ports of Portland and Vancouver and interstate commerce. I-5 is a critical component of the regional transportation system that includes local roads, transit, active transportation facilities, railroad, aviation, and marine transportation facilities.

5.6 Property Values and Tax Revenues

Assessed 2017 value for all taxable land within the API is approximately \$921 million; of that, commercial property represents the largest components at approximately \$831 million (Corporate GIS and Portland Bureau of Technology Services 2018). Tax revenues from commercial properties within the API in 2017 were approximately \$23 million. Table 9 provides a summary of API property value and tax revenue by general land use types.

Table 9. Property Value and Tax Assessment within the API

Land Use	Area (acres)	2017 Assessed Value	2017 Property Tax
Commercial	84.0	\$831,174,850	\$20,779,371
Multi-family residential	43.8	\$28,644,020	\$716,100
Single-family residential	0.2	\$1,248,500	\$31,212
Other	16.7	\$60,293,550	\$1,507,338

Note: API = Area of Potential Impact

6 Environmental Consequences

Direct effects are caused by an action and occur at the same time and place. Indirect effects are caused by the action but are removed in time or location. The approach for assessing effects of the No-Build and Build Alternatives to each socio-economic element of this assessment is described in Section 4. In general, the assessment of direct effects was focused on the API and the assessment of indirect effects focused on the larger MSA.

6.1 No-Build Alternative

As described in Section 2.1, the No-Build Alternative consists of existing conditions and other planned and funded transportation improvement projects that would be completed in and around the API by 2045.

6.1.1 Direct Impacts

Under the No-Build Alternative, the proposed I-5 mainline and Broadway/Weidler interchange area improvements would not be constructed, and the current road system would remain in place. Actions implemented under the No-Build Alternative would have minor effects on population characteristics, public services, and employment in the API. When constructed, I-5 and associated transportation facilities created a substantial barrier between the areas to the east and west of the highway. While the No-Build Alternative would not create any new barriers to community cohesion and connectivity, historic isolation would remain. The No-Build Alternative would not isolate or disrupt existing communities and would not affect current accessibility of public services. Development of limited infrastructure, along with commercial and residential redevelopment, would create short-term benefits from factors like construction jobs and expenditures. No direct effects to public services or business activity in the API are likely to result from the No-Build Alternative.

Many factors affect the socio-economic conditions of the larger MSA; direct effects of the No-Build Alternative in the MSA would be minor. As noted in Section 2.1, future conditions on I-5 would continue to deteriorate in terms of safety, delay, and levels of service, which would adversely affect the movement of people and goods through the API. The No-Build Alternative would be unlikely to directly affect regional conditions and trends with respect to social environment, public services, economy, and employment.

6.1.2 Indirect Impacts

As noted in Section 2.1, future conditions on I-5 would deteriorate and adversely impact transportation conditions on the surrounding transportation systems. Congestion and delays could adversely impact public services and business activities in the API. The trend of increased delay and congestion on I-5 and the

regional transportation network that would occur under the No-Build Alternative would have an adverse indirect effect on regional economic conditions; economic development goals for the API and vicinity would not be met due to congestion on I-5, in the Broadway/Weidler interchange area, and on the local transportation system. Increased congestion would adversely impact the regional economy and businesses by delaying the movement of goods and people through the I-5 corridor and on the regional transportation network.

6.2 Build Alternative

Under the Build Alternative, the Project's proposed roadway, bicycle, and pedestrian improvements would be constructed, as described in Section 2.2.

6.2.1 Short-Term (Construction) Impacts

The Build Alternative would result in temporary impacts in the API related to construction activities. Adverse short-term effects on both the API and MSA during construction include construction-related impacts (such as noise and utilities impacts), delays on I-5 and the local transportation system, diversion of traffic, and potential limitations of access to local land uses. In turn, these effects would have temporary adverse effects on neighborhoods, public services, and businesses in the API. The Build Alternative would also have short-term beneficial socio-economic impacts related to increased construction employment and spending on procurement of construction materials and equipment.

