Aurora Corridor Study
Existing Conditions Report

Prepared for
Seattle Department of Transportation, King County Metro

Seattle Department of Transportation

King County METRO

February 2024

Parametrix

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Existing Conditions Report

Prepared for

Seattle Department of Transportation, King County Metro

Prepared by

Parametrix
719 2nd Avenue, Suite 200
Seattle, WA 98104
T. 206.394.3700 F. 1.855.542.6353
www.parametrix.com

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Acronyms and Abbreviations

AADT	annual average daily traffic
ADA	Americans with Disabilities
ADT	average daily traffic
AVTC	Aurora Village Transit Center
AWDT	average weekday traffic
AWSC	all-way stop controlled
BAT	business access and transit
BMP	Bicycle Master Plan
CSR	Customer Service Requested
EB	eastbound
FMP	Freight Master Plan
HCM	Highway Capacity Manual
LOS	Level of Service
LTS	Level of Traffic Stress
Metro	King County Metro Transit
MEV	million entering vehicles
mph	miles per hour
MVMT	million vehicle miles traveled
ORCA	One Regional Card for All
OWSC	one-way stop controlled
PHF	peak hour factor
PMP	Pedestrian Master Plan
ROW	right of way
RTIS	real time information sign
SBL	southbound left
SDOT	Seattle Department of Transportation
SPU	Seattle Public Utilities
SR	State Route

Acronyms and Abbreviations (continued)

TMC	turning movement counts
TMP	Transit Master Plan
TSP	transit signal priority
TWSC	two-way stop controlled
v/c	volume to capacity
VPD	vehicles per day
WB	westbound
WSDOT	Washington State Department of Transportation

1. Introduction

The Aurora Avenue N/State Route (SR) 99 corridor is one of the highest traffic volume streets within the City of Seattle, facilitating some of the region's busiest bus routes, most critical freight movements, and connections to dense housing, businesses, social services, and employment opportunities. Aurora Avenue N has a history of collisions, gaps in pedestrian facilities, inconsistent streetscape design, and accessibility barriers that make travel especially difficult for people with mobility challenges.

The last comprehensive Route Development Plan for the Aurora Avenue N corridor was published in 2003, and while recommendations for near-term improvements were included, few improvements have been made. Aurora Avenue N has been a longstanding priority for transportation upgrades that improve safety and mobility for all travelers. Among these, there is a strong desire to enhance comfort and access for people walking along the corridor, reduce collisions for all users, and improve the quality of transit service.

In the last few years, the Seattle Department of Transportation (SDOT) pursued funding to study safety and mobility improvements in the corridor. In late 2021, SDOT was awarded funding through a Pedestrian and Bicycle Program grant from the Washington Department of Transportation (WSDOT). King County Metro (Metro) is also contributing funds and partnering with SDOT to develop a new comprehensive design vision for the Aurora Avenue N corridor and identify near-term projects that will advance improvements and safety. This study is also a necessary step in identifying transit improvements for addressing safety and security, improving transit travel speed and reliability, enhancing transit connections, and improving user experience.

As a part of this study, SDOT and Metro are collaborating with other programs, departments, and agencies who are doing work along this corridor, including Seattle Public Utilities (SPU) and SDOT's Home Zone program.

1.1 Project Purpose

The purpose of the Aurora Corridor Study is to:

- Conduct planning study to define long-range vision and cross sections for Aurora Avenue N with emphasis on safety, mobility, and accessibility
- Focus on safety for vulnerable users
- Identify near-term safety project implementation
- Identify potential transit service improvements and connections as well as safety and security upgrades

1.2 Study Corridor Description

The study corridor is approximately 10.9 miles in length and includes Aurora Avenue N beginning at the northern portal of the SR 99 downtown Seattle tunnel near Harrison Street in the south to the Aurora Village Transit Center (AVTC) at N 200th Street in the north. Because the study corridor includes a diverse array of land uses, development contexts, neighborhoods, and roadway characteristics, the study corridor has been divided into six distinct segments for the

purposes of this study. The segment extents and lengths are summarized in Table 1-1 and displayed in Figure 1-1.

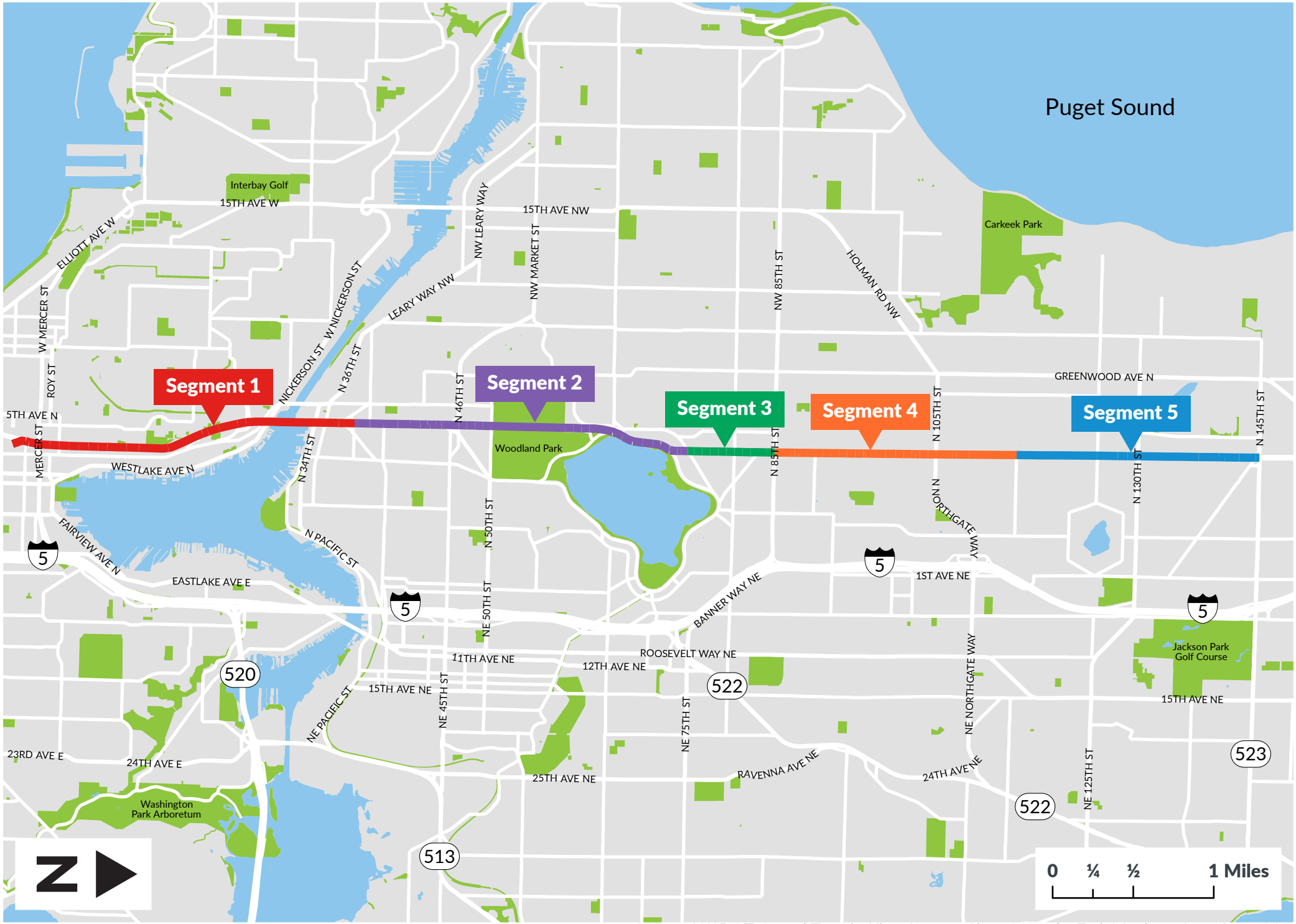
Table 1-1. Aurora Avenue N Segment Lengths

Segment	Start	End	Approx. Length
Segment 1	Harrison Street	N 38th Street	2.2 miles
Segment 2	N 38th Street	Winona Avenue N	2.1 miles
Segment 3	Winona Avenue N	N 85th Street	0.7 miles
Segment 4	N 85th Street	N 115th Street	1.5 miles
Segment 5	N 115th Street	N 145th Street	1.5 miles
Segment 6	N 145th Street	N 200th Street (AVTC)	2.9 miles

This document primarily focuses on the 8-mile portion of the study corridor within the City of Seattle, comprising Segments 1-5. Segment 6 extends north of the Seattle city limits into the City of Shoreline, and its discussion in this document is limited to transit operations associated with Metro's RapidRide E Line service. Unless otherwise noted, references to the study corridor in this document are limited to Segments 1-5.

This report is organized into eight chapters:

- The Introduction provides a brief overview of the project background and purpose and describes the study corridor and structure of the report.
- The Corridor Summary chapter provides an overview of existing conditions along the length of the study corridor across a wide array of topics including:
  - → Roadway Characteristics
  - → Traffic Operations
  - → Nonmotorized facilities
  - → Safety
  - → Transit
  - → Transportation Plans and Policies
  - → Land Use
  - → Underground Utilities
- The remaining chapters detail conditions in each segment of the corridor across the same categories.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 1-1. Study Corridor

Seattle Department of Transportation

King County METRO

2. Corridor Summary

2.1 Roadway Characteristics

Aurora Avenue N along the study corridor is classified by SDOT as a Principal Arterial throughout all segments. This functional classification signifies that Aurora Avenue N provides access to a wide range of uses including businesses, residences, and offices. Accordingly, the roadway is expected to carry more through traffic at higher speeds and longer trip lengths than a lower intensity street such as a Collector Arterial.

Aurora Avenue N is a state highway and is classified as a Highway of Statewide Significance. WSDOT is responsible for management of traffic operations along its length through the Cities of Seattle and Shoreline. It is part of the National Highway System.

The Aurora Bridge, officially named the George Washington Memorial Bridge, spans 2,945 feet across Lake Union and connects Aurora Avenue N to the Queen Anne and Fremont neighborhoods via a 70 foot wide right of way. The bridge was opened in 1932 and uses a cantilever and truss design. Although the Federal Highway Administration National Bridge Inventory declared the bridge as functionally obsolete in 2007, the bridge's foundations and structure were found to be stable and adequate. Extensive work to seismically retrofit the bridge occurred in 2011 and 2012, with additional seismic work completed in 2019 to remedy an issue discovered during an inspection.

Generally, the study corridor is six to seven lanes wide from curb to curb, within a right-of-way (ROW) width that varies from 70 to 197 feet. This includes four general purpose lanes (2 in each direction). Curb side business access and transit (BAT) lanes are located intermittently along the corridor, with varying time periods for operations including peak only BAT lanes as well as those with no time restrictions. Northbound and southbound travel lanes are separated by a mix of raised jersey barriers, hardened centerlines/c-curbs, and open center turn lanes. Left turn pockets are present at many intersections. With the exception of the Aurora Bridge, if there is not a left or center turn lane present, there is typically either a painted center turn lane, raised median, or jersey barrier present within the study corridor. On- and off-ramps and a protected two-way bike lane are also included in the total ROW width in various locations.

2.2 Traffic Operations

2.2.1 Study Intersections

Thirty eight intersections, shown on Figure 2-1 through Figure 2-5, were evaluated for this study. These include signalized intersections, unsignalized intersections and on/off ramps along Aurora Avenue N.

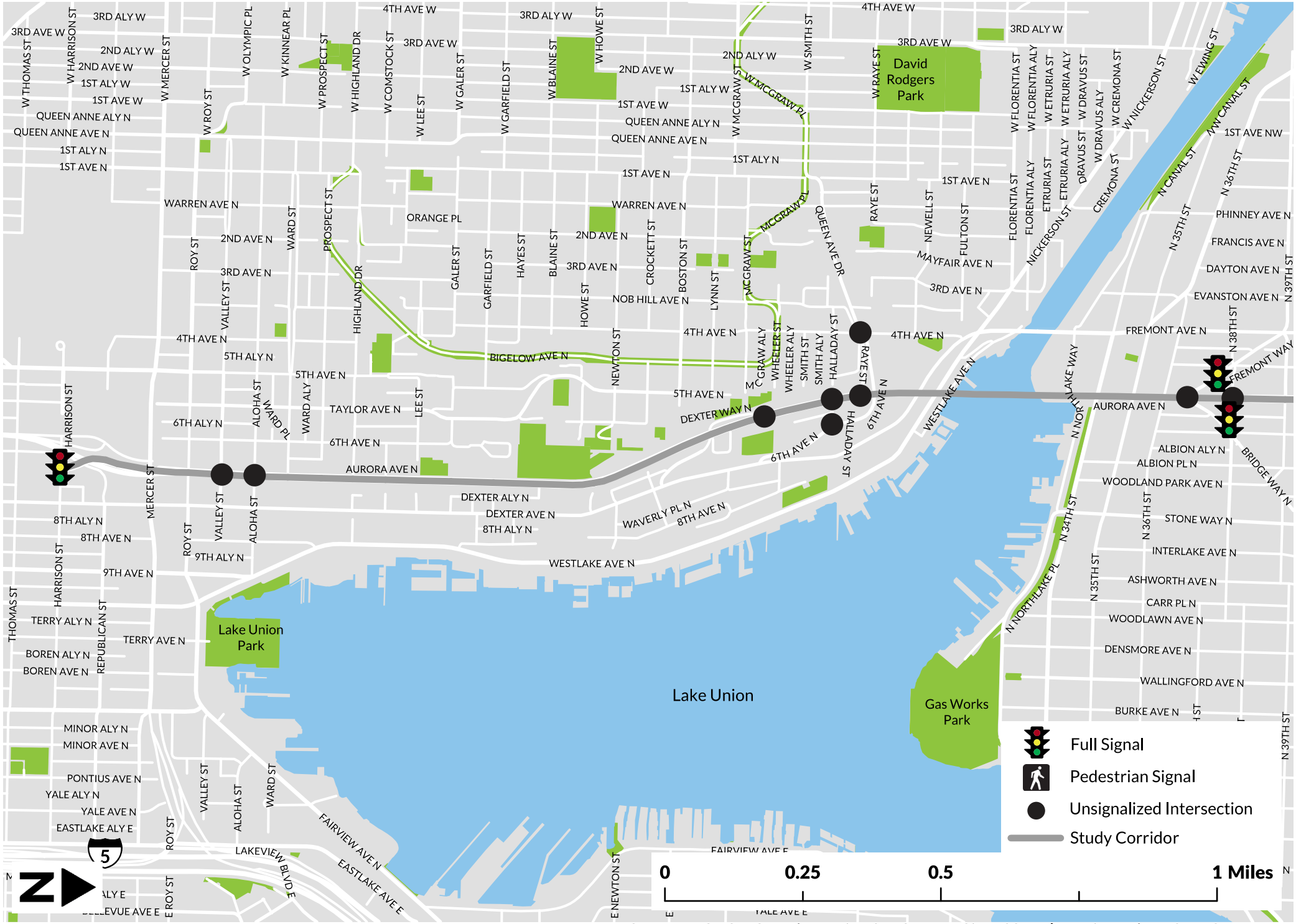


Figure 2-1. Segment 1 Study Intersections

Seattle Department of Transportation

King County METRO

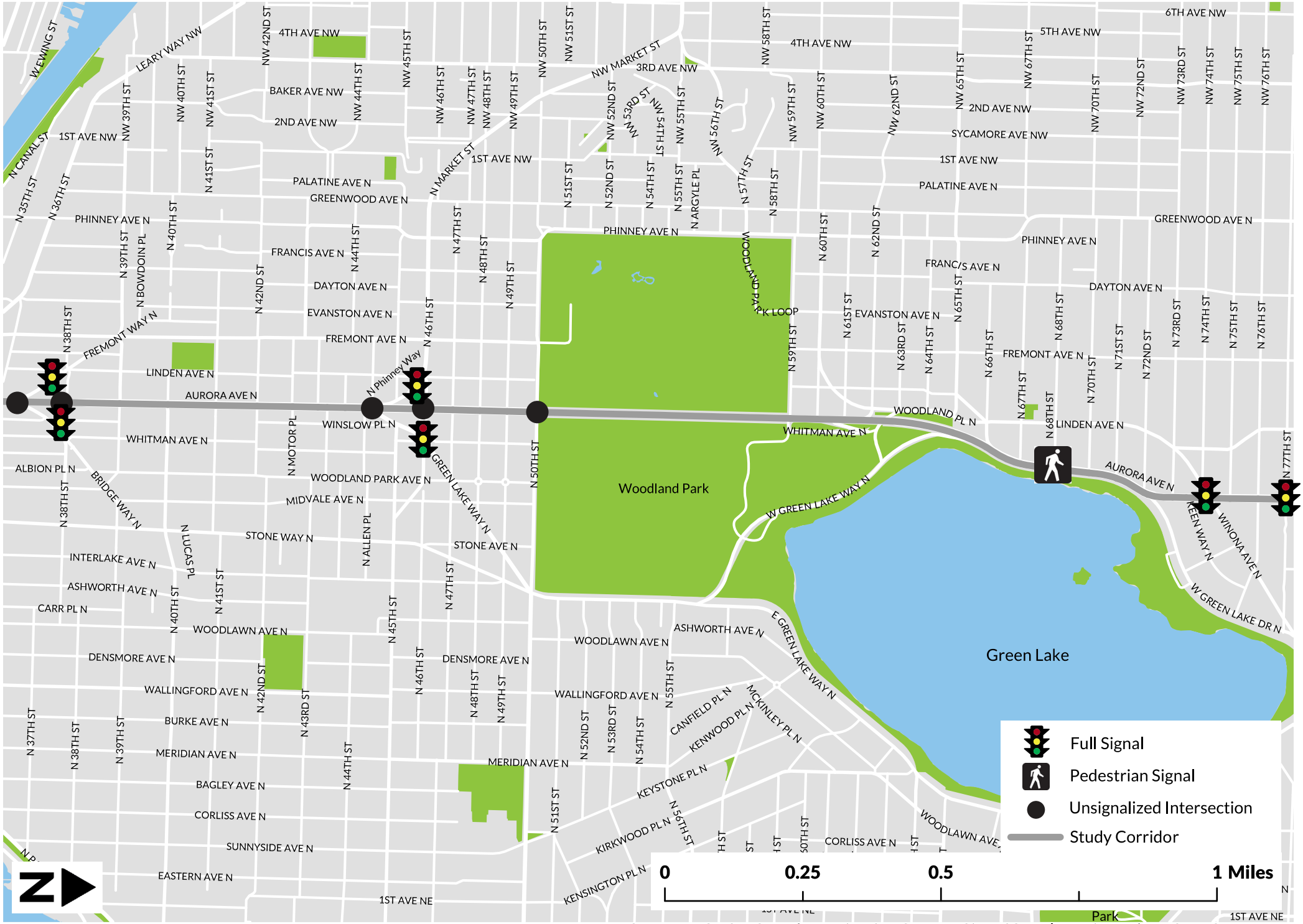
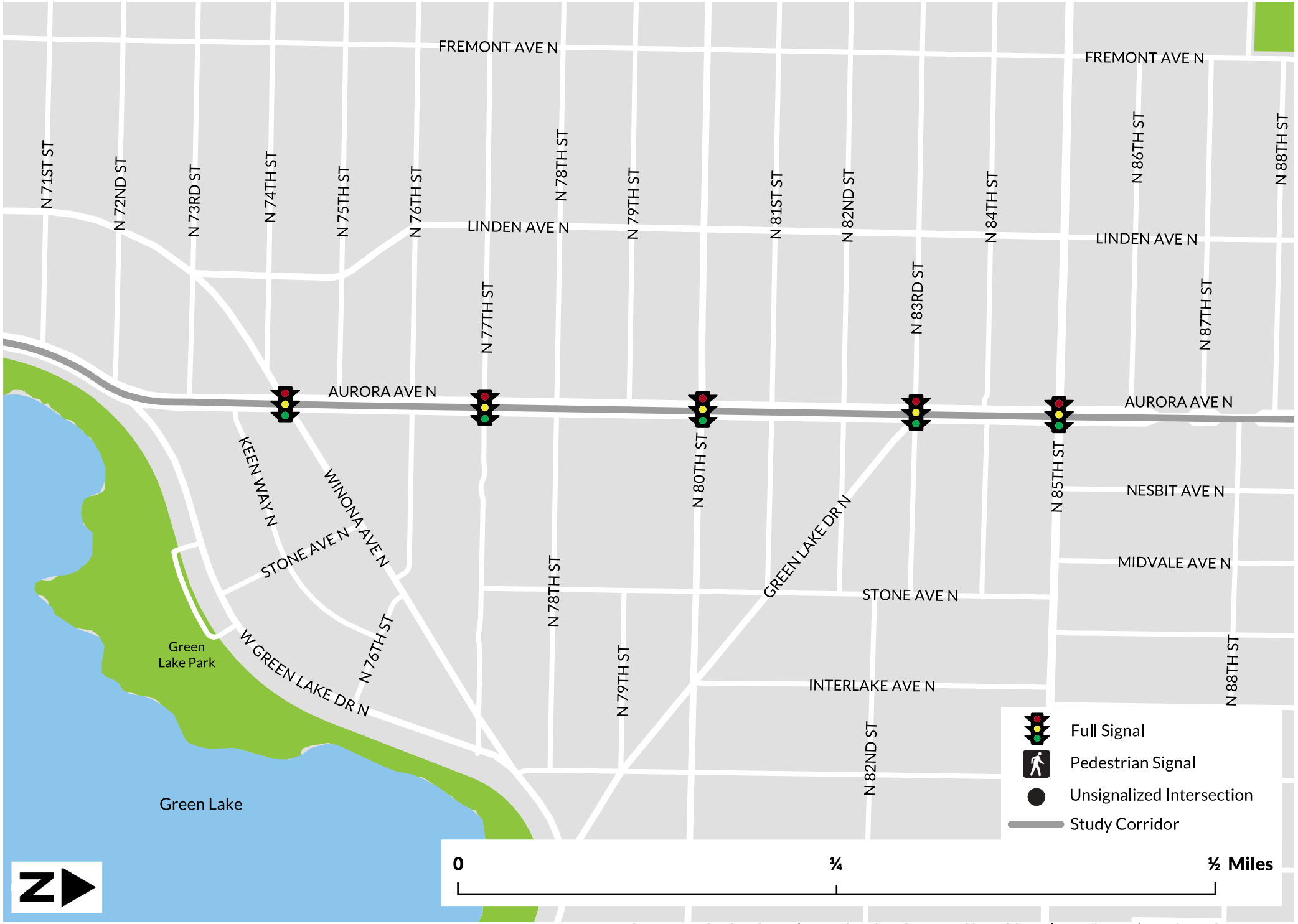


Figure 2-2. Segment 2 Study Intersections

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 2-3. Segment 3 Study Intersections

Seattle Department of Transportation

King County METRO

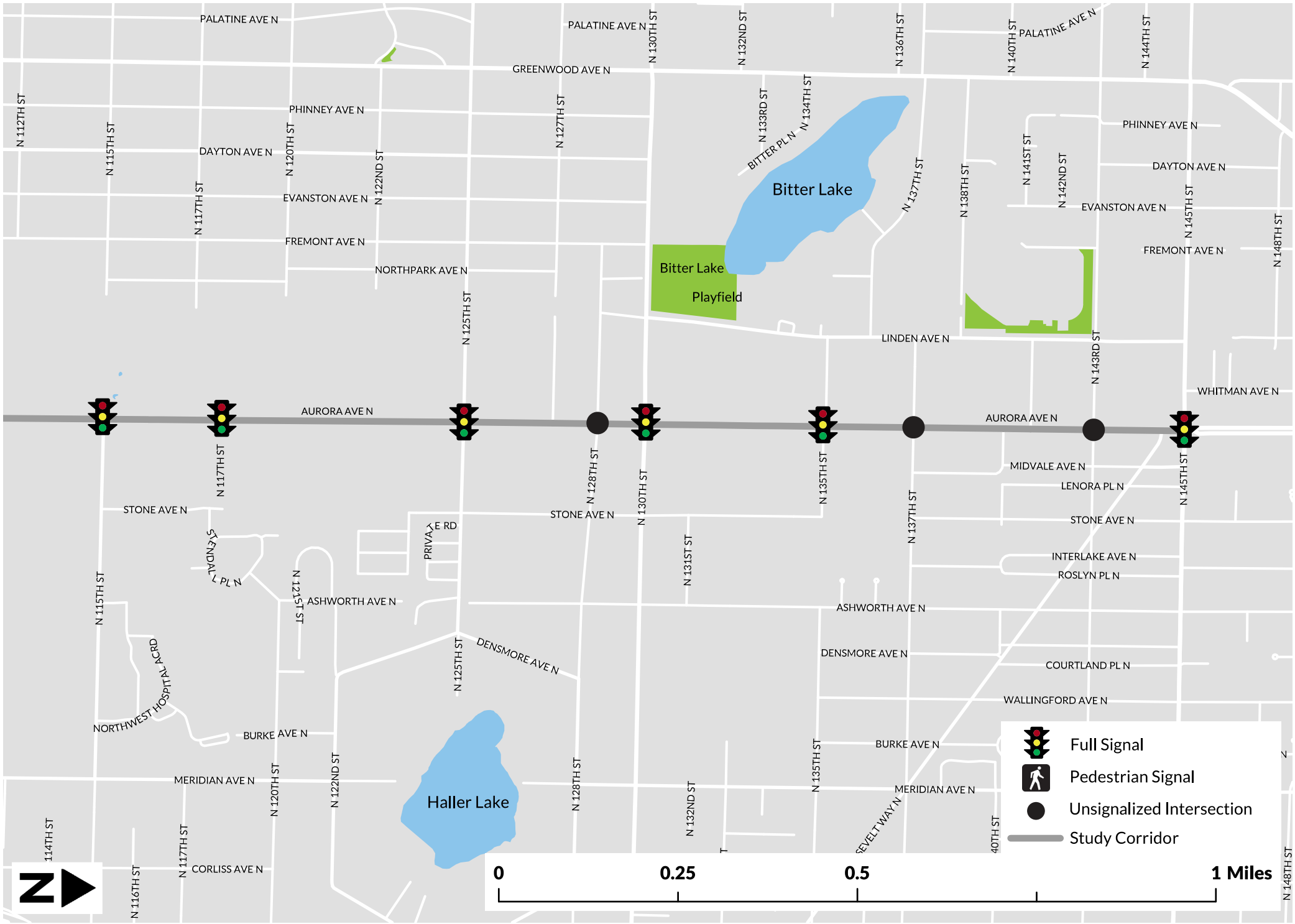


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 2-4. Segment 4 Study Intersections

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Segment 2-5. Segment 5 Study Intersections

Seattle Department of Transportation

King County METRO

2.2.2 Traffic Volumes

Based on March 2023 traffic counts, the average daily traffic (ADT) volumes on Aurora Avenue N range from approximately 23,600 to 51,800, and the average weekday daily traffic (AWDT) range from 25,200 to 55,100. The highest volumes are in Segment 1 at the south end of the corridor, whereas the lowest volumes are in Segment 3. Southbound volumes are typically higher during the AM peak period and northbound volumes are typically higher during the PM peak period. Total traffic volumes in both directions are highest during the PM peak.

Intersection turning movement counts (TMCs) were collected for all study intersections of the project. The collected TMCs include vehicular volumes, peak hour factors (PHF), heavy vehicle percentage, pedestrian volumes, and bicyclist volumes. The TMCs were collected during March 2023 and May 2023. According to the intersection TMCs and 24-hour tube counts characteristics, the AM peak hour of 7:45 AM to 8:45 AM and PM peak hour of 3:45 PM to 4:45 PM were identified for the traffic operations analysis. The AM and PM peak periods represent the most critical conditions of the traffic operations along Aurora Avenue N and were used to evaluate the operational performance of the study corridor.

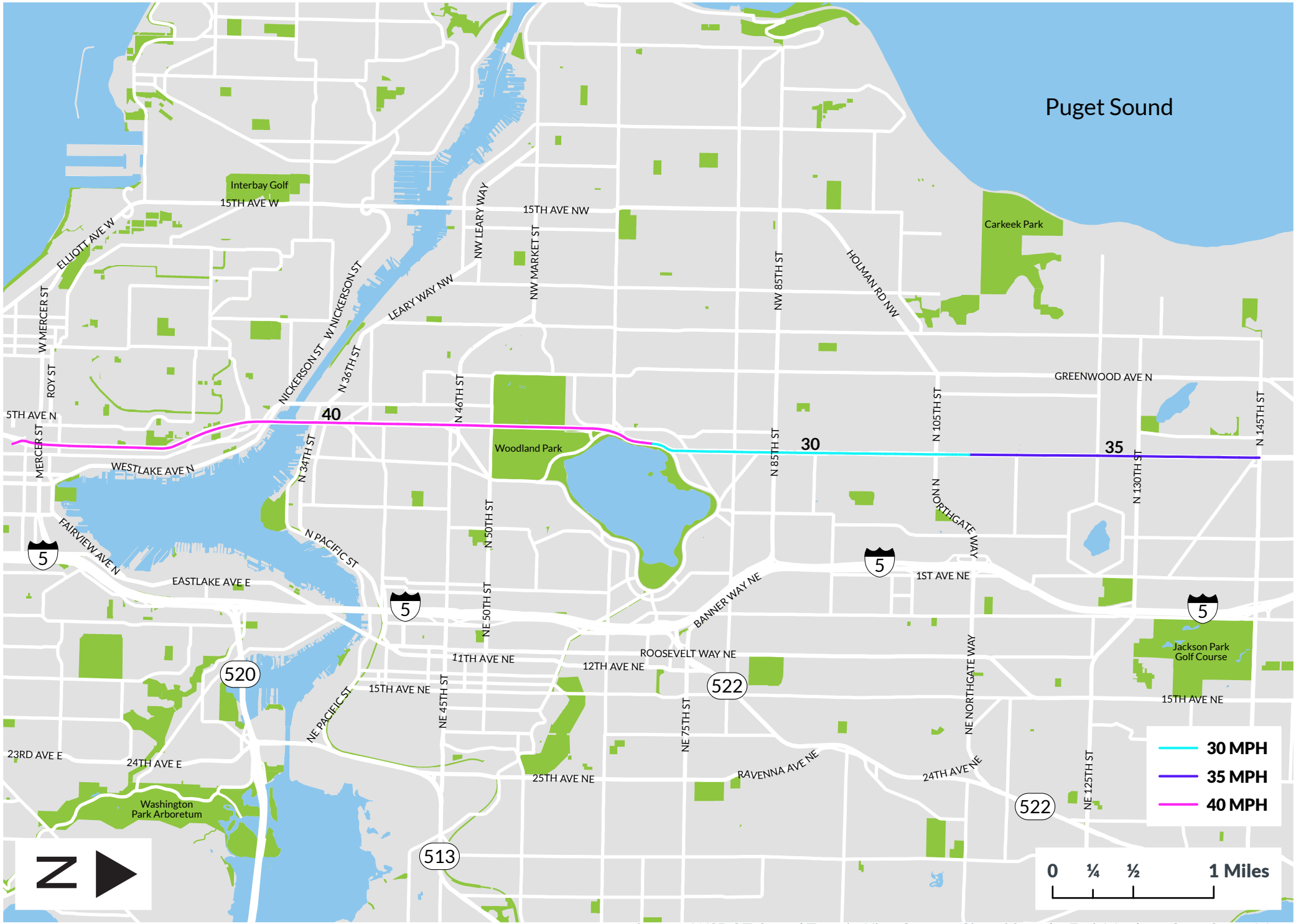
2.2.3 Freight Vehicle Volumes

Based on intersection turning movement counts along Aurora Avenue N, the heavy vehicle percentage in the northbound direction ranges from 5% to 9% during the AM peak period and 1% to 4% during the PM peak period; the southbound heavy vehicle percentage ranges from 2% to 9% during the AM peak period and 2% to 5% during the PM peak period. Overall, the freight vehicle volumes are higher during the AM peak hour than during the PM peak hour. It should be noted that the SR 99 Battery Street Tunnel prohibits the transportation of hazardous materials by trucks during weekday peak travel periods from 7:00 to 9:00 AM and 4:00 to 6:00 PM.

2.2.4 Measured 85th Percentile Traffic Speeds

The posted speed limit on Aurora Avenue N ranges from 30 miles per hour (mph) to 40 mph. The posted speed limit is 40 mph between Harrison Street and N 70th Street, 30 mph between N 70th Street and N 109th Street, and 35 mph between N 109th Street and N 145th Street. Speed limit signs are present along the corridor in both travel directions to inform users of the posted speed limit. Figure 2-6 displays the study corridor speed limits.

Traffic speed data was collected from the 7-day continuous tube counts at each segment of the corridor in March 2023. In the northbound direction, the 85th percentile speeds range from 33 mph to 54 mph, with travel speed 3 mph (10%) to 22 mph (73%) above the speed limit; in the southbound direction, the 85th percentile speed ranges from 35 mph to 53 mph, with travel speed 5 mph (13%) to 16 mph (53%) above the speed limit.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 2-6. Aurora Avenue N Speed Limits

Seattle Department of Transportation

King County METRO

2.2.5 Vehicle Travel Time

Vehicle travel time information was provided by Iteris ClearGuide (Iteris). Iteris collects and derives real-time speed data from GPS-enabled devices and aggregates and stores them in a data platform. The AM and PM peak periods intersection-to-intersection travel time data from mid-week of March 2023 were collected from Iteris and summarized for each segment.

The average northbound vehicle travel time from the south end (Harrison Street) to the north end (N 145th Street) is 17.3 minutes during the AM peak and 22.0 minutes during PM peak. The average southbound vehicle travel time from the north end (N 145th Street) to the south end (Harrison Street) is 22.4 minutes during the AM peak and 23.9 minutes during PM peak. The corridor wide vehicle travel time in both directions is typically highest in the PM peak due to higher traffic volumes.

2.2.6 Intersection Operation Metrics

An operational analysis was conducted not only for each of the signalized intersections on Aurora Avenue N between Harrison Street and N 145th Street, but also signalized intersections that serve as access and egress point to and from the study corridor, as well as key unsignalized intersections and on/off ramps along Aurora Avenue N, summarized in Table 2-1.

Table 2-1. Intersections and Traffic Control

Intersection Number	Intersection	Traffic Control[1]
1	Aurora Ave N and Harrison St	Full Signal
2	Aurora Ave N and Valley St	TWSC
3	Aurora Ave N and Aloha St	OWSC
4	Aurora Ave N and Dexter Way N	Off-Ramp
5	Aurora Ave N and Halladay St	OWSC
6	Halladay St and 6th Ave N*	TWSC
7	4th Ave and Queen Anne Dr/Raye St*	AWSC
8	Aurora Ave N and Raye St	OWSC
9	Aurora Ave N and Bridge Way N	On/Off-Ramps
10	N 38th St and Bridge Way N*	Full Signal
11	N 38th St and Fremont Way N*	Full Signal
12	Aurora Ave N and N 38th St	TWSC
13	Aurora Ave N and Green Lake Way N	On/Off-Ramps
14	Green Lake Way and N 46th St*	Full Signal
15	N Phinney Way and N 46th St*	Full Signal
16	Aurora Ave N and N 46th St	TWSC
17	Aurora Ave N and N 50th St	TWSC
18	Aurora Ave N and N 68th St	Pedestrian Signal
19	Aurora Ave N and Winona Ave N	Full Signal
20	Aurora Ave N and N 77th St	Full Signal

Table 2-1. Intersections and Traffic Controllers (continued)

Intersection Number	Intersection	Traffic Control[1]
21	Aurora Ave N and N 80th St	Full Signal
22	Aurora Ave N and N 83rd St	Full Signal
23	Aurora Ave N and N 85th St	Full Signal
24	Aurora Ave N and N 90th St	Full Signal
25	Aurora Ave N and N 92nd St	Pedestrian Signal
26	Aurora Ave N and N 95th St	Full Signal
27	Aurora Ave N and N 100th St	Full Signal
28	Aurora Ave N and N 103rd St	TWSC
29	Aurora Ave N and N 105th St/N Northgate Way	Full Signal
30	Aurora Ave N and Washelli	Full Signal
31	Aurora Ave N and N 115th St	Full Signal
32	Aurora Ave N and N 117th St	Full Signal
33	Aurora Ave N and N 125th St	Full Signal
34	Aurora Ave N and N 128th St	TWSC
35	Aurora Ave N and N 130th St	Full Signal
36	Aurora Ave N and N 135th St	Full Signal
37	Aurora Ave N and N 137th St	TWSC
38	Aurora Ave N and N 143rd St	TWSC
39	Aurora Ave N and N 145th St	Full Signal

[1] One-way stop-controlled, two-way stop-controlled, and all-way stop-controlled are denoted as OWSC, TWSC, and AWSC, respectively.
* Indicates the intersection is located off Aurora Ave N

The operational analysis was conducted using Synchro 11 software. The Synchro 11 methodology is used to calculate the average vehicle delay and volume to capacity (V/C) ratios for each signalized intersection. The HCM 2000 methodology is used to calculate the average vehicle delay and V/C ratios for each stop-controlled intersection. Level of service (LOS) is used as a measure of effectiveness for vehicular operations at an intersection. The LOS is like a report card rating ranging from LOS A to F, based on the average vehicle delay. LOS A represents free-flow conditions with little to no vehicular delay, while LOS F represents significant congestion conditions for an intersection. Table 2-2 identifies a summary of LOS grades based on average vehicle delay at an intersection or approach. While signalized and all-way stop controlled intersection LOS is defined in terms of the average vehicle delay of all the movements through an intersection, one-way and two-way stop-controlled intersection LOS is expressed in terms of the worst stop-controlled movement.

The V/C ratio is a measure of the traffic volumes operating through an intersection or movement divided by capacity of the overall intersection or individual movement. If the V/C ratio is greater than 1.0, the demand exceeds the available capacity of the intersection or movement, high delays and queuing are anticipated.

LOS, delay, and V/C ratio were used as metrics to evaluate the performance of individual movement and overall intersection on all study intersections of the project.

Table 2-2. Intersection Level-of-Service (LOS) Thresholds

LOS	Delay per Vehicle (sec/veh)	
	Unsignalized Intersections	Signalized Intersections
A	<10	<10
B	10-15	10-20
C	15-25	20-35
D	25-35	35-55
E	35-50	55-80
F	>50	>80

2.3 Nonmotorized Facilities

2.3.1 Pedestrian Facilities

Sidewalks are present along the east and west sides of Aurora Avenue N for most the study corridor, generally varying between six and eight feet in width. Approximately 1.8 miles of sidewalk gaps exist throughout the corridor, with the majority of these gaps occurring north of N 110th Street. Where sidewalks are not present, people traveling along Aurora Avenue N on foot and/or using mobility devices must use informal, curb-separated dirt paths, the roadway shoulder, or adjacent private parking lots.

SDOT rates sidewalk conditions across five tiers: Excellent, Good, Fair, Poor, Very Poor

Sidewalk conditions are guided by American Disability Act (ADA) standards. In the SDOT Sidewalk Condition Assessment Report (2018), SDOT rates sidewalks based on width, cross slope, existing discontinuities, amount of sidewalk replacement needed, and issues within the pedestrian clear zone. Approximately 80% of the sidewalks on Aurora Avenue N have a condition rating of “fair” or better, 7% rated as “poor” or “very poor,” and 13% with no rating reported.

At-grade and grade-separated pedestrian crossings of the study corridor are present at infrequent intervals. At-grade pedestrian crossings do not exist south of N 68th Street, where access across the roadway is limited by a median. Between N 68th Street and N 105th Street/N Northgate Way, at-grade crossings are generally present every 750–1,250 feet or 3-5 blocks. Crossings become more sporadic north of the N 105th Street/N Northgate Way intersection, with most located at least 1,250 feet apart and up to 2,600 feet at the far northern end. Most at-grade crossings include striped markings and are located at intersections with signals and countdown timers.

Along Aurora Avenue N, grade-separated crossings come in the form of pedestrian bridges and undercrossings. Pedestrian bridges are located at Galer Street, N 41st Street, N 102nd Street, and N 130th Street. There are three pedestrian bridges traversing Aurora Avenue N in Woodland Park, however they are not accessible from the roadway. Undercrossings exist at Dexter Way N, 6th Avenue N, N 36th Street, N 38th Street, N 46th Street, N 50th Street, N 63rd Street, and N 79th Street, the latter of which is not accessible to the public.

ADA-compliant features are not consistently located along the study corridor. No ADA-compliant curb ramps are present south of N 66th Street. ADA-compliant curb ramps are spaced infrequently approximately two to ten blocks apart north to N 96th Street and ten or more blocks apart north to N 145th Street. Accessible pedestrian signals do not have a frequent presence along the study corridor, located only at N 92nd Street, N 130th Street, and N 135th Street. No overcrossings or undercrossings except for N 46th Steet and N 50th Street are ADA compliant.

As described in Section 2.6.7, SDOT identifies sidewalk width standards for different types of streets in Seattle Streets Illustrated: The Right-of-Way Improvements Manual. Sidewalks in the study corridor are classified as Urban Village Main or Urban Center Connector, however, significant portions of Aurora Avenue N do not meet SDOT's sidewalk standards for these classifications.

2.3.2 Bicycle Facilities

No bicycle facilities exist along the study corridor except for a two-way protected bicycle lane on the east side of the roadway between W Green Lake Way N and W Green Lake Drive N. Several bicycle facilities cross the study corridor, including below-grade bicycle facilities at N 50th Street and at-grade bicycle facilities at N 83rd Street, N 92nd Street, N 100th Street, and N 125th Street. There are several planned bicycle facilities that intersect or pass the study corridor. These include neighborhood greenways clustered between N 68th Street and N 90th Street. Painted bike lanes are scheduled to be installed under the south end of the Aurora Bridge and at Winona Avenue N, while a protected bike lane is planned for N 130th Street.

2.3.3 WSDOT Standards and Level of Traffic Stress

WSDOT's standards identify a minimum width of five feet for sidewalks along state facilities. They do not include minimum standards for bicycle facilities.

WSDOT has assessed the pedestrian and bicycle Level of Traffic Stress (LTS) along the study corridor. LTS, ranked on a scale of 1 to 4, measures the quality and comfort of facilities between origins and destinations. WSDOT defines a "1" score as a facility that is suitable for travel by people of all ages and abilities and a "4" score as a facility with functional gaps that present systemic safety issues and deter many users of active modes. WSDOT's criteria for a pedestrian LTS score of "4" include a roadway with narrow or nonexistent sidewalks, a high number of general purpose lanes, high traffic speed limits, and a high annual average daily traffic (AADT). The WSDOT pedestrian LTS for Aurora Avenue N from Harrison Street through N 74th Street is all categorized as "4." The LTS for the majority of roadway between N 74th Street and N 107th Street is rated as "3," whereafter the designation changes to a "4" through the end of Segment 5 at N 145th Street.

WSDOT's criteria for a bicycle LTS score of "4" include a roadway with narrow or nonexistent bike lanes, a high number of general purpose lanes, high traffic speed limits, and a high AADT. Bicycle LTS is rated at a "4" for the entire study corridor.

2.4 Safety

Crash data for the corridor was provided by SDOT for the most recent five years (2018-2022). A total of 1,458 crashes occurred along the entire corridor between 2018 and 2022. Table 2-3 summarizes these crashes by severity and Table 2-4 provides a breakdown by study segment. The segment extents listed in Table 2-4 pertain to all safety analysis.

Table 2-3. Study Corridor Crashes by Severity (2018-2022)

Crash Severity	Crash Frequency
Fatal Crashes	22
Serious Injury Crashes	48
Injury Crashes	503
Property Damage Only Crashes	829
Unknown Crashes	56
Total Segment Crashes	*1,458*

Table 2-4. Study Corridor Crashes by Study Segment (2018-2022)

Study Segment	Crash Frequency	Crash Frequency per Mile
Segment 1: Harrison Street to Aurora Avenue N//Aurora SB off ramp and Bridge Way N/Aurora NB off ramp	277	125
Segment 2: Aurora NB off ramp/N 38th Street to Aurora Avenue N/Keen Way N	200	95
Segment 3: Aurora Avenue N/Winona Avenue N to Aurora Avenue N/N 84th Street	108	154
Segment 4: Aurora Avenue N/N 85th Street to Aurora Avenue N/N 112th Avenue	329	219
Segment 5: Aurora Avenue N/N 115th Street to Aurora Avenue N/N 145th Street	544	363
Total Crashes	*1,458*	*182*

Segment 5 between N 115th Street and N 145th Street had the highest number of crashes and the highest number of crashes per mile. Segment 3 had the lowest crash frequency, but Segment 2 had the lowest crash frequency per mile.

2.4.1 Crashes by Location – Intersections and Mid-Block Locations

Overall, the study corridor experienced 929 mid-block crashes and 529 intersection crashes during the study period. Table 2-5 summarizes the intersection and mid-block crashes by study segment and severity.

Table 2-5. Corridor Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Intersections	**5**	**14**	**190**	**306**	**14**	**529**
Segment 1	0	1	20	39	0	60
Segment 2	1	2	22	41	3	69
Segment 3	1	0	14	33	0	48
Segment 4	1	6	57	82	5	151
Segment 5	2	5	77	111	6	201
Mid-Block Locations	**17**	**34**	**313**	**523**	**42**	**929**
Segment 1	4	6	55	144	8	217
Segment 2	3	4	40	78	6	131
Segment 3	3	1	15	38	3	60
Segment 4	2	7	67	94	8	178
Segment 5	5	16	136	169	17	343
Total Crashes	*22*	*48*	*503*	*829*	*56*	*1,458*

Segment 5 had the highest frequency of both intersection and mid-block crashes, in addition to the highest number of fatal and serious injury crashes.

2.4.2 Crashes by Type

Along the study corridor, there were 107 non-motorized crashes, 91 pedestrian-involved crashes and 16 bicyclist-involved crashes. Table 2-6 summarizes the non-motorized crashes for the corridor by study segment and severity.

Table 2-6. Non-Motorized Corridor Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**15**	**20**	**47**	**9**	**0**	**90**
Segment 1	4	1	0	1	0	6
Segment 2	2	1	2	0	0	5
Segment 3	2	1	2	1	0	6
Segment 4	2	11	21	3	0	37
Segment 5	5	6	22	4	0	36
Bicyclist-Involved Crashes	**0**	**5**	**11**	**0**	**0**	**16**
Segment 1	0	1	0	0	0	1
Segment 2	0	1	2	0	0	3
Segment 3	0	0	3	0	0	3
Segment 4	0	1	2	0	0	3
Segment 5	0	2	4	0	0	6
Total Crashes	*15*	*25*	*58*	*9*	*0*	*107*

The other 1,351 crashes on the corridor were vehicle-only crashes. Table 2-7 summarizes the mid-block and intersection vehicle-only crashes by segment and crash type.

Table 2-7. Corridor Motorized Crashes by Segment and Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block Crashes	**291**	**112**	**183**	**9**	**31**	**107**	**139**	**872**
Segment 1	52	6	68	2	2	41	39	210
Segment 2	35	5	26	1	10	28	22	127
Segment 3	22	3	16	1	2	4	8	56
Segment 4	68	17	36	1	7	8	24	161
Segment 5	114	81	37	4	10	26	46	318
Intersection Crashes	**69**	**230**	**40**	**4**	**4**	**52**	**80**	**479**
Segment 1	9	12	9	1	1	12	16	60
Segment 2	10	25	6	0	1	11	12	65
Segment 3	5	21	3	1	1	5	7	43
Segment 4	14	71	9	0	1	8	25	128
Segment 5	31	101	13	2	0	16	20	183
Total Motorized Crashes	*360*	*342*	*223*	*13*	*35*	*159*	*219*	*1,351*

Rear end crashes (33%) were the most common mid-block crash type followed by sideswipe crashes (21%). At intersections, angle or turning crashes were the most common crash type (48%) followed by rear end crashes (14%).

2.4.3 Crash Contributing Factors

Contributing factor data from WSDOT's crash database was used to supplement SDOT's crash data to provide more information regarding actions and/or events that ultimately led to a crash. Table 2-8 summarizes the primary contributing factors for the overall corridor crashes. Three hundred and ninety-six crashes (27%) did not have a documented contributing factor and are excluded from the summary.

Table 2-8. Corridor Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Corridor Crashes
Did not grant right-of-way to vehicle	147	10%
Distracted	142	10%
Inattention	128	9%
Improper maneuver	120	8%
Following too closely	94	6%
Alcohol/drug impaired	73	5%
Speeding	55	4%

Table 2-8. Corridor Crashes by Primary Contributing Factor (2018-2022) (continued)

Primary Contributing Factor	Crash Frequency	Percent of Corridor Crashes
Disregard traffic control	42	3%
Improper non-motorist behavior	17	1%
Fatigued/Ill	17	1%
Did not grant right-of-way to non-motorist	12	1%
Operating defective equipment	10	1%
Other (does not include none)	205	14%
Total	*1,062*	*73%*

Overall, a failure to grant right-of-way to a vehicle was the most common contributing factor on the corridor (10%), followed by distracted driving (10%), and inattention (8%). The "other" contributing factor category collectively accounted for 15% of the corridor crashes.

2.4.4 Crashes by Time of Day

Figure 2-7 shows the total corridor crashes by time of day, aggregated by the hour of the day.

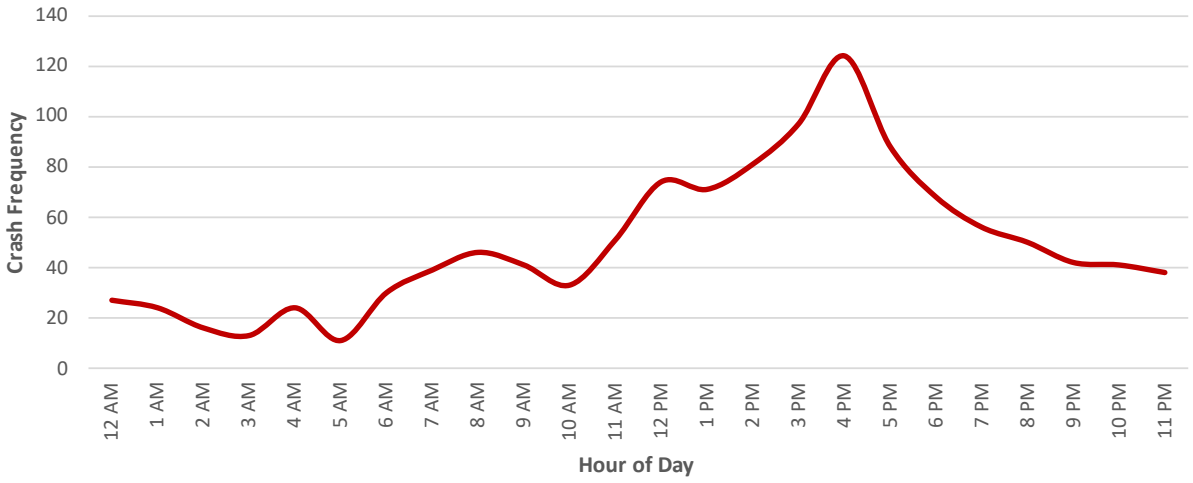


Figure 2-7. Corridor Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak, during the 4 PM hour. Crashes generally increase throughout the day from the start of the AM peak period before decreasing again after the peak at 4 PM. Figure 2-8 summarizes the total corridor crashes by lighting condition.

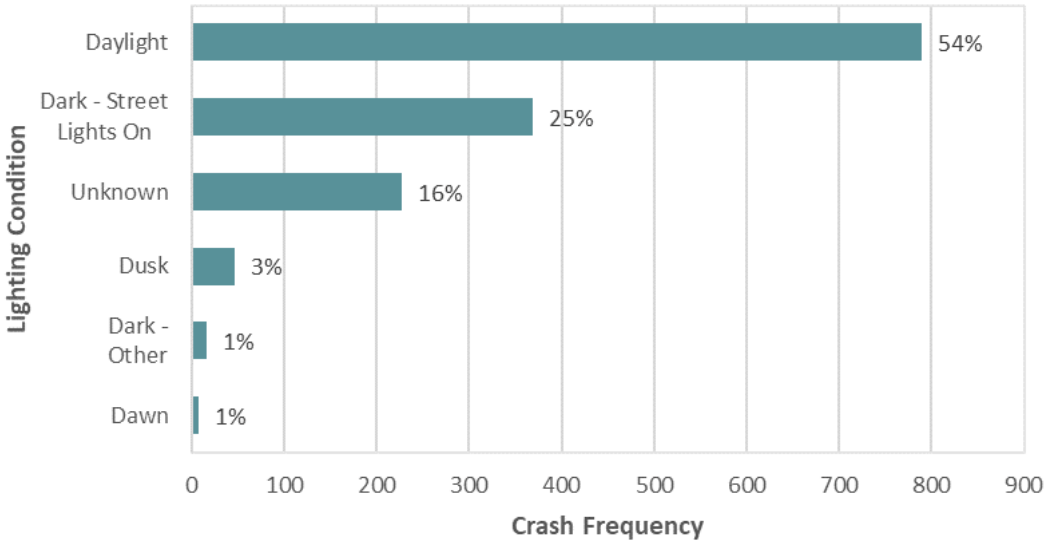


Figure 2-8. Corridor Crashes by Lighting Condition (2018-2022)

The majority of corridor crashes (54%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (96% of dark condition crashes).

2.4.5 Mid-Block and Signalized Intersection Crash Rates

Crash rates are an assessment of observed crashes that also takes into account exposure data (i.e., traffic volumes) to determine the relative safety of a location compared to other locations. Crash rates for segments calculate the estimated crashes per 1 million vehicle miles traveled (MVMT) and crash rates for intersections calculate the estimated crashes per million entering vehicles (MEV). There is no threshold for calculated crash rates that indicates poor performance, but rates can be used to compare across locations to identify segments, intersections, or areas of higher priority within a corridor or study area.

Crash rates were calculated for the individual mid-block locations in the study corridor as well as the signalized intersections (due to the availability of volumes for these locations). Table 2-9 summarizes the average crash rate by study segment for mid-block locations and signalized intersections. Segment 5 had the highest average mid-block and intersection crash rates.

Table 2-9. Study Corridor Average Crash Rates by Study Segment (2018-2022)

Study Segment	Average Mid-Block Crash Rate (crashes/MVMT)	Average Intersection Crash Rate (crashes/MEV)
Segment 1	1.22	N/A
Segment 2	0.87	0.02
Segment 3	2.55	0.18
Segment 4	2.52	0.24
Segment 5	4.76	0.32
Total Corridor	*1.98*	*0.26*

2.5 Transit

Metro's RapidRide E Line operates between 3rd Avenue S in downtown Seattle in the south to the Aurora Village Transit Center (AVTC) in Shoreline in the north. It is 12.5 miles long and serves 37 stations. It travels almost exclusively on Aurora Avenue N between Harrison Street and the AVTC, except for a short northbound diversion along Linden Avenue N between Whitman Avenue N and Winona Avenue N and along N 200th Street to access the AVTC. It operates almost 24 hours per day on weekdays with headways of 4 to 7 minutes during the AM and PM peak hours, 7 to 8 minutes midday, and 30 to 60 minutes during late evening/early morning hours through March 29, 2024. Weekend headways are every 10 to 15 minutes or better for most of the day, extending to 30 to 60 minutes during late evening/early morning hours.

The E Line is Metro's highest ridership line. While the E Line's ridership has fallen from a pre-pandemic Fall 2019 count of 16,700 weekday rides, Metro's 2023 System Evaluation indicates that weekday ride figures have been increasing; Spring 2023 ridership was counted at 11,426 riders – an increase of 1,116 riders from Spring 2022.

As described in Metro Connects, the RapidRide system is envisioned as a bus rapid transit system running 16 to 20 hours a day with frequencies of 5 to 15 minutes and stop spacings every ½ mile. The stations at stops should have broad shelters, real-time arrival signs, and One Regional Card for All (ORCA) readers installed on the sidewalk to quicken rider payments. RapidRide lines are served with 60 foot long articulated buses, with online WiFi for riders and transit signal priority treatments at key intersections to increase travel speed. Arterials selected for this treatment must have strong service demand and connections to and between major destinations; however, equity and sustainability play large roles which future lines are selected for investment.

The Seattle Roadway Classification classifies the study corridor as a Major Transit Route for the entirety of its length in the City of Seattle. Aurora Avenue N is also designated by the Seattle Transit Master Plan as a High Capacity Transit Corridor and part of the Frequent Transit Network. The draft STP classifies Aurora Avenue N as a Transit Capital Investment Corridor and part of the Frequent Transit Network. Several other bus routes intersect with the E Line along Aurora Avenue N and provide connection opportunities for riders as shown in Table 2-10.

Table 2-10. Transit Lines Intersecting with Aurora Avenue N

Route Number	Route Service Type	Aurora Operating Extent
5	Frequent all-day route	Mercer Street – N 43rd Street
16	Peak-only route	*
28	All-day route	Mercer Street – N 38th Street
40	Frequent all-day route	N 105th Street
44	Frequent all-day route	N 46th Street
45	Frequent all-day route	N 85th Street
Community Transit 101	All-day route	AVTC
Community Transit 115	All-day route	AVTC
Community Transit 130	All-day route	AVTC
301	Peak-only route	*

Table 2-10. Transit Lines Intersecting with Aurora Avenue N (continued)

Route Number	Route Service Type	Aurora Operating Extent
302	Peak-only route	AVTC
303	Peak-only route	AVTC
304	Peak-only route	*
330	All-day route	NE 155th Street – N 160th Street
331	All-day route	AVTC
342	Peak-only route	*
345	All-day route	N 130th Street
346	All-day route	AVTC
348	All-day route	N 185th Street
994	Weekday school shuttle	N 85th Street
SWIFT Blue Line	BRT	Aurora Village Transit Center

* Suspended through March 29, 2024

Average daily boardings by station vary from a low of approximately 13 people at N 72nd Street to a high of approximately 823 people at the AVTC. Average daily alightings by station vary from a low of approximately 13 people at N 200th Street to a high of approximately 855 people at the AVTC. Other high ridership/transfer locations include N 46th Street, N 85th Street, N 105th Street/N Northgate Way, N 130th Street, N 145th Street, and N 185th Street.

