CITY OF OREGON CITY
TRANSPORTATION ADVISORY COMMITTEE (TAC)
AGENDA

Virtual Meeting

Tuesday, July 20, 2021 at 6:00 PM

Contact vwalker@orcity.org for the link to participate in the meeting

CALL TO ORDER

ROLL CALL

APPROVAL OF THE MINUTES

1. Approval of minutes from the June 15, 2021 Transportation Advisory Committee Meeting

ADOPTION OF AGENDA (Agenda Analysis)

Committee members have the opportunity to move items to New Business/Discussion Items from Communications if they are interested in discussion. The Committee may also add an item to the agenda with the consensus of the Committee.

PUBLIC COMMENTS

Citizens are allowed up to 3 minutes to present information relevant to the City but not listed as an item on the agenda,however, the Chair has the discretion to waive limitations. Prior to speaking, citizens shall complete a comment form and deliver it to the Staff Member.When the Chair calls your name, proceed to the speaker table and state your name and city of residence into the microphone.The Transportation Advisory Committee Officers do not generally engage in dialog with those making comments but may refer the issue to the City Manager.

NEW BUSINESS / DISCUSSION ITEMS

2. I-205 Toll Project

3. Oregon City Connector Shuttle

COMMUNICATIONS

ADJOURNMENT

PUBLIC COMMENT GUIDELINES

Complete a Comment Card prior to the meeting and submit it to the City Recorder. When the Mayor/Chair calls your name, proceed to the speaker table, and state your name and city of residence into the microphone. Each speaker is given three (3) minutes to speak. To assist in tracking your speaking time, refer to the timer on the table.

As a general practice, the City Commission does not engage in discussion with those making comments.

Electronic presentations are permitted but shall be delivered to the City Recorder 48 hours in advance of the meeting.

ADA NOTICE

The location is ADA accessible. Hearing devices may be requested from the City Recorder prior to the meeting. Individuals requiring other assistance must make their request known 48 hours preceding the meeting by contacting the City Recorder's Office at 503-657-0891.

Agenda Posted at City Hall, Pioneer Community Center, Library, City Website.

Video Streaming & Broadcasts: The meeting is streamed live on the Oregon City's website at www.orcity.org and available on demand following the meeting. The meeting can be viewed on Willamette Falls Television channel 28 for Oregon City area residents as a rebroadcast. Please contact WFMC at 503-650-0275 for a programming schedule.

CITY OF OREGON CITY

Staff Report

625 Center Street
Oregon City, OR 97045
503-657-0891

To: Transportation Advisory Committee **Agenda Date:** 07/20/2021

From: Senior Administrative Assistant-Kim Davis

SUBJECT:

Approval of minutes from the June 15, 2021 Transportation Advisory Committee Meeting

STAFF RECOMMENDATION:

Approve the minutes

OPTIONS:

1. Approve the minutes
2. Disapprove the minutes

OREGON CITY

Transportation Advisory Committee Minutes

June 15, 2021

1. **CALL TO ORDER AND ROLL CALL**

The Transportation Advisory Committee (TAC) meeting of **Tuesday June 15, 2021,** was called to order by Chair Henry Mackenroth at 6:00 PM via a virtual Zoom Meeting.

Committee members present included Ray Atkinson, Henry Mackenroth, Tim Morgan, Savannah Ovaldia, Ben Simmons, Cedomir Jesic and Tim Wuest. Bob LaSalle was absent.

Staff members present included John Lewis, Public Works Director, Vance Walker, Assistant Public Works Director, and Kim Davis, Senior Administrative Assistant.

2. **APPROVAL OF THE MINUTES**

Mr. Simmons **moved to approve** the minutes of **May 18, 2021,** and it carried **unanimously** by the following vote: Aye: Atkinson, Mackenroth, Morgan, Ovaldia, Simmons and Wuest.

3. **AGENDA ANALYSIS**

No new business items to add.

4. **CITIZEN COMMENTS**

No citizen comments were made.

5. **NEW BUSINESS/DISCUSSION ITEM**

a. **Downtown Pedestrian and Bicycle Needs Inventory and Action Plan**

Major points were as follows:

- Kelly Reid, a Senior Planner, gave an update on the bike and ped needs and action plan. Ms. Reid said the bike and ped needs inventory is part of the Transportation Demand Management Plan (TDM).
- Ms. Reid said the goal of the project is to improve conditions for bicycles and pedestrians downtown, so that if people chose to use that mode, it feels safe and comfortable to do so.
- Ms. Reid went through the data that was collected from the project.
- Ms. Reid shared the different project concepts and discussed them with the TAC members.

b. Glen Oak Road Corridor Analysis

Major points were as follows:

- Dayna Webb, City Engineer, gave an update on the Glen Oak Road Corridor Analysis. Ms. Web said in May 2020, ODOT issued a revised speed zone manual.
- Ms. Webb said there is no current speed order issued for Glen Oak Road.
- Ms. Webb said there are two options for issuing a speed limit. The first is to use the statutory speed limit and the second is to request a speed zone to the State.
- Mr. Mackenroth moved to submit to ODOT for a 30 MPH speed limit on Glen Oak Road. There was not a second and it carried by the following vote: Aye: Mackenroth, Morgan, Ovaldia, Wuest. Nay: Atkinson, Simmons.

c. Public Works Report

Major points were as follows:

- Mr. Lewis gave an update on the I-205 Temporary Traffic Diversion.
- Mr. Walker gave an update on the lighting on Redland Road at Holcomb Boulevard. He said they have been in contact with PGE and they will be installing light son three different poles on Redland Road.
- Mr. Walker said the Transportation Division will be on Holcomb Boulevard trimming low hanging tree limbs.

6. COMMUNICATION

7. FUTURE AGENDA ITEMS

- Mr. Atkinson brough up ODOT/Metro Regional Mobility Policy Update and the I-205 Toll Project - Policies, Performance Measures and Strategies.

8. ADJOURNMENT

There being no further business, the meeting adjourned at 8:05 pm.

Respectfully Submitted,

Kimberly Davis
Senior Administrative Assistant

625 Center Street
Oregon City, OR 97045
503-657-0891

CITY OF OREGON CITY

Staff Report

To: Transportation Advisory Committee **Agenda Date:** 07/20/2021

From: ODOT Representative

SUBJECT:

I-205 Toll Project

EXECUTIVE SUMMARY:

A representative from ODOT will be in attendance to talk about the I-205 Toll Project.

I-205 Toll Project

PURPOSE AND NEED STATEMENT

Draft 7/15/2020

INTRODUCTION

In 2016, the Governor’s Transportation Vision Panel held a series of regional forums across the state to better understand how the transportation system affects local economies. The negative effect of congestion in the Portland metro area was consistently identified as one of three key themes across Oregon. Congestion in the Portland metropolitan region affects commuters and businesses, as well as producers who move their products across the state.

In response to the input from stakeholders across the state, House Bill (HB) 2017 Section 120 directed the Oregon Transportation Commission (OTC) to seek approval from the Federal Highway Administration (FHWA) to develop a congestion relief fund and implement tolling (also referred to as value pricing or congestion pricing) on the Interstate 5 (I-5) and Interstate 205 (I-205) corridors to reduce traffic congestion in the Portland metro area.

In 2018, the OTC and the Oregon Department of Transportation (ODOT) conducted the Portland Metro Area Value Pricing Feasibility Analysis to study how and where congestion pricing could be applied. Substantial public input and a Policy Advisory Committee informed the final recommendations. For I-205, the Policy Advisory Committee recommended implementing tolls on all lanes of I-205 on or near the Abernethy Bridge as a potential funding strategy and for congestion management. In December of 2018, the OTC submitted a proposal to the Federal Highway Administration outlining the findings of the feasibility analysis and seeking approval to continue the process of implementing tolls on I-5 and I-205 (ODOT 2018a). In January 2019, FHWA provided guidance to move into the next phase of evaluation and study (FHWA 2019).

PURPOSE

The purpose of the I-205 Toll Project is to manage congestion on I-205 between Stafford Road and Oregon Route 213 (OR 213) and raise revenue to fund congestion relief projects through the application of variable-rate tolls.[1]

NEED FOR THE PROPOSED ACTION

Traffic congestion results in unreliable travel

A 3.3 percent population increase in the Portland metro area from 2015 to 2017 and strong economic growth during these years resulted in a 20.1 percent increase in vehicle hours of delay

[1] Variable-rate tolls are user fees that vary in amount based on certain conditions (e.g. time of day, day of the week, direction of travel). Variable-rate tolls can occur on a fixed schedule that is known to travelers.

and 13.4 percent increase in hours of congestion on the highway and regional corridor system. Daily vehicle hours of delay for I-205 increased by 25 percent in each direction from 2015 to 2017, indicating that the extent and duration of congestion in the corridor continues to increase and that travel continues to become less and less reliable (ODOT 2018b).

In 2018 more than 100,000 vehicles used the section of I-205 between Stafford Road and OR 213 each day (ODOT 2019). Northbound I-205 from I-5 to the Abernethy Bridge has been 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 212 to the Abernethy Bridge experienced over 3 hours of congestion in the morning from 6:00 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.[2]

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

Traffic congestion impacts freight movement

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

Traffic congestion contributes to climate change

Greenhouse gas emissions from cars and trucks have been rising since 2013 and represented 39 percent of total statewide emissions in 2016 (Oregon Global Warming Commission 2018). Idling vehicles sitting in congestion conditions contribute to these emissions. In March 2020, the Governor signed an executive order to reduce greenhouse gas emissions 45 percent below 1990 levels by 2035 and 80 percent below 1990 levels by 2050.

Critical congestion relief projects need construction funding

Available funding for transportation has not kept pace with the cost of maintaining our transportation system or the cost of construction of new transportation and congestion relief

[2] The coronavirus pandemic (COVID-19) has dramatically altered current traffic levels. Future traffic volumes on I-205 are unknown, but as the risks of COVID-19 are reduced, traffic congestion is expected to return.

projects. ODOT revenue comes from a mix of federal and state sources, including fuels taxes, taxes on heavy vehicles, and driver and vehicle licensing and registration fees. The federal gas tax has not been adjusted since October of 1993 and the share of federal contributions to state transportation projects has greatly decreased. On the state level, escalating expenditures to maintain aging infrastructure, the need to perform seismic upgrades for state's bridges, and rising construction costs have greatly increased financial needs.

Compounding this problem is a substantial increase in travel demand as the state experiences strong population growth, particularly in the Portland metro area. ODOT must explore every possible method for getting the most out of its existing infrastructure, funding congestion relief projects to ease congestion, and planning for increased earthquake resiliency. ODOT has identified the I-205 Improvements Stafford Road to OR 213 Project as part of the strategy to improve mobility on I-205 and seismically upgrade the Abernethy Bridge. The project is included in the 2018 Region Transportation Plan and is expected to benefit the Portland metro region and the state. The I-205 Improvements Project and the I-205 Toll Project have independent utility, as either one could be implemented independent of the other project; both have logical termini; and neither restrict consideration of alternatives for future transportation improvements. The I-205 Improvements Project has already received NEPA clearance and is in the process of obtaining permits; however, there is currently no funding source identified for construction of this project. Tolls collected on I-205 are anticipated to be used to fund congestion relief projects in the corridor, including, but not limited to, the I-205 Improvements Project.[3, 4]

GOALS AND OBJECTIVES

Project goals and objectives are desirable outcomes of the project beyond the purpose and need statement. The following goals and objectives reflect input collected from the Value Pricing Feasibility Analysis Policy Advisory Committee, partner agencies, the Project equity team, and other Project stakeholders; these goals and objectives will be considered when comparing alternatives.

- Goal: Provide equitable benefits for all users
  - Acknowledge and consider populations who use or live near the segment of I-205 between Stafford Road and OR 213 and have been historically underserved and underrepresented or negatively impacted by transportation projects
  - Engage people from historically underserved communities to participate throughout the project design, development, implementation, monitoring, and evaluation processes

[3] Net toll revenue for capital projects represents the available cash flow from tolling after covering an allowance for revenue leakage, the costs of toll collection operations and maintenance (O&M), and the costs of roadway facility O&M. Net toll revenues may be used to pay for capital improvement directly and/or they may be used to pay the principal and interest on borrowed (financed) funds.

[4] HB 2017 established a Congestion Relief Fund which would receive any net proceeds from tolling. The Oregon Constitution (Article IX, Section 3a) specifies that revenues collected from the use or operation of motor vehicles is 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.

  - Maximize benefits and minimize burdens to historically underserved and underrepresented communities
  - Provide 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 facilities
- Goal: Limit additional traffic diversion from I-205 to adjacent roads and neighborhoods
  - Design toll system to limit rerouting from tolling
  - Design toll system to minimize additional noise impacts from traffic rerouting
- Goal: Support safe travel regardless of mode of transportation
  - Enhance vehicle safety on I-205 by reducing congested conditions
  - Ensure multi-modal travel (e.g. pedestrians, bicycles, and transit) does not become less safe on local roadways affected by tolling on I-205
- Goal: Improve air quality and reduce contributions to climate change effects
  - Reduce vehicle air pollutants and greenhouse gas emissions through improved travel efficiency
  - Reduce localized air pollutants through reduced congestion and improved travel efficiency, particularly in community areas where pollutants are concentrated
- Goal: Support multi-modal transportation choices
  - Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (transit, walk, bike, telework)
  - Collaborate with transit providers to enhance availability and access to transit service in underserved and underrepresented areas along the tolled segment of the I-205 corridor
- Goal: Support regional economic growth
  - Provide for reliable and efficient movement of goods and people through the I-205 corridor
- Goal: Support travel demand management
  - Design 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 (e.g. transit, parking, etc.) in the region

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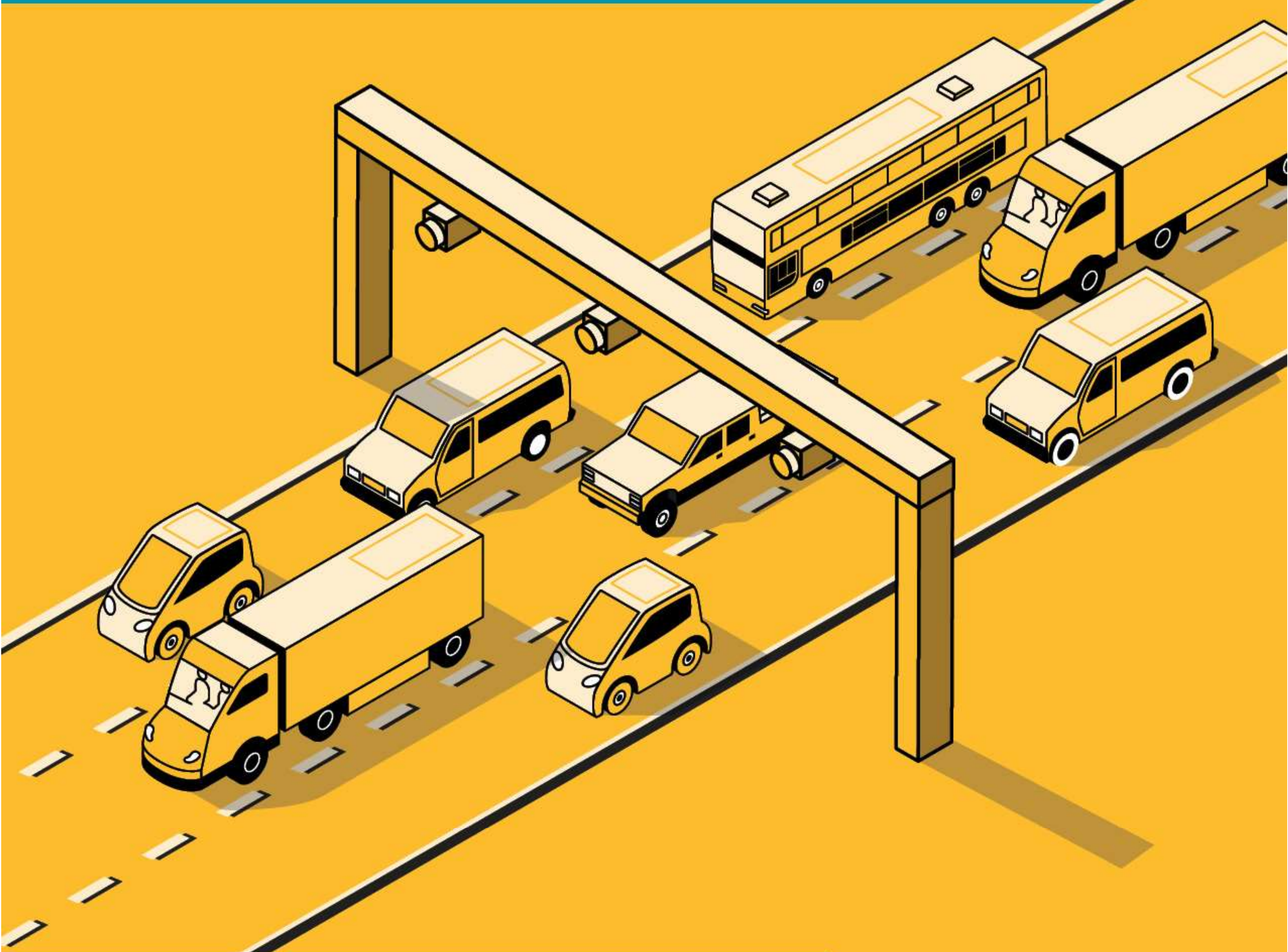
I-205 Toll Project



I-205 Corridor User Analysis

February 2021

Oregon Department of Transportation

I-205 Toll Project

I-205 Corridor User Analysis

Prepared for:

Oregon Department of Transportation

Prepared by:

WSP

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Americans with Disabilities Act and Title VI of the Civil Rights Act of 1964

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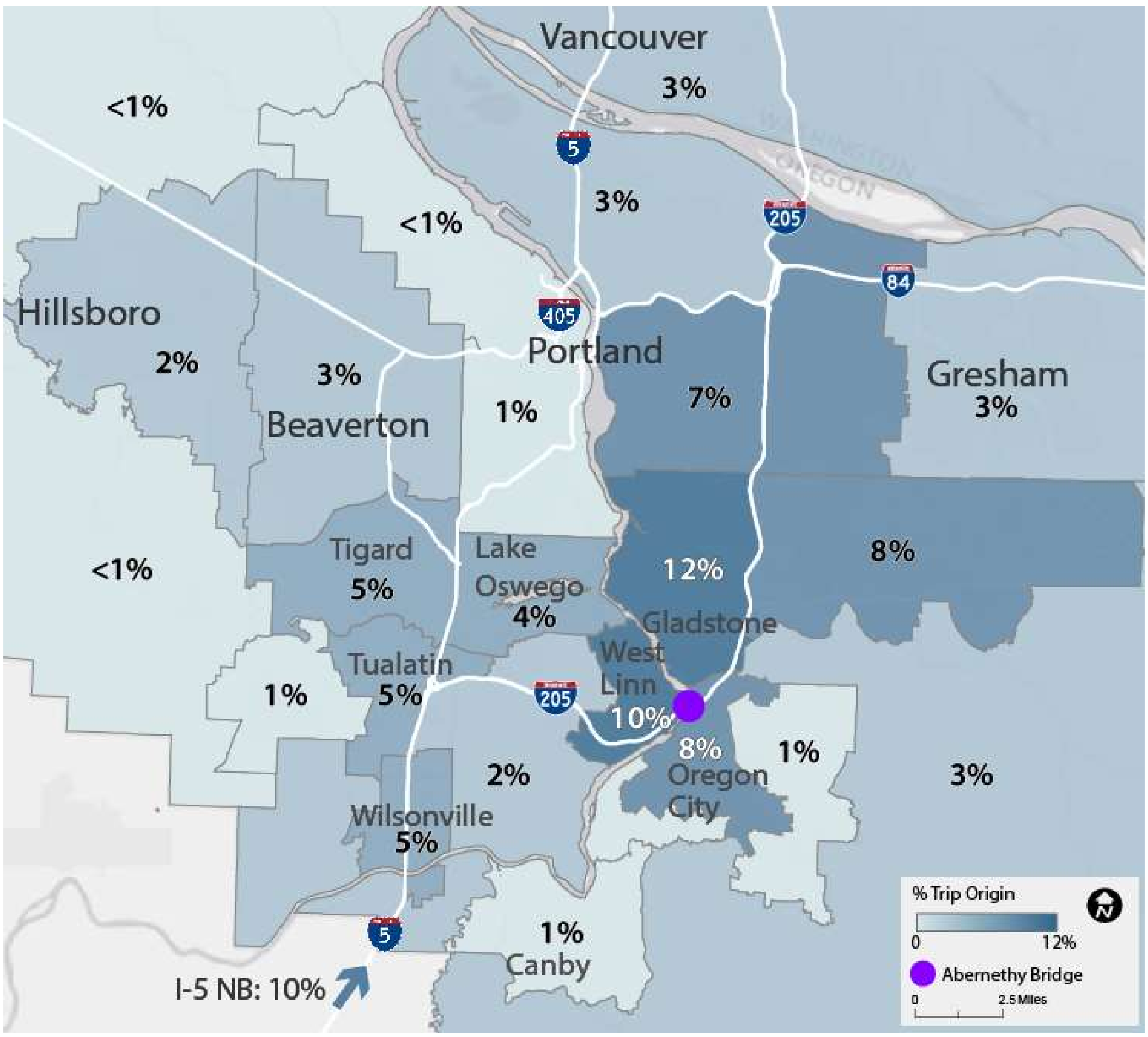
EXECUTIVE SUMMARY

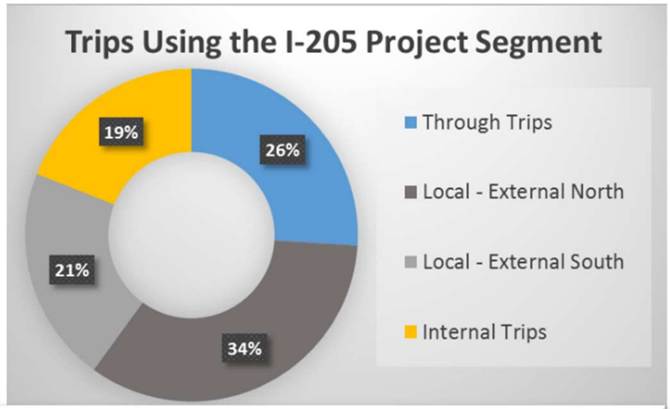
The I-205 Corridor User Analysis was undertaken to better understand travel characteristics of current users of the I-205 corridor currently being considered for tolling. The Oregon Department of Transportation (ODOT) will use this information to inform the development, screening, and analysis of alternatives for the I-205 Toll Project. The Executive summary presents a summary of the key findings from the analysis.

Where do users of the I-205 corridor travel to and from?

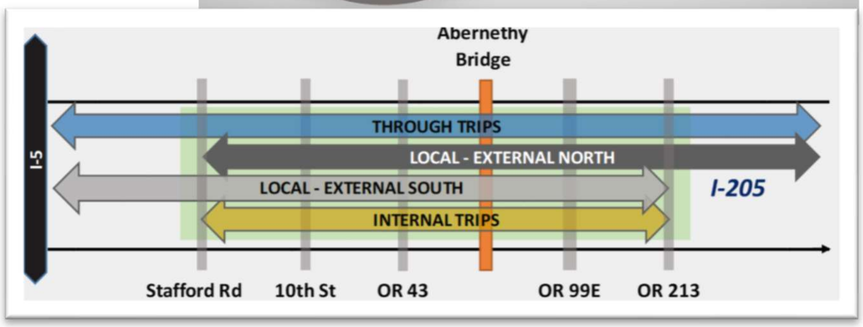
While trips using the I-205 corridor come from throughout the Portland metropolitan region and beyond, a large share of them originate locally within the corridor. The map below shows the origins of travelers using the I-205 Abernethy Bridge. Darker blue shading of zones indicates a higher percentage of trips from those zones. Higher percentages of users come from nearby areas such as West Linn, Oregon City, Gladstone, and Clackamas. Fewer travelers come from areas farther away, including approximately 3% from Clark County, Washington.



What percentage of trips are through trips?

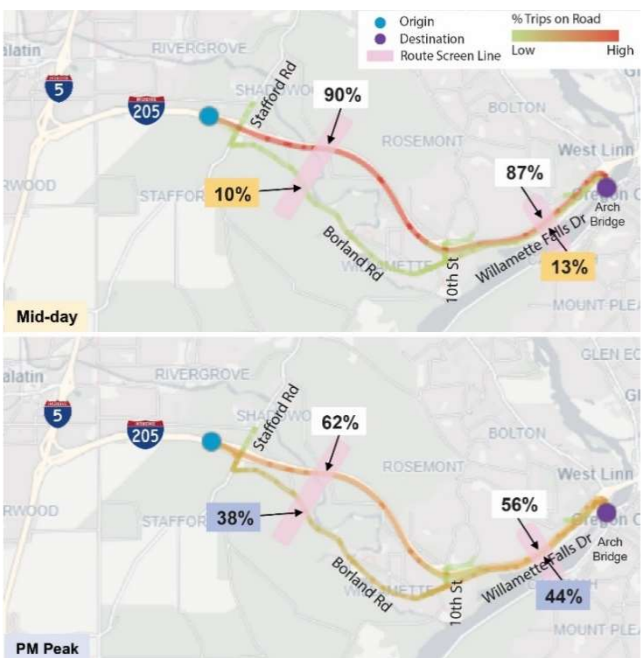


The segment of I-205 that ODOT is considering for tolling stretches between the Stafford Road and OR 213 interchanges. Through trips comprise only about one-quarter of the trips on this Project segment. The remaining three-quarters of users acess I-205 locally in the Project segment—meaning that they enter or exit I-205 at one of the five interchanges in this segment of I-205 (see diagram below). This includes 19% "internal" trips—which both enter and exit I-205 within the Project segment interchanges.



I-205 Toll "Project Segment" is indicated in green shading

Do users reroute off I-205 during times of congestion?



Source: StreetLight Insight Platform

Example Rerouting Pattern

Our analysis shows vehicles rerouting off of I-205 during higher demand periods when traffic congestion is present. For example, for northbound I-205 travelers to the Oregon City Arch Bridge, an estimated 10% to 15% of trips exit I-205 and take alternative roads (Borland Road and/or Willamette Falls Drive) during the midday when there is little congestion. During the PM peak period, however, the proportion of travelers choosing these alternative routes to the Arch Bridge increases to 35% to 45%. This difference indicates that during the PM peak period 20% to 30% of these travelers may be rerouting away from I-205 to local routes to avoid traffic congestion. The Project team conducted rerouting analyses for other origin/destination pairs as well. Results indicate shifts in traffic routing away from I-205 to local routes during peak travel times may be above 50% for some travel patterns. Borland Road, Willamette Falls Drive, OR 99E, Stafford Road and Schaeffer Road were identified as alternative routes that experience the greatest amount of rerouting.

1 INTRODUCTION

1.1 Purpose

This memorandum summarizes an assessment of corridor user travel characteristics undertaken for the Interstate 205 (I-205) Toll Project (Project). The objective of the analysis is to inform the alternatives development, screening, and analysis through enhanced understanding of travel behavior and characteristics of existing and potential users of the Project corridor. The Project team used the StreetLight Data, Inc. (StreetLight) mobility platform as the primary tool for the analysis, with available information from the Metro Regional Travel Demand Model (RTDM) and the Oregon Statewide Integrated Model also used to cross-check key findings, fill in gaps in information, or identify potential uncertainties.

1.2 Organization

The remainder of this memorandum is structured into the following sections:

- ***Methodology*** describes tools and data sources used for the analysis.
- ***Corridor User Travel Patterns*** summarizes origins/destination patterns and other travel characteristics of corridor users.
- ***Existing Rerouting Patterns*** uses StreetLight to assess the likelihood of trips rerouting from I-205 due to current congestion levels.
- ***Corridor User Demographics*** provides estimated demographic breakdowns of corridor users and compares them to the regional averages.
- ***Appendices***

2 METHODOLOGY

2.1 Overview

The corridor user analysis focuses on trips and users of the I-205 corridor encompassing segments being evaluated for tolling between the Stafford Road and OR 213 interchanges (Project segment), including the I-205 Abernethy Bridge over the Wilamette River. The analyzed geographic area included the Project segment—the I-205 mainline between Stafford Road and OR 213—as well as other facilities throughout the region that these trips use to get to/from the Project segment. The Project team also analyzed travel on local roads that serve as alternative routing options to I-205.

The majority of this corridor user analysis is based on findings from analyzing data provided through StreetLight with additional information and comparisons provided via Metro's RTDM and the Oregon Statewide Integrated Model which can be found in Appendix B.

2.2 Background Information on StreetLight Data

StreetLight is a web-based, on-demand mobility data analytics platform. This service uses anonymized, personal cellular-device location data (location-based services data) and navigation GPS data that is processed into origin/destination matrices, travel time, and routing information. This corridor user analysis used location-based services data. The raw location-based services data were processed into probable trips, with adjustments to trip data made based on sampled devices compared to the population at the level of the census block.

The Streetlight tool provides access to a larger scale of transportation data to support better understanding of transportation patterns and behavior in the study area than would be available through more traditional data collection techniques.

For more details on StreetLight's methodology and data sources, refer to Appendix A, which include *StreetLight Insight Metrics: Our Methodology and Data Sources* (updated July 2019) and "*StreetLight Volume and Methodology & Validation White Paper* (updated August 2019).

2.3 Analysis Parameters and Sample Size

This analysis used location-based services data from 2019. The Project team used StreetLight location-based services dataset for 2019 weekday travel (Monday to Thursday, January through December) for all analyses. The project team also performed comparisons using average weekday daily travel data from Metro's RTDM from the 2015 baseline model.

Depending on the geographies selected for a particular analysis, the sample size ranged from around 10,000 devices (for a specific origin-destination pattern) to 100,000 or more devices (for a regionwide analysis of trips crossing the Abernethy Bridge).

In the six counties in the vicinity of the Project segment—Multnomah, Clackamas, Washington, Marion, Yamhill and Clark Counties—StreetLight provided the number of devices captured in each county in March 2019 (Table 1). The number of devices in relation to the total population of each county indicates a relatively robust sample size.