Portions of two parcels abutting N Flint would be used as temporary easements during construction of the N Dixon extension. Both parcels are currently used as parking lots. In addition, the full block along the Broadway/Weidler couplet bounded by NE Victoria and NE 1st would be acquired and used as a construction staging area. This block consists of five parcels under a single private ownership and is currently used as a commercial parking lot. Once construction is completed, these parcels (or the portions of these parcels not acquired for permanent ROW) may return to the existing or other permissible uses or be sold and developed by a future owner (see the *Right of Way Technical Report* [ODOT 2019d] for additional information on short-term ROW impacts).

Construction best management practices would be implemented to minimize adverse socio-economic effects of construction. Construction activities would comply with *Oregon Standard Specifications for Construction* (ODOT 2019e) as a standard operating procedure. Construction staging, material sources, and disposal locations would be determined by the construction contractors in accordance with applicable laws and requirements. Temporary traffic management plans would minimize construction impacts on I-5 operations. Traffic control and access management plans to minimize construction impacts on businesses, residents, public services would be prepared by the construction contractor(s), approved by ODOT and/or City of Portland, and implemented by the contractor(s). Traffic and access management plans would be compliant with applicable special provisions of ODOT and City of

Portland specifications, as applicable, and would address all modes of transportation, including road, bicycle, pedestrian, and public transit. ODOT would coordinate with TriMet and Portland Streetcar to follow standard procedures regarding temporary impacts to transit services. This coordination would follow standard communication procedures for temporary transit stop closures or relocations, schedule changes, and route diversions that would be required during construction.

6.2.2 Long-Term and Operational Direct Impacts

6.2.2.1 Social Environment

The Build Alternative would improve safety and operations on I-5 and in the Broadway/Weidler interchange area. It would not divide or isolate existing neighborhoods; rather, it would enhance the existing east-west connectivity and community cohesion by providing new multimodal connections in the form of the Hancock-Dixon highway cover and Clackamas bicycle/pedestrian overcrossing of I-5. The Build Alternative would revise localized travel patterns in the Broadway/Weidler interchange area and provide new and enhanced active transportation facilities. The Build Alternative would have positive urban design effects in the API by reducing the physical and visual barrier I-5 presents to the surrounding urban area and providing open space and opportunities for greater continuity of the surrounding urban forms. The Build Alternative is consistent with planned land use and would support growth consistent with the planned land use (see the *Land Use Technical Report* [ODOT 2019c] for additional information on the Build Alternative's consistency with and support of adopted plans and policies). Therefore, the Build Alternative would not have a long-term direct effect on population, demographic, housing, or income in the API or the MSA.

6.2.2.2 Public Services

The Build Alternative would have no direct effects on public services facilities in the API. The Build Alternative would have a long-term beneficial effect on police, fire, and rescue services by reducing delays and crashes on I-5 and in the Broadway/Weidler interchange area (for all modes). The Build Alternative would not have direct operational impacts on schools or other public facilities or the provision of social services. While the Build Alternative would help address transportation demand due to continued population and economic growth in the API and MSA, it would not create a demand for public services beyond what is planned for in the adopted and proposed changes in the comprehensive plans and zoning.

6.2.2.3 Economy

The Build Alternative would have long-term direct beneficial economic impact by reducing congestion on I-5 and in the Broadway/Weidler interchange area. I-5 is a critical corridor for the movement of people and freight in the Portland region (as represented by the MSA), and the Broadway/Weidler interchange is an important link

between I-5 and the local transportation network. The Build Alternative is consistent with economic development goals for the API, the City of Portland, and the Portland region; it is consistent with adopted plans and policies, including the N/NE Quadrant Plan (part of the Central City 2035 Plan which is, in turn, part of the City's Comprehensive Plan), Metro's Urban Growth Management Functional Plan (Title V), and the Oregon Freight Plan.

While the local and regional economies are influenced by many local, regional, and national factors, reducing congestion and delay on I-5 and in the Broadway/Weidler interchange area would contribute to the overall economic well-being of the Portland region.