Metro installs RapidRide shelters at stations meeting daily boarding thresholds. The style of shelter will vary based on the number of daily boardings at each station. Ten of the E Line's 37 stops do not have a shelter. Table 2-11 illustrates thresholds for RapidRide shelters.

Table 2-11. RapidRide Shelter Thresholds

Station Facility	Shelter Amenity	Daily Boardings Threshold
Large raised station	Large RapidRide shelter	350+
Large station	Standard RapidRide shelter	150 – 349
Medium station	Standard RapidRide shelter	50 - 149
Small station	No shelter	< 50

Transit Signal Priority (TSP) treatments are a critical piece of Metro's RapidRide system to improve transit travel speed and reliability. TSP is present at all signalized intersections along the study corridor (18 intersections).

2.5.1 Transit Travel Speeds

Average transit travel speeds along Aurora Avenue N in 2022 ranged from under 20 mph to under 40 mph. Inbound/southbound and outbound/northbound travel times were generally slower in the PM than in the AM. Segment 3 had the slowest average transit travel speeds while Segment 1 had the fastest.

2.5.2 Bus collisions

Bus collisions along Aurora Avenue N between January 2019 and February 2023 generally increased in frequency from south to north. Collisions were most numerous between approximately N 80th Street and N 145th Street and largely comprised collisions with other non-transit vehicles. Intersections with heavier concentrations of crashes included N 80th Street, N 105th Street/N Northgate Way, N 125th Street, and N 135th Street. Collisions with active transportation users occurred at approximately N 107th Street, north of N 115th Street, and south of N 143rd Street.

Security incident reports on the E Line grew year-over-year from 2019 to 2022. The top three behaviors over the course of the four years were 1) sleepers/non-destinational riders, 2) disruptive behavior/yelling, and 3) refusal to alight. 2022's top three security incident reports were 1) sleepers/non-destinational riders, 2) drug use, and 3) disruptive behavior/yelling. A summary of non-compliant behaviors in 2022 is provided in Table 2-12.

Table 2-12. Security Incident Reports on E Line (2022)

Behavior	Number of Incidences
Alcohol	12
Blocking	26
Denial of Service	3
Disruptive Behavior/Yelling	129
Drug Use	143
Employee – Assault	10
Encampment/Sheltering	2
Fire	2
Harassment/Threats	41
Pass vs. Pass – Assault	32
Passenger – Assault	24
Property Damage/Graffiti	17
Racial/Bias	1
Refusal to Alight	92
Sex Offense	1
Sleeper/Non-Destinational Rider	232
Smoking/Vaping	67
Striking Coach/Thrown Objects	3
Theft	4
Thrown Object/Striking	1
UTC	17

2.6 Transportation Plans and Policies

Development and maintenance of transportation facilities in the City of Seattle, including Aurora Avenue N, is informed by several policy and guidance documents. These documents guide development of both publicly and privately improved transportation infrastructure.

2.6.1 Seattle Transportation Plan

The Seattle Transportation Plan (STP), in draft form at the time of this report, aims to identify a sustainable transportation system that will work both now and in the future, encompassing all infrastructure, including sidewalks and buses. It will establish goals, strategies, and recommendations that will shape future transportation funding as well as projects and programs related to how people move through the city. Key goals that are guiding the creation of the plan include 1) Safety, 2) Equity, 3) Sustainability, 4) Mobility, 5) Livability, and 6) Maintenance and Modernization. It is currently being developed at the same time as the City's Comprehensive Plan is being updated, with adoption scheduled in late 2023-early 2024. After adoption, the STP will supersede previously adopted modal master plans. The STP addresses previously adopted modal master plans in the following ways:

- Bicycle Master Plan
    - Builds on foundation of BMP by growing investment in bicycling and e-mobility, improving Seattle's all ages and abilities bicycle and e-mobility network, identifying catalyst projects and programmatic investments to expand access and encourage bicycling, and identifying and focusing on policies and investments that improve safety for people bicycling and equitably invest in the network.
- Pedestrian Master Plan
    - Builds on foundation of PMP and aims to create a more walkable Seattle by leveraging existing and emerging programmatic activities and initiatives, developing a safe and connected pedestrian network, and utilizing improved safety data to guide investments
- Transit Master Plan
    - Builds on foundation of TMP by continuing SDOT's role in transit delivery, leveraging investment in the Link light rail system, updating the Frequent Transit Network, introducing Community and Mobility Hubs, and improving passengers' physical and digital experiences.
- Freight Master Plan
    - Builds on foundation of FMP by considering all transportation modes associated with goods movement, providing reliable connections to facilities and terminals, establishing a policy framework to increase safety around freight movement, improving access to resources and quality of life for freight industry employees, and addressing adverse impacts of freight on adjacent Seattle neighborhoods.

2.6.2 Bicycle Master Plan

The Bicycle Master Plan's (BMP) vision is to make riding a bicycle a comfortable and integral part of daily life in Seattle for people of all ages and abilities. The BMP is undergirded by five goals which focus on 1) increasing bicycle ridership, 2) improving safety for people riding bicycles, 3) creating a connected and high-quality bicycle network, 4) improving bicycle riding for all through equity in engagement, project delivery, and capital investments, and 5) building vibrant communities by a creating welcoming environment for bicycle riding. The BMP identifies gaps in the bicycle network as well as future locations and types of bicycle facilities to increase access for people riding bicycles. The timeline of implementing all bicycle improvements is filtered through a prioritization framework, which prioritizes projects that best meet the BMP goals and capitalize on current opportunities. The most recent update to the BMP created an implementation plan for 2021 – 2024.

2.6.3 Pedestrian Master Plan

The Pedestrian Master Plan's (PMP) vision is to make Seattle the most walkable and accessible city in the nation by 2037. The PMP's goals center around 1) reducing crashes involving pedestrians, 2) developing a connected pedestrian environment, 3) making Seattle a more walkable and accessible city for all through actions that promote equity, and 4) improving health by getting more people moving. The PMP identifies Seattle's roadway types and locations with pedestrian needs, creating a catalogue of sidewalk improvements to be carried out within 20 years.

The PMP classifies the study corridor as an Arterial Street within the PMP's Priority Investment Network (PIN), a collection of streets and crossings that provide connections to frequent transit and K-12 public schools. SDOT has assigned scores to each location in the PIN ranging from Tier 1 (most need) to Tier 5 (least need). As noted in the PMP, Aurora Avenue N is in particular need of crossing and street improvements north of N 85th Street and south of Raye Street. Tier 1/Tier 2 priority crossings and Tier 3/Tier 4 arterial priority investment designations are prominent in these locations.

The most recent update to the PMP created an implementation plan for 2023 – 2024.

2.6.4 Transit Master Plan

The Transit Master Plan's (TMP) purpose is to establish a network of top quality, frequent transit services that meets the travel needs of most Seattle residents and workers. The TMP's goals include: 1) meet sustainability, growth management, and economic goals, 2) make it easier and more desirable to take transit, 3) respond to the needs of vulnerable populations, 4) create great places where modes connect, and 5) advance implementation without constraints. The TMP also identifies the current and future location of high capacity transit corridors that would be developed by 2052. The study corridor is classified as a High Capacity Transit Corridor for its entire length.

2.6.5 Freight Master Plan

The Freight Master Plan's (FMP) 20-year vision is to create a vibrant city and thriving economy connecting people and products within Seattle and to regional and international markets. The FMP's goals include 1) providing a freight network that supports a growing economy for Seattle, 2) improving safety and the predictable movement of goods and people, 3) reliably connecting industrial centers and business districts with freight networks, 4) maintaining the freight network

to ensure safe operations, 5) benefitting residents and businesses through equity in freight investments, and 6) making the goods movement more efficient while reducing its carbon footprint. The FMP identifies the current freight network as well as future safety and access improvements that are needed.

The study corridor is classified as Major Truck Street for its entire length, in recognition of how it connects major freight generators and carries significant amounts of freight traffic. This designation highlights Aurora's importance in facilitating goods reception and delivery and thus roadway users may encounter a higher percentage of truck traffic on Aurora Avenue N than on other lesser classified streets. It is classified as a Seaport Highway Connector from Harrison Street to N 85th Street and as an Over-Legal Route from N 130th Street to N 145th Street.

2.6.6 Complete Streets Ordinance

Seattle passed the Complete Streets Ordinance in 2007 to provide improved accommodations for pedestrians, bicyclists, transit riders, and persons of all abilities while promoting safe operation for all users. Principles of the Ordinance were incorporated into all appropriate modal SDOT plans with the intention of using all sources of transportation funding to implement Complete Streets. The Ordinance is carried out through Streets Illustrated, a roadmap of how the Ordinance is administered, and the Complete Streets Checklist, which identifies specific improvements to be incorporated into projects over $500,000.

2.6.7 Streets Illustrated

Streets Illustrated is Seattle's Right-of-Way Improvements Manual and provides design guidance and standards to properly design, build, and manage within the ROW. Streets Illustrated takes into account the needs of everyone needing to travel. The manual is centered around safety, the preservation and maintenance of roadway infrastructure and utility services, context sensitive design, and preserving Seattle's environment.

The Streets Illustrator Street Types for each segment of the corridor and their locations in each segment are summarized in Table 2-13.

Table 2-13. Streets Illustrated Classifications Along the Aurora Ave N Study Corridor

Segment	Urban Village Main	Urban Center Connector
1	Roy St to Galer St Raye St to N 38th St	Galer St to Raye St
2	N 38th St to N 46th St	N 46th St to Winona Ave N
3	N 84th St to N 85th St	Winona Ave N to N 84th St
4	N 85th St to N 109th St	N 10th St to N 115th St
5	N 115th St to N 145th St	

2.6.8 WSDOT Complete Streets

WSDOT's Complete Streets approach seeks to create a safe and convenient transportation system for people using all modes of travel, including walking, rolling, biking, driving, and riding transit. The Complete Streets approach looks to increase safety and mobility on roadways by

constructing infrastructure that provides access to all users. State transportation projects over $500,000 must utilize Complete Streets principles in their design and execution.

2.6.9 Climate Change Response Framework

SDOT's Climate Change Response Framework aims to hasten a reduction in Seattle's transportation emissions to meet their goal of reducing greenhouse gas emissions by 82% from a 2008 baseline and achieving zero-emission trips for 90% of all personal trips and 30% of all freight trips by 2030. This reduction will occur through six categories that employ 27 strategies; categories include making transit more convenient, reliable, and affordable, and enabling the use of climate-friendly travel choices.

2.6.10 Metro Connects

King County Metro's Metro Connects is a long-range service and capital vision framework that seeks to incorporate Metro's core values of safety, equity, and sustainability in increasing service by 70% by 2050, increasing mobility services of all types to complement the high-capacity transit network, and committing to work with partners to improve the quality of services. Metro also plans to respond to and address historic inequities by making investments for communities with the greatest needs, who include People of Color, people with low income or disabilities, immigrants or refugees, and linguistically diverse populations.

2.7 Land Use

2.7.1 Land Use

Current land uses along Aurora Avenue N within the study corridor are diverse. Broadly, the land uses are densest further south along the corridor, closer to Seattle's urban core. In the southern portion of the corridor, the land use is generally made up of higher-density multifamily and mixed use or commercial uses with smaller setbacks. From N 50th Street to N 59th Street, the corridor runs through Woodland Park. Just north of the park, from N 59th Street to N 72nd Street, uses along the corridor and on surrounding blocks is predominantly single family. Travelling north along the corridor, most parcels directly abutting the corridor are mixed-use/commercial, with some mixed-use commercial and multifamily residential on the surrounding blocks. For much of the northern segment, the use 1-2 blocks off the corridor is predominantly single-family residential. The mixed-use commercial along the corridor is characterized by 1-2 story small commercial buildings, some new multifamily development, and large big box stores with surface parking lots.

Future land uses along Aurora Avenue N are detailed in the Seattle 2035 Comprehensive Plan, whose Future Land Use Map illustrates land use designations that are anticipated by Comprehensive Plan policies. These land uses are assigned to parcels and aim to influence future zoning designations. The Future Land Use Map shows Multi-Family Residential, Commercial/Mixed Use, and Urban Center land uses on Aurora Avenue N south of the Aurora Bridge. North of the Aurora Bridge, land use designations include Hub Urban Village, Commercial/Mixed Use, and Residential Urban Village.

2.7.2 Zoning

The Seattle zoning code governs currently eligible uses that may be carried out on parcels of land throughout the city. Seattle's Generalized Zoning Map illustrates Seattle Mixed, Commercial/Mixed Use, and Multi-Family zones dominating the general zones intersecting with

Aurora Avenue N. Zoning near the southern third of Lake Union is the only section of Aurora Avenue N designated Seattle Mixed; the balance of zoning up to N 145th Street is comprised of Commercial/Mixed Use, Multi-Family, or Neighborhood Residential.

2.7.3 Urban Villages

The City's Urban village strategy attempts to align Seattle's growth with the existing and desired future character of neighborhoods. The strategies build on the Comprehensive Plan's land use designations and establish different categories that provide a relevant balance of housing, jobs, and industrial uses for neighborhoods that are best positioned for the growth. Urban villages have policies to support walking and transit use and to allow densities sufficient to take advantage of significant investment in public transit.

The study corridor's designation as a High Capacity Transit Corridor means that different types of urban villages are located along its length. These include Uptown (Urban Center), South Lake Union (Urban Center), Fremont (Hub Urban Village), Wallingford (Residential Urban Village), Aurora-Licton Springs (Residential Urban Village), and Bitter Lake Village (Hub Urban Village). Urban Centers represent the densest neighborhoods that offer a variety of housing, office, and commercial uses, Hub Urban Villages provide a lower density of housing and employment, and Residential Urban Villages focus on goods and services for residents.

2.8 Underground Utilities

Underground utilities, including water, stormwater, and sewer, are present along the length of the corridor. Water lines provide Seattle's residents with clean drinking water. The study corridor has water lines along its west and east lengths except for stretches of the Aurora Bridge, N 39th Street to N 85th Street, and the Evergreen Washelli Funeral Home and Cemetery from N 110th Street to approximately N 120th Street. A stretch of water line has been abandoned from Harrison Street to Mercer Street.

Aurora Avenue N runs through the middle of the Densmore Basin, a large, separated drainage system that drains 1,600 acres of north Seattle to Green Lake and Lake Union. The basin covers the Aurora Avenue N corridor between N 85th Street and N 145th Street, encompassing almost the entirety of the Aurora-Licton Springs and Bitter Lake Urban Villages. SPU has identified the Densmore Basin as a catchment with needs for extensive drainage improvements, as many parts of the conveyance system are undersized and prone to flooding, in non-standard and difficult to access locations, and/or consist of informal drainage assets such as ditches and culverts. Many subareas within the basin lack conveyance entirely.

The Densmore Basin Study, completed in 2003, represents the last comprehensive analysis of the basin. SPU's Drainage System Capacity Evaluation (2020), Wastewater System Capacity Evaluation (2020), and Risk Area Prioritization (2020) show the Aurora corridor as having numerous drainage and sewer capacity risks, with many capacity risk areas classified as "critical" south of N 105th Street/N Northgate Way and "high" north of N 105th Street/N Northgate Way. The area between N 93rd Street and N 120th Street has a significant sewer gap, presenting challenges for future development connections, while sewer function for approximately 1,000 acres of north Seattle depends on a non-standard sewer main running through private property at the Evergreen Washelli Cemetery.

Long stretches of Aurora Avenue N lack piped storm drains for development connections, resulting in expensive, complex mainline extensions or exceptions that perpetuate system gaps.

Many areas have a single sewer main on one side of the street, where dual lines would better serve future development. Building out and upsizing sewer mains on Aurora Avenue N has potential to improve development connections, increase maintenance access, and reduce capacity risks.

SPU is currently developing a planning-level system layout for stormwater conveyance and sewer trunk lines throughout the Densmore Basin and a more detailed layout for the Aurora-Licton Springs Urban Village. SDOT and SPU project timing presents an opportunity to concurrently plan for complimentary transportation and stormwater and sewer conveyance improvements along the Aurora corridor.

3. Segment 1

3.1 Segment Description

Segment 1 of Aurora Avenue N is approximately 2.2 miles long, extending from Harrison Street in the south to N 38th Street in the north. Beginning in the south, Segment 1 runs from the north portal of the SR 99 tunnel, rising to merge with 7th Avenue N. The tunnel's width and enclosed, car-exclusive space lends a freeway-like feel to the road which contrasts with the dense residential buildings located one block north of the tunnel's end. The posted speed limit for the length of Segment 1 is 40 mph. A jersey barrier, few pedestrian crossings, and limited right turn access to residential/office buildings and businesses further isolate neighborhoods located on either side of Aurora Avenue N. The Aurora Bridge crosses the Lake Washington Ship Canal west of Lake Union into the Fremont neighborhood, after which the surrounding residential density begins to decline. Industrial commercial uses are also present on the north shore of the lake. Table 3-1 summarizes key characteristics of Segment 1.

Table 3-1. Segment 1 At a Glance

Segment Extents	Harrison Street to N 38th Street
Segment Length	2.2 miles
Annual Average Daily Traffic	57,700
Measured 85th Percentile Traffic Speeds	52-54 mph (posted speed limit: 40 mph)
Average Distance Between Pedestrian Crossings	2,080 feet
Crashes Per Mile (2018-2022)	126
Crashes Involving Vulnerable Users (2018-2022)	7
Bus Routes Serving the Segment	E Line, 5, 16X, 28
Bus Stops	4
Total Average Daily E Line Boardings/Alightings in Segment 1	Boardings: 125/Alightings: 164

3.2 Roadway Characteristics

Segment 1 is six lanes for the majority of its length, widening to seven lanes at the northern end of the segment. The ROW in Segment 1 ranges from 70 to 165 feet in width. This includes five to six general purpose lanes, a jersey barrier for the southern half of the segment, a southbound 24/7 BAT lane for the southern half of the segment, and intermittent painted centerlines with bollards.

The existing medians include painted centerlines with bollards and jersey barriers. With the exception of the Aurora Bridge, there is a jersey barrier present. The jersey barrier diminishes local road access to the adjacent neighborhoods by prohibiting left turns. Access to adjacent neighborhoods is provided via right turns/ramps, with underpasses for vehicles to reach the opposite side of the road.

Figure 3-1 illustrates travel lane characteristics, existing medians, access management, and ROW width on Segment 1 of Aurora Avenue N.

Aurora Avenue N is classified entirely as a principal arterial in Segment 1. Mercer Street is the only Principal Arterial that intersects with Aurora Avenue N. Intersecting minor arterials that intersect with Aurora Avenue N include Raye Street, 6th Avenue N, Valley Street and Dexter Way N. Of the arterials, only Mercer Street and Valley Street N provide vehicular access across Aurora Avenue N. Figure 3-2 illustrates the roadway network surrounding Aurora Avenue N in Segment 1.

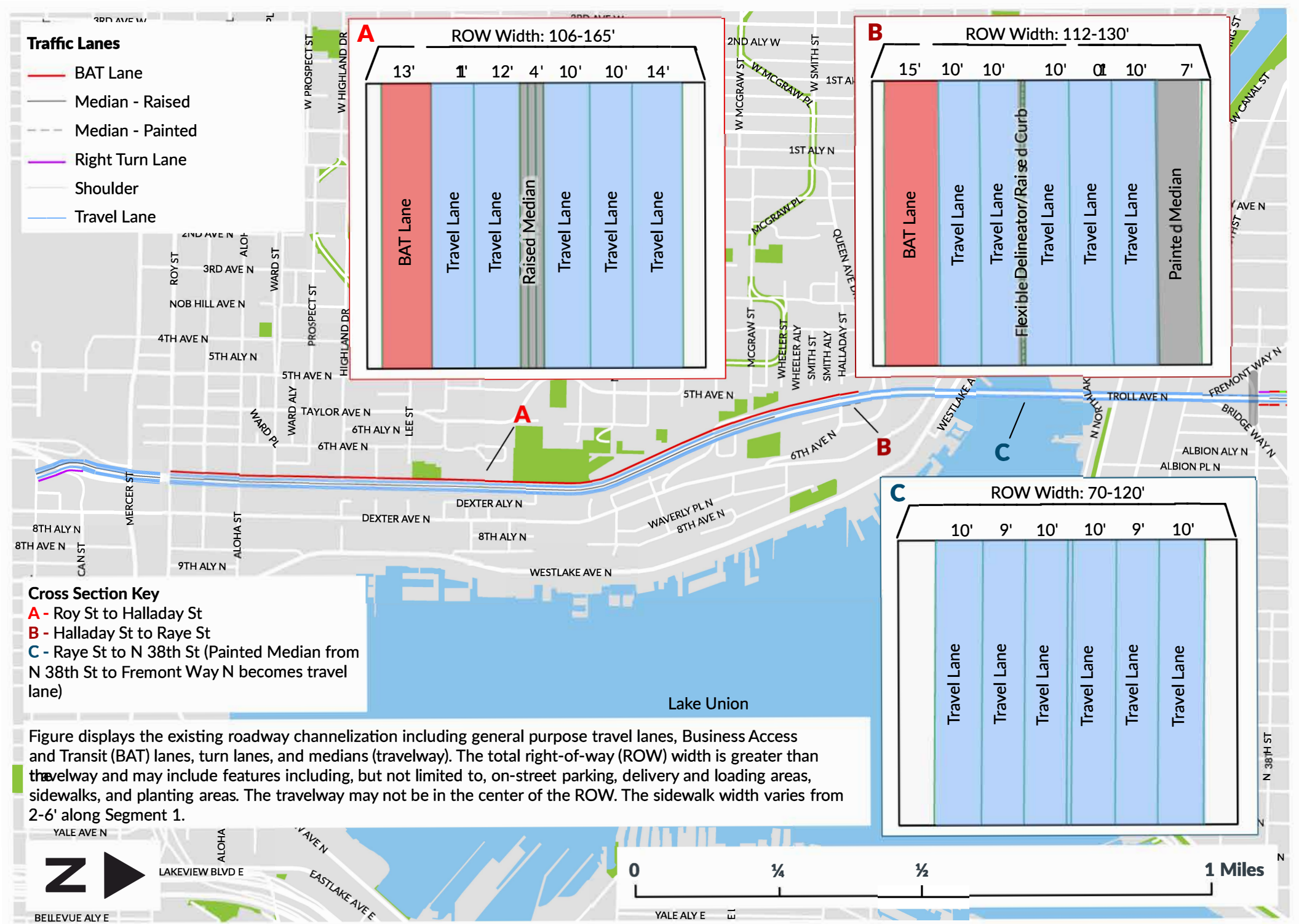


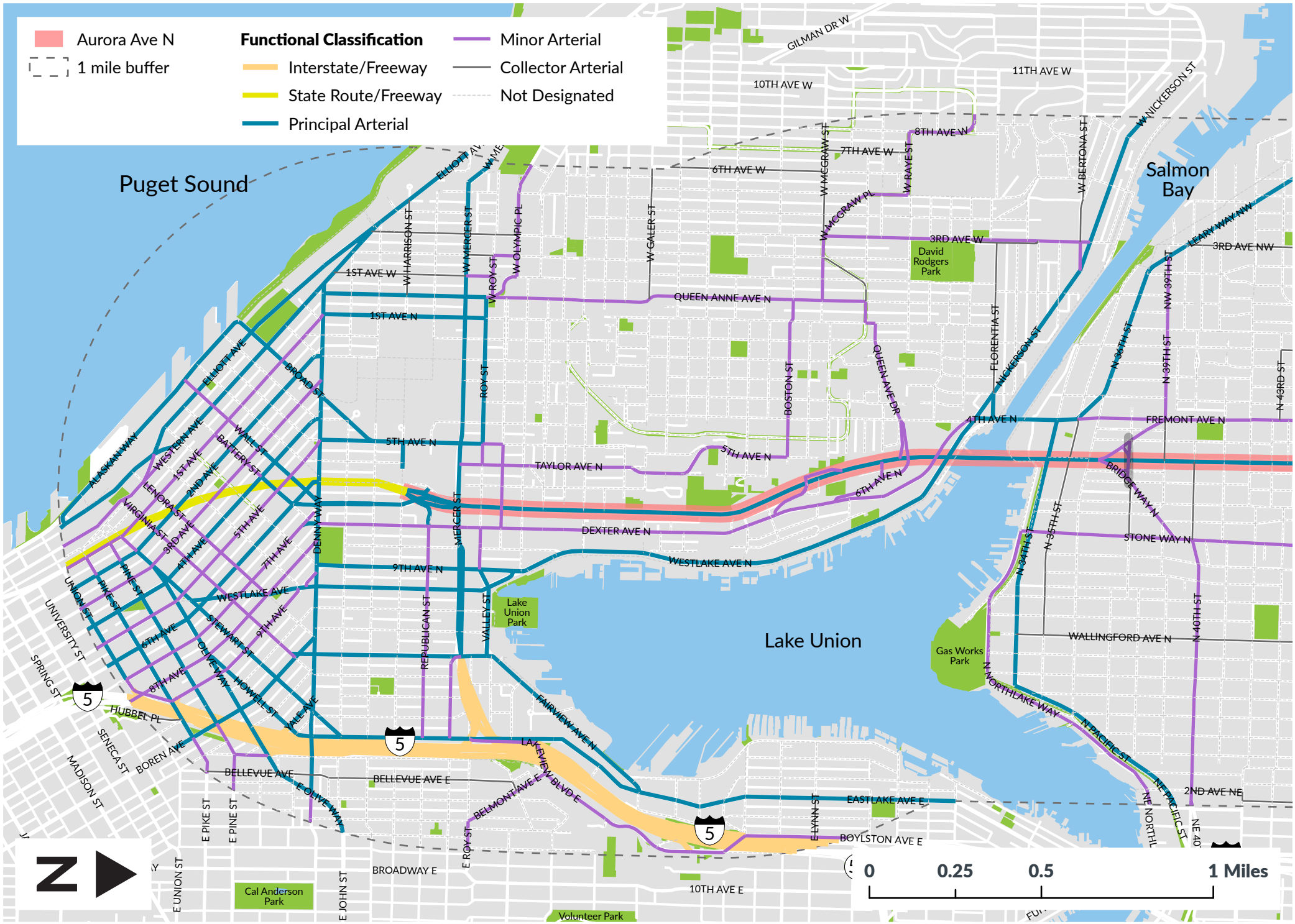
Figure displays the existing roadway channelization including general purpose travel lanes, Business Access and Transit (BAT) lanes, turn lanes, and medians (travelway). The total right-of-way (ROW) width is greater than the travelway and may include features including, but not limited to, on-street parking, delivery and loading areas, sidewalks, and planting areas. The travelway may not be in the center of the ROW. The sidewalk width varies from 2-6' along Segment 1.

Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-1. Segment 1 Channelization and Cross Sections

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-2. Segment 1 Functional Classification

Seattle Department of Transportation

King County METRO

On-street parking is not permitted along any part of Aurora Avenue N in Segment 1.

3.3 Traffic Operations

3.3.1 Traffic Volumes

Based on March 2023 traffic counts, the ADT volumes in Segment 1 are approximately 51,800 vehicles, with 25,200 vehicles in the northbound direction and 26,600 in the southbound direction. The AWDT volumes in Segment 1 are approximately 55,100 vehicles, with 26,700 vehicles in the northbound direction and 28,400 in the southbound direction. A profile of the AWDT volumes by 15-minute intervals is shown in Figure 3-3 for Segment 1. There are two distinct peaks in traffic volumes during the AM and PM peak periods, with a shorter, more concentrated peak during the morning, and a larger, longer duration peak during the afternoon. During the morning peak period the volumes are higher in the southbound direction than the northbound direction. In the afternoon peak the volumes in the southbound begin to peak earlier than volumes in the northbound direction but then the southbound volumes begin to decrease when the northbound volumes peak in the evening. Figure 3-4 illustrates the average daily volumes in the Segment 1 extent of Aurora Avenue N.

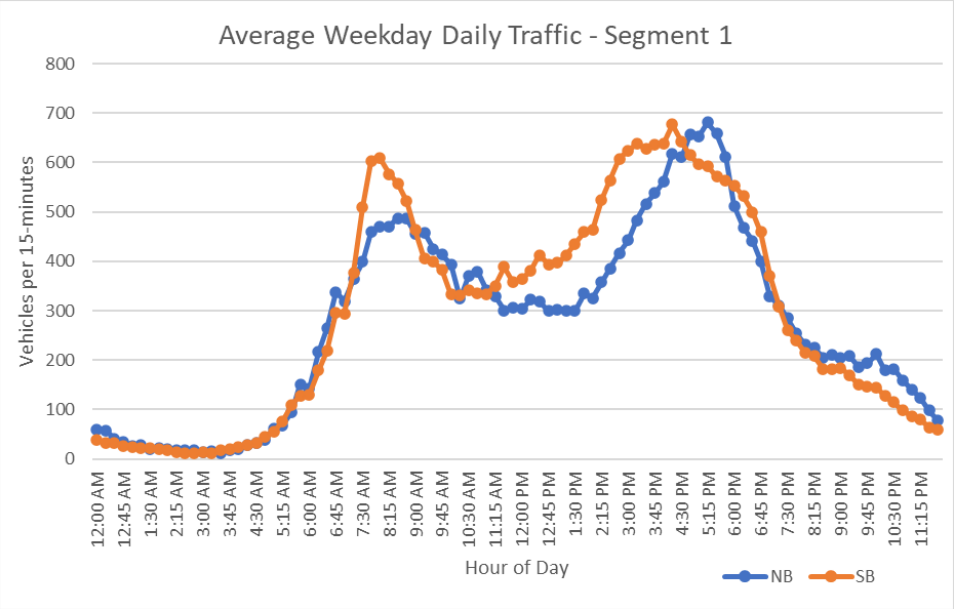
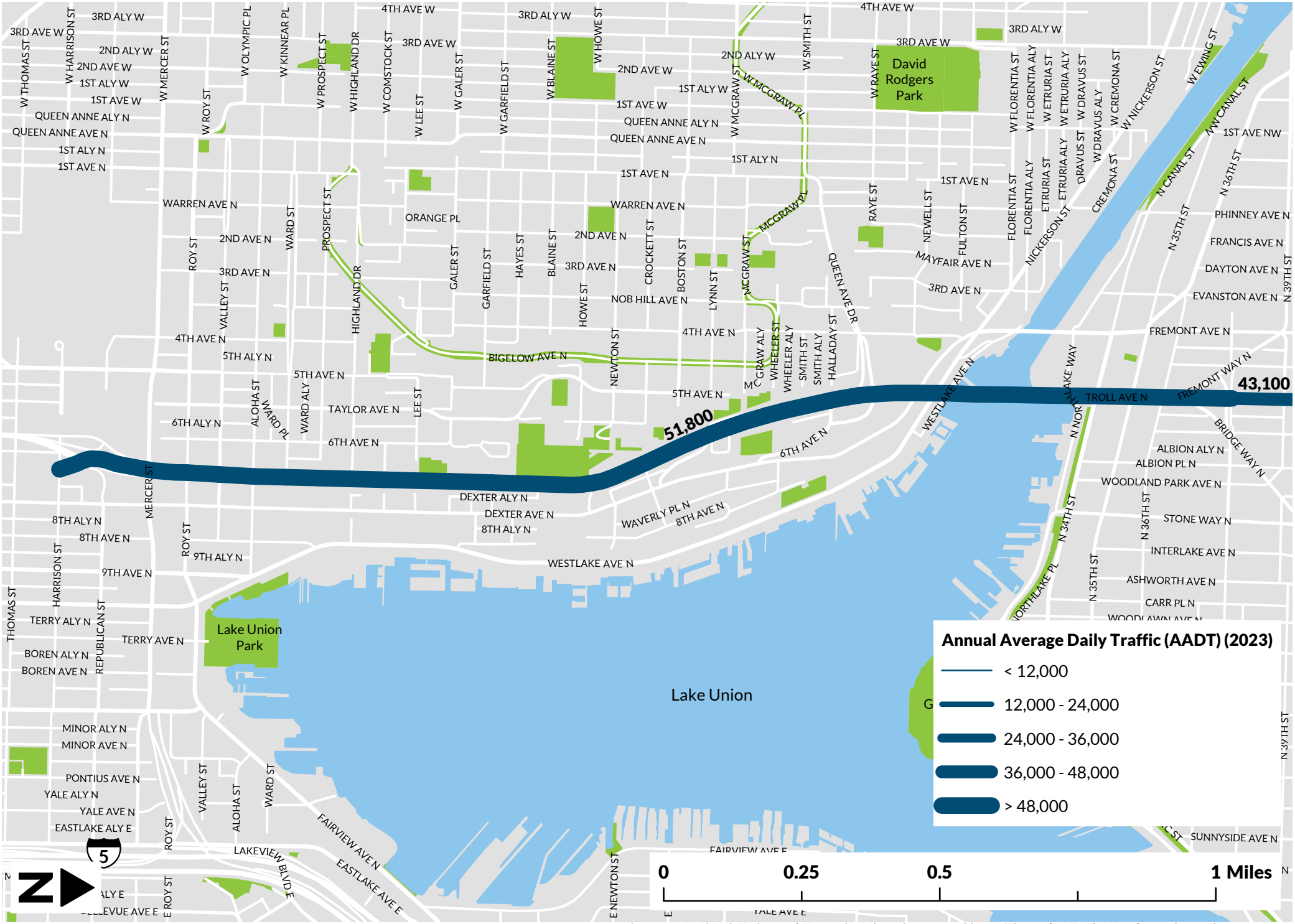


Figure 3-3. Segment 1 Average Weekday Daily Traffic by Time of Day



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-4. Segment 1 Average Annual Daily Traffic (AADT)

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Turning movement counts were collected in March 2023 for Aurora Avenue N and Harrison Street, and in May 2023 for the other study intersections in Segment 1. The Aurora Avenue N and Halladay Street intersection has the highest vehicular entering volumes with approximately 5,600 and 6,700 vehicles during the AM and PM peak periods, respectively. Figure 3-5 summarizes the TMCs for the study intersections in Segment 1 of the project.

3.3.2 Freight Network and Vehicle Volumes

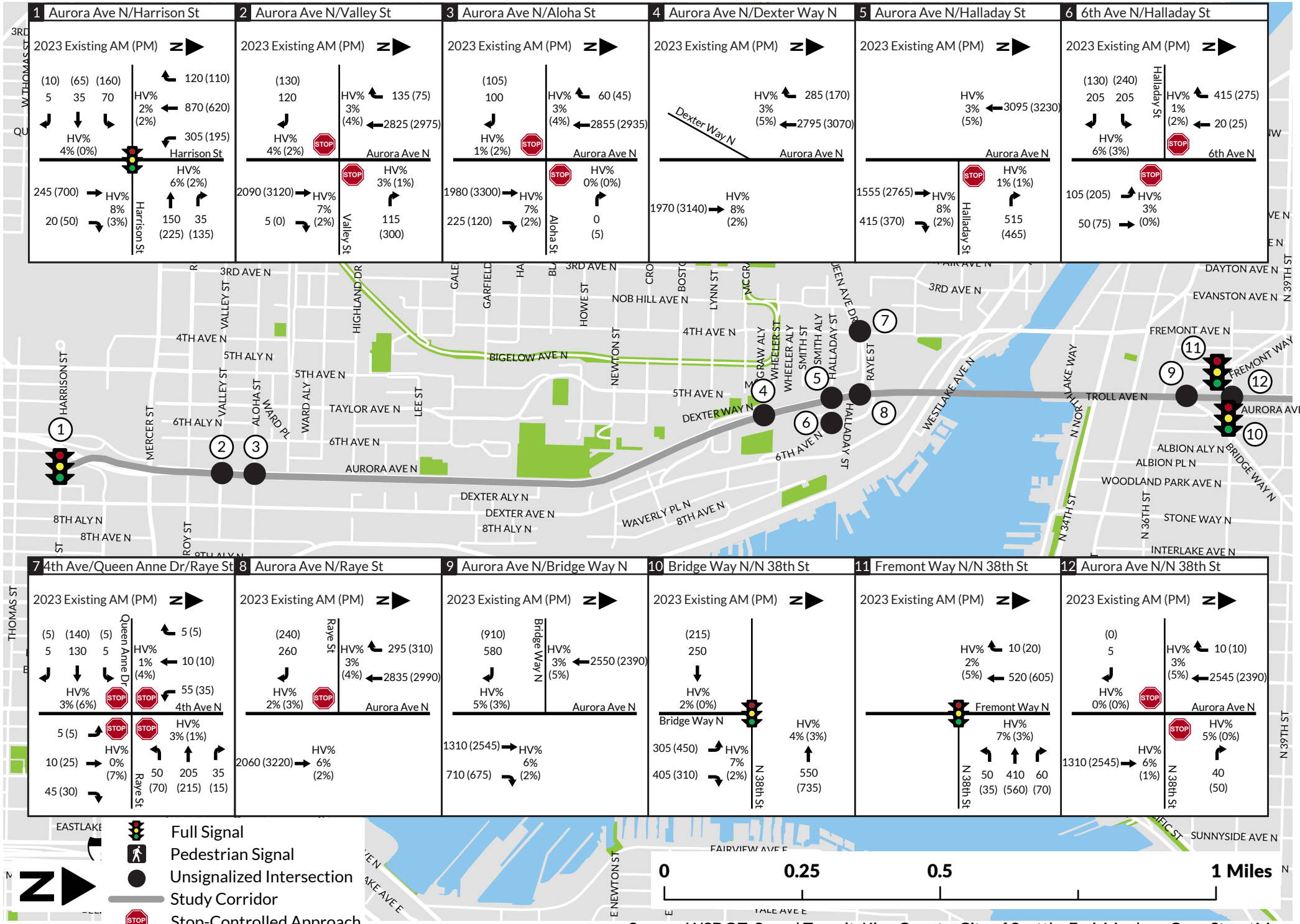
As shown in Figure 3-5, the heavy vehicle percentage in the northbound direction ranges from 6% to 8% during the AM peak period and 2% to 3% during the PM peak period; the southbound heavy vehicle percentage ranges from 2% to 3% during the AM peak period and 2% to 5% during the PM peak period. Figure 3-6 displays the freight network in Segment 1.

3.3.3 Measured 85th Percentile Traffic Speeds

The posted speed limit is 40 mph in both directions in Segment 1. The 85th percentile speeds measured from 24-hour tube counts collected in March 2023 are 54 mph in the northbound direction and 52 mph in the southbound direction in Segment 1, 35% and 30% above the speed limit, respectively. Figure 3-7 shows the 85th percentile northbound and southbound traffic speeds and the posted speed limit of Segment 1.

3.3.4 Vehicle Travel Time

The average travel time traveling northbound in Segment 1 is 3.3 minutes during AM peak and 3.4 minutes during the PM peak periods. The average travel time traveling southbound in Segment 1 is 4.5 minutes during the AM peak and 4.7 minutes during PM peak periods.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-5. Segment 1 Traffic Volumes

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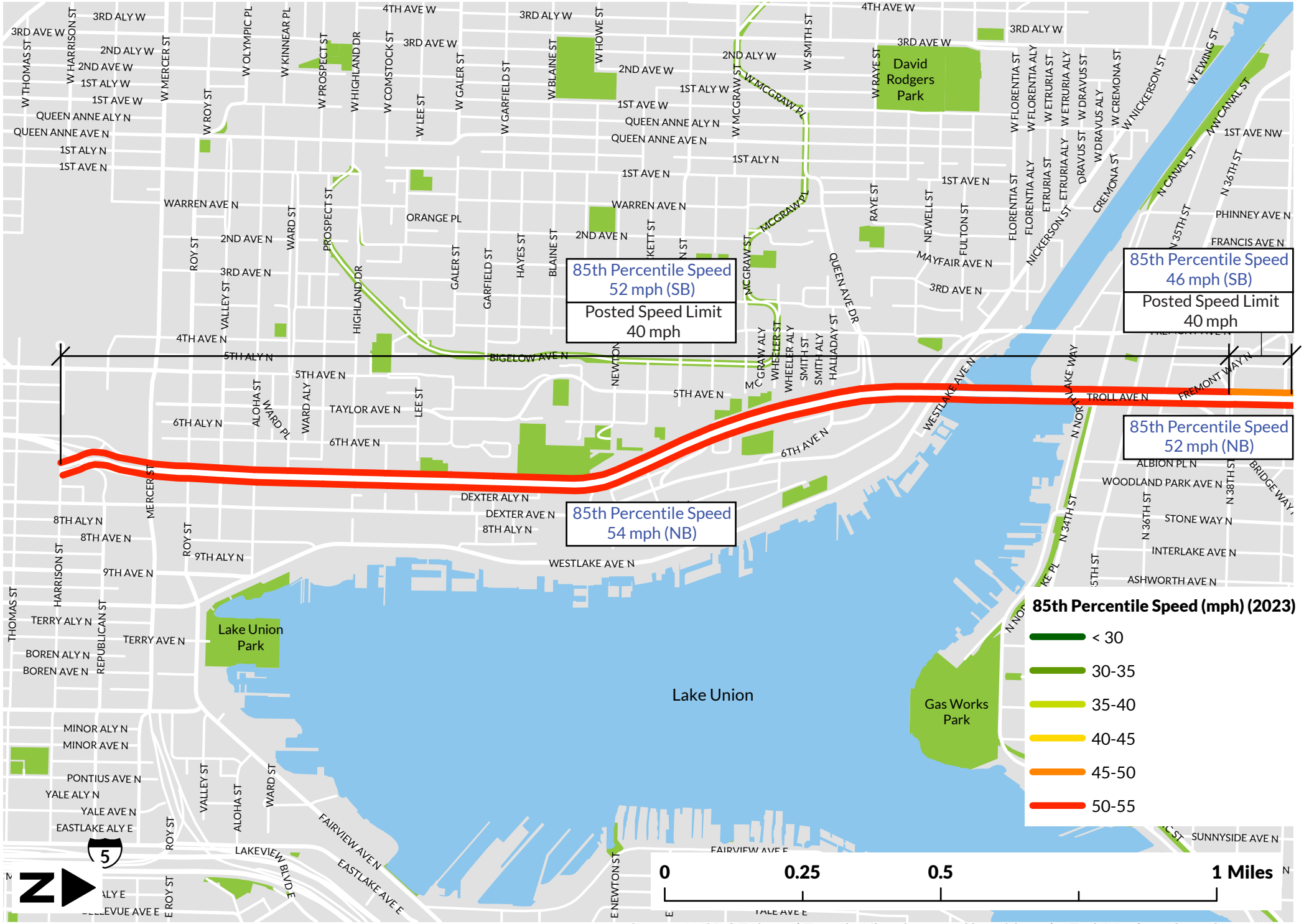


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-6. Segment 1 Freight Network

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-7. Segment 1 85th Percentile Speed

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3.3.5 Intersection Operation Metrics

The existing operation metrics of the study intersections in Segment 1 under the are shown in Table 3-2. The LOS of the overall intersection for signalized intersections are illustrated in Figure 3-8 and approach LOS of unsignalized intersections are displayed in Figure 3-9.

Table 3-2. Segment 1 Intersection Operation Metrics

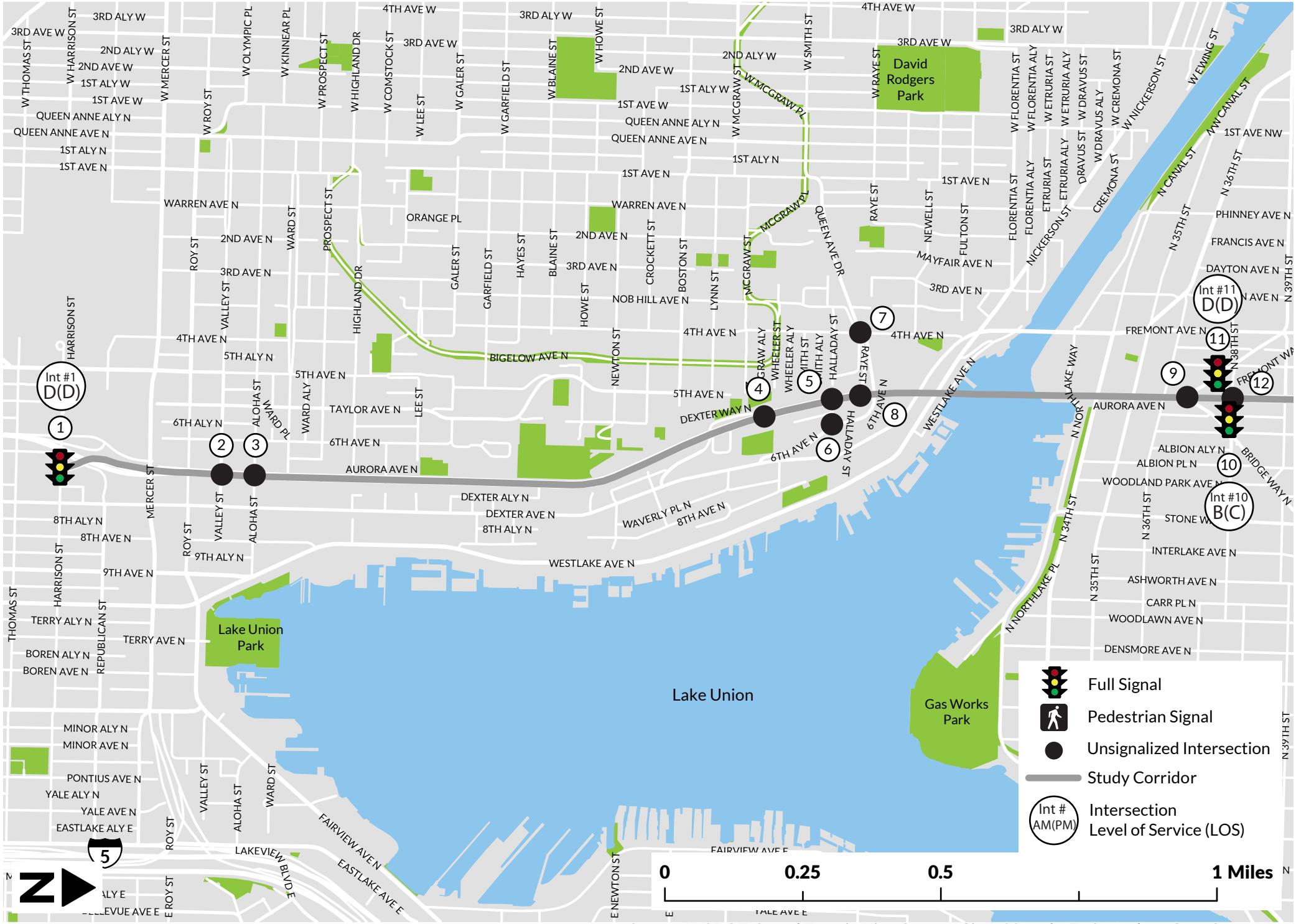
Intersection	Traffic Control	AM Peak			PM Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
Aurora Ave N and Harrison St	Full Signal	51.5	D	1.01	43.6	D	0.81
Aurora Ave N and Valley St	TWSC	39.5	E	0.55 (EBR)	200+	F	1.42 (WBR)
Aurora Ave N and Aloha St	OWSC	31.2	D	0.43 (EBR)	34.1	D	0.47 (EBR)
Aurora Ave N and Dexter Way N	Off-Ramp						
Aurora Ave N and Halladay St	OWSC	200+	F	1.54 (WBR)	200+	F	2.60 (WBR)
Halladay St and 6th Ave N*	TWSC	158.5	F	1.00 (NBL)	200+	F	1.42 (NBL)
4th Ave and Queen Anne Dr/Raye St*	AWSC						
Aurora Ave N and Raye St	OWSC	200+	F	1.35 (EBR)	200+	F	1.38 (EBR)
Aurora Ave N and Bridge Way N	On/Off-Ramps						
N 38th St and Bridge Way N*	Full Signal	17.4	B	0.36	22.4	C	0.42
N 38th St and Fremont Way N*	Full Signal	38.8	D	0.78	38.8	D	0.82
Aurora Ave N and N 38th St	TWSC	29.3	D	0.03 (EBR)	42.8	E	0.36 (WBR)

*Indicates that the intersection is located off Aurora Ave N

Notes:

EBR – Eastbound right
NBL – Northbound left
NBR – Northbound right
WBR – Westbound right

All three signalized intersections on Aurora Avenue N within Segment 1, including Aurora Avenue N/Harrison Street, N 38th Street/Bridge Way N and N 38th Street/Fremont Way N intersections, operate at LOS D or better during both AM and PM peak periods. The stop-controlled intersections in Segment 1 are either off Aurora Ave N or reporting the stop-controlled movements of side streets to Aurora Avenue N and do not contribute to queuing or delays for northbound or southbound traffic. Stop-controlled intersections in Segment 1 operate at LOS E or F during peak periods except for Aurora Avenue N/Aloha Street during both peak periods and Aurora Avenue N/N 38th Street during the AM peak. The Aurora Avenue N/Harrison Street intersection obtains a V/C ratio greater than 1.0 during the AM peak period, and the Aurora Avenue N/Valley Street intersection obtains a V/C ratio greater than 1.0 during the PM peak period. Three other study intersections receive a V/C ratio of 1.0 or greater during both the AM and PM peak periods, namely Aurora Avenue N/Halladay Street, Halladay Street/6th Avenue N, and 4th Avenue/Queen Anne Drive/Raye Street.

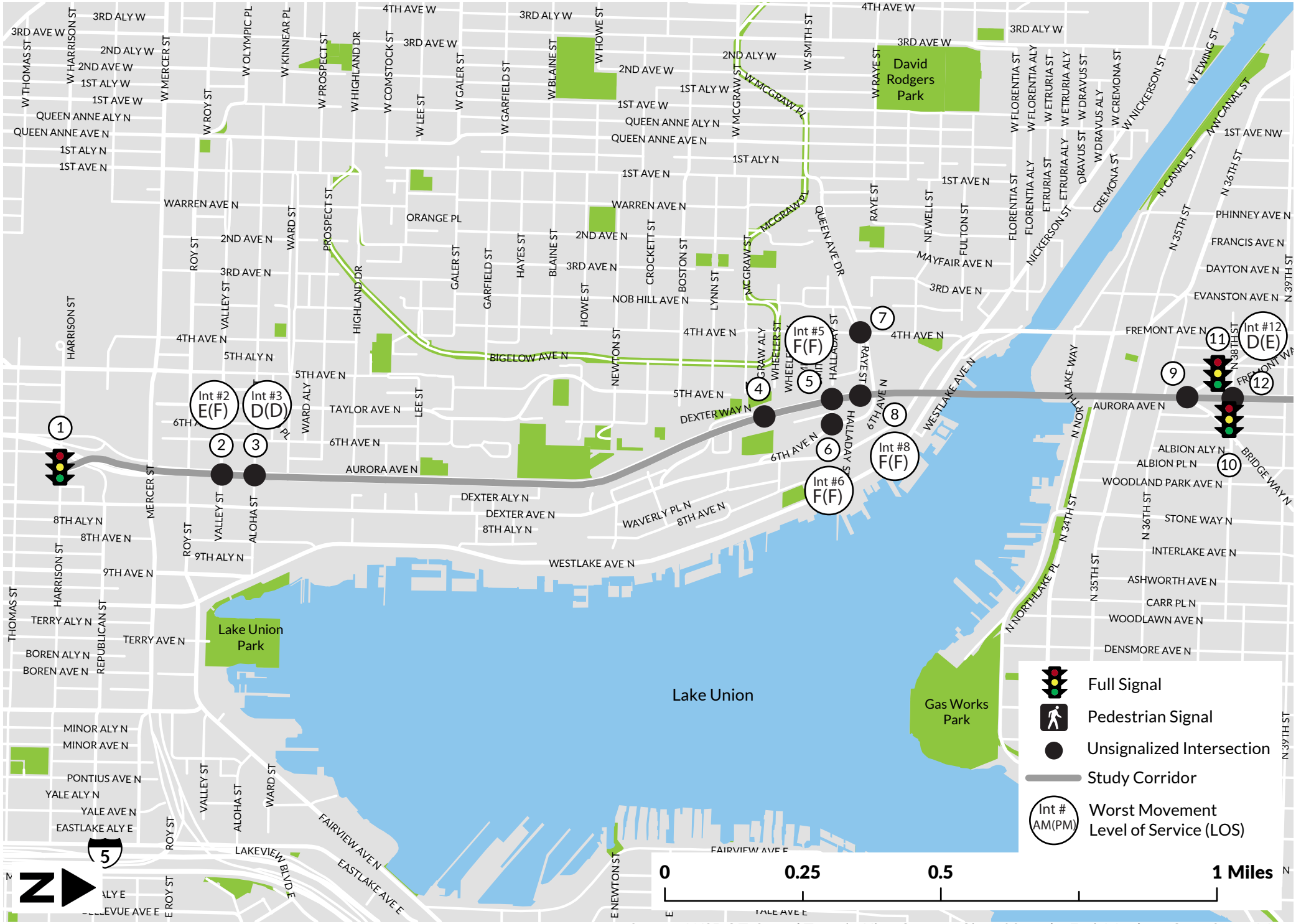


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-8. Segment 1 Signalized Intersection Overall LOS

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-9. Segment 1 Approach LOS for Unsignalized Study Intersections

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3.4 Nonmotorized Facilities

3.4.1 Pedestrian Facilities

Aurora Avenue N has sidewalks present along all of Segment 1 on both sides of the roadway. Most sidewalks are 5 – 6 feet or greater in width, however, they are narrower (4 – 5 feet wide or less) along several stretches of the roadway including both sides of the Aurora Bridge and the east side of Aurora Avenue N from approximately Garfield Street to Howe Street. The WSDOT Pedestrian LTS on Aurora Avenue N is rated as "4" throughout the entirety of Segment 1

Figure 3-10 illustrates sidewalk width and WSDOT's Pedestrian Level of Traffic Stress along Segment 1 of Aurora Avenue N.

The condition of sidewalks in Segment 1 is primarily "fair" or better. The sidewalks on the Aurora Bridge are rated as "good" on both sides and there are multiple blocks of sidewalk south of Aloha Street in "excellent" condition. "Fair" to "poor" stretches include both sides of Aurora Avenue N from Galer Street to Raye Street. There is one "very poor" block of sidewalk on the east side of Aurora Avenue N in between Highland Drive and Comstock Street.

Figure 3-11 depicts existing sidewalk conditions on Segment 1 of Aurora Avenue N.

Segment 1 contains one above-grade pedestrian crossing of Aurora Avenue N in the form of a pedestrian bridge at Galer Street and undercrossings at the north and south ends of the Aurora Bridge. Raye Street provides direct access to and an undercrossing of Aurora Avenue N. Below-grade crossings exist on roadways with sidewalks or paths that pass under the Aurora Bridge between Westlake Avenue N and N 36th Street, however these crossings do not provide access to Aurora Avenue N. These roadways and paths include Dexter Avenue N, Westlake Avenue N, the Cheshiahud Lake Union Loop, N Northlake Way, N 34th Street, N 35th Street, and N 36th Street.

Figure 3-12 displays at-grade and grade-separated pedestrian crossings in Segment 1 of Aurora Avenue N.

SDOT's Compliant Curb Ramp App revealed two ADA-compliant curb ramps at Valley Street and two at Raye Street in Segment 1. No accessible pedestrian signals were recorded and neither the over or undercrossings are ADA accessible.

Figure 3-13 shows the lack of accessible pedestrian signals and the in-service ADA-compliant curb ramps in Segment 1 of Aurora Avenue N.

SDOT street types present on Aurora Avenue N in Segment 1 from south to north include Urban Village Main and Urban Center Connector. Total minimum width without frontage required for these street types according to Streets Illustrated is 12 feet and 18 feet, respectively. Sidewalk facilities along Aurora Avenue N are compliant with SDOT's standards for approximately half of Segment 1. Significant stretches that are not compliant include both sides of the Aurora Bridge, the east side of Aurora Avenue N from Galer Street to Howe Street, and the west side of Aurora Avenue N from Aloha Street to Galer Street.

Figure 3-14 depicts existing sidewalks' consistency with SDOT's minimum sidewalk standards for roadways in Segment 1 of Aurora Avenue N.

