EPASS

EAST PORTLAND ARTERIAL STREETS STRATEGY

APPENDIX APRIL 2021

PBOT
PORTLAND BUREAU OF TRANSPORTATION

Table of Contents

EPASS

APPENDIX A

EPASS NETWORK SAFETY ANALYSIS

PORTLAND BUREAU OF TRANSPORTATION

1120 SW Fifth Avenue, Suite 800 Portland, OR 97204 503.823.5185
Fax 503.823.7576 TTY 503.823.6868 www.portlandoregon.gov/transportation
Chloe Eudaly Commissioner **Chris Warner** Interim Director

EAST PORTLAND ARTERIAL STREETS STRATEGY MEMO #3

Date: July 5, 2019
To: PBOT and Consultant EPASS Staff
From: Anamaria Perez, Kate Drennan and Steve Szigethy on behalf of the PBOT EPASS Team
Subject: Traffic Safety Analysis on EPASS Corridors

Executive Summary

The East Portland Arterial Streets Strategy (EPASS) aims to guide PBOT decision-making on the design and operation of arterial streets east of 82nd Avenue with the intent of reducing fatal and serious injury crashes while improving mobility and accessibility for all road users. Conducted on each of the eleven EPASS corridors as well as an overall comparative network analysis, the EPASS traffic safety analysis is an assessment of ten years of crash data; vehicle speed count studies; multi-modal infrastructure; and street lighting.

Crash data in this study follows Portland Vision Zero guidelines and is a subset of all crashes, which includes only crashes resulting in fatal and serious injuries to vehicle occupants and all injury levels for cyclists and pedestrians. In the ten-year period, 878 crashes resulted in injuries to people walking, bicycling, or riding in vehicles—and 49 of these injuries were fatal. Pedestrian crashes were most common, accounting for 43 percent of injury crashes on EPASS corridors. Turning movements were a top crash type for all three modes (45% of all crashes). Angle crashes were common for bicyclists (26%) and, similarly, pedestrians were often struck by straight-moving vehicles (53%). Rear-end crashes were the most common among serious vehicle crashes (30%).

Each corridor had varying frequencies of crashes at night for each mode. Pedestrian crashes altogether occurred more frequently at night, especially on Sandy Boulevard, Glisan Street, Stark Street, and Division Street, while night-time bicycle crashes were more frequent on 122nd Avenue and Halsey Street. Corridors where more than 50 percent of vehicle crashes happened at night were on 102nd Avenue, 122nd Avenue, Airport Way, and Foster Road. Another trend identified was that pedestrians were more frequently struck by a vehicle while crossing an EPASS corridor and bicycle crashes were more often when a cyclist was moving along the corridor. Crash locations were also taken into consideration in the safety analysis of the EPASS network for bicycle and pedestrian crashes. Most pedestrian crashes occurred at signalized intersections but crashes at mid-block locations were also frequent. Bicyclists, however, were more often struck at unsignalized intersections, although crashes at driveway locations were also notable.

EPASS corridors have some of the highest posted speeds in the city, and most speed limits are 30 mph or greater, including some segments with speed limits up to 45 mph. However, the World Health Organization recommends that speed limits on urban roadways do not exceed 30 mph. In this study, vehicle speed data considered was 85th percentile, percentage of vehicles traveling over 30 mph, and percentage of vehicles traveling 10 or more mph over the speed limit. Despite the high posted speeds on EPASS corridors, many vehicles were excessively speeding.

Most multi-modal infrastructure on the EPASS network is substandard and does not meet PBOT guidelines, but there are many planned projects that aim to improve these conditions over the next several years. Similarly, street lighting on most of the EPASS corridors is only on one side, which is insufficient to illuminate these wide roadways.

In conclusion, the EPASS network is dangerous to all road users, but particularly for people walking. The historical context of these streets sheds light on the design of these major corridors that have deficient multi-modal infrastructure and street lighting as well as high posted speeds. These corridors may share many characteristics, but each one has a unique combination of safety issues that need to be addressed as Portland continues to grow.

Introduction and Purpose

The East Portland Arterial Streets Strategy (EPASS) will guide PBOT decision-making on the design and operation of East Portland arterial streets with the intent of reducing fatal and serious injury crashes while improving mobility and accessibility for all road users. East Portland arterials have seen a disproportionate number of serious injury and fatal crashes relative to the city as a whole. This memo summarizes the quantity, type, and circumstances of crashes experienced on the EPASS network (as defined in Memo #2) for the most recently available ten years of data. The intent of this summary is to help inform street design changes that will be proposed or supported as part of EPASS.

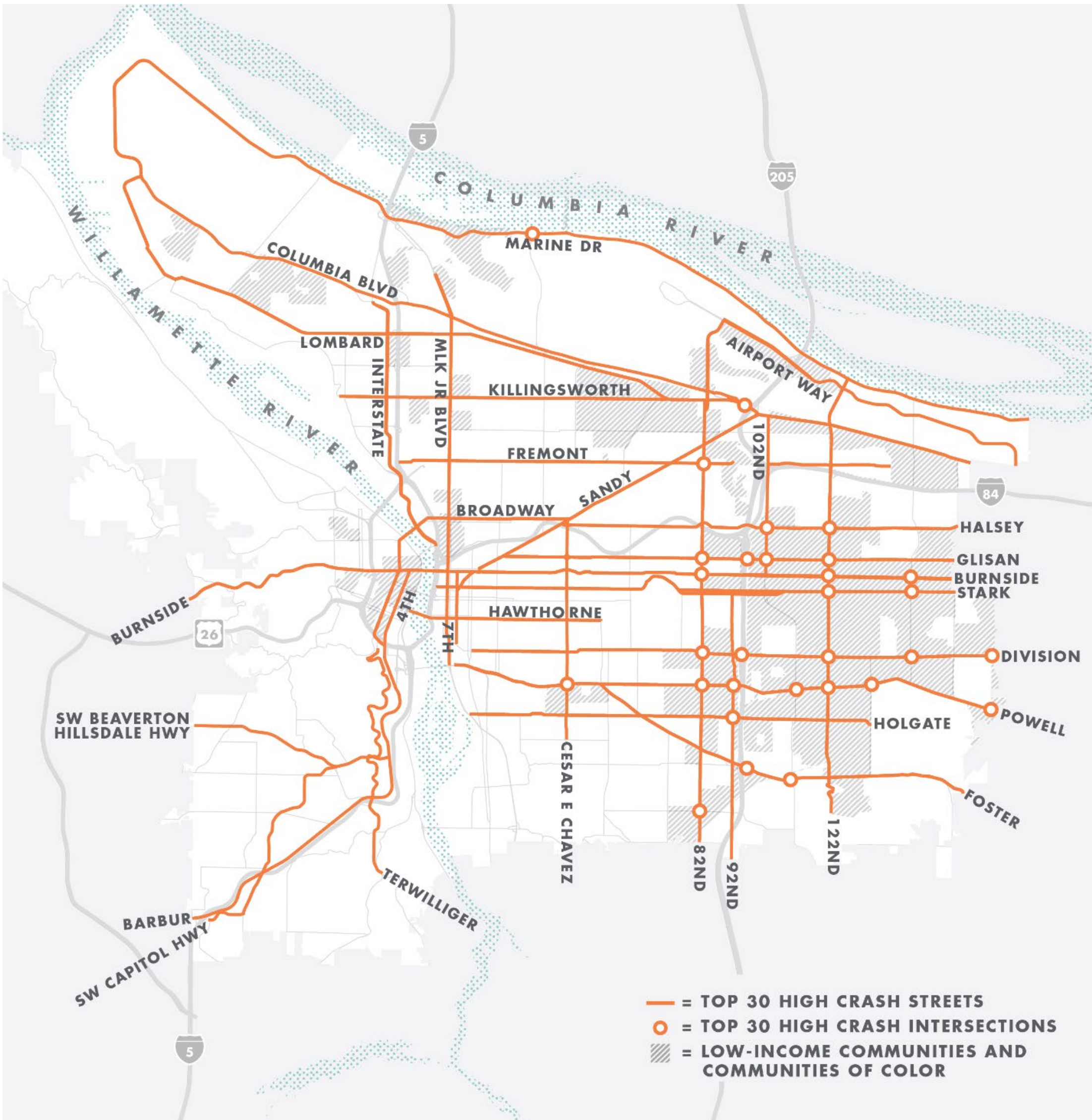
Background

Vision Zero was adopted by the City of Portland City Council in 2015 with the goal of eliminating traffic fatalities and serious injuries on Portland streets by 2025. Vision Zero identified a High Crash Network (HCN), the top 30 streets in Portland with the most crashes by each travel mode (walking, bicycling, and operating or riding in motor vehicles (Map 1)). From 2014 – 2018[1], 65 percent of fatal crashes occurred on the HCN, which accounts for just eight percent of Portland streets.

East Portland, defined as the area of the city east of and including 82nd Avenue, includes over half of the High Crash Corridors (HCCs) and 28 out of the 30 High Crash Intersections (HCIs) that make up the HCN. The EPASS network is almost entirely composed of HCN streets, except for NE 148th Avenue and SE 162nd Avenue. The EPASS network accounts for 19 percent of the HCN streets by mileage.

Many factors play into the disproportionate amount of crash activity seen on East Portland arterials, most significantly mid-20th century suburban road design and land use patterns that prioritized and encouraged fast automobile travel and property access. This memo aims to identify patterns and specific safety issues to help inform street design proposals made as part of EPASS and other efforts.

[1] Fatality data for 2018 is provided by the Portland Police Bureau (PPB) and is subject to change when official Oregon Department of Transportation (ODOT) crash data is available.



Map 1: Portland's High Crash Network and High Crash Intersections

Data and Methodology

The EPASS traffic safety analysis pulls from several different data sources. Using data collected by PBOT and data provided by partners such as ODOT and PPB, staff summarized crashes within the most recent ten years of data and identified other traffic safety risk factors such as vehicle speeds, bicycle and pedestrian infrastructure deficiencies, and street lighting deficiencies along the EPASS corridors.

Crash Analysis

Ten years of crash data was analyzed for each EPASS corridor. Historical traffic crash data is provided to PBOT by the ODOT Crash Analysis & Reporting Unit and includes all crashes involving a motor vehicle that resulted in property damage, injury, or fatality. This data derives from police reports and self-reported crashes to the Oregon Department of Motor Vehicles. A full dataset from ODOT is only available through 2016, and thus the ten-year traffic crash analysis was conducted for the period of 2007-2016. Analysis on non-motorist movements and direction of travel at the time of a crash was done using an additional data tool that is limited to the ten-year period of 2006–2015.

Crash data was analyzed by mode for each corridor or segment in the EPASS network. In this study, only fatal and incapacitating injury crashes were included for vehicle crashes and all injury levels for bike and pedestrian crashes. For brevity, this selection of crashes is here defined as **Vision Zero Focused Crashes** and follows the same methodology used in PBOT's Vision Zero crash data analysis. Crashes involving, but not resulting in injury to, cyclists and pedestrians were analyzed as additional insight into non-motor road user risk factors. Many of these pedestrian- or bike-involved crashes result in minor injuries to vehicle occupants or property damage only. Each crash in the dataset describes the level of injury for all individuals involved as follows: Fatal, Incapacitating Injury (also called "severe", "serious", or "Injury A"), Non-incapacitating Injury ("moderate" or "Injury B"), and Possible Injury/Complaint of Pain ("minor" or "Injury C").

In addition to the crash data, this safety analysis includes identification of other risk factors such as speed, presence/absence of pedestrian infrastructure, and street lighting deficiencies.

Speed Data

The World Health Organization (WHO) lists speed as one of the five top risk factors for traffic injuries and states that vehicle speed directly influences risk of a crash, severity, and potential of death.[2] PBOT speed count data was used to analyze vehicle speed along the EPASS corridors and evaluate risk. Existing speed count data is not evenly dispersed on the

[2] Global Status Report on Road Safety 2018, World Health Organization.

EPASS network, meaning that some portions of a corridor have more speed count studies than others. The speed count data used in this analysis was collected between May 2015 and April 2019 and each study collected data for 2 to 5 days, although the temporal limitation and date of the studies vary by corridor. The number of existing speed counts also varies by corridor, ranging from 2 on SE Foster Road to 29 on SE Division St. Speed count data points used in this study include date, location, posted speed(s) on the segment (if multiple), 85th percentile, and percentage of vehicles traveling 10 mph or more above the posted speed, also called "top-end speeding" or "excessive speeds." Values that were interpolated are the minimum, maximum, and average of the 85th percentile, percentages of vehicles traveling over 30 mph[3] ("over safe speeds" or "WHO recommended maximum speeds"), and top-end speeding. These values were calculated as an aggregate of all speed counts on the corridor.

Multi-Modal Infrastructure

This memorandum also documents the availability and spacing of pedestrian crossings, sidewalks, and bike lanes. This data is provided by PBOT's Transportation Planning Division and includes information on bicycle and pedestrian infrastructure, including location and whether the infrastructure meets PBOT guidelines. Detailed maps of this data can be found in Appendix 1.

Ped PDX, the city's Pedestrian Master Plan adopted in June 2019, provides new guidelines for the spacing of marked pedestrian crossings. Along streets designated as City Walkways or Major City Walkways (which includes all of the EPASS Network), marked pedestrian crossings should be provided every 800 feet, or every 530 feet within Pedestrian Districts. In addition, marked crosswalks should be provided within 100 feet of all transit stops. Very few EPASS corridors meet these guidelines, though upcoming capital projects such as the Outer Division Multimodal Safety Project will bring corridors much closer to compliance.

The city standard for pedestrian corridor width along arterial streets is 12 feet, or 15 feet in Pedestrian Districts. This width includes a minimum six-foot pedestrian through zone free

[3] According to the WHO Road Safety Report for 2018, best practice criteria for speed management includes urban speed limits not exceeding 50 km/h (approximately 30 mph).

of obstructions, a planting strip between the curb and the through zone, and a frontage zone between the back of sidewalk and the property line. Very few corridors in the EPASS network meet these standards. Most commonly sidewalks along the EPASS corridors are approximately six feet wide, located immediately adjacent to the curb ("curb-tight"), and obstructed by power poles, sign posts and other infrastructure.

Guidance for arterial bike lane design in Portland is provided by the *Portland Protected Bike Lane Planning and Design Guide* completed in November 2018. Based on National Association of City Transportation Officials (NACTO) guidance, the guide calls for installation of protected bike lanes on streets with daily vehicle volumes above 6,000 or speeds above 25 mph. These conditions are found on the entirety of the EPASS Network. The guide provides a flexible menu of design treatments and widths to establish a protected bike lane in different contexts. Generally, a protected bike lane requires between 7 and 11 feet of roadway width per direction, with an unobstructed bicycling zone between 5 and 8 feet wide, and a buffer zone between 1.5 and 3 feet wide. The installation of protected bike lanes is in process on several EPASS corridors including the NE Halsey-Weidler Couplet, NE Glisan Street, and SE Division Street.

Street Lighting

Street lighting is an essential traffic safety tool in the Portland region due to the area's climate and latitude. On the winter solstice, Portland experiences just 8 hours and 42 minutes of daylight.[4] Climatologically, Portland experiences an annual average of 296 cloudy or partly cloudy days and 36 inches of rain, mostly in the winter months.[5] Frequent precipitation, cloudy sky conditions, and short daylight hours in the winter contribute to lower pedestrian and cyclist visibility, including during peak traffic hours.

PBOT's Signals and Street Lights (SSL) team provided streetlight data for the EPASS network. The data provided shows whether street lighting is present on one side of the street, on two sides, or neither. A unique aspect of the East Portland street network is that

[4] U.S. Naval Observatory, Astronomical Applications Department.
[5] U.S. National Weather Service, Local Climate Data from Portland Airport, "Condensed Climate Normals." https://www.wrh.noaa.gov/pqr/pdxclimate/pg133.pdf.

nearly all the five-lane corridors have street lighting on only one side of the street. Single-sided lighting on wide, five-lane corridors results in uneven lighting conditions, creating pockets of darkness between street lights. This decreases visibility for all road users.

There is no apparent pattern or reasoning behind why lighting is on one side or the other (north vs. south side of a corridor, for example). Many street lights are mounted on utility poles and the location of these poles is driven by utility company needs.

All data described here is presented as a table, figure, or map in the following sections or appendices at the end of this document.

EPASS Network

The EPASS network is comprised of eleven major arterials in the East Portland area. In the next section, the EPASS corridors are individually analyzed with respect to each of the datasets mentioned previously. Despite the similarity in width and speeds on these arterials, each of the EPASS corridors is unique. Data gaps and overall trends in the network are documented here in the aggregate. The four maps at the end of this section show the geographic distribution of crashes across the EPASS network.

Table 1 documents crash data for the whole EPASS network by mode and vehicle crash type for each corridor. The leading crash types are highlighted for each mode on each corridor. Below are some key findings for the EPASS network:

- 878 crashes resulted in injury
- 441 crashes involved a cyclist or pedestrian where the non-motorist was not injured.
- The number of injury crashes ranged from 3 on 148th to 220 on Division

Table 1: Vehicle crash types by mode on the EPASS corridors, 2007-2016. Bike- and pedestrian-involved crashes are shown below the main table and include Property Damage Only (PDO) crashes and some with minor injuries to vehicle occupants. Red shading indicates the highest crash frequencies for each mode.

Mode	Crash Type	NE/SE 102nd	NE/SE 122nd	NE 148th	SE 162nd	NE Airport	NE Sandy	NE Halsey	NE Glisan	SE Stark	SE Division	SE Foster
Bike	Angle	1	20	-	-	-	1	6	6	7	10	8
	Backing	-	-	-	-	-	-	-	-	-	-	-
	Fixed object	-	-	-	-	-	-	-	1	-	-	-
	Head-on	-	-	-	-	-	-	1	-	-	-	-
	Parking maneuver	-	-	-	-	-	-	-	-	-	1	-
	Pedestrian	-	-	-	-	-	-	-	-	-	-	-
	Rear-end	-	1	-	-	-	-	1	-	2	1	1
	Sideswipe - O/M	-	2	-	-	1	1	1	-	-	2	2
	Turning movement	10	**41**	-	5	4	3	11	17	17	32	10
	Other/non-collision	-	-	-	-	-	-	-	-	-	-	-
Bike Total		11	64	-	5	5	5	20	24	26	46	21
Pedestrian	Angle	-	-	-	-	-	-	-	-	-	-	1
	Backing	-	-	-	-	-	-	-	-	-	1	-
	Fixed object	-	1	-	-	-	-	-	2	-	1	-
	Head-on	-	-	-	-	-	-	-	-	-	-	-
	Parking maneuver	-	-	-	-	-	-	-	1	1	-	-
	Pedestrian	-	-	-	-	-	-	-	-	-	-	-
	Rear-end	1	-	-	-	-	-	1	-	1	1	-
	Sideswipe - O/M	-	-	-	-	-	-	-	-	-	1	-
	Turning movement	21	30	-	3	2	4	16	12	38	29	9
	Straight movement - un	4	39	-	2	-	15	10	22	28	**68**	11
	Other/non-collision	-	1	-	-	-	-	-	1	-	-	-
Pedestrian Total		26	71	-	5	2	19	27	38	68	101	21
Vehicle	Angle	2	3	-	-	-	1	5	5	15	7	8
	Backing	-	-	-	-	-	-	-	-	-	-	-
	Fixed object	-	3	2	2	8	-	3	6	4	8	4
	Head-on	-	1	-	-	-	-	1	2	-	-	-
	Parking maneuver	-	-	-	-	-	-	-	-	-	-	-
	Pedestrian	-	-	-	-	-	-	-	-	-	-	-
	Rear-end	4	4	-	2	2	-	4	10	13	**40**	7
	Sideswipe - O/M	1	-	-	-	-	1	1	1	-	2	1
	Turning movement	7	8	1	2	3	1	15	12	15	14	4
	Other/non-collision	-	-	-	-	2	-	1	2	-	2	1
Vehicle Total		14	19	3	6	15	3	30	38	47	73	25
TOTAL		**51**	**154**	**3**	**16**	**22**	**27**	**77**	**100**	**141**	**220**	**67**

Bike Involved	-	64	-	2	-	1	1	3	4	3	1
Pedestrian Involved	24	69	-	3	1	4	1	35	40	163	22

Table 2 summarizes the number of crashes per mile on each EPASS corridor by mode. The top crashes per mile for each mode is highlighted in red.

- SE Division Street has the highest number of crashes per mile in total and for pedestrian and motor vehicle crashes.
- NE/SE 122nd Avenue, the longest of the EPASS corridors, has the highest number of bike crashes per mile.

Table 2: EPASS corridor length and crashes per mile by mode, 2007-2016.

	NE/SE 102nd	NE/SE 122nd	NE 148th	SE 162nd	NE Airport	NE Sandy	NE Halsey	NE Glisan	SE Stark	SE Division	SE Foster	TOTAL
Corridor Length (mi)	3.47	6.20	1.03	1.64	3.77	0.99	4.80	4.01	5.34	4.65	2.66	**38.57**
Ped Crashes Per Mile	7.50	11.45	-	3.05	0.53	19.15	5.63	9.47	12.74	21.72	7.90	**99.13**
Bike Crashes Per Mile	3.17	10.32	-	3.05	1.32	5.04	4.17	5.98	4.87	9.89	7.90	**55.71**
Vehicle Crashes Per Mile	4.04	3.06	2.91	3.66	3.97	3.02	6.25	9.47	8.80	15.70	9.41	**70.30**
Total Crashes Per Mile	***14.71***	***24.83***	***2.91***	***9.76***	***5.83***	***27.22***	***16.05***	***24.92***	***26.41***	***47.31***	***25.21***	***225.14***

Table 3 contains speed count data collected on or near the EPASS segments. This data is summarized by EPASS corridor and then grouped by counts collected at locations with the same posted speed. Because of the wide range of values collected, data is shown as maximum, minimum, and average values for each group of counts at a posted speed. These three values are shown for the three categories analyzed in this study: 85th percentile (mph), percent of vehicles traveling over 30 mph (WHO recommended maximum speed), and percent of vehicles top-end speeding (10+ mph over the posted speed).

Table 3: Traffic speed count collection data by EPASS corridor, 2015–2019. The percentage of vehicles traveling over 30 mph is included in this study even though posted speeds may be higher because the World Health Organization recommends that urban speed limits do not exceed 30 mph.

	NE 102nd			NE 122nd			SE 122nd			NE 148th			SE 162nd						NE Airport			NE Sandy			NE Halsey						
Posted Speed	35			35			35			35			35			40			45			35			25	35			45		
85th Percentile (MPH)	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Total**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
	31	42	37	36	49	40	35	42	37		40		40	43	41	38	46	42	44	50	48	38	40	39	34	35	41	39	44	47	46
% over 30mph	27	94	61	53	90	72	35	91	38	85	90	87	91	92	92	0.7	0.9	92	74	92	83	78	89	84	29	64	87	79	75	87	81
% 10+ mph over posted speed	0.1	5.6	2.4	0.7	29	5.3	0.1	5.0	1.3	2.4	3.9	3.2	3.0	7.4	6.1	0.0	0.2	5.2	0.3	4.4	2.0	1.0	2.7	1.9	12	0.5	4.7	2.8	0.5	1.5	1.0

NE Glisan									SE Stark						SE Division						SE Foster		
35			40			45			30			35			30			35			40		
Min	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
38	49	42	40	45	42	41			29	42	37	34	42	39	31	41	36	35	42	38	44	47	46
82	96	90	81	96	87	47	50	48	11	92	64	49	94	81	21	93	60	56	93	74	94	97	96
1	36.7	11	0.6	3.2	1.2	0.1	0.2	0.15	0.3	22.8	6.8	0.4	6.1	2.8	0.4	11.9	5.1	0.5	5.2	2.0	1.9	6.5	4.2

Figure 1 is composed of three side-by-side charts displaying the light conditions at the time of crashes on the EPASS network. From left to right, the figures show bicycle, pedestrian, and vehicle crashes that occurred from 2006-2015. The number of crashes on each EPASS corridor is represented by occurrence during light or dark light conditions. Dark light conditions include twilight, dusk, and dawn and are not a representation of street lighting presence. The bike and pedestrian charts do not show NE 148th Avenue because there were no crashes that occurred on this segment during the study period. Note that the y-axis for all three modes is different. Some key findings from the EPASS network analysis includes:

- Pedestrian crashes occur more frequently at night (45%) than other modes: bike (24%) and motor vehicle (43%)
- Sandy, Glisan, Stark, and Division have the highest occurrence of pedestrian crashes at night
- SE 122nd and Halsey have the highest frequency of bike crashes at night: 36 percent for each street
- Vehicle crashes during dark conditions occur on 102nd, 122nd, Airport Way, and Foster more frequently than on the other EPASS corridors (>50% of total).

Figure 1: Light conditions at time of crash on EPASS corridors, 2006-2015. From left to right are bikes, pedestrians, and vehicle crashes. Note that NE 148th Avenue is not shown on the bike and pedestrian charts because there were no crashes during this period.

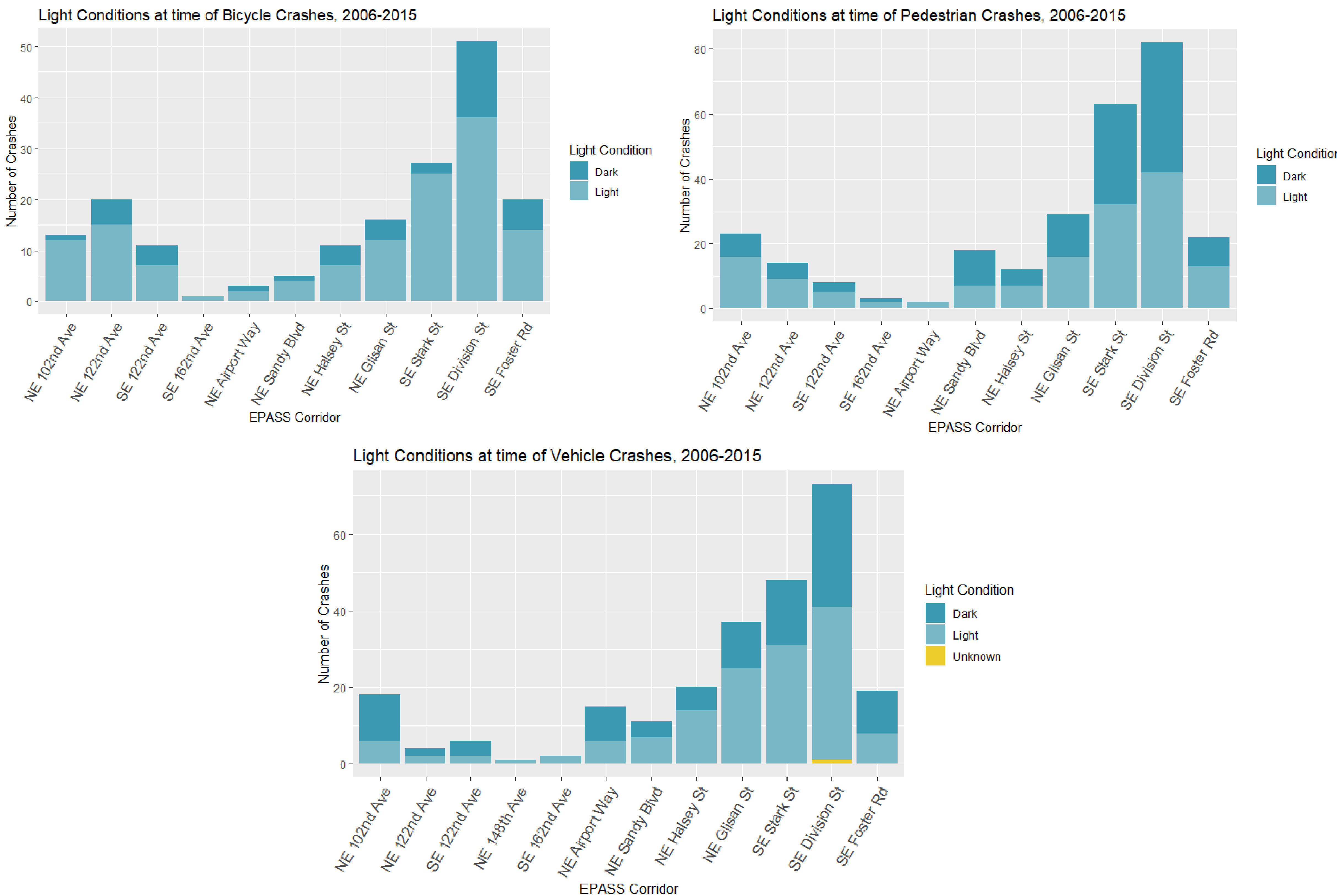


Figure 2 shows bicycle, pedestrian, and vehicle crashes with respect to road user movements at the time of the crash. For bicycles and pedestrians, movements are shown directionally in relation to the segment, such as moving across or along SE Stark Street. The chart for vehicle crashes shows the distribution of nine different crash types observed across the EPASS network, although they may not all be represented on each corridor. Some key findings from the EPASS network analysis includes:

- 58.6 percent of pedestrian crashes occur when the pedestrian is moving across the arterial street
- 69.7 percent of bicycle crashes occur while the cyclist is moving along the arterial street (typically hooked by a turning vehicle or cross traffic)
- Rear-end (30.3%) and turning movement (29.5%) crashes are the most common vehicle crash types, followed by angle (16.5%) and fixed object (15.7%)

Figure 2: Movement of road users at time of crash separated by mode. Bike and pedestrian movements are shown directionally in relation to the EPASS segment, while vehicle movements show the crash type only. Note that NE 148th Avenue is not shown on the bike and pedestrian charts because there were no crashes during this period.

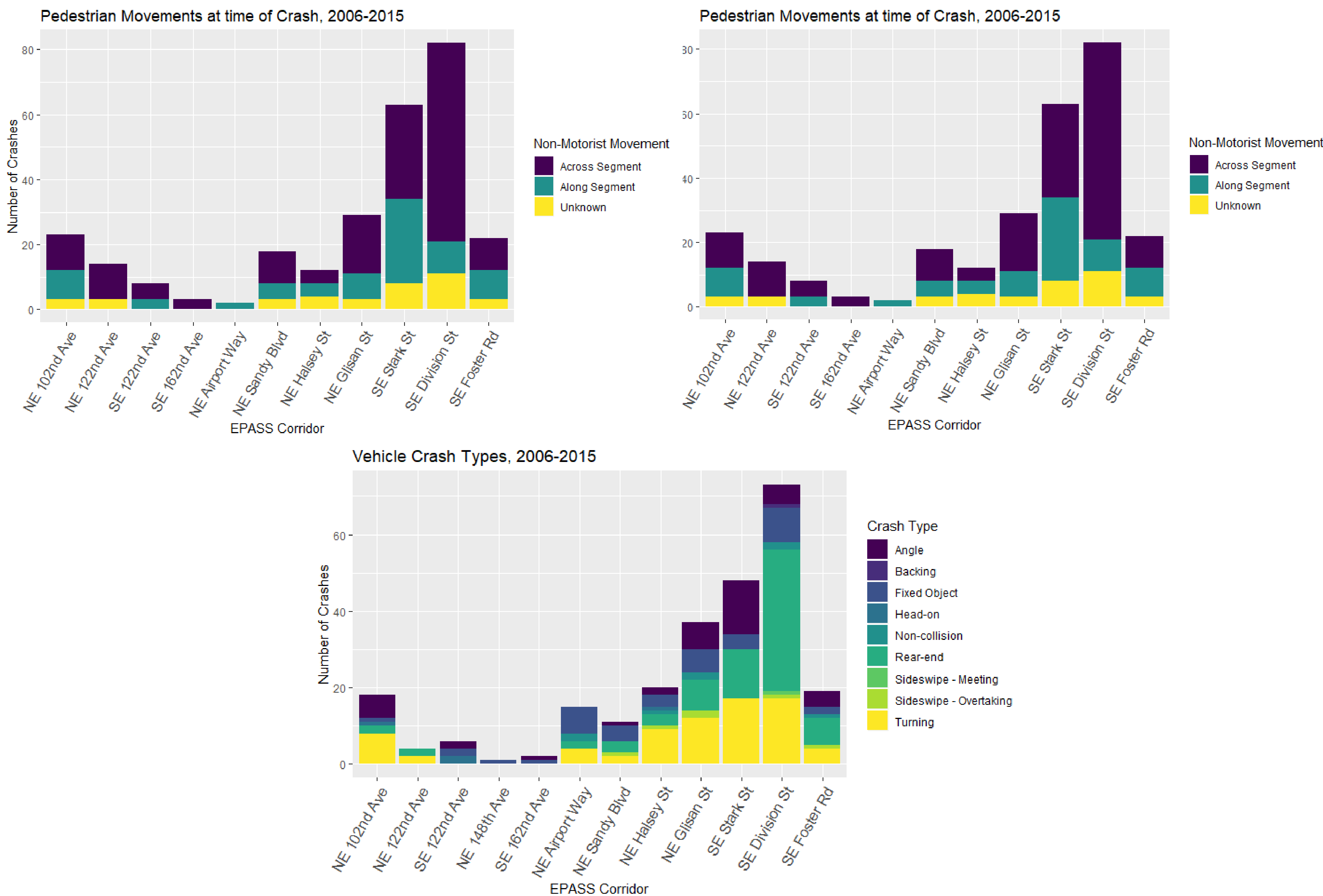


Table 4 summarizes pedestrian crash types at different locations on each corridor. The location types are driveway, mid-block, signalized intersection, and unsignalized intersection. The crash types for each location are descriptive in that they indicate the vehicle movement, pedestrian movement, or road user error, such as failure to yield for a pedestrian or a pedestrian crossing against a signal. The top numbers of crashes at each location type are highlighted.

- Signalized intersections are where the largest share of pedestrian crashes occur (38%). Two-thirds of pedestrian crashes occur when turning vehicles failed to yield to pedestrians.
- Crashes at unsignalized intersections are more attributed to pedestrians not providing enough time for a vehicle to stop, as well as those through-moving vehicles failing to yield, rather than from vehicles turning.
- At unsignalized intersections, pedestrians are more likely to be struck by a vehicle moving straight than at signalized intersections, especially on Glisan and Division streets.
- Division Street has a much higher rate of pedestrians being struck while crossing between intersections than other corridors.

Table 4: Pedestrian crashes summarized by crash type at different locations on each EPASS corridor, 2006 – 2015. Red shading indicates the highest crash frequencies.

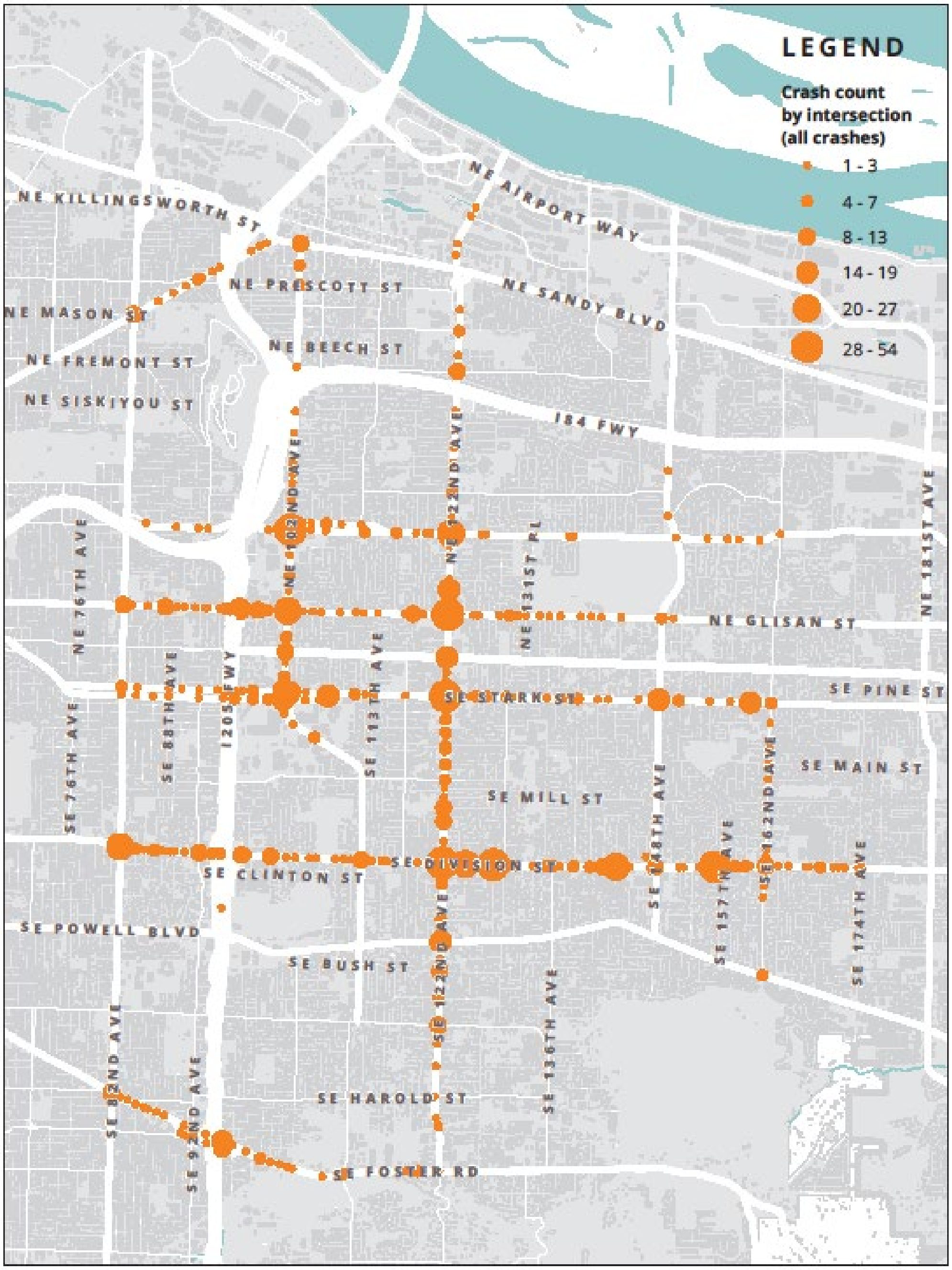
Location Type	Crash Type: Pedestrian	EPASS Corridor											TOTAL
		NE 102nd Ave	NE 122nd Ave	SE 122nd Ave	SE 162nd Ave	NE Airport Way	NE Sandy Blvd	NE Halsey St	NE Glisan St	SE Stark St	SE Division St	SE Foster Rd	
Signalized Intersection	Driver going straight failed to yield						1		3	3	2	1	10
	Left turning driver failed to yield	8	6				1	1	2	10	6		34
	Pedestrian crossing against signal	2	2			1		1		6	2	2	16
	Right turning driver failed to yield	8			1	1		2	5	6	11	2	36
	Other	2						1	1	1	3	1	9
	Total	**20**	**8**		**1**	**2**	**2**	**5**	**11**	**26**	**24**	**6**	**105**
Unsignalized Intersection	Driver going straight failed to yield								7	3	7	1	18
	Left turning driver failed to yield			3			1			2	3	1	10
	Ped did not provide sufficient time for vehicle to stop			1			4	1	1	8	4	2	21
	Right turning driver failed to yield	1	1				2			3		1	8
	Other							1	2		1	1	5
	Total	**1**	**1**	**4**	**0**	**0**	**7**	**2**	**10**	**16**	**15**	**6**	**62**
Mid-block	Pedestrian crossing between intersections		4	3	2		9	2	7	11	37	7	82
	Other		1					1	1	6	3	3	15
	Total		**5**	**3**	**2**		**9**	**3**	**8**	**17**	**40**	**10**	**97**
Driveway	Driveway	2		1				2		4	3		12
	Total	**2**		**1**				**2**		**4**	**3**		**12**
TOTAL		**23**	**14**	**8**	**3**	**2**	**18**	**12**	**29**	**63**	**82**	**22**	**276**

Table 5 summarizes the position and location of bicyclists in crashes involving bicycle and vehicle users. Some crash types unique to these crashes are improper lane change and whether the bike was in or outside of the roadway, such as on the sidewalk.

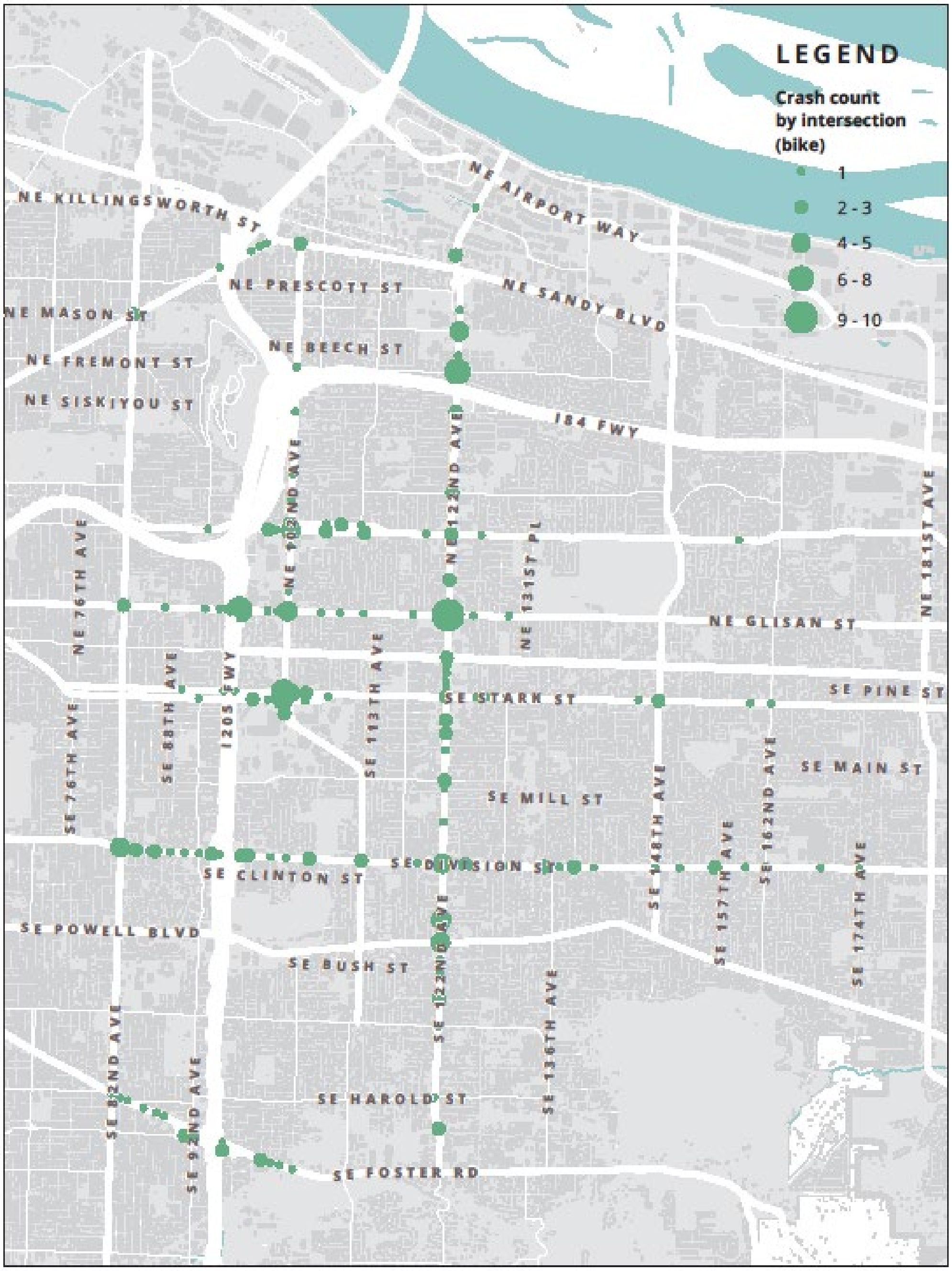
- The highest number of bike crashes are on SE Division Street, NE/SE 122nd Avenue, and SE Stark Street.
- When 122nd Avenue's NE and SE segments are combined, it has the second highest number of crashes (31); however, NE 122nd has twice as many bike crashes as the SE segment.
- More crashes occur at driveways for bicyclists than for pedestrians.
- Crashes when a bicyclist is riding outside of the roadway occur more than twice as often than when the bike is in the roadway.
- At signalized intersections, bike crashes occur most frequently (35%) when a right turning driver fails to yield to the cyclist.
- Slightly more bike crashes occur at unsignalized intersections, and they are primarily due to turning vehicles failing to yield.

Table 5: Bicycle crashes summarized by crash type at different locations, 2006 – 2015. Red shading indicates the highest crash frequencies.

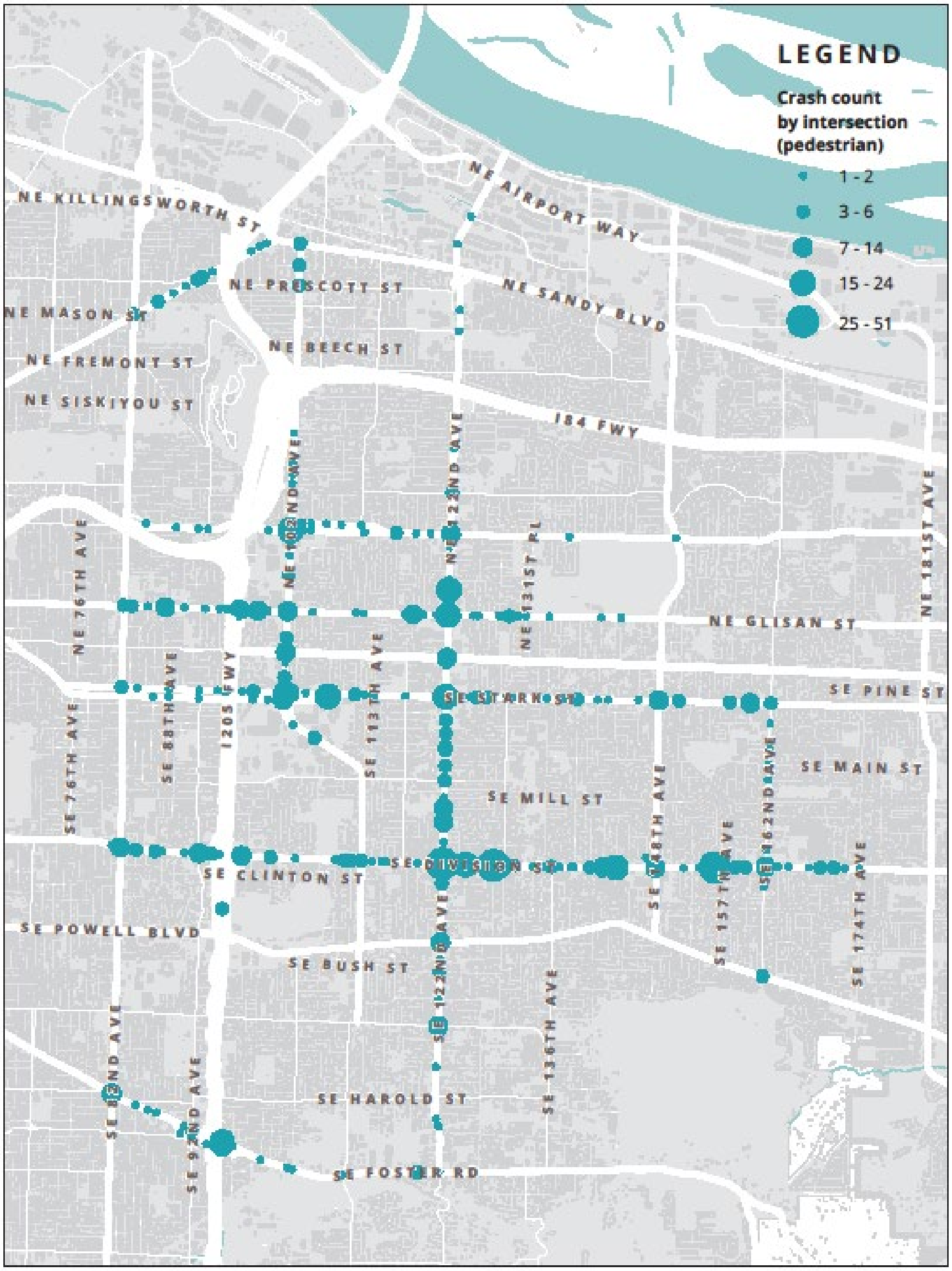
Location Type	Crash Type: Bike	EPASS Corridor											TOTAL
		NE 102nd Ave	NE 122nd Ave	SE 122nd Ave	SE 162nd Ave	NE Airport Way	NE Sandy Blvd	NE Halsey St	NE Glisan St	SE Stark St	SE Division St	SE Foster Rd	
Signalized Intersection	Bicyclist disregarded traffic signal or did not have right-of-way							1	3	2	4	2	12
	Driver going straight failed to yield	1					1			2		1	5
	Left turning driver failed to yield	1		2			1				1		5
	Right turning driver failed to yield	4	1			1		1	2	6	1	2	18
	Other	1	2					1	2	2	2	1	11
Signalized Intersection		**7**	**3**	**2**		**1**	**2**	**3**	**7**	**12**	**8**	**6**	**51**
Unsignalized Intersection	Bicyclist did not have right-of-way	1								1			2
	Bicyclist disregarded stop sign or flashing red										1	1	2
	Driver going straight failed to yield			1				1		2	2		6
	Left turning driver failed to yield	2	3						3	1	4	3	16
	Right turning driver failed to yield	1		1				3		1	4	3	13
	Other	1	3					3	1		9	2	19
Unsignalized Intersection		**5**	**6**	**2**				**7**	**4**	**5**	**20**	**9**	**58**
Mid-block	Bike crossing or improper lane change		1	4			1		2	1	5	3	17
	Driver colliding with cyclist while traveling straight		1								3	2	6
	Other								2		2		4
Mid-block			**2**	**4**			**1**		**4**	**1**	**10**	**5**	**27**
Driveway	Driveway - Bike in roadway	1	3				1	1		4	2		12
	Driveway - Bike outside roadway (e.g., sidewalk, bike path)		4	2	1	2	1		1	5	8		24
	Other		2	1							3		6
Driveway		**1**	**9**	**3**	**1**	**2**	**2**	**1**	**1**	**9**	**13**		**42**
TOTAL		**13**	**20**	**11**	**1**	**3**	**5**	**11**	**16**	**27**	**51**	**20**	**178**



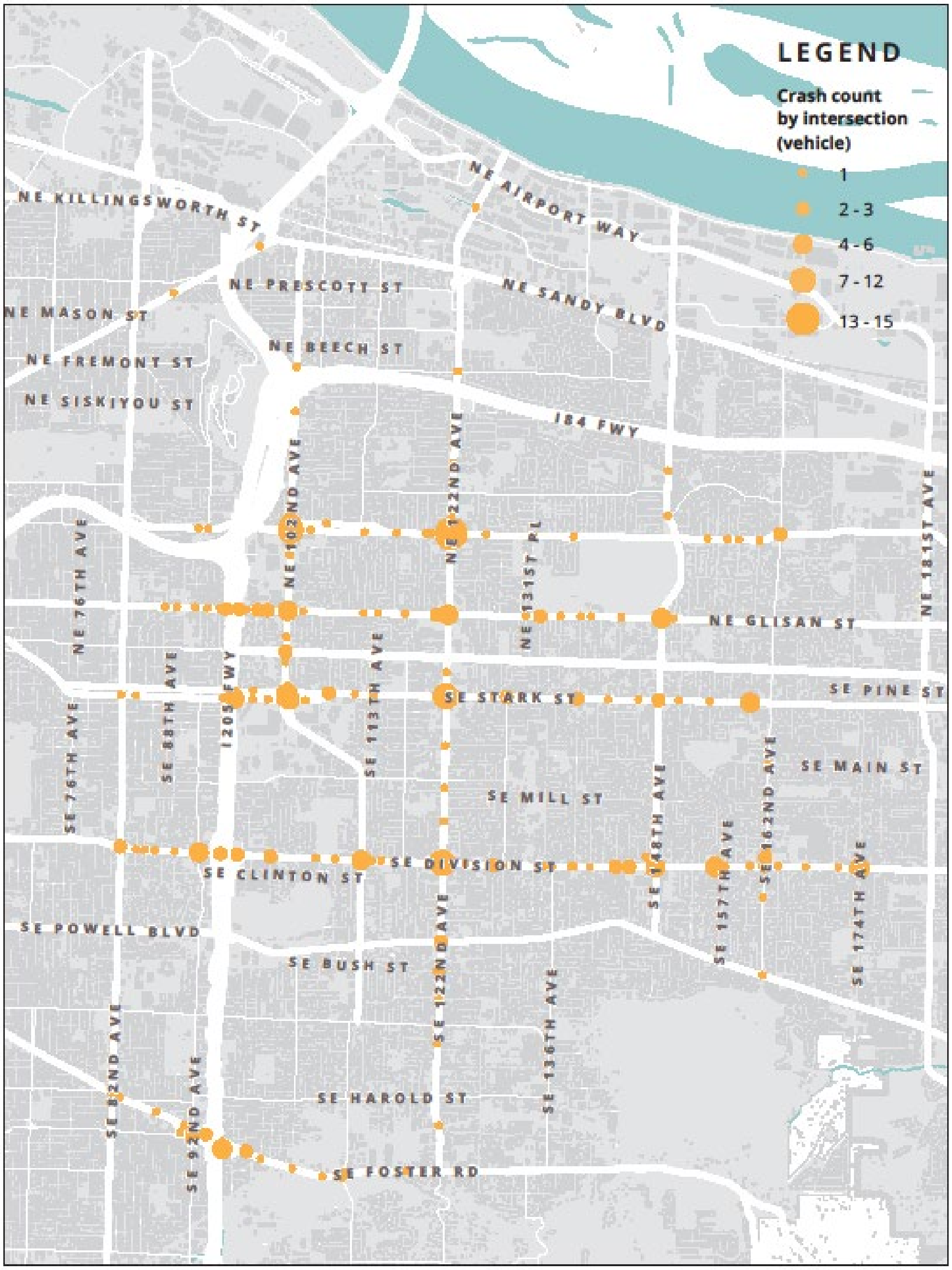
Map 2: Distribution of all High Priority Crashes on the EPASS network by number of occurrences, 2007-2016. Larger symbols indicate more crashes in an area. Crashes are not shown for non-EPASS network streets.



Map 3: Distribution of bike-related crashes on the EPASS network by number of occurrences, 2007-2016. Larger symbols indicate more crashes in an area. Crashes are not shown for non-EPASS network streets.



Map 4: Distribution of all pedestrian-related crashes on the EPASS network by number of occurrences, 2007-2016. Larger symbols indicate more crashes in an area. Crashes are not shown for non-EPASS network streets.



Map 5: Distribution of fatal and serious injury vehicle crashes on the EPASS network by number of occurrences, 2007-2016. Larger symbols indicate more crashes in an area. Crashes are not shown for non-EPASS network streets.

EPASS Corridor Profiles

NE/SE 102nd Ave (3.47 miles)

The EPASS network includes NE/SE 102nd Avenue with a short segment of SE 103rd Avenue and SE Cherry Blossom Street. The endpoints of this EPASS corridor are NE Sandy Boulevard and SE 106th Avenue. The segment north of E Burnside Street is part of the HCN, while the SE segment is not. The 102nd Avenue corridor intersects with three other EPASS corridors: the Halsey-Weidler Couplet, NE Glisan Street, and SE Stark-Washington Street. The intersections of NE 102nd Avenue at the Halsey-Weidler Couplet and NE Glisan are Vision Zero High Crash Intersections (HCIs), meaning that they are two of the thirty most dangerous intersections in Portland.

Crash History

In the 10-year period analyzed, 51 crashes occurred on the 102nd Avenue corridor with 54 injuries. There were also an additional 24 pedestrian-involved crashes that did not result in injury to the pedestrian and zero additional bike-involved crashes (Figure 1). Crash injuries are summarized by mode in the table below (Table 6). Compared to the other corridors, 102nd Avenue also has a relatively moderate number of crashes per mile at 14.71 (Table 2).

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**11**	0	0	6	5	**11**
Ped	**26**	1	1	9	16	**27**
Vehicle	**14**	1	15	-	-	**16**
Total	**51**	**2**	**16**	**15**	**21**	**54**

Table 6: Number of injury crashes and level of injuries sustained in traffic crashes on 102nd Avenue, 2007-2016.

Based on data in Figure 1, the number of crashes during light and dark conditions varied greatly by mode. Very few bike crashes occurred in dark conditions here (8 percent), while 30 percent of pedestrian and 67 percent of motor vehicle crashes occurred at night.

Most pedestrians were struck by vehicles while crossing 102nd Avenue (48 percent), rather than while crossing a side street along 102nd Avenue. This trend is not as strong as the network-wide average. Bicycle crashes, however, strongly follow the trend of a bicyclist moving along the segment when they were struck, accounting for 77 percent of bike crashes on this corridor. Crashes among vehicles were primarily turning movements (44 percent), followed by angle crashes (33 percent) (Figure 2).

Speed Data

The posted speed limit on the 102nd Avenue EPASS corridor ranges from 25 to 35 mph. From the NE Weidler Loop to NE Multnomah Street—a highly commercial area—the posted speed is 25 mph. In late 2018, the posted speed limit was lowered from 35 to 30 mph on the northern and southern segments of 102nd Avenue.

Table 3 summarizes the speed count data on each corridor. NE 102nd Avenue had eight speed counts from 2015 – 2018, most recently in December 2018. Speed counts were only collected in segments where the posted speed was 35 mph. The average percentage of vehicles traveling over 30 mph was 60.7 percent and top end speeding was 2.4 percent.

Multimodal Infrastructure and Lighting

Appendix 1 contains detailed maps of the current pedestrian and bicycle infrastructure on all EPASS corridors. Pages 1-7 show the 102nd Avenue corridor.

Although the entirety of 102nd Avenue has sidewalks present on at least one side, most of these sidewalks do not meet PBOT standards, particularly north of the Halsey-Weidler Couplet. Similarly, there are few segments of this corridor that meet PBOT's crossing spacing standards, especially north of E Burnside Street. The bicycling facilities on 102nd Avenue include a mix of bike lanes and buffered bike lanes; however, they are only present from NE Weidler Street to SE Stark Street.

Street lighting on 102nd Avenue is present, but it is not uniform along the whole corridor. The segments of 102nd Avenue that have street lighting on both sides are from NE Fremont Street to NE 103rd Place and from NE Weidler Street to E Burnside Street.

A multi-phase, urban renewal-funded streetscape project in the 2000s improved 102nd Avenue from E Burnside Street to NE Weidler Street with wider sidewalks, pedestrian scale street lighting, street trees, and periodic median islands. Repaving in 2017 narrowed vehicle travel lanes and striped buffered bike lanes. A pilot project in 2019 will install buffered bike lanes and pedestrian crossing islands while reducing vehicle travel lanes from four to two north of NE Weidler Street.

Summary

Based on crash analysis, vehicle speeds, bike and pedestrian infrastructure, and street lighting, the greatest areas of concern on 102nd Avenue are at the HCIs. 102nd Avenue is also among the top corridors for pedestrian-related crashes that occurred while a vehicle was turning. Turning movements were also the leading crash type for bike-related crashes and vehicle-only crashes on this corridor (Table 1). Nighttime vehicle crashes are common and tied for the highest frequency of this type of crash on the EPASS network. Additionally, the narrow sidewalk on the I-84-Union Pacific Railroad overcrossing does not meet ADA horizontal clearance in places, which causes people on mobility devices to move into the roadway.

NE/SE 122nd Avenue (6.2 miles)

Nearly the entire length of NE/SE 122nd Avenue, extending from NE Airport Way to SE Foster Road, is included in EPASS. The 122nd Avenue corridor is an HCC and intersects with six other EPASS Corridors in this study: NE Airport Way, NE Halsey Street, NE Glisan Street, SE Stark Street, SE Division Street, and SE Foster Road. The intersections at NE Halsey, NE Glisan, SE Stark, and SE Division are also HCIs in the High Crash Network. Totaling 6.20 miles in length, the 122nd Avenue EPASS corridor is the longest corridor in the network.

Crash History

In the 10-year period analyzed, 154 crashes occurred on the 122nd Avenue corridor with 159 injuries. There were an additional 64 bike-involved crashes and 69 pedestrian-involved crashes on this corridor. Crash injuries are summarized by mode in Table 7. With 24.83 crashes per mile, 122nd Avenue ranks 6th; however, it does have the highest concentration of bicycle crashes in the EPASS network, 10.32 per mile (Table 2).

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**64**	1	5	33	25	**64**
Ped	**71**	1	11	34	26	**72**
Vehicle	**19**	3	20	-	-	**23**
Total	**154**	**5**	**36**	**67**	**51**	**159**

Table 7: Number of injury crashes and level of injuries sustained in traffic crashes on 122nd Avenue, 2007-2016.

Figure 1 shows that about one-third of pedestrian crashes occurred at night on 122nd Avenue, similar to other EPASS corridors. However, both the NE and SE segments had some of the highest numbers of vehicle crashes in the network, both over 50 percent occurring in dark conditions. SE 122nd had 36 percent of bike crashes at night, which is tied with NE Halsey Street for the top bike crashes in this category.

Speed Data

The posted speed limit on 122nd Avenue is 35 mph from NE Sandy Boulevard to SE Foster Road. Between NE Airport Way to NE Sandy the posted speed is 45 mph. Since 2015, there have been 26 traffic speed counts on the corridor, the most recent in November 2017 on the NE segment, and in April 2019 on the SE segment.

The average percentage of vehicles traveling over WHO recommended maximum speeds (30 mph) on NE 122nd Avenue was 72 percent, while the average on the SE segment was 38 percent (Table 3), which could be attributed to posted speeds of at least 35 mph. Top end speeding was also more prevalent on the NE segment with 5.3 percent of vehicles traveling faster than 10 mph over the posted speed, as opposed to 1.3 percent on SE 122nd Avenue.

Multimodal Infrastructure and Lighting

Appendix 1, pages 8-20 include maps of the bike and pedestrian infrastructure on 122nd Avenue.

Sidewalks are present on both sides of the street except for in the northern-most segment. From the NE Sandy Boulevard ramp to NE Airport Way, sidewalks are lacking, primarily on the eastern side of the corridor. Regardless, sidewalks along 122nd Avenue do not meet current PBOT standards, apart from a segment near the Springwater Corridor which was improved with a federal grant in the early 2010s. Most of 122nd Avenue does not meet PBOT's pedestrian crossing spacing standards, though new enhanced crossings have been added incrementally over the past ten years. Standard bike lanes are present for the entire length of the corridor.

Two pinch points are present for people walking, biking, and using mobility devices: the undercrossing of I-84 and the Union Pacific Railroad Graham Line, and the undercrossing of NE Sandy Boulevard and the Union Pacific Railroad Kenton Line.

Street lighting on 122nd Avenue, is primarily only on one side of the roadway. There are two short segments with two-sided street lighting on 122nd Avenue: NE Inverness Drive to NE Sandy Boulevard and NE Fremont Street to the NE 122nd Avenue Frontage Road. The latter segment crosses the I-84 freeway, which is a similar street lighting pattern to NE 102nd Avenue.

Summary

122nd Avenue has a high crash frequency, but not a necessarily high number of crashes per mile. The high frequency of bicycle-related crashes on 122nd Avenue is notable, primarily attributed to turning movement collisions. 122nd Avenue also has the highest number of angle collisions (20) for bicycle-related crashes of any of the EPASS corridors. Pedestrian-related crashes are also prevalent on 122nd Avenue with 66 rear-end vehicle crashes, frequently due to a vehicle yielding to a pedestrian and the vehicle behind it following too closely. There were also 39 crashes in which a pedestrian was struck by a vehicle moving straight, the second highest frequency of this pedestrian crash type on the EPASS network. Vehicle injuries only accounted for 15 percent of total injuries on 122nd Avenue. The leading vehicle collision type was turning movements, with 8 occurrences, or 42 percent of collisions (Table 1). Darkness appears to be a concern for vehicle and bike crashes, especially on the SE segment.

NE 148th Avenue (1.03 miles)

The NE 148th Avenue EPASS corridor is a 1.03-mile long segment, from NE Sacramento Street to NE Glisan Street. 148th Avenue is a much longer corridor running from NE Marine Drive to SE Powell Boulevard, but only the segment with four or five vehicle lanes is studied in EPASS. NE 148th Avenue is not in the HCN and does not have any HCIs. The roadway does intersect with two other EPASS corridors: NE Halsey Street and NE Glisan Street. NE 148th Avenue is the second shortest corridor in the EPASS network and has the lowest number of crashes for all modes.

Crash History

There were zero bike- or pedestrian-related crashes on 148th Avenue and only three vehicle crashes, resulting in a vehicle—and total—of 2.91crashes per mile (Table 2). Table 8 summarizes the number and severity of crashes on NE 148th Avenue.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**-**	-	-	-	-	-
Ped	**-**	-	-	-	-	-
Vehicle	**3**	1	2	-	-	3
Total	**3**	**1**	**2**	**0**	**0**	**3**

Table 8: Number of injury crashes and level of injuries sustained in traffic crashes on NE 148th Avenue, 2007-2016.

Because there were so few crashes on NE 148th Avenue, it is undetermined whether there are any trends in day or night conditions. Two of the three crashes that occurred on 148th Avenue involved a vehicle colliding into a fixed object, both being a curb.

Speed Data

The posted speed limit on NE 148th Avenue is 35 mph and no recent traffic speed counts have been conducted on this segment. The most recent speed counts (2) were collected in April 2015 at NE 148th Place, which is north of the I-84 freeway and north of the EPASS segment. The speed limit at this location is 35 mph and the average percentage of vehicles driving over 30 mph was 87 percent, while 3.2 percent of vehicles were top-end speeding. (Table 3).

Multimodal Infrastructure and Lighting

In Appendix 1, pages 21-23 map bike and pedestrian facilities on 148th Avenue.

This corridor lacks sidewalks on almost the entire west side of the street, and the segment from Halsey to Glisan had no walking infrastructure until a 2019 project completed sidewalks on the east side. North of Halsey, sidewalks are present on the east side of the street but vary in whether they meet PBOT's standards. Some segments lack sidewalks but have a curb. Despite the lack of sidewalk presence, the entire segment meets PBOT's crossing spacing guidelines. For cyclists, a standard bike lane is present for the entire length of the 148th Avenue EPASS corridor. Street lighting on the 148th Avenue corridor is all on one side.

Summary

148th Avenue is relatively uniform for the entire EPASS segment. There have been few fatal and serious injury crashes in the most-recent ten years of data, and no bike or pedestrian crashes. When analyzing vehicle crashes on this corridor, two of the three crashes involved a vehicle crashing into a fixed object; in both cases the vehicles struck a curb. NE 148th Avenue does not have complete sidewalks along the segment, but pedestrian crossings are spaced to meet PBOT guidelines. One such crossing, at NE Sacramento Street, will be improved with a rectangular rapid flashing beacon as part of a Safe Routes to School project in 2020.

SE 162nd Avenue (1.64 miles)

The EPASS segment of SE 162nd Avenue begins about 200 feet south of SE Stark Street and ends at SE Powell Boulevard. North of the EPASS segment, 162nd Avenue enters City of Gresham jurisdiction. This corridor only intersects with one other EPASS corridor at SE Division Street, though SE Stark Street is close by at the north end. SE 162nd Avenue is not in the HCN, but it does have two HCIs—one at SE Division Street and the other at SE Powell Boulevard. The 162nd Avenue corridor is relatively short compared to other streets in the EPASS network.

Crash History

A total of 16 crashes and 17 injuries occurred on 162nd Avenue during the 10-year study period. 162nd Avenue has one of the lowest overall crashes per mile, 9.76, which is relatively evenly distributed across bike, pedestrian, and vehicle crashes (Table 2). Table 9 summarizes the number and severity of crashes by mode.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**5**	0	0	4	1	**5**
Ped	**5**	0	1	2	3	**6**
Vehicle	**6**	1	5	-	-	**6**
Total	**16**	**1**	**6**	**6**	**4**	**17**

Table 9: Number of injury crashes and level of injuries sustained in traffic crashes on SE 162nd Avenue, 2007-2016.

SE 162nd Avenue does not have many crashes and most of them happen during daylight. For vehicles and bikes, 100 percent of crashes occurred during the day, while one of the three pedestrian crashes was at night (Figure 1).

Similar to elsewhere in the EPASS network, the bike and pedestrian crashes on SE 162nd Avenue have similar characteristics of pedestrians crossing the segment and bikes traveling along the roadway when struck. The only vehicle crash types were angle crashes and collisions into fixed objects (Figure 2)

Speed Data
162nd Avenue is the only EPASS corridor that is entirely posted at 40 mph. There have been four recent traffic speed counts on this segment, most recently in May 2018. Even with the higher speed limit relative to the other nearby arterials, on average, 92 percent of vehicles were traveling over WHO recommended maximum speeds (over 30 mph) and 5.2 percent of vehicles were driving at excessive speeds (Table 3).

Multimodal Infrastructure and Lighting
As mapped in Appendix 1, pages 24-27, the bicycle and pedestrian infrastructure on 162nd Avenue is more complete than the other EPASS corridors previously described.

The entire length of the corridor meets PBOT crossing spacing standards and sidewalks are present on both sides, with a single block exception between SE Main Street and SE Market Street. While present, all of the existing sidewalks are substandard. A bike lane is present on 162nd Avenue and street lighting is only present on one side of the street.

Summary
SE 162nd Avenue is unique in that it is relatively uniform across the corridor in posted speed, bicycle and pedestrian facilities, lighting, and crashes per mile. Crash frequency is very similar between modes with no prevalent anomalies. The collision type to note on SE 162nd Avenue is turning movements, which had the highest frequency for bike-related crashes (6). Otherwise, all other modes' crashes were distributed across vehicle movement type (Table 1).

NE Airport Way (3.77 miles)

NE Airport Way is the northern-most EPASS corridor and extends from NE Glenn Widing Drive (where PBOT gains roadway jurisdiction east of I-205) to the Portland city limits at NE 181st Avenue. Airport Way is in the HCN, does not have any HCIs, and intersects with only NE 122nd Avenue on the EPASS network. This corridor differs from other EPASS corridors in that it runs through a primarily commercial and industrial land use area, has a higher level of access management, and features numerous curves. NE Airport Way was constructed as a new roadway in the 1990s to promote industrial development.

Crash Data

The NE Airport Way EPASS corridor is moderate in length compared to the rest of the network at 3.77 miles and has the second lowest number of crashes per mile, 5.83 (Table 2). Airport Way had 22 crashes with 22 injuries. In this auto-centric and industrial-focused district, the corridor had a higher frequency of vehicle crashes than other modes, accounting for 65 percent of total. Table 10 summarizes crashes by severity and mode.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**5**	0	1	3	1	**5**
Ped	**2**	0	0	1	1	**2**
Vehicle	**15**	4	11	-	-	**15**
Total	**22**	**4**	**12**	**4**	**2**	**22**

Table 10: Number of injury crashes and level of injuries sustained in traffic crashes on NE Airport Way, 2007-2016.

Figure 1 shows that all pedestrian crashes happened during the day, and four of the five bike crashes on Airport Way happened during daylight hours. In contrast, 60 percent of auto crashes were in darkness or low-light conditions.

Although the frequency of bike and pedestrian crashes was low on Airport Way, all of them were when these road users were traveling along the corridor (Figure 2). When analyzing vehicle crashes, this corridor has the highest percentage of vehicles colliding with fixed objects (47 percent), many of these crashes citing speed or driving too fast for conditions as a factor.

Speed Data

The posted speed limit on the whole NE Airport Way EPASS corridor is 45 mph, the highest single-speed corridor in the network. The most recent traffic speed counts were collected in May 2015. The data from these four speed counts indicates that the average percentage of vehicles driving over 30 mph was 83.3 percent and 2.0 percent were top-end speeding (Table 3).

Multimodal Infrastructure and Lighting

Appendix 1, pages 28-35 include maps of the pedestrian and bicycle infrastructure on NE Airport Way.

Infrastructure is uniform along the whole corridor. Substandard, curb-tight sidewalks are present on both sides of the roadway. The entire corridor meets PBOT's crossing spacing standards and consistent bike lanes are present on both sides of the roadway, though they are less than six feet wide. NE Airport Way is the only corridor in the EPASS network that has street lighting on both sides of the whole corridor. NE Airport Way features extensive access management and center medians because of its construction as a uniform capital project in the 1990s.

Summary

NE Airport Way is a homogeneously designed corridor in the EPASS network—pedestrian and bike facilities are consistent, and lighting is on both sides of the corridor. The speed limit is higher than others in the network, and it is evident that speed is a factor in approximately 40 percent of vehicle crashes. Vehicle crashes occur at a higher frequency than bike and pedestrian crashes, especially under dark conditions. The most common collision type for vehicle crashes on Airport Way was a vehicle crashing into a fixed object (Table 1). On this corridor, fixed object crashes include collisions with curbs, utility poles, and trees, with speed or driving too fast for conditions commonly being a contributing cause. The roadway's numerous curves may be another factor in these crashes.

NE Sandy Boulevard (0.99 miles)

The segment of NE Sandy Boulevard that is part of the EPASS network begins at NE 82nd Avenue and ends at NE Killingsworth Street / 99th Avenue. East of this location, Sandy Boulevard falls under ODOT jurisdiction. Sandy Boulevard is an HCC, but this segment does not intersect with any other EPASS corridors in this study. This corridor has HCIs at NE 82nd Avenue and NE Killingsworth Street. Only a mile in length, NE Sandy Boulevard is the shortest corridor in the EPASS network. NE Sandy Boulevard travels at an angle across the typical Portland grid, creating non-orthogonal intersections that pose safety and design challenges.

Crash History

Sandy Boulevard has the fourth highest number of crashes per mile in the network, 27.22. Many crashes are pedestrian-related, 19.15 per mile (Table 2). This is the second highest concentration of pedestrian-related crashes in the EPASS network, along with a high number of pedestrian injuries.

Table 11 details the injuries sustained on this corridor, where pedestrian injuries account for 69 percent of all injuries. In the 23 pedestrian-involved crashes, 20 pedestrians were injured. This is a higher crash-to-injury ratio than many other corridors, which often have more pedestrian-related, property damage only (PDO) crashes.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**5**	0	0	3	2	**5**
Ped	**19**	2	5	7	6	**20**
Vehicle	**3**	0	4	-	-	**4**
Total	**27**	**2**	**9**	**10**	**8**	**29**

Table 11: Number of injury crashes and level of injuries sustained in traffic crashes on NE Sandy Boulevard, 2007-2016.

Few motor vehicle and bike crashes happen on the EPASS segment of Sandy Boulevard, and most are during the day. However, Figure 1 shows that 61.1 percent of pedestrian crashes on this corridor are in dark conditions. This is the only corridor in the EPASS network where more than 50 percent of pedestrian crashes are after dark.

Bike crashes are common when a bicyclist is traveling along Sandy Boulevard (80 percent), whereas 56 percent of pedestrian crashes are when a person was crossing the segment, especially mid-block (Table 4). There were few vehicle crashes, and Figure 2 shows that 36.4 percent were crashes into fixed objects, the top vehicle crash type on this corridor.

Speed Data

The posted speed limit on the EPASS segment of NE Sandy Boulevard is 35 mph. The most recent speed counts were collected in September 2017, where an average of 84 percent of vehicles were traveling over 30 mph and 1.9 percent were driving at excessive speeds (Table 3). Despite the rate of speeding vehicles, there are few crashes for any mode that list speed as a contributing factor.

Multimodal Infrastructure and Lighting

Appendix 1, pages 36-map the existing bicycle and pedestrian infrastructure on NE Sandy Boulevard.

Sidewalks are present on both sides of the corridor, although they do not meet the PBOT standards. Sandy Boulevard has some short segments that meet PBOT’s crossing spacing standards, but it varies along the corridor. New crossings will be added at NE 85th Avenue and NE 92nd Avenue in the summer of 2019. There are no bike lanes of any kind on Sandy Boulevard, although a bike lane in the westbound direction from the Parkrose Transit Center to NE 91st Avenue will be striped at the same time as the new crossings. The western half of Sandy Boulevard has single-sided street lighting while the eastern half has lighting on both sides.

Summary

NE Sandy Boulevard is the shortest corridor in the EPASS network and has a high concentration of pedestrian crashes, especially at night. Most commonly, pedestrians are struck when a vehicle is moving straight (Table 2) and almost all crashes result in injury to the pedestrian. Combined, vehicle and bicycle crashes were only 28 percent of crashes on Sandy Boulevard. Infrastructure for non-motorized users is substandard, and non-existent for cyclists. Similarly, street lighting is present on NE Sandy Boulevard, but not consistent along the whole corridor.

NE Halsey Street (4.80 miles)

The NE Halsey Street EPASS corridor begins at NE 82nd Avenue and continues east to NE 162nd Avenue, with at least five different cross sections along this 4.8-mile length. The EPASS corridor also includes the Halsey-Weidler Couplet between NE 100th Avenue and NE 114th Avenue. NE Halsey Street is an HCC and intersects with three other EPASS corridors: NE 102nd Avenue, NE 122nd Avenue, and NE 148th Avenue. The intersections at 102nd Avenue and 122nd Avenue are also HCIs. The Halsey Street EPASS corridor is the third-longest corridor in the EPASS network.

Crash History

In the aggregate, the Halsey corridor ranks in the lower half of crashes per mile with 16.46 crashes per mile (Table 3). Of total crashes, vehicle crashes are the most frequent (6.25 per mile) and the most severe (Table 12). Out of 77 total crashes, 81 people were injured, the highest number being road users in vehicles with 34 fatal and serious injuries, or 42 percent of total.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**20**	1	1	8	10	**20**
Ped	**27**	0	2	13	12	**27**
Vehicle	**30**	2	32	-	-	**34**
Total	**77**	**3**	**35**	**21**	**22**	**81**

Table 12: Number of injury crashes and level of injuries sustained in traffic crashes on NE Halsey Street, 2007-2016.

Most crashes on Halsey Street happened during the day, but pedestrian crashes occurred at the highest nighttime crash frequency of the EPASS corridors (42 percent) (Figure 1). This street is also tied with SE 122nd Avenue for the highest ratio of nighttime bike crashes on the EPASS network, 36 percent, which were primarily crashes where a bicycle was traveling along the corridor (Figure 2). Turning movements were the most prevalent crash type for vehicle crashes involving an injury to a vehicle occupant.

Speed Data

NE Halsey Street has four different posted speed limits along the corridor. Beginning from the western end of the corridor, the speed limit is 35 mph, then decreases at the Halsey-

Weidler Couplet: NE Weidler Street becomes 30 mph while NE Halsey Street becomes 25 mph for several blocks (until 105th Avenue) and then increases to 30mph. After the couplet, the posted speed increases to 35 mph until NE 137th Avenue where it increases again to 45 mph through the remainder of the corridor. In April 2019, PBOT received approval to lower the speed limit on Halsey Street from 137th Avenue to 162nd Avenue down to 40 mph.

The most recent traffic speed counts were collected in February 2018 and in locations where posted speeds at the time were 35 and 45 mph (Table 3). The average percentage of vehicles traveling over WHO recommended maximum speeds was about 80 percent in 35 and 45 mph zones, but 29 percent where the posted speed was 25 mph. Top end speeding was also highest in the 25-mph zone, measuring 12 percent of vehicles driving over 10 mph over the posted speed. In the 35-mph speed zone, 2.8 percent of vehicles were top-end speeding, while 1 percent of vehicles were excessively speeding where posted speeds were 45 mph. The segment between 137th and 148th Avenues features Glendoveer Golf Course on the south side of Halsey Street. The relative lack of urban features on this side of the road—a lack of "friction"—may contribute to speeding in this area.

Multimodal Infrastructure and Lighting

The Halsey Street EPASS corridor has varying levels of infrastructure for bicycles and pedestrians, as seen in Appendix 1, pages 38-45.

From west to east, NE Halsey Street has sparse sidewalks until after the I-205 freeway overpass. The Halsey-Weidler Couplet has sidewalks present on both sides on both streets, which continues through NE 128th Place. The segment east of NE 128th Place has little to no sidewalks through NE 162nd Avenue but does have curbs. Nearly all these sidewalks do not meet PBOT standards. PBOT's Outer Halsey Safety Project will provide some sidewalk infill east of 114th Avenue; while the federally-funded Halsey Safe Access to Transit will provide a multi-use path west of 92nd Avenue. For crossing spacing, the only segment that meets the crossing spacing guidelines is the Halsey-Weidler Couplet. This segment also has a bike lane from the west end of the couplet to 162nd Avenue. The 2019-completed Halsey-Weidler Streetscape project constructed parking-protected bike lanes on the Halsey-Weidler Couplet.

Street lighting on Halsey Street varies. The segments from 82nd Avenue to 102nd Avenue and 160th Avenue to 162nd Avenue have cobra-style lighting on both sides of the street. The Halsey-Weidler Streetscape project installed pedestrian-scale lighting in 2019. All other segments on this corridor have single-sided lighting.

Summary

NE Halsey Street is one of the longest corridors in the EPASS network but does not have a high crash frequency relative to the other corridors. Driving was the mode with the highest crash occurrence and the highest number of injuries. Turning movements were the leading collision type for bike and vehicle crashes on NE Halsey Street (Table 1). Speed does not appear to be coded as a prevailing factor in crashes on NE Halsey Street, despite the posted speed changing several times along the corridor and having some of the city's highest posted speeds east of 137th Avenue. Sidewalks and crossings do not meet PBOT's standards and although bike lanes and street lighting are present along the corridor, they are likely not enough to make road users feel safe.

NE Glisan Street (4.01 miles)

The NE Glisan Street EPASS corridor extends from NE 82nd Avenue to several hundred feet west of NE 162nd Avenue, where it enters the City of Gresham. This segment of NE Glisan Street is an HCC and intersects with NE 102nd Avenue, NE 122nd Avenue, and NE 148th Avenue in the EPASS network. Glisan Street has four HCIs on this segment: NE 82nd Avenue, the I-205 on- and off-ramps, NE 102nd Avenue, and NE 122nd Avenue. Capital projects in 2019 and 2020 will reduce the number of vehicle lanes from five to three east of 102nd Avenue, except approaching major signalized intersections.

Crash History

The NE Glisan Street corridor is four miles long and has the third highest overall number of crashes per mile, 34.49 (Table 2). In 10 years, there were 100 crashes and 113 injuries on Glisan Street. Over half of these crashes involved pedestrians (Table 1), and 38 pedestrians were injured. Four of the pedestrian injuries were fatal, making walking the mode with the most fatalities on NE Glisan Street (Table 13).

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total
Bike	**24**	0	2	15	7	**24**
Ped	**38**	4	3	15	16	**38**
Vehicle	**38**	3	48	-	-	**51**
Total	**100**	**7**	**53**	**30**	**23**	**113**

Table 13: Number of injury crashes and level of injuries sustained in traffic crashes on NE Glisan Street, 2007-2016.

Light conditions do not appear to be a significant factor in crashes on NE Glisan Street because all modes are at or below average for the rate of nighttime crashes on the EPASS network. The amount of vehicle crashes at night (32 percent) is also below the EPASS network average. Twenty-five percent of bike crashes and 45 percent of pedestrian crashes occurred at night, comparable to the average across the EPASS network. However, night-time pedestrian crashes on NE Glisan Street occurred at the fourth highest frequency among the EPASS corridors (Figure 1).

Pedestrian crashes follow the trend on other EPASS corridors in that they are more common when a pedestrian is crossing the street. Bike crashes are evenly distributed among cyclists moving across and along NE Glisan Street. Turning movements are the leading crash type for vehicles (Figure 2).

Speed Data

NE Glisan Street has two posted speed limits on the EPASS segment. From 82nd Avenue to 122nd Avenue, the posted speed is 35 mph. East of 122nd Avenue, the speed limit increases to 40 mph through the city limit. Posted speeds are proposed to be reduced to 30 mph as part of the capital projects east of 102nd Avenue.

From 2015-2018, there were 17 speed counts collected on NE Glisan Street. For those collected in the 35-mph segment, an average of 90 percent of vehicles were traveling faster than 30 mph and 11 percent of vehicles were top end speeding. In the areas with 40 and 45 mph posted speeds, the percentage of vehicles driving over WHO recommended maximum speeds and excessively speeding decreased as the posted speed increased (Table 3). The segment between 131st Place and 148th Avenues features Glendoveer Golf Course on the north side of Glisan Street. The relative lack of urban features on this side of the road—a lack of "friction"—may contribute to speeding in this area.

Multimodal Infrastructure and Lighting

Appendix 1, pages 46-54 show the sidewalk and bike lane presence and crossing gaps on NE Glisan Street.

This corridor has a substandard, but nearly complete double-sided sidewalk network until NE 122nd Avenue. East of 122nd, there are several blocks missing sidewalks, particularly adjacent to Glendoveer Golf Course. The only segment that meets PBOT's crossing spacing guidelines is on the bridge over I-205. New crossings at 108th, 113th, and 128th are under design or construction and will help Glisan come closer to compliance. There are no bike lanes present on NE Glisan Street, though the 2019 and 2020 capital projects will be installed protected bike lanes east of 102nd Avenue. Street lighting is present on both sides of the corridor from NE 82nd Avenue to NE 99th Avenue, where it becomes single-sided through the city limits.

Summary

NE Glisan Street is a moderately long corridor in the EPASS network with a high overall crash occurrence. Pedestrian-related crashes prevail on this corridor, and it has one of the highest numbers of fatal pedestrian crashes in the network, suggesting there is a higher risk for pedestrians being struck while crossing the corridor. Pedestrian infrastructure on Glisan does not meet PBOT standards and there is no presence of bicycle infrastructure. The East Glisan Street Update, a PBOT initiative that encompasses five different capital projects in 2019 and 2020, will address many of these safety issues.

SE Stark Street (5.34 miles)

The SE Stark Street corridor is similar in orientation to the NE Halsey Street and NE Glisan Street corridors. The SE Stark Street EPASS segment begins at SE 82nd Avenue and ends at the city limit, several hundred feet west of SE 162nd Avenue. This corridor also includes the Stark-Washington Couplet in the Gateway Regional Center. SE Stark Street is an HCC and intersects with two other EPASS corridors: SE 102nd Avenue (at both 102nd and 103rd Avenues) and SE 122nd Avenue. Stark Street has four HCIs: I-205 ramps, SE 122nd Avenue, SE 139th Avenue, and SE 148th Avenue.

Crash History

SE Stark Street is the second longest corridor in the EPASS network and had the second highest overall number of crashes per mile. SE Stark had 35 crashes per mile (Table 2). In the 10-year period, 141 crashes and 150 injuries occurred on SE Stark (Table 14). Pedestrian-related crashes (40) and pedestrian injuries are far more frequent on this corridor than crashes for other modes.

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**26**	0	3	13	10	**26**
Ped	**68**	4	8	37	23	**72**
Vehicle	**47**	2	50	-	-	**52**
Total	**141**	**6**	**61**	**50**	**33**	**150**

Table 14: Number of injury crashes and level of injuries sustained in traffic crashes on SE Stark Street, 2007-2016.

The distribution between crashes occurring in dark and light conditions varies greatly by mode (Figure 1). Vehicle crashes at night were below EPASS average (35.4 percent) and bicycle crashes were well-below average (7.4 percent), the lowest night rate of all the EPASS corridors. In contrast, 49.2 percent of pedestrian crashes happened after dark.

SE Stark Street follows the pattern of pedestrians being struck while moving across the corridor and bikes moving along the corridor (Figure 2). Turning movements, angle crashes, and rear-end crashes are common vehicle crash types on Stark Street, accounting for about one third of crashes each.

Speed Data

As of April 30, 2018, the posted speed limit on the entire SE Stark EPASS corridor is 30 mph. At the time of traffic speed collection, speed limits on this corridor were 30 mph through the couplet and then 35 mph eastward to the city limits. Twenty-eight speed counts were collected in recent years and many vehicles were traveling over WHO recommended maximum speeds, likely due to the posted speeds. In the 30-mph segment, an average of

64 percent of vehicles were traveling over 30 mph and 7 percent of vehicles were top-end speeding. Where posted speeds were 35 mph, 3 percent of vehicles were traveling faster than 30 mph (Table 3).

Multimodal Infrastructure and Lighting

Appendix 1, pages 55-63 document the bike and pedestrian infrastructure on SE Stark Street.

Substandard sidewalks are present on both sides of the corridor—including the Stark-Washington Couplet—except for at the I-205 freeway crossing where sidewalks are only present on the southern side of the corridor. Very occasionally, new development has provided standard-width sidewalk corridors for short lengths. There are a few block-long segments where crossing gaps meet PBOT guidelines, primarily in the Stark-Washington Couplet. Similarly, bike lanes are only present from SE 82nd Avenue through the couplet. Street lighting is primarily on one side of the corridor except on Stark from 82nd Avenue to 92nd Avenue, and over the I-205 freeway.

Summary

SE Stark Street is the second longest corridor and has the second highest number of crashes per mile in the EPASS network. On this corridor, pedestrian crashes occurred the most, approximately 20 crashes per mile, with a much lower vehicle and bike crash frequency: 8.8 and 5.6 per mile respectively. Turning movements were the leading crash type for all modes, but SE Stark Street had the highest number of angle vehicle crashes in the network.

This corridor has one of the highest average percentage of vehicles top-end speeding in all the network, however speed is not cited as a frequent crash factor in the crash data. Bike, pedestrian, and street lighting infrastructure are substandard and incomplete along the corridor. This may contribute to the high number of pedestrian-related crashes.

SE Division Street (4.65 miles)

The SE Division Street EPASS segment begins at SE 82nd Avenue and ends at the city limit at SE 175th Place. Division Street is an HCC and intersects SE 122nd Avenue and SE 162nd Avenue in the EPASS network. These two intersections are HCIs as well as the intersections at SE 82nd Avenue, I-205, SE 112th Avenue, SE 129th Avenue, SE 148th Avenue, and SE 174th Avenue. SE Division Street has the most HCIs in both the EPASS network and the Vision Zero HCN. SE Division Street is the most heavily travelled corridor in the EPASS network, with daily vehicle volumes exceeding 40,000 in some locations and the frequent #2 bus generating transit and pedestrian trips. Numerous business districts distributed throughout the corridor also act as trip generators and contribute to the mix of modes on the corridor.

Crash History

SE Division Street has the highest number of crashes per mile in the whole EPASS network—47.3 crashes per mile. This is approaching double the frequency of crashes on NE Sandy Boulevard, the corridor with the next highest number of crashes per mile. SE Division Street also had the highest concentration of pedestrian and vehicle crashes, 21.7 and 15.7 per mile respectively (Table 2). In the 220 total crashes on SE Division, 232 injuries occurred, and nearly half of those injured were pedestrians (Table 15).

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total Injuries
Bike	**46**	1	1	28	17	**47**
Ped	**101**	13	27	36	29	**105**
Vehicle	**73**	2	78	-	-	**80**
Total	**220**	**16**	**106**	**64**	**46**	**232**

Table 15: Number of injury crashes and level of injuries sustained in traffic crashes on SE Division Street, 2007-2016.

Pedestrian and bike crashes on Division Street occurred at night at a slightly above average rate than the rest of the EPASS network. In this study, 49 percent of pedestrian and 29 percent of bike crashes happened after dark. Serious vehicle crashes more frequently occurred during daylight hours.

Non-motorized road user movements strongly follow the pedestrian-crossing and bike-along crash trend seen on the rest of the EPASS network. Among pedestrian crashes, 74 percent of people walking were crossing Division Street when they were struck by a vehicle, a similar proportion to cyclists struck while traveling along the corridor (73 percent). Among crashes resulting in serious or fatal injuries to vehicle occupants, 51 percent were rear-end crashes (Figure 2), a crash type that occurs nearly four times as frequently on this corridor than on the rest of the network.

Furthermore, Division Street has by far the most pedestrian-involved crashes (163), over twice as many as 122nd Avenue (69), which has the second highest frequency of crashes of this type (Table 1). As stated in other corridor profiles, pedestrian-involved crashes are often rear-end crashes, so the frequency of rear-end crashes on this corridor is quite high compared to the rest of the EPASS network. This finding suggests that there is potentially a higher risk of injury to vehicle occupants and people walking on SE Division Street. For these and other reasons, PBOT declared a safety emergency on SE Division Street in 2017, the first such declaration made by PBOT.

Speed Data

In March 2017, the posted speed limit on Division Street was lowered to 30 mph, but recent speed count data was collected prior to this change when some segments were 35 mph.

Since 2015, 29 speed counts were collected along the corridor, most recently in April 2019. In 30 mph zones, 61 percent of vehicles were traveling faster than WHO recommended speeds and 5 percent of vehicles were excessively speeding. Where the posted speed was 35 mph, 74 percent were traveling faster than 30 mph and 2 percent were top-end speeding.

Multimodal Infrastructure and Lighting
Appendix 1, pages 64-72 depict maps of bike and pedestrian infrastructure on Division Street.

Like other corridors in the EPASS network, Division Street has substandard sidewalks present on both sides of the corridor, apart from a few segments of missing sidewalk that will be infilled as part of a 2019 capital project, and limited segments of standard sidewalks provided by new development. The entire corridor does not meet PBOT's crossing spacing guidelines, though capital projects in 2019 and 2020 will provide more than ten new crossings to bring Division closer to compliance. Division features a standard bike lane that will be upgraded to a vertically-protected bike lane in 2020. Division Street has street lighting on one side for most of the corridor, except for the segments between 82nd Avenue and 92nd, and 122nd Avenue and 130th, where more complete lighting is present.

Summary
SE Division Street is unequivocally the most dangerous corridor in the EPASS network. Division Street leads in crashes per mile, crash frequencies, injury frequencies, pedestrian injuries, and pedestrian fatalities. Even though most of the EPASS corridors are similar to SE Division Street in that their pedestrian infrastructure is below the PBOT standard, this corridor is distinguished by the high number of pedestrian crashes and injuries to pedestrians. In pedestrian-related crashes, 163 were of the rear-end crash type, suggesting that vehicles are yielding to pedestrians at times, but there may not be enough traffic control devices for drivers to be aware of a crossing. Vehicle turning movements are the leading collision type for bike and pedestrian collisions, while vehicle occupants are most often seriously injured in a rear-end crash. It is also worth noting that Division Street has some of the highest average daily traffic (ADT) volumes in the EPASS network, which should also be considered a risk factor. PBOT's East Portland Access to Transit project and Outer Division Multimodal Safety Project, along with TriMet's Division Transit Project, are installing numerous safety countermeasures to address these serious safety problems.

SE Foster Road (2.66 miles)
SE Foster Road is the southern-most corridor in the EPASS network, stretching from SE 82nd Avenue to SE 122nd Avenue, and includes the Foster-Woodstock Couplet in Lents Town Center. Foster Road is an HCC and only intersects with other EPASS corridors at its

endpoints. The SE 82nd Avenue intersection is also an HCI. The segment west of 90th Avenue underwent a 4-to-3 lane reorganization in 2019, along with the addition of bike lanes, wider sidewalks, and street lighting. The Foster-Woodstock Couplet west of I-205 received streetscape upgrades in the early 2010s, while the couplet east of I-205 is slated to receive safety upgrades in 2021. No projects are currently funded on the five-lane segment east of the couplet.

Crash History

Despite its shorter length, this corridor has the fifth highest number of crashes per mile (33.8), but it does not have the top per-mile crash rate for any mode (Table 2). SE Foster Road had 67 total crashes with 71 injuries, with all injury frequencies in a similar range. Of the 43 pedestrian-related crashes, half of them resulted in a pedestrian being injured (Table 16).

Mode	Crashes	Fatal	Injury A	Injury B	Injury C	Total
Bike	**21**	1	2	13	6	**22**
Ped	**21**	0	4	12	5	**21**
Vehicle	**25**	1	27	-	-	**28**
Total	**67**	**2**	**33**	**25**	**11**	**71**

Table 16: Number of injury crashes and level of injuries sustained in traffic crashes on SE Foster Road, 2007-2016.

SE Foster Road had one of the higher nighttime vehicle crash frequencies in the EPASS network, 58 percent, 15 percentage points above network-wide (Figure 1). Bike crashes were also above average, 30.0 percent of them happening after dark. In contrast, pedestrian crashes were slightly below average with 41 percent occurring in darkness.

Compared to Division Street and NE 122nd Avenue, there was less variance in pedestrian crash movements on Foster Road—46 percent crossing and 41 percent moving along the corridor. Bicyclists moving along the corridor were more frequently struck by a vehicle. Rear-end crashes are prevalent for vehicle crashes on this corridor (Figure 2).

Speed Data

This segment of Foster Road has three different speed limits: 30 mph on the Foster-Woodstock Couplet, 35 mph from 82nd to 102nd Avenue, and 40 mph from 102nd to 122nd Avenue. The most recent traffic speed count on Foster Road was collected in a 40 mph zone in April 2019 (Table 3). Because of the high posted speed limit, an average of 96 percent of vehicles were traveling over the WHO recommended speed of 30 mph. However, the 85th percentile average of both directions in this segment was 45.5 mph. Top-end speeding in this section represented only 4 percent of vehicles, which is not unusual with such a high posted speed.

Multimodal Infrastructure and Lighting

Bike and pedestrian infrastructure is mapped on pages 73-77 in Appendix 1. Bike lanes installed as part of the 2019 Foster Streetscape project are not shown.

As is common with other arterials in this network, sidewalks are present on both sides of the roadway, but most do not meet PBOT standards. The 2019 Foster Streetscape project east of 90th Avenue is unique in that it moved the curb lines toward the center of the street in order to install wider sidewalks. The corridor also does not meet PBOT crossing spacing standards on Foster Road but does meet these standards on the Foster-Woodstock Couplet.

Bike lanes are present through the couplet to SE 122nd Avenue. In a similar pattern, street lighting is found on both sides from 82nd through Woodstock, but single-sided on Foster from 92nd Avenue through 122nd. The Lents Town Center Streetscape project provided pedestrian-scale lighting in the couplet area west of I-205.

Summary

SE Foster Road is similar to other EPASS corridors in lack of consistent multimodal infrastructure along the corridor. Foster Road does have a moderately high pedestrian-related crash per mile rate, 16.2, and half of these crashes do not result in pedestrian injury. Turning movements are the leading crash type for cyclists on Foster and rear-end crashes are common in vehicle crashes. Even though posted speeds are high in places, speeding should be noted as a concern based on 85th percentile measurements. Speeding is particularly problematic east of the Foster-Woodstock Couplet where land uses become less dense and the roadway widens to 76 feet curb-to-curb.

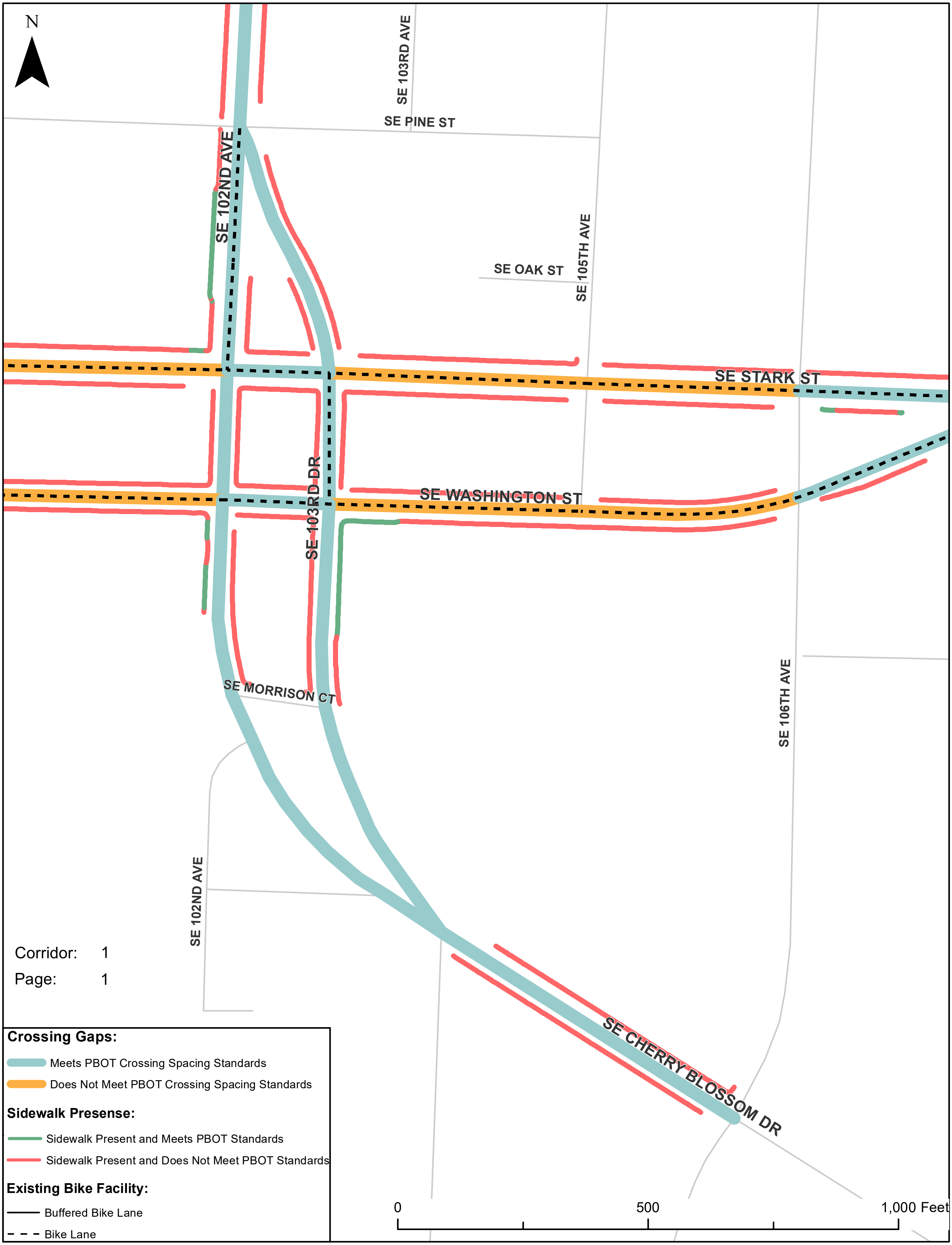
Conclusion

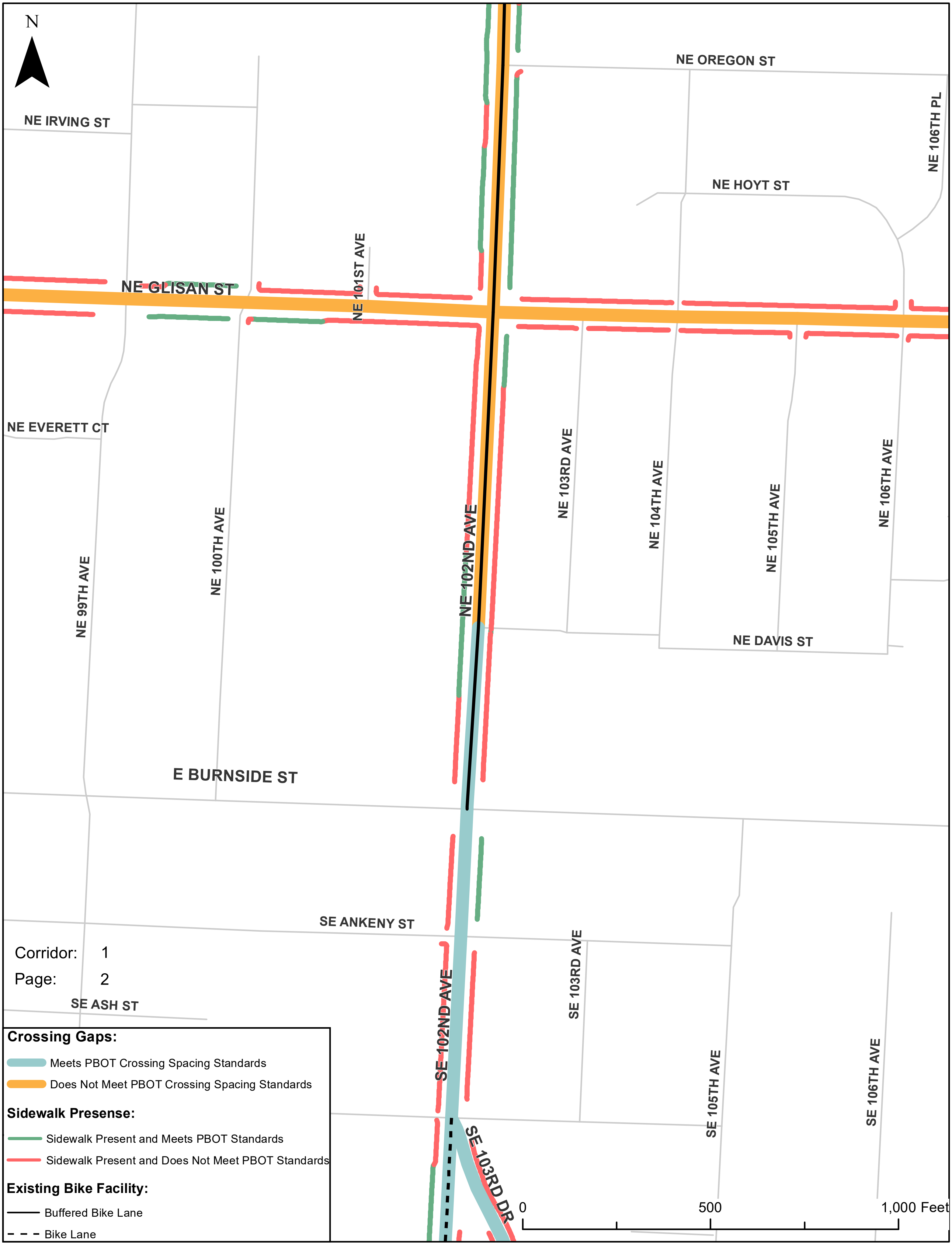
The data shows that the EPASS network is dangerous to all road users, particularly for people walking. Street designs that place high vehicle volumes and speeds in an environment where vulnerable road users are traveling along or across the street with insufficient safety infrastructure are contributing factors. Most EPASS corridors continue to have deficiencies in the availability and design of sidewalks, bike lanes, pedestrian crossings, and street lighting. These corridors may share many characteristics, but each one has a unique combination of safety issues that need to be addressed as Portland continues to grow. A lack of infrastructure for people walking and biking that meet PBOT guidelines, unsafe driving speeds, and driver behavior has resulted in injury and loss of life for too many people who live, work, and otherwise travel in East Portland. Consistent population growth, including an influx of residents more dependent on non-auto travel modes, will lead to more conflict on East Portland arterials. PBOT has responded to these issues with no less than 15 safety projects currently in planning, design, or construction on EPASS arterials. These engineering solutions must continue, along with education and enforcement initiatives, to create a safe system that is proactive—rather than reactive—in its quest for Vision Zero in a growing and diversifying city.