Table 1. StreetLight's Device Sample Size in Project Area

County	Number of Devices (March 2019)	Total Population
Multnomah County	155,616	804,606
Washington County	92,000	589,481
Clark County	74,832	473,252
Clackamas County	65,500	410,463
Marion County	57,000	339,641
Yamhill County	16,000	104,831

Data source: American Community Survey 2019 5-Year Estimate, StreetLight

StreetLight has published a case study of device sample share in Florida at the census tract level. Device sample share is defined as number of devices captured over total population. StreetLight calculated the number of devices in one census block during nighttime and then aggregated that to the census tract level. The assumption is that if a device stays overnight in one census block, then this census block is most likely its home location. The study found the average device sample share to be about 13% of the population; however, the exact percentage of trips captured through these devices is unclear.*

2.4 Data Limitations

The methods by which StreetLight gathers, transforms, analyzes, and models data are fundamentally insufficient to portray reality with 100% certainty. Any presentation of data, metrics, or statistics should be viewed with a discerning eye. While StreetLight bases its data on actual, historical information collected from travelers, it 1) provides only a sample of the total trips being made, and 2) requires algorithms to normalize and expand location-based data. As such, its accuracy can be questioned and uncertainty in any findings should be reconized.

Additionally, because StreetLight's data depends on smart device tracking, some inherent biases in the sample base could occur because a higher proportion of members of certain demographic groups may not use smart devices; therefore, these groups could be underrepresented in StreetLight data. The Project team does not know the identity of individual drivers or smart devices, as the data is anonymized.

Despite the limitations noted above, this data source provides useful indicators for understanding travel patterns and user characteristics on the I-205 Project segment. Research to-date shows that the accuracy of StreetLight's data for analysis of trip origins and destinations and other travel pattern information increases as the sample size increases.[1] Furthermore, the information presented was cross-checked against other available sources where available, including the Metro RTDM and the Oregon Statewide Integrated Model (Appendix B), and was found to be consistent.

[1] *Guidelines for Using StreetLight Data for Planning Tasks*, Yang, et.al., Virginia Transportation Research Council, March 2020.

3 CORRIDOR USER TRAVEL PATTERNS

This section discusses the Project corridor's existing use patterns. The Project team addressed the following questions related to travel patterns:

- **Origin/Destination Analysis:** Where do trips using the I-205 Project segment come from and go to?
- **Travel Shed Analysis:** How far off of I-205 do Project segment trips typically travel, and what routes are used most often?
- **I-205 Mainline Travel Patterns:** Which ramp interchanges are used most frequently to access I-205, and what share of trips are passing all the way through the corridor?

3.1 Origin/Destination Analysis

KEY FINDINGS

- A relatively high share of Abernethy Bridge trips are local access trips from/to nearby areas such as West Linn, Oregon City, Gladstone and Clackamas
- Broad regional coverage of trip origins/destinations beyond the Project segment, including urban areas in Washington County
- About 10 to 15% of Abernethy Bridge trips have an origin or destination outside of the Portland metro region
- Less than 5% of Abernethy Bridge trips are from/to Clark County, Washington

This analysis examined origins and destinations of I-205 trips crossing the Abernethy Bridge. The Project team divided the region into 23 geographic areas designed to provide an overview of potential usage patterns, with smaller areas identified near the Project segment allowing for a finer level of analysis. The Project team also identified external gateways representing the primary roadways travelers take into and out of the region including I-5, US 26, I-84 and OR 99W. All geographic areas correspond to the RTDM areas (aggregations of the model's transportation analysis zone system). Appendix B includes a map of the geographic areas and external gateways.

Figure 1 and Figure 2 identify the percentage of Abernethy Bridge trips coming from and going to each geographic area, respectively. The StreetLight dataset sampled approximately 101,000 total unique devices and approximately 467,000 trips. The distribution of trip origins (Figure 1) is similar to that of trip destinations (Figure 2) over the course of the day.

The origin/destination analysis indicates that a relatively high share of trips on this segment of I-205 originate locally, in nearby areas such as West Linn, Oregon City, Gladstone, and Clackamas. However, there is also broad regional use of the corridor, including trips originating in or destined to urban areas in Washington County such as Tualatin, Tigard, and Beaverton.

Approximately 3% of all Abernethy Bridge trips are from/to Clark County, Washington. While most Abernethy Bridge trips begin and end in the Portland metro area, roughly 12% of trips travel to or from outside of the region. Among these external trips, the majority are via I-5 to/from the south, accounting for about 9% of all trips over Abernethy Bridge.

Figure 1. Regional Origins of I-205 Trips Crossing the Abernethy Bridge

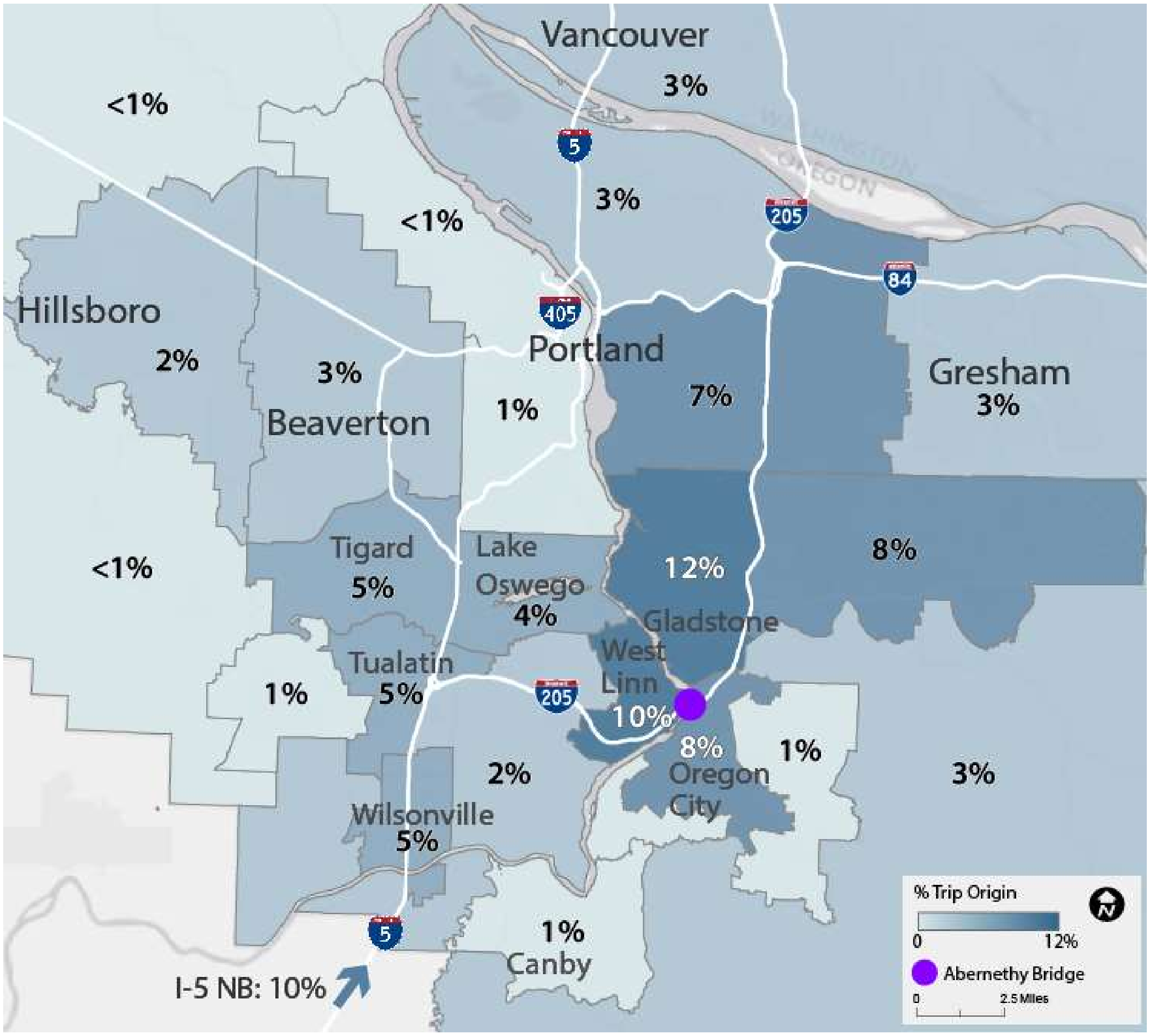
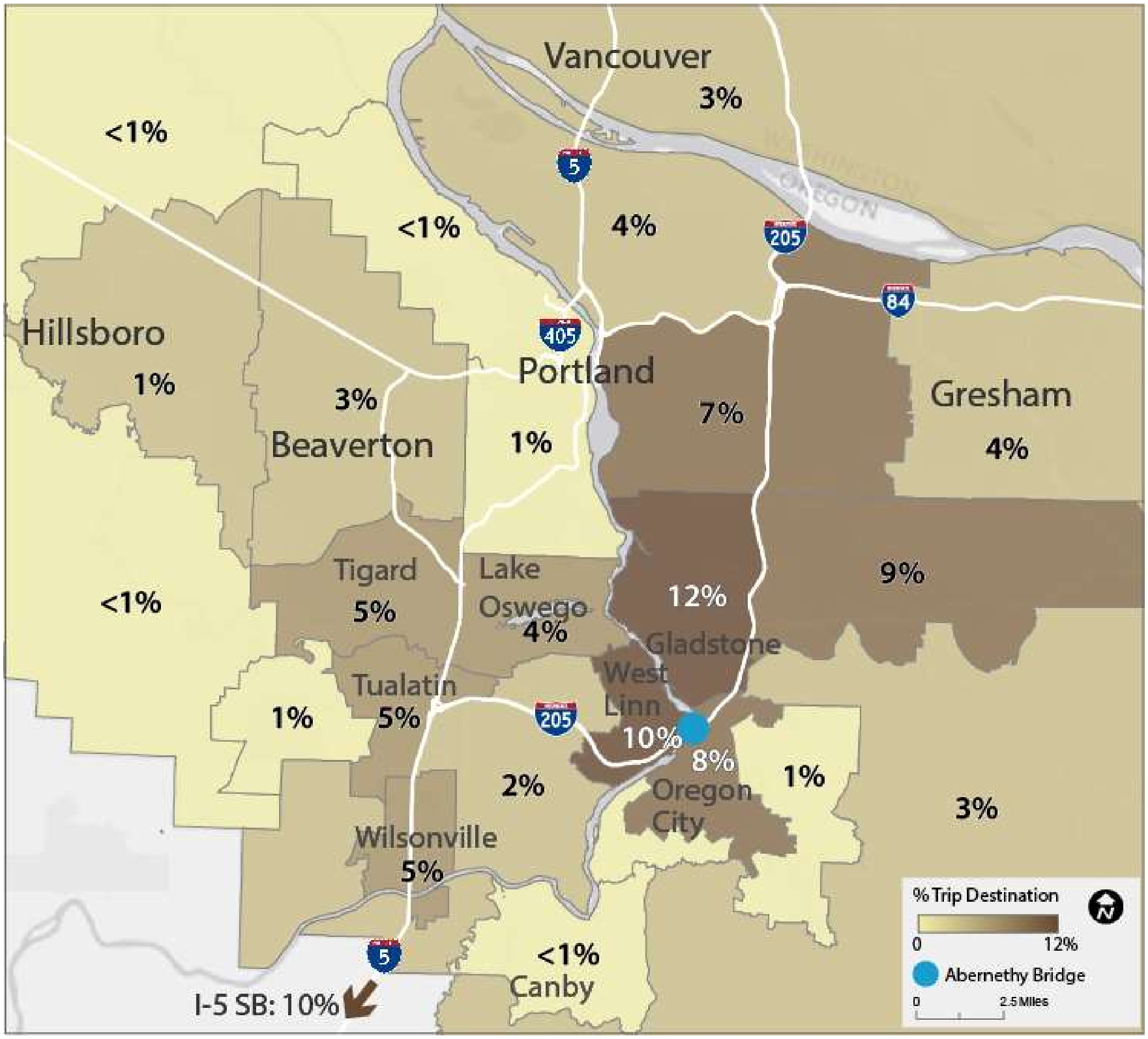


Figure 2. Regional Destinations of I-205 Trips Crossing the Abernethy Bridge



Data Validation with the Regional Travel Demand Model

The Project team compared StreetLight origin/destination analysis results with a similar analysis of Abernethy Bridge origin/destination patterns performed using the RTDM (2015 model base year). The results show a high degree of consistency in daily travel patterns between the StreetLight and RTDM-based analyses. Most zones are within 1% of total demand, though one notable difference in trip percentage was identified in the North Portland zone (3% with StreetLight, compared to 1% with the RTDM). This area includes the Portland International Airport and could reflect challenges in capturing airport activities using these tools. Comparison with ODOT's Statewide Integrated Model also showed consistency with the StreetLight results. Appendix B includes a table comparing origin/destination results from the RTDM, the Statewide Integrated Model, and StreetLight.

3.2 Travel Shed for Abernethy Bridge Users

KEY FINDINGS

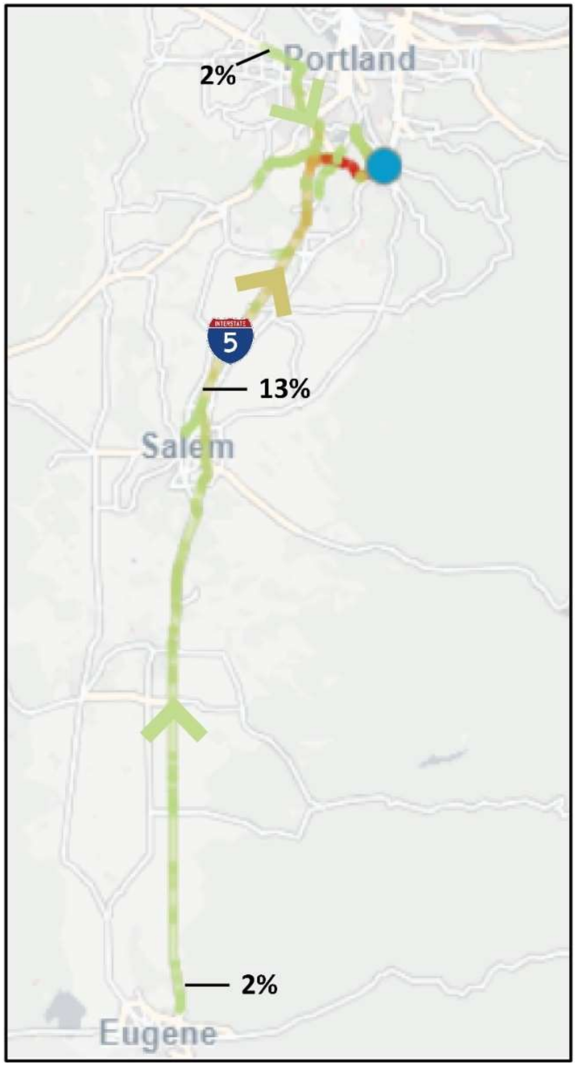
- More than half of trips traveling northbound across the Abernethy Bridge come from I-5
- More than 80% of northbound trips across the Abernethy Bridge exit I-205 before the I-84 interchange
- Trips patterns crossing the Abernethy Bridge southbound mirror the northbound patterns

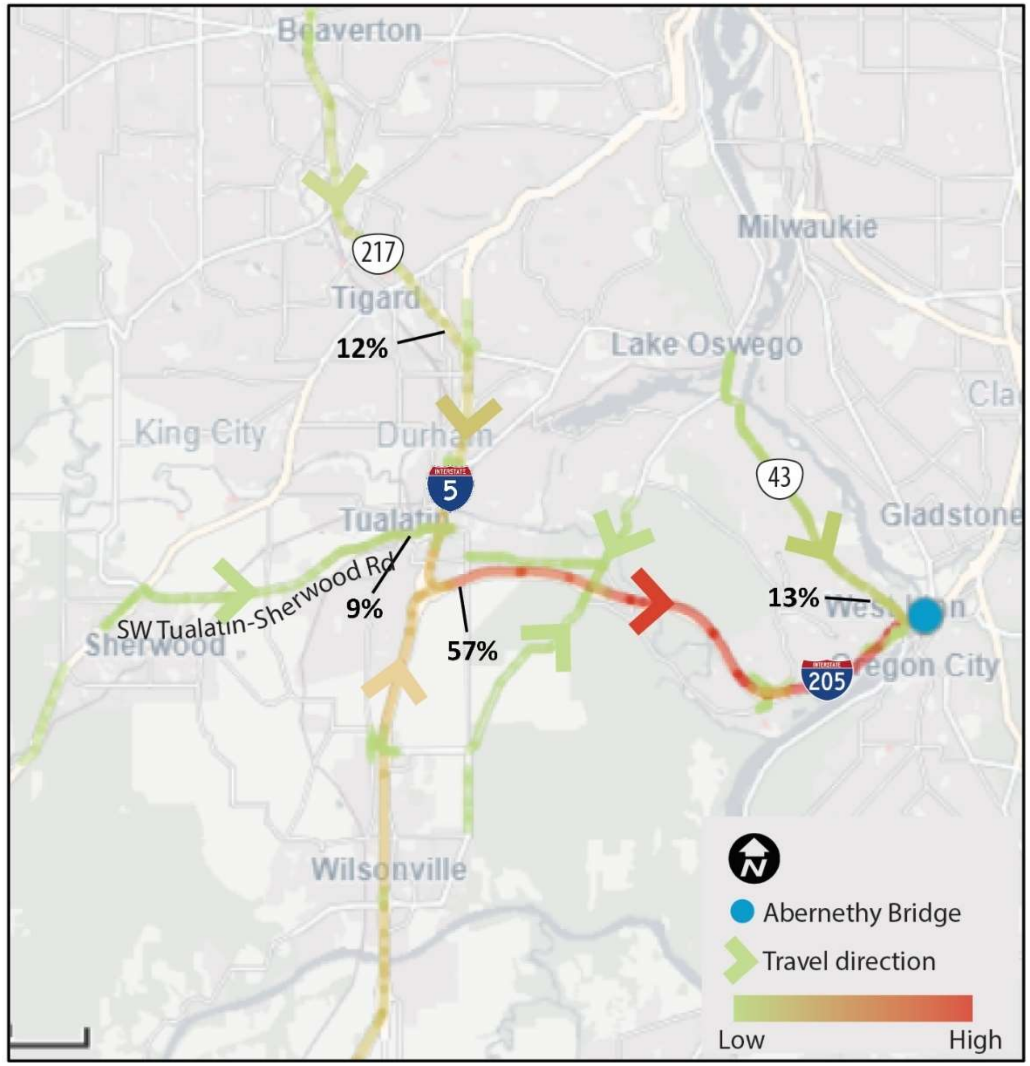
This analysis shows the commonly used routes to get to and from the Abernethy Bridge. Otherwise known as the "travel shed," the graphic depicts the concentration and distribution of trips throughout the roadway network over the day. The travel shed analysis is consistent with the origin/destination analysis results in that it indicates a relatively high percentage of bridge trips coming from areas near the Project segment.

Figure 3 shows the daily travel shed for trips traveling to the Abernethy Bridge from their points of origin. Figure 4 shows the travel shed for northbound travel from the Abernethy Bridge to destinations to the north. The colored routes indicate intensity of routing choices to or from the Bridge. StreetLight's data used in this analysis for both northbound and southbound directions sampled approximately 209,000 unique devices and 1,445,000 trips.

I-5 to I-205 is the most used route to access Abernethy Bridge northbound, accounting for more than half of all northbound trips on the Bridge. The travel shed shown in Figure 3 illustrates a long tail to the south and a relatively short tail to the north, which reflects longer distance trips coming from areas south of the metro region. Other significant connections for northbound travel across the Bridge include OR 43 connecting with Lake Oswego and West Linn, and SW Tualatin-Sherwood Road connecting with the communities of Newberg, Sherwood, and Tualatin.

Figure 3. Trips To Abernethy Bridge Northbound





Regional View
Source: StreetLight Insight Platform

Corridor View

Most northbound Abernethy Bridge trips traveled only a relatively short distance farther on I-205. Most exited at nearby interchanges connecting to Gladstone, Oregon City, and other areas of Clackamas County. Figure 4 shows that OR 213 (connecting with the southern part of Oregon City), OR 99E (connecting with Gladstone and Milwaukie), and OR 212 (connecting to Happy Valley and beyond) were the most common routes. Only about 30% of trips remained on I-205 past Johnson Creek Boulevard and fewer than 20% continued beyond the I-84 interchange. Approximately 5%[2] of northbound trips traveled across the Glenn Jackson Bridge into Washington.

Analysis of southbound Abernethy Bridge trips showed similar travel shed patterns as northbound travel. Appendix C contains maps showing the southbound results.

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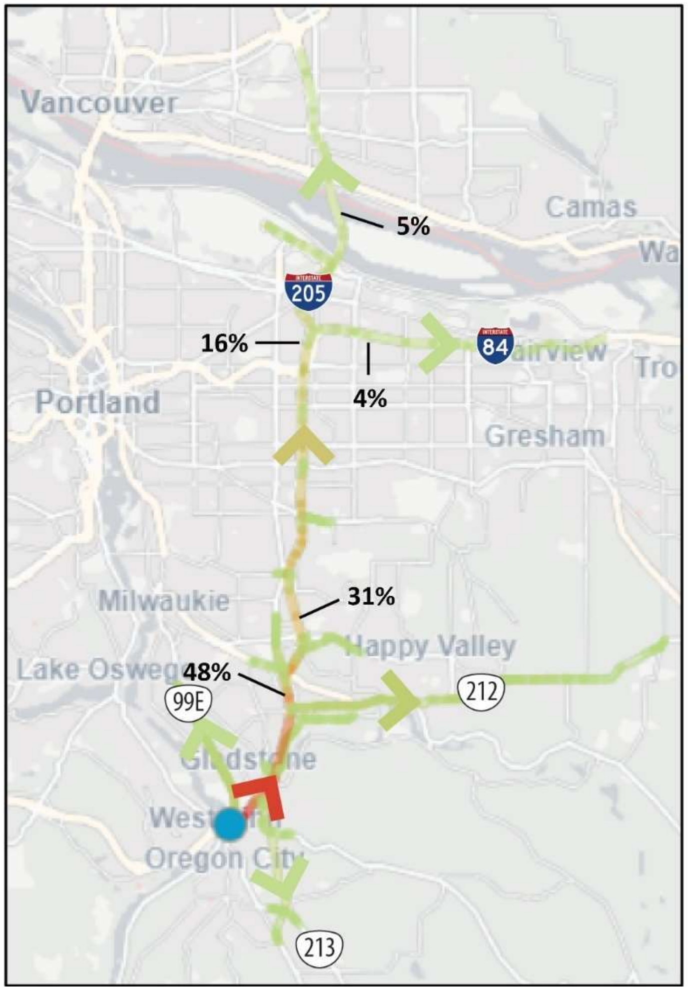
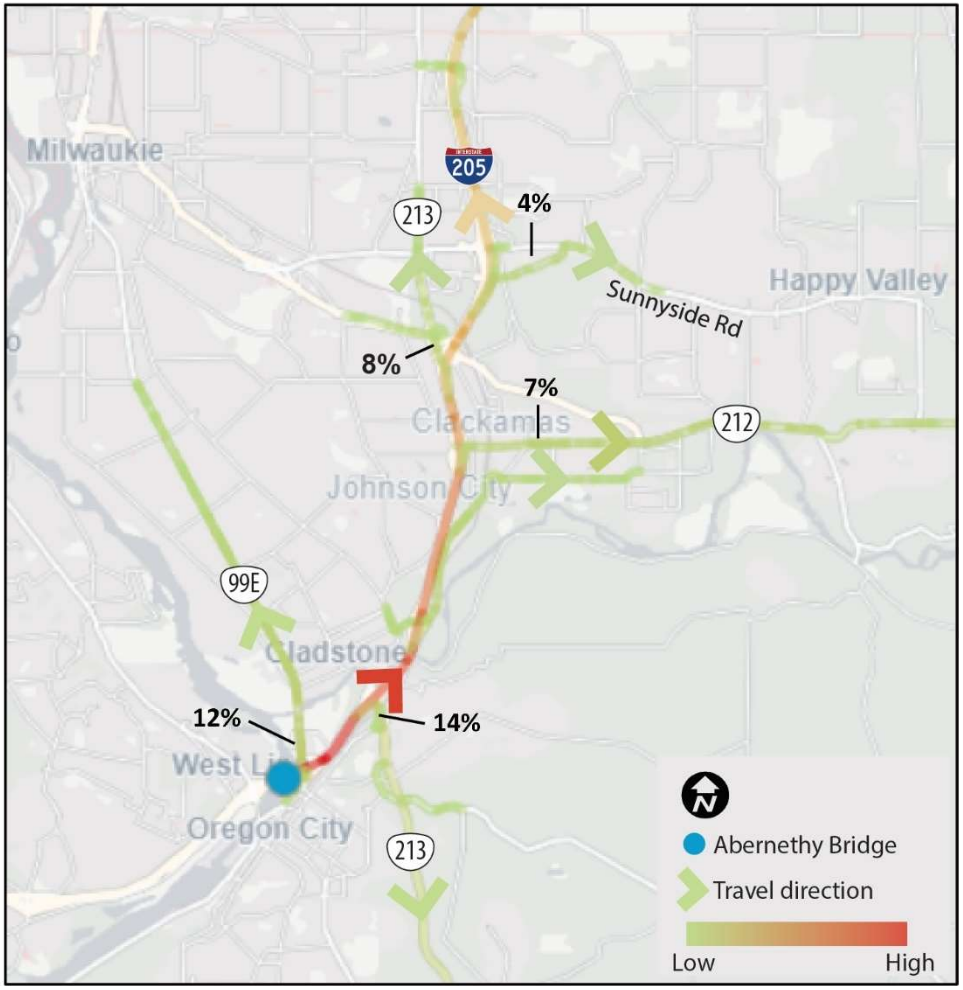
[2] The Abernethy Bridge user destination analysis (Figure 2) shows 3% of trips end in Clark County, Washington, while this analysis shows 5% traveling across the Glenn Jackson Bridge into Washington. The discrepancy is due to slight differences in methodologies such as including Washington trips outside of Clark County and the direction of the analysis being northbound as opposed to bidirectional.

Figure 4. Trips From Abernethy Bridge Northbound



Regional View



Corridor View

Source: StreetLight Insight Platform

3.3 I-205 Mainline Travel Patterns

KEY FINDINGS

- Through trips make up about one-quarter of the I-205 trips between Stafford Road and OR 213.
- The remaining three-quarters of trips enter and/or exit I-205 at one of the five local interchanges.
- About 15 to 20% of trips are internal to the Project segment, entering and exiting within the five local interchanges.

To understand I-205 mainline travel patterns on the Project segment between Stafford Road and OR 213, the Project team conducted an assessment of where these vehicle trips entered and exited I-205. These trips were classified as follows:

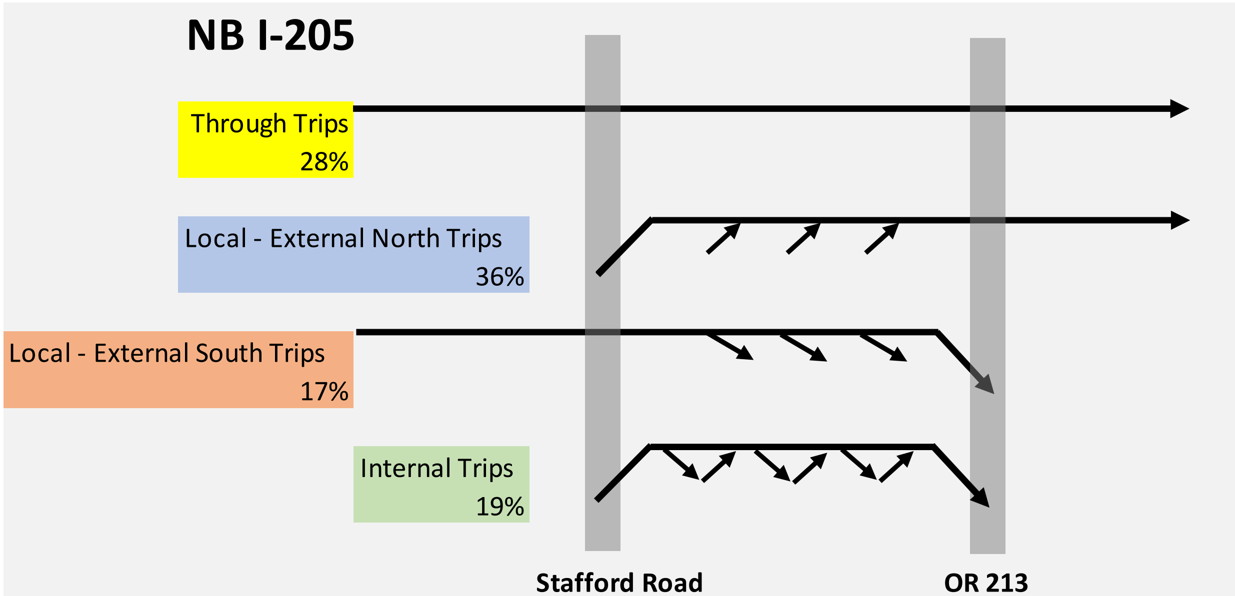
- *Through trips*: trips that travel on I-205 all the way between Stafford Road and OR 213 without using any local entrance or exit ramps.
- *Local – External South trips*: northbound trips that enter I-205 south of the Project segment and exit I-205 at one of the ramps within the Project segment; and southbound trips that enter I-205 at one of the ramps within the Project segment and exit I-205 south of the Project segment.
- *Local – External North trips*: northbound trips that enter I-205 at one of the ramps within the Project segment, and exit I-205 north of the Project segment; and southbound trips that enter I-205 north of the Project segment and exit I-205 at one of the ramps within the Project segment.
- *Internal trips*: trips that both enter and exit I-205 within the Project segment.