6.2.2.4 Employment

The Build Alternative is anticipated to require the relocation of four commercial or service-related businesses, which would reduce the number of jobs in the API if displaced businesses cannot be relocated in the API. The exact amount of property acquisition for the Project would be determined during final design and would be subject to negotiations between ODOT and affected property owners. Because of privacy laws, the specific impacts on business employment and payroll cannot be disclosed. Oregon Revised Statute 657.665 provides "all information in the records of the Oregon Employment Department (OED) pertaining to the administration of the unemployment insurance, employment service and labor market information programs is confidential and for the exclusive use and information of the Director of the Employment Department." The OED Commitment to Confidentiality Level 1 guideline that applies to all data from the private sector is to "never publish, share, or discuss employment or other data for a specific employer." While the proposed improvements may reduce the number of jobs in the API due to displacement, it is not expected that employment capacity would be diminished nor would business development be precluded in the future.

6.2.2.5 Business Activity

The Build Alternative is consistent with the goals of adopted economic development plans and policies, and as such, would support economic development in the API.

As noted above, the Build Alternative would displace four commercial or service-related businesses: a gas station/convenience store at 15 NE Broadway, a retail paint store at 35 NE Weidler, a real estate/mortgage office also at 35 NE Weidler, and a day care center at 1730 N Flint. The Build Alternative would improve existing transportation facilities, both on interstate highways and local roads in the area influenced by the interchange with the highway. It would not divide or isolate any existing business districts in the API or change the character of business districts. Pedestrian and bicycle facility revisions and enhancements may contribute to benefiting the overall business environment in the API.

6.2.2.6 Property Value and Tax Revenue

Proposed ROW acquisition within the API would affect tax revenues because privately owned, taxable property would be converted to publicly owned, non-taxable property. Additional partial acquisitions along existing ROWs are anticipated as well. Details of the anticipated Build Alternative ROW acquisition are presented in the *Right of Way Technical Report* (ODOT 2019d).

As noted in Section 6.2.2.4, the exact amount of property acquisition for the Project would be determined during final design and would be subject to negotiations between ODOT and affected property owners. No residential relocations are proposed. The Build Alternative is anticipated to take part or all of 23 privately held tax lots, including four existing businesses. The 2017 assessed value of businesses anticipated to be acquired is \$2,024,510, with property tax revenues from those properties totaling \$50,638. Proposed acquisitions would represent approximately 0.2 percent of the assessed value of all taxable commercial land within the API and would not represent a substantial change in overall property tax revenues generated in the API. Property values could increase slightly because of improved pedestrian and bicycle accessibility, but the offset effect cannot be measured.

6.2.3 Long-Term and Operational Indirect Impacts

Long-term indirect effects of the Build Alternative would be the same as those experienced throughout the API. As noted in Section 6.2.2, the improvements in safety and reductions in congestion and delays on I-5 (compared to the No-Build Alternative) that would result from the Build Alternative would have an indirect beneficial effect on the regional economy by contributing to the movement of goods and people both throughout the region and the west coast, indirectly contributing to the overall economic well-being of the Portland region.

6.3 Cumulative Effects

Cumulative impacts are environmental effects that result from the incremental effect of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (Title 40 Code of Federal Regulations 1508.7).

The analysis of cumulative impacts involves a series of steps conducted in the following order:

- Identify the resource topics that could potentially experience direct or indirect impacts from construction and operation of the proposed action.
- Define the geographic area (spatial boundary) within which cumulative impacts will be assessed, as well as the timeframe (temporal boundary) over which other past, present, and reasonably foreseeable future actions will be considered.

- Describe the current status or condition of the resource being analyzed, as well as its historic condition (prior to any notable change) and indicate whether the status or condition of the resource is improving, stable, or in decline.
- Identify other actions or projects that are reasonably likely to occur within the area of potential impact during the established timeframe and assess whether they could positively or negatively affect the resource being analyzed.
- Describe the combined effect on the resource being analyzed when the direct and indirect impacts of the project are combined with the impacts of other actions or projects assumed to occur within the same geographic area during the established time frame.