EPASS

APPENDIX A1

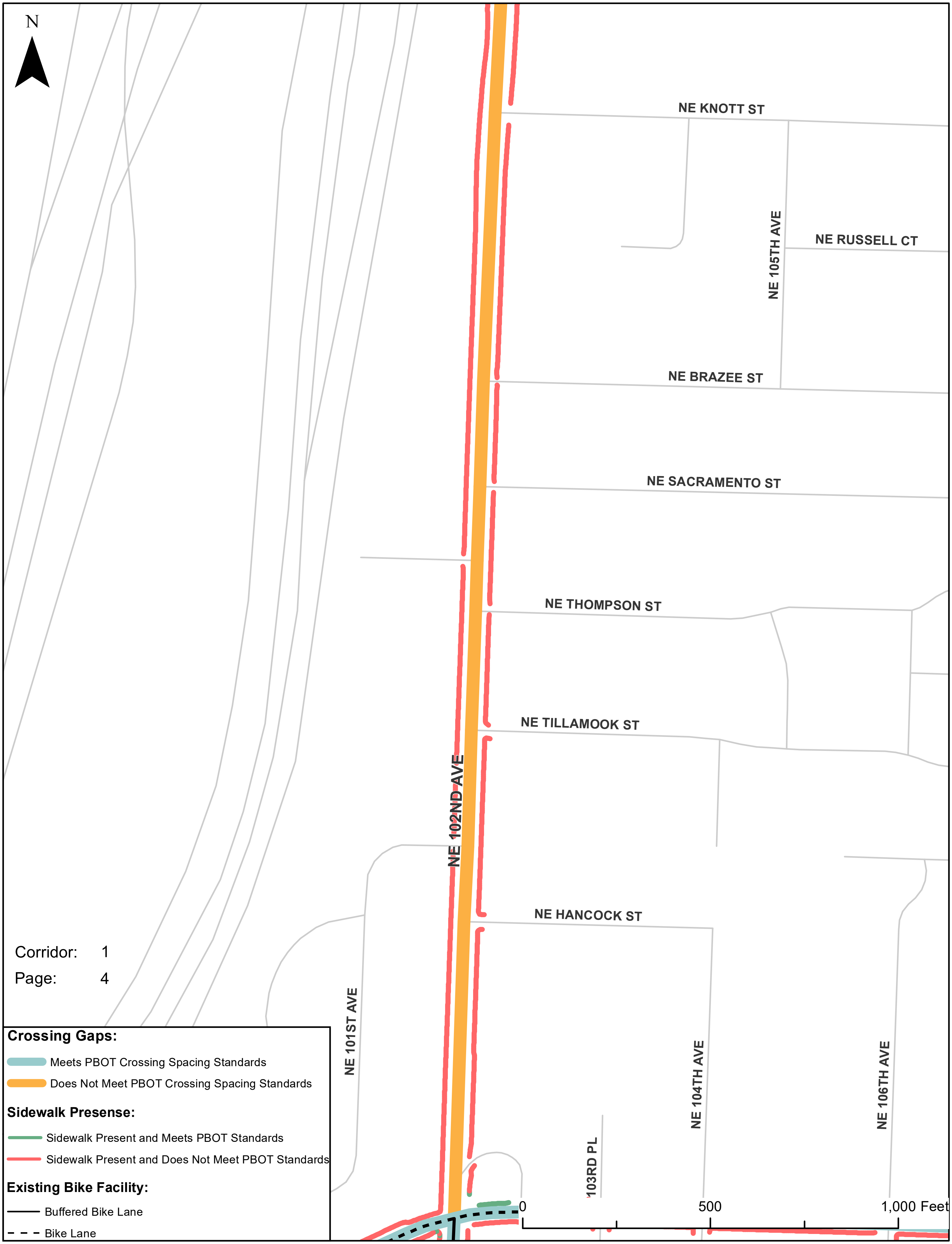
EPASS NETWORK SAFETY ANALYSIS APPENDIX

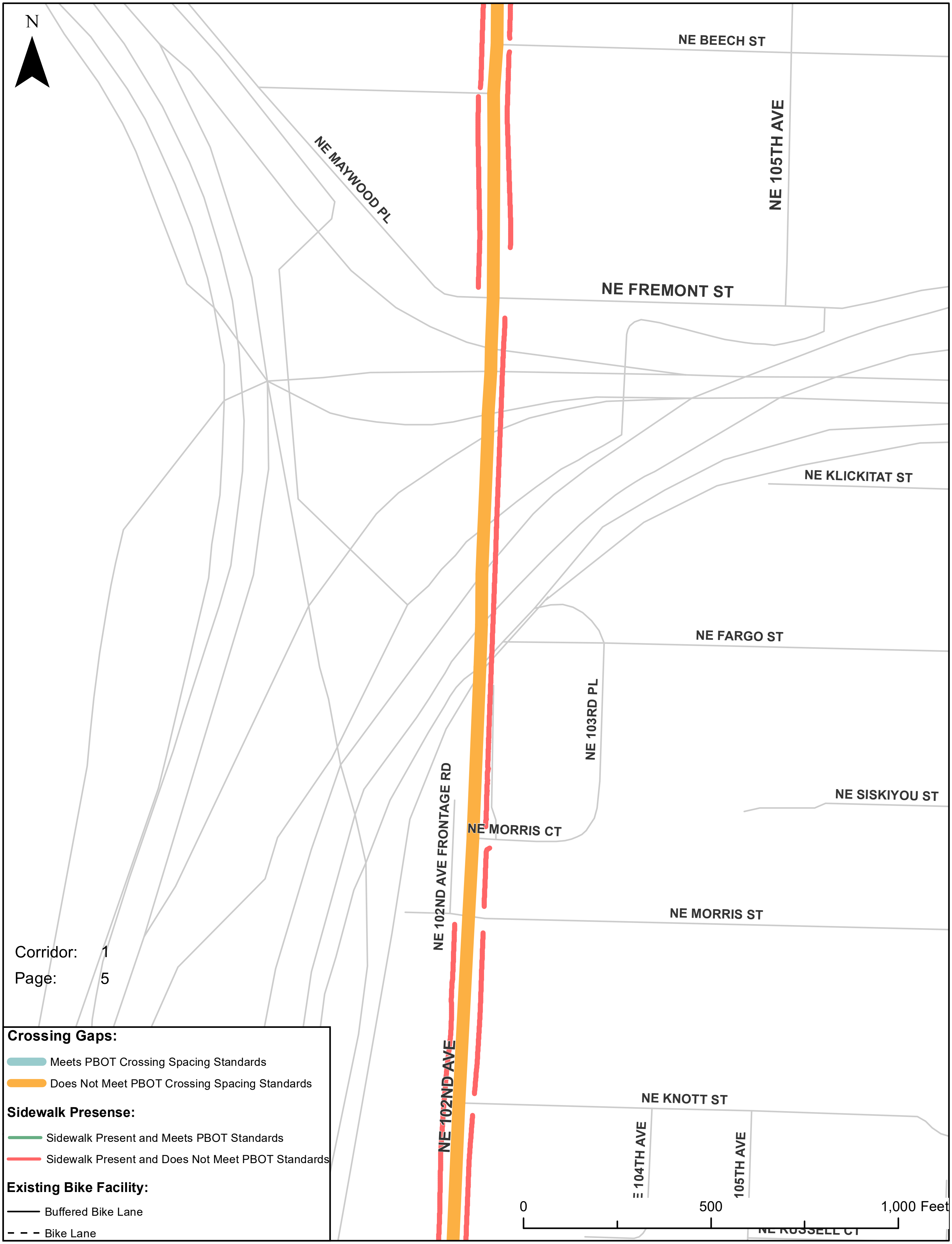

N
SE 103RD AVE
SE PINE ST
SE 102ND AVE
SE OAK ST
SE 105TH AVE
SE STARK ST
SE WASHINGTON ST
SE 103RD DR
SE MORRISON CT
SE 106TH AVE
SE 102ND AVE
SE CHERRY BLOSSOM DR
Corridor: 1
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

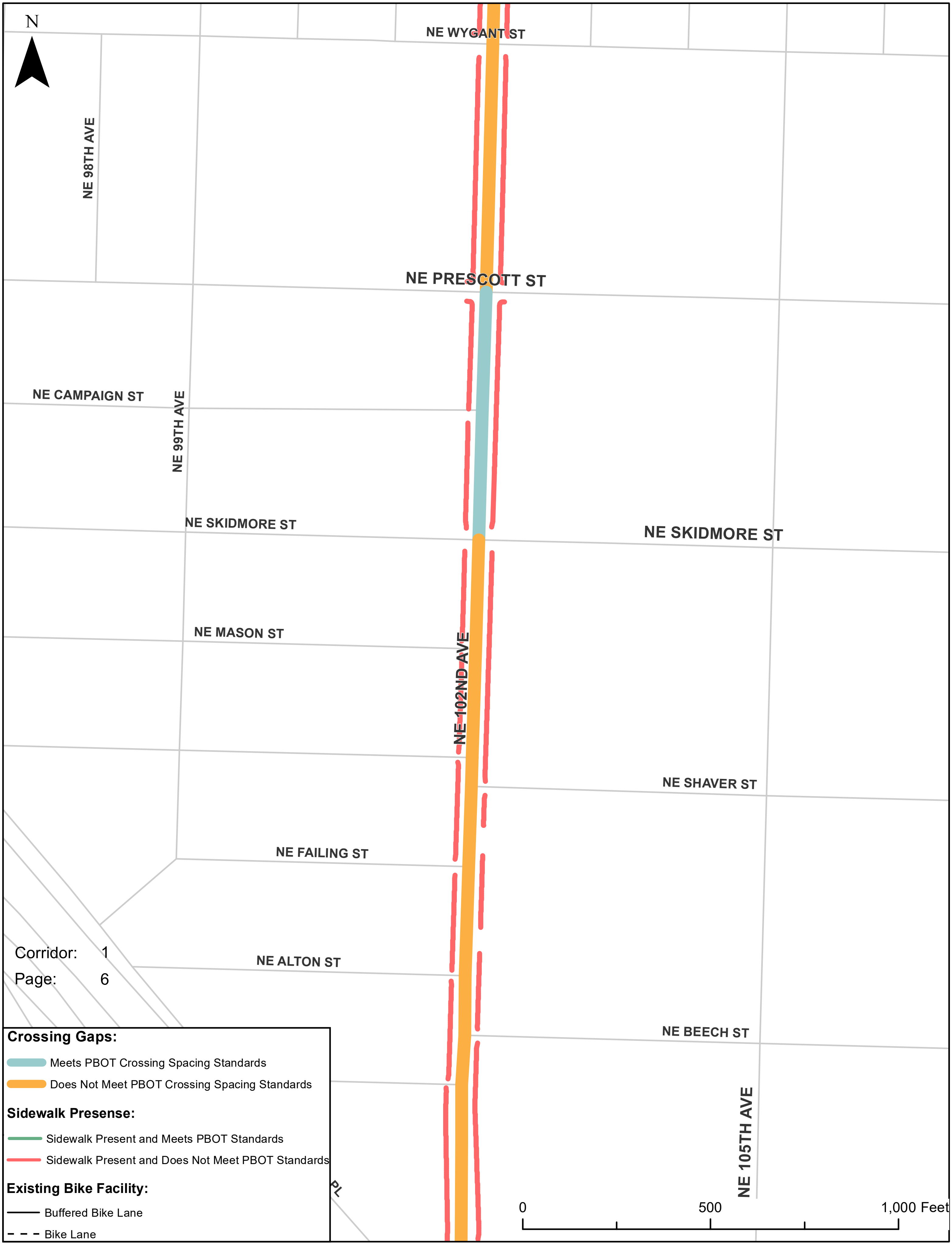


N
NE OREGON ST
NE IRVING ST
NE 106TH PL
NE HOYT ST
NE GLISAN ST
NE 101ST AVE
NE EVERETT CT
NE 103RD AVE
NE 104TH AVE
NE 105TH AVE
NE 106TH AVE
NE 99TH AVE
NE 100TH AVE
NE 102ND AVE
NE DAVIS ST
E BURNSIDE ST
SE ANKENY ST
SE 103RD AVE
SE 102ND AVE
SE ASH ST
SE 105TH AVE
SE 106TH AVE
SE 103RD DR
Corridor: 1
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE BELL DR
NE 101ST AVE
NE WEIDLER ST
NE HALSEY ST
NE 103RD PL
NE WEIDLER ST
NE HALSEY ST
NE 99TH AVE
NE 102ND AVE
NE CLACKAMAS ST
NE WASCO ST
NE 103RD AVE
NE 104TH AVE
NE 106TH AVE
NE HOLLADAY ST
NE PACIFIC ST
NE OREGON ST
NE 106TH PL
NE HOYT ST
Corridor: 1
Page: 3
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE KNOTT ST
NE 105TH AVE
NE RUSSELL CT
NE BRAZEE ST
NE SACRAMENTO ST
NE THOMPSON ST
NE TILLAMOOK ST
NE 102ND AVE
NE HANCOCK ST
NE 101ST AVE
103RD PL
NE 104TH AVE
NE 106TH AVE
0
500
1,000 Feet
Corridor: 1
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
NE BEECH ST
NE 105TH AVE
NE MAYWOOD PL
NE FREMONT ST
NE KLICKITAT ST
NE FARGO ST
NE 103RD PL
NE SISKIYOU ST
NE 102ND AVE FRONTAGE RD
NE MORRIS CT
NE MORRIS ST
NE KNOTT ST
NE 102ND AVE
104TH AVE
105TH AVE
0
500
1,000 Feet
Corridor: 1
Page: 5
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
NE WYGANT ST
NE 98TH AVE
NE PRESCOTT ST
NE CAMPAIGN ST
NE 99TH AVE
NE SKIDMORE ST
NE SKIDMORE ST
NE MASON ST
NE 102ND AVE
NE SHAVER ST
NE FAILING ST
NE ALTON ST
NE BEECH ST
NE 105TH AVE
PL
0
500
1,000 Feet
Corridor: 1
Page: 6
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

Corridor: 1

Page: 7

Crossing Gaps:

Meets PBOT Crossing Spacing Standards

Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:

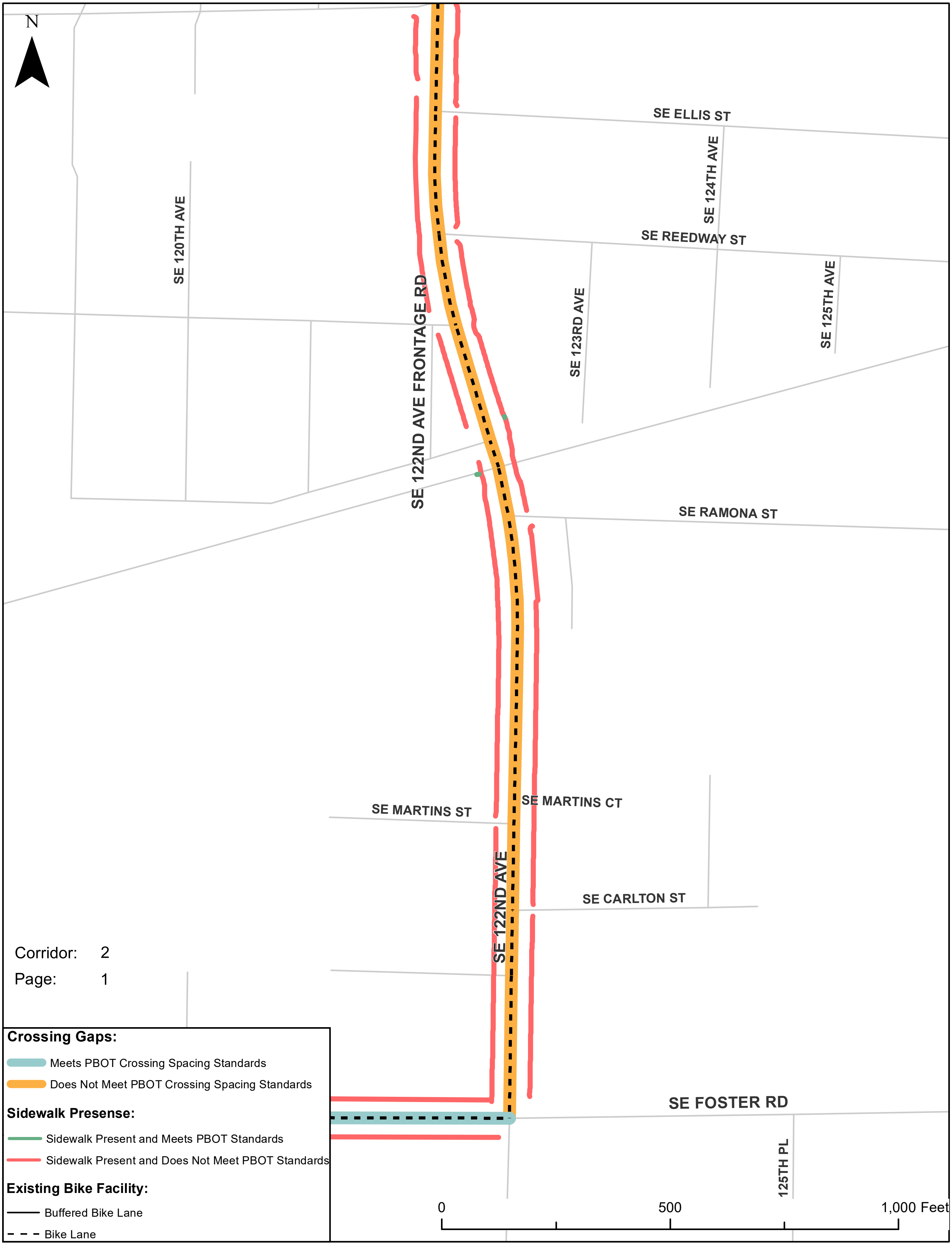
Sidewalk Present and Meets PBOT Standards

Sidewalk Present and Does Not Meet PBOT Standards

Existing Bike Facility:

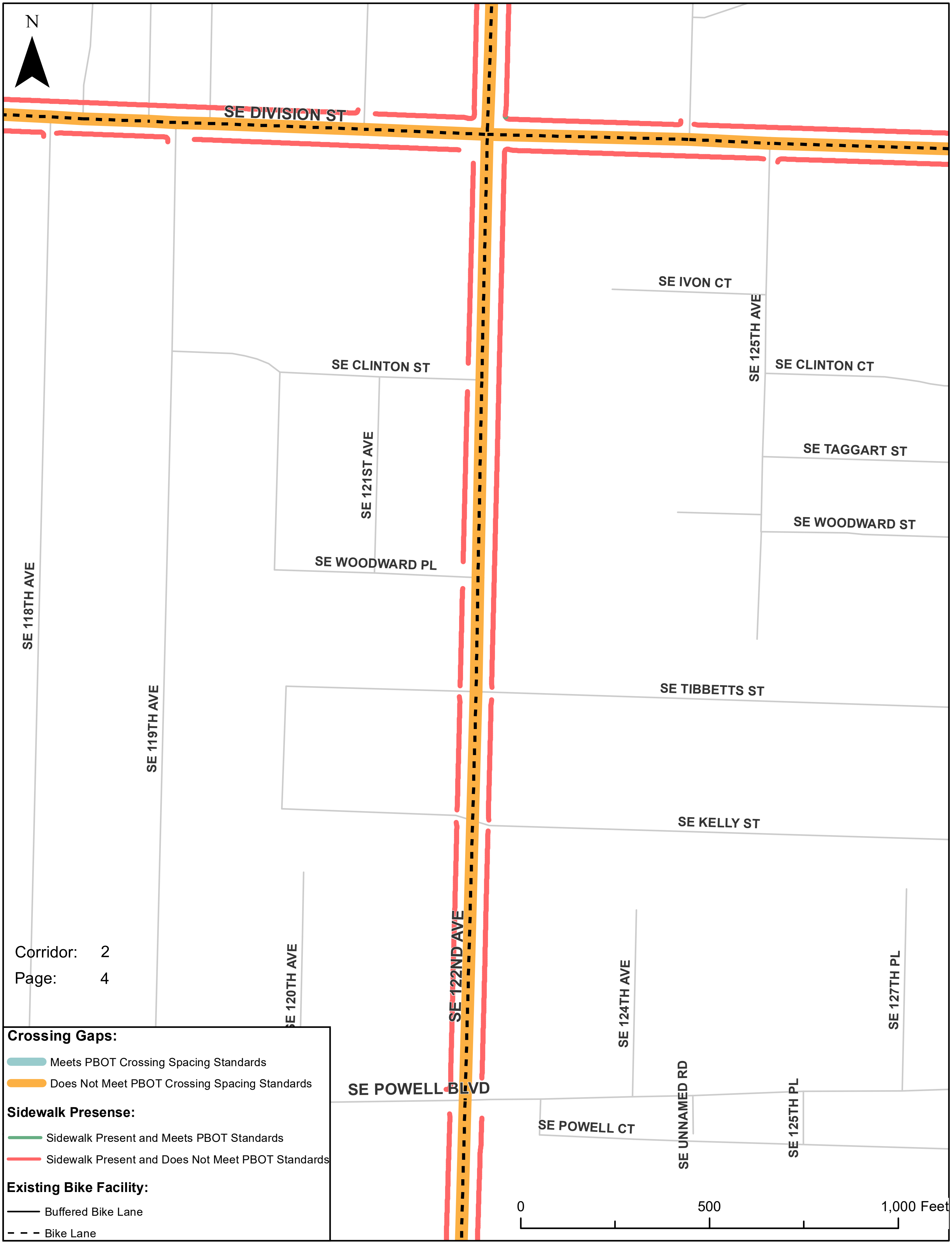
Buffered Bike Lane

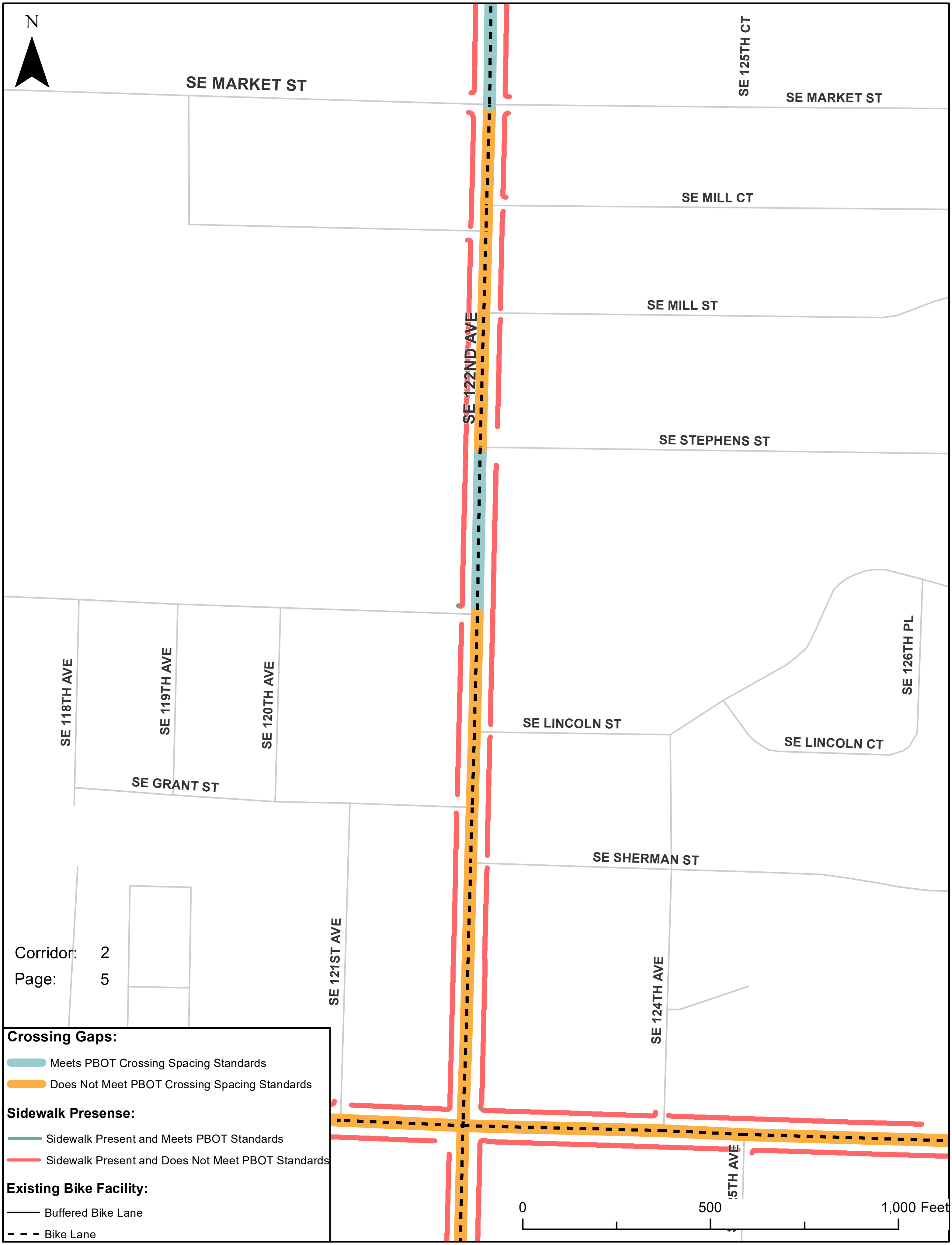
Bike Lane


N
SE ELLIS ST
SE 124TH AVE
SE REEDWAY ST
SE 120TH AVE
SE 122ND AVE FRONTAGE RD
SE 123RD AVE
SE 125TH AVE
SE RAMONA ST
SE MARTINS ST
SE MARTINS CT
SE 122ND AVE
SE CARLTON ST
SE FOSTER RD
125TH PL
0
500
1,000 Feet
Corridor: 2
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

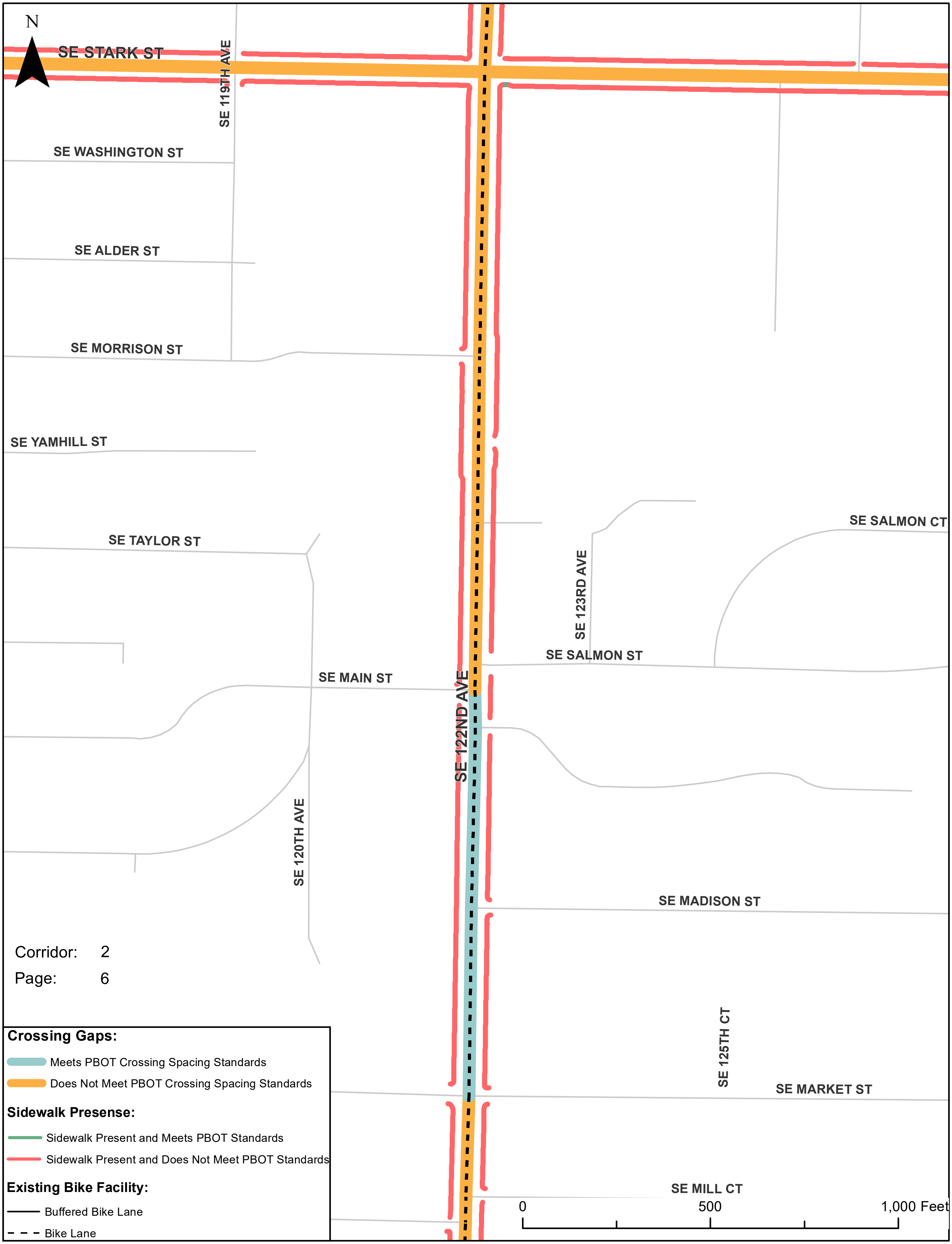

SE HOLGATE BLVD
SE MALL ST
SE 125TH AVE
SE 127TH AVE
SE PARDEE ST
SE LONG ST
SE SCHILLER ST
SE 121ST PL
SE LIEBE ST
SE RAYMOND ST
SE 122ND AVE
SE 118TH AVE
SE 120TH AVE
SE STEELE ST
SE 126TH PL
SE 119TH AVE
SE 121ST AVE
SE HAROLD ST
SE ELLIS ST
Corridor: 2
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

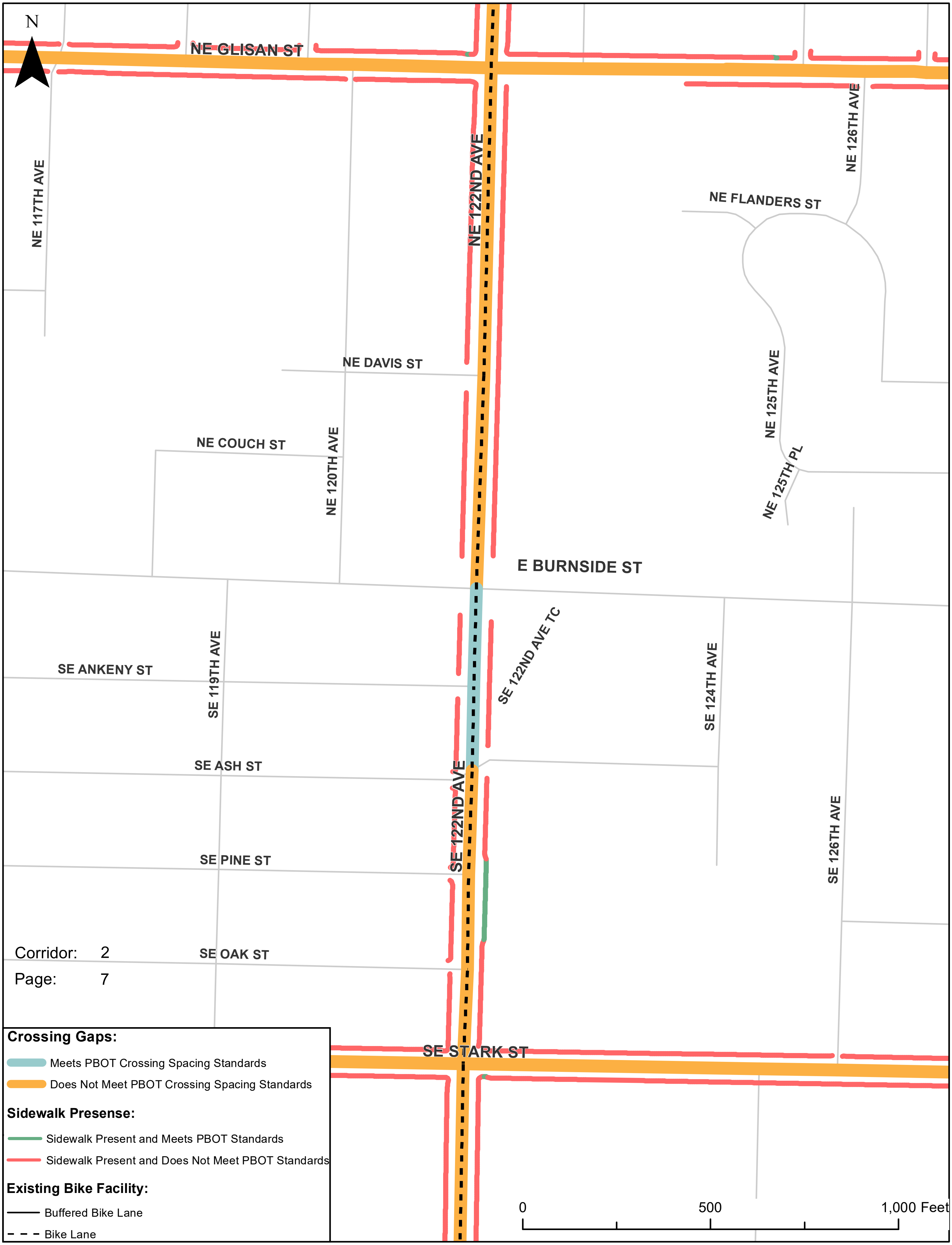

N
SE POWELL BLVD
SE POWELL CT
SE UNNAMED RD
SE 125TH PL
SE 127TH PL
SE 119TH AVE
SE RHONE ST
SE BUSH ST
SE 125TH AVE
SE 117TH PL
SE CENTER ST
SE GLADSTONE ST
SE 118TH PL
SE BOISE ST
SE 122ND AVE
SE 124TH AVE
SE 120TH AVE
SE 126TH AVE
SE CORA ST
SE 126TH PL
Corridor: 2
Page: 3
SE MALL ST
SE HOLGATE BLVD
7TH AVE
0
500
1,000 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

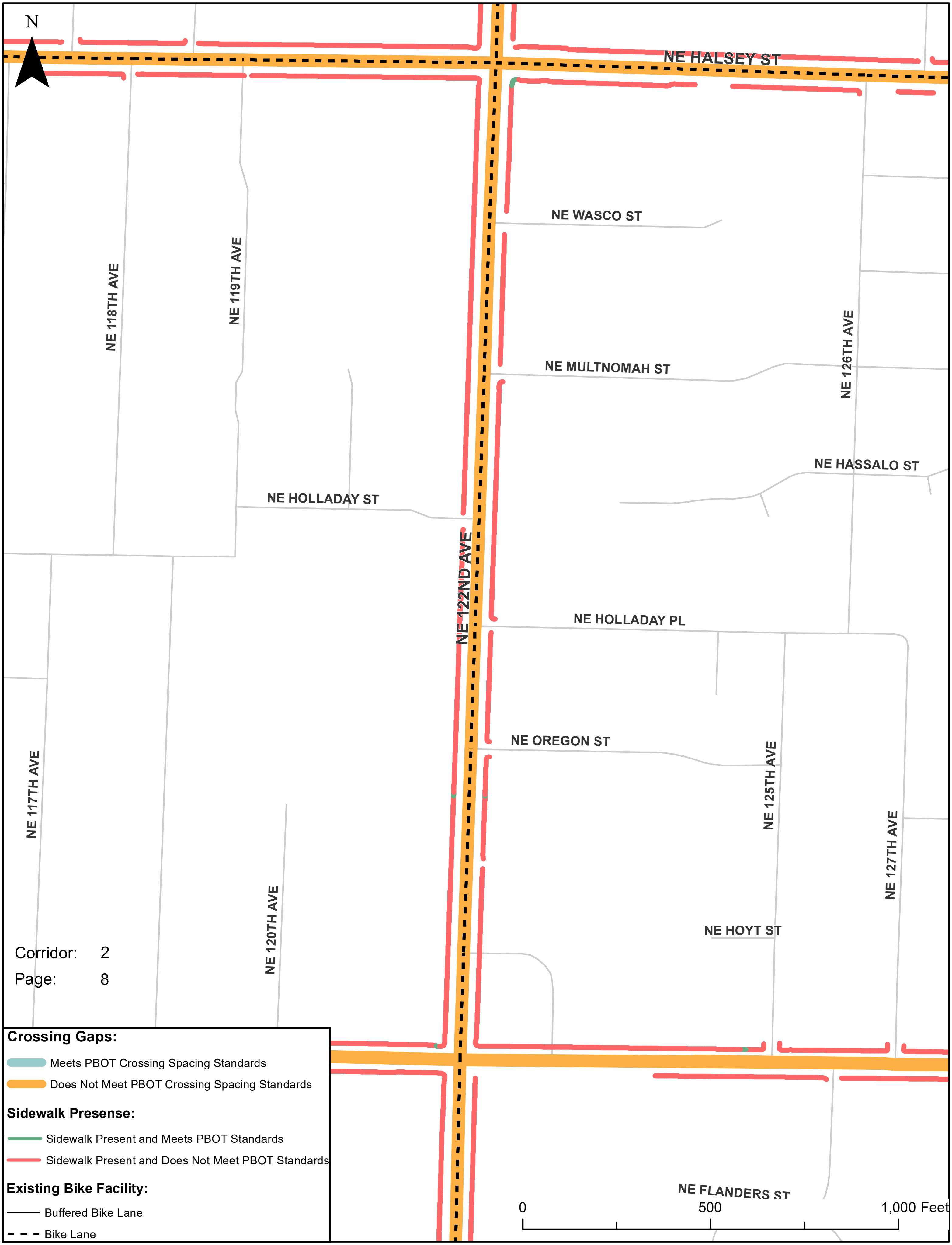

N
SE DIVISION ST
SE IVON CT
SE 125TH AVE
SE CLINTON ST
SE CLINTON CT
SE TAGGART ST
SE 121ST AVE
SE WOODWARD ST
SE WOODWARD PL
SE 118TH AVE
SE TIBBETTS ST
SE 119TH AVE
SE KELLY ST
SE 122ND AVE
SE 120TH AVE
SE 124TH AVE
SE 127TH PL
SE POWELL BLVD
SE POWELL CT
SE UNNAMED RD
SE 125TH PL
Corridor: 2
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet



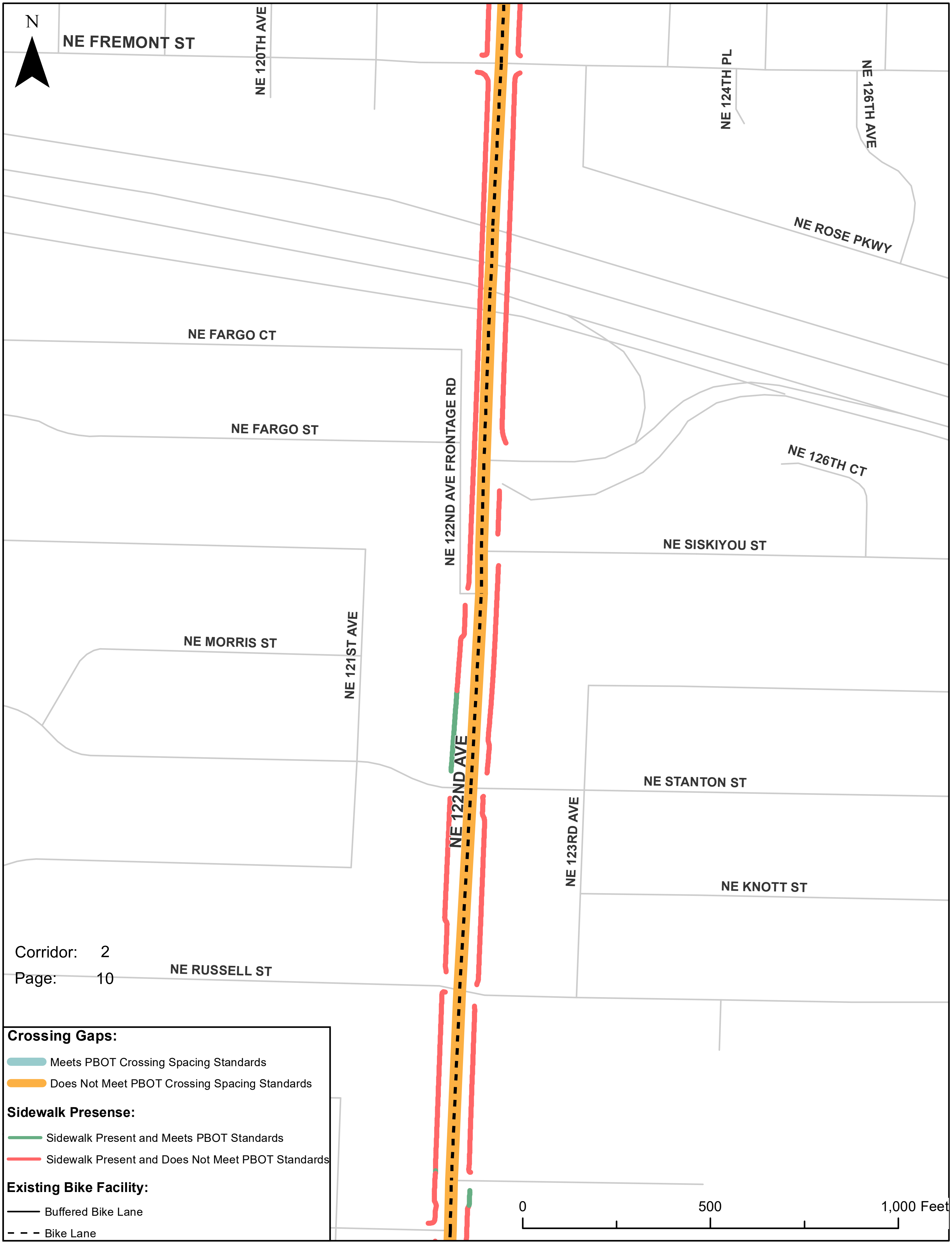
N
SE MARKET ST
SE 125TH CT
SE MARKET ST
SE MILL CT
SE MILL ST
SE 122ND AVE
SE STEPHENS ST
SE 126TH PL
SE 118TH AVE
SE 119TH AVE
SE 120TH AVE
SE LINCOLN ST
SE LINCOLN CT
SE GRANT ST
SE SHERMAN ST
SE 121ST AVE
SE 124TH AVE
Corridor: 2
Page: 5
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

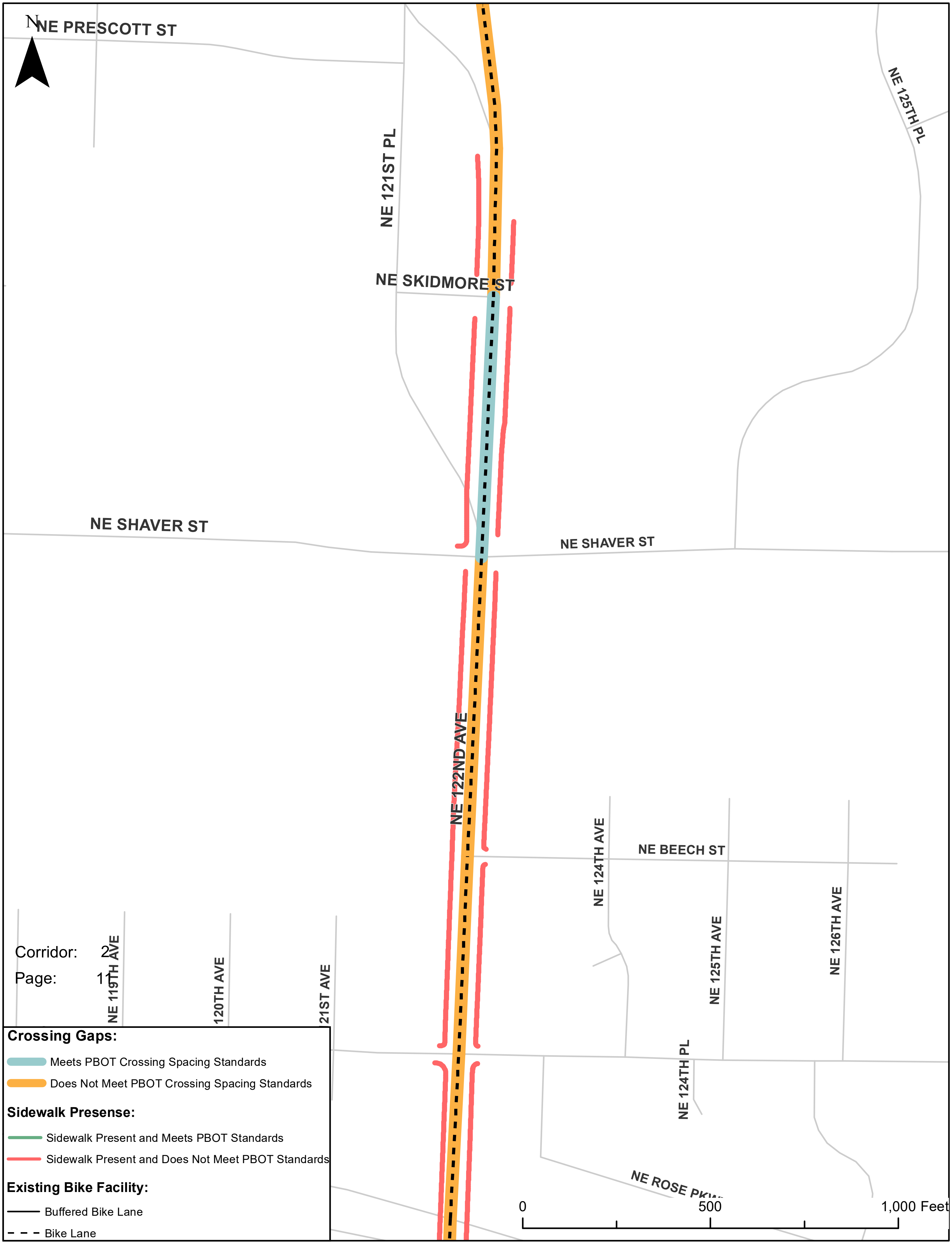

N
SE STARK ST
SE 119TH AVE
SE WASHINGTON ST
SE ALDER ST
SE MORRISON ST
SE YAMHILL ST
SE TAYLOR ST
SE SALMON CT
SE 123RD AVE
SE SALMON ST
SE MAIN ST
SE 122ND AVE
SE 120TH AVE
SE MADISON ST
SE 125TH CT
SE MARKET ST
SE MILL CT
0
500
1,000 Feet
Corridor: 2
Page: 6
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
NE GLISAN ST
NE 117TH AVE
NE 122ND AVE
NE 126TH AVE
NE FLANDERS ST
NE DAVIS ST
NE COUCH ST
NE 120TH AVE
NE 125TH AVE
NE 125TH PL
E BURNSIDE ST
SE 122ND AVE TC
SE ANKENY ST
SE 119TH AVE
SE 124TH AVE
SE ASH ST
SE 122ND AVE
SE PINE ST
SE 126TH AVE
SE OAK ST
SE STARK ST
Corridor: 2
Page: 7
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE HALSEY ST
NE WASCO ST
NE MULTNOMAH ST
NE HASSALO ST
NE HOLLADAY ST
NE HOLLADAY PL
NE OREGON ST
NE HOYT ST
NE FLANDERS ST
NE 117TH AVE
NE 118TH AVE
NE 119TH AVE
NE 120TH AVE
NE 122ND AVE
NE 125TH AVE
NE 126TH AVE
NE 127TH AVE
Corridor: 2
Page: 8
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

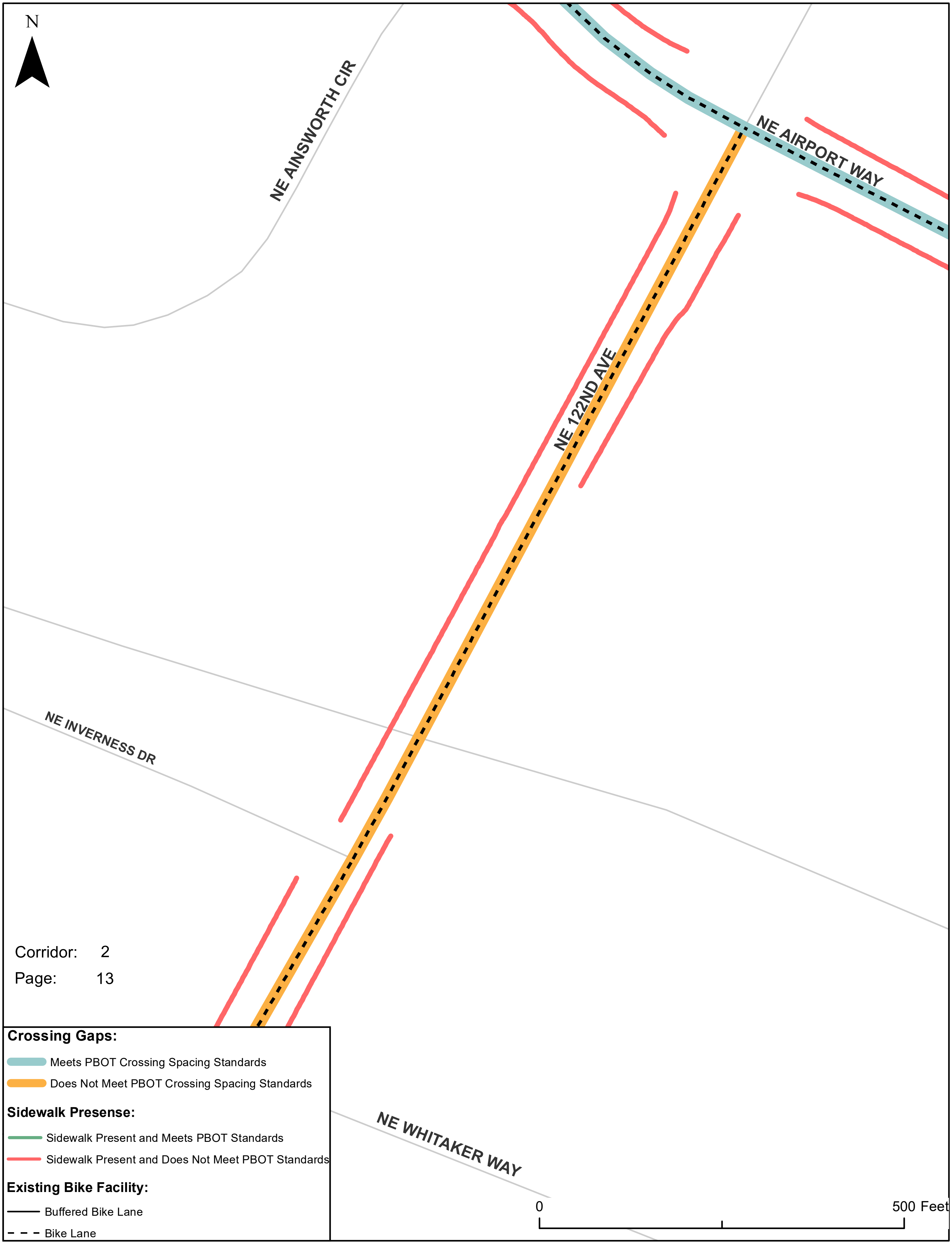

N
NE BRAZEE ST
NE SACRAMENTO ST
NE 121ST AVE
NE THOMPSON ST
NE 122ND AVE
NE EUGENE ST
NE SAN RAFAEL ST
NE 126TH PL
NE HANCOCK ST
NE 125TH AVE
NE 118TH AVE
NE 119TH AVE
NE 120TH AVE
NE SCHUYLER ST
NE BROADWAY
Corridor: 2
Page: 9
NE 126TH AVE
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
NE HALSEY ST
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

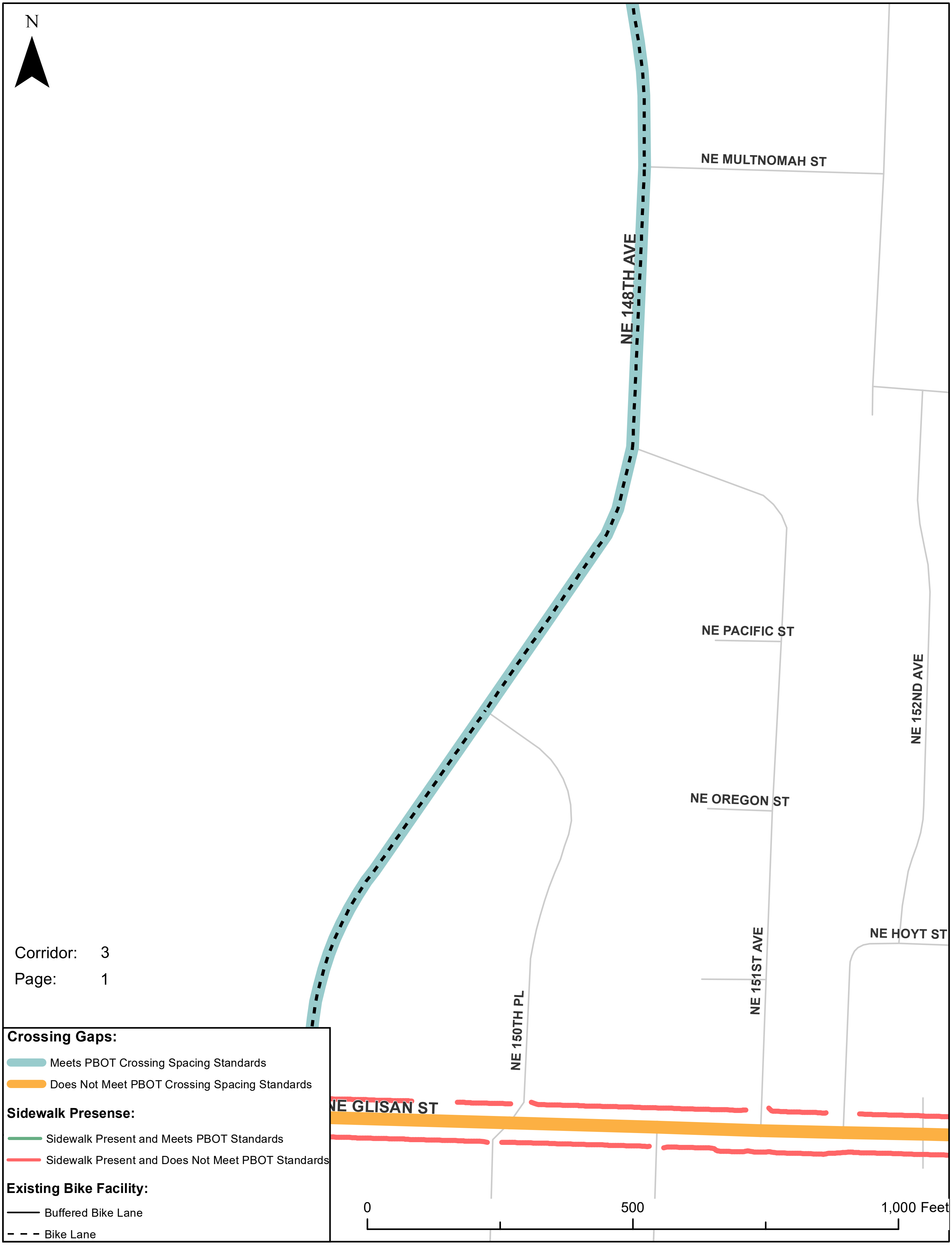

N
NE FREMONT ST
NE 120TH AVE
NE 124TH PL
NE 126TH AVE
NE ROSE PKWY
NE FARGO CT
NE FARGO ST
NE 122ND AVE FRONTAGE RD
NE 126TH CT
NE SISKIYOU ST
NE MORRIS ST
NE 121ST AVE
NE 122ND AVE
NE STANTON ST
NE 123RD AVE
NE KNOTT ST
Corridor: 2
Page: 10
NE RUSSELL ST
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

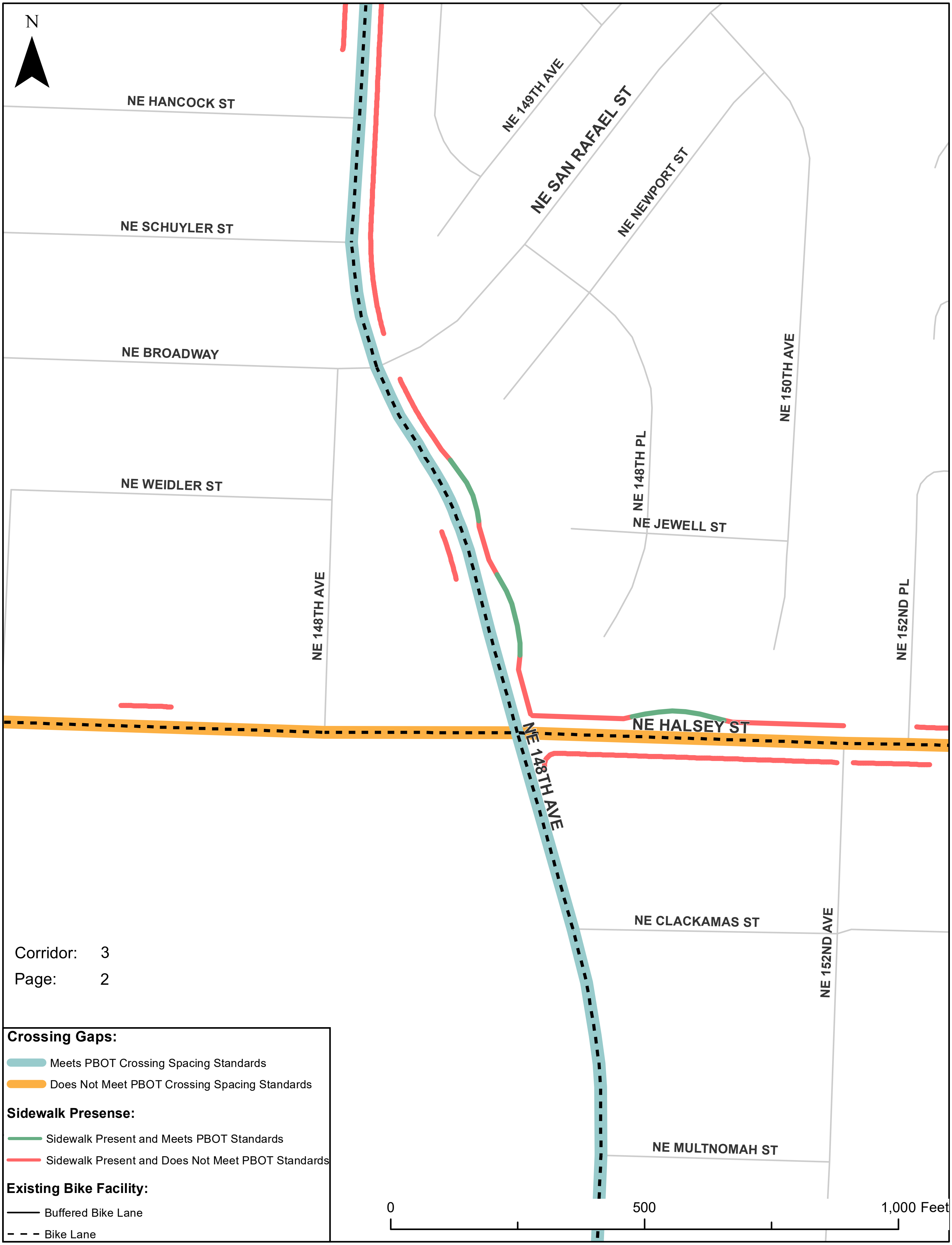


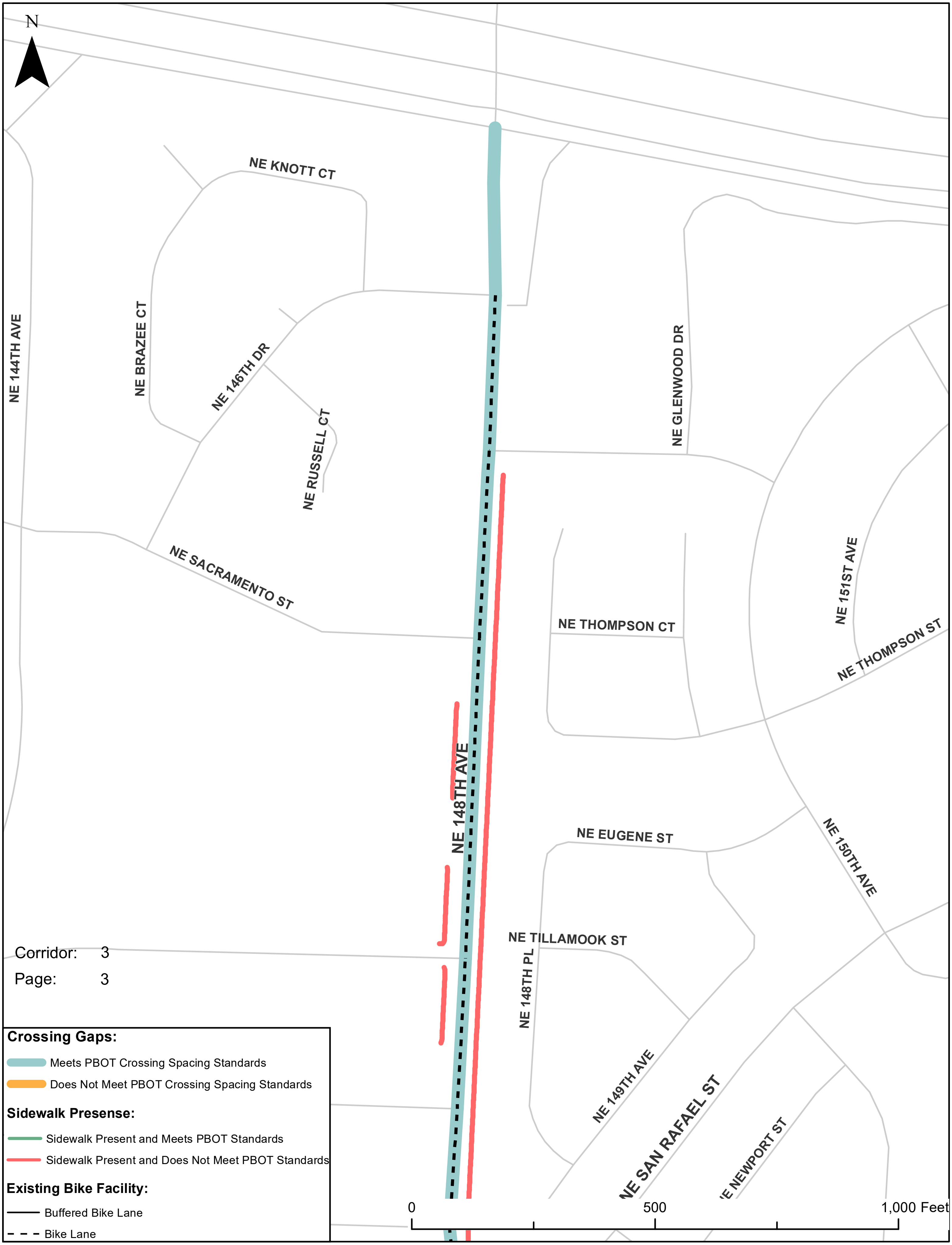
N
NE PRESCOTT ST
NE 121ST PL
NE 125TH PL
NE SKIDMORE ST
NE SHAVER ST
NE SHAVER ST
NE 122ND AVE
NE 124TH AVE
NE BEECH ST
NE 125TH AVE
NE 126TH AVE
NE 119TH AVE
120TH AVE
21ST AVE
NE 124TH PL
NE ROSE PKWY
Corridor: 2
Page: 11
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

N
NE WHITAKER WAY
NE 122ND AVE
NE SUMNER ST
NE 121ST AVE
NE ERIN WAY
NE MARX ST
NE SANDY BLVD
NE 118TH AVE
NE 119TH AVE
NE 121ST PL
NE 125TH PL
NE PRESCOTT ST
Corridor: 2
Page: 12
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE AINSWORTH CIR
NE AIRPORT WAY
NE 122ND AVE
NE INVERNESS DR
NE WHITAKER WAY
Corridor: 2
Page: 13
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500 Feet

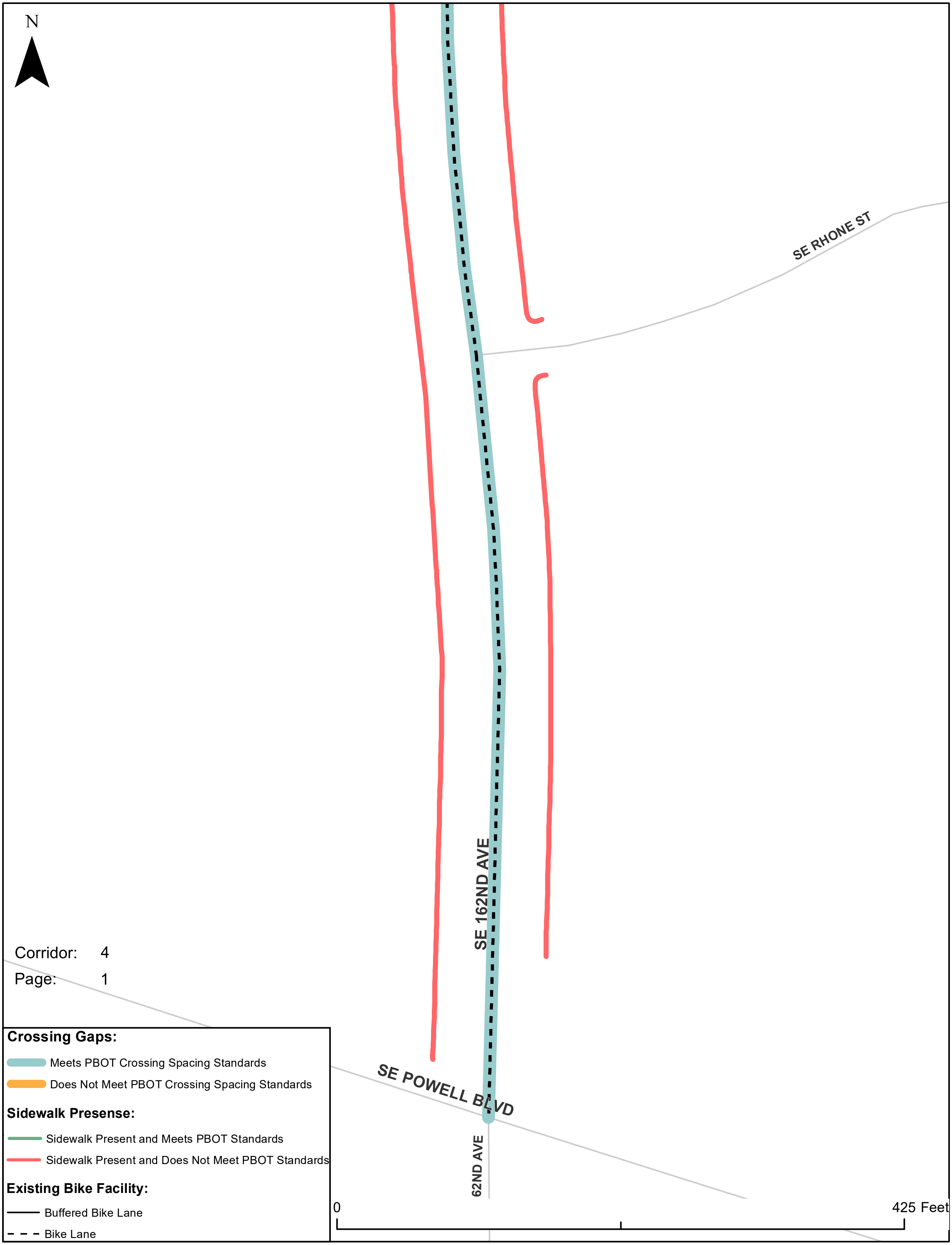

N
NE MULTNOMAH ST
NE 148TH AVE
NE PACIFIC ST
NE 152ND AVE
NE OREGON ST
NE HOYT ST
NE 151ST AVE
NE 150TH PL
NE GLISAN ST
Corridor: 3
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE HANCOCK ST
NE SCHUYLER ST
NE BROADWAY
NE WEIDLER ST
NE 148TH AVE
NE 149TH AVE
NE SAN RAFAEL ST
NE NEWPORT ST
NE 148TH PL
NE JEWELL ST
NE 150TH AVE
NE 152ND PL
NE HALSEY ST
NE 148TH AVE
NE CLACKAMAS ST
NE 152ND AVE
NE MULTNOMAH ST
0
500
1,000 Feet
Corridor: 3
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

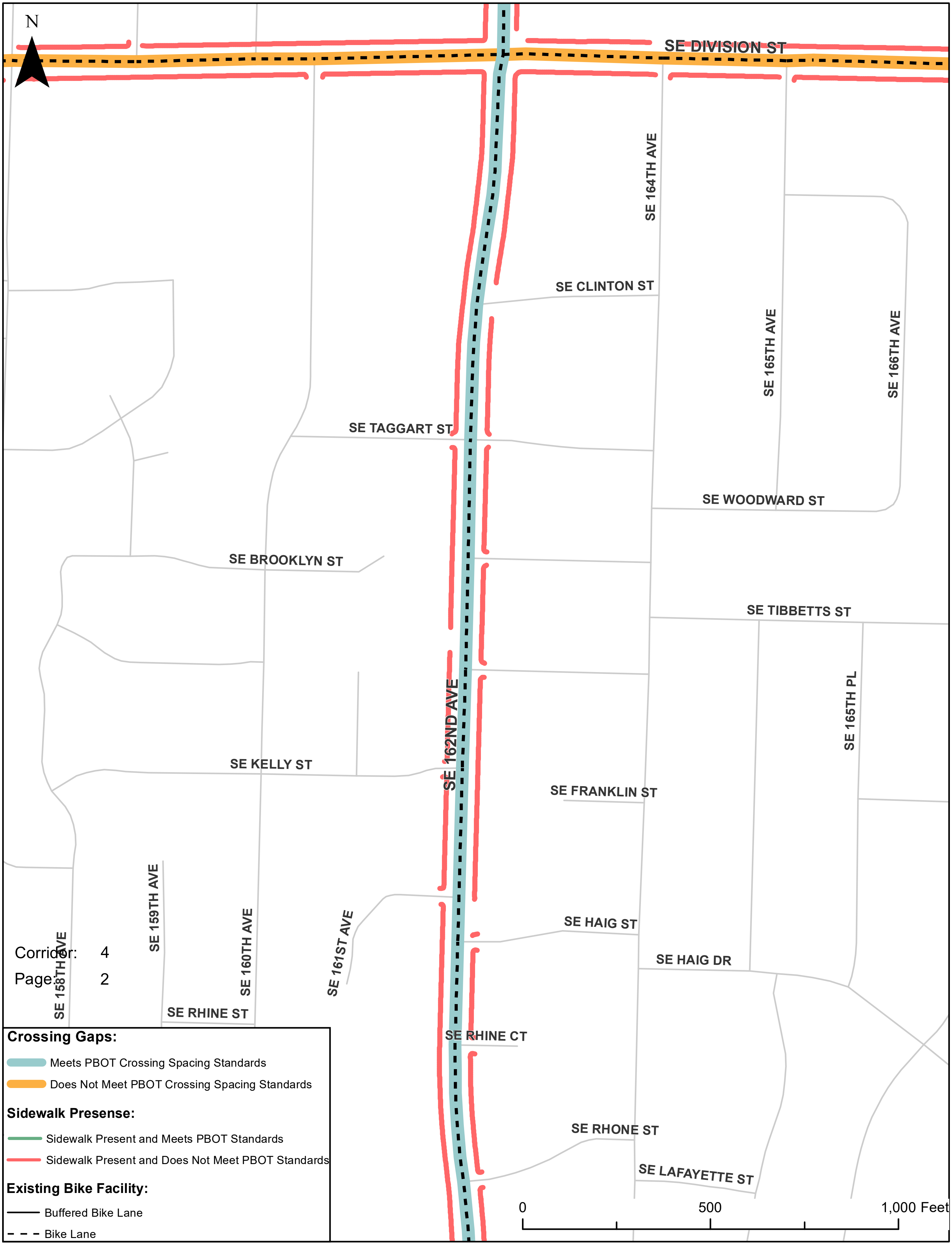


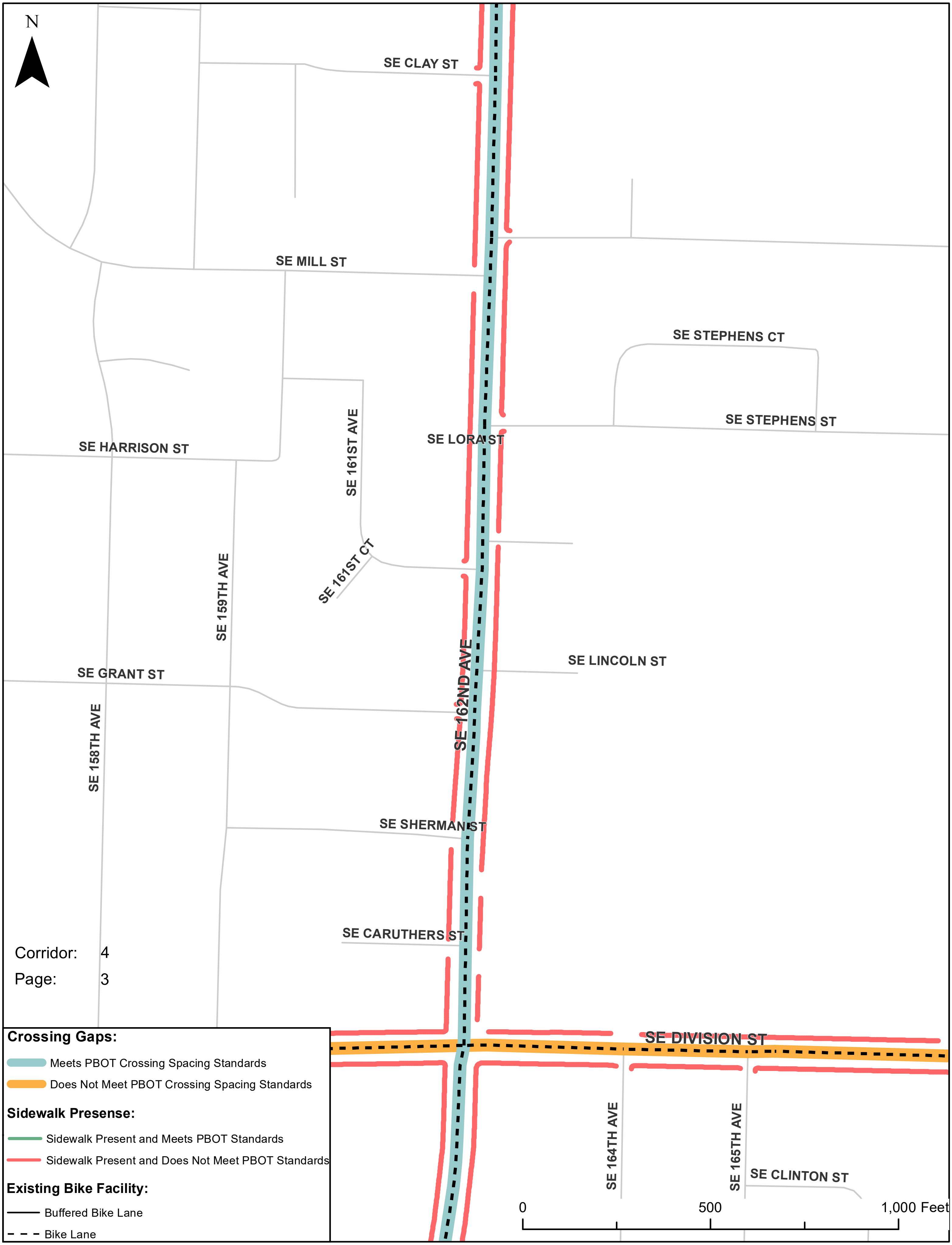
Corridor: 3

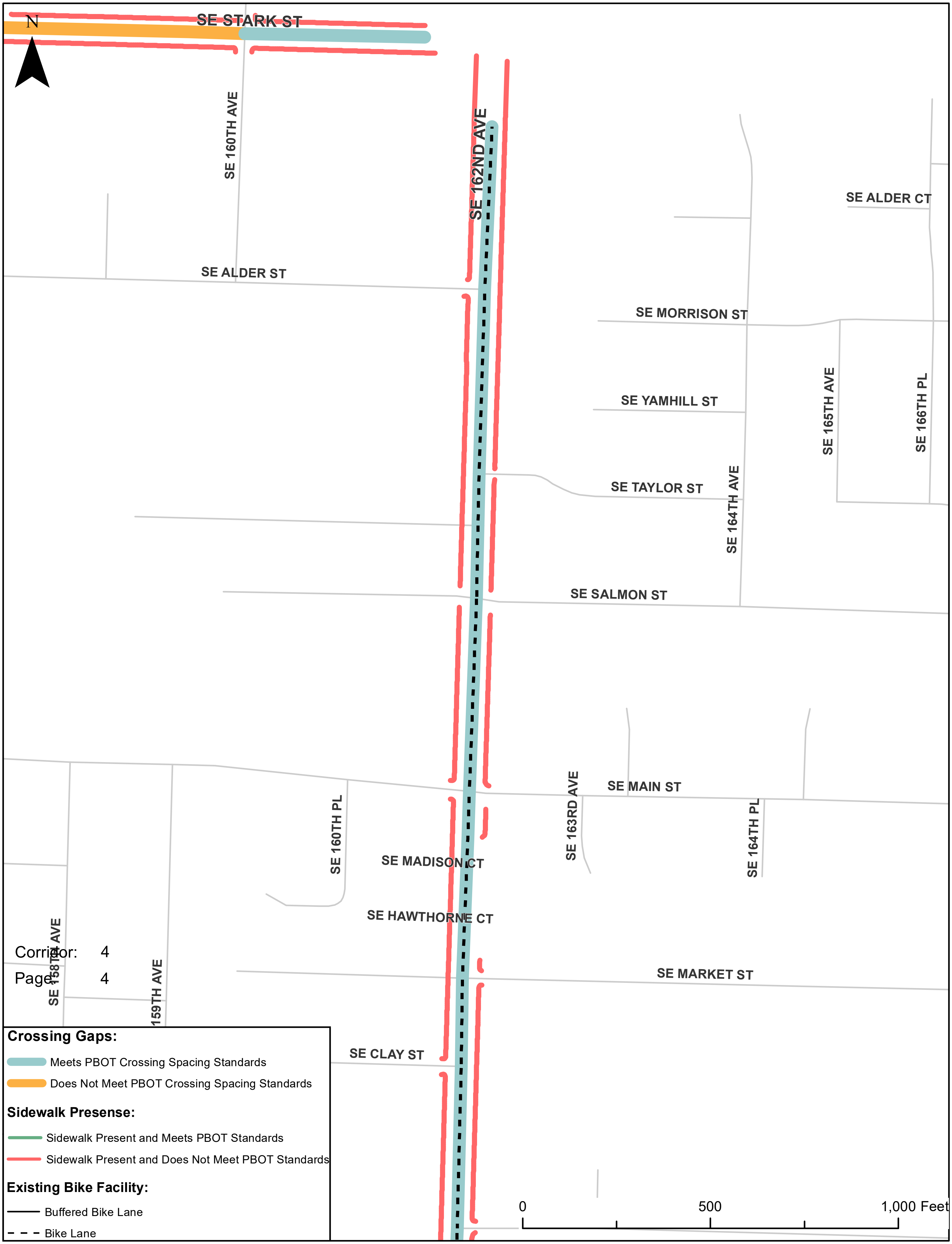
Page: 3



N
SE RHONE ST
SE 162ND AVE
SE POWELL BLVD
62ND AVE
Corridor: 4
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
425 Feet


N
SE DIVISION ST
SE 164TH AVE
SE CLINTON ST
SE 165TH AVE
SE 166TH AVE
SE TAGGART ST
SE WOODWARD ST
SE BROOKLYN ST
SE TIBBETTS ST
SE 162ND AVE
SE 165TH PL
SE KELLY ST
SE FRANKLIN ST
SE HAIG ST
SE HAIG DR
SE 159TH AVE
SE 160TH AVE
SE 161ST AVE
SE 158TH AVE
SE RHINE ST
SE RHINE CT
SE RHONE ST
SE LAFAYETTE ST
Corridor: 4
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
SE CLAY ST
SE MILL ST
SE STEPHENS CT
SE STEPHENS ST
SE LORA ST
SE HARRISON ST
SE 161ST AVE
SE 161ST CT
SE 159TH AVE
SE LINCOLN ST
SE GRANT ST
SE 162ND AVE
SE 158TH AVE
SE SHERMAN ST
SE CARUTHERS ST
Corridor: 4
Page: 3
SE DIVISION ST
SE 164TH AVE
SE 165TH AVE
SE CLINTON ST
0
500
1,000 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

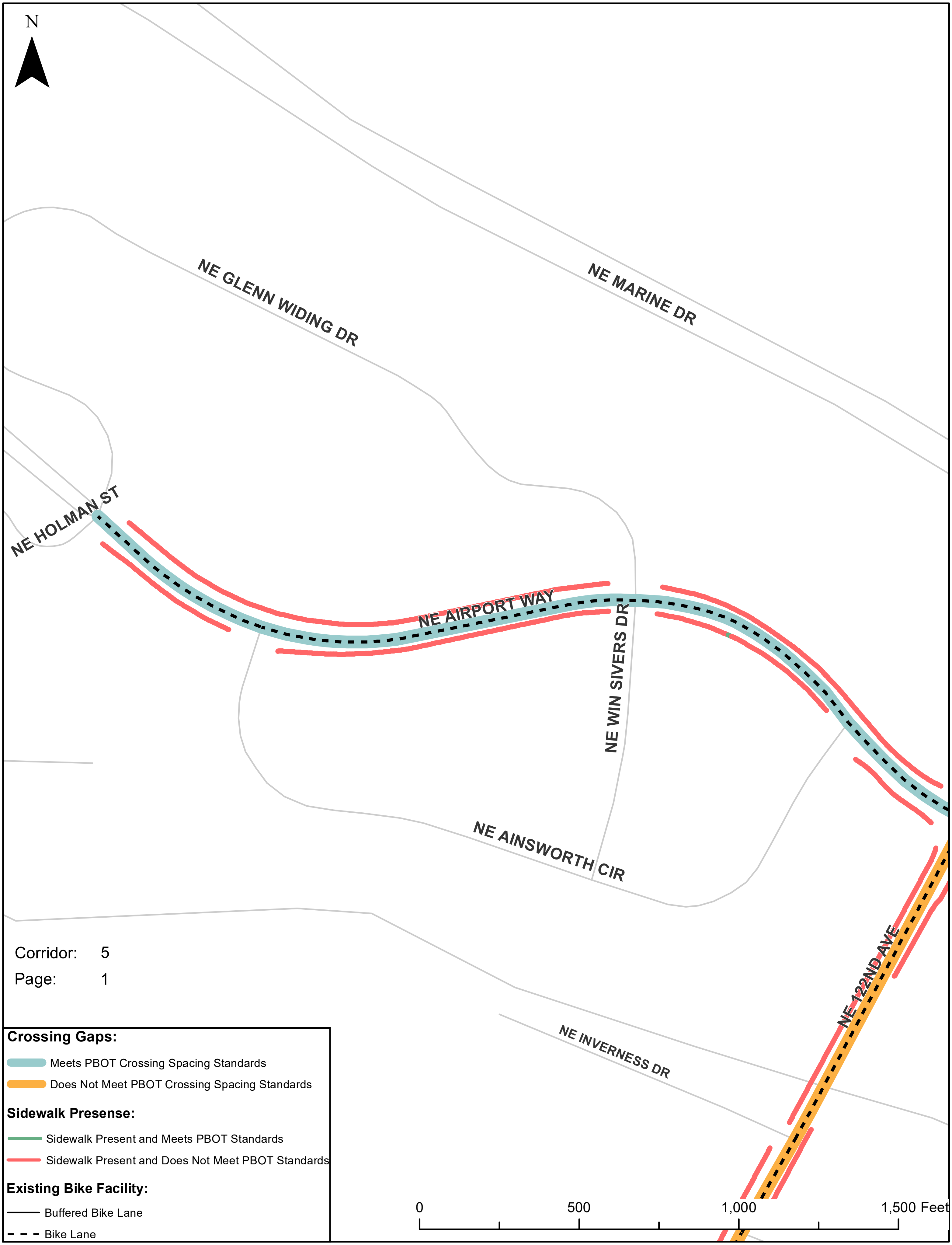


Corridor: 4
Page: 4

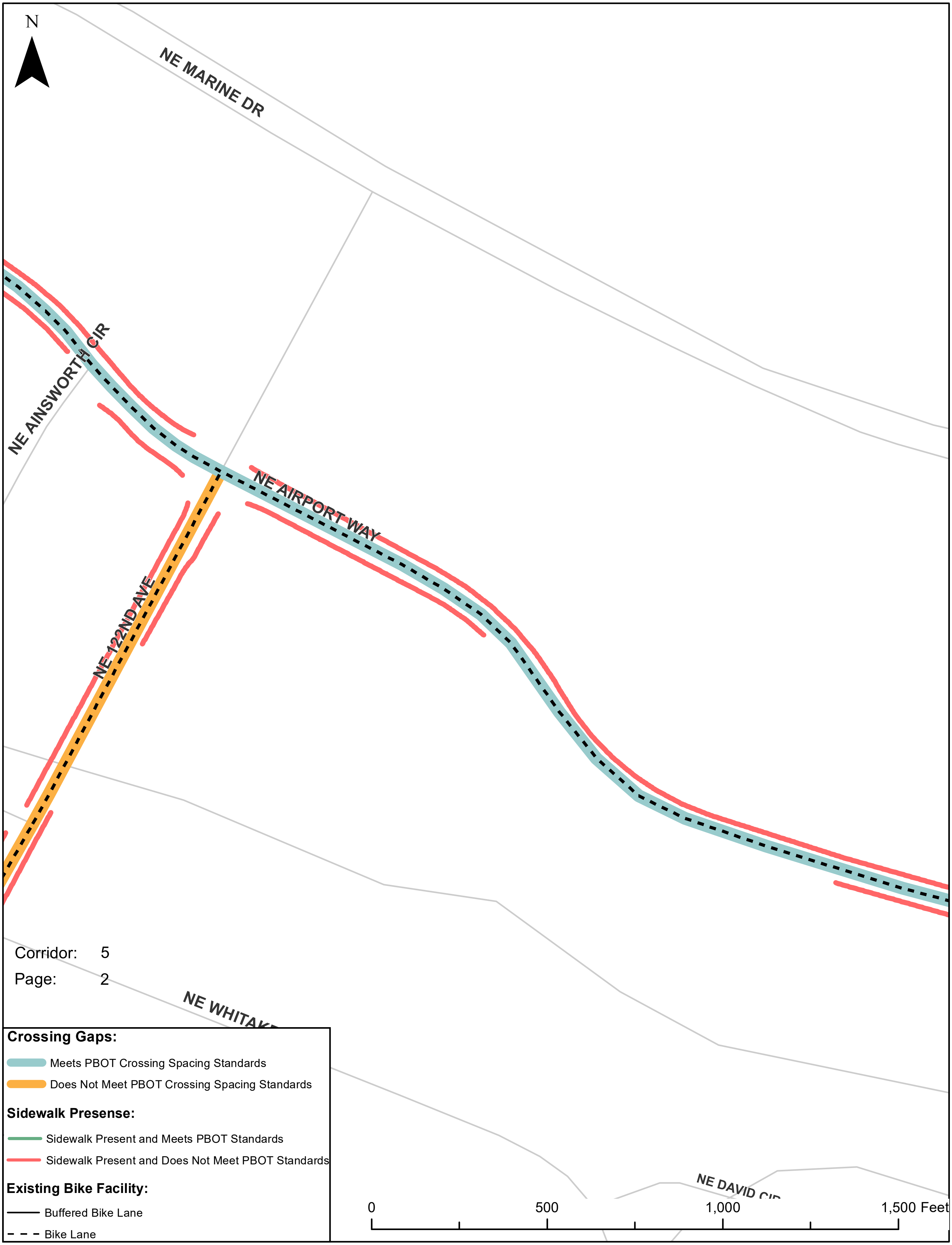
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards

Existing Bike Facility:
Buffered Bike Lane
Bike Lane



N
NE GLENN WIDING DR
NE MARINE DR
NE HOLMAN ST
NE AIRPORT WAY
NE WIN SIVERS DR
NE AINSWORTH CIR
NE 122ND AVE
NE INVERNESS DR
Corridor: 5
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet



Corridor: 5

Page: 2

Crossing Gaps:

Meets PBOT Crossing Spacing Standards

Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:

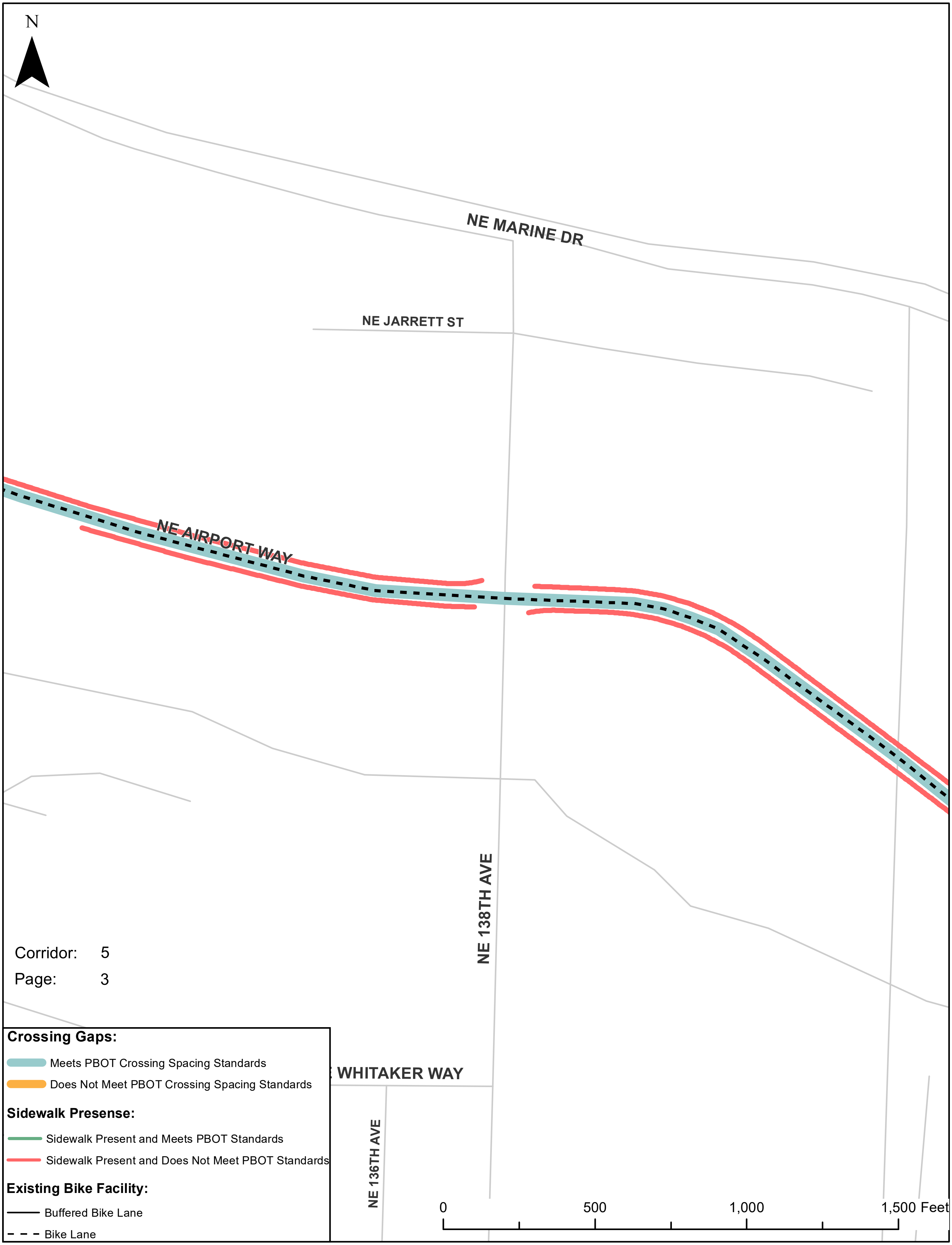
Sidewalk Present and Meets PBOT Standards

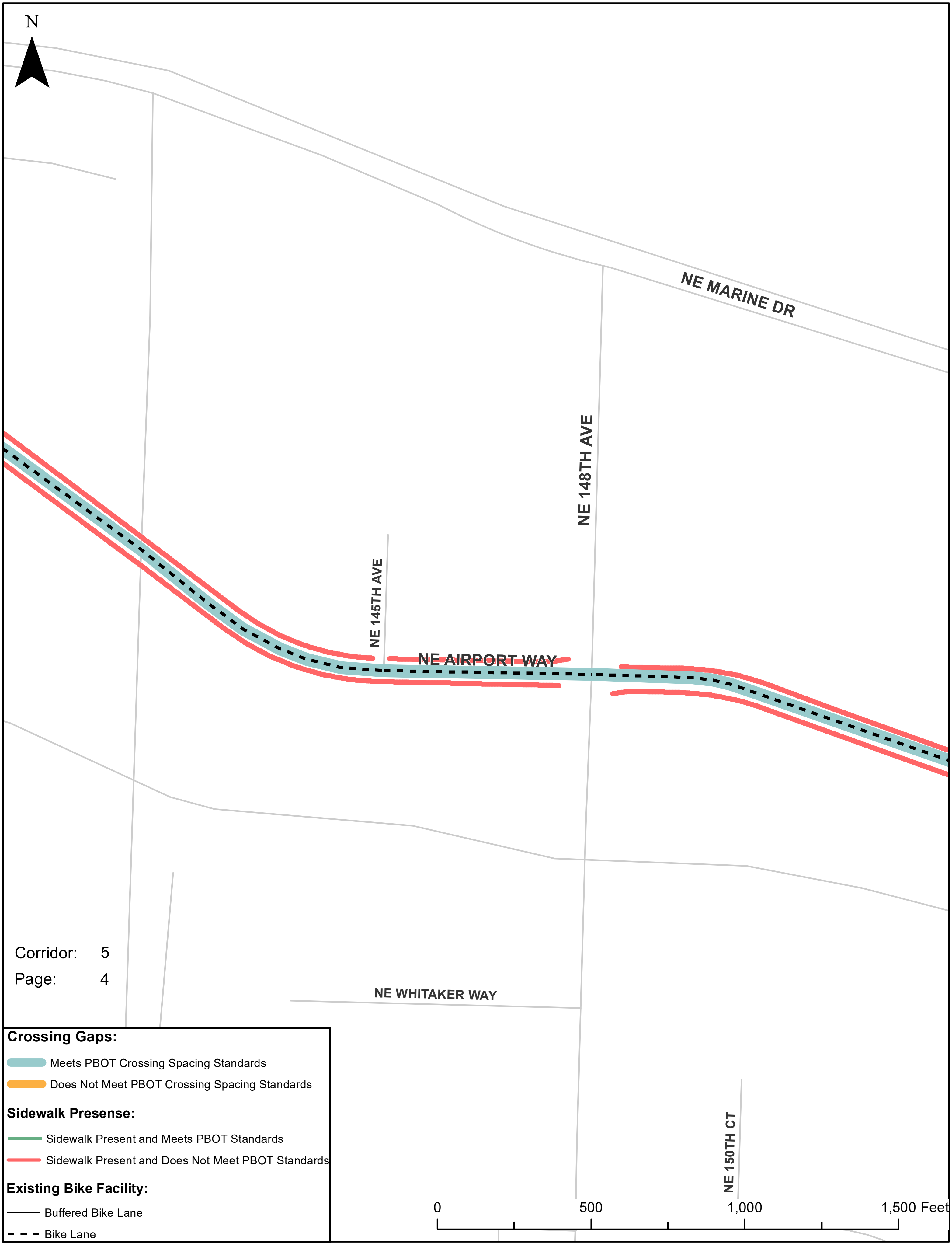
Sidewalk Present and Does Not Meet PBOT Standards

Existing Bike Facility:

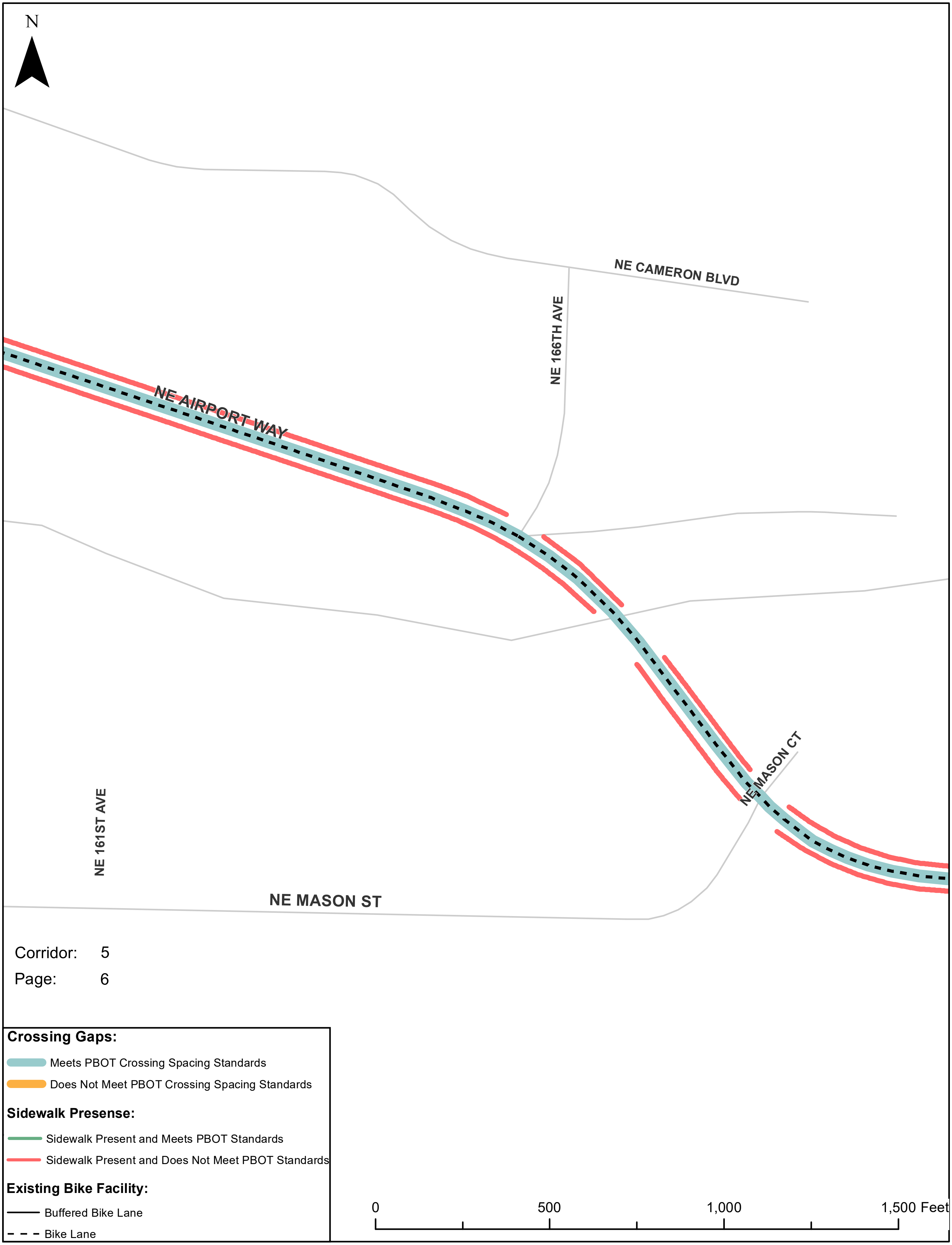
Buffered Bike Lane

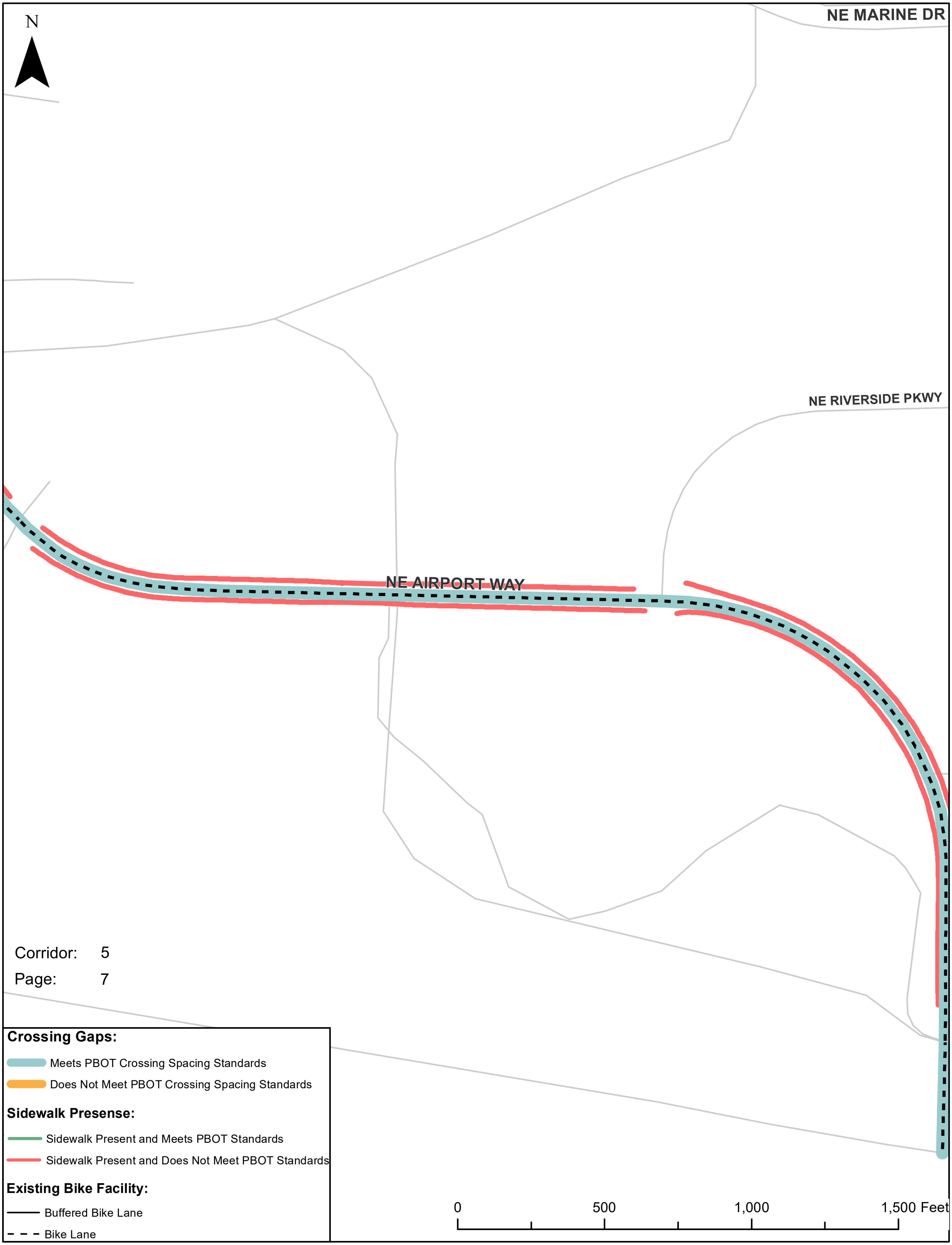
Bike Lane

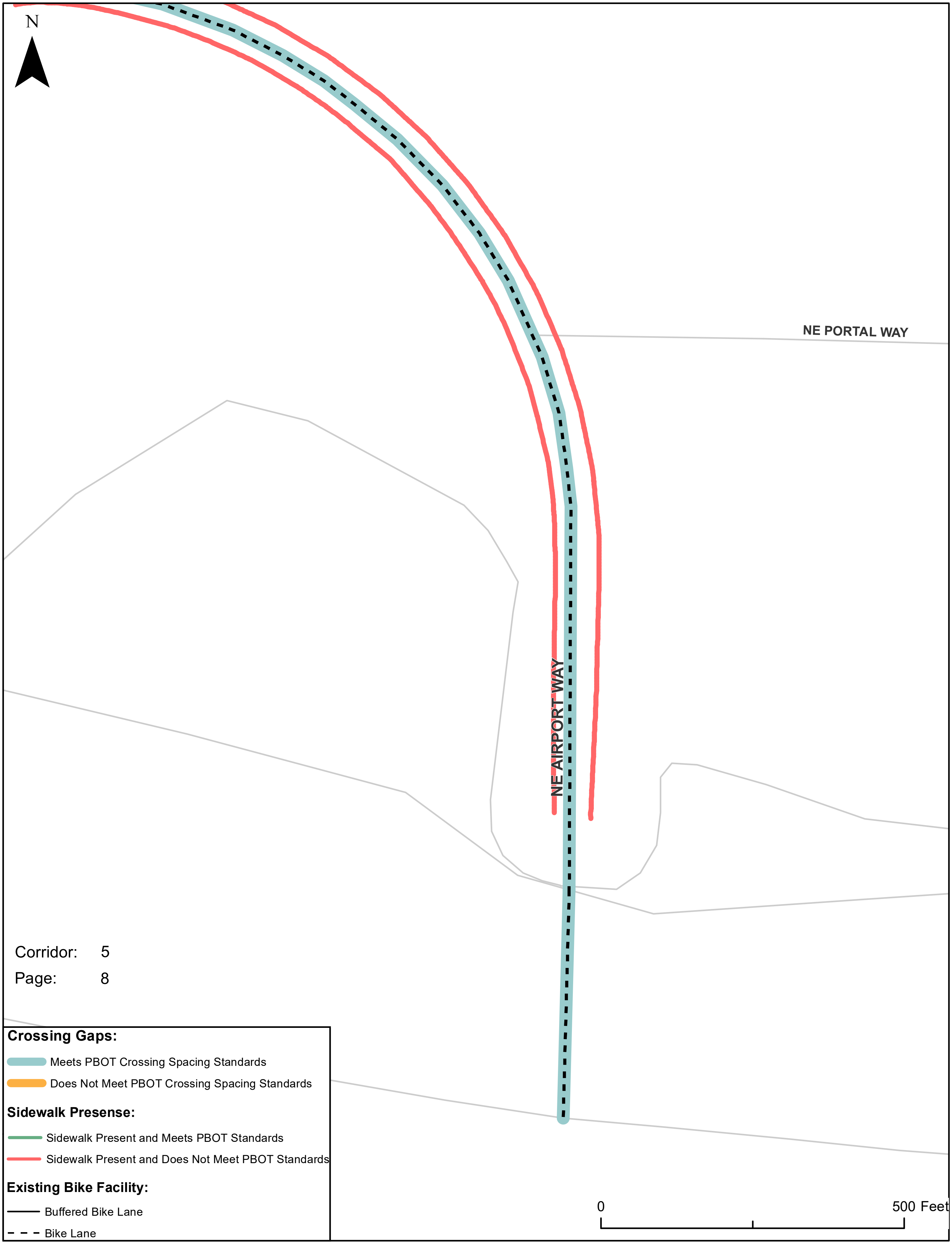

N
NE MARINE DR
NE JARRETT ST
NE AIRPORT WAY
NE 138TH AVE
WHITAKER WAY
NE 136TH AVE
Corridor: 5
Page: 3
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE MARINE DR
NE 148TH AVE
NE 145TH AVE
NE AIRPORT WAY
NE WHITAKER WAY
NE 150TH CT
Corridor: 5
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

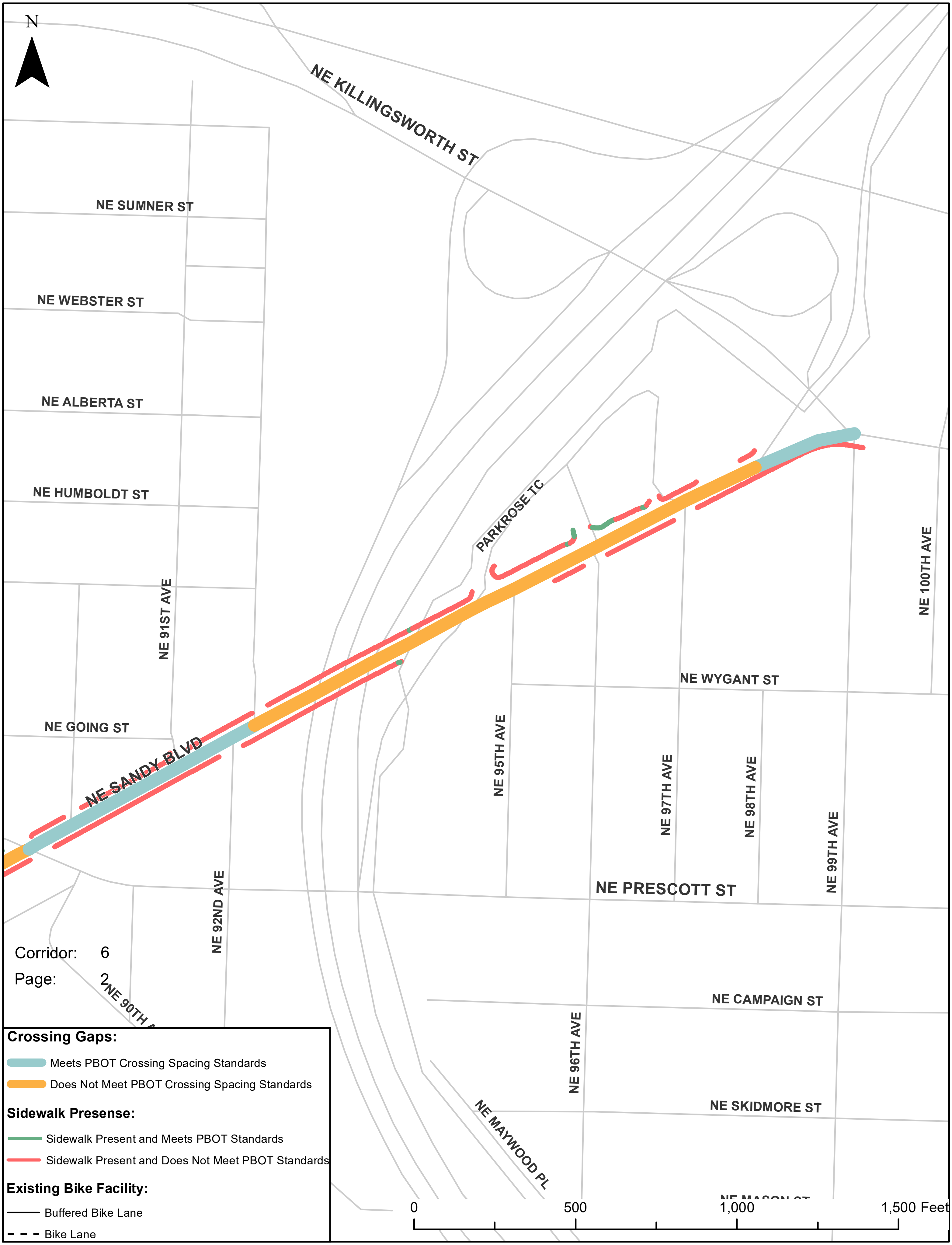

N
NE MARINE DR
NE 152ND PL
NE 158TH AVE
NE CAMERON BLVD
NE AIRPORT WAY
NE 161ST AVE
NE MASON ST
Corridor: 5
Page: 5
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

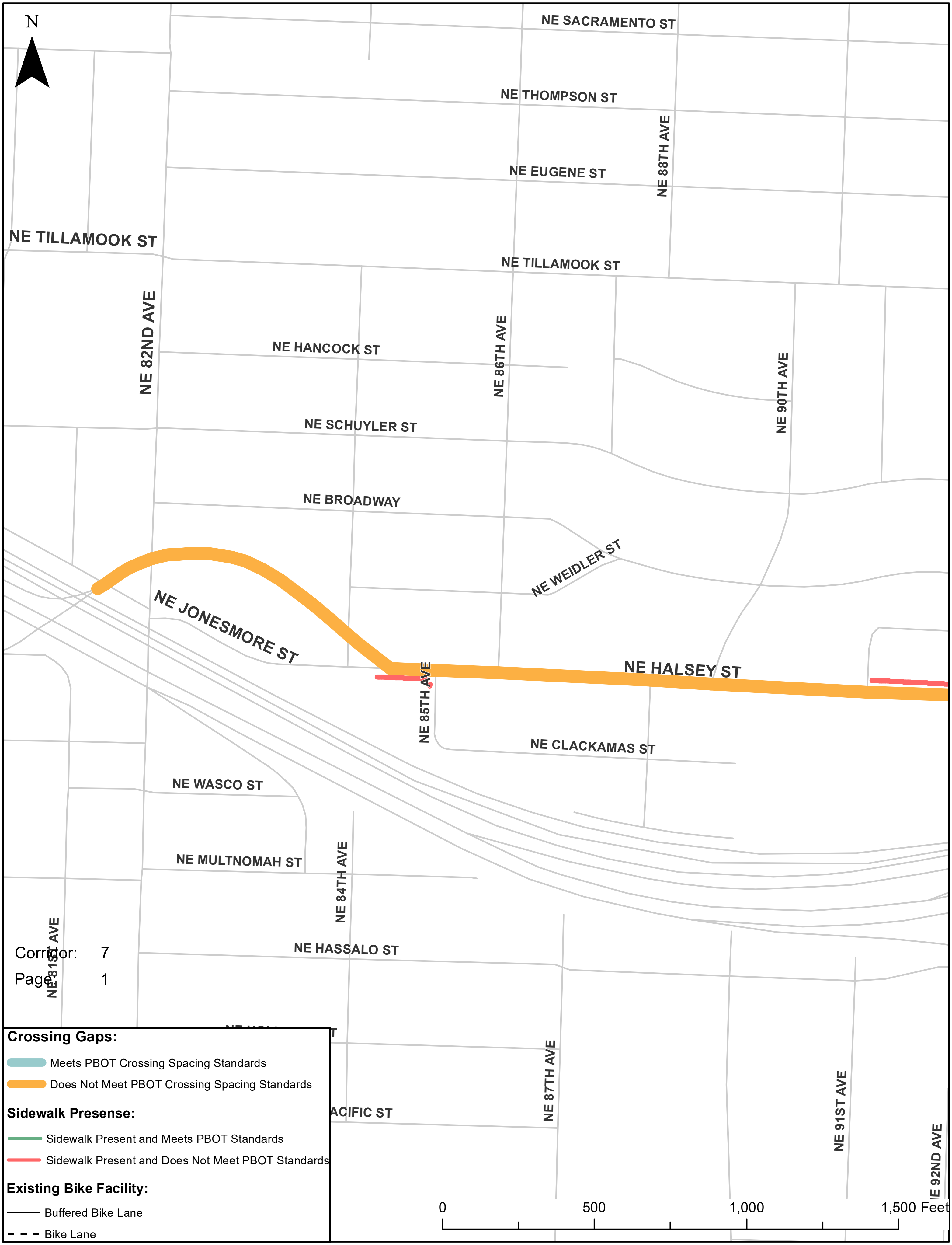

N
NE CAMERON BLVD
NE 166TH AVE
NE AIRPORT WAY
NE MASON CT
NE 161ST AVE
NE MASON ST
Corridor: 5
Page: 6
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE MARINE DR
NE RIVERSIDE PKWY
NE AIRPORT WAY
Corridor: 5
Page: 7
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

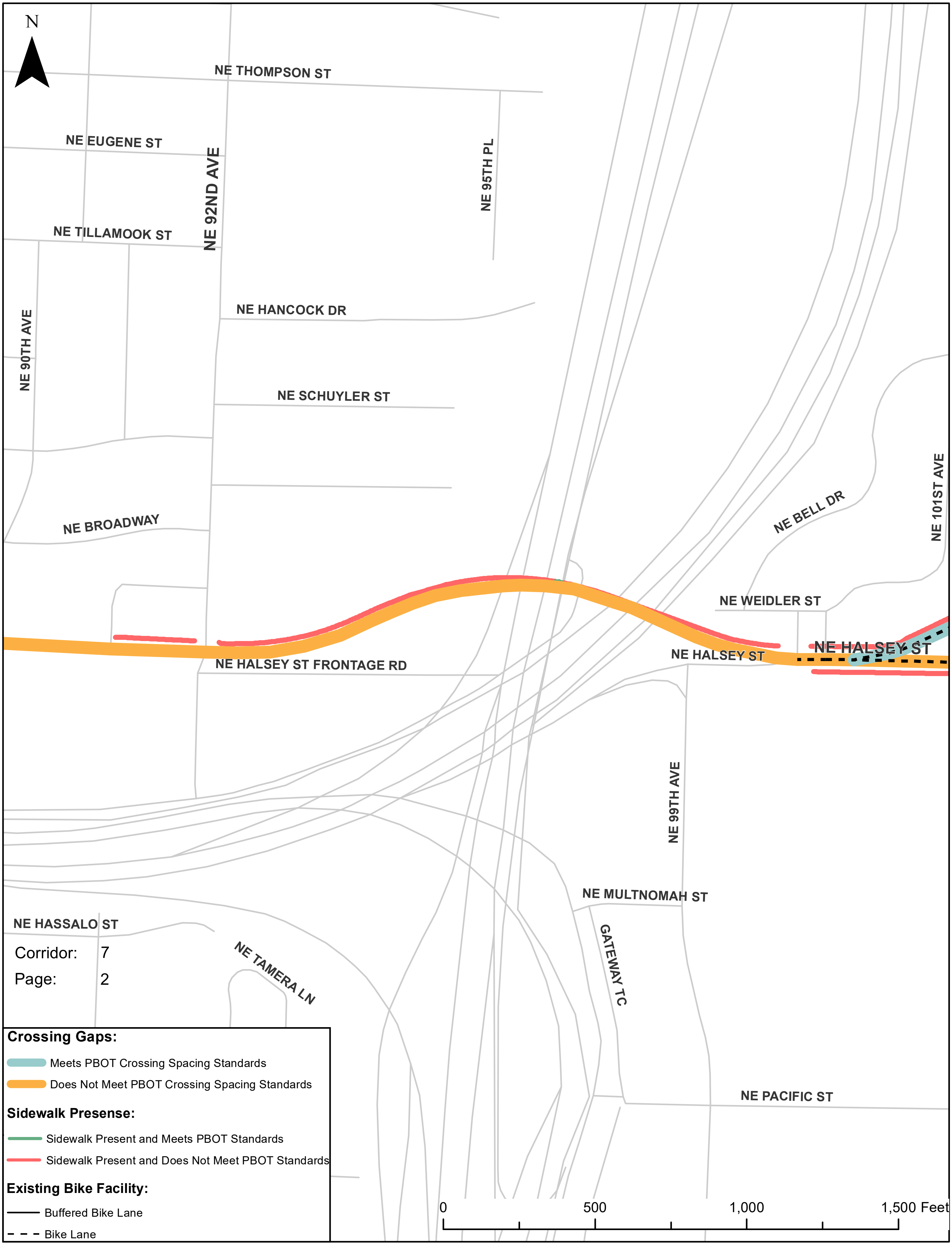

N
NE PORTAL WAY
NE AIRPORT WAY
Corridor: 5
Page: 8
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500 Feet


N
NE ALBERTA ST
NE HUMBOLDT ST
NE WYGANT ST
NE GOING PL
NE GOING ST
NE PRESCOTT ST
NE SANDY BLVD
NE SKIDMORE CT
NE SKIDMORE ST
NE WARD ST
NE 88TH AVE
NE MASON ST
NE CLIFF ST
NE BEECH ST
NE 81ST AVE
NE 82ND AVE
NE 83RD AVE
NE 84TH AVE
NE 85TH AVE
NE 86TH AVE
NE 87TH AVE
NE 89TH AVE
NE 90TH AVE
NE 91ST AVE
NE 91ST AVE
Corridor: 6
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE KILLINGSWORTH ST
NE SUMNER ST
NE WEBSTER ST
NE ALBERTA ST
NE HUMBOLDT ST
NE 91ST AVE
NE GOING ST
NE SANDY BLVD
PARKROSE TC
NE 100TH AVE
NE WYGANT ST
NE 95TH AVE
NE 97TH AVE
NE 98TH AVE
NE 99TH AVE
NE PRESCOTT ST
NE 92ND AVE
Corridor: 6
Page: 2
NE CAMPAIGN ST
NE 96TH AVE
NE SKIDMORE ST
NE MAYWOOD PL
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane



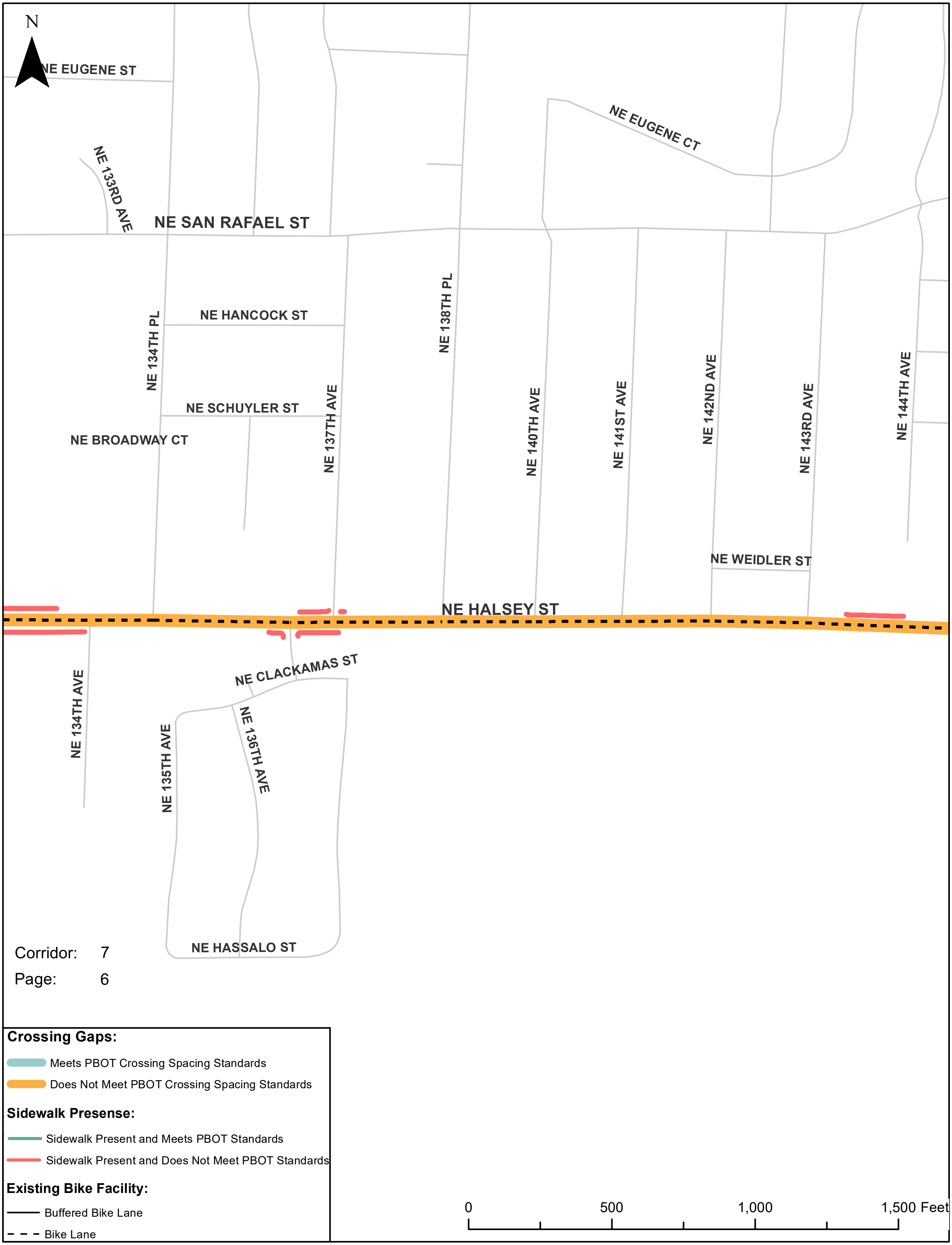
N
NE SACRAMENTO ST
NE THOMPSON ST
NE EUGENE ST
NE 88TH AVE
NE TILLAMOOK ST
NE TILLAMOOK ST
NE 82ND AVE
NE HANCOCK ST
NE 86TH AVE
NE 90TH AVE
NE SCHUYLER ST
NE BROADWAY
NE WEIDLER ST
NE JONESMORE ST
NE HALSEY ST
NE 85TH AVE
NE CLACKAMAS ST
NE WASCO ST
NE MULTNOMAH ST
NE 84TH AVE
NE 81ST AVE
Corridor: 7
Page: 1
NE HASSALO ST
NE 87TH AVE
NE 91ST AVE
E 92ND AVE
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE THOMPSON ST
NE EUGENE ST
NE 92ND AVE
NE 95TH PL
NE TILLAMOOK ST
NE HANCOCK DR
NE 90TH AVE
NE SCHUYLER ST
NE BROADWAY
NE BELL DR
NE 101ST AVE
NE WEIDLER ST
NE HALSEY ST
NE HALSEY ST FRONTAGE RD
NE HALSEY ST
NE 99TH AVE
NE MULTNOMAH ST
NE HASSALO ST
NE TAMERA LN
GATEWAY TC
NE PACIFIC ST
Corridor: 7
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE 105TH AVE
NE RUSSELL CT
NE RUSSELL ST
NE BRAZEE ST
NE SACRAMENTO ST
NE THOMPSON ST
NE EUGENE ST
NE 108TH AVE
NE TILLAMOOK ST
NE SAN RAFAEL ST
NE SAN RAFAEL ST
NE HANCOCK ST
NE 101ST AVE
NE 102ND AVE
NE 104TH AVE
NE 106TH AVE
NE BELL DR
NE SCHUYLER ST
NE 114TH AVE
NE BROADWAY
NE 103RD PL
NE WEIDLER ST
NE HALSEY ST
NE CLACKAMAS ST
NE WASCO ST
NE HASSALO ST
NE 107TH PL
NE 109TH AVE
NE 112TH AVE
NE 113TH AVE
NE HOLLADAY ST
NE PACIFIC ST
NE 107TH AVE
NE 110TH AVE
NE 111TH AVE
NE 106TH PL
NE 109TH CT
Corridor: 7
Page: 3
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500
2,000
2,500 Feet


N
NE THOMPSON ST
NE EUGENE ST
NE 121ST AVE
NE SAN RAFAEL ST
NE HANCOCK ST
NE 114TH PL
NE SCHUYLER ST
NE 114TH AVE
NE 116TH PL
NE 118TH AVE
NE 119TH AVE
NE 120TH AVE
NE BROADWAY
NE HALSEY ST
NE CLACKAMAS ST
NE 116TH AVE
NE WASCO ST
NE 117TH AVE
NE MULTNOMAH ST
NE 122ND AVE
NE HASSALO ST
Corridor: 7
Page: 4
NE 113TH AVE
NE HOLLADAY ST
NE HOLLADAY PL
NE OREGON ST
NE 125TH AVE
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

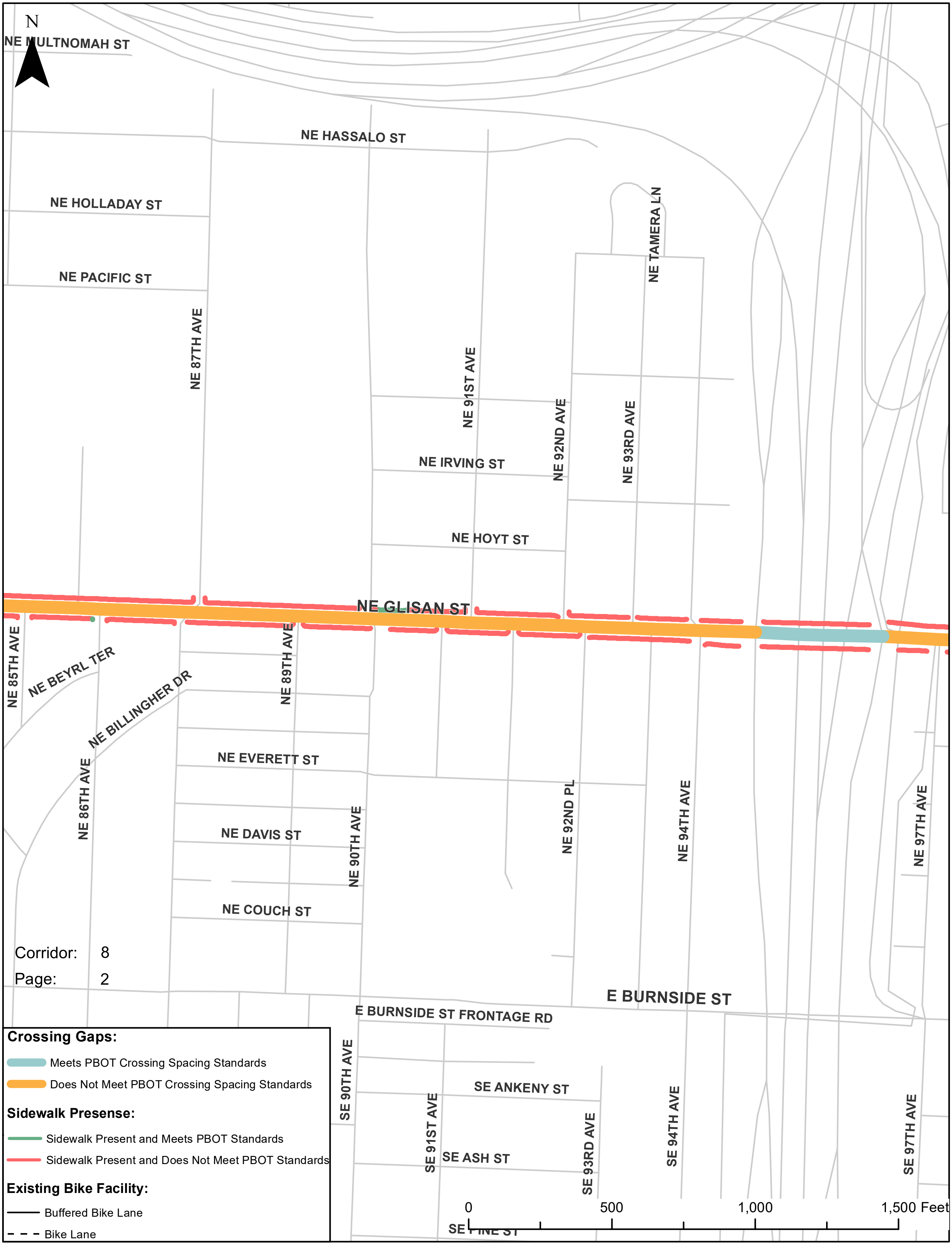

N
NE SAN RAFAEL ST
NE 130TH AVE
NE 131ST AVE
NE EUGENE ST
NE TILLAMOOK ST
NE 133RD AVE
NE 126TH PL
NE 125TH AVE
NE HANCOCK ST
NE 132ND AVE
NE 134TH PL
NE SCHUYLER ST
NE 129TH PL
NE BROADWAY
NE BROADWAY CT
NE WEIDLER ST
NE HALSEY ST
NE CLACKAMAS ST
NE 134TH AVE
NE WASCO ST
NE 135TH AVE
NE 126TH AVE
NE MULTNOMAH ST
NE HASSALO ST
Corridor: 7
Page: 5
NE HOLLADAY ST
NE HOLLADAY CT
NE 131ST PL
NE 128TH AVE
NE PACIFIC ST
NE PACIFIC CT
NE OREGON ST
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