The analysis showed that through trips made up approximately 25% of travel on the Project segment. Approximately 75% of vehicles entered or exited I-205 locally (including Local External – South, Local – External North, and Internal trips). A significant portion, around 15 to 20% of all corridor trips, were internal users who traveled only a short distance on I-205—both entering and exiting within the Project segment.

Figure 5 and Figure 6 illustrate the breakdown of trip categories in the northbound and southbound directions, respectively. For the northbound direction, the analysis sampled approximately 166,000 devices and 1,003,000 trips. For the southbound direction, the analysis sampled approximately 175,000 devices and 1,052,000 trips.

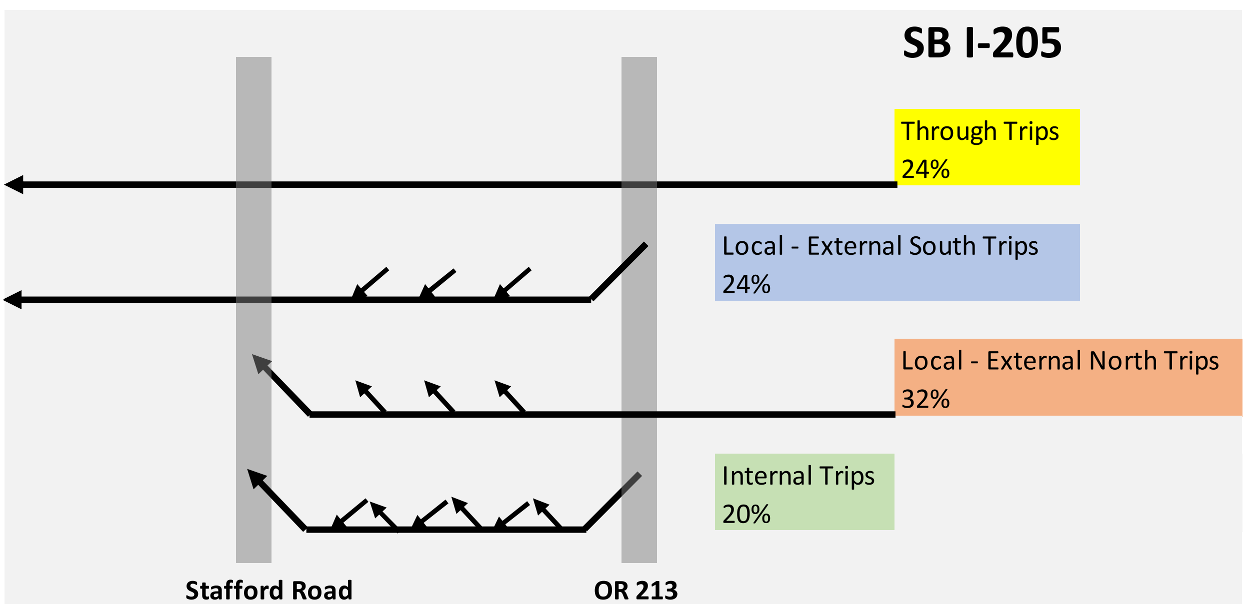
The northbound and southbound directions show similar travel patterns and are combined to assess the patterns on the Project segment as a whole. The directional analysis of Local – External North and Local – External South trips over the course of the day indicates that there were more corridor trips traveling from/to the north (approximately 30 to 35%) as compared to the south (approximately 20 to 25%).

Figure 5. I-205 Project Corridor Trip Classification for Northbound Travel



Source: StreetLight Insight Platform

Figure 6. I-205 Project Corridor Trip Classification for Southbound Travel



Source: StreetLight Insight Platform

Data Validation with the RTDM

A similar analysis was conducted for mainline travel patterns using the RTDM to compare with the results from StreetLight. The directional and bi-directional comparisons in Error! Reference source not found. indicate a high degree of similarity between these two tools. The RTDM shows slightly lower shares of internal travel and slightly more Local-External travel to/from the south, but the overall results indicate that the general travel patterns in the data represented in StreetLight are similar to those modeled in the RTDM.

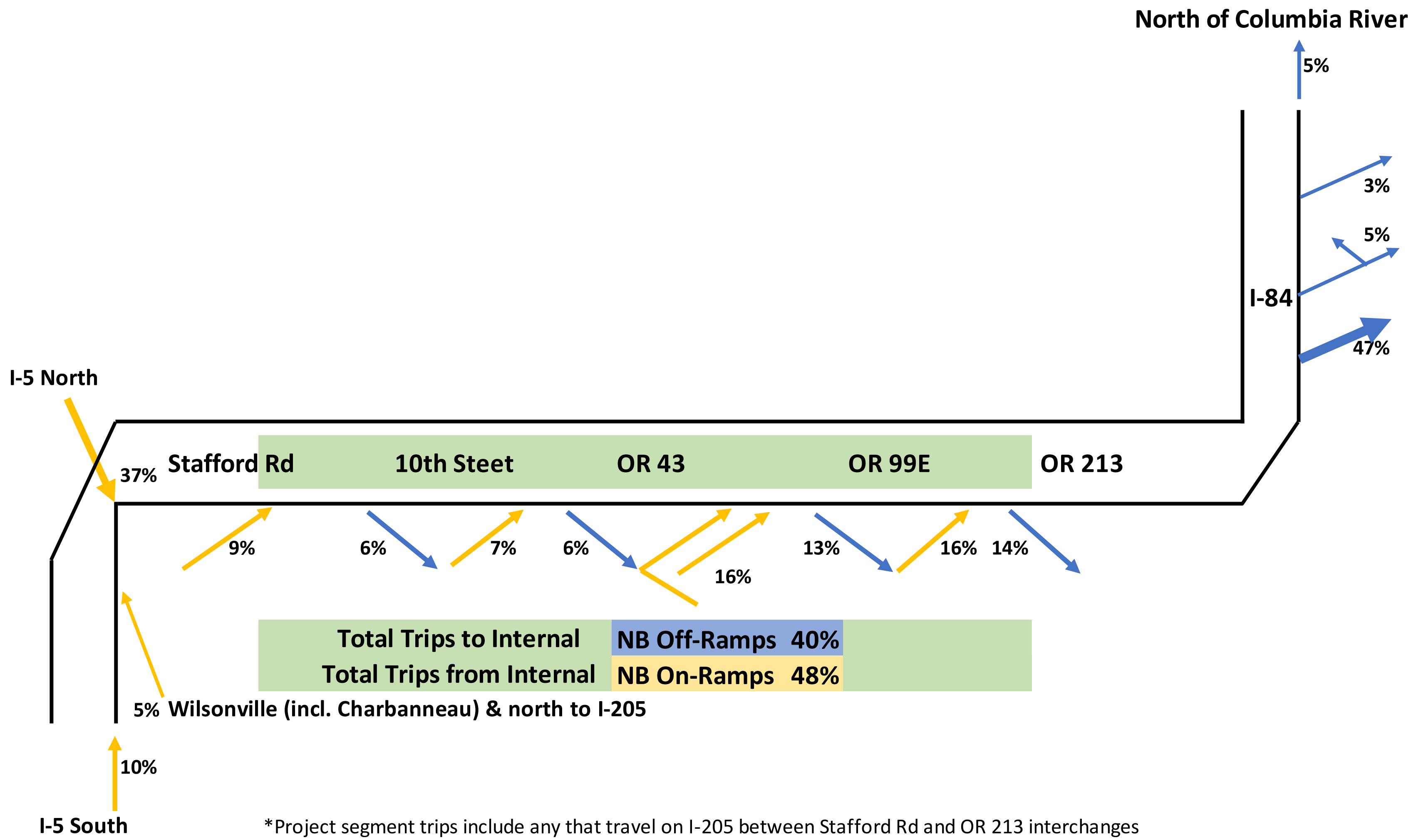
Table 2. I-205 Project Corridor Trip Classification Comparison (Bi-Directional)

Type of Trip	StreetLight Results			Regional Travel Demand Model Results		
	Northbound	Southbound	Bi-Directional	Northbound	Southbound	Bi-Directional
Through Trips	28%	24%	26%	27%	27%	27%
Local - External North	36%	32%	34%	33%	33%	33%
Local - External South	17%	24%	21%	25%	25%	25%
Internal Trips	19%	20%	19%	15%	15%	15%

Using the RTDM, the Project team conducted a more extensive assessment of I-205 mainline travel patterns beyond the Project segment, as summarized in Figure 7 and Figure 8. The two figures represent northbound and southbound I-205 trips that traveled on any portion of the Project segment between the Stafford Road and OR 213 interchanges. The analysis used the RTDM (2015 baseline model scenario) to estimate the ramp-to-ramp flows on the I-205 mainline for average weekday conditions. The figures show the percentage of total I-205 corridor trips using interchange ramps (both entrances and exits) for northbound and southbound travel on I-205.

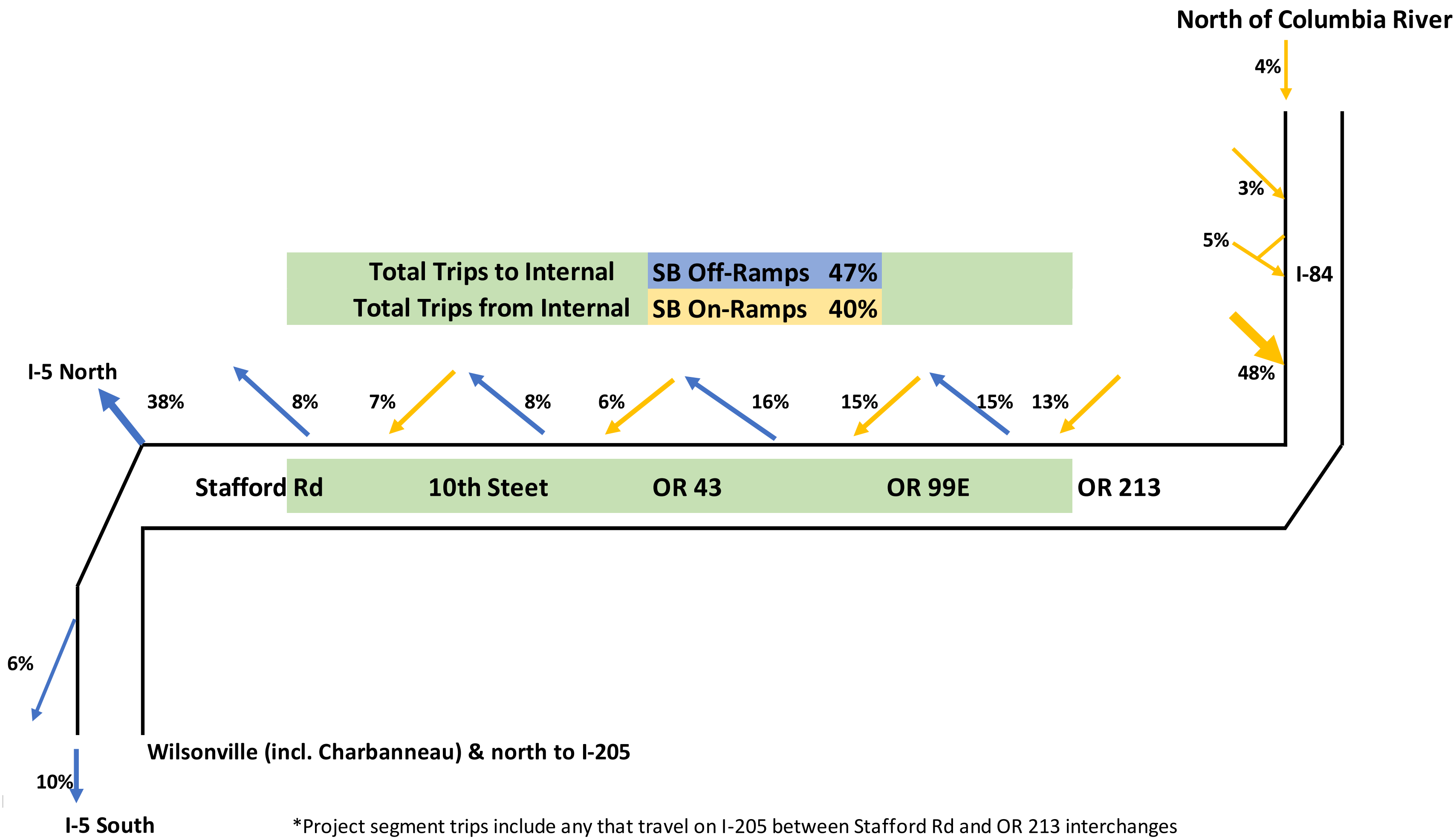
The RTDM indicates that 45% to 50% of the project segment trips begin or end between the OR 213 and I-84 interchanges. Similar to previous analysis of Abernethy Bridge trips, the Project segment trips show 5% or less of trips crossing the Glenn Jackson Bridge to/from Washington. At the southern end of the corridor, about 10% of the trips come from/go to the south beyond the Portland metro area via I-5.

Figure 7. Ramp-to-Ramp Traffic Diagram for Northbound Trips on the Project Segment (Regional Travel Demand Model)



Source: Metro RTDM

Figure 8. Ramp-to-Ramp Traffic Diagram for Southbound Trips on the Project Segment (Regional Travel Demand Model)



Source: Metro RTDM

4 EXISTING REROUTING PATTERNS

4.1 Rerouting Overview

The Project team analyzed travel patterns within the I-205 corridor to provide evidence of, and insight into, current rerouting trends. Rerouting, sometimes called diversion, refers to changes in routing for trips that could or would use I-205 but instead choose to take another alternative route, typically to save time by avoiding congestion delays experienced on I-205 during peak demand periods.

The rerouting analysis investigated a variety of origin/destination pairs with reasonable routing alternatives that could include I-205 mainline, parallel roadway alternatives to the I-205 mainline, or a combination of both. By identifying differences in routing choices between peak and off-peak travelers, the analysis indicates the degree to which peak-period congestion on I-205 could be causing travelers to reroute away from I-205 and onto other roadways.

Although differences in travel patterns by time of day could reflect other differences in travel characteristics (such as trip purpose), the shifts in traveler routing away from I-205 across many origin/destination pairs in the area appear strongly related to the time and direction of recurring congestion on I-205.

4.2 Rerouting Summary

KEY FINDINGS

- Consistent evidence of rerouting off of I-205 and onto local streets during peak periods across a range of origin/destination travel patterns
- Rerouting takes place in both directions and often corresponds to heavier traffic congestion (delays) on I-205 in the southbound direction during the AM peak period and in the northbound direction during the PM peak period
- The magnitude of rerouting varied across different origin/destination pairs
- Local travel patterns generally showed a higher liklihood of rerouting than longer-distance regional trips.
- Borland Road, Willamette Falls Drive, OR 99E, Stafford Road and Schaeffer Road were identified as alternative routes that experience the greatest amount of rerouting.

The Project team identified and further evaluated vehicle trip patterns between 21 distinct origin/destination pairs. For each, the Project team identified two or three potential routes—one route being via the I-205 mainline and the other(s) being other parallel roadways that can be used as local alternatives to travel on I-205. The relative share of trips using each route were evaluated and compared for off-peak (midday from 10 a.m. to 3 p.m.) and peak periods (either from 7 to 9 a.m. or from 4 to 6 p.m.).

The difference between percentage traffic share for I-205 versus an alternative route by time of day indicates the magnitude of rerouting, also known as the percentage shift of travel onto local roadways for trips between a given origin/destination pair. Appendix E includes a detailed breakdown for percentage share using each origin/destination pair route by time of day (AM peak, midday, and PM peak). Appendix E also includes a table summarizing the amount of existing rerouting estimated (i.e., changes between peak and off-peak percentage share of trips utilizing the identified local routes).

For example, in Figure 9—excerpted from the table in Appendix E—the call-out box identifies the origin/destination pair for travel between the West Linn area and the Arch Bridge. For this origin/destination pair, the Project team compared trips on the segment of I-205 between 10th Street and OR 43 with an alternative routing option along Willamette Falls Drive, the parallel local route alternative. The analysis results indicate that 15% more travelers chose to travel via Willamette Falls Drive during the peak period compared to midday in both the northbound and southbound directions—indicating 15% of these trips may be rerouting off I-205 during the peak periods.

Figure 9. Example Excerpt from Rerouting Analysis Summary Table

Origin-Destination Pairs	# of Routes	Rerouting Street Segments	D.	Local Route Utilization % Change (Increase from Mid-Day to Peak)
West Linn & Willamette Area -- Arch Bridge	2	Willamette Falls Dr	NB	15%
			SB	15%
Tualatin Area East of I-5 -- West Linn Area	3	Borland Rd (S. of I-205)	NB	26%
		Rosemont Rd		9%
		Borland Rd (S. of I-205)	SB	33%
		Rosemont Rd		14%
	2	Willamette Falls Dr	NB	24%

The analysis found consistent evidence of rerouting onto local streets during peak periods, though the magnitude of shift varied across different origin/destination pairs. Rerouting takes place in both northbound and southbound directions on weekdays, and often corresponds to heavier traffic congestion (delays) on I-205 in the southbound direction during the AM peak period and in the northbound direction during the PM peak period.

The shifts away from I-205 during peak hours were shown in longer-distance regional trips as well as more local trips. However, the more local trips generally showed a higher share of rerouting than longer-distance regional trips. This may reflect a greater willingness for local travelers to use local roadways as compared to longer-distance travelers who may be less comfortable with travel off of the I-205 mainline due to lack of familiarity or desire to avoid out-of-direction travel.

4.3 Example Rerouting Patterns

This section contains examples that illustrate existing routing patterns for travel between specific origin/destination pairs in the area, and how they can vary by time of day. The change in routing between different times of day, in peak and off-peak travel conditions, indicates a tendency for rerouting. Each analysis contains two maps, one for midday and one for a peak period, that illustrate the primary and alternative routes used.

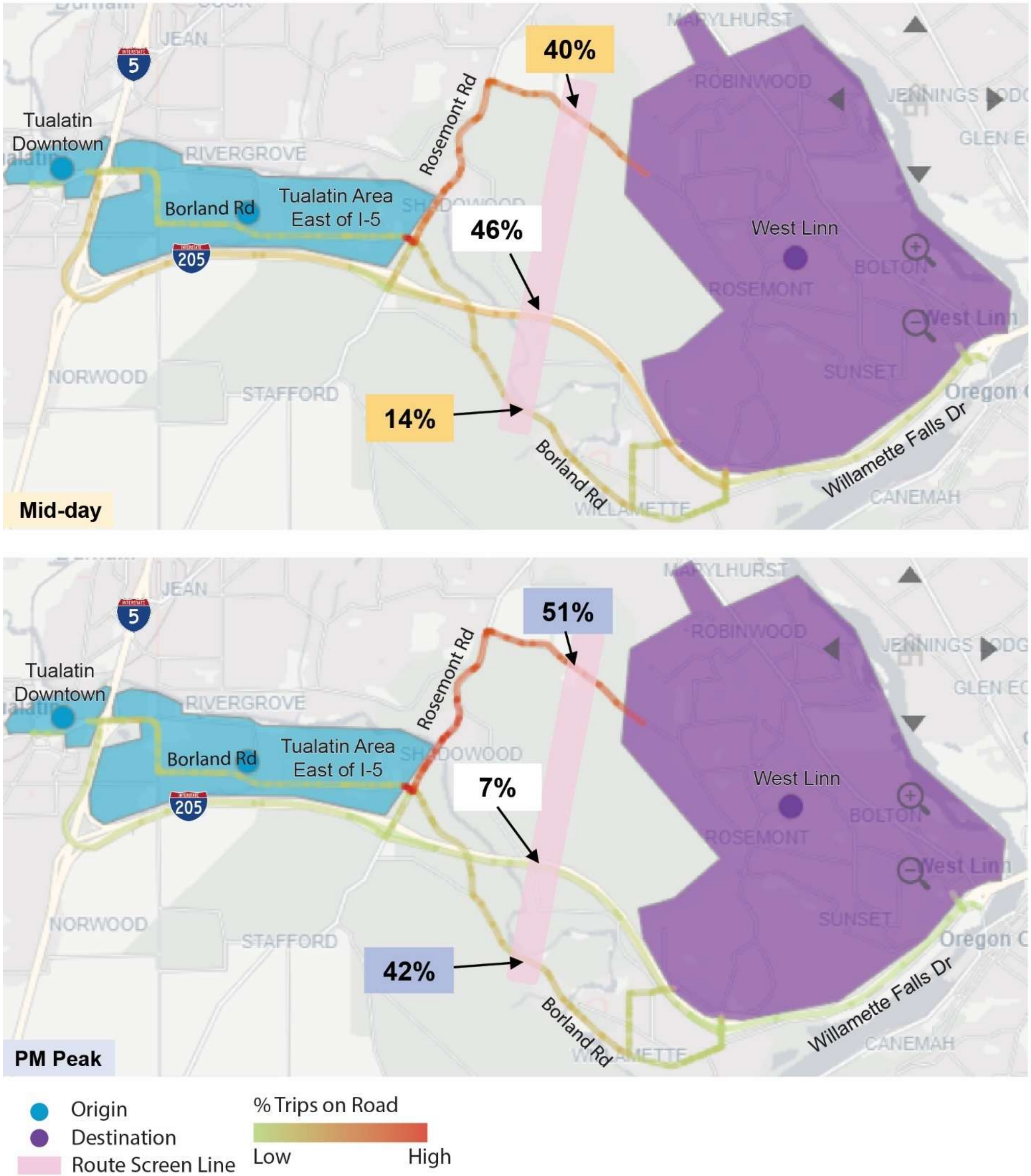
The examples are intended represent existing rerouting patterns in the corridor and were selected based on the magnitude of traffic shift onto local alternative routes between non-peak and peak periods. Rerouting patterns are often more prominent in the northbound direction and during the PM peak period, so more of these examples are included. Appendix E includes the full list of analyzed travel patterns and level of indicated rerouting.

4.3.1 Tualatin Downtown & Area East of I-5 to West Linn Area

Trips from downtown Tualatin and the area east of I-5 to West Linn (Figure 10) showed a pattern of rerouting during the PM peak period. During the midday period when I-205 was generally uncongested, the primary routes were via I-205 (46%) and Rosemont Road (40%). In the PM peak period, a large share of trips shifted off I-205 (only 7% remaining), with a corresponding increase in routing via Borland Road (increasing from 14% to 42% in the peak period). Routing via Rosemont Road also moderately increased from 40% to 51% in the PM peak. These results indicate a shift in travel patterns away from I-205 during the PM peak period when recurring congestion occurs on I-205 in the northbound direction.

While the shift of travel patterns between midday and PM peak period could be attributed to other changes in travel behavior that vary by time of day, the routing shift away from northbound I-205 occurred when congestion was most prevalent. The travel pattern during the AM peak period shows a much smaller shift away from I-205 as about 42% of trips used I-205 northbound compared to the 46% usage in midday. This difference between AM and PM peak periods aligns with directional traffic conditions near the Project segment, as I-205 is generally not severely congested northbound in the AM peak period. This reinforces the idea that congestion is likely an important contributing factor in the travel pattern shifts shown for the PM peak period.

Figure 10. Tualatin Downtown and Area East of I-5 to West Linn Area Routing Patterns

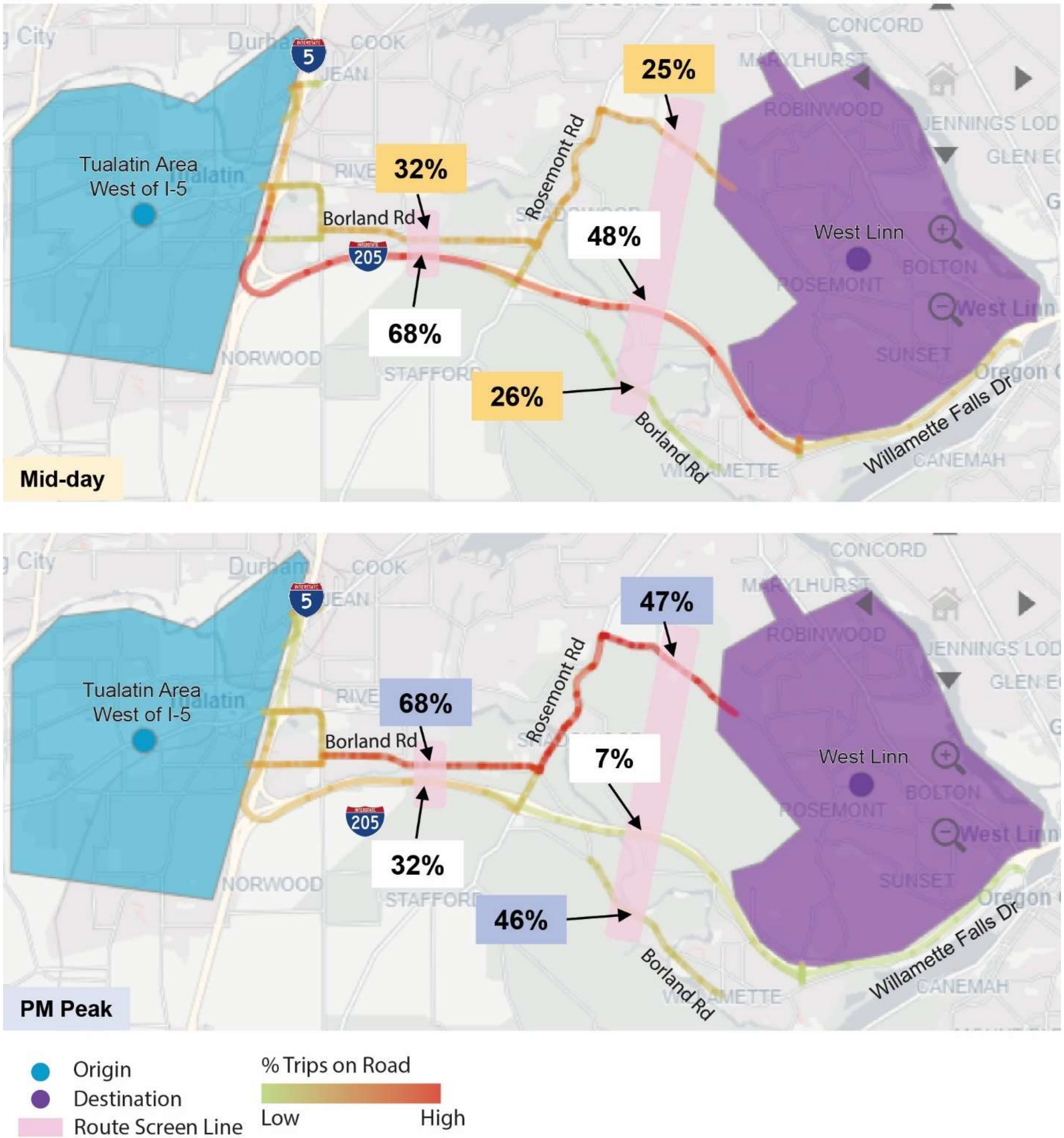


Source: StreetLight Insight Platform

4.3.2 Tualatin Area West of I-5 to West Linn Area

For trips from the Tualatin area west of I-5 to the West Linn Area (Figure 11), the analysis indicated a notable shift of traffic away from I-205 onto local alternative routes via Borland Road and Rosemont Road during the PM peak. During midday, 68% of these trips traveled via I-205, whereas Borland Road north of I-205 had 32% of trip routing. During the PM peak period, the share reversed and Borland Road saw the most trips between this origin/destination pair. This shift in routing indicates that users tend to choose local streets over I-205 during the peak period.

Figure 11. Tualatin Area West of I-5 to West Linn Area Routing Patterns



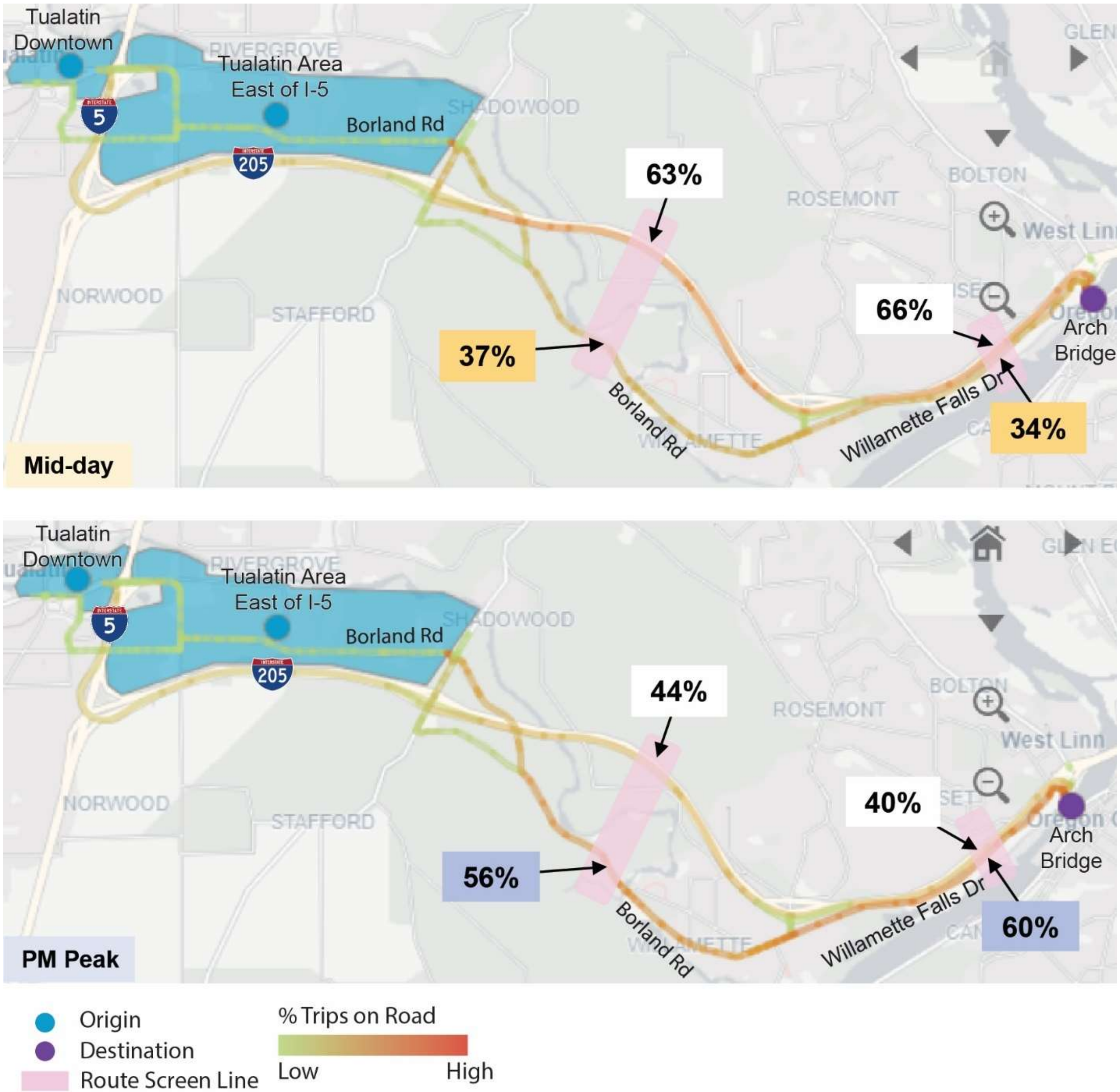
Source: StreetLight Insight Platform

4.3.3 Tualatin Downtown and Area East of I-5 to Arch Bridge

Similar to the previous analysis for Tualatin Downtown and area east of I-5, the travel pattern to the Arch Bridge (Figure 12) indicates that more than half of all travelers chose Borland Road and/or Willamette Falls Drive over I-205 during the PM peak period, whereas the majority used I-205 during midday. The analysis also suggests that during peak periods, users tended to exit I-

205 one or two interchanges prior to the nearest interchange (OR 43) that provides access to the Arch Bridge.