6.3.1 Spatial and Temporal Boundaries

The geographic area used for the cumulative impact analysis is the same as the API described in Section 4.1.

The time frame for the cumulative impact analysis extends from the beginning of large-scale urban development in and around the API to 2045, the horizon year for the analysis of transportation system changes.

6.3.2 Past, Present, and Reasonably Foreseeable Future Actions

The past, present, and reasonably foreseeable future actions that were considered in assessing cumulative effects are provided in the following subsections.

6.3.2.1 Past Actions

Past actions include the following:

- Neighborhood and community development
 - Historical development of the Portland area and accompanying changes in land use
 - Development of the local transportation system (including roads, bicycle and pedestrian facilities, and bus transit)
 - Utilities (water, sewer, electric, and telecommunications)
 - Parks, trails, bikeways
- Commercial and residential development in and around the API
 - Veterans Memorial Coliseum (1960)
 - Lloyd Center (1960)
 - Legacy Emanuel Medical Center (1970)
 - Oregon Convention Center (1990)
 - Rose Garden (1995)



- Regional transportation system development
 - Marine terminal facilities on the Willamette River
 - Port of Portland (1892)
 - Commission of Public Docks (1910)
 - Port of Portland (1970; consolidation of Port of Portland and Commission of Public Docks)
 - Freight rail lines (late 1800s and early 1900s)
 - Highways
 - I-84 (1963)
 - I-5 (1966)
 - I-405 (1973)
 - Rail transit system
 - MAX light rail (1986)
 - Portland Streetcar (2001)

6.3.2.2 Present Actions

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

- Ongoing safety improvements for bicycles and pedestrians
- Local and regional transportation system maintenance
- Utility maintenance

6.3.2.3 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions were identified collaboratively with the City and are listed below:

- Redevelopment of existing urban areas in the API and vicinity
- Ongoing maintenance and development of existing urban infrastructure in the API and vicinity

These actions include private redevelopment, public development, and infrastructure projects, as well as combined public and private redevelopments. Specific projects and the plans identifying them are described in detail in the memorandum presented in Appendix A. Given the highly developed nature of the API and vicinity, the reasonably foreseeable future actions are not expected to substantially change the types or intensities of existing land uses.

6.3.3 Results of Cumulative Impact Analysis

Past actions have resulted in development of neighborhoods, urban infrastructure, community facilities, public services, and the business and economic environment that exists in the API and surroundings. Development of industry and major transportation facilities like marine, railroad, and highway facilities have helped shape the overall socio-economic environment of the API and greater Portland. Local development of urban infrastructure and services has shaped the API, including its neighborhoods, public facilities, and businesses. The development of I-5, along with I-84 and the roadway system in Portland, enhanced access and mobility throughout the region. However, I-5 also introduced a substantial east-west barrier through the neighborhoods adjacent to the facility. Present actions noted above continue to shape the socio-economic environment.

Past and present actions have also contributed to changes in the housing, demographic, and business conditions in the API and throughout the Portland region. Past actions noted above including the Vanport and shipyard development during and following World War II; development of I-5, Legacy Emanuel Medical Center, Veterans Memorial Coliseum, and Rose Quarter; urban renewal; and the lending practice known as “redlining” have been identified as past actions that have affected population, demographic characteristics, neighborhoods, and community cohesion (ODOT 2017b). The City of Portland’s *Gentrification and Displacement Study: Implementing an Equitable Inclusive Development Strategy in the Context of Gentrification* (City of Portland 2013) notes that public and private investments in Northeast and North Portland have contributed to creating upward pressure on rents and property values, in turn increasing displacement of low-income residents and small business serving local communities. The City of Portland has recognized these pressures and proposed policies to address them through the planning process (City of Portland 2018).

Reasonably foreseeable future actions are likely to sustain and enhance the urban development in the API through redevelopment that would update infrastructure and commercial developments. Reasonably foreseeable future actions are also likely to contribute to patterns of growth and development that have and would continue to result in changes to the regional and local economies, including property value increases and transitions in neighborhoods.