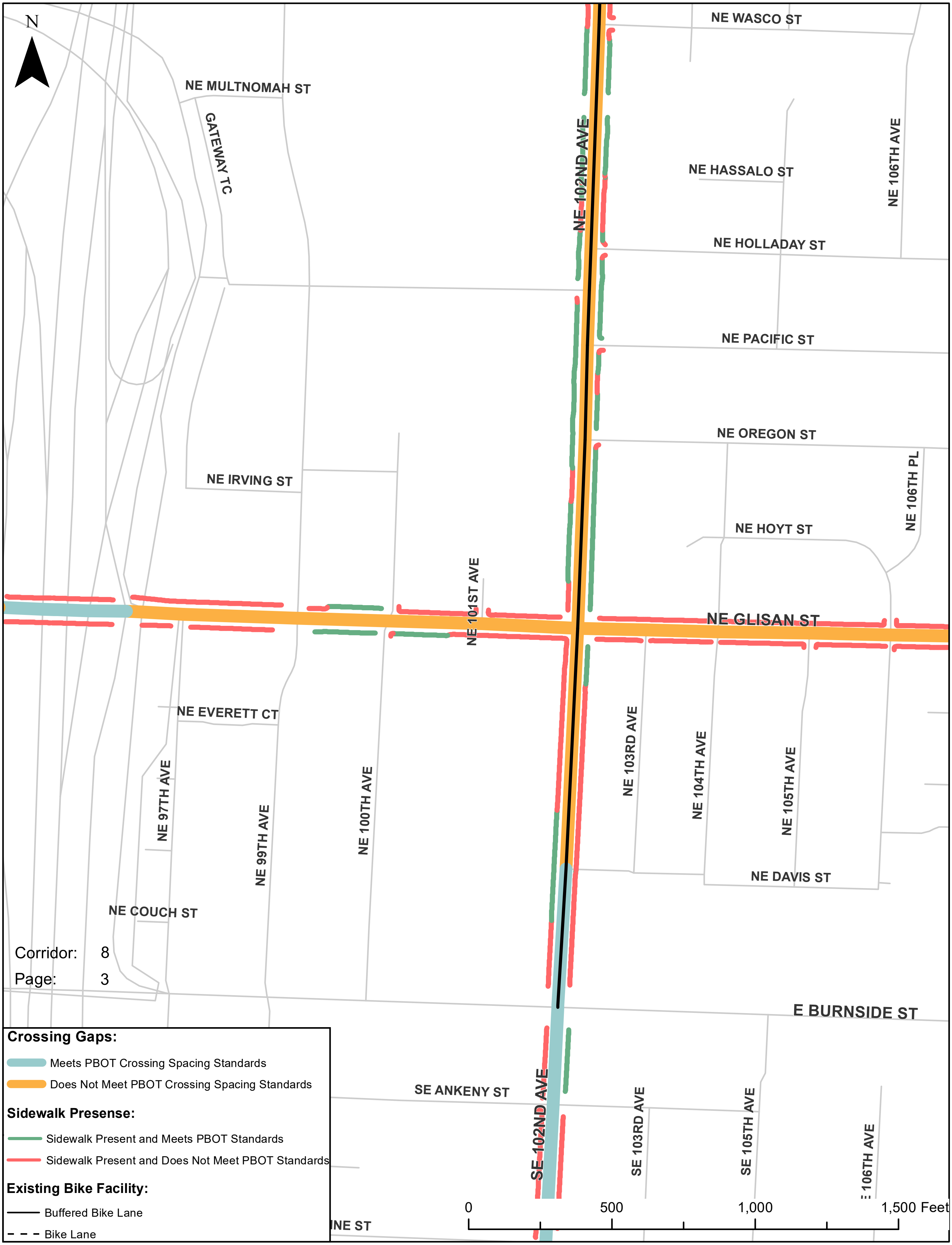

N
NE EUGENE ST
NE 133RD AVE
NE SAN RAFAEL ST
NE EUGENE CT
NE HANCOCK ST
NE 134TH PL
NE 138TH PL
NE SCHUYLER ST
NE BROADWAY CT
NE 137TH AVE
NE 140TH AVE
NE 141ST AVE
NE 142ND AVE
NE 143RD AVE
NE 144TH AVE
NE WEIDLER ST
NE HALSEY ST
NE CLACKAMAS ST
NE 134TH AVE
NE 135TH AVE
NE 136TH AVE
NE HASSALO ST
Corridor: 7
Page: 6
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE 142ND AVE
NE 148TH AVE
NE THOMPSON ST
NE EUGENE ST
NE TILLAMOOK ST
NE SUMMERPLACE DR
NE 154TH CT
NE 149TH AVE
NE SAN RAFAEL ST
NE NEWPORT ST
NE HANCOCK ST
NE HANCOCK CT
NE SCHUYLER ST
NE SCHUYLER CT
NE 143RD AVE
NE 144TH AVE
NE BROADWAY
NE 150TH AVE
NE WEIDLER ST
NE 148TH PL
NE 146TH AVE
NE 148TH AVE
NE 152ND PL
NE 153RD PL
NE HALSEY ST
NE CLACKAMAS ST
NE 152ND AVE
NE MULTNOMAH ST
NE 153RD AVE
NE 155TH AVE
NE HOLLADAY ST
NE 150TH PL
NE 151ST AVE
Corridor: 7
Page: 7
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE SUMMERPLACE DR
NE 152ND CT
NE 155TH CT
NE 158TH AVE
NE 158TH PL
NE EUGENE CT
NE ST GEORGE ST
NE SAN RAFAEL ST
NE 158TH CT
NE 160TH PL
NE HANCOCK ST
NE 162ND AVE
NE SCHUYLER ST
NE 159TH AVE
NE BROADWAY
NE 153RD PL
NE 156TH AVE
NE WEIDLER ST
NE 159TH CT
NE HALSEY ST
NE HALSEY ST
NE 153RD AVE
NE 155TH AVE
NE 157TH AVE
NE 160TH AVE
Corridor: 7
Page: 8
NE HOLLADAY ST
NE JEAN
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

N
NE 82ND AVE
NE GLISAN ST
NE 83RD AVE
NE 84TH AVE
NE 85TH AVE
NE 86TH AVE
NE BILLINGHER DR
NE BEYRL TER
Corridor: 8
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500 Feet

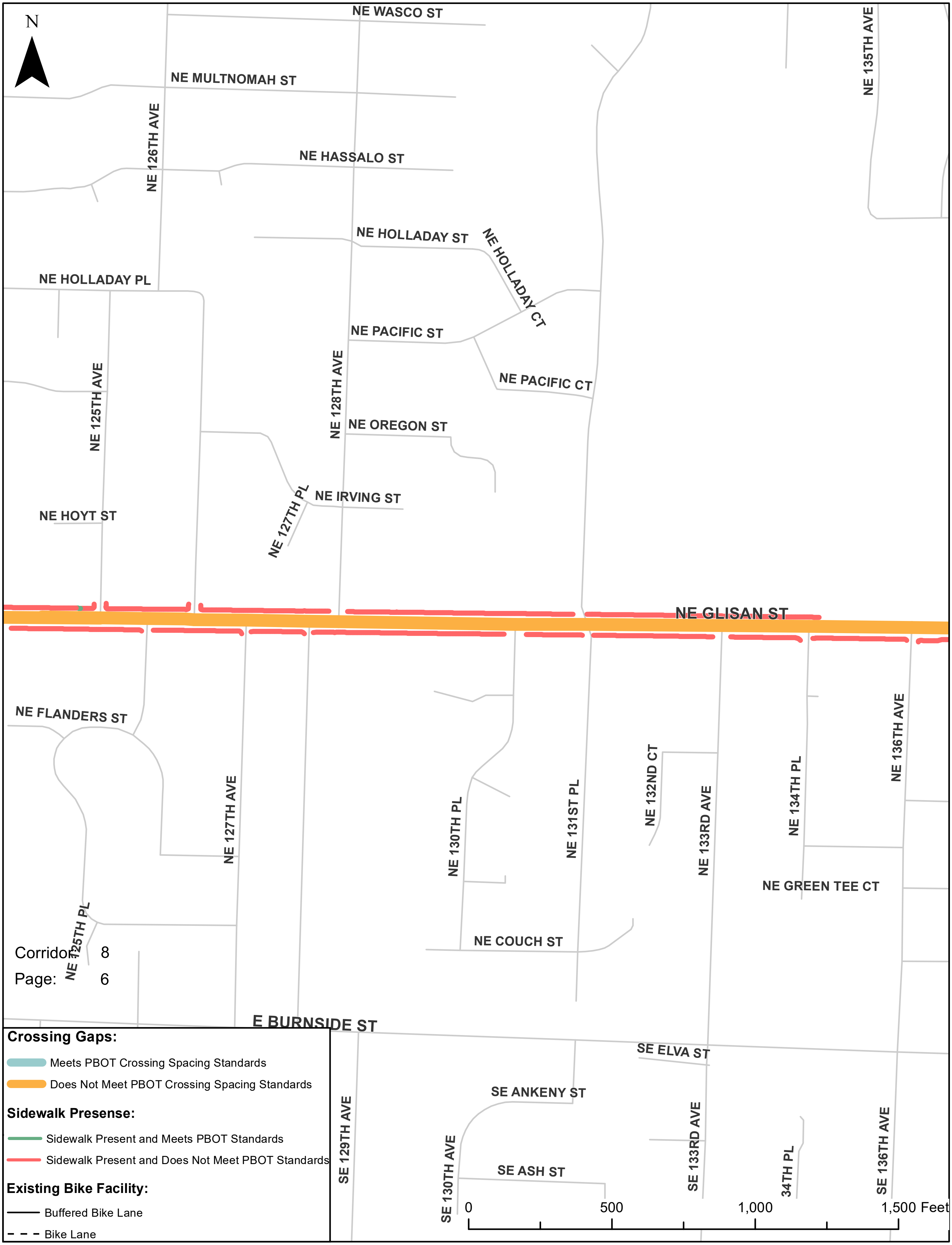

N
NE MULTNOMAH ST
NE HASSALO ST
NE HOLLADAY ST
NE PACIFIC ST
NE 87TH AVE
NE TAMERA LN
NE 91ST AVE
NE 92ND AVE
NE 93RD AVE
NE IRVING ST
NE HOYT ST
NE GLISAN ST
NE 85TH AVE
NE BEYRL TER
NE BILLINGHER DR
NE 89TH AVE
NE 86TH AVE
NE EVERETT ST
NE DAVIS ST
NE 90TH AVE
NE 92ND PL
NE 94TH AVE
NE 97TH AVE
NE COUCH ST
Corridor: 8
Page: 2
E BURNSIDE ST
E BURNSIDE ST FRONTAGE RD
SE 90TH AVE
SE 91ST AVE
SE ANKENY ST
SE 93RD AVE
SE 94TH AVE
SE 97TH AVE
SE ASH ST
SE PINE ST
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

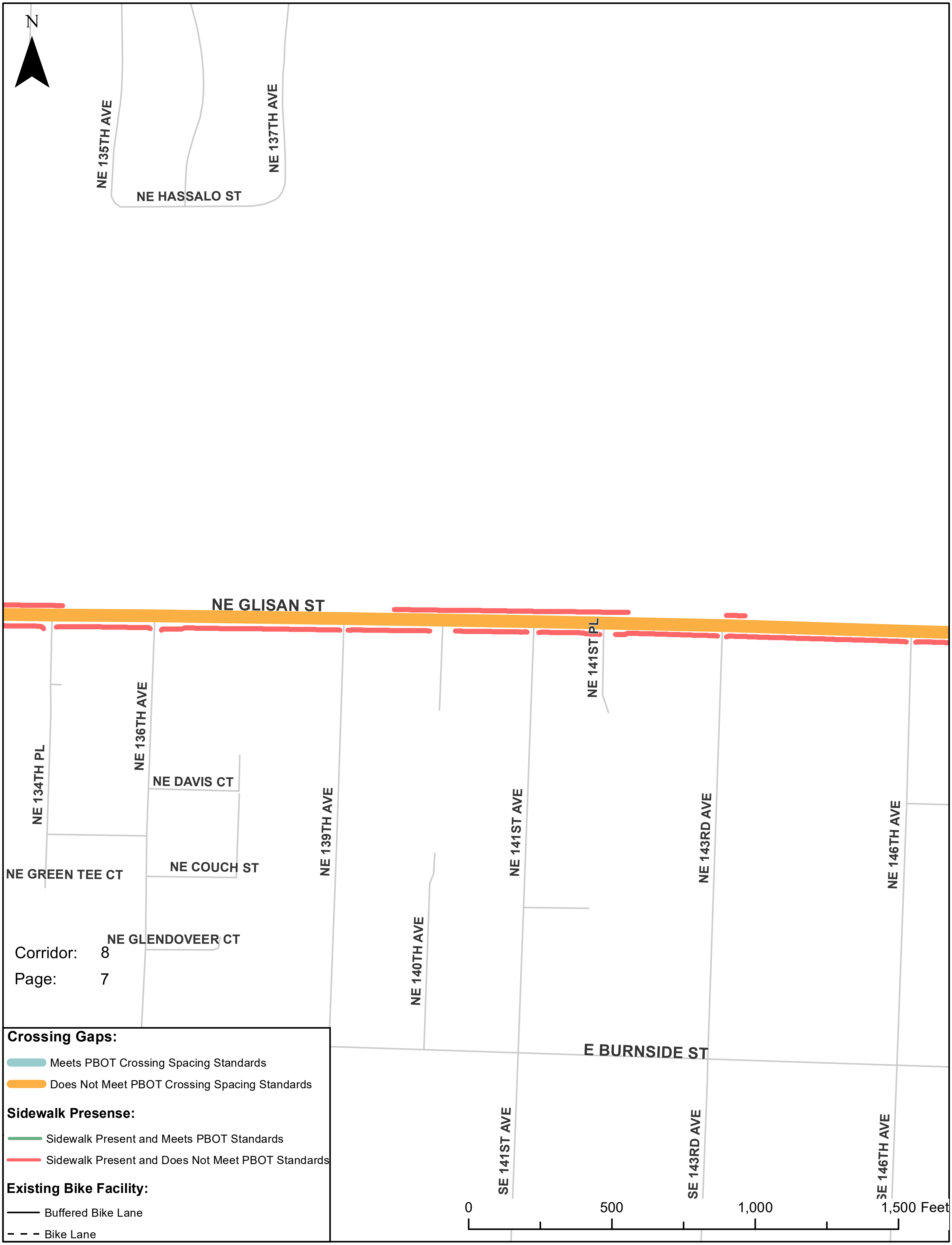


N
NE WASCO ST
NE MULTNOMAH ST
GATEWAY TC
NE 102ND AVE
NE HASSALO ST
NE 106TH AVE
NE HOLLADAY ST
NE PACIFIC ST
NE OREGON ST
NE IRVING ST
NE 106TH PL
NE HOYT ST
NE 101ST AVE
NE GLISAN ST
NE EVERETT CT
NE 103RD AVE
NE 104TH AVE
NE 105TH AVE
NE 97TH AVE
NE 99TH AVE
NE 100TH AVE
NE DAVIS ST
NE COUCH ST
Corridor: 8
Page: 3
E BURNSIDE ST
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
SE ANKENY ST
SE 102ND AVE
SE 103RD AVE
SE 105TH AVE
E 106TH AVE
INE ST
0
500
1,000
1,500 Feet


N
NE MULTNOMAH ST
NE HASSALO ST
NE HOLLADAY ST
NE PACIFIC ST
NE OREGON ST
NE HOYT ST
NE GLISAN ST
NE FLANDERS ST
NE EVERETT CT
NE EVERETT ST
NE DAVIS ST
NE COUCH CT
E BURNSIDE ST
SE ANKENY ST
SE ASH CT
NE 104TH AVE
NE 105TH AVE
NE 106TH PL
NE 106TH AVE
NE 107TH PL
NE 107TH AVE
NE 108TH AVE
NE 108TH PL
NE 109TH AVE
NE 109TH CT
NE 110TH AVE
NE 111TH AVE
NE 112TH AVE
NE 113TH AVE
NE 113TH PL
NE 114TH AVE
NE 116TH CT
NE 116TH PL
NE 116TH AVE
SE 111TH AVE
NE CT
SE 113TH AVE
SE 117TH AVE
Corridor: 8
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE MULTNOMAH ST
NE HASSALO ST
NE 126TH AVE
NE 114TH AVE
NE HOLLADAY ST
NE HOLLADAY PL
NE 122ND AVE
NE PACIFIC ST
NE OREGON ST
NE 117TH AVE
NE 118TH AVE
NE 125TH AVE
NE 116TH CT
NE 120TH AVE
NE HOYT ST
NE GLISAN ST
NE 116TH PL
NE FLANDERS ST
NE EVERETT ST
NE DAVIS ST
NE 116TH AVE
NE COUCH ST
NE 125TH PL
Corridor: 8
Page: 5
E BURNSIDE ST
SE 122ND AVE TC
SE ANKENY ST
SE 122ND AVE
SE 124TH AVE
SE 126TH AVE
SE ASH ST
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
NE WASCO ST
NE MULTNOMAH ST
NE 126TH AVE
NE HASSALO ST
NE 135TH AVE
NE HOLLADAY ST
NE HOLLADAY CT
NE HOLLADAY PL
NE PACIFIC ST
NE PACIFIC CT
NE 125TH AVE
NE 128TH AVE
NE OREGON ST
NE 127TH PL
NE IRVING ST
NE HOYT ST
NE GLISAN ST
NE FLANDERS ST
NE 127TH AVE
NE 130TH PL
NE 131ST PL
NE 132ND CT
NE 133RD AVE
NE 134TH PL
NE 136TH AVE
NE GREEN TEE CT
NE 125TH PL
NE COUCH ST
Corridor: 8
Page: 6
E BURNSIDE ST
SE ELVA ST
SE ANKENY ST
SE 129TH AVE
SE 130TH AVE
SE ASH ST
SE 133RD AVE
34TH PL
SE 136TH AVE
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane



N
NE 135TH AVE
NE 137TH AVE
NE HASSALO ST
NE GLISAN ST
NE 141ST PL
NE 136TH AVE
NE 134TH PL
NE DAVIS CT
NE COUCH ST
NE GREEN TEE CT
NE 139TH AVE
NE 141ST AVE
NE 143RD AVE
NE 146TH AVE
NE GLENDOVEER CT
NE 140TH AVE
Corridor: 8
Page: 7
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
E BURNSIDE ST
SE 141ST AVE
SE 143RD AVE
SE 146TH AVE
0
500
1,000
1,500 Feet

N
NE MULTNOMAH ST
NE 153RD AVE
NE HOLLADAY ST
NE 155TH AVE
NE PACIFIC ST
NE 152ND AVE
NE OREGON ST
NE HOYT ST
NE GLISAN ST
NE FLANDERS ST
NE 150TH PL
NE 151ST AVE
NE 146TH AVE
NE DAVIS CT
NE 149TH PL
NE 156TH AVE
NE COUCH CT
NE 147TH AVE
NE COUCH ST
E 148TH AVE
E BURNSIDE ST
NE 154TH AVE
SE 151ST AVE
SE 153RD AVE
SE 154TH AVE
SE 155TH PL
0
500
1,000
1,500 Feet
Corridor: 8
Page: 8
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

Corridor: 8
Page: 9

Crossing Gaps:

Meets PBOT Crossing Spacing Standards

Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:

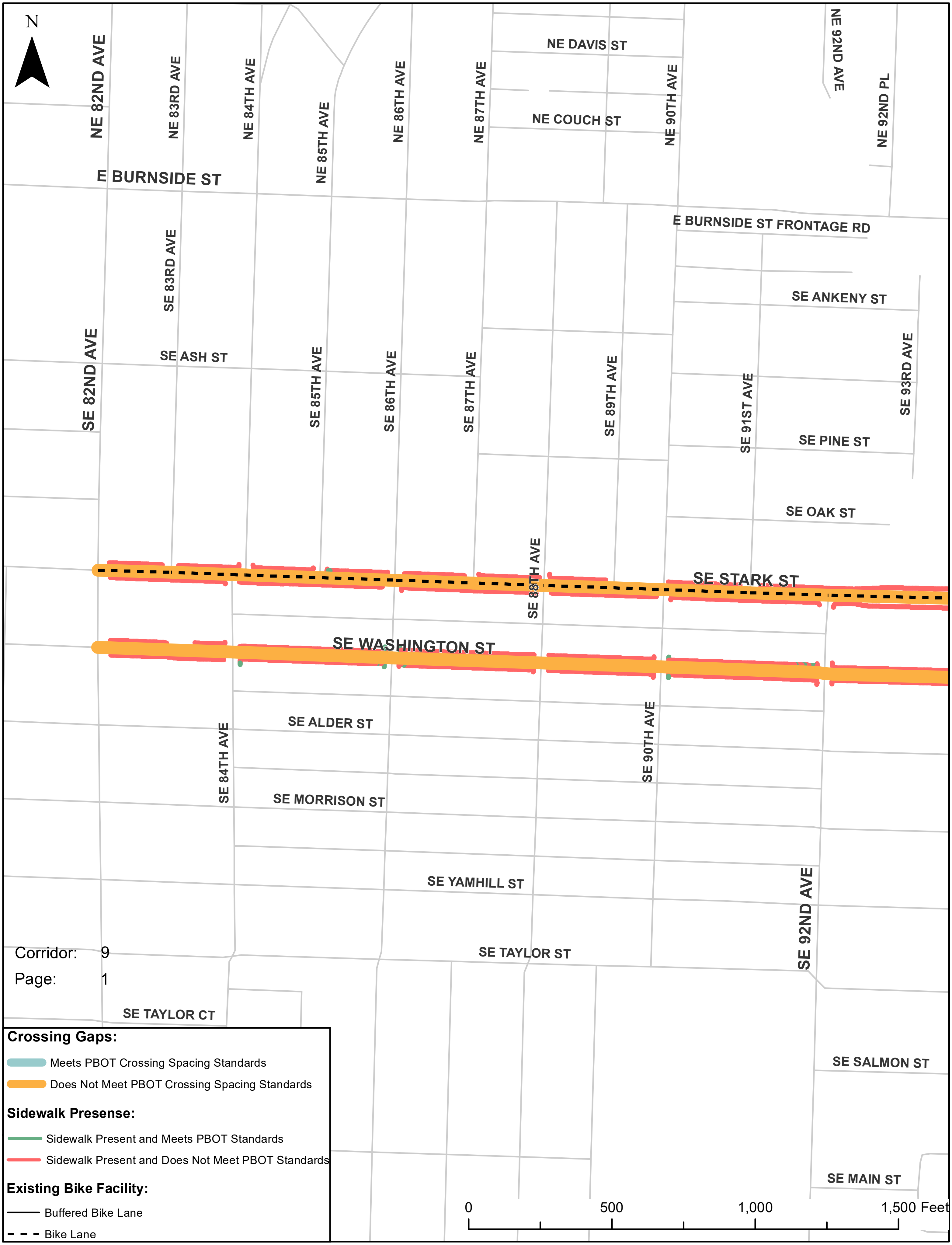
Sidewalk Present and Meets PBOT Standards

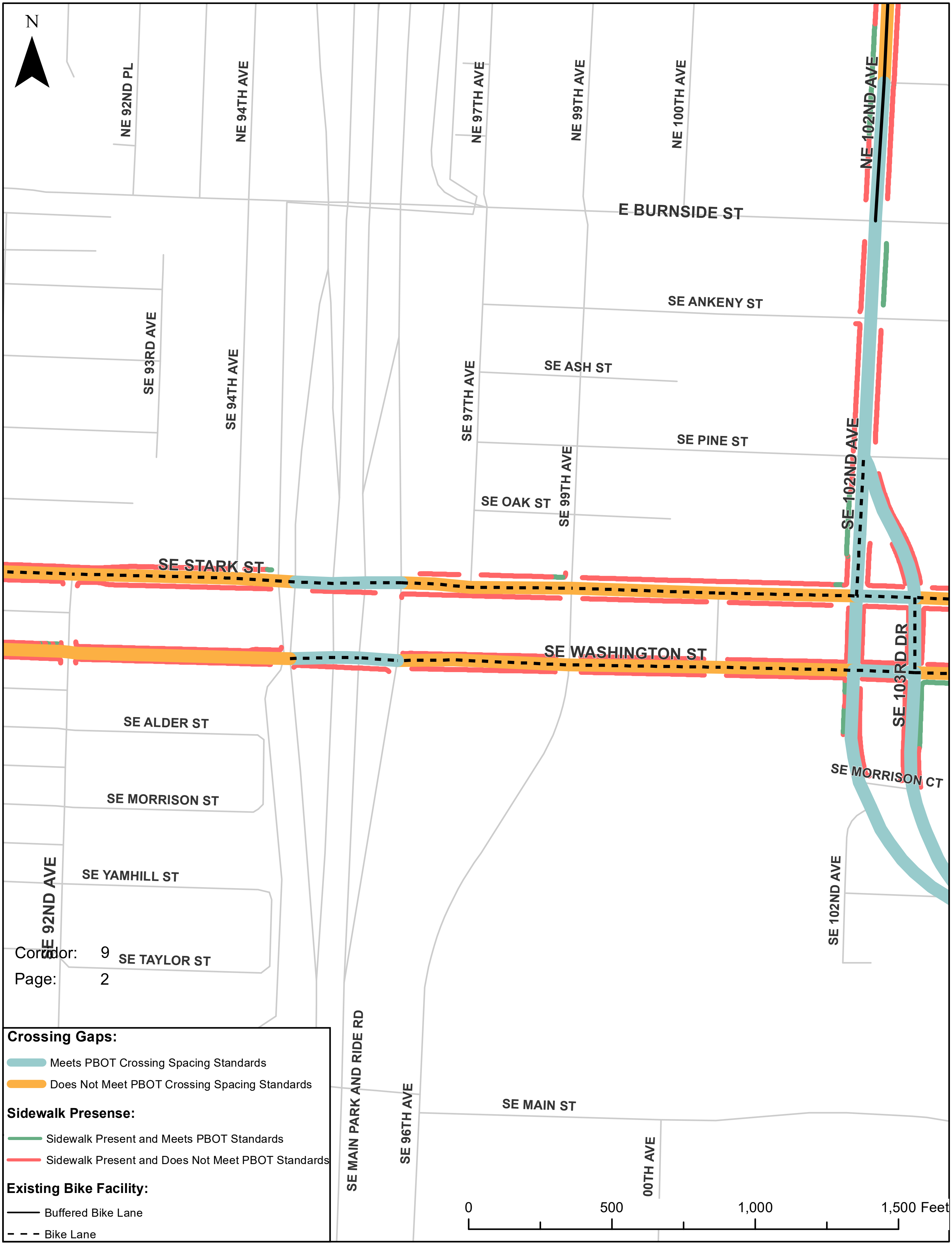
Sidewalk Present and Does Not Meet PBOT Standards

Existing Bike Facility:

Buffered Bike Lane

Bike Lane


N
NE 82ND AVE
NE 83RD AVE
NE 84TH AVE
NE 85TH AVE
NE 86TH AVE
NE 87TH AVE
NE DAVIS ST
NE COUCH ST
NE 90TH AVE
NE 92ND AVE
NE 92ND PL
E BURNSIDE ST
E BURNSIDE ST FRONTAGE RD
SE ANKENY ST
SE 83RD AVE
SE ASH ST
SE 82ND AVE
SE 85TH AVE
SE 86TH AVE
SE 87TH AVE
SE 89TH AVE
SE 91ST AVE
SE 93RD AVE
SE PINE ST
SE OAK ST
SE 88TH AVE
SE STARK ST
SE WASHINGTON ST
SE ALDER ST
SE 84TH AVE
SE 90TH AVE
SE MORRISON ST
SE YAMHILL ST
SE 92ND AVE
SE TAYLOR ST
SE TAYLOR CT
SE SALMON ST
SE MAIN ST
Corridor: 9
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

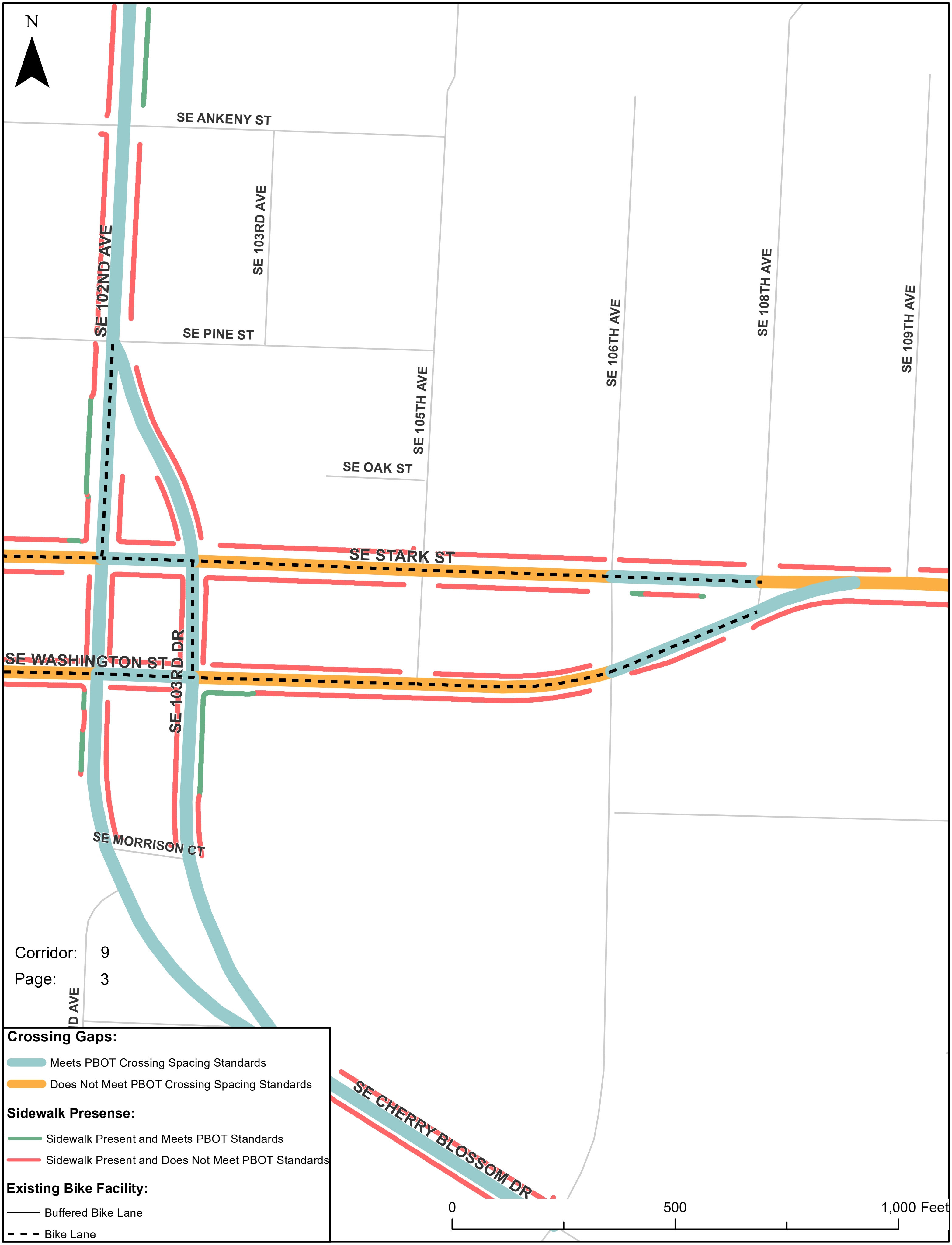


Corridor: 9
Page: 2

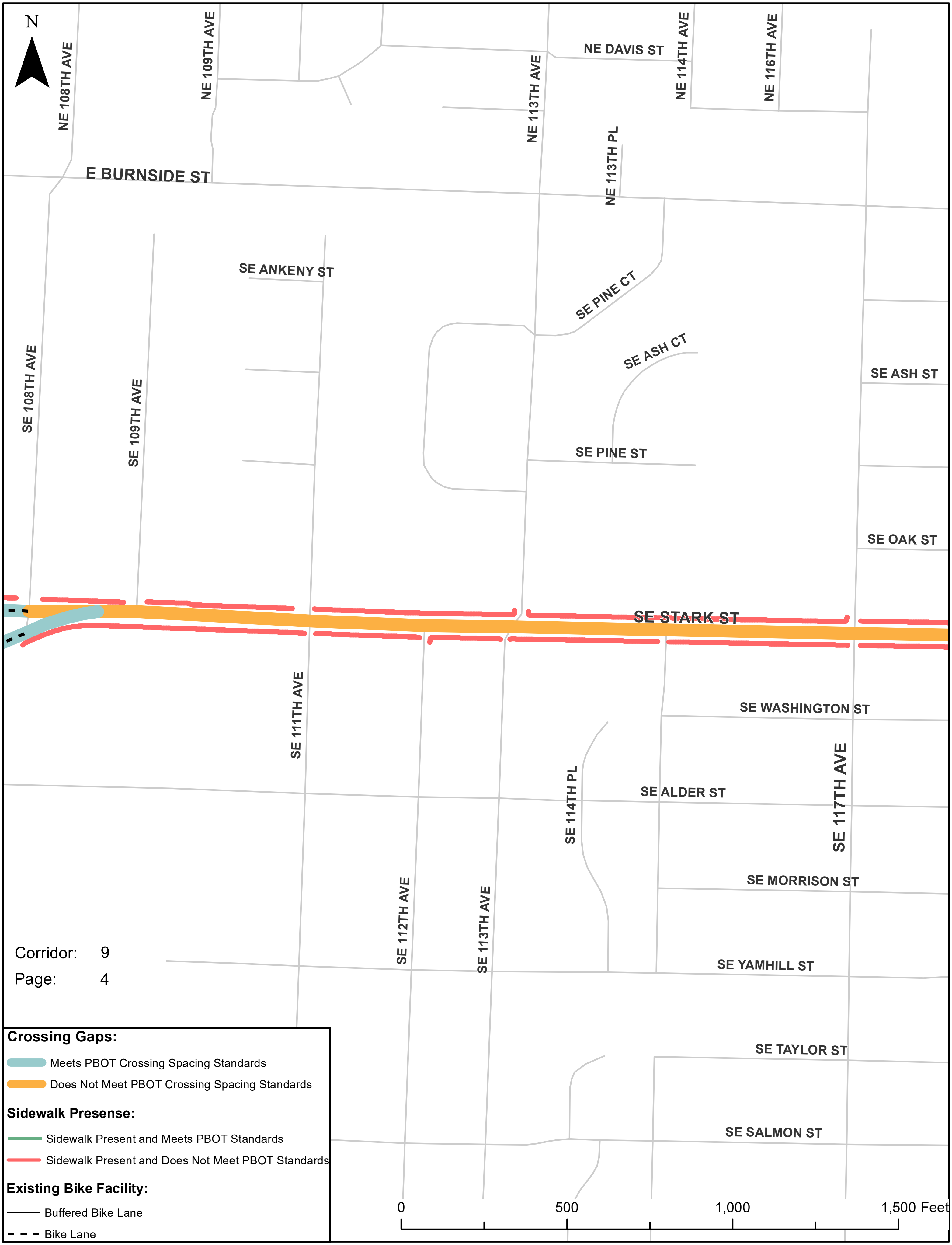
Crossing Gaps:
- Meets PBOT Crossing Spacing Standards
- Does Not Meet PBOT Crossing Spacing Standards

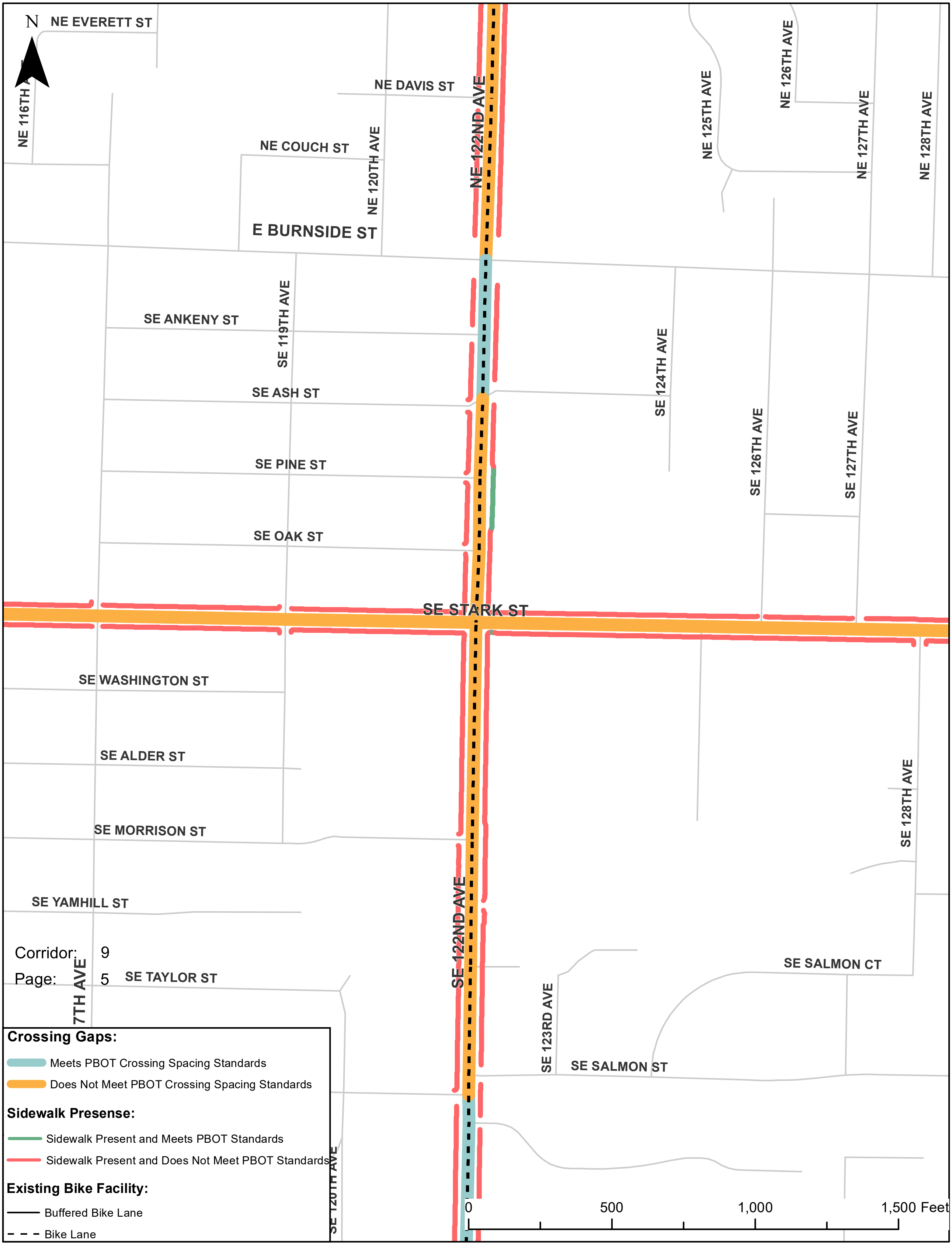
Sidewalk Presense:
- Sidewalk Present and Meets PBOT Standards
- Sidewalk Present and Does Not Meet PBOT Standards

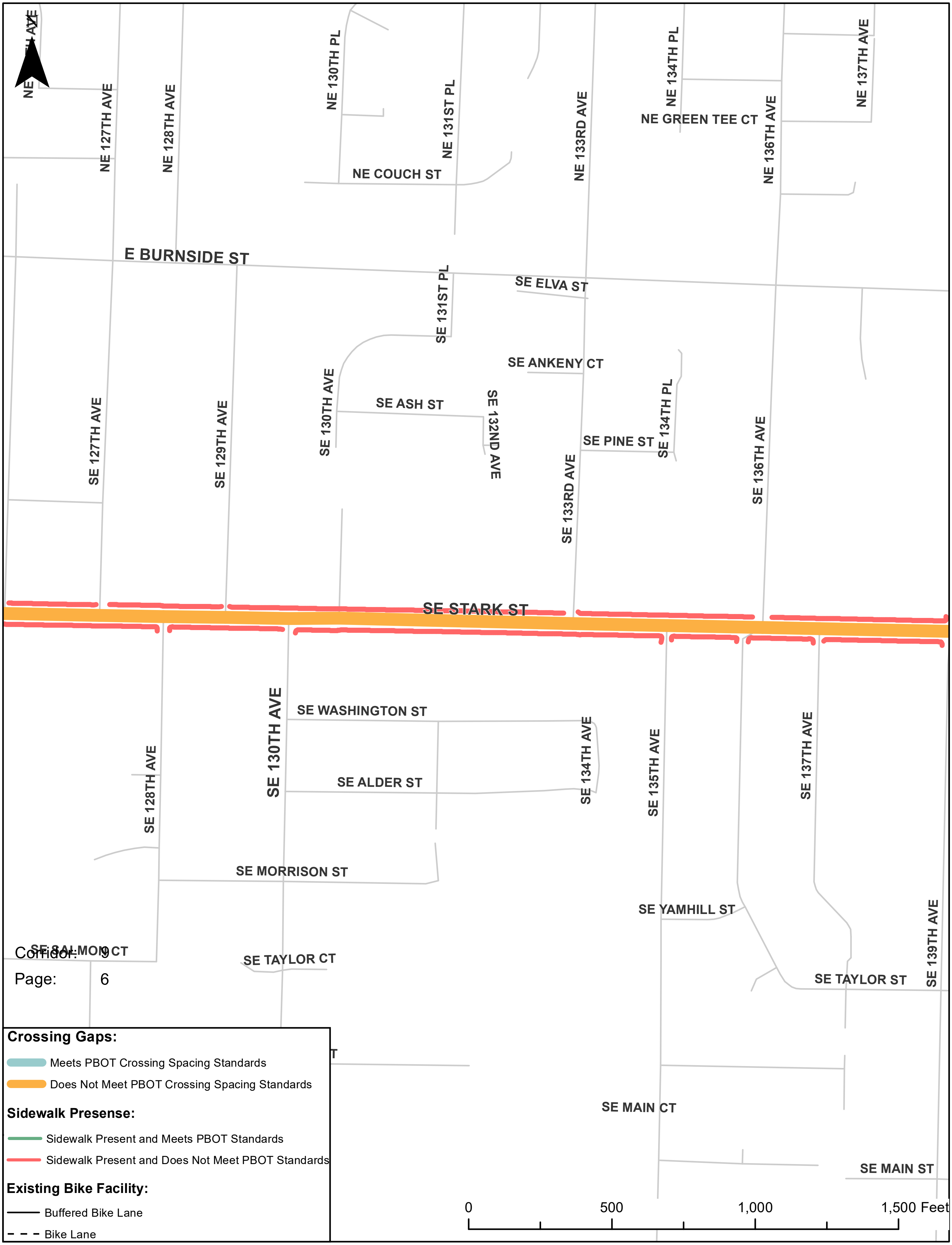
Existing Bike Facility:
- Buffered Bike Lane
- Bike Lane



Corridor: 9
Page: 3


N
NE 108TH AVE
NE 109TH AVE
NE DAVIS ST
NE 113TH AVE
NE 114TH AVE
NE 116TH AVE
NE 113TH PL
E BURNSIDE ST
SE ANKENY ST
SE PINE CT
SE ASH CT
SE ASH ST
SE 108TH AVE
SE 109TH AVE
SE PINE ST
SE OAK ST
SE STARK ST
SE WASHINGTON ST
SE 111TH AVE
SE 114TH PL
SE ALDER ST
SE 117TH AVE
SE MORRISON ST
SE 112TH AVE
SE 113TH AVE
SE YAMHILL ST
SE TAYLOR ST
SE SALMON ST
Corridor: 9
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
NE EVERETT ST
NE 116TH AVE
NE DAVIS ST
NE COUCH ST
NE 120TH AVE
NE 122ND AVE
NE 125TH AVE
NE 126TH AVE
NE 127TH AVE
NE 128TH AVE
E BURNSIDE ST
SE ANKENY ST
SE 119TH AVE
SE ASH ST
SE 124TH AVE
SE PINE ST
SE 126TH AVE
SE 127TH AVE
SE OAK ST
SE STARK ST
SE WASHINGTON ST
SE ALDER ST
SE MORRISON ST
SE 128TH AVE
SE YAMHILL ST
SE 122ND AVE
Corridor: 9
Page: 5
SE TAYLOR ST
SE SALMON CT
SE 123RD AVE
SE SALMON ST
SE 120TH AVE
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet



Corridor: 9

Page: 6

Crossing Gaps:

Meets PBOT Crossing Spacing Standards

Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:

Sidewalk Present and Meets PBOT Standards

Sidewalk Present and Does Not Meet PBOT Standards

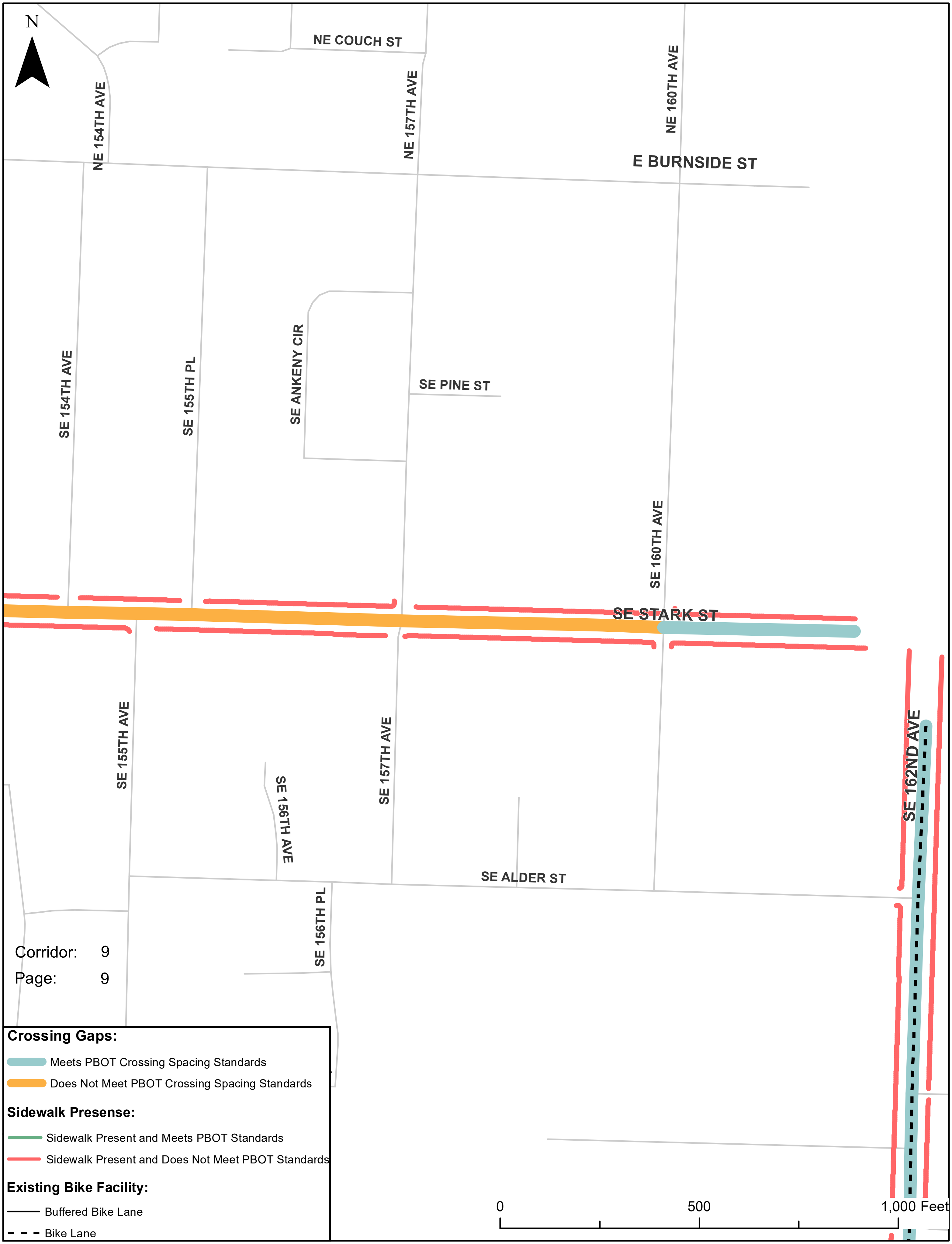
Existing Bike Facility:

Buffered Bike Lane

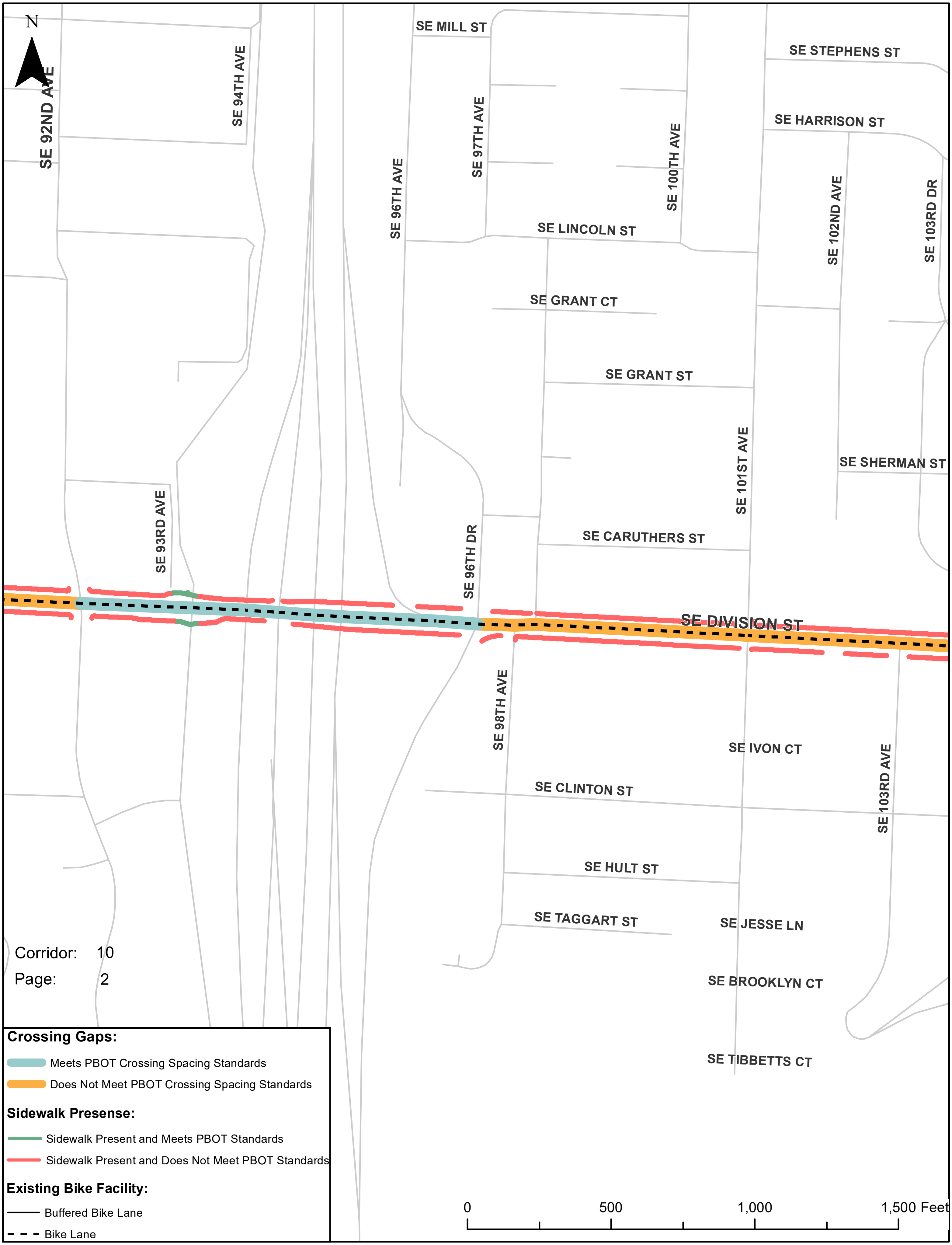
Bike Lane


N
NE DAVIS CT
NE COUCH ST
NE EVERETT ST
NE 136TH AVE
NE 139TH AVE
NE 140TH AVE
NE 141ST AVE
NE 143RD AVE
NE 146TH AVE
NE 147TH AVE
E BURNSIDE ST
SE PINE CT
SE 146TH AVE
SE OAK CT
SE OAK ST
SE STARK ST
SE 140TH PL
SE 137TH AVE
SE ALDER ST
SE ALDER CT
SE 141ST AVE
SE 143RD AVE
SE MORRISON ST
SE 142ND AVE
SE 139TH AVE
SE YAMHILL ST
Corridor: 9
SE TAYLOR ST
Page: 7
SE TAYLOR CT
SE 148TH AVE
SE 147TH AVE
SE 144TH AVE
SE SALMON ST
SE MAIN ST
SE MADISON ST
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane

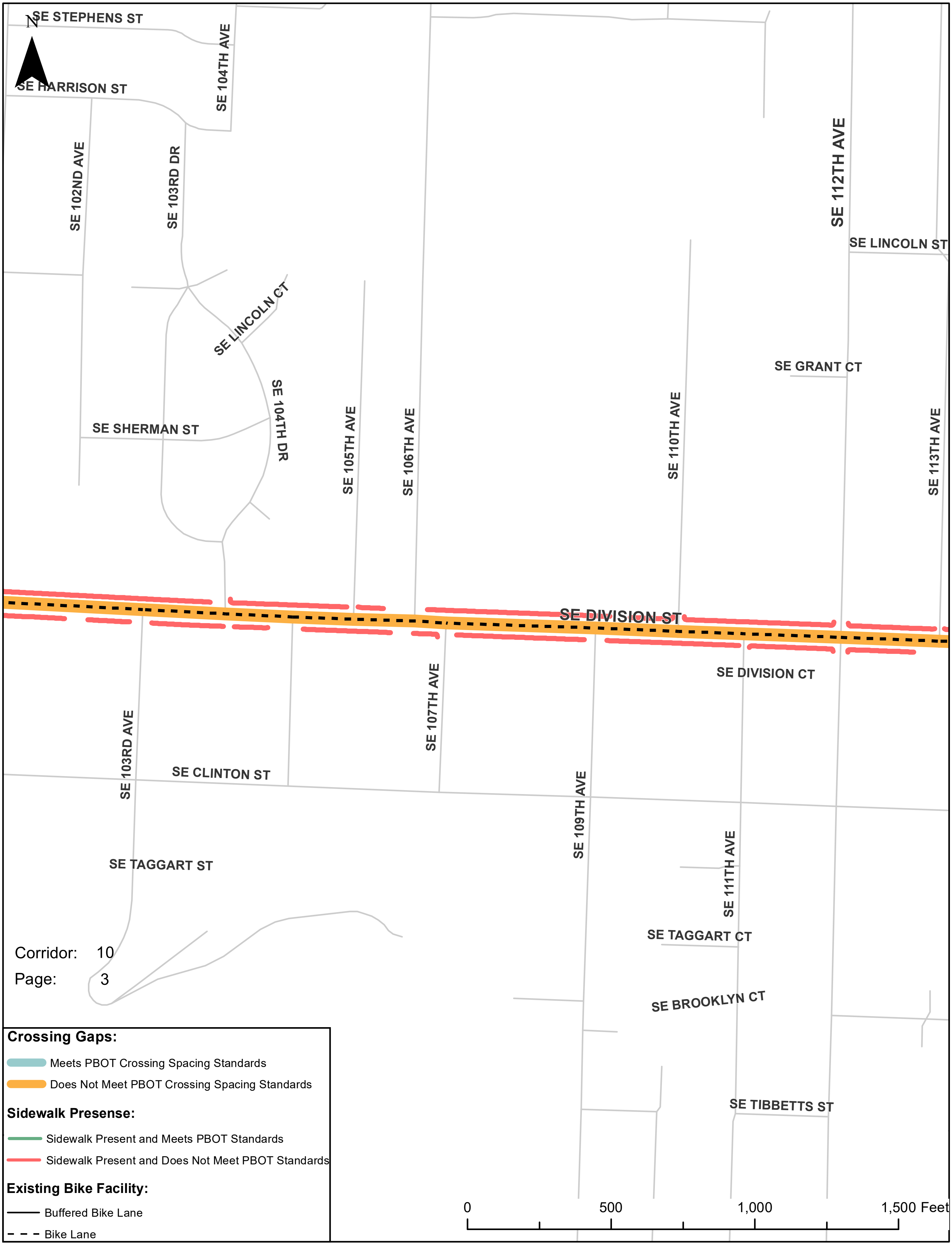

N
NE 147TH AVE
NE 148TH AVE
NE 151ST AVE
NE 154TH AVE
E BURNSIDE ST
SE 148TH AVE
SE PINE CT
SE 154TH AVE
SE STARK ST
SE 153RD AVE
SE 155TH AVE
SE ALDER CT
SE 151ST AVE
SE 149TH PL
SE YAMHILL ST
Corridor: 9
Page: 8
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
NE COUCH ST
NE 154TH AVE
NE 157TH AVE
NE 160TH AVE
E BURNSIDE ST
SE 154TH AVE
SE 155TH PL
SE ANKENY CIR
SE PINE ST
SE 160TH AVE
SE STARK ST
SE 155TH AVE
SE 156TH AVE
SE 157TH AVE
SE 162ND AVE
SE ALDER ST
SE 156TH PL
Corridor: 9
Page: 9
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet

N
SE MILL ST
SE STEPHENS ST
SE 92ND AVE
SE HARRISON ST
SE 88TH AVE
SE LINCOLN CT
SE LINCOLN ST
SE 82ND AVE
SE GRANT CT
SE 89TH AVE
SE 90TH AVE
SE CARUTHERS ST
SE 83RD AVE
SE 93RD AVE
SE DIVISION ST
SE 84TH AVE
SE 85TH AVE
SE CLINTON ST
SE TAGGART ST
SE 87TH AVE
Corridor: 10
Page: 1
OKLYN ST
SE VICTOR LN
SE 90TH PL
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

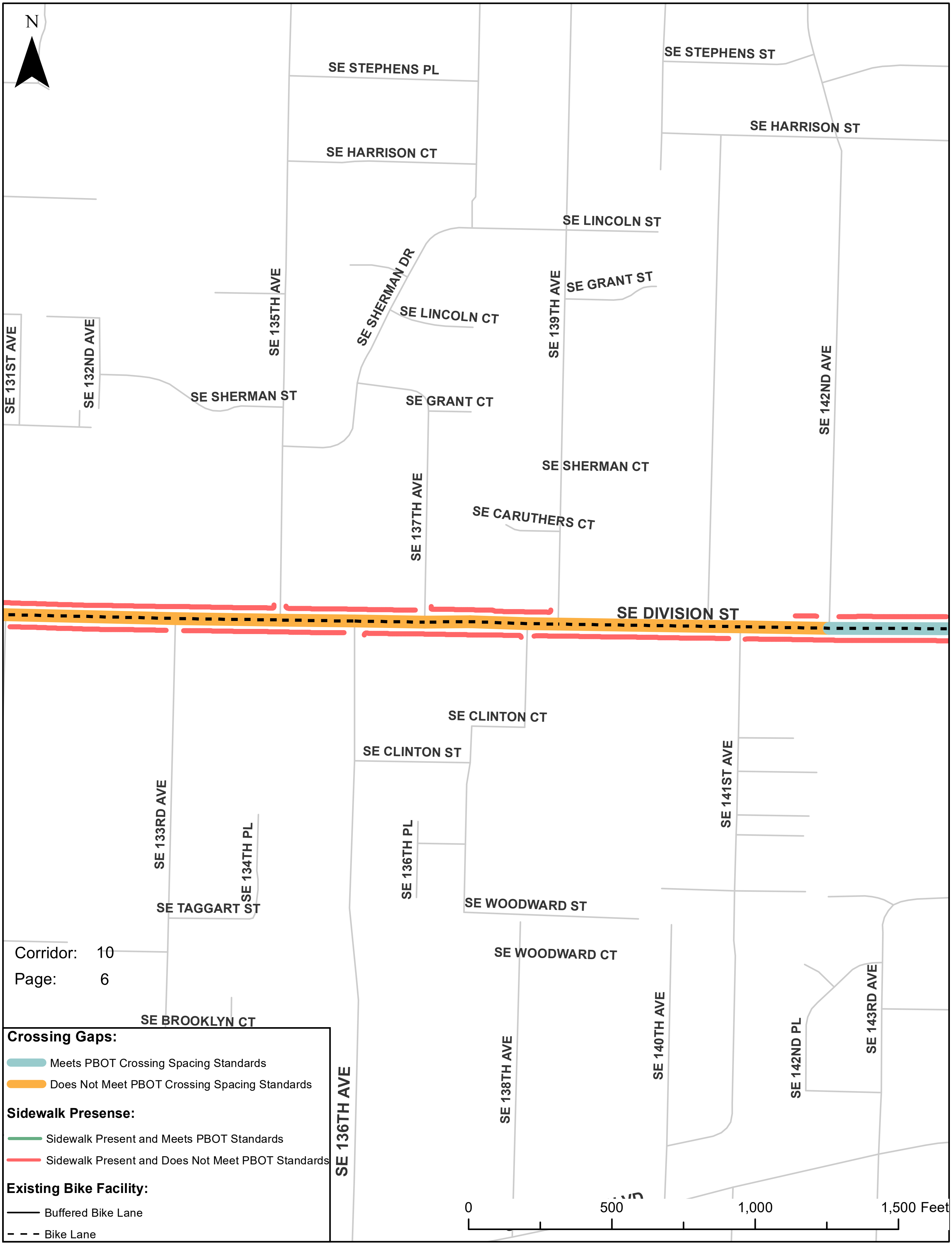


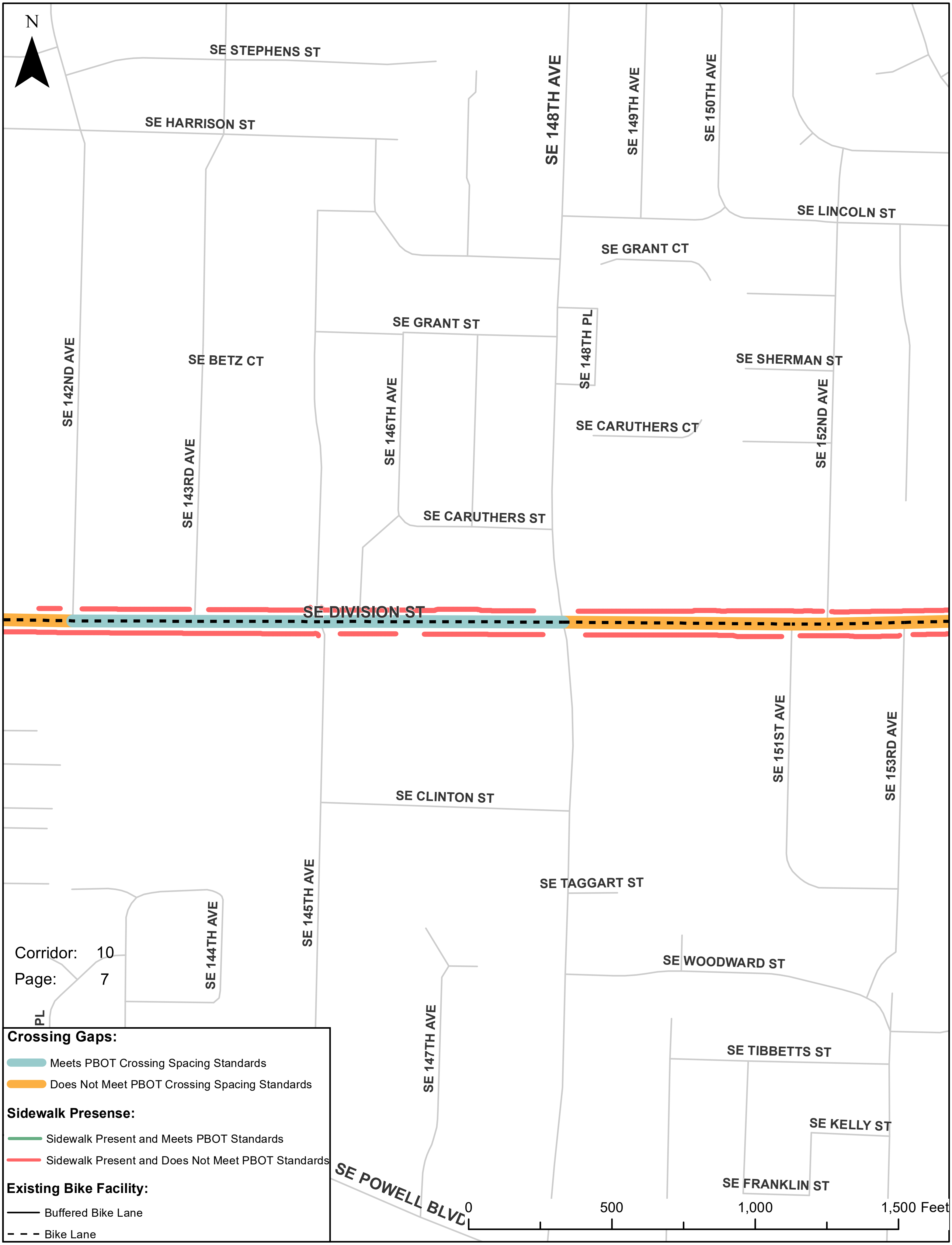
N
SE MILL ST
SE STEPHENS ST
SE HARRISON ST
SE 92ND AVE
SE 94TH AVE
SE 96TH AVE
SE 97TH AVE
SE 100TH AVE
SE 102ND AVE
SE 103RD DR
SE LINCOLN ST
SE GRANT CT
SE GRANT ST
SE 101ST AVE
SE SHERMAN ST
SE CARUTHERS ST
SE 93RD AVE
SE 96TH DR
SE DIVISION ST
SE 98TH AVE
SE IVON CT
SE 103RD AVE
SE CLINTON ST
SE HULT ST
SE TAGGART ST
SE JESSE LN
SE BROOKLYN CT
SE TIBBETTS CT
Corridor: 10
Page: 2
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
SE STEPHENS ST
SE HARRISON ST
SE 104TH AVE
SE 102ND AVE
SE 103RD DR
SE 112TH AVE
SE LINCOLN ST
SE LINCOLN CT
SE 104TH DR
SE 105TH AVE
SE 106TH AVE
SE 110TH AVE
SE GRANT CT
SE 113TH AVE
SE SHERMAN ST
SE DIVISION ST
SE DIVISION CT
SE 103RD AVE
SE 107TH AVE
SE CLINTON ST
SE 109TH AVE
SE TAGGART ST
SE 111TH AVE
SE TAGGART CT
SE BROOKLYN CT
SE TIBBETTS ST
Corridor: 10
Page: 3
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
SE STEPHENS ST
SE HARRISON ST
SE 115TH PL
SE 117TH AVE
SE LINCOLN ST
SE 114TH PL
SE LINCOLN CT
SE GRANT CT
SE 113TH AVE
SE GRANT ST
SE SHERMAN CT
SE 121ST AVE
SE DIVISION ST
SE 112TH AVE
SE CLINTON CT
SE CLINTON ST
SE 122ND AVE
SE 115TH AVE
SE 118TH AVE
SE 119TH AVE
SE 120TH AVE
SE WOODWARD PL
Corridor: 10
Page: 4
SE BROOKLYN ST
SE HANNAH LN
SE 116TH AVE
SE KELLY ST
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet

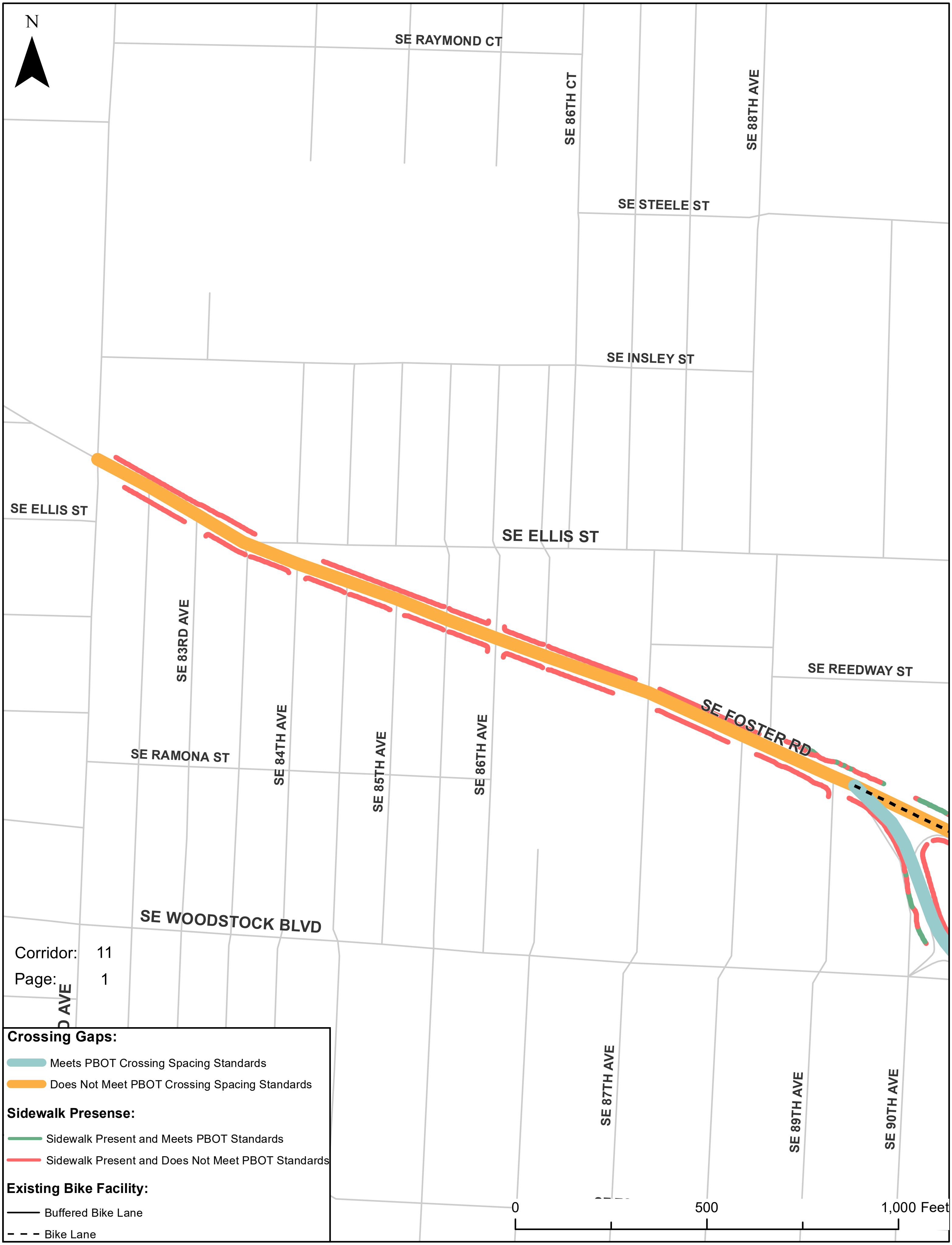

N
SE STEPHENS ST
SE HARRISON ST
SE LINCOLN ST
SE 126TH PL
SE LINCOLN CT
SE 130TH AVE
SE GRANT ST
SE 132ND AVE
SE SHERMAN ST
SE TESSA ST
SE 124TH AVE
SE DIVISION ST
SE IVON CT
SE 125TH AVE
SE CLINTON CT
SE 129TH AVE
SE 131ST AVE
SE 133RD AVE
SE TAGGART ST
SE 127TH AVE
SE WOODWARD ST
SE 130TH AVE
SE 122ND AVE
Corridor: 10
Page: 5
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
SE KELLY CT
0
500
1,000
1,500 Feet


N
SE STEPHENS PL
SE STEPHENS ST
SE HARRISON CT
SE HARRISON ST
SE LINCOLN ST
SE GRANT ST
SE SHERMAN DR
SE LINCOLN CT
SE 131ST AVE
SE 132ND AVE
SE 135TH AVE
SE 139TH AVE
SE 142ND AVE
SE SHERMAN ST
SE GRANT CT
SE SHERMAN CT
SE 137TH AVE
SE CARUTHERS CT
SE DIVISION ST
SE CLINTON CT
SE CLINTON ST
SE 133RD AVE
SE 134TH PL
SE 136TH PL
SE 141ST AVE
SE TAGGART ST
SE WOODWARD ST
SE WOODWARD CT
SE BROOKLYN CT
SE 136TH AVE
SE 138TH AVE
SE 140TH AVE
SE 142ND PL
SE 143RD AVE
Corridor: 10
Page: 6
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
SE STEPHENS ST
SE HARRISON ST
SE 148TH AVE
SE 149TH AVE
SE 150TH AVE
SE LINCOLN ST
SE GRANT CT
SE GRANT ST
SE 148TH PL
SE BETZ CT
SE SHERMAN ST
SE 142ND AVE
SE 146TH AVE
SE CARUTHERS CT
SE 152ND AVE
SE 143RD AVE
SE CARUTHERS ST
SE DIVISION ST
SE 151ST AVE
SE 153RD AVE
SE CLINTON ST
SE 145TH AVE
SE TAGGART ST
SE 144TH AVE
SE WOODWARD ST
PL
SE 147TH AVE
SE TIBBETTS ST
SE KELLY ST
SE FRANKLIN ST
SE POWELL BLVD
0
500
1,000
1,500 Feet
Corridor: 10
Page: 7
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
SE MILLMAIN DR
SE STEPHENS CT
SE 157TH DR
SE MILL ST
SE 155TH PL
SE HARRISON ST
SE STEPHENS ST
SE LORA ST
SE 161ST AVE
SE LINCOLN ST
SE 161ST CT
SE 155TH AVE
SE 156TH AVE
SE 154TH AVE
SE GRANT ST
SE 158TH AVE
SE 152ND AVE
SE 157TH AVE
SE SHERMAN ST
SE CARUTHERS ST
SE DIVISION ST
SE 151ST AVE
SE 153RD AVE
SE 160TH AVE
SE 164TH AVE
SE CLINTON ST
SE CLINTON CT
SE TAGGART ST
SE 159TH AVE
SE WOODWARD ST
SE WOODWARD CT
SE BROOKLYN ST
SE 162ND AVE
SE TIBBETTS ST
SE KELLY ST
Corridor: 10
Page: 8
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500
2,000 Feet

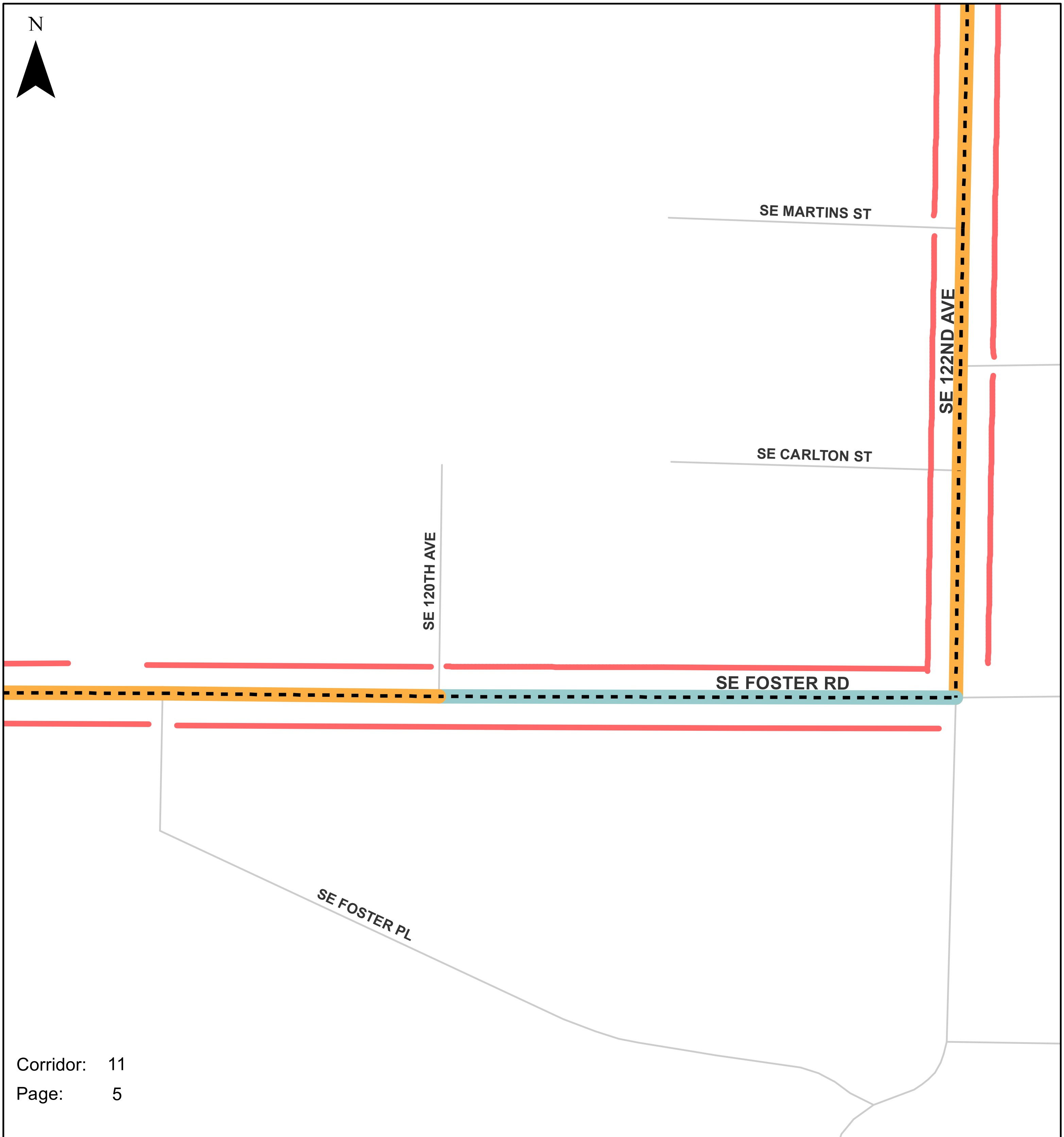

N
SE MILL ST
SE STEPHENS CT
SE 169TH AVE
SE MILL CT
SE STEPHENS ST
SE HARRISON ST
SE EMMERT CT
SE LINCOLN ST
SE LINCOLN CT
SE GRANT ST
SE 162ND AVE
SE 166TH PL
SE 171ST AVE
SE SHERMAN ST
SE 174TH AVE
SE DIVISION ST
SE IVON ST
SE 164TH AVE
SE JULIANO CT
SE JULIE PL
SE 165TH AVE
SE CLINTON ST
SE 168TH AVE
SE 170TH AVE
SE EZGOIN LN
SE TAGGART ST
SE WOODWARD ST
SE WOODWARD CT
Corridor: 10
SE BROOKLYN ST
Page: 9
SE TIBBETTS ST
SE 171ST DR
SE RAJESSA CT
SE 166TH AVE
SE 167TH AVE
SE KELLY ST
SE FRANKLIN CT
0
500
1,000
1,500
2,000 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
SE RAYMOND CT
SE 86TH CT
SE 88TH AVE
SE STEELE ST
SE INSLEY ST
SE ELLIS ST
SE ELLIS ST
SE 83RD AVE
SE 84TH AVE
SE 85TH AVE
SE 86TH AVE
SE RAMONA ST
SE FOSTER RD
SE REEDWAY ST
SE WOODSTOCK BLVD
SE 87TH AVE
SE 89TH AVE
SE 90TH AVE
Corridor: 11
Page: 1
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000 Feet


N
SE STEELE ST
SE INSLEY ST
SE 100TH AVE
SE HAROLD ST
SE ELLIS ST
SE ELLIS ST
SE 88TH AVE
SE 97TH AVE
SE REEDWAY ST
SE 99TH AVE
SE RAMONA ST
SE KNIGHT ST
SE 98TH AVE
SE YUKON ST
SE FOSTER RD
SE 91ST AVE
SE 92ND AVE
SE WOODSTOCK BLVD
SE WOODSTOCK BLVD
SE 89TH AVE
SE TOLMAN ST
SE 96TH PL
SE WOODSTOCK CT
SE 90TH AVE
SE HENRY ST
Corridor: 11
Page: 2
SE DUKE ST
SE 93RD AVE
SE 94TH AVE
SE 96TH AVE
GLENWOOD S
0
500
1,000
1,500 Feet
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane


N
SE ELLIS ST
SE REEDWAY ST
SE RAMONA ST
SE KNIGHT ST
SE YUKON ST
SE MARTINS ST
SE HENRY ST
SE WOODSTOCK CT
SE FOSTER RD
SE WOODSTOCK BLVD
SE DUKE ST
SE COOPER ST
SE 98TH AVE
SE 99TH AVE
SE 101ST AVE
SE 102ND AVE
SE 103RD AVE
SE 104TH AVE
SE 108TH AVE
SE 109TH AVE
Corridor: 11
Page: 3
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet


N
SE 111TH AVE
SE FOSTER RD
SE FOSTER PL
SE 110TH DR
SE 114TH AVE
SE 115TH AVE
SE 115TH PL
SE COOPER ST
SE BROOKSIDE DR
108TH AVE
SE 116TH AVE
SE 117TH PL
SE 112TH AVE
SE OGDEN ST
SE 118TH DR
Corridor: 11
Page: 4
Crossing Gaps:
Meets PBOT Crossing Spacing Standards
Does Not Meet PBOT Crossing Spacing Standards
Sidewalk Presense:
Sidewalk Present and Meets PBOT Standards
Sidewalk Present and Does Not Meet PBOT Standards
Existing Bike Facility:
Buffered Bike Lane
Bike Lane
0
500
1,000
1,500 Feet



Corridor: 11

Page: 5

Crossing Gaps:

- Meets PBOT Crossing Spacing Standards
- Does Not Meet PBOT Crossing Spacing Standards

Sidewalk Presense:

- Sidewalk Present and Meets PBOT Standards
- Sidewalk Present and Does Not Meet PBOT Standards

Existing Bike Facility:

- Buffered Bike Lane
- Bike Lane

EPASS

APPENDIX B

PREVIOUS EAST PORTLAND PUBLIC INPUT

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION

PBOT
PORTLAND BUREAU OF TRANSPORTATION
1120 SW Fifth Avenue, Suite 800 Portland, OR 97204 503.823.5185
Fax 503.823.7576 TTY 503.823.6868 www.portlandoregon.gov/transportation
Chloe Eudaly Commissioner **Chris Warner** Interim Director

EAST PORTLAND ARTERIAL STREETS STRATEGY MEMO #1

Date: February 8, 2019

To: PBOT and Consultant EPASS Staff

From: Mimi Phillips and Steve Szigethy on behalf of the PBOT EPASS Team

Subject: Past public input pertaining to East Portland arterial streets

---

Before undertaking a comprehensive strategy and public outreach effort focused on East Portland's arterial streets, the EPASS project team thought it would be appropriate to review the wealth of public input that has been gathered over the past decade during community involvement efforts for plans and projects. The project team hoped to identify recurring themes heard during these processes and to subsequently share and validate these themes with the 2019 East Portland community. These themes will help inform concepts developed as part of EPASS.

This memo summarizes past public input from a variety of planning, design, and capital projects undertaken over the past ten (10) years in East Portland. Comments were gathered for projects through open houses, online feedback forms, workshops, public meetings, as well as letters and emails submitted to project managers. Common themes gleaned from these projects are summarized at the front of this memo, followed by more detailed, project-specific feedback from the following 14 projects:

- 82nd Avenue of Roses High Crash Corridor Plan (2008)
- East Portland In Motion (2012)
- Vision Zero Action Plan (2016)
- Growing Transit Communities (2017)
- Bloom Report (2018)
- Transportation Systems Plan (TSP) Update (2018)
- Enhanced Transit Corridors (2018)
- PedPDX (In progress)
- "Walking While Black" Focus Groups (2017)
- 122nd Avenue Safety Project (In progress)
- 102nd Avenue Safety Project (In progress)
- Outer Division Multi-Modal Safety Project (In progress)
- East Glisan Street Update (In progress)
- 162nd Avenue Safety and Access to Transit Project (In progress)
- Stark Human-Centered Design Piot (2018)
- EPASS (In progress)

Summary of Common Themes

Different public outreach methods were used for each of the East Portland projects to gather local commentary. These methods included workshops, open houses, online surveys, online and paper feedback forms, presentations at standing neighborhood and business association meetings, educational outreach and trainings, door-to-door information sharing, project office hours, testimony before council, and the collection of letters and emails by project managers. Important to note while reading this section is that individual PBOT projects rarely have the resources to perform public opinion surveys of a statistically significant representative sample of the local population. Despite concerted efforts such as working with capacity building groups that organize underrepresented populations, PBOT continues to hear from a disproportionately white, older and homeowning population in East Portland.

Overall, planners and project managers generally perceived residents to be open to the participation process and in support of improved conditions. Support for projects varied somewhat, but overall public comment was generally positive towards the studied projects.[1] Support was particularly variant depending on the stage that the project was in (early planning vs design and construction). Support also varied strongly based on the type of design being implemented. Projects seemed to accumulate more negative feedback once designs materialized and people perceived that there may be interruptions to their travel routines. Additionally, project managers and planners received more negative comments if a project implemented a new design that residents believed would permanently lengthen their commute times. Several themes remained constant throughout all the examined outreach efforts. Generally, these themes can be characterized under the realm of either safety, congestion, or both. The main areas of concern presented by community members (in no particular order) are described below:

Safe Crossings – The difficulty and danger of crossing multi-lane arterials on foot or mobility device was a concern brought up for every project on such streets. Additional frequency and visibility of crossings - especially near schools and parks - was generally desired. While concerns generally focused on "uncontrolled" locations where people must cross to reach a bus stop or other destination, there were also comments about challenges crossing at fully signalized intersections, even with a walk signal and legal right-of-way. Conversely, some lamented that people sometimes will cross at an uncontrolled location even if there is an enhanced crossing a short distance away, or that some people wear dark clothing at night.

Speeding – Speeding was a commonly raised issue, particularly during off-peak hours on larger arterials. Streets with lower density of land uses, such as Halsey and Glisan near Glendoveer Golf Course, were mentioned as particular speeding problems.

Sidewalk Improvements and Infill – East Portland residents experience a large proportion of streets with substandard, narrow, or missing sidewalks. Input early in

[1] East Glisan Street Update is the one project that has received a majority of negative feedback. The reasons for this will be examined in section II. b.

the 2010s leaned toward maximizing the length of sidewalk infill along arterials, even if that meant building curb-tight sidewalks with no planter strip. More recent feedback has focused on the need to build better, wider sidewalks that meet city standards and are not obstructed by utility poles and other obstacles. This concern ties in with the safety and modal separation desires mentioned concurrently during multiple outreach efforts.

Street Lighting – A top safety concern mentioned during multiple processes is deficient street lighting on East Portland arterials. Most East Portland arterials have street lights mounted on utility poles on just one side of the street. People have communicated that walking and accessing transit during the dark hours feels dangerous when only one side of the street is lit, and that even these lights do not provide adequate illumination levels for pedestrians crossing or walking along the street. These lighting concerns apply not just to traffic safety (fear of being hit by a car), but also personal safety (fear of being assaulted). Furthermore, focus groups and surveys revealed that deficient street lighting is a top barrier to walking for Black Portlanders, compared to citywide responses that rate this concern lower.

Enforcement – East Portland residents seemed to generally feel that they do not receive an equal amount of speed and other traffic violation enforcement on their arterial streets compared to other parts of Portland. Though vehicular speeding was a major theme, unsafe behavior by pedestrians was also raised as a common concern across the various projects and enforcement of safe crossing practices was also desired. At the same time, there were concerns about racial profiling in the enforcement of traffic laws for both people driving and walking. Separately, accounts of drunk drivers hitting and demolishing infrastructure such as signal poles and bus shelters were often heard.

Modal Separation – Residents were generally more favorable towards designs that separated modes, such as neighborhood greenways and off-street paths for cyclists rather than integrated bike lanes on arterial streets. This preference was strong even in the case of barrier protected bike lanes. Off-street paths, however, have faced increased scrutiny in the wake of the homelessness crisis due to camping.

Congestion – Residents preferred design alternatives that they did not believe would hinder commute times. Community members were concerned about current congestion on arterial streets, particularly during peak travel times. Road reconfigurations that involved reducing traffic lanes were generally not as well received as projects that used other design features to improve safety and calm traffic. People often asked how the city can reduce traffic lanes when population and jobs continue to grow.

Access to Transit - A common concern was that residents in East Portland don't feel that they have a viable alternative to driving. Design options that paired with improved access to transit and more frequent transit service were highly favored and increased positive responses to road reorganization.

Traffic Diversion– Residents of East Portland were concerned about residential streets being used as cut-throughs during peak travel times. Many people commented on the side streets near arterials currently being unsafe as drivers often speed through them to avoid traffic during morning and evening rushes. Concern that this problem will persist and perhaps increase with growing congestion was raised multiple times on each of the projects, particularly when a road reconfiguration was considered. Speed enforcement, traffic calming, and limited access to residential streets were favored as design interventions.

Less Support for Bicycle Infrastructure – On nearly every capital project that proposed to add or enhance bike lanes, project managers heard anecdotal sentiments that "the only people that bike in East Portland are homeless or collecting cans, etc." and that project designs are prioritizing a travel mode – cycling – that is sparsely used in East Portland. While this is a gross generalization, public surveys (such as those for Glisan and 162nd) tended to follow a similar track, with bicycle improvements typically scoring as the least desired improvements, particularly if they take away space from vehicle travel or parking. Other comments included that "there is nothing to bike too," or "my job is too far away to bike." Support for better bicycle facilities is not totally absent, however. Longtime East Portland cycling advocates, along with new residents that previously lived in neighborhoods closer to downtown Portland, tended to support increased investments in bikeways in east Portland. As mentioned above under modal separation, neighborhood greenways and off-street paths tended to be supported to a greater degree than arterial bike lanes.

Public Comments for Individual Projects

82nd Avenue of Roses High Crash Corridor Plan (2008)

This plan covered a seven-mile section of 82nd Ave, which had been designated as one of Portland's most dangerous streets, particularly for pedestrians. The key project goal was to create an action plan that could reduce fatalities and injuries along the corridor.

Summary of Outreach Methods Used: The public involvement process for this project included three open houses, a safety survey distributed in both paper and electronic form, the formation of a CAC (Citizens Advisory Committee) and TAC (Technical advisory committee), and frequent communication with neighborhood association and district coalition members.

Themes: The major issues raised by community members regarding this project were safety related. The top concerns voiced by the community were pedestrian safety, followed by vehicles speeding, pedestrians jaywalking, and excessive traffic and congestion. Other recurring comments regarding the street focused on vehicle traffic violations and unsafe interaction between transit modes. When asked what treatments they would like to see to address these issues, the most popular responses were speed reduction devices and enforcement and enhancements for pedestrian safety (pedestrian islands, curb extensions, more frequent crossings, etc.).

East Portland in Motion (2012)

East Portland in Motion is a five-year implementation strategy for active transportation projects and programs east of 82nd Avenue in East Portland.

Summary of Outreach Methods Used: Public involvement efforts for East Portland in Motion included collaboration with neighborhood groups, staffed "stations" at community events engaging with community members and voting on locations for sidewalk projects, interviews with community members and groups of typically underrepresented populations conducted by Portland State University Master of Urban and Regional Planning (MURP) students, a travel survey conducted through a local mailing by MURP students, presentations and feedback received from stakeholder advisory groups, and through feedback received via the project website.

Themes: Community feedback prioritized safety (particularly for children), improving transit and access to transit, preference of greenways over bike lanes, and a strong desire for basic infrastructure (street maintenance and pot hole repair, safer crossings on busy streets and improved signals and sidewalks on busy streets). It was also noted that minority and lower income populations prioritized active transportation improvements (safer crossings and sidewalks on busy streets, sidewalks that access transit and neighborhood greenways), while white and upper-income populations prioritized pothole repair and signal timing. EPIM feedback also resulted in PBOT's early 2010s strategy of completing more miles of less-expensive curb-tight sidewalk on arterials, rather than fewer miles of new-construction sidewalk with storm water facilities and planter strips.

Vision Zero Action Plan (2016)

The Vision Zero Action Plan sets a goal of eliminating all traffic deaths and serious injuries by 2025.

Summary of Outreach Methods Used: Public comments for this project were gained from an online survey, as well as both one-on-one interviews and an interactive wall at public events including a Town Hall Listening Session, Portland Safe Streets Fair, Good in the Hood, and Rosewood National Night Out.

Themes: Community members were concerned with safety and accessibility, particularly for pedestrians. Bicycle safety and visibility was also mentioned frequently in survey comments, along with improving transit options. Common treatments included a desire for infrastructure changes including lower speed limits, safer crossings, traffic calming, and improved sidewalks and wheelchair access, along with narrowing of streets. Enforcement and education were also common solutions mentioned by residents. Comments regarding East Portland had particular emphasis on improved and more frequent pedestrian crossings.

Growing Transit Communities (2017)

This plan is an effort to identify and prioritize the most beneficial improvements that would make getting to the bus and using the bus a safer and more convenient option along corridors in East Portland.

Summary of Outreach Methods Used: Public outreach consisted of a physical and virtual open house, an online survey, a community walk, several visits to community organizations and neighborhood associations, and regular meetings with a Community Advisory Group with community members from the selected corridors.

Themes: Public outreach efforts for this project were focused on gleaning values of the community and turning those into criteria for transit development and corridor selection. The three main criteria that planners found for corridor development in East Portland were transportation safety, improved access to transit, and equity (benefits for people of color, low income households, people with disabilities, etc.).

Bloom Report (2018)

PBOT partnered with Bloom Communications to gauge public attitudes and perceptions surrounding the work of the Bureau, with the purpose of improving PBOT's messaging and communications efforts. The research objects were to set a baseline measurement of attitudes towards the organization, discover top transportation priorities and issues of residents, and to gauge how current PBOT messages are being received.

Summary of Outreach Methods Used: Bloom Communications conducted an online regional poll of 1,000 Portland residents using a geographically and demographically representative sample of the city. They then conducted two in-person focus groups with a total of 17 Portland residents with demographic and geographic considerations. Responses and results of the focus group can be analyzed based on geographic location in the city.

Themes: Based on survey results, the top transportation priorities for residents were safety, congestion, and road maintenance. These priorities held true among East Portland respondents. In comparison to other areas of the city, however, East Portland residents more frequently worry about the safety of their children while traveling on Portland streets, and more residents responded that poor road conditions ore one of the worst parts of getting around Portland. In comparison to the rest of the city, East Portland also had higher rates of respondents saying that they drive every day, and that their trips consist of "always go[ing] to my place of employment." Finally, East Portland respondents placed pedestrian safety as a higher priority than most other areas of the city.

Transportation System Plan (TSP) Update (2018)

The TSP is the 20-year plan to guide transportation policies and investments in Portland.

Summary of Outreach Methods Used: The TSP Update involved a wide range of public outreach methods, working in conjunction with the Comprehensive Plan as well as the utilization of public engagement efforts gleaned from recently completed plans and projects. Public comment came from direct contact with planners, surveys, outreach events, testimony before council, and advisory committees.

Themes: The main themes from feedback for the TSP are well reflected in the overall feedback themes in the summary section of this report. Community members greatest priorities and preference in street design included flexibility to cater to the needs of different areas (for instance, prioritizing sidewalk infill over bicycle infrastructure, allowing for curb tight sidewalks to get more sidewalk miles in areas with lack of access for pedestrians), safe crossings of main streets, as well as concern over cut through traffic on residential streets. Although comments were gathered from the City of Portland as a whole, a specific concern raised in the TSP outreach was displacement vulnerability in East Portland because of street updates and new design implementation.

Enhanced Transit Corridors (2018)

This plan - lead by PBOT staff in collaboration with TriMet - identifies a new vision for frequent, reliable, high-ridership transit and how we can achieve it in Portland.

Summary of Outreach Methods Used: The project team sought stakeholder comments through public open houses, online surveys, reaching out to community members waiting at bus stops, commission briefings, and visits to stakeholder groups and committees.

Themes: Public input on this project largely fell in line with the themes found throughout all the East Portland projects. In general, East Portland community members prioritized safety highest among their concerns, followed by congestion concerns and predictability of transit (particularly during peak periods), and equitable access. Residents highly favored individual analysis of locations to select the best design treatments over broad policy implementations, but generally favored separation of travel modes for improved safety and predictability on intermodal interactions.

PedPDX (In progress)

PedPDX is Portland's citywide pedestrian plan. It aims to identify key strategies and tools to make walking safer and more comfortable across the city, and to make Portland a truly great walking city.

Summary of Outreach Methods Used: PedPDX utilized a variety of public outreach methods, including an online survey and public outreach events. Targeted outreach allowed PedPDX to gain significant input from East Portland residents. Area specific community input was collected in their *Walking Priorities* survey, which will be utilized to apply themes found in the survey to EPASS.

Themes: In East Portland sidewalks/walking paths missing on BUSY streets was the highest rated impediment to walking. The next two highest ratings for impediments to walking in East Portland were people driving too fast on Residential streets, followed by there not being enough places to cross busy streets. East Portland residents reported that they felt the most important places to improve walking conditions were areas that serve people who need to rely on walking the most, followed by streets where people walking have been killed or injured, school connections and streets connecting people to transit/bus stops. Additionally, in an open-ended question asking which places were most important to improve walking in Portland, various locations in East Portland arose as an overall theme from respondents' city wide.

"Walking While Black" Focus Groups (2017)

As part of the PedPDX public involvement process, PBOT held two focus groups to elevate and better understand the walking experiences of communities of color, particularly Black Portlanders. This more intentional effort stemmed from an underrepresentation of survey responses from communities of color and the critical need to understand the unique challenges faced by people of color, and specifically Black Portlanders, walking in Portland.

Summary of Outreach Methods Used: PBOT organized and facilitated two focus group events held in November 2017, one each at the June Key Delta House in North Portland and at the Immigrant & Refugee Community Organization (IRCO) Africa House on NE Glisan Street in East Portland. Approximately 50 registrants attended, representing a broad cross section of the Black community, as indicated by age, gender, country of origin, education level, place of residence within Portland, and mode of transportation.

Themes: When asked the same questions that were asked citywide, the biggest difference revealed at the focus groups was the impact of poor lighting on city streets. Participants raised lighting as the top concern that makes walking difficult, followed by the lack of sidewalks on busy streets, people driving too fast on busy streets, and shortage of places to safely cross busy streets. The focus groups also revealed a general feeling of vulnerability in the everyday experience of traveling around Portland while Black, from microaggressions to profiling to racial slurs and attacks. There was also a recognition that pedestrian infrastructure, including safe access to transit, schools and shopping, is severely deficient in East Portland, where many members of the Black community are now living due in part to gentrification and displacement.

122nd Avenue Safety Project (In progress)

PBOT is developing a plan to identify improvements on 122nd Avenue, between SE Foster Road and NE Marine Drive. PBOT will consider changes to the street cross-section, additional enhanced crossings, lighting, signal changes and more to meet the following goals: Increase safety for all, improve pedestrian & bicycle access and support better transit while balancing needs of freight & other modes. Identify improvements to help eliminate serious injuries and fatalities and remove 122nd Ave from the Vision Zero High Crash Corridor network.

Summary of Outreach Methods Used: Community outreach strategies for this project have included a series of 'community sounding board' meetings, public open houses, targeted language-based outreach with the Community Engagement Liaison (CELs) program, tabling at local events, presentations to community organizations, surveys, maintaining the website, a public video, and email and social media updates. The public outreach process is ongoing, and the themes in the following section are taken from the summary report of Community Survey #1, which incorporated comments from over 1,000 participants.

Themes: Respondents to the survey identified what they considered to be the most important criteria for evaluating changes to 122nd Avenue as traffic impacts (including congestion and diversion to local streets) and safety. Following these top two priorities were pedestrian access and comfort, transit performance, and holistic improvements ranked at nearly the same level of importance, followed closely by equity investments. In an open commentary section of the survey, key themes that emerged as priorities were crossing safety, traffic and congestion, vehicle speed, and enforcement. Comments were split on the topic of roadway reorganization. Many survey participants worried that a reduction of lanes would increase congestion and cut-through traffic on residential streets. Alternatively, there were many respondents who were enthusiastic about creating a multi-modal boulevard including protected bikeways and transit-only or transit priority lanes and suggested obtaining the needed right of way through lane reduction or removal of underutilized parking.

NE 102nd Avenue Safety Project (In progress)

The NE 102nd Avenue Safety Project will improve safety for people walking, biking, taking transit, and driving on NE 102nd Avenue between Weidler Street and Sandy Boulevard. The project goals include reducing crashes, reducing vehicle speeds, improving pedestrian crossings and access to transit, and to create bicycle facilities that serve all ages and abilities. Reduction of vehicle lanes from five to three has been proposed.

Summary of Outreach Methods Used: Outreach methods used for this project have included several open houses, an online survey posted on the project website, and comments received by the project manager. This is an ongoing project and public outreach is still in process.

Themes: Community members have voiced concern over safety, particularly for pedestrians. Survey results from both the open houses and the online survey indicate that residents are concerned with speeding along this arterial and the lack of safe crossings. Support for this plan, however, is split. There is large support for safety improvements, but there is wavering support on design elements. While some community members favor a road reconfiguration for safety and speed reduction, many who commute through the neighborhood by car are not in favor of a lane reduction approach and voice stronger support for more enforcement, signage, and other traffic calming treatments. A final repeated concern is cut through traffic onto residential streets – this concern coming from both East Portland community members and echoed strongly by residents of The City of Maywood Park. Community members are concerned that this issue will increase if measures are not taken to limit access to side streets during peak periods, particularly if there is a lane reduction on the main arterial.

Outer Division Multimodal Safety Project (In progress)

Since 2009, the City of Portland has been working with the community on outer SE Division Street to develop projects that improve safety, including sidewalks, safer crossings and bike lanes. Safety for people walking is a special focus because outer Division is one of Portland's most deadly streets for walking. This project includes street improvements that have been proven to prevent crashes and save lives, most notably the installation of center medians.

Summary of Outreach Methods Used: Comments from community members for this project were gathered through two open houses (including surveys), business and community member surveys, open office hours for project design review, contacting local businesses through the employment of a "street team", business associations and neighborhood associations, project managers attending community events, and the formation of focus groups for community input.

Themes: Safety for pedestrians came out as a primary community concern, followed by safety for bicyclists and transit users. The community has shown enormous support for this project and its effort to enhance safety for all users. As has been a common theme with other East Portland projects, many respondents believe that enforcement should play a larger role in addressing safety concerns, both for vehicular traffic violations as well as pedestrian lawbreaking. A design element that garnished some community backlash was the center medians. Businesses shared concerns that freight deliveries would have a difficult time turning into their lots with the addition of medians and protected bike lanes to Division. Work between project management and the community to ensure safety for all modes while keeping businesses accessible for deliveries is ongoing.

East Glisan Street Update (In progress)

This project aims to achieve community and city council goals of improving street safety, providing multimodal options, and improving access to opportunity. The project covers NE Glisan Street from I-205 to NE 162nd Avenue and includes several elements such as new signalized pedestrian/bicycle crossings, protected bike lanes, and a five-to-three-lane road reorganization.

Summary of Outreach Methods Used: East Glisan Street Update has appeared at several open houses with opportunities for community comments, an online survey, and communications made directly to the project manager after a widespread mailing. Construction begins in spring 2019 and public involvement continues.

Themes: Safety was brought up as a concern for community members, with the main issues being speeding vehicles and safe crossings. While there are select very supportive community members of a road reconfiguration and reduction from five to three lanes, most of the public comments have not been supportive of this design alternative. Many comments focused on travel times and increased cut through traffic concerns, and favored increased enforcement of speed limits, improved signage, and safer crossings. Of note in the community comments was that Glisan is not a frequent transit corridor, and community members who submitted comments don't see alternative transit modes as a viable alternative to driving. Previous examined surveys have shown designs that improve transit, as well as modal separation, have been held in higher favor with community members. It is also of note that almost 90% of survey respondents self-identified as white/Caucasian, while statistically about half of the population in the project area identifies as people of color. Additionally, many of the comments received have come from commuters traveling from Gresham into Portland as opposed to community members living near East Glisan.

162nd Avenue Safety and Access to Transit

This project, funded in part with a Federal Transit Administration grant, will provide new enhanced pedestrian crossings to access the #74 bus line which began service in 2018. As part of the project, the cross section will be reduced from five vehicles lanes to three.

Summary of Outreach Methods Used: The project was introduced at a June 2018 multi-project open house held at the Rosewood Initiative. Design has just begun, and public involvement will continue throughout 2019, including coordination efforts with the Metro grant-funded Rosewood Equitable Development Plan.

Themes: Comments received at the open house included requests for sidewalk infill, safer crossings, and lighting improvements. Concerns were also raised regarding speeding and right turn on reds resulting in pedestrian and vehicle conflicts. There were split opinions regarding lane reconfiguration and congestion. A dot exercise with open house attendees revealed that the most popular proposed design element was lowering the speed limit, followed by improved street lighting and protected bike lanes.

Stark Human Centered Design (HCD) Pilot (2018)

This pilot program was performed in conjunction with the Multnomah Idea Lab, a partnership of Multnomah County and the Portland Bureau of Planning & Sustainability. The key goal of the pilot was to have PBOT staff experience HCD and to learn possible benefits of the process. When selecting the focus area of SE Stark St from 148th to 162nd Ave, the group wanted to identify issues along a high-crash corridor in a diverse and relatively underdeveloped neighborhood.

Summary of Outreach Methods Used: The HCD process included several iterations of interviews conducted with both community members and experts. Team members spent an afternoon at the focus area interviewing local constituents, as well as additional time spent with local experts such as a police officer, fire fighters, a local library administrator, and non-profit organization staff.

Themes: During the immersion interviews on SE Stark, community members were quick to tell stories of how drug use and accompanying crime made the area feel unsafe, especially at night. Many referenced local "hotspots", mostly bars, that attracted people who may participate in these activities. In addition, many pointed out that street lights only line the south side of SE Stark, leading to a lack of light on the north side. Both factors led people to say that they were afraid to go out at night or at all.

EPASS (In progress)

Early input for EPASS has come from meetings with the East Portland Acton Plan Technical Advisory Committee and the East Portland Land Use and Transportation Committee in the second half of 2018. Input from these committees emphasized considering displacement and affordable housing in the strategy, as well as access to jobs (particularly in non-downtown employment centers) and planning for growth both in East Portland and surrounding areas. The groups suggested consulting past plans and strong coordination with other city agencies, the Oregon Department of Transportation (ODOT) and community organizations. The committees felt strongly that community outreach efforts should strive to be transparent in their CAC selection process and emphasized the importance of the committees being specific to East Portland. The major concerns of the advisory groups for design efforts were safety - particularly at intersections and other crossings - and addressing substandard sidewalks (including narrow, obstacle filled, and missing sidewalks).

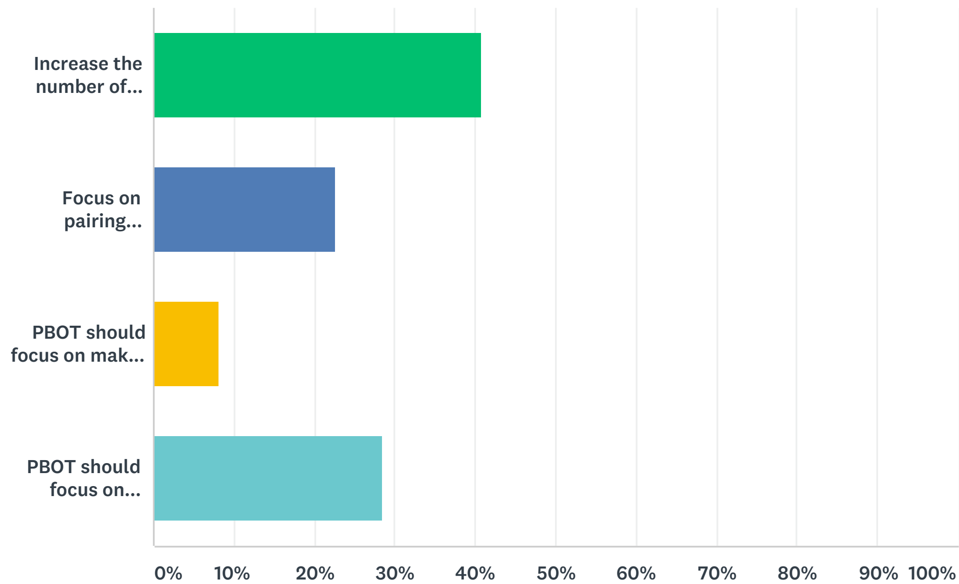
EPASS

APPENDIX C

QUESTIONNAIRE FINDINGS (PBOT'S QUESTIONS FOR EAST PORTLAND COMMUNITY)

Q1 Pedestrian Crossings East Portland arterial streets rank among the most dangerous for pedestrians, with a high number of injuries and fatalities compared to other roadways in the City. Please choose the approach that you would most like to see toward improving pedestrian safety.

Answered: 1,040 Skipped: 13

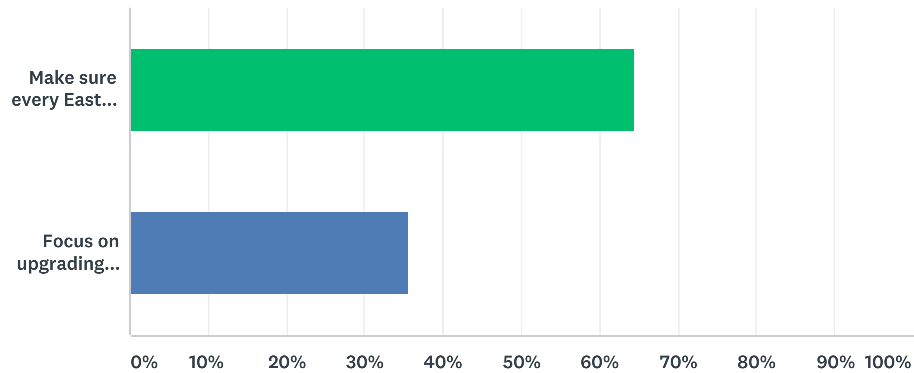


ANSWER CHOICES	RESPONSES	
Increase the number of pedestrian crossings on East Portland arterial streets so that there are more places to safely cross.	40.87%	425
Focus on pairing crossings only with traffic signals rather than using marked mid-block crosswalks, signs, or flashing yellow beacons.	22.60%	235
PBOT should focus on making the major intersections (like 122nd & Stark) safer for pedestrians to cross.	8.08%	84
PBOT should focus on pedestrian behavior such as crossing at crosswalks or carrying lights.	28.46%	296
TOTAL		1,040

East Portland Arterial Streets Strategy Opinion Survey

Q2 Sidewalk Improvements and InfillPBOT has added a lot of sidewalk on East Portland arterials over the past decade, but there are still some sidewalk gaps. We’ve heard that much of the existing sidewalks are too narrow and blocked by power poles or sign posts. Please choose where you think PBOT should focus its efforts.

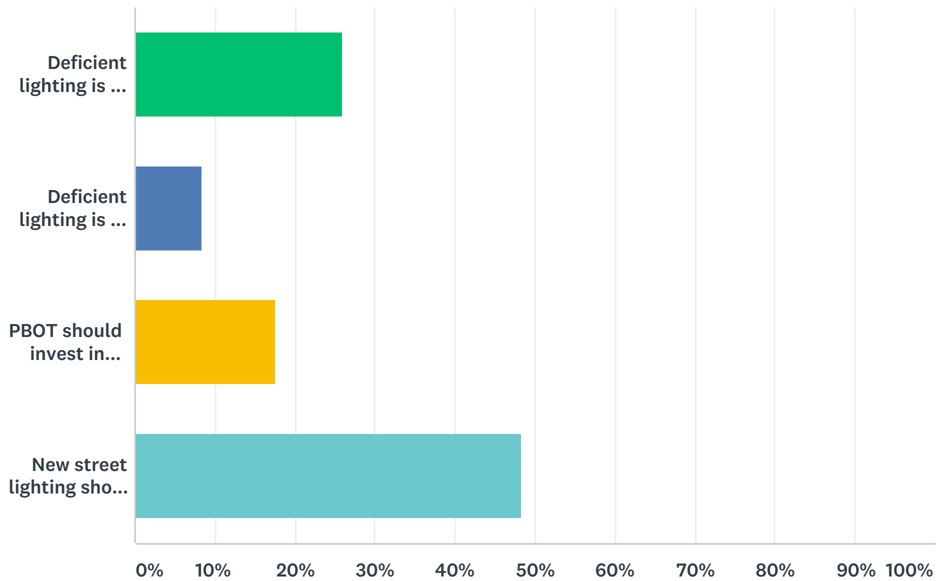
Answered: 1,015   Skipped: 38



ANSWER CHOICES	RESPONSES	
Make sure every East Portland arterial street has sidewalk coverage on both sides of the street, even if they narrower or without a planting strip.	64.33%	653
Focus on upgrading narrow sidewalks in busy pedestrian and transit areas so that they meet the city standard, including a planter strip with trees, and a pedestrian walkway that isn’t blocked by poles and signs.	35.67%	362
TOTAL		1,015

Q3 Street LightingMost East Portland arterial streets only have street lights on one side of the street, and we've heard many comments about how dark these streets are at night. Please indicate which statement reflects your top concern with lighting in East Portland.

Answered: 1,022 Skipped: 31

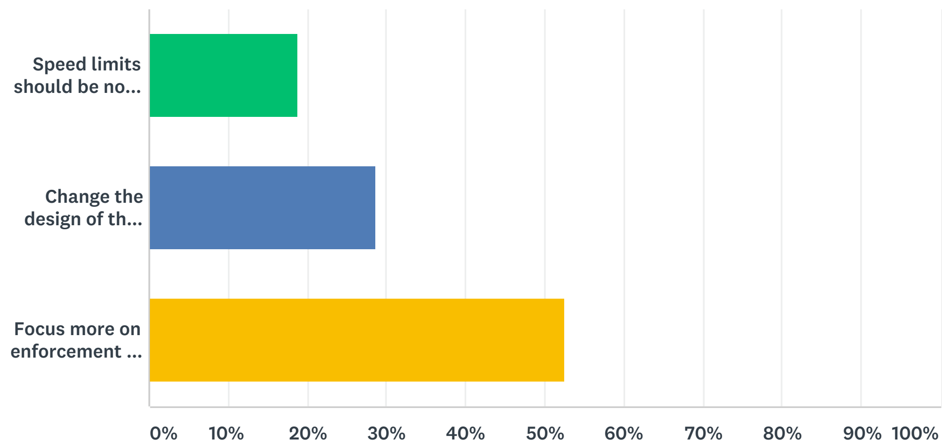


ANSWER CHOICES	RESPONSES	
Deficient lighting is a concern for traffic safety – it's hard to see pedestrians or bicycles at night.	25.93%	265
Deficient lighting is a concern for personal safety – I'm afraid I will be assaulted at night when walking along the roadway.	8.32%	85
PBOT should invest in roadway lighting on both sides of an arterial street before making other significant changes.	17.51%	179
New street lighting should be pedestrian-scale and focus on the ability for walkers to see and be seen. It's already easy to see other cars with their lights on.	48.24%	493
TOTAL		1,022

East Portland Arterial Streets Strategy Opinion Survey

Q4 SpeedingPublic feedback and speed data both indicate that people regularly drive over the speed limit on East Portland arterial streets. Please choose which approach you think PBOT should focus on to improve street safety:

Answered: 991   Skipped: 62

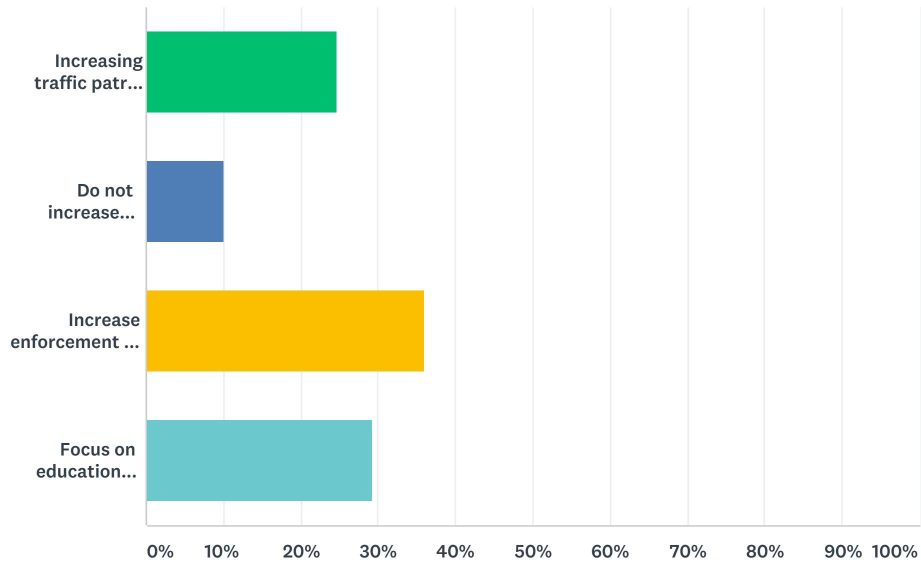


ANSWER CHOICES	RESPONSES	
Speed limits should be no more than 30 mph on East Portland arterial streets to help reduce the number and severity of crashes we're seeing.	18.87%	187
Change the design of the streets to encourage slower driving.	28.56%	283
Focus more on enforcement and education to reduce traffic speeds, such as speed safety cameras, traffic patrols and safety campaigns.	52.57%	521
TOTAL		991

East Portland Arterial Streets Strategy Opinion Survey

Q5 Enforcement & EducationWe hear a wide range of opinions and experiences with traffic enforcement and education. Some people tell us that the city's traffic safety interventions should focus on enforcement and education, while others tell us they are concerned about disproportionate enforcement on people of color ("racial profiling"). Please choose the statement that most closely reflects your preferred approach:

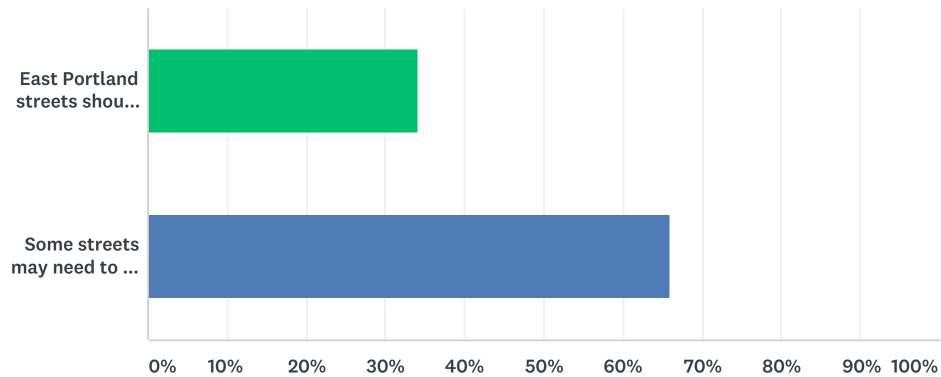
Answered: 1,028   Skipped: 25



ANSWER CHOICES	RESPONSES	
Increasing traffic patrols by the Portland Police Bureau will increase traffic safety in East Portland.	24.71%	254
Do not increase traffic enforcement activities by police specifically because I'm concerned about racial profiling.	10.12%	104
Increase enforcement by using speed cameras because they cannot profile drivers.	35.89%	369
Focus on education campaigns to encourage people to travel more safely and avoid distractions, whether they are driving, walking or using other modes.	29.28%	301
TOTAL		1,028

Q6 Accommodating all Travel ModesEast Portland arterial streets carry all modes of transportation, in part because few other streets connect through the area. This leads to arterial streets being important for transit, biking, walking, driving, emergency response, and delivery of goods. Please choose the statement that most closely reflects the approach you would like to see applied to the street.