Figure 12. Tualatin Downtown and Area East of I-5 to Arch Bridge Routing Patterns



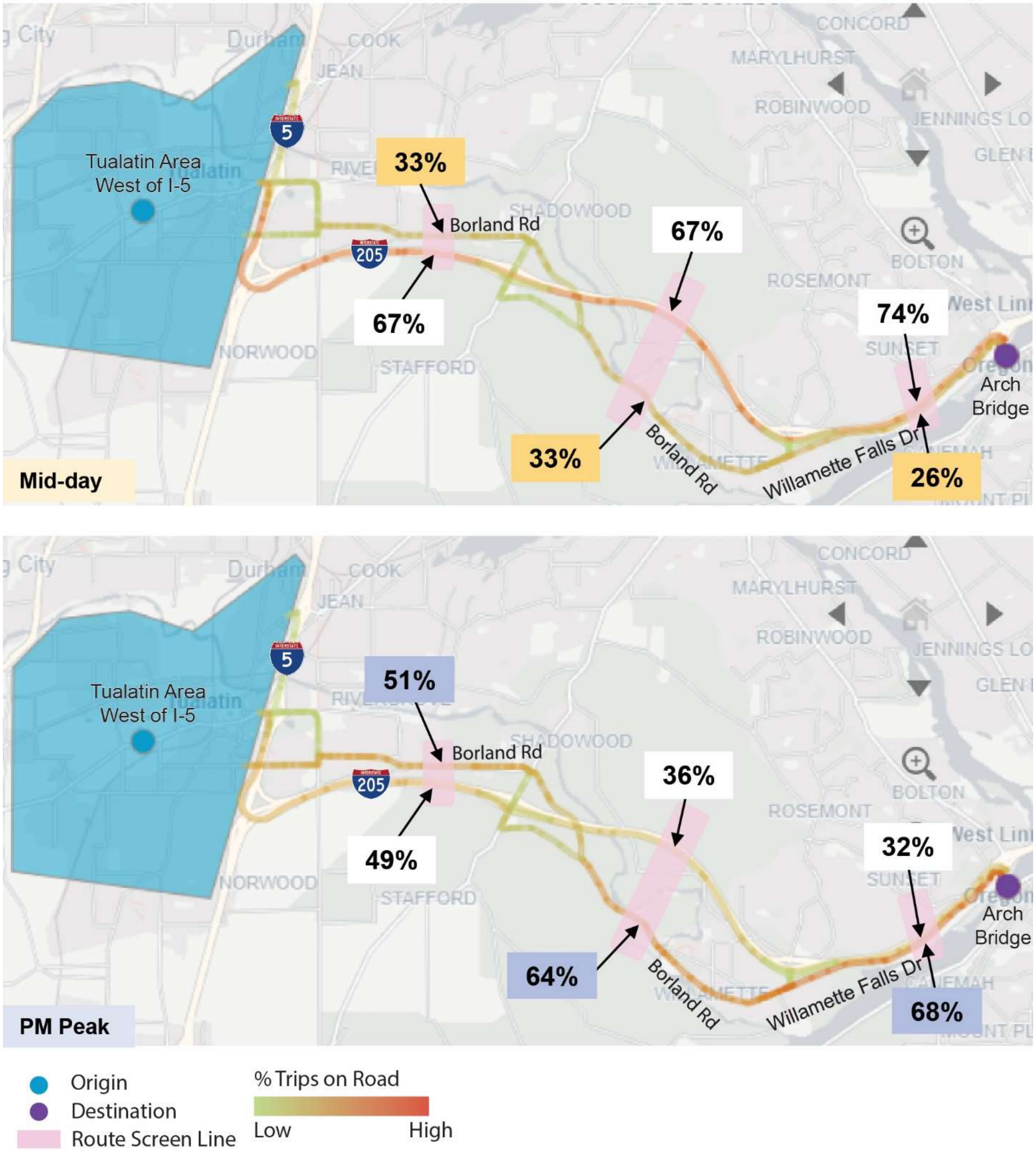
Source: StreetLight Insight Platform

Due to the relatively short trip distance, some users may avoid I-205 completely and use local streets as their main route, regardless of time of day or level of congestion, which is indicated by the notable share of routing via Borland Road (37%) seen even during midday. This is likely because travelers between this origin/destination pair have a choice of routes and use I-205 during non-peak periods to shorten travel time but readily shift when the travel time benefit is not present on the I-205 mainline.

4.3.4 Tualatin Area West of I-5 to Arch Bridge

For trips from the Tualatin area west of I-5 to the Arch Bridge (**Error! Not a valid bookmark self-reference.**), travel patterns shifted significantly onto local streets during the PM peak compared to midday patterns. About two-thirds of these trips chose I-205 over local street routing alternatives during the midday, whereas the majority chose local street route alternatives during the PM peak period, when recurring congestion is experienced along I-205. Closer to the Abernethy Bridge, the shift in routing to local street alternatives was more pronounced during the PM peak, potentially indicating avoidance of congestion in the area.

Figure 13. Tualatin Area West of I-5 to Arch Bridge Routing Patterns

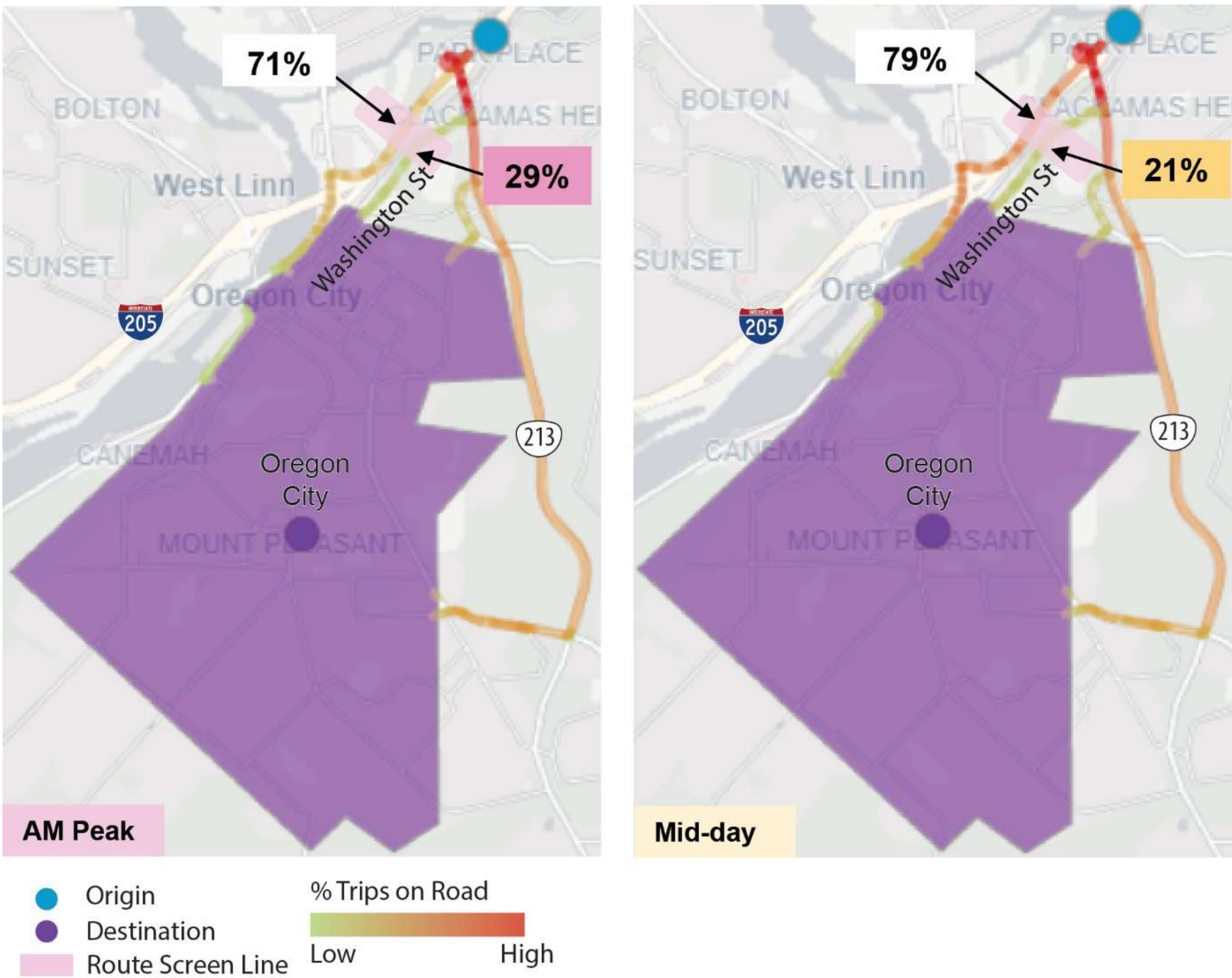


Source: StreetLight Insight Platform

4.3.5 Southbound I-205 to Oregon City Area

Examining the travel pattern on I-205 north of OR 213 interchange heading southbound to the Oregon City area (Figure 14), most trips (79%) used the OR 99E interchange during the midday. However, a moderate shift of about 8% to travel via OR 213 and Washington Street was evident during the AM peak. This may reflect some travelers exiting I-205 one interchange earlier to avoid congestion on southbound I-205 during the AM peak period.

Figure 14. Southbound I-205 to Oregon City Area Routing Patterns

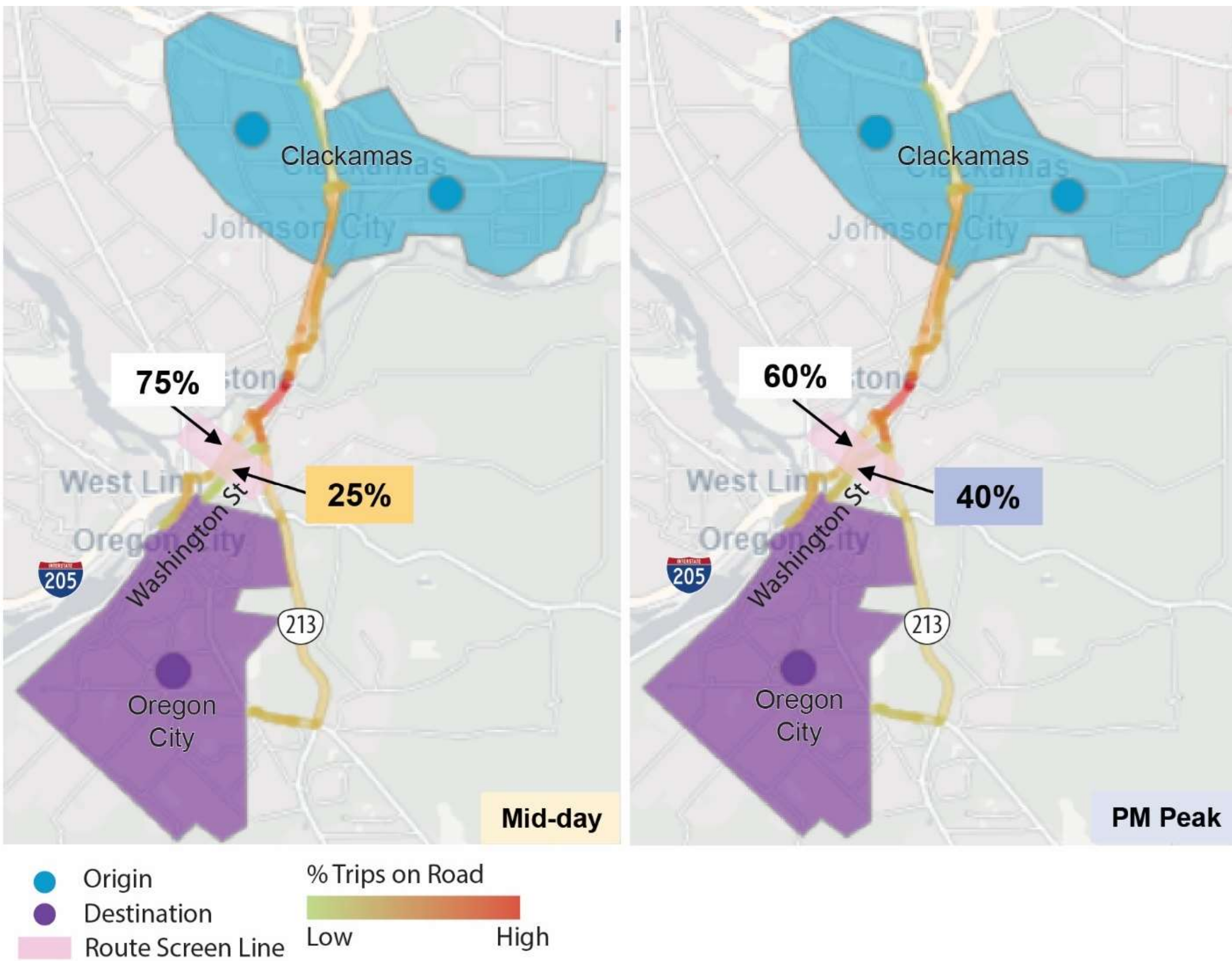


Source: StreetLight Insight Platform

4.3.6 Clackamas Area to Oregon City Area west of OR 213

Similar to the rerouting noted in Figure 15, the share of southbound trips from the Clackamas area to the Oregon City area that route via Washington Street increased from about 25% during the midday period to 34% and 40% during the AM and PM peak periods, respectively. This suggests that congestion on Abernethy Bridge southbound likely caused some rerouting during the AM and PM peaks, though this rerouting pattern appears less dramatic than some of the previous travel patterns noted in the northbound direction during the PM peak period.

Figure 15. Clackamas Area to Oregon City Area west of OR 213 Routing Patterns



Source: StreetLight Insight Platform

4.3.7 I-5 to Salamo Road

Analysis of travel from I-5 (via northbound I-205) to Salamo Road in West Linn indicated that a large change in routing occurred between the midday and PM peak periods. As shown in Figure 16, I-205 mainline users (west of Stafford Road) going to Salamo Road were almost all (96%) traveling via the 10th Street interchange off-ramp during the AM peak and midday periods. However, during the PM peak period, about one-third of these travelers exited I-205 one interchange earlier at Stafford Road and rerouted via Borland Road to get to Salamo Road.

This shift in travel pattern was not evident in the southbound direction where I-205 mainline traffic congestion was less of an issue. Almost all southbound trips (99%) used the I-205 mainline during both peak and non-peak periods.

Figure 16. I-5 to Salamo Road Routing Patterns

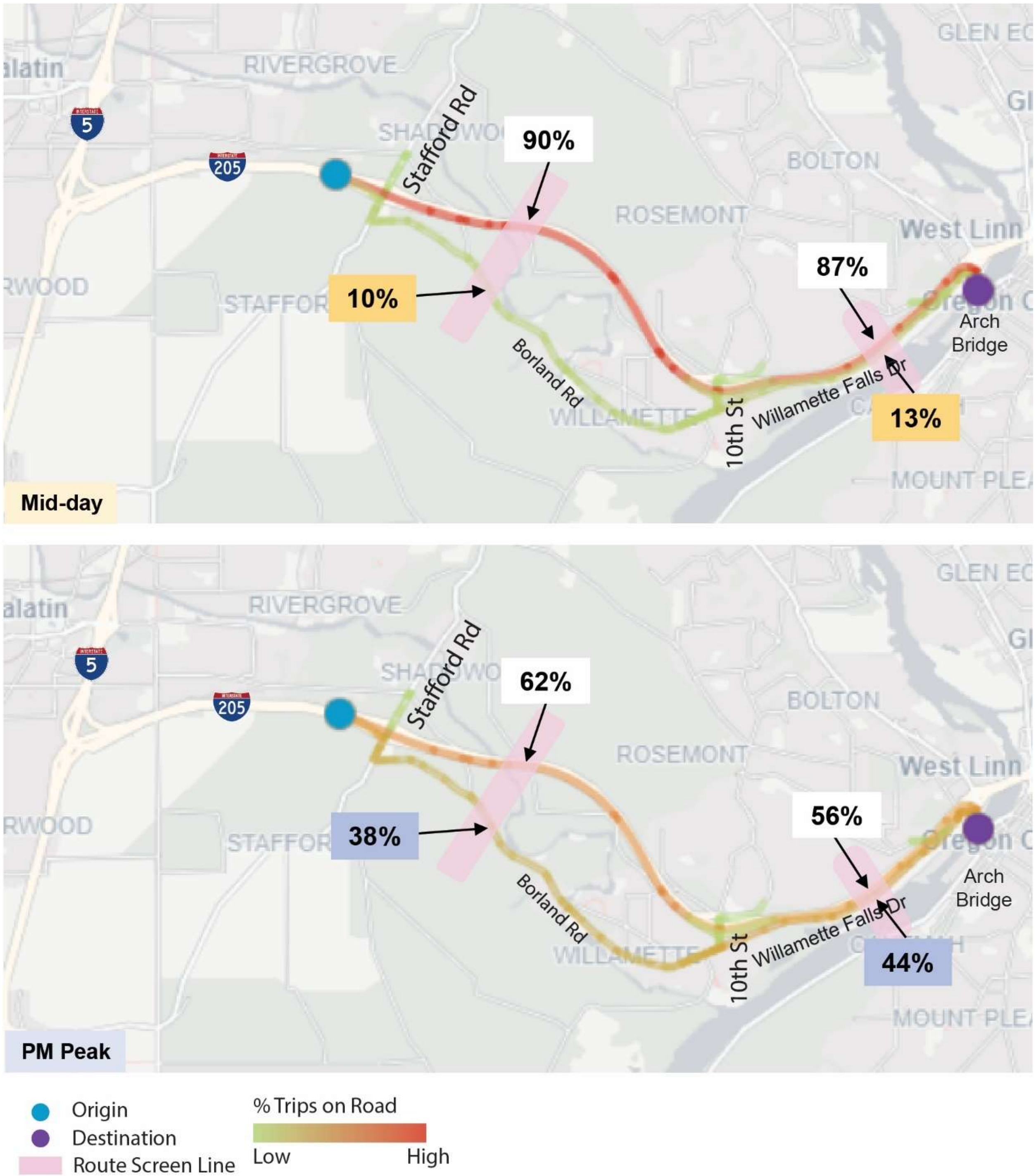
Source: StreetLight Insight Platform

4.3.8 I-5 to Arch Bridge

For travelers from I-5 traveling on northbound I-205 west of Stafford Road going to the Arch Bridge (Figure 17), a notable indication of rerouting onto Borland Road and Willamette Falls Drive during the PM peak was observed. For this travel pattern, an estimated 35% to 45% of PM peak trips appeared to route via Borland Road and/or Willamette Falls Drive to access the Arch Bridge. During the midday (off-peak period) this routing represented only 10% to 15% of these trips.

Compared to the localized rerouting patterns from Tualatin to the Arch Bridge described previously, this travel pattern—which is more regional in nature due to connecting to I-5 —showed less propensity for rerouting onto local street alternatives. However, the shift to Borland Road routes during the PM peak remained notable (from 10% to 38%), indicating that these potentially longer-distance travel patterns are also sensitive to congestion.

Figure 17. I-5 to Arch Bridge Routing Patterns

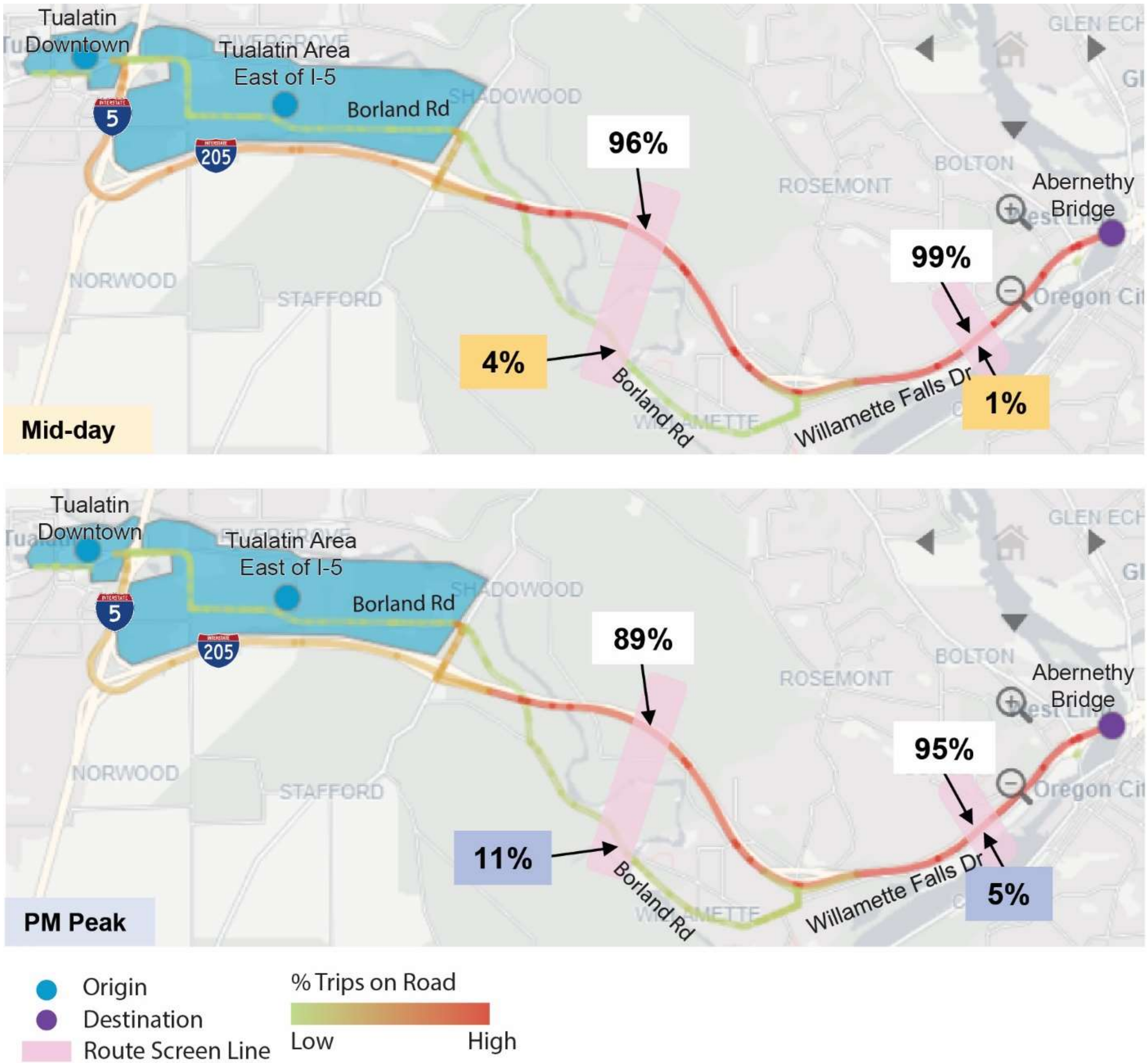


Source: StreetLight Insight Platform

4.3.9 Tualatin Downtown and Area East of I-5 to Abernethy Bridge

For trips from the Tualatin Downtown and area east of I-5 across the Abernethy Bridge (Figure 18), about 11% used Borland Road instead of I-205 between Stafford Road and 10th Street during the PM peak. This compared to only 2% and 4% in the AM and midday periods, respectively, indicating some rerouting was likely caused by congestion on I-205 northbound during the PM peak period.

Figure 18. Tualatin Downtown and Area East of I-5 to Abernethy Bridge Routing Patterns



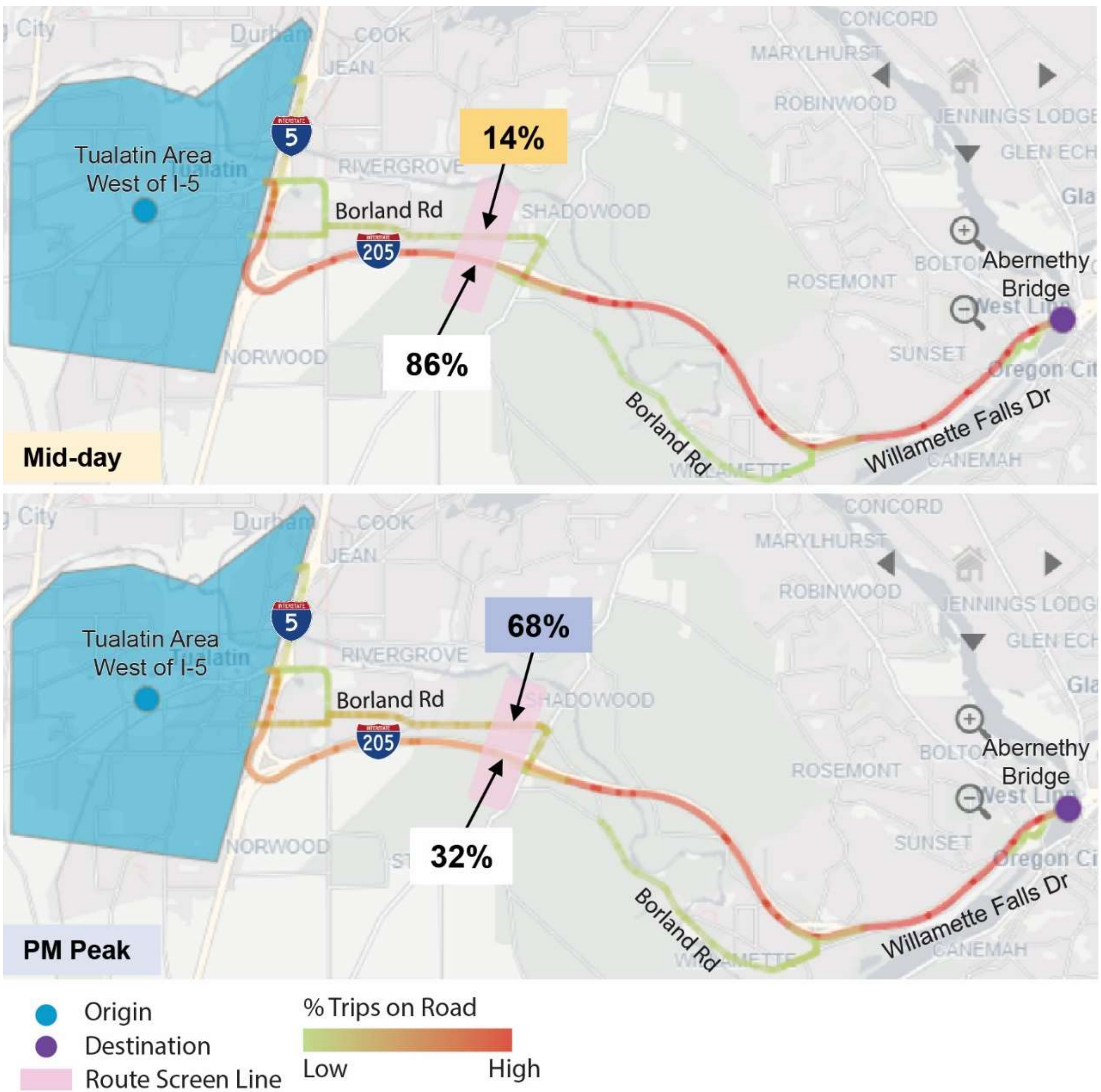
Source: StreetLight Insight Platform

The relatively low percentage of trips on Borland Road and Willamette Falls Drive routes compared to the similar travel pattern to the Arch Bridge (identified in Figure 12) could be attributed to the need to get back onto I-205 to cross the Abernethy Bridge. To do so requires making left turns from Borland Road at 10th Street or from Willamette Falls Drive at OR 43 to access the I-205 interchanges at those locations. These left turns could be onerous during congested periods and could result in longer travel time on the local street routing alternatives for this travel pattern.

4.3.10 Tualatin Area West of I-5 to Abernethy Bridge

While most trips between the Tualatin area west of I-5 and the Abernethy Bridge routed via I-205 during both the midday and PM peak periods, substantially more travelers chose to travel via Borland Road during the PM peak period (32%) as compared to during the midday (14%) as shown in Figure 19. This result is similar to those for other trip patterns in indicating that when there is congestion, users are more likely to choose local routes. Congestion on I-5 may also contribute to this rerouting pattern.