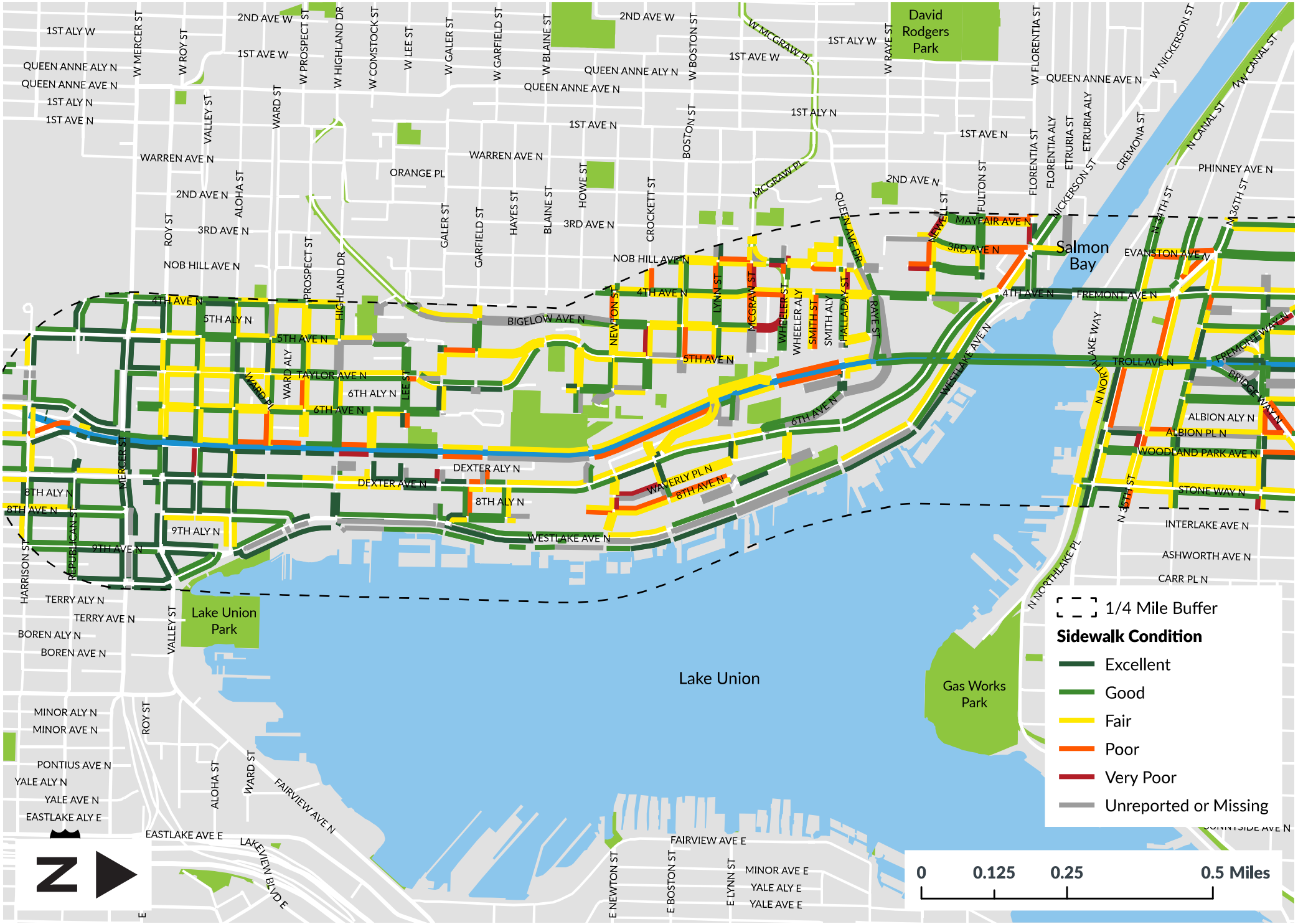


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-10. Segment 1 Sidewalk Consistency with WSDOT Standards

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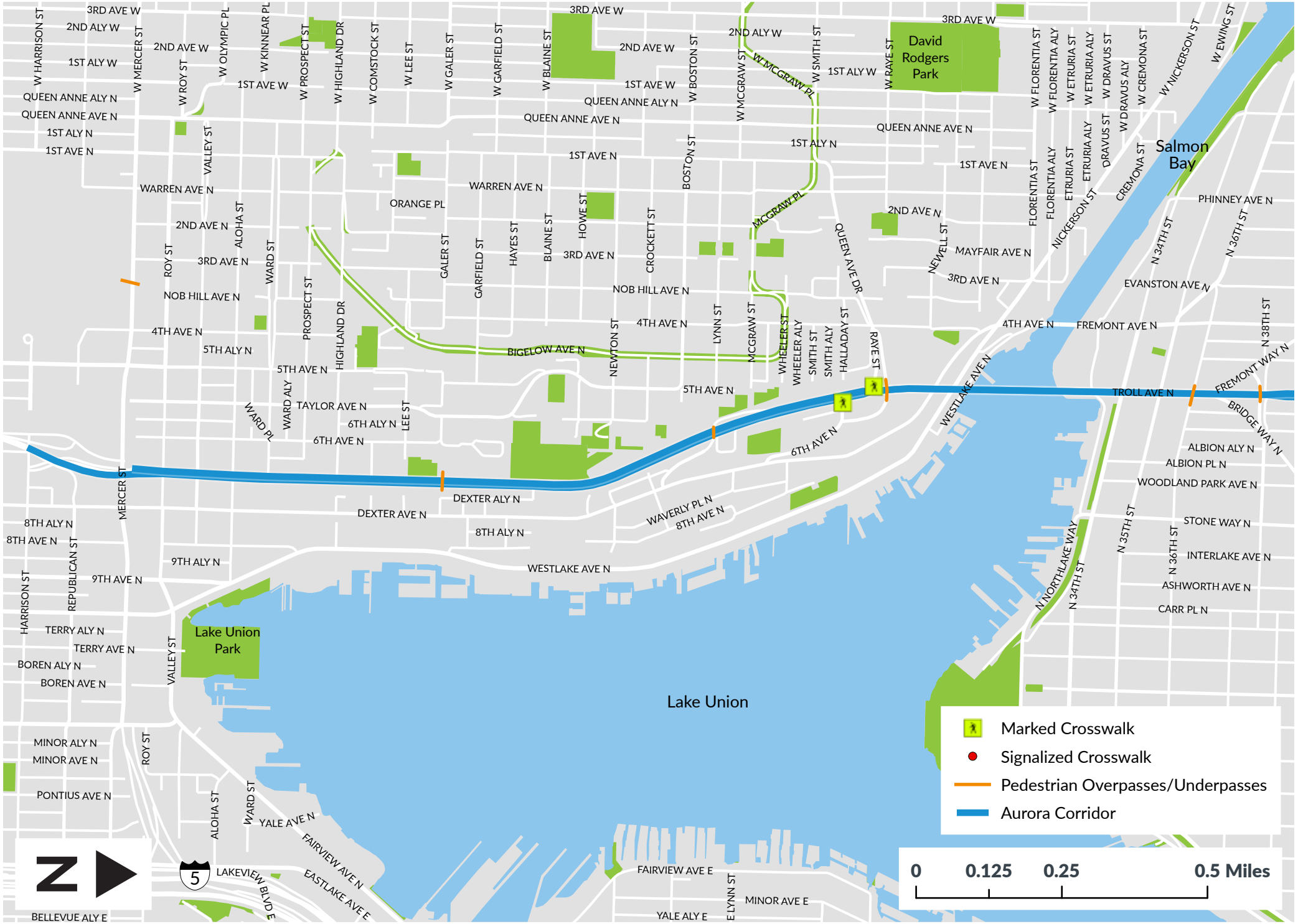


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-11. Segment 1 Existing Sidewalk Condition

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-12. Segment 1 Pedestrian Crossings

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ADA compliant curb ramps include those surveyed in 2015-2016 by SDOT. This survey scored ramps on the basis of features such as slope, width and signage.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-13. Segment 1 Pedestrian ADA Features

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-14. Segment 1 Sidewalk Consistency with SDOT Street Types

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3.4.2 Bicycle Facilities

No bicycle facilities currently exist on Aurora Avenue N in Segment 1. Five streets with bicycle facilities pass under Aurora Avenue N along Segment 1. Mercer Street is equipped with a protected two-way bicycle facility that proceeds underneath Aurora Avenue N. Dexter Avenue N's buffered bike lanes pass under the south end of the Aurora Bridge. Parallel to Westlake Avenue N is the Cheshiahud Lake Union Loop trail that also passes under the Aurora Bridge. N 34th Street provides users with a protected bicycle facility, while the Burke Gilman Trail provides a completely separated multi-use trail. WSDOT ranks the Bicycle LTS along the entirety Segment 1 as "4."

Figure 3-15 illustrates the presence of bicycle facilities in the Segment 1 extent of Aurora Avenue N.

3.5 Safety

A total of 277 crashes occurred in Segment 1 between 2018 and 2022. Table 3-3 summarizes these crashes by severity.

Table 3-3. Segment 1 Crashes by Severity (2018-2022)

Crash Severity	Crash Frequency
Fatal Crashes	4
Serious Injury Crashes	7
Injury Crashes	75
Property Damage Only Crashes	183
Unknown Crashes	8
Total Segment Crashes	*277*



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-15. Segment 1 Existing Bicycle Facilities

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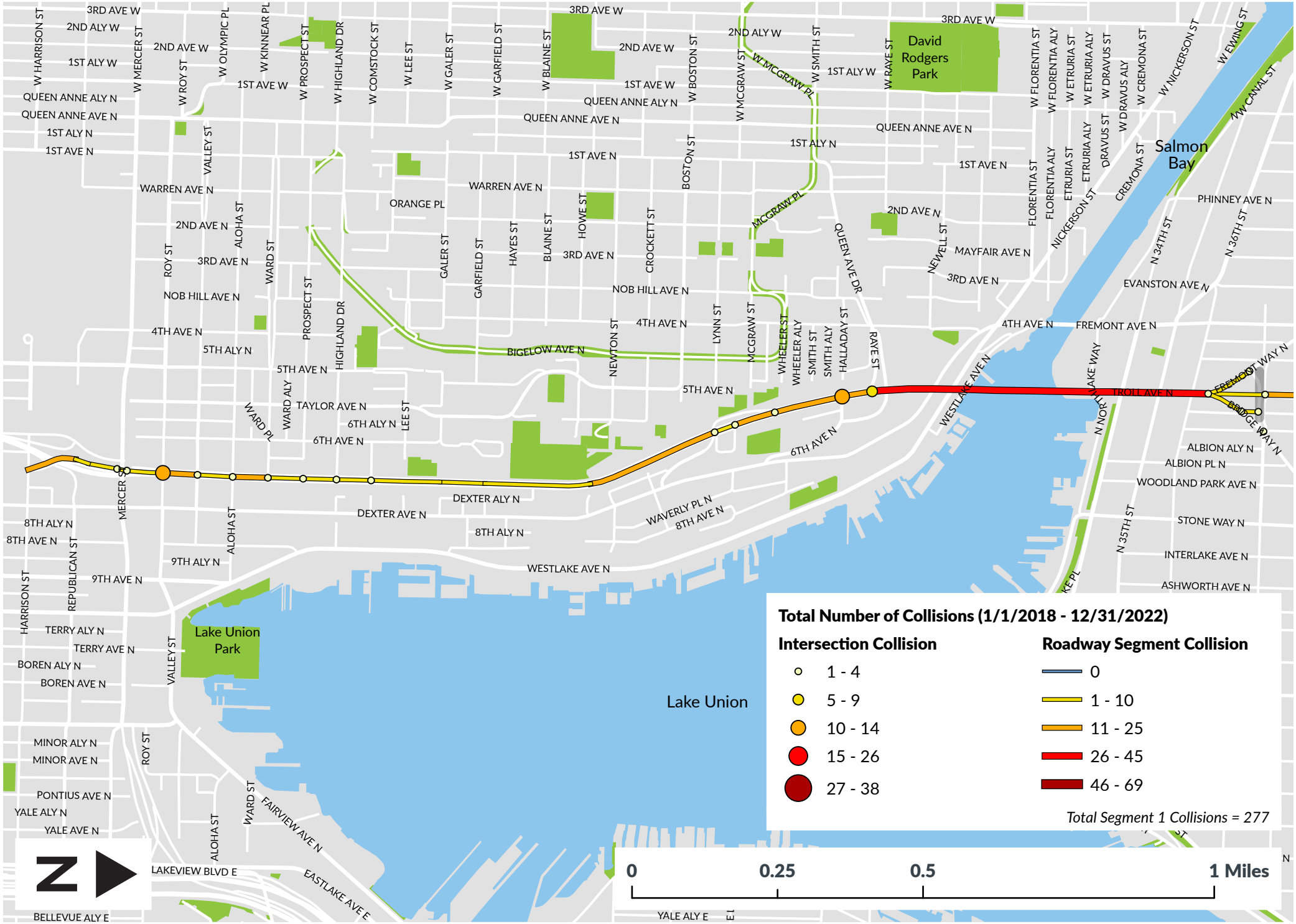
3.5.1 Crashes by Location – Intersections and Mid-Block Locations

Segment 1 included 60 intersection crashes and 217 mid-block crashes during the study period. Table 3-4 summarizes the intersection crashes by location and severity.

Table 3-4. Segment 1 Intersection Crashes by Severity (2018-2022)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N & Off-Ramp to Harrison St	0	0	0	1	0	1
Aurora Ave N & Mercer St	0	0	2	1	0	3
Aurora Ave N & Roy St	0	0	2	9	0	11
Aurora Ave N & Valley St	0	0	0	3	0	3
Aurora Ave N & Aloha St	0	0	0	3	0	3
Aurora Ave N & Ward St	0	1	1	1	0	3
Aurora Ave N & Prospect St	0	0	1	1	0	2
Aurora Ave N & Highland Dr	0	0	2	1	0	3
Aurora Ave N & Comstock St	0	0	1	1	0	2
Aurora Ave N & Lynn St	0	0	1	1	0	2
Aurora Ave N & McGraw St	0	0	0	1	0	1
Aurora Ave N & Dexter Way N	0	0	2	0	0	2
Aurora Ave N & Halladay St	0	0	5	6	0	11
Aurora Ave N & Raye St	0	0	2	6	0	8
Aurora Ave N & Bridge Way N	0	0	1	4	0	5
Total Intersection Crashes	*0*	*1*	*20*	*39*	*0*	*60*

No fatal crashes occurred at an intersection in Segment 1 and there was one serious injury crash that occurred at Aurora Avenue N and Ward Street that was an angle collision. The intersections with Roy Street and Halladay Street had the highest number of crashes, both with 11. Sixty-five percent of crashes were property damage only crashes. Figure 3-16 displays total collisions on Segment 1 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-16. Segment 1 Total Collisions

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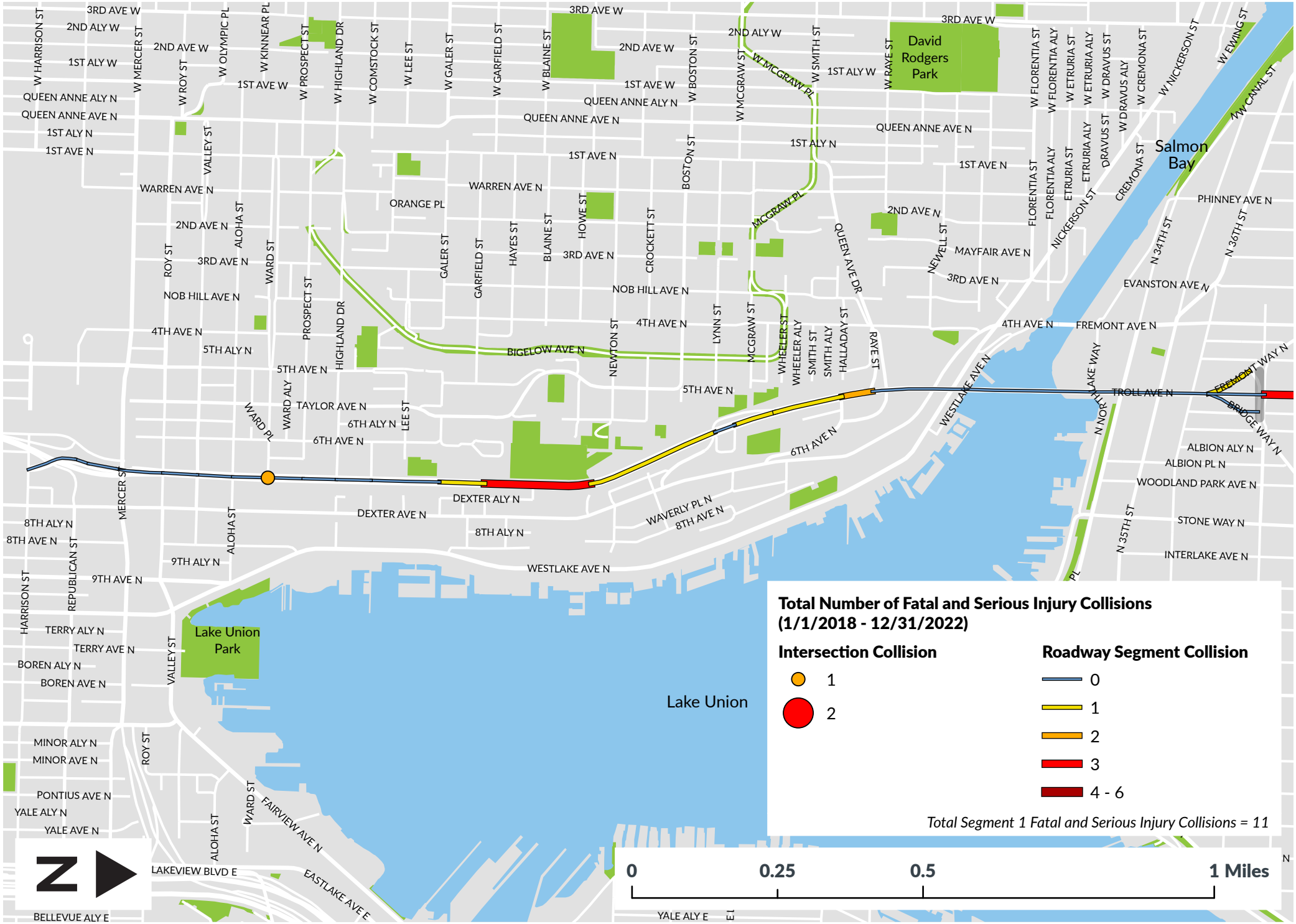
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Table 3-5 summarizes the mid-block crashes by location and severity for Segment 1.

Table 3-5. Segment 1 Mid-Block Crashes by Severity (2018-2022)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N Between Harrison St & Republican St	0	0	4	7	0	11
Aurora Ave N Between Republican St & Aurora Ave NB Off-Ramp	0	0	1	1	0	2
Aurora Ave N Between Aurora Ave NB Off-Ramp & Aurora Ave SB Off-Ramp	0	0	2	1	0	3
Aurora Ave N Between Aurora Ave SB Off-Ramp & Roy St	0	0	1	9	0	10
Aurora Ave N Between Roy St & Valley St	0	0	3	9	1	13
Aurora Ave N Between Valley St & Aloha St	0	0	1	5	1	7
Aurora Ave N Between Aloha St & Ward St	0	0	4	8	1	13
Aurora Ave N Between Ward St & Prospect St	0	0	0	6	0	6
Aurora Ave N Between Prospect St & Highland Dr	0	0	1	1	0	2
Aurora Ave N Between Highland Dr & Comstock St	0	0	1	5	0	6
Aurora Ave N Between Comstock St & Galer St	0	0	3	4	0	7
Aurora Ave N Between Galer St & Garfield St	0	1	4	5	0	10
Aurora Ave N Between Garfield St & Howe St	1	2	2	3	0	8
Aurora Ave N Between Howe St & Lynn St	1	0	2	14	0	17
Aurora Ave N Between Lynn St & McGraw St	0	0	0	3	0	3
Aurora Ave N Between McGraw St & Dexter Way N	1	0	2	10	1	14
Aurora Ave N Between Dexter Way N & Halladay St	0	1	4	9	1	15
Aurora Ave N Between Halladay St & Raye St	1	1	5	4	2	13
Aurora Ave N Between Raye St & Bridge Way N	0	0	10	32	1	43
Aurora Ave N Between Bridge Way N & N 38 Upper St	0	0	4	3	0	7
Aurora Ave NB Off-Ramp between Bridge Way N and N 38th St	0	0	0	1	0	1
Bridge Way N Between Aurora Ave N & Aurora Ave N NB Off-Ramp	0	0	0	2	0	2
Fremont Way N Between Aurora Ave N & Fremont Turn Rd	0	1	1	2	0	4
Total Segment Crashes	*4*	*6*	*55*	*144*	*8*	*217*

Four fatal crashes occurred on four different blocks, two of which also experienced one or more serious injury crashes. There were six total serious injury crashes. All of the fatal and serious injury crashes occurred between Galer Street and Raye Street, south of the Aurora Bridge. The highest number of total mid-block crashes (43 crashes) occurred between Raye Street and Bridge Way on the Aurora Bridge. Almost 75% of these crashes were property damage only crashes. Figure 3-17 displays total fatal and serious injury collisions on Segment 1 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-17. Segment 1 Fatal and Serious Injury Collisions

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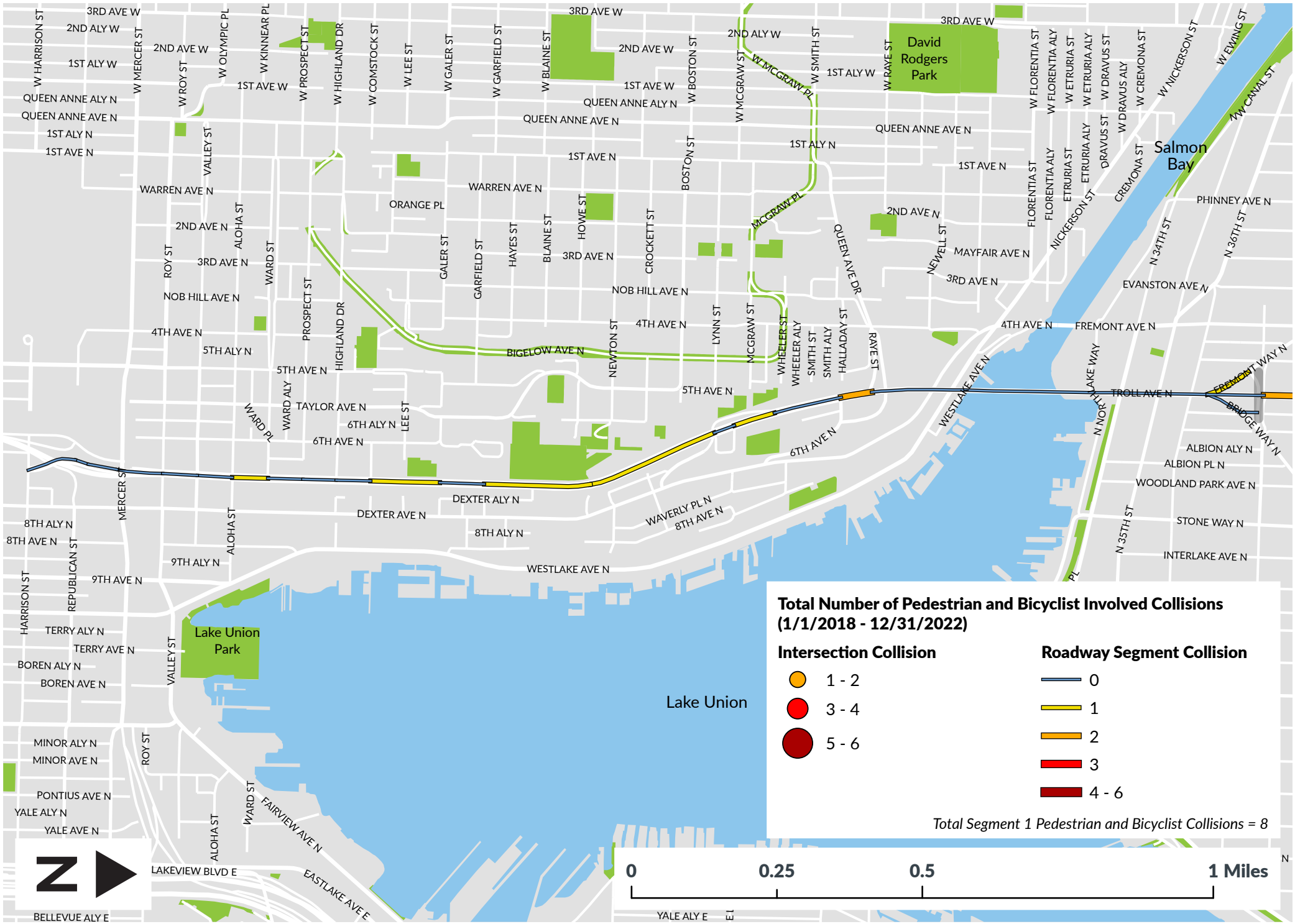
3.5.2 Crashes by Type

In Segment 1, there were 6 pedestrian-involved crashes and 1 bicyclist-involved crashes, all of which occurred mid-block (i.e., no pedestrian- or bicyclist-involved crashes occurred at intersections). Table 3-6 summarizes the locations and severities of these non-motorist-involved crashes.

Table 3-6. Segment 1 Non-Motorized Crashes by Location and Severity (2018-2022)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**4**	**1**	**0**	**1**	**0**	**6**
Aurora Ave N Between Comstock St & Galer St	0	0	0	1	0	1
Aurora Ave N Between Garfield St & Howe St	1	0	0	0	0	1
Aurora Ave N Between Howe St & Lynn St	1	0	0	0	0	1
Aurora Ave N Between McGraw & Dexter Way N	1	0	0	0	0	1
Aurora Ave N Between Halladay & Raye St	1	1	0	0	0	2
Bicyclist-Involved Crashes	**0**	**1**	**0**	**0**	**0**	**1**
Fremont Way Between Aurora Ave N & Fremont Turn Rd	0	1	0	0	0	1
Total Segment Non-Motorized Crashes	*4*	*2*	*0*	*1*	*0*	*7*

Four of the seven non-motorized crashes were fatal crashes, two were serious injury crashes, and one was a property damage only crash. One fatal crash involved a pedestrian crossing outside of a crosswalk, one involved a pedestrian walking in the roadway, and the other two fatal crashes and one serious injury crash did not provide any additional contributing factor information. The bicyclist in the bicyclist-involved crash was riding with traffic and was struck by a distracted driver. Figure 3-18 displays total pedestrian and bicyclist involved collisions on Segment 1 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-18. Segment 1 Pedestrian and Bicyclist Collisions

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The other 270 crashes in Segment 1 were all vehicle-only crashes. Table 3-7 summarizes the mid-block and intersection vehicle-only crashes by crash type.

Table 3-7. Segment 1 Motorized Crashes by Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block	52	6	68	2	2	41	39	210
Intersections	9	12	9	1	1	12	16	60
Total Motorized Crashes	*61*	*18*	*77*	*3*	*3*	*53*	*55*	*270*

Mid-block, the most common crash type is sideswipe crashes (32%) followed by rear end crashes (25%). Just under 40% of mid-block crashes were categorized as other or unknown. At intersections, the most common crashes were angle or turning crashes (20%). Over 46% of intersection crashes were categorized as other or unknown.

3.5.3 Crash Contributing Factors

Table 3-8 summarizes the primary contributing factors for the Segment 1 crashes. Ninety-three crashes (36%) did not have a documented contributing factor and are excluded from the summary.

Table 3-8. Segment 1 Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Segment 1 Crashes
Distracted	36	13%
Inattention	24	9%
Following too closely	22	8%
Did not grant right-of-way to vehicle	19	7%
Alcohol/drug impaired	15	5%
Improper maneuver	14	5%
Speeding	12	4%
Fatigued/Ill	5	2%
Did not grant right-of-way to non-motorist	1	<1%
Operating defective equipment	1	<1%
Disregard traffic control	0	0%
Improper non-motorist behavior	0	0%
Other (does not include none)	35	13%
Total	*184*	*66%*

In Segment 1, distraction was the most common primary contributing factor (13%) followed by inattention (9%) and following too closely (8%). The "other" contributing factor category collectively accounted for 13% of Segment 1 crashes as well.

3.5.4 Crashes by Time of Day

Figure 3-19 shows the total Segment 1 crashes by time of day, aggregated by the hour of the day.

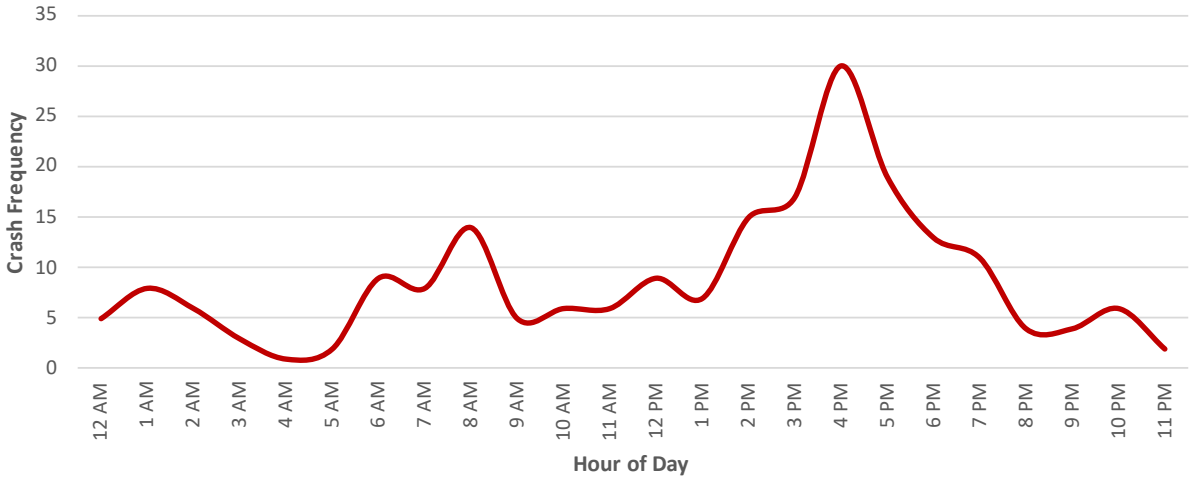


Figure 3-19. Segment 1 Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak period, topping out during the 4 PM hour. The PM peak period is also when traffic volumes are the highest. There was also a smaller peak during the AM peak period during the 8 AM hour. Figure 3-20 summarizes the total corridor crashes by lighting condition.

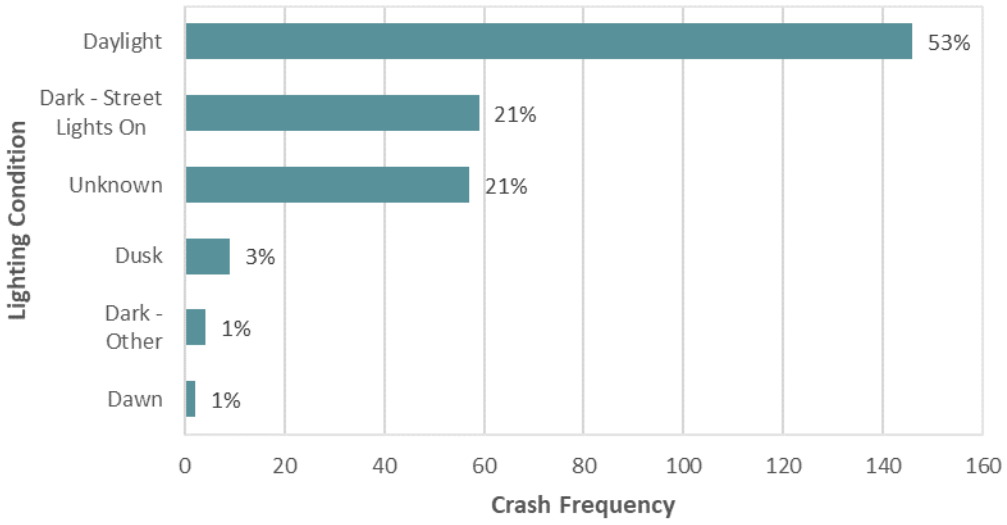


Figure 3-20. Segment 1 Crashes by Lighting Condition (2018-2022)

The majority of corridor crashes (53%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (94% of dark condition crashes).

3.5.5 Mid-Block and Signalized Intersection Crash Rates

Crash rates were calculated for the individual mid-block locations within Segment 1 and are summarized in Table 3-9. Segment 1 does not include any signalized intersections, therefore only the mid-block crash rates are provided.

Table 3-9. Segment 1 Mid-Block Crashes by Severity (2018-2022)

Mid-Block Location	Length (miles)	ADT (vehicles per day [vpd])	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N Between Harrison St & Republican St	0.09	51,800	11	1.29
Aurora Ave N Between Republican St & Aurora Ave NB Off-Ramp	0.04	51,800	2	0.53
Aurora Ave N Between Aurora Ave NB Off-Ramp & Aurora Ave SB Off-Ramp	0.03	51,800	3	1.06
Aurora Ave N Between Aurora Ave SB Off-Ramp & Roy St	0.18	51,800	10	0.59
Aurora Ave N Between Roy St & Valley St	0.06	51,800	13	2.29
Aurora Ave N Between Valley St & Aloha St	0.06	51,800	7	1.23
Aurora Ave N Between Aloha St & Ward St	0.06	51,800	13	2.29
Aurora Ave N Between Ward St & Prospect St	0.06	51,800	6	1.06
Aurora Ave N Between Prospect St & Highland Dr	0.06	51,800	2	0.35
Aurora Ave N Between Highland Dr & Comstock St	0.06	51,800	6	1.06
Aurora Ave N Between Comstock St & Galer St	0.12	51,800	7	0.62

Table 3-9. Segment 1 Mid-Block Crashes by Severity (2018-2022) (continued)

Mid-Block Location	Length (miles)	ADT (vehicles per day [vpd])	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N Between Galer St & Garfield St	0.04	51,800	10	2.64
Aurora Ave N Between Garfield St & Howe St	0.21	51,800	8	0.40
Aurora Ave N Between Howe St & Lynn St	0.24	51,800	17	0.75
Aurora Ave N Between Lynn St & McGraw St	0.07	51,800	3	0.45
Aurora Ave N Between McGraw St & Dexter Way N	0.03	51,800	14	4.94
Aurora Ave N Between Dexter Way N & Halladay St	0.12	51,800	15	1.32
Aurora Ave N Between Halladay St & Raye St	0.05	51,800	13	2.75
Aurora Ave N Between Raye St & Bridge Way N	0.58	51,800	43	0.78
Aurora Ave N Between Bridge Way N & N 38 Upper St	0.09	51,800	1	0.82

The blocks with the highest crash rates in Segment 1 include between McGraw Street and Dexter Way N (4.94 crashes/MVMT), between Halladay Street and Raye Street (2.75 crashes/MVMT), between Galer Street and Garfield Street (2.64 crashes/MVMT), and between Roy Street and Valley Street and between Aloha Street and Ward Street (both 2.29 crashes/MVMT). All other blocks in Segment 1 have a crash rate less than 2 crashes/MVMT. The average mid-block crash rate for Segment 1 is 1.22 crashes/MVMT.

3.6 Transit

Bus lines that currently travel on Aurora Avenue N within Segment 1 include the E Line (RapidRide), Route 5 (frequent all-day route), Route 16X (peak-only route, service suspended through March 29, 2024), and Route 28 (all-day route).

The E Line has 2 station pairs within Segment 1. In fall 2022, average daily boardings at these stations ranged from 15 to 51 riders and average daily alightings ranged from 28 to 58 riders. The northbound stop at Galer Street (Stop ID 6300) has the highest level of overall activity within Segment 1.

Figure 3-21 displays average daily E Line ridership and transit lines that travel on or intersect with Aurora Avenue N in Segment 1

All 4 stations within Segment 1 are equipped with at least 1 shelter. No layover or comfort stations are located in Segment 1. Figure 3-22 shows passenger amenities at transit stops along Segment 1 of Aurora Avenue N.

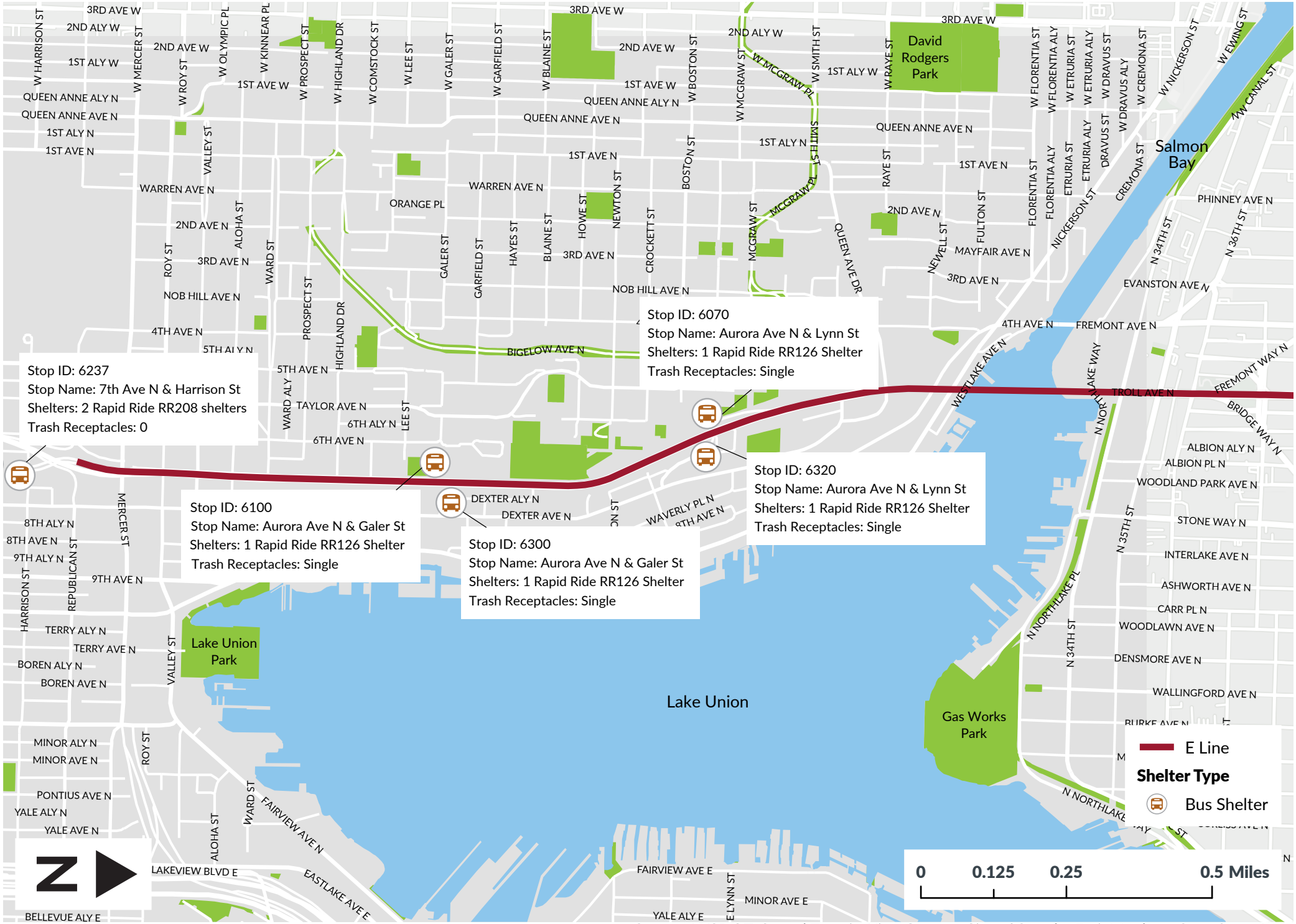


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-21. Segment 1 Average Daily E Line Ridership

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-22. Segment 1 Passenger Amenities

Seattle Department of Transportation

King County METRO

3.6.1 Transit Travel Speeds

No TSP systems are present in Segment 1. Average transit travel speeds vary within Segment 1 of Aurora Avenue N. Table 3-10 and Table 3-11 display the various average transit speeds within Segment 1 during the AM and PM hours, respectively.

Figure 3-23 and Figure 3-24 display transit travel speeds in Segment 1 in the AM and PM peak periods, respectively. Transit travel speeds do not include dwell time at stops.

Table 3-10. Segment 1 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
Republican Street – Galer Street	0 – 20 mph	21 – 30 mph
Galer Street – McGraw Street	31 – 40 mph	31 – 40 mph
McGraw Street – N 38th Street	31 – 40 mph	31 – 40 mph

Table 3-11. Segment 1 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
Republican Street – Galer Street	0 – 20 mph	21 – 30 mph
Galer Street – McGraw Street	31 – 40 mph	31 – 40 mph
McGraw Street – N 38th Street	31 – 40 mph	21 – 30 mph

3.6.2 Bus collisions

Between January 2019 and February 2023, there were seven bus collisions along Aurora Avenue N in Segment 1. All collisions were with other non-transit vehicles. Notable clusters of collisions were located around Mercer Street and 6th Avenue N.

Figure 3-25 displays bus collisions from 2021 and 2022 along Segment 1 of Aurora Avenue N.

3.7 Transportation Plans

The PMP's Arterial Priority Investment Network assigned Segment 1 of Aurora Avenue N a score of Tier 4 south of Garfield Street and a score of largely Tier 5 north of Garfield Street. The PMP's Priority Crossings gave Segment 1 of Aurora Avenue N three Tier 2 ratings at crossings immediately north of Mercer Street and two Tier 1 ratings at crossings just south of the Aurora Bridge.

Figure 3-26 depicts the PMP's Arterial Priority Investment Network and Priority Crossings along Segment 1 of Aurora Avenue N.

Four streets with planned bicycle facilities pass under Aurora Avenue N along Segment 1. Thomas Street, Queen Anne Drive and 6th Avenue N, and Dexter Avenue N pass under the Aurora Bridge on the south side of Lake Union. N 36th Street passes under Aurora Avenue N on the north side of Lake Union and is scheduled to become a neighborhood greenway.

Figure 3-27 displays planned bicycled facilities and WSDOT's Bicycle Level of Traffic Stress on Segment 1 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-23. Segment 1 AM Transit Travel Speeds

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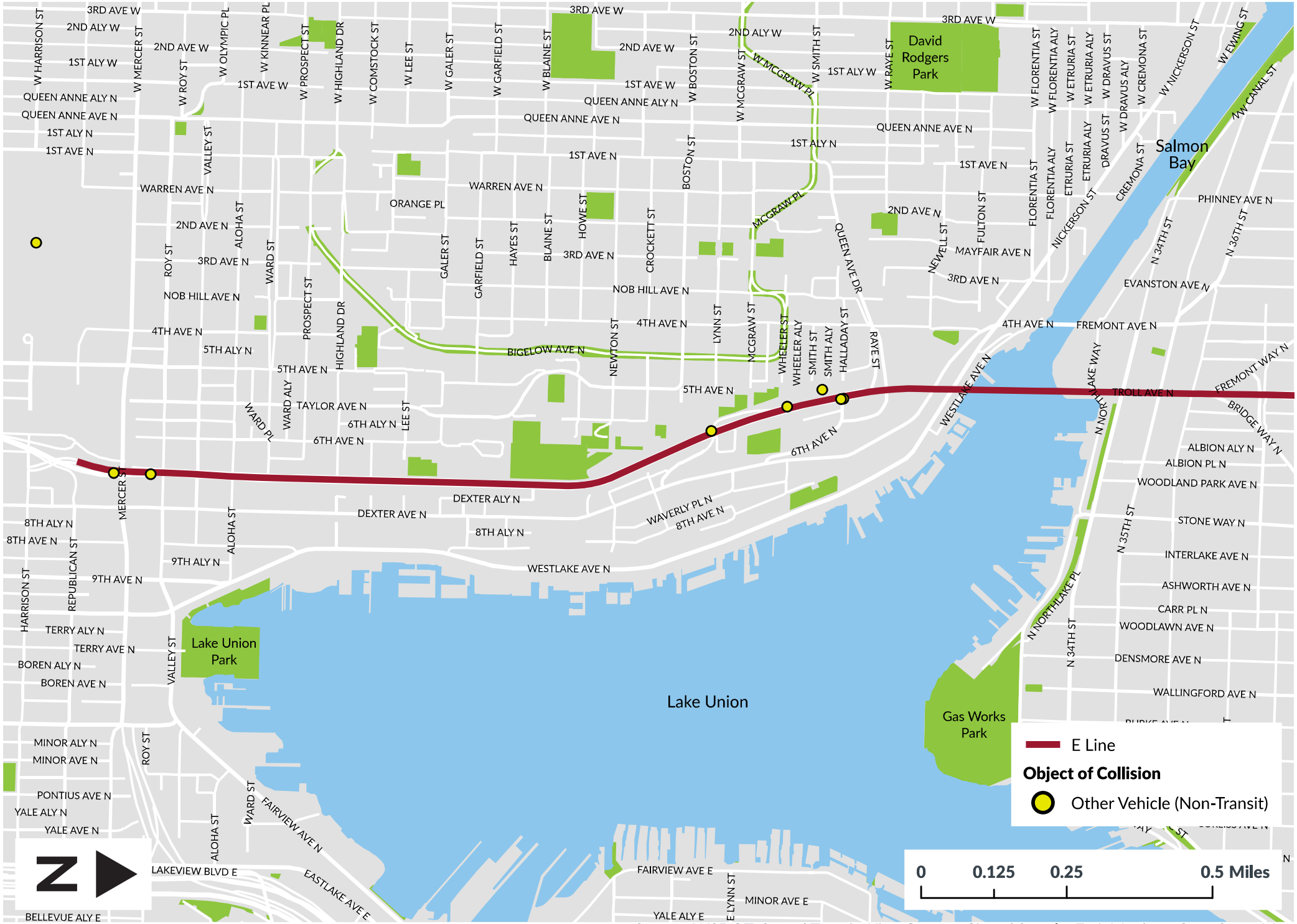


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-24. Segment 1 PM Transit Travel Speeds

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King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-25. Bus Collision Locations

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King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-26. Segment 1 Pedestrian Master Plan Corridor Designation

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King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-27. Planned Bicycle Facilities

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King County METRO

3.7.1 In-process, Planned, and Potential Future Transportation and Infrastructure Improvements

Several in-process, planned, and potential future improvements are located along Segment 1 of Aurora Avenue N.

- **Active transportation**
  - SDOT ADA Program – 2023 Customer Service Requested (CSR) Curb Ramps: improvement of curb ramps at identified intersections around Seattle, to be constructed by SDOT crews. Applicable intersections include Bridge Way N at Winslow Place N and Bridge Way N at Whitman Avenue N.
- **Transit**
  - Harrison Street Transit Corridor: conversion of Harrison Street between Fairview Avenue E and 5th Avenue N into a transit corridor. Design elements for transit could include bus stops with shelters and real time information signs (RTIS), future trolley wire infrastructure, paving to support transit operations, traffic signals and TSP, rechannelization, and curb space adjustments.
  - Transit Zone Improvement – Bus Stop Shelters: installation of bus shelter footings (concrete foundations) at select bus stops. Applicable locations include Aurora Avenue N at Prospect Street.
- **Private development**
  - Eight-story hotel development: construction of an eight-story hotel building with five apartments and parking for 66 vehicles. The existing buildings are to be demolished.
  - 12-story office/research development: construction of a 12-story research laboratory building.
  - 250 unit multifamily development: construction of two-high rise residential towers sharing a podium with parking and support function. Towers will provide 250 residential units and the parking podium will provide approximately 104 parking stalls.
- **Operations/ITS**
  - Aurora Avenue N ITS Improvements: modifications to signal timing on northbound Aurora Avenue N to improve freight traffic during the morning peak period.
  - Harrison Street Corridor Operational Improvements: improvement of four signals along Harrison Street between 5th Avenue N and Dexter Avenue N connecting to the SR 99 north tunnel portal. Harrison Street is a future transit corridor that will benefit from the signal upgrades.
- **Utilities**
  - Landslide Mitigation: construction of an approximately 400-foot catchment wall with horizontal drain along the west side of Aurora Avenue N between Galer Street and Raye Street.

Figure 3-28 displays in-process, planned, and potential future transportation and infrastructure improvements along Segment 1 of the Aurora corridor.[1]

[1] Projects shown represent public and private development projects entered into the City of Seattle's Project and Construction Coordination Map (dotmaps application), included in SDOT modal plans, or included in SDOT's sidewalk development program. Not all projects shown are planned for near-term implementation.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-28. Segment 1 In-Process, Planned, and Future Improvements

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3.8 Land Use

3.8.1 Land Use

Existing land uses within Segment 1 differ on the south and north sides of the Aurora Bridge. South of the bridge, the high-density mixed-use Uptown and South Lake Union Urban Centers contain many residential, office, and retail uses. Much of the development on the east side of Aurora Avenue N south of the bridge is oriented toward Lake Union and vehicular access to these properties is provided via streets to the east including or adjacent east/west streets, rather than Aurora Avenue N. East of the corridor, recreational uses line the shores of Lake Union, while the Northeast Queen Anne Greenbelt lines Aurora Avenue N to the west. Steep slopes along the greenbelt create limited space for development adjacent to Aurora Avenue N. Across the Aurora Bridge north of the Fremont Cut, land uses transition from office and retail to dense residences within the Fremont Hub Urban Village. Structures along Aurora Avenue N within Segment 1 generally have minimal setbacks from the ROW.

Designations from the Future Land Use 2035 map along Segment 1 of Aurora Avenue N include Commercial/Mixed Use Areas, and Multi-Family Residential Areas. The most prevalent planned land use along Aurora Avenue N is Commercial/Mixed Use Areas from Galer Street to 6th Avenue N, north of which lies a brief stretch of Multi-Family Residential Areas to Lake Union.

Urban villages are designated in two locations along Aurora Avenue N in Segment 1. The Urban Center designation stretches from Harrison Street north to Galer Street, and the Hub Urban Village designation is applied from the north shores of Lake Union to N 38th Street.

Figure 3-29 illustrates future land use and Urban Village designations along Segment 1 of Aurora Avenue N.

3.8.2 Zoning

Zoning along Aurora Avenue N is primarily mixed use with some sections dedicated to exclusively residential use. The south end of Segment 1 is zoned as Seattle Mixed-South Lake Union from Harrison Street to Galer Street. North of Galer Street, the zoning begins to split between Lowrise 2, Lowrise 3, and Commercial 1. Neighborhood Residential 3 zoning appears at Raye Street. North of Lake Union, the zoning shifts to Industrial Commercial, Commercial 1, Neighborhood Commercial 3, and Lowrise 3. Zoning in neighborhoods near Aurora Avenue N's Segment 1 is primarily low density residential and mixed-use.

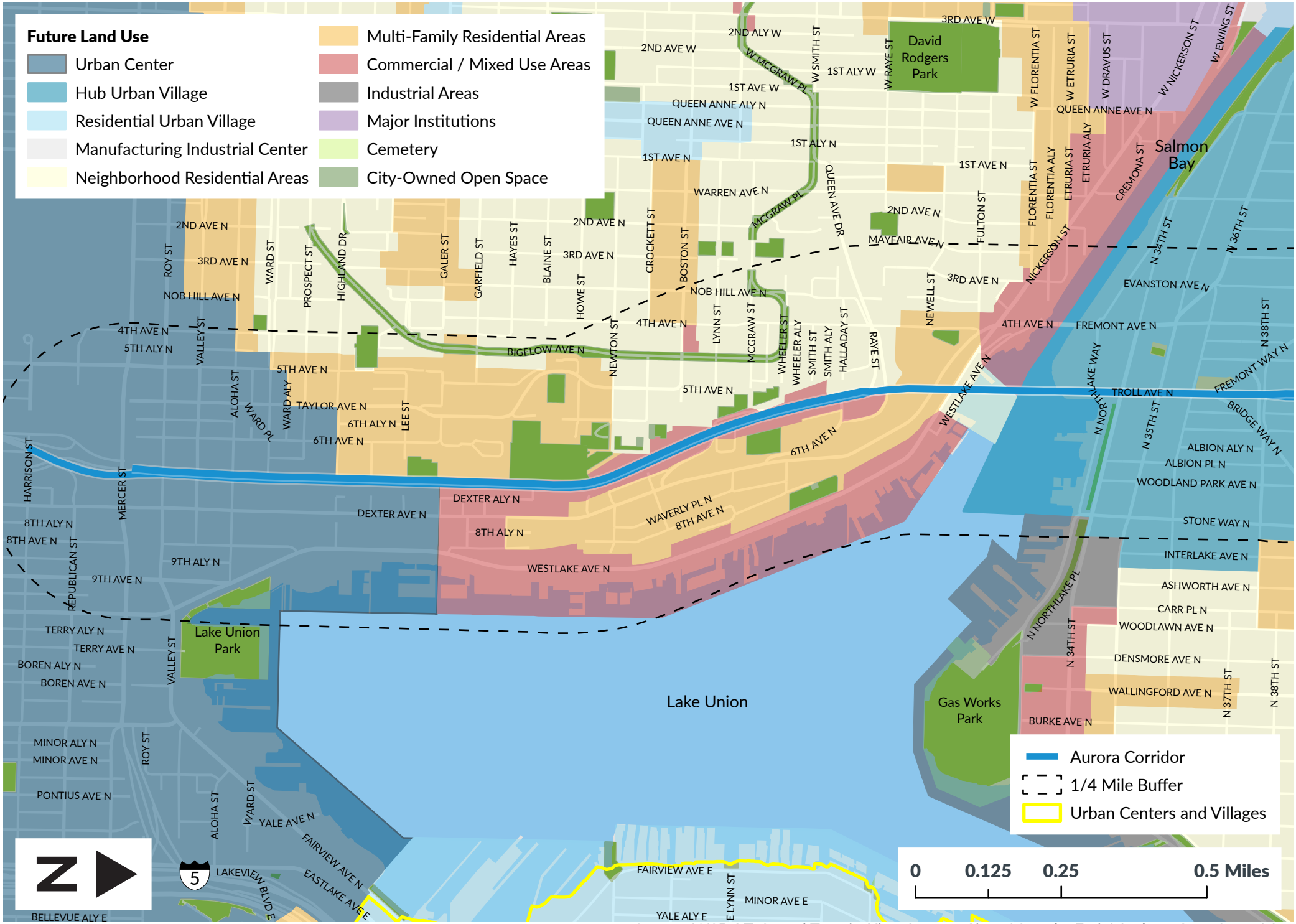
Figure 3-30 displays existing zoning along Segment 1 of Aurora Avenue N.

3.9 Underground Utilities

3.9.1 Water

Existing water lines in Segment 1 run along Aurora Avenue N's east side from Mercer Street north to Raye Street. Existing water lines resume just north of N 36th Street. Water lines also intersect Aurora Avenue N at a perpendicular angle at intervals roughly corresponding to the existing street grid. There are no water lines across the Aurora Bridge. A small new water line has recently been constructed on the west end of Aurora Avenue N at Roy Street, and water lines south of Mercer Street leading into the SR99 tunnel have been abandoned.

Figure 3-31 illustrates existing, new, and abandoned water lines on Segment 1 of Aurora Avenue N.

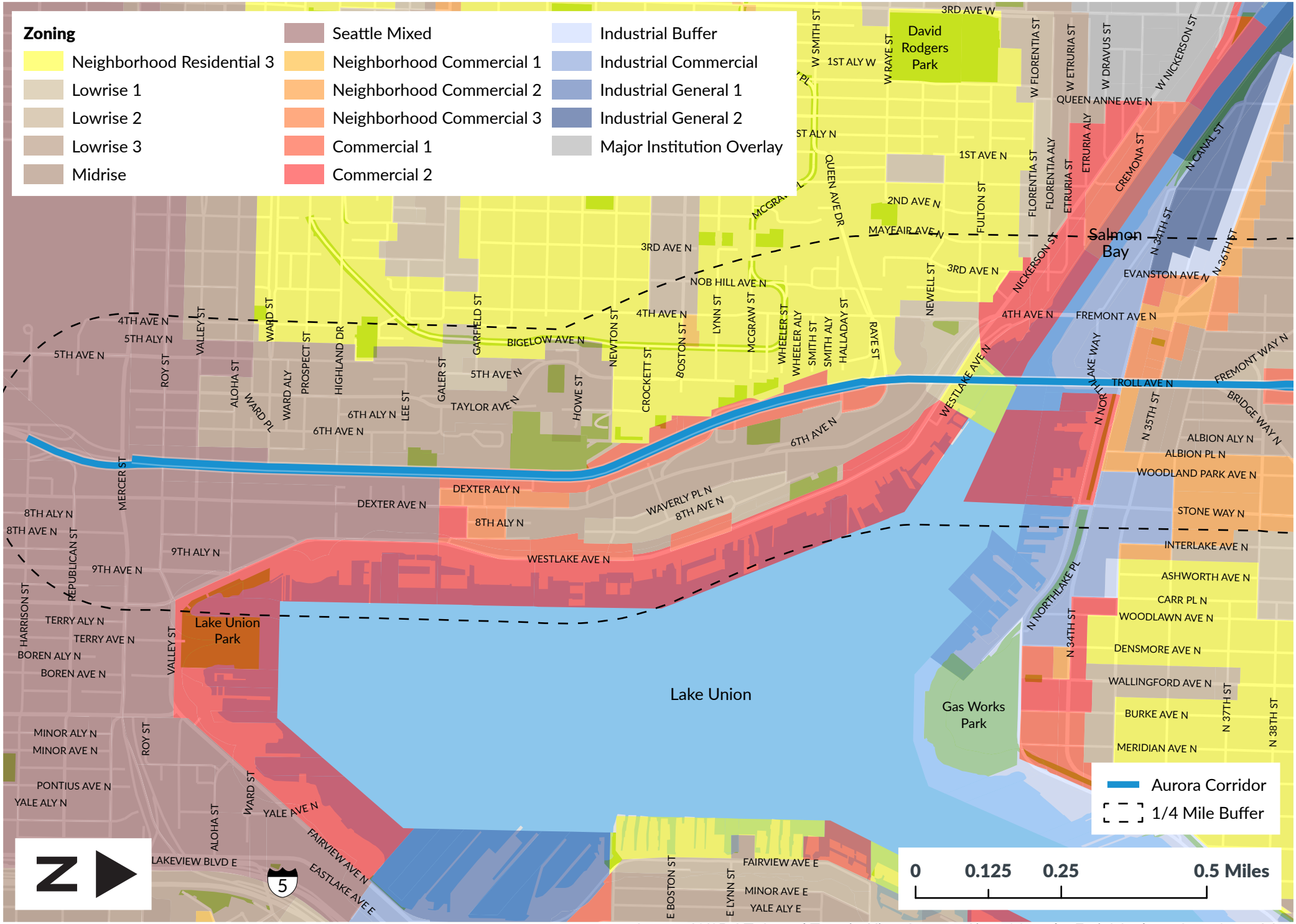


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-29. Segment 1 Land Use

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King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-30. Segment 1 Zoning

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Figure 3-31. Segment 1 Utilities: Water

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King County METRO

3.9.2 Sewer and Drainage

Sewer facilities are present along nearly all of Segment 1. Sewer mainlines switch intermittently between Aurora Avenue N's west side, east side, and center. Some locations, such as between McGraw Street and Halladay Street, possess mainlines on both sides of the street. Mainline endpoints are densely clustered south of Roy Street. North of Roy Street, the endpoints are spaced approximately at one to two per block. Side sewers branch east and west from the mainlines at regular intervals with the exception of the Aurora Bridge, which possesses no sewer facilities.