Answered: 1,034   Skipped: 19

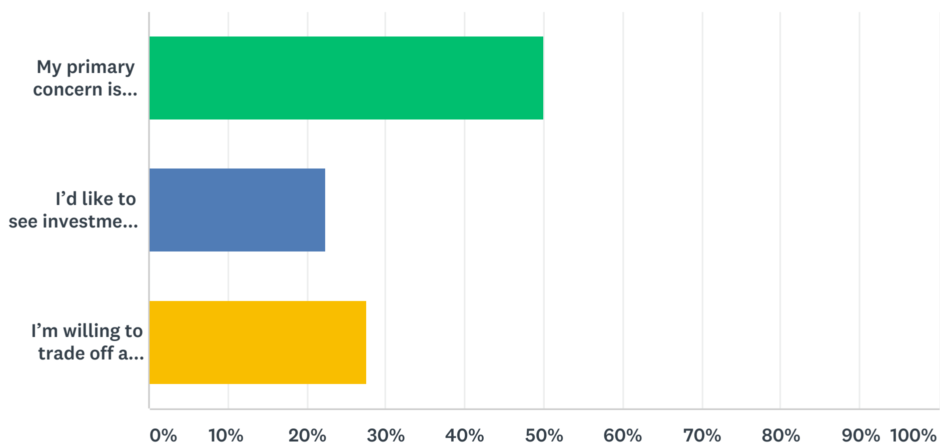


ANSWER CHOICES	RESPONSES	
East Portland streets should be able to safely accommodate all modes of travel – walking, biking, accessing transit, driving and freight delivery.	34.04%	352
Some streets may need to be more vehicle-oriented, while other streets may be more pedestrian and bicycle-focused.	65.96%	682
TOTAL		1,034

East Portland Arterial Streets Strategy Opinion Survey

Q7 Congestion and Travel OptionsIn East Portland and citywide, traffic and congestion are on the minds of many commuters as jobs and population have increased over the past decade. Some people want us to focus on traffic congestion, while others think we should focus on making driving alternatives safe and convenient. Please choose the statement that most aligns with your investment priorities:

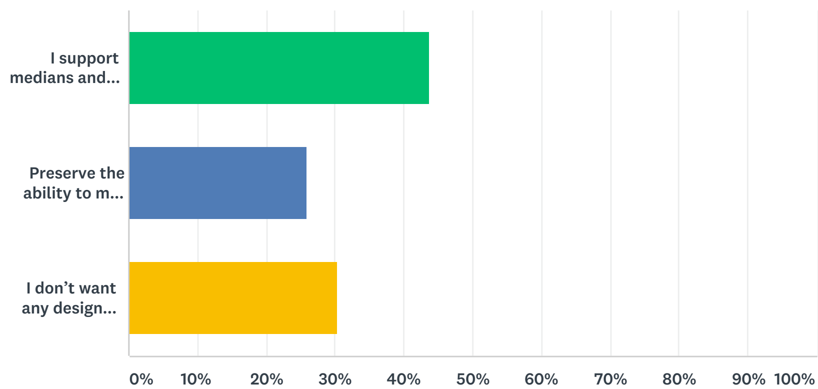
Answered: 1,032 Skipped: 21



ANSWER CHOICES	RESPONSES	
My primary concern is reducing congestion and delays to driving on the arterial streets.	50.10%	517
I'd like to see investment in making alternatives to driving safer and more efficient (such as transit improvements or a buffer near a bike lane).	22.38%	231
I'm willing to trade off a little bit of delay while driving (for example, one extra minute on a ten-minute drive) to make safety investments to reduce serious injuries and fatalities.	27.52%	284
TOTAL		1,032

Q8 Traffic Calming and DiversionSafe street design builds infrastructure shown to lower the number and severity of crashes by slowing vehicles and limiting unsafe driving movements that are more likely to lead to a crash. The limiting factors that improve safety can also limit some access movements (such as turning left across traffic anywhere on a block face). Choose the statement that most aligns with your investment priorities:

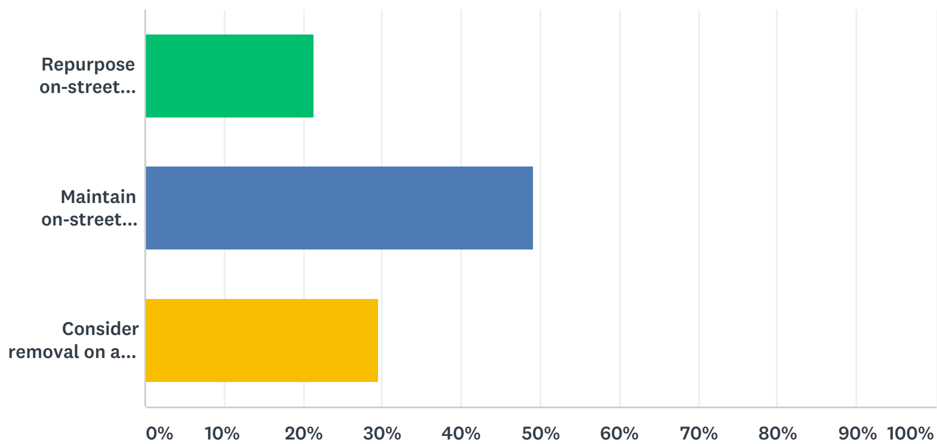
Answered: 1,033 Skipped: 20



ANSWER CHOICES	RESPONSES	
I support medians and other design measures to improve safety and reduce crash-related delay.	43.66%	451
Preserve the ability to make left turns from anywhere on the street and use other design methods to address safety.	26.04%	269
I don't want any design changes because it could lead to more cars taking side streets.	30.30%	313
TOTAL		1,033

Q9 ParkingOn-street parking presence varies across East Portland. In most cases, destinations have parking lots or driveways for vehicles, but in some cases, businesses prefer to maintain on-street parking. Choose the statement that most aligns with your transportation priorities:

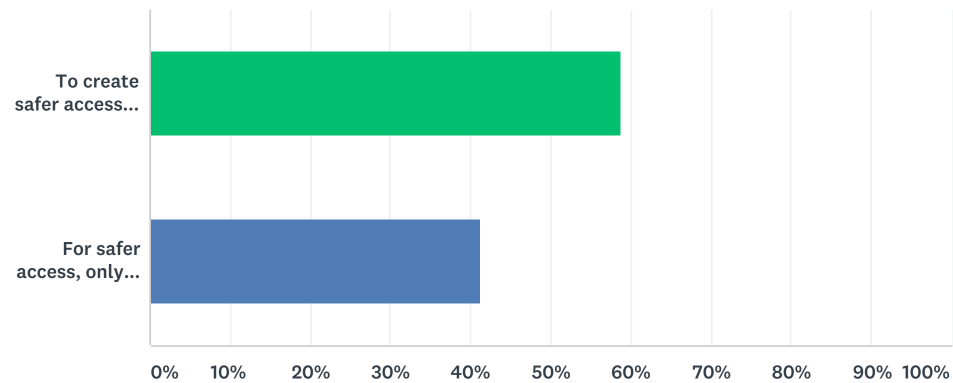
Answered: 1,029 Skipped: 24



ANSWER CHOICES	RESPONSES	
Repurpose on-street parking spaces for active use so that we can accommodate more types of travel safely one the roadway.	21.38%	220
Maintain on-street parking where it is today to serve establishments and serve as a sidewalk buffer.	49.17%	506
Consider removal on a strategic, individualized scale.	29.45%	303
TOTAL		1,029

Q10 TransitMany people in East Portland, especially those with lower incomes, rely on transit to get around. Both frequent and infrequent users of transit have told us about the challenges of accessing transit in East Portland. Choose the statement that most aligns with your investment priorities:

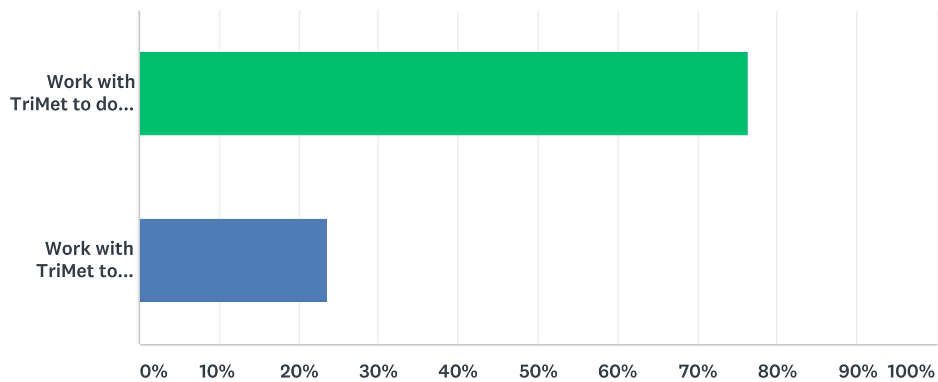
Answered: 1,021   Skipped: 32



ANSWER CHOICES	RESPONSES	
To create safer access, focus improvements at unprotected crossings near bus and MAX stops.	58.86%	601
For safer access, only locate bus stops near signalized crosswalks, even if it means eliminating a few bus stops to accomplish this goal.	41.14%	420
TOTAL		1,021

Q11 Transit ReliabilityReliable bus travel times are important for those who depend on transit, as well as attracting drivers out of their cars and onto transit. Which statement most closely reflects your preferred approach to improving transit travel times.

Answered: 988 Skipped: 65

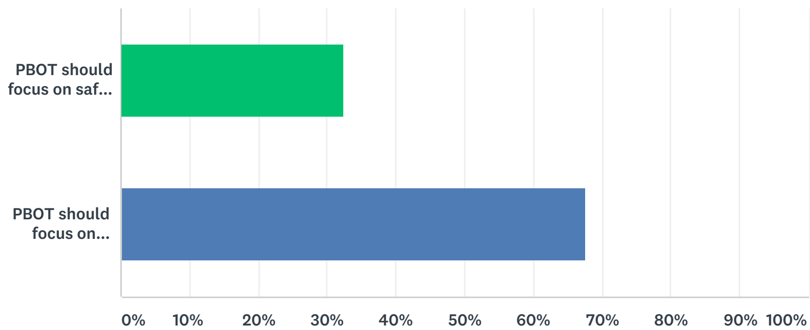


ANSWER CHOICES	RESPONSES	
Work with TriMet to do spot improvements at congested intersections that allow buses to bypass traffic during busy times of day.	76.42%	755
Work with TriMet to create exclusive bus lanes on many East Portland arterial streets to bypass congestion, even if that means taking away a general-purpose vehicle lane.	23.58%	233
TOTAL		988

East Portland Arterial Streets Strategy Opinion Survey

Q12 BikingOver the years PBOT has heard varying levels of support for bicycle infrastructure in East Portland. Choose the statement that most closely reflects where you think PBOT should focus on active transportation investments:

Answered: 1,014   Skipped: 39

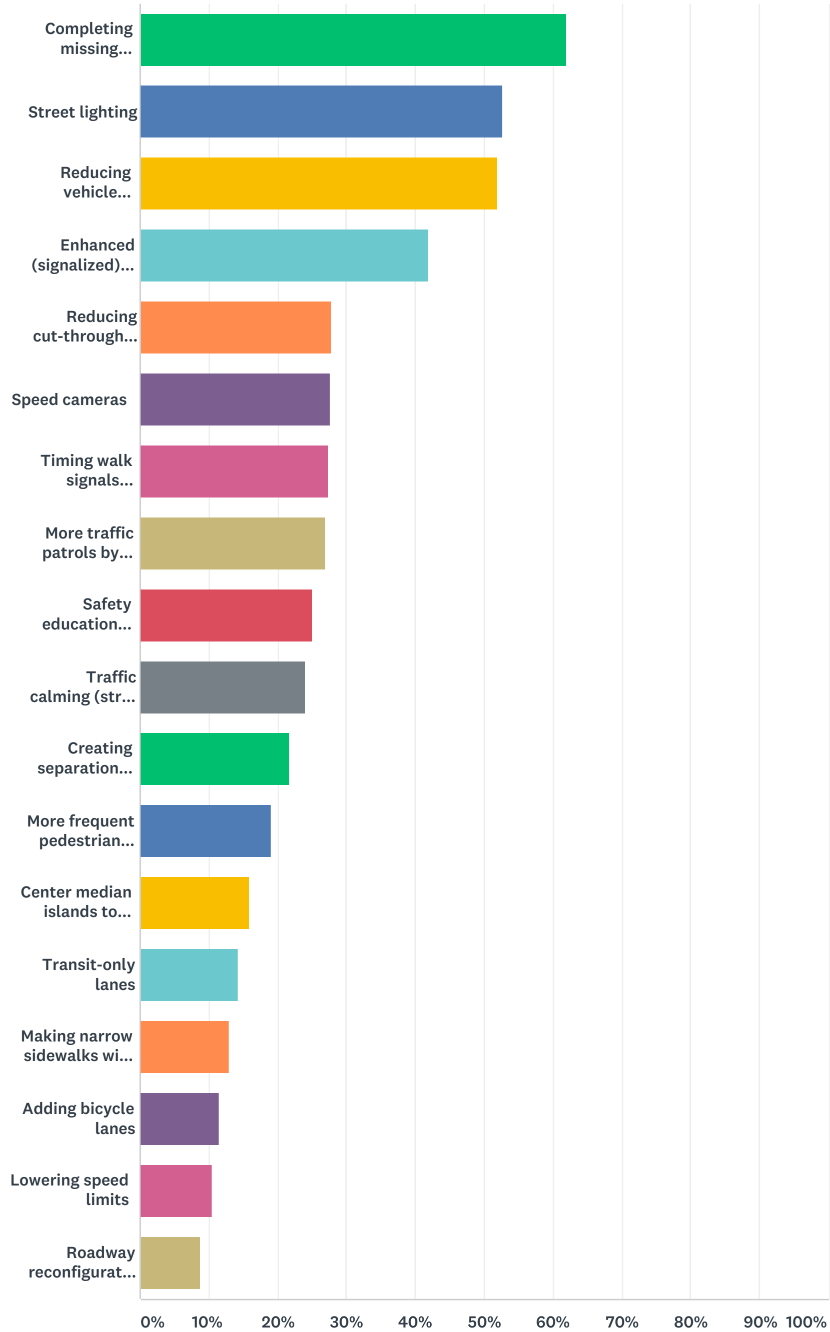


ANSWER CHOICES	RESPONSES	
PBOT should focus on safer, defined bicycle infrastructure on arterial streets so every user knows where to operate and can connect to destinations on these routes.	32.35%	328
PBOT should focus on creating and improving bike routes on quieter neighborhood streets with less traffic, even if this means the routes are less direct and may not connect directly to destinations.	67.65%	686
TOTAL		1,014

Q13 Help Us Prioritize InvestmentsRank our investments on East Portland arterials. Thinking about your responses to the questions above, please select what you think are the top investments PBOT should make on East Portland arterial streets. Pick your top five.

Answered: 1,043 Skipped: 10

East Portland Arterial Streets Strategy Opinion Survey



ANSWER CHOICES	RESPONSES	
Completing missing sidewalks	61.94%	646

East Portland Arterial Streets Strategy Opinion Survey

Street lighting	52.73%	550
Reducing vehicle congestion and bottlenecks	51.97%	542
Enhanced (signalized) pedestrian crossings	41.90%	437
Reducing cut-through traffic on residential side streets	27.90%	291
Speed cameras	27.61%	288
Timing walk signals separately from turning vehicles	27.33%	285
More traffic patrols by police	26.94%	281
Safety education campaigns	25.02%	261
Traffic calming (street trees, on-street parking)	24.07%	251
Creating separation between bicycles and vehicle travel lanes (“protected bike lanes”)	21.76%	227
More frequent pedestrian crossings	19.08%	199
Center median islands to reduce left turn crashes	15.92%	166
Transit-only lanes	14.19%	148
Making narrow sidewalks wider and less obstructed by poles	13.04%	136
Adding bicycle lanes	11.41%	119
Lowering speed limits	10.55%	110
Roadway reconfigurations (vehicle lanes repurposed for other uses)	8.72%	91
Total Respondents: 1,043		

Q14 Is there anything else you would like to share about East Portland arterial streets? Please type below.

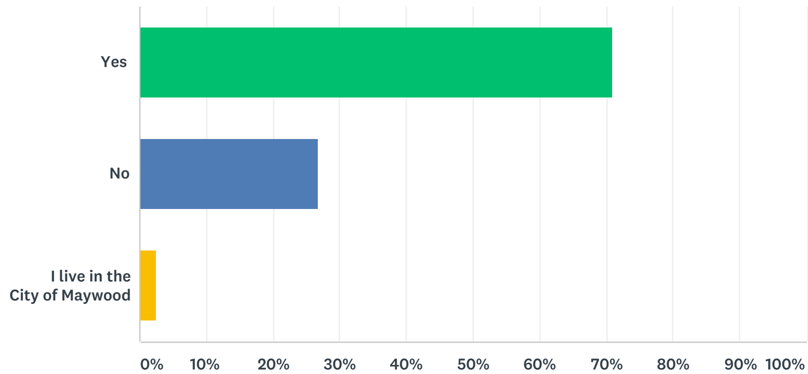
Answered: 692 Skipped: 361

Q15 We ask demographic questions to help us understand who we are hearing from. Tell us a little about yourself via the following questions.

Answered: 216 Skipped: 837

Q16 Do you live in East Portland (inside the City of Portland east of 82nd Avenue)?

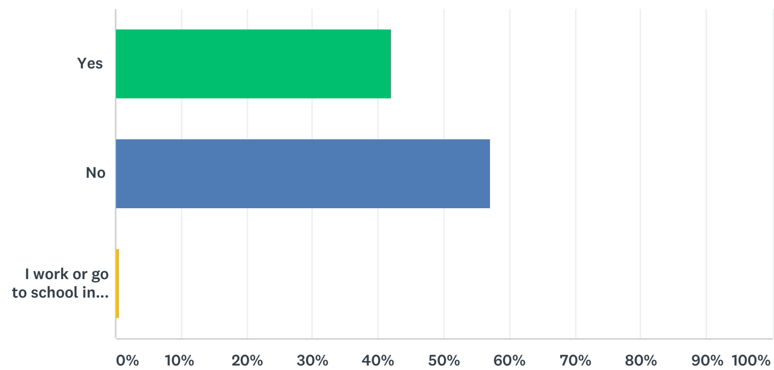
Answered: 1,035 Skipped: 18



ANSWER CHOICES	RESPONSES	
Yes	70.82%	733
No	26.76%	277
I live in the City of Maywood	2.42%	25
TOTAL		1,035

Q17 Do you work or go to school in East Portland?

Answered: 1,037 Skipped: 16

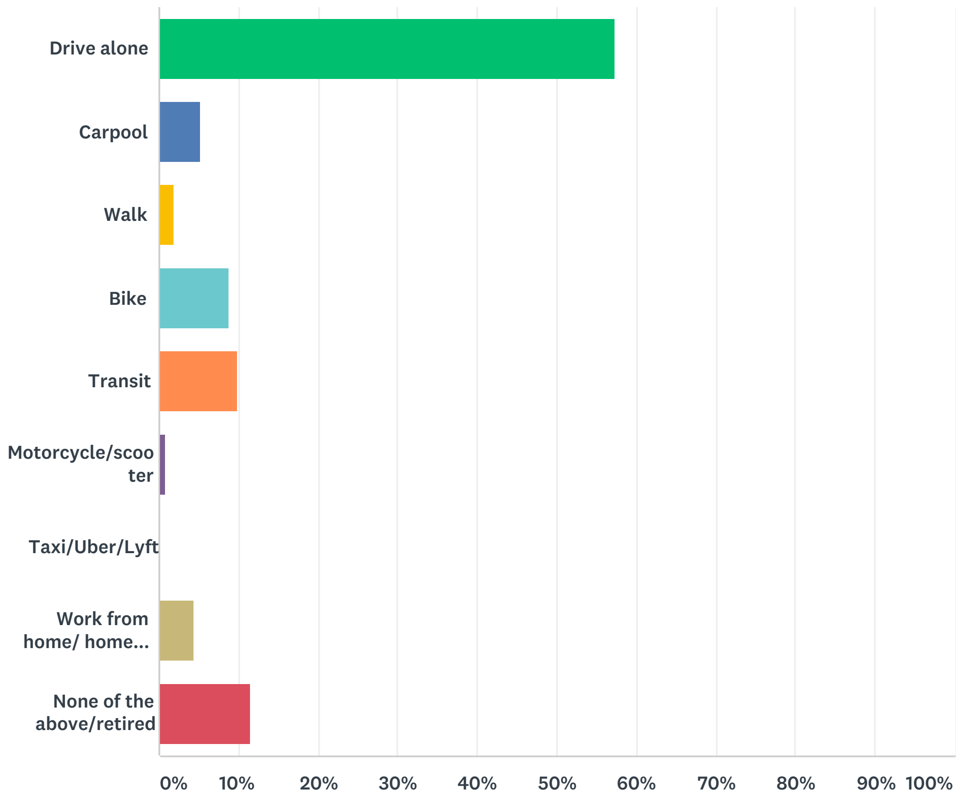


ANSWER CHOICES	RESPONSES	
Yes	42.14%	437
No	57.18%	593
I work or go to school in the City of Maywood Park	0.68%	7
TOTAL		1,037

East Portland Arterial Streets Strategy Opinion Survey

Q18 How do you typically travel to work or school?

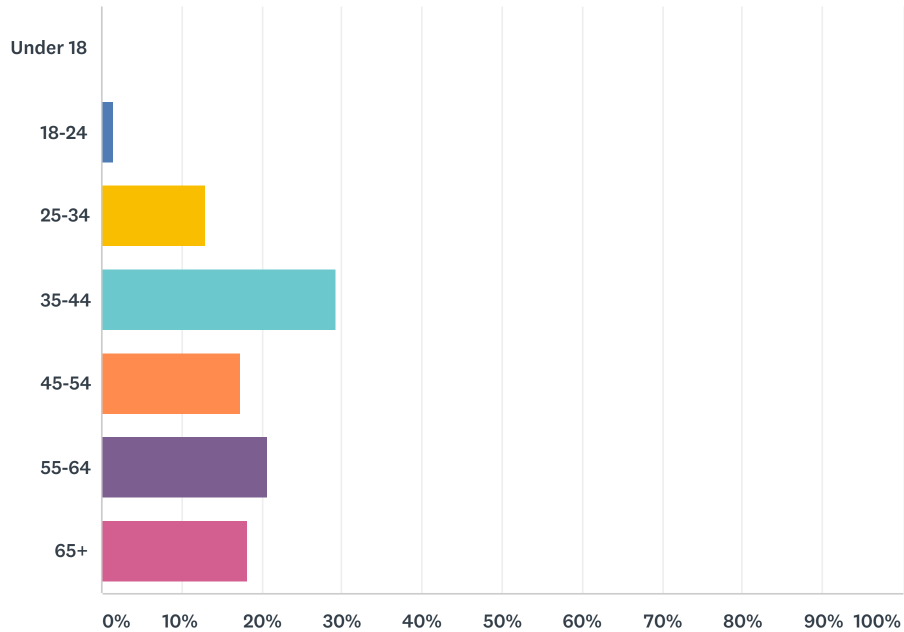
Answered: 1,036 Skipped: 17



ANSWER CHOICES	RESPONSES	
Drive alone	57.24%	593
Carpool	5.31%	55
Walk	1.83%	19
Bike	8.78%	91
Transit	9.85%	102
Motorcycle/scooter	0.87%	9
Taxi/Uber/Lyft	0.10%	1
Work from home/ home school	4.44%	46
None of the above/retired	11.58%	120
TOTAL		1,036

Q19 What is your age?

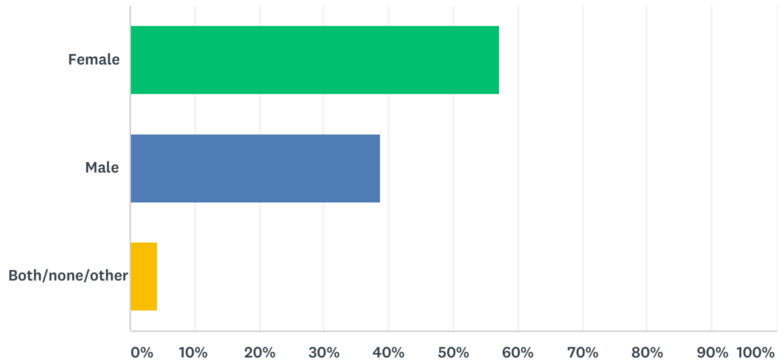
Answered: 1,033 Skipped: 20



ANSWER CHOICES	RESPONSES	
Under 18	0.00%	0
18-24	1.45%	15
25-34	12.97%	134
35-44	29.33%	303
45-54	17.33%	179
55-64	20.81%	215
65+	18.10%	187
TOTAL		1,033

Q20 What is your gender identity?

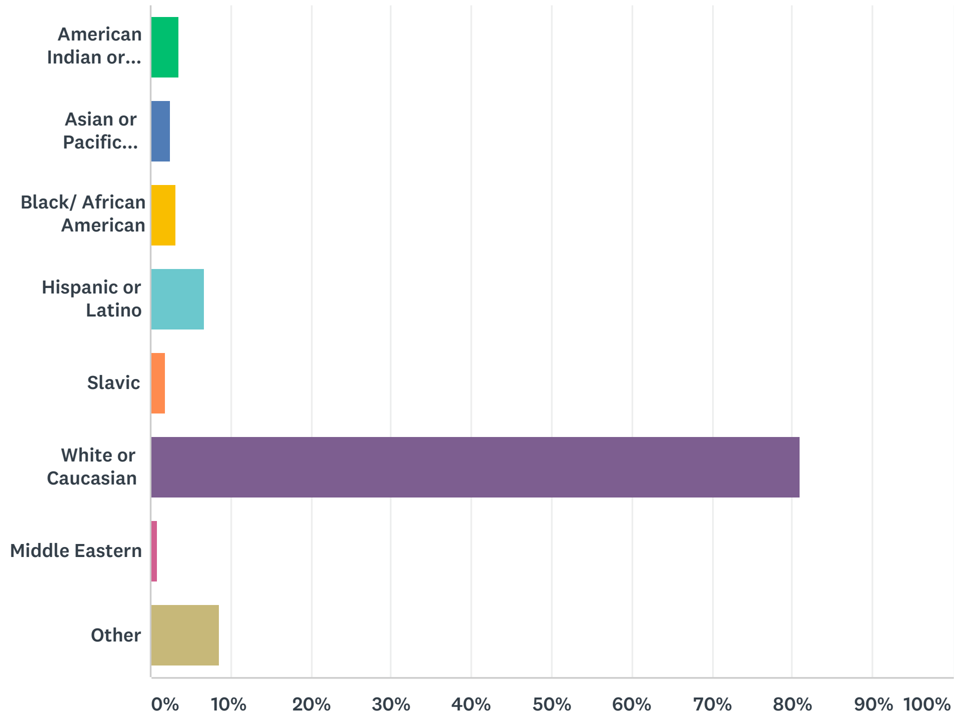
Answered: 1,032 Skipped: 21



ANSWER CHOICES	RESPONSES	
Female	57.17%	590
Male	38.66%	399
Both/none/other	4.17%	43
TOTAL		1,032

Q21 What is your race or ethnicity? Select all that apply.

Answered: 1,012 Skipped: 41

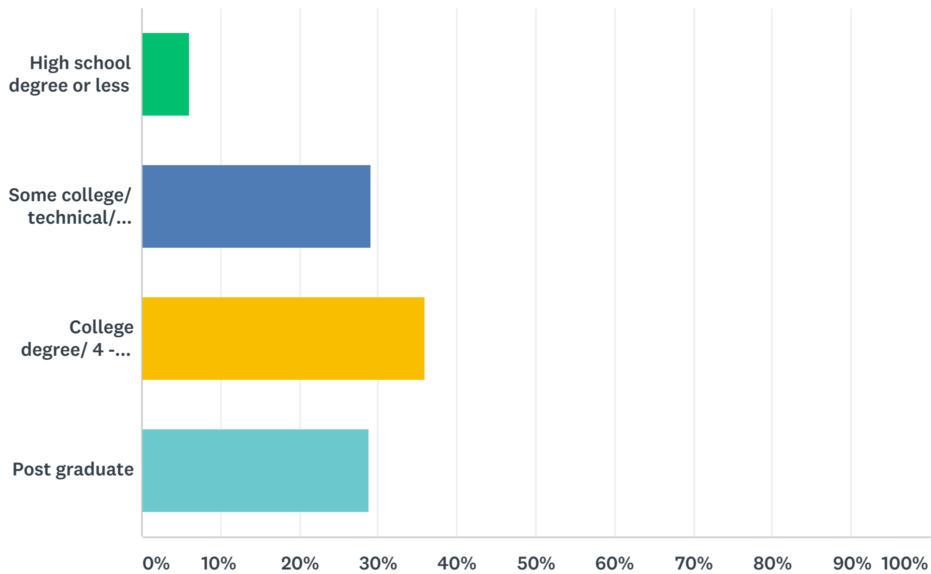


ANSWER CHOICES	RESPONSES	
American Indian or Alaska Native	3.46%	35
Asian or Pacific Islander	2.57%	26
Black/ African American	3.16%	32
Hispanic or Latino	6.72%	68
Slavic	1.88%	19
White or Caucasian	80.93%	819
Middle Eastern	0.89%	9
Other	8.60%	87
Total Respondents: 1,012		

East Portland Arterial Streets Strategy Opinion Survey

Q22 What is the highest level of education?

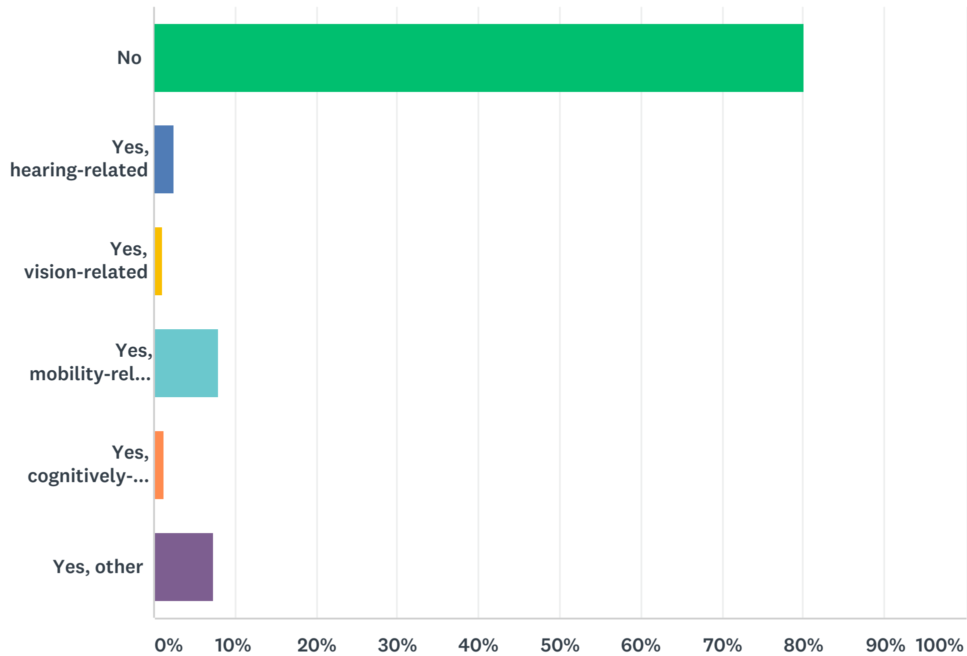
Answered: 1,025 Skipped: 28



ANSWER CHOICES	RESPONSES	
High school degree or less	6.15%	63
Some college/ technical/ community college/ 2-year degree	29.07%	298
College degree/ 4 - year degree	35.90%	368
Post graduate	28.88%	296
TOTAL		1,025

Q23 Do you live with a disability?

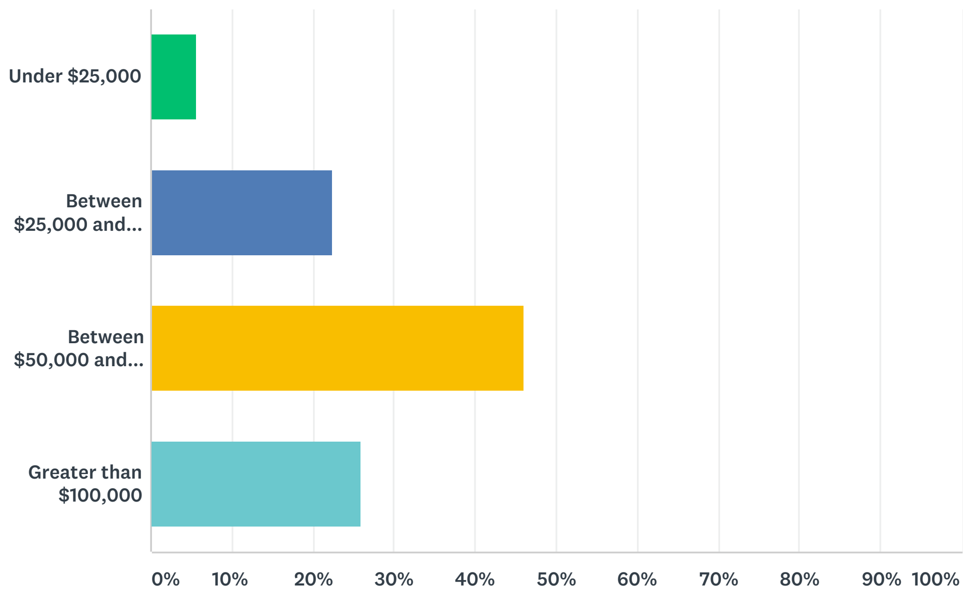
Answered: 1,032 Skipped: 21



ANSWER CHOICES	RESPONSES	
No	80.14%	827
Yes, hearing-related	2.52%	26
Yes, vision-related	0.97%	10
Yes, mobility-related	7.85%	81
Yes, cognitively-related	1.26%	13
Yes, other	7.27%	75
TOTAL		1,032

Q24 What was your approximate household income last year?

Answered: 967 Skipped: 86



ANSWER CHOICES	RESPONSES	
Under $25,000	5.69%	55
Between $25,000 and $50,000	22.44%	217
Between $50,000 and $100,000	46.02%	445
Greater than $100,000	25.85%	250
TOTAL		967

EPASS

APPENDIX D

ARTERIAL POLICY AND PROJECT REVIEW

PORTLAND BUREAU OF TRANSPORTATION
1120 SW Fifth Avenue, Suite 800 Portland, OR 97204 503.823.5185
Fax 503.823.7576 TTY 503.823.6868 www.portlandoregon.gov/transportation
Chloe Eudaly Commissioner **Chris Warner** Interim Director

EAST PORTLAND ARTERIAL STREETS STRATEGY MEMO #2

Date: February 6, 2019

To: PBOT and Consultant EPASS Staff

From: Corrine Montana and Steve Szigethy on behalf of PBOT EPASS Team

Subject: Arterial policy and project review

This memo provides a summary of transportation and land use policies that apply to the arterial street network in East Portland, a report of existing corridor conditions, and an accounting of planned major transportation capital projects. By describing adopted policies, existing conditions and planned projects, this memo is to serve as a reference when discussing potential design changes, space allocations, and other proposals for "the EPASS network". The EPASS Network includes streets maintained by PBOT and with four or more vehicle lanes east of 82nd Avenue.

Memo Outline

I. Policy Review

This section provides a review of policies and planning processes that guide the design and operation of the EPASS network. These include federal, regional and local policies and policies that address the East Portland Pattern Area and specific arterials within East Portland. The goal of the review is to provide a grounding in policy as EPASS proposes modernizations to the arterial street network.

Transportation System Plan Policies (2018)

The 2035 [Transportation System Plan](#) (TSP) and [Comprehensive Plan](#) (CP) were adopted concurrently in three stages from 2016-2018. The TSP is the transportation element of the Comprehensive Plan, the state-mandated 20-year plan that guides the City's future growth. The Comprehensive Plan guides long-range planning and initiate goals and performance measures for the City. The TSP is the primary transportation policy and planning document for the City of Portland and incorporates plans conducted prior to its adoption, many of which are included later in this section. The following TSP policies should be considered throughout the development of EPASS proposals:

DESIGN AND PLANNING POLICIES (CP CHAPTER 9: TRANSPORTATION)

Use of classifications: Plan, develop, implement, and manage the transportation system in accordance with street design and policy classifications outlined in the Transportation System Plan. (COMPREHENSIVE PLAN Policy 9.4)

a: Classification descriptions are used to describe how streets should function for each mode of travel, not necessarily how they are functioning at present. (TRANSPORTATION SYSTEM PLAN Policy 9.4.a)

Transportation strategy for people movement: Implement a prioritization of modes for people movement by making transportation system decisions according to the following ordered list.

- *Walking*
- *Bicycling*
- *Transit*
- *Fleets of electric, fully automated, multiple passenger vehicles*
- *Other shared vehicles*
- *Low or no occupancy vehicles, fossil-fueled non-transit vehicles (COMPREHENSIVE PLAN Policy 9.6)*

When implementing this prioritization, ensure that:

- *The needs and safety of each group of users are considered, and changes do not make existing conditions worse for the most vulnerable users higher on the ordered list.*
- *All users' needs are balanced with the intent of optimizing the right-of-way for multiple modes on the same street.*
- *When necessary to ensure safety, accommodate some users on parallel streets as part of a multi-street corridor.*
- *Land use and system plans, network functionality for all modes, other street functions, and complete street policies, are maintained.*
- *Policy-based rationale is provided if modes lower in the ordered list are prioritized.*

Moving goods and delivering services: In tandem with people movement, maintain efficient and reliable movement of goods and services as a critical transportation system function. Prioritize freight system reliability improvements over single-

occupancy vehicle mobility where there are solutions that distinctly address those different needs. (COMPREHENSIVE PLAN Policy 9.7)

LAND USE, DEVELOPMENT, AND PLACEMAKING POLICIES (CP CHAPTER 9: TRANSPORTATION)

Land use and transportation coordination: Implement the Comprehensive Plan Map and the Urban Design Framework through coordinated long-range transportation and land use planning. Ensure that street policy and design classifications and land uses complement one another. (COMPREHENSIVE PLAN Policy 9.11)

STREETS AS PUBLIC SPACES POLICIES (CP CHAPTER 9: TRANSPORTATION)

Streets for transportation and public spaces: Integrate both placemaking and transportation functions when designing and managing streets by encouraging design, development, and operation of streets to enhance opportunities for them to serve as places for community interaction, environmental function, open space, tree canopy, recreation, and other community purposes. (COMPREHENSIVE PLAN Policy 9.14)

SYSTEM MANAGEMENT POLICIES (CP CHAPTER 9: TRANSPORTATION)

Traffic management: Evaluate and encourage traffic speed and volume to be consistent with street classifications and desired land uses to improve safety, preserve and enhance neighborhood livability, and meet system goals of calming vehicle traffic through a combination of enforcement, engineering, and education efforts. (COMPREHENSIVE PLAN Policy 9.46)

a: Use traffic calming tools, traffic diversion and other available tools and methods to create and maintain sufficiently low automotive volumes and speeds on neighborhood greenways to ensure comfortable cycling environment on the street. (TRANSPORTATION SYSTEM PLAN Policy 9.46.a)

The following modal targets are referred to in the Corridor Summaries section of this memo. All Performance Measure goals (9.49.a - 9.49.i) are listed under Comprehensive Plan Policy 9.49.

e: By 2035, increase the mode share of daily non-drive alone trips to 70 percent citywide, and to the following in the five pattern areas:

Table 1 Transportation System Plan Policy 9.49.e

Pattern Area	2035 Daily Target Mode Share
Central City	85%
Inner Neighborhoods	70%
Western Neighborhoods	65%
Eastern Neighborhoods	65%
Industrial and River	55%

PARKING MANAGEMENT POLICIES (CP CHAPTER 9: TRANSPORTATION)

Parking management: Reduce parking demand and manage supply to improve pedestrian, bicycle and transit mode share, neighborhood livability, safety, business district vitality, vehicle miles traveled (VMT) reduction, and air quality. Implement strategies that reduce demand for new parking and private vehicle ownership, and that help maintain optimal parking occupancy and availability. (COMPREHENSIVE PLAN Policy 9.55)

Curb Zone: Recognize that the Curb Zone is a public space, a physical and spatial asset that has value and cost. Evaluate whether, when, and where parking is the highest and best use of this public space in support of broad City policy goals and local land use context. Establish thresholds to utilize parking management and pricing tools in areas with high parking demand to ensure adequate on-street parking supply during peak periods. (COMPREHENSIVE PLAN Policy 9.56)

FINANCE, PROGRAMS, AND COORDINATION POLICIES (CP CHAPTER 9: TRANSPORTATION)

Coordination: Coordinate with state and federal agencies, local and regional governments, special districts, other City bureaus, and providers of transportation services when planning for, developing, and funding transportation facilities and services. (COMPREHENSIVE PLAN Policy 9.62)

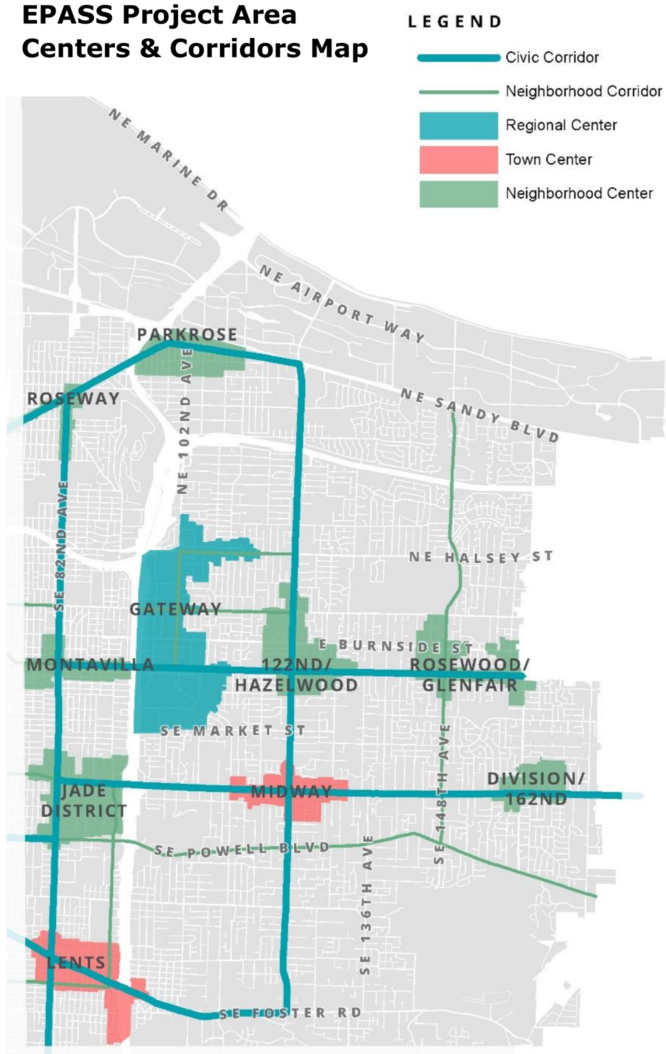
Project and program selection criteria: Establish transportation project and program selection criteria consistent with [Transportation] goals 9A through 9I, to cost-effectively achieve access, placemaking, sustainability, equity, health, prosperity, and safety goals. (COMPREHENSIVE PLAN Policy 9.66)

Chapter 3 of the Comprehensive Plan addresses urban form. The purpose of Chapter 3 is to:

- *Foster an equitable system of compact mixed use and commercial centers across the city to increase access to community services and businesses, and to create more low-carbon, complete, healthy connected neighborhoods.*
- *Improve Portland's major corridors so that they become vibrant urban places and key transportation connections.*
- *Enhance Portland's public realm, integrate nature into the city, and link people, places, and wildlife through active transportation facilities, green infrastructure investments, urban tree canopy, and habitat connections.*
- *Describe the city's overall development pattern and area character to inform and guide future plans, investments, and development.*

The EPASS project area includes many designated Centers and Corridors. The following sections from the Comprehensive Plan are included to identify EPASS Centers and Corridors and define the purpose and goals of each designation type.

EPASS Project Area Centers & Corridors Map



Urban Form Policies and Key Definitions

CENTERS (CP CHAPTER 3: URBAN FORM POLICIES)

Places with concentrations of commercial and community services, housing, gathering places, and transit connections. Centers provide services to surrounding neighborhoods and are intended to be enhanced as places because they are a focus of housing and job growth. There are four types of centers with varying functions, levels of activity, and scales and intensities of development: Central City, Gateway Regional Center, Town Centers and Neighborhood Centers.

Gateway Regional Center Policies (CP Chapter 3: Urban Form Policies)

Transportation: Enhance Gateway's role as a regional high-capacity transit hub that serves as an anchor for East Portland's multimodal transportation system. (COMPREHENSIVE PLAN Policy 3.29.) Gateway is the only Regional Center in East Portland and the only other Regional Center in Portland besides the Central City.

Town Centers Policies (CP Chapter 3: Urban Form Policies)

Transportation: Improve Town Centers as multimodal transportation hubs that optimize access from the broad area of the city they serve and are linked to the region's high-capacity transit system. (COMPREHENSIVE PLAN Policy 3.33.) East Portland Town Centers include Midway and Lents.

Neighborhood Centers Policies (CP Chapter 3: Urban Form Policies)

Transportation: Design Neighborhood Centers as multimodal transportation hubs that are served by frequent-service transit and optimize pedestrian and bicycle access from adjacent neighborhoods. (COMPREHENSIVE PLAN Policy 3.37.) East Portland Neighborhood Centers include Parkrose, Montavilla, 122nd/Hazelwood, Rosewood/Glenfair, Jade District, and Division/162nd.

CORRIDORS (CP CHAPTER 3: URBAN FORM POLICIES)

Corridor, as defined in the Comprehensive Plan, is an area that may be a single major street, or a broad mobility corridor that provides connections for a range of transportation modes (transit, pedestrians, cyclists, freight, motor vehicles, and so forth), not necessarily on the same street. There are three types of corridors: Civic, Neighborhood and Freight.

Civic Corridors Policies (CP Chapter 3: Urban Form Policies)

Integrated land use and mobility: Enhance Civic Corridors as distinctive places that are models of ecological urban design, with transit-supportive densities of housing and employment, prominent street trees and other green features, and high-quality transit service and pedestrian and bicycle facilities. (COMPREHENSIVE PLAN Policy 3.48.) East Portland Civic Corridors include NE Sandy Boulevard, SE Stark Street, SE Division Street, SE Foster Road west of 122nd, 82nd Avenue, and 122nd Avenue.

Neighborhood & Freight Corridors Policies (CP Chapter 3: Urban Form Policies)

Neighborhood Corridors: Enhance Neighborhood Corridors as important places that support vibrant neighborhood business districts with quality multi-family housing, while providing transportation connections that link neighborhoods. (COMPREHENSIVE PLAN Policy 3.52.) East Portland Neighborhood Corridors include NE Halsey Street (102nd – 122nd), NE Glisan Street (I-205 – 122nd), SE Powell Boulevard, SE 92nd Avenue south of Division, 102nd Avenue (Halsey-Stark), and 148th Avenue (Sandy-Powell).

Freight Corridors: Primary routes into and through the city that support Portland as an important West Coast hub and a gateway for international and domestic trade. These facilities are integral to the growth of traded sector businesses such as manufacturing, warehousing, and distribution industries. Comprehensive Plan policies 9.7 and 9.30 - 9.36 are freight policies. There are also freight-related policies in Chapter 6: Economic Development. East Portland Freight Corridors include NE Airport Way, NE Killingsworth Street east of I-205, NE Columbia Boulevard east of I-205, Interstate 84, NE 82nd Avenue north of Columbia, Interstate 205, and NE 122nd Avenue (Airport Way – Sandy).

PATTERN AREAS (CP CHAPTER 3: URBAN FORM POLICIES)

Eastern Neighborhoods Pattern Area Policies (CP Chapter 3: Urban Form Policies)

Five primary geographies in Portland that have differing physical characteristics, needs, and assets. Each of these areas has unique topographies and natural features, patterns and types of development, street and other infrastructure characteristics, and histories that have shaped their urban form. The five primary Pattern Areas are: Central City, Inner Neighborhoods, Western Neighborhoods, Eastern Neighborhoods and River.

The EPASS project area lies primarily within the Eastern Neighborhoods Pattern Area with the northern portion of the project area located in the River Pattern Area. The Eastern Neighborhoods Pattern Area is mainly located east of 82nd Avenue, developed mostly after World War II, and was annexed to Portland in the 1980s and 1990s. The built environment is defined by large blocks, deep lots, gaps in pedestrian and bicycle connectivity, and wide street corridors. Natural features include the East Buttes, Douglas fir groves, and stream corridors. The River Pattern Area includes the land along the Willamette and Columbia Rivers and the Columbia Slough, which in East Portland is defined by a mix of industrial land and wildlife habitat.

Regional Transportation Plan Policies (2018)
The Metro Regional Transportation Plan (RTP) was adopted by Metro Council on December 7, 2018. Arterials that are included in the RTP are those that, "are intended to provide general mobility for travel within the region and provide important connections to the throughway network" (Chapter 3.5.3). RTP arterial spacing guidelines recommend a major arterial every two miles, with minor arterials (or higher classification) every mile, and collectors (or higher classification) every half mile. The following table lists RTP Arterial Classifications for the EPASS Network. No classifications were changed in the 2018 update for the EPASS Project Area.

Table 2 EPASS Project Area RTP Arterial Classifications

Principal Arterials/ Throughways	**Major Arterials**	**Minor Arterials**	**No Classification**
82nd Ave	**102nd Ave**	**102nd Ave/103rd Ave**	103rd Ave/Cherry Blossom Ave
181st Ave/182nd Ave	**122nd Ave**	**122nd Ave**	Woodstock Blvd
	Sandy Blvd	**148th Ave**	**148th Ave**
	Halsey St/Weidler St	162nd Ave	
	Glisan St	**Glisan St**	
	Stark St/Washington St	Airport Way	
	Powell Blvd	Division St	
	Foster Rd		

Note: Streets in bold have two different classifications within the EPASS project area.

The 2018 RTP addresses safety, especially on the regional arterials where approximately 60% of regional fatal and severe injury crashes occur. Many arterial streets in the EPASS network are regional high injury corridors. RTP Chapter 3.5.3 Regional Motor Vehicle Network Policies provides the following direction regarding arterial safety:

Efforts to substantively improve transportation safety in the region must give arterial roadways high priority, with a focus on the region's high injury corridors, and may include:

- *Proven designs and strategies such as medians, speed management, access management, improved pedestrian crossings and street lighting, replacing intersections with roundabouts, reducing speeds to levels which are safe for pedestrians, and road diets;*
- *Enforcement actions targeting high-risk behaviors, such as speeding, aggressive driving, driving under the influence, red-light running, and failure-to-yield at bike and pedestrian crossings; and*
- *Education initiatives intended to promote safer behavior among all users of the transportation system.*

Metro's Livable Streets Handbooks provide additional design guidance for arterials to achieve regional goals, including transportation safety.

National Highway Designations

The National Highway System (NHS) is a designation established by the Federal Highway Administration that identifies routes important to the nation's economy, defense and mobility. The NHS includes the interstate highway system, principal arterials and highways that connect to major ports, airports and other intermodal facilities, and highways important to national defense. It includes both state and non-state roadways. PBOT's 2008 guidance document, Designing for Truck Movements and Other Large Vehicles guide states:

Where streets or highways have these federal NHS or NN designations, the federal design guidelines (administered by ODOT) are typically applied when federal funds are being used. In addition, State highways designated as Freight Routes in the Oregon Highway Plan and those on the National Network are subject to ORS 366.215, which states that Oregon Transportation Commission (OTC) approval is required for any reductions in capacity on identified freight routes.

The following table lists NHS designations for the EPASS network.

Table 3 National Highway System Designations

NHS State Designation	NHS Non-State Designation	No NHS Classification
Airport Way	Glisan St	**Airport Way**
Sandy Blvd	**Sandy Blvd**	102nd Ave/103rd Ave
82nd Ave	**Halsey St/Weidler St**	**Halsey St/Weidler St**
	Division St	**Division St**
	181st Ave	122nd Ave
		148th Ave
		162nd Ave
		Stark St/Washington St
		Foster Rd/Woodstock Blvd

Note: Streets in bold have two different classifications within the EPASS project area.

ODOT Guidelines for Interchange Area Management Plans (2013)
ODOT's Interchange Area Management Plan Guidelines provide guidance for ODOT and local governments in preparing Interchange Area Management Plans (IAMPs). An IAMP is a long-range facility plan for transportation operations and land use access in the area of a highway interchange. In practice, IAMPs are typically pursued by jurisdictions experiencing high levels of new "greenfield" development near an interchange. No IAMPs have been developed for the I-84 or I-205 interchanges in East Portland. However, ODOT typically reviews traffic changes that may impact freeway mainline operations, onramps and offramps, structures, and general changes within a ¼ mile of interchanges. The EPASS project area includes the following interchanges:

- Airport Way (I-205)
- Sandy Blvd (I-205)
- Halsey St/Weidler St (I-205)
- Glisan St (I-205)
- Stark St (I-205)
- Division St (I-205)
- Foster Rd/Woodstock Blvd (I-205)
- 102nd Ave (I-84)
- 122nd Ave (I-84)

82nd Ave Plan

The Bureau of Planning and Sustainability led a study of 82nd Ave (2016-2017) focused on land use and community development entitled, 82nd Ave Study: Understanding Barriers to Development. The study's transportation recommendations focused on improving safety and surrounding street connectivity. ODOT concurrently developed the 82nd Ave of the Roses Implementation Plan (2015-2017) to identify priority projects with a 5-10 year timeline. ODOT's 82nd Ave Plan includes different funding scenarios and strategies for project implementation. 82nd Ave is the western boundary of the EPASS project area and is adjacent to five EPASS corridors: Halsey, Glisan, Stark, Division and Foster. Detailed recommendations for 82nd Ave are not included as part of EPASS.

Vision Zero Action Plan (2016)

The Vision Zero Action Plan describes near-term strategies (2-year and 5-year actions) to address the causes of crashes, including actions in the categories of street design, impairment, speed, dangerous behaviors, and encouragement and accountability. While Vision Zero is citywide in reach, targeted action focuses on the city's High Crash Network, consisting of the top 30 streets and top 30 intersections for serious and fatal crashes. East Portland contains a disproportionate amount of the High Crash Network, including all but two streets in the EPASS network. The Plan guides the prioritization of projects and recommends the development of guidelines for intersection crossings and bike lanes.

The Outer Division Safety Action Plan narrows in on Vision Zero actions for Outer Division (between 82nd and 174th), a high crash corridor that saw a particularly problematic increase in fatal crashes in the 2010s. The Outer Division Plan addresses street design and recommends specific near-term improvements including enhanced pedestrian crossings, center medians, access management, more street lighting, and protected bike lanes. The City's safety enhancements are complemented with TriMet's Division Transit Project, which will provide high-capacity, higher-speed bus service between downtown Portland and Gresham.

Enhanced Transit Corridors Plan (2018)

The Enhanced Transit Corridors (ETC) Plan offers approaches to improving transit speed and reliability on portions of TriMet's frequent service bus network. The following EPASS corridors are included in the ETC pilot program:

- 102nd Avenue Corridor along NE Pacific St/102nd Ave from Gateway Transit Center to 102nd Ave & Washington St (#15 bus)
- 122nd Ave from NE Shaver St to SE Powell Blvd/Rhone St (#73 bus)
- Sandy Blvd from NE 14th Ave to Parkrose Transit Center (#12 bus)
- Stark St/Washington St along E Burnside/ SE Stark St from 109th Ave to 122nd Ave, and later to 162nd Ave (#20 bus)

A key recommendation in the ETC Plan is to, "consider impacts to transit speed and reliability in every project." Design treatments in the ETC toolbox that can be implemented by PBOT in coordination with TriMet include dedicated bus lanes, business access & transit (BAT) lanes, intersection queue jump lanes, transit-only apertures, pro-time transit lanes, bus shoulders, "bikes behind station" treatments, left side bike lanes, dedicated bike signals, shared bus/bike zones, curb extensions for stations/stops, level boarding, far-side bus stop placement, bus stop consolidation, transit signal priority, and other signal improvements.

As part of the 122nd Avenue Plan, alternative street cross-section options are currently being evaluated for further study, which will include transit priority alternatives among others.

TriMet Eastside Service Enhancement Plan (2016)
TriMet's Eastside Service Enhancement Plan provides a vision for increased transit service east of I-205. Key recommendations are to increase north-south bus service and provide more access to opportunities such as jobs, education and food. The following EPASS corridors are included in the Eastside Service Enhancement Plan:

- *102nd Ave:* Part of a new service on SE/NE 148th, NE Airport Way, NE 102nd and NE Prescott between = Parkrose Transit Center and Powell/148th. New service will provide access to jobs in the Columbia Corridor and education at David Douglas High School. It will also improve connections to east-west service and the Parkrose Transit Center.
- *122nd Ave:* Frequent service on SE/NE 122nd with increased frequency along SE/NE 122nd between Lents Town Center and the Parkrose Transit Center to improve connections and access to essential services. Renumbering Line 71 to Line 73 along SE/NE 122nd between the Parkrose Transit Center and SE 94th and Foster. Splits into two bus lines at Parkrose Transit Center (implemented in 2018).
- *148th Ave:* New service on SE/NE 148th, NE Airport Way, NE 102nd and NE Prescott between Parkrose Transit Center and Powell/148th. Lines 22 and 23 combine to add service in both directions. Increased frequency and hours of service and added weekend service on Line 23 to match service on Line 22.
- *162nd Ave:* New north-south service on SE/NE 162nd and NE 185 Dr between SE Powell and NE Riverside Parkway. New service will provide access to jobs in the Columbia Corridor and essential services offered at the Rosewood Initiative, as well as other social service providers (implemented in 2018)
- *Airport Way:* Increased frequency and hours of service for Line 87 and new weekend service along Airport Way. This will improve access to jobs in the Columbia Corridor. Line 87 increased to frequent service along SE 182nd and SE/NE 181st between NE Sandy and SE Powell. Increased frequency also includes weekend service along NE Airport Way between NE Sandy and the Gateway Transit Center. Line 87 could split into two bus lines at SE Powell and SW Highland to match ridership demand with bus service levels. Route could change to serve SW Pleasant View and SW/SE Butler.
- *Halsey St/Weidler St:* Frequency and hours of service increased for Line 77.
- *Stark St/Washington St:* Increase Line 20 to frequent service running every 15 minutes or better throughout most hours of the day, seven days a week.

Growing Transit Communities (2017)
The Growing Transit Communities (GTC) Plan recommends projects that would provide safer, more convenient access to three bus transit corridors in East

Portland: Halsey (Line 77), Stark-Burnside (Line 20) and Airport Way (Line 87). These three corridors and the EPASS network overlap. Some projects prioritized in the GTC Plan have been included the in the TSP Major Projects List.

Eastside MAX Station Communities Project Report (2009)
The Eastside MAX Station Communities Project Report presents land use concepts and transportation improvements for six MAX light rail station areas, including 82nd Avenue, Parkrose Sumner, 122nd Avenue, 148th Avenue and 162nd Avenue within the EPASS project area. Some of the Eastside MAX Station Communities projects are included in the TSP Major Projects List.

East Portland Action Plan (2009)
The East Portland Action Plan outlines strategies to address five issue areas: Built, Environmental, Economic, Learning and Social. Transportation strategies are offered under the Built strategies section, which lists roles and partners, funding needs and level of effort and implementation timeline. The Transportation strategies include recommendations to prioritize sidewalks and crossings near schools; study and fund crossing improvements on Glisan, Halsey, Stark, Division 122nd and Foster; install bike lanes on all major arterials through East Portland; and fill bike network gaps. Sidewalk infill is further addressed as a link to transit through multi-agency coordination of sidewalk improvements and transit stop improvements. In addition, the Plan recommends study and implementation of signal timing changes on 102nd, 122nd, and 148th at Burnside and improvements to high crash intersections on 122nd Avenue.

Bicycle Plan for 2030 (2010)
The Bicycle Plan for 2030, adopted in 2010, identifies a recommended bicycle network using different bicycle facility types, from multi-use paths and neighborhood greenways, to separated in-roadway bikeways. It also includes a list of capital projects and recommended actions and policies. Related to the EPASS project, the Plan emphasizes the need for safe and convenient non-arterial routes and safe crossings when bikeways cross arterial streets. The Plan calls for separated in-roadway bikeways on much of the EPASS network itself, to be implemented as pilots and then evaluated for permanent build-out. These types of projects are emphasized in the Plan to move Portland toward bicycle network completion.

East Portland in Motion (2012)
East Portland in Motion (EPIM) builds upon previous plans including East Portland Action Plan, Portland Bicycle Plan for 2030, 122nd Avenue Complete and Green Main Street Project, City of Portland Transportation System Plan, as well as the Safe and Sound and Green Streets planning efforts. EPIM prioritized active transportation projects and programs for near-term implementation based on feedback from the public, organizations and school districts and utilizes equity, accessibility, connectivity and opportunities to leverage funding as criteria to prioritize projects.

As part of EPIM, the Sidewalk & Bicycle Priorities Survey was designed to guide East Portland sidewalk and bikeway investment. To gather feedback, PBOT conducted outreach with neighborhood groups, at community events and open houses, with community and advisory groups and through mailers to 3,000 households. Public involvement findings from EPIM led PBOT to invest in widespread basic sidewalk infill on arterial streets, a short list of more substantial separated sidewalk projects on collector streets, and build-out of the neighborhood greenway network. Many of the recommended EPIM projects are complete or under construction.

Division - Midway Neighborhood Street Plan (2015)
The Division - Midway Neighborhood Street Plan focuses on creating or improving local street and walkway connections in the area between 112th and 148th Avenues and Stark and Division Streets within the EPASS project area. Appendix C in the Plan includes a list of prioritized projects with considerations based on community feedback and Bureau of Environmental Services notes on stormwater viability for each project. In addition, the Plan includes details on existing conditions, context for the project area and examples of design concepts for connection improvements. While the Plan focuses primarily on better connectivity in the areas between the arterials, better connections to destinations on the arterials (such as shopping and transit) are also important principles in the Plan.

PedPDX (in progress)
PedPDX, an update to Portland's citywide pedestrian plan, is nearing completion as of winter 2018-19. A draft plan is being developed for public review in early 2019. PedPDX includes a toolbox of actions to improve pedestrian safety and access. The plan will include new policies on crossing spacing and parking setbacks at intersections. For the EPASS network, which is comprised almost entirely of streets designated as City Walkways or Major City Walkways, PedPDX recommends marked pedestrian crossings every 800 feet, or every 530 feet within a Pedestrian District. (Pedestrian Districts in East Portland are located in the Gateway Regional Center and Lents Town Center, and in the 82nd, 122nd, 148th and 162nd MAX station areas.)

Freight Master Plan (2006)
Key considerations for freight routes include commercial truck access to businesses and lane widths to accommodate truck turning movements. The City's Freight Master Plan provides vehicle characteristic and turning movement information to guide street and intersection design. Freight Master Plan Chapter 6 includes additional guidance on street design. On the EPASS Network, Priority Truck Streets include NE Airport Way, the portion of NE 122nd Avenue between Airport Way and Sandy Boulevard, and NE Killingsworth/Columbia west of I-205.

Table 4 Truck Design Vehicle Characteristics and Turning Movement Information

Design Vehicles	Trailer	Wheelbase	Overall Length	Minimum Design Turning Radius	Truck Widths* (Without Mirrors)	Minimum Inside Radius**
Automobile	None	11′	19′	24′	N/A	14.4′
Bus	None	25′	40′	42′	8.5′	24.5′
Signal Unit Truck	None	20′	30′	42′	8.5′	28.3′
Intermediate Semi -Trailer	33′ trailer	40′	45′	40′	8.5′	19.3′
Intermediate Semi -Trailer	42.5′ trailer	50′	55′	45′	8.5′	17.0′
Intermediate Semi -Trailer	48′ trailer	62′	68. 6′	45′	8.5′	7.9′
Intermediate Semi -Trailer	53′ trailer	65′	73. 5′	45′	8.5′	4.4′

Source: AASHTO *A Policy on Geometric Design of Highways and Streets*, 2001, Fourth Edition.
* Mirrors on trucks extend between 12” and 18” from the frame of the truck.
** For a 180-degree turn.

The City intends to update the Freight Master Plan in the next few years. EPASS freight routes may be impacted by the plan update.

II. Corridor Summaries

The Corridor Summaries below include key physical dimensions, traffic volumes, and policy designations that will help inform concept designs as part of EPASS.

Northeast/Southeast 102nd/103rd/Cherry Blossom Avenues (Sandy to 106th)

CORRIDOR DETAILS
Segment Length: 3.1 miles
Typical Roadway Width (existing): 66'
Typical Sidewalk Width (existing): 7'
Typical Right-of-Way (existing): 80'
ADT Volume Range: 13,000-21,000
Comp Plan Pattern Area: Eastern
Centers: Gateway Regional Center
Corridors: NE & SE 102nd Avenue (Neighborhood)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian District
Bicycle: City Bikeway
Transit: Major Transit Priority Street
Design: Community Corridor, Neighborhood Main Street
Emergency Response: Major Emergency Response Street
Freight: Truck Access Street
Traffic: District Collector

Northeast/Southeast 122nd Avenue (Airport Way to Glisan)

CORRIDOR DETAILS
Segment Length: 2.3 miles
Typical Roadway Width (existing): 76'
Typical Sidewalk Width (existing): 7'
Typical Right-of-Way (existing): 90'
ADT Volume Range: 16,000-26,000
Comp Plan Pattern Area: Rivers, Eastern
Centers: 122nd/Hazelwood
Corridors:122nd Avenue (Civic)
Drive Alone Commute Mode Goal: 65% within Eastern Pattern Area, 55% within Rivers Pattern Area

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian District
Bicycle: Major City Bikeway
Transit: Major Transit Priority Street
Design: Civic Corridor, Civic Main Street
Emergency Response: Major Emergency Response Street
Freight: Priority Truck Street, Major Truck Street
Traffic: District Collector, Major City Traffic Street

Northeast/Southeast 148th Avenue (I-84 to Powell)

CORRIDOR DETAILS
Segment Length: 3.1 miles
Typical Roadway Width (existing): 66′
Typical Sidewalk Width (existing): 7′
Typical Right-of-Way (existing): 80′
ADT Volume Range: 11,000-13,000
Comp Plan Pattern Area: Eastern
Centers: 122nd/Hazelwood
Corridors:148th Avenue (Neighborhood)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian District
Bicycle: City Bikeway
Transit: Major Transit Priority Street
Design: Neighborhood Main Street, Neighborhood Corridor
Emergency Response: Major Emergency Response Street
Freight: None
Traffic: District Collector

Southeast 162nd Avenue (Stark to Powell)

CORRIDOR DETAILS
Segment Length: 1.8 miles
Typical Roadway Width (existing): 76′
Typical Sidewalk Width (existing): 6.5′
Typical Right-of-Way (existing): 89′
ADT Volume Range: 10,000-18,000
Comp Plan Pattern Area: Eastern
Centers: Rosewood/Glenfair
Corridors: None
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway
Bicycle: City Bikeway
Transit: None
Design: Community Corridor
Emergency Response: Major Emergency Response Street
Freight: Truck Access Street
Traffic: District Collector

Northeast Airport Way (Glenn Widing to 181st)

CORRIDOR DETAILS
Segment Length: 3.8 miles
Typical Roadway Width (existing): 66′
Typical Sidewalk Width (existing): 5′
Typical Right-of-Way (existing): 76′
ADT Volume Range: 12,000-38,000
Comp Plan Pattern Area: Eastern
Centers: None
Corridors: None
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway
Bicycle: City Bikeway
Transit: Major Transit Priority Street
Design: Industrial Road
Emergency Response: Major Emergency Response Street
Freight: Priority Truck Street, Freight District
Traffic: District Collector

Northeast Sandy Boulevard (82nd to Killingsworth)

CORRIDOR DETAILS
Segment Length: 1 mile
Typical Roadway Width (existing): 60′
Typical Sidewalk Width (existing): 8′
Typical Right-of-Way (existing): 76′
ADT Volume Range: 14,000-17,000
Comp Plan Pattern Area: Eastern
Centers: Roseway, Parkrose
Corridors: Inner NE Sandy Boulevard (Civic)
Drive Alone Commute Mode Goal: 65% single-occupancy vehicle

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway
Bicycle: City Bikeway
Transit: Major Transit Priority Street, Transit Access Street
Design: Civic Main Street, Civic Corridor
Emergency Response: Major Emergency Response Street
Freight: Major Truck Street
Traffic: Major City Traffic Street

Northeast Halsey/Weidler Street (82nd to 162nd)

CORRIDOR DETAILS
Segment Length: 4 miles
Typical Roadway Width (existing): 66′ (44′ for each street at couplet segment)
Typical Sidewalk Width (existing): 7′
Typical Right-of-Way (existing): 80′ (60′ for each street at couplet segment)
ADT Volume Range: 19,000-31,000
Comp Plan Pattern Area: Eastern
Centers: Gateway Regional Center
Corridors: NE Halsey Street (Neighborhood)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian District
Bicycle: Major City Bikeway
Transit: Transit Access Street
Design: Regional Corridor, Neighborhood Main Street, Neighborhood Corridor, Community Corridor
Emergency Response: Major Emergency Response Street
Freight: Major Truck Street, Freight District
Traffic: Major City Traffic Street

Northeast Glisan Street (82nd to 162nd)

CORRIDOR DETAILS
Segment Length: 4 miles
Typical Roadway Width (existing): 66′
Typical Sidewalk Width (existing): 7′
Typical Right-of-Way (existing): 80′
ADT Volume Range: 16,000-27,000
Comp Plan Pattern Area: Eastern
Centers: Gateway Regional Center, 122nd/Hazelwood, Rosewood/Glenfair
Corridors: NE Glisan Street (Neighborhood)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian Districts
Bicycle: City Bikeway
Transit: Transit Access Street
Design: Neighborhood Main Street, Neighborhood Corridor, Community Corridor
Emergency Response: Major Emergency Response Street
Freight: Truck Access Street, None
Traffic: District Collector

Southeast Stark Street/Washington Street (82nd Ave to 162nd)

CORRIDOR DETAILS
Segment Length: 4 miles
Typical Roadway Width (existing): 66′ (44′ for each street at couplet segment)
Typical Sidewalk Width (existing): 7′
Typical Right-of-Way (existing): 80′ (60′ for each street at couplet segment)
ADT Volume Range: 23,000-27,000
Comp Plan Pattern Area: Eastern
Centers: Montavilla, Gateway Regional Center, 122nd/Hazelwood, Rosewood/Glenfair
Corridors: SE Stark Street (Civic), Burnside Street (Not identified as a Corridor)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway, Pedestrian Districts
Bicycle: City Bikeway
Transit: Major Transit Priority Street
Design: Civic Main Street, Civic Corridor
Emergency Response: Major Emergency Response Street
Freight: Major Truck Street
Traffic: Major City Traffic Street

Southeast Division Street (82nd to 174th)

CORRIDOR DETAILS
Segment Length: 4.6 miles
Typical Roadway Width (existing): 76′
Typical Sidewalk Width (existing): 7′
Typical Right-of-Way (existing): 90′
ADT Volume Range: 23,000-34,000
Comp Plan Pattern Area: Eastern
Centers: Jade District, Midway, Division/162nd
Corridors: Outer SE Division Street (Civic)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway
Bicycle: City Bikeway
Transit: Major Transit Priority Street
Design: Civic Main Street, Civic Corridor
Emergency Response: Major Emergency Response Street
Freight: Truck Access Street
Traffic: District Collector

Southeast Foster Road/Woodstock Boulevard (82nd to 122nd)

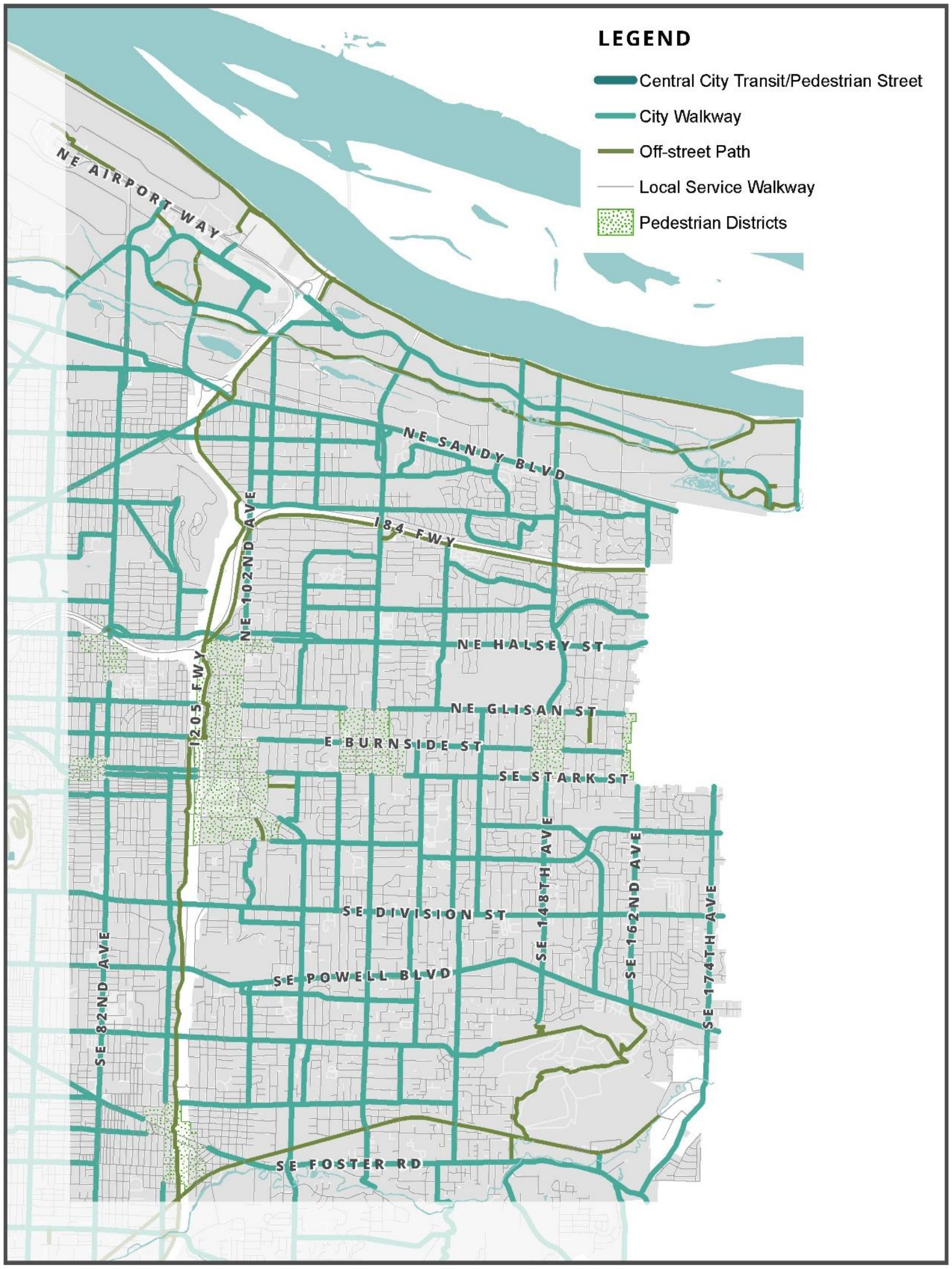
CORRIDOR DETAILS
Segment Length: 1.5 miles
Typical Roadway Width (existing): 76′ on Foster, 44′ on Woodstock
Typical Sidewalk Width (existing): 8′ on Foster, 6′ on Woodstock
Typical Right-of-Way (existing): 92′ on Foster, 56′ on Woodstock
ADT Volume Range: 9,000-13,000
Comp Plan Pattern Area: Eastern
Centers: Lents
Corridors: SE Foster Road (Civic)
Drive Alone Commute Mode Goal: 65%

TSP STREET CLASSIFICATIONS
Pedestrian: City Walkway
Bicycle: City Bikeway
Transit: Major Transit Priority Street, part of Woodstock Blvd classified as Transit Access Street
Design: Civic Main Street, Neighborhood Main Street, Civic Corridor
Emergency Response: Major Emergency Response Street
Freight: Truck Access Street
Traffic: Major City Traffic Street

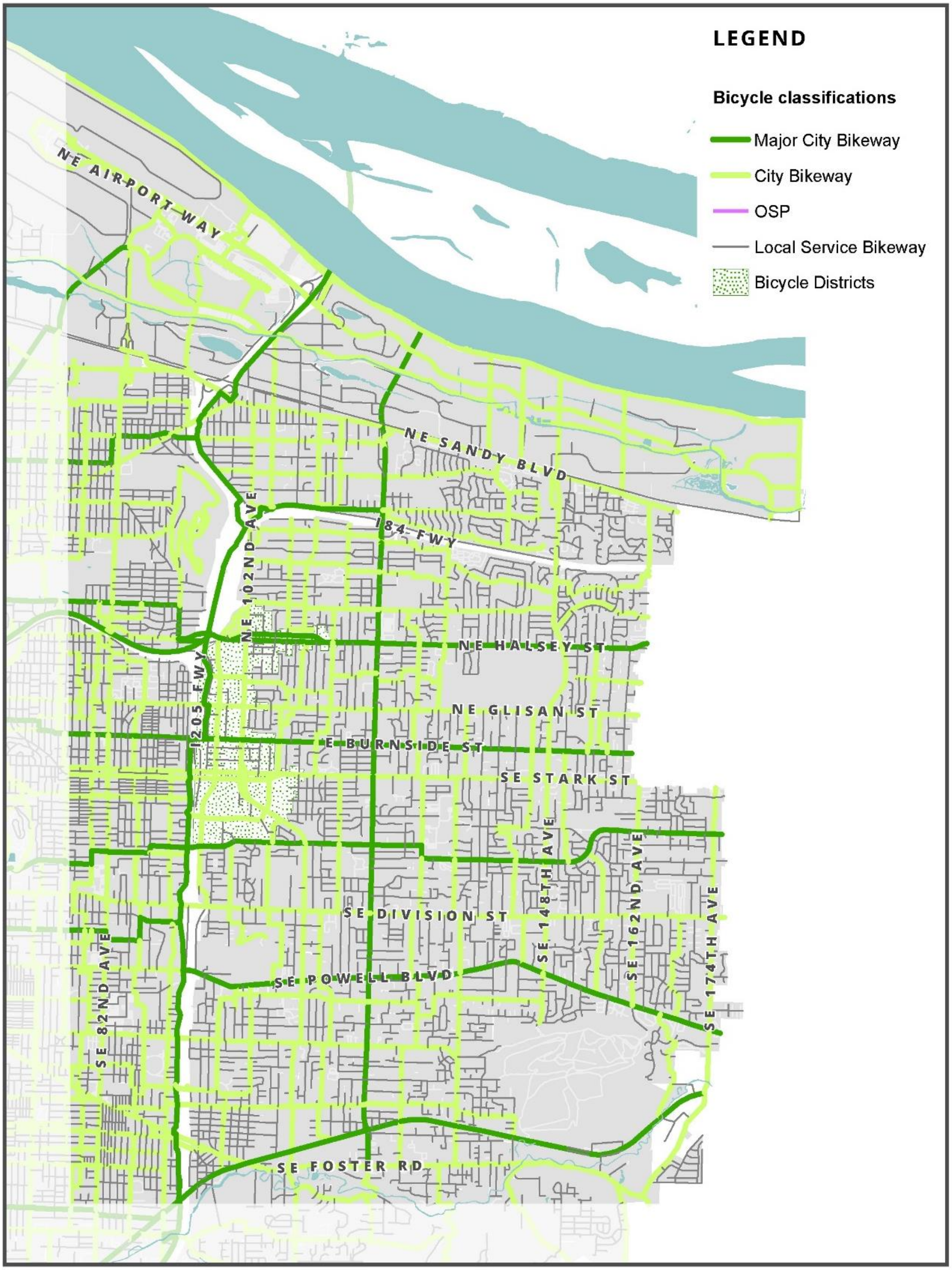
III. Project Area Maps

The maps below include TSP functional classes for each mode and zoning districts.

EPASS Project Area Street Classifications Map: Pedestrian



EPASS Project Area Street Classifications Map: Bicycle

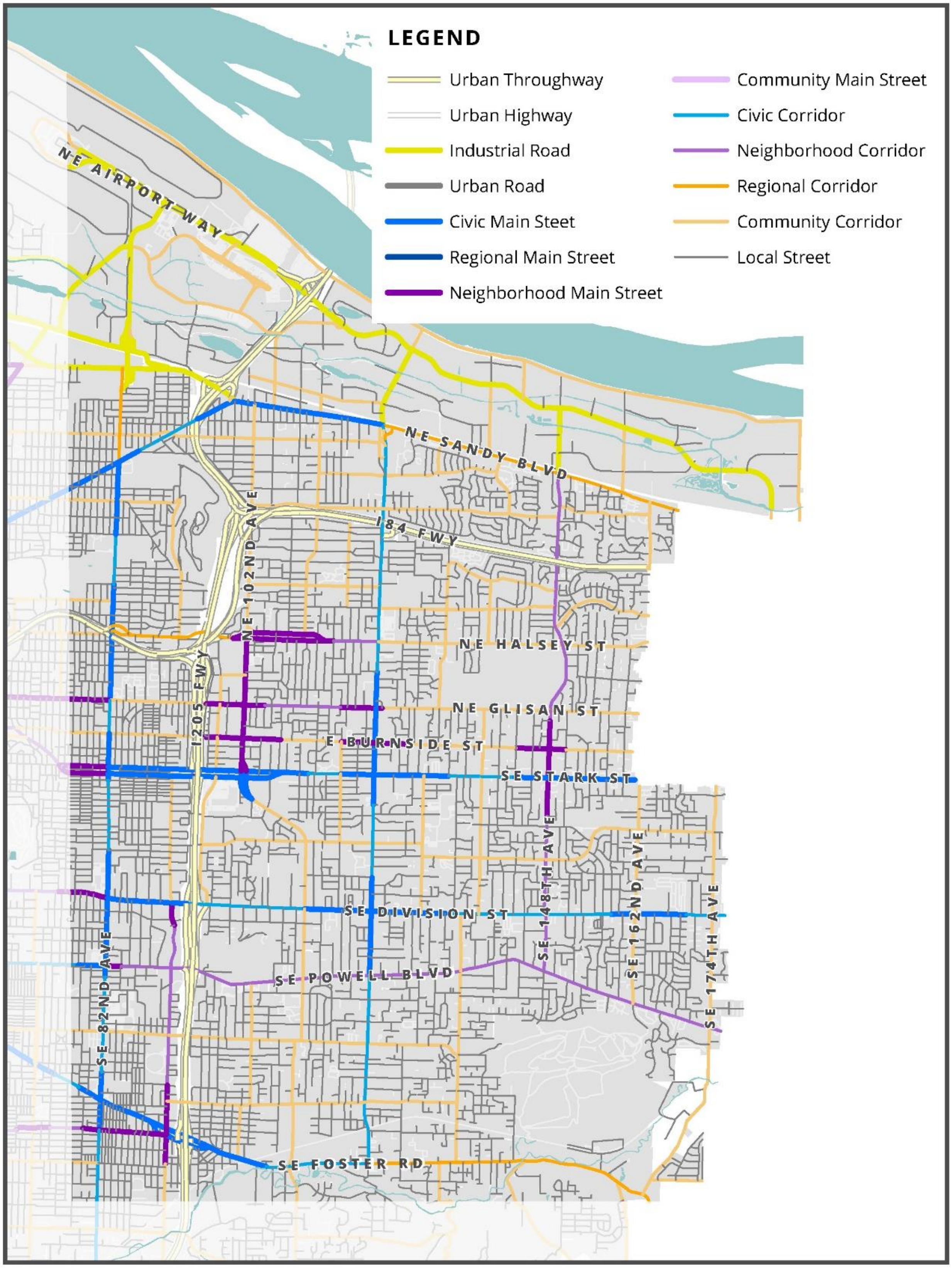


EPASS Project Area Street Classifications Map: Transit

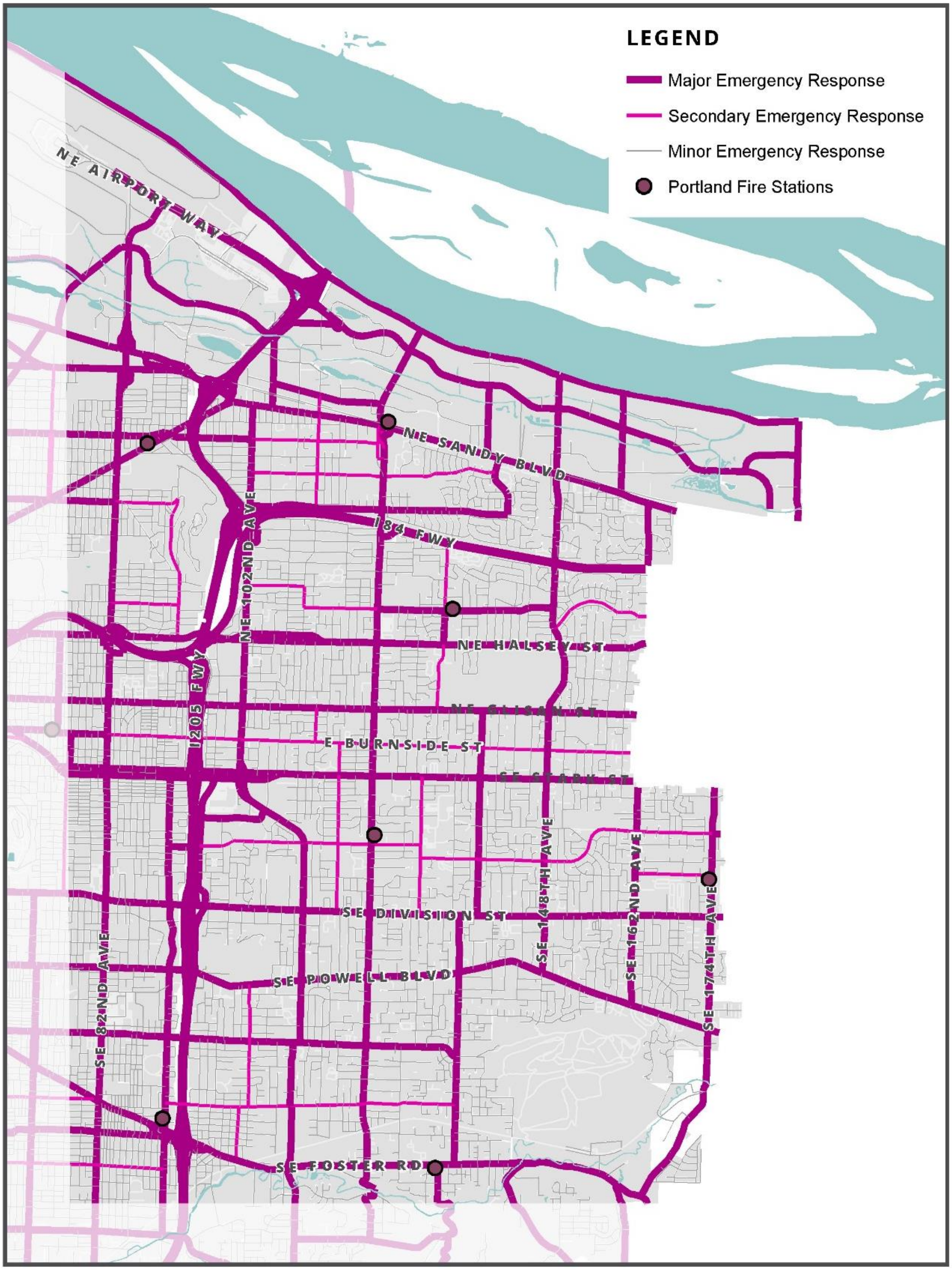
EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION

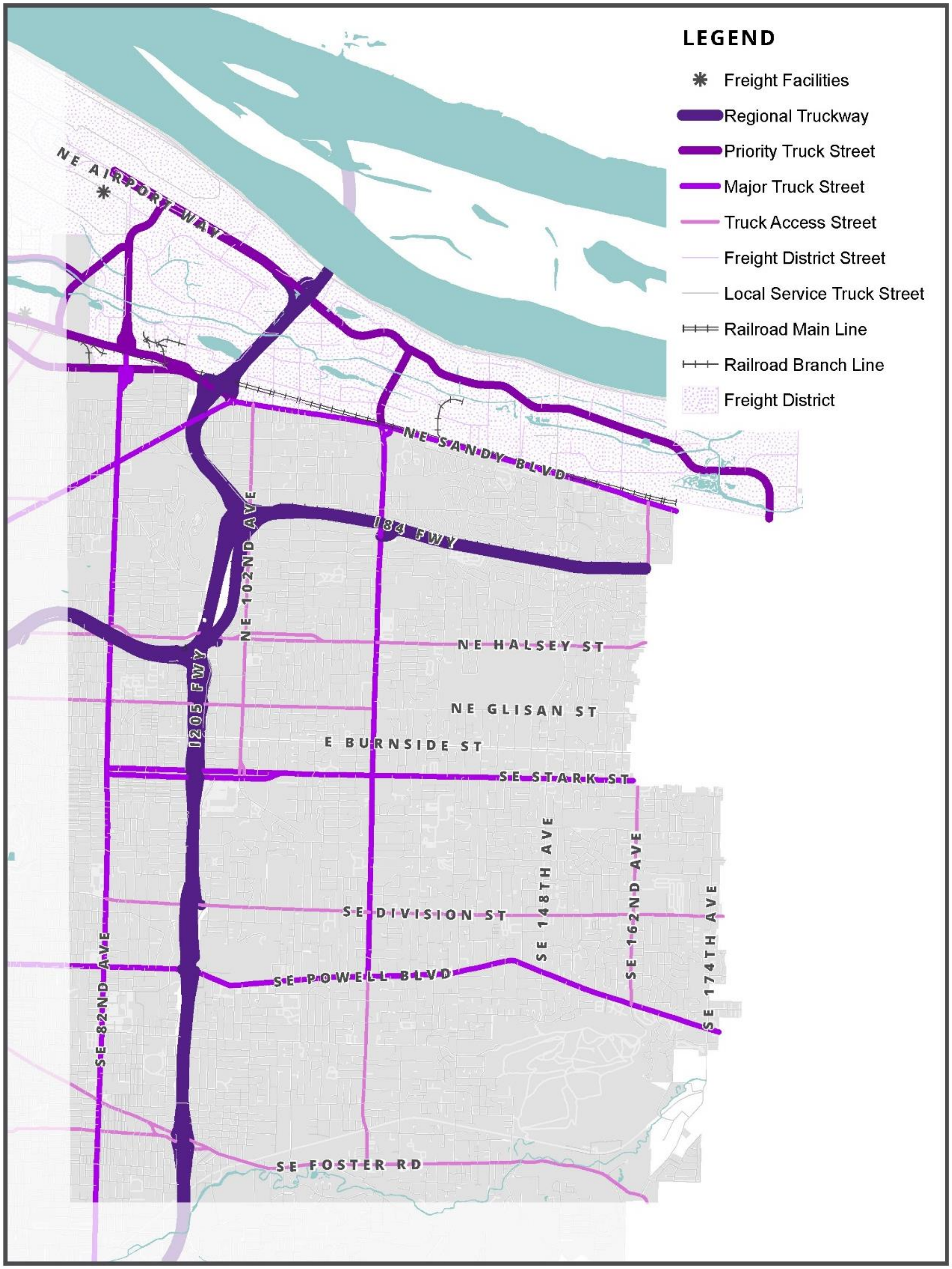
EPASS Project Area Street Classifications Map: Design



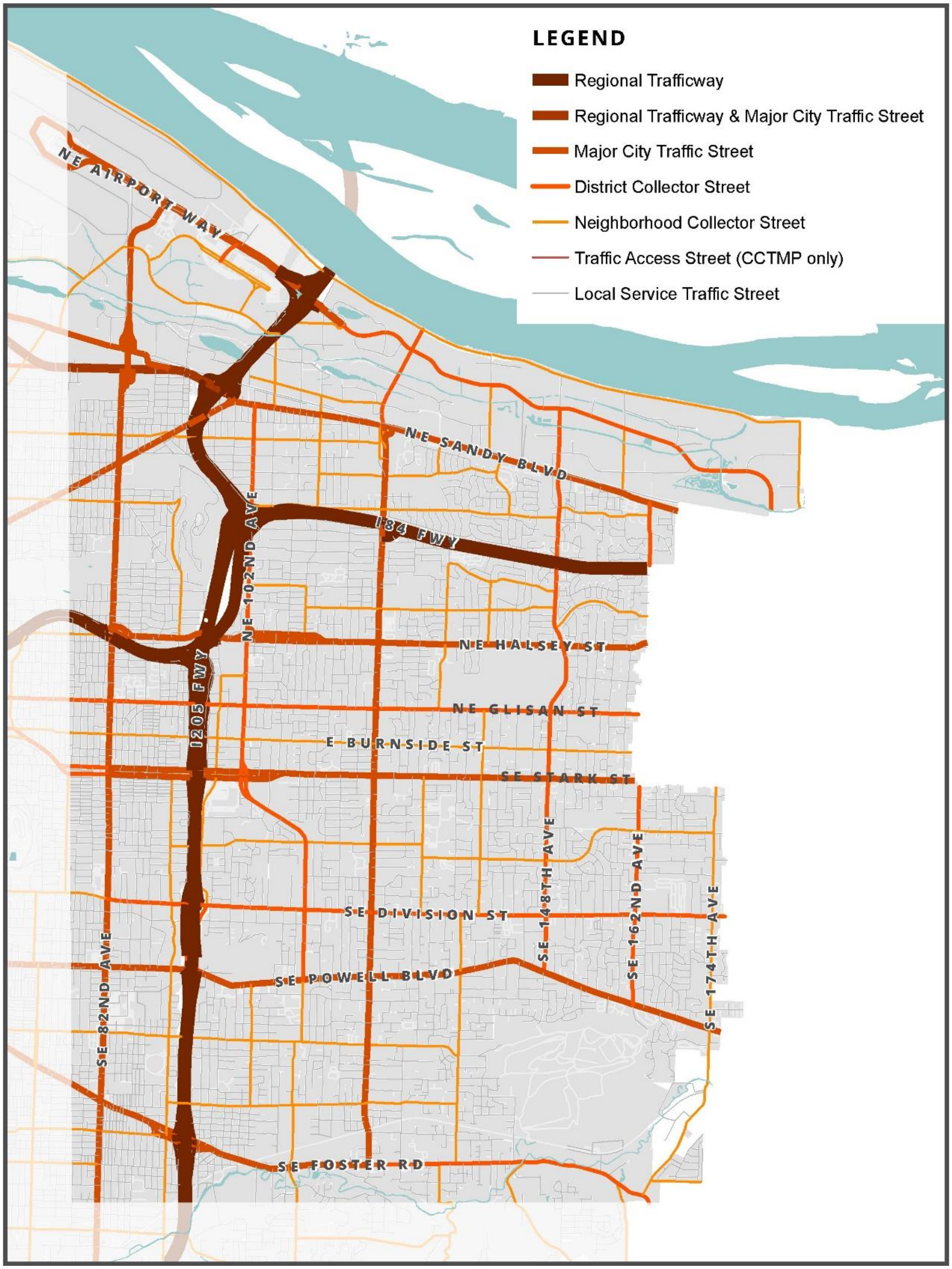
EPASS Project Area Street Classifications Map: Emergency Response



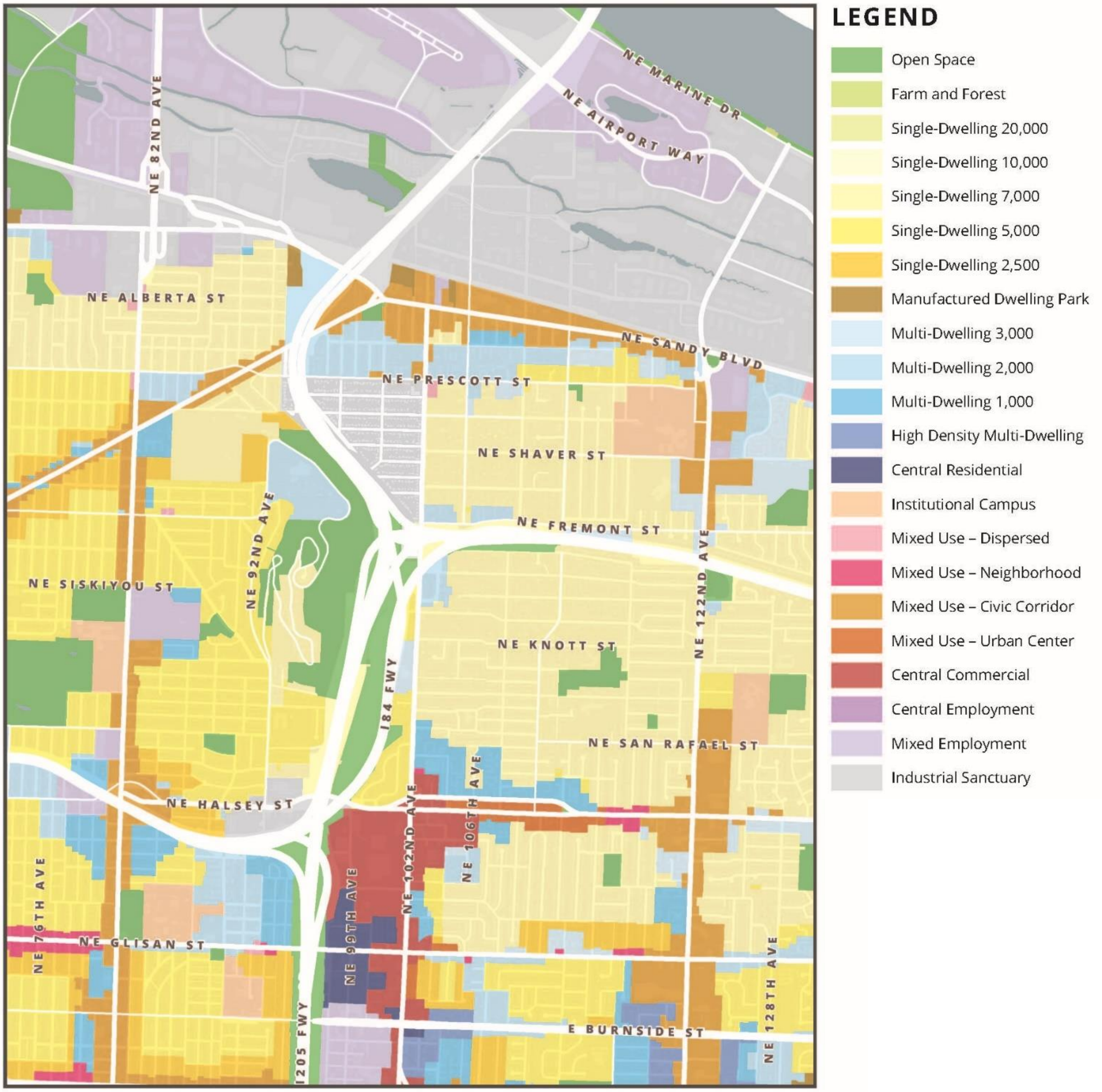
EPASS Project Area Street Classifications Map: Freight



EPASS Project Area Street Classifications Map: Traffic



Comprehensive Plan Zoning Map: East Portland (Northwest)



EPASS

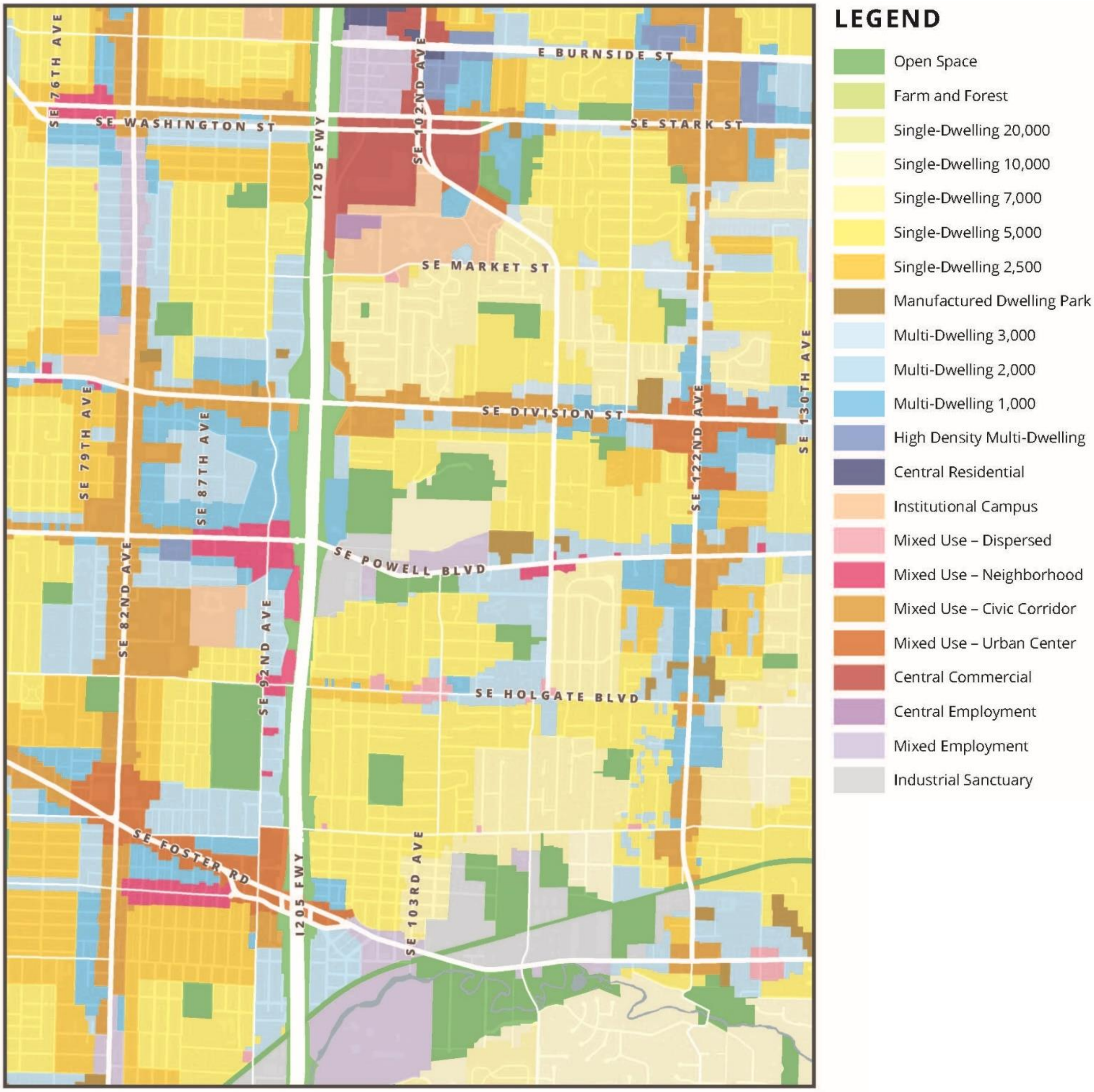
PBOT
PORTLAND BUREAU OF TRANSPORTATION

Comprehensive Plan Zoning Map: East Portland (Northeast)

LEGEND

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
- Single-Dwelling 5,000
- Single-Dwelling 2,500
- Manufactured Dwelling Park
- Multi-Dwelling 3,000
- Multi-Dwelling 2,000
- Multi-Dwelling 1,000
- High Density Multi-Dwelling
- Central Residential
- Institutional Campus
- Mixed Use – Dispersed
- Mixed Use – Neighborhood
- Mixed Use – Civic Corridor
- Mixed Use – Urban Center
- Central Commercial
- Central Employment
- Mixed Employment
- Industrial Sanctuary

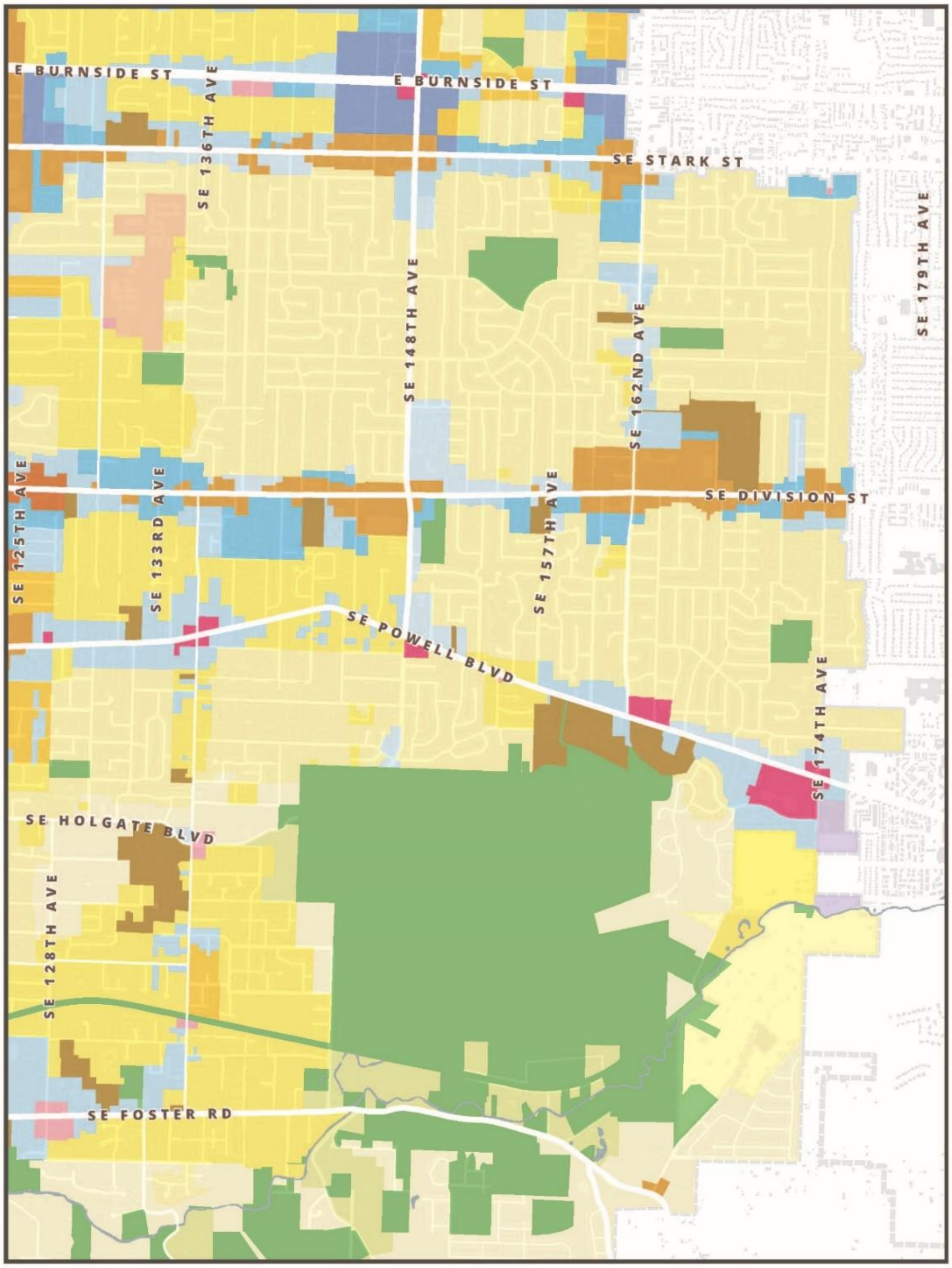
Comprehensive Plan Zoning Map: East Portland (Southwest)



EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION

Comprehensive Plan Zoning Map: East Portland (Southeast)



LEGEND

- Open Space
- Farm and Forest
- Single-Dwelling 20,000
- Single-Dwelling 10,000
- Single-Dwelling 7,000
- Single-Dwelling 5,000
- Single-Dwelling 2,500
- Manufactured Dwelling Park
- Multi-Dwelling 3,000
- Multi-Dwelling 2,000
- Multi-Dwelling 1,000
- High Density Multi-Dwelling
- Central Residential
- Institutional Campus
- Mixed Use – Dispersed
- Mixed Use – Neighborhood
- Mixed Use – Civic Corridor
- Mixed Use – Urban Center
- Central Commercial
- Central Employment
- Mixed Employment
- Industrial Sanctuary

IV. TSP Major Projects List for EPASS Network

TSP ID	Project Name	Project Status	Project Description	Lead Agency	Estimated Cost	Estimated Timeframe	Funding Status
40068	Sandy Blvd Corridor Improvements, Phase 2	Constrained	Retrofit existing street with multi-modal street improvements including bicycle facilities, redesign of selected intersections to improve pedestrian crossings, streetscape, and safety improvements. Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.	PBOT	$6,481,860	Years 1 - 10	Project development only
40086	Halsey St Bikeway, Phase 1	Constrained	Implement a lane reorganization including bicycle facilities from 67th to 80th, and add improved pedestrian/bicycle crossings at 67th and 80th.	PBOT	$500,000	Years 1 - 10	CIP funded
80017	Outer Stark Ped/Bike Improvements	Constrained	Construct sidewalks and crossing improvements and provide bicycle facilities. Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.	PBOT	$8,209,130	Years 1 - 10	CIP funded
80018	Gateway--Stark/Washington Streetscape Improvements	Constrained	Implement Gateway regional center plan with boulevard design retrofit including new traffic signals, improved pedestrian facilities and crossings, and street lighting. Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.	PBOT	$6,157,767	Years 1 - 10	Project development only
50003	102nd Ave Streetscape Improvements, Phase 3	Constrained	Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, improved pedestrian facilities and crossings, street lighting and new bicycle facilities.	PBOT	$2,000,000	Years 11 - 20	Project development only
50004	NE 102nd Ave Corridor Improvements	Constrained	Construct sidewalks and improved crossings, install bicycle facilities, and make traffic safety improvements.	PBOT	$5,224,878	Years 1 - 10	CIP funded
50009	NE 148th Ave Safety Improvements	Constrained	Design and implement pedestrian and bicycle facilities, including intersection crossing improvements at 148th & Sandy. Improve traffic safety by addressing line of sight issues just north of I-84.	PBOT	$3,000,000	Years 1 - 10	Project development only
50012	NE 162nd Ave Bikeway	Constrained	Design and implement separated in-roadway bicycle facilities.	PBOT	$4,107,779	Years 11 - 20	CIP funded

TSP ID	Project Name	Project Status	Project Description	Lead Agency	Estimated Cost	Estimated Timeframe	Funding Status
50025	Outer Glisan Safety and Streetscape Improvements	Constrained	Install bicycle facilities on existing street. Install street trees (requires sidewalk widening, curb extensions, and/or bioswales). Install a signal at 131st Pl to improve pedestrian and vehicular access to Glisan St.	PBOT	$1,963,022	Years 11 - 20	CIP funded (partial)
50028	Outer Halsey Pedestrian Improvements	Constrained	Construct sidewalks, crossing improvements for pedestrian travel, and access to transit improvements.	PBOT	$6,389,475	Years 11 - 20	CIP funded
50039	Halsey/Weidler Streetscape Improvements	Unconstrained	Implement Gateway Regional Center Plan boulevard design including new traffic signals, improved pedestrian facilities and crossings and street lighting.	PBOT	$16,000,000	N/A	CIP funded
50024	Gateway--Glisan Streetscape Improvements	Constrained	Implement Gateway regional center plan with boulevard design retrofit, new traffic signals, bike facilities, improved pedestrian facilities and crossings, and street lighting.	PBOT	$3,240,930	Years 1 - 10	Unfunded
70047	Foster Rd Transit Improvements	Constrained	Construct improvements that enhance frequent bus service along the Foster corridor.	PBOT	$667,784	Years 1 - 10	CIP funded
40069	Sandy Blvd ITS	Constrained	Install ITS infrastructure (communication network, enhanced bus detection, Bluetooth detection, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system consistent with our policies of moving people more effectively.	PBOT	$519,110	Years 1 - 10	Unfunded
50005	122nd Ave ITS	Constrained	Install needed ITS infrastructure (communication network, new traffic controllers, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system.	PBOT	$515,703	Years 1 - 10	CIP funded
50016	Airport Way ITS	Constrained	Install needed ITS infrastructure (communication network, new traffic controllers, CCTV cameras, and vehicle /pedestrian detectors). These ITS devices allow us to provide more efficient and safe operation of our traffic signal system.	PBOT	$278,251	Years 1 - 10	Unfunded

TSP ID	Project Name	Project Status	Project Description	Lead Agency	Estimated Cost	Estimated Timeframe	Funding Status
80039	Powell/Division HCT--Project Development	Other Agency	Project Development through ROW acquisition/early construction for High Capacity Transit project between Portland and Gresham.	TRIMET	$75,000,000	Years 1 - 10	TSP List
50049	122nd Ave Corridor Improvements	Constrained	Design and implement multimodal improvements to sidewalks, crossings, bicycle facilities, transit stops, striping, and signals to enhance ped/bike safety, access to transit, and transit operations. Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.	PBOT	$8,000,000	Years 1 - 10	CIP funded
70072	SE Washington Bikeway Gap	Constrained	Design and implement bicycle facilities. Project design will consider freight movement needs, consistent with policies, street classification(s) and uses.	PBOT	$783,000	Years 1 - 10	CIP funded
50053	NE 148th Ave Sidewalk Infill	Constrained	Construct a 6-foot curb-tight sidewalk on the west side of the street.	PBOT	$891,332	Years 1 - 10	Project development only
80034	East Portland Access to Transit	Constrained	Construct SE Division St sidewalk infill and 130s Bikeway.	PBOT	$4,472,488	Years 1 - 10	CIP funded
80035	East Portland Access to Employment	Constrained	This project will build sidewalks and crossing improvements on Powell Blvd, improve sidewalks for access to transit, improve transit stops, improve transit operations, and build the 100s and 150s Neighborhood Greenways.	PBOT	$5,870,072	Years 1 - 10	CIP funded
40086	Halsey St Bikeway, Phase 2	Constrained	Design and implement bicycle facilities and improved crossings.	PBOT	$2,000,000	Years 11 - 20	CIP funded (partial)
70015	SE Division St Transit Improvements	Constrained	Provide capital improvements that benefit frequent bus service along Division from downtown Portland to Gresham.	PBOT	$5,000,000	Years 11 - 20	CIP funded
70024	Lents Town Center Improvements, Phase 2	Constrained	Implement Lents Town Center Business District Transportation Plan with new traffic signals, pedestrian amenities, wider sidewalks, pedestrian crossings, and street lighting.	PBOT	$11,510,000	Years 11 - 20	CIP funded
80009	Outer Division Corridor Improvements	Constrained	Construct streetscape improvements to enhance sidewalks, lighting, crossings, bus shelters and benches, and bicycle facilties.	PBOT	$5,710,912	Years 1 - 10	CIP funded

TSP ID	Project Name	Project Status	Project Description	Lead Agency	Estimated Cost	Estimated Timeframe	Funding Status
80010	Outer Foster Rd Pedestrian Improvements	Constrained	Construct sidewalks and crossing improvements to facilitate pedestrian travel and access to transit.	PBOT	$1,403,000	Years 11 - 20	Unfunded
80005	SE 148th Ave Pedestrian Improvements	Constrained	Construct sidewalks, curbs, and drainage improvements.	PBOT	$2,000,000	Years 1 - 10	Project development only
80040	Powell-Division Corridor HCT--Capital Construction	Other Agency	Capital construction of High Capacity Transit project between Portland and Gresham along Powell/Division Corridor.	TRIMET	$75,000,000	N/A	CIP funded
80037	Powell-Division Safety and Access to Transit	Other Agency	Construct improvements for safety, access to transit, and transit operations in the Powell-Division corridor.	TRIMET	$2,800,000	Years 1 - 10	CIP funded
80033	Eastside MAX Station Pedestrian Improvements	Constrained	Retrofit existing streets along eastside MAX and at intersecting streets to include better sidewalks and crossings, curb extensions, bus shelters, and benches at 82nd, 148th, and 162nd stations.	PBOT	$3,156,750	Years 11 - 20	Unfunded
70079	Glisan St Bridge Replacement	Constrained	Replace existing poor-condition, weight-restricted bridge (#033) to ensure continued use by trucks, transit, and emergency response.	PBOT	$975,800	Years 1 - 10	CIP funded

EPASS

APPENDIX E

STREET DESIGN MENU

Memo

Date:	Monday, July 29, 2019
Project:	East Portland Arterial Streets Strategy
To:	Portland Bureau of Transportation
From:	Beth Wemple, Sumi Malik, and Sam Klump, HDR
Subject:	**Task 6 - Street Design Menu**

1.0 Introduction

The East Portland Arterial Street Strategy's (EPASS) objectives are to develop an approach for road improvement and modernization to increase safety and mobility on major arterials with four or more lanes in east Portland, from 82nd Avenue to the eastern city limits. Safety issues and concerns are present on many major corridors in east Portland, where there have been a disproportionate number of fatal and serious injury crashes. Nine of the arterials in the EPASS network are on the Portland Bureau of Transportation (PBOT) Vision Zero High Crash Network and 28 of the 30 High Crash Intersections in the city are located in east Portland.[1] As an outcome, EPASS will propose a list of capital projects that will potentially be included in upcoming funding measures for road improvement.