Figure 19. Tualatin Area West of I-5 to Abernethy Bridge Routing Patterns

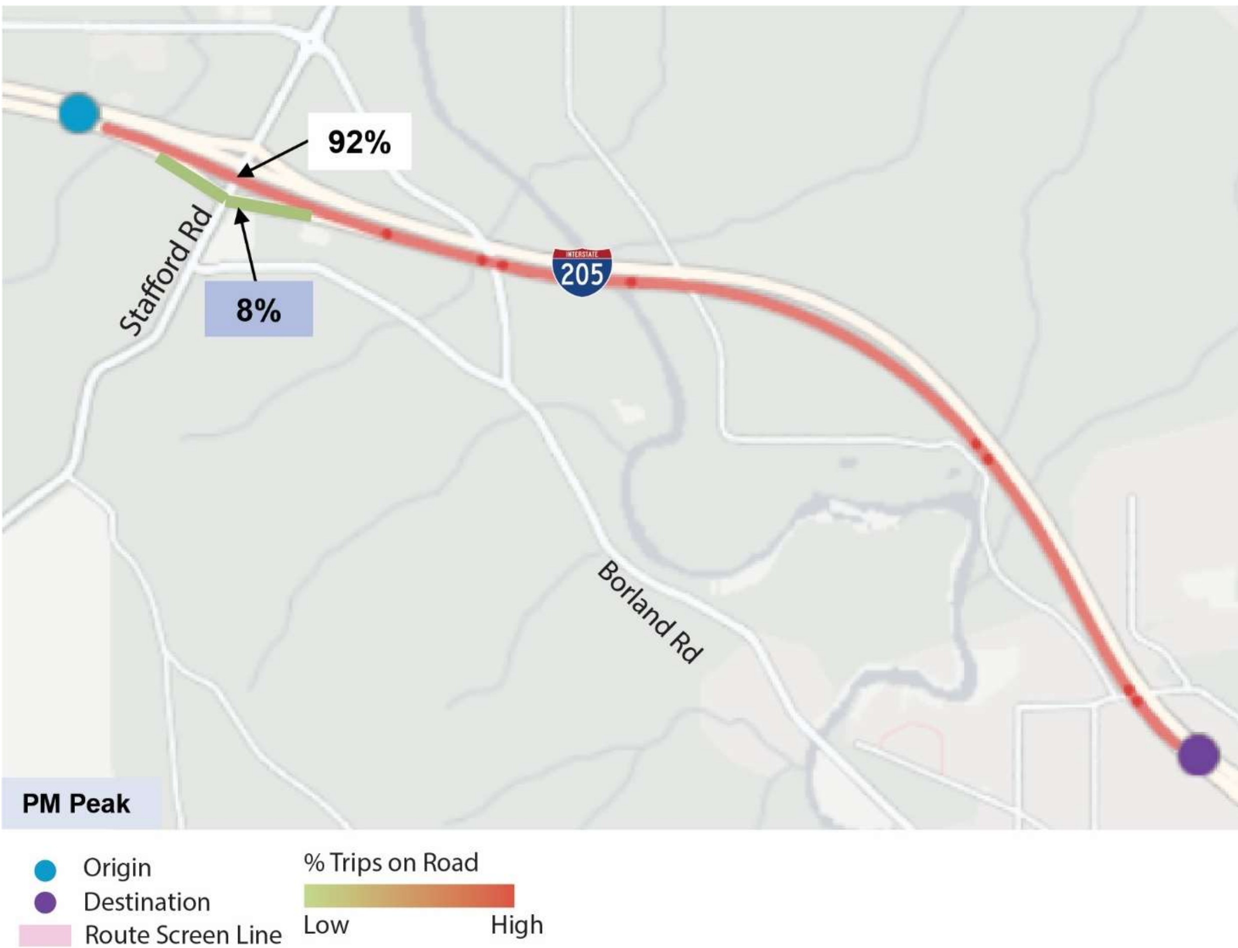


Source: StreetLight Insight Platform

4.3.11 I-205 Northbound Ramp-to-Ramp Traffic at Stafford Road Interchange

The vast majority of users already on I-205 and traveling through the Stafford Road interchange stay on I-205. However, the analysis indicates that 8% of northbound I-205 PM peak period trips took the Stafford Road off-ramp and then got right back on via the on-ramp to reroute around the (likely congested) I-205 mainline (Figure 20). During the midday and AM peak periods when congestion is generally not an issue, less than 1% of the northbound I-205 traffic used this route. This added traffic volume at the ramp terminals during the PM peak period can contribute significantly to traffic congestion at the interchange.

Figure 20. I-205 Northbound Ramp-to-Ramp Traffic at Stafford Road Interchange Routing Patterns

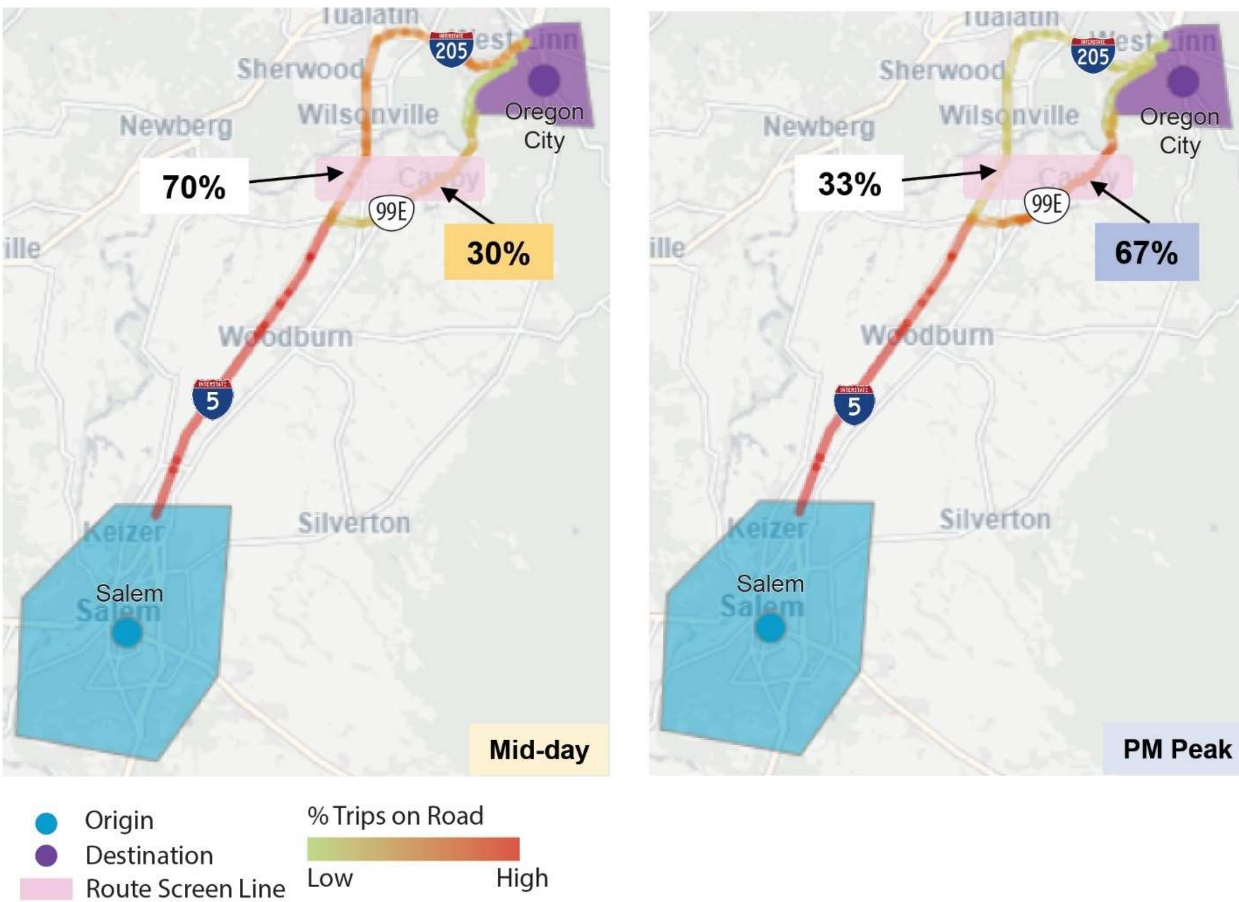


Source: StreetLight Insight Platform

4.3.12 Salem Area to Oregon City Area

For regional trips traveling northbound on I-5 from the Salem area to the Oregon City area (Figure 21), the traffic travel patterns shifted from I-205 to OR 99E via Canby during the PM peak period. While I-5 to I-205 was the preferred route (70%) from Salem to Oregon City during the midday, about two-thirds of these trips chose OR 99E during both the AM and PM peak periods. Most other rerouting patterns tended to occur during just one of the two peak periods. However, the combined congestion patterns on I-5 and I-205 appear to make this route alternative attractive during both peak periods. Most trips routing onto OR 99E during the peak periods exited I-5 at the Ehlen Road interchange west of Canby and continued north on OR 99E through downtown Canby.

Figure 21. Salem Area to Oregon City Area Routing Patterns

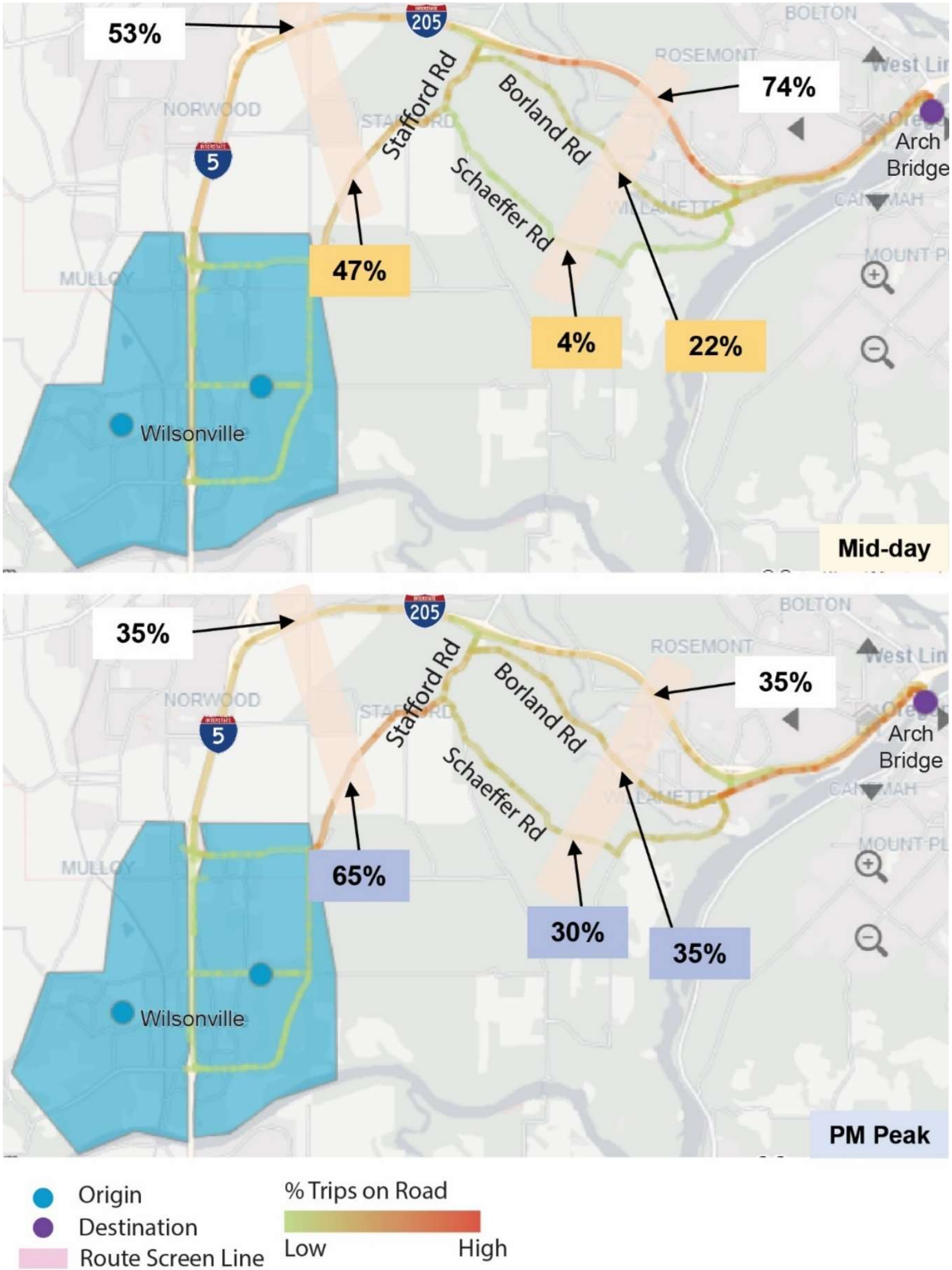


Source: StreetLight Insight Platform

4.3.13 Wilsonville Area to Arch Bridge

Trips from the Wilsonville area to the Arch Bridge have multiple potential routing alternatives (Figure 22). Travelers can use I-5 or Stafford Road to get to I-205 or travel farther east via Borland Road, Schaeffer Road, and Willamette Falls Drive as alternatives to I-205 east of Stafford Road. Travelers used these alternative routes more heavily during the PM peak period than during off-peak hours. The share of these trips using I-205 east of Stafford Road decreased from 74% in the midday to 35% in the PM peak periods.

Figure 22. Wilsonville Area to Arch Bridge Routing Patterns



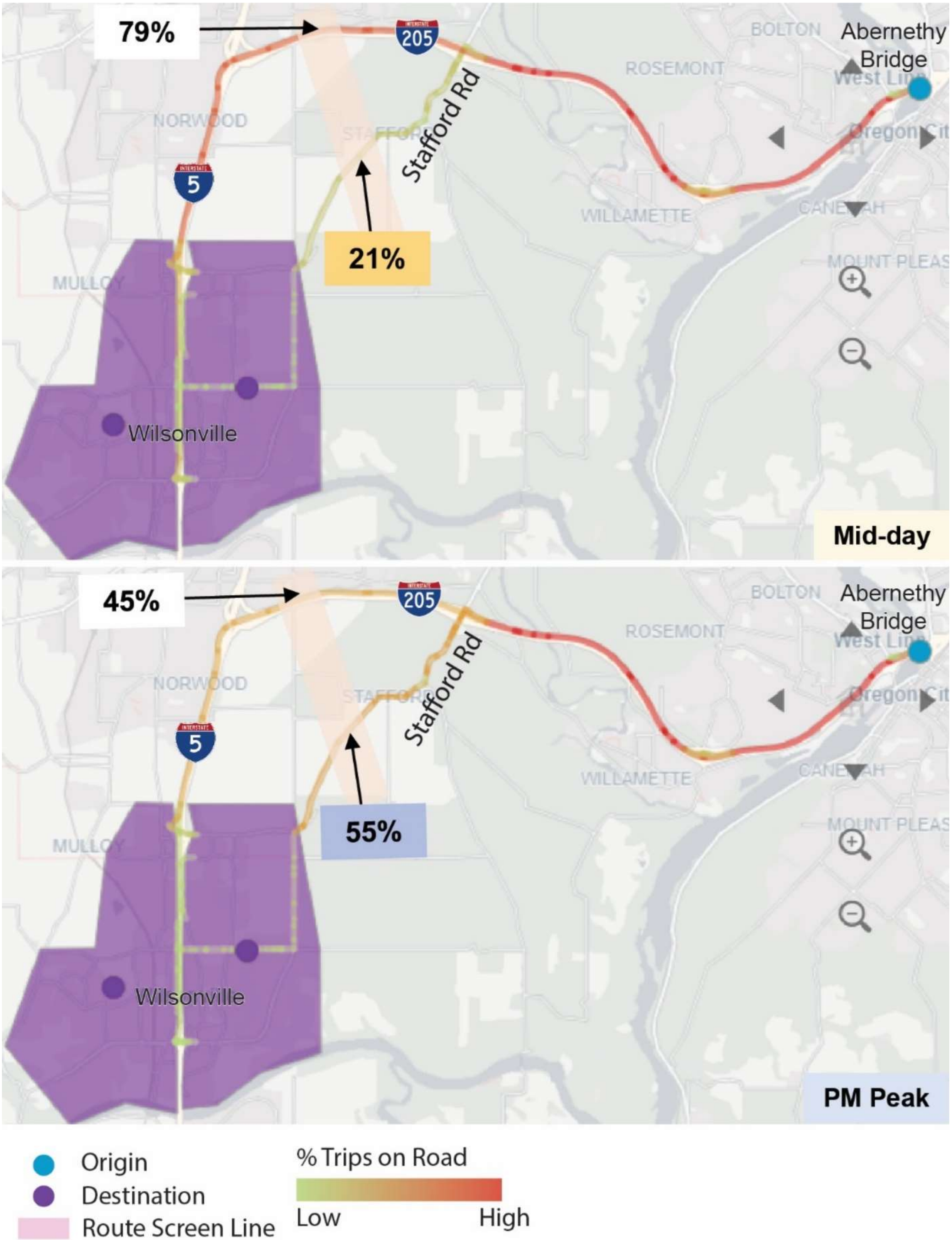
Source: StreetLight Insight Platform

4.3.14 Abernethy Bridge to Wilsonville Area

Southbound (Figure 23) and northbound (not pictured) travel patterns between Abernethy Bridge (I-205) and the Wilsonville area heavily favored the I-5/I-205 route over Stafford Road during the AM peak and midday periods. This routing pattern changed in the PM peak period as Stafford Road experienced a surge in the share of these trips from approximately 21 to 55%. This shift was likely due to an overall increase in demand for I-5 southbound for the PM peak, including trips leaving Portland in the afternoon, causing those traveling to Wilsonville from I-205 to reroute onto Stafford Road. The northbound travel pattern showed a similar but smaller shift during the PM peak.

Unlike the travel pattern between Wilsonville and the Arch Bridge, the Project team identified no significant shift away from I-205 to Borland Road or Schaeffer Road for this travel pattern.

Figure 23. Abernethy Bridge to Wilsonville Area Routing Patterns



Source: StreetLight Insight Platform

5 CORRIDOR USER DEMOGRAPHICS

The StreetLight platform does not collect device-user demographic information but instead estimates user demographics based on assigning a given device a "likely home location."[3] Because this information is based on estimates and does not contain device-user data, this analysis only considered whether user demographics for I-205 Abernethy Bridge trips appeared to be similar to demographic percentages for the region as whole, and for Clackamas County specifically (since a large share of the trips using the bridge are local). StreetLight did not collect or model individual demographic information, and used this information only to determine if there were potentially different user patterns of note for different demographic groups.

KEY FINDINGS:

- The StreetLight demographic estimates do not indicate a disproportionate use of the I-205 Abernethy Bridge by persons of color or low income users. Bridge users appear to largely mirror the demographic characteristics of the region as a whole and for Clackamas County specifically.

Table 3. Race and Ethnicity - Comparison of I-205 Users to Portland Metro Area

	White	Black	American Indian/ Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Other Race	Multiple Races	Hispanic*
I-205 Users	84%	2%	1%	5%	Less than 1%	4%	4%	10%
Clackamas County	88%	1%	1%	4%	Less than 1%	3%	3%	8%
Portland Metro**	81%	3%	1%	6%	Less than 1%	5%	4%	11%

Source: StreetLight, U.S. Census Bureau, 2010
* Hispanic is an ethnicity, and people who identify as Hispanic can be of any race.
** Portland Metro refers to the census Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area.

Table 4. Income Level - Comparison of I-205 Users to Portland Metro Area

	Less than $50K	$50K to $125K	More than $125K
I-205 Users	41%	43%	16%
Clackamas County	40%	44%	16%
Portland Metro*	44%	42%	14%

Source: StreetLight, American Community Survey 2010 5-Year Estimates
* Portland Metro refers to the Census Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area.

[3] The demographic information provided by StreetLight is derived based on an estimate for the "likely home location" of smart devices. If a device regularly pings overnight within a residential area, StreetLight considers the block as a likely home location of the device owner. The device is hence assigned the distribution of race, income, and other demographic information from the U.S. Census Bureau and American Community Survey of the likely home block or block group. The device then "carries" the demographic distribution to all its trips. The demographics data is linked to smart devices that generate location-based data and not directly linked to individual trips.

Appendix A StreetLight Methodology References

A.1 DATA SOURCE, METHODOLOGY AND VALIDATION DOCUMENTATIONS FROM STREETLIGHT

StreetLight's data source, data processing methodology and validation can be found in the following white papers:

- *StreetLight Insight Metrics: Our Methodology and Data Sources*, StreetLight Data, Inc., July 2019
- *StreetLight Volume Methodology & Validation White Paper*, StreetLight Data, Inc., August 2019

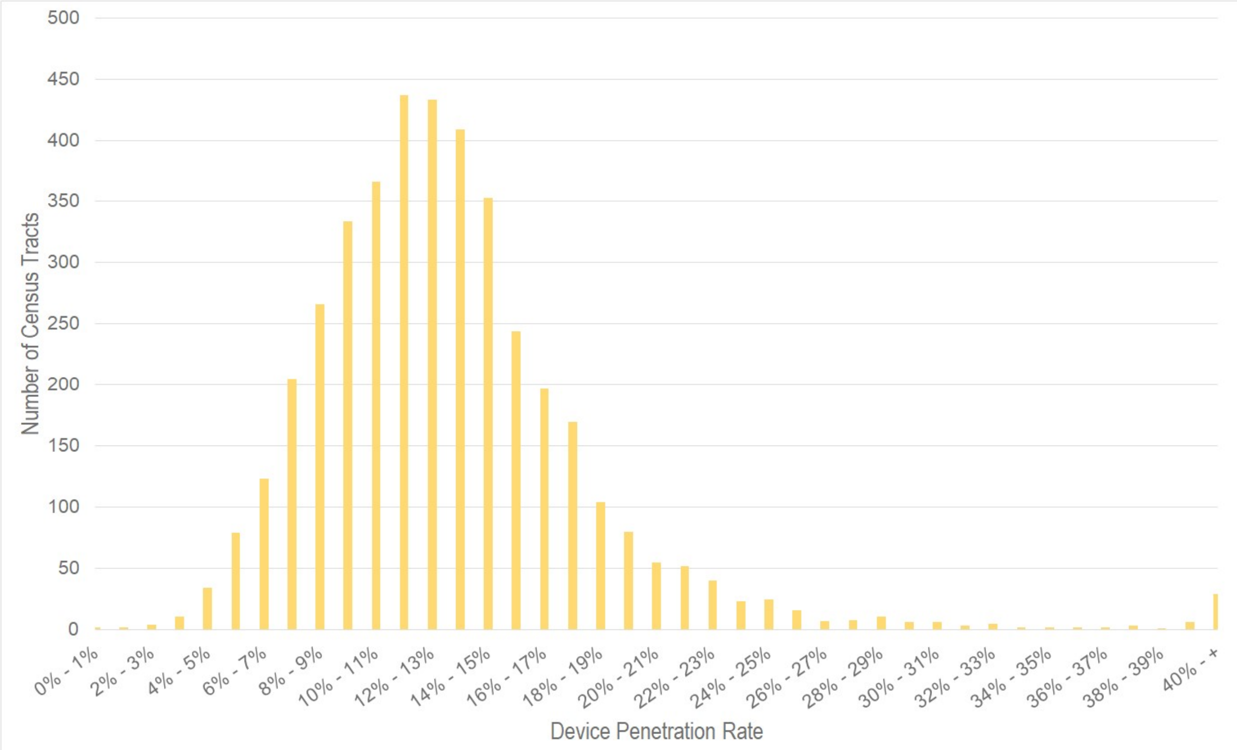
A.2 DEVICE SAMPLE SHARE

How Big Data Supports Environmental Justice in Transportation, StreetLight Data, Inc. August 2020: https://www.streetlightdata.com/big-data-supports-environmental-justice-in-transportation/

In this article, StreetLight published a case study of device sample share in Florida at the census tract level. Device sample share is defined as number of devices captured over total population. StreetLight calculated the number of devices in one census block based on the device "home location," which is defined as the location of the device during nighttime. The assumption is that if a device stays overnight in one census block, then this census block is most likely its home location. The device sample is then aggregated to the census tract level. As shown in Figure A-1, the study found 90% of census tracts have 6 to 20% device sample share. The average device sample share across all census tracts are about 13%, meaning that the sample reflects devices that belong to about 13% of the population.[4]

[4] "How Big Data Supports Environmental Justice in Transportation," StreetLight Data, Aug. 3, 2020. https://www.streetlightdata.com/big-data-supports-environmental-justice-in-transportation/

Figure A-1. Device Sample Share in Census Tracts in Florida



Source: *How Big Data Supports Environmental Justice in Transportation, StreetLight Data*, Inc., August 3, 2020

Appendix B Regional Travel Demand Model Zones and Results Comparison to StreetLight

In this Appendix, origin/destination analysis results of Abernethy Bridge trips from RTDM is shown in Figure B-1. Figure B-2 shows the aggregated transit analysis zones (TAZs) or Districts used in the RTDM origin/destination analysis. Table C-1 compares origin/destination analysis results from the Oregon Statewide Integrated Model, Metro's Regional Travel Demand Model (RTDM) and StreetLight, showing that the origin/destination trip share is relatively consistent across the three data sources.

Figure B-1. Regional Origins of I-205 Trips Crossing the Abernethy Bridge from Regional Travel Demand Model