All sewer infrastructure in Segment 1 is part of a combined sewer system, conveying both stormwater and wastewater. Portions of Aurora Avenue N in Segment 1 contribute to sewer capacity risk areas, as identified in SPU's Wastewater System Analysis (2020). This segment is not part of SPU's current system layout analysis for Aurora Avenue N.

Figure 3-32 depicts sewage systems along Segment 1 of Aurora Avenue N.

3.10 Key Takeaways

Key elements of existing conditions that will inform the future vision for Segment 1 of Aurora Avenue N include:

- Limited potential for redevelopment on the west side of the roadway north of Lee Street due to topographic constraints and orientation of uses on the east side away from Aurora Avenue N.
- Several bus lines travel on Segment 1 of Aurora Avenue N between downtown Seattle and communities north of the Aurora Bridge.
- Opportunities to cross Aurora Avenue N in Segment 1 are extremely limited, not ADA accessible, and can require lengthy diversions for pedestrians. Topographic challenges on the west side of the roadway also present challenges for pedestrians.
- The character of the roadway lends to freeway-like feel with speeds regularly reaching over 10 mph higher than the posted limit of 40 mph.
- All four fatal injury crashes in Segment 1 involved people walking.
- Distractions, inattention, and following too closely represent key factors contributing to collisions.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 3-32. Segment 1 Utilities: Drainage Wastewater

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4. Segment 2

4.1 Segment Description

Segment 2 of Aurora Avenue N is approximately 2.1 miles long, extending from N 38th Street in the south to Winona Avenue N in the north. This segment begins in the Fremont neighborhood, at the north end of the Aurora Bridge where Aurora Avenue N transitions to an at-grade road. Aurora Avenue N cuts through Woodland Park and the Woodland Park Zoo on the south edge of Green Lake. Three above-grade crossings cross Aurora Avenue N at Woodland Park but are inaccessible from the street level. Discontinuous sidewalks are present along Segment 2 and the 41st Street Pedestrian Viaduct provides an above-grade crossing for pedestrians with stairs and no ramp. Three undercrossings pass under Aurora Avenue N at N 38th Street, N 46th Street, and N 50th Street.

There is a marked crosswalk at N 68th Street, the only one of its kind in Segment 2. The segment's high traffic speeds with a posted speed limit of 40 mph and car-centric facilities lends a freeway-like feel to the road which contrasts with the intersecting crossroads and mixed residential and commercial uses surrounding. There is a jersey barrier for the majority of the segment, further isolating connections across Aurora Avenue N between the Fremont and Phinney Ridge neighborhoods to the west and the Wallingford neighborhood to the east. In late 2022, a protected bicycle lane was completed on the portion of Aurora Avenue N that abuts Green Lake, creating a safer connection for bicyclists and other micromobility users from W Green Lake Way N to W Green Lake Drive N along Aurora. Table 4-1 summarizes key characteristics of Segment 2.

Table 4-1. Segment 2 At a Glance

Segment Extents	N 38th Street to Winona Avenue N
Segment Length	2.1 miles
Annual Average Daily Traffic	48,100
Measured 85th Percentile Traffic Speeds	46-52 mph (posted speed limit: 30-40 mph)
Average Distance Between Pedestrian Crossings	1,410 feet
Crashes Per Mile (2018-2022)	95
Crashes Involving Vulnerable Users (2018-2022)	8
Bus Routes Serving the Segment	E Line, 16, 44
Bus Stops	5
Total Average Daily E Line Boardings/Alightings in Segment 2	Boardings: 561/Alightings: 598

4.2 Roadway Characteristics

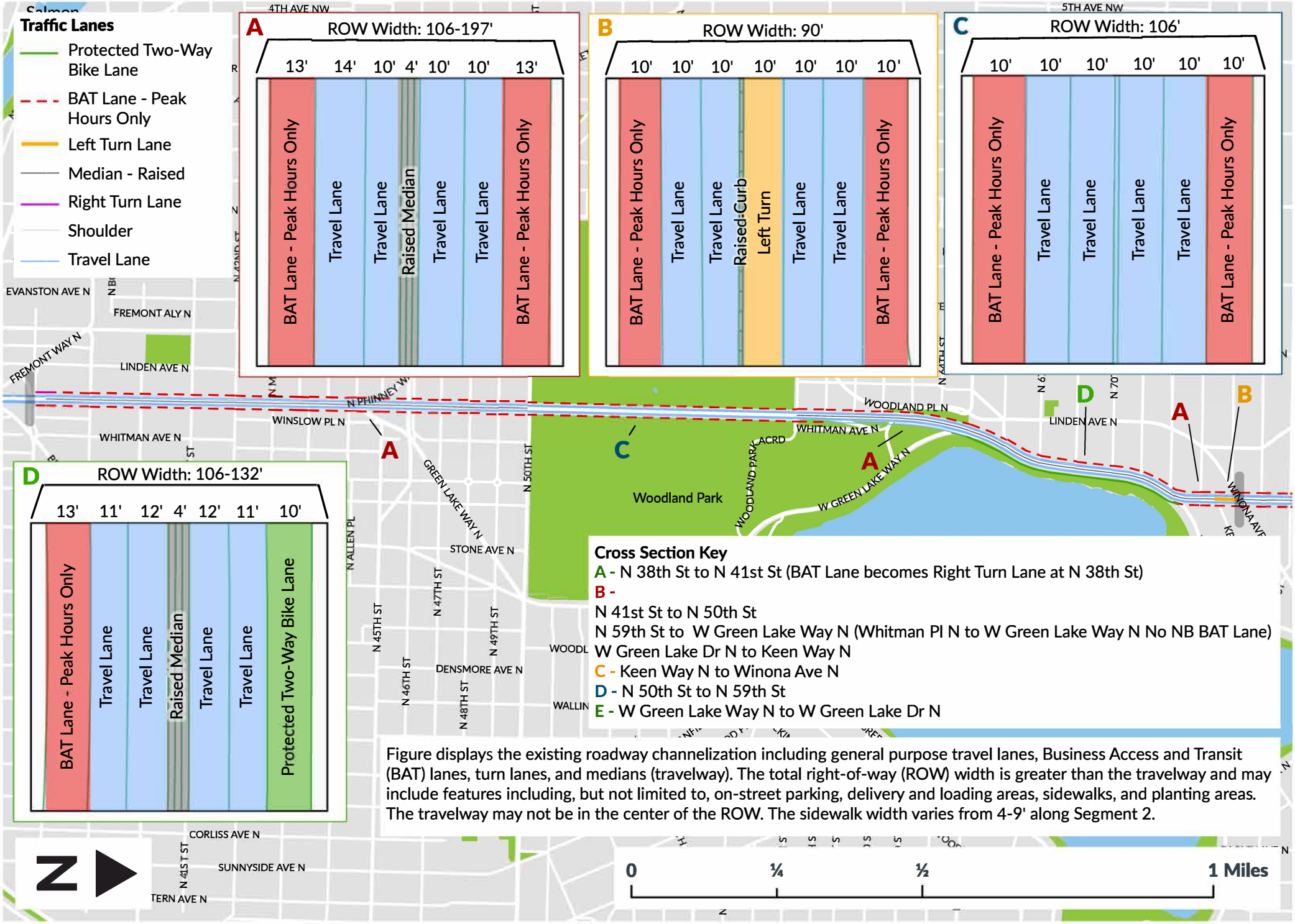
Segment 2 is six lanes through the majority of its length. The ROW in Segment 2 ranges from 90 to 197 feet in width. The wider ROW is present near N 45th Street and Whitman Place (by the on- and off-ramps) and where the protected two-way bike lane is adjacent to the travel lanes. Through the Woodland Park and Zoo, the ROW is 106 feet however the ROW between the existing fence-line is 80 feet. The roadway is channelized with four general purpose lanes, two peak hour BAT lanes, and a raised median. Between W Green Lake Way N to W Green Lake Drive N, there is only a southbound BAT lane, as northbound buses travel on Linden Avenue N through the majority of this segment, and a protected two-way bike lane. From Keen Way N to Winona Avenue N, the roadway widens to seven lanes where a left turn lane narrows the raised median to a c-curb.

With the exception of N 50th Street to N 59th Street and Keen Way N to Winona Avenue N, there is a jersey barrier present. The jersey barrier diminishes local road access to the Fremont, Wallingford, Phinney Ridge, and Green Lake neighborhoods by prohibiting left turns.

Figure 4-1 illustrates travel lane characteristics, existing medians, access management, and ROW width on Segment 2 of Aurora Avenue N.

Aurora Avenue N is classified entirely as a Principal Arterial in Segment 2. Principal arterials that intersect with Aurora Avenue N include N Phinney Way and Green Lake Way N (near N 46th Street), serving as southbound on-ramps and northbound off-ramps, respectively. Minor arterials that intersect with Aurora Avenue N include Fremont Way N and Woodland Place N, which serve as southbound on-ramps, and Bridge Way N, and Whitman Place N, which serve as south bound on-ramps. W Green Lake Way N (near N 65th Street), W Green Lake Drive, and Winona Avenue N are additional minor arterials that intersect with Aurora Avenue N. Winona Avenue N is the only arterial that provides a vehicular crossing of Aurora Avenue N. Figure 4-2 illustrates the roadway network surrounding Aurora Avenue N in Segment 2.

On-street parking is not permitted along Aurora Avenue N from approximately N 50th Street to approximately Winona Avenue N in Segment 2. South of N 50th Street, stretches of Aurora approximately four blocks in length prohibit parking from 6-9 AM or from 6-9 AM and 3-7 PM. Figure 4-3 illustrates peak hour parking restrictions.

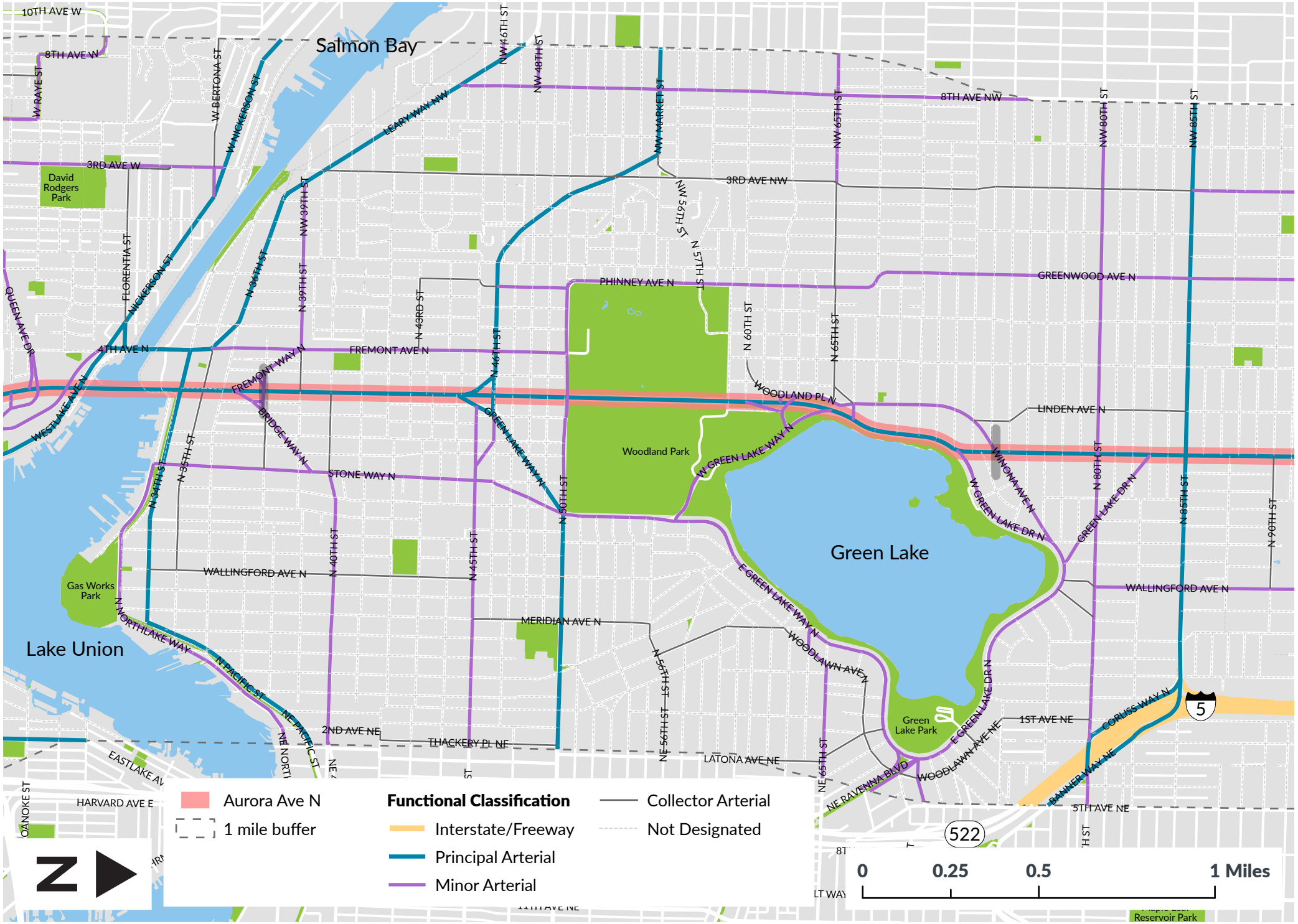


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-1. Segment 2 Channelization and Cross Sections

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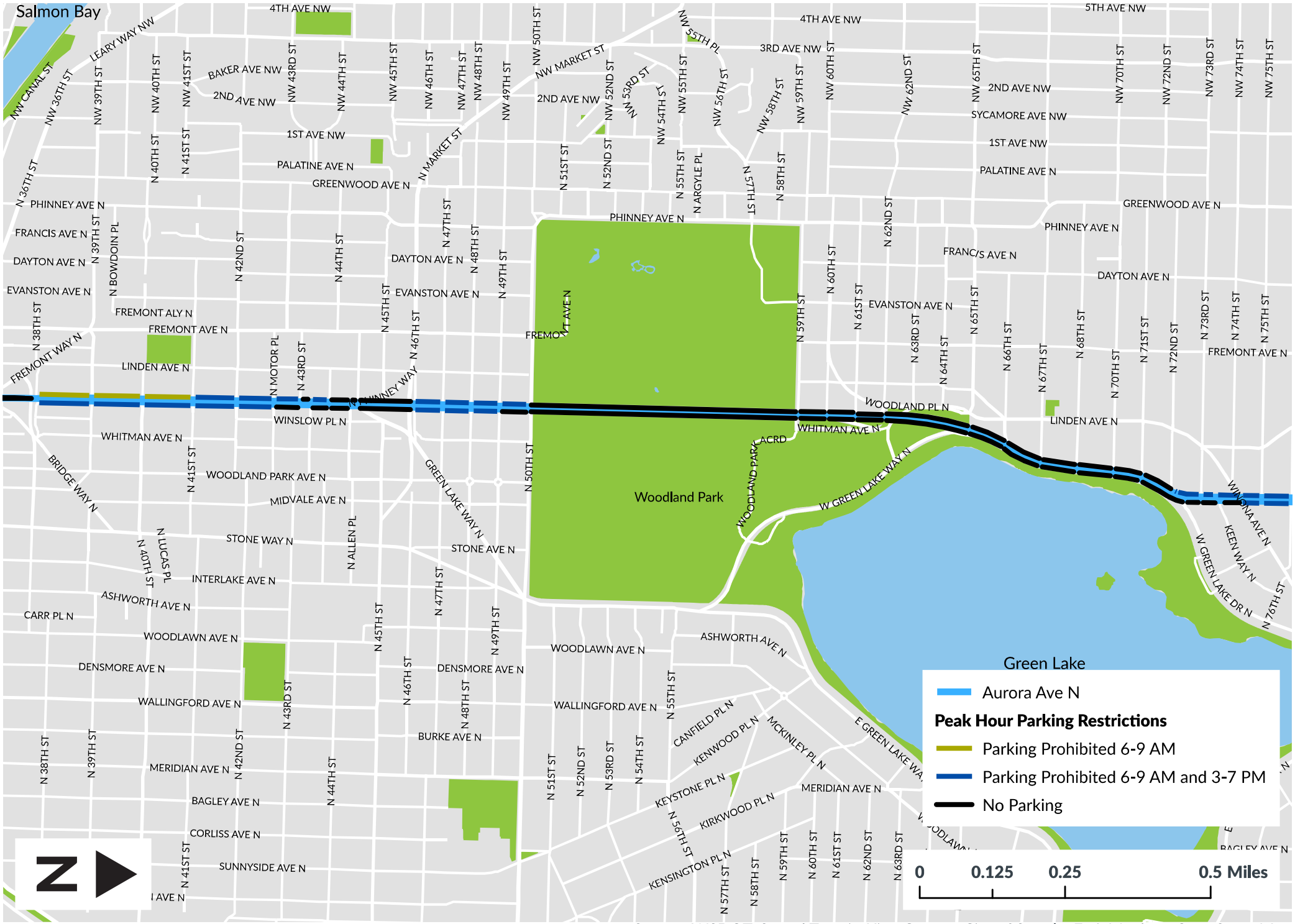


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-2. Segment 2 Functional Classification

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-3. Existing Peak Hour Parking Restrictions

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4.3 Traffic Operations

4.3.1 Traffic Volumes

Based on March 2023 traffic counts, the ADT volumes in Segment 2 are 43,100, with 19,600 vehicles in the northbound direction and 23,500 in the southbound direction. The AWDT volumes in Segment 2 are 45,800, with 20,700 vehicles in the northbound direction and 25,100 in the southbound direction. A profile of the AWDT volumes by 15-minute intervals is shown in Figure 4-4 below for Segment 2. There are two distinct peaks in traffic volumes during the AM and PM peak periods, with a shorter, more concentrated peak during the morning, and a larger, longer duration peak during the afternoon. During the morning peak period the volumes are significantly higher in the southbound direction than the northbound direction. In the afternoon, the volumes in the southbound direction begin to peak earlier than volumes in the northbound direction and remain higher than the northbound volumes later into the evening. Figure 4-5 illustrates the average daily volumes in the Segment 2 extent of Aurora Avenue N.

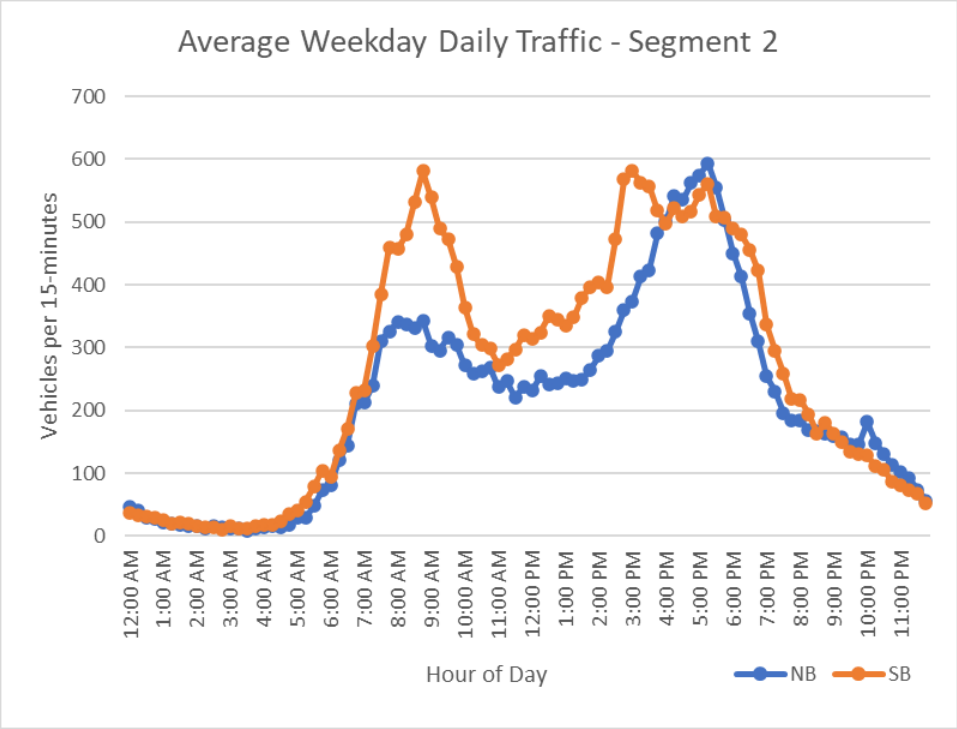


Figure 4-4. Segment 2 Average Weekday Daily Traffic by Time of Day



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-5. Segment 2 Average Annual Daily Traffic (AADT)

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Turning movement counts of Aurora Avenue N and Green Lake Way N were derived from traffic volumes upstream and downstream of the intersection. The Aurora Avenue N/68th and Aurora Avenue N/Winona Avenue N TMCs were conducted in March 2023, and the other study intersections in Segment 2 were collected in May 2023. The Aurora Avenue N and Green Lake Way N intersection has the highest vehicular entering volumes with approximately 4,700 and 5,300 vehicles during the AM and PM peak periods, respectively. Figure 4-6 summarizes the TMCs for the study intersections in Segment 2 of the project.

4.3.2 Freight Network and Vehicle Volumes

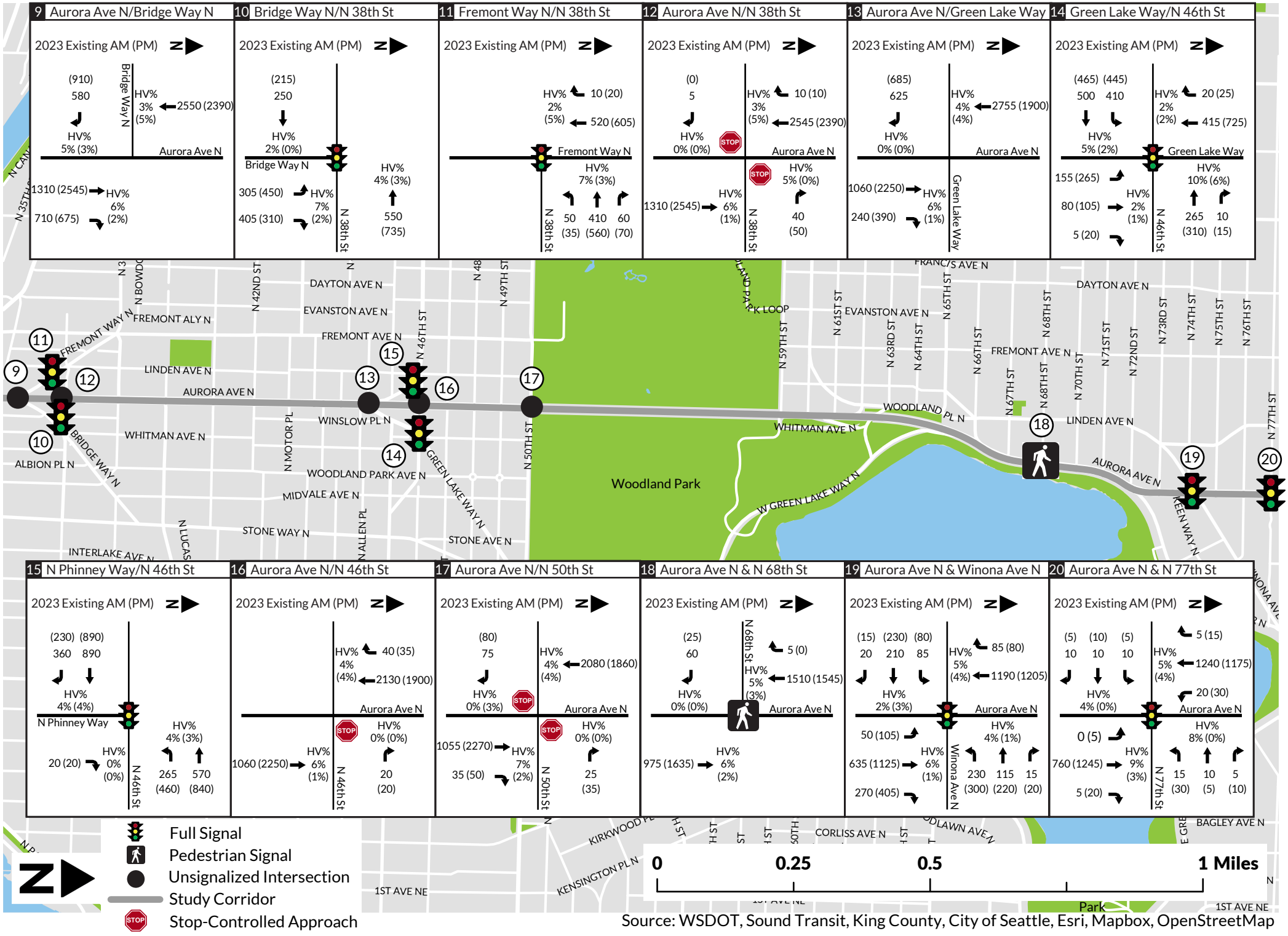
As illustrated in Figure 4-6, the heavy vehicle percentage in the northbound direction is 6% during the AM peak period and 1% to 2% during the PM peak period; the southbound heavy vehicle percentage ranges from 3% to 5% during the AM peak period and 4% to 5% during the PM peak period. Figure 4-7 displays the freight network in Segment 2.

4.3.3 Measured 85th Percentile Traffic Speeds

The posted speed limit is 40 mph for the northbound and southbound directions on the portion of Segment 2 between N 38th Street and N 70th Street, and is 30 mph in both directions between N 70th Street and Winona Avenue N. The 85th percentile speeds measured from 24-hour tube counts collected in March 2023 are 52 mph in the northbound direction and 46 mph in the southbound direction between N 38th Street and Winona Avenue N, 30% and 15% above the speed limit, respectively. Figure 4-8 shows the 85th percentile northbound and southbound traffic speeds and the posted speed limit of Segment 2.

4.3.4 Vehicle Travel Time

The average travel time traveling northbound in Segment 2 is 3.3 minutes during AM peak and 3.7 minutes during the PM peak periods. The average travel time traveling southbound in Segment 2 is 4.0 minutes during the AM peak and 4.4 minutes during PM peak periods.

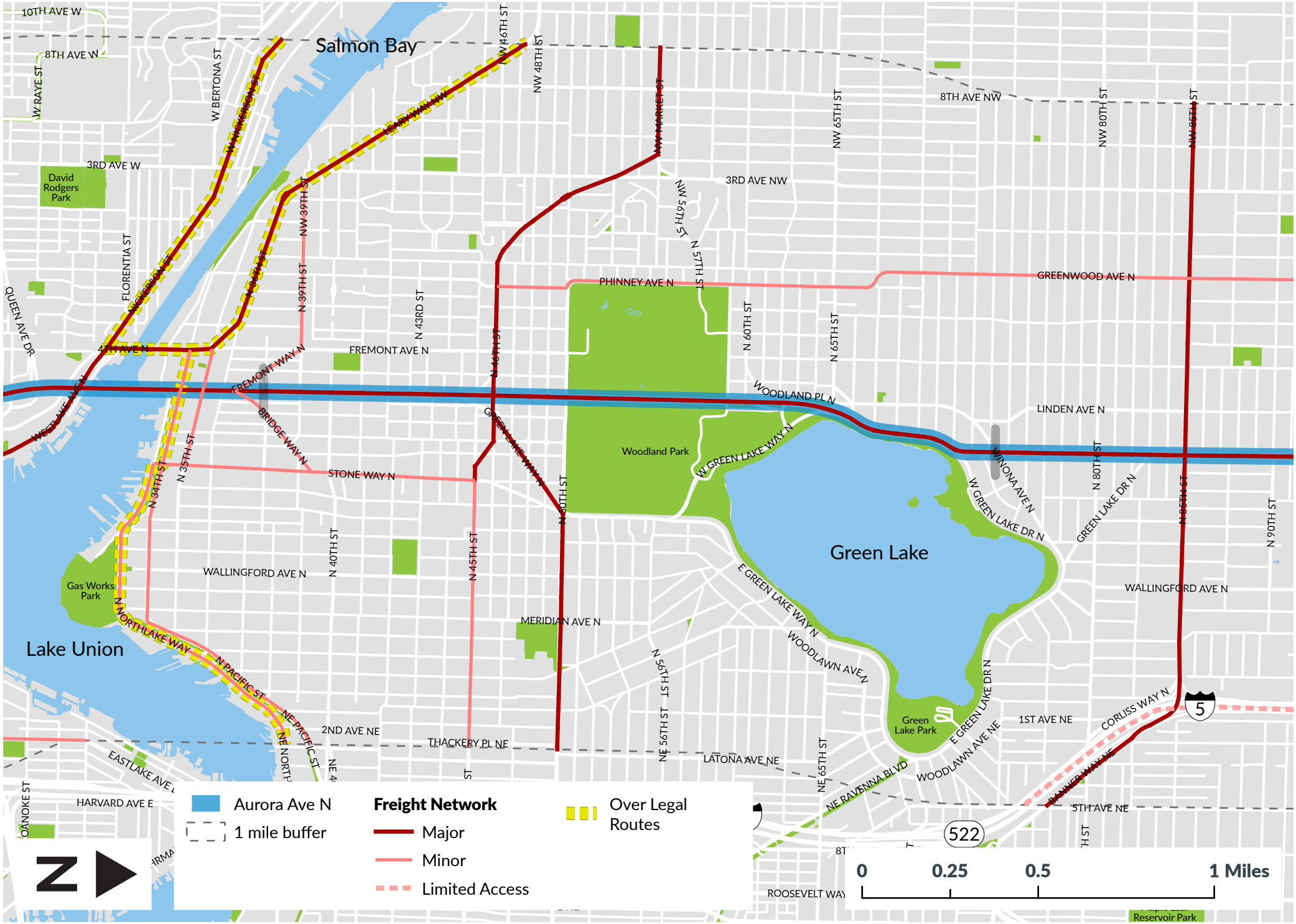


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-6. Segment 2 Traffic Volumes

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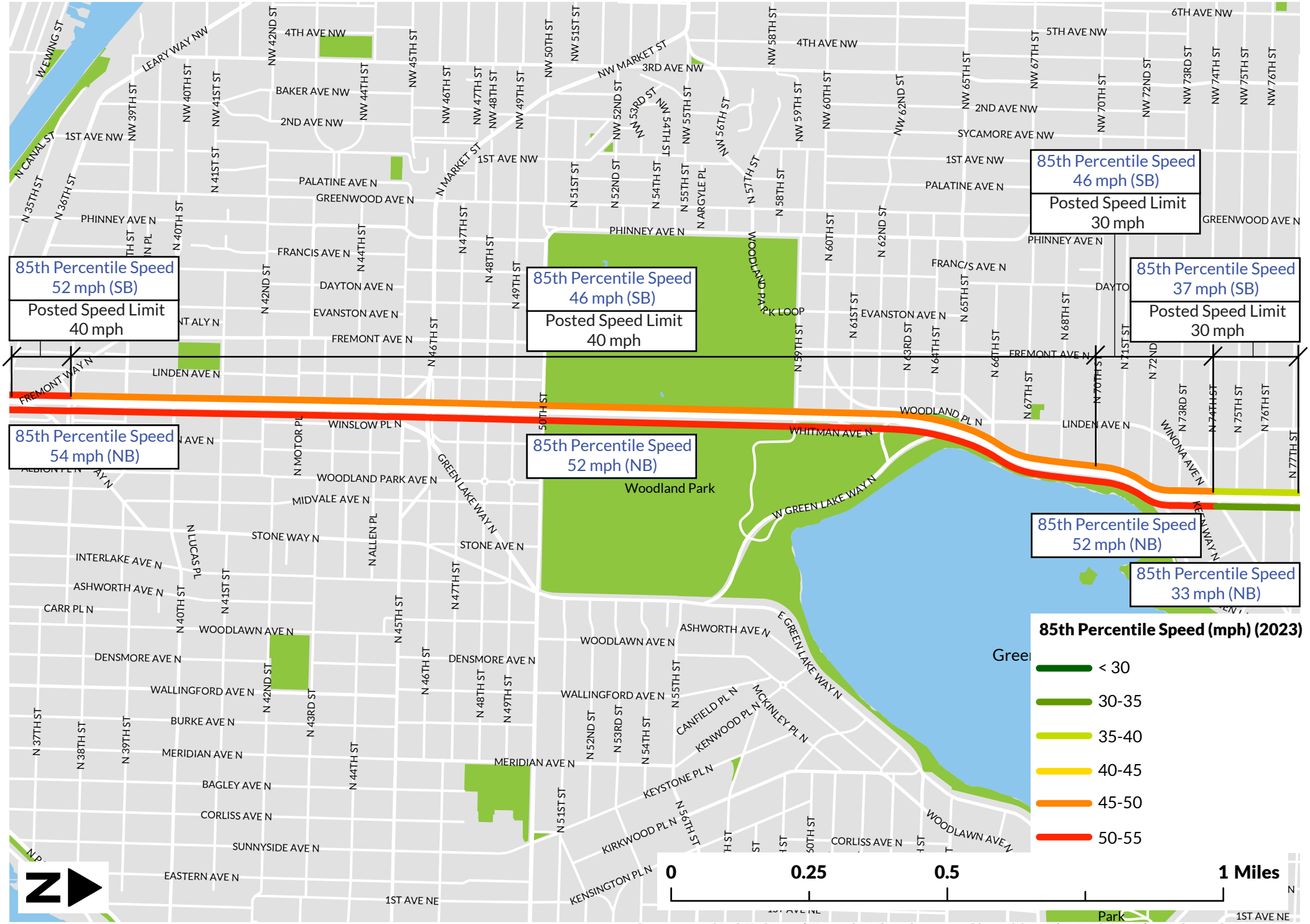


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-7. Segment 2 Freight Network

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-8. Segment 2 85th Percentile Speed

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King County METRO

4.3.5 Intersection Operation Metrics

The existing operation metrics of the study intersections in Segment 2 are shown in Table 4-2. The LOS of the overall intersection for signalized intersections are illustrated in Figure 4-9 and approach LOS of unsignalized intersections are displayed in Figure 4-10.

Table 4-2. Segment 2 Intersection Operation Metrics

Intersection	Traffic Control	AM Peak			PM Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
Aurora Ave N and N 38th St	TWSC	29.3	D	0.03 (EBR)	42.8	E	0.36 (WBR)
Aurora Ave N and Green Lake Way N	On/Off-Ramps						
Green Lake Way and N 46th St*	Full Signal	34.0	C	0.88	30.1	C	0.81
N Phinney Way and N 46th St*	Full Signal	19.0	B	0.85	31.2	C	1.08
Aurora Ave N and N 46th St	TWSC	12.8	B	0.04 (WBR)	28.4	D	0.13 (WBR)
Aurora Ave N and N 50th St	TWSC	29.7	D	0.35 (EBR)	32.5	D	0.23 (WBR)
Aurora Ave N and N 68th St	Pedestrian Signal	4.3	A	0.61	17.3	B	0.67
Aurora Ave N and Winona Ave N	Full Signal	52.0	D	1.09	40.6	D	1.00

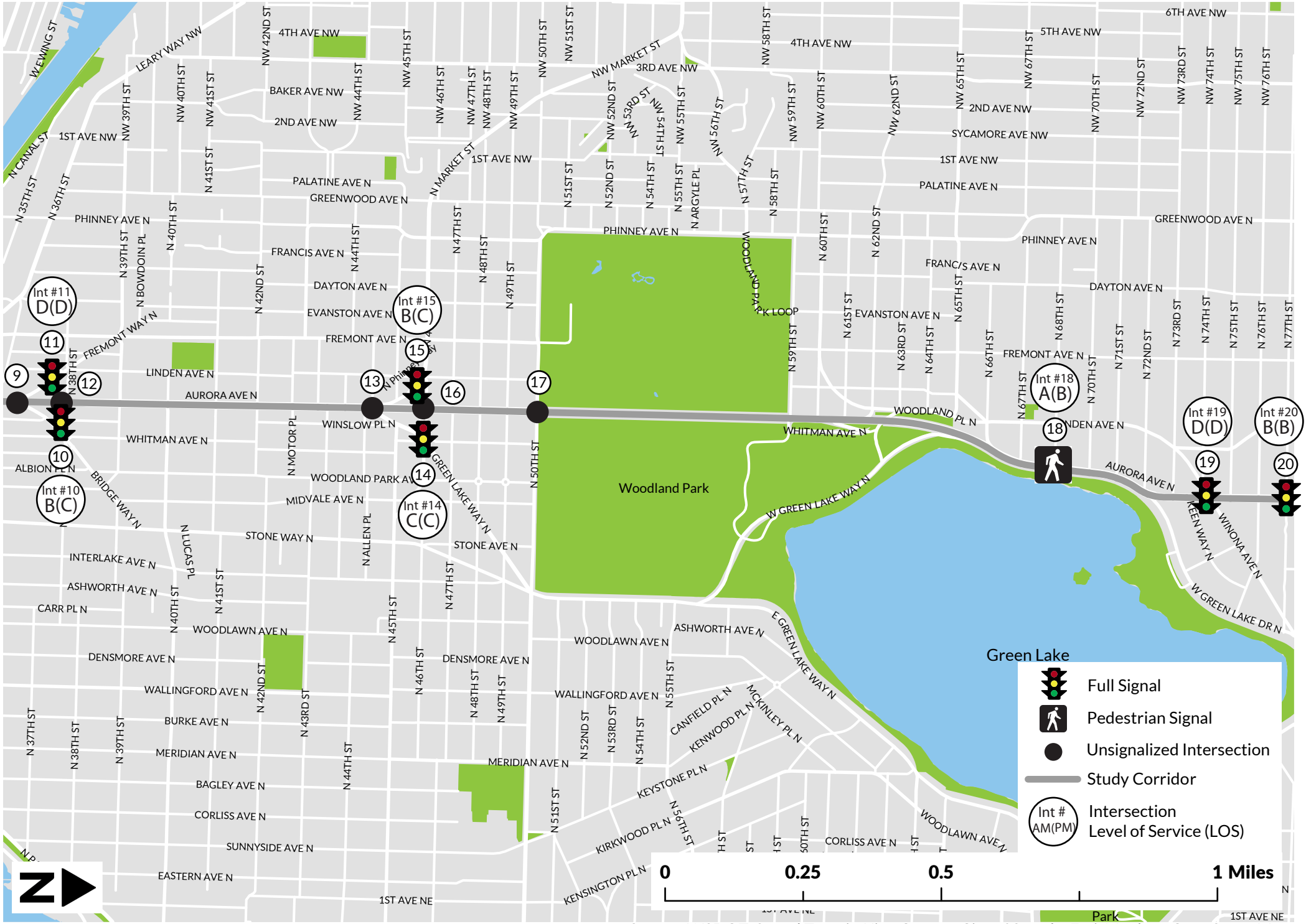
*Indicates that the intersection is located off Aurora Ave N

Notes:

EBR – Eastbound right

WBR – Westbound right

All the signalized intersections within Segment 2 operate at LOS D or better. The stop-controlled intersections in Segment 2 are either off Aurora Ave N or are reporting delay for the stop-controlled movements of the side streets to Aurora Avenue N and do not contribute to queuing or delays for northbound or southbound traffic. All stop-controlled intersections in Segment 2 operate at LOS D or better besides Aurora Avenue N/N 38th Street intersection during the PM peak period. The intersection of Aurora Ave N/Winona Ave N has a V/C ratio greater than 1.0 in the AM and PM peak hours and the intersection of N Phinney Way/N 46th St has a V/C ratio greater than 1.0 in the PM peak hour in Segment 2.

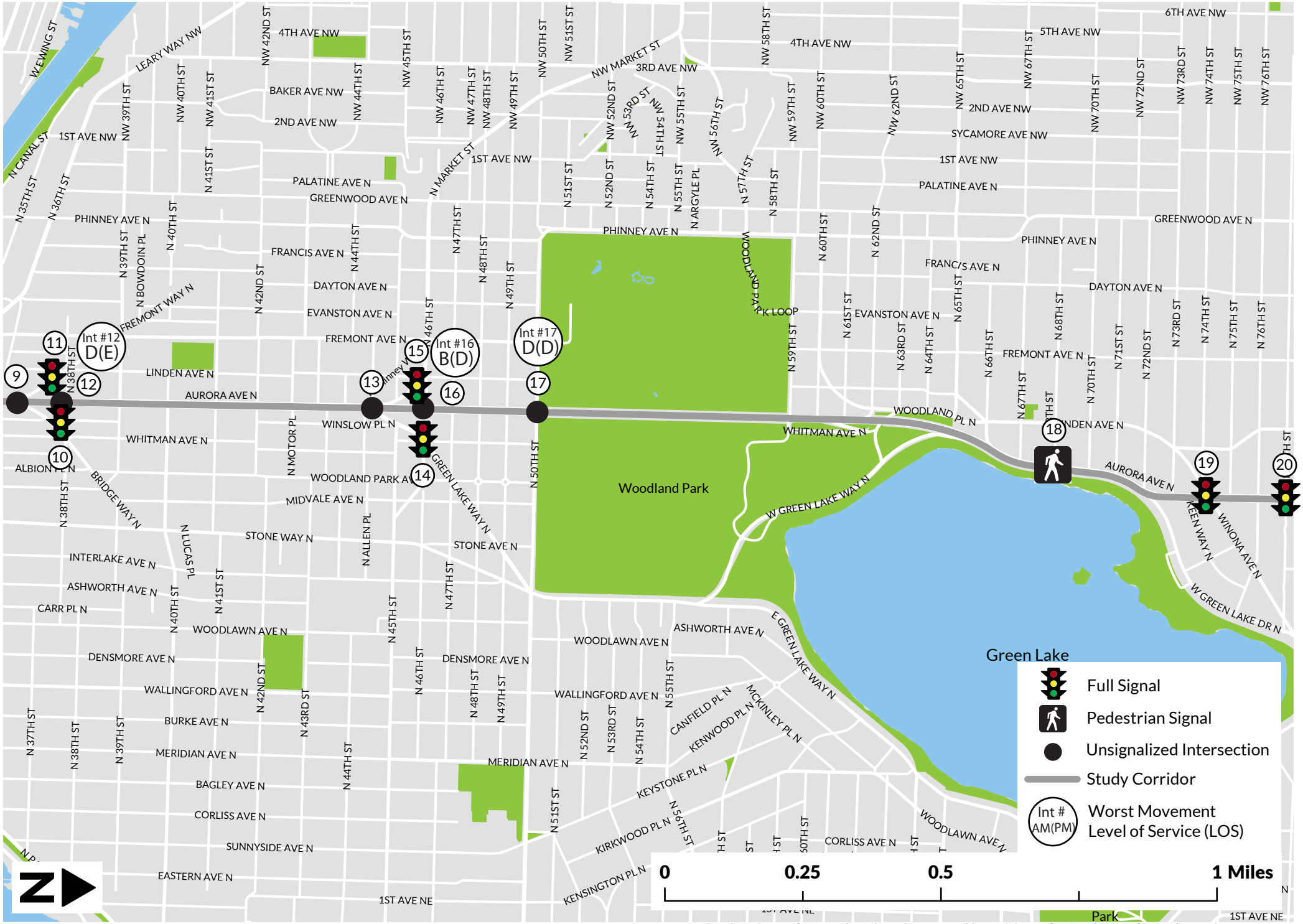


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-9. Segment 2 Signalized Intersection Overall LOS

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-10. Segment 2 Approach LOS for Unsignalized Intersections

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4.4 Nonmotorized Facilities

4.4.1 Pedestrian Facilities

Aurora Avenue N has sidewalks on both sides of the roadway for approximately 70% of Segment 2. Paved sidewalks are missing on the east side of Aurora Avenue N from approximately N 61st Street to N 72nd Street. The width of sidewalks is primarily 6 – 8 feet. A notable exception is the east side of Aurora Avenue N from N 65th Street to N 70th Street, which possesses sidewalks of 4 – 6 feet in width. The WSDOT Pedestrian LTS on Aurora Avenue N is largely rated as "3" throughout Segment 2 except for the intersections of N 81st Street, N 82nd Street, N 83rd Street, and N 85th Street, which are rated "4."

Figure 4-11 illustrates sidewalk width and WSDOT's Pedestrian Level of Traffic Stress along Segment 2 of Aurora Avenue N.

The condition of sidewalks along Aurora Avenue N in Segment 2 is primarily "good." The condition of sidewalks on the east side of Aurora Avenue N north of N 61st Street is rated "unreported" through the north border of Segment 2.

Figure 4-12 depicts existing sidewalk conditions on Segment 2 of Aurora Avenue N.

Segment 2 contains four grade-separated pedestrian crossings of Aurora Avenue N, however, the three crossings at Woodland Park are not accessible from the roadway. A pedestrian bridge is present at N 41st Street. Signalized crosswalks exist just north of N 68th Street and at Winona Way N.

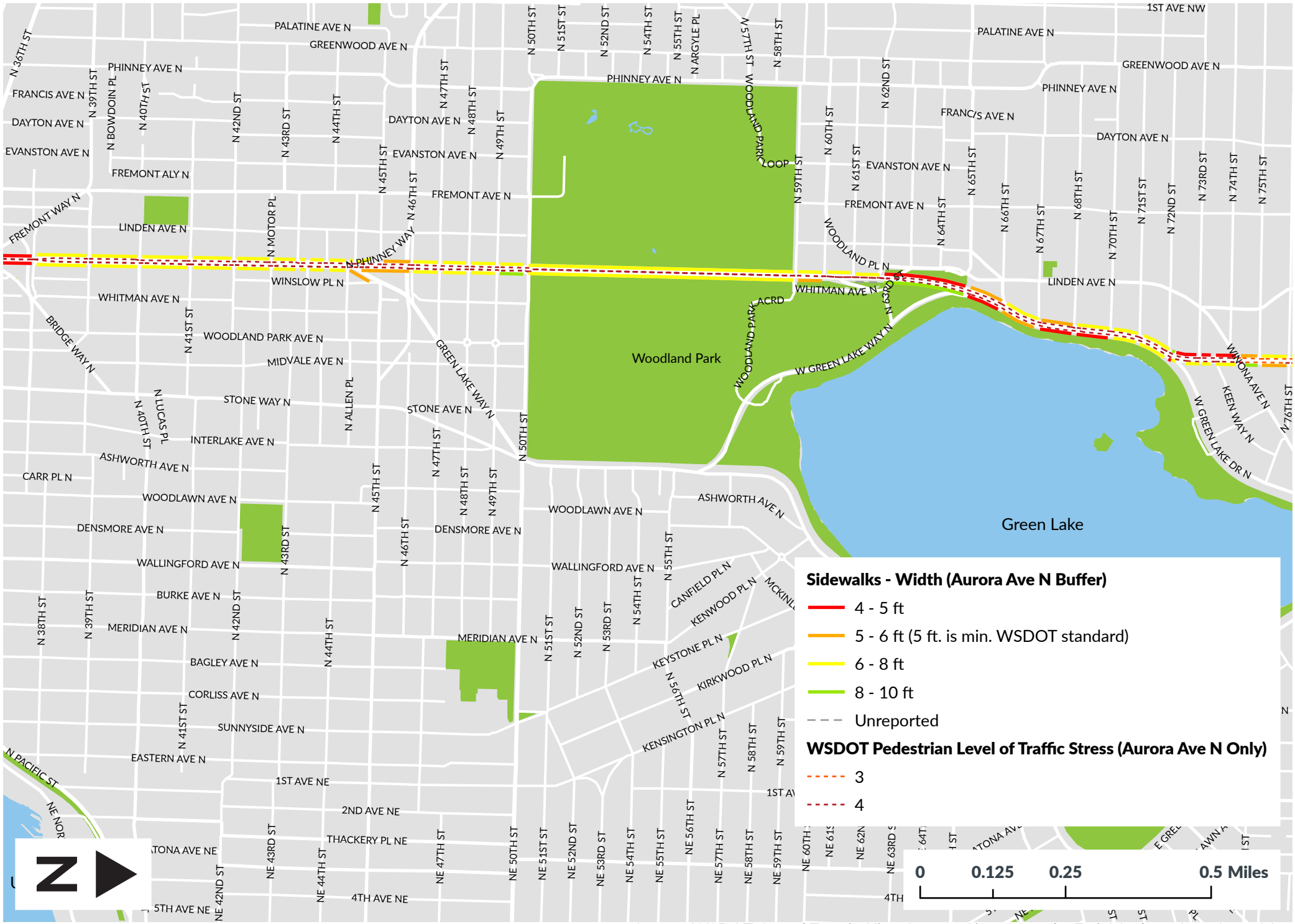
Figure 4-13 displays at-grade and grade-separated pedestrian crossings in Segment 2 of Aurora Avenue N.

SDOT's Compliant Curb Ramp App revealed one ADA-compliant curb ramp at the intersections of N 39th Street, N 46th Street, and N 60th Street. ADA-compliant curb ramps are also located at N 66th Street, Winona Avenue N, and in between N 68th Street and N 70th Street. No accessible pedestrian signals were recorded and the overcrossing at N 41st is not ADA accessible.

Figure 4-14 shows accessible pedestrian signals and in-service ADA-compliant curb ramps in Segment 2 of Aurora Avenue N.

SDOT street types present on Aurora Avenue N in Segment 2 from south to north include Urban Village Main and Urban Center Connector. Total minimum width without frontage required for these street types according to Streets Illustrated is 12 feet and 18 feet, respectively. Sidewalk facilities along Aurora Avenue N are compliant with SDOT's standards for nearly all of Segment 2. The most significant sections of Aurora Avenue N lacking compliance include stretches of both sides of the road north of N 59th Street.

Figure 4-15 depicts existing sidewalks' consistency with SDOT's minimum sidewalk standards for roadways in Segment 2 of Aurora Avenue N.