This memo (Task 6) presents a street design menu, which consists of a toolbox of recommended safety countermeasures and treatments to reduce future crash frequency and severity, to consider for implementation on the EPASS road network. The main findings from the Safety Analysis (Task 3) are summarized and countermeasures corresponding to the high priority crash types and travel modes are identified. The street design memo will subsequently be used to evaluate alternatives for cross section design for corridors in the study area.

2.0 Main Findings from Safety Analysis Conducted by PBOT

Major crash trends and characteristics identified in the Task 3 Safety Analysis were reviewed. Of particular concern were pedestrian-involved, bicyclist-involved, speeding-related, and low-lighting conditions crashes. The major findings from the Safety Analysis are shown in Table 1.

[1] *Portland's High Crash Network, Vision Zero.* Portland Bureau of Transportation. 2016. https://www.portlandoregon.gov/transportation/54892

hdrinc.com 1050 SW 6th Avenue, Suite 1800, Portland, OR 97204-1151
(503) 423-3700

Table 1: Major Findings of the Safety Analysis

Crash Type	Major Findings
Pedestrian-Involved Crashes	• Nearly 60% of crashes involved pedestrians moving across the segment • 38% occurred at signalized intersections, 35% occurred at mid-block locations, and 22% occurred at un-signalized intersections • One-third were caused by turning vehicles not granting right-of-way
Bicyclist-Involved Crashes	• Two-thirds of crashes involved bicyclist moving along the segment • 33% occurred at un-signalized intersections, 29% at signalized intersections, and 24% at driveways • 30% were caused by turning vehicles not granting right-of-way
Vehicle Crashes, Vehicle Speeds, Fixed Object Crashes	• Rear-end (30%), turning movement (30%), and angle (17%) crashes were most common • 85% of vehicles traveled at speeds higher than the posted speed limit on all corridors • Varying by road and segment, the percentage of vehicles traveling over 30 miles per hour ranged from 29-96% of all vehicles (increases injury severity) • Fixed objects were collided with in 16% of all vehicle crashes
Crashes in Low Light Conditions	• 45% of pedestrian crashes, 24% of bicyclist crashes, and 43% of motor vehicle crashes occurred at night in areas with inadequate street lighting

3.0 Countermeasure Definition and Sources

A countermeasure (also known as a treatment) is a project, policy, or program implemented to reduce crash frequency or change crash severity at a site. Many countermeasures have a crash modification factor (CMF). A CMF is a multiplicative factor applied to observed or estimated future crashes to estimate the safety performance at a site after implementation of the countermeasure. For example, a CMF with a value of 0.75 indicates an estimated 25 percent reduction in crashes after implementation of the treatment. Some agencies also use the term crash reduction factor (CRF). A CRF is equal to 100% * (1-CMF). This memo refers exclusively to CMFs.

Countermeasures and CMFs were researched and selected from both national and local sources. Many of the sources reference each other and have significant overlap. For instance, many of the same countermeasures are included in the Predictive Method for Urban and Suburban Arterials, Crash Modification Factors Clearinghouse, and ODOT's Highway Safety Improvement Program Countermeasures and Crash Reduction Factors. In addition, the PBOT Vision Zero Action Plan, PedPDX, and the Urban Street Design Guide utilize similar strategies to reduce crashes, such as slowing down traffic in urban settings and prioritizing pedestrian and bicyclist safety. The following sources were reviewed for potential countermeasures:

- *Crash Modification Factors Clearinghouse.* Federal Highway Administration, 2019.
- *NCHRP Report 500: Guidance for Implementation of the AASHTO Strategic Highway Safety Plan,* National Cooperative Highway Research Program, 2004.
- *ODOT's HSIP Countermeasures and Crash Reduction Factors.* Oregon Department of Transportation, 2018.
- *PedPDX: Portland's Citywide Pedestrian Plan.* Portland Bureau of Transportation, 2019.
- *PBOT Analysis Road Reconfigurations Reduce Crashes and Speeding in Portland.* Portland Bureau of Transportation, 2014.
- *PBOT Vision Zero Action Plan.* Portland Bureau of Transportation, 2016.
- *Predictive Method for Urban and Suburban Arterials, Highway Safety Manual,* American Association of State Highway Transportation Officials, 2010.
- *Safe Systems Synthesis: An International Scan for Domestic Application.* University of North Caroline Highway Safety Research Center, 2018.
- *Urban Street Design Guide.* National Association of City Transportation Officials, 2013.

4.0 Countermeasures for Consideration

Countermeasures for consideration are shown in Table 2. The countermeasures are selected to address the prioritized crash types identified in the Safety Analysis Memo. The countermeasures are organized according to the crash type to which they correspond, namely:

- Pedestrian and bicyclist crashes at intersections
- Speeding related and bicyclist involved crashes
- Crashes in low light conditions
- Crashes with fixed objects

Table 2 shows the crash type that the countermeasure addresses, the safety issue or concern, the countermeasure name, the effectiveness, and an image of the countermeasure. The countermeasures table does not include recommendations for specific locations in the EPASS network for implementation. Each countermeasures should be evaluated for feasibility and considered in conjunction with other evaluation criteria.

A few specific notes about the information in Table 2 are as follows:

- If a CMF was taken from the FHWA CMF Clearinghouse, the "Clearinghouse ID" is provided under the "Effectiveness (CMF)" column in the tables to allow quick and easy searching on the CMF Clearinghouse website. All countermeasures from the CMF Clearinghouse are rated four out of five stars or better (unless otherwise noted) which indicates a high level of reliability in the research.

- If a CMF was taken from the ODOT HSIP Countermeasures and Crash Reduction Factors source, the “ODOT ID” is also provided and the effectiveness is expressed as a CMF.
- Where both Clearinghouse and ODOT HSIP CMFs are available, the ODOT CMF is provided. Otherwise, the Clearinghouse CMF is shown.

Though each countermeasure is grouped with a particular crash type, many of the countermeasures apply to multiple crash types. For instance, restricting right-turn-on-red movements may decrease turning crashes with pedestrians and bicyclists on the crosswalk and may decrease crashes with vehicles travelling straight through the intersection. Similarly, reducing driveway density may reduce vehicle sideswipe crashes as well as bicyclist crashes with right turning vehicles.

The countermeasures have varying levels of cost, time to implement, and feasibility. Leading pedestrian intervals are relatively less expensive, faster, and face less public concern compared to reducing driveway densities. Within each crash type, countermeasures are listed from less expensive, faster to implement, and higher feasibility to more costly, slower to implement, and less feasible. For near term responses to high crash frequencies and severities, countermeasures listed higher in the table in each crash type category may be considered before countermeasures listed lower in the table.

Equitable, Safe Solutions

Racial Bias in Drivers’ Yielding Behavior at Crosswalks: Understanding the Effect[2], a study conducted by Portland State University, explored the hypothesis that “drivers will exhibit racial bias when making decisions about whether or not to stop for pedestrians waiting to cross the street at a crosswalk, which may reflect conscious or non-conscious bias.” Based on a Centers for Disease Control Study examining crash history, racial minorities are disproportionately represented in pedestrian fatalities (2013). Studying driver yielding behavior at marked crosswalks, the study found that black male pedestrians were passed by twice as many cars as, and waited 32 percent longer than, white male pedestrians. Drivers were less likely to stop for black and male pedestrians, and when they did stop, they were more likely to stop closer to black male and female pedestrians as compared to white male or white female pedestrians, regardless of drivers’ race and gender. These negative experiences lead to increased stress and harms in for black pedestrians.

The EPASS study area is a community of color. As a result of these observed data, this analysis makes two recommendations: 1) reduce overall harm by reducing travel speeds, and 2) provide more robust crossing treatments, such as the installation of pedestrian hybrid-beacons and illumination more frequently to better achieve equitable outcomes and address racial disparities in pedestrian-involved crashes.

Countermeasures to pedestrian and bicyclist crashes at intersections include:

- Installing leading pedestrian intervals - leading pedestrian intervals grant a pedestrian or bicyclist a three to seven second head start to enter the crosswalk before the right turn vehicle phase begins, which may decrease pedestrian and bicyclist turning crashes by 37 percent.
- Replacing protected/permissive left turn phases with protected only phases - replacing permissive left signal phases with protected only phases reduces the chance of left turn vehicles not granting right-of-way to pedestrians or bicyclists using the crosswalk and may reduce left turn crashes by 99 percent.

[2] Kahn, Kimberly, Jean McMahon, Tara Goddard and Arlie Adkins. 2017. *Racial Bias in Drivers’ Yielding Behavior at Crosswalks: Understanding the Effect.* NITC-RR-869. Portland, OR: Transportation Research and Education Center (TREC). https://doi.org/10.15760/trec.185

- Providing high visibility crosswalks at intersections - high visibility crosswalks increase the conspicuity of pedestrians and bicyclists in the crosswalk and may increase the chances of vehicles stopping prior to the painted stop bar, which research suggests reduces pedestrian and bicyclist crashes by 40 percent.

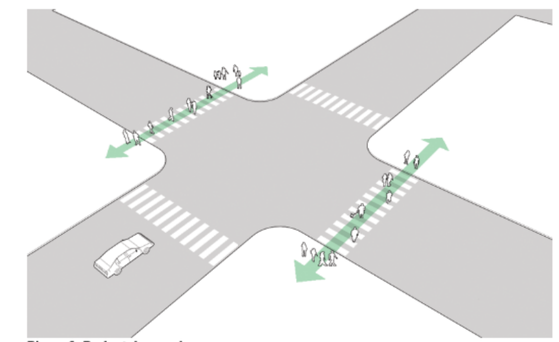
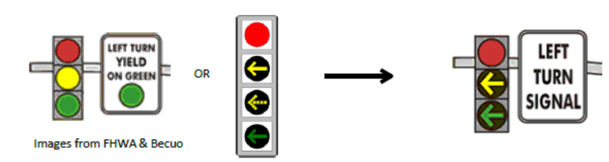
For reducing speeding related crashes and bicyclist crashes along segments:

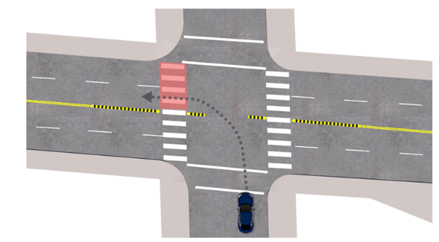
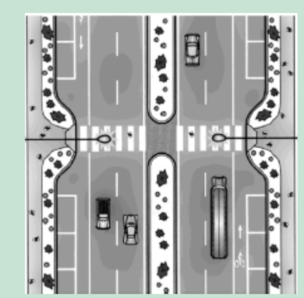
- Installing automated speed enforcement - automated speed enforcement involves setting up cameras that detect when vehicle speeds are higher than the posted speed limit, take a photo of the driver's license plate, and send a citation in the mail to the driver. Speed cameras are shown to reduce fatal and injury crashes by 17 percent.
- Reducing the posted speed limit to 25 miles per hour - when speed limits are reduced from 30 miles per hour to 25 miles per hour, crashes may decrease by 26 percent. As crash severity is generally higher when vehicles are traveling at higher speeds, reducing the speed limit reduces the likelihood of a fatal or serious injury when crashes do occur.
- Reconfiguring a five-lane section to a three-lane section with buffered bike lanes (i.e., road diet) – PBOT has implemented road diets along five corridors throughout Portland, including NE Glisan Street, SE 7th Street, SE Tacoma Street, and SE Division Street. Although the sample sizes are small, data analysis of crash frequencies before and after the road reconfigurations show reductions in both traffic crash rates and traffic speeds on these corridors.[3]

Finally, many of the corridors in the EPASS network have been identified as having sub-standard lighting. Increasing the average illuminance of roadway segments may reduce crashes that occur in low light conditions. Reducing fixed object density and/or increasing the offset from the travel lanes may reduce lane departure crashes by 22 percent for all severities.

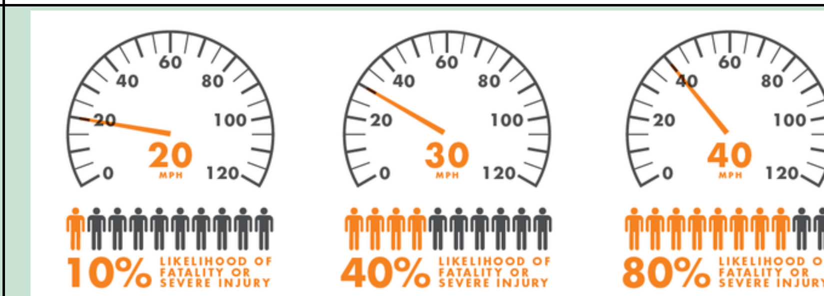
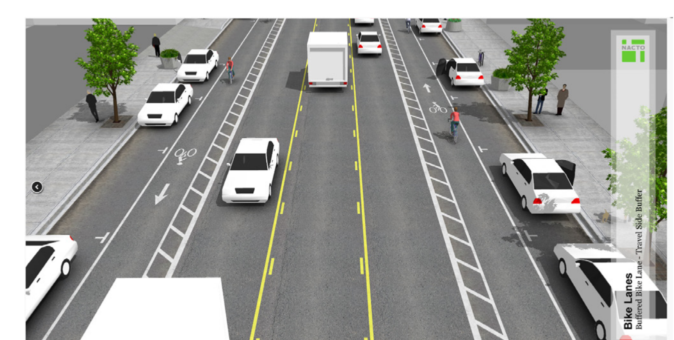
[3] *PBOT Analysis: Road Reconfigurations Reduce Crashes and Speeding in Portland*. Portland Bureau of Transportation. October 2014. https://www.portlandoregon.gov/transportation/article/505257

Table 2: Countermeasures for Consideration on the EPASS Network

Crash Type	Safety Issue/Concern	Countermeasure Name	Effectiveness (CMF)	Image
Pedestrian and bicyclist crashes at intersection	**Vehicles turning into pedestrians/bicyclists at intersections**	Install leading pedestrian intervals (LPI) (ODOT, 2018)	0.63 (all severities, pedestrian and bicyclist crashes, ODOT ID=BP3)	 Phase 1: Pedestrians only Pedestrians are given a minimum 3–7 second head start entering the intersection. (NACTO, 2013)
		Restrict right-turn-on-red movements at intersections (HSM, 2010)	0.92 (all severities, all crash types, Clearinghouse ID=5194)	 (PedPDX, 2019)
		Replace permissive or protected/permissive left turn with protected only (ODOT, 2018)	0.01 (all severities, left turn crashes, ODOT ID=I4)	 (ODOT, 2018)

Crash Type	Safety Issue/Concern	Countermeasure Name	Effectiveness (CMF)	Image
		Provide high visibility/raised crosswalks at intersections (PedPDX, 2019)	0.60 (all severities, pedestrian crashes, Clearinghouse ID=4123, 2 Stars)	 (PedPDX, 2019)
		Install left turn calming (PBOT Pilot Program, 2019)	Unknown	 (PBOT Pilot Program, 2019)
		• Install curb extension with marked crosswalks according to PedPDX crossing spacing guidelines (ODOT, 2018) • Install pedestrian hybrid beacon (e.g. HAWK signal). (ODOT, 2018)	0.63 (all severities, pedestrian crashes, ODOT ID=BP12) 0.45 (all severities, pedestrian and bicyclist crashes, ODOT ID=BP15)	 (ODOT, 2018)  (ODOT, 2018)

Crash Type	Safety Issue/Concern	Countermeasure Name	Effectiveness (CMF)	Image
Speeding related and bicyclist involved crashes	**Motor vehicles traveling at unsafe speeds, motor vehicles collisions with bicycles along segments**	• Install bicycle box at conflict points (ODOT, 2018) • Install green painted conflict point for bicyclists at local streets and high volume commercial driveways (NACTO, 2013)	0.65 (all severities, bicycle crashes, ODOT ID=BP6) Unknown	 (ODOT, 2018)
		Reduce cycle lengths and use slower signal progressions (NACTO, 2013)	Unknown	 (Lafayette University, https://sites.lafayette.edu/bahrinmotion/2012/11/09/coordinated-traffic-signals/)
		• Install automated speed enforcement (Vision Zero Action Plan, 2016) • Install individual changeable speed warning signs (ODOT, 2018)	0.83 (fatal and injury, all crash types, Clearinghouse ID=4583) 0.59 (all severities, all crash types, ODOT ID=H47)	 (City of Portland, https://www.portlandoregon.gov/police/article/649328)

Crash Type	Safety Issue/Concern	Countermeasure Name	Effectiveness (CMF)	Image
				 (MidAtlantic Mailbox, https://www.midatlanticmailboxes.com/RadarandDriverFeedbackSigns.html)
		Lower posted speed limit from 30 miles per hour to 25 miles per hour (CMF Clearinghouse, 2019)	0.74 (all severities, all crash types, Clearinghouse ID=8076)	 (Vision Zero Action Plan, 2016)
		• Road diet: Change 5 lane section to 3 lane section with buffered bike lanes (PBOT, 2014) • Install buffered bicycle lanes (NACTO, 2013)	Unknown Unknown	 (NACTO, 2013)

Crash Type	Safety Issue/Concern	Countermeasure Name	Effectiveness (CMF)	Image
		• Install raised median (ODOT, 2018) • Reduce driveway density (ODOT, 2018)	0.78 (all injury, all crash types, ODOT ID=H34) 0.71 (all injury, all crash types, ODOT ID=H30)	 (ODOT, 2018)
Crashes in low light conditions	**All mode crashes in dark light conditions along segments**	Increase average illuminance on roadway segments and sidewalks (CMF Clearinghouse, 2019)	0.96 (all severities, crashes during dark lighting conditions, Clearinghouse ID=8798, 3 Stars)	 (PedPDX, 2019)
Fixed object crashes	**Road departure crashes with utility poles and light poles**	Reduce fixed object density, increase offset to fixed objects (HSM, 2010)	0.78 (all severities, fixed object crashes, Clearinghouse ID=35)	 (SE Division Street, Google Earth)

5.0 Next Steps

The countermeasures presented in the street design memo will be used to develop and evaluate various alternatives for corridor re-designs and improvements throughout the EPASS network. Specifically, cross-sections and intersection design concepts will be developed, evaluated, and used for implementation into the EPASS network-wide traffic model.

EPASS

APPENDIX F

CROSS SECTION DEVELOPMENT FOR NEW CORRIDORS

TOOLE DESIGN

319 SW WASHINGTON STREET
SUITE 420
PORTLAND, OR 97204

503.205.4607
TOOLEDESIGN.COM

MEMORANDUM

May 5, 2020

To: Sumi Malik/HDR
From: Sharon Daleo and Gwen Shaw/ Toole Design
Project: East Portland Arterial Streets Strategy

Re: Memo #7 – Cross Section Development for New Corridors

The East Portland Arterial Street Strategy's (EPASS) objectives are to develop an approach for road improvement and modernization to increase safety and mobility on major arterials with four or more lanes in east Portland, from 82nd Avenue to the eastern city limits. Safety issues and concerns are present on many major corridors in east Portland, where there have been a disproportionate number of fatal and serious injury crashes. Nine of the arterials in the EPASS network are on the Portland Bureau of Transportation (PBOT) Vision Zero High Crash Network and 28 of the 30 High Crash Intersections in the city are located in east Portland. Five of the arterials are summarized in this memo and potential cross sections solutions were provided separately. As an outcome, EPASS will propose a list of capital projects that will potentially be included in upcoming funding measures for road improvement.

This memo presents proposed corridor-wide and cross-sectional improvements, which were developed from a toolbox of recommended safety countermeasures and treatments to reduce future crash frequency and severity, provided in Memo #6. The cross-section memo (Memo #7) will subsequently be used to inform the district-level and traffic-level corridor reorganization assessment memo (Memo #8).

Cross Section Development

Cross section development was based on the countermeasures identified in Memo #6 and include the following:

- Available curb-to-curb and right-of-way width
- Typical cross section in mid-block locations and definition of extents.
- Design assumptions at major signalized intersections
- Cross section with adjacent property redevelopment scenario
- Description of notable features related to each more of travel.
    - Pedestrian: sidewalk widths with and without redevelopment, location of enhanced pedestrian crossings, features to reduce ped crashes at major signalized intersections, street lighting.
    - Bicycle: Bike lane treatment (standard, buffered, protected, etc.), intersection treatments.
    - Transit: Transit (BAT) lanes, queue jumps, floating islands.
    - Freight: Lane widths
    - Vehicular: travel lanes, turn lanes, on-street parking, access management, medians, street lighting.

Considerations for All Corridors

Each of the corridors described below have site specific features and different needs based on the adjacent land uses and placement in the larger network. These streets also have common elements that should be addressed in a consistent manner as they get designed in final phases.

Common Treatments

The below list of recommendations should be included on each corridor:

- Street lighting should be increased, particularly at existing and proposed crossing locations and bus stops.
- If bike lanes are present, conflict markings at driveways are recommended to increase driver awareness and visibility of people on bikes.
- Driveways should be consolidated as feasible.

New Development

The existing sidewalks on these streets are inconsistent in width and occasional gaps exist. As development along these corridors occur, it may trigger the requirement to provide a 12- to 15-foot wide pedestrian corridor. The corridor should be consistent with current city guidance, and generally would include the following elements:

- Furnishing Zone (FZ): 4'-5'
- Pedestrian Through Zone (PTZ): 6'-8'
- Building Frontage Zone (BFZ): 2'-4'

When feasible, landscaping and/or trees should be placed within the furnishing zone.

Right Turn Conflicts

One of the common elements present in the proposed cross-sections is a bike lane proposed to the right of right-turning vehicles. Without mitigation, this design has a high chance for right-hook crashes. To account for this, four typical scenarios have been developed, and more details are provided in the appendix:

- Curbside Bike Lane with Shared Through/Right Lane and Bike Box
- Protected Corner and Offset Bike Lane
- Curbside Bike Lane with separate signal phase
- Transition Bike Lane

NE Airport Way

For this study, the section of Airport Way from NE Glen Widing Drive to NE Sandy Boulevard was evaluated. The existing cross-section is relatively consistent throughout this segment and includes two general purpose travel lanes in each direction, a center-running landscaped median that transitions to a center turn-lane as needed, a standard 5' bike lane in each direction, and an approximately 6' wide sidewalk in each direction.

There are no proposed changes to the cross-section for this corridor given that to make any significant changes, the existing landscaped median would need to change which is costly and would provide minimal safety enhancements given the uses of the street. However, several intersections and mid-block locations have been identified for intersection studies and truck aprons are recommended at intersections with heavy freight access. For each of the intersection studies, specific treatments are suggested.

At the approach to Glen Widing Drive / Holman St, TriMet may consider the potential for a center-running bus lane; Line 87 is planned as a future frequent service route. It is recommended that as part of these changes, consideration be given to relocating the eastbound bus stop to be closer to the intersection and that a paired stop be added in the opposite direction.

SE Foster Road

The section of SE Foster Road from SE 101st Avenue to SE 122nd Avenue was evaluated for this study. The existing cross-section consists of two travel lanes in each direction, a two-way center turn lane, and a 5' standard bike lane in each direction. The roadway widens and parking is added on both sides of the street for the segment east of the Springwater Corridor Trail.

The proposed cross-section recommends narrowing the existing travel lanes and using the additional width to provide a buffered bike lane. Parking is recommended on one side of the street only and the buffered bike lane widths are increased in locations where the overall street width widens. Parking is recommended on the north side for the segment between the 11600 Block to Foster Place and then on the south side from Foster Place to SE 122nd Avenue. This proposed parking placement is based on the existing land uses; providing access to Zanger Farms to the north and to the neighborhood grid on the south.

There is an existing sidewalk gap on the south side of the street near the 11600 block that is proposed to be filled in. A pedestrian hybrid beacon (PHB) with a median island is proposed just east of the gap to access the bus stops that are present, to facilitate and access the parking on either side of the street, and to access Zanger Farms.

The center turn lane will become a left-turn lane at intersections and final design will determine which treatment is best to mitigate potential right-hook crashes. At the western end of the project limits, there is an existing sidewalk-level bike lane on the south side of Foster Road which currently ends at SE 100th Avenue. Consideration should be given to extending that by one block so that it connects to the existing N-S bike lanes on SE 101st Avenue.

NE Glisan Street

NE Glisan Street from NE 82nd Avenue to NE 102nd Avenue was evaluated for this study. The existing conditions vary throughout the corridor, but generally consist of two travel lanes in each direction, a two-way center turn lane, and no dedicated bike facility. The outside travel lanes are wider than necessary, and the shoulder serves as a de facto bike lane. For the segment between 93rd Avenue and 99th Avenue as Glisan Street crosses over I-205, there are dedicated left-turn lanes in both directions.

The proposed cross-sections also vary in response to the available width. From 82nd Avenue to 87th Avenue, there are no proposed changes and the bike facility will begin at NE 87th Avenue and will continue east. The segment from 87th Avenue to 92nd Avenue is constrained and there are several options for consideration. The final design should include connections to the 87th Avenue Neighborhood Greenway and how those facilities connect should be a key factor in selecting the final cross-section.

From 93rd Avenue to 99th Avenue the proposed cross-section is 5 lanes with a traffic-separator protected bike lane in each direction. As it is shown, there is some unassigned roadway width that can be distributed to the various elements in final design. From 99th Avenue to 102nd Avenue the proposed cross-section is 3 lanes, with parking on both sides and a buffered bike lane in each direction.

There are three Safe Routes to School crossing improvement projects identified in the corridor: 82nd Avenue, 87th Avenue, and 102nd Avenue. Specific improvements such as leading pedestrian intervals, and protected left phases are recommended as considerations.

NE Halsey Street

NE Halsey Street from NE 122nd Avenue to NE 162nd Avenue was evaluated for this study. The existing cross-section is two travel lanes in each direction, a two-way center turn lane, and a bike lane in each direction. Parking exists on both sides of the street between 132nd Avenue and 134th Place. Glendoveer Golf Course is located along the south side of the segment from 134th Place to 160th Avenue with no existing sidewalk. There is a curb and then a steep incline to the south to raise up to the golf course property, presenting a challenge to extending the Right of Way. Between 160th Avenue and 162nd Avenue NE Halsey Street bends and shifts north before continuing east.

Much of Halsey Street has no sidewalks on either side of the street. All proposed cross-sections recommend a consistent sidewalk on the north side, however, walkway alternatives for the south side may be considered given the topography and high cost associated with construction.

The proposed cross-section removes parking for the segment between 132nd Avenue and 134th Place, increases the bike lane width, and adds a wide bike buffer in both directions. There are several options for the segment fronting Glendoveer Park, including a two-way facility on the south side. This and other options are discussed below. For the segment between 160th Avenue and 162nd Avenue, it is recommended to have the bike facilities be directional regardless of the configuration west of 160th Avenue so that bikes are aligned at the intersection with 162nd Avenue to either continue east or connect to the N-S bike lanes at 162nd Avenue without significant signal and intersection modifications.

For the middle segment along Glendoveer, there is are multiple options and the selected configuration will be determined during future design phases. If a two-way facility on the south side of the street is selected, special consideration to how and where users transition to and from it will be critical. For this study, a transition between a south side two-way facility and directional facilities at 160th Avenue was conceptualized. Future design phases will need refine the crossing of 160th Avenue, the configuration of the bus stop and bike lane, and the crossing of Halsey. Given the atypical geometry as Halsey bends, there appears to be available space that can be utilized to provide a low-conflict design. Future design phases should consider a floating bus stop or large curb extension to reconfigure the intersection with Barr Road. The bikes could potentially ramp up to sidewalk level to eliminate conflicts with the bus stop.

NE Sandy Boulevard

The section of NE Halsey Street from NE 82nd Avenue to NE 96th Avenue was evaluated for this study. The existing cross section consists of two travel lanes in each direction, a two-way center turn lane throughout; parking is added to both sides where the roadway widens between 85th/Skidmore Street and 92nd Avenue. From 92nd Avenue to 96th Avenue, the roadway widens slightly, and parking is replaced by a standard bike lane in the southbound direction and widened outside lane with shared lane markings in the northbound direction.

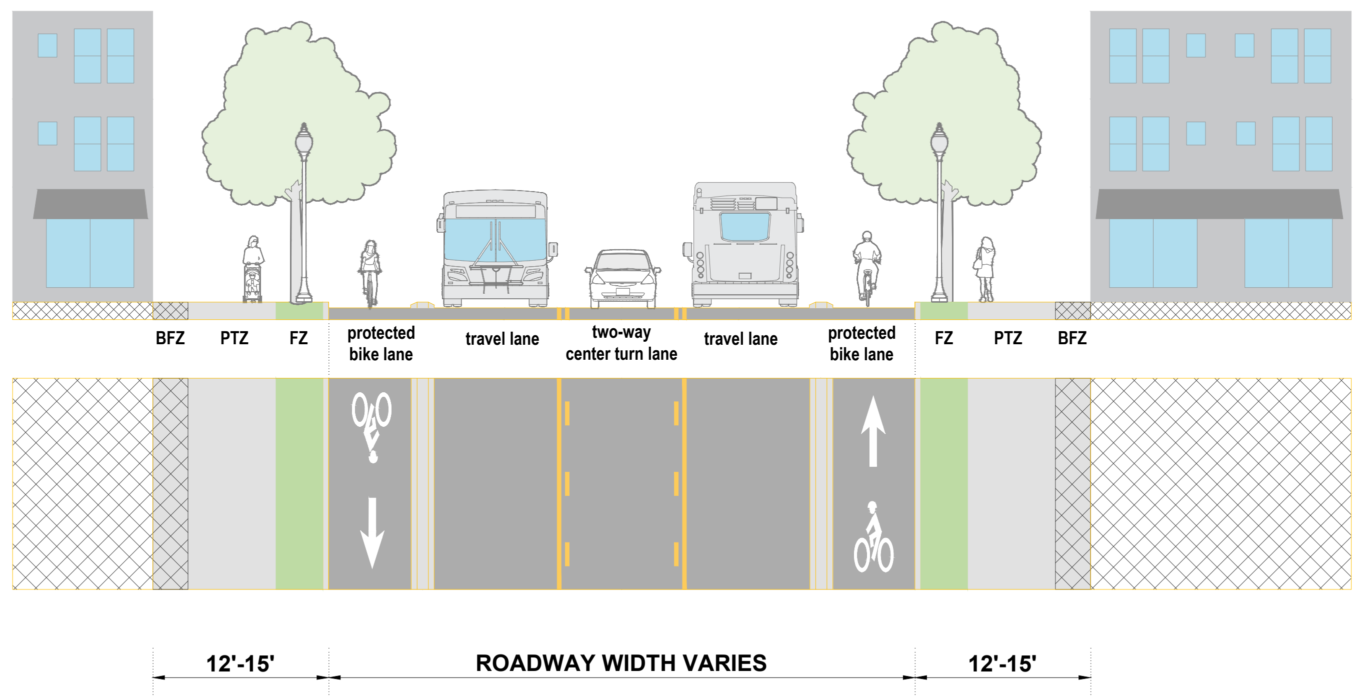
The proposed cross-sections propose bike facilities via the removal of at least one travel lane. For the segment between 82nd Avenue and 85th/Skidmore Street, the proposed cross-section includes one travel lane in each direction, a two-way center turn lane, and buffered bike lanes in each direction. From 85th/Skidmore Street to 92nd Avenue, the proposed cross-section is similar, but the buffered bike lanes are narrowed to provide space for an eastbound BAT lane. 92nd Avenue is the planned Neighborhood Greenway and there is an existing marked crosswalk and RRFB. From 92nd Avenue to 96th Avenue, which serves the Parkrose/Sumner Transit Center and provides an off-street connection to the I-205 Multi-Use Path, there are two potential cross-sections provided. Both cross-sections would consist of two travel lanes in each direction and a two-way center turn lane, but one option keeps bikes directional on both sides of the street and the other recommends a two-way facility on the north side. Given that the Neighborhood Greenway and I-205 Multi-Use Path connections are both on the north side and that there is a freeway on-ramp on the south side, the two-way facility provides several benefits. The prepared graphics also provide concepts to reduce conflicts at the on-ramp.

It may be infeasible to remove a travel lane on NE Sandy Blvd west of 92nd Avenue, so an alternative approach could be for people on bikes to utilize the existing and planned bike network around Sandy Blvd to get to NE 92nd

Avenue and then utilize the proposed facilities to connect to NE 96th Avenue. Future design phases will explore these options in more detail.

Adjacent development along these corridors may trigger a 12- to 15-foot wide pedestrian corridor including the following elements:

FZ = Furnishing Zone: 4'-5'
PTZ = Pedestrian Through Zone: 6'-8'
BFZ = Building Frontage Zone: 2'-4'

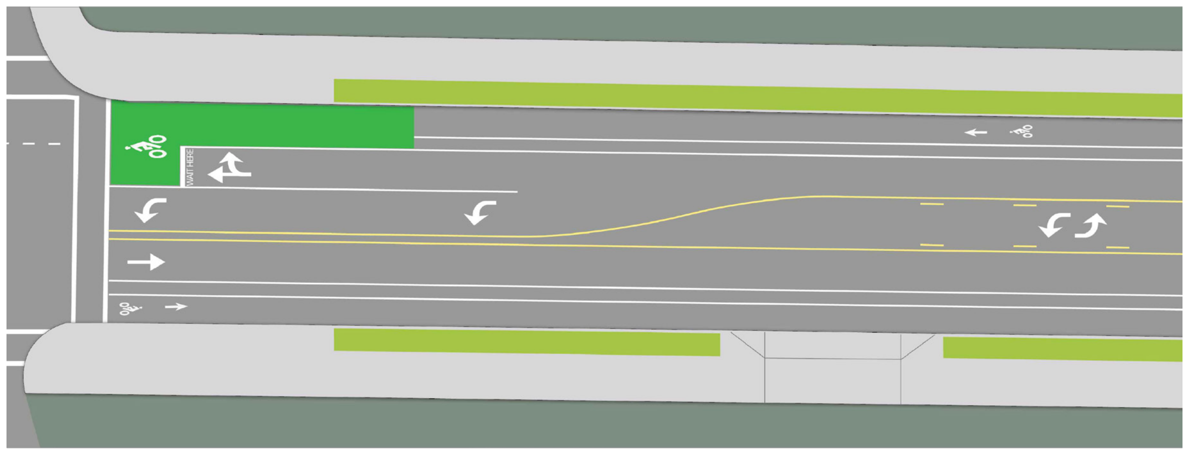


THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

All Corridors - New Development Considerations

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

Right Turn Treatment Options for Shared Through/Right Turn Lanes



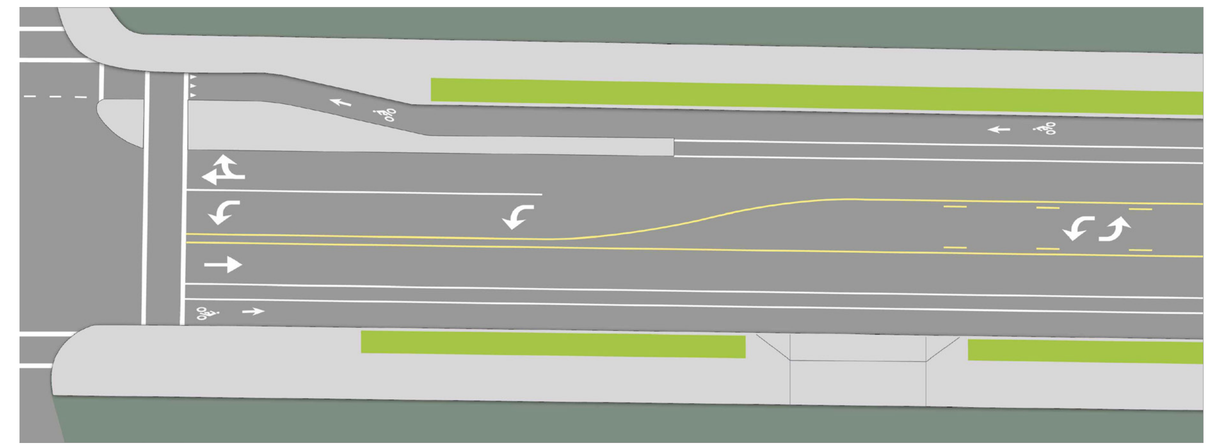
Curbside Bike Lane with Shared Through/Right Lane and Bike Box

-Applicable where an exclusive right-turn lane is not provided and right-turn volumes are low to moderate

-Places bicyclists to the right of the vehicle shared through/right-turn lane

-Bike box can be used at signalized intersections with this type of configuration to help mitigate right-turn conflicts at the start of a green signal phase by positioning bicyclists ahead of vehicles

-Bike box implementation requires a right-turn-on-red restriction for motor vehicles



Protected Corner and Offset Bike Lane

-Applicable where an exclusive right-turn lane is not provided and right-turn volumes are low to moderate

-Provides protective island to separate and offset the bike lane from the traffic lane

-Design ensures that a turning vehicle is further into its turn at the conflict point with the bike lane, increasing the cone of vision of the driver to observe a bicyclist in the bike lane

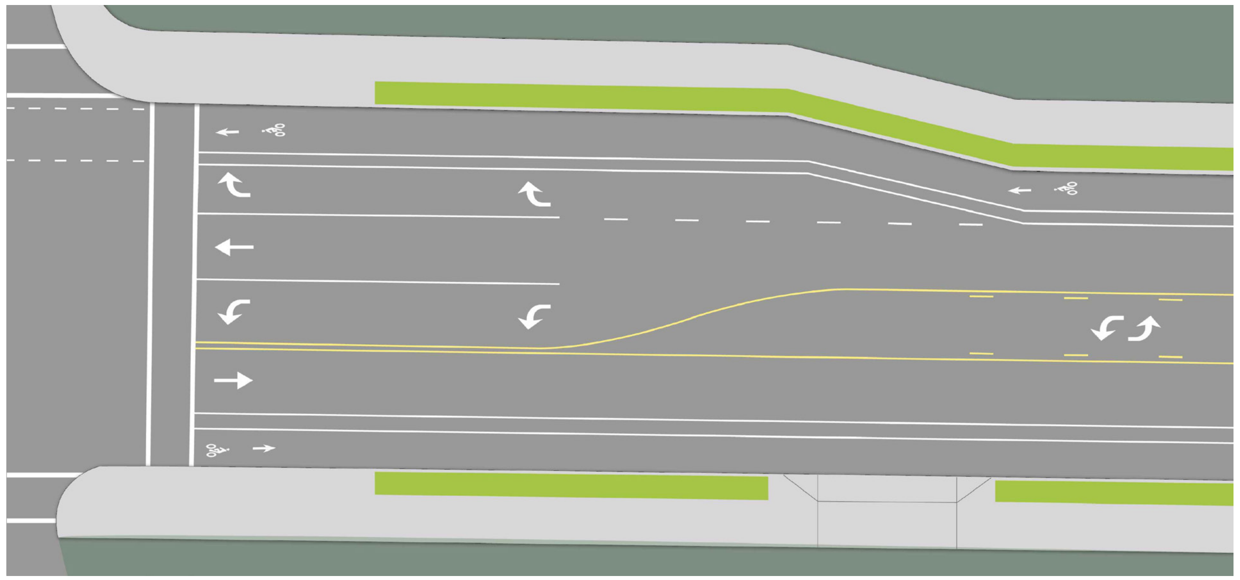
-Reduced curb radius slows vehicles through the turn and provides more time for perceiving and reacting to potential conflicts

-Offset width from the through-lane to the edge of the bike lane should be between 6'-16.5'.

-Can be used at any intersection or driveway where additional protection is required and adequate ROW is available

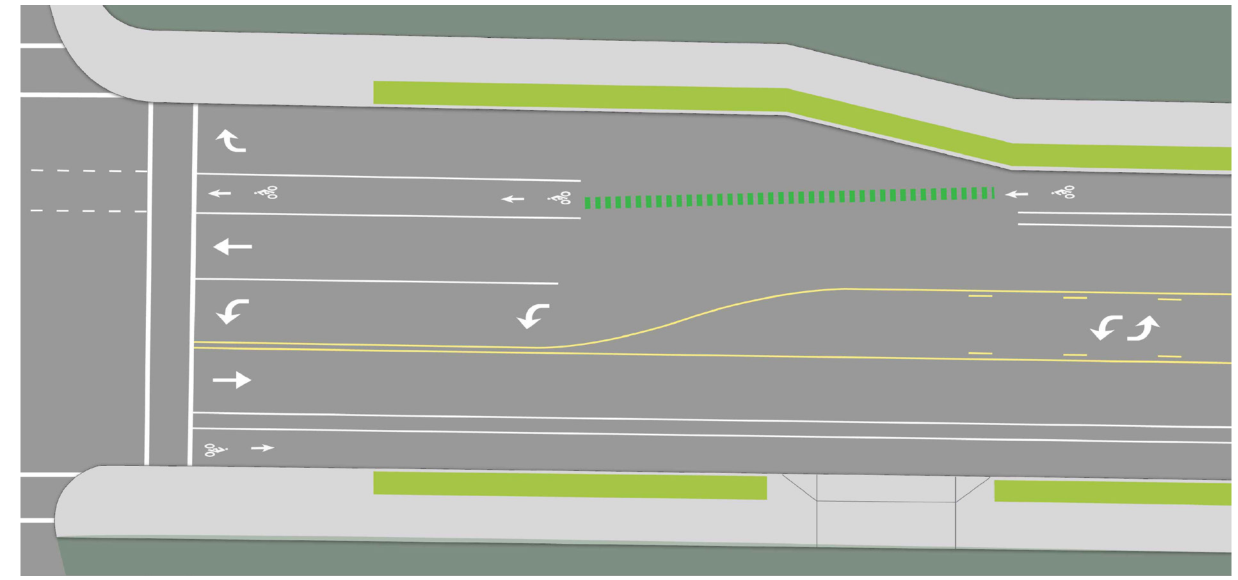
All Corridors - Right Turn Conflict Considerations

Right Turn Treatment Options for Exclusive Right Turn Lanes



Curbside Bike Lane

-Applicable where a right-turn lane is provided and right-turn volumes are moderate
-Places bicyclists to the right of the vehicle right-turn lane
-Requires separate bike phase and prohibiting right-turn-on-red for motor vehicles to avoid right-hook crashes
-Any protection elements in the buffer should be continued up to the intersection to provide maximum separation

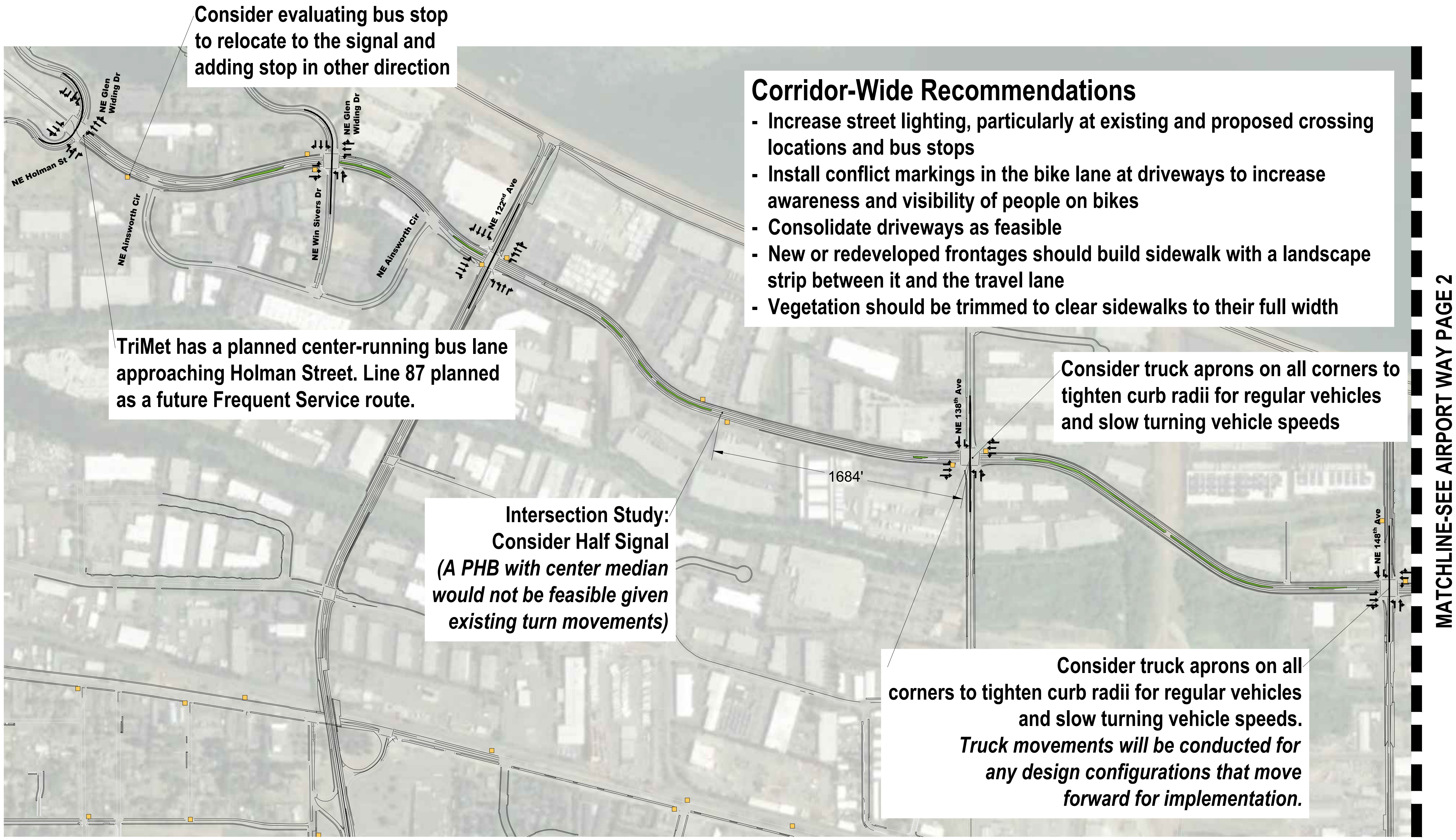


Transition Bike Lane

-Applicable where a right-turn lane is provided and right-turn volumes are moderate
-Places bicyclists between the right-turn lane and through-lane; which can be uncomfortable for the majority of rider types
-Reduces the right-hook conflict but introduces new conflict point at the transition of the right-turn lane as motor vehicles weave across the bike lane to enter the turn pocket
-Does not require a separate bike phase
-Should be designed to keep the transition and crossing area as short as possible

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE AIRPORT WAY (PAGE 1)

CORRIDOR OVERVIEW

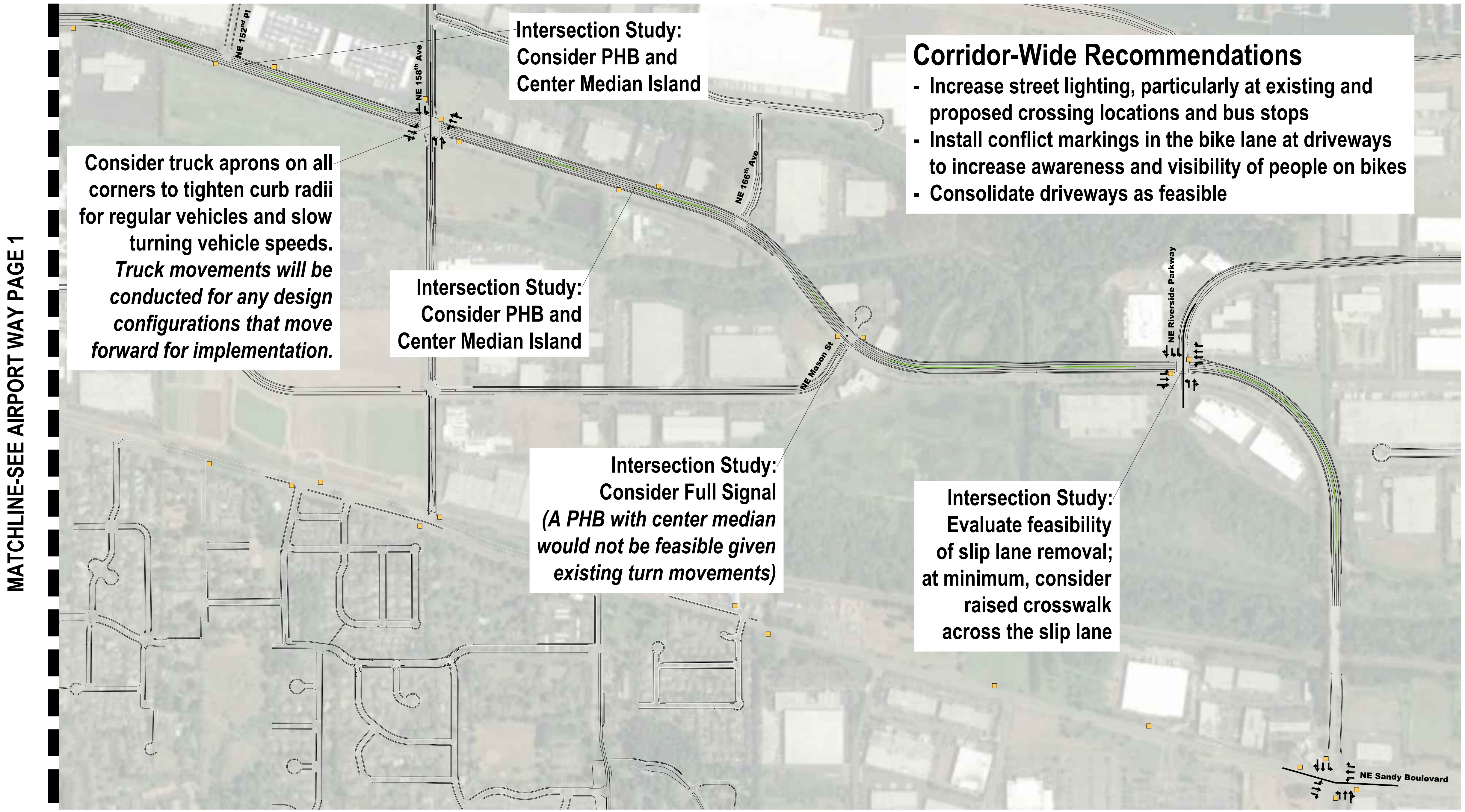
LEGEND

- Bus Stop
- Landscaped Median
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE AIRPORT WAY (PAGE 2)

CORRIDOR OVERVIEW

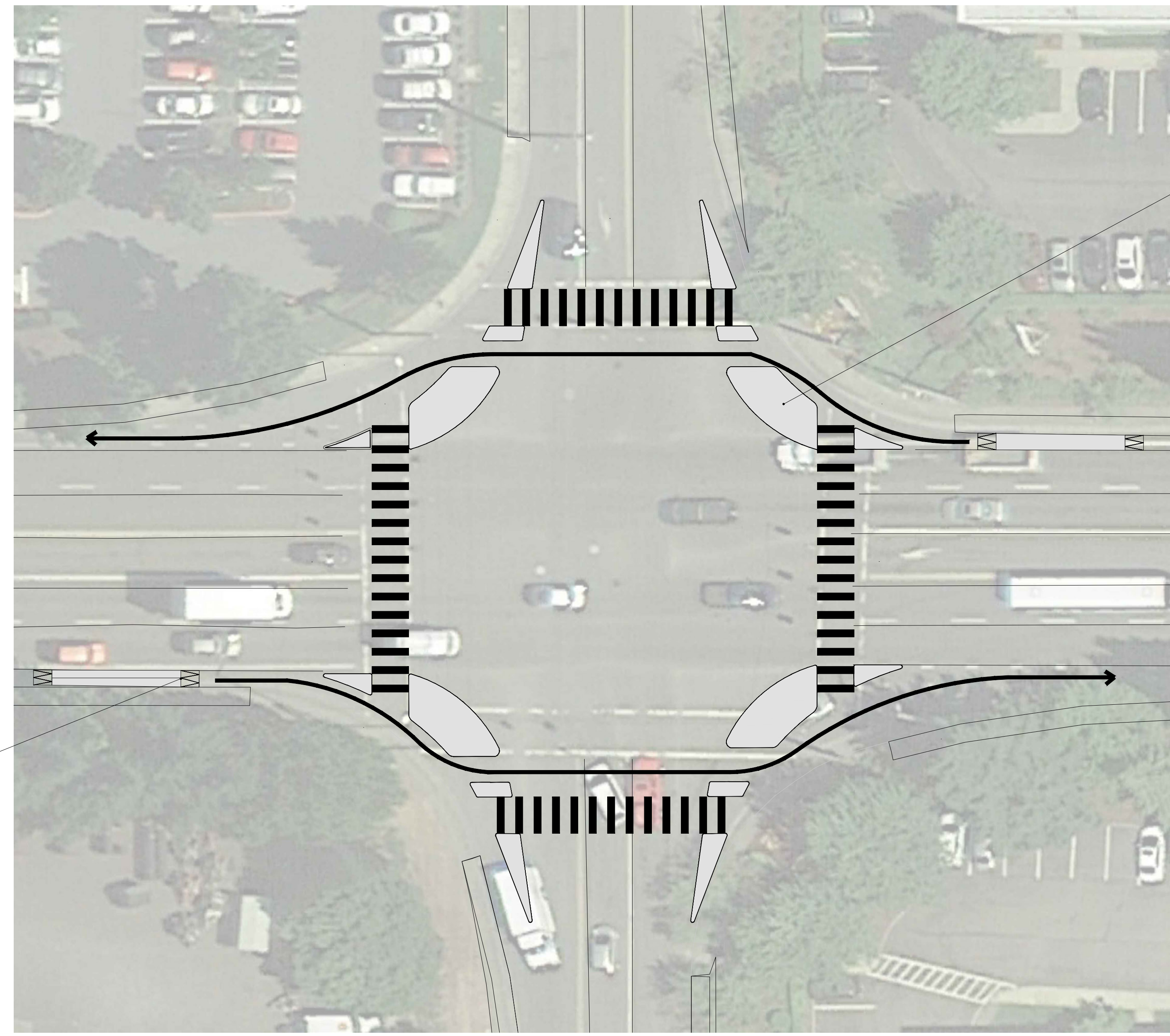
LEGEND

- Bus Stop
- Landscaped Median
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

Proposed Intersection Concept - Protected Intersection

Airport Way and 138th Avenue



Curb height for concrete islands to be determined during preliminary and final design. Survey will be needed to reach a final determination. Options include vertical curb, beveled curb, mountable truck aprons, etc.

Bus Stops on NE and SW Corners:

Raise Bike Lane to provide step out for bust stop; allows bus to stop in lane and passengers to cross bike lane to access door

TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE AIRPORT WAY

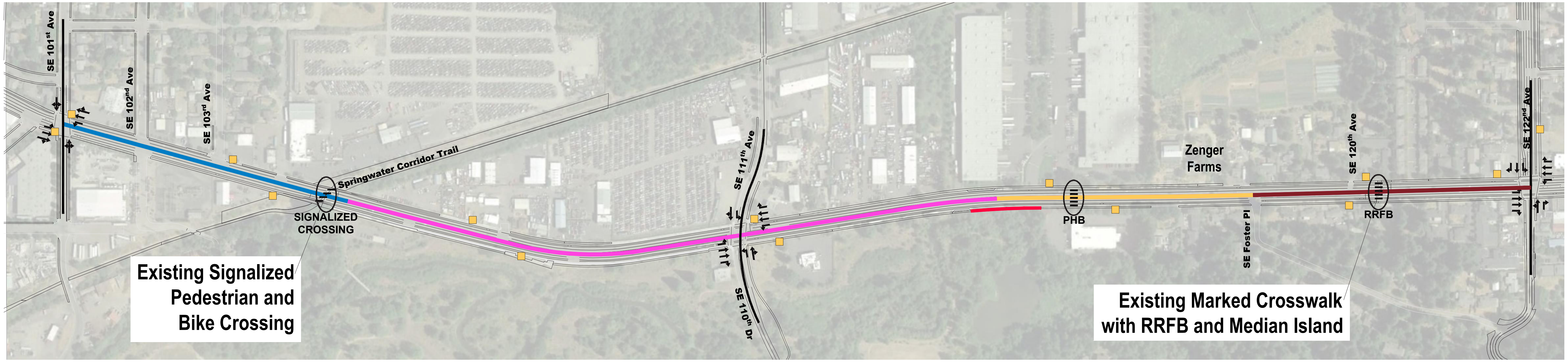
INTERSECTION CONCEPT

LEGEND

Bike Movement

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

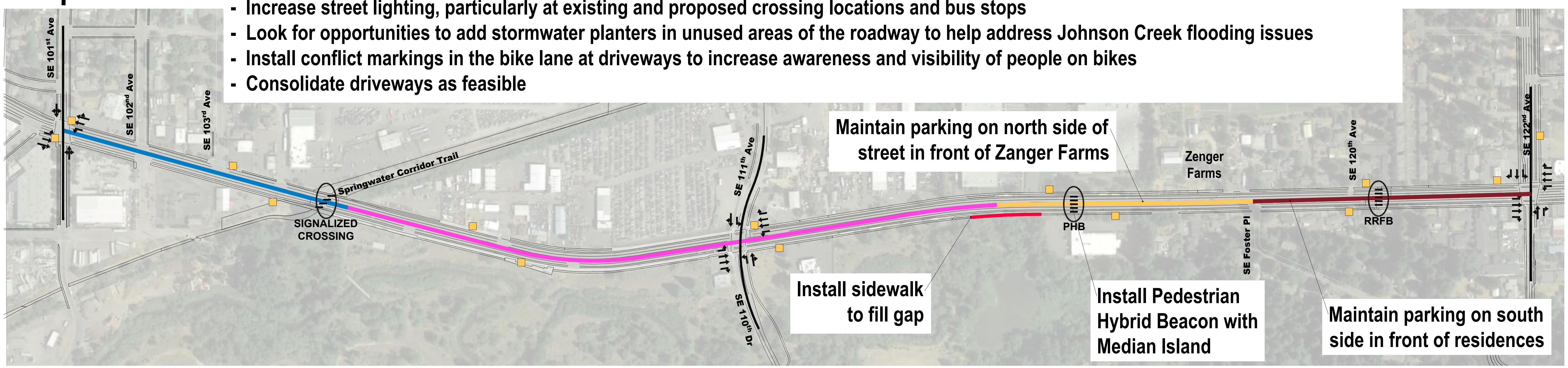
Existing



Proposed

Corridor-Wide Recommendations

- Increase street lighting, particularly at existing and proposed crossing locations and bus stops
- Look for opportunities to add stormwater planters in unused areas of the roadway to help address Johnson Creek flooding issues
- Install conflict markings in the bike lane at driveways to increase awareness and visibility of people on bikes
- Consolidate driveways as feasible



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

SE FOSTER ROAD

CORRIDOR OVERVIEW

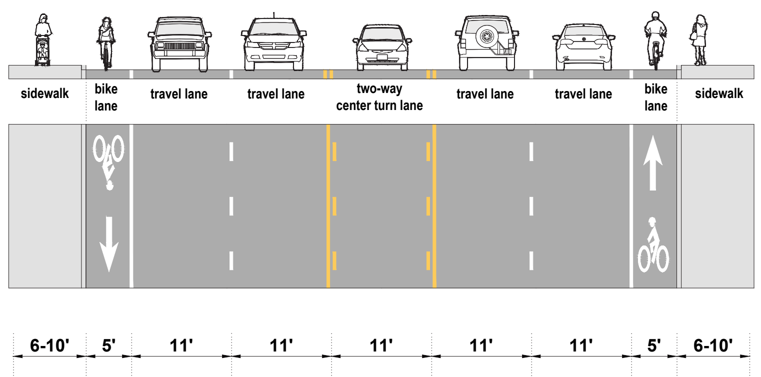
LEGEND

- Bus Stop
- Sidewalk Gap
- Existing Crosswalk
- Existing RRFB
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

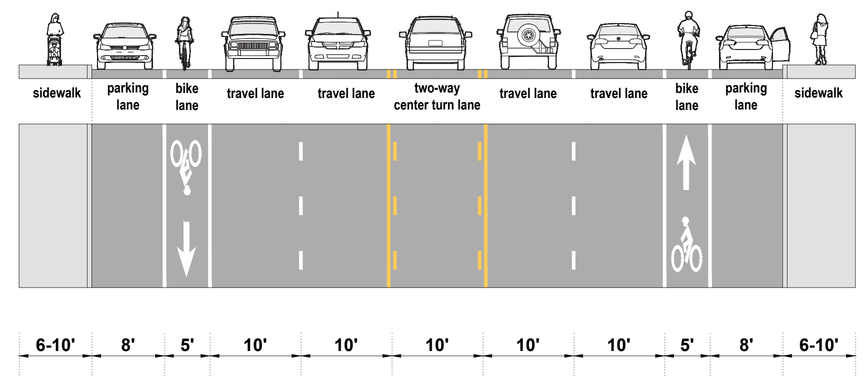
Existing

101st to Springwater Corridor Trail - 65' curb to curb



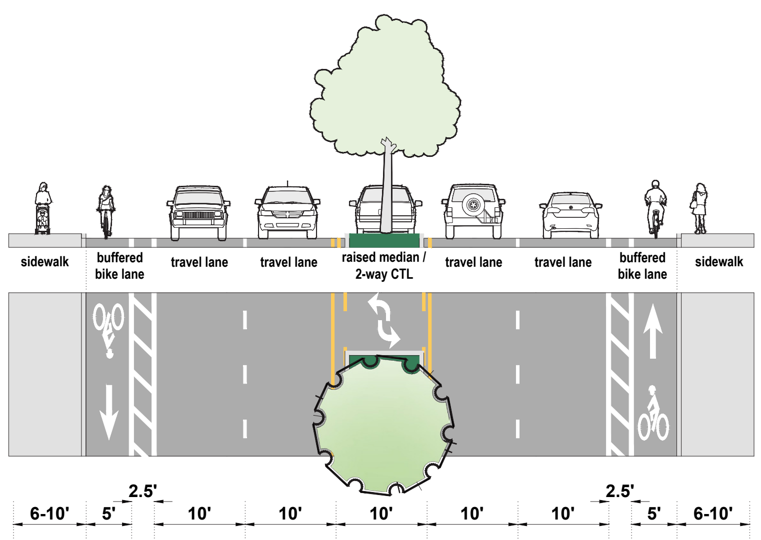
Existing

Springwater Corridor Trail to 122nd - 76' curb to curb



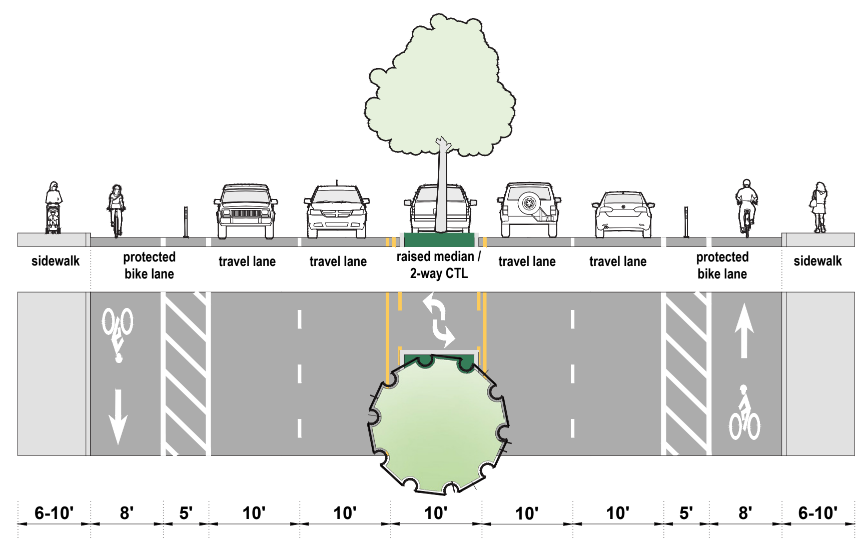
Proposed

101st to Springwater Corridor Trail - 65' curb to curb



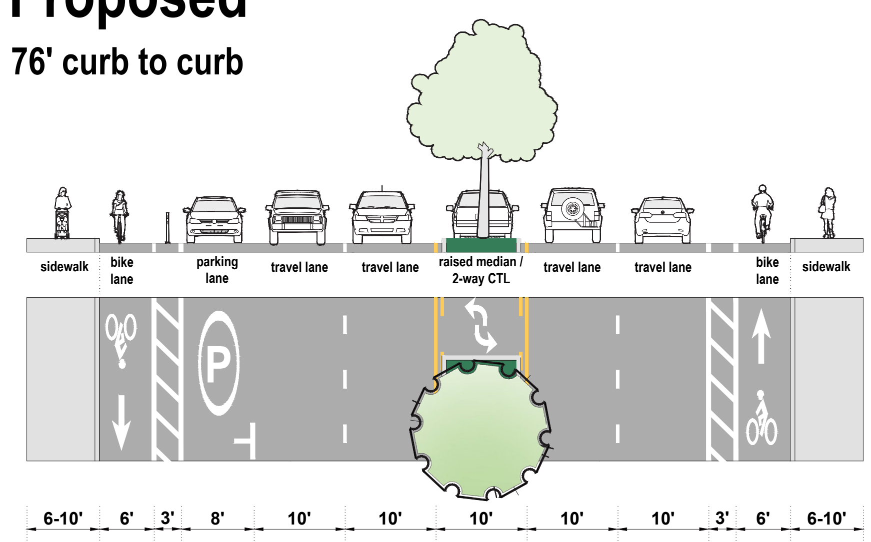
Proposed

Springwater Corridor Trail to 11600 Block - 76' curb to curb



Proposed

76' curb to curb



11600 Block to Foster Place - Parking on North Side

Foster Place to 122nd - Parking on South Side

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

SE FOSTER ROAD

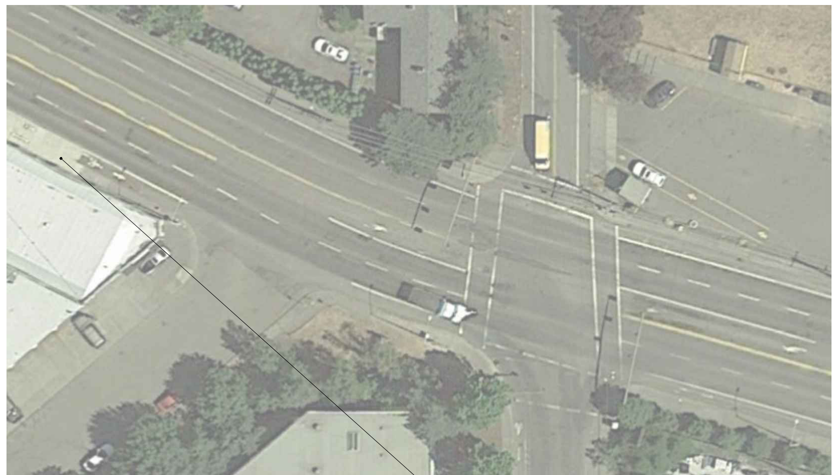
CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

EPASS

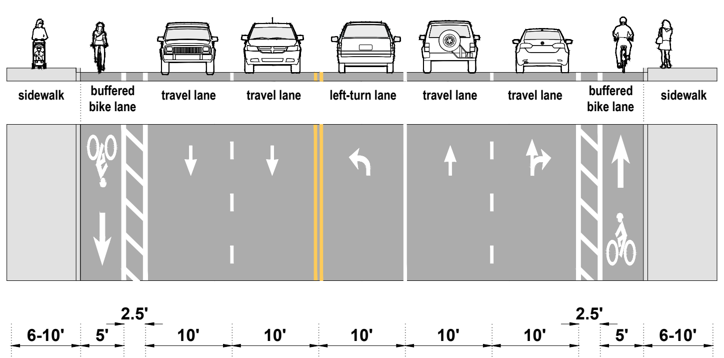
PBOT
PORTLAND BUREAU OF TRANSPORTATION

Existing
At SE 101st Avenue

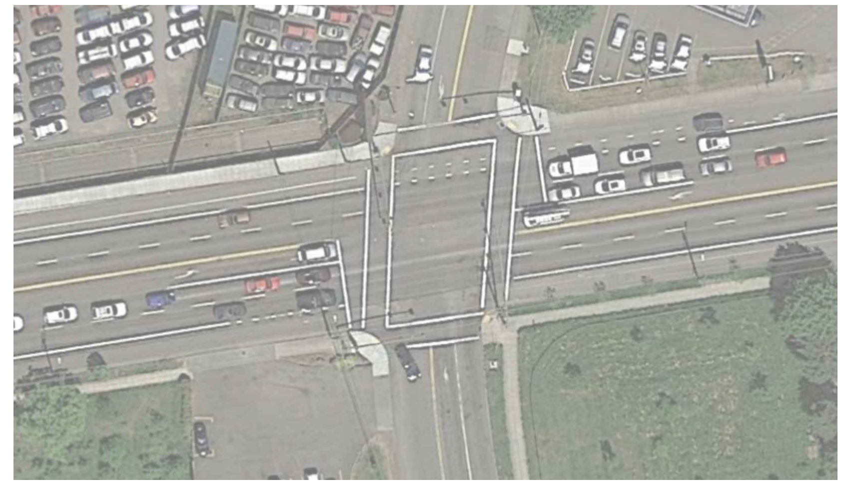


Consider extending the existing sidewalk level bike lane on the south side of Foster to 101st where there are N-S bike facilities to connect to.

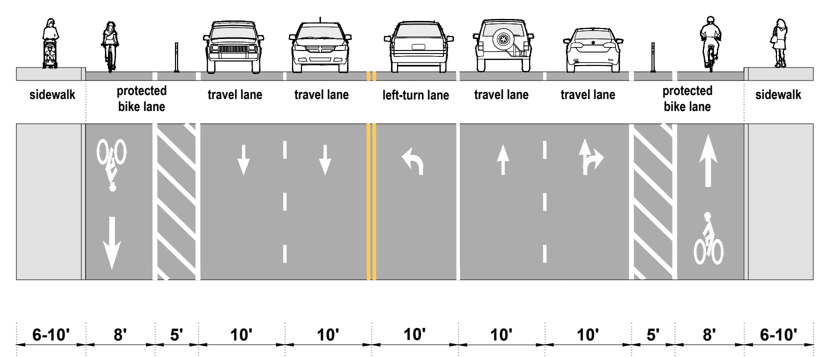
Proposed
65' curb to curb - facing west



Existing
At SE 110th Avenue



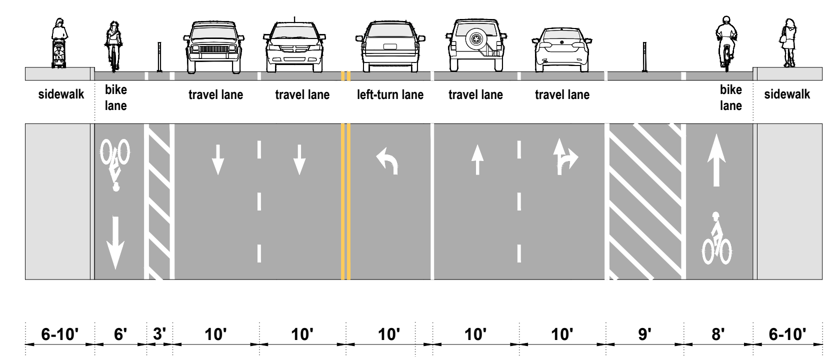
Proposed
76' curb to curb - facing west and/or east



Existing
At SE 122nd Avenue

Parking lane to be dropped in advance of driveway and intersection; widen bike lane and buffer. Exact treatment to be determined in future design phases.

Proposed
76' curb to curb - facing east



TOOLE DESIGN

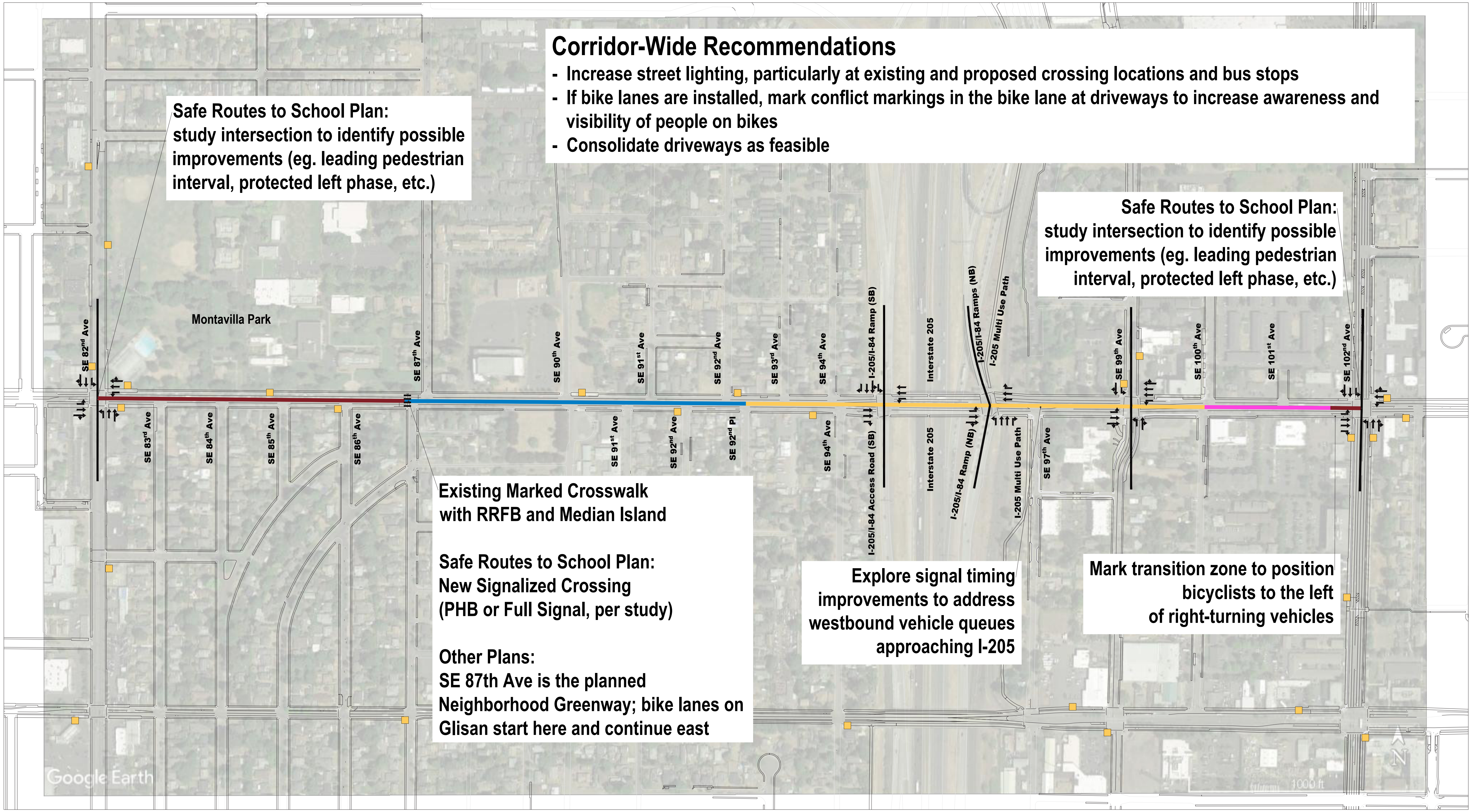
THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

SE FOSTER ROAD
CROSS SECTIONS AT INTERSECTION APPROACHES

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE GLISAN STREET

CORRIDOR OVERVIEW

LEGEND

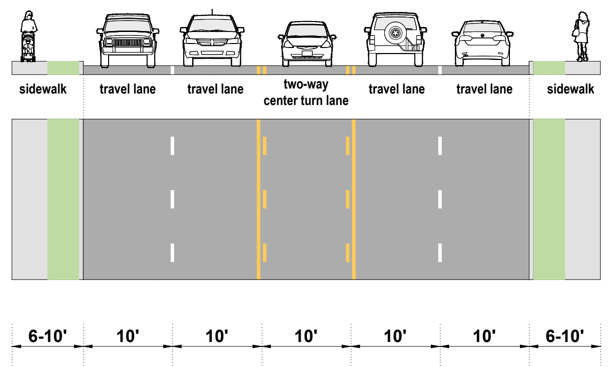
- Bus Stop
- Existing Crosswalk
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

Existing

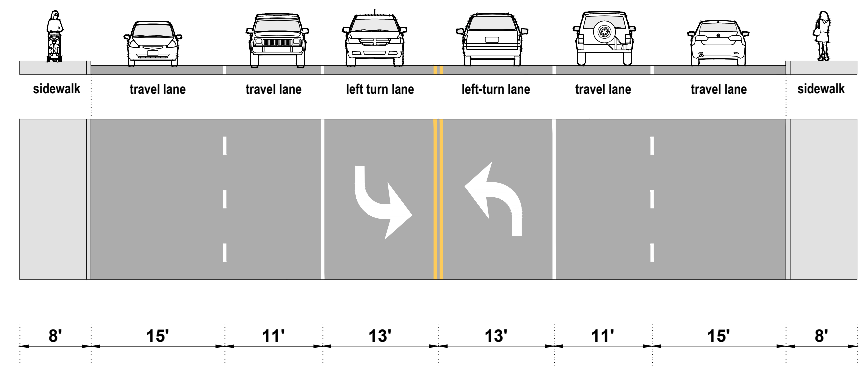
82nd to 92nd - 50' curb to curb

Note: The landscape buffer varies within this section (e.g. grass only, grass and trees, etc.)



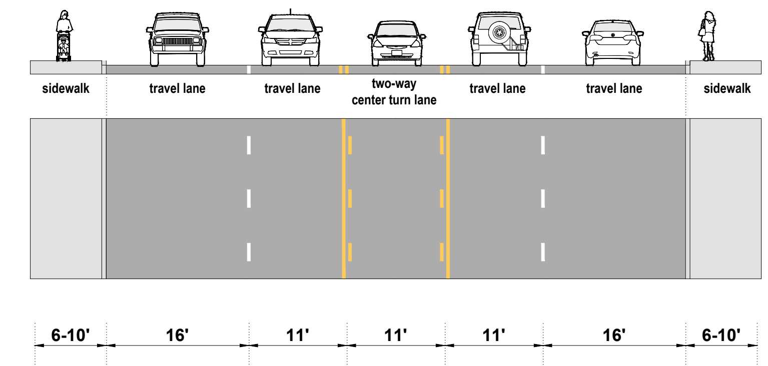
Existing

93rd to 99th - 78' curb to curb



Existing

99th to 102nd - 66' curb to curb



Proposed

82nd to 92nd - 50' curb to curb

82nd 87th planned to maintain exisitng curb to curb configuration; Bike lanes begin at 87th and continue east

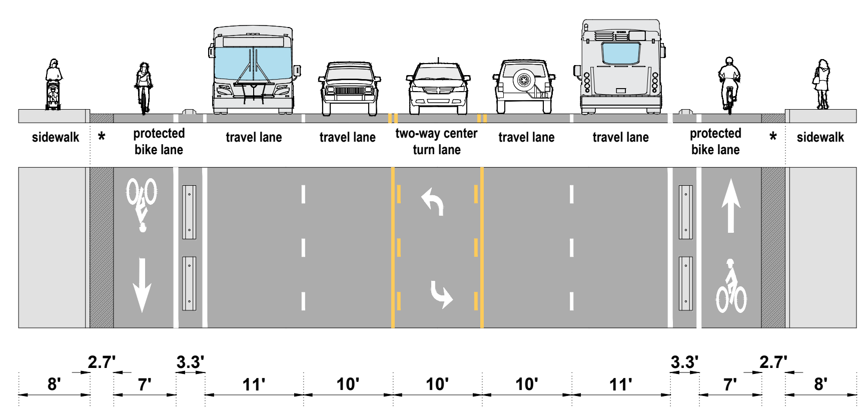
See next page for multiple options to consider from 87th to 92nd

Proposed

93rd to 99th - 78' curb to curb

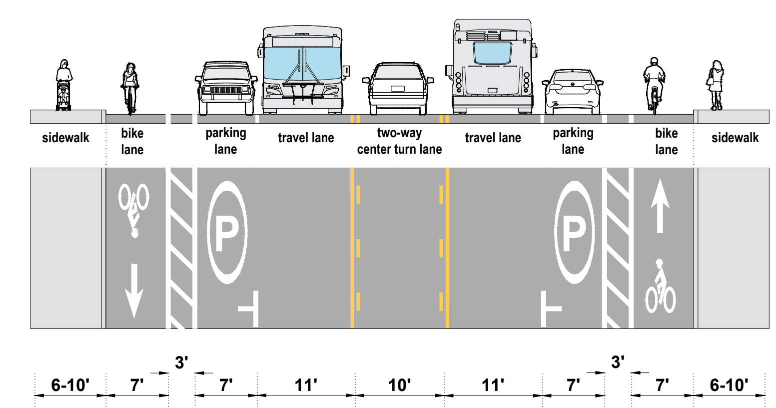
Note: Requires design exception with ODOT

* = Unassigned roadway width; available to other elements in the roadway



Proposed

99th to 102nd - 66' curb to curb



THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE GLISAN STREET

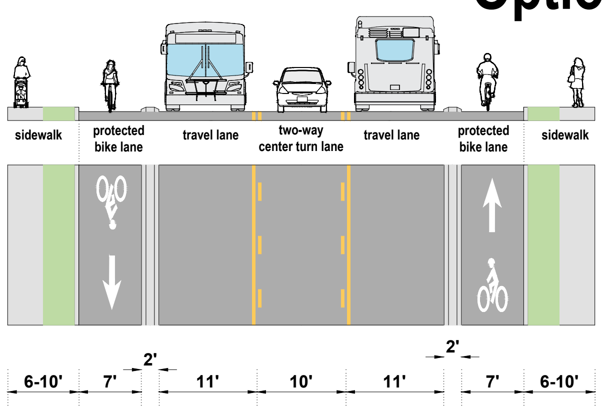
CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

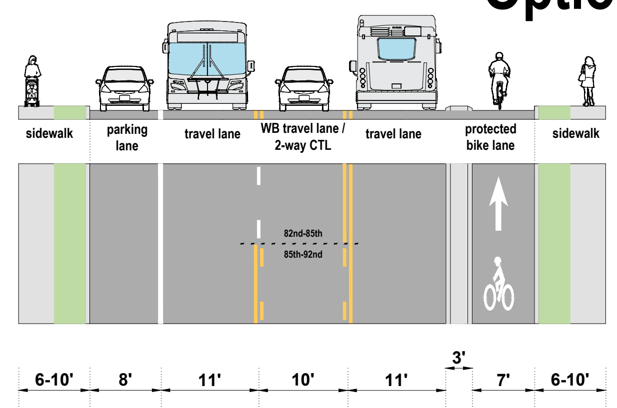
Proposed

87th to 92nd - 50' curb to curb

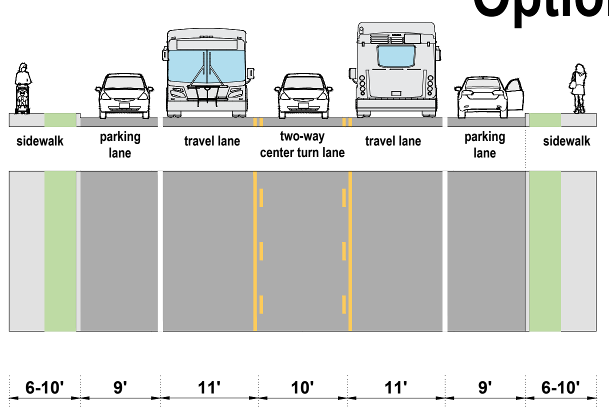
Option 1



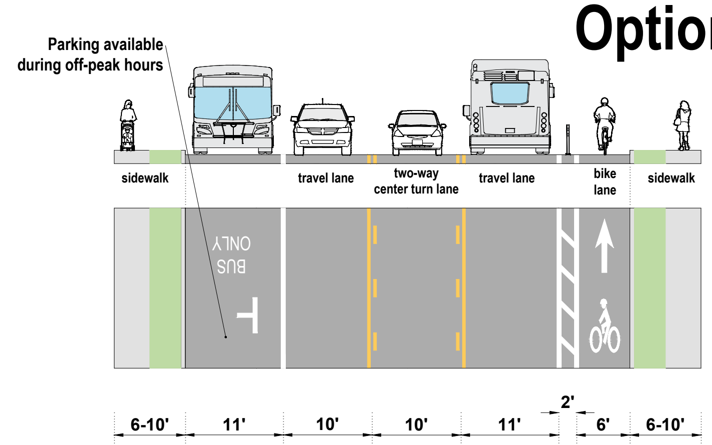
Option 2



Option 3



Option 4



THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

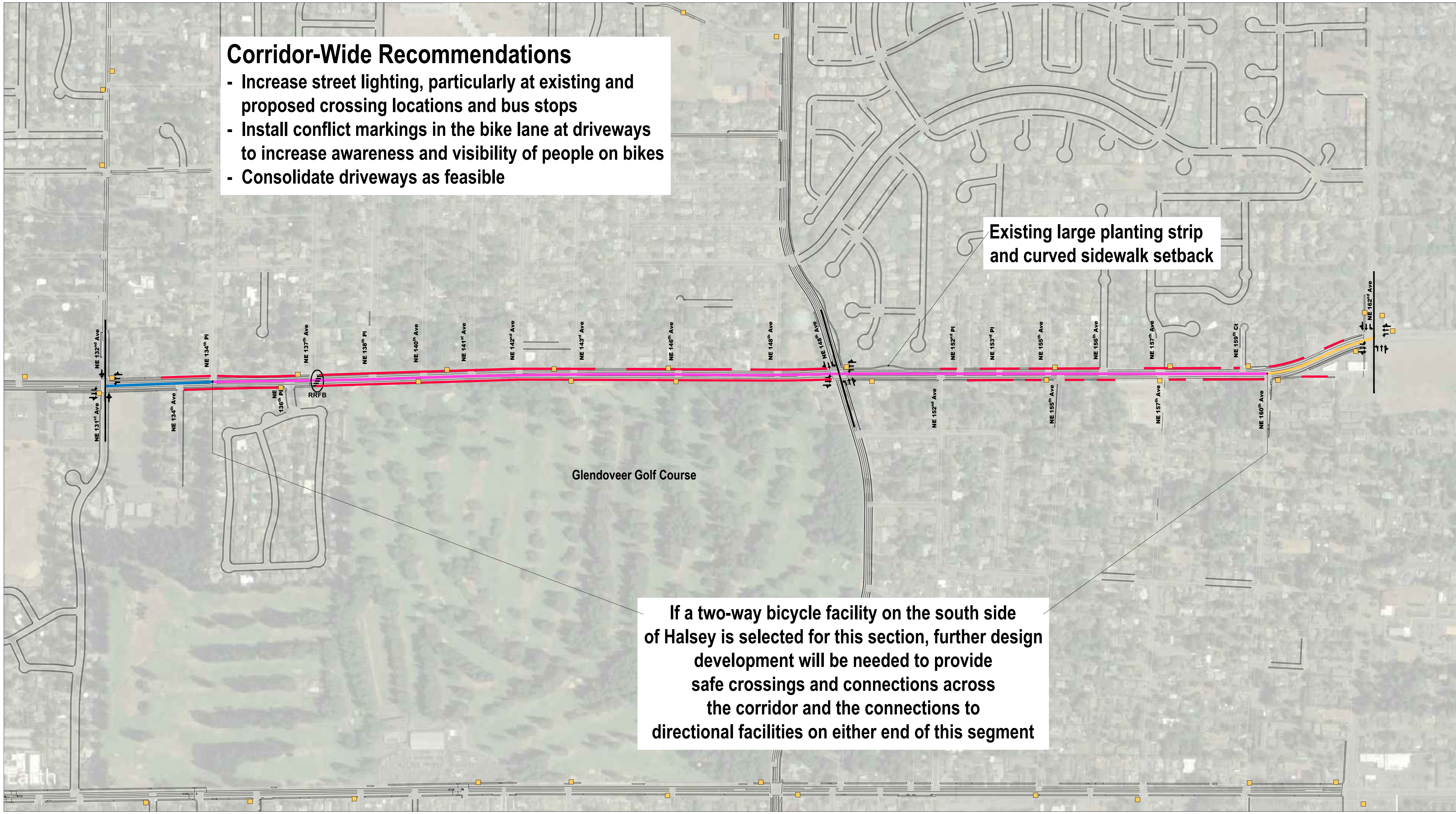
NE GLISAN STREET

CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE HALSEY STREET

CORRIDOR OVERVIEW

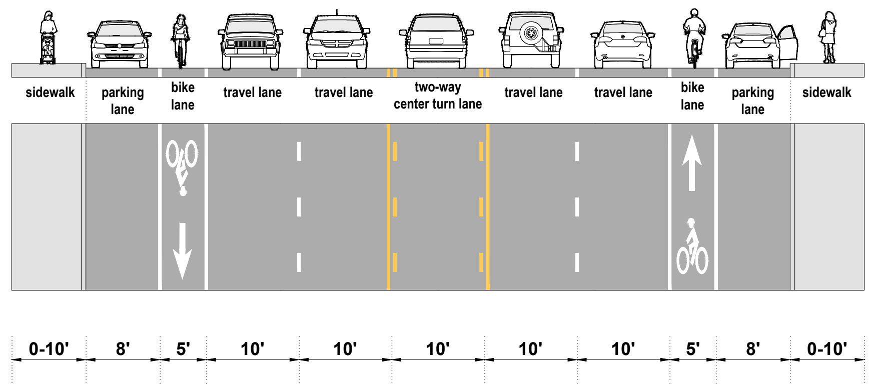
LEGEND

- Bus Stop
- Sidewalk Gap
- Existing Crosswalk
- Existing RRFB
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

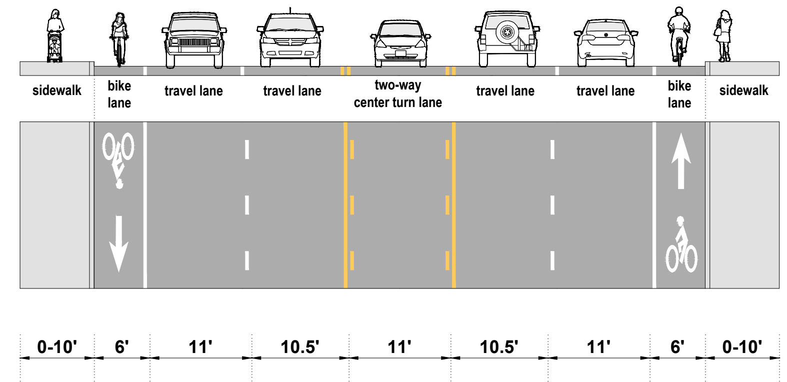
Existing

132nd to 134th Pl - 76' curb to curb



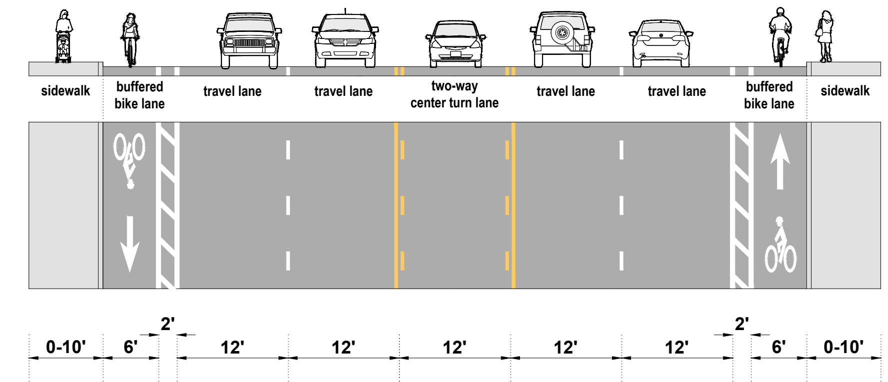
Existing

134th Pl to 160th - 66' curb to curb



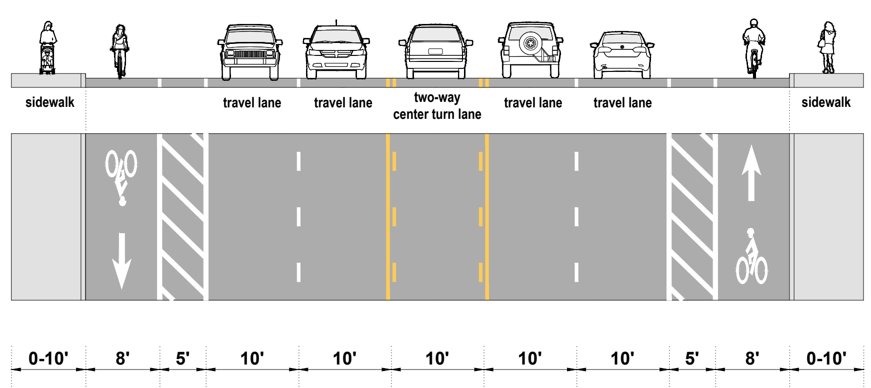
Existing

160th to 162nd - 76' curb to curb



Proposed

132nd to 134th Pl - 76' curb to curb



Proposed

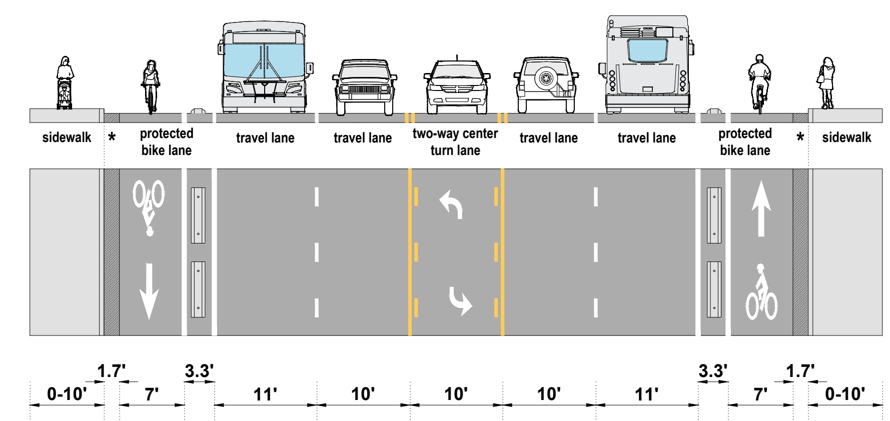
134th Pl to 160th - 66' curb to curb

See next page for multiple options to consider

Note: If a two-way bicycle facility on the south side of Halsey is selected for this section, further design development will be needed to provide safe crossings and connections across the corridor and the connections to directional facilities on either end of this segment

Proposed

160th to 162nd - 76' curb to curb



* = Unassigned roadway width; available to other elements in the roadway

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE HALSEY STREET

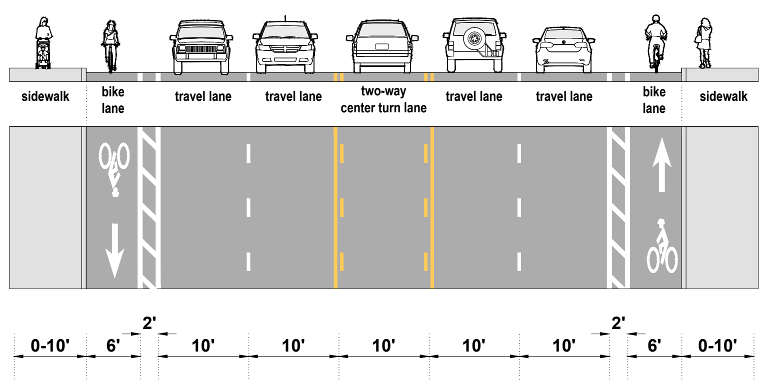
CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

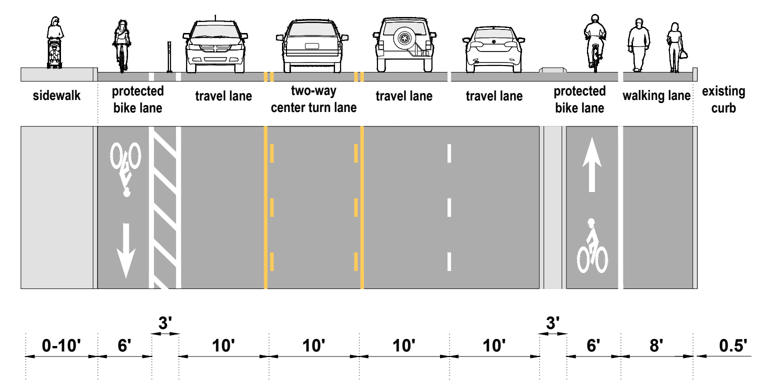
Proposed

134th Pl to 160th - 66' curb to curb

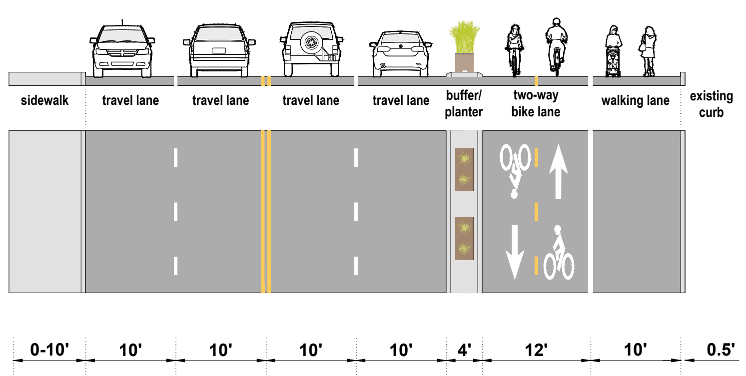
Option 1



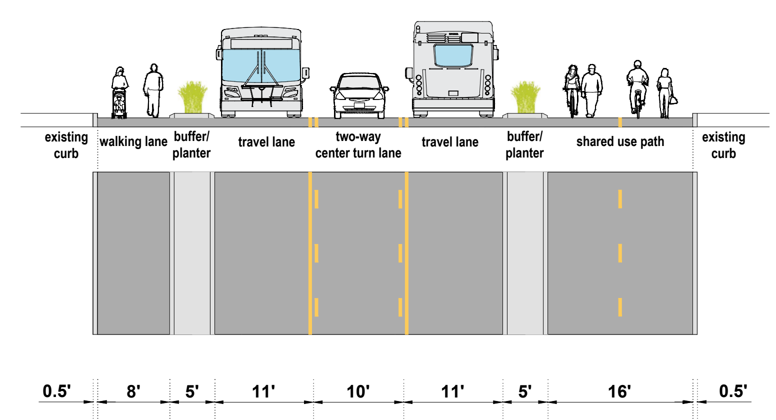
Option 2



Option 3



Option 4

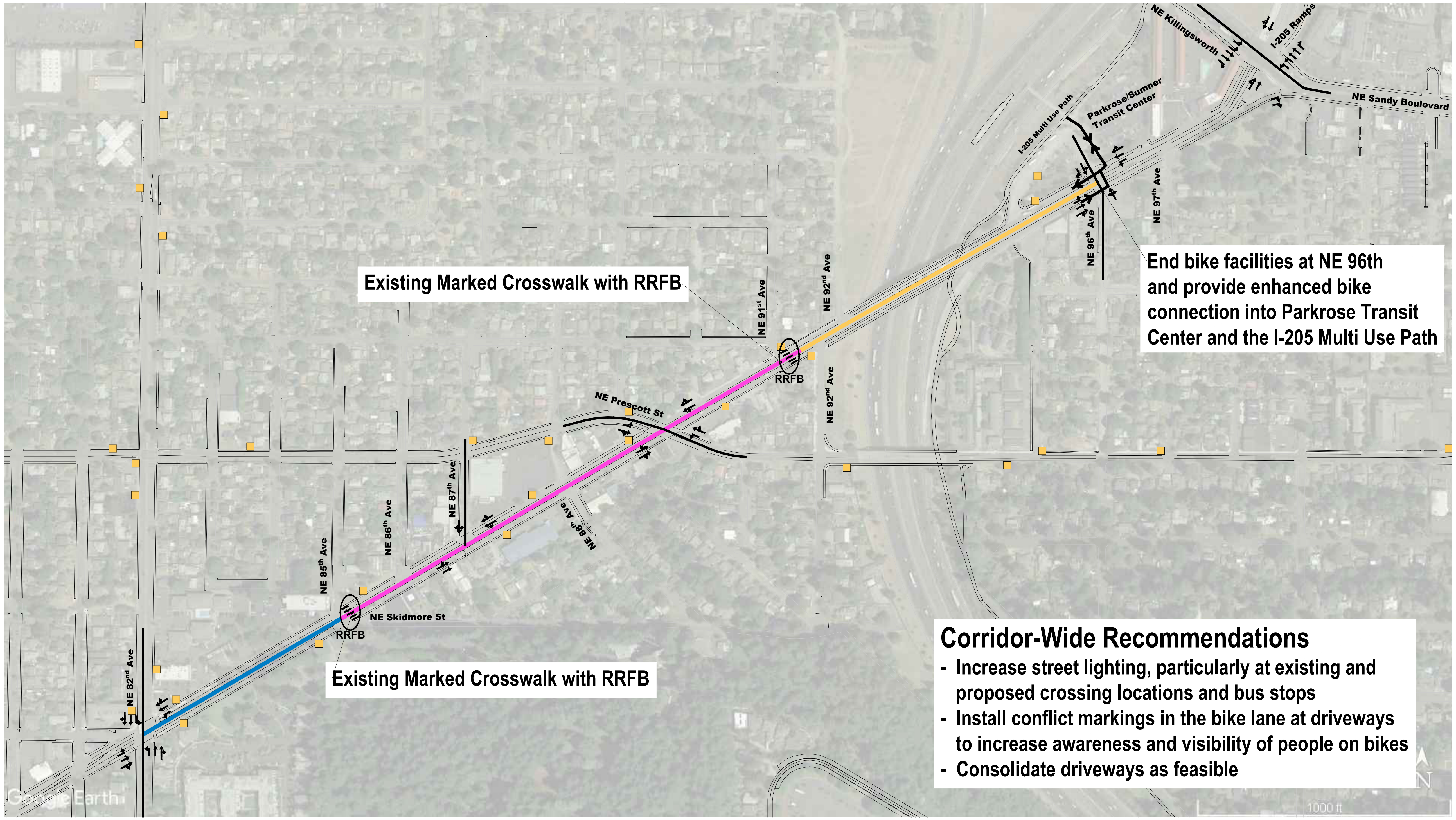


THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE HALSEY STREET

CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION



TOOLE DESIGN

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE SANDY BOULEVARD

CORRIDOR OVERVIEW

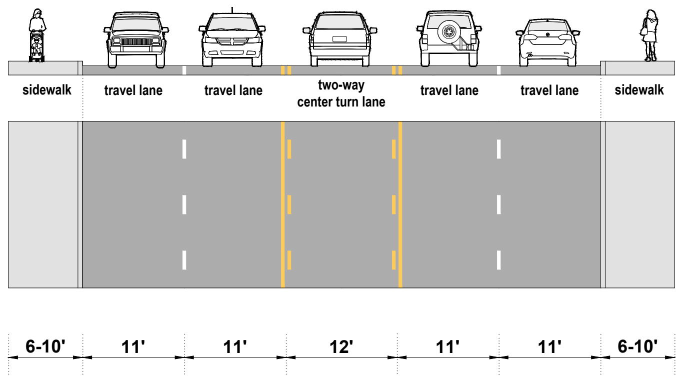
LEGEND

- Bus Stop
- Proposed MUP Connection
- Existing Crosswalk
- Signalized Intersection Turning Movements

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

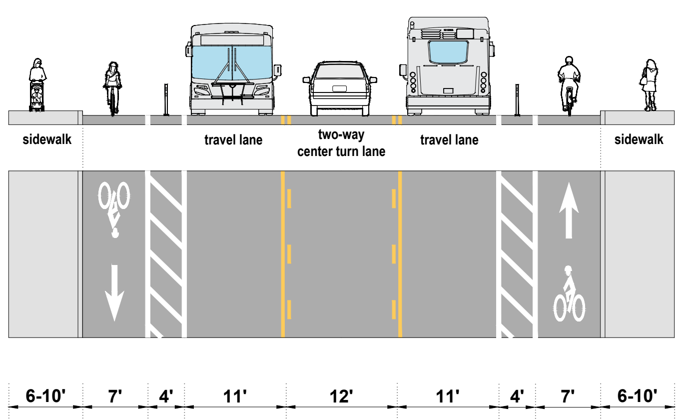
Existing

82nd to 85th/Skidmore - 56' curb to curb



Proposed

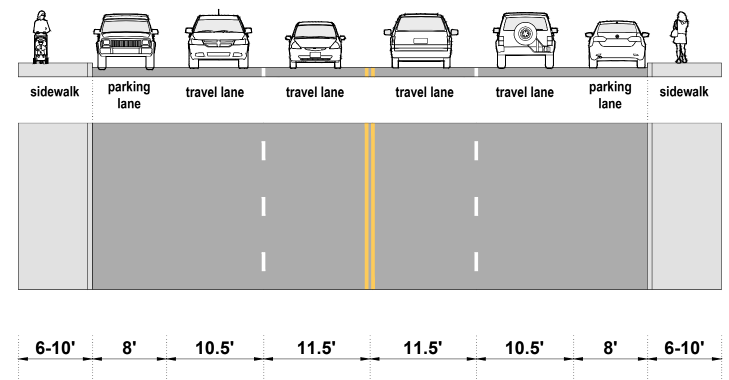
82nd to 85th/Skidmore - 56' curb to curb



Note: If five vehicle travel lanes are needed, consider expanding sidewalk and build sidewalk level bike lane

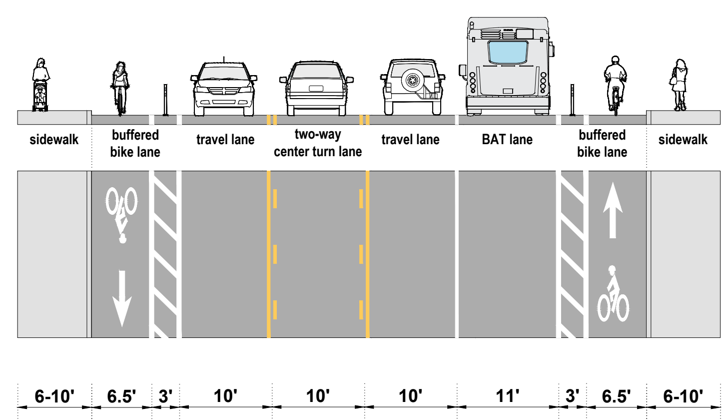
Existing

85th/Skidmore to 92nd - 60' curb to curb



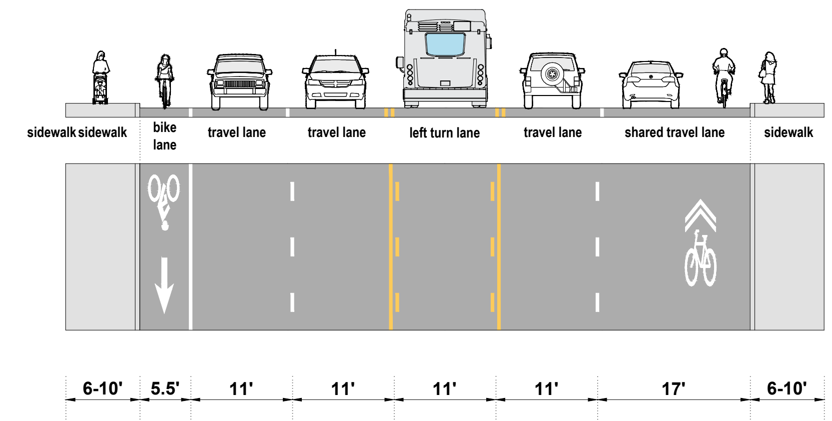
Proposed

85th/Skidmore to 92nd - 60' curb to curb



Existing

92nd to 96th - 66' curb to curb



Note: Bus-only left-turn lane for portion of left-turn lane. A faint 5' bike lane in NE direction appears to be present for the overpass portion of this segment

Proposed

92nd to 96th - 66' curb to curb

See next page for multiple options to consider

THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE SANDY BOULEVARD

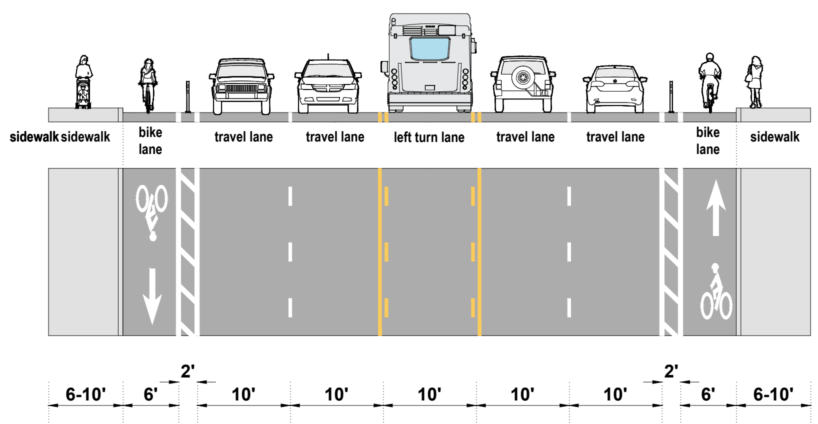
CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

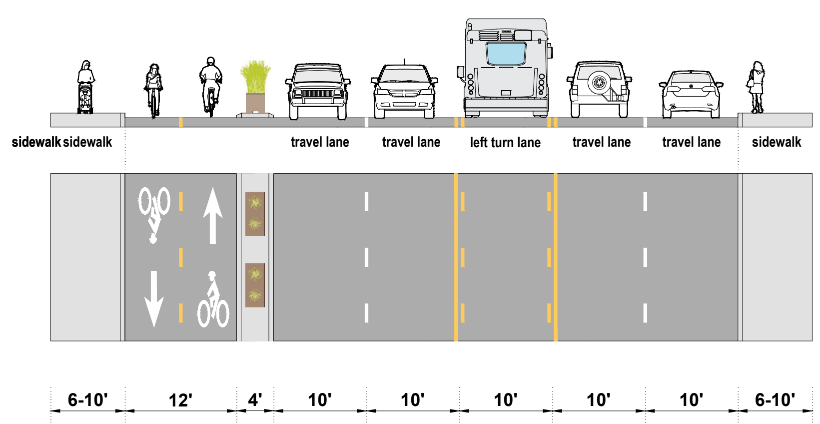
Proposed

92nd to 96th - 66' curb to curb

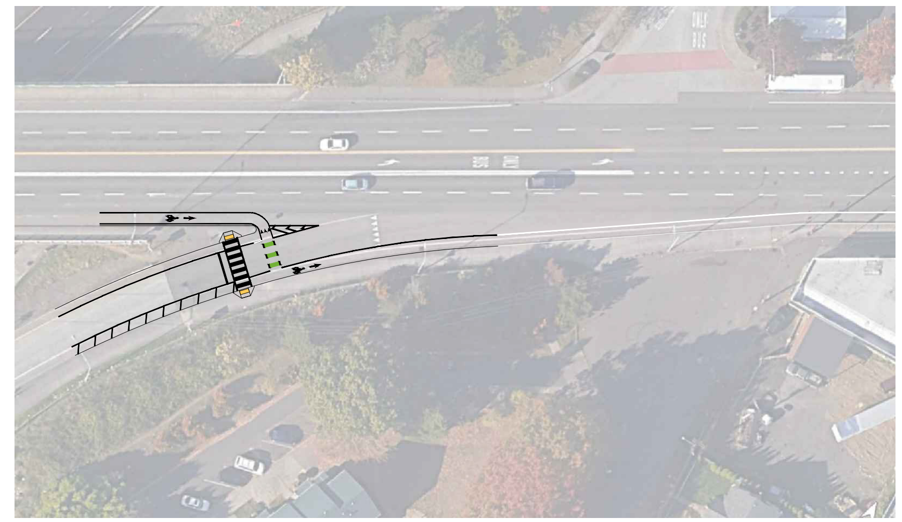
Option 1

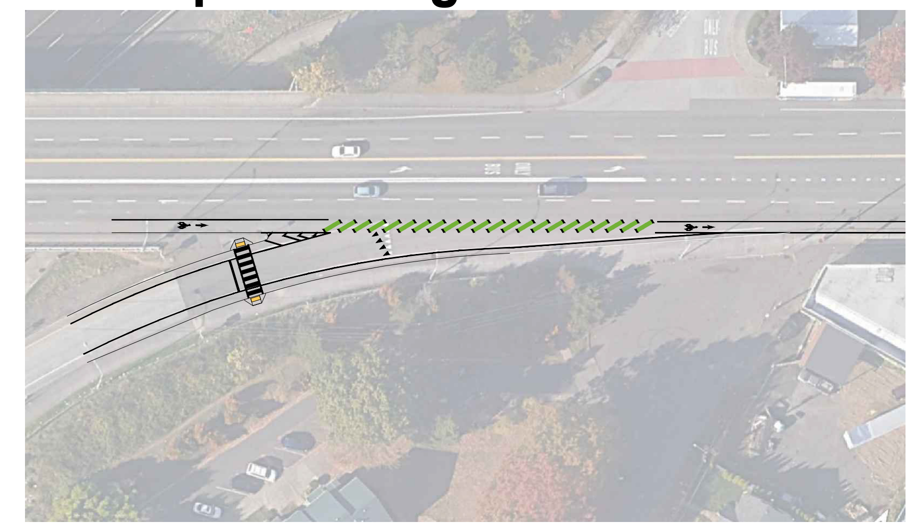


Option 2



Detail: Potential treatments for I-205 off-ramp crossing





THIS IS A PRELIMINARY CONCEPT. FIELD VERIFICATION, SITE CONDITION ASSESSMENTS, ENGINEERING ANALYSIS AND DESIGN ARE NECESSARY PRIOR TO IMPLEMENTING ANY OF THE RECOMMENDATIONS CONTAINED HEREIN.

NE SANDY BOULEVARD

CROSS SECTIONS

PRELIMINARY CONCEPT - NOT FOR CONSTRUCTION

EPASS

APPENDIX G

AIMSUM NEXT MODEL DEVELOPMENT AND DISTRICT-LEVEL TRAVEL DEMAND ANALYSIS

Memo

Date:	Wednesday, September 09, 2020
Project:	East Portland Arterial Streets Strategy
To:	Steve Szigethy and Kate Drennan, PBOT
From:	Lewis Kelley, HDR
Subject:	**Memo #4 Aimsun Model Development and District Level Existing Traffic Conditions**

1.0 Introduction

This memo provides a summary of existing infrastructure, transportation demand, and travel patterns within the East Portland Arterial Streets Strategy (EPASS) Project Area. The aim of this summary is to document the modeling methodology and analysis to better understand the existing district-level travel demand patterns prior to modeling the effects of future arterial reorganization that will be detailed in future memos. Thus, this memo functions as a baseline for comparison of future and preferred scenarios.

The aim of EPASS is to understand the capacity for reorganizing the East Portland arterial network to include improved transit, safety, and bicycle and pedestrian connections without significantly affected levels of traffic congestion or inducing large amounts of traffic diversion onto local streets. When the project concludes, EPASS will recommend an approved package of street redesigns across the network that would meet this goal. The extent of the EPASS project area includes 11 arterial corridors with a total of 33 centerline miles of roadway. Given the extent of the project area and the number of corridors under consideration, a systems approach to decision-making of future design and operation considerations would be the best approach. Therefore, the arterial system in East Portland was modeled to assemble an understanding of how the transportation system in East Portland functions as a whole and could be developed before changes along the corridors are considered.

This memo outlines the existing transportation infrastructure, the building of the travel model using Aimsun, the results of the existing conditions modeling effort at both the corridor and district wide level, and key performance measures used as a base of comparison in future scenarios. The model outputs from Aimsun provide performance measures for auto traffic only.

2.0 Methodology

The 2020 base year model for the study area was built using the Aimsun.Next traffic operations software platform. Aimsun.Next provides a flexible environment that offers tools that an analyst can use to support transport modelling projects: importing and editing a transport network; estimating and refining the transport demand; simulating transport movement in static macroscopic assignments or in dynamic mesoscopic, microscopic or hybrid simulation with route paths derived by simple "All or Nothing" methods to complex Dynamic User Equilibrium algorithms.

Due to the varying nature of the simulations between runs with different random seed numbers, Aimsun.Next results can differ from one run to the next. To improve model accuracy, the Aimsun.Next model conducts multiple, dynamic runs to mimic changes in travel behavior over time until it converges to meet network equilibrium then produces results for these runs. The Aimsun.Next EPASS model conducted Meso Dynamic User Equilibrium runs for the 2020 model year, with a maximum iteration of 100 runs.

The City of Portland (City) provided a subarea model derived from the Regional Portland Metro travel demand model using PTV's Visum software. The data imported from the City's subarea model, included road network basic geometry, road classifications, general intersection configurations, Origin and Destination Matrices, and roadway user classes and vehicle types. In addition to the City's information, transit service level data was obtained from TriMet's website to capture all lines and routes within the subarea model. The road network was analyzed for needed updates to properly model the EPASS network using Aimsun.Next, including cleaning up roadway attributes, verifying turning movements, adjusting roadway speeds and capacities.

2020 is the base year/current year for the Aimsun.Next EPASS model. The data and modeling reflects a pre-Covid-19 environment where traffic levels were unaffected by the stay-at-home orders issued in March of 2020. In 2019, PBOT constructed several projects 2019 along EPASS corridors within the Project Area. In order to capture the effects on traffic along each corridor and for the EPASS network, the Aimsun.Next EPASS model was updated with the most up-to-date road network within the Project Area. The 2020 scenario acts provides a basis of comparison for testing an assortment of roadway reorganization packages. The Aimsun.Next EPASS model was for the weekday, PM Peak hour only, 4:00 to 5:00 PM.