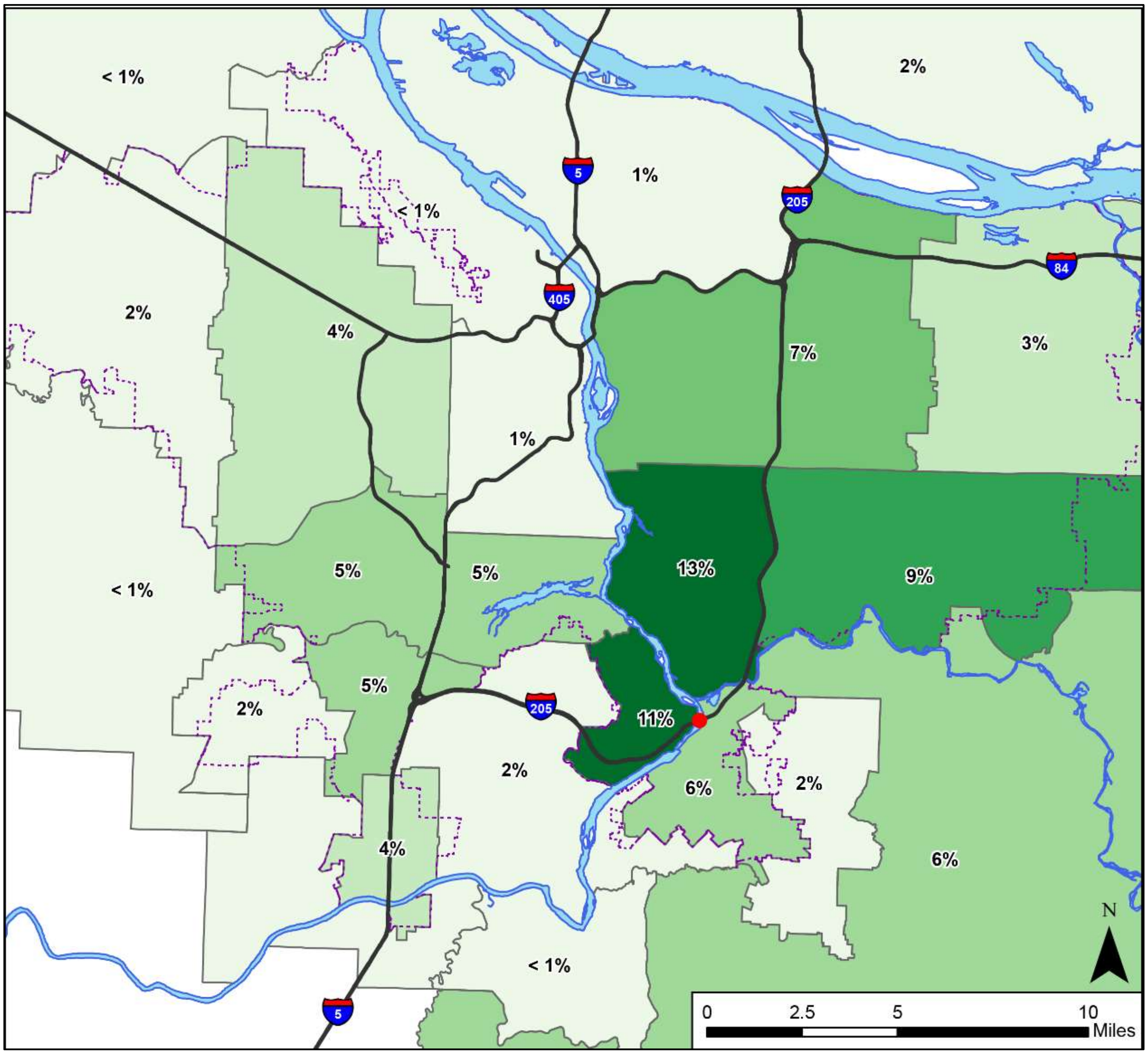
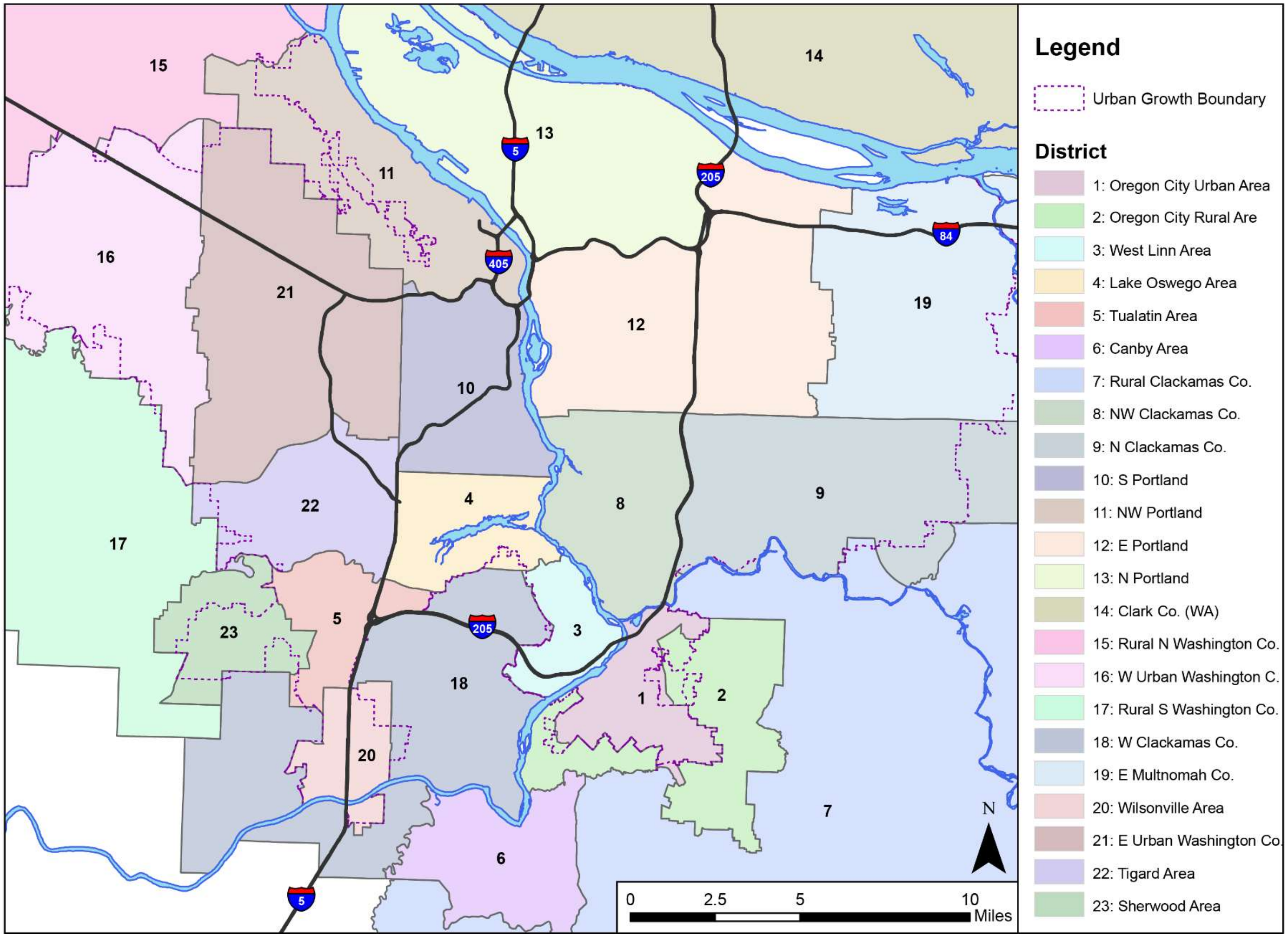
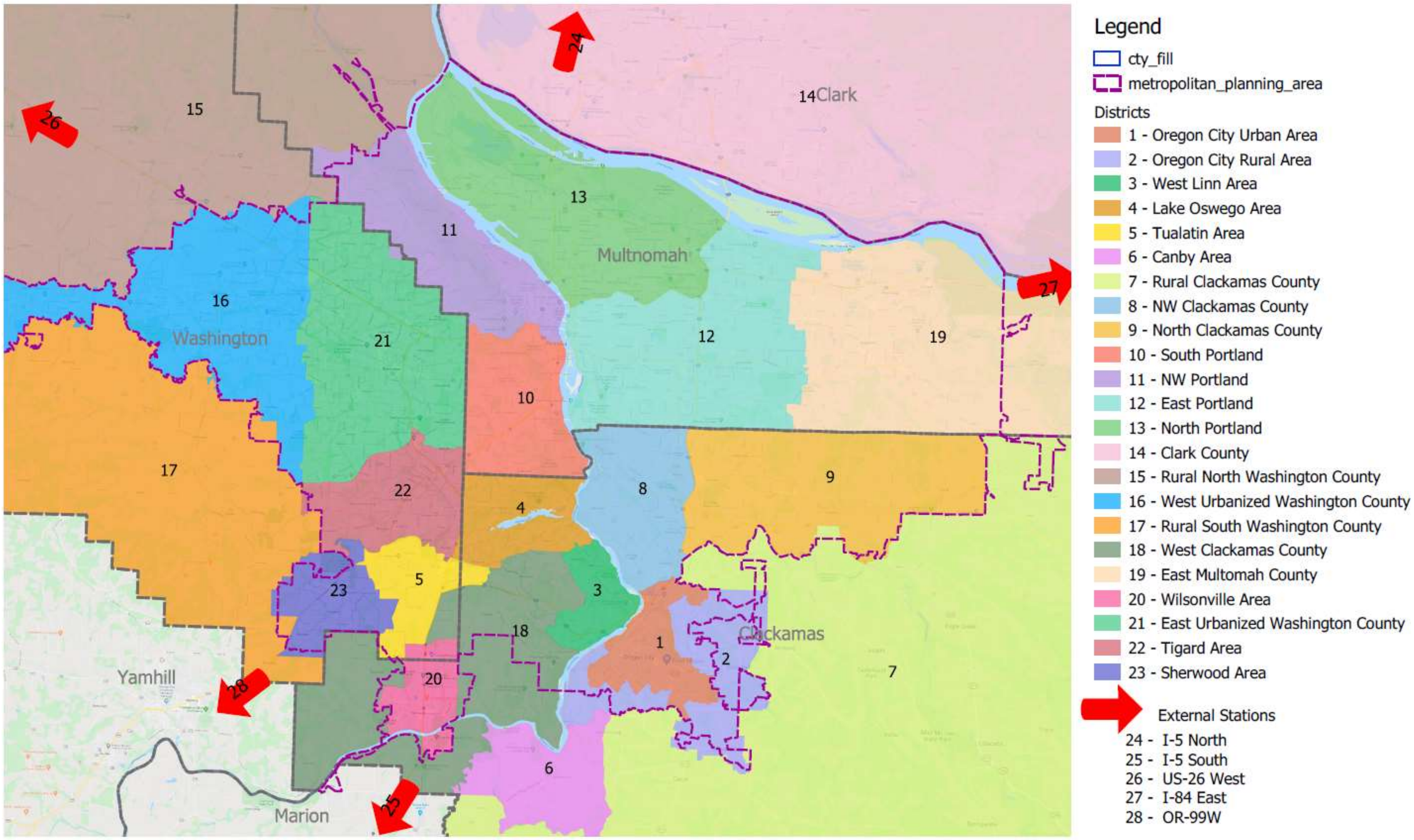


Figure B-2. Regional Travel Demand Model Aggregated Zones/Districts





Legend
cty_fill
metropolitan_planning_area
Districts
1 - Oregon City Urban Area
2 - Oregon City Rural Area
3 - West Linn Area
4 - Lake Oswego Area
5 - Tualatin Area
6 - Canby Area
7 - Rural Clackamas County
8 - NW Clackamas County
9 - North Clackamas County
10 - South Portland
11 - NW Portland
12 - East Portland
13 - North Portland
14 - Clark County
15 - Rural North Washington County
16 - West Urbanized Washington County
17 - Rural South Washington County
18 - West Clackamas County
19 - East Multnomah County
20 - Wilsonville Area
21 - East Urbanized Washington County
22 - Tigard Area
23 - Sherwood Area
External Stations
24 - I-5 North
25 - I-5 South
26 - US-26 West
27 - I-84 East
28 - OR-99W
Clark
Multnomah
Washington
Clackamas
Yamhill
Marion

Appendix C Origin/Destination Comparison between Tools

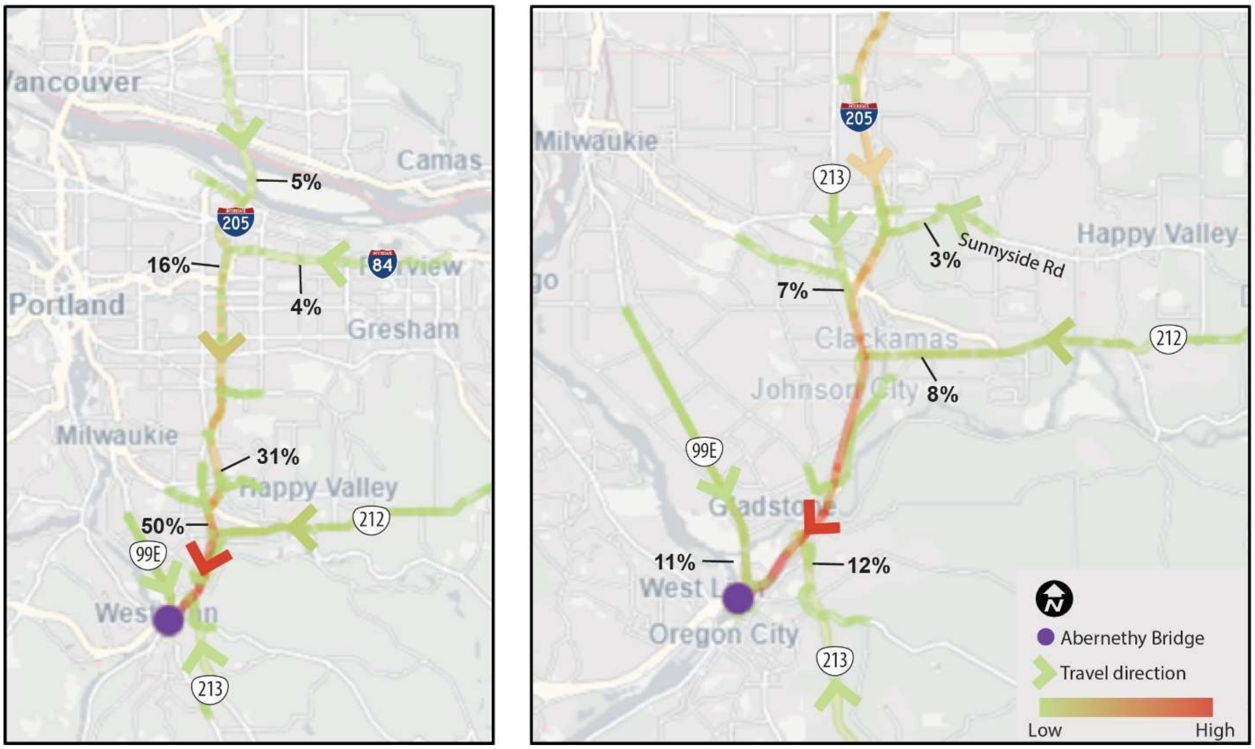
Table C-1. Trip Origin/Destination Share - Comparison Between StreetLight, Regional Travel Demand Model, and Oregon Statewide Integrated Model

	Trip Origin/Destination Share					
	SWIM Origin	SWIM Destination	Metro RTDM Origin	Metro RTDM Destination	StreetLight Origin	StreetLight Destination
External	14%	14%	10%	9%	12%	12%
Oregon City Urban Area	6%	6%	6%	6%	8%	8%
Oregon City Rural Area	2%	2%	2%	2%	1%	1%
West Linn Area	16%	16%	11%	11%	10%	10%
Lake Oswego Area	5%	5%	5%	5%	4%	4%
Tualatin Area	4%	4%	5%	5%	5%	5%
Canby Area	2%	0%	0%	0%	1%	0%
Rural Clackamas County	3%	4%	6%	5%	3%	3%
NW Clackamas County	15%	16%	13%	13%	12%	12%
North Clackamas County	9%	10%	9%	9%	9%	9%
South Portland	1%	1%	1%	1%	1%	1%
NW Portland	0%	0%	0%	0%	0%	0%
East Portland	6%	6%	7%	7%	7%	7%
North Portland	1%	1%	1%	1%	3%	4%
Clark County	2%	2%	2%	2%	3%	3%
Rural North Washington County	0%	0%	0%	0%	0%	0%
West Urbanized Washington County	0%	0%	2%	2%	2%	1%
Rural South Washington County	0%	0%	0%	0%	0%	0%
West Clackamas County	3%	3%	2%	2%	2%	2%
East Multomah County	3%	3%	3%	3%	3%	4%
Wilsonville Area	2%	2%	4%	5%	5%	5%
East Urbanized Washington County	1%	1%	4%	4%	3%	3%
Tigard Area	3%	3%	5%	6%	5%	5%
Sherwood Area	1%	1%	2%	1%	1%	1%

Appendix D Travel Shed Analysis for Abernethy Bridge Users, Southbound Trips To/From Abernethy Bridge

Figure D-1 and D-2 show the travel shed analysis of southbound trips going across Abernethy Bridge. Figure D-1 shows inbound trips going to Abernethy Bridge southbound, and Figure D-2 shows outbound trips leaving from Abernethy Bridge southbound. The results are similar to those of the northbound direction shown in Figure 3 and 4 in the travel shed for Abernethy Bridge users section.

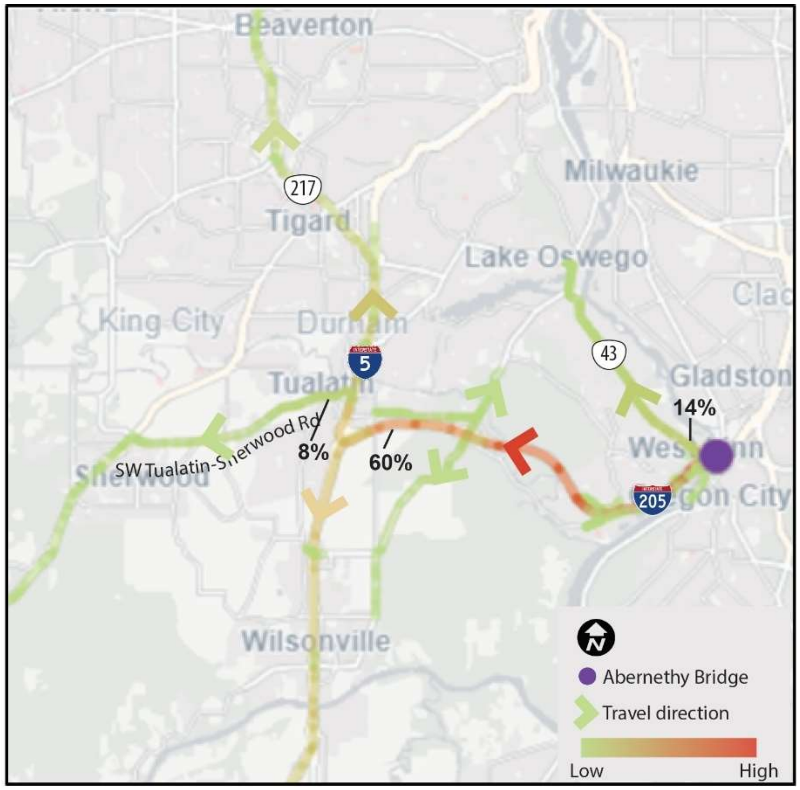
Figure D-1. Trips to Abernethy Bridge Southbound based on StreetLight's Data



Regional View *Corridor View*

Figure D-2. Trips from Abernethy Bridge Southbound based on StreetLight's Data

Regional View



Corridor View

Appendix E Complete List of Rerouting Analyses

Table E-1 contains a summary displaying the routing choice travel patterns between identified origin/destination pairs near the I-205 corridor, highlighting the trend of existing rerouting onto local alternative streets. The columns Origin-Destination Pairs and Rerouting Street Segments indicate which O-D pair the trips were recorded for and what the local alternative street was, respectively. The column Local Route Utilization % Change shows the percentage increase in trips on the local alternative street from midday to peak period (either AM peak from 7 – 9 AM or PM peak from 4 – 6 PM), which indicates the percent shift of traffic onto local streets. Route utilization is indicated by the color bar with brighter yellow indicating a higher percent of traffic preferring a given route over the other option and white indicating a lower percentage.

The geographies used in the rerouting analyses represent the area of the municipalities, but the boundaries may not align exactly with municipal or county boundary. Most of the geographies in the analyses are included in the examples in the section Current Tendency for Rerouting except for Willamette, which is part of the City of West Linn. The Willamette area used in this analysis is shown in Figure E-1.

Figure E-1. Willamette Area used in Rerouting Analysis

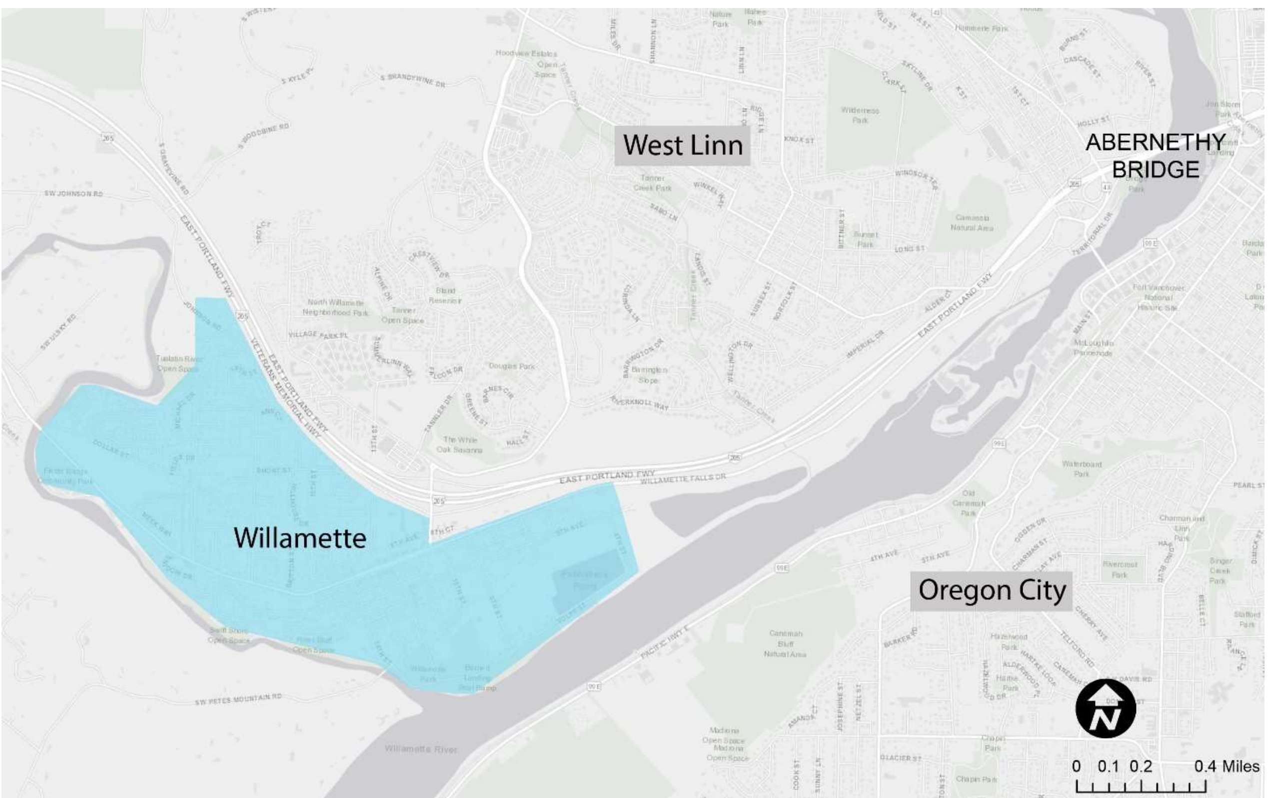


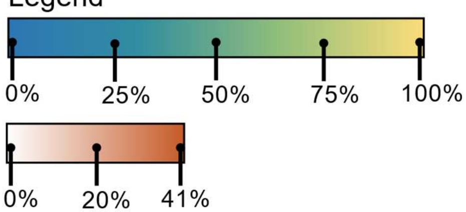
Table E-1. Complete List of Rerouting Analysis Results

	Origin-Destination Pairs	# of Routes	Rerouting Street Segments	D.	Route Utilization % Mainline AM	Mainline MD	Mainline PM	Alternate AM	Alternate MD	Alternate PM	Local Route Utilization % Change (Increase from Mid-Day to Peak)
Local Trips	West Linn & Willamette -- Arch Bridge	2	Willamette Falls Dr	NB	33%	37%	22%	67%	63%	78%	15%
				SB	16%	31%	21%	84%	69%	79%	15%
	Tualatin E. of I-5 -- West Linn	3	Borland Rd (S. of I-205)	NB	40%	38%	6%	25%	18%	44%	26%
			Rosemont Rd		-	-	-	35%	44%	50%	9%
			Borland Rd (S. of I-205)	SB	28%	47%	41%	41%	8%	10%	33%
			Rosemont Rd		-	-	-	31%	44%	49%	14%
		2	Willamette Falls Dr	NB	70%	48%	24%	30%	52%	76%	24%
				SB	47%	61%	77%	53%	39%	23%	16%
	Tualatin Downtown & E. of I-5 -- West Linn	3	Borland Rd (S. of I-205)	NB	42%	46%	7%	24%	14%	42%	27%
			Rosemont Rd		-	-	-	34%	40%	51%	11%
			Borland Rd (S. of I-205)	SB	30%	53%	47%	38%	7%	10%	32%
			Rosemont Rd		-	-	-	31%	40%	44%	9%
		2	Willamette Falls Dr	NB	69%	57%	35%	31%	43%	65%	22%
				SB	45%	68%	77%	55%	32%	23%	23%
	Tualatin W. of I-5 to West Linn	2	Borland (N. of I-205)	NB	59%	68%	32%	41%	32%	68%	36%
				SB	52%	70%	68%	48%	30%	32%	18%
		3	Borland Rd (S. of I-205)	NB	42%	48%	7%	31%	26%	46%	20%
			Rosemont Rd		-	-	-	28%	25%	47%	22%
			Borland Rd (S. of I-205)	SB	56%	64%	65%	5%	5%	4%	0%
			Rosemont Rd		-	-	-	39%	32%	30%	8%
	Tualatin E. of I-5 -- Arch Bridge	2	Borland Rd (S. of I-205)	NB	82%	58%	37%	18%	42%	63%	22%
				SB	39%	65%	69%	61%	35%	31%	26%
		2	Willamette Falls Dr	NB	89%	62%	35%	11%	38%	65%	27%
				SB	36%	65%	62%	64%	35%	38%	29%
	Tualatin Downtown & East of I-5 -- Arch Bridge	2	Borland (S. of I-205)	NB	85%	63%	44%	15%	37%	56%	22%
				SB	47%	72%	71%	53%	28%	29%	25%
		2	Willamette Falls Dr	NB	90%	66%	40%	10%	34%	60%	25%
				SB	44%	70%	64%	56%	30%	36%	26%

	Tualatin (W. of I5) -- Arch Bridge	2	Borland Rd (N. of I-205)	NB	65%	67%	49%	35%	33%	51%	18%
				SB	47%	74%	71%	53%	26%	29%	28%
		2	Borland Rd (S. of I-205)	NB	78%	67%	36%	22%	33%	64%	31%
				SB	51%	87%	84%	49%	13%	16%	36%
		2	Willamette Falls Dr	NB	74%	74%	32%	26%	26%	68%	41%
				SB	55%	82%	82%	45%	18%	18%	27%
	Clackamas -- Oregon City (west of OR213)	2	Washington St	SB	66%	75%	60%	34%	25%	40%	15%
				NB	89%	90%	93%	11%	10%	7%	3%
Regional Trips	Wilsonville -- Arch Bridge	3	Borland Rd (S. of I-205)	NB	91%	74%	35%	9%	22%	35%	13%
			SW Schaeffer		-	-	-	0%	4%	30%	26%
			Borland Rd (S. of I-205)	SB	67%	77%	75%	24%	22%	25%	4%
			SW Schaeffer		-	-	-	9%	1%	0%	8%
		2	Stafford Rd	NB	34%	53%	35%	66%	47%	65%	18%
				SB	48%	61%	29%	52%	39%	71%	32%
		2	Willamette Falls Dr	NB	83%	72%	38%	17%	28%	62%	34%
				SB	53%	69%	69%	47%	31%	31%	17%
	Wilsonville -- Stafford Gate	2	Stafford Rd	NB	19%	33%	26%	81%	67%	74%	14%
				SB	27%	36%	12%	73%	64%	88%	25%
	Wilsonville -- Willamette Downtown	3	Borland Rd (S. of I-205)	NB	23%	26%	6%	68%	71%	71%	3%
			SW Schaeffer		-	-	-	9%	3%	23%	20%
			Borland Rd (S. of I-205)	SB	18%	26%	7%	64%	71%	78%	7%
			SW Schaeffer		-	-	-	18%	3%	15%	15%
		2	Stafford Rd	NB	25%	22%	15%	75%	78%	85%	7%
				SB	23%	24%	5%	77%	76%	95%	19%
	Wilsonville -- Salamo Gate	2	Stafford Rd	NB	50%	73%	40%	50%	27%	60%	32%
				SB	86%	78%	39%	14%	22%	61%	39%
		3	Borland (S. of I-205)	NB	100%	90%	32%	0%	9%	43%	34%
			SW Schaeffer		-	-	-	0%	1%	25%	24%
			Borland (S. of I-205)	SB	90%	92%	85%	10%	8%	15%	8%
			SW Schaeffer		-	-	-	0%	0%	0%	0%
	I-205 (W. of Stafford Rd) -- Arch Bridge	2	Borland Rd (S. of I-205)	NB	97%	90%	62%	3%	10%	38%	28%
				SB	98%	99%	99%	2%	1%	1%	2%
		2	Willamette Falls Dr	NB	90%	87%	56%	10%	13%	44%	31%
				SB	83%	93%	90%	17%	7%	10%	9%

	I-205 (W. of Stafford) -- Salamo gate	2	Borland (S. of I-205)	NB	98%	96%	66%	2%	4%	34%	30%
				SB	99%	100%	99%	1%	0%	1%	1%
	I-205 N. of OR213 -- Oregon City	2	Washington St	NB	93%	95%	93%	7%	5%	7%	2%
				SB	71%	79%	73%	29%	21%	27%	9%
	Tualatin (downtown & E. of I5) -- Abernethy Bridge	2	Borland (S. of I-205)	NB	98%	96%	89%	2%	4%	11%	8%
				SB	97%	99%	99%	3%	1%	1%	1%
		2	Willamette Falls Dr	NB	99%	99%	95%	1%	1%	5%	4%
				SB	98%	99%	99%	2%	1%	1%	1%
	Tualatin (W. of I-5) -- Abernethy Bridge	2	Borland (N. of I-205)	NB	88%	86%	68%	12%	14%	32%	18%
				SB	82%	87%	81%	18%	13%	19%	6%
	West Linn & Willamette -- Abernathy Bridge	2	Willamette Falls Dr	NB	97%	94%	88%	3%	6%	12%	6%
				SB	85%	92%	94%	15%	8%	6%	7%
	Wilsonville -- Abernathy Bridge	2	Stafford Rd	NB	61%	78%	56%	39%	22%	44%	22%
				SB	82%	79%	45%	18%	21%	55%	34%
		3	Borland (S. of I-205	NB	98%	99%	83%	1%	1%	6%	4%
			SW Schaeffer		-	-	-	0%	0%	11%	11%
			Borland (S. of I-205	SB	97%	99%	97%	2%	1%	3%	2%
			SW Schaeffer		-	-	-	1%	0%	0%	1%
		2	Willamette Falls Dr	NB	98%	99%	94%	2%	1%	6%	5%
				SB	97%	99%	99%	3%	1%	1%	2%
	Oregon City -- Salem	2	OR 99E (at Canby)	NB	38%	70%	33%	62%	30%	67%	37%
				SB	59%	58%	22%	41%	42%	78%	36%
Ramp Trips	I-205 & Stafford Rd Interchange	2	On- and off-ramps	NB	100%	99%	92%	0%	1%	8%	7%

Legend



Item #2.

PERFORMANCE MEASURES: NEIGHBORHOOD HEALTH AND SAFETY

As the performance measures are updated, they immediately influence the current I-205 Toll Project. The performance measures for the I-205 Toll Project will be the basis for creating performance measures for the Regional Mobility Pricing Project, which will occur in early 2022.