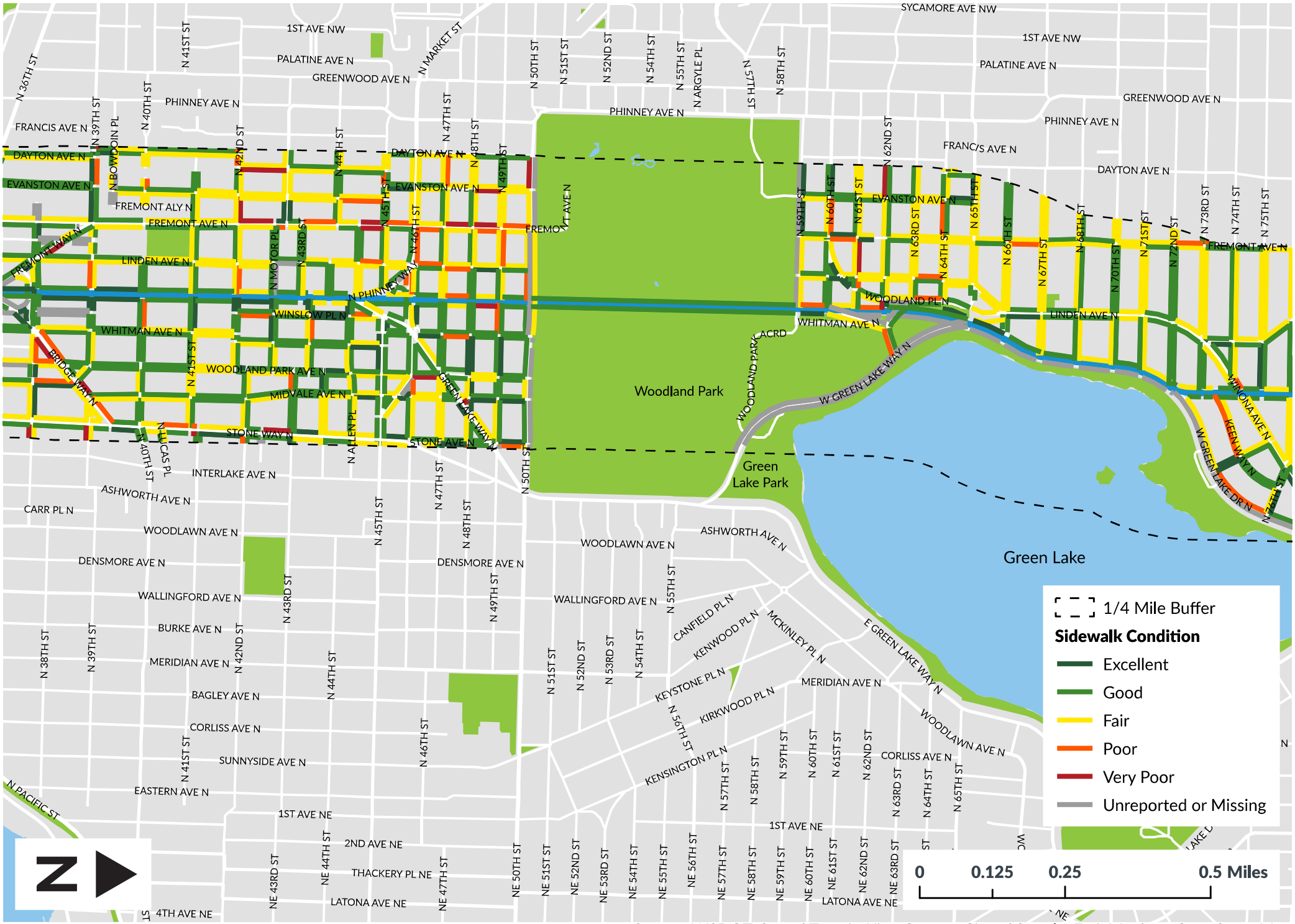


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-11. Segment 2 Sidewalk Consistency with WSDOT Standards

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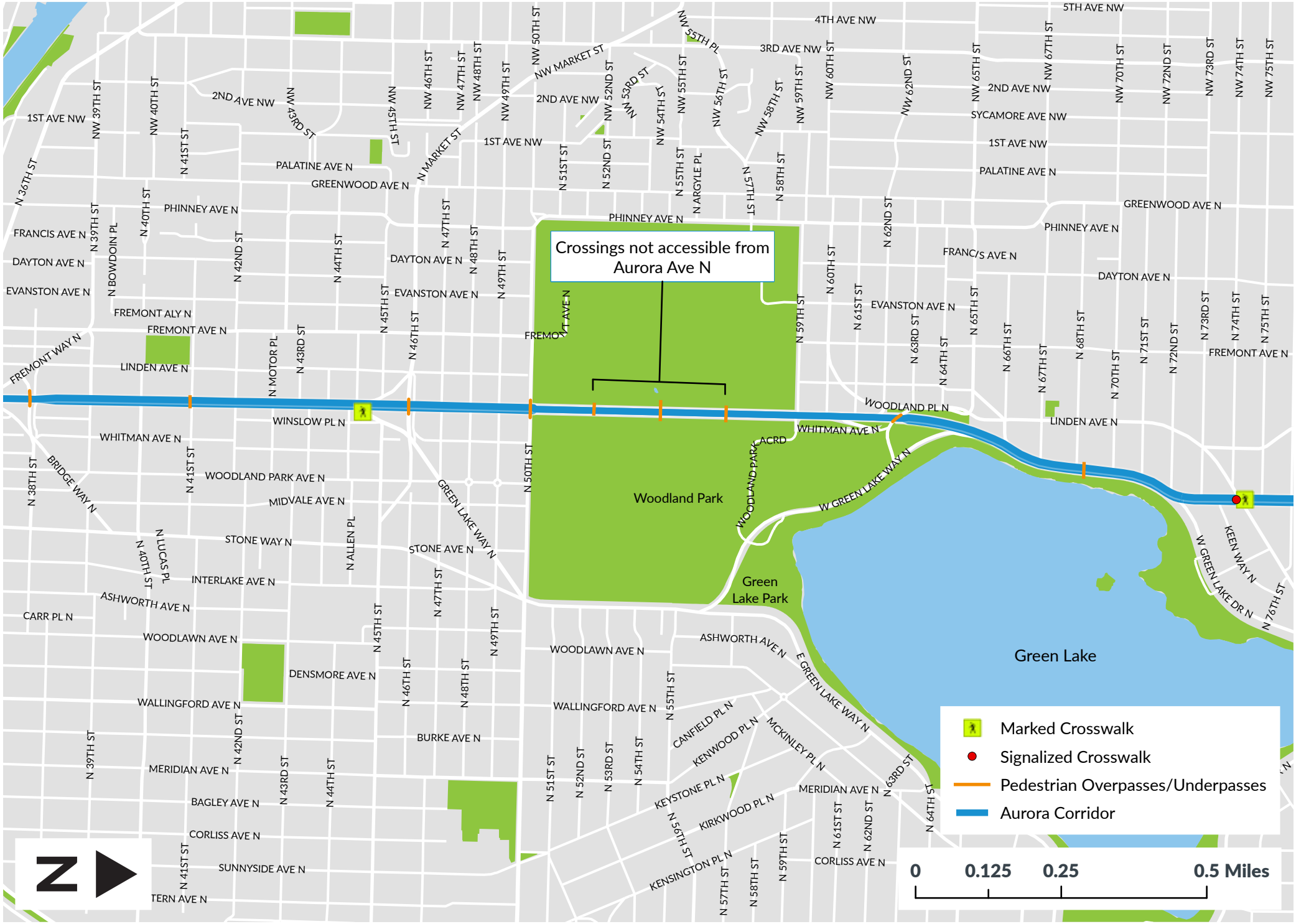


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-12. Segment 2 Existing Sidewalk Condition

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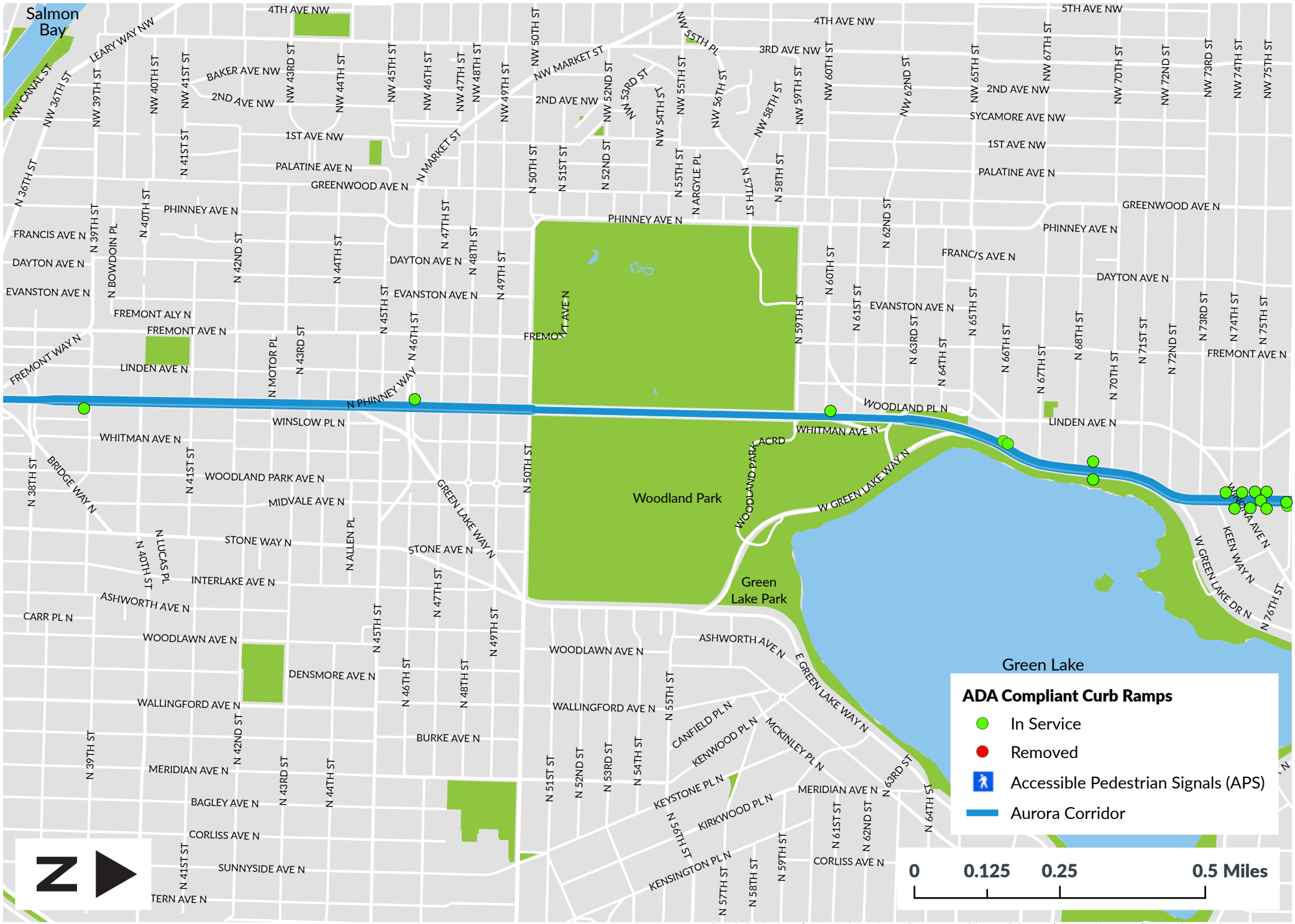


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-13. Segment 2 Pedestrian Crossings

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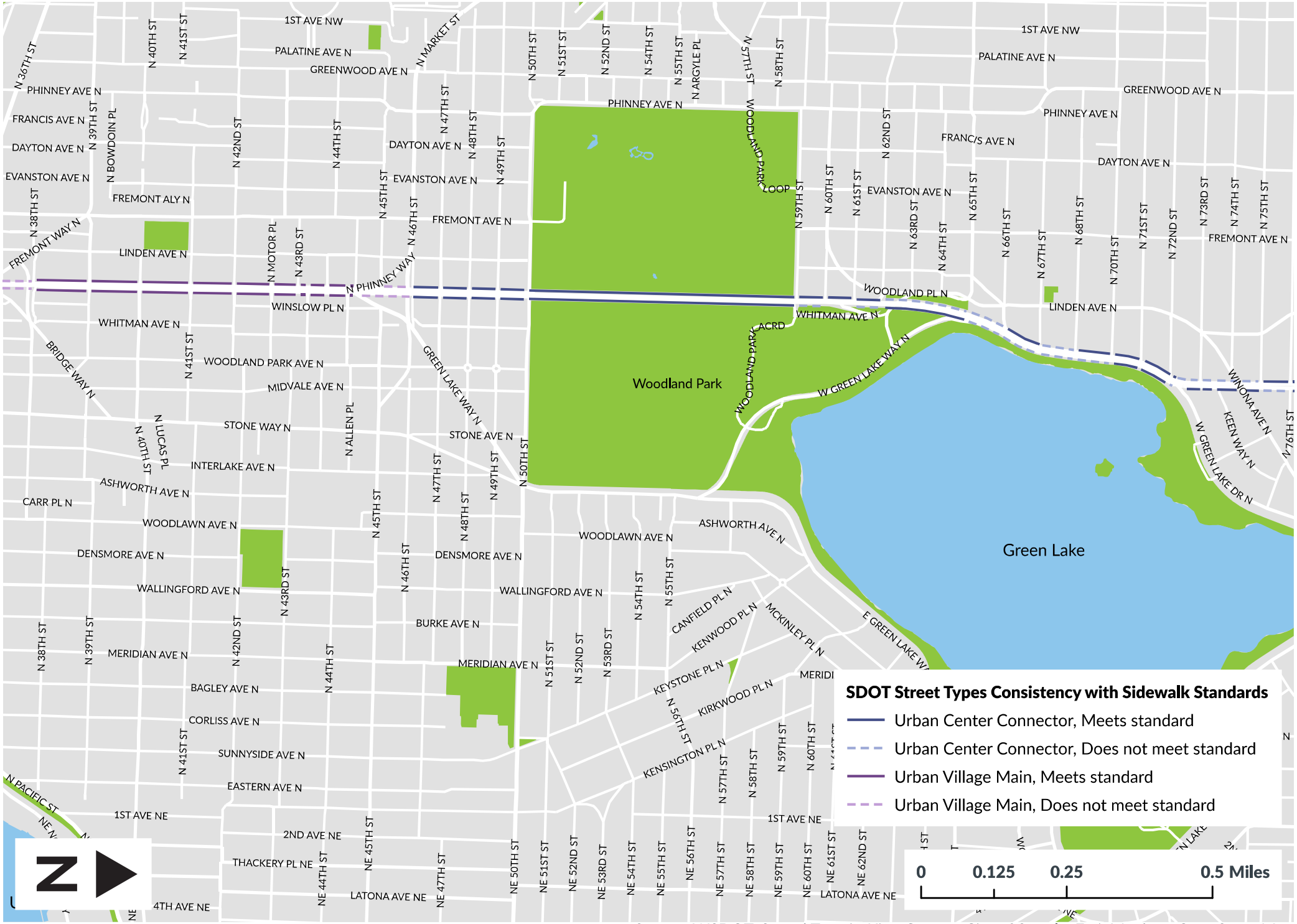


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-14. Segment 2 Pedestrian ADA Features

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-15. Segment 2 Sidewalk Consistency with SDOT Street Types

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4.4.2 Bicycle Facilities

The Green Lake Outer Loop runs along Aurora Avenue N from approximately N 68th Street in the south to West Green Lake Drive N in the north as a protected bike lane. Outside these endpoints, the Loop transitions to other protected facilities that circle Green Lake. Two streets with existing bicycle facilities pass under Aurora Avenue N along Segment 2; these include N 50th Street's painted bike lanes and N 63rd Street's sharrows. WSDOT ranks the Bicycle LTS along the entirety of Aurora Avenue N's Segment 2 as "4."

Figure 4-16 illustrates the presence of bicycle facilities in the Segment 2 extent of Aurora Avenue N.

4.5 Safety

A total of 200 crashes occurred in Segment 2 between 2018 and 2022. Table 4-3 summarizes these crashes by severity.

Table 4-3. Segment 2 Crashes by Severity (2018-2022)

Crash Severity	Crash Frequency
Fatal Crashes	4
Serious Injury Crashes	6
Injury Crashes	62
Property Damage Only Crashes	119
Unknown Crashes	9
Total Segment Crashes	*200*



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-16. Segment 2 Existing Bicycle Facilities

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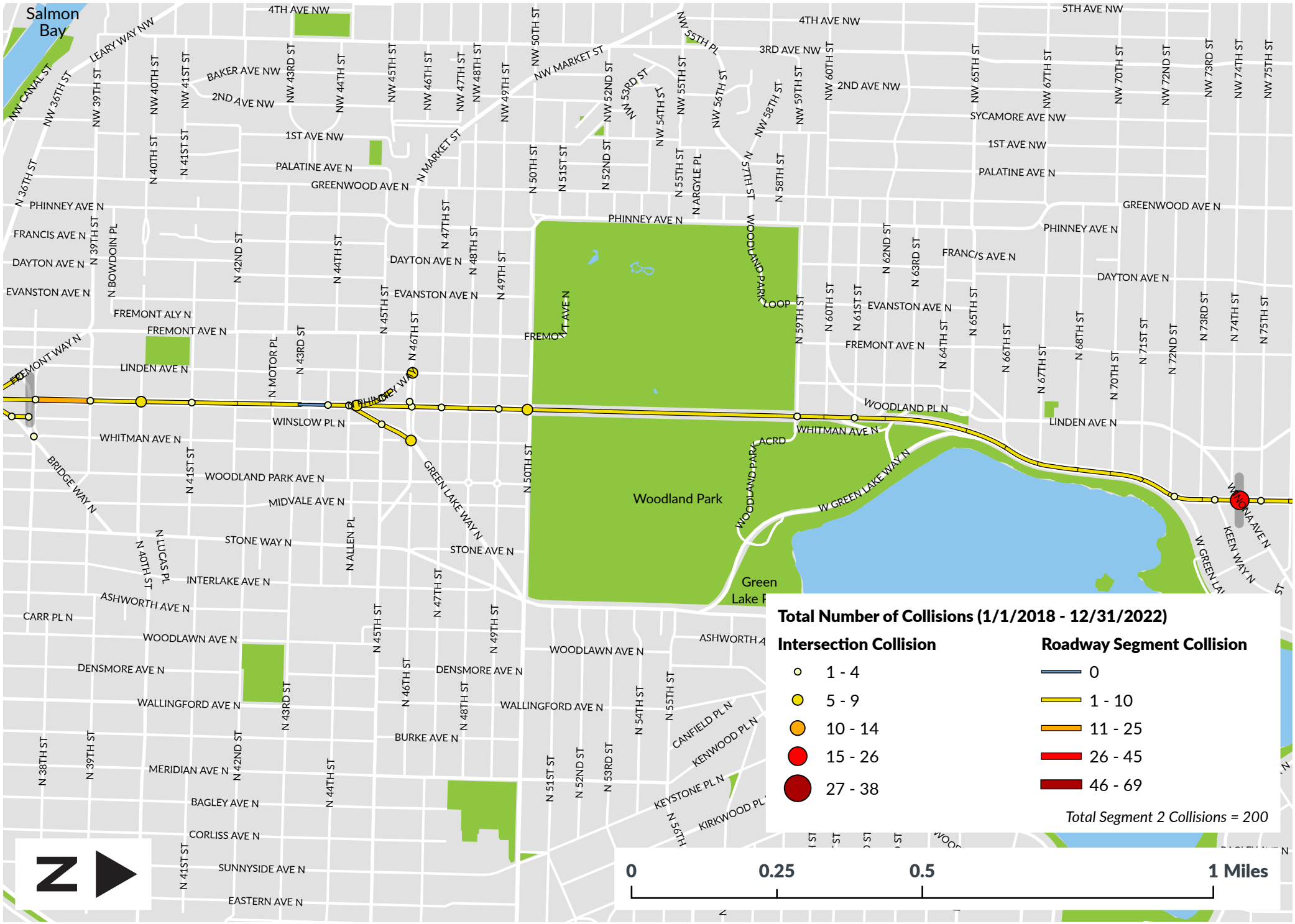
4.5.1 Crashes by Location – Intersections and Mid-Block Locations

Segment 2 included 69 intersection crashes and 131 mid-block crashes during the study period. Table 4-4 summarizes the intersection crashes by location and severity.

Table 4-4. Segment 2 Intersection Crashes by Severity (2018-2022)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N NB Off-Ramp & N 38th St	0	0	0	2	0	2
Bridge Way N & N 38th St	0	0	1	2	1	4
Fremont Way N & Fremont Turn Rd	0	0	1	0	0	1
Aurora Ave N & N 38th Upper St	0	0	1	3	0	4
Aurora Ave N & N 39th St	0	0	1	1	0	2
Aurora Ave N & N 40th St	0	0	2	3	0	5
Aurora Ave N & N 41st St	0	1	1	0	0	2
Aurora Ave N & N 44th St	0	0	0	1	0	1
Aurora Ave N & Green Lake Way N	0	0	1	2	0	3
Green Lake Way N & N 45th St	0	0	0	1	0	1
Green Lake Way N & N 46th St	0	0	3	5	0	8
Aurora Ave N & N Phinney Way	0	0	3	4	0	7
N Phinney Way & N 45th St	0	0	0	1	0	1
N 46th St & Phinney Turn Rd	0	0	1	0	0	1
Linden Ave N & N 46th St	0	0	1	4	0	5
Aurora Ave N & N 46th Upper St	1	0	2	0	1	4
Aurora Ave N & N 47th St	0	0	0	1	0	1
Aurora Ave N & N 49th St	0	0	1	3	0	4
Aurora Ave N & N 50th Upper St	0	1	2	5	1	9
Aurora Ave N & N 59th St	0	0	0	1	0	1
Aurora Ave N & N 61st St	0	0	1	0	0	1
Aurora Ave N & West Green Lake Dr N	0	0	0	1	0	1
Aurora Ave N & Keen Way N	0	0	0	1	0	1
Total Intersection Crashes	*1*	*2*	*22*	*41*	*3*	*69*

Segment 2 had one fatal crash at an intersection (pedestrian-involved) along with two serious injury crashes (one bicyclist-involved, one fixed object crash). The intersection of Aurora Avenue N and N 50th Upper Street had the most crashes with 9 and Green Lake Way N and N 46th Street had the next highest with 8 crashes. Just under 60% of crashes were property damage only crashes. Figure 4-17 displays total collisions on Segment 2 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-17. Segment 2 Total Collisions

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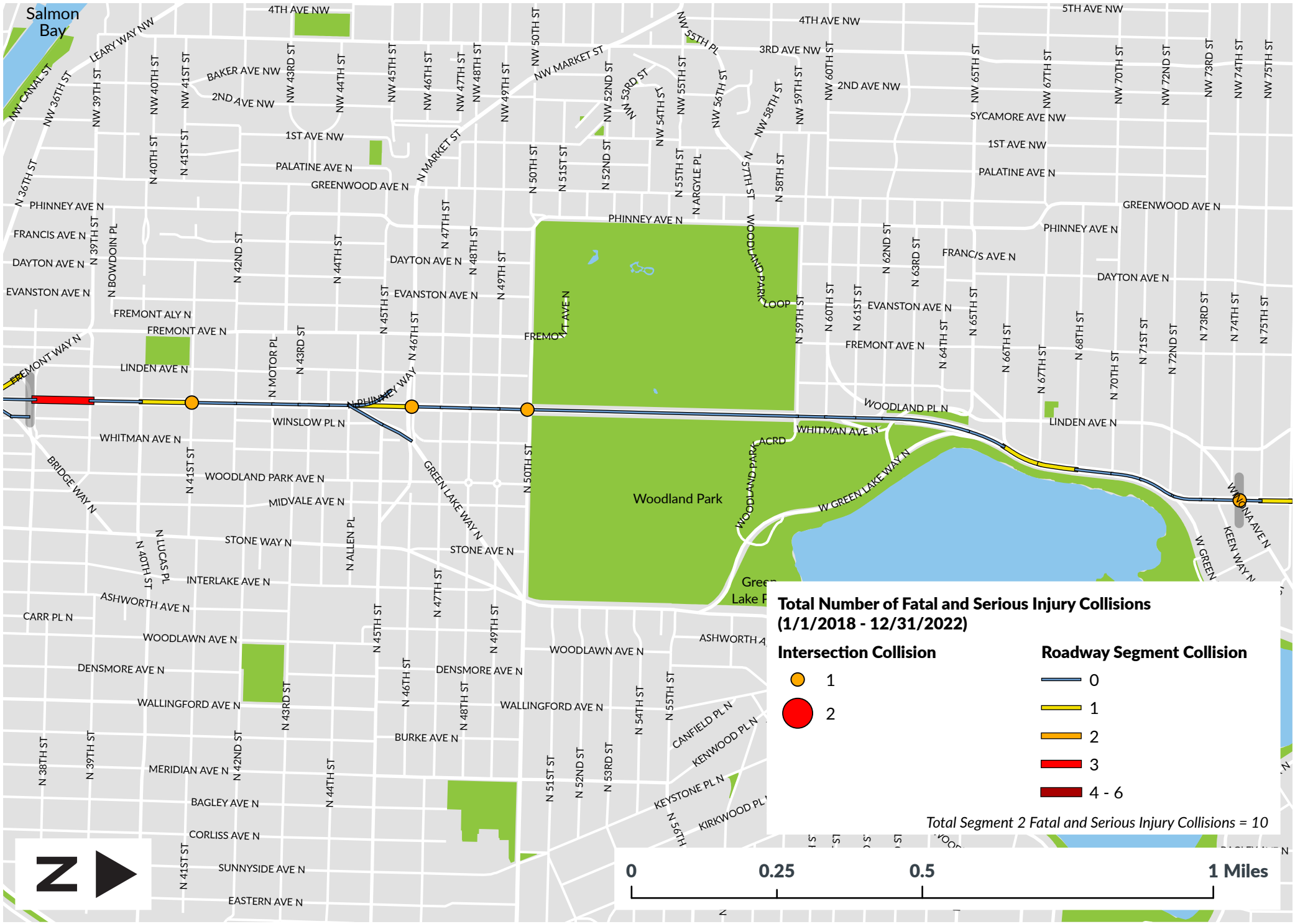
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Table 4-5 summarizes the mid-block crashes by location and severity for Segment 2.

Table 4-5. Segment 2 Mid-Block Crashes by Severity (2018-2022)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N between N 38th Upper St & N 39th St	1	2	2	13	0	18
Aurora Ave N between N 39th St & N 40th St	0	0	0	3	0	3
Aurora Ave N between N 40th St & N 41st St	0	1	1	3	0	5
Aurora Ave N between N 41st St & N 42nd St	0	0	1	0	0	1
Aurora Ave N between N 42nd St & Motor Pl	0	0	2	3	1	6
Aurora Ave N between Motor Pl & N 43rd St	0	0	1	1	0	2
Aurora Ave N between N 44th St & Green Lake Way N	0	0	0	2	0	2
Green Lake Way N between Aurora Ave N & N 45th St	0	0	0	3	0	3
Green Lake Way N between N 45th St & N 46th St	0	0	1	0	0	1
Aurora Ave N between Green Lake Way N & N Phinney Way	0	0	1	0	0	1
N Phinney Way between N 45th St & Aurora Ave N	0	0	1	3	1	5
N Phinney Way between Phinney Turn Rd & N 45th St	0	0	1	2	0	3
Aurora Ave N between N Phinney Way & N 46th Upper St	1	0	4	3	0	8
Aurora Ave N between N 46th Upper St & N 47th St	0	0	2	0	0	2
Aurora Ave N between N 47th St & N 48th St	0	0	1	4	1	6
Aurora Ave N between N 48th St & N 49th St	0	0	2	1	0	3
Aurora Ave N between N 49th St & N 50th Upper St	0	0	3	5	2	10
Aurora Ave N between N 50th Upper St & N 59th St	0	0	4	4	0	8
Aurora Ave N between N 59th St & N 60th St	0	0	1	1	0	2
Aurora Ave N between N 60th St & N 61st St	0	0	1	0	0	1
Aurora Ave N between N 61st St & N 62nd St	0	0	0	3	0	3
Aurora Ave N between N 62nd St & West Green Lake Way N	0	0	0	7	0	7
Aurora Ave N between West Green Lake Way N & N 66th St	0	0	0	1	0	1
Aurora Ave N between N 66th St & N 67th St	1	0	1	2	0	4
Aurora Ave N between N 67th St & N 68th St	0	1	1	2	0	4
Aurora Ave N between N 68th St & N 70th St	0	0	4	0	0	4
Aurora Ave N between N 70th St & N 71st St	0	0	2	0	0	2
Aurora Ave N between N 71st St & N 72nd St	0	0	1	2	0	3
Aurora Ave N between N 72nd St & West Green Lake Dr N	0	0	1	0	0	1
Aurora Ave N between West Green Lake Dr N & N 73rd St	0	0	1	1	0	2
Aurora Ave N between N 73rd St & Keen Way N	0	0	0	4	1	5
Aurora Ave N between Keen Way N & Winona Ave N	0	0	0	5	0	5
Total Segment Crashes	*3*	*4*	*40*	*78*	*6*	*131*

Three fatal crashes occurred on three different blocks, one of which (Aurora Avenue N between N 38th Upper Street and N 39th Street) also experienced two serious injury crashes. Almost 60% of the mid-block crashes in Segment 2 were property damage only crashes. Figure 4-18 displays fatal and serious injury collisions on Segment 2 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-18. Segment 2 Fatal and Serious Injury Collisions

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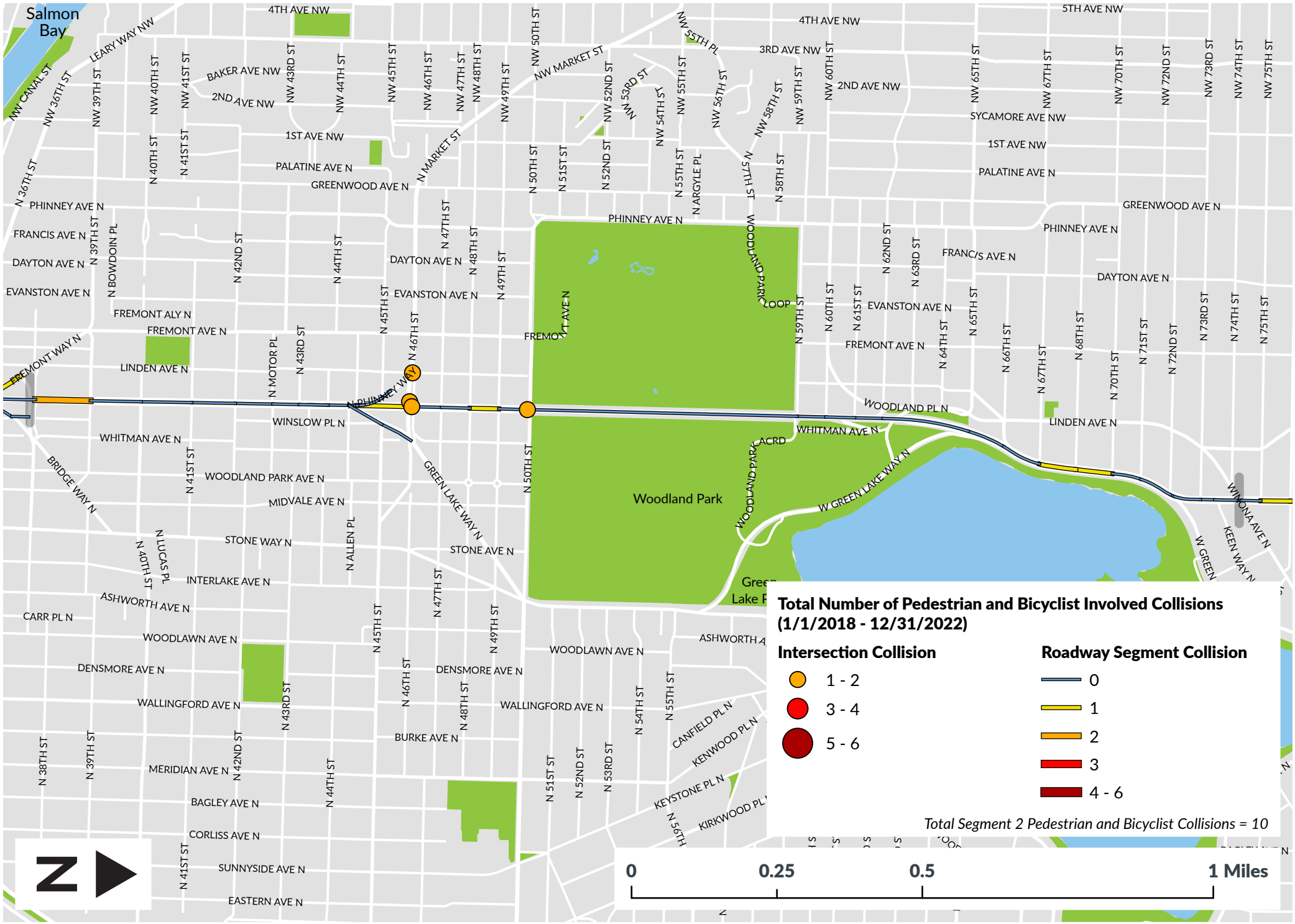
4.5.2 Crashes by Type

In Segment 2, there were 5 pedestrian-involved crashes and 3 bicyclist-involved crashes. Three pedestrian-involved crashes and one bicyclist-involved crash occurred mid-block and two pedestrian-involved crashes and two bicyclist-involved crashes occurred at intersections. Table 4-6 summarizes the locations and severities of these non-motorist-involved crashes.

Table 4-6. Segment 2 Non-Motorized Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**2**	**1**	**2**	**0**	**0**	**5**
Aurora Ave N between N Phinney Way & N 46th Upper St	1	0	0	0	0	1
Aurora Ave N between N 48th St & N 49th St	0	0	1	0	0	1
Aurora Ave N between N 67th St & N 68th St	0	1	0	0	0	1
N 46th St & Phinney Turn Rd	0	0	1	0	0	1
Aurora Ave N & N 46th Upper St	1	0	0	0	0	1
Bicyclist-Involved Crashes	**0**	**1**	**2**	**0**	**0**	**3**
Aurora Ave N between N 68th St & N 70th St	0	0	1	0	0	1
Linden Ave N & N 46th St	0	0	1	0	0	1
Aurora Ave N & N 50th St Upper	0	1	0	0	0	1
Total Non-Motorized Crashes	*2*	*2*	*4*	*0*	*0*	*8*

Two of the eight non-motorized crashes were fatal crashes, two were serious injury crashes, and four were other injury crashes. The fatal crash between N Phinney Way and N 46th Upper Street involved a pedestrian who crossed the roadway outside of a crosswalk or undercrossing, while the fatal crash at the intersection with N 46th Upper Street involved a speeding driver under the influence of alcohol. The two serious injury crashes did not provide any additional contributing factor information. Two of the injury crashes involved a failure to yield or obey the traffic control in addition to inattention, one involved a pedestrian under the influence of alcohol who did not use a crosswalk, and one listed no contributing factor information. Figure 4-19 displays pedestrian and bicyclist collisions on Segment 2 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-19. Segment 2 Pedestrian and Bicyclist Collisions

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The other 192 crashes in Segment 2 were all vehicle-only crashes. Table 4-7 summarizes the mid-block and intersection vehicle-only crashes by crash type.

Table 4-7. Segment 2 Motorized Crashes by Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block	35	5	26	1	10	28	22	127
Intersections	10	25	6	0	1	11	12	65
Total Motorized Crashes	*45*	*30*	*32*	*1*	*11*	*39*	*34*	*192*

Mid-block, the most common crash type was rear end (28%) followed by sideswipe crashes (20%). Just under 40% of mid-block crashes were categorized as other or unknown. At intersections, the most common crashes were angle or turning crashes (38%) followed by rear end crashes (15%). Over 35% of intersection crashes were categorized as other or unknown.

4.5.3 Crash Contributing Factors

Table 4-8 summarizes the primary contributing factors for the Segment 2 crashes. Sixty-one crashes (31%) did not have a documented contributing factor and are excluded from the summary.

Table 4-8. Segment 2 Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Segment 2 Crashes
Inattention	18	9%
Improper maneuver	17	9%
Following too closely	16	8%
Speeding	13	7%
Distracted	12	6%
Alcohol/drug impaired	12	6%
Did not grant right-of-way to vehicle	10	5%
Disregard traffic control	4	2%
Fatigued/Ill	2	1%
Operating defective equipment	2	1%
Did not grant right-of-way to non-motorist	1	<1%
Improper non-motorist behavior	1	<1%
Other (does not include none)	31	16%
Total	*139*	*70%*

In Segment 2, inattention was the most common primary contributing factor (9%) followed by improper maneuver (9%) and following too closely (8%). The “other” contributing factor category collectively accounted for 16% of Segment 2 crashes as well.

4.5.4 Crashes by Time of Day

Figure 4-20 shows the total Segment 2 crashes by time of day, aggregated by the hour of the day.

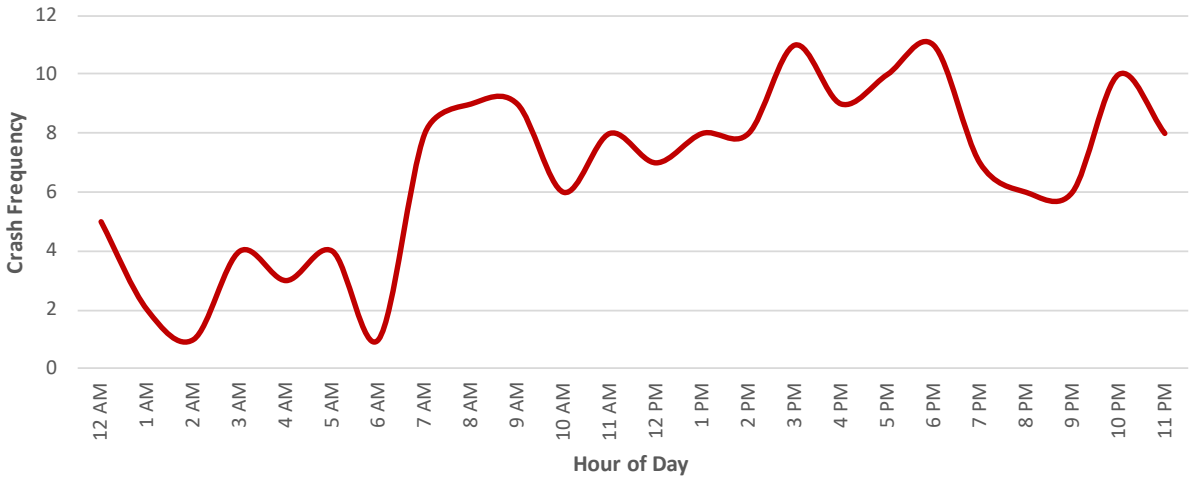


Figure 4-20. Segment 2 Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak period, however, crashes were generally higher and fairly consistent during the day from the beginning of the AM peak period to the end of the PM peak period. There was also an additional spike during the PM hour. Figure 4-21 summarizes the total corridor crashes by lighting condition.

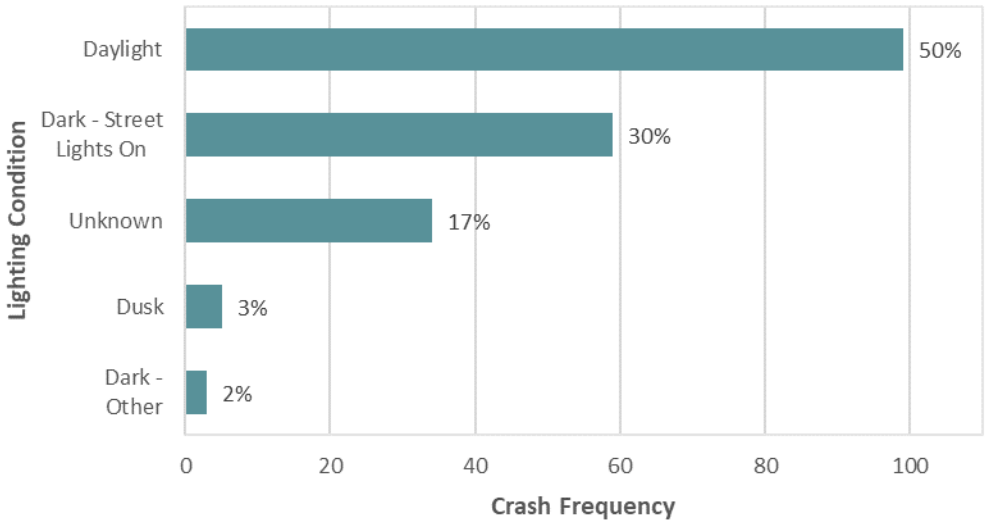


Figure 4-21. Segment 2 Crashes by Lighting Condition (2018-2022)

Half of the corridor crashes (50%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (95% of dark condition crashes).

4.5.5 Mid-Block and Signalized Intersection Crash Rates

Crash rates were calculated for the individual mid-block locations within Segment 2 and are summarized in Table 4-9. There are no signalized intersections in Segment 2 except for the signalized crossing between N 67th Street and N 68th Street. This location experienced one crash and had a crash rate of 0.02 crashes per MVMT.

Table 4-9. Segment 2 Mid-Block Crash Rates (2018-2022)

Mid-Block	Length (miles)	ADT (vpd)	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N between N 38th Upper St & N 39th St	0.10	43,100	18	2.29
Aurora Ave N between N 39th St & N 40th St	0.09	43,100	3	0.42
Aurora Ave N between N 40th St & N 41st St	0.09	43,100	5	0.71
Aurora Ave N between N 41st St & N 42nd St	0.08	43,100	1	0.16
Aurora Ave N between N 42nd St & Motor Pl	0.06	43,100	6	1.27
Aurora Ave N between Motor Pl & N 43rd St	0.05	43,100	2	0.51
Aurora Ave N between N 43rd St & N 44th St	0.05	43,100	0	0.00
Aurora Ave N between N 44th St & Green Lake Way N	0.04	43,100	2	0.64
Aurora Ave N between Green Lake Way N & N Phinney Way	0.02	43,100	1	0.64
Aurora Ave N between N Phinney Way & N 46th Upper St	0.07	43,100	8	1.45
Aurora Ave N between N 46th Upper St & N 47th St	0.06	43,100	2	0.42
Aurora Ave N between N 47th St & N 48th St	0.05	43,100	6	1.53
Aurora Ave N between N 48th St & N 49th St	0.05	43,100	3	0.76
Aurora Ave N between N 49th St & N 50th Upper St	0.05	43,100	10	2.54
Aurora Ave N between N 50th Upper St & N 59th St	0.46	43,100	8	0.22
Aurora Ave N between N 59th St & N 60th St	0.05	43,100	2	0.51
Aurora Ave N between N 60th St & N 61st St	0.05	43,100	1	0.25
Aurora Ave N between N 61st St & N 62nd St	0.05	43,100	3	0.76
Aurora Ave N between N 62nd St & West Green Lake Way N	0.16	43,100	7	0.56
Aurora Ave N between West Green Lake Way N & N 66th St	0.05	43,100	1	0.25
Aurora Ave N between N 66th St & N 67th St	0.07	43,100	4	0.73
Aurora Ave N between N 67th St & N 68th St	0.07	43,100	3	0.54
Aurora Ave N between N 68th St & N 70th St	0.06	43,100	4	0.85
Aurora Ave N between N 70th St & N 71st St	0.05	43,100	2	0.51
Aurora Ave N between N 71st St & N 72nd St	0.06	43,100	3	0.64
Aurora Ave N between N 72nd St & West Green Lake Dr N	0.02	43,100	1	0.64
Aurora Ave N between West Green Lake Dr N & N 73rd St	0.03	43,100	2	0.85
Aurora Ave N between N 73rd St & Keen Way N	0.03	43,100	5	2.12
Aurora Ave N between Keen Way N & Winona Ave N	0.04	43,100	5	1.59

The blocks with the highest crash rates in Segment 2 include between N 49th Street and N 50th Upper Street (2.54 crashes/MVMT), between N 38th Upper Street and N 39th Street (2.29 crashes/MVMT), and between N 73rd Street and Keen Way N (2.12 crashes/MVMT. All other blocks in Segment 2 have a crash rate less than 2 crashes/MVMT. The average segment crash rate for Segment 2 is 0.87 crashes/MVMT.

4.6 Transit

Bus lines that currently travel on Aurora Avenue N within Segment 2 include the E Line (RapidRide) and Route 16X (peak-only route, service suspended through March 29, 2024). Route 44 (frequent all-day route) crosses Aurora Avenue N at N 46th Street.

The E Line has 2 station pairs and 1 stand-alone station within Segment 2. In fall 2022, average daily boardings at these stations ranged from 13 to 232 riders and average daily alightings ranged from 28 to 235 riders. The southbound stop in between N 45th Street and N 46th Street (Stop ID 75408) has the highest level of overall activity within Segment 2. Routes 16X and 44 pass under Aurora Avenue N at N 46th Street and may contribute to higher boardings and alightings at stations around the intersection.

Figure 4-22 displays average daily E Line ridership and transit lines that travel on or pass under Aurora Avenue N in Segment 2.

Three out of five stations within Segment 2 are equipped with at least 1 shelter; the other 2 stations have no shelters. No layover or comfort stations are located in Segment 2.

Figure 4-23 shows passenger amenities at transit stops along Segment 2 of Aurora Avenue N.

4.6.1 Transit Travel Speeds

Three TSP systems exist in Segment 2. They are located at N 63rd Street, N 68th Street, and Winona Avenue N. Figure 4-24 depicts TSP systems on Segment 2 of Aurora Avenue N.

Average transit travel speeds vary within Segment 2 of Aurora Avenue N. Table 4-10 and Table 4-11 display the various average transit speeds within Segment 2 during the AM and PM hours, respectively. Figure 4-25 and Figure 4-26 display transit travel speeds in Segment 2 in the AM and PM peak periods, respectively. Transit travel speeds do not include dwell time at stops.

Table 4-10 Segment 2 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 38th Street – N 46th Street	31 – 40 mph	31 – 40 mph
N 46th Street – N 65th Street	21 – 30 mph	31 – 40 mph
N 65th Street – N 72nd Street	21 – 30 mph	21 – 30 mph
N 72nd Street – Winona Avenue N	0 – 20 mph	21 – 30 mph

Table 4-11 Segment 2 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 38th Street – N 46th Street	31 – 40 mph	21 – 30 mph
N 46th Street – N 65th Street	21 – 30 mph	31 – 40 mph
N 65th Street – N 72nd Street	21 – 30 mph	0 – 20 mph
N 72nd Street – Winona Avenue N	0 – 20 mph	0 – 20 mph



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-22. Segment 2 Average Daily E Line Ridership

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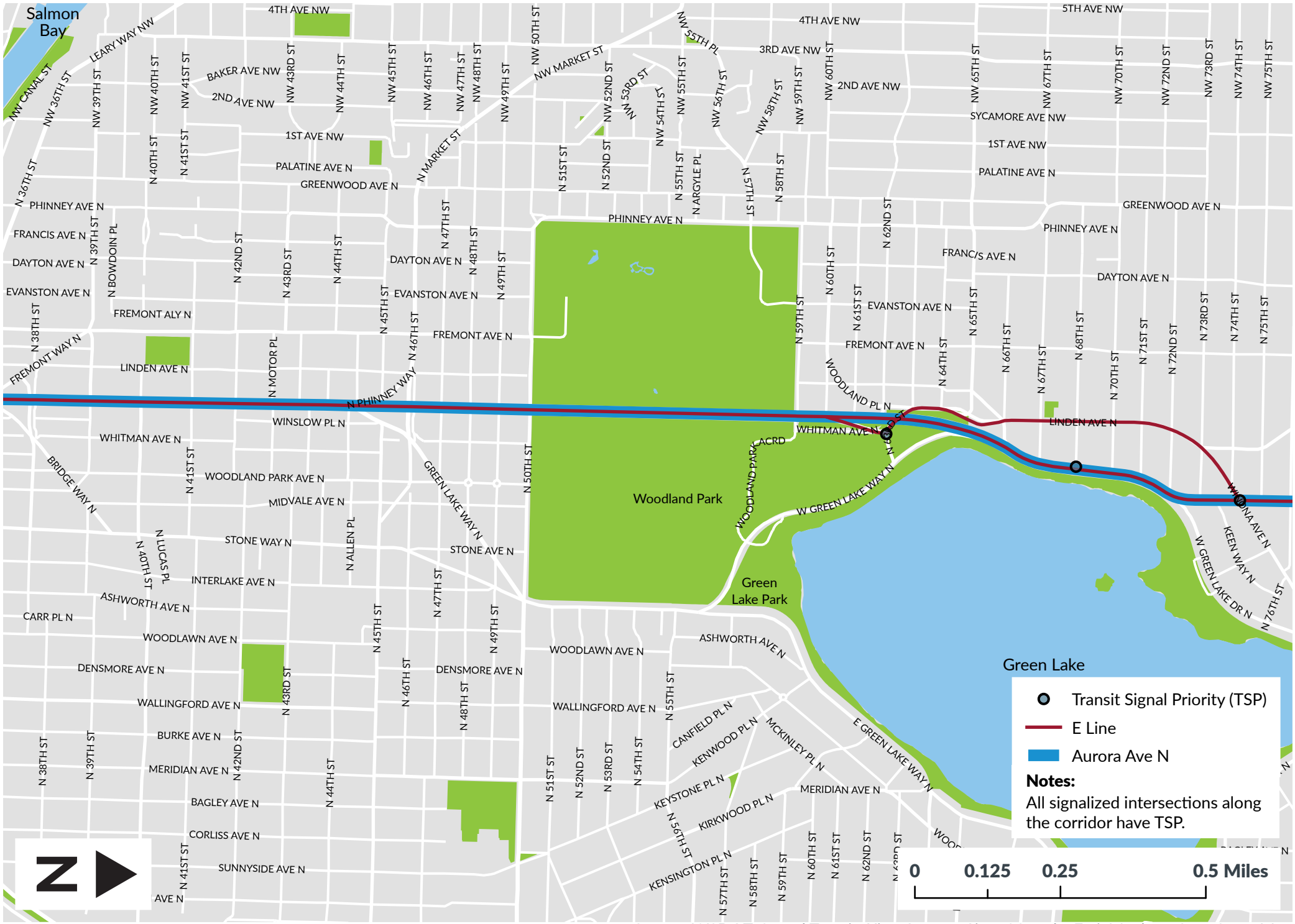


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-23. Segment 2 Passenger Amenities

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-24. Segment 2 Transit Signal Priority

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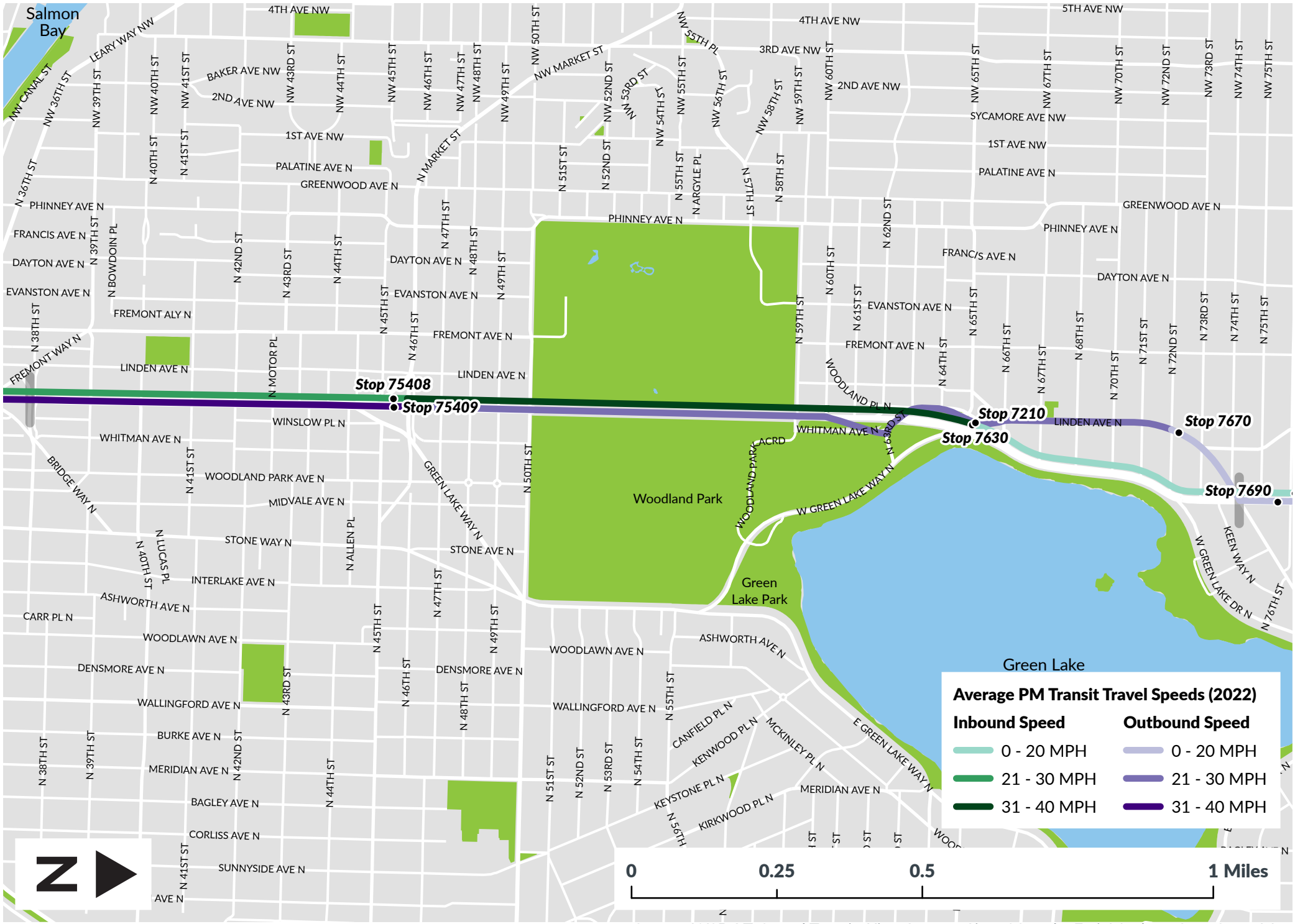


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-25. Segment 2 AM Transit Travel Speeds

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-26. Segment 2 PM Transit Travel Speeds

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4.6.2 Bus collisions

Between January 2019 and February 2023, there were six bus collisions along Aurora Avenue N in Segment 2. All collisions except one were with other non-transit vehicles; the sixth collision was with a fixed object. The collisions tended to cluster within a few blocks of the north and south ends of Woodland Park.

Figure 4-27 displays bus collisions from 2021 and 2022 along Segment 2 of Aurora Avenue N.

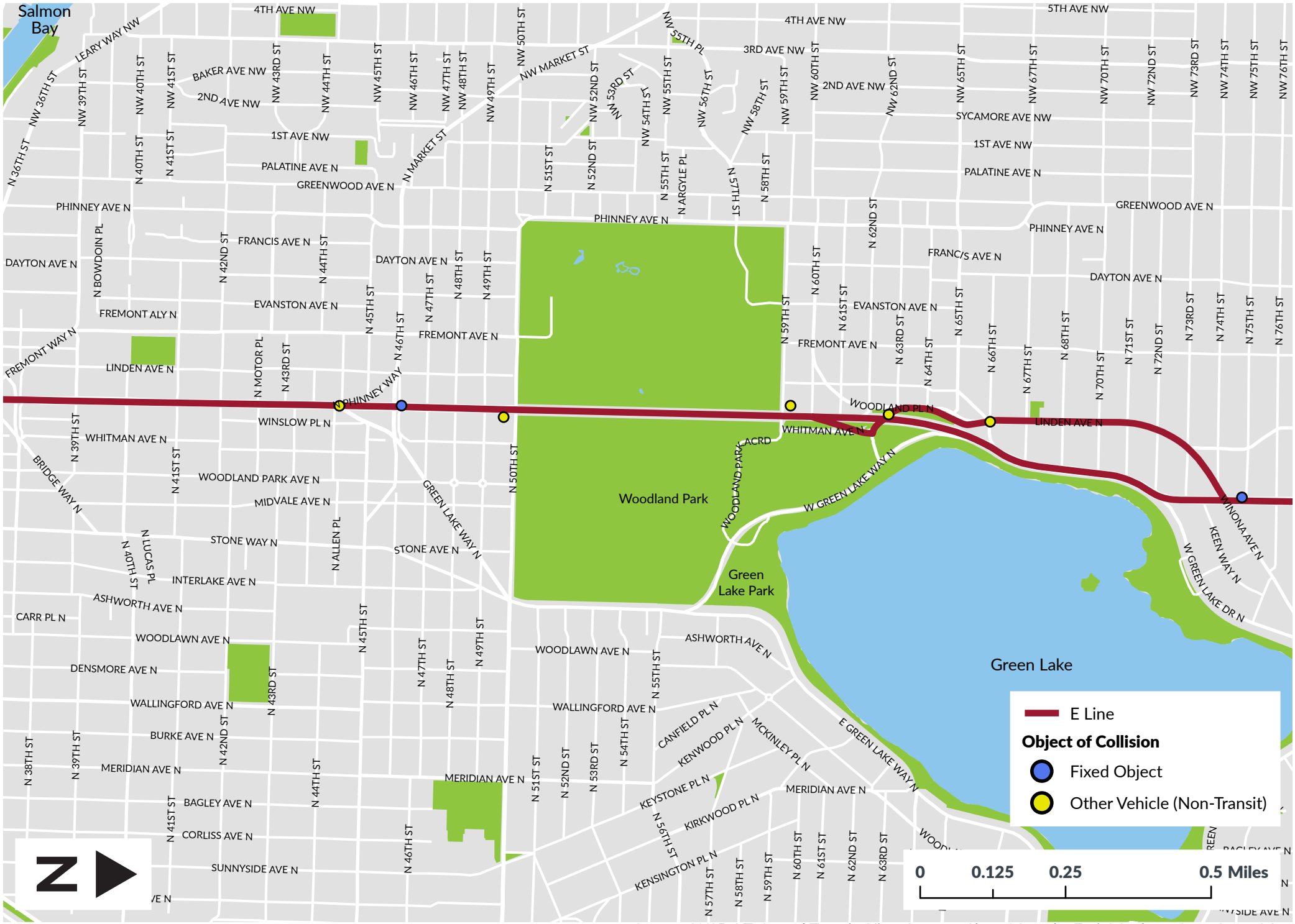
4.7 Transportation Plans

The PMP's Arterial Priority Investment Network assigned Segment 2 of Aurora Avenue N a score of Tier 5 in the majority of areas outside of Woodland Park and a score of Tier 4 along the length of Woodland Park. The PMP's Priority Crossings gave Segment 2 of Aurora Avenue N largely Tier 4 and Tier 3 ratings south of Woodland Park and largely Tier 3 and Tier 2 ratings north of Woodland Park, although one Tier 2 rating exists south of Woodland Park at N 39th Street.

Figure 4-28 depicts the PMP's Arterial Priority Investment Network and Priority Crossings along Segment 2 of Aurora Avenue N.

Five streets with planned bicycle facilities intersect Aurora Avenue N along Segment 2. N 41st Street crosses Aurora Avenue N via a pedestrian bridge and is planned to become a neighborhood greenway. N 68th Street is also planned to become a neighborhood greenway. N 50th Avenue is scheduled to become a protected bike lane. W Green Lake Way and Winona Avenue N are scheduled to receive painted bike lanes.

Figure 4-29 displays planned bicycle facilities and WSDOT's Bicycle Level of Traffic Stress on Segment 2 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-27. Segment 2 Bus Collision Locations

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-28. Segment 2 Pedestrian Master Plan Corridor Designation

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-29. Segment 2 Planned Bicycle Facilities

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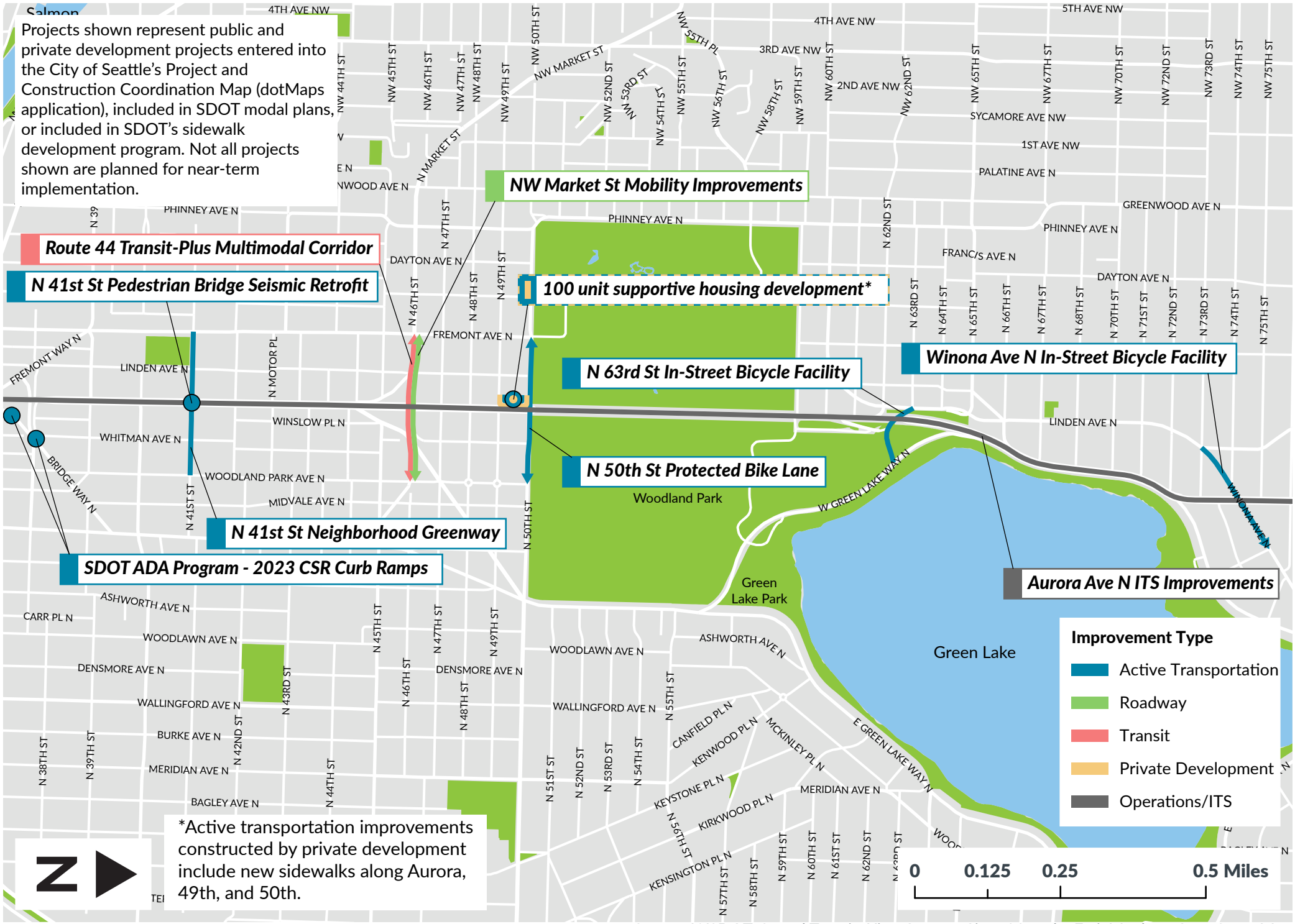
4.7.1 In-process, Planned, and Potential Future Transportation and Infrastructure Improvements

Several in-process, planned, and potential future improvements are located along Segment 2 of Aurora Avenue N:

- **Active transportation**
  - N 41st Street Pedestrian Bridge Seismic Retrofit: seismic retrofit improvements of the existing pedestrian bridge over Aurora Avenue N.
  - N 63rd Street In-Street Bicycle Facility: implementation of an in-street bicycle facility along N 63rd Street recommended in the Seattle BMP.
- **Transit**
  - Route 44 Transit-Plus Multimodal Corridor: implementation of transit speed and reliability improvements along King County Metro Route 44 between the Ballard Locks and the University of Washington Link light rail station. Investments will focus on bus lanes, channelization and signal optimization for buses, and transit signal priority. Where transit improvements are implemented, access to transit and improved safety will be supported within financial constraints.
- **Private development**
  - 100 unit supportive housing development: construction of a 6-story, 100 unit supportive housing project with ground floor residential common space. Frontage improvements include new sidewalk, street trees, and utility services on N 50th Street, Aurora Avenue N, and N 49th Street to support the new on-site development.
- **Operations/ITS**
  - Aurora Avenue N ITS Improvements: modifications to signal timing on northbound Aurora Avenue N to improve freight traffic during the morning peak period.