PBOT provided signal timing and phasing via the TransCore central database used in the PM peak period models. The project team conducted field investigations at selected locations to verify signal phasing, protected/permissive movements, right-turn-on-red behaviors, and overlap phasing. The project team also recorded stop control in the model for un-signalized intersections. Control Plans were assigned intersection specific throughout the study areas for the mesoscopic-model.

2.1 EPASS Performance Measures and Scenarios

Input from City staff helped guide the development of performance measures that could be compared across scenario runs. The model provides performance results for a one-hour PM peak period across multiple EPASS scenarios with performance measures reported for each direction of travel along a Subpath. A Subpath is a portion of an EPASS corridor used to aggregate performance measures from the Aimsun model runs and used for comparison purposes across the different scenarios. PBOT provided EPASS model scenarios, which included various configurations of EPASS corridor reorganizations. Rates of diversion onto local side streets are measured through simply analyzing traffic volumes on local streets adjacent to planned corridor reorganizations for significant increases in traffic diverting off of main arterial corridors.

2.1.1 Volume to Capacity Ratio

Volume to Capacity Ratio (V/C) is ratio of the volumes of a given roadway segment divided by the theoretical operating capacity of that same roadway segment. If the ratio is under 1.0, the roadway has additional capacity, while a ratio over 1.0 represents a roadway experiencing congestion over the design capacity of the roadway. V/C ratios below but near 1.0 may still experience congestion and elongated periods of peak period traffic.

The City uses V/C as a standard performance measure, shown in Table 1 and outlined in the latest draft Transportation System Plan (2019). The table outlines standards for maintaining acceptable levels of performance on regional arterials and throughway networks.

Table 1. City of Portland Congestion Standards

Location	Standards		
	Mid-Day One-Hour Peak*	PM 2-Hour Peak*	
		1st Hour	2nd Hour
Central City, Gateway, Town Centers, Neighborhood Centers, Station Areas	.99	1.1	.99
I-84 (from I-5 to I-205), I-5 North (from Marquam Bridge to Interstate Bridge, OR 99-E (from Lincoln St. to OR 224), US 26 (from I-405 to Sylvan Interchange), I-405	.99	1.1	.99
Other Principal Arterial Routes	.90	.99	.99

Source: City of Portland, Portland 2035 Transportation System Plan (draft)

2.1.2 Percentage of Congested Roadway Miles

Percentage of Congested Roadway Miles is an average of how much of each Subpath's roadway length is experiencing congestion with a V/C Ratio over .90. This metric can give a sense of whether a Subpath is hosting a significant amount of regional traffic, or if it is primarily service local destinations. A measure close to 100 percent represents a Subpath that is significantly congested for the majority of its length, whereas a measure of 0 percent would represent a Subpath that doesn't experience any congestion over .90 V/C for its entire length.

2.1.3 Through Trip Volumes

Through Trip Volumes are a measure of how many of the vehicle trips taking place on the EPASS network are trips that travel the whole length of a given Subpath. A measure of 88 percent would mean that 88 percent of all vehicle trips traveling along a Subpath are through trips rather than trips that are occurring within the bounds of the Subpath.

2.1.4 Subpath Weighted Average Volume

Subpath Weighted Average Volume is a measure of the average volume for each roadway Subpath. Each Subpath is made up of multiple, smaller roadway segments in-between intersections. The Aimsun Next software models traffic on each of these segments and traffic volumes can vary from segment to segment as traffic turns off the Subpath to different intersecting roadways or reach their destinations along the Subpath. Therefore, the Weighted Average Volume is an average of traffic volumes on each segment along the whole of each Subpath.

2.1.5 Through Trip Travel Time

Through Trip Travel Time is a measure of the length of time it takes a vehicle to travel from one end of a Subpath to the other. The travel time is affected by average traffic speeds and time spent waiting at intersections, which is in turn is affected by the amount of congestion on each Subpath. The measure only accounts for through trips along the Subpath.

2.1.6 Subpath Weighted Average Travel Time

Subpath Weighted Average Travel Time is a measure averaging the amount of time all vehicles spend traveling along each Subpath. This measure takes into account all traffic occurring along a Subpath, whereas Through Trip Travel Times only takes into account through trips.

2.1.7 Through Trip Average Speed

Through Trip Average Speed is a measure of traffic's average flow speed of all vehicles making through trips on an EPASS arterial Subpath. Average speeds are influenced by traffic volumes, turning movements, time spent waiting at intersections, and levels of congestion.

2.1.8 Subpath Weighted Average Speed

Subpath Weighted Average Speed is a measure of traffic's average flow speed along each Subpath. The measure considers each modeled vehicle's travel speeds along the Subpath. Average speeds are influenced by traffic volumes, turning movements, time spent waiting at intersections, and levels of congestion.

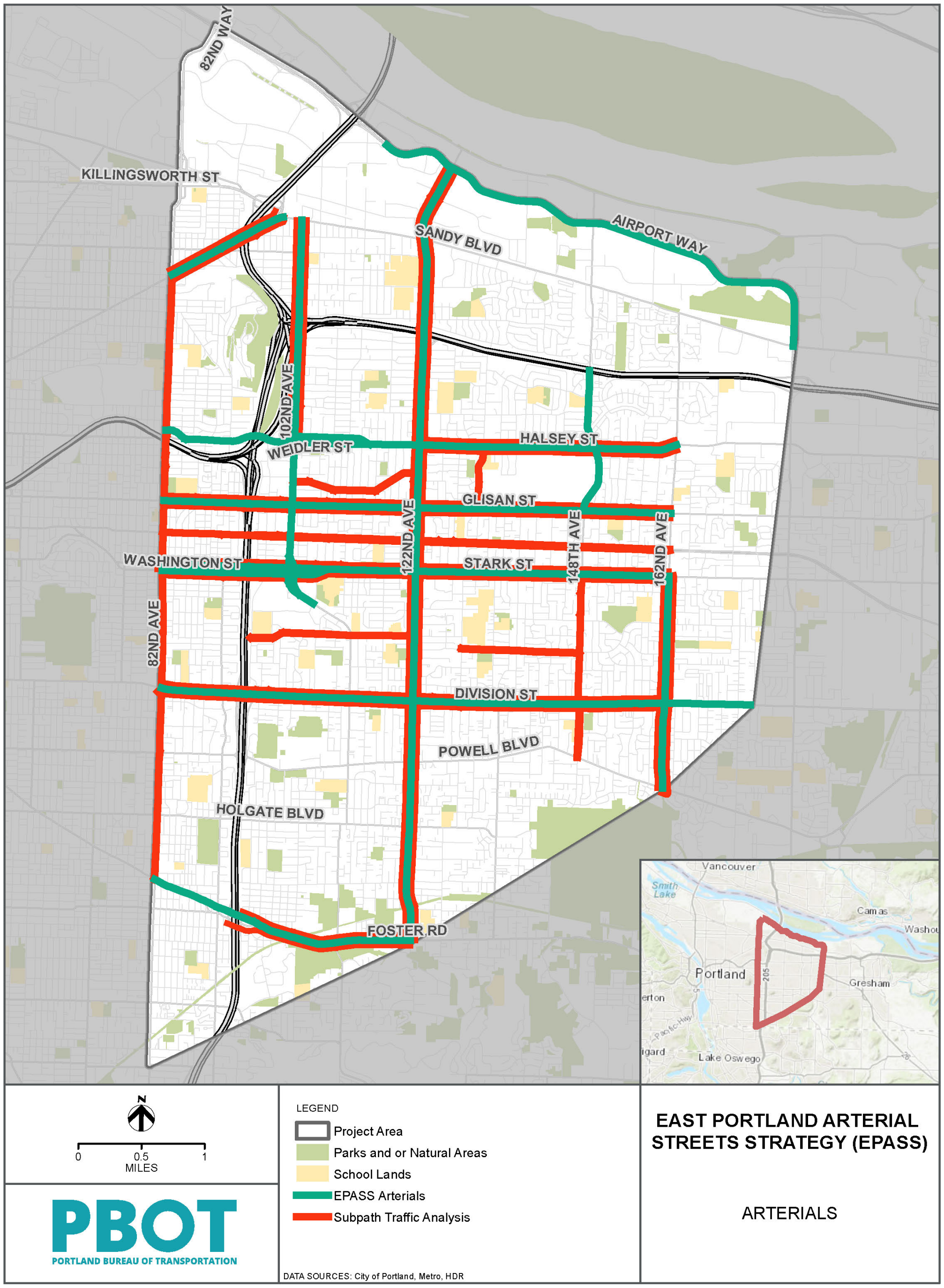
3.0 District Summary

The project area encompasses the area of the City east of NE/SE 82nd Avenue and spans to the City's eastern limits roughly between 162nd and 182nd Avenues. Modeling was conducted for portions of all the EPASS arterial corridors except for Airport Way, plus two non-EPASS corridors, NE/SE 82nd Avenue and E Burnside Street. In addition to the arterials, several neighborhood greenways were modeled including the 4M (Mill/Market/Main/Millmain), HOP (Holladay/Oregon/Pacific), and 130s greenways shown in Figure 4. Corridors were split into smaller Subpaths for the modeling effort that ranged in length from half a mile to two miles in length to better understand the impacts along each corridor between major intersections with other EPASS and non-EPASS arterials. The following streets were included in the Aimsun model and are shown in Figure 1:

- NE/SE 82nd Avenue – From Sandy Boulevard to Foster Road
- NE 102nd Avenue – From Sandy Boulevard to Halsey Street
- NE/SE 122nd Avenue – From Airport Way to Foster Road
- SE 148th Avenue – From Stark Street to Powell Boulevard
- SE 162nd Avenue – From Stark Street to Powell Boulevard
- NE Sandy Boulevard – From 82nd Avenue to 102nd Avenue
- NE Halsey Street – From 122nd Avenue to 162nd Avenue
- NE Glisan Street – From 82nd Avenue to 162nd Avenue
- E Burnside Street – From 82nd Avenue to 162nd Avenue
- SE Stark Street – From 82nd Avenue to 162nd Avenue
- SE Division Street – From 82nd Avenue to 162nd Avenue
- SE Foster Road – From 97th Avenue to 122nd Avenue

In addition to the primary and secondary streets mentioned above, the model generated traffic volumes for all other street segments included in the regional model in East Portland. This includes a number of other neighborhood collectors such as SE 111th Avenue and NE San Rafael Street.

Figure 1. EPASS Modeled Arterials and Neighborhood Greenways



PATH: X:\PROJECTS\CITY_OF_PORTLAND\10145072 - PBOT TO2 EPASS\7.2_WORK_IN_PROGRESS\MAP_DOCS\TRAFFIC\EPASS_ARTERIAL_OVERVIEW.MXD - USER: JBEARD - DATE: 10/2/2019

3.1 Base 2020 Scenario

2020 was selected as the base year to act as a basis for comparison when modeling changes across the EPASS network from future proposed roadway reorganizations. The 2020 base year incorporates a number of PBOT projects that were finished in 2019 along with a handful of projects that will start construction in 2019 and 2020 with substantial portions completed by the summer of 2020. The Base 2020 Scenario reflects a pre-Covid-19 environment prior to the announcement of stay-at-home orders. Table 2 outlines the projects included in the 2020 Base scenario, with the projects highlighted in green completed. Full descriptions of each project will be included in the EPASS Final Report. Other than I-205 Aux Lanes project, the three PBOT projects focused on surface streets and involved repurposing roadway space for multimodal users including reducing general purpose traffic lanes to make room for improved bicycle, pedestrian, and transit facilities.

Table 2. 2020 Base Traffic Conditions

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2020 Committed Projects	X	X	X	X									X	X	X					X		

Source: PBOT

The projects highlighted in green involve a variety of improvements to East Portland arterials including filling in sidewalk gaps, improved transit access, reconfigurations of lanes to provide protected space for bicycle facilities, and traffic calming measures to assist pedestrians in the safe crossing of busy arterial streets. Projects including NE 102nd Avenue, NE 148th Avenue, East Glisan, and SE 162nd Avenue also involved travel lane reorganizations in specific locations from 5 lane cross-sections to 3 lane cross-sections. The nearly complete projects highlighted in green involve a variety of roadway space reallocations that provide space for bike lanes, pedestrian crossings, or transit priority. In addition, new auxiliary lanes on I-205 between SE Foster Rd and NE Airport Way are included.

3.2 Traffic Model Results

Results of the Base 2020 Scenario model can be seen in Table 3 and are displayed for each of the Subpaths, broken out be the direction of travel. A total of 48 individual, directional Subpaths were modeled in the Aimsun scenario, eight of which consist of the Neighborhood Greenway network, leaving a total of 40 Subpaths modeled in the EPASS Project Area that cover arterial streets.

Table 3. 2020 Traffic Conditions

2020 Committed Projects	Segment Length	Volume to Capacity Ratio		Through Trips Volume	Subpath Weight Average Volume	Trip Proportion	Through Trips Travel Time	Subpath Weight Avg Travel Time	Through Trips (Subpath Results)	Subpath Weighted Average Speed
Subpath Names	**Dist (miles)**	**V/C Ratio**	**Percent > .90**	**Count**	**Count**	**% Through**	**Time (mm:ss)**	**Time (mm:ss)**	**Speed(mph)**	**Speed(mph)**
102nd Northbound Halsey to Sandy	1.7	1.27	71%	197	1092	18%	05:06	02:58	22	24
102nd Southbound Sandy to Halsey	1.7	0.80	44%	7	699	1%	04:49	02:50	23	28
122nd Northbound 1_Foster to Division	1.9	0.40	0%	150	558	27%	05:06	02:36	23	28
122nd Northbound 2_Division to Halsey	2.0	0.62	0%	16	868	2%	06:54	03:05	19	28
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0%	45	804	6%	07:11	03:19	19	26
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	8%	40	916	4%	07:07	03:37	20	24
122nd Southbound 2_Halsey to Division	2.0	0.86	50%	5	1204	0%	03:21	02:29	18	29
122nd Southbound 3_Division to Foster	1.9	0.64	0%	393	895	44%	08:13	03:56	15	22
148th Northbound Powell to Stark	1.4	0.36	0%	44	271	16%	03:37	02:25	25	29
148th Southbound Stark to Powell	1.4	0.41	0%	3	343	1%	04:49	02:18	19	28
162nd Northbound Powell to Stark	1.7	0.28	0%	58	397	15%	03:56	02:17	27	32
162nd Southbound Stark to Powell	1.7	0.38	0%	7	528	1%	04:35	02:38	23	29
82nd Northbound 1_Foster to Division	1.5	0.52	10%	109	733	15%	04:29	03:02	21	23
82nd Northbound 2_Division to Halsey	2.0	0.81	21%	191	1132	17%	06:53	03:41	18	20
82nd Northbound 3_Halsey to Sandy	1.3	0.92	47%	553	1291	43%	03:48	03:17	20	21
82nd Southbound 1_Sandy to Halsey	1.3	0.89	30%	167	1244	13%	03:36	03:11	21	22
82nd Southbound 2_ Halsey to Division	2.0	0.99	73%	229	1387	17%	09:07	04:31	13	16
82nd Southbound 3_Division to Foster	1.5	0.68	8%	74	949	8%	10:45	09:00	9	15
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0%	29	231	13%	06:21	03:03	19	24
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0%	160	390	41%	04:48	02:29	25	26
Burnside Westbound 1_162nd to 122nd	2.0	0.33	9%	21	229	9%	04:47	02:19	25	29
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0%	0	210	0%	00:00	03:41	0	24
Division Eastbound 1_82nd to 122nd	2.0	1.13	70%	30	1196	3%	08:22	03:54	15	22
Division Eastbound 2_122nd to 162nd	2.0	1.17	65%	521	1486	35%	05:07	02:41	23	31
Division Westbound 1_162nd to 122nd	2.0	0.67	0%	247	1031	24%	05:32	02:49	22	32
Division Westbound 2_122nd to 82nd	2.0	0.93	65%	208	1292	16%	11:38	05:51	11	17
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	100%	47	1751	3%	03:16	02:38	26	28
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0%	973	1318	74%	03:06	02:21	27	35
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0%	1	635	0%	01:56	03:08	30	27
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0%	368	785	47%	04:30	02:18	27	31
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0%	146	493	30%	04:05	02:17	30	30
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0%	6	798	1%	01:45	03:19	34	26
Halsey Eastbound 122nd to 162nd	2.0	0.68	0%	574	1016	56%	04:21	02:10	29	34
Halsey Westbound 162nd to 122nd	2.0	0.45	0%	257	689	37%	04:11	02:07	30	35
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0%	147	170	86%	01:12	02:33	25	24
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0%	205	213	96%	01:08	02:23	25	25
NG: 4M Eastbound 130th to 148th	0.9	0.35	0%	27	195	14%	02:29	02:58	23	21
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	19%	10	286	3%	04:00	03:09	20	21
NG: 4M Westbound 122nd to I-205	1.3	0.60	20%	27	358	8%	03:52	02:58	22	22
NG: 4M Westbound 148th to 130th	0.9	0.28	0%	16	159	10%	02:12	02:25	25	25
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0%	7	24	30%	03:00	02:56	21	21
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0%	0	83	0%	00:00	02:46	0	22
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0%	276	626	44%	02:19	02:30	26	28
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0%	261	462	57%	02:30	02:41	24	27
Stark Eastbound 1_122nd to 162nd	2.0	1.23	83%	464	1441	32%	05:23	02:40	23	28
Stark Eastbound 1_82nd to 122nd	2.0	1.14	69%	51	1623	3%	06:17	03:11	19	24
Stark Westbound 1_162nd to 122nd	2.0	0.83	27%	543	854	64%	04:41	02:23	26	31
Stark Westbound 2_122nd to 82nd	2.0	1.14	51%	106	1548	7%	07:44	03:55	17	22

Source: EPASS Aimsun Traffic Model

3.2.1 Congestion

Of the 40 arterial Subpaths, ten experienced V/C ratios above .9 during the one-hour PM Peak period modeled, these Subpaths are highlighted below in Table 4. Northbound 102nd Avenue is the most congested Subpath in the EPASS network, with a V/C ratio of 1.24 and over 70 percent of the 1.7 mile long Subpath experiencing a V/C ratio above .90. This level of congestion is likely a result of recent lane reorganizations the City has conducted on the section of 102nd Avenue modeled. NE 102nd Ave also tends to host regional traffic seeking alternate routes to the Glenn Jackson Bridge to Washington state during the PM peak.

A phase one pilot project of the NE 102nd Avenue Corridor Safety Project was completed over the summer of 2019, including lane reorganizations along much of the length of the Subpath from two general purpose travel lanes in each direction to one general purpose travel lane in each direction to better accommodate bicycle facilities and improved crossing improvements. The map shown in Figure 2 below highlights the V/C ratios for all of the 2020 modeled Subpaths

Several other EPASS arterials are modeled to experience notable levels of congestion along their lengths. Both eastbound Subpaths of Division Street have V/C ratios over 1, while the westbound section of Division Street between 82nd and 122nd Avenues has a V/C ratio of .94. Stark Street has three out of four of its Subpaths with V/C ratios above 1.0 while eastbound Foster between I-205 and 122nd is also above 1.0. Of the Subpaths with V/C ratios above 1.0, five out of seven are eastbound segments, one is northbound, and one is westbound.

Table 4. Most Congested Subpaths within EPASS Project Area

Subpath	V/C Ratio	Percent of Length with V/C > .90	Weighted Average Speed
102nd Northbound, Halsey to Sandy	1.27	71%	24
Stark Eastbound, 122nd to 162nd	1.23	83%	28
Division Eastbound, 122nd to 162nd	1.17	65%	31
Stark Westbound, 122nd to 82nd	1.14	51%	22
Stark Eastbound, 122nd to 82nd	1.14	69%	24
Division Eastbound, 82nd to 122nd	1.13	70%	22
Foster Eastbound, I-205 to 122nd	1.08	100%	28
82nd Southbound, Halsey to Division	.99	73%	16
Division Westbound, 122nd to 82nd	.93	65%	17
82nd Northbound, Halsey to Sandy	.92	47%	21

Source: EPASS Aimsun Traffic Model

Division Street, Stark Street, and 82nd Avenue all experience high levels of congestion during the Peak PM Period, with each of the corridors featuring multiple Subpaths that experience congestion above .90. Additionally, these corridors also experience levels of congestion over .90 for more than 50 percent of the length of each Subpath. 102nd Avenue experiences the congestion over the highest rate of its length, with 71 percent of the 2 mile Subpath experiencing congestion over .90. Across all of the modeled EPASS arterials the average V/C ratio in the base year is .67 with 22 percent of the average arterial length experiencing V/C ratios above .90.

The lowest arterial V/C ratios were found along NE Glisan Street between 122nd and 162nd Ave (including the road reorganization) having a V/C ratio of.25, 162nd Avenue, and Burnside Street, 15 Subpaths featured V/C ratios below .5, four being eastbound, six westbound, three northbound, and two southbound. Average speeds among the Subpaths with the lowest levels of congestion averaged 28.1 mph vs 23.1 mph for the Subpaths that featured the highest levels of congestion. Thus, average speeds were 22 percent higher among the least congested

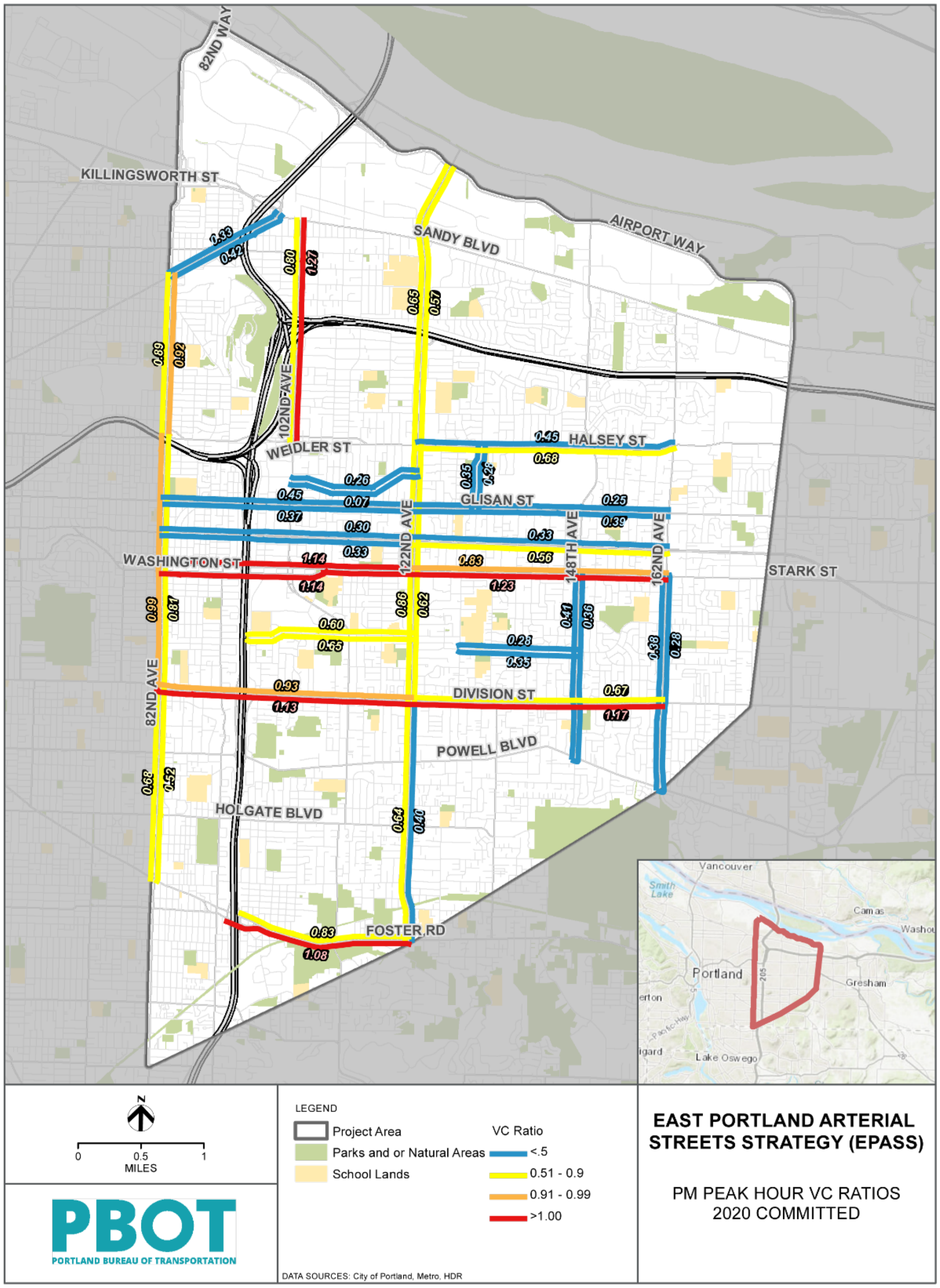
Subpaths compared to the most congested. The modeled Subpaths on both 148th Avenue and 162nd Avenue between Stark Street and Powell Boulevard all below .5, Table 5 below has a full account of the Subpath segments that featured V/C ratios of .5 or below.

Table 5. Least Congested Subpaths within EPASS Project Area

Subpath	V/C Ratio	Percent of Length with V/C > .90	Weighted Average Speed
Glisan Westbound, 162nd to 122nd	0.25	0.00	30
162nd Northbound, Powell to Stark	0.28	0.00	32
Burnside Westbound, 122nd to 82nd	0.30	0.00	24
Sandy Southbound, Killingsworth to 82nd	0.33	0.00	27
Burnside Westbound, 162nd to 122nd	0.33	0.09	29
Burnside Eastbound, 82nd to 122nd	0.33	0.00	24
148th Northbound, Powell to Stark	0.36	0.00	29
Glisan Eastbound, 82nd to 122nd	0.37	0.00	27
162nd Southbound, Stark to Powell	0.38	0.00	29
Glisan Eastbound, 122nd to 162nd	0.39	0.00	31
122nd Northbound, Foster to Division	0.40	0.00	28
148th Southbound, Stark to Powell	0.41	0.00	28
Sandy Northbound, 82nd to Killingsworth	0.42	0.00	28
Halsey Westbound, 162nd to 122nd	0.45	0.00	35
Glisan Westbound, 122nd to 82nd	0.45	0.00	26
82nd Northbound, Foster to Division	0.52	0.10	23

Source: EPASS Aimsun Traffic Model

Figure 2. V/C Ratio among EPASS Corridors



Source: EPASS Aimsun Traffic Model

3.2.2 Volumes

In total, modeled trip volumes along all EPASS arterials equaled 35,416 total trips for the one hour PM peak period. This included both through trips and internal trips along each of the arterial corridors. 82nd Avenue carried the most traffic, featuring 6,634 through trips, representing 19 percent of all traffic volume within the EPASS modeled corridors. Table 6 below shows a breakdown of traffic volumes by corridor along with a split out of directional traffic flows at the corridor level.

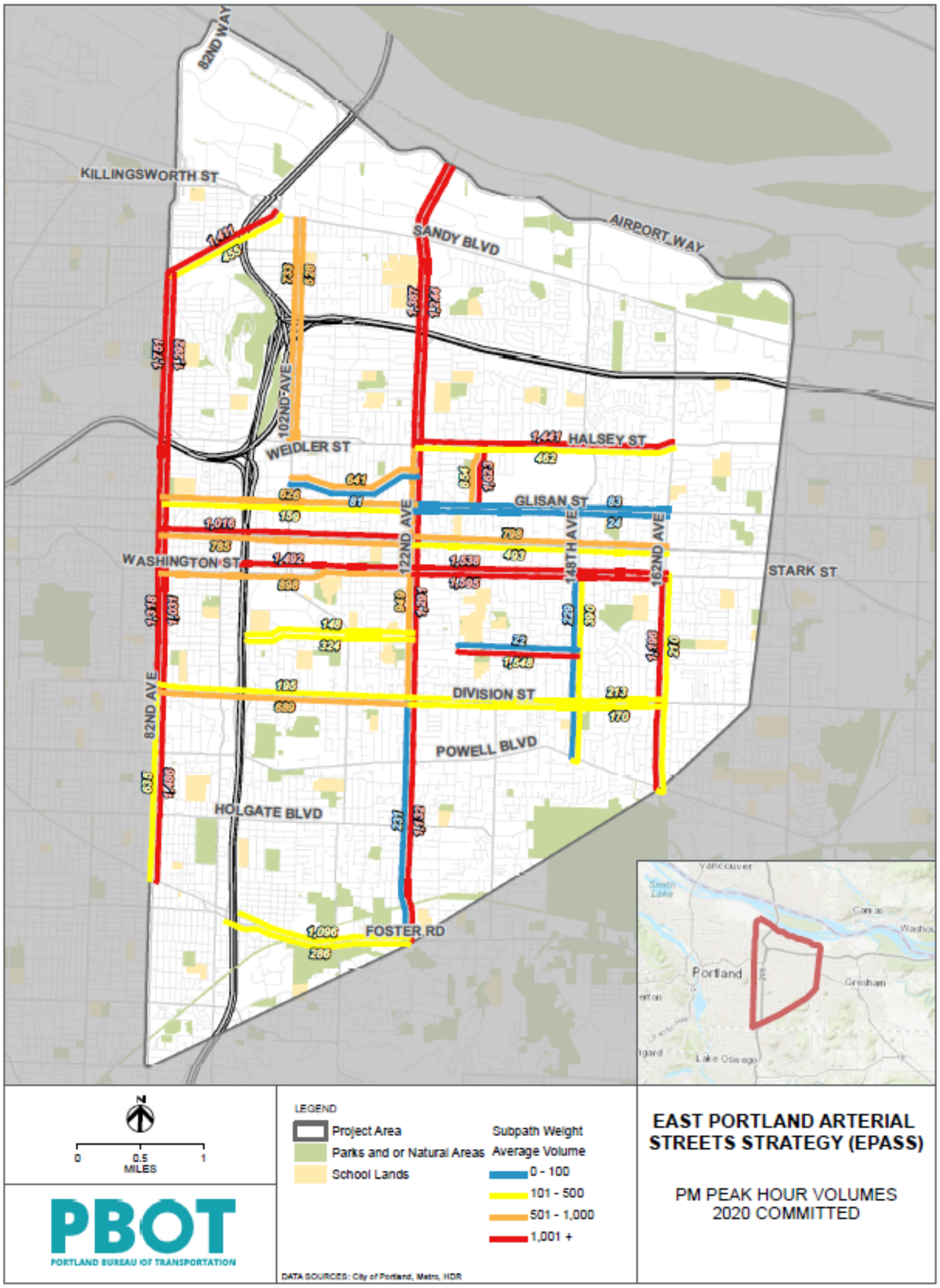
Table 6. Weighted Average Volumes

EPASS Corridor	Weighted Avg. Volumes	% of Total Trips	Percent Northbound	Percent Southbound	Percent Eastbound	Percent Westbound
82nd Avenue	6634	19.0%	47.3%	52.7%	-	-
SE Stark Street	5441	15.6%	-	-	55.2%	44.8%
NE 122nd Avenue	5181	14.8%	43.5%	56.5%	-	-
SE Division Street	5006	14.3%	-	-	53.0%	47.0%
SE Foster Road	2731	7.8%	-	-	59.1%	40.9%
NE Glisan Street	2690	7.7%	-	-	51.8%	48.2%
NE 102nd Avenue	1781	5.1%	59.7%	40.3%	-	-
NE Halsey Street	1676	4.8%	-	-	59.6%	40.4%
E Burnside Street	1160	3.3%	-	-	59.9%	40.1%
NE Sandy Boulevard	1096	3.1%	-	-	58.5%	41.5%
SE 162nd Avenue	934	2.7%	45.2%	54.8%	-	-
SE 148th Avenue	639	1.8%	44.3%	55.7%	-	-

Source: EPASS Aimsun Traffic Model

Altogether, the five corridors with the highest weighted average volumes during the one-hour PM Peak period carried over 70 percent of the modeled trips on EPASS arterials. These included 82nd Avenue, Stark Street, 122nd Avenue, Division Street, and Foster Road. 82nd Avenue far and above carried the most total volume among the modeled corridors, representing just under 20 percent of total volumes, followed by Stark Street at just under 16 percent, 122nd with 15 percent, SE Division Street at 14 percent and SE Foster Road 8 percent. The map shown in Figure 3 below features the weighted average volumes for each Subpath along the EPASS arterial corridors.

Figure 3. EPASS Corridor Volumes



Source: EPASS Aimsun Traffic Model

3.2.3 Travel Times

Travel times and average speeds are heavily correlated in the Base 2020 scenario. Subpaths exhibiting the highest through trip travel times at the same time had average speeds often well below posted speed limits. Table 7 shows the EPASS Subpaths with the highest travel times.

Table 7. Subpath Through Trip Travel Times within EPASS Project Area

Subpath	Subpath Length	Through Trips	Through Trip Travel Times	Through Trip Average Speeds
Division Westbound, 122nd to 82nd	2.0	208	11:38	11
82nd Southbound, Division to Foster	1.5	74	10:45	9
82nd Southbound, Halsey to Division	2.0	229	09:07	14
Division Eastbound, 82nd to 122nd	2.0	30	08:22	15
122nd Southbound, Division to Foster	1.9	393	08:13	15
Stark Westbound, 122nd to 82nd	2.0	106	07:44	17
122nd Northbound, Halsey to Airport Way	2.2	45	07:11	19
122nd Southbound, Airport Way to Halsey	2.2	40	07:07	20
122nd Northbound, Division to Halsey	20.	16	6:54	19
82nd Northbound, Division to Halsey	2.0	191	06:53	18
Burnside Eastbound, 82nd to 122nd	2.0	29	06:21	19
Stark Eastbound, 82nd to 122nd	2.0	51	06:17	19

Source: EPASS Aimsun Traffic Model

Westbound Division between 122nd and 82nd Avenues had the highest travel times during the PM peak hour, at 11:38 with an average speed of 11 mph. 82nd Avenue between Division Street and Foster Road was close behind, with a travel time of 10:45 and an average speed of 9 mph, the lowest average through trip speed for the 2020 EPASS Base scenario. Overall, the slowest through trip speeds and longest highest travel times occurred on three east/west arterials, Division Street, Stark Street, and Burnside Street and two north/south arterials, 82nd Avenue and 122nd Avenue. Eleven of the subpaths, representing 28 percent of the arterial corridors modeled, exhibited average through trip speeds under 20 mph.

3.3 Neighborhood Greenways

Neighborhood Greenways (NG) are residential streets that function as low stress connections where bicycles and pedestrians are given priority. PBOT developed design and operational performance guidance with the intent of keeping designated NGs low traffic and low stress, including design interventions to keep traffic speeds low and reduce cut-through vehicle traffic. These guidelines state that vehicle speeds should remain under 20 mph and hourly vehicle volumes under 100.

A concern of the EPASS project is to understand how traffic will reroute due to lane reorganizations inside the study area. NGs are of particular concern since they are expressly designed to discourage through vehicle traffic to help create that low stress environment for bicycles and pedestrians. Creating a base with which to understand how traffic may reroute onto

NGs from the resulting scenario models and at which points will help the City understand how to better plan for needed street design interventions on NGs in the EPASS study area.

Figure 4 shows the current and proposed NGs within the Project Area. Currently, two north-south routes exists, one just west of I-205 along a combination of 85th, 86th, and 87th Avenues and the second just east of I-205 along 100th and 101st Avenues. One east-west route exists routed along Bush Street between 100th and 148th Avenues.

Three NGs have been planned by PBOT with construction occurring during 2019 through 2020. For this reason, portions of the three planned NGs were included in the 2019 Base traffic model for comparison with future scenarios. These planned NGs are shown in Figure 4 and include the East Portland Active Transportation to Transit Project generally sited along 130th Avenue; the HOP NG running east from the Gateway Transit Center to NE 128th Avenue along Pacific, Oregon, and Holladay Streets, the 4M NG between SE 130th and 174th Avenues that connects a number of schools, parks, and commercial centers to transit service.

Table 8. Neighborhood Greenway 2020 Committed Project Model Results

SubPath	Average Volumes (PM Peak Hour)	V/C	%>.9	Average Speed
NG: 4M WB - 122nd to I-205	358	0..60	20%	22
NG: 4M EB - I-205 to 122nd	286	0.65	19%	21
NG: 4M EB - 130th to 148th	195	0.35	0%	21
NG: 4M WB - 148th to 130th	159	0.28	0%	25
NG: 130s SB - Halsey to Glisan	205	0.35	0%	25
NG: 130s NB - Glisan to Halsey	170	0.28	0%	24
NG: HOP WB - 122nd to 102nd	83	0.26	0%	22
NG: HOP EB - 102nd to 122nd	24	0.07	0%	21

Source: EPASS Aimsun Traffic Model

Table 8 presents key performance measures from the Base 2020 model scenario for the three NGs modeled. Model results demonstrate that only the HOP NG volumes are low enough to meet Portland's performance guidelines while none of the NGs are modeled to result in speeds low enough to meet Portland guidelines. These results for the planned NGs will be important reference points of comparison against EPASS reorganization scenarios, allowing PBOT to assess the need for additional traffic calming design interventions to discourage cut-through traffic on NGs that may result from the arterial reorganizations or upgrades to bike lanes.

3.4 Active Transportation Facilities

This section features a brief overview of the current active transportation facilities in the EPASS Project Area. Previous planning efforts in East Portland have documented substandard active transportation facilities, from incomplete sidewalks to bicycle lanes along four lane arterials that offer little buffer from fast moving traffic. One of the goals of EPASS arterial reorganization is to better accommodate multimodal transportation and make these streets safer for all users.

3.4.1 Bicycle Network

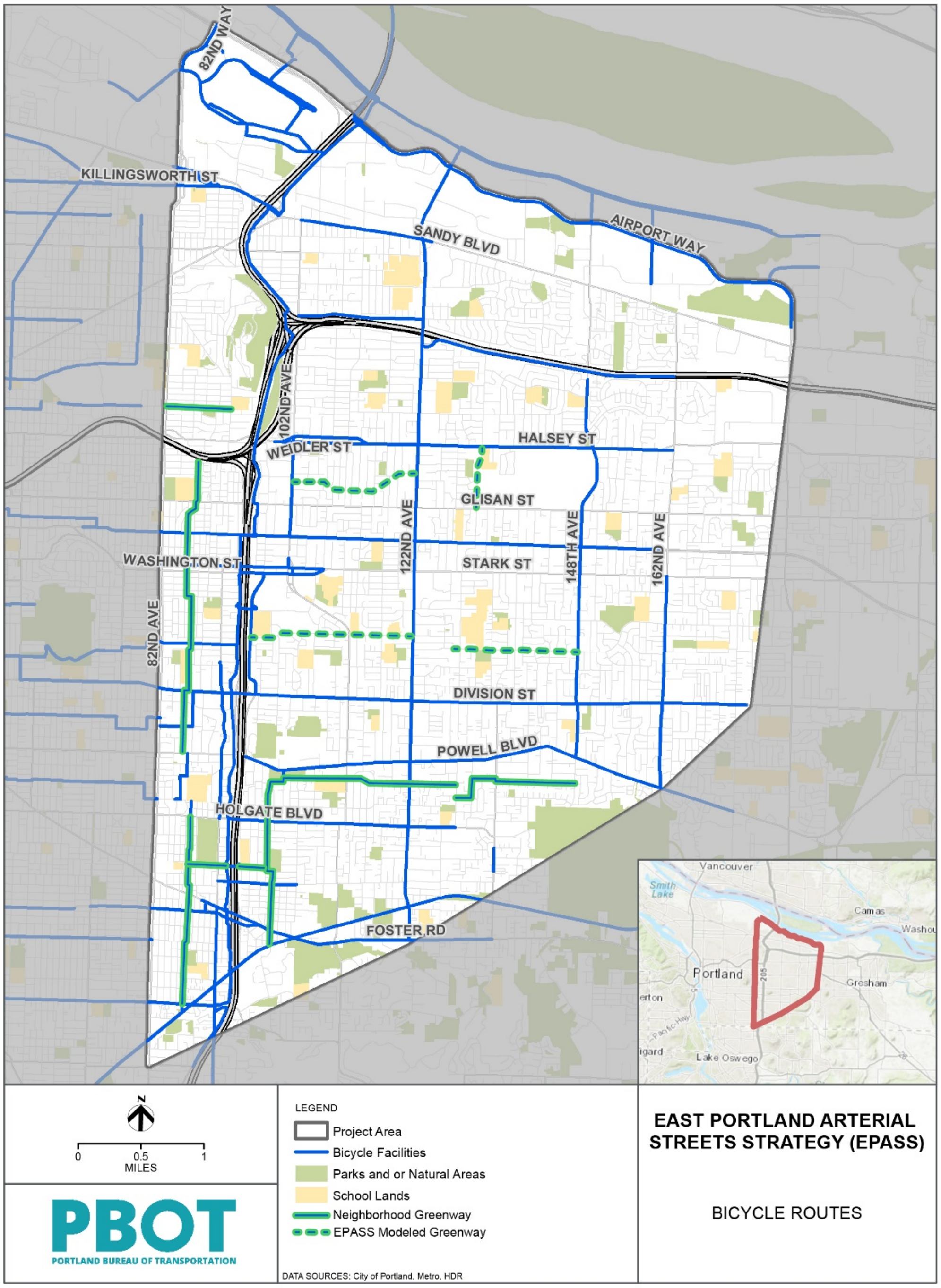
Figure 4 shows the bicycle network for the Project Area. Within the EPASS Project Area a total of 91.6 miles of dedicated bicycle facilities exist. The majority of bicycle facilities are made up of bicycle lanes, with a total of 57.5 centerline miles primarily along the arterial street network. Recent PBOT construction projects have added a number of protected and buffered bike lanes on major arterials; along 102nd Avenue from Sandy Boulevard to Stark Street, along NE Halsey Street from 92nd to 162nd Avenue, along NE Glisan Street from 102nd Avenue to 162nd Avenue, and shorter segments of SE Powell Boulevard, SE 96th Avenue, and SE Holgate Boulevard.

Halsey Street and Weidler Street couplet between 102nd Avenue to 114th Avenue, along Glisan Street between 148th Avenue and 168th Avenue. The EPASS Project Area also features 14 miles of separated, multi-use trails found primarily along the Springwater Corridor Trail and the I-205 Multi-Use Path. Table 9 shows the total miles of bicycle facilities within the Project Area. Several notable gaps exist in the bicycle network along arterials in the Project Area. The whole length of 82nd Avenue is missing bicycle facilities, but as an ODOT owned facility, 82nd Avenue outside of the scope of this project. Sandy Boulevard from 82nd Avenue to 101st Avenue is lacking bicycle facilities, as well as Sandy Boulevard east of 122nd Avenue.

Table 9. Bicycle Facilities

Facility Type	Total Miles
Bike Lanes	57.5
Buffered Bike Lanes	10.4
Protected Bike Lanes	4.4
Multi-Use Trail	19.3

Figure 4. Existing Bicycle Facilities



PATH: X:\PROJECTS\CITY_OF_PORTLAND\10145072 - PBOT TO2 EPASS\7.2_WORK_IN_PROGRESS\MAP_DOCS\TRAFFIC\CURRENT_CONDITIONS\BICYCLE_ROUTES.MXD - USER: JBEARD - DATE: 10/2/2019

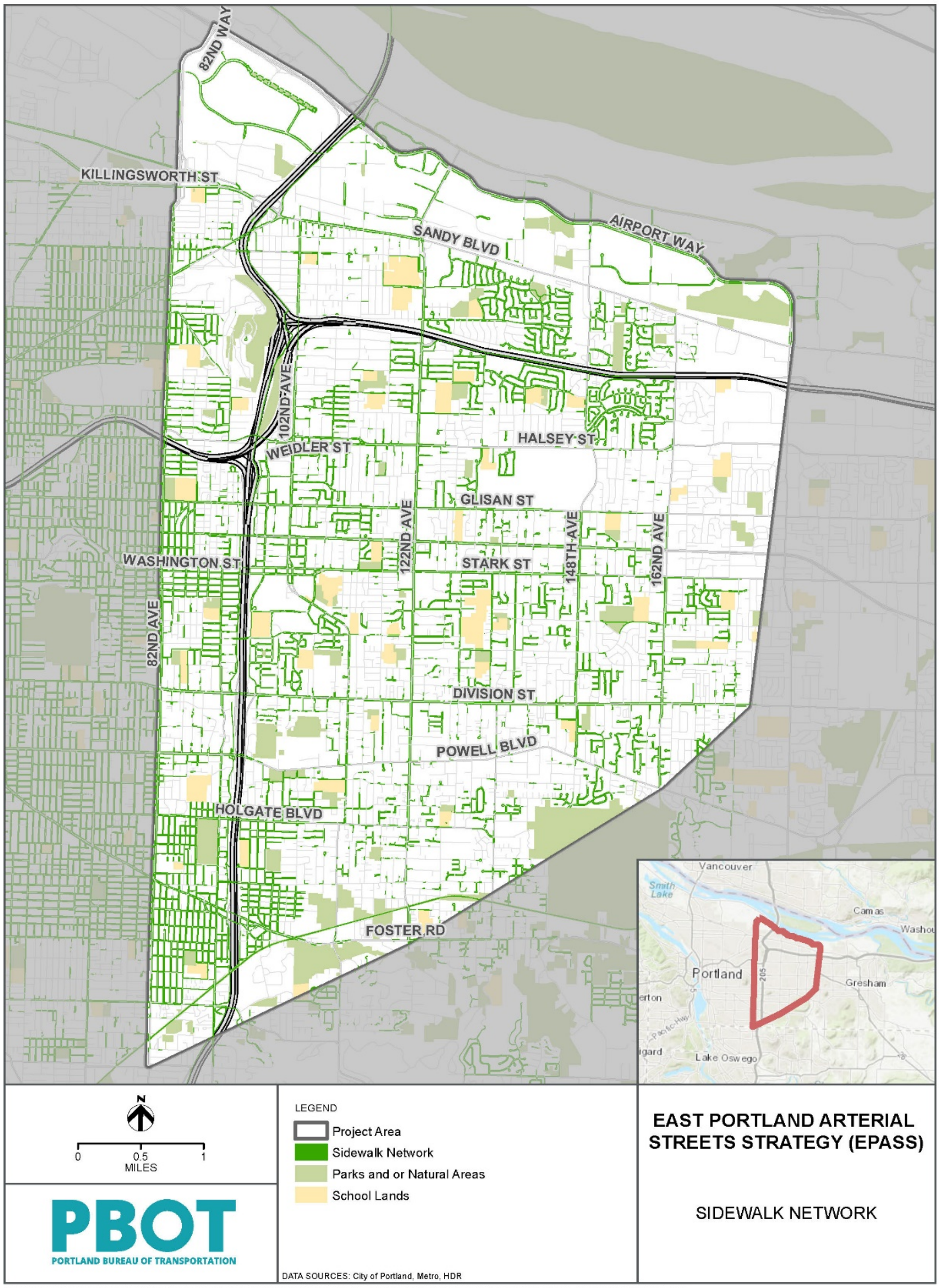
3.4.2 Sidewalk Network

East Portland streets have long been characterized by an incomplete sidewalk network with existing sidewalks often being substandard, narrow, and missing curb ramps. Figure 5 displays the existing sidewalk network within the EPASS Project Area. PBOT has been consistently working on sidewalk infill, and the majority of arterial roads in East Portland have a sidewalk network that is mostly complete. Major arterials in the area that still have substantial gaps in their sidewalk network include:

- NE 148th Avenue from Airport Way to NE Glisan Street
- NE Halsey east of NE 122nd Avenue
- SE Powell Boulevard east of I-205
- Sandy Boulevard east of NE 122nd Avenue

Many of these existing gaps along East Portland arterials have been prioritized for eventual inclusion on the TSP project funding list as Tier 2 and 3 investments in the recently adopted City PedPDX plan. Outside of the arterials, many of East Portland's local roads do not have any sidewalks present. Newer developments that have occurred since the City annexed East Portland, have full sidewalk networks, but those local areas developed prior to the City's annexation feature an often sparse sidewalk network.

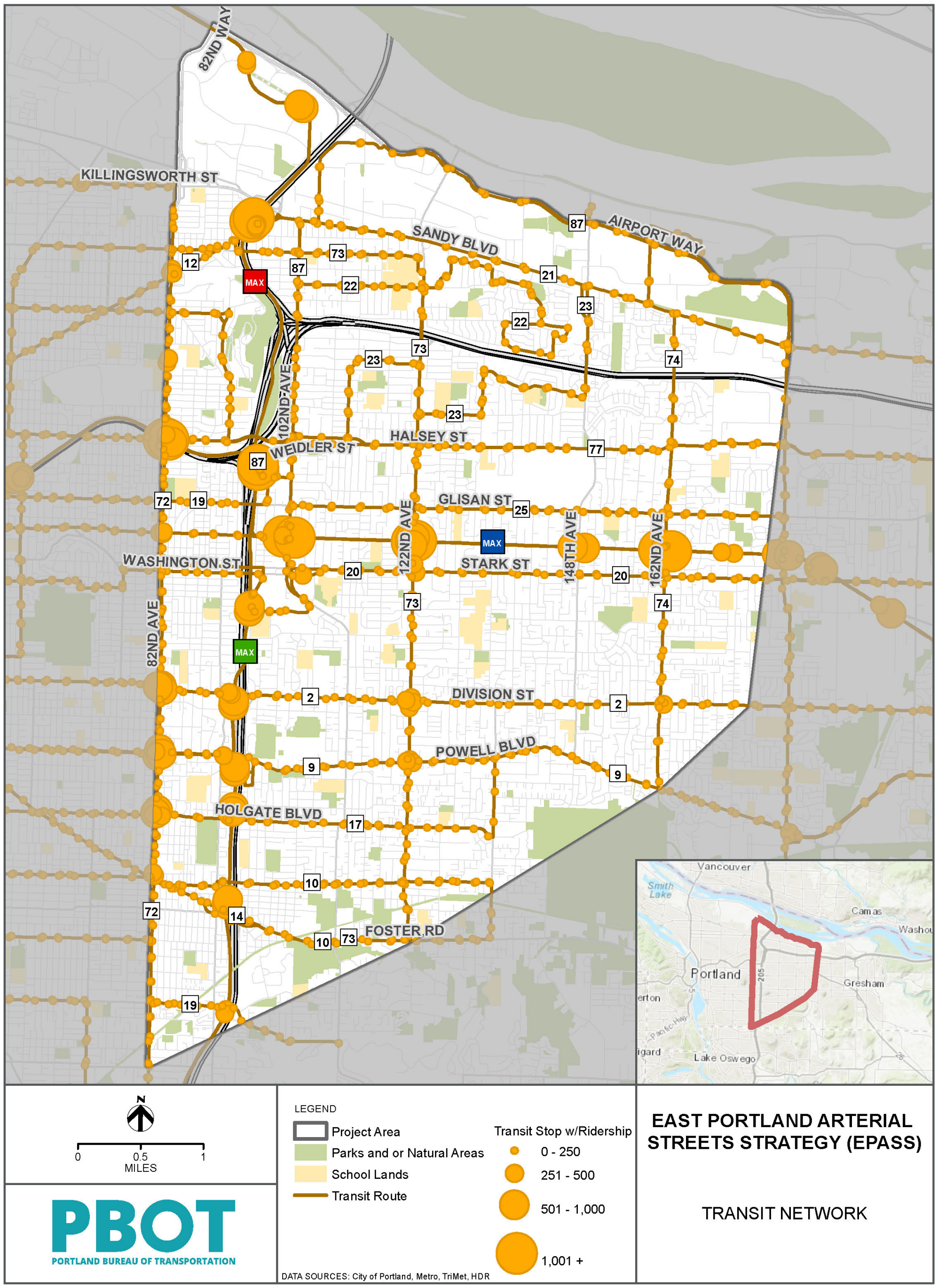
Figure 5. Existing Sidewalk Network



3.5 Transit Service

This section briefly summarizes transit service within the EPASS Project Area. Sitting in-between Portland's central city and Gresham, many of the east-west corridors in East Portland function as important transit corridors connecting the two cities while north-south routes serve to connect the wider region to important infrastructure including the Portland International Airport and industrial job centers along the Columbia River. Transit through the Project Area predominately serves land use that is made up of single-family housing and auto-oriented businesses along the arterial corridors.

Figure 6. Transit Service and Ridership



PATH: X:\PROJECTS\CITY_OF_PORTLAND\10145072 - PBOT TO2 EPASS\7.2_WORK_IN_PROGRESS\MAP_DOCS\TRAFFIC\CURRENT_CONDITIONS\TRANSIT_NETWORK.MXD - USER: JBEARD - DATE: 10/2/2019

MAX service consists of three lines, the Blue, Green, and Red Line, highlighted in Figure 6. All the MAX lines are considered frequent service, which is defined by TriMet as service that runs every 15 minutes or better. The Blue line runs between downtown Gresham in the East and downtown Hillsboro in the West and features 5.6 miles inside the EPASS project area with the majority of the Blue Line running along East Burnside Street Red Line service runs between the Portland International Airport in the East and Beaverton in the West and features five stops within the project area. Green Line service runs between the Clackamas Town Center in the Southeast and downtown Portland and features approximately 5.3 track miles running along I-205 with eight stops in the project area.

Table 10. Transit Ridership within EPASS Project Area*

Transit Service	Frequent Service	Ridership
Max Blue	*	29,018
Max Green	*	8,529
Max Red	*	11,489
2	*	7,188
9	*	4,403
10		802
12	*	1,315
14	*	805
15	*	2,285
17		2,651
19		1,373
20		5,007
21		1,434
22		1,290
23		871
24		748
25		599
71		164
72	*	16,392
73		7,634
74		728
77		3,343
87		1,377

**Average Daily Weekday Ridership*
Source: TriMet

Twenty TriMet bus lines, shown in Figure 6, serve the Project Area. Routes 4, 9, 12, 14, 15, and the 72 feature frequent transit service that runs every 15 minutes or better throughout most of the day. Five EPASS corridors currently feature frequent service; Division Street, Stark Street, Sandy Boulevard, Foster Road, and 122nd Avenue. Line 20, connecting Gresham to downtown Portland along Stark Avenue, is the only bus line in the Project Area that features 24-hour service.

Average Daily Weekday ridership in the Project Area totals 109,445 rides, with 49,036 taking place on Max and 60,409 on bus service. Table 10 breaks ridership data out by route. Four of the five TriMet lines with the highest ridership in the Project Area are frequent service lines, including all three of the Max lines. E Burnside Street is the busiest east-west corridor with total ridership of 10,899 on the Max Blue Line. The busiest north-south corridor is along 82nd Avenue with a total ridership of 16,392 on the route 72 bus.

4.0 EPASS Modeled Corridors

This section presents a series of factsheets for each of the EPASS modeled corridors. Each corridor is presented with an individualized factsheet, for a total of 12 factsheets, presenting corridor level performance measures from the Aimsun model, a summary of transportation information associated with each corridor, existing cross-sections, and an overview of planned projects.


PBOT
PORTLAND BUREAU OF TRANSPORTATION
CORRIDOR FACT SHEETS
EXISTING CONDITIONS
EPASS

Corridor Fact Sheets

East Portland Arterial Streets Strategy is developing design concepts and investment strategies for the city owned arterials east of 82nd Avenue. As part of the EPASS project, a modeling effort was undertaken to study how roadway reorganizations along a select set of arterials will effect overall traffic and congestion throughout the East Portland transportation Network.

The following fact sheets present the modeling findings from that effort. First, by providing information on the current functioning of the East Portland network as the arterials are configured in the spring of 2020. Secondly, by presenting information on future conditions based off a preferred package of roadway reorganizations and investments that are aimed at improving safety and connectivity.

Both the existing conditions and future preferred scenario are compared using five performance measures, vehicle volumes, congestion, average speeds, percentage of through trips, and travel times, which are explained in detail on this page.

Corridor Performance Measures

Volumes

Volumes are reported for the one hour afternoon peak travel times and are an average of the traffic volumes experienced along the whole of the corridor segment shown.

Congestion

Congestion is measured by a ratio of roadway capacity to the volume of traffic. A measure near 1.0 is a road at capacity, with slow moving vehicles due to congestion while a meaure near 0.0 indicates free flow traffic.

Average Speeds

Average speed is calculated for the whole corridor segment shown. Speeds are affected by the number of vehicles on the roadway and trend downwards as a road becomes congested.

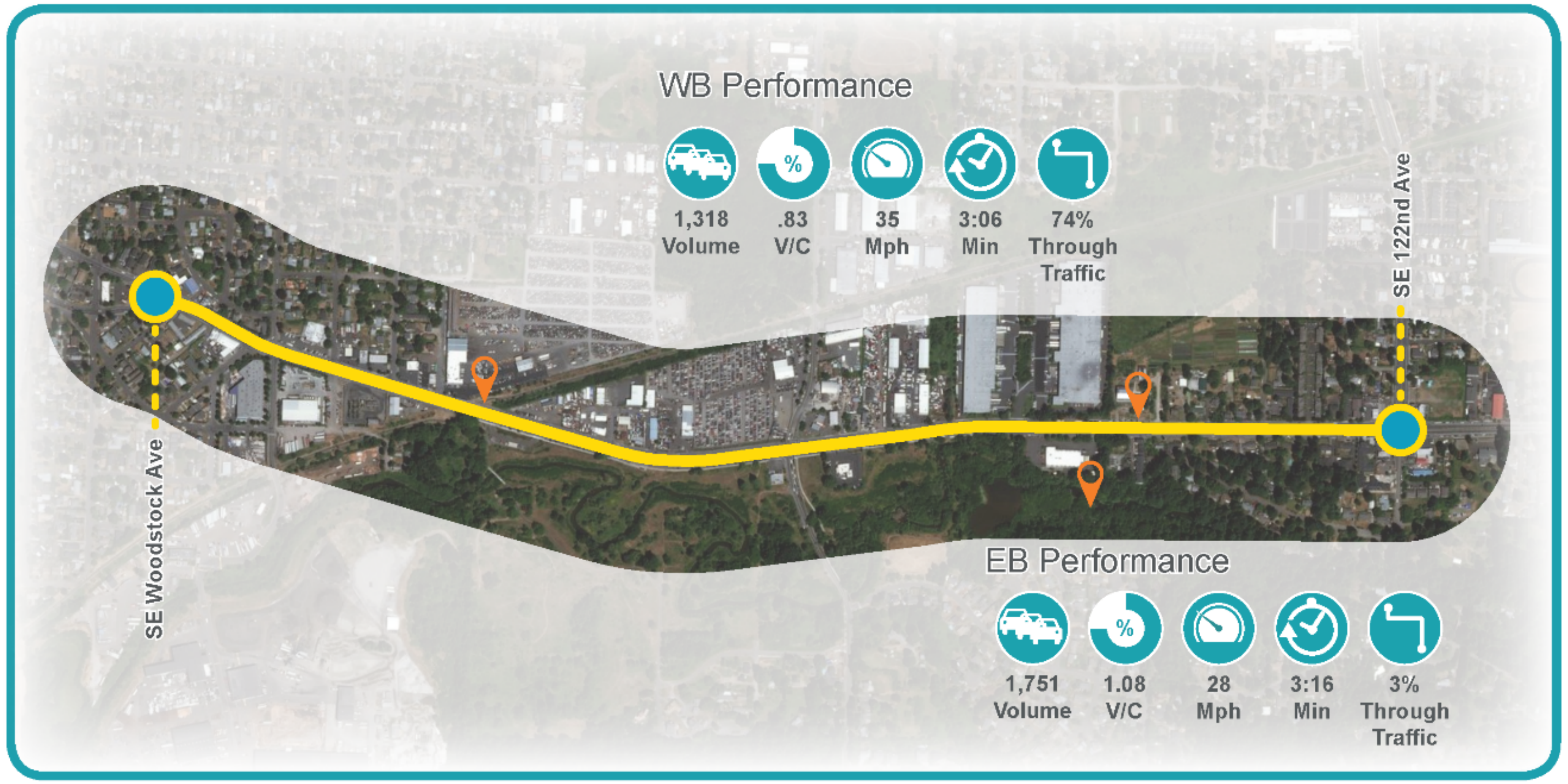
Through Trips

Through trips are calculated for the whole length of the corridor segment and represent the percentage of vehicles traveling through the corridor rather than within the corridor.

Travel Times

Travel Times are calculated based on the average time spent for vehilces to make through trips along the whole of the segment.

EXISTING CONDITIONS FACT SHEET - SE FOSTER RD



Corridor Characteristics

Corridor Length
1.4 Mile Corridor

Landuse Context
Commercial + Industrial
Residential + Open Space

Fatalities
1 Bicycle Death
1 vehicular Death

Crash Contributors
Substandard Sidewalks
High Posted Speeds

Destinations
Zenger Farm
Leach Botanical Gardens
Springwater Corridor

TriMet Service

10
Peak Frequency
17 min
Daily Boardings
64

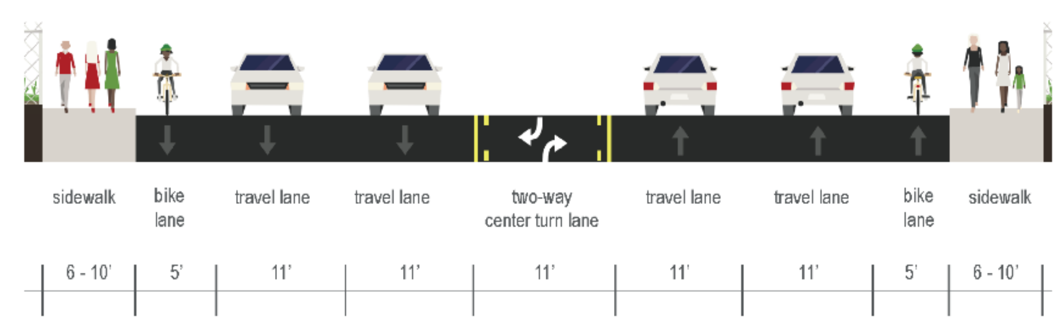
73
Peak Frequency
15 min
Daily Boardings
64

Non-EPASS Planned Projects:

Foster-Wookstock Couplet

The project is a continuation of the Lents Town Center Improvements; providing long-deferred maintenance and safety improvements for all modes. The project extends from the NB I-205 to SE 101st Ave. The safety improvements will reduce conflicts between modes by providing greater separation between users, constructing enhanced pedestrian crossings, and providing ADA upgrades.

TYPICAL CROSS-SECTION*



travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT
PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - SE DIVISION ST

Corridor Characteristics

Corridor Length
4 Mile Corridor

Landuse Context
Commercial
Residential

Fatalities
163 Pedestrian Crashes
13 Pedestrian Deaths
2 Vehicular Deaths

Crash Contributors
Unsafe Pedestrian Crossings
High Rate of Rear-Ends
Turning Movements

Destinations
Kelly Butte Natural Area
Division Crossing

TriMet Service

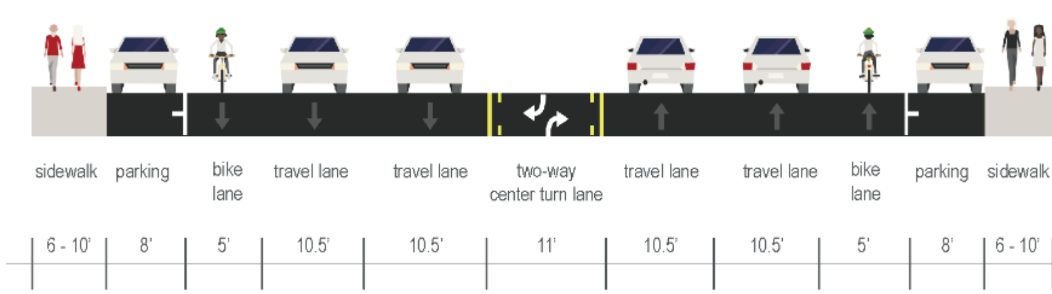
2

Peak Frequency
6 min
Daily Boardings
4,824

Non-EPASS Planned Projects:

Outer Division Multimodal Safety Project
The project is focusing on multimodal investments to achieve improved safety gains along one of highest crash corridors in Portland. Investments include enhanced crosswalks, raised medians to reduce turning movement conflicts, speed safety cameras to support enforcement of speed limits, and buffered bike lanes to increase separation between modes.

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - SE STARK ST

Corridor Characteristics

Corridor Length
4 Mile Corridor

Landuse Context
Commercial
Light + Medium Residential

Fatalities
4 Pedestrian Deaths
2 Vehicular Deaths

Crash Contributors
Turning Movements
High Rate of Speeding
Crossing Movements

Destinations
Mall 205
E. Portland Community Center
Ventura Park
Midland Library

TriMet Service

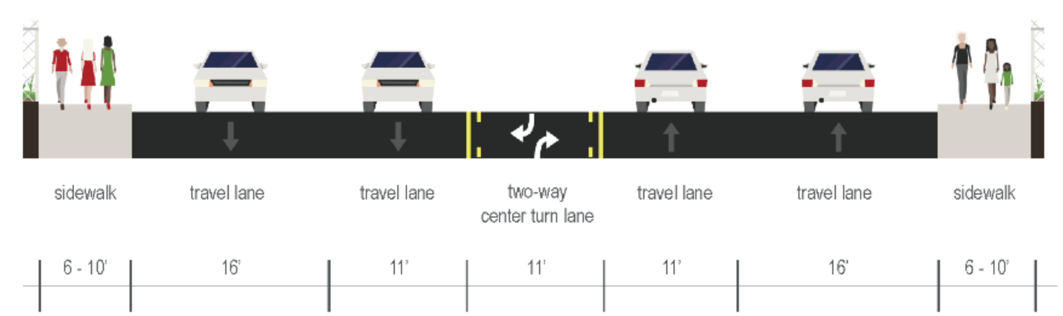
15
Peak Frequency
5 min
Daily Boardings
549

20
Peak Frequency
10 min
Daily Boardings
2,845

Non-EPASS Planned Projects:

Safer Outer Stark
The goal of this project is to reduce serious and deadly crashes for all modes, reduce excess vehicle speeds, and provide safer access and crossing for people walking and biking. The project will also support the development of enhanced transit and improved transit access along the corridor.

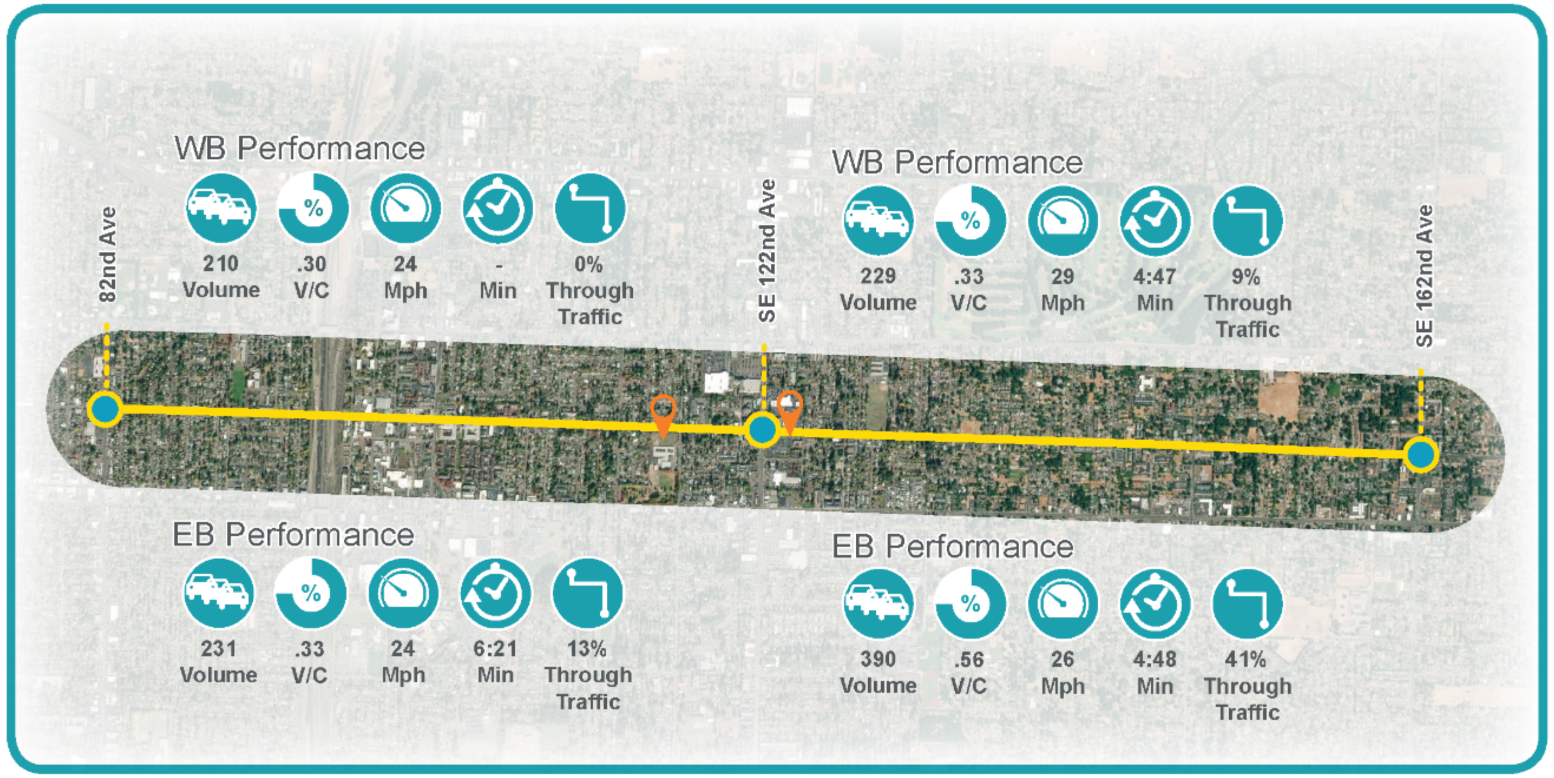
TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - E BURNSIDE ST



Corridor Characteristics

Corridor Length
4 Mile Corridor

Cross Section
Commercial
Light + Medium Residential

Fatalities
4 Vehicular Deaths

Crash Contributors
Lack of Street Lighting
Turning Movements

Destinations
Menlo Park Park & Ride
Ventura Park Elementary

TriMet Service

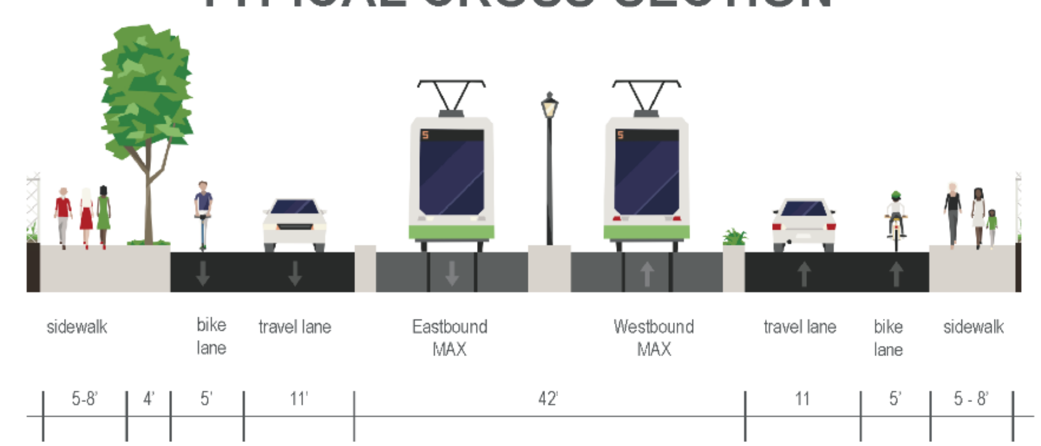
Blue Line
Peak Frequency
5 min
Daily Boardings
9,977

20
Peak Frequency
10 min
Daily Boardings
1,228

Non-EPASS Planned Projects:

Renovating MAX Blue Line Stations and Crossings
TriMet has been upgrading MAX Blue Line stations and crossings since 2015. The work continues today and involves updating station and crossing designs that are the oldest found in TriMet's MAX system. Recently completed work involved updates to MAX stations at E 122nd Ave and E 162nd Ave.

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

EXISTING CONDITIONS FACT SHEET - NE GLISAN ST

Corridor Characteristics

Corridor Length
4 Mile Corridor

Landuse Context
Commercial
Residential
Open Space

Fatalities
4 Pedestrian Deaths
3 Vehicular Deaths

Crash Contributors
Speeding
Lack of Lighting
High Rate of Night Time Crashes

Destinations
Multnomah University
Montavilla Community Center
Glendoveer Golf & Tennis
IRCO

TriMet Service

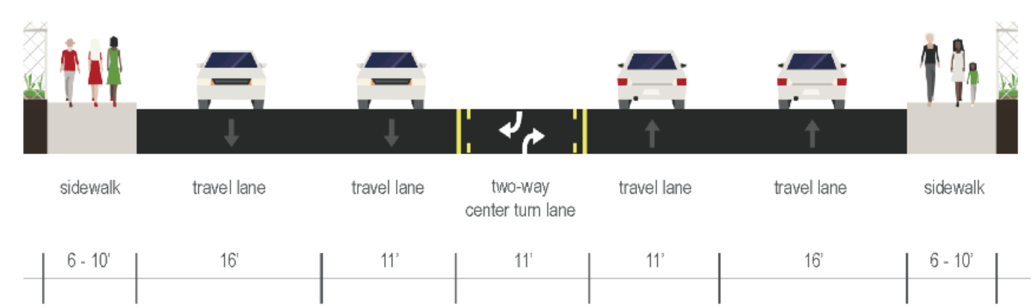
25

Peak Frequency
1 hour
Daily Boardings
636

Non-EPASS Planned Projects:

East Glisan Street Update
The East Glisan Street Update is scheduled to be completed during the summer of 2020. The project aims to reduce crashes, reduce excess vehicle speeds, increase safe crossing opportunities for pedestrians, and add more separation between pedestrians, bikes, and vehicles. Glisan will also undergo lane reorganizations along several sections.

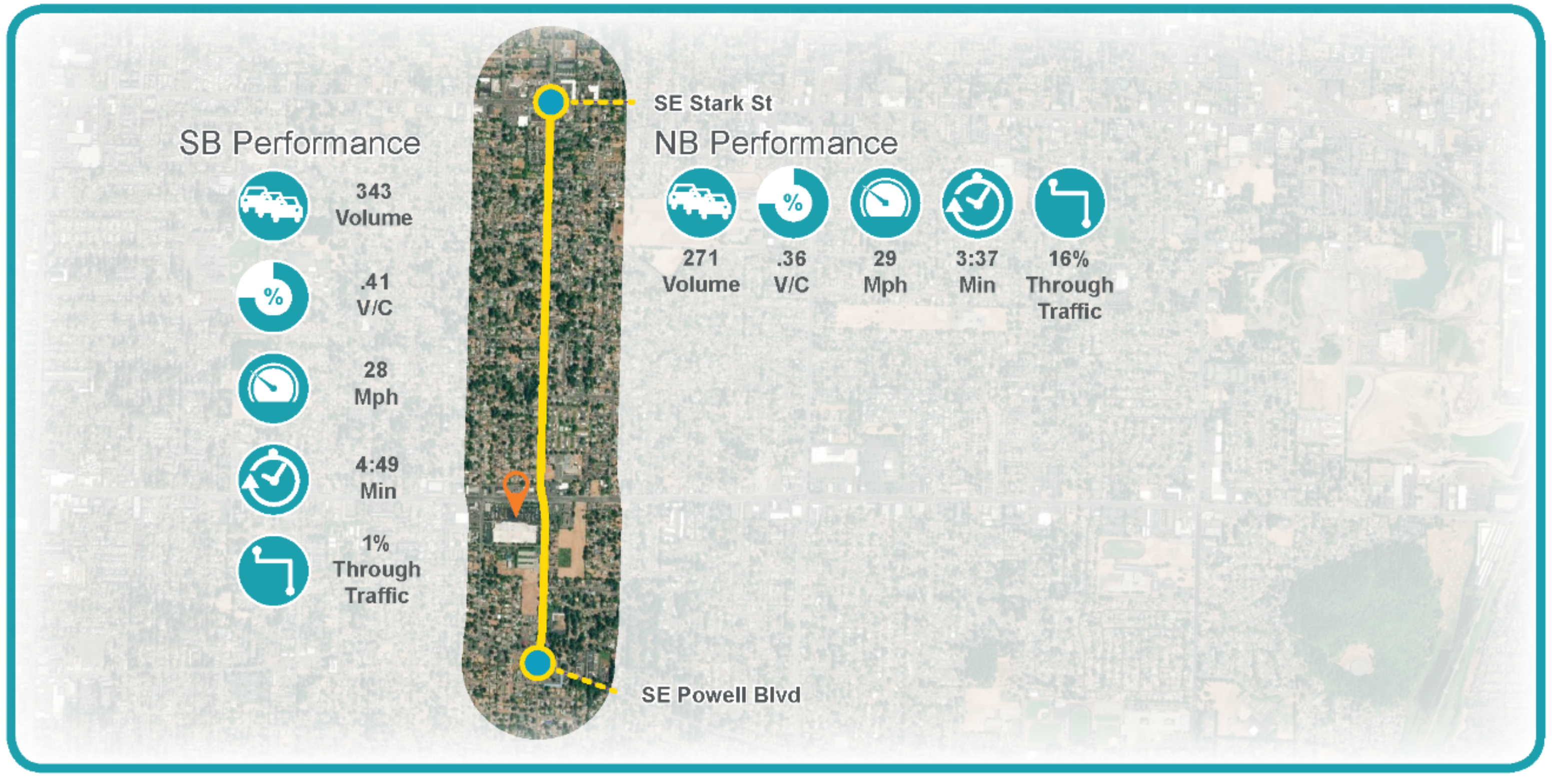
TYPICAL CROSS-SECTION*



**travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.*

PBOT
PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - SE 148TH AVE



Corridor Characteristics

Corridor Length
1 Mile Corridor

Landuse Context
Residential

Fatalities
1 Vehicular Death

Crash Contributors
Lack of Lighting

Destinations
Fred Meyer

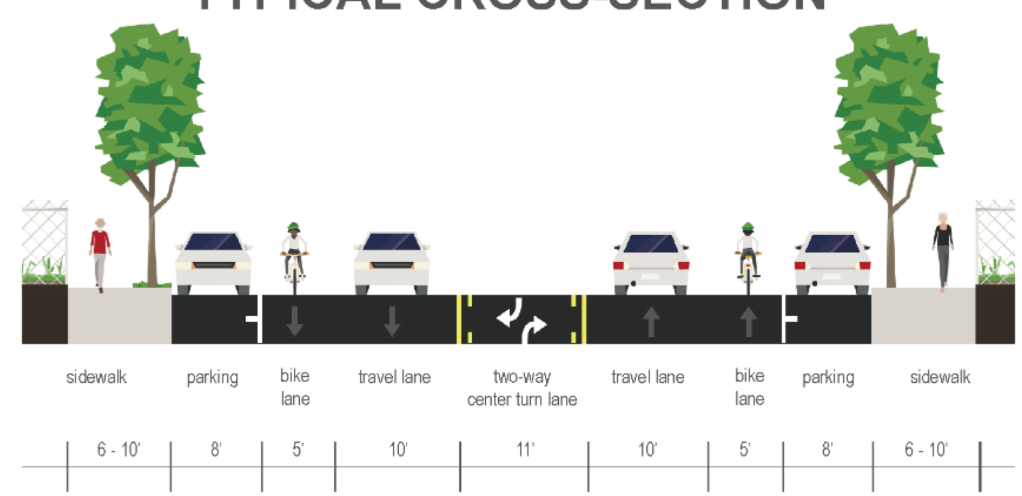
TriMet Service

No Transit Service

Non-EPASS Planned Projects:

East Portland in Motion
As part of the East Portland in Motion implementation strategy for active transportation projects east of 82nd Ave, 148th Ave is designated for sidewalk infill and crossing improvements. The crossing improvements are slated for the intersections of Main, Grant, and Division.

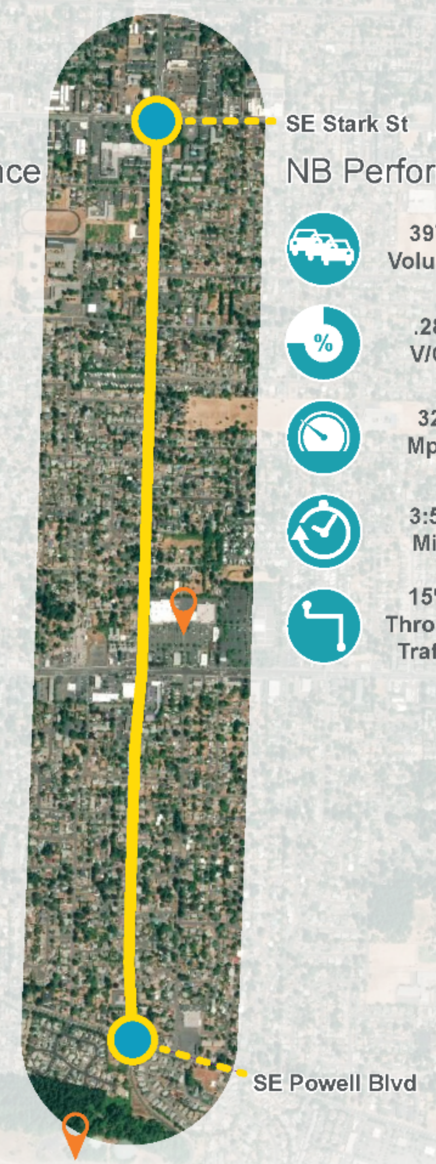
TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT
PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - SE 162ND AVE



	SB Performance	NB Performance
Volume	528	397
V/C	.38	.28
Mph	29	32
Min	4:35	3:56
Through Traffic	1%	15%

Corridor Characteristics

Corridor Length
1.7 Mile Corridor

Landuse Context
Commercial
Residential

Fatalities
1 Vehicular Death

Crash Contributors
High Posted Speeds
Turning Movements

Destinations
Powell Butte Nature Park
Division Crossing

Non-EPASS Planned Projects:

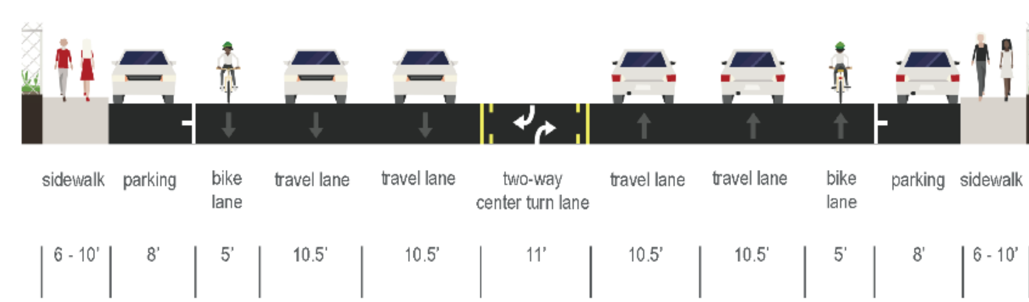
Safety and Access to Transit Project
Scheduled to start construction in the summer of 2020, the project aims to improve pedestrian crossings near transit stops serving TriMet's 74 bus line, increase safety, fill-in sidewalk gaps, reduce excess speeding, and provide enhanced bicycle facilities. Some of the segments along 162nd would undergo a lane reorganization in order to better accommodate multimodal users.

TriMet Service

74

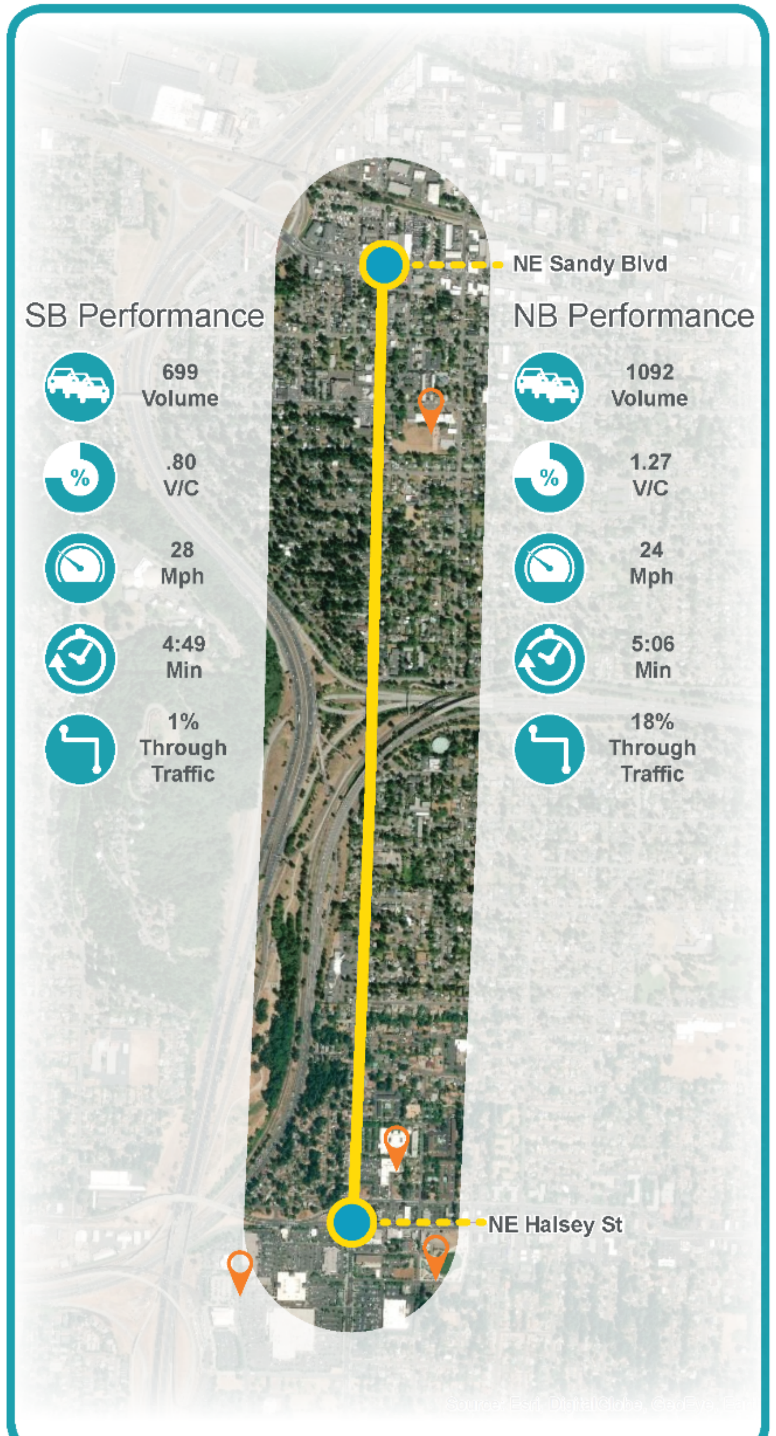
Peak Frequency
20 min
Daily Boardings
262

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

EXISTING CONDITIONS FACT SHEET - NE 102ND AVE



Corridor Characteristics

CorridorLength
1.7 Mile Corridor

Landuse Context
Commercial
Light + Medium Residential

Fatalities
1 Pedestrian Death
1 Vehicular Death

Crash Contributors
Turning Movements
Unsafe Crossings
High Posted Speeds

Destinations
Gateway Transit Center
Prescott Elementary
Kaiser Permanente
Gateway Discovery Center

Non-EPASS Planned Projects:

NE 102nd Avenue Corridor Safety Project

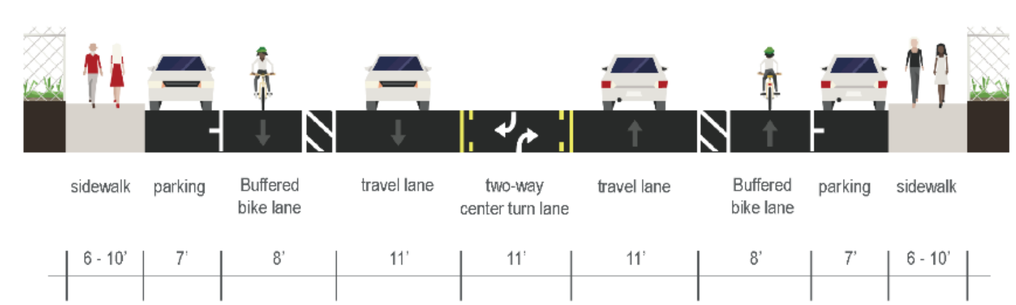
The City of Portland finished Phase One construction in the summer of 2019 of a pilot project between NE Sandy and NE Weidler St. The pilot includes lane reorganizations with a center turn lane, the installation of a protected bike lane, and improved pedestrian crossings. Final design of the project will be released in early 2020 after an evaluation period of the pilot project.

TriMet Service

22
Peak Frequency
30 min
Daily Boardings
102

87
Peak Frequency
30 min
Daily Boardings
180

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

EXISTING CONDITIONS FACT SHEET - NE SANDY BLVD

Corridor Characteristics

Corridor Length
1 Mile Corridor

Landuse Context
Commercial
Residential
Open Space

Fatalities
2 Pedestrian Deaths

Crash Contributors
High Rate of Night Time Crashes
High Rate of Speeding

Destinations
Parkrose/Sumner TC
The Grotto
Disabled American Veterans

TriMet Service

12
Peak Frequency
9 min
Daily Boardings
1,291

71
Peak Frequency
20 min
Daily Boardings
364

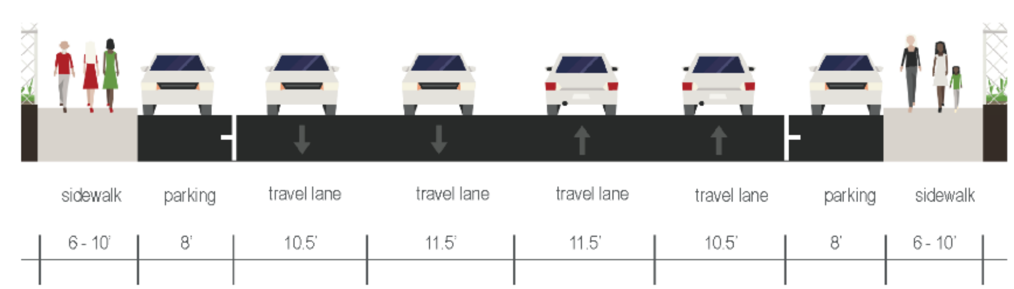
73
Peak Frequency
15 min
Daily Boardings
324

Non-EPASS Planned Projects:

East Portland Rapid Flash Beacon Project

Part of the East Portland in Motion Plan, the project combines community feedback with analysis of crash data to determine where Rapid Flash Beacons bring the mos benefit. Beacons make crossing streets much safer, as drivers are more likely to stop for a pedestrian when activated. Two Rapid Flash Beacons are planned for Sandy Blvd between 82nd Ave and I-205.

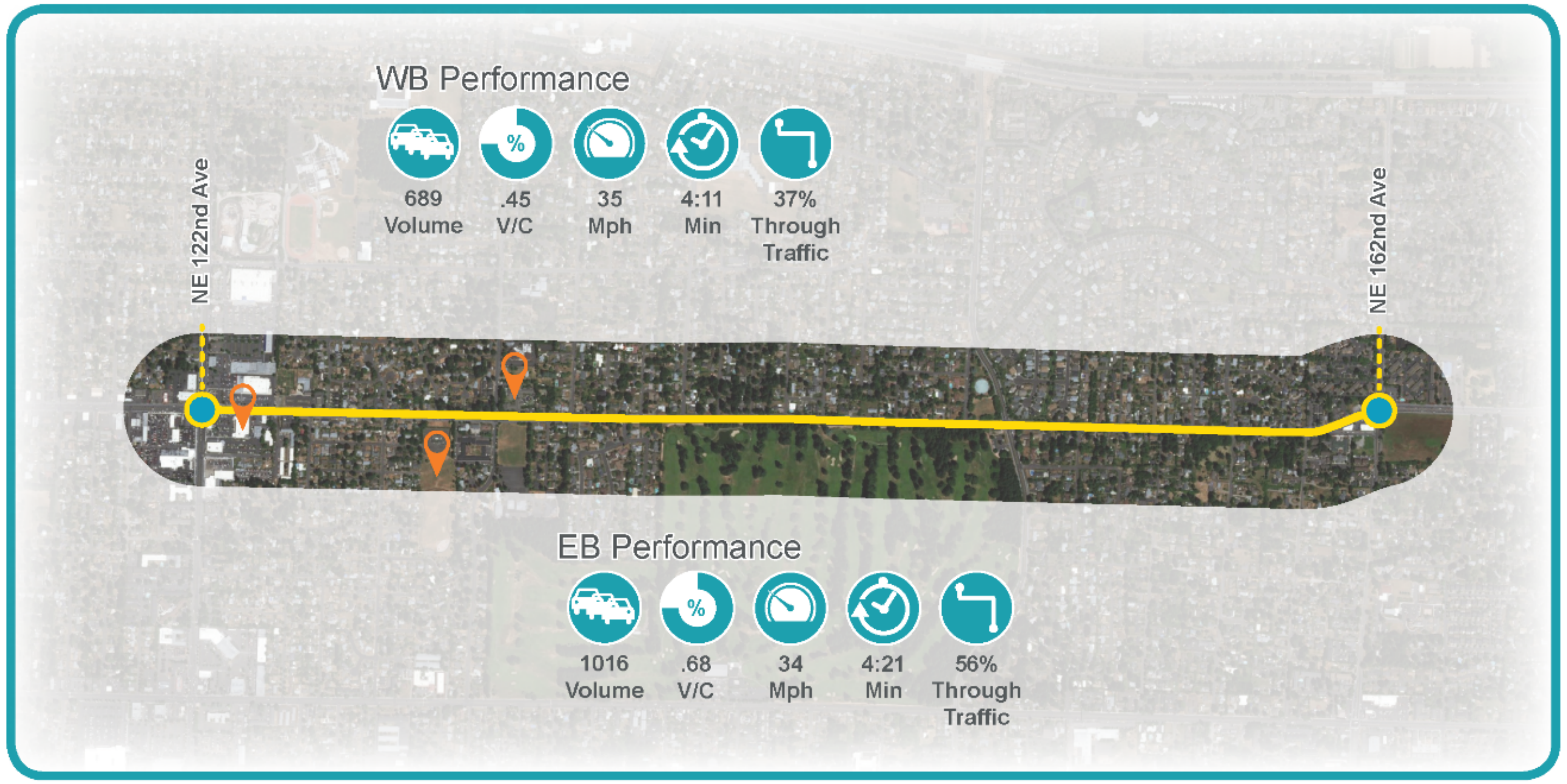
TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - NE HALSEY ST



Corridor Characteristics

Corridor Length
2 Mile Corridor

Landuse Context
Commercial
Residential
Open Space

Fatalities
1 Bike Death
2 Vehicular Deaths

Crash Contributors
Sparse Sidewalk Network
High Posted Speeds
Turning Movements

Destinations
Portland Rescue Mission
East Holladay Park
Goodwill

TriMet Service

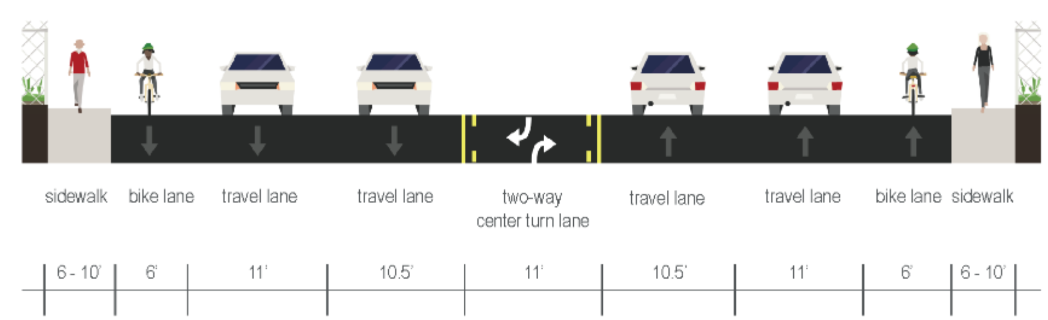
77

Peak Frequency
17 min
Daily Boardings
736

Non-EPASS Planned Projects:

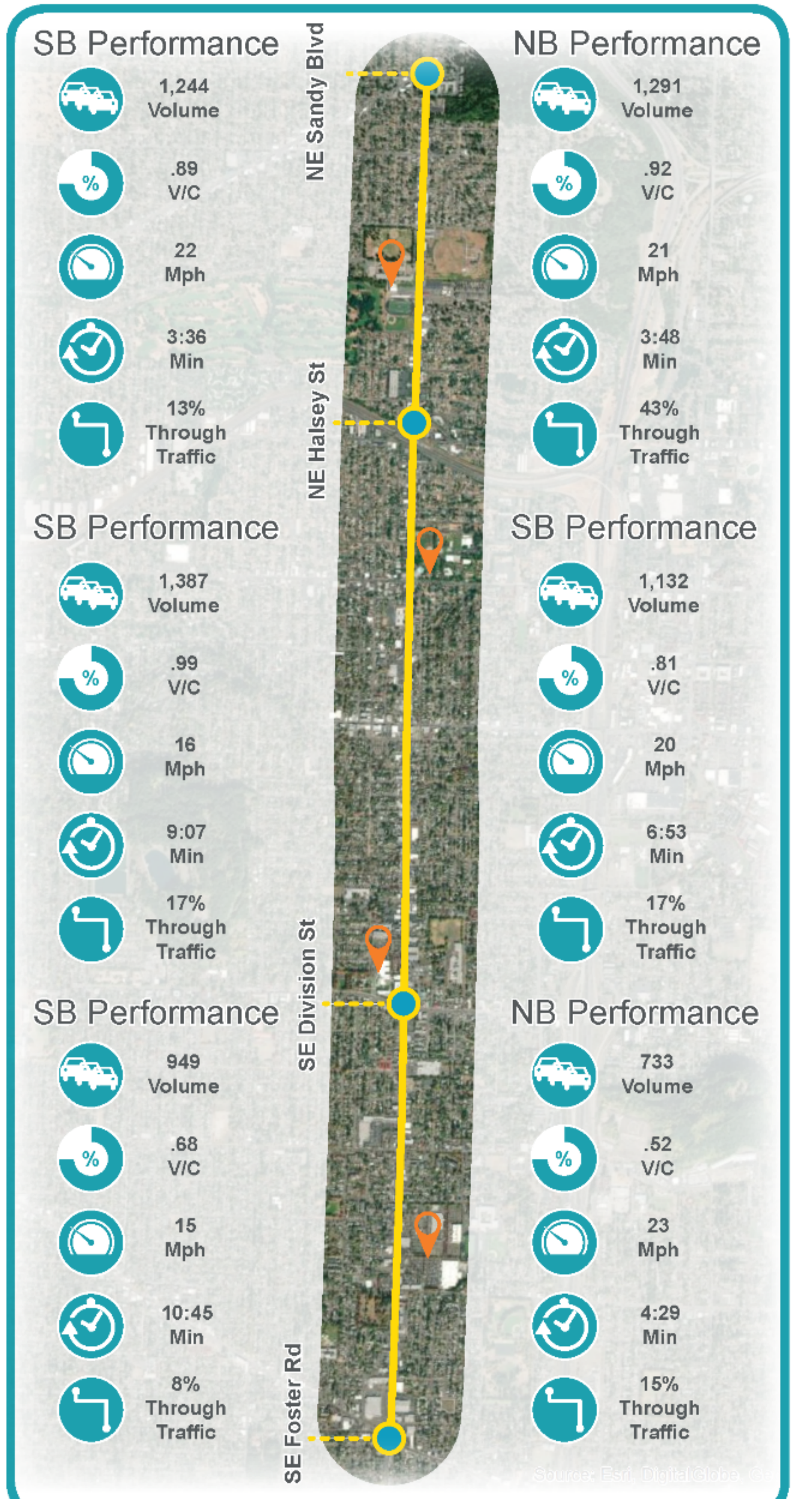
Outer Halsey Safety Project
The project aims to install safety improvements east of 114th Ave, including the installation of improved pedestrian crossings, additional street lighting, completing the sidewalk network, and installing protected bicycle lanes.

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

EXISTING CONDITIONS FACT SHEET - 82ND AVE



Corridor Characteristics

Corridor Length
4.8 Mile Corridor

Landuse Context
Commercial
Residential

Fatalities
8 Pedestrian Deaths
2 Vehicular Deaths

Crash Contributors
Turning Movements
Unsafe Crossings
Speeding

Destinations
Madison High School
PCC
Eastport Plaza
Montavilla Community Ctr

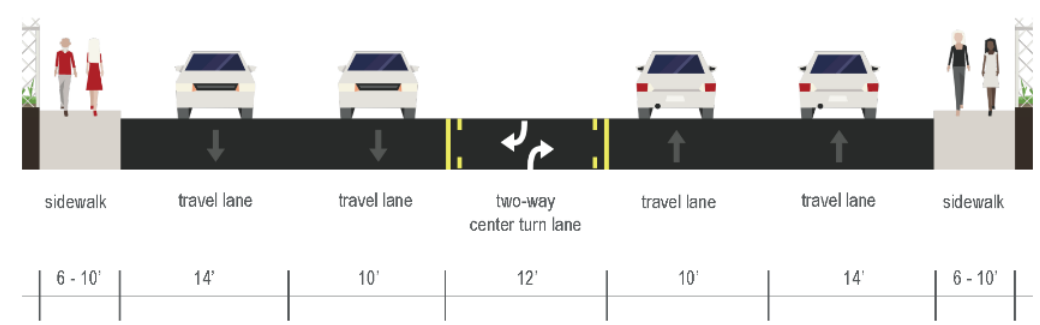
Non-EPASS Planned Projects:

82nd Avenue Plan
The plan was officially adopted in May of 2019 and sets out a vision for 82nd to function as a Civic Corridor, including the identification of capital improvement projects, policies, and design recommendations to achieve this vision. Among the many recommendations for the 82nd corridor, the plan advises investing in safety and access to transit improvements for the entire length of 82nd Ave.

TriMet Service

72
Peak Frequency
7 min
Daily Boardings
21,749

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT PORTLAND BUREAU OF TRANSPORTATION

EXISTING CONDITIONS FACT SHEET - 122ND AVE

SB Performance		NB Performance	
961	Volume	804	Volume
.65	V/C	.57	V/C
24	Mph	26	Mph
7:07	Min	7:11	Min
4%	Through Traffic	6%	Through Traffic

SB Performance		NB Performance	
1204	Volume	868	Volume
.86	V/C	.62	V/C
29	Mph	28	Mph
3:21	Min	6:54	Min
0%	Through Traffic	2%	Through Traffic

SB Performance		NB Performance	
895	Volume	558	Volume
.64	V/C	.40	V/C
22	Mph	28	Mph
8:13	Min	5:06	Min
44%	Through Traffic	27%	Through Traffic

Corridor Characteristics

Corridor Length
6.8 Mile Corridor

Landuse Context
Commercial
Light + Medium Residential

Fatalities
1 Pedestrian Death
1 Bike Death
3 Vehicular Deaths

Crash Contributors
Unsafe Crossings
High Rate of Speeding
Lack of Street Lighting

Destinations
Zenger Farm
Mill Park Elementary
Midland Library
Parkrose High School

Non-EPASS Planned Projects:

122nd Ave Plan: Safety, Access, and Transit

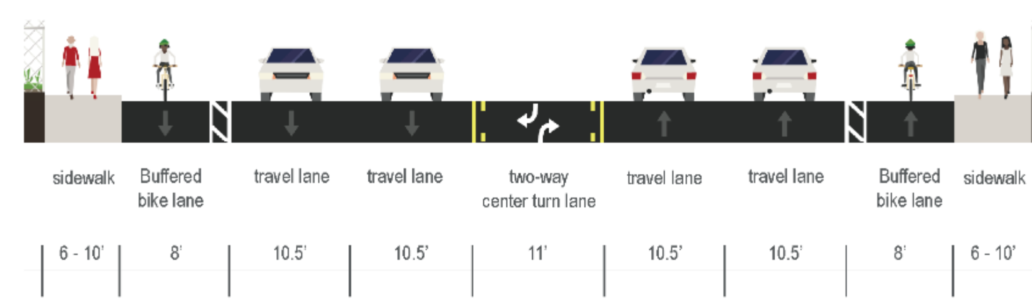
PBOT is identifying multimodal investments along 122nd Ave that will support improved safety for all users, better bicycle and pedestrian access, and help support access to transit and freight needs. The project has the potential to include street reorganizations in order to achieve the Portland Vision Zero goals.

TriMet Service

73

Peak Frequency
15 min
Daily Boardings
6,835

TYPICAL CROSS-SECTION*



*travel lanes, bike lanes, and sidewalk dimensions vary along the alignment depending on right- of-way width.

PBOT | East Portland Arterial Streets Strategy

EPASS

APPENDIX H

CORRIDOR-LEVEL TRAFFIC ANALYSIS

Memo

Date:	Tuesday, February 16, 2021
Project:	East Portland Arterial Streets Strategy
To:	Steve Szigethy & Kate Drennan, PBOT
From:	Lewis Kelley, HDR
Subject:	**Memo #5 Corridor and District Level Traffic Analysis**

1.0 Introduction

This memo provides a summary of model runs for a handful of district-wide roadway reorganization scenarios for the EPASS network. The aim of this summary is to document and compare the modeling outputs between the ten scenario packages across the entire EPASS Project Area that the Portland Bureau of Transportation (PBOT) is examining as possible roadway treatments for improving district-wide safety, transit access, and traffic operations in the East Portland area. This memo outlines and presents analysis of the various Aimsun Next scenarios built to better understand how individual roadway reorganizations and packages of roadway projects across the EPASS network will effect travel demand, travel patterns, and operations at both the district and corridor levels.

The aim of EPASS is to understand the capacity for reorganizing the East Portland arterial network to include improved transit, safety, and bicycle and pedestrian connections without significantly affected levels of traffic congestion or inducing large amounts of traffic diversion onto local streets. In the end, EPASS will recommend an approved package of street redesigns across the network that are able to meet this goal. The extent of the EPASS project area includes 11 arterial corridors with a total of 33 centerline miles of roadway. With the extent of the project area and the number of corridors under consideration, a systems approach to decision-making of future design and operation considerations would be the best approach. This memo builds on the previous memo 4, which presented a summary of the Aimsun Next model and modeled existing traffic conditions across the EPASS network. This memo documents changes to the EPASS network compared to the existing traffic conditions within the Project Area.

2.0 Methodology

For the purpose of comparative analysis, 22 separate roadway reorganization projects were built within the Aimsun Next traffic model. Each individual roadway reorganizations represents a PBOT project that is either recently completed, currently under construction, or under development with funding and plans for construction in the next two years. These 22 reorganizations were then packaged up into ten scenarios that represent reasonably foreseeable packages of roadway projects that could be completed and have impacts upon the traffic operations of the EPASS network of arterials in the near term.

Each of the packaged scenarios represent various levels of interventions and completeness of roadway reorganizations still under planning consideration and at various stages of project development. Table 1 presents the list of projects and how they have been combined to create the different scenarios. A full set of descriptions for each of the projects will be included in the EPASS final report. The 2020 Committed Projects scenario, which was described and analyzed in Memo 4, will act as the base scenario to which the other nine scenarios will be compared.

Table 1. EPASS Aimsun Scenarios

Reorganization Segment Projects	2019 Base	2020 Committed Projects	122nd Scenario B	122nd Scenario C	122nd Scenario D	122nd Scenario E	2020 + Halsey	2020 + Stark	2020 + Halsey + Stark	Gateway Changes
Foster Streetscape	X	X	X	X	X	X	X	X	X	X
NE 102nd Pilot Project	X	X	X	X	X	X	X	X	X	X
NE Sandy/99th Restripe	X	X	X	X	X	X	X	X	X	X
I-205 Aux Lanes	X	X	X	X	X	X	X	X	X	X
NE 122nd: Marine-Marx					X	X				
NE 122nd: Marx Fremont						X				
NE 122nd/I-84: 1 SB, 2 NB					X					
NE 122nd/I-84: 1 SB, 1 NB						X				
122nd: I-84-Division						X				
SE 122nd: Division-Holgate				X	X	X				
SE 122nd: Holgate - Foster			X	X	X	X				
SE Stark: 108th-162nd								X	X	
E Glisan Phase 1 (122nd & east)		X	X	X	X	X	X	X	X	X
E Glisan Phase 2 (102nd-122nd)		X	X	X	X	X	X	X	X	X
SE 162nd: Stark-Powell		X	X	X	X	X	X	X	X	X
Outer Halsey (133rd-162nd)							X		X	
Halsey Viaduct Reorg										X
Stark/Washington Couplet										X
Foster/Woodstock Couplet East										
NE 148th: Glisan - I-84		X	X	X	X	X	X	X	X	X
NE Sandy: 82nd-99th										
NE Glisan: 82nd-102nd										X

Source: PBOT

2.1 EPASS Performance Measures

Input from city staff helped guide the development of performance measures that could be compared across scenario runs. The model covers a weekday, one-hour PM peak period that will be used across all scenario runs. Performance measures are reported at two geographical scales. First, at the individual roadway segment level occurring between two intersections, second, at a subpath level. For the purpose of EPASS, a subpath is a collection of individual roadway segments along an arterial, culminating subpaths that are approximately two miles in length. This memo primarily presents modeled traffic data in three forms:

- Traffic Volumes – Traffic volumes are reported for each roadway segment bi-directionally. Volumes are reported as weighted averages for each subpath and which include both through trips and local trips along the subpath.
- Traffic Congestion -– Traffic Volume to Capacity ratios (V/C) are reported for each roadway segment bi-directionally.
- Traffic Travel Times – travel times are reported on a Subpath level.
- Traffic Diversion - Traffic Volumes on local side streets are analyzed for increased volume resulting from roadway reorganizations along nearby EPASS arterial corridors.

3.0 Scenario Comparisons

This section presents each of the individual EPASS scenarios and compares them with the 2020 Completed Projects scenario that acts as the base year comparison for all the scenarios. There is a 2019 Base scenario included among the scenarios run with the Aimsun Next model that includes only past projects that were completed in 2019.

Each scenario will have a description of the inputs and general assumptions that went into the modeling effort, followed by a discussion of how the changes to the roadway network affects traffic patterns and operations compared with the 2020 Committed Projects scenario used as a base of comparison. Detailed tables and model plots for each of the scenario runs are available in the appendix to this memo.

3.1 2019 Base and 2020 Committed Projects

3.1.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Past-Build Base 2019

Table 2. 2019 Base Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2019 Base	X	X	X	X																		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.1.2 General Assumptions

The Base 2019 scenario includes past roadway projects that were finished in 2019. This scenario compares how these previous projects perform compared with the more recently completed set of projects included in the 2020 Committed Projects scenario, projects which have started construction and are substantially complete, with a few phases be completed in 2020.

The 2019 Base includes projects which are included in every subsequent scenario model run discussed. The four projects included:

- **Foster Streetscape** – A four lane to three lane reduction extending from SE 52nd Avenue to SW 90th Avenues.
- **NE 102nd Avenue** – Between Weidler Street and Sandy Boulevard the avenue was reduced from four lanes to three lanes with added turn lanes at Weidler Street, Fremont Street, Prescott Street and Sandy Boulevard.
- **NE Sandy Boulevard/Killingsworth Street/99th Avenue** – Eastbound approach to the intersection was restriped to provide three lanes and more queuing capacity for left, straight, and right turning movements.
- **I-205 Auxiliary Lanes** – ODOT widened I-205 to provide auxiliary lanes between certain off and on ramps between Johnson Creek Boulevard and the Columbia River.

3.1.3 Notable Observations

Congestion

The 2019 Base Scenario saw significantly less congestion on several major arterials including Glisan Street as a result of the Glisan Street roadway project reflected in the 2020 Committed Project scenario. NE Glisan Street between 102nd and 162nd Avenues saw the most significant change, with eastbound traffic on 122nd and 162nd Avenues seeing the biggest drop in volumes, ranging from 350 fewer vehicles at 122nd Avenue to 408 fewer vehicles at 148th Avenue. Even with this reduction in vehicles, volumes along Glisan Street still generally stayed above 1,000 vph in the eastbound direction. 162nd Avenue also witnessed less congestion along much of its length, with the largest reductions ranging between 100-200 vph taking place between Glisan Street and Division Street. Slighter decreases in volumes occurred along northbound 122nd Avenue between Stark Street and I84, westbound Division Street from 122nd Avenue to 182nd Avenue, and eastbound Powell Boulevard from 163rd Avenue to Highland Drive.

Few corridors in the 2019 Base Scenario had significantly higher volumes compared to the 2020 scenario. The largest increases in volumes occurred along northbound 122nd Avenue between Harold Street and Stark Street, seeing the largest increase at 125 vph between Division Street and Powell Boulevard. Much of eastbound Division Street also saw large volume increases ranging between 60-150 vph. Several notable increases in the range of 50-100 vph occurred on westbound Airport Way and Sandy Boulevard between 181st and 122nd Avenues, westbound Division Street from I205 to 182nd Avenue, westbound Halsey Street from 122nd to 162nd Avenues, and northbound 102nd Avenue from Stark Street to Sacramento Street.

Travel Time

Travels times stayed consistent between the 2019 and 2020 scenarios, with most through trip travel times existing within a +/- range of only 15 seconds. Several notable exceptions occurred with travel times increasing between 40 seconds and 1:15 sections of northbound 102nd Avenue between Halsey Street and Sandy Boulevard, northbound 122nd between Division Street and Halsey Boulevard, southbound 148th Avenue between Stark Street and Powell Boulevard, and southbound 82nd Avenue between Halsey Street and Division Street. These increases in travel time represented increase of 15 percent, 25 percent, 31 percent, and 12 percent respectively.

Diversion

The changes to the EPASS corridor network between the 2019 and 2020 scenarios did not result in a heavy diversion of traffic onto neighborhood side streets. Many of the neighborhood routes saw changes in volumes fluctuating between +/- 30 vph. The heaviest diversions occurred along San Rafael Street between 132nd and 148th Avenues, 135th Avenue between Stark and Market Streets, and then Mill and Main Streets between 135th and 162nd Avenues.

Neighborhood Greenways (NGs) saw similar or slightly lower volumes under the 2019 scenario compared with the 2020 scenario. Both the Holladay-Oregon-Pacific (HOP) and 130s NGs saw roughly equal volumes, while the 4M NG saw volumes decrease by approximately 10 percent between I205 and 122nd Avenue.

3.1.4 EPASS Recommendations

The projects in the 2020 Committed Projects scenario are moving forward.

3.2 122nd Scenario B

3.2.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 122nd Scenario B

Table 3. 122nd Scenario B Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
122nd Scenario B	X	X	X	X							X		X	X	X					X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.2.2 General Assumptions

The 122nd Scenario B includes all 2019 Base and 2020 Committed Projects. This scenario tests operational changes from a 5-lane to 3-lane reorganization to a portion of SE 122nd Avenue extending from SE Holgate Boulevard to SE Foster Road. The road reorganizations for this section include a reduction in lanes from a four general purpose lanes plus center turn lane cross section to a cross section that includes two general purpose lanes and a center turn lane.

3.2.3 Notable Observations

Congestion

The 122nd Scenario B predicted some traffic diverting away from traveling along 122nd Avenue with traffic finding new arterial corridors to travel along. Decreases along 122nd Avenue had knock on effects to other corridors that connect to 122nd Avenue decreasing some major corridors.

The most significant decreases came along 122nd Avenue south of Powell Boulevard, where decreases ranged from -100 to -380 vph, representing up to a 40 percent decrease in volumes. 82nd Avenue southbound from Halsey Street to Foster Road saw lower volumes, with decreases reaching up to -100 vph. Eastbound Division Street from 122nd to 182nd Avenues saw consistent decreases of -25 to -80 vph. 102nd just north of Halsey Street saw traffic volumes in both directions decrease by approximately 12 percent. Finally, eastbound Halsey Street between 122nd and 181st Avenues saw a consistent reduction in volumes in the range of -5 percent.

The largest increase in volumes occurred along eastbound Holgate Boulevard between 112th and 122nd Avenues as vehicles appear to be turning off 122nd Avenue to avoid the roadway reorganizations. At its highest, traffic on Holgate Boulevard increased by 240 vph, an increase of 50 percent. Other arterials that saw increases in volumes included 122nd Avenue between I84 and Stark Street, increases occurred in the range between 20-115 vhp, representing an increase of up to 12 percent. Westbound Halsey Street at the intersection with 102nd Avenue saw volumes increase by 10 percent. Much of eastbound Sandy Boulevard and southbound 182nd Avenue saw consistent increases of up to 110 vph, representing increases of up to 15 percent. Finally, northbound 162nd Avenue saw increases of up to 80 vph, an increase of up to 18 percent.

The scenario also contribute significantly to southbound I-205 V/C ratios surpassing 1.0 between the Powell Boulevard and Foster Road interchanges.

Travel Time

Through trip travel times held steady for the majority of Subpath Corridors modeled, with many subpaths experiencing +/- of 15 seconds. The largest change in travel times occurred along southbound 148th Avenue, which saw a decrease in travel times of 1:34, representing a decrease of 33 percent. This result is likely due to some traffic diverting to alternative arterial corridors and finding new routes within the EPASS network to travel on.

Diversion

Notable diversions occurred to SE 111th and SE 128th Avenues between Foster Road and Holgate Boulevard. 111th Avenue volumes increased 10 percent northbound, 32 percent southbound. 130s NG volumes increased 40 percent northbound and 63 percent southbound. Between Harold Street and Holgate Boulevard, southbound volumes increased 115 percent on the 130s NG. Base volumes between Foster Road and Harold Street on the 130s NG are already above the neighborhood greenway threshold. This street has no sidewalks and is designed as a shared roadway bikeway. Other NGs in the Project Area saw little in the way of diversions due to this scenario.

Other diversions onto neighborhood streets occurred along westbound Sacramento Street. The model predicted increases of approximately 55 vph on northbound 139th Avenue, an increase of approximately 35 percent. Interestingly, the neighborhood streets bounded by Stark Street, 148th Avenue, Division Street, and 182nd Avenue experienced a reduction in cut-through traffic of approximately -22 percent.

3.2.4 EPASS Recommendations

PBOT has decided to move forward with a 5-to-3-lane road reorganization on SE 122nd Avenue between Foster Road and Holgate Boulevard. For more details see section 3.6 of this memo.

3.3 122nd Scenario C

3.3.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 122nd Scenario C

Table 4. 122nd Scenario C Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
122nd Scenario C	X	X	X	X						X	X		X	X	X					X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.3.2 General Assumptions

The 122nd Scenario C includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test operational changes to a portion of SE 122nd Avenue extending from SE Division Street to SE Foster Road. The road reorganizations for this section include a reduction in lanes from a four general purpose lanes plus center turn lane cross section to a cross section that includes two general purpose lanes and a center turn lane.