I-205 TOLL PROJECT DRAFT SOCIAL AND COMMUNITY RESOURCES MAPS

The draft maps were developed to identify social and community resources within the area of potential impact (API) for the I-205 Toll Project. The draft maps focus on the same areas included in the presentation on rerouting during Equity and Mobility Advisory Committee (EMAC) Meeting #3 (see EMAC Meeting #3 recording, 2:03:18). The following maps focus on areas identified through preliminary modeling of the I-205 Toll Project, as places that may experience the biggest changes in traffic volumes from vehicles choosing different routes (vehicle rerouting):[1]

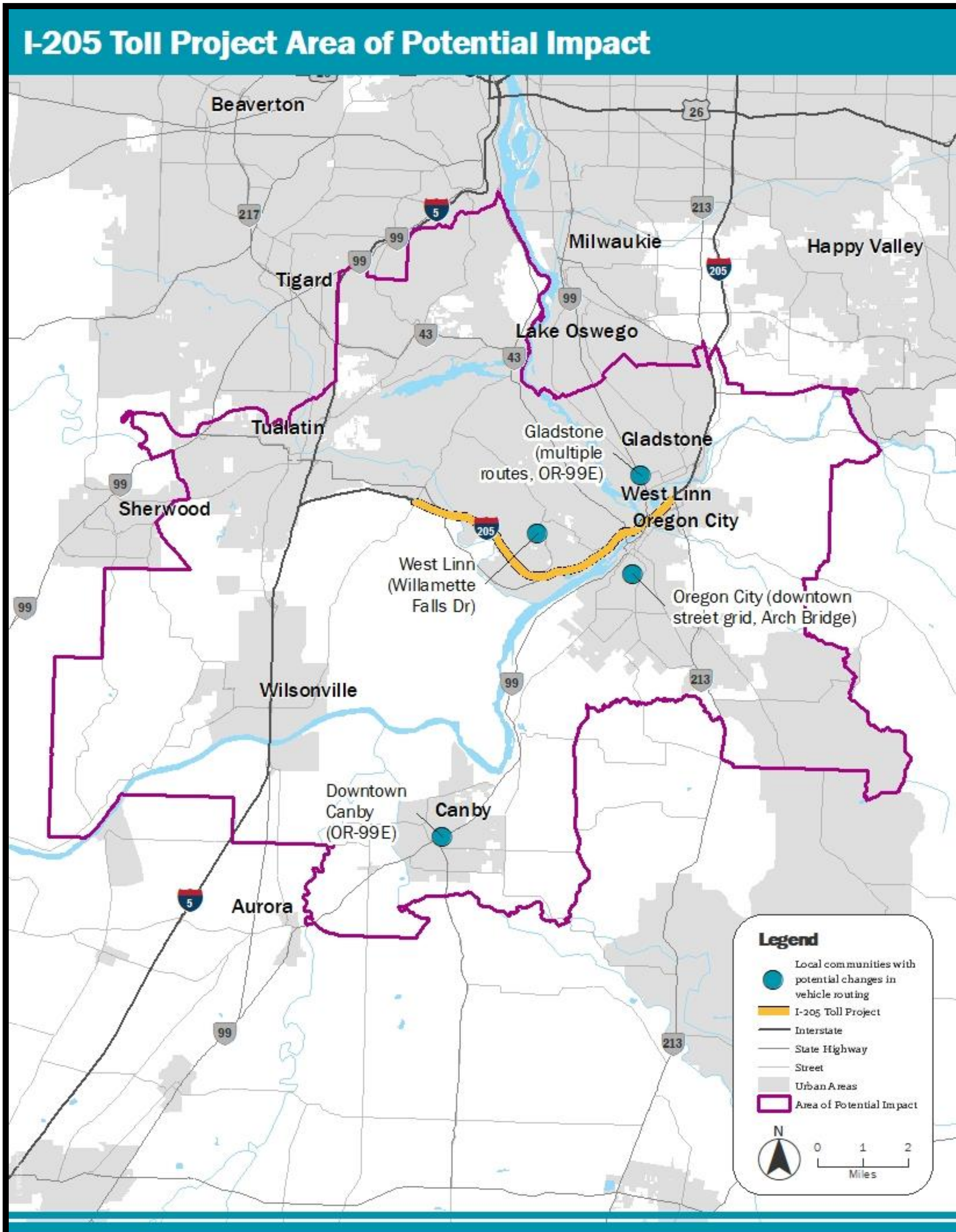
- **Downtown Canby** (along 99E)
- **Gladstone** (multiple routes and along 99E)
- **Oregon City** (downtown and Arch Bridge)
- **West Linn** (Willamette Falls Drive)

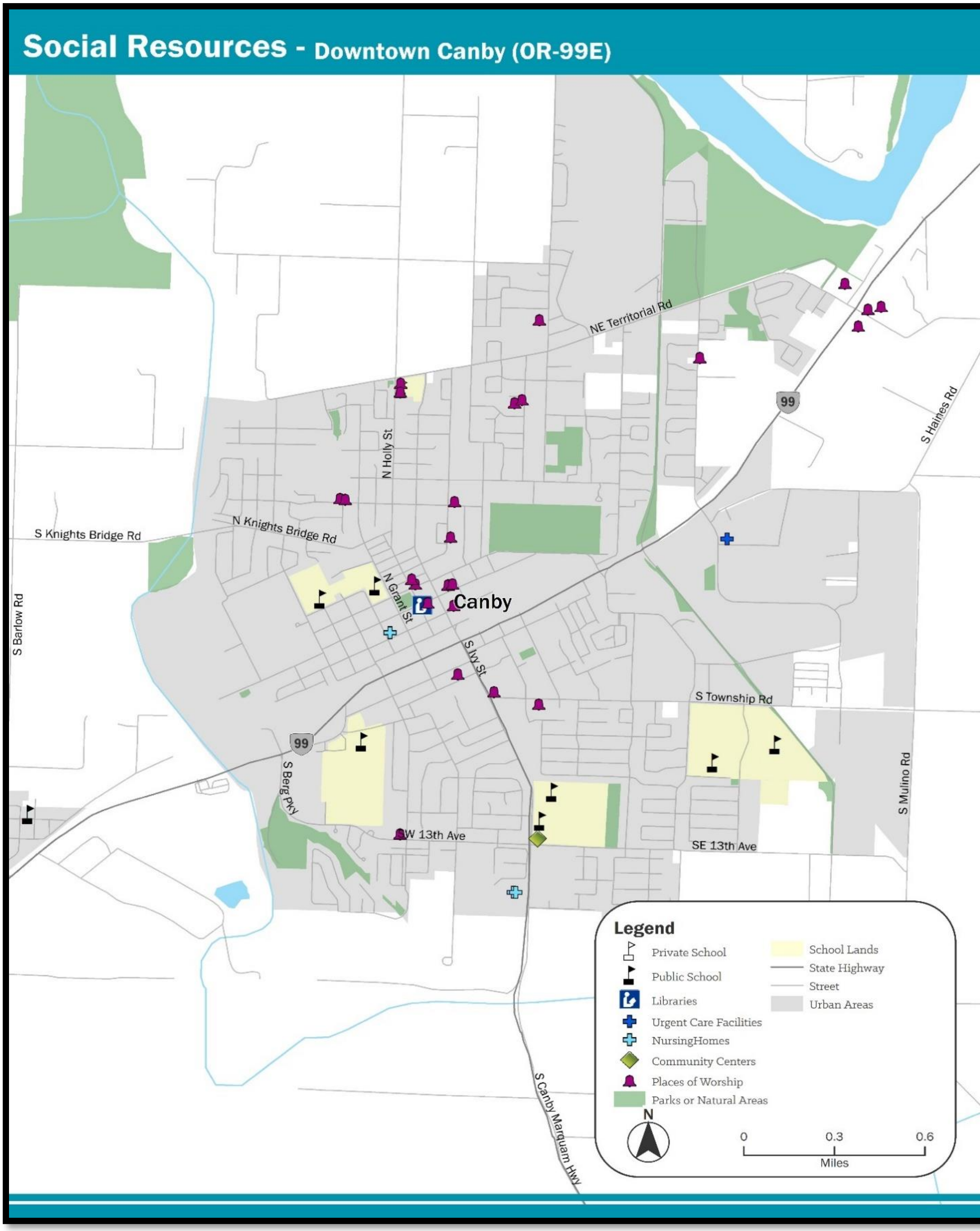
Definition of what is included as a "social or community resource" is as follows:

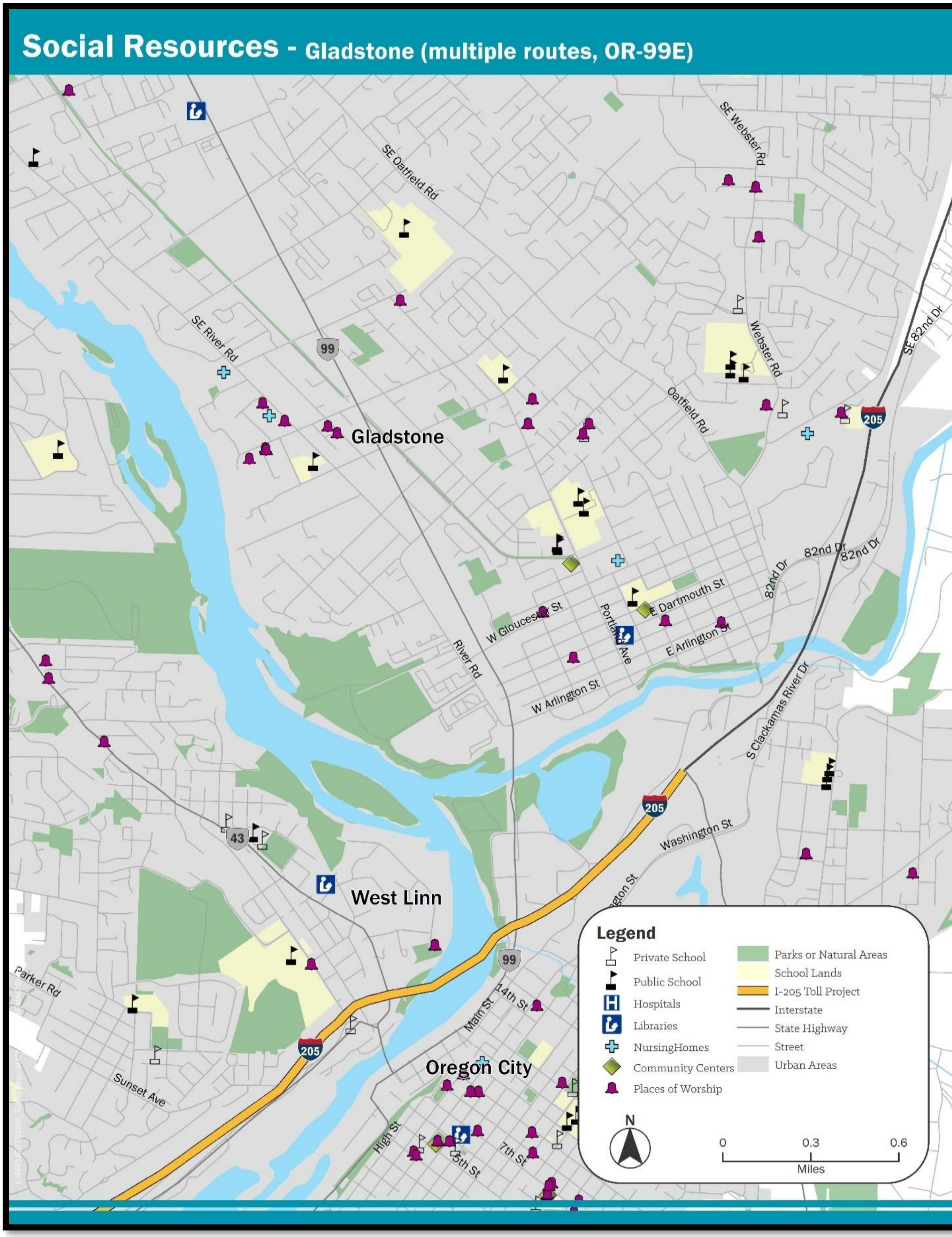
- Places of worship
- Community centers
- Hospitals
- Libraries
- Nursing homes
- Parks
- Schools
- Urgent care facilities

These resources were identified using data from Metro's Regional Land Information System (RLIS), the Homeland Infrastructure Foundation-Level Data (HIFLD), and Environmental Systems Research Institute (Esri). The maps are a work in progress and will be updated through input from EMAC, additional engagement with communities identified in the Equity Framework, and additional technical analysis.

[1] Screening analysis model scenario results for 2027 based on data from the Metro Regional Travel Demand model.


I-205 Toll Project Area of Potential Impact
Beaverton
Milwaukie
Happy Valley
Tigard
Lake Oswego
Tualatin
Gladstone (multiple routes, OR-99E)
Gladstone
West Linn
Oregon City
Sherwood
West Linn (Willamette Falls Dr)
Oregon City (downtown street grid, Arch Bridge)
Wilsonville
Downtown Canby (OR-99E)
Canby
Aurora
Legend
Local communities with potential changes in vehicle routing
I-205 Toll Project
Interstate
State Highway
Street
Urban Areas
Area of Potential Impact
N
0 1 2
Miles


Social Resources - Downtown Canby (OR-99E)
NE Territorial Rd
99
S Haines Rd
N Holly St
N Knights Bridge Rd
S Knights Bridge Rd
S Barlow Rd
N Grant St
Canby
S Ivy St
S Township Rd
99
S Berg Pkwy
S Mulino Rd
SW 13th Ave
SE 13th Ave
S Canby Marquam Hwy
Legend
Private School
Public School
Libraries
Urgent Care Facilities
NursingHomes
Community Centers
Places of Worship
Parks or Natural Areas
School Lands
State Highway
Street
Urban Areas
N
0
0.3
0.6
Miles


Social Resources - Gladstone (multiple routes, OR-99E)
Gladstone
West Linn
Oregon City
SE Oatfield Rd
SE Webster Rd
Webster Rd
Oatfield Rd
SE River Rd
SE 82nd Dr
82nd Dr
River Rd
W Gloucester St
Portland Ave
E Dartmouth St
E Arlington St
W Arlington St
S Clackamas River Dr
Washington St
Parker Rd
Sunset Ave
Main St
14th St
High St
7th St
5th St
99
43
205
Legend
Private School
Public School
Hospitals
Libraries
NursingHomes
Community Centers
Places of Worship
Parks or Natural Areas
School Lands
I-205 Toll Project
Interstate
State Highway
Street
Urban Areas
N
0
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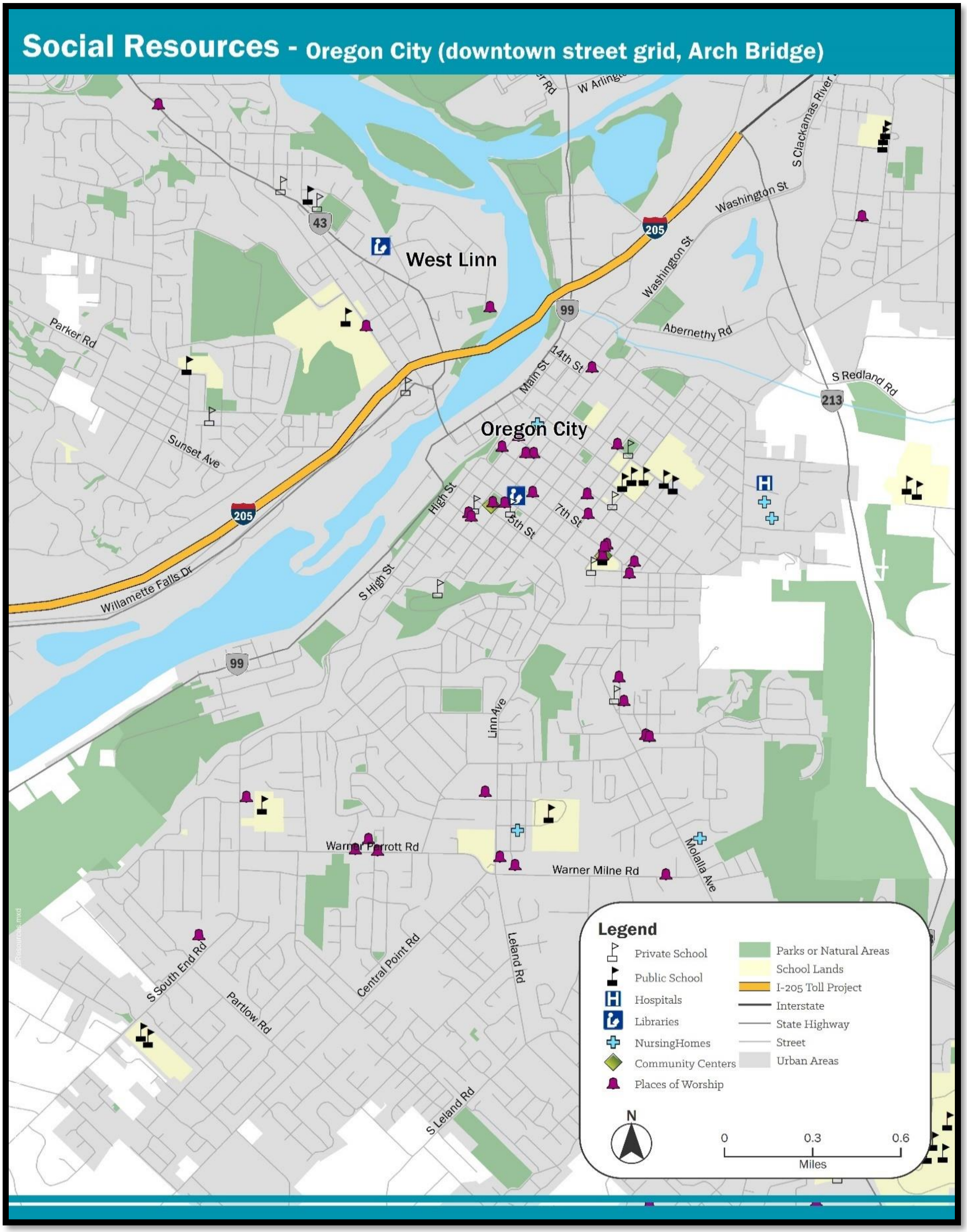
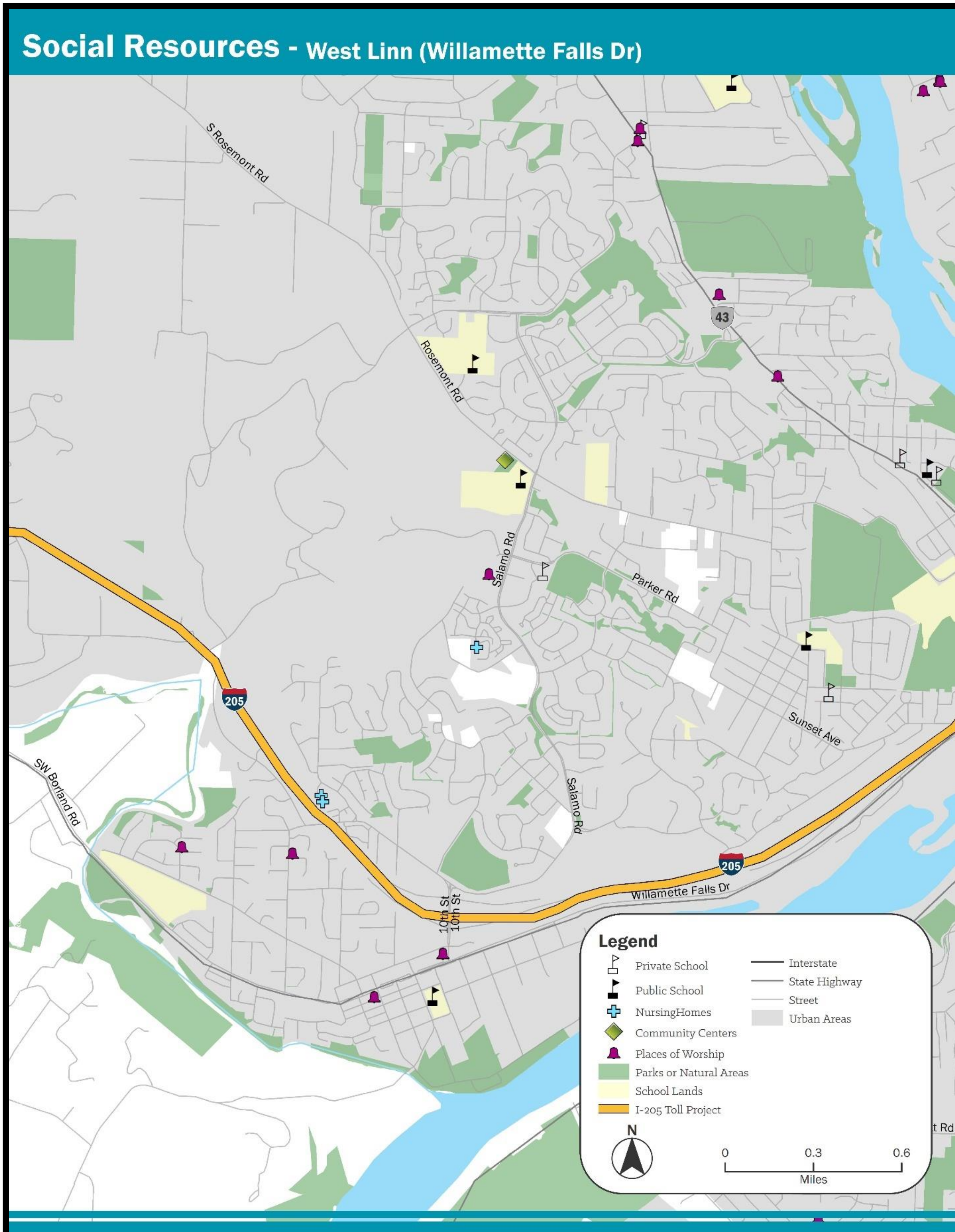

Social Resources - Oregon City (downtown street grid, Arch Bridge)
West Linn
Oregon City
Parker Rd
Sunset Ave
Willamette Falls Dr
Washington St
Abernethy Rd
S Redland Rd
S Clackamas River
14th St
Main St
High St
S High St
7th St
5th St
Linn Ave
Warner Parrott Rd
Warner Milne Rd
Molalla Ave
S South End Rd
Partlow Rd
Central Point Rd
Leland Rd
S Leland Rd
205
99
43
213
Legend
Private School
Public School
Hospitals
Libraries
NursingHomes
Community Centers
Places of Worship
Parks or Natural Areas
School Lands
I-205 Toll Project
Interstate
State Highway
Street
Urban Areas
N
0
0.3
0.6
Miles



Social Resources - West Linn (Willamette Falls Dr)
S Rosemont Rd
Rosemont Rd
Salamo Rd
Parker Rd
Sunset Ave
SW Borland Rd
10th St
Willamette Falls Dr
43
205
Legend
Private School
Public School
NursingHomes
Community Centers
Places of Worship
Parks or Natural Areas
School Lands
I-205 Toll Project
Interstate
State Highway
Street
Urban Areas
N
0
0.3
0.6
Miles

NEPA SCUBA TEAM REVIEW

Social Resource Maps

The NEPA Scuba Team (an EMAC sub-team focused on performance measures) met on June 11, 2021 to review the social resources maps and provided the following comments:

- Include food-related businesses and small businesses that serve Equity Framework-identified communities (grocery stores, ethnic markets, etc.)
- Identify food banks and community meal sites such as Meals on Wheels locations or other places that communities may pick up food (for example, free lunch programs during the summer months)
- Ensure senior centers are included in community centers
- Identify affordable housing communities
- Look at school bus routes or safe routes to schools as a potential data resource
- Consider school demographic data and identify Title 1 schools that may serve a higher percentage of Equity Framework-identified communities.
- Include community clinics/neighborhood health centers and other specialized treatment centers, such as dialysis centers, cancer treatment centers, and drug addiction treatment centers. These clinics could replace hospitals on the maps.

Neighborhood Health and Safety Performance Measures

The NEPA Scuba Team proposed specific revisions to the performance measures, which are as follows (identified in track changes on the following pages):

- Provide more details on how the qualitative assessments related to community impacts will be conducted. If engagement surveys will be used, what questions will be asked of community members? How will the surveys be distributed?

- Go beyond "best professional judgement" for qualitative assessment of impacts – consider experience of people living in the area.

- Add detail to the performance measures to identify the specific impacts being measured (i.e. safety and neighborhood livability versus access and environmental quality).

- Consider impacts to bus routes (public and school buses) as it relates to travel time, reliability, and access.

- Provide information on current condition of ADA facilities (where are sidewalks missing?).

- Comments were provided about the need to identifying social and community resources and representative origin-destination (O-D) pairs.

- Consider identifying representative "community places" in each social/community resource category (i.e. health centers, schools, etc.) to be included in the origin-destination (O-D) pairs.
- Define "health promoting activities".
- Consider federally qualified health centers as a data source to identify health centers that serve equity framework-identified communities.[2]
- Identify key community "connectors" – service and/or educational organizations/centers that may not directly provide health care services, but connect community members to other services.
- Include social security and government offices that provide financial resources.
- To select O-D pairs, identify areas that have overlapping concentrations of equity framework-identified communities, as these are the areas that are likely to experience the greatest impact/burden.

- Provide definitions for mobile source air toxins and regional energy consumption.

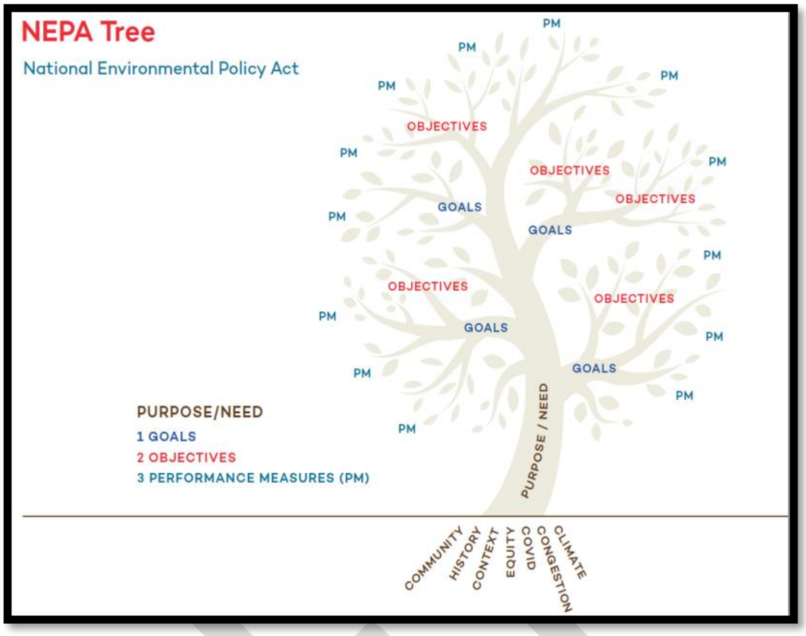
- Consider the following resources for performance measures related to health outcomes and incorporate health impact assessment principles and some discussion of health outcomes into the performance measures:
  - RTP-Appendix_J_Climate_Smart_Strategy_Monitoring181206.pdf (oregonmetro.gov)
  - OHA-PHD_CSS HIA_Final.pdf (oregon.gov)

- Consider highlighting the following performance measure for neighborhood health and safety: "Change in I-205 safety conditions, which includes frequency and/or severity of vehicular crashes, as well as mode shift."

- Related to the performance measure, "Change in roadway safety conditions by mode (transit, auto, bike, and walk) for areas impacted by diversion, especially for high crash corridors and/or locations that result in injury or death:"
  - Add more detail in the "how" column describing what features are captured in the model inputs and MCE toolkit.
  - Add "social and environmental" before "risks" in the qualitative assessment description.

[2] Federally qualified health centers are community-based health care providers that receive funds from the Health Resources and Services Administration Health Center Program to provide primary care services in underserved areas. Federally Qualified Health Centers | Official web site of the U.S. Health Resources & Services Administration (hrsa.gov)

DEFINITION



Performance measures identify the information needed to help us understand impacts and to understand if we are meeting project goals and objectives. Information can be numerical or measured (**Quantitative**) or through interviews, questionnaires, or focus groups (**Qualitative**). In the National Environmental Policy Act (NEPA) process, performances measures emanate from purpose, need, goals, and objectives.

WHY ARE PERFORMANCE MEASURES IMPORTANT?

Performance measures are used to compare the tolling alternatives for burdens and benefits. They can lead to identifying mitigation investments.

Mitigation is a NEPA term that addresses impacts identified in the environmental analysis for a toll project. Mitigation can include a specific project or investment or be a general statement that describes how ODOT will work toward a solution in the future. Mitigation commitments are tied to the toll project environmental analysis and must be related to an identified impact.

The Oregon Toll Program seeks to advance equity, which requires that we go beyond traditional mitigation of negative impacts and focus on benefits to equity communities. Our approach is to use the performance measures to both address baseline mitigation and inform policies and strategies to advance equity.

The following pages identify the **performances measures with the neighborhood health and safety measures highlighted in blue.**

Equity Framework informed performance measures that go beyond what is federally required

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Maximize benefits and minimize burdens associated with implementation of tolling	**Identify safety and neighborhood livability impacts to Equity Framework-identified Communities located near roadways experiencing traffic volume changes due to the project**	Quantitative: Traffic volume changes on select roadways (AM peak hour, PM peak hour, off-peak, daily) Qualitative: Community impacts	Census data mapping Maps will be overlaid with output from the traffic models identifying roadways with vehicle rerouting (AM peak hour, PM peak hour, off-peak) to qualitatively assess the Equity Framework-identified communities (low-income, minority, other historically and currently excluded and underserved) and community resources potentially affected by rerouting)
		Change in vehicle operating costs in the Portland metro area; delineate between general population and Equity Framework-identified communities	Quantitative Model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Qualitative Best professional judgement based on analysis	WSP Benefit Cost Analysis (BCA) Model and Multi-Criteria Evaluation (MCE) Toolkit (indexed scenario comparison of vehicle operating costs)
		Change in travel costs as a percentage of household income for the general population and Equity Framework-identified Communities	Quantitative Model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities	Metro travel demand model to identify number community of places one can access from a transportation analysis zone (TAZ) during peak hours within a mode-specific travel time threshold.[3] TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. Metro travel demand model to identify number of jobs one can access from a TAZ during AM peak hours within a mode-specific travel time threshold.[4] TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. For environmental justice, use TAZs identified as representative samples for Equity Framework-identified communities, which includes environmental justice populations (low income and minorities) to identify changes in access. Use representative Origin-Destination pairs to assess travel time and reliability for environmental justice populations. For social resources and communities, use TAZs identified as representative samples of Equity Framework-identified communities to identify changes in access. Use representative O-D pairs to assess travel time and reliability for other Equity Framework-identified communities.

[3] For community places, peak period travel time thresholds of 30 minutes by auto, 45 minutes by transit, 30 minutes by bike, and 20-minute walk are applied.
[4] For jobs, AM peak period travel time thresholds of 20 minutes by auto, 30 minutes by transit, 15 minutes by bike, and 20-minute walk are applied.

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Support equitable and reliable access to job centers and community places, such as grocery stores, schools, and gathering places	**Change in travel time, reliability, and access by mode (auto, transit, bike, and walk) to jobs and community places; delineate between the general population and Equity Framework-identified communities**	Quantitative Community places accessible by mode (auto, transit, bike, walk); change in access will be assessed for region and Transportation Area of Potential Impact (areas possibly impacted by diversion), and model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Jobs accessible by mode (auto, transit, bike, and walk). Change in access will be assessed for region and Transportation Area of Potential Impact (areas possibly impacted by diversion), and model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Change in travel time by mode (auto, transit, bike, and walk) for sample origin to destination (O-D) pairs during average weekday peak periods and selected off-peak period times that represent Equity Framework-identified community commuting patterns Qualitative Best professional judgment for reliability based of travel time impacts and sample origin to destination (O-D) pairs	Metro travel demand model to identify number of community of places one can access from a transportation analysis zone (TAZ) during peak hours within a mode-specific travel time threshold.[5] TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. Metro travel demand model to identify number of jobs one can access from a TAZ during AM peak hours within a mode-specific travel time threshold.[6] TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. For environmental justice, use TAZs identified as representative samples for Equity Framework-identified communities, which includes environmental justice populations (low income and minorities) to identify changes in access. Use representative O-D pairs to assess travel time and reliability for environmental justice populations. For social resources and communities, use TAZs identified as representative samples of Equity Framework-identified communities to identify changes in access. Use representative O-D pairs to assess travel time and reliability for other Equity Framework-identified communities.