Figure 4-30 displays in-process, planned, and potential future transportation and infrastructure improvements along Segment 2 of the Aurora corridor.[2]

[2] Projects shown represent public and private development projects entered into the City of Seattle's Project and Construction Coordination Map (dotmaps application), included in SDOT modal plans, or included in SDOT's sidewalk development program. Not all projects shown are planned for near-term implementation.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-30. Segment 2 In-Process, Planned, and Future Improvements

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4.8 Land Use

4.8.1 Land Use

Existing designations along Aurora Avenue N in Segment 2 transition from the high-density, mixed-use Fremont Hub and Wallingford Residential Urban Villages in the south, to recreation/open space as the roadway traverses Woodland Park and the west side of Green Lake, to low-density residential use in the north, and to moderate-density neighborhood commercial uses in the far north. South of Woodland Park, structures along Aurora Avenue N generally have minimal setbacks from the right-of-way, which transition to larger setbacks on the west side of the roadway north of the park.

Designations from the Future Land Use 2035 map along Segment 2 of Aurora Avenue N include Commercial/Mixed Use Areas and Neighborhood Residential Areas. The most prevalent designation along Aurora Avenue N is Neighborhood Residential Area, which stretches from N 50th Street to N 72nd Street. Commercial/Mixed Use Areas fill the balance of planned land uses for Segment 2.

Urban villages are designated in two locations along Aurora Avenue N in Segment 2. The Urban Center designation stretches from N 38th Street to N 40th Street, and the Residential Urban Village designation is applied from N 40th Street to N 46th Street.

Figure 4-31 illustrates future land use and Urban Village designations along Segment 2 of Aurora Avenue N.

4.8.2 Zoning

Along Aurora Avenue N, the south end of Segment 2 is zoned as Commercial 1 and Neighborhood Commercial 3 from N 38th Street to N 50th Street. North to Winona Avenue N, the zoning is primarily Neighborhood Residential 3 with a small stretch of Neighborhood Commercial 3. Zoning in neighborhoods near Aurora Avenue N in Segment 2 is primarily residential with some mixed uses in the south.

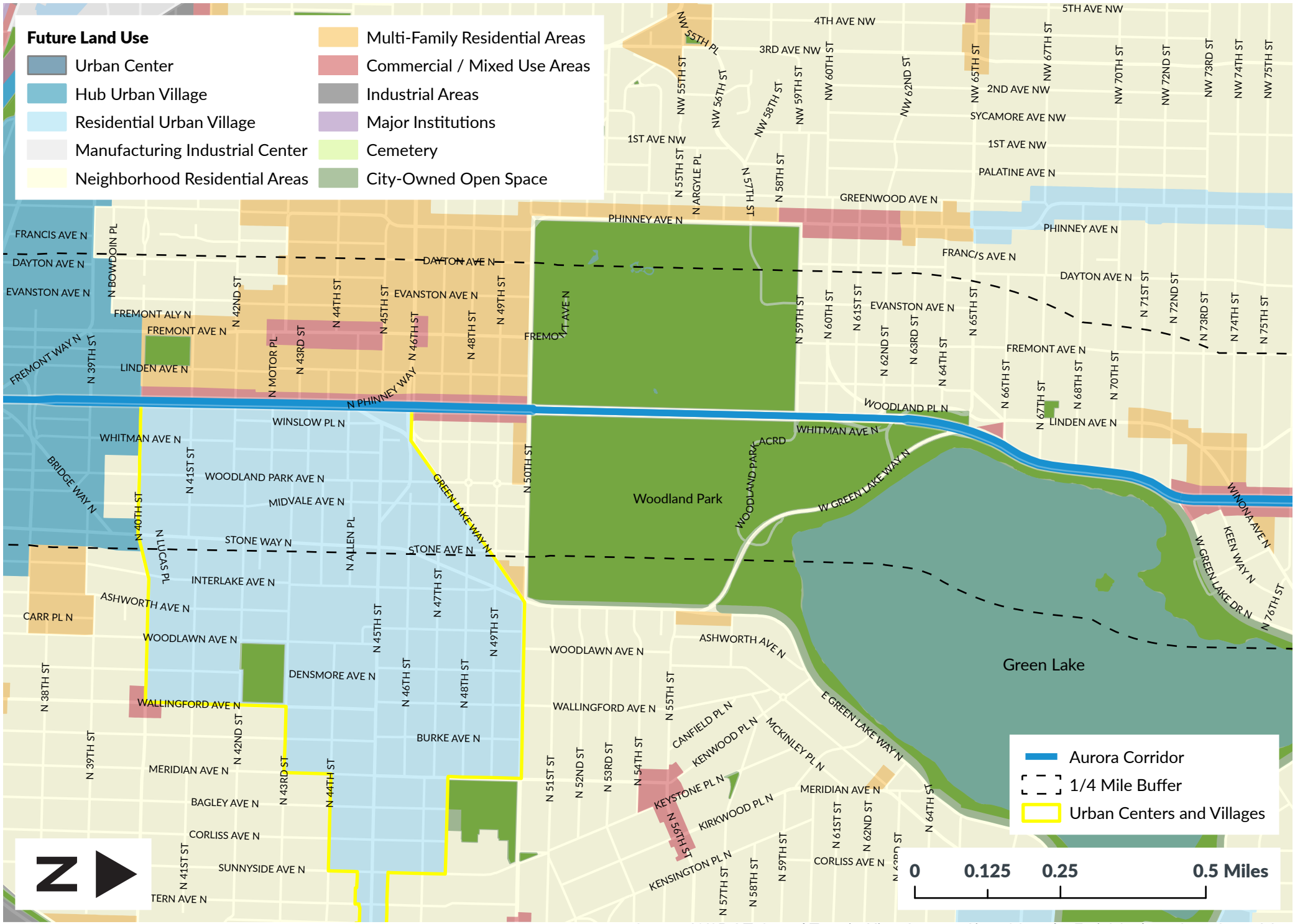
Figure 4-32 displays existing zoning along Segment 2 of Aurora Avenue N.

4.9 Underground Utilities

4.9.1 Water

Existing water lines in Segment 2 mainly run along Aurora Avenue N's east side from N 38th Street north to N 45th Street and along the west side from N 66th Street north to Winona Avenue N. Water lines intersect Aurora Avenue N at a perpendicular angle at intervals roughly corresponding to the existing street grid from N 38th Street to N 50th Street and north of N 66th Street. Aurora Avenue N does not have any water lines connected to Woodland Park.

Figure 4-33 illustrates existing, new, and abandoned water lines on Segment 2 of Aurora Avenue N.

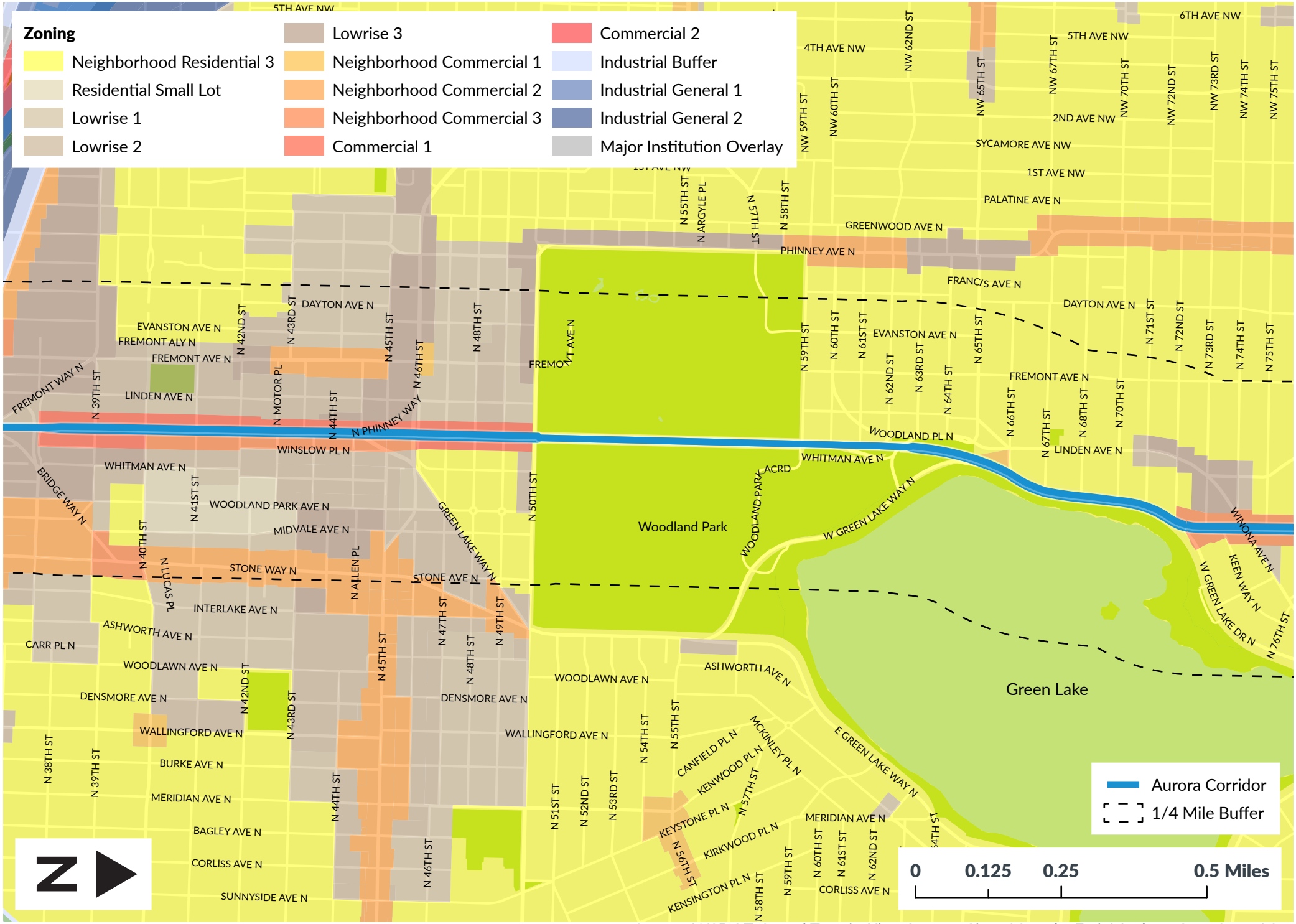


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-31. Segment 2 Land Use

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-32. Segment 2 Zoning

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-33. Segment 2 Utilities: Water

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4.9.2 Sewer and Drainage

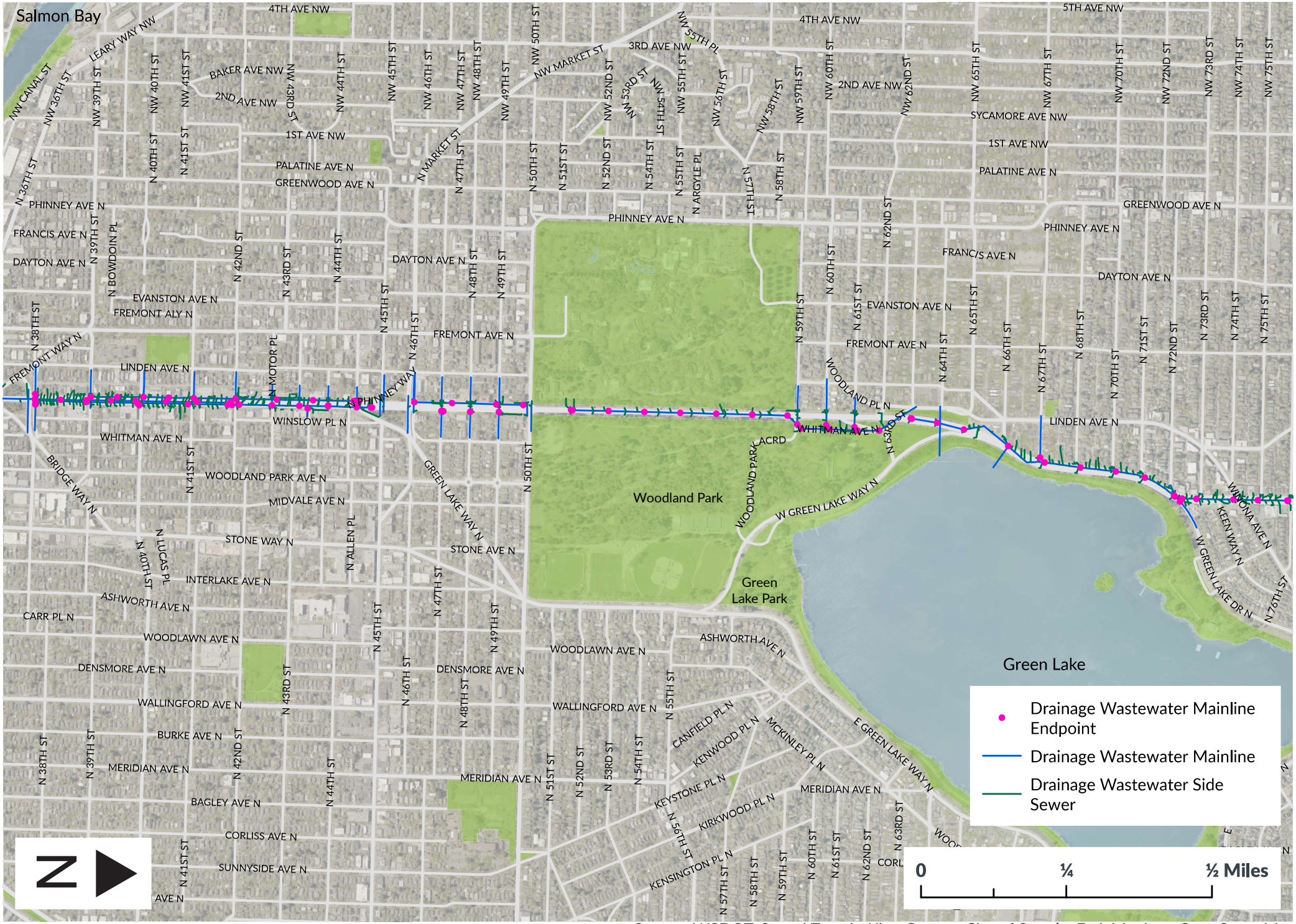
Sewer facilities are present along nearly all of Segment 2. Sewer mainlines switch intermittently between Aurora Avenue N's west side, east side, and center. Some locations, such as between N 39th Street and N 42nd Street, possess a mainline in the center of the street and in the eastern travel lane. Mainline endpoints are spaced at approximately one to two per block. Side sewers branch east and west from the mainlines at regular intervals. Drainage mains are predominately located on the west side of the street. A disconnected series of combined sewer lines runs from N 50th Street to Winona Avenue N.

Sewer and drainage infrastructure in Segment 2 are largely separated systems, with wastewater conveyed in sewer mains and stormwater conveyed in storm drains and culverts. Portions of Aurora in Segment 2 contribute to sewer capacity risk areas, as identified in SPU's Wastewater System Analysis (2020). This segment is not part of SPU's current system layout analysis for Aurora Avenue N.

Figure 4-34 depicts sewage systems along Segment 2 of Aurora Avenue N.

4.10 Key Takeaways

- Land uses transition from high-density mixed-use areas at the south end of the segment to the open space of Woodland Park and the west side of Green Lake, followed by low-density residential uses at the north end of the segment.
- The junction of Aurora Avenue N and N 46th Street represents a high-ridership transfer point between the E Line and Route 44.
- Sidewalk gaps are present along the east side of Aurora Avenue N north of Woodland Park.
- Opportunities to cross Aurora Avenue N in Segment 2 are extremely limited, not ADA accessible, and can require lengthy diversions for pedestrians.
- The character of the roadway lends to freeway-like feel with speeds regularly reaching over 10 mph higher than the posted limit of 40 mph.
- Fatal and serious injury crashes have largely taken place along roadway blocks between intersections.
- Inattention, improper driver maneuvers, and following too closely represent key factors contributing to collisions.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 4-34. Segment 2 Utilities: Drainage Wastewater

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5. Segment 3

5.1 Segment Description

Segment 3 of Aurora Avenue N is approximately 0.7 miles long, extending from Winona Avenue N in the south to N 85th Street in the north. This segment begins on the northwest edge of Green Lake. The posted speed limit along Segment 3 is 30 mph. There are discontinuous sidewalks present along Segment 3 and designated crosswalks at the five major intersections, with no designated crosswalks at the minor intersections or midblock locations. The lack of continuous pedestrian and bicyclist facilities make for a car-centric environment. Segment 3 is surrounded by commercial, neighborhood commercial, lowrise, and neighborhood residential zoning. Table 5-1 summarizes key characteristics of Segment 3.

Table 5-1. Segment 3 At a Glance

Segment Extents	Winona Avenue N to N 85th Street
Segment Length	0.7 miles
Annual Average Daily Traffic	26,100
Measured 85th Percentile Traffic Speeds	33-37 mph (posted speed limit: 30 mph)
Average Distance Between Pedestrian Crossings	700 feet
Crashes Per Mile (2018-2022)	154
Crashes Involving Vulnerable Users (2018-2022)	9
Bus Routes Serving the Segment	E Line, 45
Bus Stops	5
Total Average Daily E Line Boardings/Alightings in Segment 3	Boardings: 533/Alightings: 526

5.2 Roadway Characteristics

Segment 3 is six to seven lanes for the entirety of the segment. The ROW in Segment 3 is 90 feet in width. This includes four general purpose lanes and two peak hour BAT lanes for the entirety of the segment, and a raised median for approximately half of the segment. The raised median is present from Winona Avenue N to N 77th Street, N 78th Street to N 79th Street, and N 81st Street to N 83rd Street. The area with seven lanes is where the raised median transitions to a left turn lane with a c-curb.

Figure 5-1 illustrates travel lane characteristics, existing medians, access management, and ROW width on Segment 3 of Aurora Avenue N.

Aurora Avenue N is classified entirely as a Principal Arterial in Segment 3. N 85th Street is the only Principal Arterial that intersects with Aurora Avenue N, while minor arterials that intersect with Aurora Avenue N include N 80th Street and Green Lake Drive N. Figure 5-2 illustrates the roadway network surrounding Aurora Avenue N in Segment 3.

On-street parking is not permitted along Aurora Avenue N from N 82nd Street to N 85th Street. South of N 80th Street, parking is prohibited largely between 6-9 AM and 3-7 PM. Figure 5-3 illustrates peak hour parking restrictions.

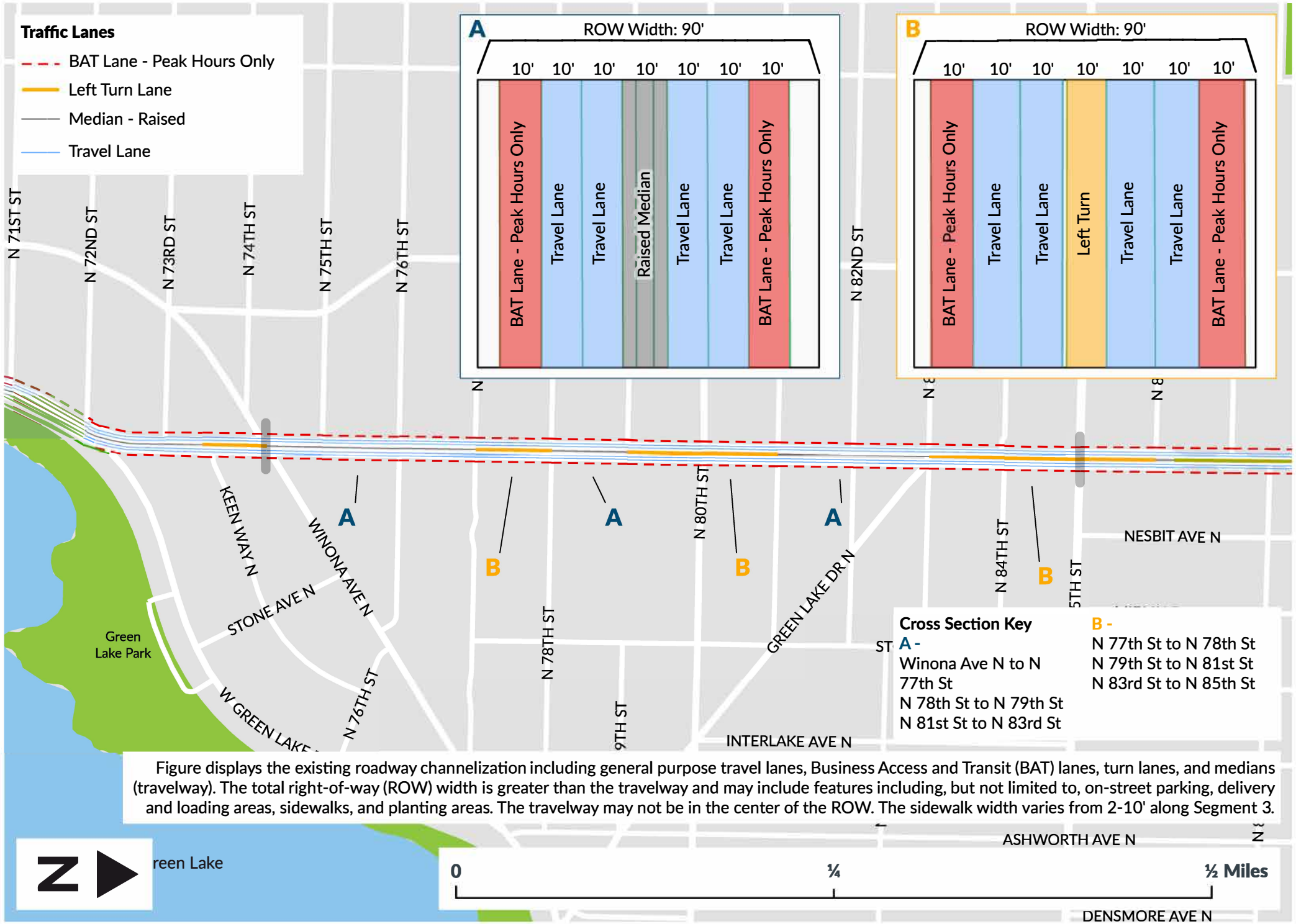


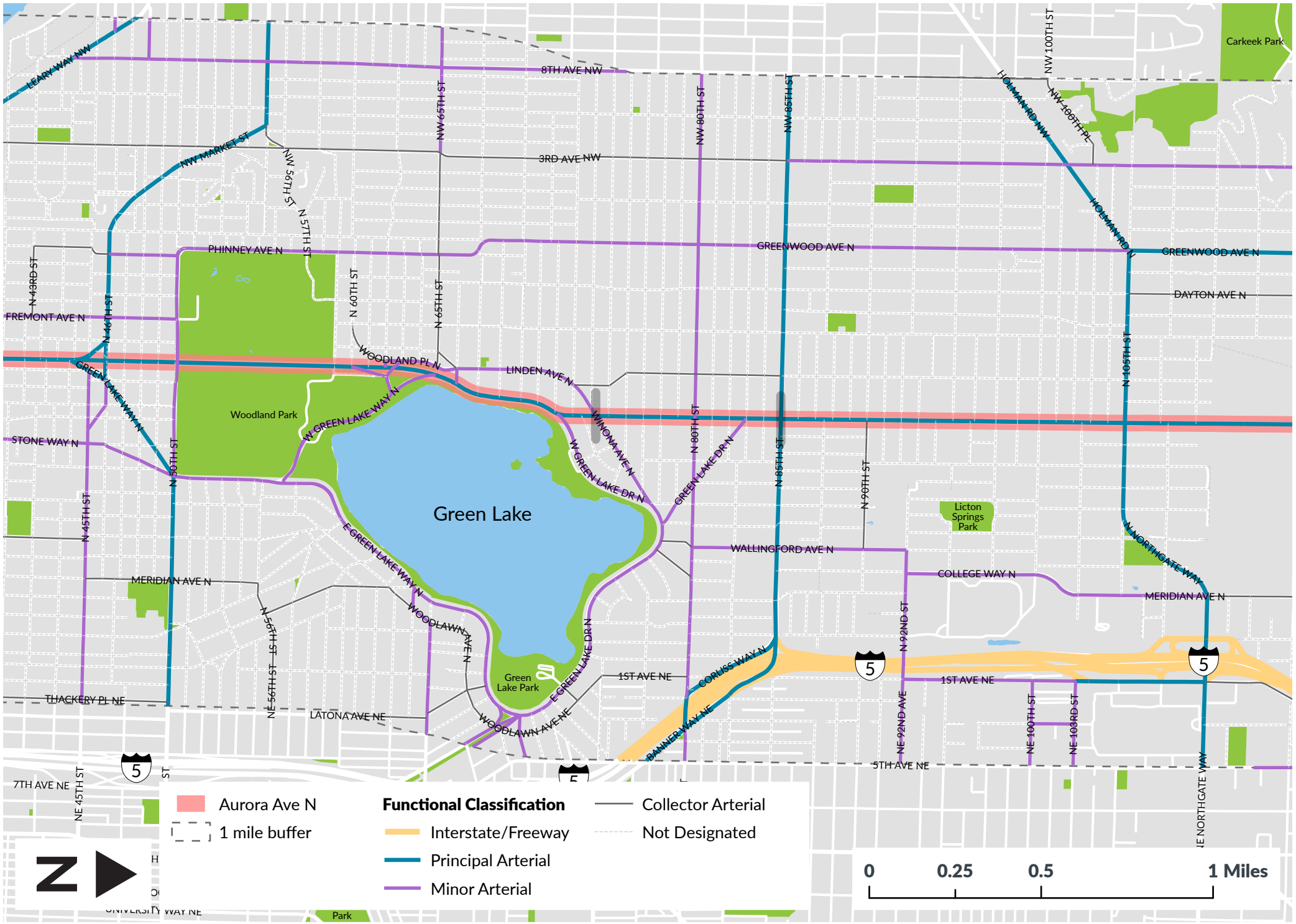
Figure displays the existing roadway channelization including general purpose travel lanes, Business Access and Transit (BAT) lanes, turn lanes, and medians (travelway). The total right-of-way (ROW) width is greater than the travelway and may include features including, but not limited to, on-street parking, delivery and loading areas, sidewalks, and planting areas. The travelway may not be in the center of the ROW. The sidewalk width varies from 2-10' along Segment 3.

Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-1. Segment 3 Channelization and Cross Sections

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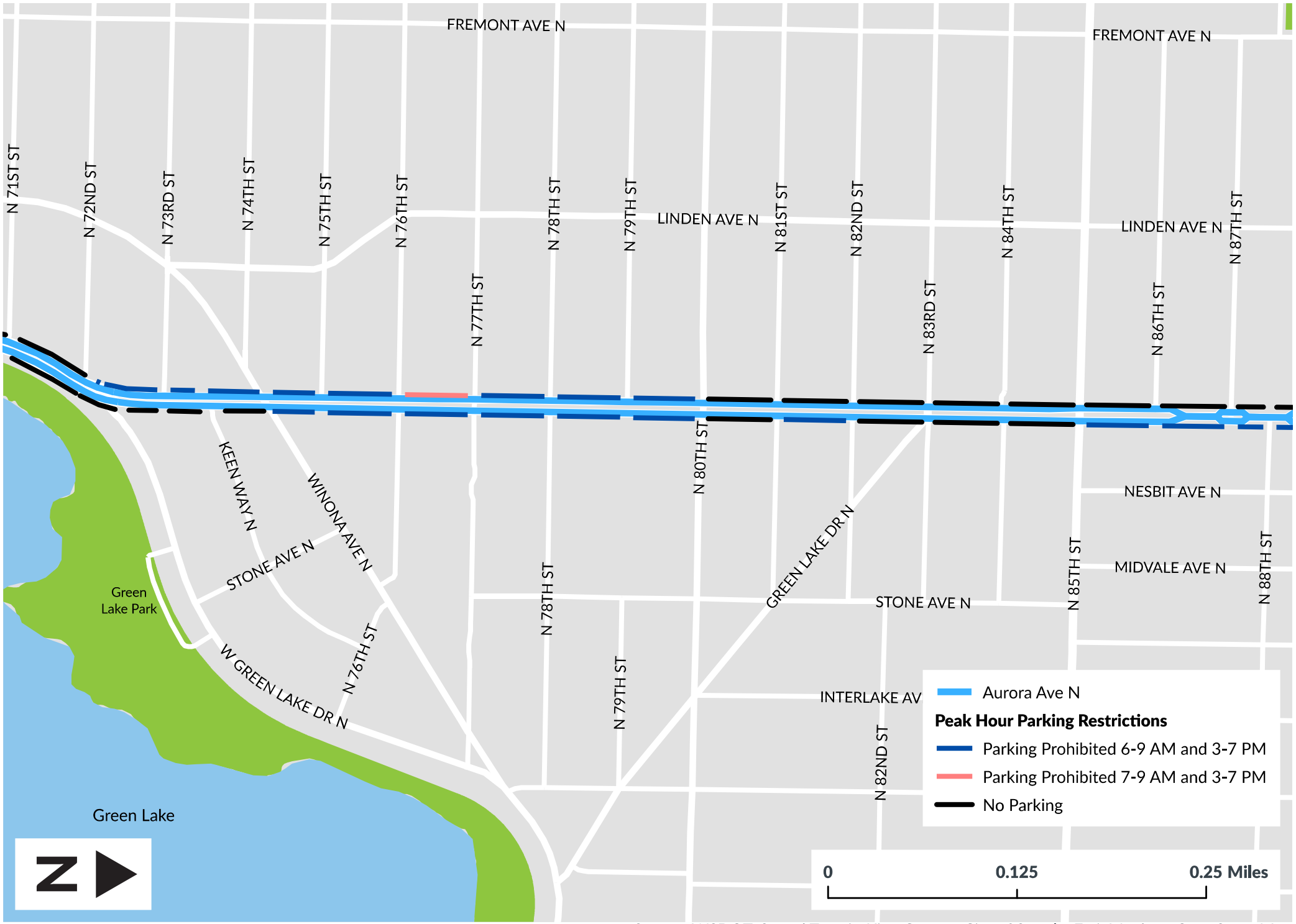


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-2. Segment 3 Functional Classification

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-3. Segment 3 Existing Peak Hour Parking Restrictions

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5.3 Traffic Operations

5.3.1 Traffic Volumes

Based on March 2023 traffic counts, the ADT volumes in Segment 3 are 23,600 vehicles, with 11,400 vehicles in the northbound direction and 12,200 vehicles in the southbound direction. The AWDT volumes in Segment 3 are 25,100 vehicles, with 12,000 vehicles in the northbound direction and 13,100 vehicles in the southbound direction. A profile of the AWDT volumes by 15-minute intervals is shown in Figure 5-4 for Segment 3. There are two distinct peaks in traffic volumes during the AM and PM peak periods, though less pronounced than the peaks in Segments 1 and 2 at the south end of the corridor. During the morning peak period the volumes are significantly higher in the southbound direction than the northbound direction. In the afternoon, the volumes in the southbound direction begin to peak earlier than volumes in the northbound direction but the northbound volumes are higher than southbound later in the afternoon peak. Figure 5-5 illustrates the average daily volumes in the Segment 3 extent of Aurora Avenue N.

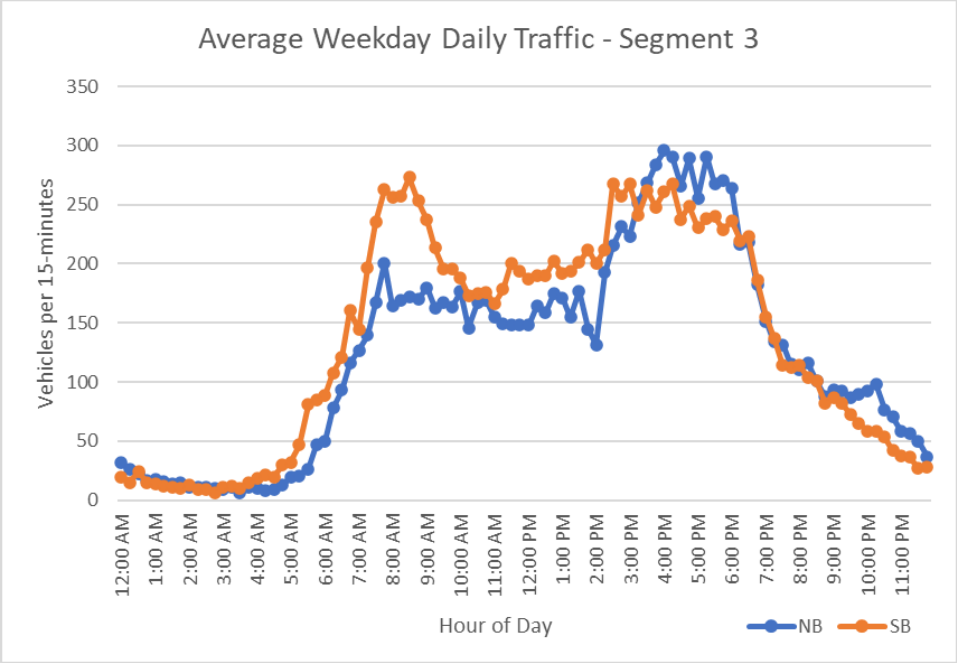


Figure 5-4. Segment 3 Average Weekday Daily Traffic by Time of Day



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-5. Segment 3 Average Annual Daily Traffic (AADT)

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Turning movement counts were collected in March 2023 for all study intersections in Segment 3. The Aurora Avenue N and N 85th Street intersection has the highest vehicular entering volumes with approximately 3,700 and 3,800 vehicles during the AM and PM peak periods, respectively. Figure 5-6 summarizes the TMCs for the study intersections in Segment 3 of the project.

5.3.2 Freight Network and Vehicle Volumes

As shown in Figure 5-6, the heavy vehicle percentage in the northbound direction ranges from 6% to 9% during the AM peak period and 1% to 3% during the PM peak period; the southbound heavy vehicle percentage ranges from 5% to 7% during the AM peak period and 4% during the PM peak period. Figure 5-7 displays the freight network in Segment 3.

5.3.3 Measured 85th Percentile Traffic Speeds

The posted speed limit is 30 mph for both the northbound and southbound directions between Winona Avenue N and N 85th Street. The 85th percentile speeds measured from 24-hour tube counts collected in March 2023 are 33 mph in the northbound direction and 37 mph in the southbound direction between Winona Avenue N and N 85th Street, 10% and 23% above the speed limit, respectively. Figure 5-8 shows the 85th percentile northbound and southbound traffic speeds and the posted speed limit of Segment 3.

5.3.4 Vehicle Travel Time

The average travel time traveling northbound is 2.0 minutes during AM peak and 3.4 minutes during the PM peak periods. The average travel time traveling southbound is 3.4 minutes during the AM peak and 3.7 minutes during PM peak periods in Segment 3.

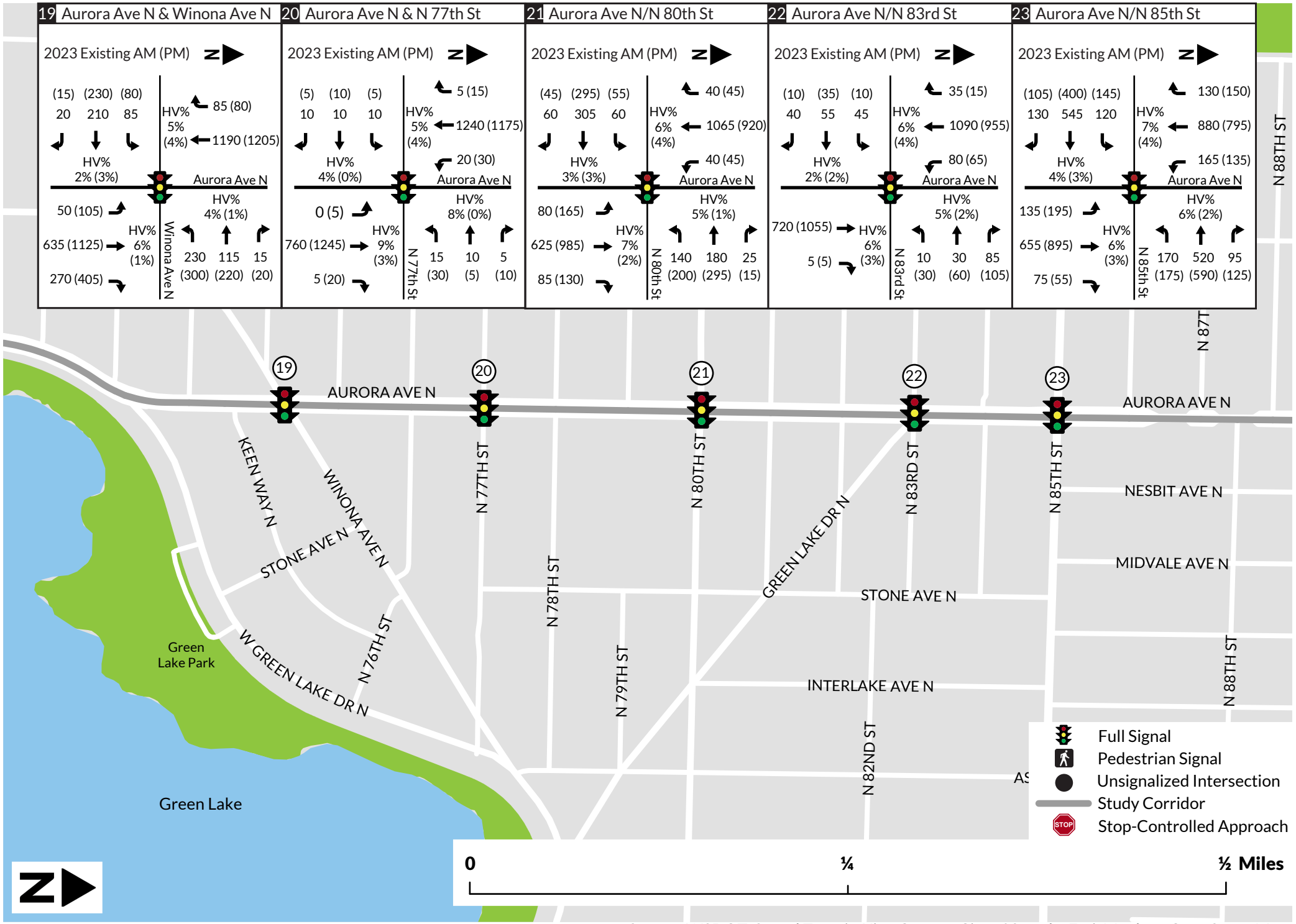
5.3.5 Intersection Operation Metrics

The existing operation metrics of the study intersections in Segment 3 are shown in Table 5-2. The LOS of the overall intersection for signalized intersections are illustrated in Figure 5-9 and approach LOS of unsignalized intersections are displayed in Figure 5-10.

Table 5-2. Segment 3 Intersection Operation Metrics

Intersection	Traffic Control	AM Peak			PM Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
Aurora Ave N and Winona Ave N	Full Signal	52.0	D	1.09	40.6	D	1.00
Aurora Ave N and N 77th St	Full Signal	14.0	B	0.55	16.3	B	0.79
Aurora Ave N and N 80th St	Full Signal	41.9	D	0.97	45.9	D	1.01
Aurora Ave N and N 83rd St	Full Signal	30.0	C	0.94	48.7	D	0.97
Aurora Ave N and N 85th St	Full Signal	109.5	F	1.36	90.9	F	1.27

One out of five intersections within Segment 3 operates at LOS E or F, including Aurora Avenue N/N 85th Street intersection operating at LOS F during both the AM and PM peak periods. Other study intersections in Segment 3 operate at a LOS D or better during peak periods. The V/C ratios for Aurora Ave N/Winona Ave N and Aurora Avenue N/N 85th Street intersections are 1.00 or greater during both AM and PM peak periods. The V/C ratio for the intersection of Aurora Ave N and N 80th St is greater than 1.00 during the PM peak period only.

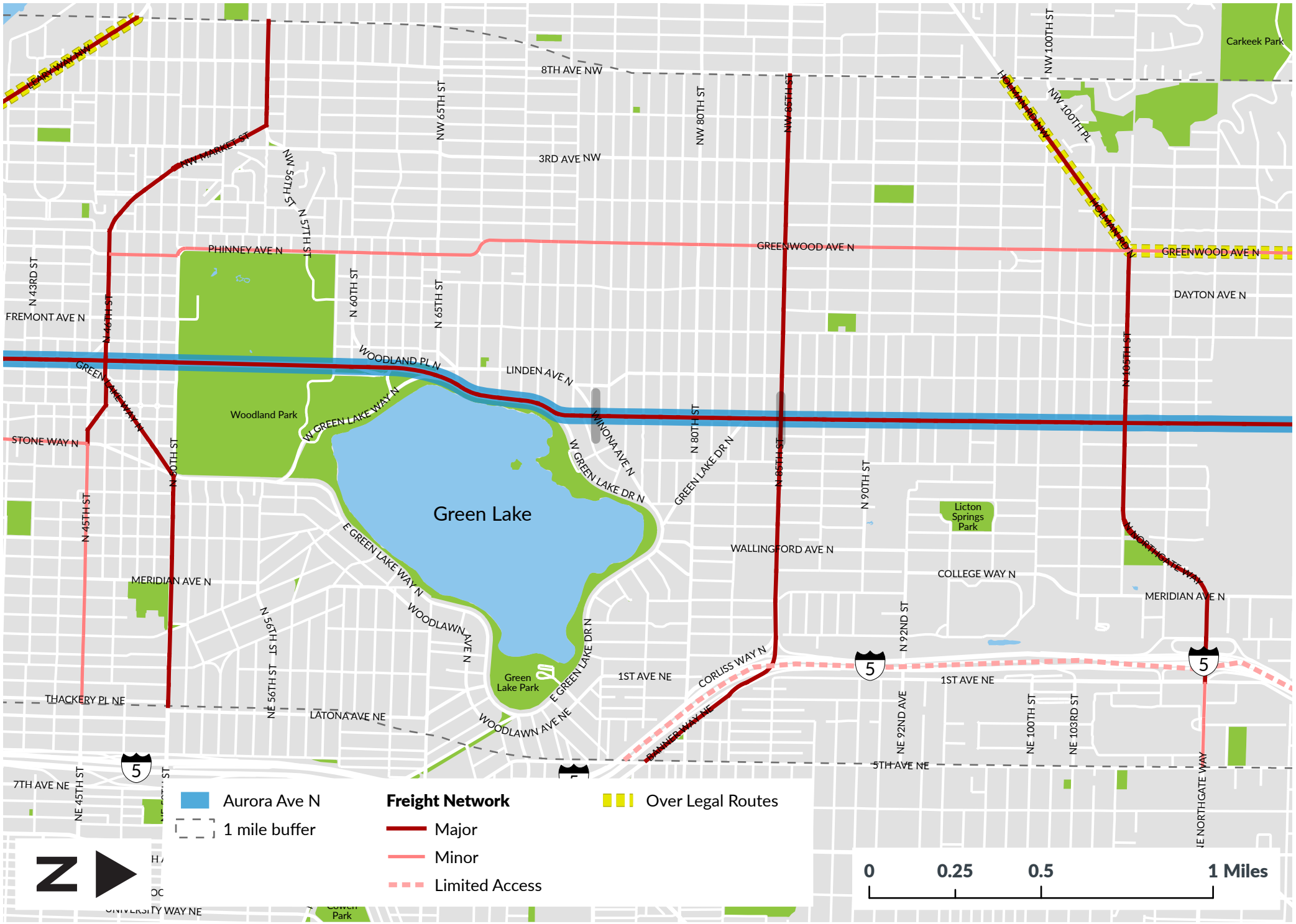


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-6. Segment 3 Traffic Volumes

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-7. Segment 3 Freight Network

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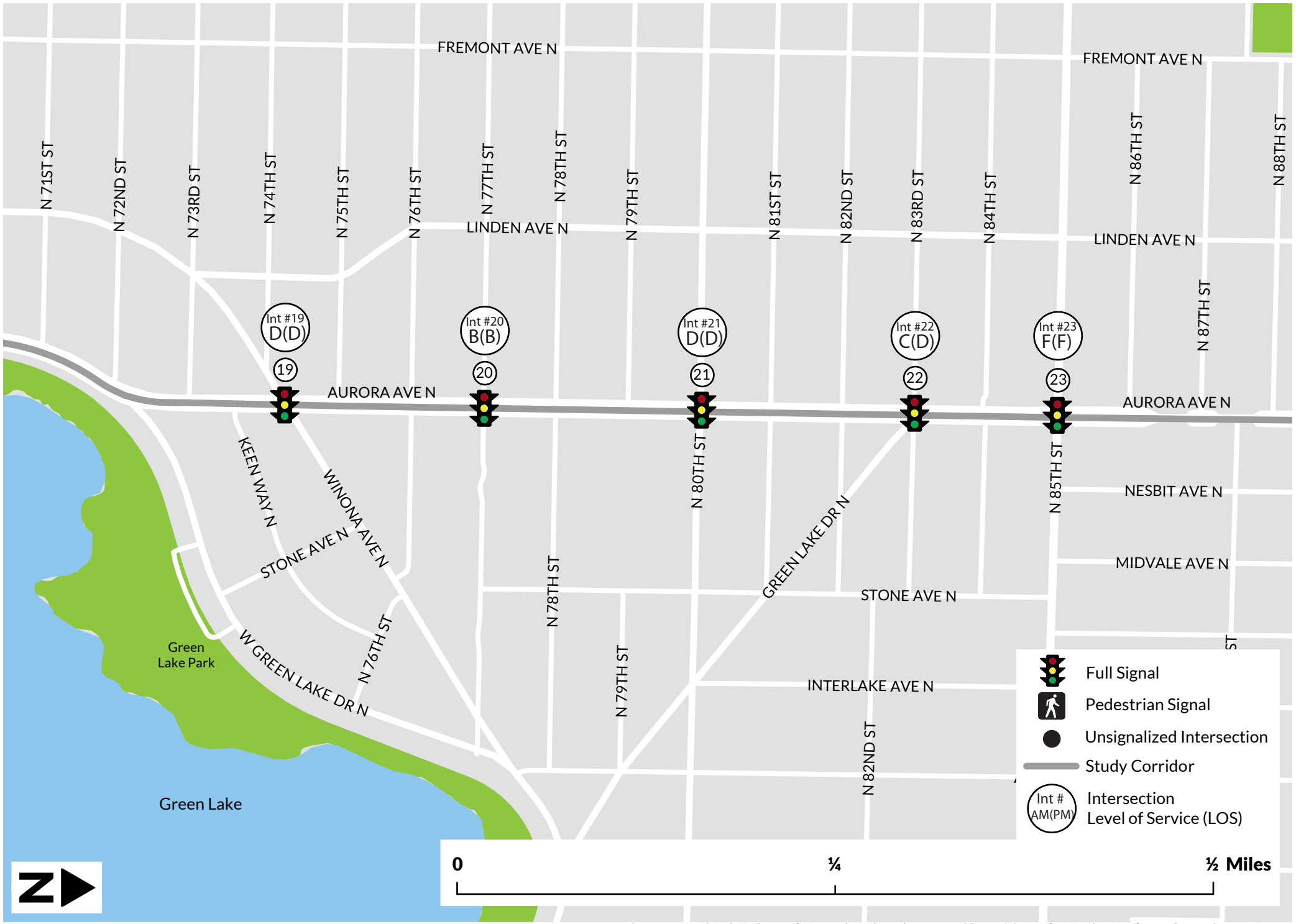


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-8. Segment 3 85th Percentile Speed

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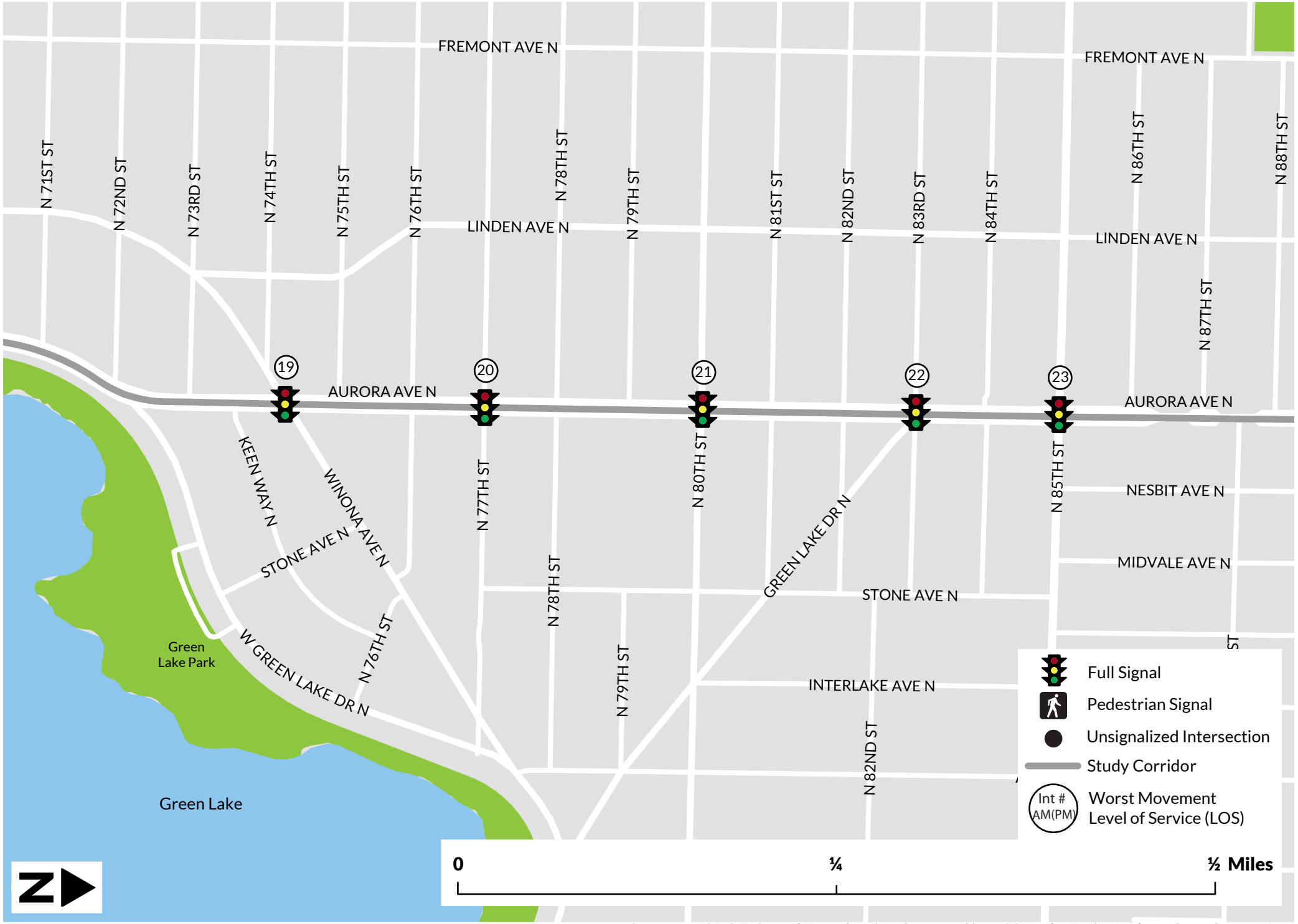


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-9. Segment 3 Signalized Intersection Overall LOS

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-10. Segment 3 Approach LOS for Unsignalized Study Intersections

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King County METRO

5.4 Nonmotorized Facilities

5.4.1 Pedestrian Facilities

The width of sidewalks along Aurora Avenue N in Segment 3 is primarily 4 – 5 feet or less. N 76th Street to N 79th Street's sidewalks exceed 6 feet in width and sidewalks north of N 80th Street are primarily less than 5 feet wide. The WSDOT Pedestrian LTS on Aurora Avenue N is largely rated "3" throughout Segment 3. Intersections with an LTS of "4" include N 81st Street, N 82nd Street, N 83rd Street, and N 85th Street.

Figure 5-11 illustrates sidewalk width and WSDOT's Pedestrian Level of Traffic Stress along Segment 3 of Aurora Avenue N.

The condition of sidewalks along Aurora Avenue N in Segment 3 is primarily "fair" or better. The condition of sidewalks on the east side of Aurora Avenue N from N 67th Street to N 72nd Street is rated "unreported" and one stretch of sidewalk on the west side of Aurora Avenue N from N 80th Street to N 81st Street is rated as "poor."

Figure 5-12 depicts existing sidewalk conditions on Segment 3 of Aurora Avenue N.

Segment 3 contains 5 signalized crosswalks, spaced approximately 3 blocks apart. An undercrossing not accessible to the public is present at N 79th Street.

Figure 5-13 displays at-grade and grade-separated pedestrian crossings in Segment 3 of Aurora Avenue N.

SDOT's Compliant Curb Ramp App revealed ADA-compliant curb ramps regularly distributed at nearly every intersection in Segment 3. Locations without ADA-compliant curb ramps include N 79th Street and N 84th Street. No accessible pedestrian signals were recorded.

Figure 5-14 shows accessible pedestrian signals and in-service ADA-compliant curb ramps in Segment 3 of Aurora Avenue N.

SDOT street types present on Aurora Avenue N in Segment 3 from south to north include Urban Center Connector and Urban Village Main. Total minimum width without frontage required for these street types according to Streets Illustrated is 18 feet and 12 feet, respectively. RapidRide bus stops within the Urban Center Connector street type require a minimum of 10 feet for pedestrian clear zone and 8 feet for landscaping (18 feet total). Sidewalk facilities along Aurora Avenue N are compliant with SDOT's standards for approximately half of Segment 3. The most significant sections of Aurora Avenue N lacking compliance largely include both sides of the street from N 79th Street to N 85th Street.

Parts of the corridor that are within Pedestrian Designated Zones per the Municipal Code have slightly greater sidewalk requirements (14 feet). This includes both sides of Aurora Ave N from West Green Lake Dr N to N 80th St, and both sides of Aurora Ave N from N 84th St to N Northgate Way/N 105th St.

Figure 5-15 depicts existing sidewalks' consistency with SDOT's minimum sidewalk standards for roadways in Segment 3 of Aurora Avenue N.