3.3.3 Notable Observations

Congestion

122nd Avenue experienced minor increases in traffic volumes between I84 and Stark Street, counterbalanced by major decreases in volume south of Stark Street due to the roadway reorganizations represented in the 122nd Avenue C scenario. The biggest increases occurred between Halsey Street and Glisan Street, ranging up to 180 more vph, representing an increase of 20 percent. The largest decreases occurred in the southbound direction between Market Street and Holgate, with decrease ranging from -344 to -502 vph, representing up to a 50 percent decrease in traffic volumes while much of the corridor between Airport Way and I84 saw volumes fall by 10 percent. Other notable decreases in traffic volumes occurred along westbound Foster Road west of I205, where volumes decreased by 5 percent along the majority of the corridor. 102nd Avenue between Halsey and Sacramento Streets experienced decreases between 5-30 percent. Division Street from I-205 to 122nd Avenue experienced consistent decreases in volume in both directions, ranging up to 9 percent.

Volume increases due to the 122nd Avenue C reorganizations were mild but wide spread across the network, with many corridors experiencing traffic volume increases in the range of 5-10 percent, including much of 181st/182nd Avenues, eastbound Sandy Boulevard east of 138th Avenue, northbound 162nd Avenue, eastbound Powell Boulevard east of 136th Avenue, and westbound Stark Street. Larger volume increases in the range of 30 percent occurred in several locations, including along Holgate Boulevard between 111th and 136th Avenues, 102nd Avenue south of Market and Weidler Street westbound as the street approaches 102nd Avenue.

Travel Time

The largest increase in travel times occurred along southbound 122nd Avenue between Division Street and Foster Road where travel times increased by 1:21, for an increase of 16 percent. This result is likely due to the wider extent of road reorganization applied to 122nd Avenue for this scenario as compared to the 122nd B scenario. The majority of modeled subpaths did not exhibit large changes in through trip travels times, with many of the subpaths experiencing changes in travel times of only +/- 15 seconds. The largest travel time savings occurred along southbound 82nd between Halsey Street and Division Street where travels times decreased by just over a minute, for a 12 percent time savings. This result is likely due to some diversion onto southbound I-205 with traffic then diverting back to 82nd Avenue at several interstate crossings such as Division Street, Washington Street, and Powell Boulevard.

Diversion

Several neighborhood greenways saw increases in cut-through traffic as a result of the 122nd C package of roadway reorganizations. The 4M NG between I205 and 122nd Avenue saw eastbound traffic increase by up to 128 vph, an increase of 40 percent while eastbound HOP traffic increased by up to 42 vph, an increase of over 100 percent. Additionally, similar issues on 112th Avenue and the 130s NG identified in Scenario B were present and extended farther north.

This decreases along 122nd Avenue south of Market Street did not have a large impact on nearby roadways, the biggest impact was upon Holgate Boulevard just to the east of 122nd Avenue, where volumes increased by up to 30 percent. Other notable diversions on neighborhood streets occurred along westbound Shaver Street, where volumes increased by 30 percent between 102nd and 122nd Avenues, Marx Street in the eastbound direction, where volumes increased by 30 percent between 102nd and 122nd Avenues, and southbound 130th Avenue to the south of Powell Boulevard, where volumes increased by up to 65 percent. Cute through traffic at Tillamook and San Rafael Streets between 102nd and 122nd Avenues decreased by up to 50 percent.

3.3.4 EPASS Recommendations

Roadway reorganization on 122nd Avenue north of SE Holgate Boulevard is not recommended. For more details see section 3.6 of this memo.

3.4 122nd Scenario D

3.4.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 122nd Scenario D

Table 5. Scenario D Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
122nd Scenario D	X	X	X	X	X		X			X	X		X	X	X					X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.4.2 General Assumptions

The 122nd Scenario D includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test operational changes to a selection of roadway segments along NE and SE 122nd Avenue. The road reorganizations modeled include a reduction in lanes from a four general purpose lanes plus center turn lane cross section to a cross section that includes two general purpose lanes and a center turn lane. The segments with these treatments include from NE Marine Drive to NE Marx Street, SE Division Street to SE Foster Road. A portion of 122nd Avenue between NE Fremont Street to the I-84 ramps receives a separate treatment that includes one southbound lane and two northbound lanes. The intent of this treatment is to provide room for an improved pedestrian connection underneath the I-84 and railroad overcrossings.

3.4.3 Notable Observations

Congestion

Congestion in the 122nd D scenario does not significantly increase along any single corridor or at any particular intersection. Rather, congestion increases broadly across many corridors within a range between five and fifteen percent over the 2020 scenario. It appears that diversion away from 122nd Avenue due to the roadway reorganizations has traffic finding alternative arterial routes far upstream of 122nd itself. Sandy Boulevard east of Killingsworth Street, Halsey Street near the intersection with 148th Avenue, Stark Street, 162nd Avenue in the northbound direction, and Division Street between 122nd and 148th Avenues all see minor increases to traffic, with the respective increases observed at 10 percent, 7 percent, 4 percent, 10 percent, and 9 percent. Other impacts to congestion include:

- NE Fremont Street volumes between 102nd and 122nd Avenues increase 21 percent eastbound, 14 percent westbound, including 58 percent westbound between 120th and 122nd Avenues. V/C remains above 1.0 near the 102nd Avenue signal.
- NE 102nd Avenue between Halsey Street and Sandy Boulevard, which has already been reorganized and above 1.0 V/C, adds 22 trips NB, 74 trips SB. V/C increases from 1.27 to 1.30 northbound, 0.80 to 0.89 southbound.
- I-84 EB off-ramp to 122nd remains above V/C 1.0 (risk of backup onto mainline freeway), though some trips are removed.
- Additional southbound volume on all crossings of I-84: 82nd, 148th, 162nd, 181st Avenues.
- SB 148th Avenue under I-84 increases from 1,043 to 1,149 trips, worsening V/C above 1.0.
- Sandy Boulevard EB – 148th Avenue SB and Sandy Boulevard EB – 162nd Avenue SB neighborhood cut-through routes in Argay/Wilkes see increases in volume. (Note: these routes are not coded property, but model is picking up on the demand)

For several corridors the model predicted decreases in traffic volumes. The largest decreases were along 122nd Ave, where a significant amount of road reorganization occurred under this scenario. 122nd between Airport Way and I84 saw large decreases, up to 30 percent north of Sandy Boulevard. The whole southbound length experienced decreases, with the most significant decreases occurring south of Division, with decreases ranging from 15 percent to 44 percent fewer vehicles. 92nd Avenue also saw a decrease in traffic of up to 18 percent in the southbound direction south of Stark Street.

Travel Time

The southern portion of 122nd Avenue added 1:38 additional travel time delay from Division Street to Foster Road in the SB direction as compared to 1:22 delay in Scenario C. The majority of modeled subpaths did not exhibit large changes in through trip travels times, with many of the subpaths experiencing changes in travel times of only +/- 15 seconds. The largest travel time savings where 11 percent, occurring at two locations, eastbound Division Street between 82nd and 122nd Avenues and southbound 82nd Avenue between Halsey and Division Streets. The largest increase in travel times occurred along southbound 122nd between Division Street and Foster Road where travel times increased by 1:38, for an increase of 20 percent, 4 percentage points over the increase seen in the 122nd C scenario.

Diversion

The 122nd D scenario predicted an increase in the number of neighborhood streets that experienced increases in cut-through traffic due to the roadway reorganizations modeled. The 130s NG saw southbound traffic increase by 20 percent, to more than twice the recommended hourly volume for a designated NG, while volumes along the 4M NG increased from between

10-30 percent for the majority of roadway segments. Only the HOP NG is predicted to experience traffic volumes that remained unchanged or slightly decreased.

A pattern of diversion appeared stronger along neighborhood streets connecting 102nd and 122nd Avenues. Besides the increases describe above along the 4M NG, notable increases in volumes also occurred along Fremont, Shaver, and San Rafael Streets with increases of 28 percent, 24 percent, and 16 percent consecutively. Other notable changes to cut-through traffic on neighborhood streets occurred along 136th Avenue south of Powell Boulevard, 117th Avenue between Market and Division Streets, and 72nd Avenue between Holgate Boulevard and Powell Boulevard of 35 percent, 21 percent, and 22 percent consecutively.

3.4.4 EPASS Recommendations

Roadway reorganization on 122nd Avenue north of SE Holgate Boulevard is not recommended. For more details see section 3.6 of this memo.

3.5 122nd Scenario E

3.5.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 122nd Scenario E

Table 6. 122nd Scenario E Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
122nd Scenario E	X	X	X	X	X	X		X	X	X	X		X	X	X					X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.5.2 General Assumptions

The 122nd Scenario E includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test operational changes the whole of 122nd Avenue, spanning 6.5 miles from NE Marine Drive to SE Foster Road. The road reorganizations modeled include a reduction in lanes from a four general purpose lanes plus center turn lane cross section to a cross section that includes two general purpose lanes and a center turn lane.

3.5.3 Notable Observations

Congestion

Congestion for the 122nd E scenario predicted significant increases in traffic volumes along major corridors as traffic decreased along the whole of 122nd and shifted to other arterial routes. The 122nd E scenario represents the largest reorganization of 122nd Avenue and as such, has a large impact on traffic patterns throughout the EPASS network given the arterial's primary position as a north/south travel corridor. Much of 122nd Avenue experienced decreases in volume ranging from 200 vph all the way to 500 fewer vehicles per hour, representing decreases of up to 50 percent in the southbound direction south of Division Street. No segment of 122nd Avenue saw V/C ratios above .89 due to the volume drops and diversion of traffic away from the corridor.

The decrease on 122nd Avenue was accompanied by increases elsewhere in the system. The majority of 102nd, 148th and 162nd Avenues experienced increases in traffic in both the north and southbound directions, with increases of up to 15 percent, 20 percent, and 20 percent respectfully. Other notable spots of increased volumes occurred along westbound Sandy Boulevard between 82nd Avenue and Killingsworth Street, westbound Weidler Street at the couplet, and eastbound Powell Boulevard between 148th and 162nd Avenues, with increases of 25 percent, 13 percent, and 12 percent respectfully.

Decreases elsewhere in the EPASS system occurred along the vast majority of westbound Glisan Street, eastbound Stark Street, both directions of Holgate Boulevard, and westbound Sandy Boulevard. Decreases for these streets were up to 18 percent, 22 percent, and 14 percent respectfully.

Travel Time

Travel times on 122nd Avenue experienced impacts both in travel time increases and decreases including:

- NB travel time on 122nd between Halsey Street and Airport Way increases by 2:09.
- SB travel time on 122nd between Halsey Street and Division Street <u>decreases</u> by 1:11.

Throughout the system, the 122nd E scenario of roadway reorganizations predicted larger increases in travel times compared to the other 122nd scenarios modeled. While many subpaths still had changes in travel time that were only in the range of +/- 15 seconds, a higher rate of increases occurred in the range of +/- 30 to 60 seconds. The largest increase in travel times occurred along northbound 122nd between Division Street and Foster Road where travel times increased by 2:09, for an increase of 30 percent. Southbound 102nd Avenue also experienced an increase in travel times between Sandy Boulevard and Halsey Street of 1:57, a 40 percent increase.

Diversion

The 122nd E scenario predicted the most diversion of any of the 122nd Avenue modeled scenarios, with large increases in the number of neighborhood streets that experienced increases in cut-through traffic due to the roadway reorganizations modeled including on:

- 130s NG between Division Street and Stark Street and between Glisan Street and San Rafael Street
- 139th Avenue between Division Street and Glisan Street
- 112th Avenue between Holgate Boulevard and Market Street
- HOP NG between 102nd and 122nd Avenues
- Burnside between 122nd and 162nd Avenues
- 4M NG between I-205 and 148th Avenue

The 130s NG experienced northbound traffic increase by 30 percent, approximately 275 vph, while southbound traffic decreased by 15 percent. Volumes along the 4M NG saw significant increases in both directions by between 20 and 150 vph, representing an increase of 25-45 percent for the majority of roadway segments, ending in vehicle volumes significantly higher than recommended NG guidelines. The HOP NG also saw traffic volumes increase, but at a smaller range of between 30-40 vph, representing approximately a 20 percent increase.

Along other neighborhood streets, a pattern of diversion appeared strong as vehicles appeared to avoid travel along 122nd Avenue and sought alternative routes. Notable increases in volumes occurred along Fremont Street, NE 141st Avenue, and San Rafael Street with increases of up to 50 percent, 58 percent, and 35 percent respectfully. Other notable changes to cut-through traffic on neighborhood streets occurred along 136th south of Powell Boulevard, 112th south of Market, and 130th between Stark Street and Division, increases of up to 75 percent, 35 percent, and 80 percent respectively.

3.5.4 EPASS Recommendations

Roadway reorganization on 122nd Avenue north of SE Holgate Boulevard is not recommended. For more details see section 3.6 of this memo.

3.6 Summary of 122nd Scenarios

Generally speaking, the primary issue with 122nd Avenue reorgs is diversion, less so delay or congestion on 122nd Avenue itself. Notable travel time increases do appear southbound south of Division Street in Scenarios C through E, and northbound north of Halsey Street in Scenario E. Volumes drop on segments where lanes are reduced; however, hourly directional volumes north of Powell Boulevard remain in the 800-1200 range, which would pose challenges and risks for left turning vehicles and unprotected pedestrian crossings.

The most troubling diversion issues are:

- Diversion onto NE 102nd Avenue (which was already reduced to 3 lanes in 2019)
- Diversion onto the 130s NG
- Diversion onto other collectors or local streets that are narrow and lack sidewalks

Reassignment of trips in Outer NE Portland is seen as far away as 82nd and 181st Avenues in the southbound direction in the PM peak; presumably related, in part, to Columbia Corridor and Portland Airport employment.

Also concerning are persisting or incremental additional congestion on the freeway system, including I-205 SB in Lents, and the 122nd Avenue exit off I-84 EB. ODOT's jurisdictional influence in interchange areas would pose challenges to approval of some of the reorg concepts, particular changes to the 122nd/I-84 interchange.

Finally, planned growth on the Rossi Farm (Parkrose-Argay Development Strategy), in Pleasant Valley southeast of Portland, and in the Division-Midway Town Center, are expected to increase travel demand on the 122nd Avenue Corridor into the future. Reorganizations on 122nd Avenue would compromise its role as an arterial street hosting district-wide and regional trips now and into the future, diverting many of these trips onto local street networks that cannot safely handle additional vehicle traffic.

For these reasons, the EPASS recommendation is to transform 122nd Avenue with a 5-3 reorganization between SE Holgate and SE Foster Road because the predicted congestion was low due to lower volumes, and diversion onto nearby collectors and greenways was low enough to be acceptable. Other safety countermeasures and active transportation improvements are being pursued, including additional signalized pedestrian crossings, street lighting, protected bike lanes, bus lanes at key delay segments (per PBOT's Rose Lane Project), center medians, and wider sidewalks.

The desire for an improved pedestrian/bicycle connection under I-84 on NE 122nd Avenue should be accomplished in the short term by improved lighting, vegetation clearance and ADA compliance upgrades; and in the long term by a reconstruction of the Union Pacific Railroad overcrossing. PBOT may also consider revisiting a new pedestrian/bicycle crossing of I-84 at NE 132nd Avenue, which was initially proposed as part of East Portland in Motion in 2011 but was not forwarded for serious consideration.

3.7 2020 + Halsey

3.7.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 2020 + Halsey

Table 7. 2020 + Halsey Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2020 + Halsey	X	X	X	X									X	X	X	X				X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.7.2 General Assumptions

The 2020 + Halsey scenario includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test operational changes to Outer Halsey from 133rd to 162nd Avenues resulting from the planned Outer Halsey Safety Project. Operational changes to Outer Halsey from 133rd to 162nd Avenues if a roadway reorganization from five lanes to see were pursued.

3.7.3 Notable Observations

Congestion

Congestion in the 2020 + Halsey scenario stays relatively the same compared with the 2020 committed scenario, with many of the arterial corridors experiencing changes in traffic volumes within a range of +/- 5 percent. Notable exceptions include along Glisan Street, Burnside Avenue, and Stark Street including:

- Glisan Street east of 122nd Avenue often experienced increases in traffic volumes of up to 25 percent with the largest single increases happening 122nd and 181st Avenues, where increases ranged from 30 to 50 percent.
- Burnside east of 122nd Avenue often experienced increases in traffic volumes of up to 20 percent
- Stark Street saw a mixture of volume increases and decreases, regardless, much of the corridor's length east of 102nd saw V/C ratios above 1.0

Several other corridors experienced traffic increases in the range of 10 to15 percent, including eastbound Sandy Boulevard east of 148th Avenue, eastbound Foster Road east of 122nd, 92nd Avenues just north of Lents town center, eastbound Powell Boulevard between 148th and 162nd Avenues, and southbound 122nd Avenue near Sandy Boulevard.

Along Halsey Street itself, where many of the road reorganizations in this scenario occurred, significant decreases in traffic occurred. Much of the corridor was predicted to have decreases in volumes in both directions, ranging from 30 to 150 fewer vph. The largest decrease occurred in the westbound direction at the intersection with 148th Avenue, where volumes decreased by 465 vph, for a decrease of 50 percent.

Travel Time

The 2020 + Halsey Street scenario saw minor travel time decreases along corridor subpaths for 23 of the 40 arterial subpaths. The largest decreases was observed along westbound Stark Street between 122nd and 82nd Avenues, where travel times decreased by 1:12, a decrease of 16 percent. 16 arterial corridors experienced minor travel time increases, the majority of which were under 20 seconds. The largest increases in travel times occurred along northbound 162nd Avenue between Powell Boulevard and Stark Street, where times increased by only 38 seconds, for an increase of 16 percent.

Diversion

The 2020 + Halsey scenario witnessed only minor levels of traffic diversions and many side streets actually experienced reduced levels of cut-through traffic. Among the neighborhood greenways in East Portland, eastbound traffic along the 4M NG only increased by 7 percent, while westbound traffic decreased by up to 8 percent. Traffic volumes stays level or slightly declined along the HOP NG and decreased along the 130 NG by up to 22 percent in the southbound direction.

Along other neighborhood streets, traffic generally stayed within a band of +/- 5 percent. A few exceptions were observed along SE Millmain Drive and SE 114th Avenue, where volumes increased by 27 percent and 14 percent respectively.

3.7.4 EPASS Recommendations

PBOT has decided to not pursue a roadway reorganization on NE Halsey Street at this time because traffic capacity has already been reduced on the next arterial south, NE Glisan Street. In addition, NE Halsey Street is a significant regional arterial that extends to Troutdale, while NE Glisan Street is a district collector. However, other safety interventions are needed to reduce crashes and speeding west of NE 122nd Avenue.

3.8 2020 + Stark

3.8.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 2020 + Stark

Table 8. Road Reorganization Projects Include:

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2020 + Stark	X	X	X	X								X	X	X	X					X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.8.2 General Assumptions

The 2020 + Stark scenario includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test operational changes to SE Stark Street along a 2.7 mile segment from 108th to 162nd Avenues where the roadway is reorganized from five lanes to three lanes with an outside lane repurposed to a business access and transit lane. Current plans for the Safer Outer Stark Project do not include a roadway reorganization from five lanes to three lanes, and thus this scenario is meant to test the difficulty in completing a roadway reorganization.

3.8.3 Notable Observations

Congestion

Congestion in the 2020 + Stark scenario predicted that many of the east-west arterial corridors in East Portland will experience increased levels of traffic due to the reorganizations along Stark. Much of Halsey Street and eastbound Sandy Boulevard experienced increases ranging from 5 percent to 10 percent. Much of Burnside Street in both directions experienced traffic increases above 15 percent, with the largest increase being 42 percent in the eastbound direction east of 148th Avenue. Division Street also witnessed increases of 15 percent between 102nd and 148th Avenues.

Along Stark Street itself, where many of the road reorganizations in this scenario occurred, significant decreases in traffic were predicted. Much of the corridor in both directions experienced decreases in traffic, often ranging from 100 to 250 fewer vph. The largest decrease occurred in the eastbound direction around 117th Avenue, where volumes decreased by 678 vph, representing a 56 percent decrease. Even with the volume decreases, the segment from 108th to 122nd remains above capacity in many places, and directional volumes are as high as 1600 vph.

Travel Time

The 2020 + Stark scenario predicted travel time decreases along corridor subpaths for 16 of the 40 arterial subpaths while 24 subpaths saw increases. Once again, the vast majority of travel time changes occurred within a band of +/- 15 seconds. The largest decrease was observed along southbound 148th Avenue between Stark Street and Powell Boulevard, where travel times decreased by 1:11, or -25 percent. 122nd southbound between Halsey and Division Streets also saw a large decrease of 1:01, or -30 percent.

Several corridors were predicted to experience increases in travel times above 25 percent, including eastbound Stark Street between 82nd and 122nd, eastbound Glisan Street between 122nd and 162nd Avenues, and eastbound Burnside Street between 82nd and 122nd Avenues, representing increases of 1:41, 1:12, and 2:17 respectively.

Diversion

The 2020 + Stark scenario witnessed only minor levels of traffic diversions and many side streets actually experienced reduced levels of cut-through traffic. Among the neighborhood greenways in East Portland, the 4M NG near 122nd Avenue is expected to have the biggest increases of traffic at an additional 100 vph for an increase of 25 percent. Eastbound traffic along the HOP NG increased by almost 300 percent, while traffic in the westbound direction decreased by 20 percent. The 130 NG saw decreases in the range of -5 percent.

Along other neighborhood streets, traffic generally stayed within a band of +/- 5 percent. A few exceptions were observed along NE Sacramento Street and SE Main Street west of 162nd Avenue, where traffic increased by 36 percent and 23 percent respectively. SE Main Street east of 162nd Avenue saw significant decreases in traffic up to 75 percent fewer vehicles per hour.

3.8.4 EPASS Recommendations

PBOT has decided to not pursue a road reorg on SE Stark St due to predicted congestion between 108th and 139th Avenues, and predicted diversion onto the 4M NG, both of which could lead to secondary safety impacts.

3.9 2020 + Halsey + Stark

3.9.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: 2020 + Halsey + Stark

Table 9. 2020 + Halsey + Stark Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2020 + Halsey + Stark	X	X	X	X								X	X	X	X	X				X		
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.9.2 General Assumptions

The 2020 + Halsey + Stark scenario includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test the cumulative impact on traffic operations resulting from the roadway reorganizations found in the 2020 + Halsey and 2020 + Stark scenarios.

3.9.3 Notable Observations

Congestion

Congestion in the 2020 + Halsey + Stark scenario predicted many of the east-west arterial corridors in East Portland would experience increased levels of traffic due to the reorganizations along Stark Street modeled in this scenario. Both Stark Street and Halsey Street, where many of the road reorganizations in this scenario occurred, saw significant decreases in traffic. Stark Street saw the greatest decreases in the eastbound direction, with up to 680 fewer vph near 122nd while Halsey Street saw the 400 fewer vph in the westbound direction near 148th Avenue, representing decreases in vph of up to 50 percent and 38 percent respectively.

Elsewhere in the EPASS network, many of the east-west corridors experience increased traffic as vehicles avoided Stark Street and Halsey Street. Much of Burnside Street saw increases in both directions in the range of 50-200 vph, with the largest increases occurring eastbound near 148th Avenue, an increase of 52 percent. Much of Glisan Street also saw increases in the range of 40-130 vph with the largest increases happening eastbound near 130th Avenue with an increase of 15 percent. Powell between 82nd Avenue and I205 saw an increase in westbound traffic of 17 percent while much of Division Street between I205 and 148th Avenues saw increases between 10 to 15 percent.

Travel Time

The 2020 + Halsey + Stark scenario predicted travel time decreases along corridor subpaths for 19 of the 40 arterial subpaths while 21 subpaths saw increases. Once again, the vast majority of travel time changes occurred within a band of +/- 15 seconds. The largest decrease, and the only decrease above 1:00 was observed along southbound 82nd Avenue between Halsey Street and Division Street, where travel times decreased by 1:35, or -17 percent.

Two corridors experience travel time increases above one minute, 1:48 for eastbound traffic along Stark Street between 82nd and 122nd Avenues, and 1:32 for eastbound traffic on Foster Road between I205 and 122nd, representing increases of 29 percent and 47 percent respectfully.

Diversion

The 2020 + Halsey + Stark scenario witnessed only minor levels of traffic diversions and many side streets actually experienced reduced levels of cut-through traffic. An exception to this is on the HOP NG, which saw the biggest increase of just over 200 percent. While this increase is large, it is from a relatively low starting traffic volume. Traffic along the 4M NG increased by a slightly more reasonable 45 percent just west of 148th, again from a relatively low starting traffic volume. The 130 NG saw traffic stay the same.

Along other neighborhood streets, traffic generally stayed within a band of +/- 5 percent. A few exceptions were observed along NE Sacramento Street between 102nd and 122nd Avenues, NE Shaver Street between 102nd and 122nd Avenues, and NE San Rafael Street between 148th and 162nd Avenues, with increases of 60 percent, 24 percent, and 100 percent respectively.

3.9.4 EPASS Recommendations

PBOT requested this scenario in case findings from 2020+Halsey and 2020+Stark were both found to be acceptable and led to the pursuit of both options in concert. However, since PBOT was not comfortable with road reorg results on either of the feeder scenarios, this hybrid scenario will not be pursued.

3.10 Gateway Changes

3.10.1 Model Scenario Comparison

- No-Build: 2020 Committed Projects
- Future Build: Gateway Changes

Table 10. Gateway Changes Road Reorganization Projects

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate - Foster	SE Stark: 108th-162nd	E Glisan Phase 1 (122nd & east)	E Glisan Phase 2 (102nd-122nd)	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet East	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
Gateway Changes	X	X	X	X									X	X	X		X	X		X		X
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.10.2 General Assumptions

The Gateway Changes scenario includes all 2019 Base and 2020 Committed Projects. This scenario is meant to test a package of operational changes to the roadway network centered around the Gateway Regional Center. The projects included in the scenario include the dropping of one eastbound travel lane to be replaced with a two-way protected bike lane along NE Halsey Street from 92nd to 100th Avenues, a repurposing of a travel lane along the Stark Street and Washington Couplet to allow for bus queue jumps and protected bike lanes from 92nd to 108th Avenues, and a reorganization along NE Glisan Street from 82nd to 102nd Avenues that includes bike lanes and a potential double left turn lane to get onto southbound I-205.

3.10.3 Notable Observations

Congestion

Congestion in the Gateway Changes scenario is predicted to have a varied impact of volume increases and decreases in no clear pattern. Many corridors saw minor decreases in ranging from 5 percent to 10 percent traffic, including much of Stark Street, Division Street, Foster Road, southbound 82nd north of Stark Street, and northbound 82nd south of Stark Street. The most significant decreases occurred at the couplet of Stark Street and Washington Street between 82nd and 122nd Avenues, with eastbound traffic decreasing by up to 705 vph and westbound decreases of 350 vph, for relative decreases of 29 percent and 18 percent respectively.

Increases in volumes in the EPASS network were likewise relatively minor, with many corridors only experiencing increases of less than 5 percent. A few exceptions occurred near Gateway along Glisan Street, where traffic generally increased by 15 percent to 20 percent, southbound 102nd Avenue north of Halsey Street where traffic generally increased between 10 percent and 15 percent, and southbound 122nd Avenue, where traffic generally increased by between 10 percent and 15 percent. This scenario also did not result in any noticeable changes in V/C ratio on the streets and freeways of Gateway.

Travel Time

The Gateway Changes scenario predicted travel time decreases along corridor subpaths for 18 of the 40 arterial subpaths while 22 subpaths saw increases. Once again, the vast majority of travel time changes occurred within a band of +/- 15 seconds. One subpath experienced a decrease in travel times greater than one minute, southbound 148th Avenue between Stark Street and Powell Boulevard at a decrease of 1:19 for a 27 percent decrease in travel times. The largest increase was 1:44 along eastbound Stark Street between 82nd and 122nd Avenues for an increase of 28 percent.

Diversion

The Gateway Changes scenario witnessed only minor levels of traffic diversions and many side streets actually experienced reduced levels of cut-through traffic. Traffic along the 4M NG saw the biggest increase among NG with an increase of 90 percent just east of I205. This portion of the $M will feature bike lanes. The 130 NG saw traffic decrease slightly by 30 vph in the southbound direction while the HOP NG also saw a slight decrease of several vph, staying right at the 100 vph guideline for volumes.

Along other neighborhood streets, traffic generally stayed within a band of +/- 5 percent. A few exceptions were observed along NE Sacramento Street between 102nd and 122nd Avenues, NE Shaver Street between 102nd and 122nd Avenues, and SE 88th Avenue between Stark Street and Division Avenue, with increases of 20 percent, 40 percent, and 120 percent respectively.

3.10.4 EPASS Recommendations

PBOT did not see any concerning results from this scenario, and is moving ahead with funded roadway reorganizations on the Stark/Washington couplet and on the Halsey Viaduct. PBOT also intends to pursue the reorg on NE Glisan Street between 82nd Avenue and just west of I-205, when funding is available. Detailed tables and model plots for each of the scenario runs are available in the appendix to this memo.

EPASS

APPENDIX H1

CORRIDOR-LEVEL TRAFFIC ANALYSIS MODEL TABLES AND PLOTS

EPASS Aimsun Scenario Comparison

EPASS PBOT PORTLAND BUREAU OF TRANSPORTATION

EPASS: Scenario Development

The below table outlines the mix of PBOT roadway projects included in each of the Aimsun scenario model runs.

	Foster Streetscape	NE 102nd: Weidler-Sandy	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx-Fremont	NE 122nd @ I-84: 1 SB, 2 NB	NE 122nd @ I-84: 1 NB, 1 SB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate-Foster	SE Stark: 108th-162nd	NE Glisan: 122nd-162nd	NE Glisan: 102nd--162nd	SE 162nd: Stark-Powell	NE Halsey: 133rd-162nd	NE Halsey: 92nd-100th	Stark/Washington: 92nd-108th	Foster/Woodstock: I-205-101st	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
2019	X	X	X	X																		
2020 Committed Proejcts	X	X	X	X									X	X	X					X		
122nd-B	X	X	X	X							X		X	X	X					X		
122nd-C	X	X	X	X						X	X		X	X	X					X		
122nd-D	X	X	X	X	X		X			X	X		X	X	X					X		
122nd-E	X	X	X	X	X	X		X	X	X	X		X	X	X					X		
2020+Halsey	X	X	X	X									X	X	X	X				X		
2020+Stark	X	X	X	X								X	X	X	X					X		
2020+Halsey+Stark	X	X	X	X								X	X	X	X	X				X		
Gateway Changes	X	X	X	X									X	X	X		X	X		X		X
Final Preferred	X	X	X	X							X		X	X	X		X	X	X	X		X

Scenario: 2019 Base

Scenario 1	Scenario 2
2019 Base	2020 Committed Projects
250235	250807

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red

More vehicles, longer travel times, lower average speeds relative to the base

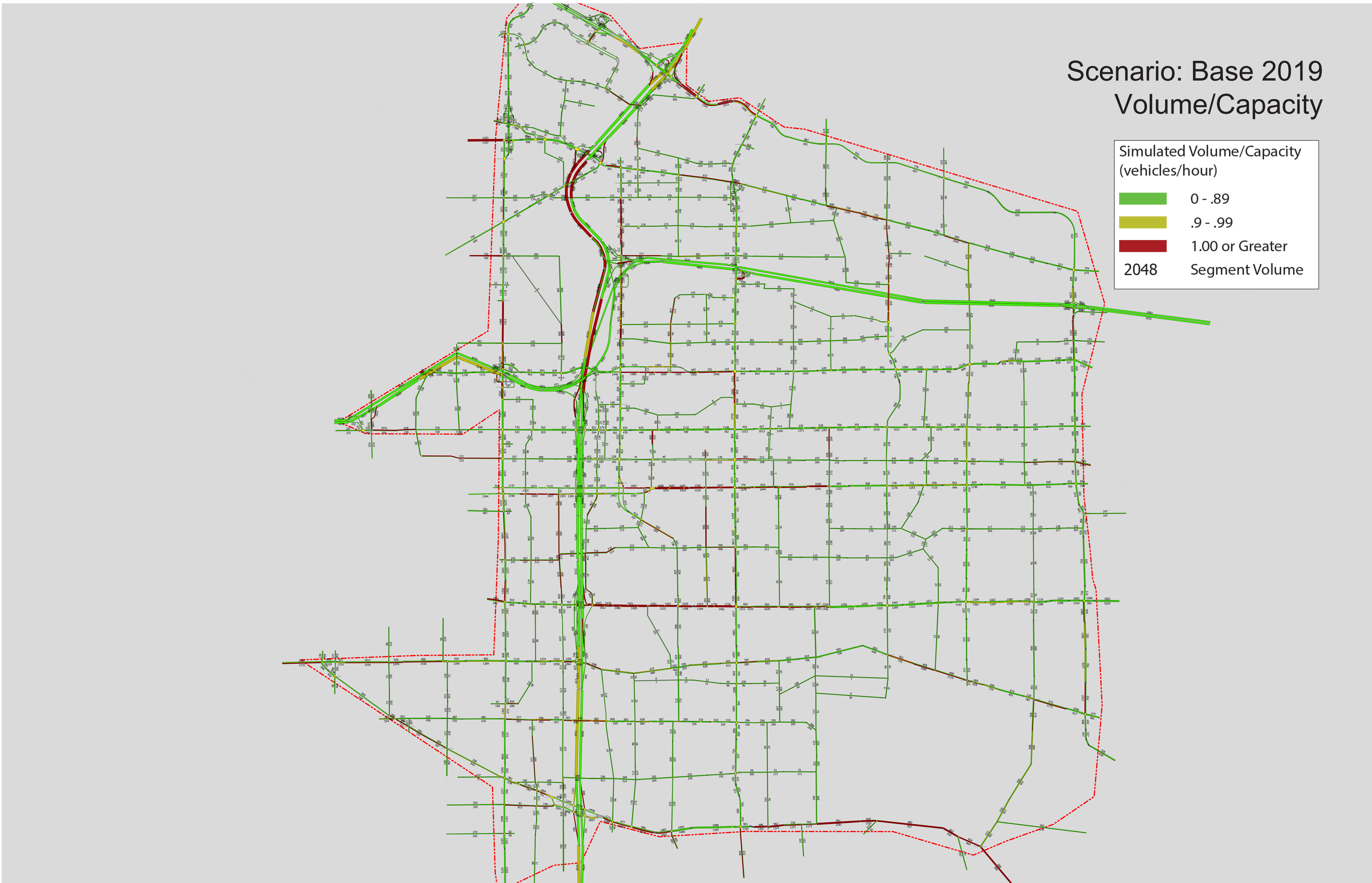
Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.27	71%	71%	182	15	1082	10	17%	1%	04:25	00:41	28	-3
102nd Southbound Sandy to Halsey	1.7	0.83	0.80	51%	44%	6	1	718	-19	1%	0%	04:36	00:13	30	-2
122nd Northbound 1_Foster to Division	1.9	0.34	0.40	0%	0%	133	17	477	81	28%	-1%	05:03	00:02	29	0
122nd Northbound 2_Division to Halsey	2.0	0.63	0.62	0%	0%	15	1	875	-7	2%	0%	06:43	00:11	27	1
122nd Northbound 3_Halsey to Airport Way	2.2	0.58	0.57	0%	0%	39	6	816	-12	5%	1%	07:24	-00:13	26	1
122nd Southbound 1_Airport Way to Halsey	2.2	0.68	0.65	8%	8%	43	-3	952	-36	5%	0%	07:02	00:05	23	1
122nd Southbound 2_Halsey to Division	2.0	0.86	0.86	56%	50%	4	1	1198	6	0%	0%	02:40	00:41	29	0
122nd Southbound 3_Division to Foster	1.9	0.64	0.64	0%	0%	359	34	903	-8	40%	4%	08:10	00:04	23	-1
148th Northbound Powell to Stark	1.4	0.36	0.36	0%	0%	29	15	272	-1	11%	6%	03:42	-00:04	29	-1
148th Southbound Stark to Powell	1.4	0.41	0.41	0%	0%	6	-3	339	3	2%	-1%	03:40	01:09	28	0
162nd Northbound Powell to Stark	1.7	0.35	0.28	0%	0%	89	-31	483	-86	18%	-4%	04:26	-00:30	32	0
162nd Southbound Stark to Powell	1.7	0.40	0.38	0%	0%	21	-14	565	-37	4%	-2%	04:20	00:15	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.52	10%	10%	88	21	730	3	12%	3%	04:41	-00:12	22	0
82nd Northbound 2_Division to Halsey	2.0	0.82	0.81	16%	21%	193	-2	1147	-15	17%	0%	07:00	-00:07	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.91	0.92	47%	47%	540	13	1280	11	42%	1%	03:42	00:06	22	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.89	30%	30%	156	11	1241	3	13%	1%	03:41	-00:05	22	0
82nd Southbound 2_ Halsey to Division	2.0	0.97	0.99	73%	73%	223	6	1359	29	16%	0%	08:11	00:57	17	-1
82nd Southbound 3_Division to Foster	1.5	0.67	0.68	8%	8%	61	13	937	12	7%	1%	10:50	-00:05	15	0
Burnside Eastbound 1_82nd to 122nd	2.0	0.29	0.33	0%	0%	14	15	203	28	7%	6%	05:46	00:35	25	0
Burnside Eastbound 2_122nd to 162nd	2.0	0.43	0.56	0%	0%	152	8	302	88	50%	-9%	04:41	00:07	27	-1
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.33	9%	9%	23	-2	232	-3	10%	-1%	05:00	-00:13	28	0
Burnside Westbound 2_122nd to 82nd	2.0	0.31	0.30	0%	0%	0	0	217	-7	0%	0%	00:00	00:00	24	-1
Division Eastbound 1_82nd to 122nd	2.0	1.10	1.13	70%	70%	25	5	1158	38	2%	0%	08:02	00:20	22	0
Division Eastbound 2_122nd to 162nd	2.0	1.11	1.17	40%	65%	424	97	1408	79	30%	5%	05:01	00:06	31	-1
Division Westbound 1_162nd to 122nd	2.0	0.69	0.67	0%	0%	234	13	1054	-23	22%	2%	05:36	-00:04	32	0
Division Westbound 2_122nd to 82nd	2.0	0.92	0.93	65%	65%	212	-4	1277	15	17%	-1%	11:13	00:25	20	-3
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.02	1.08	56%	100%	28	19	1654	97	2%	1%	03:36	-00:20	27	1
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.82	0.83	6%	0%	968	5	1315	3	74%	0%	03:07	-00:02	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.43	0.37	0%	0%	1	0	756	-120	0%	0%	01:28	00:27	29	-2
Glisan Eastbound 2_122nd to 162nd	2.0	0.58	0.39	0%	0%	625	-257	1158	-373	54%	-7%	04:15	00:15	31	0
Glisan Westbound 1_162nd to 122nd	2.0	0.29	0.25	0%	0%	161	-15	576	-82	28%	2%	04:00	00:06	30	0
Glisan Westbound 2_122nd to 82nd	2.0	0.48	0.45	0%	0%	9	-3	850	-52	1%	0%	01:54	-00:09	27	-1
Halsey Eastbound 122nd to 162nd	2.0	0.63	0.68	0%	0%	530	44	939	77	56%	0%	04:16	00:05	35	0
Halsey Westbound 162nd to 122nd	2.0	0.43	0.45	0%	0%	219	38	652	38	34%	4%	04:02	00:08	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.24	0.28	0%	0%	110	37	143	28	77%	9%	01:17	-00:05	23	1
NG: 130s Southbound Halsey to Glisan	0.5	0.42	0.35	0%	0%	245	-40	253	-40	97%	-1%	01:08	-00:00	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.31	0.35	0%	0%	9	18	175	20	5%	9%	02:33	-00:04	21	0
NG: 4M Eastbound I-205 to 122nd	1.3	0.69	0.65	19%	19%	9	1	315	-29	3%	1%	04:05	-00:06	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.59	0.60	20%	20%	29	-2	353	5	8%	-1%	03:34	00:18	21	1
NG: 4M Westbound 148th to 130th	0.9	0.27	0.28	0%	0%	5	11	153	6	3%	7%	02:07	00:06	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.06	0.07	0%	0%	0	7	20	4	0%	30%	00:00	03:00	21	-1
NG: HOP Westbound 122nd to 102nd	1.0	0.21	0.26	0%	0%	0	0	68	15	0%	0%	00:00	00:00	21	1
Sandy Northbound 82nd to Killingsworth	1.0	0.45	0.42	0%	0%	271	5	661	-34	41%	3%	02:17	00:02	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.33	0%	0%	272	-11	461	1	59%	-2%	02:34	-00:05	26	1
Stark Eastbound 1_122nd to 162nd	2.0	1.13	1.23	40%	83%	465	-1	1327	115	35%	-3%	04:48	00:35	29	-1
Stark Eastbound 1_82nd to 122nd	2.0	1.15	1.14	69%	69%	51	0	1635	-12	3%	0%	05:55	00:22	24	-1
Stark Westbound 1_162nd to 122nd	2.0	0.86	0.83	27%	27%	558	-15	881	-27	63%	0%	04:34	00:07	31	0
Stark Westbound 2_122nd to 82nd	2.0	1.13	1.14	51%	51%	111	-5	1534	14	7%	0%	07:06	00:38	23	-1

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION


Scenario: Base 2019
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume

Scenario: 2020 Committed Projects

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION

Scenario 1	Scenario 2		Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
2020 Committed Projects	2020 Committed Projects																
250807	250807	SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
		102nd Northbound Halsey to Sandy	1.7	1.27	1.27	71%	71%	197	0	1092	0	18%	0%	05:06	00:00	24	0
		102nd Southbound Sandy to Halsey	1.7	0.80	0.80	44%	44%	7	0	699	0	1%	0%	04:49	00:00	28	0
		122nd Northbound 1_Foster to Division	1.9	0.40	0.40	0%	0%	150	0	558	0	27%	0%	05:06	00:00	28	0
		122nd Northbound 2_Division to Halsey	2.0	0.62	0.62	0%	0%	16	0	868	0	2%	0%	06:54	00:00	28	0
		122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	0	804	0	6%	0%	07:11	00:00	26	0
		122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.65	8%	8%	40	0	916	0	4%	0%	07:07	00:00	24	0
		122nd Southbound 2_Halsey to Division	2.0	0.86	0.86	50%	50%	5	0	1204	0	0%	0%	03:21	00:00	29	0
		122nd Southbound 3_Division to Foster	1.9	0.64	0.64	0%	0%	393	0	895	0	44%	0%	08:13	00:00	22	0
		148th Northbound Powell to Stark	1.4	0.36	0.36	0%	0%	44	0	271	0	16%	0%	03:37	00:00	29	0
		148th Southbound Stark to Powell	1.4	0.41	0.41	0%	0%	3	0	343	0	1%	0%	04:49	00:00	28	0
		162nd Northbound Powell to Stark	1.7	0.28	0.28	0%	0%	58	0	397	0	15%	0%	03:56	00:00	32	0
		162nd Southbound Stark to Powell	1.7	0.38	0.38	0%	0%	7	0	528	0	1%	0%	04:35	00:00	29	0
		82nd Northbound 1_Foster to Division	1.5	0.52	0.52	10%	10%	109	0	733	0	15%	0%	04:29	00:00	23	0
		82nd Northbound 2_Division to Halsey	2.0	0.81	0.81	21%	21%	191	0	1132	0	17%	0%	06:53	00:00	20	0
		82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.92	47%	47%	553	0	1291	0	43%	0%	03:48	00:00	21	0
		82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.89	30%	30%	167	0	1244	0	13%	0%	03:36	00:00	22	0
		82nd Southbound 2_ Halsey to Division	2.0	0.99	0.99	73%	73%	229	0	1387	0	17%	0%	09:07	00:00	16	0
		82nd Southbound 3_Division to Foster	1.5	0.68	0.68	8%	8%	74	0	949	0	8%	0%	10:45	00:00	15	0
		Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.33	0%	0%	29	0	231	0	13%	0%	06:21	00:00	24	0
		Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.56	0%	0%	160	0	390	0	41%	0%	04:48	00:00	26	0
		Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.33	9%	9%	21	0	229	0	9%	0%	04:47	00:00	29	0
		Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.30	0%	0%	0	0	210	0	0%	0%	00:00	00:00	24	0
		Division Eastbound 1_82nd to 122nd	2.0	1.13	1.13	70%	70%	30	0	1196	0	3%	0%	08:22	00:00	22	0
		Division Eastbound 2_122nd to 162nd	2.0	1.17	1.17	65%	65%	521	0	1486	0	35%	0%	05:07	00:00	31	0
		Division Westbound 1_162nd to 122nd	2.0	0.67	0.67	0%	0%	247	0	1031	0	24%	0%	05:32	00:00	32	0
		Division Westbound 2_122nd to 82nd	2.0	0.93	0.93	65%	65%	208	0	1292	0	16%	0%	11:38	00:00	17	0
		Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.08	100%	100%	47	0	1751	0	3%	0%	03:16	00:00	28	0
		Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.83	0%	0%	973	0	1318	0	74%	0%	03:06	00:00	35	0
		Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.37	0%	0%	1	0	635	0	0%	0%	01:56	00:00	27	0
		Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.39	0%	0%	368	0	785	0	47%	0%	04:30	00:00	31	0
		Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.25	0%	0%	146	0	493	0	30%	0%	04:05	00:00	30	0
		Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.45	0%	0%	6	0	798	0	1%	0%	01:45	00:00	26	0
		Halsey Eastbound 122nd to 162nd	2.0	0.68	0.68	0%	0%	574	0	1016	0	56%	0%	04:21	00:00	34	0
		Halsey Westbound 162nd to 122nd	2.0	0.45	0.45	0%	0%	257	0	689	0	37%	0%	04:11	00:00	35	0
		NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.28	0%	0%	147	0	170	0	86%	0%	01:12	00:00	24	0
		NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.35	0%	0%	205	0	213	0	96%	0%	01:08	00:00	25	0
		NG: 4M Eastbound 130th to 148th	0.9	0.35	0.35	0%	0%	27	0	195	0	14%	0%	02:29	00:00	21	0
		NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.65	19%	19%	10	0	286	0	3%	0%	04:00	00:00	21	0
		NG: 4M Westbound 122nd to I-205	1.3	0.60	0.60	20%	20%	27	0	358	0	8%	0%	03:52	00:00	22	0
		NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	0	159	0	10%	0%	02:12	00:00	25	0
		NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.07	0%	0%	7	0	24	0	30%	0%	03:00	00:00	21	0
		NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.26	0%	0%	0	0	83	0	0%	0%	00:00	00:00	22	0
		Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.42	0%	0%	276	0	626	0	44%	0%	02:19	00:00	28	0
		Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.33	0%	0%	261	0	462	0	57%	0%	02:30	00:00	27	0
		Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.23	83%	83%	464	0	1441	0	32%	0%	05:23	00:00	28	0
		Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.14	69%	69%	51	0	1623	0	3%	0%	06:17	00:00	24	0
		Stark Westbound 1_162nd to 122nd	2.0	0.83	0.83	27%	27%	543	0	854	0	64%	0%	04:41	00:00	31	0
		Stark Westbound 2_122nd to 82nd	2.0	1.14	1.14	51%	51%	106	0	1548	0	7%	0%	07:44	00:00	22	0

Green

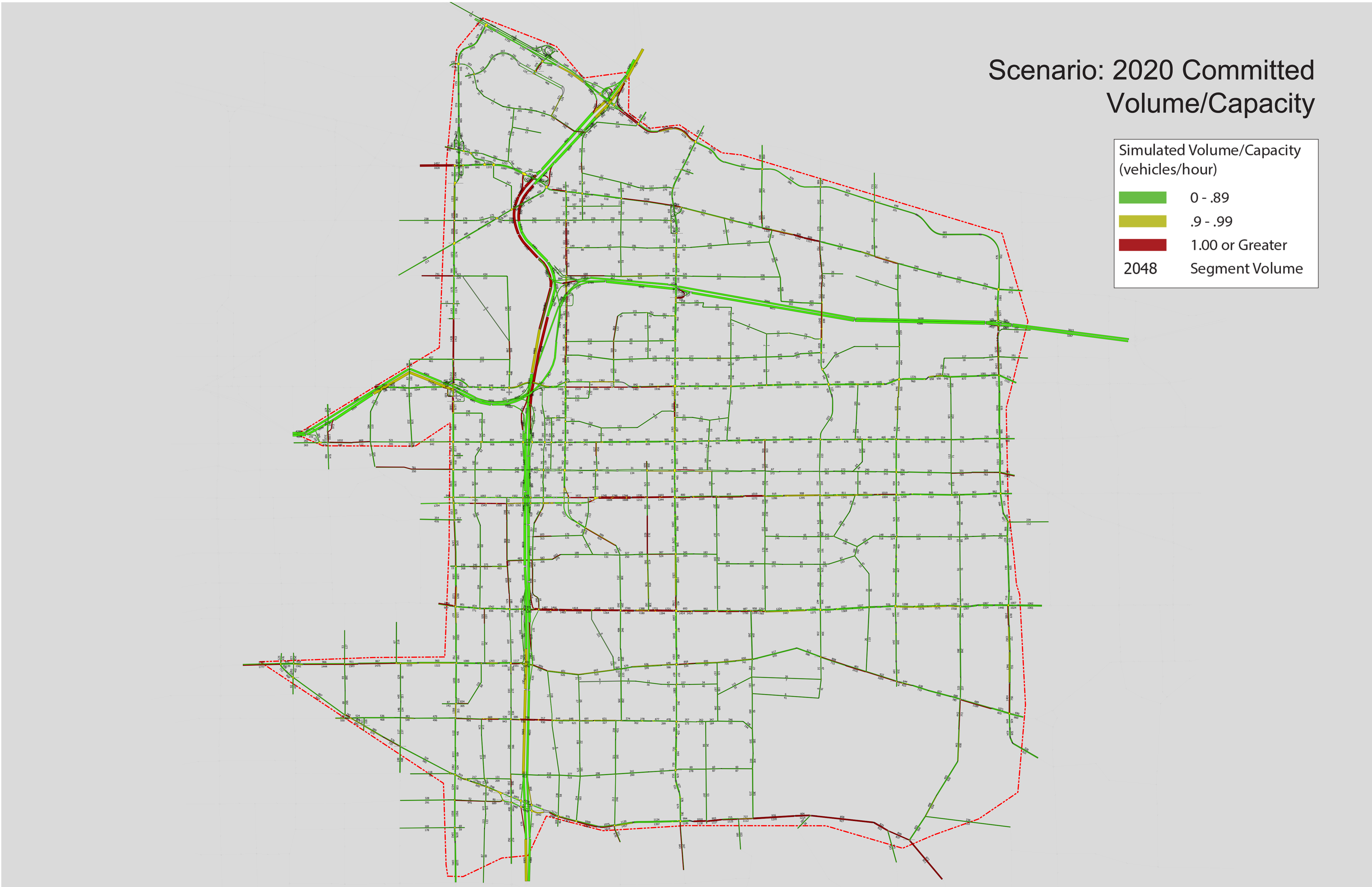
Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red

More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change


Scenario: 2020 Committed
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume

Scenario: 122nd B

EPASS

PBOT

Scenario 1	Scenario 2
2020 Committed Projects	122ndB-Mild Rd Reorg
250807	250674

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red

More vehicles, longer travel times, lower average speeds relative to the base

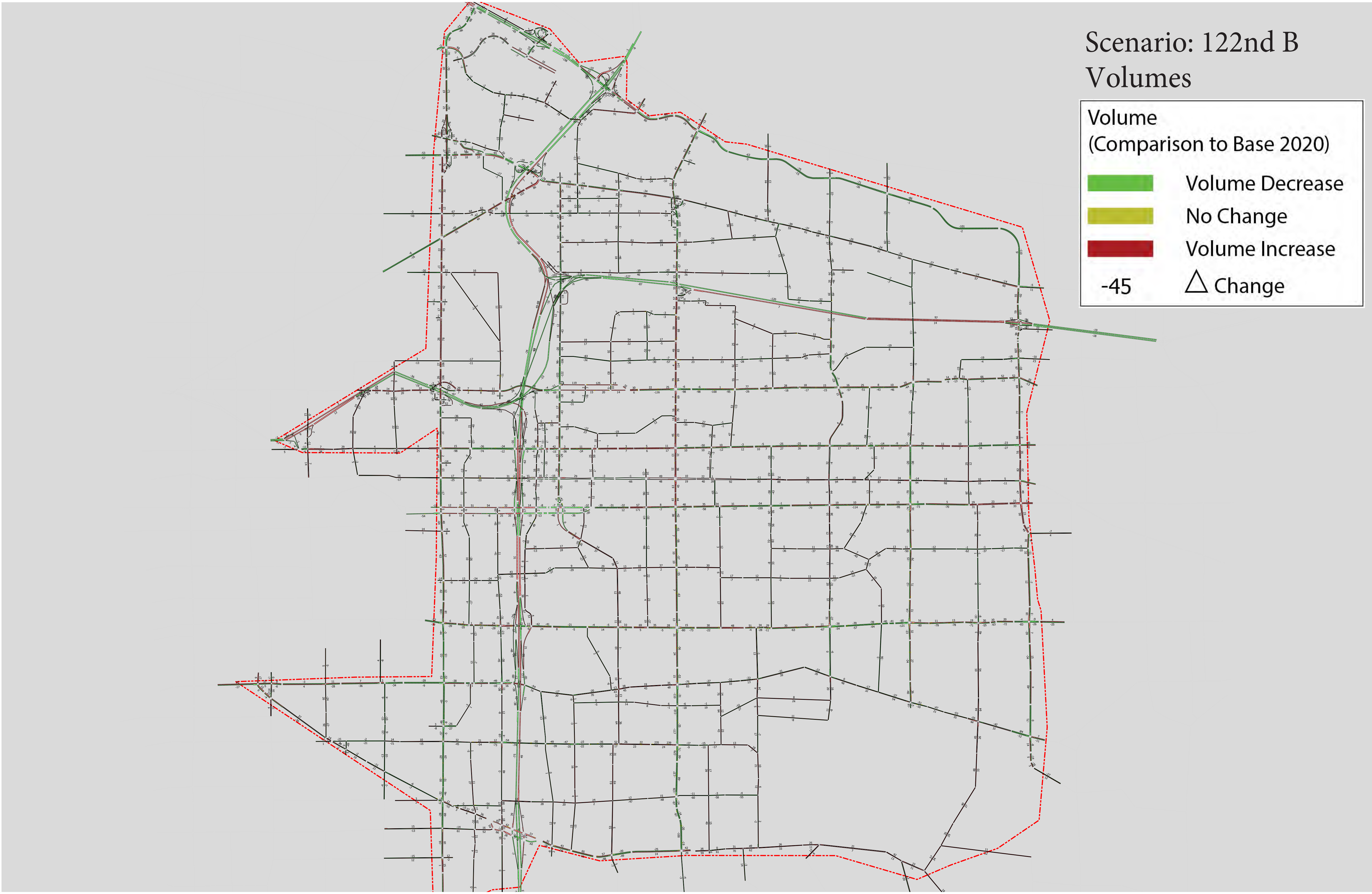
Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.24	71%	71%	197	5	1092	-31	18%	1%	05:06	-00:31	24	2
102nd Southbound Sandy to Halsey	1.7	0.80	0.78	44%	37%	7	1	699	-19	1%	0%	04:49	-00:12	28	2
122nd Northbound 1_Foster to Division	1.9	0.40	0.37	0%	0%	150	-3	558	-43	27%	2%	05:06	-00:05	28	0
122nd Northbound 2_Division to Halsey	2.0	0.62	0.62	0%	0%	16	4	868	-5	2%	0%	06:54	-00:29	28	-2
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	-4	804	-8	6%	0%	07:11	00:06	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.68	8%	8%	40	8	916	38	4%	1%	07:07	-00:08	24	0
122nd Southbound 2_Halsey to Division	2.0	0.86	0.87	50%	56%	5	-4	1204	17	0%	0%	03:21	00:31	29	-2
122nd Southbound 3_Division to Foster	1.9	0.64	0.57	0%	0%	393	-92	895	-98	44%	-6%	08:13	00:16	22	-1
148th Northbound Powell to Stark	1.4	0.36	0.37	0%	0%	44	-11	271	1	16%	-4%	03:37	-00:04	29	0
148th Southbound Stark to Powell	1.4	0.41	0.42	0%	0%	3	8	343	11	1%	2%	04:49	-01:34	28	0
162nd Northbound Powell to Stark	1.7	0.28	0.31	0%	0%	58	28	397	41	15%	5%	03:56	00:01	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.35	0%	0%	7	5	528	-37	1%	1%	04:35	-00:12	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.51	10%	10%	109	-6	733	-18	15%	0%	04:29	-00:02	23	1
82nd Northbound 2_Division to Halsey	2.0	0.81	0.83	21%	21%	191	16	1132	25	17%	1%	06:53	00:27	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.97	47%	47%	553	53	1291	74	43%	2%	03:48	00:13	21	-1
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.90	30%	34%	167	-8	1244	22	13%	-1%	03:36	00:03	22	0
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.94	73%	60%	229	-17	1387	-66	17%	0%	09:07	00:48	16	-1
82nd Southbound 3_Division to Foster	1.5	0.68	0.65	8%	0%	74	-11	949	-43	8%	-1%	10:45	-00:00	15	0
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.31	0%	0%	29	-14	231	-16	13%	-6%	06:21	00:05	24	0
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.67	0%	0%	160	39	390	77	41%	2%	04:48	00:06	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.35	9%	9%	21	4	229	13	9%	1%	04:47	00:07	29	0
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.33	0%	0%	0	3	210	20	0%	1%	00:00	07:33	24	1
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.13	70%	70%	30	-13	1196	-4	3%	-1%	08:22	00:48	22	0
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.14	65%	40%	521	-93	1486	-52	35%	-5%	05:07	-00:02	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.68	0%	0%	247	-18	1031	8	24%	-2%	05:32	00:03	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.94	65%	65%	208	-1	1292	5	16%	0%	11:38	-00:35	17	2
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.07	100%	100%	47	-7	1751	-21	3%	0%	03:16	00:47	28	-1
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.84	0%	19%	973	19	1318	16	74%	1%	03:06	-00:07	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	5	635	-23	0%	1%	01:56	-00:04	27	0
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.40	0%	0%	368	58	785	14	47%	6%	04:30	00:07	31	0
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.24	0%	0%	146	-44	493	-19	30%	-8%	04:05	00:09	30	0
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.45	0%	0%	6	2	798	-2	1%	0%	01:45	00:25	26	-1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.65	0%	0%	574	-95	1016	-49	56%	-7%	04:21	-00:07	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.47	0%	0%	257	-9	689	20	37%	-2%	04:11	-00:03	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.27	0%	0%	147	-15	170	-8	86%	-5%	01:12	00:02	24	-1
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.44	0%	0%	205	51	213	50	96%	1%	01:08	00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.35	0%	0%	27	-7	195	2	14%	-4%	02:29	-00:00	21	1
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.63	19%	19%	10	-3	286	-13	3%	-1%	04:00	00:10	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.62	20%	20%	27	0	358	16	8%	0%	03:52	-00:08	22	1
NG: 4M Westbound 148th to 130th	0.9	0.28	0.30	0%	0%	16	7	159	11	10%	3%	02:12	00:04	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.12	0%	0%	7	15	24	15	30%	27%	03:00	00:03	21	0
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.22	0%	0%	0	0	83	-10	0%	0%	00:00	00:00	22	0
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.46	0%	0%	276	31	626	57	44%	1%	02:19	-00:00	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.31	0%	0%	261	-8	462	-22	57%	1%	02:30	00:04	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.14	83%	40%	464	-64	1441	-104	32%	-2%	05:23	-00:21	28	1
Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.15	69%	69%	51	-6	1623	7	3%	0%	06:17	-00:11	24	0
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.84	27%	27%	543	28	854	13	64%	2%	04:41	-00:02	31	0
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.15	51%	51%	106	-10	1548	11	7%	-1%	07:44	-01:21	22	3

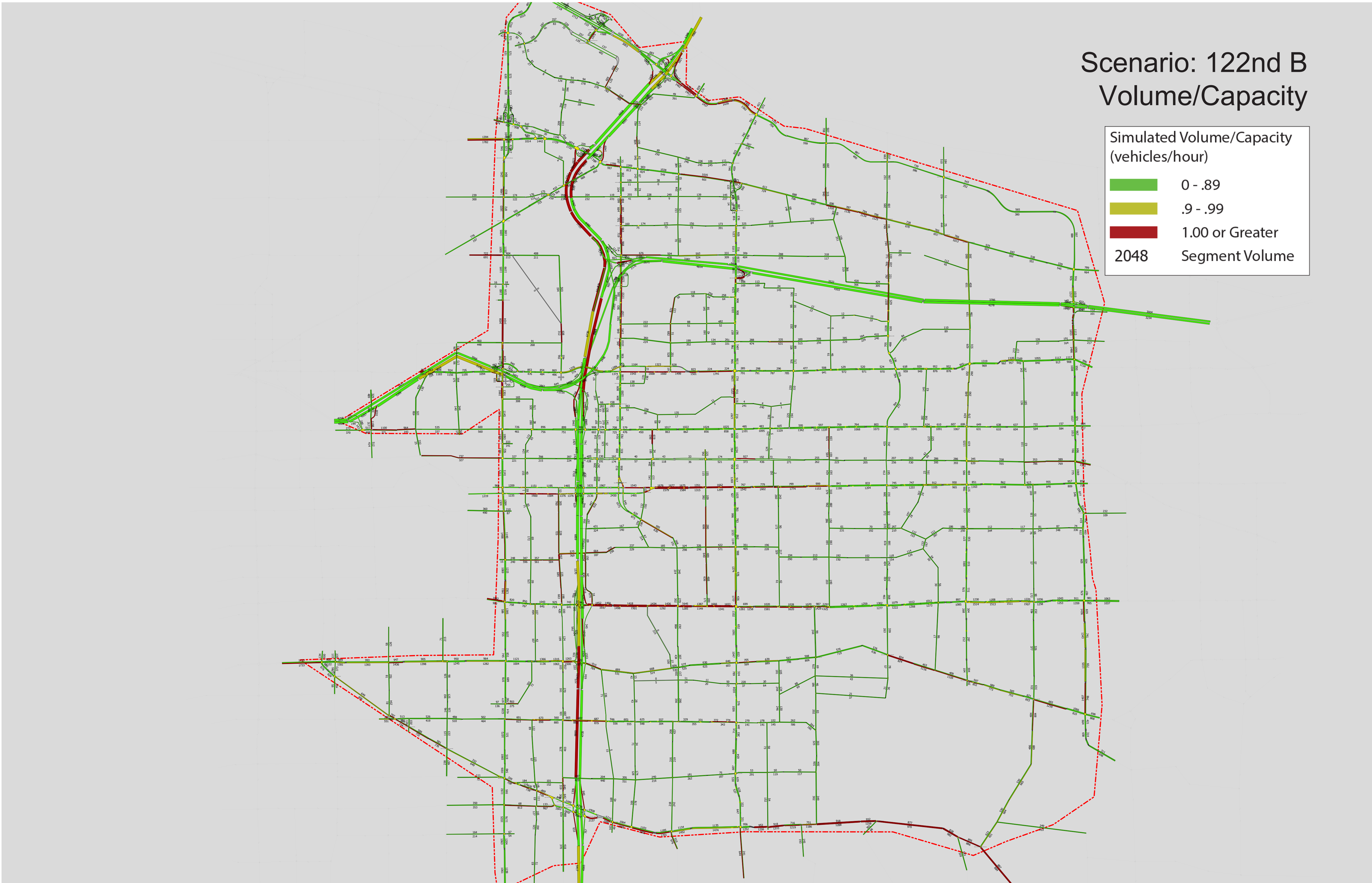
EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



Scenario: 122nd C

Scenario 1	Scenario 2
2020 Committed Projects	122ndC-Med Rd Reorg
250807	250681

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

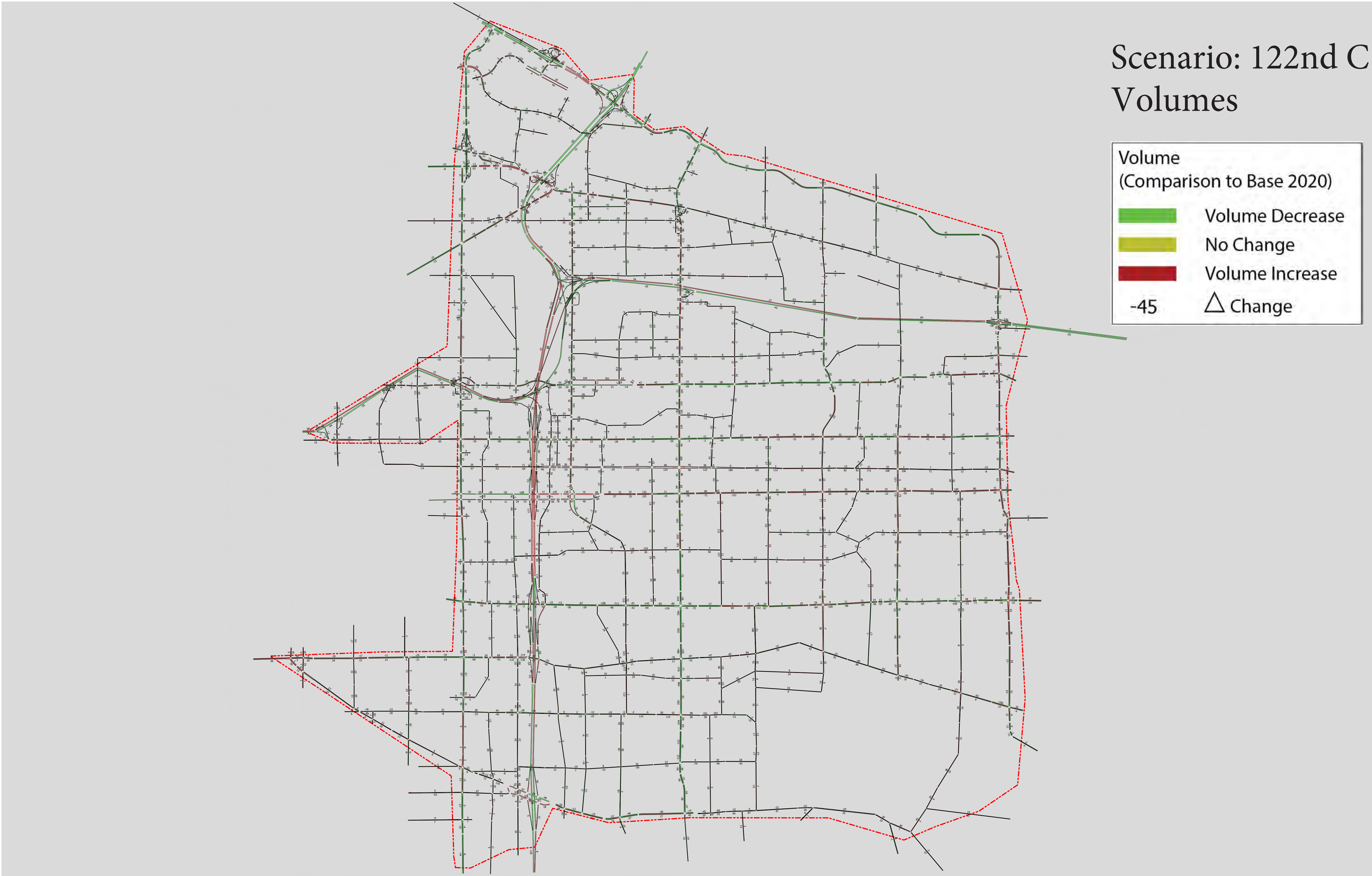
Red

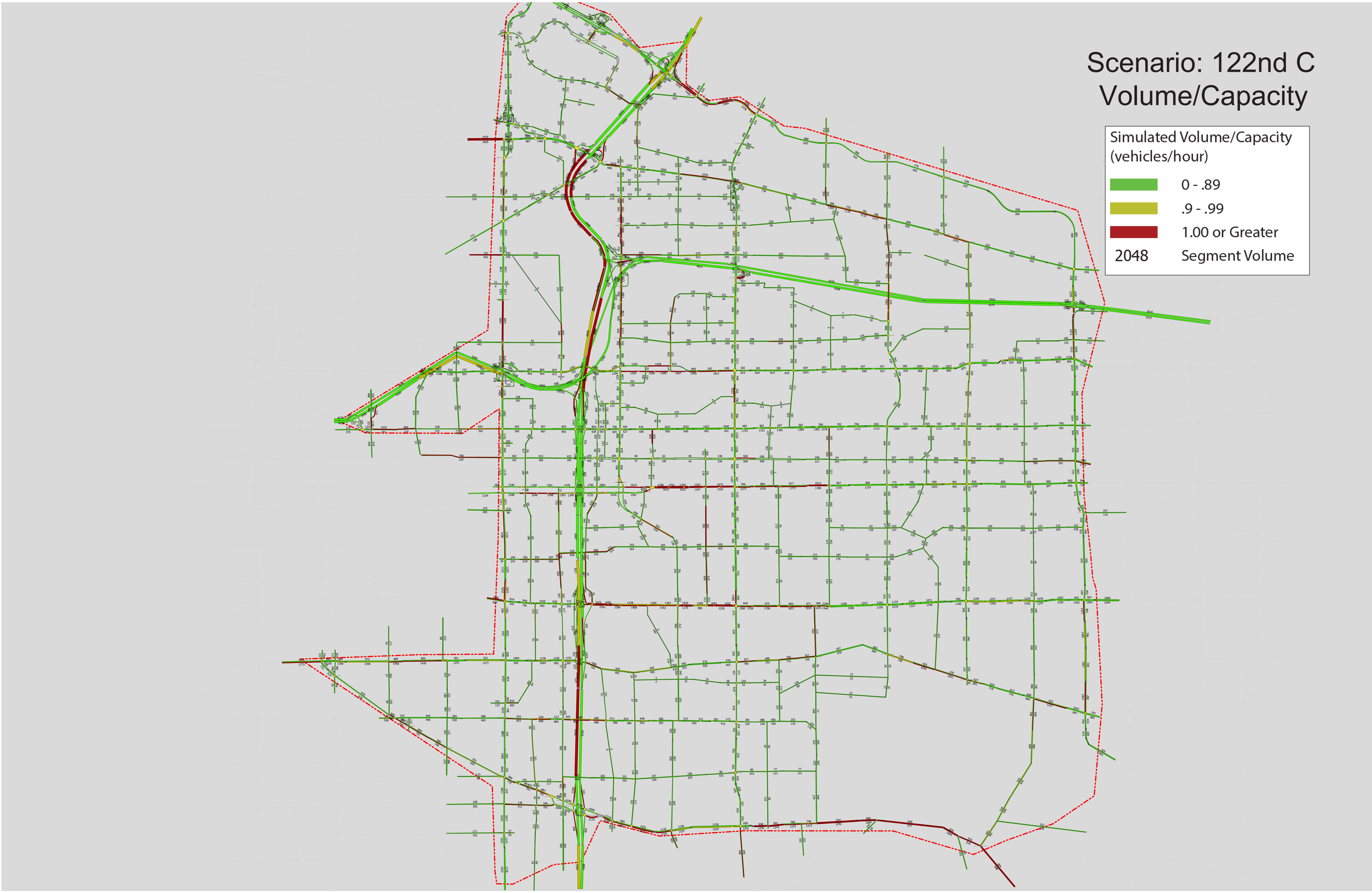
More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.28	71%	71%	197	-47	1092	-15	18%	-4%	05:06	-00:24	24	1
102nd Southbound Sandy to Halsey	1.7	0.80	0.76	44%	37%	7	-1	699	-43	1%	0%	04:49	-00:06	28	1
122nd Northbound 1_Foster to Division	1.9	0.40	0.33	0%	0%	150	-4	558	-90	27%	4%	05:06	00:03	28	-1
122nd Northbound 2_Division to Halsey	2.0	0.62	0.65	0%	0%	16	6	868	46	2%	1%	06:54	00:31	28	-2
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	5	804	-7	6%	1%	07:11	-00:10	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.66	8%	8%	40	-3	916	1	4%	0%	07:07	-00:20	24	0
122nd Southbound 2_Halsey to Division	2.0	0.86	0.76	50%	30%	5	-4	1204	-144	0%	0%	03:21	-00:06	29	0
122nd Southbound 3_Division to Foster	1.9	0.64	0.44	0%	0%	393	-161	895	-280	44%	-6%	08:13	01:21	22	-2
148th Northbound Powell to Stark	1.4	0.36	0.37	0%	0%	44	-13	271	5	16%	-5%	03:37	-00:06	29	0
148th Southbound Stark to Powell	1.4	0.41	0.43	0%	0%	3	12	343	24	1%	3%	04:49	-00:50	28	0
162nd Northbound Powell to Stark	1.7	0.28	0.31	0%	0%	58	25	397	38	15%	4%	03:56	00:12	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.35	0%	0%	7	8	528	-40	1%	2%	04:35	-00:21	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.52	10%	10%	109	-15	733	-4	15%	-2%	04:29	00:19	23	-1
82nd Northbound 2_Division to Halsey	2.0	0.81	0.83	21%	16%	191	9	1132	27	17%	0%	06:53	-00:04	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.90	47%	47%	553	-18	1291	-26	43%	-1%	03:48	00:08	21	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.89	30%	30%	167	-5	1244	3	13%	0%	03:36	-00:05	22	0
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.95	73%	60%	229	-9	1387	-56	17%	0%	09:07	-01:07	16	0
82nd Southbound 3_Division to Foster	1.5	0.68	0.66	8%	8%	74	-9	949	-23	8%	-1%	10:45	00:16	15	-1
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.29	0%	12%	29	-22	231	-26	13%	-9%	06:21	-00:02	24	1
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.72	0%	7%	160	65	390	118	41%	3%	04:48	00:01	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.34	9%	9%	21	-4	229	9	9%	-2%	04:47	00:11	29	-1
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.37	0%	0%	0	0	210	49	0%	0%	00:00	00:00	24	-1
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.09	70%	70%	30	-4	1196	-47	3%	0%	08:22	00:09	22	-1
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.14	65%	40%	521	-125	1486	-50	35%	-7%	05:07	00:04	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.67	0%	0%	247	-12	1031	0	24%	-1%	05:32	-00:03	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.90	65%	59%	208	22	1292	-43	16%	2%	11:38	-00:42	17	4
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.10	100%	100%	47	-1	1751	18	3%	0%	03:16	00:39	28	0
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.81	0%	0%	973	-25	1318	-28	74%	0%	03:06	-00:10	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	2	635	-33	0%	0%	01:56	-00:16	27	0
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.38	0%	0%	368	6	785	-31	47%	3%	04:30	-00:08	31	0
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.26	0%	0%	146	-13	493	20	30%	-4%	04:05	00:23	30	0
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.45	0%	0%	6	-1	798	-6	1%	0%	01:45	00:12	26	1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.67	0%	0%	574	-25	1016	-20	56%	-1%	04:21	-00:03	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.44	0%	0%	257	-23	689	-16	37%	-3%	04:11	00:04	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.25	0%	0%	147	-20	170	-18	86%	-3%	01:12	00:03	24	-1
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.40	0%	0%	205	20	213	28	96%	-3%	01:08	00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.39	0%	0%	27	4	195	23	14%	0%	02:29	00:04	21	0
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.65	19%	19%	10	-6	286	-1	3%	-2%	04:00	-00:12	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.74	20%	20%	27	20	358	84	8%	3%	03:52	-00:02	22	0
NG: 4M Westbound 148th to 130th	0.9	0.28	0.27	0%	0%	16	-2	159	-4	10%	-1%	02:12	00:13	25	-1
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.21	0%	0%	7	36	24	39	30%	39%	03:00	00:15	21	-1
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.17	0%	0%	0	0	83	-30	0%	0%	00:00	00:00	22	0
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.45	0%	0%	276	25	626	36	44%	1%	02:19	00:06	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.33	0%	0%	261	-2	462	-3	57%	0%	02:30	00:03	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.18	83%	83%	464	-44	1441	-52	32%	-2%	05:23	-00:20	28	0
Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.16	69%	73%	51	-7	1623	34	3%	0%	06:17	00:13	24	0
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.87	27%	44%	543	24	854	41	64%	0%	04:41	-00:04	31	0
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.16	51%	51%	106	-12	1548	28	7%	-1%	07:44	00:38	22	-1


Scenario: 122nd C
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change



Scenario: 122nd C
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume

Scenario: 122nd D

Scenario 1	Scenario 2
2020 Committed Projects	122ndD-Med Rd Reorg w/Freeway MUP
250807	250688

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

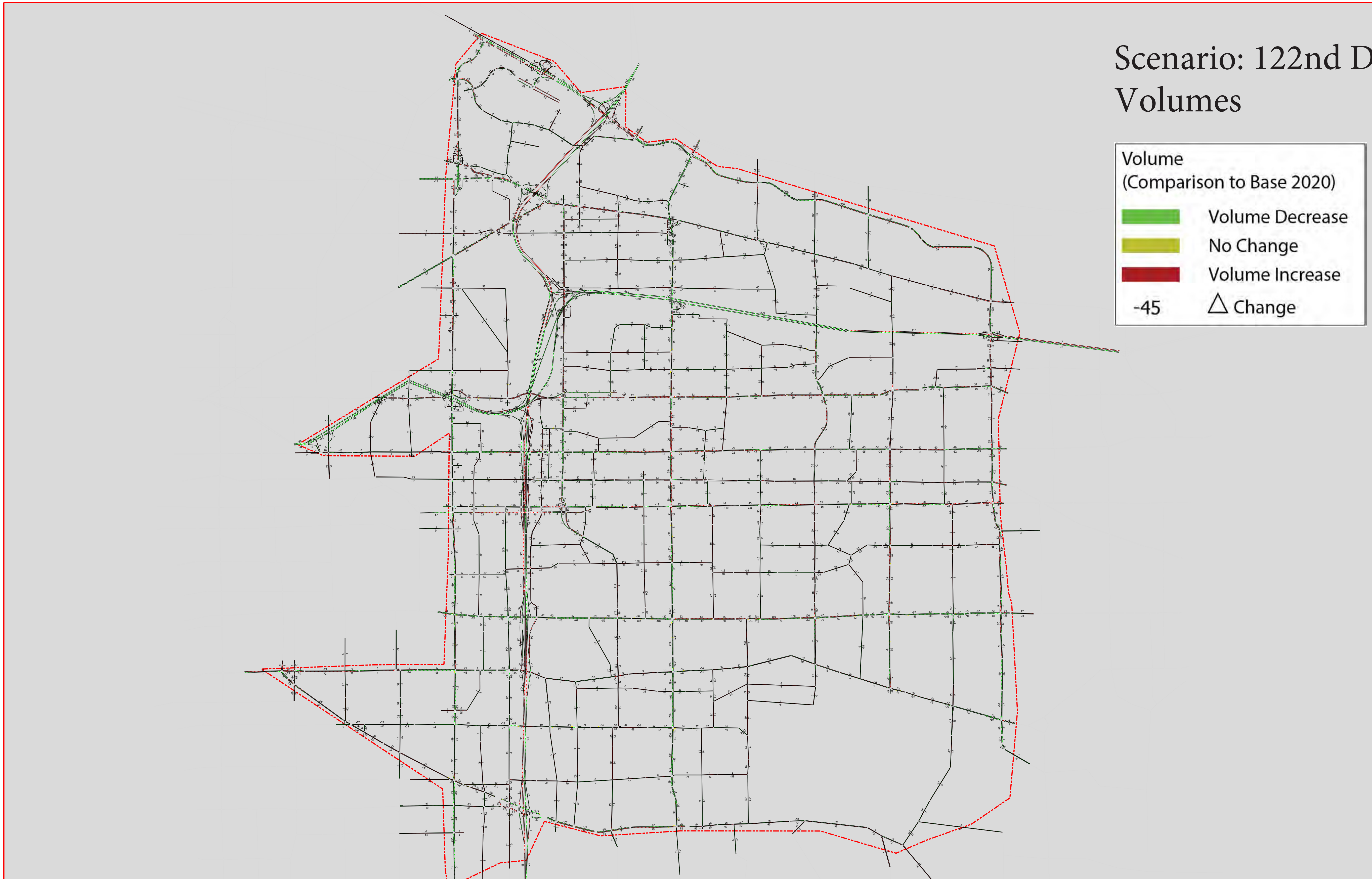
Red

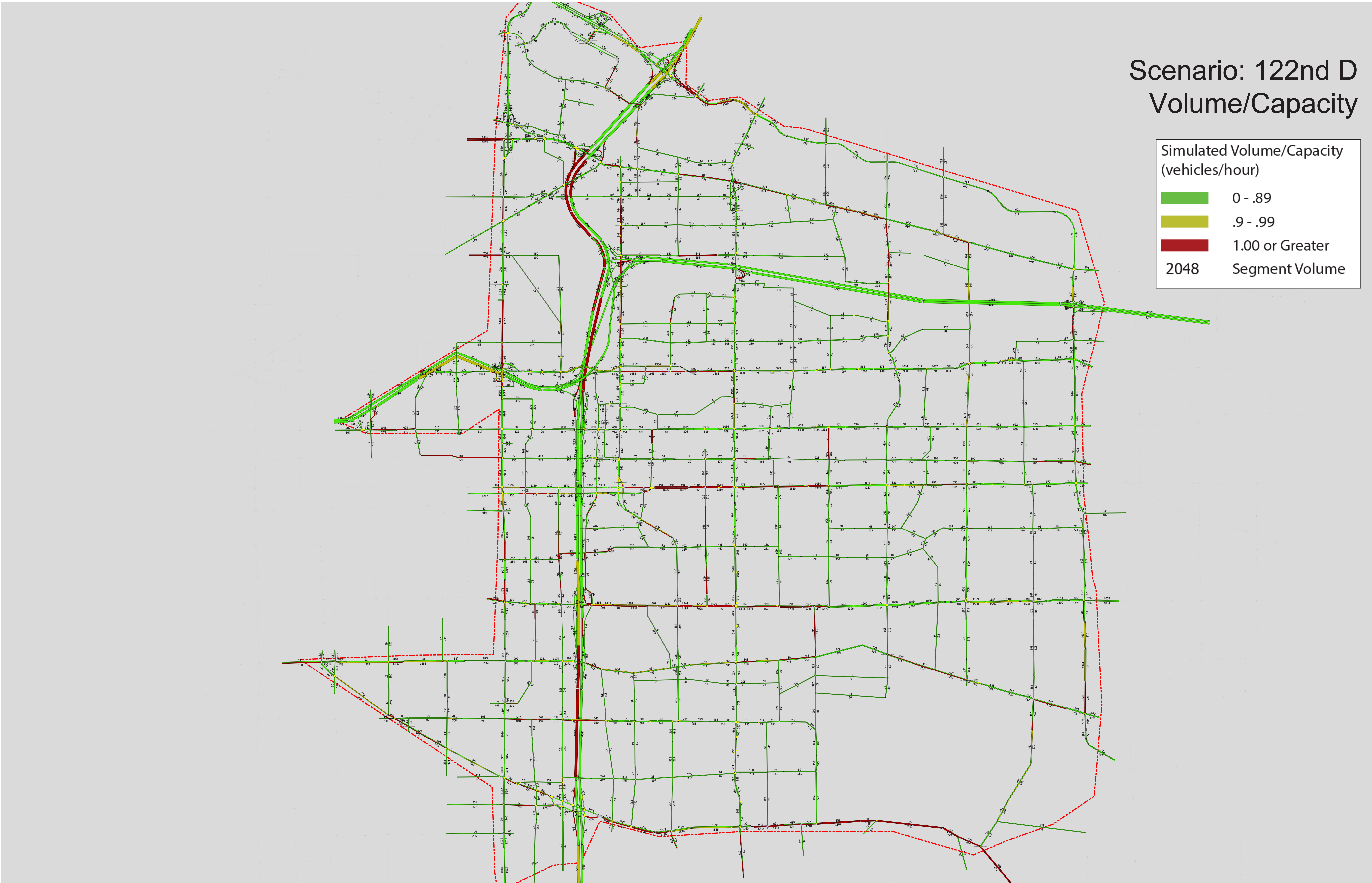
More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.30	71%	71%	197	-17	1092	22	18%	-2%	05:06	-00:07	24	1
102nd Southbound Sandy to Halsey	1.7	0.80	0.89	44%	70%	7	1	699	74	1%	0%	04:49	00:02	28	1
122nd Northbound 1_Foster to Division	1.9	0.40	0.34	0%	0%	150	-22	558	-80	27%	0%	05:06	00:09	28	-1
122nd Northbound 2_Division to Halsey	2.0	0.62	0.64	0%	0%	16	4	868	22	2%	0%	06:54	-00:14	28	0
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.55	0%	0%	45	-7	804	-30	6%	-1%	07:11	00:13	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.53	8%	0%	40	-16	916	-179	4%	-1%	07:07	-00:16	24	1
122nd Southbound 2_Halsey to Division	2.0	0.86	0.77	50%	30%	5	0	1204	-128	0%	0%	03:21	-00:22	29	0
122nd Southbound 3_Division to Foster	1.9	0.64	0.41	0%	0%	393	-201	895	-318	44%	-11%	08:13	01:38	22	-1
148th Northbound Powell to Stark	1.4	0.36	0.36	0%	0%	44	-12	271	-3	16%	-4%	03:37	-00:07	29	0
148th Southbound Stark to Powell	1.4	0.41	0.44	0%	0%	3	3	343	19	1%	1%	04:49	-00:12	28	0
162nd Northbound Powell to Stark	1.7	0.28	0.31	0%	0%	58	17	397	42	15%	2%	03:56	00:10	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.37	0%	0%	7	11	528	-10	1%	2%	04:35	00:10	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.53	10%	10%	109	-13	733	6	15%	-2%	04:29	00:03	23	0
82nd Northbound 2_Division to Halsey	2.0	0.81	0.81	21%	16%	191	1	1132	3	17%	0%	06:53	-00:08	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.91	47%	47%	553	-5	1291	-15	43%	0%	03:48	-00:01	21	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.90	30%	47%	167	-1	1244	21	13%	0%	03:36	-00:03	22	0
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.96	73%	60%	229	-15	1387	-45	17%	-1%	09:07	-00:36	16	0
82nd Southbound 3_Division to Foster	1.5	0.68	0.66	8%	8%	74	-5	949	-21	8%	0%	10:45	00:26	15	0
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.29	0%	0%	29	-18	231	-25	13%	-7%	06:21	-00:02	24	1
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.67	0%	7%	160	21	390	77	41%	-2%	04:48	00:10	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.34	9%	9%	21	-2	229	12	9%	-1%	04:47	00:31	29	0
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.36	0%	0%	0	0	210	39	0%	0%	00:00	00:00	24	-1
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.06	70%	70%	30	-8	1196	-77	3%	-1%	08:22	-00:55	22	0
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.14	65%	40%	521	-82	1486	-46	35%	-5%	05:07	-00:01	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.71	0%	0%	247	-10	1031	51	24%	-2%	05:32	00:07	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.90	65%	65%	208	1	1292	-47	16%	1%	11:38	00:10	17	2
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.10	100%	100%	47	2	1751	32	3%	0%	03:16	00:07	28	0
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.78	0%	0%	973	-77	1318	-74	74%	-2%	03:06	-00:10	35	1
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	4	635	-23	0%	1%	01:56	00:00	27	-1
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.40	0%	0%	368	7	785	12	47%	0%	04:30	00:24	31	-1
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.24	0%	0%	146	-17	493	-16	30%	-3%	04:05	00:17	30	-1
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.46	0%	0%	6	-1	798	9	1%	0%	01:45	00:04	26	1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.68	0%	0%	574	-27	1016	-3	56%	-2%	04:21	-00:00	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.48	0%	0%	257	12	689	39	37%	0%	04:11	-00:03	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.29	0%	0%	147	2	170	2	86%	0%	01:12	00:05	24	-1
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.42	0%	0%	205	45	213	41	96%	2%	01:08	00:00	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.37	0%	0%	27	-12	195	16	14%	-7%	02:29	00:08	21	1
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.72	19%	19%	10	-1	286	44	3%	-1%	04:00	00:01	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.69	20%	20%	27	4	358	58	8%	0%	03:52	-00:20	22	2
NG: 4M Westbound 148th to 130th	0.9	0.28	0.25	0%	0%	16	1	159	-14	10%	2%	02:12	-00:09	25	1
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.07	0%	0%	7	-4	24	-1	30%	-16%	03:00	-00:06	21	0
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.27	0%	0%	0	2	83	6	0%	2%	00:00	02:51	22	0
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.44	0%	0%	276	-13	626	31	44%	-4%	02:19	-00:00	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.32	0%	0%	261	-22	462	-19	57%	-3%	02:30	-00:01	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.17	83%	83%	464	-32	1441	-66	32%	-1%	05:23	-00:26	28	1
Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.17	69%	69%	51	-5	1623	37	3%	0%	06:17	00:12	24	0
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.86	27%	27%	543	8	854	26	64%	-1%	04:41	-00:06	31	0
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.12	51%	51%	106	-6	1548	-32	7%	0%	07:44	01:12	22	-1


Scenario: 122nd D
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change



Scenario: 122nd D
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume

Scenario: 122nd E

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION

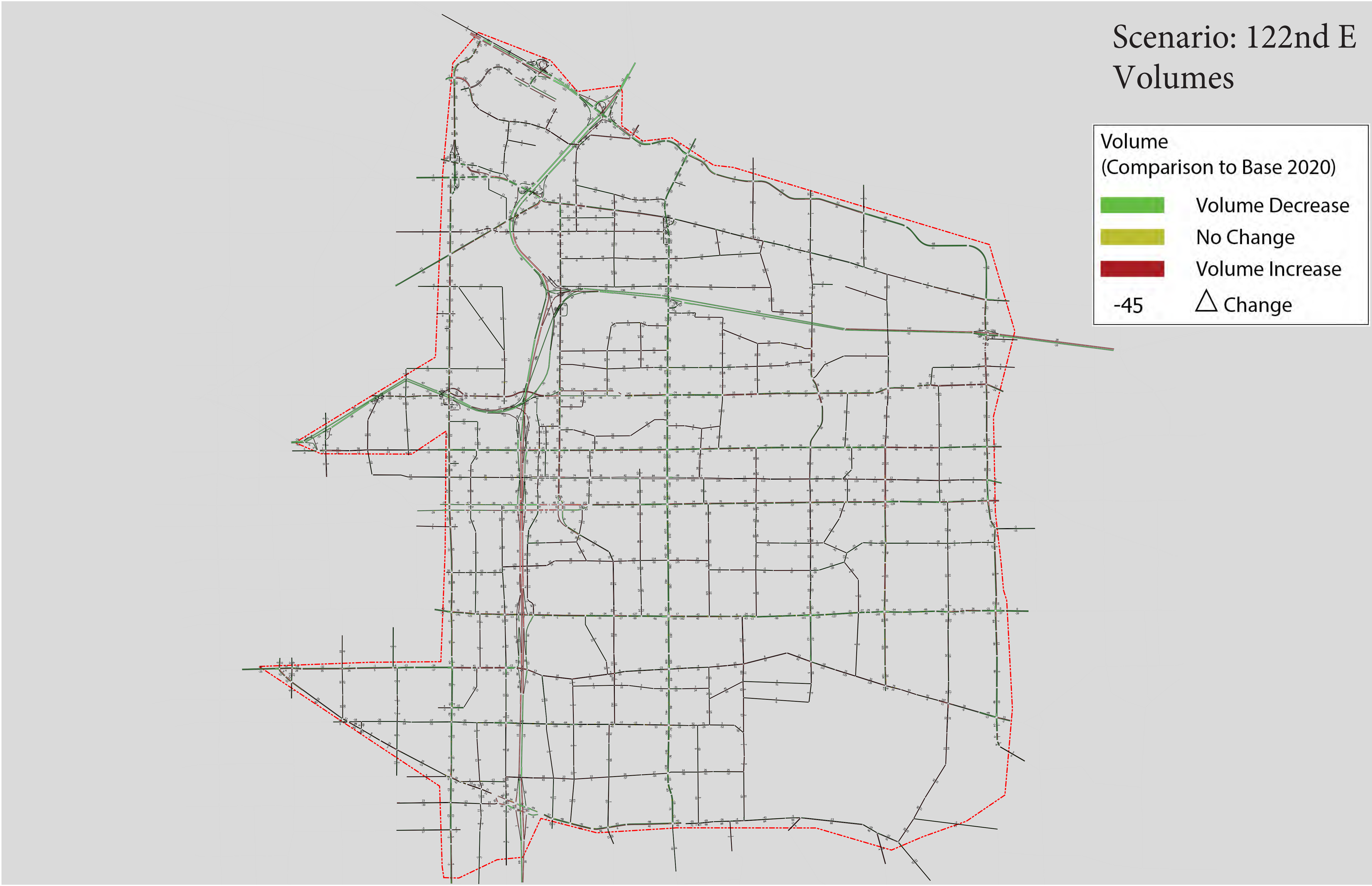
Scenario 1	Scenario 2
2020 Committed Projects	122ndE-Full Rd Reorg
250807	250695

Green
Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red
More vehicles, longer travel times, lower average speeds relative to the base

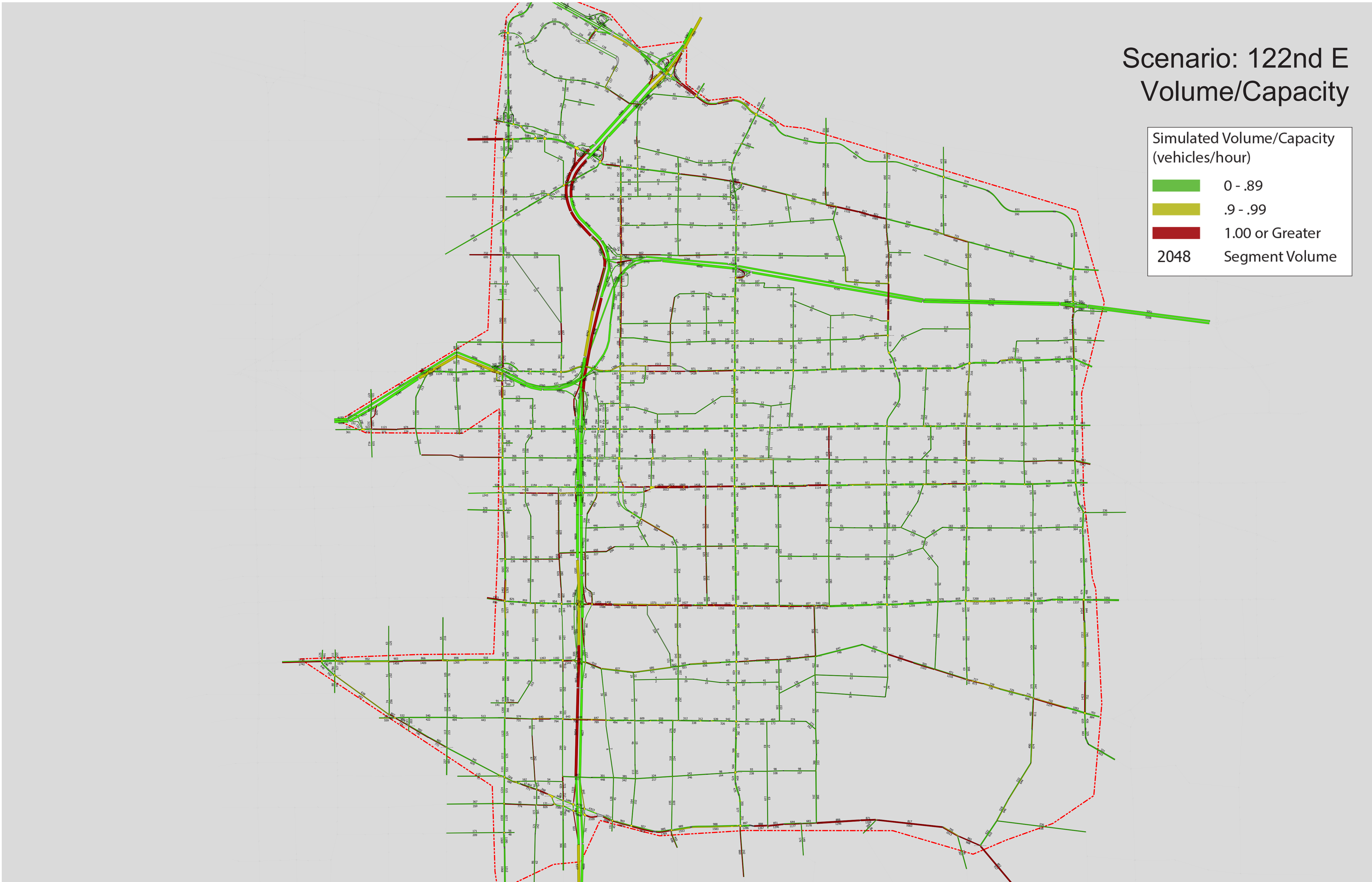
Gold
No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.30	71%	71%	197	-36	1092	17	18%	-4%	05:06	00:02	24	0
102nd Southbound Sandy to Halsey	1.7	0.80	0.82	44%	37%	7	5	699	13	1%	1%	04:49	01:57	28	-4
122nd Northbound 1_Foster to Division	1.9	0.40	0.33	0%	0%	150	-11	558	-95	27%	3%	05:06	00:15	28	-1
122nd Northbound 2_Division to Halsey	2.0	0.62	0.44	0%	0%	16	-12	868	-254	2%	-1%	06:54	00:08	28	-2
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.41	0%	0%	45	-24	804	-226	6%	-2%	07:11	02:09	26	-1
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.44	8%	0%	40	-28	916	-296	4%	-2%	07:07	-00:42	24	-1
122nd Southbound 2_Halsey to Division	2.0	0.86	0.65	50%	7%	5	-2	1204	-299	0%	0%	03:21	-01:11	29	-4
122nd Southbound 3_Division to Foster	1.9	0.64	0.42	0%	0%	393	-151	895	-311	44%	-2%	08:13	01:09	22	-1
148th Northbound Powell to Stark	1.4	0.36	0.36	0%	0%	44	-13	271	-3	16%	-5%	03:37	00:04	29	-1
148th Southbound Stark to Powell	1.4	0.41	0.43	0%	0%	3	6	343	9	1%	2%	04:49	-01:19	28	1
162nd Northbound Powell to Stark	1.7	0.28	0.31	0%	0%	58	43	397	36	15%	9%	03:56	00:23	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.35	0%	0%	7	5	528	-42	1%	1%	04:35	00:15	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.51	10%	10%	109	-9	733	-14	15%	-1%	04:29	-00:01	23	1
82nd Northbound 2_Division to Halsey	2.0	0.81	0.84	21%	16%	191	7	1132	38	17%	0%	06:53	-00:15	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.95	47%	47%	553	77	1291	37	43%	5%	03:48	-00:04	21	1
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.88	30%	30%	167	-4	1244	-11	13%	0%	03:36	-00:10	22	1
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.95	73%	60%	229	-7	1387	-62	17%	0%	09:07	00:13	16	0
82nd Southbound 3_Division to Foster	1.5	0.68	0.66	8%	0%	74	2	949	-25	8%	0%	10:45	-00:14	15	0
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.29	0%	0%	29	-10	231	-24	13%	-3%	06:21	00:29	24	0
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.75	0%	7%	160	42	390	132	41%	-2%	04:48	-00:03	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.32	9%	9%	21	1	229	-4	9%	1%	04:47	00:13	29	0
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.38	0%	0%	0	4	210	56	0%	2%	00:00	08:18	24	-1
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.09	70%	70%	30	-7	1196	-53	3%	0%	08:22	-00:24	22	1
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.14	65%	40%	521	-159	1486	-58	35%	-10%	05:07	00:12	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.66	0%	0%	247	-22	1031	-22	24%	-2%	05:32	-00:05	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.93	65%	65%	208	-3	1292	-2	16%	0%	11:38	-00:52	17	3
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.10	100%	100%	47	-4	1751	23	3%	0%	03:16	-00:10	28	0
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.78	0%	0%	973	-64	1318	-75	74%	-1%	03:06	-00:02	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.36	0%	0%	1	1	635	-12	0%	0%	01:56	00:06	27	1
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.39	0%	0%	368	14	785	-9	47%	2%	04:30	00:37	31	-1
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.23	0%	0%	146	1	493	-31	30%	2%	04:05	00:17	30	-1
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.40	0%	0%	6	-3	798	-109	1%	0%	01:45	00:12	26	1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.69	0%	0%	574	-62	1016	11	56%	-7%	04:21	-00:04	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.43	0%	0%	257	-71	689	-35	37%	-9%	04:11	-00:02	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.24	0%	0%	147	-25	170	-27	86%	-1%	01:12	00:03	24	-1
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.46	0%	0%	205	60	213	63	96%	0%	01:08	00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.42	0%	0%	27	1	195	41	14%	-2%	02:29	00:19	21	0
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.66	19%	19%	10	-2	286	14	3%	-1%	04:00	-00:29	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.74	20%	20%	27	10	358	87	8%	1%	03:52	-00:14	22	1
NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	1	159	1	10%	1%	02:12	-00:02	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.18	0%	0%	7	15	24	33	30%	9%	03:00	00:18	21	-1
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.36	0%	0%	0	29	83	31	0%	25%	00:00	02:54	22	0
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.48	0%	0%	276	55	626	90	44%	2%	02:19	00:02	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.30	0%	0%	261	-18	462	-38	57%	1%	02:30	00:05	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.09	83%	57%	464	-78	1441	-150	32%	-2%	05:23	-00:33	28	1
Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.09	69%	69%	51	-10	1623	-51	3%	-1%	06:17	00:35	24	0
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.90	27%	44%	543	43	854	74	64%	0%	04:41	00:06	31	-1
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.16	51%	51%	106	-9	1548	12	7%	-1%	07:44	-00:10	22	-1


Scenario: 122nd E
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change

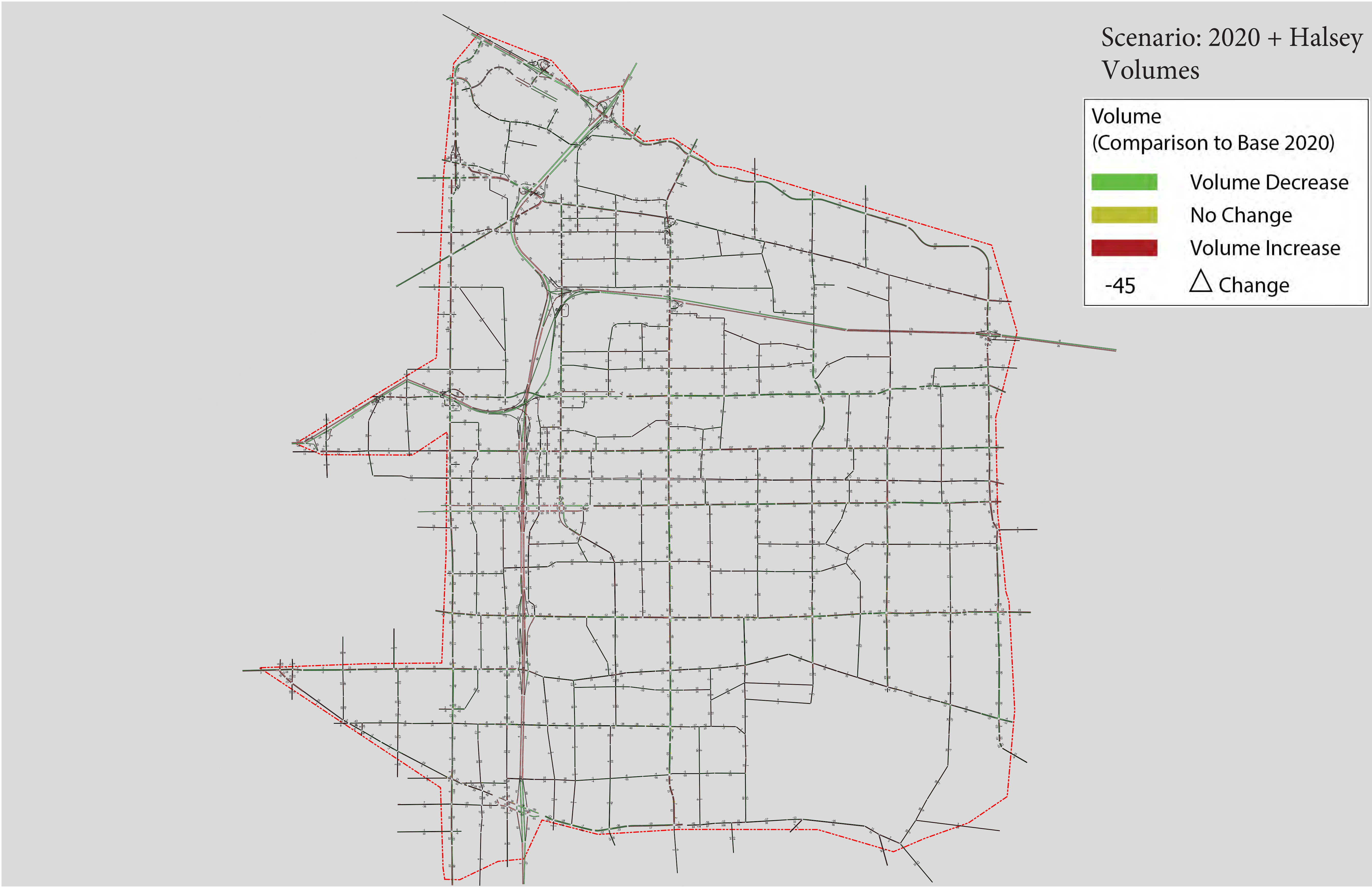
EPASS

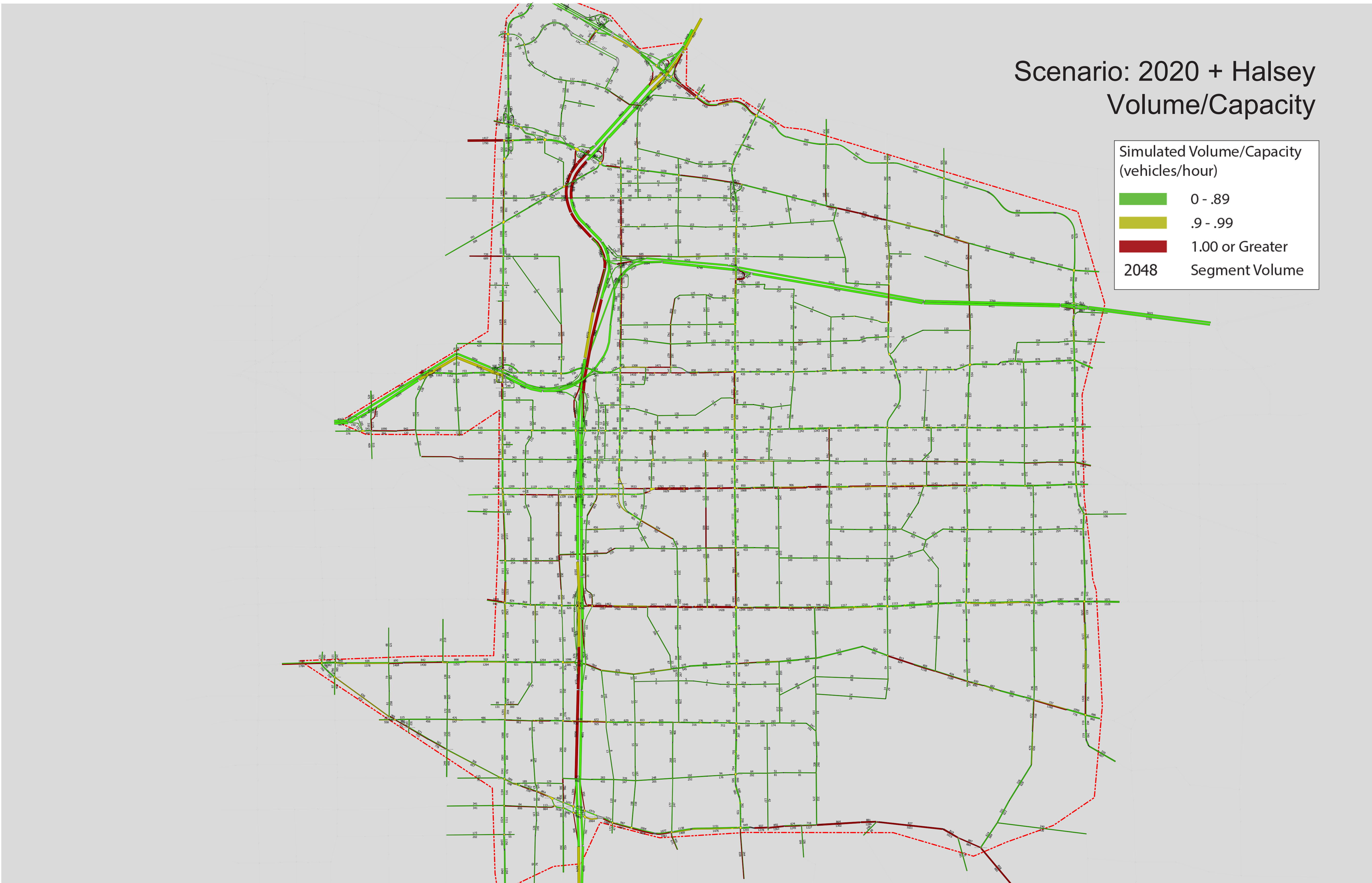
PBOT
PORTLAND BUREAU OF TRANSPORTATION



Scenario: 2020 + Halsey

Scenario 1	Scenario 2																
2020 Committed Projects	2020 + Halsey		Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
250807	250793	SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
		102nd Northbound Halsey to Sandy	1.7	1.27	1.26	71%	71%	197	-32	1092	-22	18%	-3%	05:06	-00:41	24	3
		102nd Southbound Sandy to Halsey	1.7	0.80	0.80	44%	44%	7	-1	699	-3	1%	0%	04:49	00:06	28	2
Green		122nd Northbound 1_Foster to Division	1.9	0.40	0.37	0%	0%	150	18	558	-39	27%	6%	05:06	00:18	28	-1
Fewer vehicles, shorter travel times, higher average speeds relative to the base		122nd Northbound 2_Division to Halsey	2.0	0.62	0.61	0%	0%	16	8	868	-20	2%	1%	06:54	-00:09	28	-2
		122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	-5	804	-2	6%	-1%	07:11	00:13	26	0
		122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.70	8%	14%	40	19	916	62	4%	2%	07:07	-00:07	24	0
Red		122nd Southbound 2_Halsey to Division	2.0	0.86	0.83	50%	39%	5	-2	1204	-39	0%	0%	03:21	-00:17	29	0
More vehicles, longer travel times, lower average speeds relative to the base		122nd Southbound 3_Division to Foster	1.9	0.64	0.63	0%	0%	393	13	895	-7	44%	2%	08:13	-00:48	22	1
		148th Northbound Powell to Stark	1.4	0.36	0.37	0%	0%	44	-14	271	3	16%	-5%	03:37	-00:11	29	-1
		148th Southbound Stark to Powell	1.4	0.41	0.44	0%	0%	3	6	343	18	1%	2%	04:49	-00:22	28	0
Gold		162nd Northbound Powell to Stark	1.7	0.28	0.33	0%	0%	58	43	397	60	15%	7%	03:56	00:38	32	-1
No change		162nd Southbound Stark to Powell	1.7	0.38	0.34	0%	0%	7	6	528	-48	1%	1%	04:35	-00:35	29	1
		82nd Northbound 1_Foster to Division	1.5	0.52	0.50	10%	10%	109	-20	733	-38	15%	-2%	04:29	00:09	23	0
		82nd Northbound 2_Division to Halsey	2.0	0.81	0.82	21%	11%	191	10	1132	21	17%	1%	06:53	-00:00	20	0
		82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.92	47%	47%	553	34	1291	1	43%	3%	03:48	-00:03	21	0
		82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.89	30%	30%	167	-5	1244	3	13%	0%	03:36	-00:02	22	0
		82nd Southbound 2_ Halsey to Division	2.0	0.99	0.96	73%	60%	229	-15	1387	-40	17%	-1%	09:07	-00:03	16	0
		82nd Southbound 3_Division to Foster	1.5	0.68	0.67	8%	8%	74	6	949	-17	8%	1%	10:45	-00:08	15	0
		Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.29	0%	12%	29	-22	231	-27	13%	-9%	06:21	-00:50	24	1
		Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.74	0%	25%	160	75	390	129	41%	4%	04:48	00:25	26	-1
		Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.36	9%	9%	21	3	229	26	9%	0%	04:47	00:08	29	0
		Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.35	0%	0%	0	0	210	32	0%	0%	00:00	00:00	24	0
		Division Eastbound 1_82nd to 122nd	2.0	1.13	1.12	70%	70%	30	-3	1196	-16	3%	0%	08:22	-00:02	22	0
		Division Eastbound 2_122nd to 162nd	2.0	1.17	1.12	65%	40%	521	-104	1486	-73	35%	-6%	05:07	-00:01	31	1
		Division Westbound 1_162nd to 122nd	2.0	0.67	0.69	0%	0%	247	-18	1031	28	24%	-2%	05:32	-00:09	32	0
		Division Westbound 2_122nd to 82nd	2.0	0.93	0.95	65%	65%	208	7	1292	26	16%	0%	11:38	-00:26	17	2
		Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.07	100%	100%	47	0	1751	-27	3%	0%	03:16	-00:00	28	0
		Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.81	0%	0%	973	-22	1318	-21	74%	-1%	03:06	-00:03	35	0
		Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	6	635	-39	0%	1%	01:56	-00:06	27	-1
		Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.38	0%	0%	368	-27	785	-17	47%	-2%	04:30	00:06	31	0
		Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.30	0%	0%	146	-10	493	112	30%	-7%	04:05	00:17	30	-1
		Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.46	0%	0%	6	1	798	13	1%	0%	01:45	00:08	26	0
		Halsey Eastbound 122nd to 162nd	2.0	0.68	0.61	0%	0%	574	-61	1016	-111	56%	0%	04:21	00:18	34	-1
		Halsey Westbound 162nd to 122nd	2.0	0.45	0.29	0%	0%	257	-82	689	-244	37%	2%	04:11	00:24	35	-3
		NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.28	0%	0%	147	-9	170	-2	86%	-4%	01:12	00:08	24	-2
		NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.29	0%	0%	205	-39	213	-40	96%	0%	01:08	00:02	25	-1
		NG: 4M Eastbound 130th to 148th	0.9	0.35	0.35	0%	0%	27	0	195	0	14%	0%	02:29	-00:01	21	1
		NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.69	19%	19%	10	-5	286	23	3%	-2%	04:00	-00:15	21	1
		NG: 4M Westbound 122nd to I-205	1.3	0.60	0.56	20%	20%	27	-4	358	-24	8%	-1%	03:52	00:39	22	0
		NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	2	159	1	10%	1%	02:12	00:03	25	0
		NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.11	0%	0%	7	11	24	11	30%	23%	03:00	00:11	21	-1
		NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.22	0%	0%	0	1	83	-11	0%	1%	00:00	03:57	22	0
		Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.44	0%	0%	276	-5	626	19	44%	-2%	02:19	00:02	28	0
		Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.31	0%	0%	261	4	462	-27	57%	4%	02:30	00:07	27	0
		Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.15	83%	74%	464	-9	1441	-86	32%	1%	05:23	-00:20	28	1
		Stark Eastbound 1_82nd to 122nd	2.0	1.14	1.16	69%	73%	51	-2	1623	33	3%	0%	06:17	00:32	24	0
		Stark Westbound 1_162nd to 122nd	2.0	0.83	0.85	27%	27%	543	4	854	21	64%	-1%	04:41	-00:00	31	0
		Stark Westbound 2_122nd to 82nd	2.0	1.14	1.13	51%	59%	106	7	1548	-6	7%	0%	07:44	-01:12	22	2


Scenario: 2020 + Halsey
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change


Scenario: 2020 + Halsey
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048
Segment Volume