[5] For community places, peak period travel time thresholds of 30 minutes by auto, 45 minutes by transit, 30 minutes by bike, and 20-minute walk are applied.
[6] For jobs, AM peak period travel time thresholds of 20 minutes by auto, 30 minutes by transit, 15 minutes by bike, and 20-minute walk are applied.

Goal	Objective	Performance Measure	How	Tool or Data Source
Provide benefits for historically and currently excluded and underserved communities	Support equitable and reliable access to health promoting activities (e.g. parks, trails, recreation areas) and health care facilities	**Change in access to health promoting activities and health care facilities for the general population and Equity Framework-identified communities within 30-minute trip by mode (auto, transit, walk, and bicycle)**	Quantitative Medical places accessibility within 30-minute drive will be assessed for region and Transportation API, and model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Mode shift from auto travel to active transportation travel modes (transit, bicycle, and pedestrian) Change in auto travel time for sample origin to destination (O-D) pairs during average weekday peak periods and selected off-peak period times that represent Equity Framework-identified community commuting patterns Qualitative Overall assessment of access to health promoting activities based on above	Metro travel demand model to identify number of medical facilities (community places) one can access from a transportation analysis zone (TAZ) during peak hours within a 30-minute drive. TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. Metro travel demand model to identify daily mode shift to active transportation modes. For environmental justice, present table of change in auto travel time to health promoting activities and health care facilities for representative O-D pairs to assess the populations (low-income, minority, other historically and currently excluded and underserved) and community resources potentially affected by rerouting. For social resources and communities, present table of change in auto travel time -to health promoting activities (i.e. parks, open spaces, and trails) and health care facilities (including dialysis centers, cancer treatment centers, and drug addiction centers) for representative O-D pairs to assess the populations (other historically and currently excluded and underserved populations) and community resources potentially affected by rerouting.
	Design the toll system to support travel options for people experiencing low incomes	Compare the benefit of mitigation, strategy, and policy commitments for people experiencing low incomes relative to the general population	Quantitative Using selected performance measures to study proposed investments to understand where we can advance equity Qualitative Best professional judgement based on comparison of benefits of mitigations, strategies, and commitments and community engagement feedback	Consideration of the following: • Policy, strategy, or mitigation commitments to address affordability, neighborhood health and safety, transit, and multimodal transportation options • Interoperability with other transportation systems • Access to jobs and social resources • Vehicle operating costs Community engagement feedback Selected performance measures

Goal	Objective	Performance Measure	How	Tool or Data Source
Limit additional traffic diversion from tolls on I-205 to adjacent roads and neighborhoods	Design the toll system to limit rerouting from tolling	**Change in auto volumes in the region, Transportation Area of Potential Impact (areas possibly impacted by diversion), and areas where Equity Framework-identified communities live.**	Quantitative Change in vehicle miles traveled within region, Transportation API (areas possibly impacted by diversion), and model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Change in travel time during peak hours on key corridors and selected off-peak period times that represent Equity Framework-identified community commuting patterns Identify changes on key roadways or areas that are most relevant for (adjacent to) Equity Framework-identified communities, based on community mapping	Regional travel demand model for Vehicle Miles Traveled measures and analysis of Metro Equity communities and TAZs identified as representative samples for Equity Framework-identified communities Dynamic Traffic Assignment (DTA) model results for AM and PM peak hour travel times within the Transportation Area of Potential Impact. Census data maps of Equity Framework-identified communities
	Design the toll system to avoid and minimize impacts to quality of life factors, such as health, noise, safety, job access, travel costs, and environmental quality for local communities from traffic rerouting	**Change in the quality of life in areas impacted by diversion; delineate between the general population and Equity Framework-identified communities**	Qualitative Best professional judgement based on analysis	Consideration of the following (see other performance measures identified in this memo): • Access to health promoting activities and health care facilities • Safety • Access to jobs • Travel costs • Air quality • Census mapping of Equity Framework-identified communities For noise impacts: • Traffic noise levels modeled with Federal Highway Administration (FHWA) Traffic Noise Model (TNM) 2.5 • Traffic Data from Regional Travel Demand Model and Dynamic Traffic Assignment Model (peak hour and truck peak hour) with vehicle mix and posted speed limits. • Project design imported into FHWA TNM 2.5

Goal	Objective	Performance Measure	How	Tool or Data Source
Support safe travel regardless of mode of transportation	Enhance vehicle safety on I-205 by reducing congested conditions and increasing use of transit or higher occupancy vehicles	Change in I-205 safety conditions, which includes frequency and/or severity of vehicular crashes, as well as mode shift	Quantitative Estimated change in number of crashes on I-205 Change in total daily auto trips in region and Transportation Area of Potential Impact (areas possibly impacted by diversion) Analysis of crash history on I-205 (existing conditions)	Highway Safety Manual Part C Methodology for corridors MCE Toolkit (indexed scenario comparison of crashes) for region or study area Mode shift assumptions and analysis of existing conditions and proposed mitigation or strategy investments
	Support safe multimodal travel options (e.g. pedestrians, bicycles, transit, and automobiles) on roadways affected by tolling, especially in high crash corridors	**Change in roadway safety conditions by mode (transit, auto, bike, and walk) for areas impacted by diversion, especially for high crash corridors and/or locations that result in injury or death**	Quantitative Model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Qualitative Assessment of potential social and environmental risks to safety for multimodal travel options based on analysis and community engagement feedback	Existing conditions for transit and multimodal elements; identify high crash corridors and locations MCE Toolkit (indexed scenario comparison of crashes).Highway Safety Manual Part C Methodology for corridors For environmental justice, use TAZs identified as representative samples for Equity Framework-identified communities, including environmental justice populations For social resources and communities, use TAZs identified as representative samples for Equity Framework-identified communities

Goal	Objective	Performance Measure	How	Tool or Data Source
Contribute to regional improvements in air quality and reduced contributions to climate change effects	Contribute to reduced vehicle air pollutants and greenhouse gas emissions in the Portland metro 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	**Change in annual regional vehicle emissions of Mobile Source Air Toxics (MSATs)[7] from vehicle operations**	Quantitative Change in regional vehicle emissions	MOVES model (motor vehicle emissions simulator) - using 24-hour vehicle miles traveled (VMT) output by vehicle class and speed bin from the regional travel demand model. MSAT emissions are estimated as part of the project's air quality analysis using volume and speed data from individual roadway segments in the study area, accounting for localized increases and decreases, to develop a regional estimate.
	Reduce localized air pollutants through reduced congestion and improved travel efficiency, particularly in community areas where pollutants may be concentrated due to traffic congestion	**Change in annual regional energy consumptions and CO2e[8] emissions from vehicle operations**	Quantitative Change in regional vehicle energy consumption	MOVES model - using 24-hour VMT output by vehicle class and speed bin from the regional travel demand model. Transportation accounts for a major portion of energy consumed in Oregon, as well as the Unites States as a whole, primarily due to petroleum use. Operational energy consumption from transportation projects is an evaluation of fuel used by vehicles traveling on the project roadways. Total energy consumption in units of British thermal units (Btu) and regional CO_2e emissions are estimated as part of the I-205 Toll Project's energy analysis using volume and speed data from individual roadway segments in the study area, accounting for localized increases and decreases, to develop a regional estimate.

[7] MSATs are a set of 9 pollutants (1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter) for which the Federal Highway Administration requires an evaluation as part of its NEPA approval process. The 9 pollutants have been identified by the Environmental Protection Agency as being among the national and regional-scale cancer risk drivers or contributors with significant contributions from mobile sources (cars, trucks, and other on-road vehicles).

[8] CO_2 Equivalents (CO_2e) is a combined measure of greenhouse gas (GHG) emissions weighted according to the global warming potential of each gas, relative to carbon dioxide (CO_2). CO_2e from vehicle exhaust is be determined using contributions of CO_2, nitrous oxide (N_2O), and methane (CH_4).

Oregon Department of Transportation

Goal	Objective	Performance Measure	How	Tool or Data Source
Support multimodal transportation choices	Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (transit, walk, bike, telework)	Change in regional person trips by single occupancy vehicles compared to other modes (transit, vanpooling, or carpooling); delineate between impact to general population and Equity Framework-identified communities	Quantitative Change in regional person trips by mode, including high and single occupancy vehicles (HOV and SOV), transit, bike, and walk Qualitative Potential impacts to carpool, vanpool, paratransit, and shared ride modes, not explicitly broken out in regional model Potential impacts to Equity Framework-identified communities, not explicitly broken out in regional model.	Regional travel demand model Feedback from the Transit Multimodal Work Group
	Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (transit, walk, bike, telework)	Change in level of traffic stress for bicycle and pedestrian corridors impacted by traffic volume changes due to the project	Quantitative Roadway corridor MMLOS (level of service) or LTS (level of stress) for bicycle and pedestrian Qualitative Best professional judgement based on the impact to roadway corridors in Equity Framework-identified communities	MMLOS (level of service) calculation tool or LTS (Level of stress) bike and walk
		Identify barriers and opportunities to encourage greater use of higher occupancy vehicles and other modes of transportation for the general population and Equity Framework-identified communities	Qualitative Best professional judgement based on the analysis and community engagement	Feedback from the Transit Multimodal Work Group and community engagement
		Change in transit level of service and accessibility during peak periods and selected off-peak period times that represent Equity Framework-identified community commuting patterns	Quantitative Roadway corridor MMLOS (level of service) for transit Transit accessibility measures (identified in earlier performance measures) Peak hour travel times and selected off-peak period times that represent Equity Framework-identified community commuting patterns on select roadways corridors with existing or planned transit services	Regional travel demand model MMLOS (level of service) for transit users for study corridors within the Transportation Area of Potential Impact (areas possibly impacted by diversion) Dynamic Traffic Assignment (DTA) for peak hours

Goal	Objective	Performance Measure	How	Tool or Data Source
Support multimodal transportation choices	Support shifts to higher occupancy vehicles (including carpooling) and other modes of transportation (transit, walk, bike, telework)	Identify barriers and opportunities to improve feeling of safety and ease for transit, carpooling, and vanpools users within areas impacted by diversion; delineate between the general population and Equity Framework-identified communities	Qualitative Best professional judgement based on the analysis and community engagement	Feedback from the Transit Multimodal Work Group and community engagement

Goal	Objective	Performance Measure	How	Tool or Data Source
Support multimodal transportation choices	Collaborate with transit providers to support availability and enhancements to transit services in the I-205 corridor, especially for historically and currently excluded and underserved communities	Change in transit level of service and accessibility during peak periods and selected off-peak period times that represent Equity Framework-identified community commuting patterns	<u>Quantitative</u> Roadway corridor MMLOS (level of service) for transit Transit accessibility measures (identified in earlier performance measures) Peak hour travel times and selected off-peak period times that represent Equity Framework-identified community commuting patterns on select roadways corridors with existing or planned transit services	Regional travel demand model MMLOS (level of service) for transit users for study corridors within the Transportation Area of Potential Impact (API) Dynamic Traffic Assignment (DTA) for peak hours
Support regional economic growth	Provide for reliable and efficient regional movement of goods and people through the I-205 corridor and on local roadways affected by tolling	Freight or commercial vehicle throughput on I-205 and nearby roadways impacted by volume changes due to toll project	<u>Quantitative</u> Change in vehicle volume by vehicle type on I-205 and local roadways Identification of commercial or freight by business or job type <u>Qualitative</u> Best professional judgement of the impact to Equity Framework-identified populations and businesses based on the analysis and community engagement	Regional travel demand model (daily) and Dynamic Traffic Assignment (DTA) for peak hours Employment data by land use codes or other sources (e.g. NAICS) Census mapping Equity Framework-identified populations Community engagement feedback
		Vehicle travel time savings: overall and for Equity Framework-identified communities, which includes environmental justice communities	<u>Quantitative</u> Vehicle travel time savings by TAZ from regional model Vehicle travel time savings for an OD pair during peak hour from regional or DTA traffic model <u>Qualitative</u> Identify TAZs that have significant equity populations Identify OD pairs that have significant equity populations	MCE Toolkit (indexed scenario comparison) Regional travel demand model and/or DTA subarea model Select sample TAZ-level origin to destination pairs (TAZs that utilize I-205)identified as representative samples for Equity Framework-identified populations
		People throughput on I-205 segments between Stafford Road and OR 213	<u>Quantitative:</u> Vehicle volume by vehicle type and conversion to person trip	Regional travel demand model (daily) and DTA (peak hours)

Goal	Objective	Performance Measure	How	Tool or Data Source
Support regional economic growth	Improve regional access to jobs and employment centers, especially for historically and currently excluded and underserved communities	Change in jobs accessible by mode (auto, transit, bike, and walk); delineate between the overall movement and access that begins or ends in areas within or adjacent to Equity Framework-identified communities or job centers	Quantitative Job accessibility by mode (auto, transit, bike, and walk). Change in access will be assessed for region and Transportation Area of Potential Impact (areas possibly impacted by diversion), and model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities Qualitative Best professional judgment for reliability based of travel time impacts and sample origin to destination (O-D) pairs	Metro travel demand model to identify number of jobs one can access from a TAZ during AM peak hours within a mode-specific travel time threshold.[9] TAZ measures are aggregated to report average impacts for region and Transportation API, based on weighted average of households in each TAZ. For environmental justice, use TAZs identified as representative samples for Equity Framework-identified communities, which includes environmental justice populations (low income and minorities) to identify changes in access. Use representative O-D pairs to assess travel time and reliability for environmental justice populations. For social resources and communities, use TAZs identified as representative samples of Equity Framework-identified communities to identify changes in access. Use representative O-D pairs to assess travel time and reliability for other Equity Framework-identified communities.

[9] For jobs, AM peak period travel time thresholds of 20 minutes by auto, 30 minutes by transit, 15 minutes by bike, and 20 minute walk are applied.

Goal	Objective	Performance Measure	How	Tool or Data Source
Support management of congestion and travel demand	Design the toll system to improve efficient use of roadway infrastructure and improve travel reliability	Change in vehicle miles traveled (VMT) for highway and non-highway travel in the region and Transportation Area of Potential Impact (areas possibly impacted by diversion)	Quantitative Change in Vehicle Miles Traveled Qualitative Best professional judgement based on vehicle travel time reliability impacts informed by model results for change in travel time on sample origin to destination (O-D) pairs	Regional travel demand model and sample origin to destination (O-D) pairs
		Change in person trips by mode (auto, transit, bike, and walk) for the region; delineate between impact to general population and Equity Framework-identified communities	Quantitative Change in daily regional mode share based on the model outputs for Metro Equity groups and selected transportation area zones (TAZs) that represent areas with Equity Framework-identified communities	Regional travel demand model
Maximize integration with future toll systems	Design a toll system that can be expanded in scale, integrated with tolling on other roadways, or adapted to future toll system applications	Potential to expand system in future to a broader tolling system including other state facilities or different tolling structures	Qualitative Best professional judgement	
Maximize interoperability with other transportation systems	Design a toll system that is interoperable with other transportation systems in the region	Potential to integrate the toll system with other transportation systems, such as transit, carpooling, vanpooling, ride-hailing, and scooter or bike sharing (e.g. TriMet Hop Pass), that could support a shared system for payment (transit wallet) or service	Qualitative Best professional judgement based on feedback from partner mobility service providers and community engagement	Feedback from the Transit Multimodal Work Group and community engagement

Federally required analysis

Performance Measure(s)	Tool and/or Data Source
Impacts from (current or new) traffic diversion on identified business concentrations in the study area	Primary research and analysis of identified commercial corridors or concentrations, Metro Regional Travel Demand Model for diversion patterns
Changes in economic conditions (employment, labor income, economic activity) from project construction	IMPLAN economic modeling software
Changes in economic conditions (employment, labor income, economic activity) from collection and use of toll revenue	IMPLAN economic modeling software
Change in reliability, travel times, and travel costs for freight users	Dynamic Traffic Assignment Model, MCE Toolkit (indexed scenario comparison of truck segmentation of benefits, where applicable)
Monetary value of vehicle travel time savings to users	WSP Benefit Cost Analysis (BCA) Model and MCE Toolkit (indexed scenario comparison))
Monetary value of changes in safety, emissions, noise. pavement maintenance costs, and other identified impacts	WSP Benefit Cost Analysis (BCA) Model
Number of contaminated sites (low, medium, and high risk) disturbed by project constructed	Data will be collected from Federal and state environmental databases for potential sites within the API, historical and existing land uses, previously-prepared environmental reports, and review of historical data regarding land use and geologic and groundwater conditions.
Number, type, and location of historic properties (including archaeological sites) directly impacted by the project	Development footprint of the tolling gantries, associated signage, and utilities.
Number, type, and location of historic properties (including archaeological sites) indirectly impacted by the project	Information obtained from traffic model showing forecasted changes in traffic volumes that would result from tolling on roadways adjacent to historic properties.
Land area by type (vacant, open space, right-of-way) converted (temporary and permanent) from non-transportation uses to transportation improvements	GIS and/or AutoCAD output of impact and acquisition areas for permanent and temporary transportation improvements by parcel and for land use and zoning designations using RLIS.

Performance Measure(s)	Tool and/or Data Source
Change in land use character as a result of the Project	GIS and/or AutoCAD total impact areas by land use and zoning designation using RLIS.
Change in access (temporary and permanent) as a result of the Project	Location of temporary and permanent changes to access points on project design plans.
Construction easements needed and their effect on existing land uses	Project design plans showing construction easements and existing land use layer in RLIS
Changes to current and planned land uses located near roadways affected by vehicle rerouting	Current land use and zoning designations in RLIS and agency future land use maps and subarea plans outside the API along road corridors experiencing changes in traffic volumes based on Information obtained from traffic model.
Location, scale, and schedule of future development projects based on agency input	Conversation with agency planning and development review staff.
Number of sensitive noise receptors experiencing noise levels that reach the ODOT Noise Abatement Approach Criteria	Comparison of modeled traffic noise levels to ODOT Noise Abatement Approach Criteria.
Number of sensitive noise receptors experiencing noise levels that reach the ODOT Substantial Increase (10 dBA over existing noise levels)	Comparison of modeled traffic noise levels to ODOT Substantial Increase.
Anticipated construction noise levels and duration of construction noise at sensitive noise receptors	Qualitative assessment consistent with ODOT Noise Manual.
Distance of noise impact contour from future project alignment to undeveloped properties	Graphical representation of modeled Noise Abatement Approach Criteria distance for ODOT Land Use Activity Categories B and C using FHWA TNM 2.5 and graphics software.
Area of ground disturbance for project construction	Approximate locations of direct impacts from construction of toll gantries and relocated utilities will be determined from Project drawings. Additional information will be obtained from the APIs of land use and utilities and any changes that may occur.
Physical changes to park and recreation resources	Presence of park and recreation resources within the limits of construction and an assessment of short-term and long-term direct impacts to the identified resources.

Performance Measure(s)	Tool and/or Data Source
Changes to access to park and recreation resources located near roadways affected by vehicle rerouting	Information obtained from traffic model showing forecasted changes in traffic volumes that would result from tolling on roadways adjacent to park and recreation resources.
Change in intersection volume-to-capacity (v/c) ratios, level of service (LOS), delay and queuing	Synchro
Changes in LOS on I-205 between Stafford Road and OR 213	Synchro and/or Vissim
Change in travel time reliability on I-205 between Stafford Road and OR 213	MCE (indexed scenario comparison) and/or Regional Integrated Transportation Information System (RITIS).
Change in hours of congestion on I-205 between Stafford Road and OR 213	Regional travel demand model
Change in travel times on I-205 between Stafford Road and OR 213 and along other study corridors within the transportation API	Synchro and/or DTA
Regional and study area vehicle hours traveled (VHT) for freeway and non-freeway travel	Regional travel demand model
Relative effort associated with implementation	Best professional judgement
Flexibility to respond to changes in traffic conditions in the project vicinity	Best professional judgement
Eligibility under preferred federal tolling authority program	Best professional judgement
Gross toll revenue (less estimated revenue leakage)	Net Revenue Model
O&M costs associated with physical tolling infrastructure including (but not limited to): gantries, equipment cabinets, cameras, fixed signage, dynamic message signs, and telecommunications infrastructure as well as procurement of vendor services and vendor transition on a periodic basis	Net Revenue Model

Performance Measure(s)	Tool and/or Data Source
O&M costs associated with toll collections including (but not limited to): banking fees for credit card transactions, toll equipment maintenance, back-office systems support, customer service center operations, ODOT and consultant staffing, and administrative costs	Net Revenue Model
Net revenue (Adjusted gross toll revenue collected less toll O&M costs and highway O&M costs)	Net Revenue Model
Capital costs associated with implementing the physical toll infrastructure and procuring toll vendor services	Net Revenue Model
Utility relocations required due to Project construction	Existing utility locations will be identified using the ITIC program and other available sources. Use project design plans to identify any potential utility relocations
Temporary disruptions to existing electrical and communication services during construction when new utility connections for the tolling equipment are established	Use existing electrical and communication services information from ITIC and other available sources and project design plans to identify potential service disruptions
New utility lines/connections (electrical and communications) required to operate tolling equipment	Use project design plans to identify new utility lines and connections
Area of direct impacts to vegetation, wildlife, or aquatic species and their habitat	The approximate project footprint (limits of cut/fill) will be established from the project drawings, and this footprint will be overlain on the vegetation, wildlife, and aquatic species mapping to estimate an approximate quantity of direct impact to vegetation, wildlife, or aquatic species and their habitat.
Area of indirect impacts to vegetation, wildlife, or aquatic species and their habitat	The approximate project footprint (limits of cut/fill) will be established from the project drawings. Scientific Best Professional Judgement will be used to determine the extent of any indirect impacts to vegetation, wildlife, or aquatic species and their habitat.

Performance Measure(s)	Tool and/or Data Source
Change in visual quality resulting from installation of toll gantries	Visual quality will be evaluated by comparing proposed project elements to existing visual conditions and documenting how visual impacts would affect viewers. Visual impacts will be based on data and process provided in the FHWA Guidelines for visual impact assessment.
Area of wetlands/waters filled	The approximate project footprint (limits of cut/fill) will be established from the project drawings, and this footprint will be overlain on the wetlands/waters resource mapping to estimate an approximate quantity of direct wetland impact.
Area of wetlands/waters indirectly affected	The approximate project footprint (limits of cut/fill) will be established from the project drawings. Scientific Best Professional Judgement will be used to determine the extent of any indirect impacts to wetlands/water resources.

DEFINITIONS AND DESCRIPTIONS

The following table provide definitions and descriptions for technical terms referenced in the performance measures:

Definitions of technical terms

Term	Definition
24-hour VMT output	Vehicle miles traveled (VMT) in one 24-hour period. VMT means the total number of miles driven on the Portland metro area roadway network in an average weekday.
AM/PM peak hour; and off-peak	Generally, the highest traffic-volume time period in the morning and afternoon. In the Portland region, this is between 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. Off-peak means travel that occurs outside of 7 a.m. to 9 a.m. and 4 p.m. to 6 p.m. peak periods.
Annual toll cost estimate	Average total cost that toll users would pay in one year.
Corridor	The corridor for this project has not been specifically defined. Generally, a corridor can mean the roadway and the surrounding area, including frontage roads, on and off ramps, parallel routes, other transportation facilities (like bus stops), and adjacent land uses.
Environmental justice populations	Low-income populations and minority populations are collectively referred to as environmental justice populations by the federal government. During the National Environmental Policy Act (NEPA) process, additional populations also will be considered, such as older adults, people with limited English proficiency and people with disabilities.
Indexed scenario comparison	A comparison in which performance measures are normalized to more easily compare relative differences between alternative scenarios.
Interoperability	The ability of payment technology to transfer between systems; to pay for not only tolls in the project area, but also tolls in other regions or transit fare (e.g., TriMet).
Mode (or travel mode)	The various methods for travel. In this context, mode refers to walking (non-motorized travel), biking, driving a vehicle, riding in a vehicle as a passenger, riding transit, and truck trips.
Model	A technical tool that represents travel patterns and evaluates differences between alternative scenarios. Several models are using in the analysis of toll projects including the Metro Regional Travel Demand Model.
Origin-to-destination pairs	Refers to where a trip starts and where it ends.

Term	Definition
Social and community resources	Places that are significant to the social health of a community, for example: social service providers, community recreation centers, churches, schools, libraries, and parks.
Speed bin	Groupings of vehicle travel speeds. (e.g., 40-49mph, 50-59mph).
Transportation Analysis Zones (TAZs)	Geographical areas used in travel models to represent the travel behavior of categories of transportation system user groups. There are approximately 2,000 TAZs in the Portland region.
Toll cost range	The identified maximum and minimum that someone would pay for any given trip. With variable rate tolling, the range could change over the course of the day as well as on the distance travelled on tolled roadways.
Vehicle class	Types of vehicles included in the travel demand model roadway volumes. These include: single-occupancy vehicle (driving alone), high-occupancy vehicle (driving with at least one passenger), and various truck sizes.

Tools and data sources

Tool/Data	Description
Best professional judgment	Judgment exercised on the job as informed by the education and experience of credentialed professionals. Credentialed professionals typically hold degrees from accredited institutions, and many have professional certifications that govern ethics and practice standards, such as American Institute of Certified Planners (AICP), Professional Engineer (PE) and Professional Transportation Planners (PTP).
Census data (American Community Survey 5-year estimates)	The American Community Survey is an ongoing survey, conducted by the United States Census Bureau, that provides vital information on a yearly basis about our nation and its people. This vital information includes demographic characteristics.
Census tracts	Census tracts are small, relatively stable and consistently defined geographic areas that usually have a population between 2,500 and 8,000 persons, roughly corresponding to the size of an average American neighborhood. The minimum population of 2,500 allows for statistically significant data analysis, while the maximum population of 8,000 facilitates the ability to create useful geographic blocks. There are approximately 490 census tracts in the Portland-Vancouver metro area.
Dynamic Traffic Assignment (DTA)	This is a type of traffic model being developed for the for I-205 subarea. It refines the Regional Travel Demand Model results for the purposes of peak-hour traffic analysis near the study area. There is no direct connection to equity.

Tool/Data	Description
FHWA Traffic Noise Model Version 2.5	This is the Federal Highway Administration’s most current version of a noise model. A traffic noise model helps predict the noise level of a specific roadway under various alternative scenarios.
GIS	GIS stands for geographic information system, and it is a framework for gathering, managing and analyzing data related to spatial location and geography.
Highway Safety Manual Part C Methodology	The American Association of State Highway and Transportation Officials Highway (AASHTO) produces and uses a highway safety manual. Part C of this manual defines the methods for predictive safety analysis.
MOVES model	This is the motor vehicle emissions simulator. The project team uses this tool to estimate motor vehicle emissions at the regional level.
Multi-Criteria Evaluation (MCE) toolkit	The MCE toolkit associates regional travel demand model outcomes for specific Transportation Analysis Zones with demographic data provided by the Census Bureau. This helps to give an indication of impacts on different populations and can support analyzing equity.
ODOT’s MMLOS calculation tool	MMLOS stands for multimodal level of service. The Oregon Department of Transportation (ODOT) uses this tool to calculate the quality of travel by walking, biking, or transit. ODOT does not use this tool for evaluating the quality of service for people driving vehicles.
Qualitative	This refers to project team evaluations that are generally not directly tied to specific numerical measures, but rather informed by best professional judgment and informed by technical results as available.
Regional Travel Demand Model	This tool is used by Portland Metro to represent travel behavior and patterns in the region. It is a primary tool used for projecting growth in future travel demand using assumptions about expected growth in population (households) and jobs (employment).
WSP Benefit Cost Analysis (BCA) model	This is a technical analysis tool, developed and used by the project’s consultant, WSP, that evaluates economic impacts including benefits and costs.

Si desea obtener información sobre este proyecto traducida al español, sírvase llamar al 503-731-4128.

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CITY OF OREGON CITY

Staff Report

To: City Commission **Agenda Date:** 07/20/2021

From: City Engineer Dayna Webb, P.E.

SUBJECT:

Oregon City Connector Shuttle

EXECUTIVE SUMMARY:

We are launching a new transit shuttle service that will provide a vital connection to our rural communities and areas that are hard to get to by transit. This shuttle will help relieve congestion on roads and will provide critical, last-mile connection between service provided by regional transit.

The shuttles are a free “deviated fixed-route” service. Can’t make it to the main bus stop or route? Call 24 hours in advance to make arrangements and check availability to be picked up or dropped off within ¾ mile from the route. You may also signal/flag the bus to get on or off the bus in-between stops. The Oregon City Shuttle operates on weekdays only. The Oregon City Shuttle does not operate on New Year’s Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, or Christmas Day. The most current Route and Schedule can be found here: https://www.clackamas.us/h3s/connects-shuttle

The Oregon City Connector Shuttle aims to make connections that will enable people to travel all the way to work, school, and other daily destinations on transit. The Oregon City Shuttle will fill gaps from TriMet stops to underserved portions of Oregon City, in particular connecting the Oregon City Transit Center, Clackamas Community College, and employers throughout the city, especially for transit-dependent and low-income populations. The Oregon City Shuttle will also provide critical connections with other regional transit providers serving Oregon City.

BACKGROUND:

With the passage of House Bill 2017, Keep Oregon Moving, the Oregon Legislature made a significant investment in transportation to help advance the things that Oregonians value—a vibrant economy, strong communities, high quality of life, a clean environment, and safe, healthy people. This historic investment in Oregon's transportation system will produce benefits for decades to come. A centerpiece of Keep Oregon Moving is the Statewide Transportation Improvement Fund (STIF). This fund provides a new dedicated source of funding to expand public transportation to access jobs, improve mobility, relieve congestion, and reduce greenhouse gas emissions around Oregon.