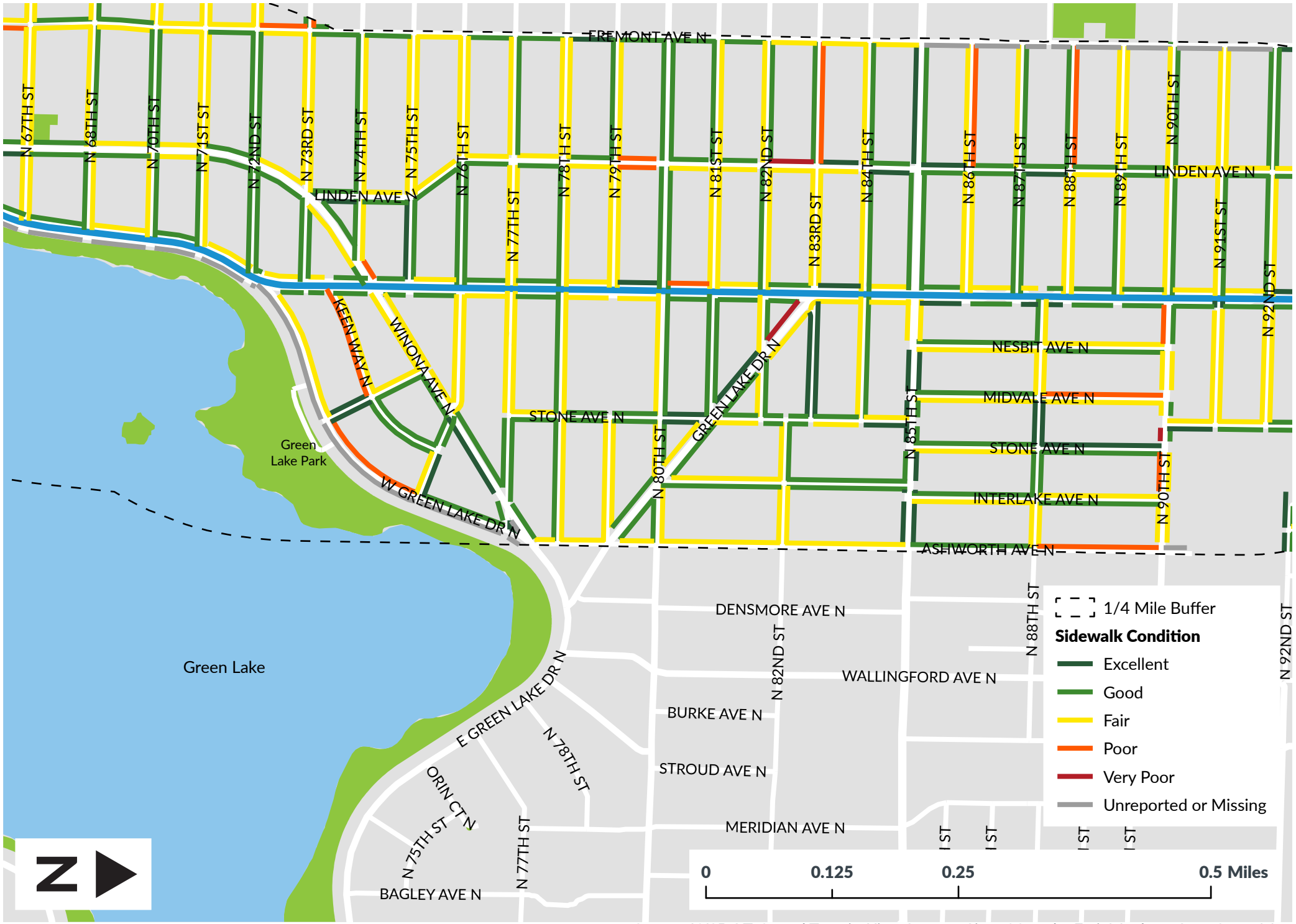


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-11. Segment 3 Sidewalk Consistency with WSDOT Standards

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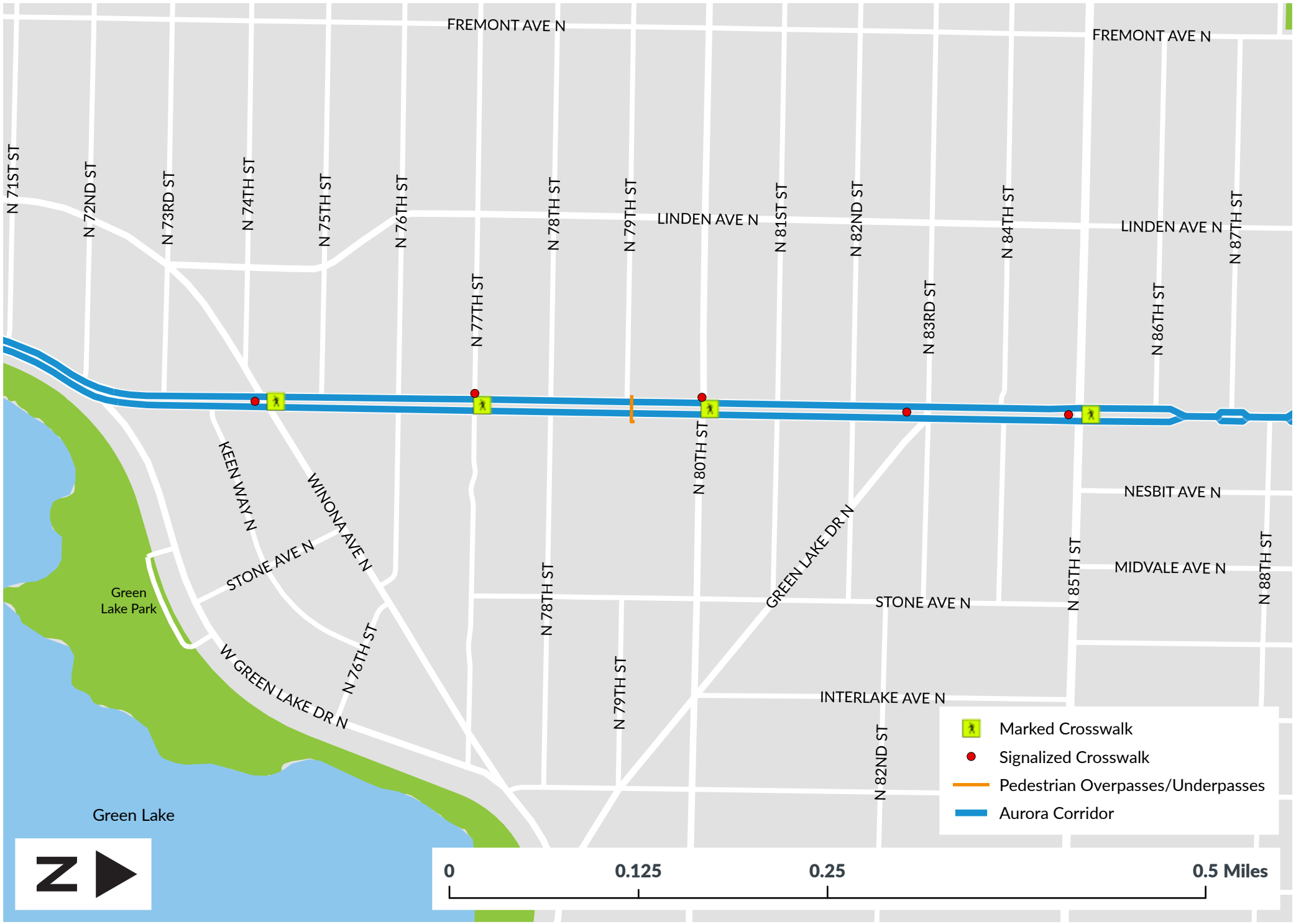


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-12. Segment 3 Existing Sidewalk Condition

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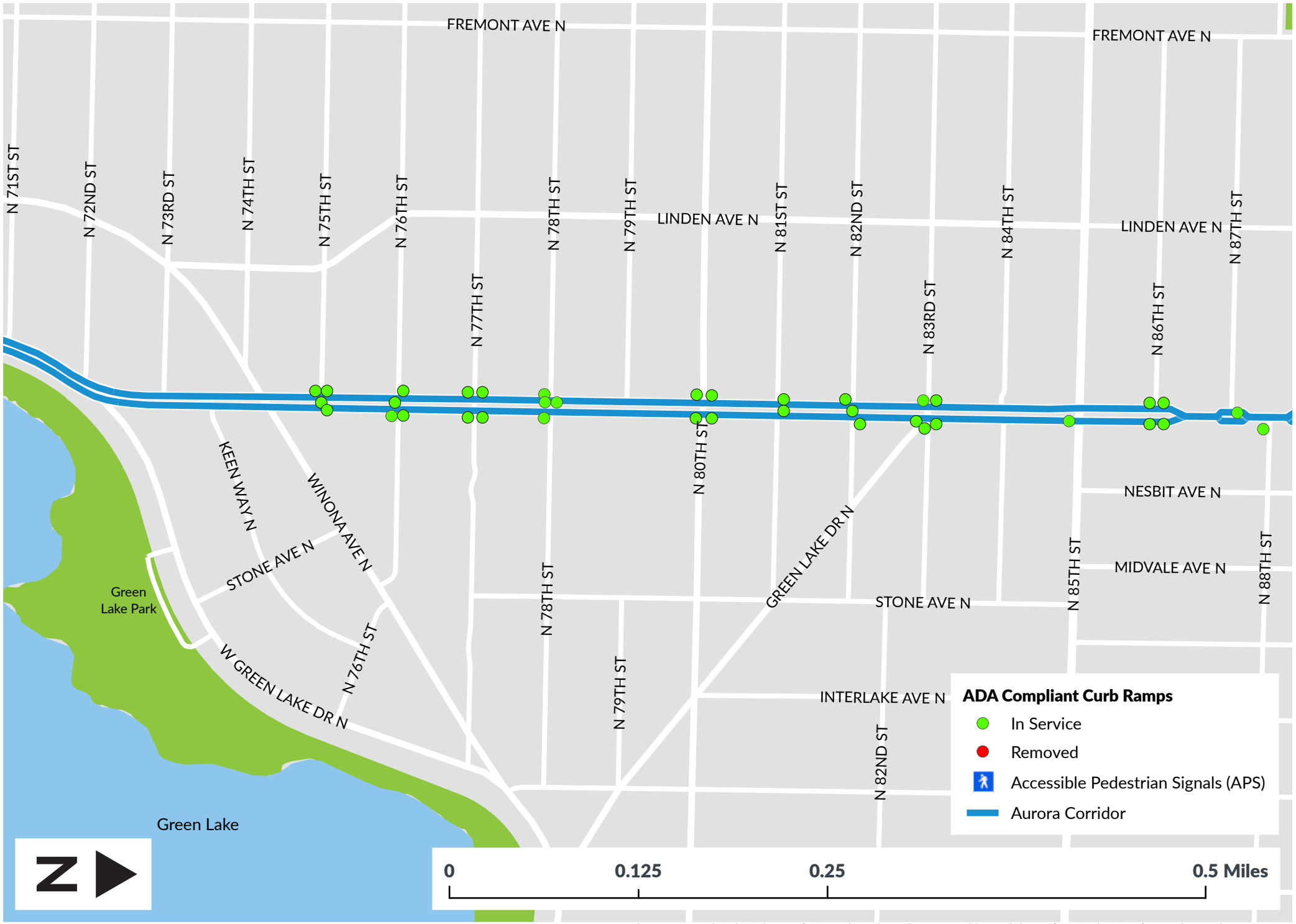


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-13. Segment 3 Pedestrian Crossings

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-14. Segment 3 Pedestrian ADA Features

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-15. Segment 3 Sidewalk Consistency with SDOT Street Types

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5.4.2 Bicycle Facilities

No bicycle facilities currently exist on Aurora Avenue N in Segment 3. Two streets with existing bicycle facilities intersect Aurora Avenue N along Segment 3. N 83rd Street's neighborhood greenway on the west side of Aurora Avenue N changes to protected bike lanes on Green Lake Drive N on the east side of Aurora. N 92nd Avenue provides users with a neighborhood greenway while crossing Aurora. WSDOT ranks the Bicycle LTS along the entirety of Aurora Avenue N's Segment 3 as "4."

Figure 5-16 illustrates the presence of bicycle facilities in the Segment 3 extent of Aurora Avenue N.

5.5 Safety

A total of 108 crashes occurred in Segment 3 between 2018 and 2022. Table 5-3 summarizes these crashes by severity.

Table 5-3. Segment 3 Crashes by Severity (2018-2022)

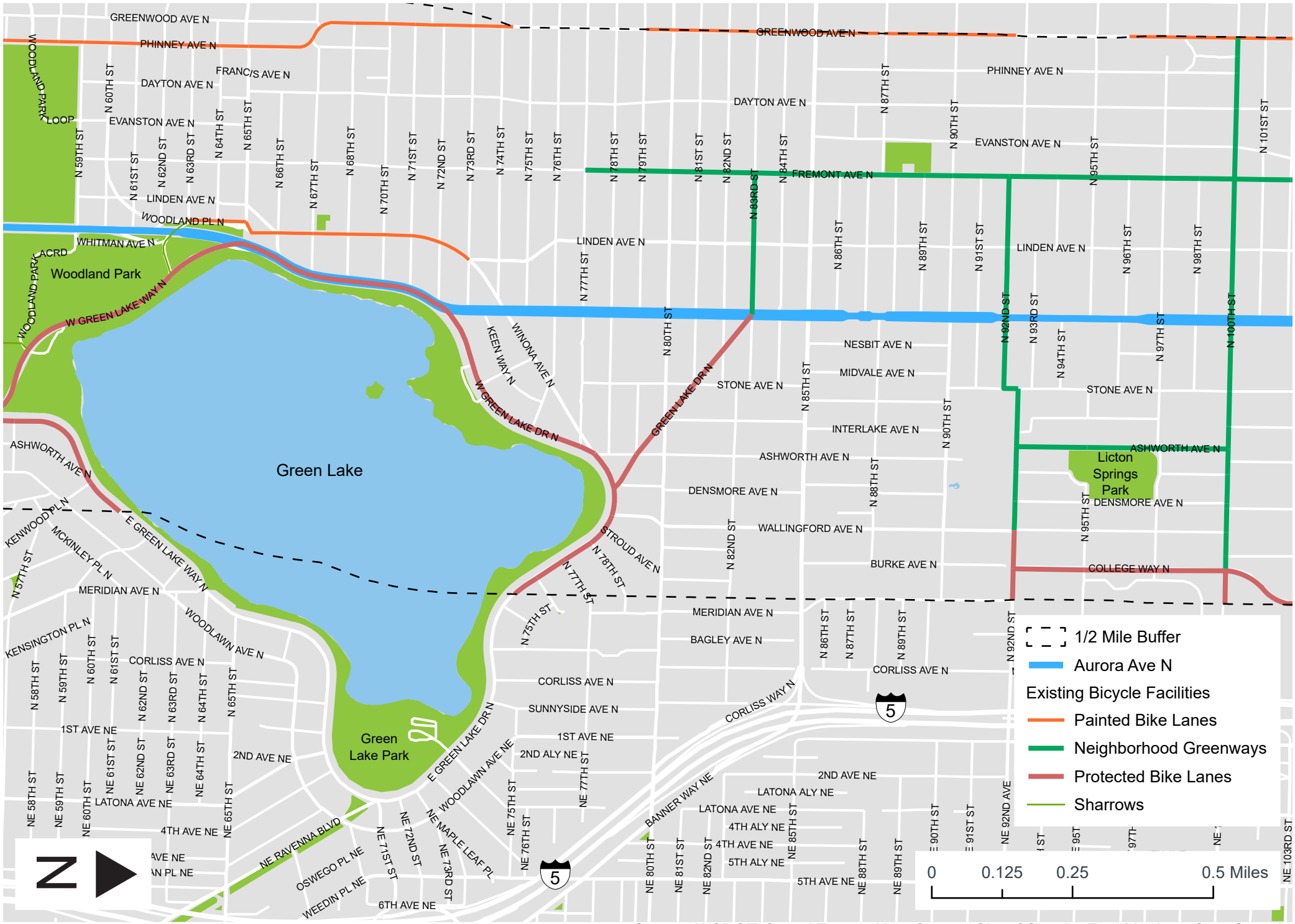
Crash Severity	Crash Frequency
Fatal Crashes	4
Serious Injury Crashes	1
Injury Crashes	29
Property Damage Only Crashes	71
Unknown Crashes	3
Total Segment Crashes	*108*

5.5.1 Crashes by Location – Intersections and Mid-Blocks

Segment 3 included 48 intersection crashes and 60 mid-block crashes during the study period. Table 5-4 summarizes the intersection crashes by location and severity.

Table 5-4. Segment 3 Intersection Crashes by Severity (2018-2022)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N & Winona Ave N	1	0	2	16	0	19
Aurora Ave N & N 75th St	0	0	0	2	0	2
Aurora Ave N & N 77th St	0	0	0	4	0	4
Aurora Ave N & N 80th St	0	0	3	5	0	8
Aurora Ave N & N 81st St	0	0	1	2	0	3
Aurora Ave N & N 82nd St	0	0	1	0	0	1
Aurora Ave N & Green Lake Dr N	0	0	6	3	0	9
Aurora Ave N & N 84th St	0	0	1	1	0	2
Total Intersection Crashes	*1*	*0*	*14*	*33*	*0*	*48*



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-16. Segment 3 Existing Bicycle Facilities

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Segment 3 had one fatal crash at an intersection (angle crash) and no serious injury crashes. The intersection of Aurora Avenue N and Winona Avenue N had the most crashes with 19 (including the one fatal crash) and Aurora Avenue N and Green Lake Way N had the next highest with 9 crashes. Just under 70% of crashes were property damage only crashes. Figure 5-17 displays total collisions on Segment 3 of Aurora Avenue N.

Table 5-5 summarizes the mid-block crashes by location and severity for Segment 3.

Table 5-5. Segment 3 Mid-Block Crashes by Severity (2018-2022)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N between Winona Ave N & N 75th St	0	0	1	1	0	2
Aurora Ave N between N 75th St & N 76th St	0	1	2	0	0	3
Aurora Ave N between N 76th St & N 77th St	1	0	0	1	0	2
Aurora Ave N between N 77th St & N 78th St	0	0	1	2	0	3
Aurora Ave N between N 78th St & N 79th St	0	0	1	2	0	3
Aurora Ave N between N 79th St & N 80th St	0	0	3	3	0	6
Aurora Ave N between N 80th St & N 81st St	0	0	0	7	0	7
Aurora Ave N between N 81st St & N 82nd St	0	0	0	4	1	5
Aurora Ave N between N 82nd St & Green Lake Dr N	0	0	3	0	0	3
Aurora Ave N between Green Lake Dr N & N 84th St	0	0	0	10	0	10
Aurora Ave N between N 84th St & N 85th St	2	0	4	8	2	16
Total Segment Crashes	*3*	*1*	*15*	*38*	*3*	*60*

Three fatal crashes occurred on two different blocks. There was one serious injury crash. The block between N 84th Street and N 85th Street experienced the most crashes with 16 (27%), including 2 of the fatal crashes. About 63% of the mid-block crashes in Segment 3 were property damage only crashes. Figure 5-18 displays total fatal and serious injury collisions.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-17. Segment 3 Total Collisions

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-18. Segment 3 Fatal and Serious Injury Collisions

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5.5.2 Crashes by Type

In Segment 3, there were 6 pedestrian-involved crashes and 3 bicyclist-involved crashes. Four pedestrian-involved crashes occurred mid-block, and two pedestrian-involved crashes and all three bicyclist-involved crashes occurred at intersections. Table 5-6 summarizes the locations and severities of these non-motorist-involved crashes.

Table 5-6. Segment 3 Non-Motorized Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**2**	**1**	**2**	**1**	**0**	**6**
Aurora Ave N between N 75th St & N 76th St	0	1	0	0	0	1
Aurora Ave N between N 76th St & N 77th St	1	0	0	0	0	1
Aurora Ave N between N 79th St & N 80th St	0	0	1	0	0	1
Aurora Ave N between N 84th St & N 85th St	1	0	0	0	0	1
Aurora Ave N & Green Lake Dr N	0	0	1	0	0	1
Aurora Ave N & N 84th St	0	0	0	1	0	1
Bicyclist-Involved Crashes	**0**	**0**	**3**	**0**	**0**	**3**
Aurora Ave N & N 80th St	0	0	1	0	0	1
Aurora Ave N & Green Lake Dr N	0	0	2	0	0	2
Total Non-Motorized Crashes	*2*	*1*	*5*	*1*	*0*	*9*

Two of the nine non-motorized crashes were fatal crashes, one was a serious injury crash, five were other injury crashes, and one was a no injury crash. The fatal crash between N 84th Street and N 85th Street involved a pedestrian who crossed outside of a crosswalk, while the fatal crash between N 84th Street and N 85th Street did not include contributing factor information. The one serious injury crash involved a distracted driver. Two of the injury crashes involved distracted driving or inattention, one involved a pedestrian who crossed outside of a crosswalk, and two involved a disregard of traffic control. Figure 5-19 displays total pedestrian and bicyclist collisions on Segment 3 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-19. Segment 3 Pedestrian and Bicyclist Collisions

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The other 99 crashes in Segment 3 were all vehicle-only crashes. Table 5-7 summarizes the mid-block and intersection vehicle-only crashes by crash type.

Table 5-7. Segment 3 Motorized Crashes by Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block	22	3	16	1	2	4	8	56
Intersections	5	21	3	1	1	5	7	43
Total Motorized Crashes	*27*	*24*	*19*	*2*	*3*	*9*	*15*	*99*

Mid-block, the most common crash type was rear end (39%) followed by sideswipe crashes (29%). Just over 20% of mid-block crashes were categorized as other or unknown. At intersections, the most common crashes were angle or turning crashes (49%) followed by rear end crashes (12%). Over 28% of intersection crashes were categorized as other or unknown.

5.5.3 Crash Contributing Factors

Table 5-8 summarizes the primary contributing factors for the Segment 3 crashes. Twenty-eight crashes (26%) did not have a documented contributing factor and are excluded from the summary.

Table 5-8. Segment 3 Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Segment 3 Crashes
Improper maneuver	14	13%
Distracted	11	10%
Inattention	9	8%
Did not grant right-of-way to vehicle	9	8%
Following too closely	6	6%
Alcohol/drug impaired	5	5%
Disregard traffic control	5	5%
Fatigued/Ill	2	2%
Speeding	1	1%
Operating defective equipment	1	1%
Did not grant right-of-way to non-motorist	1	1%
Improper non-motorist behavior	1	1%
Other (does not include none)	15	14%
Total	*80*	*74%*

In Segment 3, improper driver maneuver was the most common primary contributing factor (13%) followed by distracted driving (10%) and inattention and failure to grant right-of-way to a vehicle (both with 8%). The “other” contributing factor category collectively accounted for 14% of Segment 3 crashes as well.

5.5.4 Crashes by Time of Day

Figure 5-20 shows the total Segment 3 crashes by time of day, aggregated by the hour of the day.

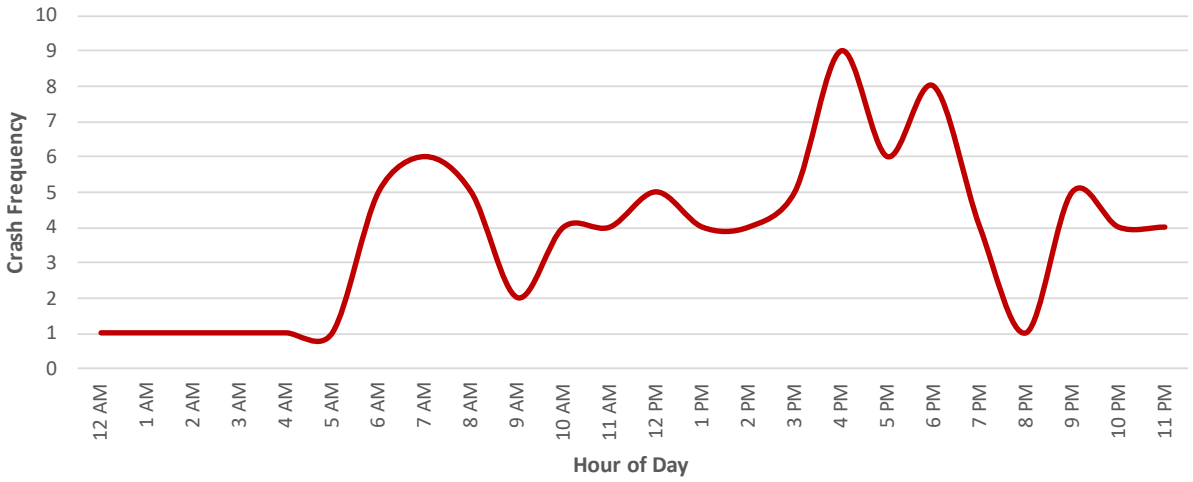


Figure 5-20. Segment 3 Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak, period between 4pm and 6pm. There was also a smaller spike of crashes during the AM peak period, between 6am and 8am. Figure 5-21 summarizes the total corridor crashes by lighting condition.

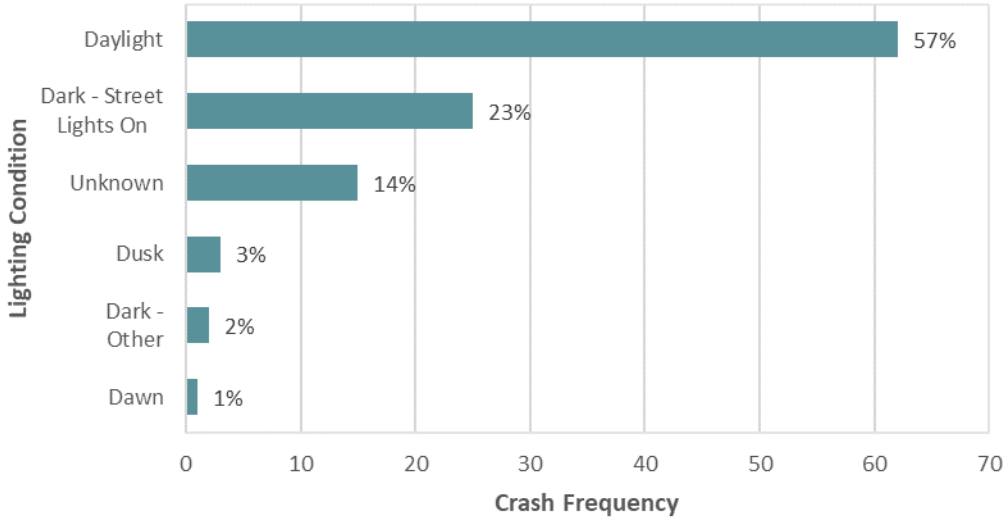


Figure 5-21. Segment 3 Crashes by Lighting Condition (2018-2022)

The majority of corridor crashes (57%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (93% of dark condition crashes).

5.5.5 Mid-Block and Signalized Intersection Crash Rates

Crash rates were calculated for the individual mid-block locations and signalized intersections within Segment 3 and are summarized in Table 5-9 and Table 5-10, respectively.

Table 5-9. Segment 3 Mid-Block Crash Rates (2018-2022)

Mid-Block Location	Length (miles)	ADT (vpd)	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N between Winona Ave N & N 75th St	0.04	23,600	2	1.16
Aurora Ave N between N 75th St & N 76th St	0.05	23,600	3	1.39
Aurora Ave N between N 76th St & N 77th St	0.05	23,600	2	0.93
Aurora Ave N between N 77th St & N 78th St	0.05	23,600	3	1.39
Aurora Ave N between N 78th St & N 79th St	0.05	23,600	3	1.39
Aurora Ave N between N 79th St & N 80th St	0.05	23,600	6	2.79
Aurora Ave N between N 80th St & N 81st St	0.05	23,600	7	3.25
Aurora Ave N between N 81st St & N 82nd St	0.05	23,600	5	2.32
Aurora Ave N between N 82nd St & Green Lake Dr N	0.05	23,600	3	1.39
Aurora Ave N between Green Lake Dr N & N 84th St	0.05	23,600	10	4.64
Aurora Ave N between N 84th St & N 85th St	0.05	23,600	16	7.43

The blocks with the highest crash rates in Segment 3 include between N 84th Street and N 85th Street (7.43 crashes/MVMT), between Green Lake Drive N and N 84th Street (4.64 crashes/MVMT), and between N 80th Street and N 81st Street (3.25 crashes/MVMT). All other blocks in Segment 3 have a crash rate less than 3 crashes/MVMT. The average mid-block crash rate for Segment 3 is 2.55 crashes/MVMT.

Table 5-10. Segment 3 Signalized Intersection Crash Rates (2018-2022)

Intersection	Total Entering Vehicles (vpd)	Total Crashes	Crash Rate (Crashes/MEV)
Aurora Ave N & Winona Ave N	37,250	19	0.28
Aurora Ave N & N 77th St	25,200	4	0.09
Aurora Ave N & N 80th St	31,350	8	0.14
Aurora Ave N & Green Lake Dr N	22,000	9	0.22

The intersection with the highest crash rate in Segment 3 is Aurora Avenue N and Winona Avenue N (0.28 crashes/MEV. All of the signalized intersections in Segment 3 have a crash rate less than this. The average intersection crash rate for Segment 3 is 0.18 crashes/MVMT.

5.6 Transit

Bus lines that currently travel on Aurora Avenue N within Segment 3 include the E Line (RapidRide). Routes 45 (frequent all-day route) and 994 (Downtown Seattle Special) both cross Aurora Avenue N at N 85th Street.

The E Line has five stations within Segment 3. In fall 2022, average daily boardings at these stations ranged from 67 to 191 riders and average daily alightings ranged from 55 to 214 riders. The southbound stop at N 84th Street (Stop ID 7160) has the highest level of overall activity within Segment 3. Route 45 intersects Aurora Avenue N at N 85th Street and may contribute to higher boardings and alightings at stations around the intersection.

Figure 5-22 displays average daily E Line ridership and transit lines that travel on or intersect with Aurora Avenue N in Segment 3.

Three out of five stations within Segment 3 are equipped with 1 shelter; the other 2 stations have no shelters. No layover or comfort stations are located in Segment 3.

Figure 5-23 shows passenger amenities at transit stops along Segment 3 of Aurora Avenue N.

5.6.1 Transit Travel Speeds

Four TSP systems exist in Segment 3. They are located at N 77th Street, N 80th Street, N 83rd Street, and N 85th Street.

Figure 5-24 depicts TSP systems on Segment 3 of Aurora Avenue N.

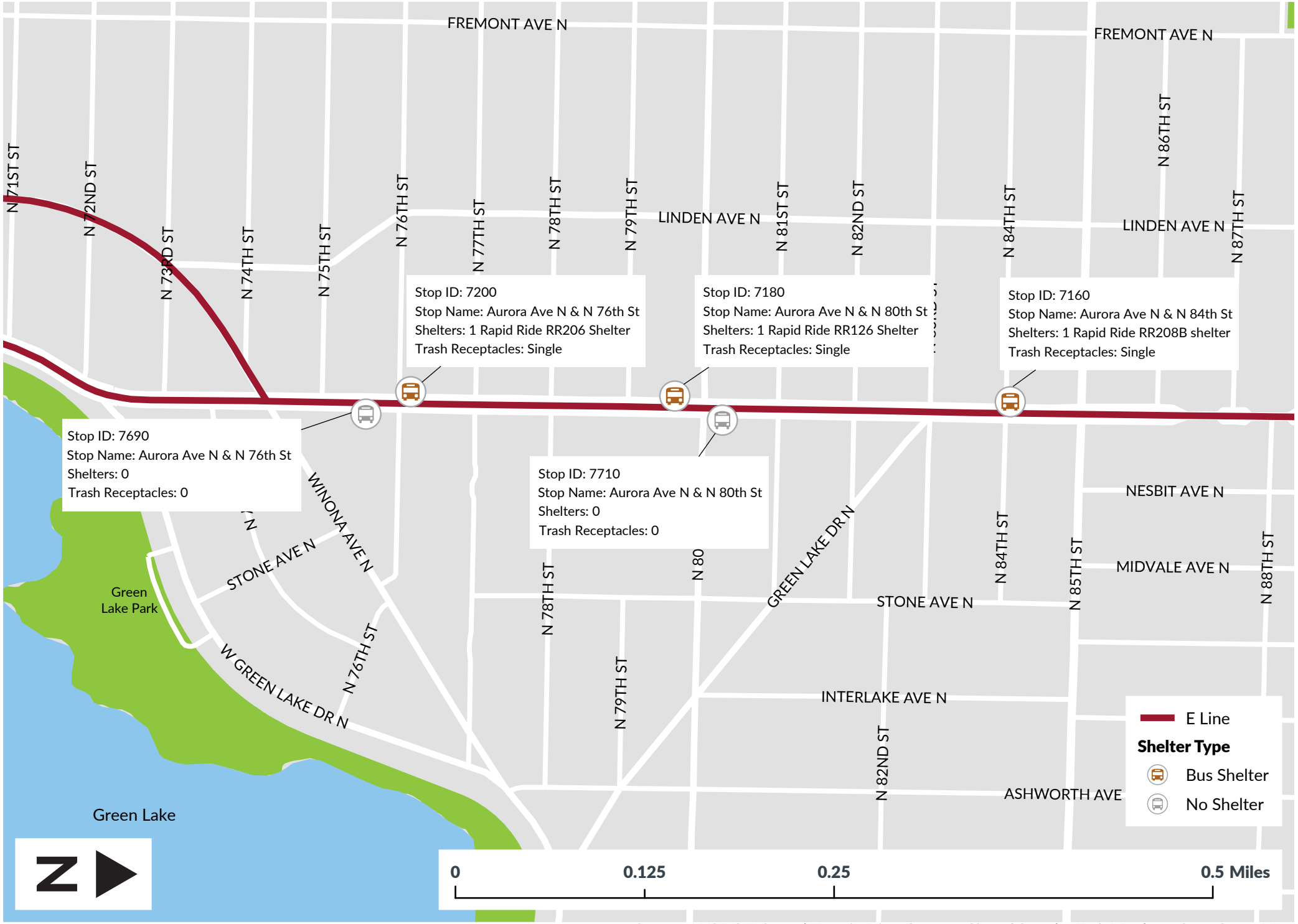


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-22. Segment 3 Average Daily E Line Ridership

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-23. Segment 3 Passenger Amenities

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-24. Segment 3 Transit Signal Priority

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Average transit travel speeds vary within Segment 3 of Aurora Avenue N. Table 5-11 and Table 5-12 display the various average transit speeds within Segment 3 during the AM and PM hours, respectively. Figure 5-25 and Figure 5-26 display transit travel speeds in Segment 3 in the AM and PM peak periods, respectively. Transit travel speeds do not include dwell time at stops.

Table 5-11 Segment 3 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
Winona Avenue N – N 80th Street	0 – 20 mph	21 – 30 mph
N 80th Street – N 85th Street	0 – 20 mph	0 – 20 mph

Table 5-12 Segment 3 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
Winona Avenue N – N 80th Street	0 – 20 mph	0 – 20 mph
N 80th Street – N 85th Street	0 – 20 mph	0 – 20 mph

5.6.2 Bus collisions

Between January 2019 and February 2023, there were thirteen bus collisions along Aurora Avenue N in Segment 3. All collisions except two were with other non-transit vehicles; the other two collisions were with a fixed object. The collisions were clustered around N 80th Street and N 85th Street.

Figure 5-27 displays bus collisions from 2021 and 2022 along Segment 3 of Aurora Avenue N.

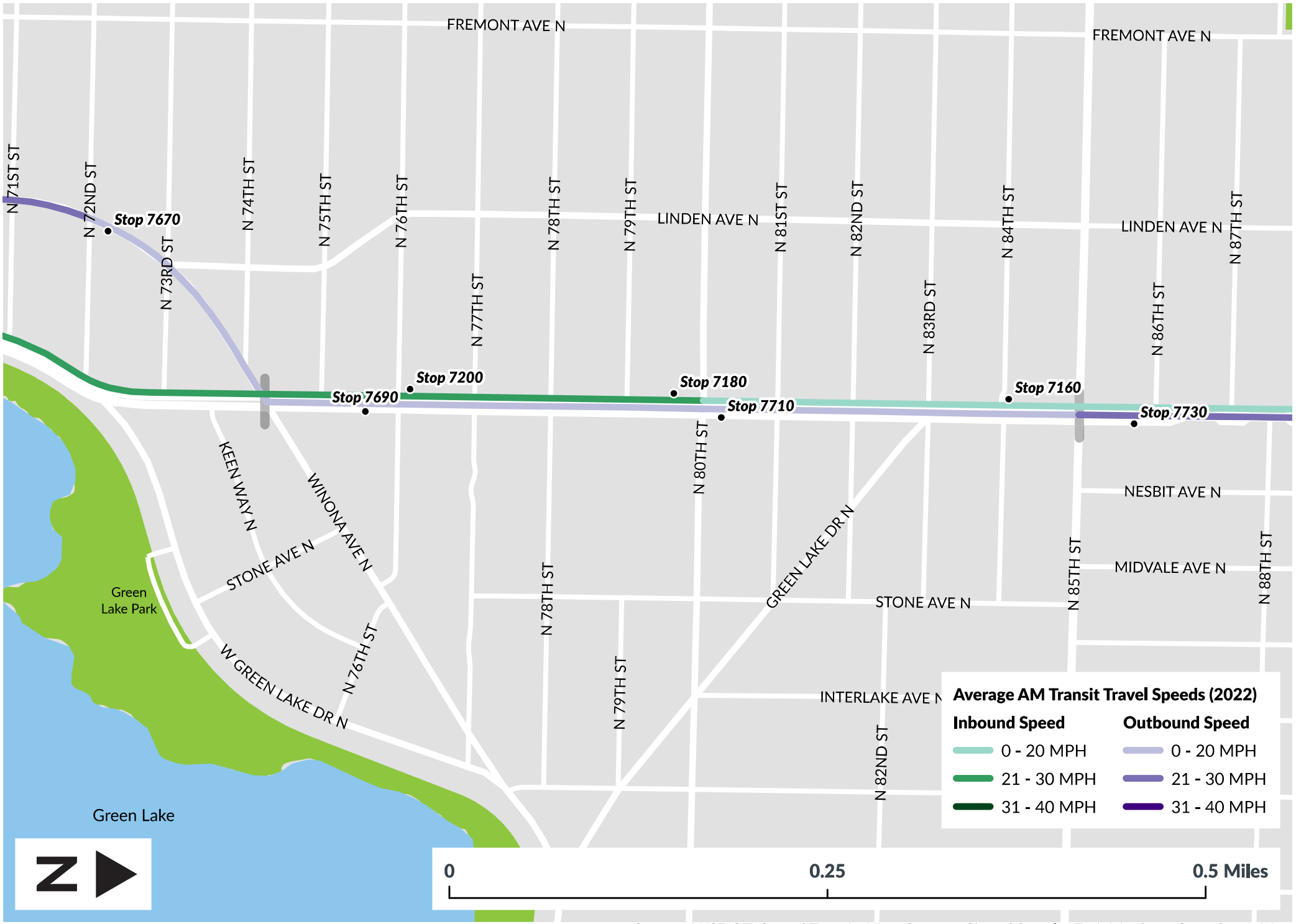
5.7 Transportation Plans

The PMP's Arterial Priority Investment Network assigned Segment 3 of Aurora Avenue N a score of largely Tier 5 The PMP's Priority Crossings gave Segment 3 of Aurora Avenue N several Tier 3 ratings at N 75th Street, N 80th Street, and N 85th Street, with the balance of ratings at Tier 4 and Tier 5.

Figure 5-28 depicts the PMP's Arterial Priority Investment Network and Priority Crossings along Segment 3 of Aurora Avenue N.

Two streets with planned bicycle facilities intersect Aurora Avenue N along Segment 3. N 77th Street fully crosses Aurora Avenue N and is planned to become a neighborhood greenway. N 83rd Street is scheduled to become a neighborhood greenway proceeding east from Aurora.

Figure 5-29 displays planned bicycle facilities and WSDOT's Bicycle Level of Traffic Stress on Segment 3 of Aurora Avenue N.

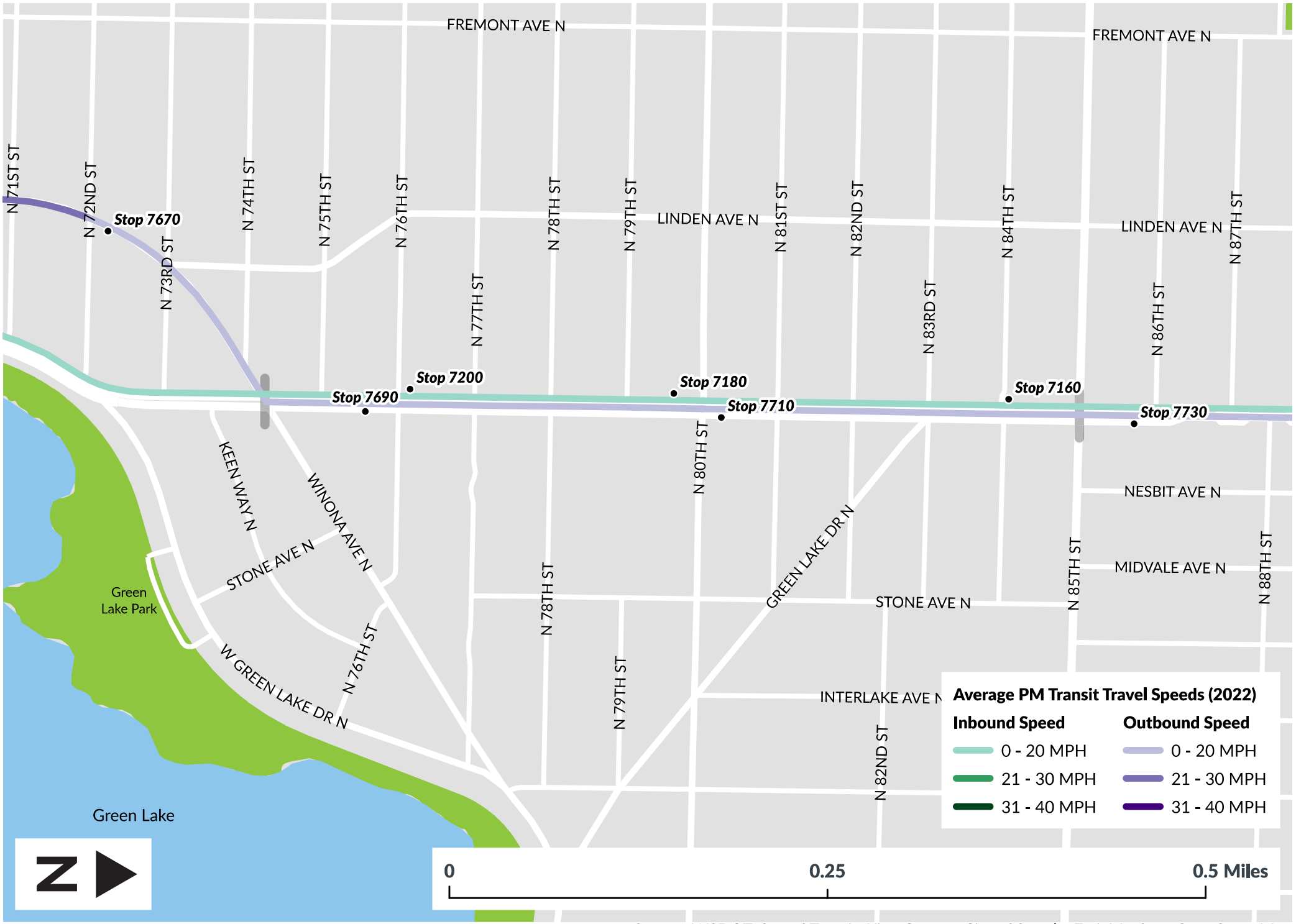


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-25. Segment 3 AM Transit Travel Speeds

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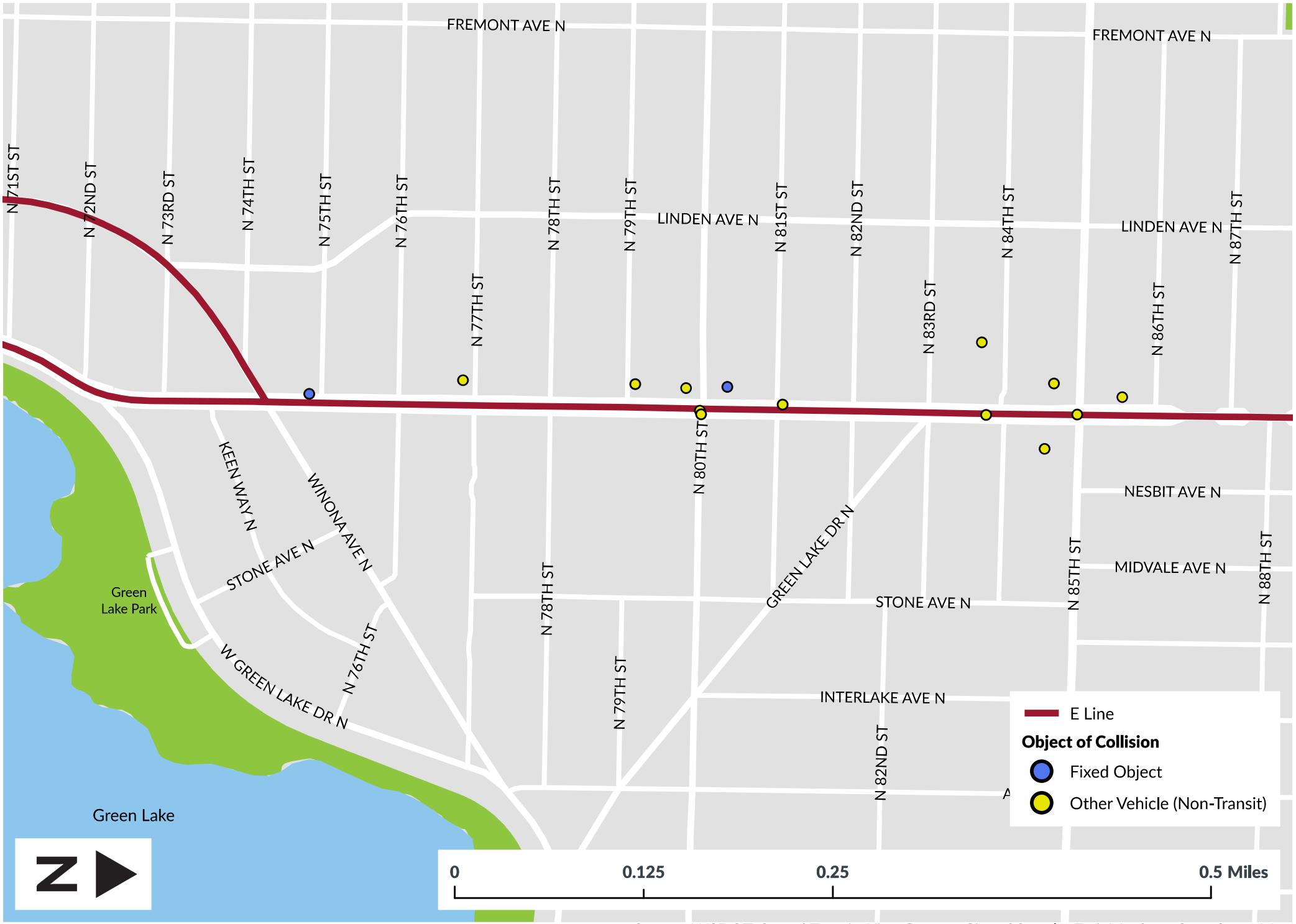


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-26. Segment 3 PM Transit Travel Speeds

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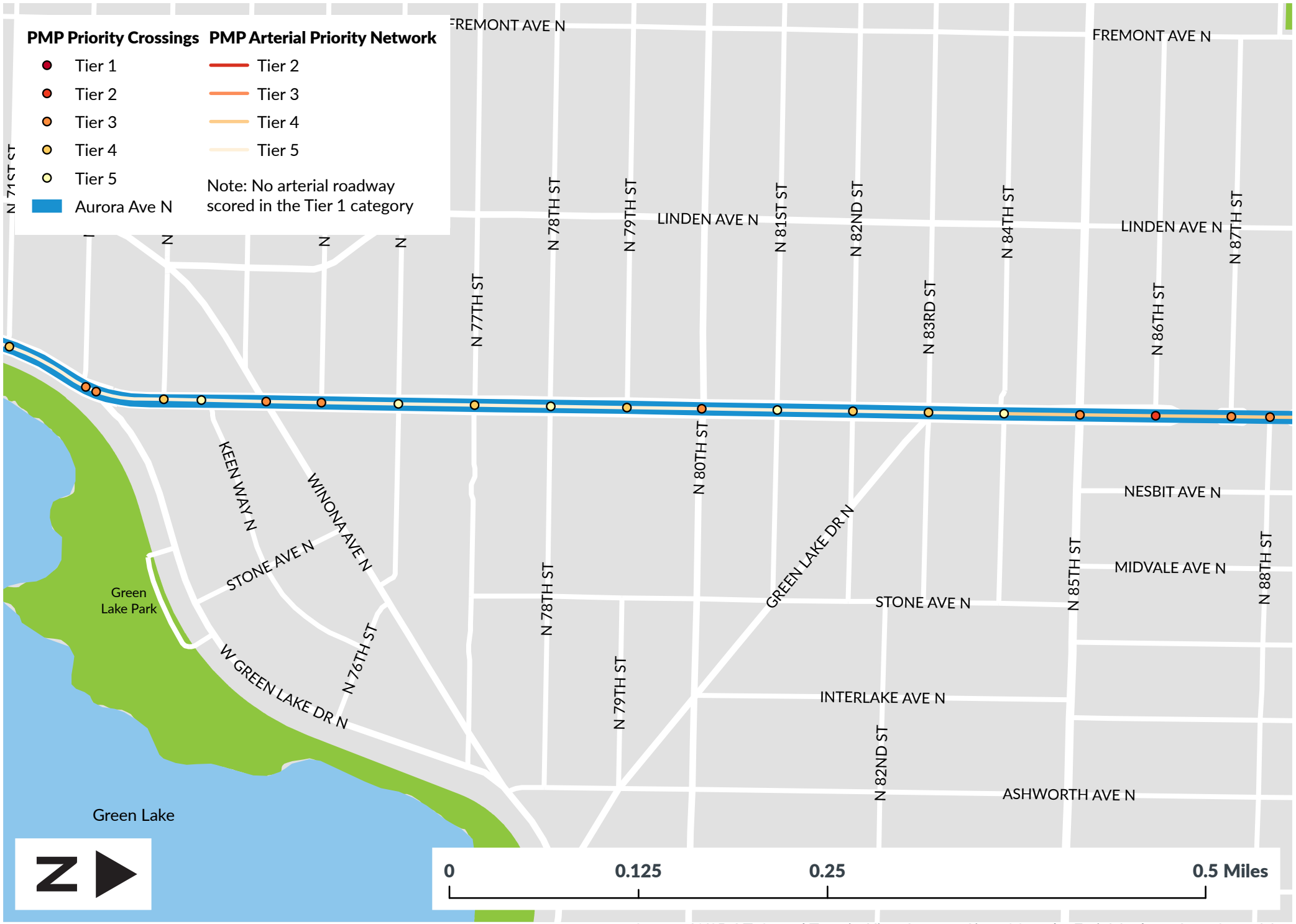


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-27. Segment 3 Bus Collision Locations

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-28. Segment 3 Pedestrian Master Plan Corridor Designation

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-29. Segment 3 Planned Bicycle Facilities

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5.7.1 In-process, Planned, and Potential Future Transportation and Infrastructure Improvements

Several in-process, planned, and potential future improvements are located along Segment 3 of the Aurora corridor:

- **Active transportation**
    - N 86th Street Improvements: installation of new ADA ramps, widening of sidewalk with street trees, and street restoration on the north side of N 86th Street. Corresponds with a private development project along N 86th Street.
- **Private development**
    - 124 unit supportive housing development: construction of 124 permanent supportive housing units in 4 stories of residential levels over one story of ground floor supportive service and staff area.
- **Operations/ITS**
    - Aurora Avenue N ITS Improvements: modifications to signal timing on northbound Aurora Avenue N to improve freight traffic during the morning peak period.
    - N 85th Street Integrated Corridor Management System: implementation of integrated corridor management to provide the opportunity for freight to avoid congestion on a given facility when it is present between 15th Avenue NW/Holman Road NW and I-5.
    - N 85th Street ITS Improvements: installation of traffic signal control improvements (either traffic adaptive or responsive) to provide consistent travel times on the freight corridor from Aurora Avenue N to I-5. Includes the implementation of additional detection to provide congestion information.

Figure 5-30 displays in-process, planned, and potential future transportation and infrastructure improvements along Segment 3 of the Aurora corridor.[3]

5.7.2 Near Term Spot Safety Improvements

A near term safety improvement planned in Segment 3 is hardened centerlines at N 77th Street.

[3] Projects shown represent public and private development projects entered into the City of Seattle's Project and Construction Coordination Map (dotmaps application), included in SDOT modal plans, or included in SDOT's sidewalk development program. Not all projects shown are planned for near-term implementation.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-30. Segment 3 In-Process, Planned, and Future Improvements

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5.8 Land Use

5.8.1 Land Use

Existing land uses along Aurora Avenue N in Segment 3 primarily comprise moderate-density neighborhood commercial uses, transitioning into the in the high-density, mixed-use Aurora-Licton Springs Residential Urban Village in the far north. Within one block of the Aurora Avenue N corridor to the east and west lie areas dominated by low-density residential uses. Structures along Aurora Avenue N within the southern portion of Segment 3 largely do not have setbacks from the right-of-way, while structures in the northern portion have larger setbacks that accommodate auto-oriented uses.

Planned land uses from the Future Land Use 2035 map along Segment 3 of Aurora Avenue N include exclusively Commercial/Mixed Use Areas from Winona Avenue N to N 84th Street.

Urban villages are designated in one location along Aurora Avenue N in Segment 3. The Residential Urban Village designation is applied from N 84th Street to N 85th Street.

Figure 5-31 illustrates future land use and Urban Village designations along Segment 3 of Aurora Avenue N.

5.8.2 Zoning

Zoning along Aurora Avenue N in Segment 3 is primarily commercial with permitted residential uses. The south end of Segment 3 is zoned as Neighborhood Commercial 3 from Winona Avenue N to N 80th Street and N 84th Street to N 85th Street. Commercial 1 zoning is designated for Aurora Avenue N between N 80th Street and N 84th Street. Zoning in neighborhoods near Aurora Avenue N in Segment 3 is primarily low density residential.

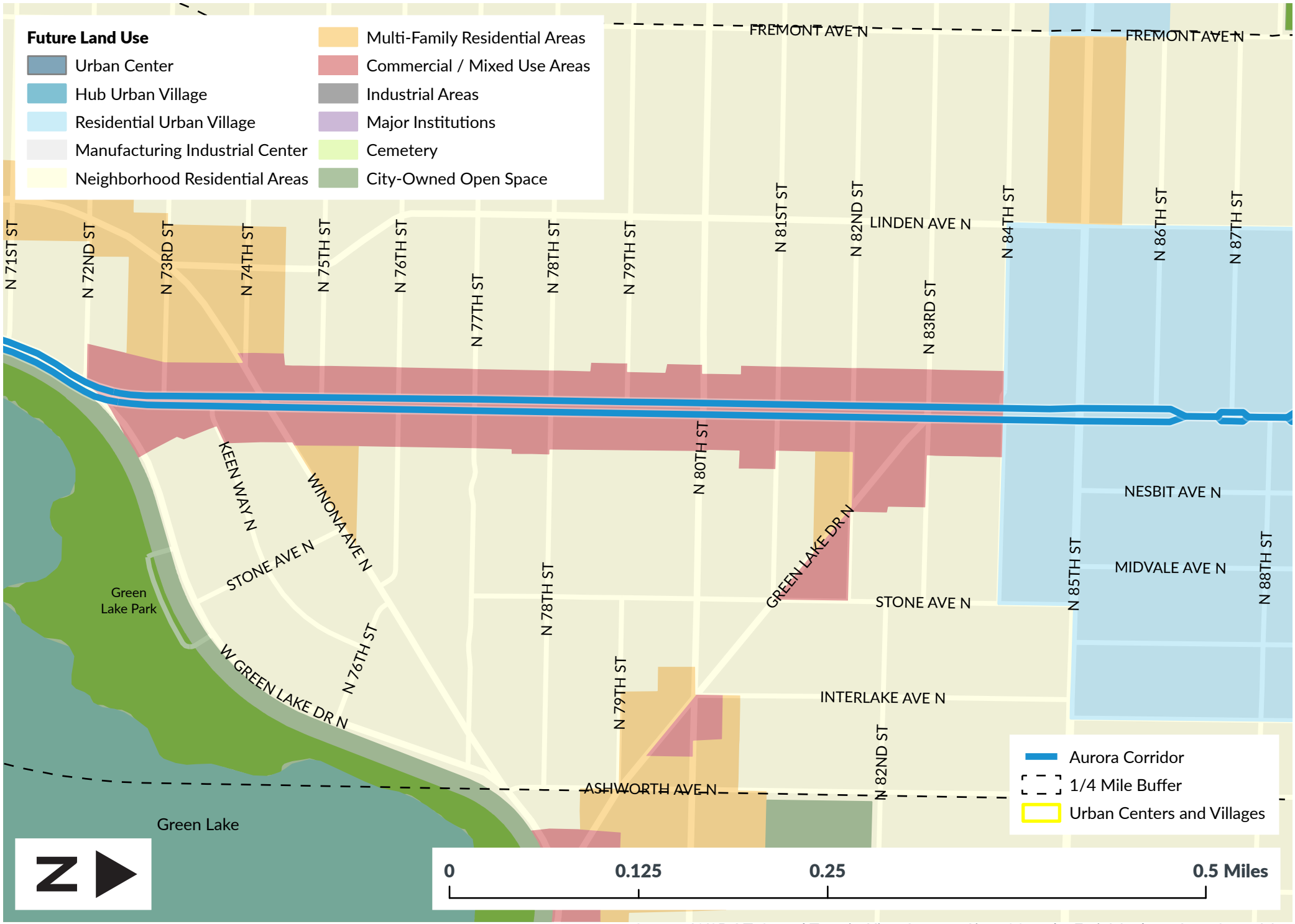
Figure 5-32 displays existing zoning along Segment 3 of Aurora Avenue N.

5.9 Underground Utilities

5.9.1 Water

Existing water lines in Segment 3 run along Aurora's east side from Winona Avenue N to N 85th Street. Water lines intersect Aurora Avenue N at a perpendicular angle at intervals roughly corresponding to the existing street grid.

Figure 5-33 illustrates existing, new, and abandoned water lines on Segment 3 of Aurora Avenue N.