The Build Alternative would provide transportation improvements that would address congestion and safety issues that have resulted from local and regional population and economic growth, including growth in employment, income, and regional GDP. The highway covers and the Clackamas bicycle/pedestrian overcrossing would provide new connections across I-5, improving community connectivity between the east and west sides of I-5. The Build Alternative is included in the City’s adopted plans and policies; therefore, it is consistent with and supportive of planned land uses and development plans.

The cumulative socio-economic effects of past and present actions have been both beneficial and adverse. Reasonably foreseeable future actions would generally

continue the historical effects of past and present actions and provide some benefits by enhancing urban development in the API. Pressures in the API, surrounding areas, and throughout the region on housing affordability and community-scale business would likely continue to be influenced by broad regional economic trends. The Build Alternative would improve connectivity across I-5 and would reduce congestion and improve safety on I-5 but would not meaningfully alter the cumulative socio-economic effects of past, present, and reasonably foreseeable future actions.

6.4 Conclusion

The Build Alternative would have direct beneficial effects by reducing future congestion and delays and improving safety on I-5 and in the Broadway/Weidler interchange area (compared to the No-Build Alternative).

There are no police, fire and rescue, social services, education, or other public service facilities that would be directly affected by the Build Alternative. Improved safety on I-5 would be a minor benefit for police and fire services. The Build Alternative would enhance active transportation facilities and improve connectivity across I-5 for all modes.

The Build Alternative would result in four business relocations. Acquisition of the business properties would have a negligible effect on employment and tax revenue in the API. Reduced tax revenue from the properties that would be acquired is less than 0.2 percent of property tax revenue generated in the API. Property values may increase slightly because of improved pedestrian and bicycle accessibility, but the offset effect cannot be measured.

The Build Alternative would have long-term direct beneficial economic impact by reducing congestion on I-5, a critical regional transportation corridor for the movement of people and goods. The Build Alternative is consistent with adopted land use and economic development plans and policies and would not have growth-inducing impacts that are contrary to those plans and policies.

7 Avoidance, Minimization, and Mitigation Measures

ODOT has coordinated with neighborhoods and businesses in the API and would continue doing so throughout final design and construction. This public outreach will communicate refinements in the Project as it progresses and help consider community input in all aspects of development and implementation of the proposed Project.

Direct impacts during construction would be minimized by best management practices to reduce adverse socio-economic effects. Construction activities would comply with *Oregon Standard Specifications for Construction* (ODOT 2018) as a standard operating procedure. Construction staging, material sources, and disposal locations would be determined by the construction contractors in accordance with applicable laws and requirements. Temporary traffic management plans would minimize construction impacts on I-5 operations. Traffic control and access management plans to minimize construction impacts on businesses, residents, and public services would be prepared by the construction contractor(s), approved by ODOT and/or City of Portland, and implemented by the contractor(s). Traffic and access management plans would be compliant with applicable special provisions of ODOT and City of Portland specifications, as applicable, and would address all modes, including road, bicycle, pedestrian, and transit. ODOT would coordinate with TriMet and Portland Streetcar to follow standard procedures regarding temporary impacts to transit services.

Any private property used for temporary construction staging or other activities would be returned to its original condition following those activities. Mitigation measures for noise impacts to residences, businesses, or parks are described in the *Noise Study Technical Report* (ODOT 2019e)

Acquisition of ROW would be minimized to the extent practicable and would be done in accordance with the Uniform Act, Oregon Revised Statutes, and ODOT guidance for financial compensation and relocation of property. The *Right of Way Technical Report* (ODOT 2019d) provides details on compensation and relocation for real property acquisitions.



8 Contacts and Coordination

In writing this report, the preparer consulted with Megan Channell (ODOT), Amy Nagy (Prosper Portland), and the Portland Business Alliance, as well as with members of the ODOT Project and consultant teams.

9 Preparers

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