Scenario:
2020 + Stark

EPASS PBOT

Scenario 1	Scenario 2
2020 Committed Projects	2020 + Stark
250807	250787

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

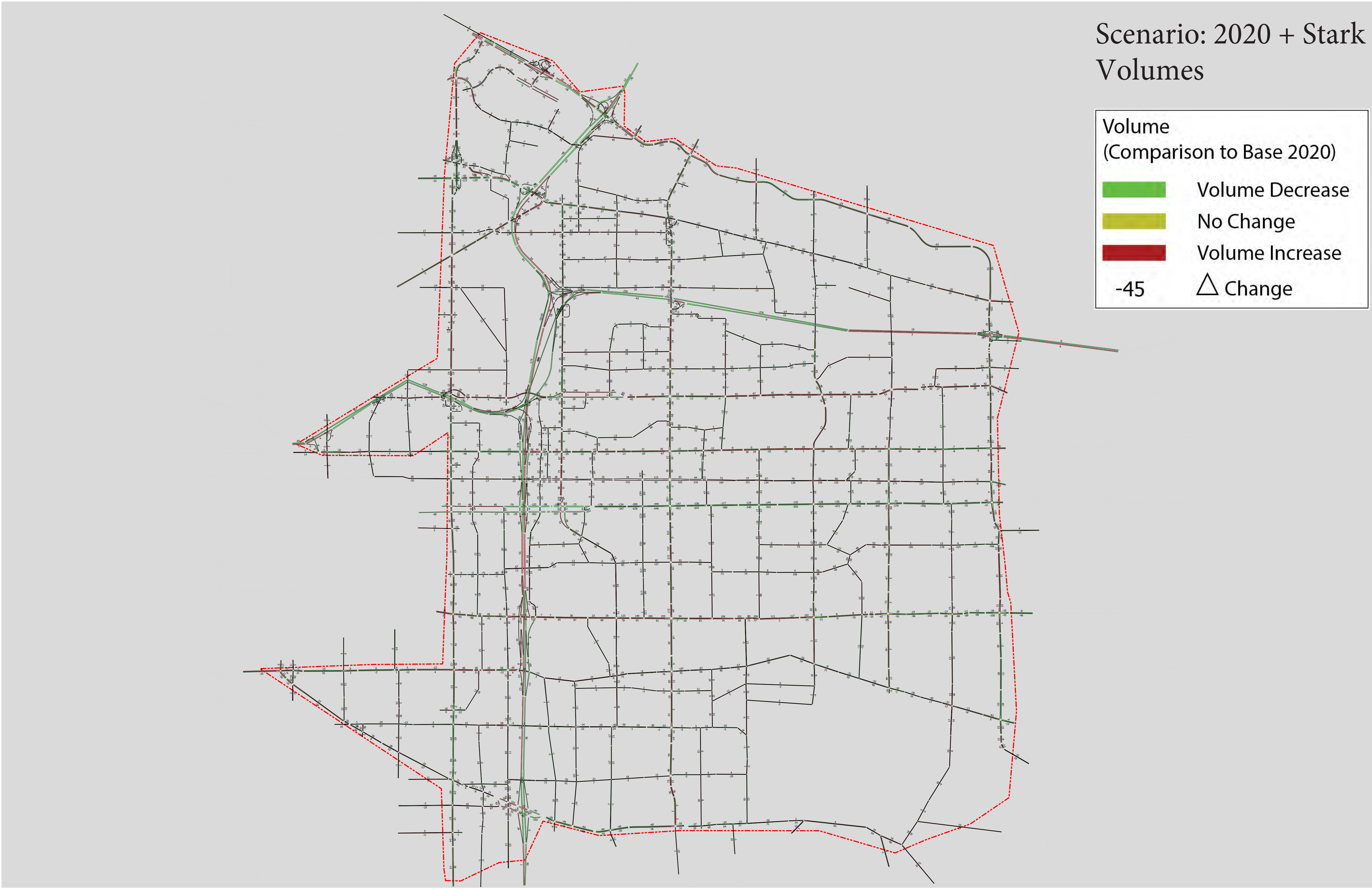
Red

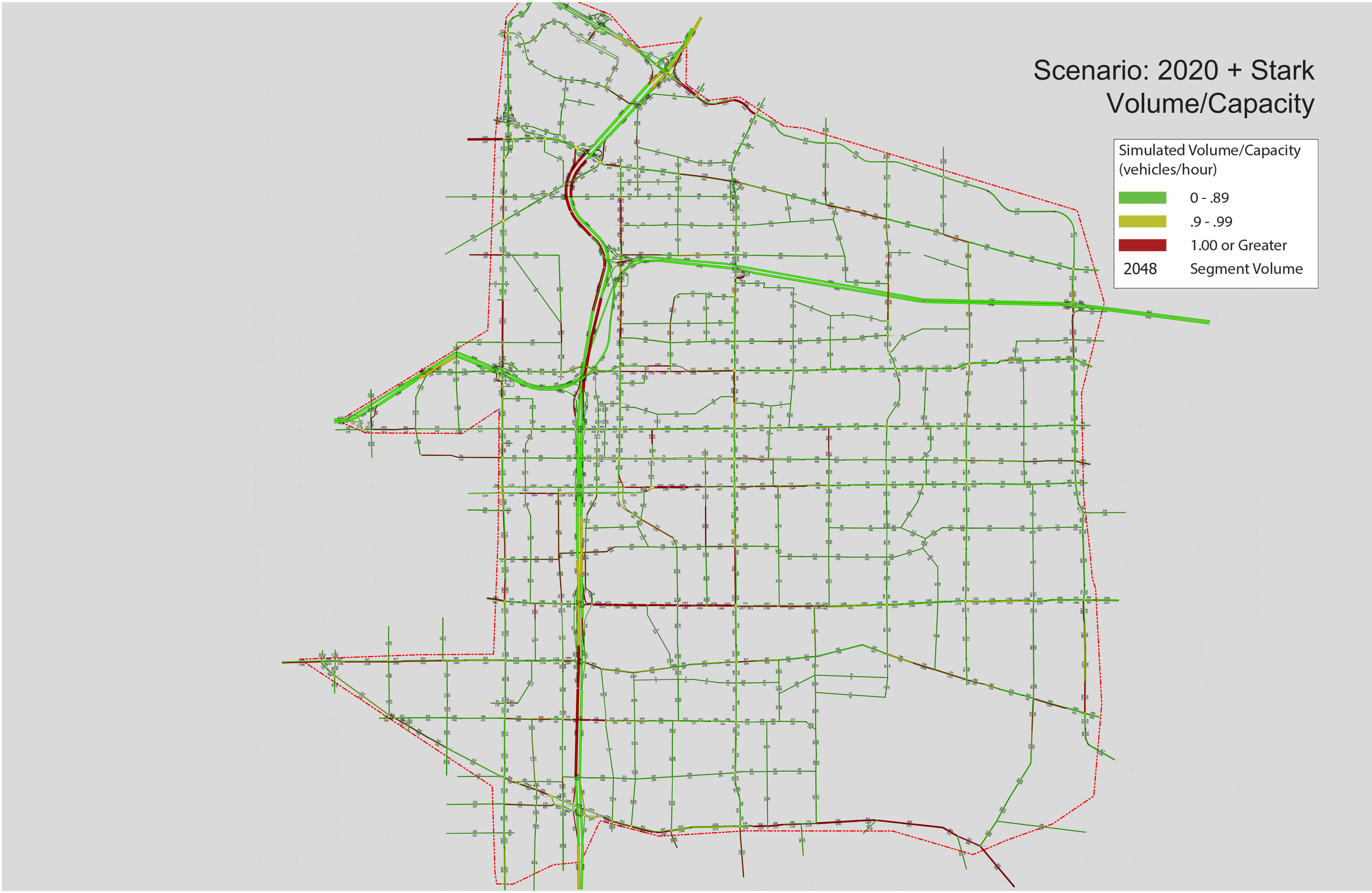
More vehicles, longer travel times, lower average speeds relative to the base

Gold

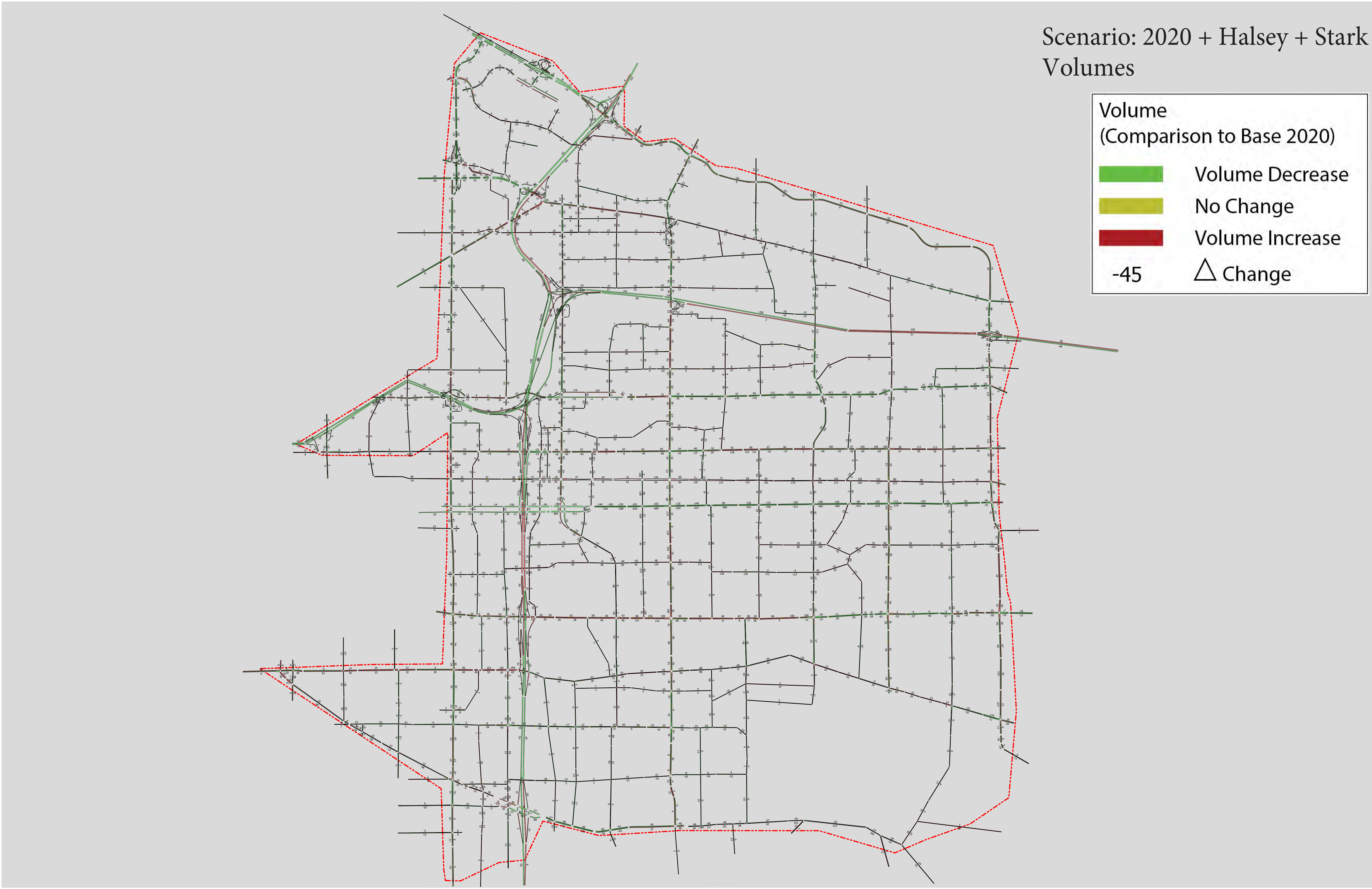
No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.24	71%	71%	197	-87	1092	-42	18%	-8%	05:06	-00:16	24	0
102nd Southbound Sandy to Halsey	1.7	0.80	0.82	44%	63%	7	-2	699	10	1%	0%	04:49	-00:01	28	1
122nd Northbound 1_Foster to Division	1.9	0.40	0.40	0%	0%	150	28	558	-1	27%	5%	05:06	00:05	28	0
122nd Northbound 2_Division to Halsey	2.0	0.62	0.60	0%	0%	16	4	868	-32	2%	1%	06:54	-00:31	28	0
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.55	0%	0%	45	-5	804	-31	6%	0%	07:11	-00:06	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.71	8%	17%	40	34	916	84	4%	3%	07:07	00:03	24	0
122nd Southbound 2_Halsey to Division	2.0	0.86	0.93	50%	59%	5	-4	1204	97	0%	0%	03:21	-01:01	29	-2
122nd Southbound 3_Division to Foster	1.9	0.64	0.66	0%	0%	393	-7	895	27	44%	-2%	08:13	-00:09	22	0
148th Northbound Powell to Stark	1.4	0.36	0.37	0%	0%	44	-18	271	2	16%	-7%	03:37	00:07	29	0
148th Southbound Stark to Powell	1.4	0.41	0.40	0%	0%	3	2	343	-9	1%	1%	04:49	-01:11	28	0
162nd Northbound Powell to Stark	1.7	0.28	0.30	0%	0%	58	22	397	25	15%	4%	03:56	00:16	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.32	0%	0%	7	4	528	-86	1%	1%	04:35	00:05	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.52	10%	10%	109	-10	733	1	15%	-1%	04:29	00:11	23	-1
82nd Northbound 2_Division to Halsey	2.0	0.81	0.82	21%	11%	191	13	1132	11	17%	1%	06:53	00:05	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.96	47%	47%	553	32	1291	47	43%	1%	03:48	00:05	21	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.90	30%	34%	167	-4	1244	17	13%	0%	03:36	00:11	22	0
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.97	73%	73%	229	3	1387	-26	17%	1%	09:07	-00:41	16	1
82nd Southbound 3_Division to Foster	1.5	0.68	0.66	8%	8%	74	-20	949	-24	8%	-2%	10:45	00:18	15	-1
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.38	0%	12%	29	-19	231	35	13%	-9%	06:21	02:17	24	-2
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.77	0%	7%	160	71	390	150	41%	2%	04:48	00:10	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.42	9%	9%	21	56	229	68	9%	17%	04:47	00:34	29	-1
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.36	0%	0%	0	12	210	41	0%	5%	00:00	09:22	24	-1
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.18	70%	70%	30	-10	1196	46	3%	-1%	08:22	00:03	22	0
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.19	65%	60%	521	-46	1486	16	35%	-3%	05:07	-00:02	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.72	0%	0%	247	3	1031	67	24%	-1%	05:32	-00:03	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.98	65%	65%	208	-5	1292	71	16%	-1%	11:38	-00:50	17	2
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.07	100%	100%	47	2	1751	-26	3%	0%	03:16	-00:13	28	-1
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.80	0%	0%	973	14	1318	-47	74%	4%	03:06	-00:08	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	1	635	-34	0%	0%	01:56	-00:12	27	-3
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.39	0%	0%	368	25	785	2	47%	3%	04:30	01:12	31	-4
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.25	0%	0%	146	-47	493	10	30%	-10%	04:05	00:29	30	0
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.46	0%	0%	6	1	798	18	1%	0%	01:45	00:14	26	0
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.71	0%	0%	574	-13	1016	40	56%	-3%	04:21	-00:03	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.49	0%	0%	257	52	689	57	37%	4%	04:11	00:05	35	0
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.27	0%	0%	147	-13	170	-10	86%	-3%	01:12	-00:01	24	0
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.33	0%	0%	205	-14	213	-13	96%	-1%	01:08	-00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.50	0%	0%	27	46	195	90	14%	12%	02:29	00:07	21	0
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.75	19%	19%	10	3	286	35	3%	1%	04:00	01:10	21	-1
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.63	20%	20%	27	-2	358	19	8%	-1%	03:52	-00:22	22	1
NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	-1	159	4	10%	-1%	02:12	00:14	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.26	0%	0%	7	-1	24	46	30%	-21%	03:00	00:32	21	-1
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.24	0%	0%	0	0	83	-8	0%	0%	00:00	00:00	22	-2
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.47	0%	0%	276	33	626	78	44%	0%	02:19	00:02	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.33	0%	0%	261	14	462	4	57%	3%	02:30	00:06	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	0.78	83%	31%	464	-253	1441	-528	32%	-9%	05:23	00:19	28	-2
Stark Eastbound 1_82nd to 122nd	2.0	1.14	0.89	69%	44%	51	-35	1623	-303	3%	-2%	06:17	01:41	24	-1
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.70	27%	0%	543	-107	854	-135	64%	-3%	04:41	00:51	31	-3
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.03	51%	51%	106	-3	1548	-123	7%	0%	07:44	-00:53	22	0


Scenario: 2020 + Stark Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change

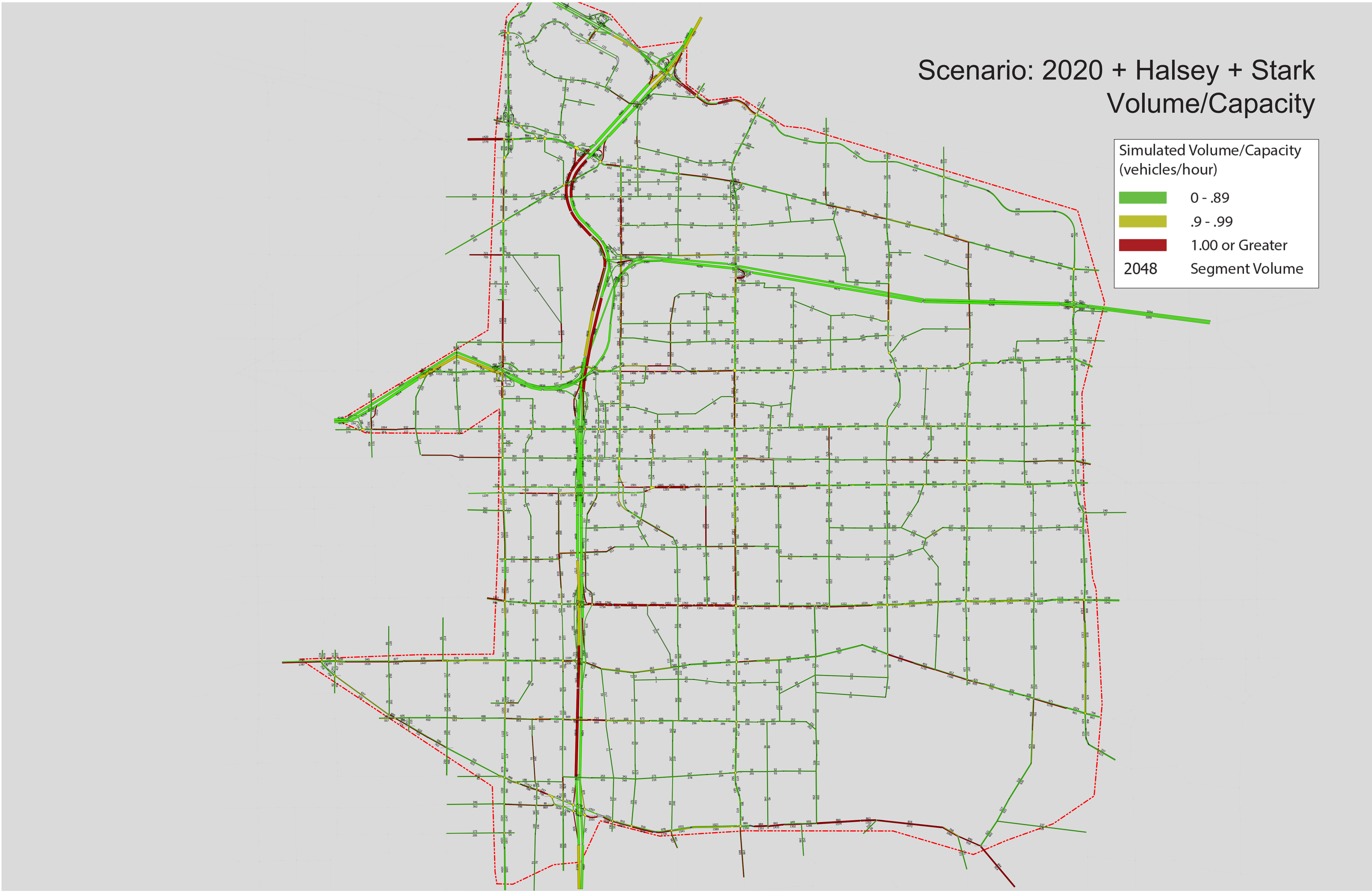

Scenario: 2020 + Stark
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume

Scenario:
2020 + Halsey + Stark


Scenario: 2020 + Halsey + Stark
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change

EPASS

PBOT
PORTLAND BUREAU OF TRANSPORTATION



Scenario 1	Scenario 2
2020 Committed Projects	2020 + Halsey + Stark
250807	250780

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red

More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
102nd Northbound Halsey to Sandy	1.7	1.27	1.26	71%	71%	197	-23	1092	-22	18%	-2%	05:06	-00:17	24	1
102nd Southbound Sandy to Halsey	1.7	0.80	0.81	44%	63%	7	1	699	-2	1%	0%	04:49	-00:20	28	1
122nd Northbound 1_Foster to Division	1.9	0.40	0.38	0%	0%	150	29	558	-22	27%	7%	05:06	00:02	28	0
122nd Northbound 2_Division to Halsey	2.0	0.62	0.61	0%	0%	16	17	868	-17	2%	2%	06:54	-00:28	28	-2
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	-5	804	-12	6%	-1%	07:11	-00:13	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.67	8%	14%	40	12	916	19	4%	1%	07:07	-00:33	24	1
122nd Southbound 2_Halsey to Division	2.0	0.86	0.91	50%	59%	5	0	1204	74	0%	0%	03:21	-00:38	29	-1
122nd Southbound 3_Division to Foster	1.9	0.64	0.65	0%	0%	393	-27	895	11	44%	-4%	08:13	-00:47	22	1
148th Northbound Powell to Stark	1.4	0.36	0.38	0%	0%	44	-22	271	11	16%	-8%	03:37	-00:02	29	0
148th Southbound Stark to Powell	1.4	0.41	0.40	0%	0%	3	3	343	-9	1%	1%	04:49	-00:21	28	-1
162nd Northbound Powell to Stark	1.7	0.28	0.32	0%	0%	58	22	397	55	15%	3%	03:56	00:14	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.33	0%	0%	7	-2	528	-65	1%	0%	04:35	-00:22	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.52	10%	10%	109	-12	733	1	15%	-2%	04:29	00:07	23	-1
82nd Northbound 2_Division to Halsey	2.0	0.81	0.82	21%	11%	191	15	1132	12	17%	1%	06:53	00:02	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.92	47%	47%	553	-7	1291	-3	43%	0%	03:48	-00:01	21	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.88	30%	34%	167	-12	1244	-11	13%	-1%	03:36	-00:09	22	1
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.97	73%	60%	229	11	1387	-27	17%	1%	09:07	-01:35	16	2
82nd Southbound 3_Division to Foster	1.5	0.68	0.67	8%	8%	74	-5	949	-10	8%	0%	10:45	-00:32	15	0
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.33	0%	0%	29	6	231	2	13%	2%	06:21	00:57	24	-2
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.78	0%	25%	160	68	390	154	41%	1%	04:48	00:00	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.46	9%	9%	21	43	229	91	9%	11%	04:47	00:30	29	-1
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.35	0%	0%	0	10	210	34	0%	4%	00:00	06:02	24	0
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.17	70%	70%	30	-10	1196	34	3%	-1%	08:22	-00:08	22	1
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.16	65%	60%	521	-77	1486	-14	35%	-5%	05:07	-00:03	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.71	0%	0%	247	12	1031	53	24%	0%	05:32	-00:03	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.99	65%	65%	208	11	1292	85	16%	0%	11:38	-00:58	17	2
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.06	100%	100%	47	27	1751	-35	3%	2%	03:16	01:32	28	-1
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.80	0%	0%	973	15	1318	-47	74%	4%	03:06	-00:02	35	0
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.35	0%	0%	1	3	635	-37	0%	1%	01:56	00:14	27	-4
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.39	0%	0%	368	12	785	-1	47%	2%	04:30	00:51	31	-2
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.28	0%	0%	146	-24	493	74	30%	-8%	04:05	00:19	30	-1
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.47	0%	0%	6	-2	798	38	1%	0%	01:45	00:30	26	1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.62	0%	0%	574	-30	1016	-93	56%	2%	04:21	00:19	34	-1
Halsey Westbound 162nd to 122nd	2.0	0.45	0.34	0%	0%	257	-36	689	-169	37%	5%	04:11	00:40	35	-3
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.29	0%	0%	147	-5	170	3	86%	-4%	01:12	00:08	24	-2
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.36	0%	0%	205	8	213	6	96%	1%	01:08	-00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.56	0%	0%	27	75	195	121	14%	18%	02:29	-00:00	21	0
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.79	19%	19%	10	13	286	61	3%	3%	04:00	00:26	21	-1
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.62	20%	20%	27	5	358	12	8%	1%	03:52	-00:22	22	1
NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	4	159	-2	10%	3%	02:12	00:03	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.22	0%	0%	7	14	24	39	30%	4%	03:00	00:10	21	-1
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.21	0%	0%	0	0	83	-15	0%	0%	00:00	00:00	22	1
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.47	0%	0%	276	18	626	66	44%	-2%	02:19	00:05	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.32	0%	0%	261	-11	462	-13	57%	-1%	02:30	00:03	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	0.78	83%	31%	464	-228	1441	-531	32%	-6%	05:23	00:43	28	-2
Stark Eastbound 1_82nd to 122nd	2.0	1.14	0.90	69%	44%	51	-43	1623	-302	3%	-3%	06:17	01:48	24	-1
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.72	27%	0%	543	-98	854	-115	64%	-3%	04:41	00:42	31	-2
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.02	51%	51%	106	-26	1548	-139	7%	-1%	07:44	00:58	22	-2

Scenario: Gateway Changes

EPASS PBOT

Scenario 1	Scenario 2																
2020 Committed Projects	Gateway Changes		Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
250807	250800	SubpathName	Dist (miles)	Sc1Subpath	Sc2Subpath	Sc1%>0.90	Sc2%>0.90	Count	ΔCount	Count	ΔCount	% Through	Δ %Through	Ttime (mm:ss)	ΔTtime/mile (mm:ss)	HSpeed(mph)	ΔHSpeed(mph)
		102nd Northbound Halsey to Sandy	1.7	1.27	1.22	71%	62%	197	-33	1092	-48	18%	-2%	05:06	-00:00	24	1
		102nd Southbound Sandy to Halsey	1.7	0.80	0.89	44%	70%	7	0	699	71	1%	0%	04:49	-00:22	28	2
		122nd Northbound 1_Foster to Division	1.9	0.40	0.37	0%	0%	150	0	558	-44	27%	2%	05:06	00:16	28	0
		122nd Northbound 2_Division to Halsey	2.0	0.62	0.63	0%	0%	16	3	868	17	2%	0%	06:54	-00:04	28	-1
		122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.55	0%	0%	45	-7	804	-33	6%	-1%	07:11	00:19	26	0
		122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.70	8%	8%	40	15	916	59	4%	1%	07:07	00:02	24	0
		122nd Southbound 2_Halsey to Division	2.0	0.86	0.88	50%	50%	5	-1	1204	32	0%	0%	03:21	-00:17	29	-1
		122nd Southbound 3_Division to Foster	1.9	0.64	0.63	0%	0%	393	-18	895	-10	44%	-2%	08:13	00:04	22	-1
		148th Northbound Powell to Stark	1.4	0.36	0.36	0%	0%	44	-19	271	-3	16%	-7%	03:37	00:07	29	0
		148th Southbound Stark to Powell	1.4	0.41	0.42	0%	0%	3	6	343	10	1%	2%	04:49	-01:19	28	-1
		162nd Northbound Powell to Stark	1.7	0.28	0.31	0%	0%	58	36	397	31	15%	7%	03:56	00:20	32	0
		162nd Southbound Stark to Powell	1.7	0.38	0.35	0%	0%	7	7	528	-39	1%	2%	04:35	-00:07	29	1
		82nd Northbound 1_Foster to Division	1.5	0.52	0.51	10%	10%	109	-12	733	-24	15%	-1%	04:29	00:06	23	0
		82nd Northbound 2_Division to Halsey	2.0	0.81	0.83	21%	34%	191	3	1132	26	17%	0%	06:53	00:01	20	0
		82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.95	47%	47%	553	10	1291	37	43%	0%	03:48	00:01	21	0
		82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.88	30%	30%	167	-9	1244	-15	13%	-1%	03:36	-00:06	22	0
		82nd Southbound 2_ Halsey to Division	2.0	0.99	0.99	73%	73%	229	-2	1387	-1	17%	0%	09:07	-00:32	16	0
		82nd Southbound 3_Division to Foster	1.5	0.68	0.68	8%	0%	74	1	949	-2	8%	0%	10:45	-00:29	15	0
		Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.44	0%	0%	29	-6	231	74	13%	-5%	06:21	00:20	24	0
		Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.62	0%	0%	160	0	390	44	41%	-4%	04:48	00:05	26	0
		Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.36	9%	9%	21	3	229	23	9%	0%	04:47	00:22	29	0
		Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.37	0%	0%	0	3	210	46	0%	1%	00:00	08:27	24	-1
		Division Eastbound 1_82nd to 122nd	2.0	1.13	1.14	70%	70%	30	-12	1196	9	3%	-1%	08:22	-00:04	22	1
		Division Eastbound 2_122nd to 162nd	2.0	1.17	1.08	65%	40%	521	-140	1486	-119	35%	-7%	05:07	-00:05	31	1
		Division Westbound 1_162nd to 122nd	2.0	0.67	0.68	0%	0%	247	-1	1031	15	24%	0%	05:32	00:03	32	0
		Division Westbound 2_122nd to 82nd	2.0	0.93	0.91	65%	65%	208	-14	1292	-38	16%	-1%	11:38	00:31	17	-1
		Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	1.03	100%	94%	47	9	1751	-82	3%	1%	03:16	00:47	28	0
		Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.75	0%	0%	973	-101	1318	-128	74%	-1%	03:06	-00:01	35	0
		Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.36	0%	0%	1	-1	635	-4	0%	0%	01:56	-01:56	27	0
		Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.36	0%	0%	368	-16	785	-56	47%	1%	04:30	-00:07	31	0
		Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.25	0%	0%	146	-21	493	-2	30%	-4%	04:05	00:06	30	0
		Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.48	0%	0%	6	0	798	40	1%	0%	01:45	00:21	26	0
		Halsey Eastbound 122nd to 162nd	2.0	0.68	0.67	0%	0%	574	-29	1016	-10	56%	-2%	04:21	-00:10	34	1
		Halsey Westbound 162nd to 122nd	2.0	0.45	0.48	0%	0%	257	36	689	48	37%	2%	04:11	00:10	35	0
		NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.23	0%	0%	147	-35	170	-33	86%	-5%	01:12	00:03	24	-1
		NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.35	0%	0%	205	-6	213	-4	96%	-1%	01:08	-00:01	25	0
		NG: 4M Eastbound 130th to 148th	0.9	0.35	0.37	0%	0%	27	-6	195	14	14%	-4%	02:29	00:12	21	1
		NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.80	19%	19%	10	10	286	91	3%	2%	04:00	00:01	21	0
		NG: 4M Westbound 122nd to I-205	1.3	0.60	0.73	20%	20%	27	24	358	80	8%	4%	03:52	00:02	22	0
		NG: 4M Westbound 148th to 130th	0.9	0.28	0.30	0%	0%	16	5	159	13	10%	2%	02:12	00:08	25	0
		NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.06	0%	0%	7	-5	24	-2	30%	-20%	03:00	-00:15	21	1
		NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.25	0%	0%	0	3	83	-3	0%	4%	00:00	03:01	22	0
		Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.46	0%	0%	276	6	626	58	44%	-3%	02:19	-00:02	28	0
		Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.33	0%	0%	261	7	462	0	57%	1%	02:30	00:01	27	0
		Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.21	83%	83%	464	37	1441	-22	32%	3%	05:23	-00:21	28	1
		Stark Eastbound 1_82nd to 122nd	2.0	1.14	0.94	69%	42%	51	-29	1623	-325	3%	-1%	06:17	01:44	24	-3
		Stark Westbound 1_162nd to 122nd	2.0	0.83	0.81	27%	27%	543	-31	854	-21	64%	-2%	04:41	-00:02	31	0
		Stark Westbound 2_122nd to 82nd	2.0	1.14	1.04	51%	59%	106	-16	1548	-147	7%	0%	07:44	00:06	22	-1

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

Red

More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change


Scenario: Gateway Changes
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change

EPASS

APPENDIX I

FINAL PREFERRED SCENARIO ANALYSIS

Memo #8

Date:	Monday, April 19, 2021
Project:	East Portland Arterial Streets Strategy
To:	PBOT
From:	HDR
Subject:	**Final Preferred Scenario Traffic Analysis (PBOT Comments)**

1.0 Introduction

This memo summarizes the final preferred scenario for the East Portland Arterial Streets Strategy (EPASS) network. The Portland Bureau of Transportation (PBOT) developed eight scenarios consisting of varying combinations of arterial roadway reorganizations. The EPASS traffic analysis process assessed each scenario's effects on congestion levels and potential diversion to adjacent streets. PBOT used this evaluation, and internal and neighborhood association input, to develop, evaluate, and select the Final Preferred Scenario, presented herein.

As a continuation of prior Aimsun Next analyses documented in prior memoranda, this memo also summarizes and compares Aimsun Next model outputs for the Final Preferred Scenario to the 2020 Committed Projects Base Scenario (the basis of comparison for all scenarios).

2.0 Methodology

To evaluate varying combinations of arterial reorganizations or scenario packages the Aimsun Next model contained 22 separate roadway reorganization projects. Each individual roadway reorganization represents a PBOT project that is either recently completed, currently under construction, or under development with funding and plans for construction in the next two years. The analysis then packaged the 22 roadway reorganizations into 10 scenarios, representing reasonably foreseeable packages of roadway projects.

The Final Preferred Scenario includes 13 individual roadway projects(Table 1). Eight projects are already committed and expected to be complete or under construction during 2020-2021. The remaining five roadway projects not already in the 2020 Committed Scenario include roadway reorganizations on 122nd Avenue, Halsey Street, Stark Street, Foster Road, and Glisan Street.

hdrinc.com 1050 SW 6th Avenue, Suite 1800, Portland, OR 97204-1151
(503) 423-3700

Table 1. EPASS Aimsun Final Preferred Scenario Roadway Reorganization Mix

Roadway Reorganization Projects	2019 Base	2020 Committed Projects	122nd Scenario B	122nd Scenario C	122nd Scenario D	122nd Scenario E	2020 + Halsey	2020 + Stark	2020 + Halsey + Stark	Gateway Changes	Final Preferred
Foster Streetscape	X	X	X	X	X	X	X	X	X	X	X
NE 102nd Pilot Project	X	X	X	X	X	X	X	X	X	X	X
NE Sandy/99th Restripe	X	X	X	X	X	X	X	X	X	X	X
I-205 Aux Lanes	X	X	X	X	X	X	X	X	X	X	X
NE 122nd: Marine-Marx					X	X					
NE 122nd: Marx-Fremont						X					
NE 122nd/I-84: 1 SB, 2 NB					X						
NE 122nd/I-84: 1 SB, 1 NB						X					
122nd: I-84-Division						X					
SE 122nd: Division-Holgate				X	X	X					
SE 122nd: Holgate – Foster			X	X	X	X					X
SE Stark: 108th-162nd								X	X		
East Glisan Phase 1 (122nd & east)		X	X	X	X	X	X	X	X	X	X
East Glisan Phase 2 (102nd-122nd)		X	X	X	X	X	X	X	X	X	X
SE 162nd: Stark-Powell		X	X	X	X	X	X	X	X	X	X
Outer Halsey (133rd-162nd)							X		X		
Halsey Viaduct Reorg										X	X
Stark/Washington Couplet										X	X
Foster/Woodstock Couplet East											X
NE 148th: Glisan - I-84		X	X	X	X	X	X	X	X	X	X
NE Sandy: 82nd-99th											
NE Glisan: 82nd-102nd										X	X

SB=southbound
NB=northbound
Source: PBOT

2.1 EPASS Performance Measures

The Aimsun Next model spans the 4 P.M. to 5 P.M. peak period, and performance measures are reported at either the full corridor length or at a subpath level (an approximately 2-mile-long subsegment of the corridor), for a more precise analysis. Analysis results are reported using the following performance measures:

- Traffic Volumes – Traffic volumes by direction
- Traffic Congestion -– Traffic volume-to-capacity (V/C) ratios by direction

- Traffic Travel Times – Traffic travel times reported by subpath
- Traffic Diversion – Increased traffic volumes on adjacent arterials and local streets

3.0 Final Preferred Scenario Analysis

This section presents Aimsun Next model results for the Final Preferred Scenario and compares them to the 2020 Committed Projects Base Scenario.

Table 2 presents roadway reorganizations under the 2020 Committed Projects Base Scenario compared with roadway reorganizations comprising the Final Preferred Scenario.

Table 2. Roadway Reorganizations Included in the Final Preferred and 2020 Committed Projects Base Scenarios

	Foster Streetscape	NE 102nd Pilot Project	NE Sandy/99th Restripe	I-205 Aux Lanes	NE 122nd: Marine-Marx	NE 122nd: Marx Fremont	NE 122nd/I-84: 1 SB, 2 NB	NE 122nd/I-84: 1 SB, 1 NB	122nd: I-84-Division	SE 122nd: Division-Holgate	SE 122nd: Holgate – Foster	SE Stark: 108th-162nd	East Glisan Phase 1 (122nd &	East Glisan Phase 2 (102nd-	SE 162nd: Stark-Powell	Outer Halsey (133rd-162nd)	Halsey Viaduct Reorg	Stark/Washington Couplet	Foster/Woodstock Couplet	NE 148th: Glisan - I-84	NE Sandy: 82nd-99th	NE Glisan: 82nd-102nd
Final Preferred	X	X	X	X							X		X	X	X		X	X	X	X		X
2020 Committed Projects	X	X	X	X									X	X	X					X		

3.1.1 General Assumptions

The Final Preferred Scenario includes roadway reorganization projects on 122nd Avenue, Halsey Street, Stark Street, Foster Road, and Glisan Street. The roadway reorganizations selected for the Final Preferred Scenario balance greater separation between modes with minimizing traffic diversion onto adjacent streets, particularly local roadways.

Additional roadway reorganizations in the Final Preferred Scenario beyond the universally assumed 2019 and 2020 projects include:

- 122nd Avenue – Operational changes from a 5-lane to 3-lane reorganization on a portion of SE 122nd Avenue between SE Holgate Boulevard and SE Foster Road.
- Halsey Viaduct Reorganization project removes one eastbound travel lane and replaces it with a two-way protected bike lane along NE Halsey Street from 92nd to 100th Avenues.
- Stark/Washington Streets Couplet project repurposes a travel lane along the Stark and Washington Streets Couplet to allow for bus queue jumps and protected bike lanes from 92nd to 108th Avenues.

- Foster Road/Woodstock Boulevard Couplet East project includes signal timing upgrades and pedestrian/bicycle safety improvements by providing enhanced separation between modes and crossing opportunities.
- Glisan Street, 82nd Avenue to 102nd Avenue project adds bike lanes and a potential double left turn lane onto I-205 southbound to reduce queuing and associated delays.

3.1.2 Notable Observations

Subpath Overview

While most of the subpaths exist on EPASS arterials, the analysis models an additional eight subpaths on existing or planned for neighborhood greenways. Table 3 summarizes performance measures and results at the corridor and subpath levels for the Final Preferred Scenario and the 2020 Committed Projects Base Scenario.

Traffic Volumes

Congestion levels under the Final Preferred Scenario are modeled to be similar to levels under the 2020 Committed Projects Base Scenario. The Final Preferred Scenario does not include a major reorganization for 122nd Avenue, because model results showed an increase in congestion and traffic diversion to adjacent roadways.

In some locations, traffic volumes are projected to decrease under the Final Preferred Scenario, including:

- The Stark Street/Washington Boulevard couplet between 82nd and 108th Avenues
- The Foster Road/Woodstock Boulevard couplet
- Foster Road
- Division Street between I-205 and 122nd Avenue
- Sandy Boulevard
- 92nd Avenue between Washington and Division Streets

In some locations, traffic volumes would increase under the Final Preferred Scenario, including:

- Powell Boulevard east of I-205
- 102nd Avenue (SB)
- 122nd Avenue

Table 3. Final Preferred Scenario Subpath Performance*

Scenario 1 = 2020 Committed Projects Base Scenario
Scenario 2 = Final Preferred Scenario

	Segment Length	Volume to Capacity Ratio (V/C)				Through Trip Volumes		Subpath Average Volume		Through Trip Proportion		Through Trip Travel Times		Subpath Average Speed	
Subpath Name	Distance (miles)	Scenario 1 Subpath	Scenario 2 Subpath	Scenario 1 % >0.90	Scenario 2 % >0.90	Count	Δ Count	Count	Δ Count	% Through	Δ % Through	Travel Time (mm:ss)	Δ Travel Time/Mile (mm:ss)	Speed (mph)	Δ Speed (mph)
102nd NB Halsey to Sandy	1.7	1.27	1.25	71%	71%	197	26	1092	-15	18%	3%	05:06	-00:48	24	3
102nd SB Sandy to Halsey	1.7	0.80	0.92	44%	70%	7	-3	699	103	1%	-1%	04:49	00:15	28	2
122nd NB 1_Foster to Division	1.9	0.40	0.40	0%	0%	150	8	558	5	27%	1%	05:06	00:11	28	-1
122nd NB 2_Division to Halsey	2.0	0.62	0.66	0%	0%	16	2	868	56	2%	0%	06:54	-00:24	28	0
122nd NB 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	3	804	-3	6%	0%	07:11	-00:27	26	0
122nd SB 1_Airport Way to Halsey	2.2	0.65	0.70	8%	12%	40	12	916	63	4%	1%	07:07	-00:17	24	0
122nd SB 2_Halsey to Division	2.0	0.86	0.88	50%	56%	5	0	1204	25	0%	0%	03:21	-00:38	29	-1
122nd SB 3_Division to Foster	1.9	0.64	0.61	0%	0%	393	-36	895	-38	44%	-2%	08:13	-00:20	22	2
148th NB Powell to Stark	1.4	0.36	0.35	0%	0%	44	-21	271	-7	16%	-8%	03:37	00:16	29	-1
148th SB Stark to Powell	1.4	0.41	0.41	0%	0%	3	4	343	-3	1%	1%	04:49	-01:09	28	0
162nd NB Powell to Stark	1.7	0.28	0.29	0%	0%	58	23	397	16	15%	5%	03:56	00:22	32	0
162nd SB Stark to Powell	1.7	0.38	0.38	0%	0%	7	9	528	0	1%	2%	04:35	00:26	29	0
82nd NB 1_Foster to Division	1.5	0.52	0.61	10%	10%	109	27	733	115	15%	1%	04:29	01:21	23	-4
82nd NB 2_Division to Halsey	2.0	0.81	0.88	21%	43%	191	13	1132	103	17%	0%	06:53	00:10	20	0
82nd NB 3_Halsey to Sandy	1.3	0.92	0.97	47%	62%	553	51	1291	65	43%	2%	03:48	-00:17	21	0
82nd SB 1_Sandy to Halsey	1.3	0.89	0.85	30%	30%	167	-44	1244	-53	13%	-3%	03:36	00:10	22	-1
82nd SB 2_ Halsey to Division	2.0	0.99	0.91	73%	46%	229	-40	1387	-117	17%	-2%	09:07	02:40	16	-3
82nd SB 3_Division to Foster	1.5	0.68	0.63	8%	0%	74	13	949	-62	8%	2%	10:45	-03:58	15	2
Burnside EB 1_82nd to 122nd	2.0	0.33	0.41	0%	0%	29	-16	231	58	13%	-8%	06:21	-00:14	24	1
Burnside EB 2_122nd to 162nd	2.0	0.56	0.71	0%	17%	160	84	390	108	41%	8%	04:48	-00:05	26	0
Burnside WB 1_162nd to 122nd	2.0	0.33	0.35	9%	9%	21	9	229	19	9%	3%	04:47	00:36	29	-1
Burnside WB 2_122nd to 82nd	2.0	0.30	0.33	0%	0%	0	0	210	19	0%	0%	00:00	00:00	24	0
Division EB 1_82nd to 122nd	2.0	1.13	1.25	70%	70%	30	7	1196	130	3%	0%	08:22	00:01	22	-1
Division EB 2_122nd to 162nd	2.0	1.17	1.09	65%	40%	521	-92	1486	-114	35%	-4%	05:07	00:09	31	0
Division WB 1_162nd to 122nd	2.0	0.67	0.69	0%	0%	247	-2	1031	33	24%	-1%	05:32	-00:04	32	0
Division WB 2_122nd to 82nd	2.0	0.93	0.89	65%	65%	208	-30	1292	-59	16%	-2%	11:38	01:02	17	-1
Foster Rd EB I-205 to 122nd	1.4	1.08	0.89	100%	42%	47	-7	1751	-315	3%	0%	03:16	-00:21	28	1
Foster Rd WB 122nd to I-205	1.4	0.83	0.67	0%	0%	973	-244	1318	-243	74%	-6%	03:06	00:28	35	-1
Glisan EB 1_82nd to 122nd	1.8	0.37	0.39	0%	0%	1	4	635	39	0%	1%	01:56	-00:17	27	1
Glisan EB 2_122nd to 162nd	2.0	0.39	0.38	0%	0%	368	-29	785	-24	47%	-2%	04:30	-00:04	31	0
Glisan WB 1_162nd to 122nd	2.0	0.25	0.23	0%	0%	146	-1	493	-28	30%	2%	04:05	00:07	30	-1
Glisan WB 2_122nd to 82nd	2.0	0.45	0.47	0%	0%	6	-1	798	33	1%	0%	01:45	00:26	26	1
Halsey EB 122nd to 162nd	2.0	0.68	0.68	0%	0%	574	-50	1016	-6	56%	-5%	04:21	-00:00	34	0
Halsey WB 162nd to 122nd	2.0	0.45	0.48	0%	0%	257	19	689	43	37%	0%	04:11	00:13	35	-1
NG: 130s NB Glisan to Halsey	0.5	0.28	0.24	0%	0%	147	-19	170	-25	86%	2%	01:12	00:02	24	-1
NG: 130s SB Halsey to Glisan	0.5	0.35	0.41	0%	0%	205	34	213	31	96%	2%	01:08	00:01	25	0

Subpath Name	Segment Length	Volume to Capacity Ratio (V/C)				Through Trip Volumes		Subpath Average Volume		Through Trip Proportion		Through Trip Travel Times		Subpath Average Speed	
	Distance (miles)	Scenario 1 Subpath	Scenario 2 Subpath	Scenario 1 % >0.90	Scenario 2 % >0.90	Count	Δ Count	Count	Δ Count	% Through	Δ % Through	Travel Time (mm:ss)	Δ Travel Time/Mile (mm:ss)	Speed (mph)	Δ Speed (mph)
NG: 4M EB 130th to 148th	0.9	0.35	0.36	0%	0%	27	-6	195	7	14%	-3%	02:29	00:13	21	1
NG: 4M EB I-205 to 122nd	1.3	0.65	0.82	19%	19%	10	5	286	113	3%	0%	04:00	-00:01	21	0
NG: 4M WB 122nd to I-205	1.3	0.60	0.69	20%	20%	27	12	358	58	8%	2%	03:52	-00:09	22	1
NG: 4M WB 148th to 130th	0.9	0.28	0.28	0%	0%	16	7	159	3	10%	4%	02:12	00:03	25	0
NG: HOP EB 102nd to 122nd	1.0	0.07	0.07	0%	0%	7	2	24	-1	30%	11%	03:00	-00:01	21	0
NG: HOP WB 122nd to 102nd	1.0	0.26	0.26	0%	0%	0	4	83	3	0%	5%	00:00	02:52	22	0
Sandy NB 82nd to Killingsworth	1.0	0.42	0.44	0%	0%	276	-33	626	23	44%	-7%	02:19	-00:01	28	0
Sandy SB Killingsworth to 82nd	1.0	0.33	0.28	0%	0%	261	-57	462	-75	57%	-4%	02:30	00:02	27	0
Stark EB 1_122nd to 162nd	2.0	1.23	1.19	83%	57%	464	62	1441	-40	32%	5%	05:23	-00:34	28	1
Stark EB 1_82nd to 122nd	2.0	1.14	0.95	69%	40%	51	-18	1623	-314	3%	-1%	06:17	01:14	24	-3
Stark WB 1_162nd to 122nd	2.0	0.83	0.83	27%	27%	543	-1	854	2	64%	0%	04:41	-00:07	31	0
Stark WB 2_122nd to 82nd	2.0	1.14	1.11	51%	59%	106	13	1548	-63	7%	1%	07:44	-01:02	22	0

Green indicates improvements in performance (fewer vehicles, shorter travel times, higher average speeds).
Red indicates decreases in performance (more vehicles, longer travel times, lower average speeds).
Gold indicates no change between the two scenarios.
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound

Travel Time

Overall, projected travel times along EPASS arterials under the Final Preferred Scenario would remain within approximately 5 percent of travel for the 2020 Committed Project Base Scenario. Corridors projected to experience substantial travel time reductions under the Final Preferred Scenario include:

- 122nd Avenue
- 82nd Avenue SB between Division Street and Foster Road
- Stark Street WB between 122nd and 82nd Avenues

Diversion to Non-EPASS Arterials

The Final Preferred Scenario would not result in significant traffic diversion onto the local street network, however the Aimsun Next Model projects traffic volume increases, or diversions, on a few arterials, including:

- Market Street between 82nd and 122nd Avenues, which could affect access to the 4M Neighborhood Greenway near I-205
- Holgate Boulevard west of 122nd Avenue
- 92nd Avenue and Harold Street
- San Rafael Street, north of Halsey Street

EPASS

APPENDIX I1

FINAL PREFERRED SCENARIO ANALYSIS

MODEL TABLES AND PLOTS

Scenario: Final Preferred

EPASS

PBOT

PORTLAND BUREAU OF TRANSPORTATION

Scenario 1	Scenario 2
2020 Committed Projects	Final Preferred
250807	250918

Green

Fewer vehicles, shorter travel times, higher average speeds relative to the base

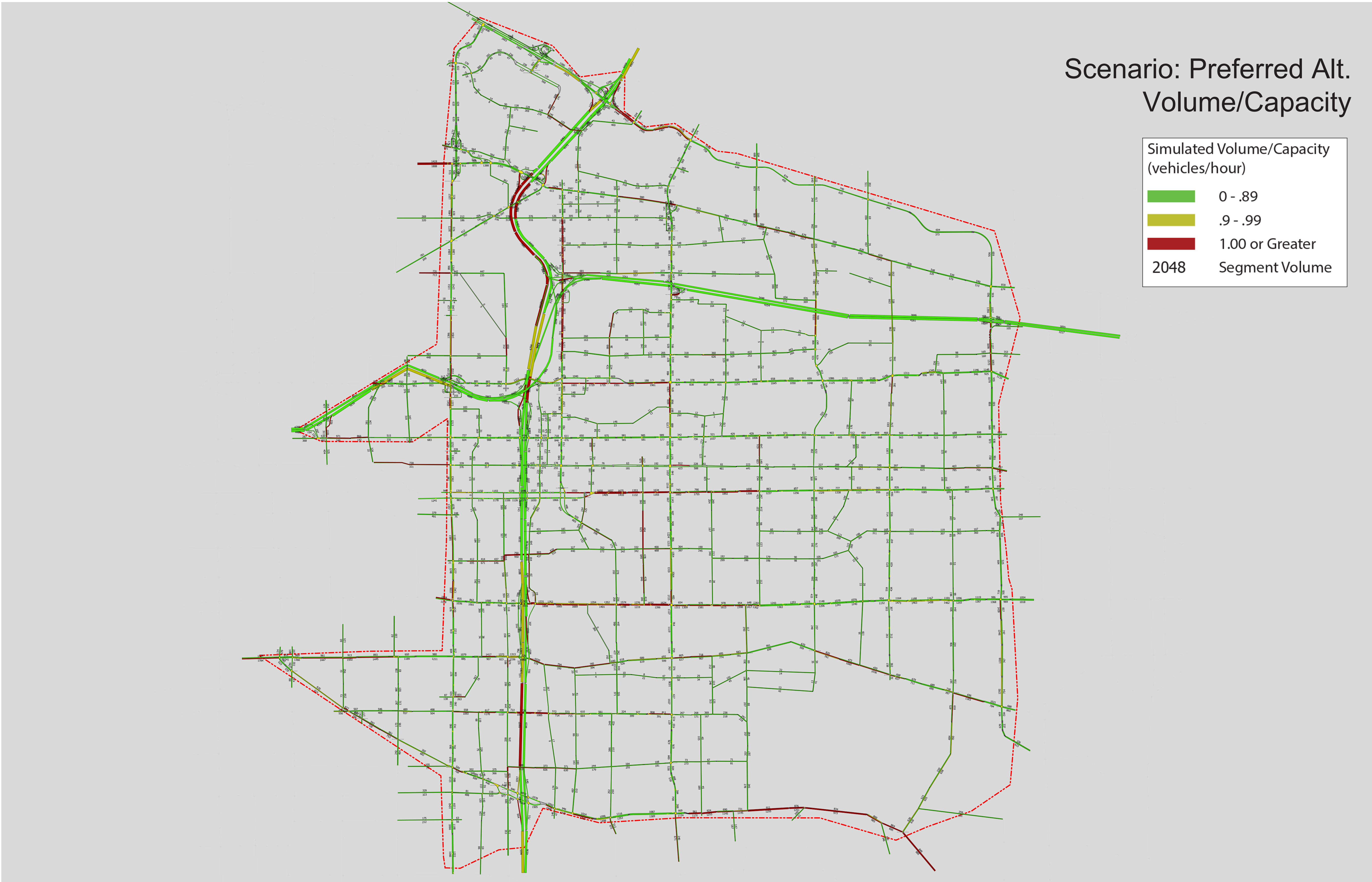
Red

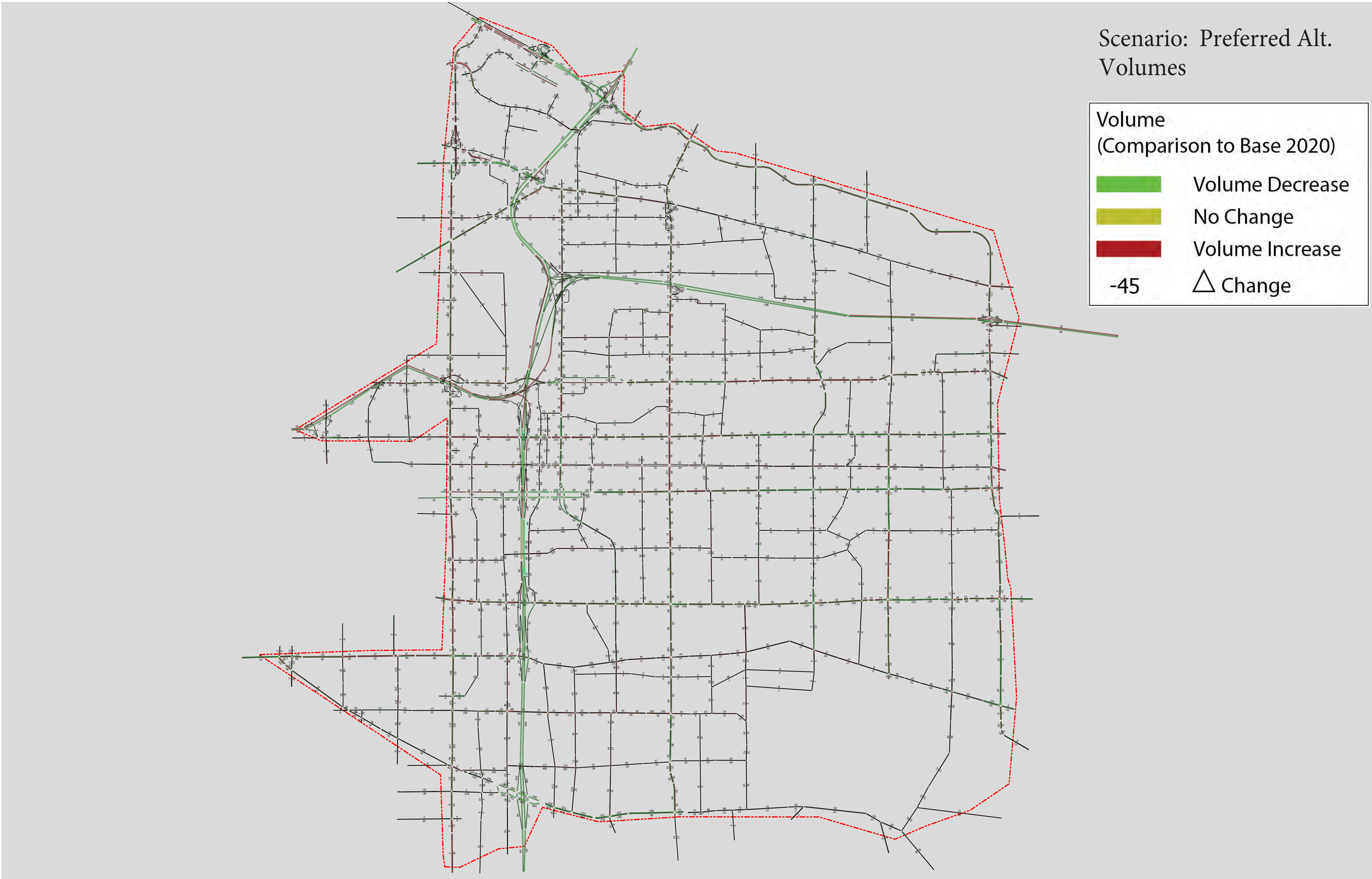
More vehicles, longer travel times, lower average speeds relative to the base

Gold

No change

	Segment Length	Volume to Capacity Ratio				Through Trips Volume		Subpath Weight Average Volume		Trip Proportion		Through Trips Travel Time		Subpath Weighted Average Speed	
SubpathName	**Dist (miles)**	**Sc1Subpath**	**Sc2Subpath**	**Sc1%>0.90**	**Sc2%>0.90**	**Count**	**ΔCount**	**Count**	**ΔCount**	**% Through**	**Δ %Through**	**Ttime (mm:ss)**	**ΔTtime/mile (mm:ss)**	**HSpeed(mph)**	**ΔHSpeed(mph)**
102nd Northbound Halsey to Sandy	1.7	1.27	1.25	71%	71%	197	26	1092	-15	18%	3%	05:06	-00:48	24	3
102nd Southbound Sandy to Halsey	1.7	0.80	0.92	44%	70%	7	-3	699	103	1%	-1%	04:49	00:15	28	2
122nd Northbound 1_Foster to Division	1.9	0.40	0.40	0%	0%	150	8	558	5	27%	1%	05:06	00:11	28	-1
122nd Northbound 2_Division to Halsey	2.0	0.62	0.66	0%	0%	16	2	868	56	2%	0%	06:54	-00:24	28	0
122nd Northbound 3_Halsey to Airport Way	2.2	0.57	0.57	0%	0%	45	3	804	-3	6%	0%	07:11	-00:27	26	0
122nd Southbound 1_Airport Way to Halsey	2.2	0.65	0.70	8%	12%	40	12	916	63	4%	1%	07:07	-00:17	24	0
122nd Southbound 2_Halsey to Division	2.0	0.86	0.88	50%	56%	5	0	1204	25	0%	0%	03:21	-00:38	29	-1
122nd Southbound 3_Division to Foster	1.9	0.64	0.61	0%	0%	393	-36	895	-38	44%	-2%	08:13	-00:20	22	2
148th Northbound Powell to Stark	1.4	0.36	0.35	0%	0%	44	-21	271	-7	16%	-8%	03:37	00:16	29	-1
148th Southbound Stark to Powell	1.4	0.41	0.41	0%	0%	3	4	343	-3	1%	1%	04:49	-01:09	28	0
162nd Northbound Powell to Stark	1.7	0.28	0.29	0%	0%	58	23	397	16	15%	5%	03:56	00:22	32	0
162nd Southbound Stark to Powell	1.7	0.38	0.38	0%	0%	7	9	528	0	1%	2%	04:35	00:26	29	0
82nd Northbound 1_Foster to Division	1.5	0.52	0.61	10%	10%	109	27	733	115	15%	1%	04:29	01:21	23	-4
82nd Northbound 2_Division to Halsey	2.0	0.81	0.88	21%	43%	191	13	1132	103	17%	0%	06:53	00:10	20	0
82nd Northbound 3_Halsey to Sandy	1.3	0.92	0.97	47%	62%	553	51	1291	65	43%	2%	03:48	-00:17	21	0
82nd Southbound 1_Sandy to Halsey	1.3	0.89	0.85	30%	30%	167	-44	1244	-53	13%	-3%	03:36	00:10	22	-1
82nd Southbound 2_ Halsey to Division	2.0	0.99	0.91	73%	46%	229	-40	1387	-117	17%	-2%	09:07	02:40	16	-3
82nd Southbound 3_Division to Foster	1.5	0.68	0.63	8%	0%	74	13	949	-62	8%	2%	10:45	-03:58	15	2
Burnside Eastbound 1_82nd to 122nd	2.0	0.33	0.41	0%	0%	29	-16	231	58	13%	-8%	06:21	-00:14	24	1
Burnside Eastbound 2_122nd to 162nd	2.0	0.56	0.71	0%	17%	160	84	390	108	41%	8%	04:48	-00:05	26	0
Burnside Westbound 1_162nd to 122nd	2.0	0.33	0.35	9%	9%	21	9	229	19	9%	3%	04:47	00:36	29	-1
Burnside Westbound 2_122nd to 82nd	2.0	0.30	0.33	0%	0%	0	0	210	19	0%	0%	00:00	00:00	24	0
Division Eastbound 1_82nd to 122nd	2.0	1.13	1.25	70%	70%	30	7	1196	130	3%	0%	08:22	00:01	22	-1
Division Eastbound 2_122nd to 162nd	2.0	1.17	1.09	65%	40%	521	-92	1486	-114	35%	-4%	05:07	00:09	31	0
Division Westbound 1_162nd to 122nd	2.0	0.67	0.69	0%	0%	247	-2	1031	33	24%	-1%	05:32	-00:04	32	0
Division Westbound 2_122nd to 82nd	2.0	0.93	0.89	65%	65%	208	-30	1292	-59	16%	-2%	11:38	01:02	17	-1
Foster Rd Eastbound I-205 Ramps to 122nd	1.4	1.08	0.89	100%	42%	47	-7	1751	-315	3%	0%	03:16	-00:21	28	1
Foster Rd Westbound 122nd to I-205 Ramps	1.4	0.83	0.67	0%	0%	973	-244	1318	-243	74%	-6%	03:06	00:28	35	-1
Glisan Eastbound 1_82nd to 122nd	1.8	0.37	0.39	0%	0%	1	4	635	39	0%	1%	01:56	-00:17	27	1
Glisan Eastbound 2_122nd to 162nd	2.0	0.39	0.38	0%	0%	368	-29	785	-24	47%	-2%	04:30	-00:04	31	0
Glisan Westbound 1_162nd to 122nd	2.0	0.25	0.23	0%	0%	146	-1	493	-28	30%	2%	04:05	00:07	30	-1
Glisan Westbound 2_122nd to 82nd	2.0	0.45	0.47	0%	0%	6	-1	798	33	1%	0%	01:45	00:26	26	1
Halsey Eastbound 122nd to 162nd	2.0	0.68	0.68	0%	0%	574	-50	1016	-6	56%	-5%	04:21	-00:00	34	0
Halsey Westbound 162nd to 122nd	2.0	0.45	0.48	0%	0%	257	19	689	43	37%	0%	04:11	00:13	35	-1
NG: 130s Northbound Glisan to Halsey	0.5	0.28	0.24	0%	0%	147	-19	170	-25	86%	2%	01:12	00:02	24	-1
NG: 130s Southbound Halsey to Glisan	0.5	0.35	0.41	0%	0%	205	34	213	31	96%	2%	01:08	00:01	25	0
NG: 4M Eastbound 130th to 148th	0.9	0.35	0.36	0%	0%	27	-6	195	7	14%	-3%	02:29	00:13	21	1
NG: 4M Eastbound I-205 to 122nd	1.3	0.65	0.82	19%	19%	10	5	286	113	3%	0%	04:00	-00:01	21	0
NG: 4M Westbound 122nd to I-205	1.3	0.60	0.69	20%	20%	27	12	358	58	8%	2%	03:52	-00:09	22	1
NG: 4M Westbound 148th to 130th	0.9	0.28	0.28	0%	0%	16	7	159	3	10%	4%	02:12	00:03	25	0
NG: HOP Eastbound 102nd to 122nd	1.0	0.07	0.07	0%	0%	7	2	24	-1	30%	11%	03:00	-00:01	21	0
NG: HOP Westbound 122nd to 102nd	1.0	0.26	0.26	0%	0%	0	4	83	3	0%	5%	00:00	02:52	22	0
Sandy Northbound 82nd to Killingsworth	1.0	0.42	0.44	0%	0%	276	-33	626	23	44%	-7%	02:19	-00:01	28	0
Sandy Southbound Killingsworth to 82nd	1.0	0.33	0.28	0%	0%	261	-57	462	-75	57%	-4%	02:30	00:02	27	0
Stark Eastbound 1_122nd to 162nd	2.0	1.23	1.19	83%	57%	464	62	1441	-40	32%	5%	05:23	-00:34	28	1
Stark Eastbound 1_82nd to 122nd	2.0	1.14	0.95	69%	40%	51	-18	1623	-314	3%	-1%	06:17	01:14	24	-3
Stark Westbound 1_162nd to 122nd	2.0	0.83	0.83	27%	27%	543	-1	854	2	64%	0%	04:41	-00:07	31	0
Stark Westbound 2_122nd to 82nd	2.0	1.14	1.11	51%	59%	106	13	1548	-63	7%	1%	07:44	-01:02	22	0


Scenario: Preferred Alt.
Volume/Capacity
Simulated Volume/Capacity
(vehicles/hour)
0 - .89
.9 - .99
1.00 or Greater
2048 Segment Volume


Scenario: Preferred Alt.
Volumes
Volume
(Comparison to Base 2020)
Volume Decrease
No Change
Volume Increase
-45
△ Change

EPASS

APPENDIX J

IMPLEMENTATION AND INVESTMENT STRATEGY

PORTLAND BUREAU OF TRANSPORTATION
1120 SW Fifth Ave, Suite 1331, Portland OR 97204
Main: 503-823-5185 TTY: 503-823-6868 Fax: 503-823-7576
Chloe Eudaly Commissioner **Chris Warner** Director

EAST PORTLAND ARTERIAL STREETS STRATEGY MEMO #10

Date: December 17, 2020

To: PBOT and Consultant EPASS Staff

From: Steve Szigethy on behalf of PBOT EPASS Team

Subject: Implementation and Investment Strategy

This memo provides a summary of recently completed, funded and unfunded capital projects that would help implement the EPASS Network vision illustrated in the Preferred Scenario and Corridor Summaries in the main body of the EPASS report. Most of the funded projects are in design engineering or under construction as of this writing. Nine additional projects to enhance the EPASS Network are unfunded at this time and are recommended for upcoming funding allocations or grant opportunities. Project summaries below are organized by funding status and listed from north to south, then west to east. Projects on NE/SE 82nd Avenue, SE Powell Boulevard, and NE Sandy Boulevard east of 99th Avenue are not listed because they are state roadways not part of the EPASS Network.

I. RECENTLY COMPLETED PROJECTS

During the two-year span of the EPASS planning process, from late 2018 through the end of 2020, PBOT finished construction on four significant capital projects on the EPASS Network, illustrated on the following page.

Table 1 – Recently Completed Capital Projects on the EPASS Network, 2018-2020

Halsey/Weidler Streetscape Project: Pedestrian crossings, transit islands, protected bike lanes, ornamental street lights, and two public plazas on NE Halsey Street and NE Weider Street from NE 102nd to 112th Avenues, completed in 2019 with funding from Prosper Portland.

East Glisan Street Update Phase I: Protected bike lanes, new signalized crossing at NE 128th Avenue, and five-to-three-lane road reorg on NE Glisan Street from NE 122nd to 162nd Avenues, completed in 2019 as part of the federal aid East Portland Active Transportation to Transit ("EPAT") project.

Foster Streetscape Project: East of SE 82nd Avenue the project provided wider sidewalks, bike lanes, street lighting, and new paving, by means of a four-to-three lane road reorg and moving the curbs inward. The combined federal aid and Fixing Our Streets project was completed in 2019 and extends from SE 52nd Avenue to SE 90th Avenue.

NE 102nd Avenue Corridor Safety Project: Pedestrian crossings with median islands and curb extensions, buffered bike lanes, and a five-to-three-lane road reorg on NE 102nd Avenue from NE Weider Street to NE Sandy Boulevard, piloted with low-cost materials in 2019, then hardened with concrete islands in 2020 after a successful evaluation period.

Also during this time period, PBOT completed smaller spot investments on the EPASS Network, including pedestrian safety improvements at the SE Division Street and 148th Avenue intersection, a new pedestrian crossing with access management at SE Stark Street and 155th Avenue, sidewalk infill on NE 148th Avenue between Glisan and Halsey Streets, and street light infill on SE Division Street east of I-205.

II. FUNDED PROJECTS

The following projects on the EPASS Network have secured funding, and are either under construction, in design engineering, or in a pre-design grant agreement phase. These projects are anticipated to be complete over the next five years (2021-2025). Information presented below includes project identification number(s), project summary, planning level cost estimate (or more refined estimate if available), anticipated year of construction, and delivery notes.

1. Halsey Street Safety and Access to Transit

Project IDs: TSP project 40086; PBOT CIP project T00871; Federal aid project K20813.

Description: Improvements on NE Halsey Street between 84th and 92nd Avenues will include sidewalk infill on the north side, a two-way cycle track on the south side, street lighting, and an intersection redesign at 84th Avenue. Additional project scope is located west of 84th Avenue.

Cost Estimate: $5,108,000

Anticipated Construction Year: 2023

Delivery Notes: This is a federal aid design-bid-build project awarded through the 2018-21 Regional Flexible Funds.

Website: www.portland.gov/transportation/hsat

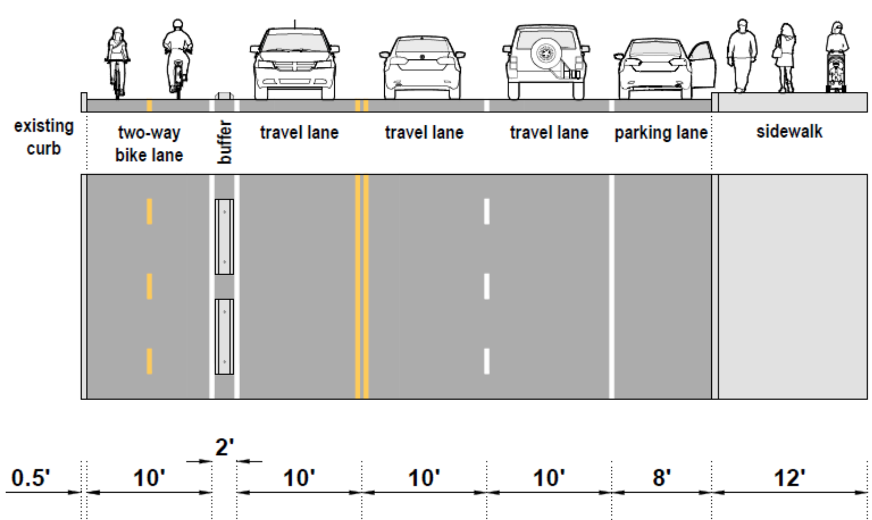


Figure 1 - Proposed cross section of NE Halsey St between 85th and 92nd Aves, looking west.

2. I-205 Overcrossing at NE Halsey Project

Project IDs: TSP project 40119; PBOT CIP project T00631; Federal aid project K20332.

Description: This project will connect the Tillamook Neighborhood Greenway west of I-205 with the Holladay-Oregon-Pacific Neighborhood Greenway east of I-205, by reallocating the southernmost eastbound vehicle lane on the NE Halsey Street viaduct between 92nd and 100th Avenues to become a protected two-way cycle track, while pedestrians use the existing north side sidewalk on the viaduct. The traffic signal at NE Halsey and 100th will be reconfigured to eliminate left turns and introduce a bicycle signal phase to safely connect the bikeways on either side of this intersection. Left turn vehicle movements will be relocated to new "jughandles" on either side of the signal. A signal modification is also proposed at NE Halsey and 92nd to facilitate the new bicycle movements. A previous iteration of the project scope included a pathway underneath I-205 next to the Union Pacific Railroad, which was found to be infeasible from a structural engineering, regulatory, and public safety standpoint.

Cost Estimate: $3,631,000

Anticipated Construction Year: 2023

Delivery Notes: This is a federal aid design-bid-build project awarded through the STIP Enhance program.

Website: Coming soon

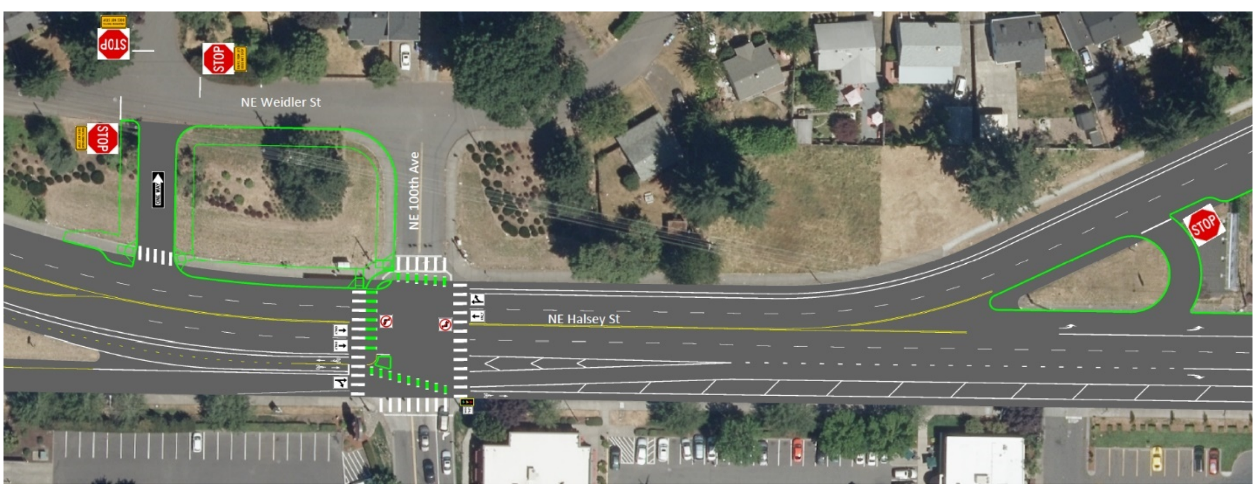


Figure 2 - Conceptual layout of proposed intersection reconfiguration at NE Halsey St & 100th Ave to transition the south side two-way bikeway to directional bike lanes. Vehicle left turn movements are relocated to new jughandles.

3. Outer Halsey Safety Project Phase I

Project IDs: TSP project 50028; PBOT CIP project T00663

Description: Curb-tight sidewalk infill and targeted ADA ramp upgrades on NE Halsey Street from 122nd to 162nd Avenues, excluding Glendoveer Golf Course frontage due to topography. New pedestrian crossings with median islands, rectangular rapid flashing beacons, and improved street lighting at NE 119th and 128th Avenues. Two separate projects, East Portland Access to Employment and Education (T00455) and NE Halsey/114th (T01039), will provide a pedestrian hybrid beacon crossing at NE 155th Avenue and a full traffic signal at NE 114th Avenue, respectively. An earlier iteration of the project scope included protected bike lanes from NE 112th to 162nd Avenues, but these were dropped due to cost overruns and placed in unfunded EPASS project E-6 below.

Figure 3 - Missing sidewalk on NE Halsey Street.

Cost Estimate: $4,459,000

Anticipated Construction Year: 2021

Delivery Notes: This is a city-funded design-bid-build project.

Website: www.portland.gov/transportation/outerhalsey

4. East Glisan Street Update Phase II

Project IDs: TSP project 50025; PBOT CIP projects T00455/T00720/T00757; Federal aid project K19297

Description: As part of the larger East Portland Access to Employment and Education project (T00455), NE Glisan St will be restriped from NE 102nd to 122nd Avenues. The road reorg results in one westbound vehicle lane, two eastbound vehicle lanes (due to heavy PM peak volume), center left turn lane, and paint-and-post protected bike lanes. Westbound car traffic regains the lost lane immediately after NE 108th Avenue to provide AM peak queueing space for the NE 102nd Avenue signal. New pedestrian hybrid signals will be provided at NE 108th Avenue (100s Neighborhood Greenway), NE 113th Avenue (Safe Route to School for Ventura Park Elementary) and NE 155th Avenue (150s Neighborhood Greenway). Street lighting will be added to both sides of the street and at new crossings. Phase I of the East Glisan Street Update was delivered in 2019 and focused east of NE 122nd Avenue.

Cost Estimate: $2,500,000 (Glisan component only)

Anticipated Construction Year: 2021

Delivery Notes: These improvements are being delivered through two different capital projects: East Portland Access to Employment Education (T00455, federal aid), and Fixing Our Streets 1 Safe Routes to School Signals and Street Lighting (T00757/T00720).

Website: www.portland.gov/transportation/East-Glisan

Figure 4 - Proposed road reorg and new pedestrian hybrid signal at NE Glisan St and 113th Ave, looking east.

5. Jade and Montavilla Multimodal Improvements Project

Project IDs: TSP project 70087.2; PBOT CIP project T00710; Federal aid project K20814

Description: This multi-site project will improve key pedestrian and bicycle routes in the Jade District and Montavilla neighborhood, connecting various neighborhood hubs. On the EPASS Network, the project includes a new eastbound buffered bike lane on SE Washington Street from SE 72nd Avenue to the I-205 Path, and new pedestrian crossings on SE Stark and Washington Streets at SE 84th and 86th Avenues. The project is also exploring solutions to circulation issues at SE 82nd/Stark/Washington caused by one-way streets and turn restrictions. Other scope items include improvement of selected substandard local streets in the Jade District near SE Division Street and 82nd Avenue.

Cost Estimate: $7,194,000

Anticipated Construction Year: 2022

Delivery Notes: This is a federal aid design-bid-build project awarded through the 2018-21 Regional Flexible Funds.

Website: www.portland.gov/transportation/jademontavilla

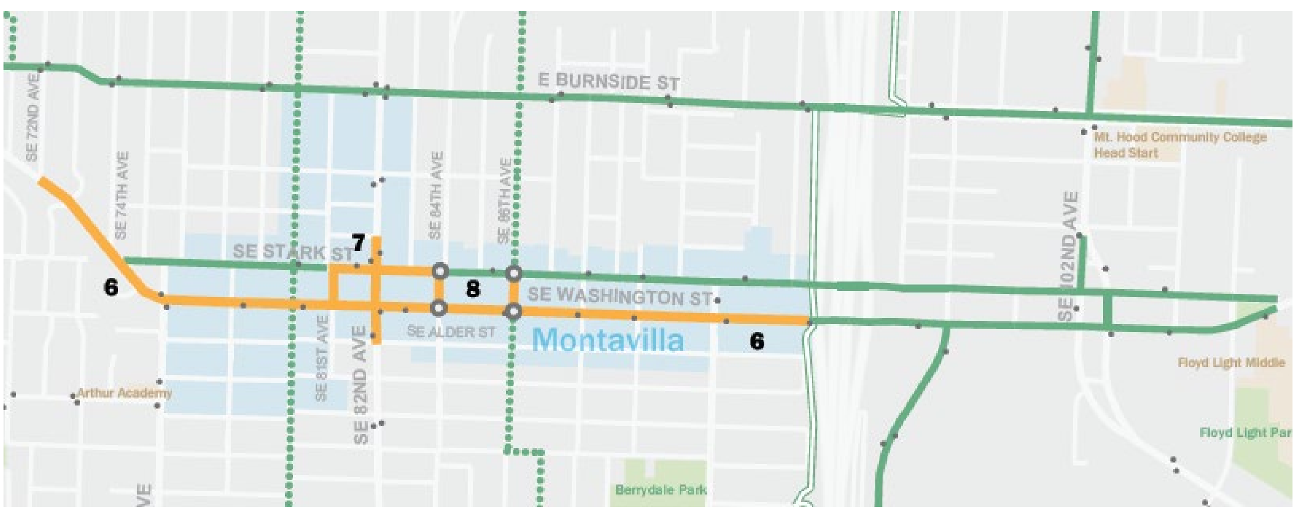


Figure 5 - Scope items under refinement include (6) a new eastbound bike lane on SE Washington St, (7) Circulation improvements near SE 82nd Avenue, and (8) new pedestrian crossings of Stark/Washington at SE 84th and 86th Avenues.

6. Stark/Washington Corridor Safety Improvement Project

Project IDs: TSP project 80018; PBOT CIP projects T01035/T01037/T01040/T01041; Federal aid project K22138

Description: This project will construct protected bike lanes, protected signal phasing for pedestrians and cyclists, transit islands to improve bus operations and transit rider comfort, pedestrian islands to shorten crossing distance, and signal controller upgrades to better manage speeds and traffic flow on the SE Stark/Washington couplet between SE 92nd and 108th Avenues. With additional funding from PBOT's Fixing Our Streets 2 program, the federal aid project will be augmented to include enhanced pedestrian crossings of SE Stark and Washington Streets at SE 105th Avenue, as well as repaving of SE Washington Street between SE 102nd and 108th Avenues. Most locations on the corridor will be reduced by one lane in each direction, as traffic levels are significantly under the capacity of this eight-lane couplet.

Cost Estimate: $11,562,000 (includes FOS2 elements)

Anticipated Construction Year: 2025

Delivery Notes: This is a federal aid design-bid-build project awarded through the 2021-24 Regional Flexible Funds, combined with three projects committed through PBOT's Fixing Our Streets 2 program.

Website: Coming soon

Figure 6 - Project concept on SE Stark and Washington Streets, shown here between SE 99th and 102nd Avenues. Improvements include pedestrian crossings, protected bike lanes and transit islands.

7. Safer Outer Stark

Project IDs: TSP project 80017; PBOT CIP project T00770; Federal aid project K21630

Description: A series of consecutive capital investments in SE Stark Street between SE 108th and 162nd Avenues seeks to create a safer, more resilient arterial street for all modes of travel. Street lighting infill began in late 2020 with the goal of illuminating the full right-of-way. Protected bike lanes will take the place of underutilized on-street parking, starting with the segment between SE 108th and 119th Avenues in early 2021, with the remainder by 2024. The most significant investments include redesigned "protected intersections" at SE 122nd and 148th Avenues (among the highest crash locations in the city), new traffic signals at SE 135th and 160th Avenues, and repaving the street between SE 122nd and 162nd Avenues. A federal aid project in 2024 proposes raised center medians between SE 148th and 162nd Avenues. No reduction on the number of vehicle travel lanes is proposed. Recent past investments have included a new traffic signal at SE 146th Avenue and a rapid flashing beacon at SE 154th/155th Avenues.

Cost Estimate: $18,453,655

Anticipated Construction Year: 2020-2024

Delivery Notes: Near term improvements through 2023 are funded locally by Build Portland, Cannabis Tax, and House Bill 2017. The 2024 median project is a federal aid project through ODOT's All Roads Transportation Safety (ARTS) program. Most projects are design-bid-build, except near term street lighting installed by price agreement.

Website: https://www.portland.gov/transportation/planning/safer-outer-stark

Figure 7 - A "protected intersection" design at SE Stark and 122nd Avenue would transform Portland's most crash-prone intersection.

8. Outer Division Multi-Modal Safety Project

Project IDs: TSP project 80037; PBOT CIP project T00629

Description: A transformational project will add ten traffic signals of various types (full signal, half signal, RRFB), add center medians to reduce turning crashes, reallocate most on-street parking to become buffered or protected bike lanes, and add street lights on SE Division Street between 80th and 174th Avenues. Repaving will occur between SE 130th and 148th Avenues. The project will be constructed at the same time as TriMet's Division Transit Project. An additional signal rebuild will occur at SE Division and 112th, funded by the ODOT ARTS program. Additional center medians will be installed between SE 166th Place and SE 174th Avenue, also funded by the ODOT ARTS program. No reduction in the number of vehicle travel lanes is proposed. A recently completed project eliminated all remaining sidewalk gaps.

Cost Estimate: $10,861,000 (T00629 only)

Anticipated Construction Year: 2021-2022 for most improvements; additional ARTS-funded medians in 2024.

Delivery Notes: The T00629 project is utilizing a negotiated Request for Proposals (RFP) method for construction contracting that evaluates contractors based on both qualifications and price. Repaving will be performed by PBOT Maintenance Operations. ODOT ARTS elements will be separate design-bid-build procurements under federal aid requirements.

Website: www.portlandoregon.gov/transportation/74204

9. Division Transit Project (TriMet)

Project IDs: TSP project 80040; PBOT CIP project T00465

Description: TriMet is delivering the Portland region's first bus rapid transit (BRT) line on SE Division Street between the downtowns of Portland and Gresham. Features include enhanced stations with shelters and real-time arrival information, transit signal priority to speed up buses, and articulated vehicles with multiple-door boarding running on frequent schedules. The project is also improving numerous intersections and bike lanes along SE Division Street near the station locations.

Cost Estimate: $175,000,000 ($16,000,000 contribution from PBOT)

Anticipated Construction Year: 2020-2022, service starts September 2022

Delivery Notes: TriMet is delivering this project.

Website: https://trimet.org/division/

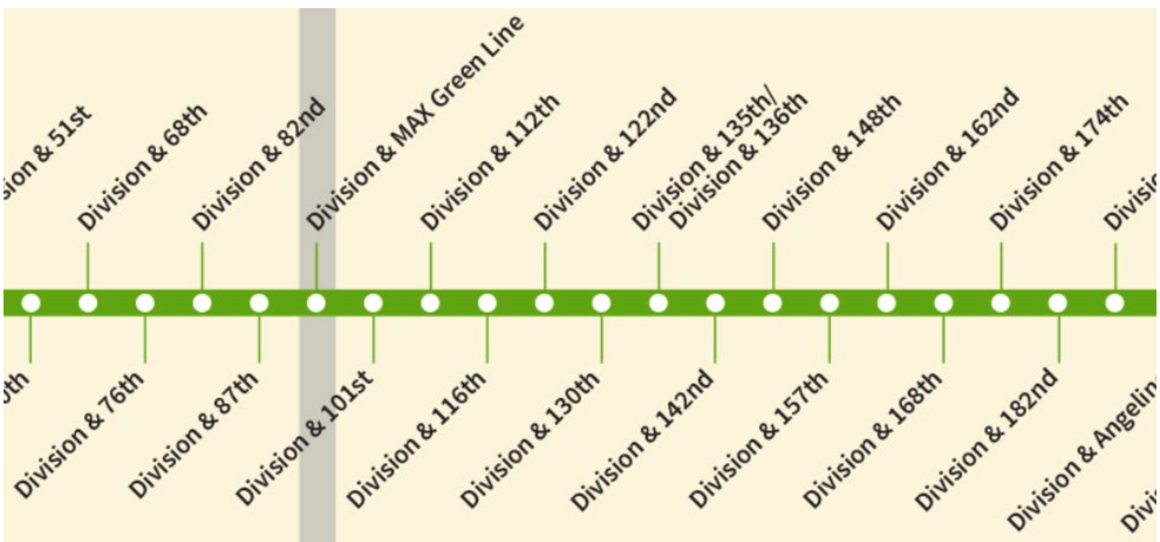


Figure 8 - Division Transit Project station locations in East Portland (source: TriMet).

10. Foster/Woodstock Couplet East Streetscape Project

Project IDs: TSP project 70024; PBOT CIP project T00771

Description: The project includes repaving, bike lane enhancements, and ADA ramp improvements on SE Foster Road and SE Woodstock Boulevard between I-205 and SE 101st Avenue. New signalized pedestrian crossings with islands will be constructed at the intersections of SE 97th Avenue with Foster and Woodstock. The remnant local street segment of SE Woodstock Boulevard between 96th and 97th Avenues will be closed off. Vehicle lane reallocation is limited to one block each of Foster and Woodstock between SE 97th Avenue and the couplet convergence, where one lane in each direction is repurposed to make room for pedestrian islands and protected bike lanes.

Cost Estimate: $7,000,000 (T00771 only)

Anticipated Construction Year: 2022

Delivery Notes: This project is locally funded by Build Portland, House Bill 2017, and TSDCs. It is a design-bid-build project that will be bundled with an adjacent Local Improvement District (LID) project on NE 102nd Avenue and Woodstock Boulevard.

Website: https://www.portlandoregon.gov/transportation/78580

11. NE/SE 122nd Avenue Fixing Our Streets I Project

Project IDs: TSP projects 50049/50048; PBOT CIP project T00646

Description: This project focuses on the most heavily travelled part of NE/SE 122nd Avenue, the 2.5 miles from SE Powell Boulevard to NE Halsey Street. Project elements include transit priority lanes near major intersections, physically protected bike lanes (taking the place of on-street parking), street lighting infill, and two new signalized pedestrian crossings: one at or near SE Clinton Street and the other at or near NE Davis Street. In addition, the project will address a bike lane continuity issue on NE Glisan Street at 122nd Avenue.

Cost Estimate: $3,640,000

Anticipated Construction Year: 2021

Delivery Notes: The project is likely to be implemented through design-bid-build as well as smaller price agreements for street lighting and concrete.

Website: https://www.portlandoregon.gov/transportation/76937

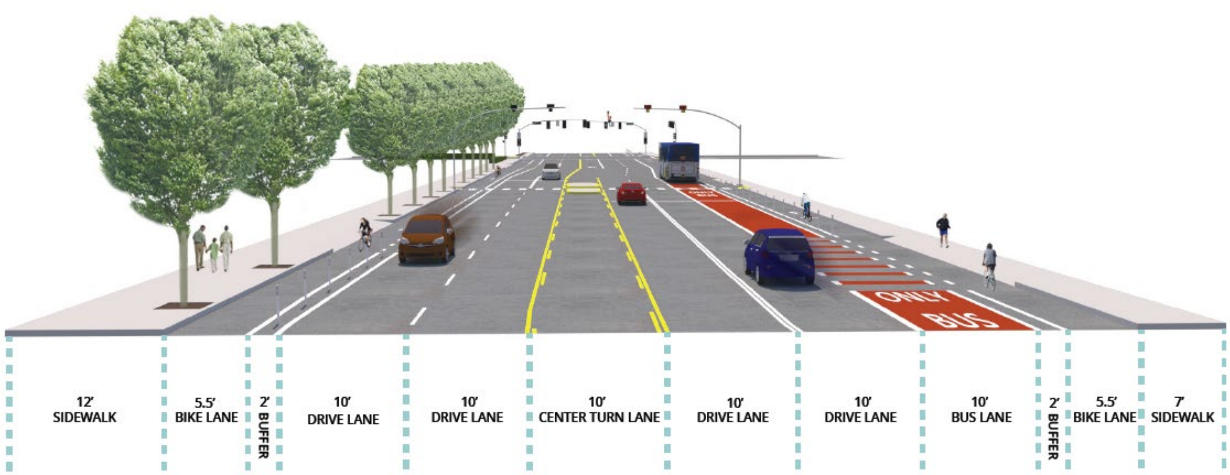


Figure 9 - Cross section concept for SE 122nd Avenue showing transit priority lane approaching a major intersection, protected bike lanes, and a wider sidewalk (left side) attained through private development.

12. SE 122nd Avenue: Foster-Holgate Fixing Our Streets II Project

Project IDs: TSP projects 50049/50048; PBOT CIP project T00998

Description: Funding from Fixing Our Streets II will repave SE 122nd Avenue from SE Foster Road to SE Steele Street, including ADA ramp upgrades. As of this writing, the plan is to implement a concurrent 5-to-3-lane road reorg on SE 122nd Avenue from SE Foster Road to SE Holgate Boulevard, based on the EPASS traffic modeling. This is about 0.3 mile longer than the repaving segment. On-street parking would remain due to high parking demand, most likely resulting in parking-protected bike lanes. Transit priority treatments and additional pedestrian crossings will be explored as well.

Cost Estimate: $4,045,000 (Foster-Steele)

Anticipated Construction Year: 2024

Delivery Notes: Paving project is too big for Maintenance delivery – this will most likely be a design-bid-build project. Additional funds may be needed to extend striping changes to Holgate, and for public involvement.

Website: https://www.portlandoregon.gov/transportation/76937

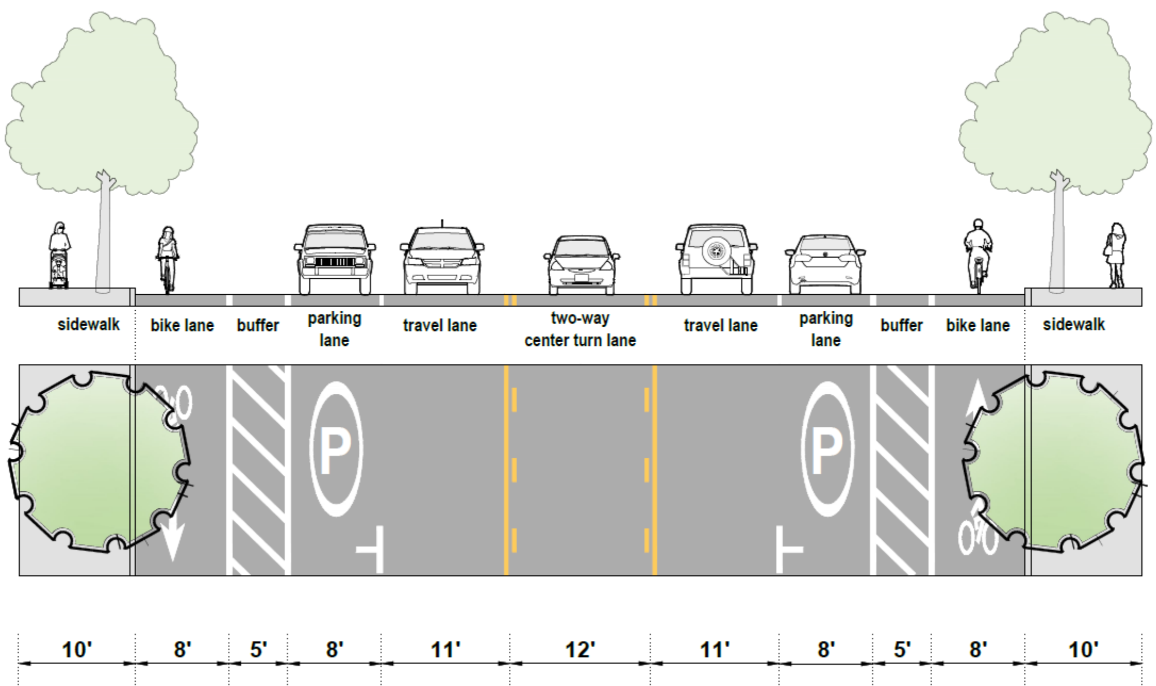


Figure 10 - Potential cross section for SE 122nd Avenue between Foster and Holgate, subject to further refinement including traffic signal approaches. EPASS traffic modeling found very few congestion or diversion impacts from this 5-to-3-lane reorg.

13. NE 122nd Avenue Multimodal Safety and Access Improvement Project

Project IDs: TSP projects 50049/50048; PBOT CIP project T01034; Federal aid project K22134

Description: This project will construct new striped and potentially signalized pedestrian crossings of NE 122nd Avenue in the vicinity of NE Beech Street, NE Sacramento/Brazee Streets, NE Broadway/Hancock Streets, and NE Wasco/Multnomah Streets. Signalization features will be determined early in the design process. Street lighting will be analyzed and addressed at the crossing locations.

Cost Estimate: $6,490,716

Anticipated Construction Year: 2025

Delivery Notes: This is a federal aid design-bid-build project awarded through the 2021-24 Regional Flexible Funds.

Website: https://www.portlandoregon.gov/transportation/76937

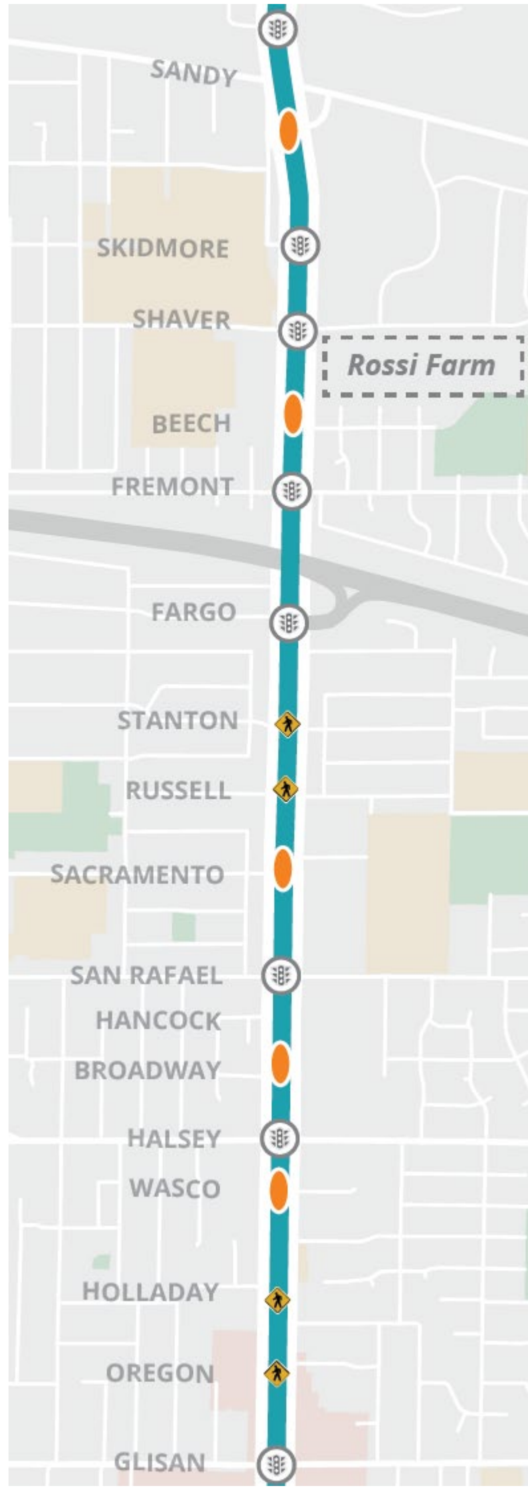


Figure 11 - This project will implement four "Tier 2 Crossings" recommended in the 122nd Avenue Plan, shown as orange ovals.

14. NE 148th Avenue / Sacramento Crossing

Project IDs: TSP project 50046; PBOT CIP projects T00707/T01055

Description: This project has three goals: (a) Create a safe pedestrian crossing of NE 148th Avenue to access Margaret Scott Elementary School (part of Reynolds School District); (b) Create a safe bicycle crossing of NE 148th Avenue for the Fixing Our Streets II-funded Sacramento/Knott Neighborhood Greenway; and (c) Improve safety on NE 148th Avenue itself, which is overbuilt relative to its traffic levels, resulting in speeding. To achieve these goals, a 5-to-3-lane road reorg from NE Halsey Street to the I-84 undercrossing will create the space for the pedestrian crossing and new protected bike lanes. NE 148th Avenue is already two lanes under I-84, which controls the capacity of this segment.

Cost Estimate: $500,000

Anticipated Construction Year: 2021

Delivery Notes: This will be delivered through PBOT's Quick Build / "Small Cap" program, which uses Maintenance Operations Work Orders or contract price agreements. Funding is from Fixing Our Streets I and II.

Website:
https://www.portlandoregon.gov/transportation/article/752358

Figure 12 - Striping concept for NE 148th Avenue at the offset crossing of NE Sacramento Street.

15. SE 162nd Avenue Safety and Access to Transit Project

Project IDs: TSP project 50013; PBOT CIP project T00814

Description: This project will improve access to TriMet's #74 bus line which started service in 2018. The project, on SE 162nd Avenue between SE Powell Boulevard and SE Stark Street, will provide four new pedestrian crossings with median islands, curb extensions, transit islands, and improved lighting. The project includes a 5-to-3-lane road reorg which makes space for the crossings as well as double-buffered bike lanes. On-street parking is retained. The passage of Fixing Our Streets II in 2020 resulted in the addition of repaving SE 162nd Avenue from SE Powell Boulevard to SE Division Street and three additional pedestrian crossings.

Cost Estimate: $5,740,000 (includes FOS II paving)

Anticipated Construction Year: 2021

Delivery Notes: The safety project, funded by a Federal Transit Administration grant disbursed through TriMet, will be bundled with the FOS II paving investment for a single design-bid-build project.

Website: www.portland.gov/transportation/162nd

Figure 13 - Illustration of proposed pedestrian crossing at SE 162nd Avenue at SE TIbbetts Street, including 5-to-3-lane road reorg.

III. UNFUNDED PROJECTS

As PBOT completes design and construction on the funded EPASS projects over the next five years, it is recommended that staff bring new projects into the "pipeline" that will continue the work of improving safety and multi-modal accessibility on the EPASS Network. The following projects do not have secured funding but can be considered as candidates for future rounds of funding, including both city budget allocations and grant opportunities. Smaller projects that are primarily limited to striping may be constructed through "quick build" methods such as PBOT Maintenance Operations work order, Job Order Contracting (JOC), and contract price agreements, while larger projects with numerous and/or complex civil improvements are likely to follow the design-bid-build process.

Unfunded projects are listed below in geographic order, not in order of priority. Planning level cost estimates are classified into ranges with break points at $100,000, $500,000, $1 million, $2 million, $5 million, $10 million, and $20 million. Engineer's Estimates have not been developed for these projects – this step is recommended prior to applying for funds. It is expected that many of the larger projects would not be constructed until after 2025, while some of the smaller, striping-focused projects could be implemented sooner.

E-1 : NE Airport Way Center-Running Bus Lane at Holman

Description: Westbound center-running transit-only lane on NE Airport Way for approximately 1,000 feet approaching the NE Holman Street signal, using surplus median space.

Project Goals: Allow TriMet's' #87 bus to bypass westbound PM peak auto congestion on NE Airport Way that spills back from I-205. This bus serves the Columbia Corridor industrial employment area and often gets delayed.

Planning Level Cost Estimate: $100,000 – $500,000

Delivery Notes: The striping and signing components of this project could potentially be delivered by contract price agreement or PBOT Maintenance Operations. Signal modification may be necessary.

Figure 14 - Surplus median space on NE Airport Way approaching NE Holman Street from the east. Image: Google.

E-2: NE Airport Way Protected Intersections

Description: Intersection redesigns with shorter crosswalks, protected bike lanes, tighter turn radii, and truck aprons for larger truck turns. Potential pilot locations at NE 138th, 148th, 158th Avenues.

Project Goals: Reduce speed of turning vehicles across crosswalks and bike lanes at signalized intersections while preserving maneuverability for large trucks. Increase visibility and reaction time for turning vehicles encountering people using the crosswalks and bike lanes. Reduce speed of through cyclists to lessen crash risk with turning vehicles.

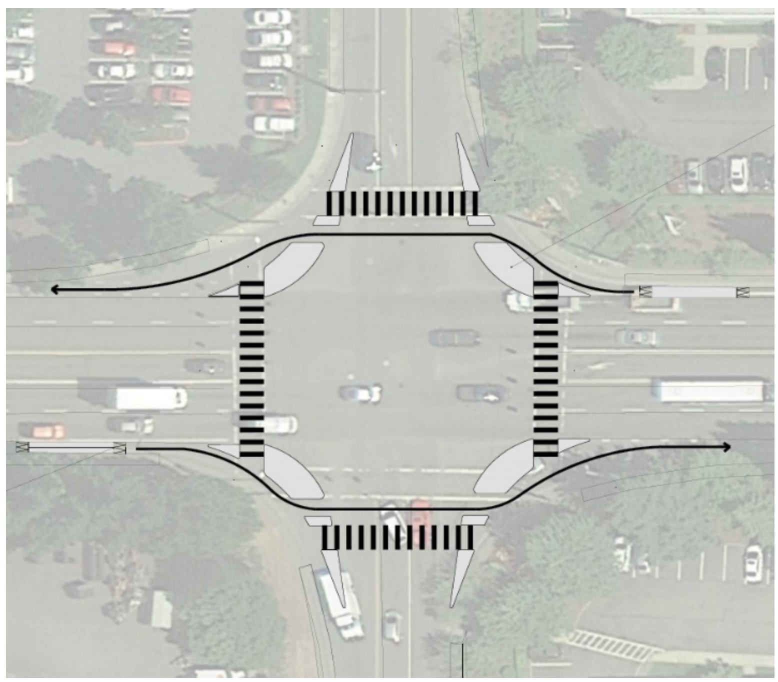


Figure 15 - Protected intersection concept, NE Airport Way at NE 138th Avenue.

Planning Level Cost Estimate: $100,000 - $500,000 per intersection.

Delivery Notes: PBOT is applying for ODOT ARTS 2025-28 funding for enhanced lighting, speed feedback signs, and reflective pavement markers on NE Airport Way – the protected intersections may be added to the funding application.

E-3: NE Airport Way Crossing Improvements

Description: Marked pedestrian crossings at remaining "unprotected" bus stop pairs with additional street lighting and potential signalization, NE Airport Way: Holman St – 181st Avenue. Coordinate with TriMet to align bus stop spacing and locations with user demand and TriMet bus stop spacing policies. Perform signal warrant analyses at crossing locations. Potential locations include NE Airport Way at 12800 block, NE 152nd Place, 16100 block, and NE Mason Street.

Project Goals: Increase safety, comfort and visibility for people crossing NE Airport Way to travel to or from TriMet bus stops. Eliminate through design all unmarked crossings that access bus stops on NE Airport Way.

Planning Level Cost Estimate: $500,000 to $1 million per crossing

Delivery Notes: Project is scalable. Design-bid-build most likely due to signalization needs.

E-4: NE Sandy Blvd Queue Jump at Prescott

Description: Westbound bus queue jump and right turn lane on NE Sandy Blvd at Prescott Street

Project Goals: Improve speed and reliability of TriMet #12 bus.

Planning Level Cost Estimate: $100,000 - $500,000

Delivery Notes: Project could be delivered by Maintenance Operations or striping contract price agreement.

E-5: NE Sandy Blvd / I-205 Pedestrian/Bicycle Safety and Access Improvements

Description: Two-way bikeway on north side of NE Sandy Blvd from NE 92nd Ave to Parkrose/Sumner Transit Center. Marked crosswalk with improved lighting and signage at northbound I-205 offramp to eastbound NE Sandy Blvd. Maintain center-running eastbound transit lane and four vehicle lanes.

Project Goals: Connect proposed Alberta Neighborhood Greenway to Parkrose-Sumner Transit Center and I-205 Path. Increase safety for pedestrians on south side of NE Sandy Boulevard crossing the freeway offramp.

Planning Level Cost Estimate: $500,000 - $1 million

Delivery Notes: Project potentially could be delivered by contract price agreement. Coordination with ODOT will be critical, and the offramp element may have difficulty overcoming sight distance hazards. Project could be split in two (north side bikeway, south side pedestrian improvement.)

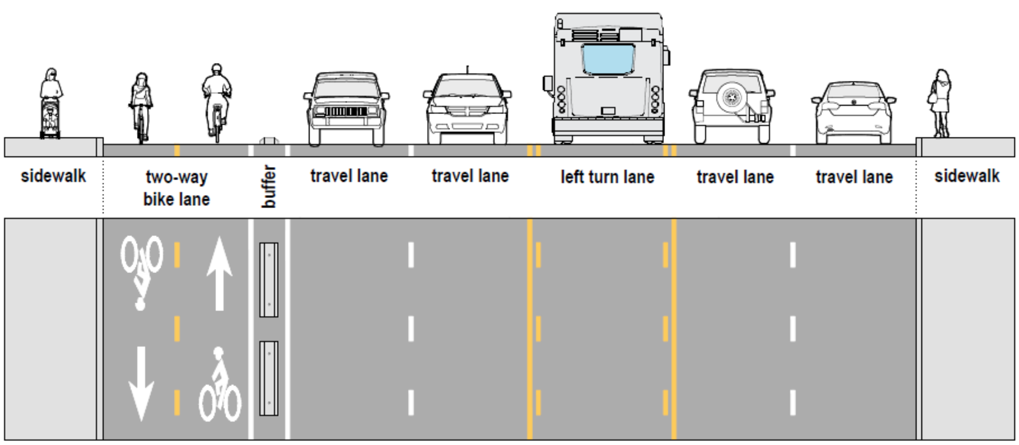


Figure 16 - Conceptual cross section, NE Sandy Blvd overcrossing of I-205, looking east. Center lane should be transit only.

E-6: Outer Halsey Safety Project Phase II

Description: Protected bike lanes with concrete or proprietary plastic separators on NE Halsey St from NE 112th Avenue to NE 162nd Avenue. Protected bike lanes from NE 112th Avenue to NE 134th Place, where roadway width is 76 feet, would be accomplished by eliminating on-street parking. From NE 134th Place to NE 162nd Avenue, where roadway width is 66 feet, protected bike lanes would fit by narrowing all vehicle lanes to ten feet. Also explore median islands to calm traffic speeds and reduce turning crashes. Reduction in number of vehicle lanes is not proposed, based on EPASS traffic modeling and parallel road reorg on NE Glisan Street.

Project Goals: Leverage bikeway investments to the west (Halsey-Weidler Streetscape, T-HOP/I-205 project) by extending high quality bike lanes on NE Halsey Street eastward to the city limit, with more distant destinations including Troutdale and the Columbia Gorge. Calm vehicle speeds.

Planning Level Cost Estimate: $1 – 2 million

Delivery Notes: Project may fit within the upper end of a contract striping price agreement, particularly if segmented to allow participation of multiple contractors.

Figure 17 - NE Halsey Street, looking west from NE 118th Avenue. Little-used on-street parking would be repurposed for protected bike lanes with concrete separators.

E-7: NE Glisan St: 82nd-102nd Multi-Modal Safety Project

Description: Bike lanes on NE Glisan St from NE 87th to 102nd Avenues, ADA ramp upgrades, permanent on-street parking between NE 84th or 85th Avenues and NE 87th Avenue, elimination of pro-time parking, potential new signalized pedestrian crossing at our near NE 91st Avenue. Partner with ODOT to explore striping and/or signal timing changes to reduce westbound queues approaching I-205 northbound and southbound onramps. Maintain five vehicle lanes approaching NE 82nd Avenue, and in I-205 interchange area.

Project Goals: Leverage bikeway investments to the east (East Glisan Street Update Phases I and II, ODOT I-205 Path Crossing Improvement) by extending bike lanes on NE Glisan Street from the 80s Neighborhood Greenway to NE 102nd Avenue. Upgrade substandard ADA ramps. Reduce driver confusion regarding pro-time parking lanes. Reduce vehicle queue lengths approaching I-205 onramps. Increase frequency of pedestrian crossings.

Planning Level Cost Estimate: $1 – 2 million.

Delivery Notes: Project can be scaled and/or phased. Coordination with ODOT will be key in the I-205 interchange area. Restriping could be accomplished at the next available repaving opportunity, potentially within the next five years.

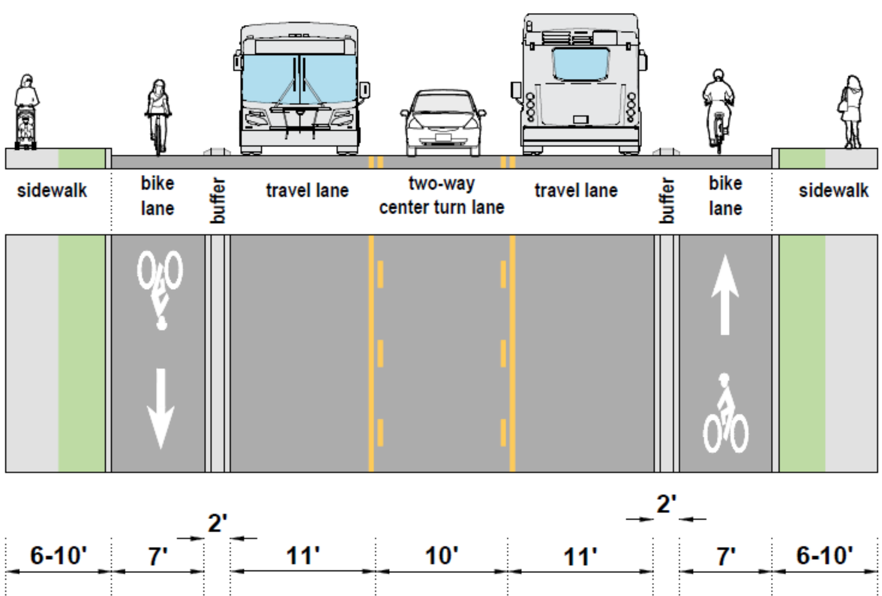


Figure 18 - Proposed cross section on NE Glisan Street between 87th Avenue and 92nd Place.

E-8: Outer Foster Safety Project

Description: Landscaped center medians, protected bike lanes, enhanced pedestrian crossing at or near 11600 block, sidewalk infill, improved street lighting, speed feedback signs, reflective pavement markings, and in-roadway stormwater treatment and detention facilities on SE Foster Road between SE 101st and 122nd Avenues. Eliminate on-street parking from SE 101st Avenue to just west of Zenger Farm (11741 SE Foster Road). From Zenger Farm to SE 122nd Avenue, provide on-street parking on the side of the street with the most demand. No reduction in number of vehicle lanes is proposed due to expected regional growth in Pleasant Valley, Happy Valley and Damascus.

Project Goals: Calm vehicle speeds, reduce turning crashes, provide more comfortable bike lanes, increase frequency of pedestrian crossings, complete last remaining sidewalk gaps, provide safer access to transit, match on-street parking to demand, reduce flooding, create "boulevard" feel instead of speedway.

Planning Level Cost Estimate: $5 – 10 million.

Delivery Notes: Most likely a design-bid-build project. Deliberate outreach, relocation and provision of services to houseless individuals occupying the parking lanes on SE Foster Road east of the Springwater Corridor will be necessary. Review findings of Foster Road Flood Mitigation Strategy developed as part of the now-defunct Foster-Lents Integration Partnership in 2013. PBOT is submitting an ODOT ARTS 2025-28 application for the enhanced lighting, speed feedback signs, and reflective pavement markers.

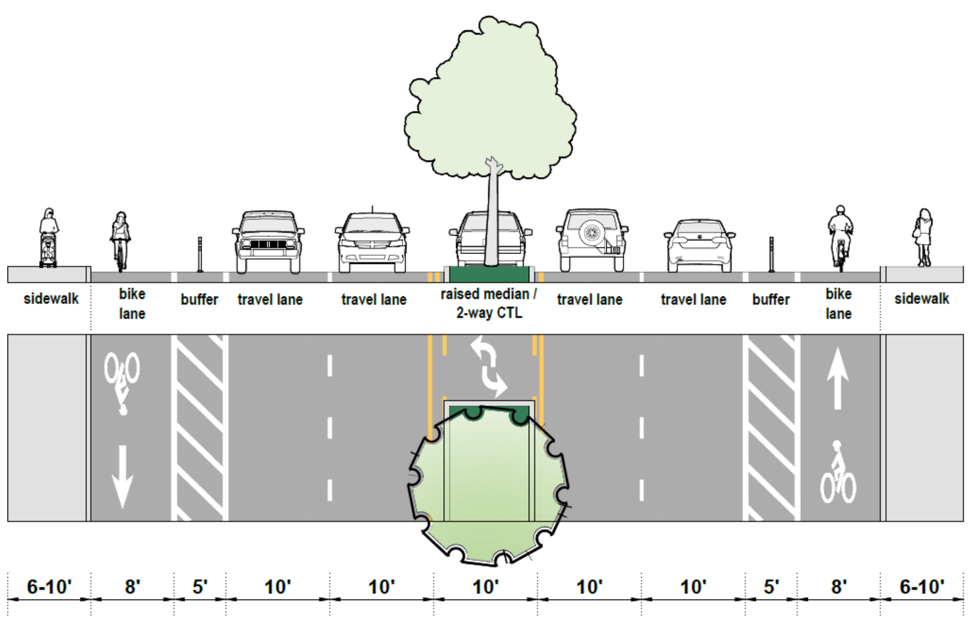


Figure 19 - Proposed cross section on SE Foster Road from SE 101st Avenue to just west of Zenger Farm.

E-9: NE 148th Ave: Glisan-Halsey Pedestrian/Bicycle Improvements

Description: Protected walkway/bikeway on west side of NE 148th Avenue between NE Glisan and Halsey Streets, created by reallocating one southbound vehicle lane and installing concrete separators.

Project Goals: Provide an ADA-accessible walkway on the west side of NE 148th Avenue without expensive grading and retaining walls. Provide a safer, more comfortable bike lane in the uphill direction. Reduce speeding and dangerous passing.

Planning Level Cost Estimate: $100,000 - $500,000.

Delivery Notes: Could be delivered through contract price agreement.

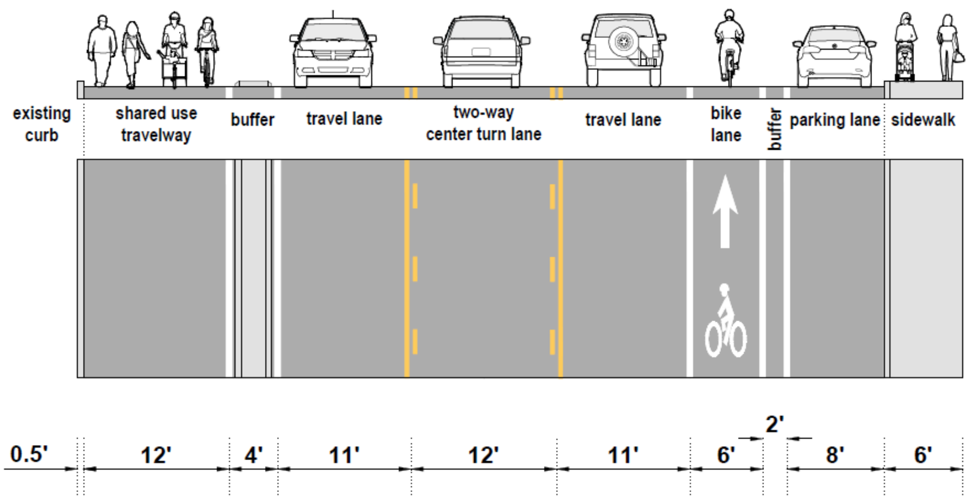


Figure 20 - Proposed cross section of NE 148th Avenue between Glisan and Halsey, looking north. 12-foot-wide shared use travelway on west side could be further delineated to separate pedestrians and cyclists.

IV. OTHER CAPITAL PROJECTS AND TRANSPORTATION NEEDS IN EAST PORTLAND

It is worth noting briefly at the conclusion of this final EPASS memo that capital investments in East Portland are not limited to the EPASS Network, nor are they the exclusive purview of PBOT. Projects are in planning, design or construction on two-lane arterials and collectors such as SE 136th Avenue and SE 174th Avenue, as well as on neighborhood greenways such as the 100s, 150s and 4M (Market-Mill-Millmain-Main) routes. Substandard local streets are targeted for investment through the Local Transportation Infrastructure Charge (LTIC), as well as through Local Improvement Districts (LIDs).

Major planned partner agency investments in addition to TriMet's Division Transit Project include:

- ODOT's **Outer Powell Transportation Safety Project**, a complete reconstruction of SE Powell Boulevard from I-205 to Gresham City Limits to provide sidewalks, bike lanes and turn lanes, representing an investment of over $100 million. Phase I between SE 122nd and 136th Avenues has nearly completed construction, while Phase II on either side is under design.

- TriMet's **A Better Red** project will add a second light rail track to MAX Red Line through Gateway, improving systemwide reliability.

- Port of Portland seeks to construct a **grade separation of NE Airport Way and 82nd Avenue** at Portland International Airport to reduce vehicle delay and turning conflicts.

PBOT continues to develop future capital projects in East Portland, with recent project development efforts including:

- **Division/Midway Connected Centers –** Developing north-south pedestrian bicycle routes on local and collector streets in the Division/Midway area between E Burnside Street, SE Holgate Boulevard, SE 112th Avenue and SE 148th Avenue.

- **SE 148th Avenue Corridor –** Developing cross sections and projects that would improve safety on the mostly-built-out two/three-lane portion of SE/NE 148th Avenue between SE Powell Boulevard and NE Glisan Street, while seeking to modernize the rural-type segment of NE 148th Avenue from I-84 to Marine Drive.

- **NE 162nd Avenue Corridor –** As part of the 2020 Regional Transportation Measure, which voters rejected in November 2020, PBOT looked to modernize the rural-type segment of NE 162nd Avenue from I-84 to NE Sandy Boulevard.

With voters rejecting the Regional Transportation Measure in November 2020, PBOT and its agency partners must regroup to determine how to address the East Portland corridors that had been a major focus of the measure: **82nd, 122nd and 162nd Avenues**. In addition, ODOT-maintained NE Sandy Boulevard east of NE 99th Avenue has unaddressed needs.

The non-arterial work must continue as well, including adding sidewalks to collector streets (such as SE Harold Street between I-205 and SE 136th Avenue, or NE San Rafael Street between NE 122nd and 148th Avenues), paving remaining gravel streets, and completing the neighborhood greenway network.

Much work remains to bring East Portland streets up to the standard that Portland has set for itself: a great city for walking, biking and transit; a city that values equity, racial justice and climate action; and a "City that Works."