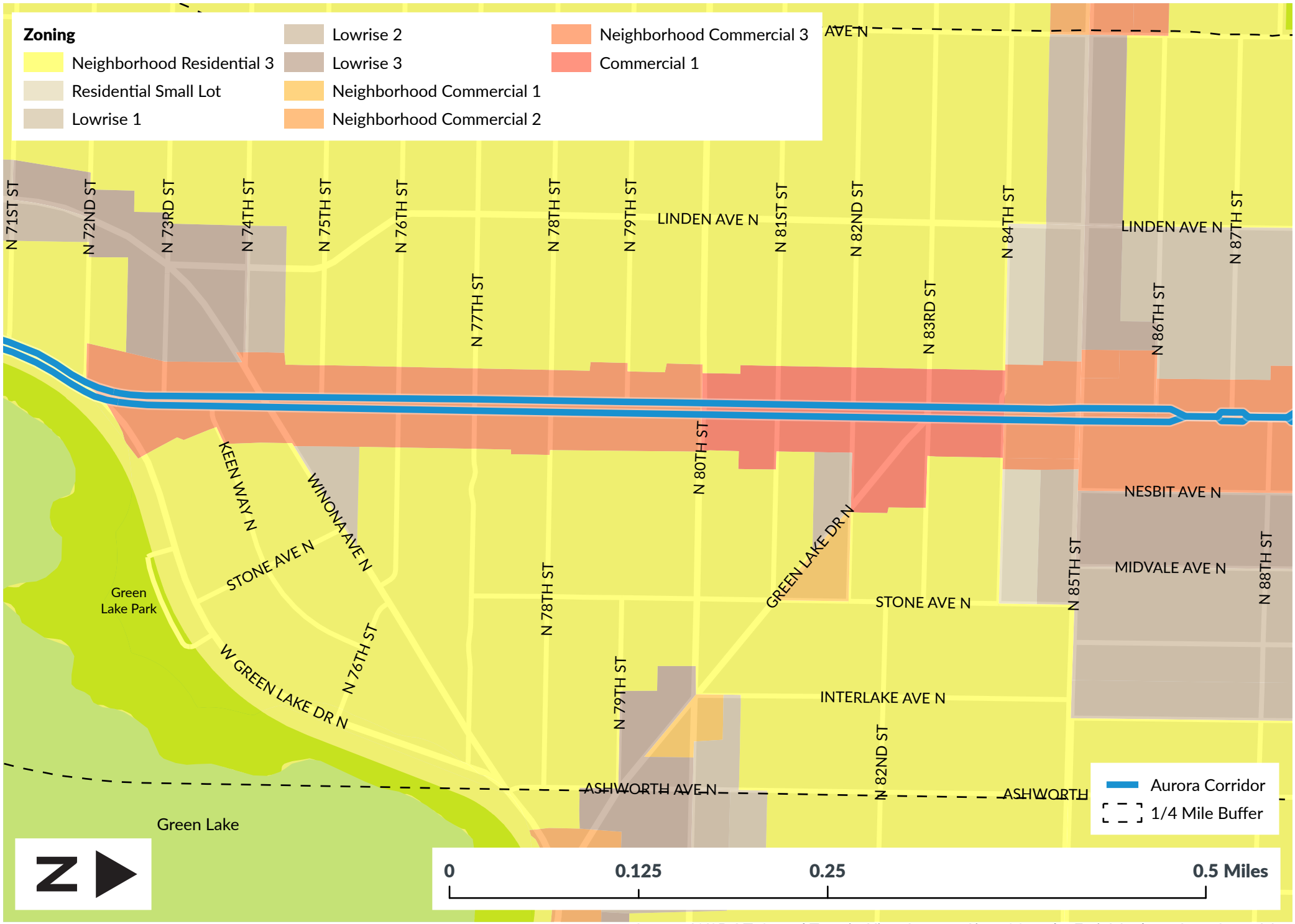


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-31. Segment 3 Land Use

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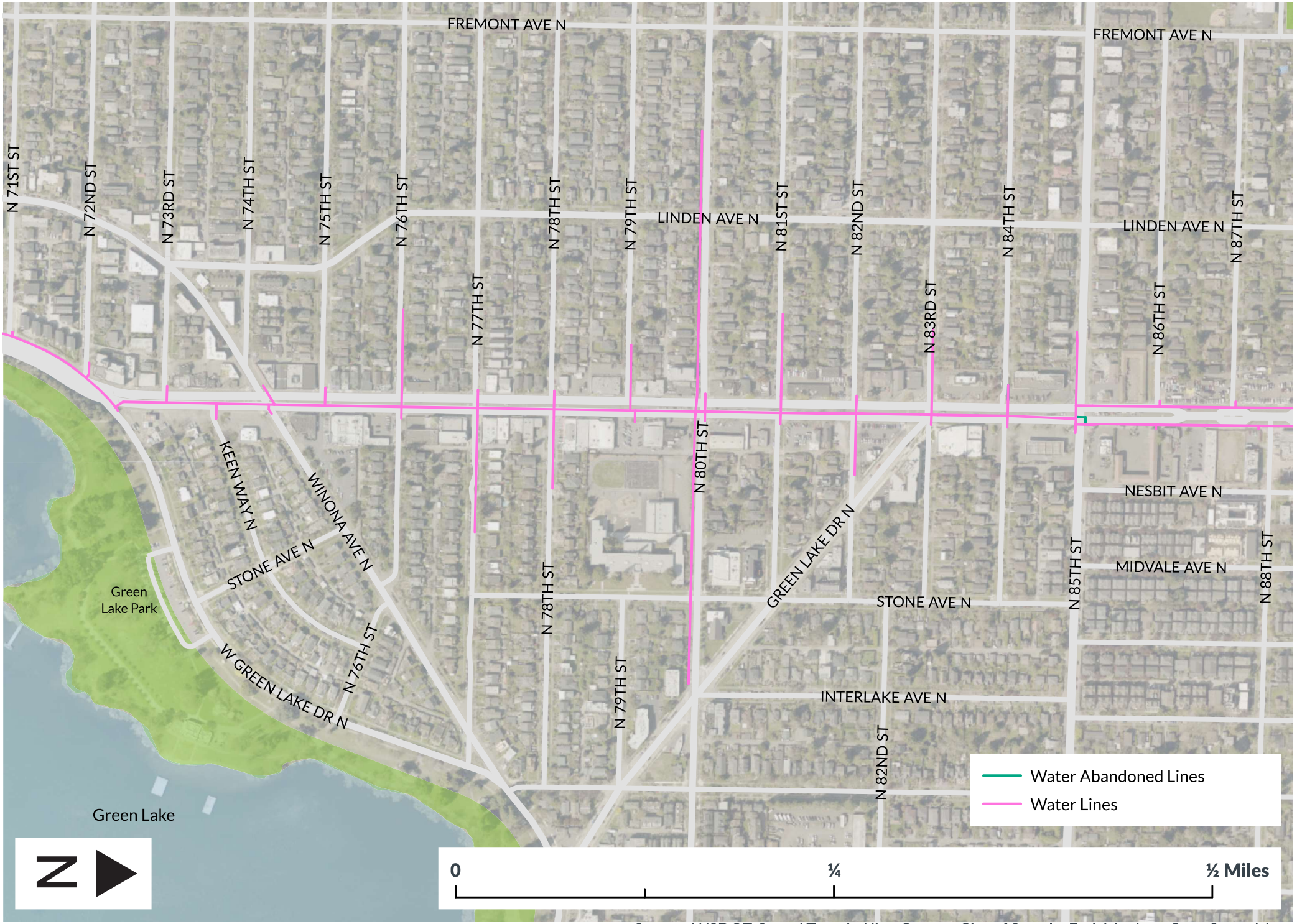


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-32. Segment 3 Zoning

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-33. Segment 3 Utilities: Water

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5.9.2 Sewer and Drainage

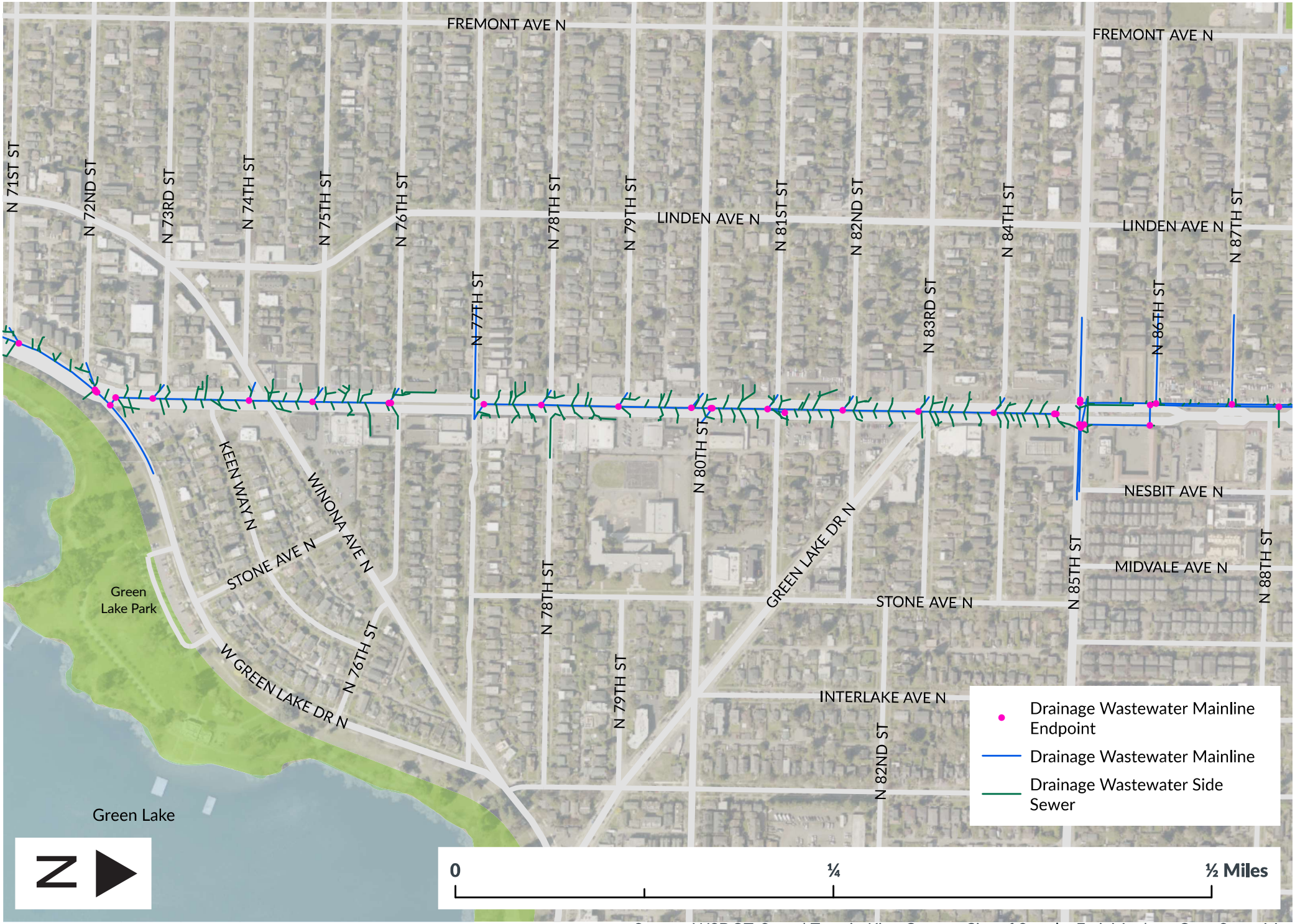
Sewer facilities are present along nearly all of Segment 3. Sewer mainlines run under the center of Aurora Avenue N. There are no mainlines in between N 76th Street and N 77th Street. Mainline endpoints are spaced at approximately one per block. Side sewers branch east and west from the mainlines at regular intervals. A disconnected series of combined sewer lines runs from Winona Avenue N to N 85th Street.

Sewer and drainage infrastructure in Segment 3 are largely separated systems, with wastewater conveyed in sewer mains and stormwater conveyed in storm drains and culverts. This segment is part of SPU's current system layout analysis for Aurora Avenue N.

Figure 5-34 depicts sewage systems along Segment 3 of Aurora Avenue N.

5.10 Key Takeaways

- Land use designations along Aurora Avenue N in Segment 3 are primarily moderate-density neighborhood commercial uses with low-density residential uses located to the east and west of the corridor.
- The junction of Aurora Avenue N and N 85th Street represents a high-ridership transfer point between the E Line and Route 45.
- Lower posted and observed speeds, at-grade intersections and crosswalks, and minimal building setbacks foster an urban main street roadway character not present in other corridor segments.
- People walking or biking were involved in over half of all fatal and serious injury collisions within Segment 3.
- Improper driver maneuvers, distractions, and inattention represent key factors contributing to collisions.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 5-34. Segment 3 Utilities: Drainage Wastewater

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6. Segment 4

6.1 Segment Description

Segment 4 of Aurora Avenue N is approximately 1.5 miles long, extending from N 85th Street in the south to N 115th Street in the north and is at-grade for the entirety of the segment. Aurora Avenue N cuts through the Evergreen Washelli Funeral Home and Cemetery at the northern end of Segment 4. The posted speed limit of Segment 4 is 30 mph for most of the segment, but transitions to 35 mph at N 109th Street to N 115th Street, the northern part of Segment 4. There are discontinuous sidewalks along the segment and there is a pedestrian bridge at N 102nd St that provides an above-grade crossing with stairs only on the west side and only a ramp on the east side. Designated crosswalks are present at the major intersections, and a couple are present at minor intersections. The length of Segment 4 is surrounded by neighborhood commercial and low to midrise residential zoning. The overall lack of continuous pedestrian and bicyclist facilities make for a car-centric environment. Table 6-1 summarizes key characteristics of Segment 4.

Table 6-1. Segment 4 At a Glance

Segment Extents	N 85th Street to N 115th Street
Segment Length	1.5 miles
Annual Average Daily Traffic	28,900
Measured 85th Percentile Traffic Speeds	43 mph (posted speed limit: 30-35 mph)
Average Distance Between Pedestrian Crossings	980 feet
Crashes Per Mile (2018-2022)	219
Crashes Involving Vulnerable Users (2018-2022)	40
Bus Routes Serving the Segment	E Line, 40
Bus Stops	10
Total Average Daily E Line Boardings/Alightings in Segment 4	Boardings: 1,679/Alightings: 1,527

6.2 Roadway Characteristics

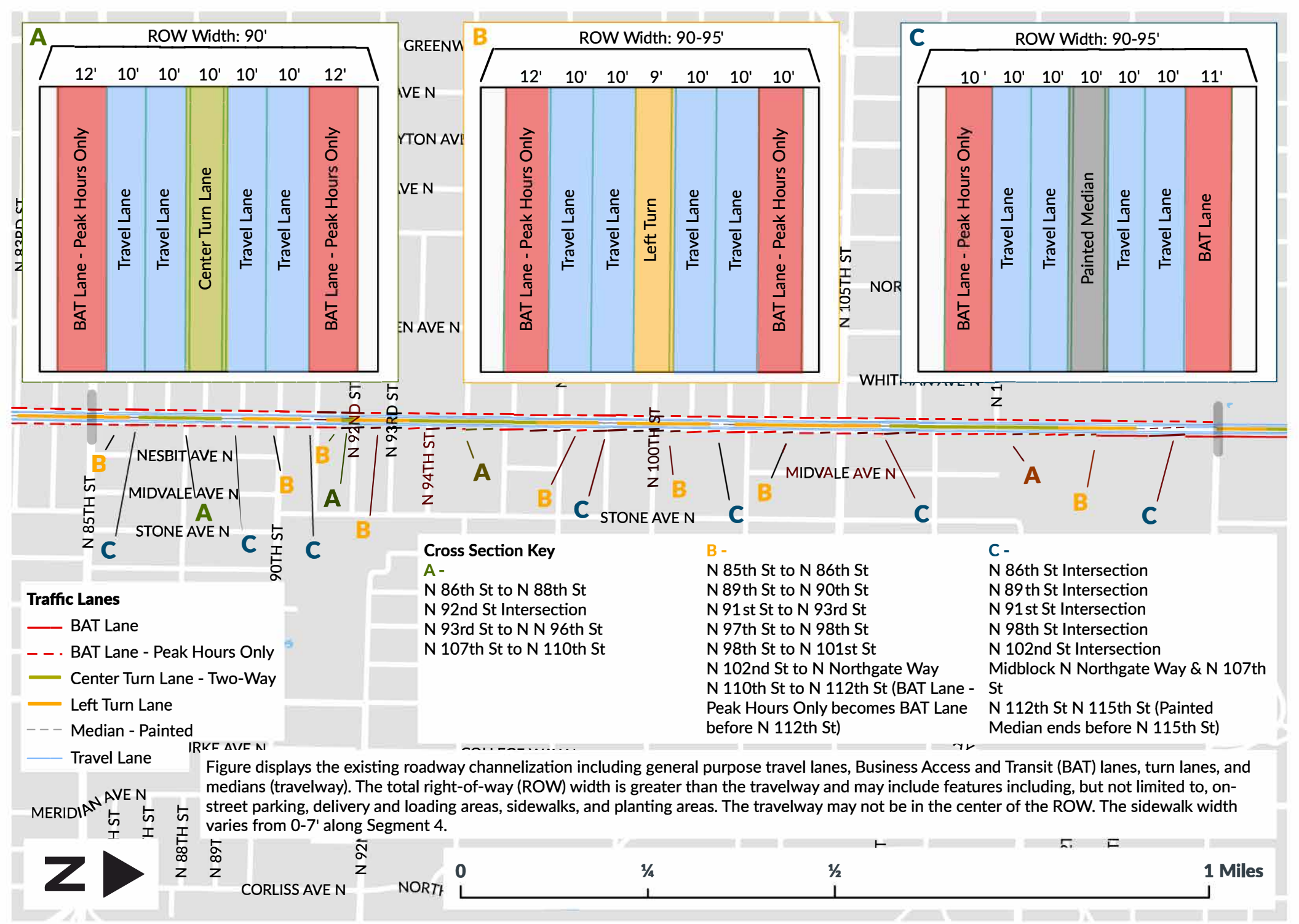
Segment 4 is six to seven lanes for the entirety of the segment. The ROW in Segment 4 ranges from 90 to 95 feet in width. This includes four general purpose lanes and two BAT lanes for the entirety of the segment as well as a raised median that intermittently changes to a c-curb or a painted center turn lane. The BAT lanes are peak hour only except near the northern end of the segment, where the northbound BAT lane becomes a 24/7 BAT lane.

The locations with seven lanes are where the median transitions to a left turn lane or center turn lane, which occurs frequently within the segment.

Figure 6-1 illustrates travel lane characteristics, existing medians, access management, and ROW width on Segment 4 of Aurora Avenue N.

Aurora Avenue N is classified entirely as a Principal Arterial in Segment 4. N 105th Street/N Northgate Way is the only Principal Arterials that intersects with Aurora Avenue N. Figure 6-2 illustrates the roadway network surrounding Aurora Avenue N in Segment 4.

On-street parking is not permitted along the west side of Aurora Avenue N from N 85th Avenue to N 90th Street. From N 90th Street to N 100th Street, parking is prohibited between 6-9 AM and 3-7 PM. Figure 6-3 illustrates peak hour parking restrictions.

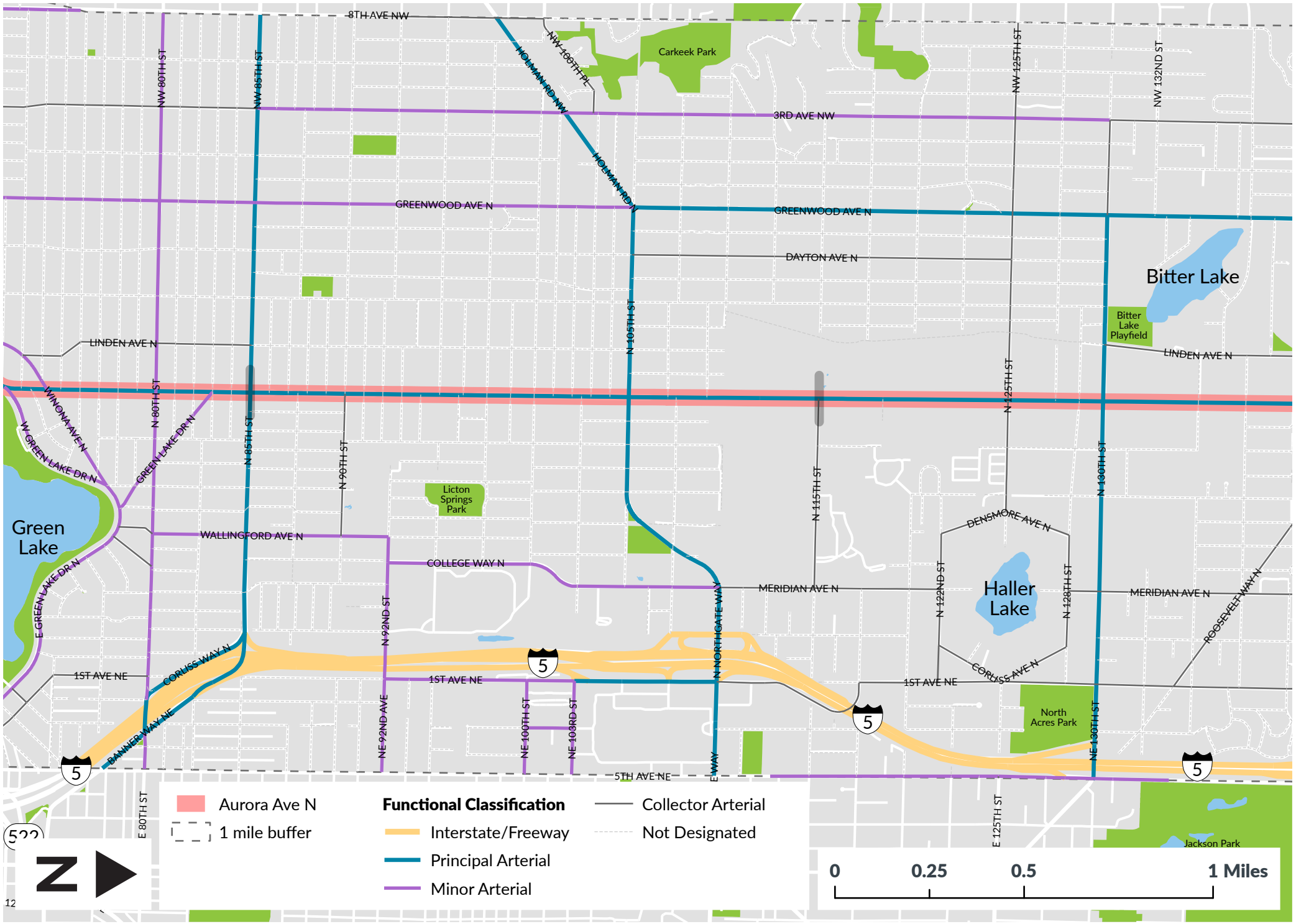


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-1. Segment 4 Channelization and Cross Sections

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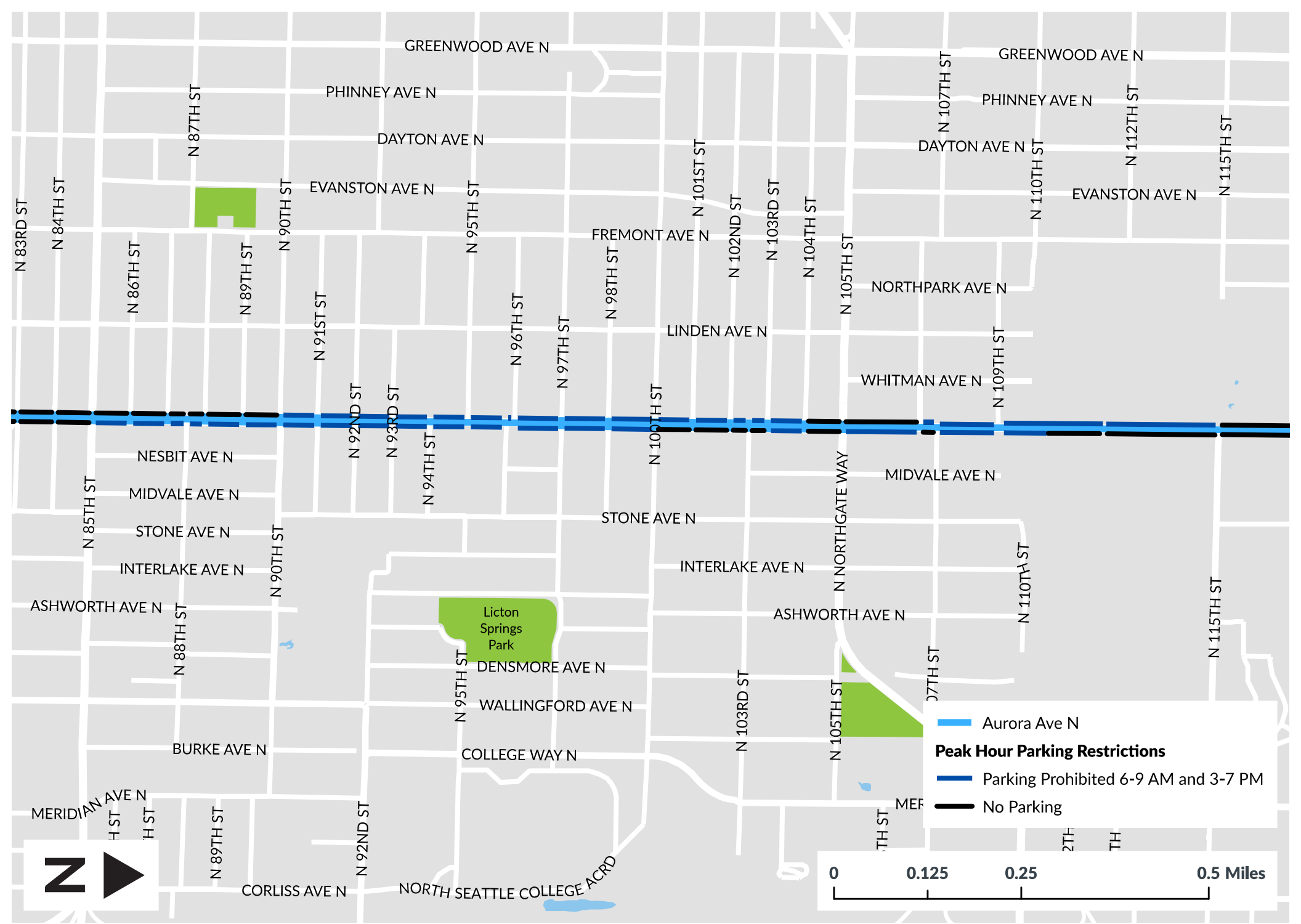


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-2. Segment 4 Functional Classification

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-3. Segment 4 Existing Peak Hour Parking Restrictions

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6.3 Traffic Operations

6.3.1 Traffic Volumes

Based on March 2023 traffic counts, the ADT volumes in Segment 4 are 27,300 vehicles, with 13,800 vehicles in the northbound direction and 13,500 vehicles in the southbound direction. The AWDT volumes in Segment 4 are 28,300 vehicles, with 14,300 vehicles in the northbound direction and 14,000 vehicles in the southbound direction. A profile of the AWDT volumes by 15-minute intervals are shown in Figure 6-4 for Segment 4. There is a slight peak in southbound traffic volumes in the morning peak period, but traffic volumes continue to grow in both directions throughout the day with a higher peak in the northbound volumes during the afternoon. Figure 6-5 illustrates the average daily volumes in the Segment 4 extent of Aurora Avenue N.

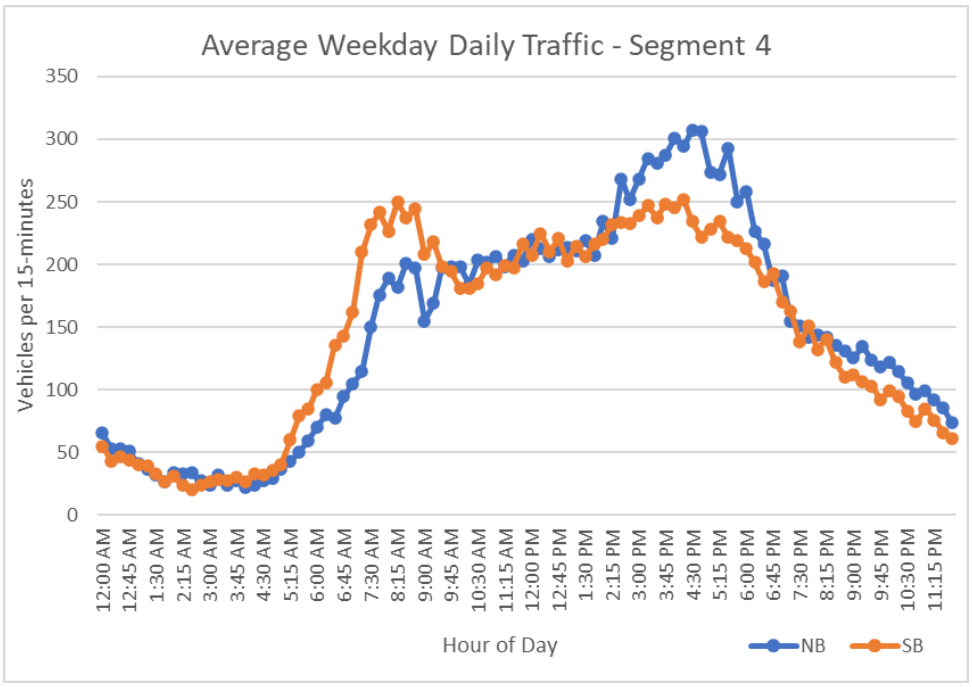


Figure 6-4. Segment 4 Average Weekday Daily Traffic by Hour of Day



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-5. Segment 4 Average Annual Daily Traffic (AADT)

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The turning movement count at Aurora Avenue N and N 92nd Street was derived from traffic counts of the nearby intersections and from historical counts of the intersection in April 2022. Turning movement counts of other study intersections in Segment 4 were collected in March 2023. The Aurora Avenue N and N 85th Street intersection has the highest entering volumes during the AM peak with approximately 3,700 vehicles; the Aurora Avenue N and N 105th Street/N Northgate Way intersection has the highest entering volumes during the PM peak with approximately 4,000 vehicles. Figure 6-6 summarizes the TMCs for the study intersections in Segment 4 of the project.

6.3.2 Freight Network and Vehicle Volumes

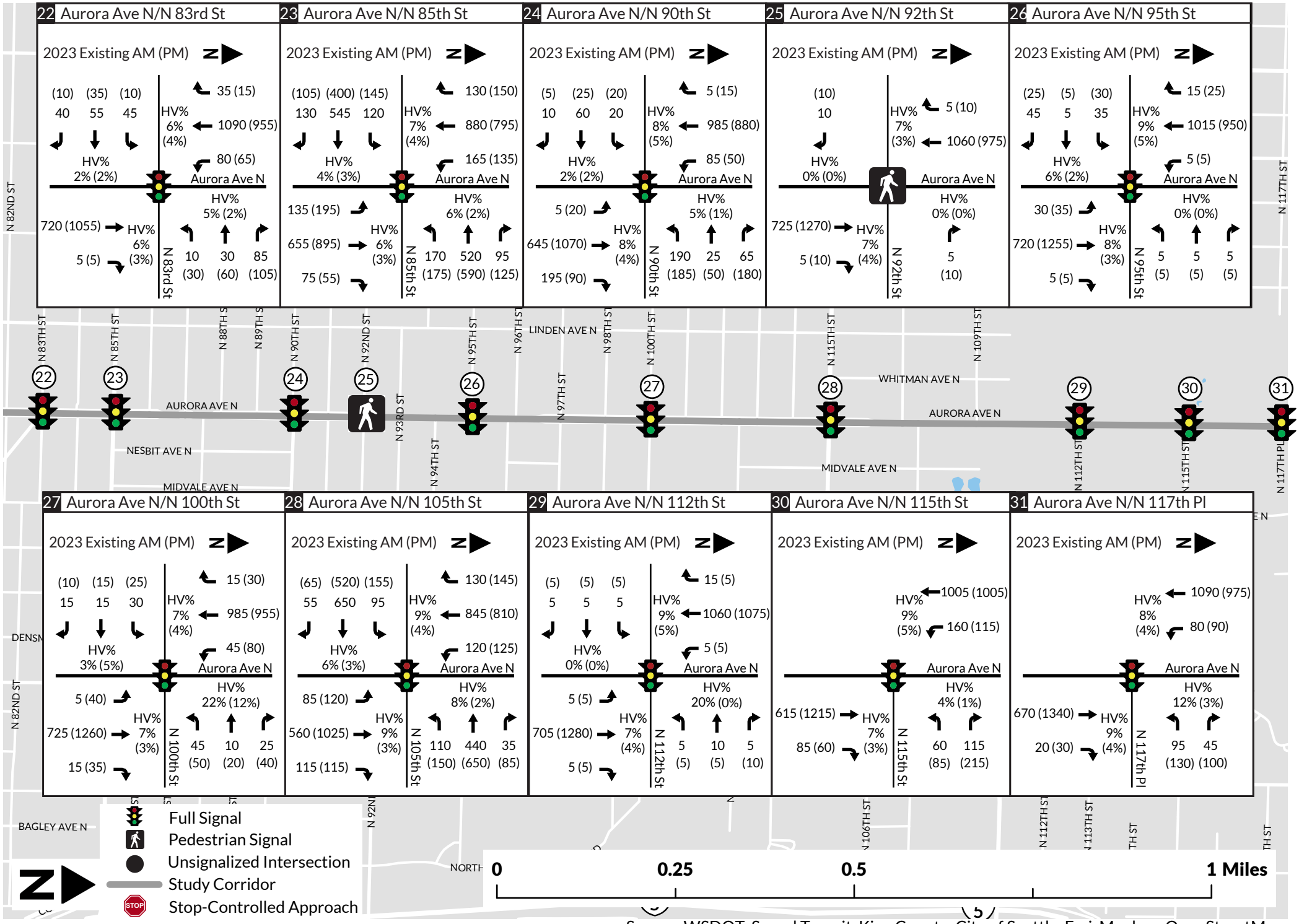
As shown in Figure 6-6 , the heavy vehicle percentage in the northbound direction ranges from 6% to 9% during the AM peak period and 3% to 4% during the PM peak period; the southbound heavy vehicle percentage ranges from 6% to 9% during the AM peak period and 3% to 5% during the PM peak period. Figure 6-7 displays the freight network in Segment 4.

6.3.3 Measured 85th Percentile Traffic Speeds

The posted speed limit is 30 mph between N 70th Street and N 109th Street in both the northbound and southbound directions. Between N 109th Street and N 115th Street, the speed limit increases to 35 mph in both the northbound and southbound directions. The 85th percentile speeds measured from 24-hour tube counts collected in March 2023 are 43 mph in both the northbound and southbound direction for Segment 4, 43% above the speed limit. Figure 6-8 shows the 85th percentile northbound and southbound traffic speeds and the posted speed limit of Segment 4.

6.3.4 Vehicle Travel Time

The average travel time traveling northbound is 4.7 minutes during AM peak and 5.5 minutes during the PM peak periods. The average travel time traveling southbound is 5.8 minutes during both the AM peak and PM peak periods in Segment 4.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-6. Segment 4 Traffic Volumes

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-7. Segment 4 Freight Network

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-8. Segment 4 85th Percentile Speed

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6.3.5 Intersection Operation Metrics

The existing operation metrics of the study intersections in Segment 4 are shown in Table 6-2. The LOS of the overall intersection for signalized intersections are illustrated in Figure 6-9 and approach LOS of unsignalized intersections are displayed in Figure 6-10.

Table 6-2. Segment 4 Intersection Operation Metrics

Intersection	Traffic Control	AM Peak			PM Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
Aurora Ave N and N 85th St	Full Signal	109.5	F	1.36	90.9	F	1.27
Aurora Ave N and N 90th St	Full Signal	26.4	C	0.94	31.4	C	0.93
Aurora Ave N and N 92nd St	Pedestrian Signal	0.3	A	0.38	0.2	A	0.40
Aurora Ave N and N 95th St	Full Signal	12.7	B	0.52	7.4	A	0.51
Aurora Ave N and N 100th St	Full Signal	11.5	B	0.64	33.9	C	0.97
Aurora Ave N and N 103rd St	TWSC	16.5	B	0.06 (WBR)	14.6	B	0.09 (WBR)
Aurora Ave N and N 105th St/ N Northgate Way	Full Signal	72.3	E	1.15	82.0	F	1.18
Aurora Ave N and Washelli	Full Signal	2.5	A	0.46	7.3	A	0.61
Aurora Ave N and N 115th St	Full Signal	11.1	B	0.69	15.8	B	0.81
Aurora Ave N and N 117th St	Full Signal	13.2	B	0.76	19.3	B	0.86

The Aurora Avenue N/N 85th Street operates at LOS F during both peak periods and Aurora Avenue N/N 105th Street/N Northgate Way intersection operates at LOS E and LOS F, during AM peak and PM peak, respectively. Other study intersections in Segment 4 operate at a LOS C or better during both AM and PM peak periods. The Aurora Avenue N/N 105th Street N/N Northgate Way and the Aurora Avenue N/85th Street intersections receive a V/C ratio greater than 1.0 during both the AM and PM peak periods.

6.4 Nonmotorized Facilities

6.4.1 Pedestrian Facilities

Aurora Avenue N has sidewalks for nearly all of Segment 4. Paved sidewalks are lacking for a stretch on the west side of Aurora Avenue N adjacent to Evergreen Washelli Funeral Home and Cemetery. The widths of sidewalks generally range from less than 4 feet to more than 6 feet. The south half of Segment 4 contains more sidewalk segments that are less than 4 feet wide, while the north half contains more sidewalk segments that are more than 6 feet wide. The WSDOT Pedestrian LTS on Aurora Avenue N is largely rated “3” from N 85th Street through N 107th Street. Intermittent sections are rated “4” along this stretch. The rating changes to a consistent “4” north of N 107th Street.

Figure 6-11 illustrates sidewalk width and WSDOT’s Pedestrian Level of Traffic Stress along Segment 4 of Aurora Avenue N.

The condition of sidewalks along Aurora Avenue N in Segment 4 is primarily “fair” or better. The condition of sidewalk on the west side of Aurora Avenue N is rated “unreported” for approximately half of the length from N 115th Street to N 109th Street.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-9. Segment 4 Signalized Intersection Overall LOS

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-10. Segment 4 Approach LOS for Unsignalized Intersections

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-11. Segment 4 Sidewalk Consistency with WSDOT Standards

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Figure 6-12 depicts existing sidewalk conditions on Segment 4 of Aurora Avenue N.

Segment 4 contains 7 marked and signalized crosswalks, spaced approximately 5 blocks apart. A pedestrian bridge is located at N 102nd Street.

Figure 6-13 displays at-grade and grade-separated pedestrian crossings in Segment 4 of Aurora Avenue N.

SDOT's Compliant Curb Ramp App revealed ADA-compliant curb ramps regularly distributed at nearly every intersection in Segment 4. Intersections with no ADA-compliant curb ramps include N 102nd Street. Some intersections such as N 90th Street and N 101st Street only have one ADA-compliant curb ramp. N 88th Street and N 96th Street had ADA-compliant curb ramps removed in the past, although both intersections currently possess ADA-compliant curb ramps. An accessible pedestrian signal exists at N 92nd Street. The pedestrian bridge at N 102nd Street is not ADA accessible.

Figure 6-14 shows accessible pedestrian signals and in-service ADA-compliant curb ramps in Segment 4 of Aurora Avenue N.

SDOT street types present on Aurora Avenue N in Segment 4 from south to north include Urban Village Main and Urban Center Connector. Total minimum width without frontage required for these street types according to Streets Illustrated is 12 feet and 18 feet, respectively. RapidRide bus stops within the Urban Center Connector street type require a minimum of 10 feet for pedestrian clear zone and 8 feet for landscaping (18 feet total). Sidewalk facilities along Aurora Avenue N are compliant with SDOT's standards for approximately half of Segment 4. Sections lacking in compliance vary between both sides of the street in the north and south of Segment 4.

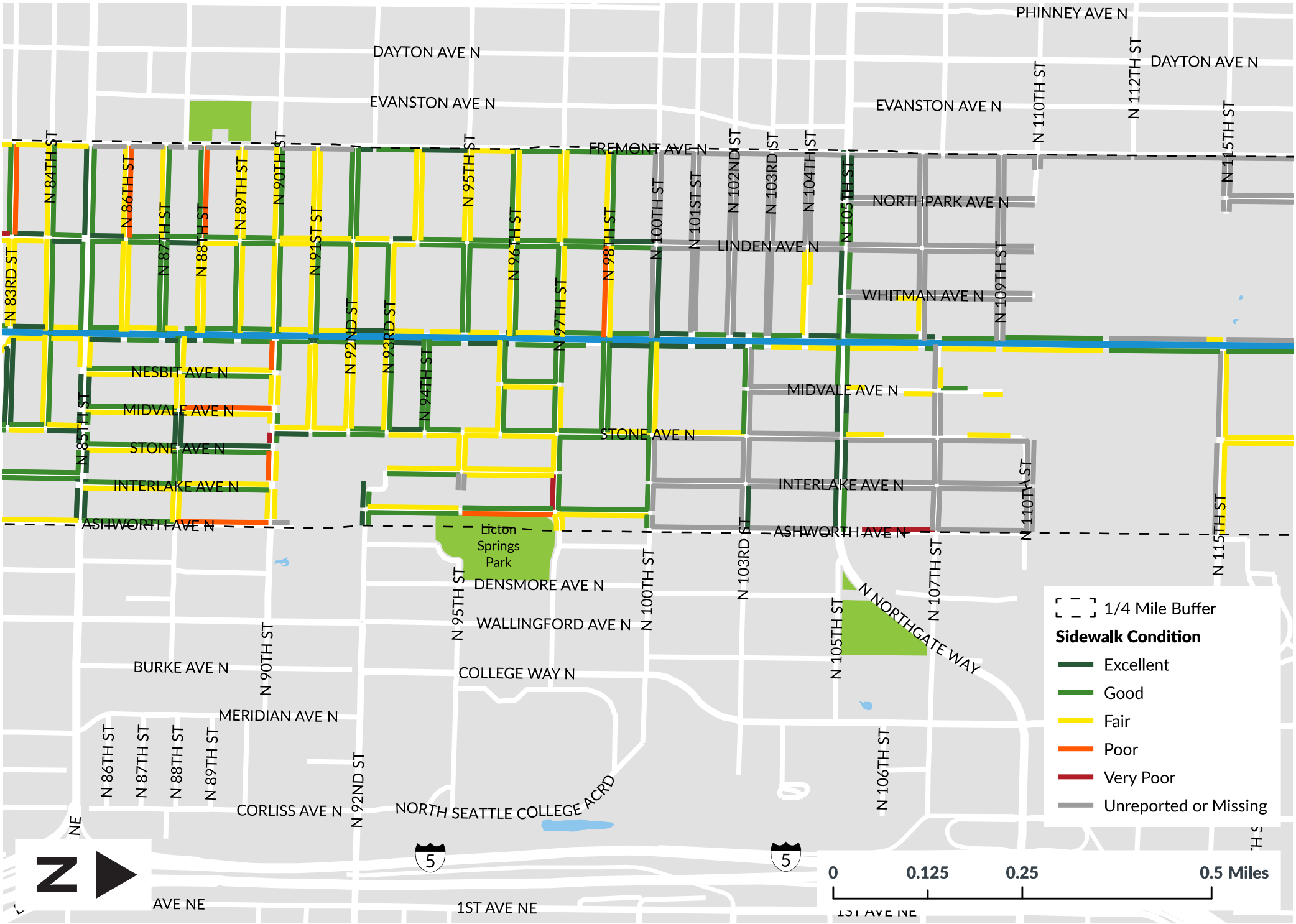
Parts of the corridor that are within Pedestrian Designated Zones per the Municipal Code have slightly greater sidewalk requirements (14 feet). This includes both sides of Aurora Ave N from N 84th St to N Northgate Way/N 105th St.

Figure 6-15 depicts existing sidewalks' consistency with SDOT's minimum sidewalk standards for roadways in Segment 4 of Aurora Avenue N.

6.4.2 Bicycle Facilities

No bicycle facilities currently exist on Aurora Avenue N in Segment 4. Two streets with existing bicycle facilities intersect Aurora Avenue N along Segment 4. These streets are N 92nd Street and N 100th Street, both of which are equipped with neighborhood greenway elements. WSDOT ranks the Bicycle LTS along the entirety of Aurora Avenue N's Segment 4 as "4."

Figure 6-16 illustrates the presence of bicycle facilities in the Segment 4 extent of Aurora Avenue N.

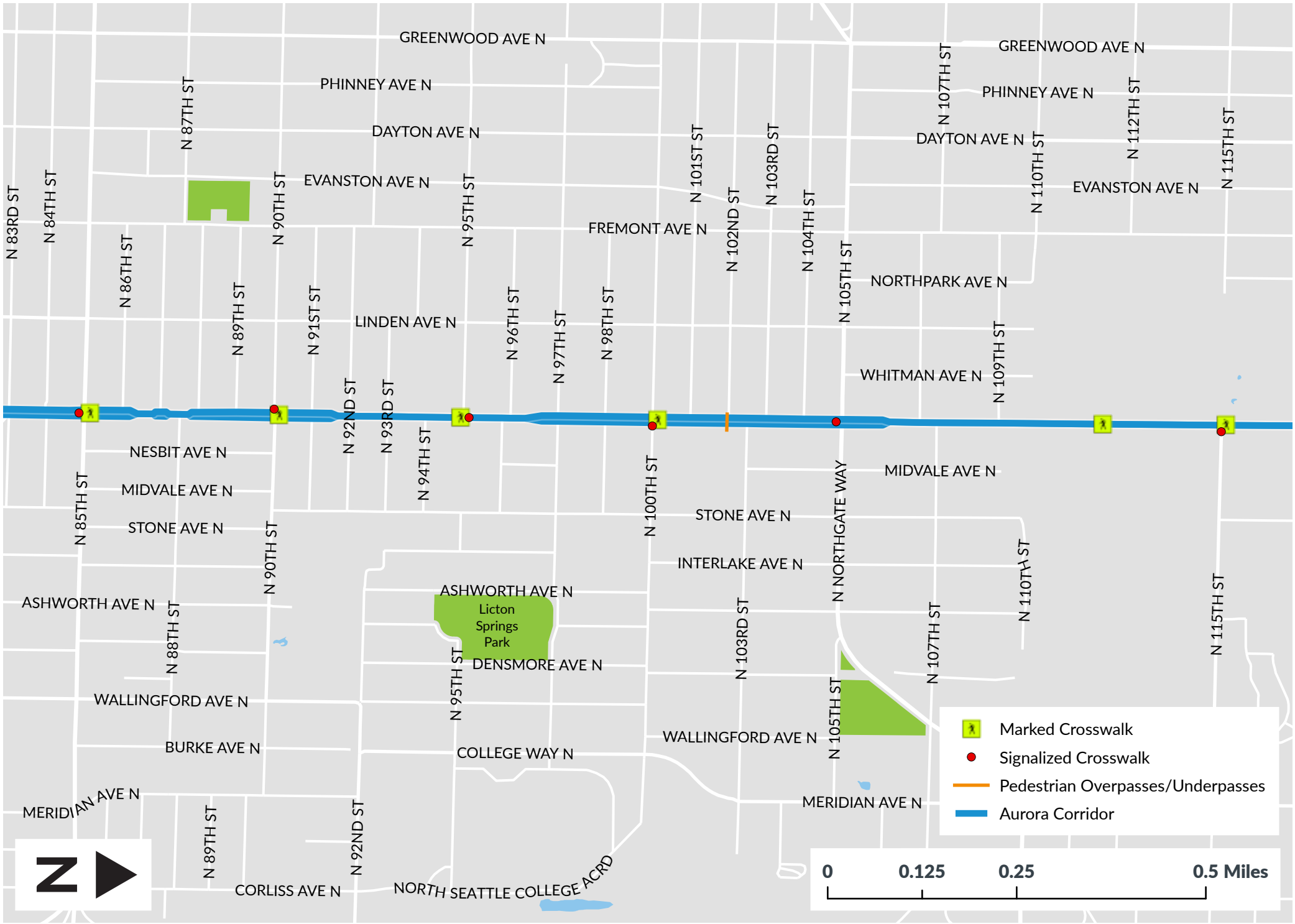


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-12. Segment 4 Existing Sidewalk Condition

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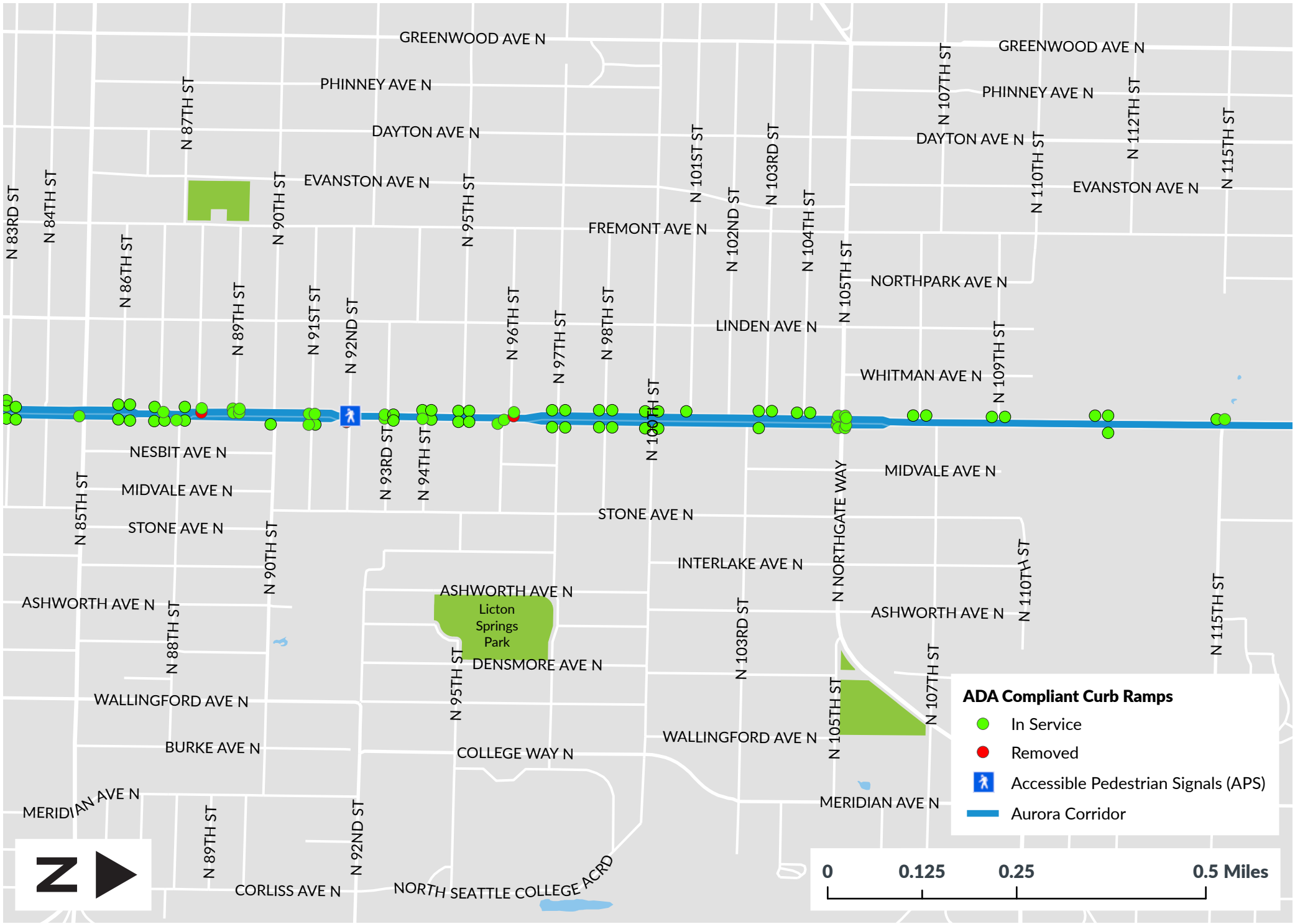


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-13. Segment 4 Pedestrian Crossings

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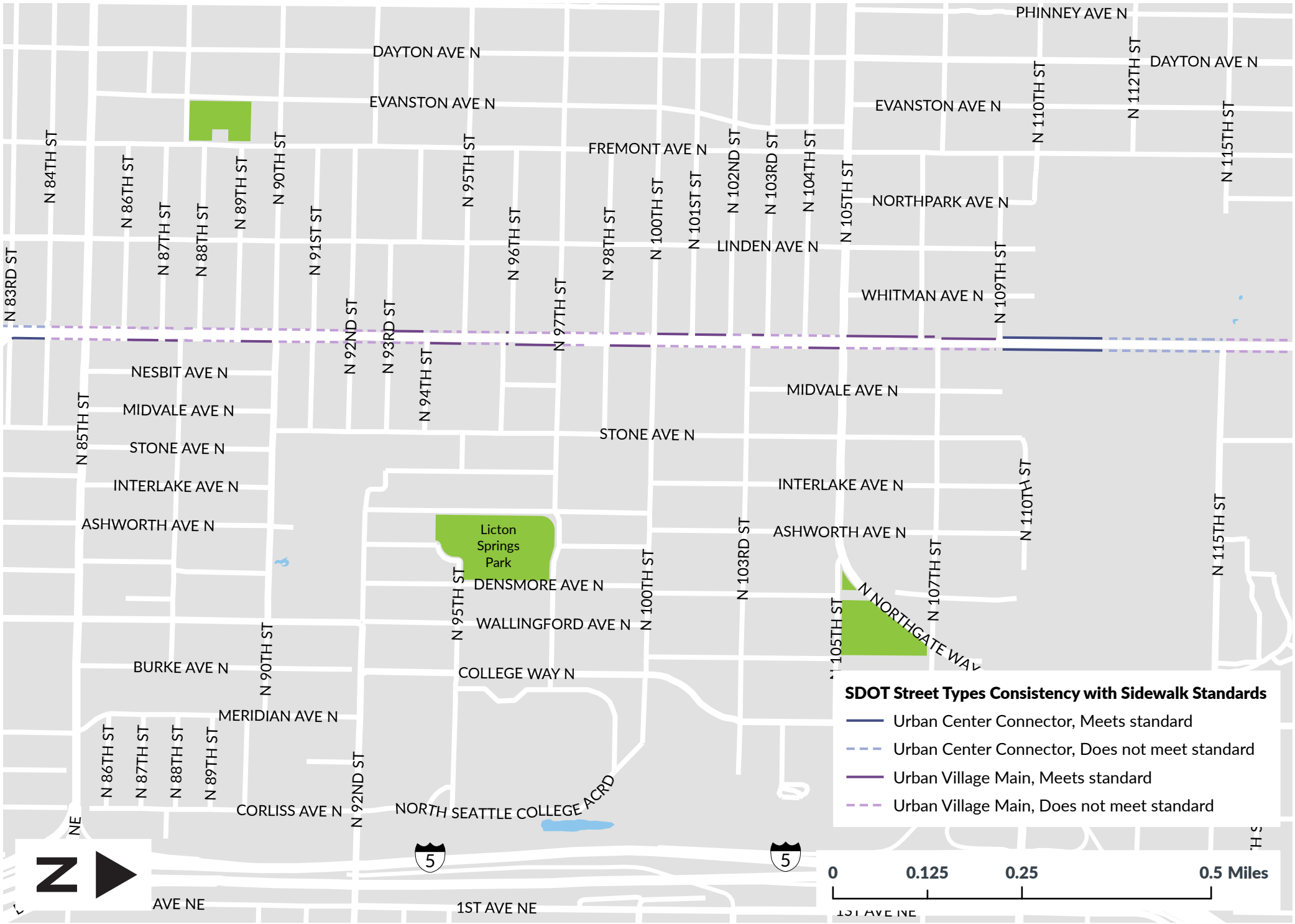


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-14. Segment 4 Pedestrian ADA Features

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-15. Segment 4 Sidewalk Consistency with SDOT Street Types

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-16. Segment 4 Existing Bicycle Facilities

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6.5 Safety

A total of 329 crashes occurred in Segment 4 between 2018 and 2022. Table 6-3 summarizes these crashes by severity.

Table 6-3. Segment 4 Crashes by Severity (2018-2022)

Crash Severity	Crash Frequency
Fatal Crashes	3
Serious Injury Crashes	13
Injury Crashes	124
Property Damage Only Crashes	176
Unknown Crashes	13
Total Segment Crashes	*329*

6.5.1 Crashes by Location – Intersections and Mid-Block Locations

Segment 4 included 151 intersection crashes and 178 mid-block crashes during the study period. Table 6-4 summarizes the intersection crashes by location and severity.

Table 6-4. Segment 4 Intersection Crashes by Severity (2018-2022)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N & N 85th St	0	2	7	12	0	21
Aurora Ave N & N 87th St	0	0	1	1	0	2
Aurora Ave N & N 88th N St	0	0	0	1	0	1
Aurora Ave N & N 89th St	0	0	1	1	0	2
Aurora Ave N & N 90th St	0	0	6	4	0	10
Aurora Ave N & N 91st St	0	0	2	0	1	3
Aurora Ave N & N 93rd St	0	0	6	3	0	9
Aurora Ave N & N 94th St	0	0	2	0	0	2
Aurora Ave N & N 95th St	0	0	5	6	0	11
Aurora Ave N & N 96th S St	0	0	2	2	0	4
Aurora Ave N & N 96th N St	0	1	0	1	0	2
Aurora Ave N & N 97th St	0	0	4	9	0	13
Aurora Ave N & N 98th St	1	1	1	0	1	4
Aurora Ave N & N 100th St	0	1	3	2	0	6
Aurora Ave N & N 101st St	0	0	0	1	0	1
Aurora Ave N & N 103rd S St	0	0	1	2	0	3
Aurora Ave N & N 103rd N St	0	0	0	1	0	1
Aurora Ave N & N 104th St	0	1	1	1	0	3
Aurora Ave N & N 105th St/N Northgate Way	0	0	9	27	2	38
Aurora Ave N & N 107th S St	0	0	2	4	0	6

Table 6-4. Segment 4 Intersection Crashes by Severity (2018-2022) (continued)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N & N 107th N St	0	0	2	2	1	5
Aurora Ave N & N 109th St	0	0	2	1	0	3
Aurora Ave N & N 112th St	0	0	0	1	0	1
Total Intersection Crashes	*1*	*6*	*57*	*82*	*5*	*151*

Segment 4 had one fatal crash at an intersection and six serious injury crashes, all of which involved pedestrians. The intersection of Aurora Avenue N and N 105th Street/N Northgate Way had the most crashes with 38 and Aurora Avenue N and N 85th Street had the next highest with 21 crashes. Just under 55% of crashes were property damage only crashes. Figure 6-17 displays total collisions on Segment 4 of Aurora Avenue N.

Table 6-5 summarizes the mid-block crashes by location and severity for Segment 4.

Table 6-5. Segment 4 Mid-Block Crashes by Severity (2018-2022)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N between N 85th St & N 86th St	1	0	5	8	0	14
Aurora Ave N between N 86th St & N 87th St	0	0	4	2	0	6
Aurora Ave N between N 87th St & N 88th S St	0	0	2	2	0	4
Aurora Ave N between N 88th S St & N 88th N St	0	0	1	1	1	3
Aurora Ave N between N 88th N St & N 89th St	0	0	3	1	0	4
Aurora Ave N between N 89th St & N 90th St	0	0	3	6	0	9
Aurora Ave N between N 90th St & N 91st St	0	0	2	5	0	7
Aurora Ave N between N 91st St & N 92nd St	0	0	0	4	0	4
Aurora Ave N between N 92nd St & N 93rd St	0	0	2	3	0	5
Aurora Ave N between N 93rd St & N 94th St	0	0	0	1	1	2
Aurora Ave N between N 94th St & N 95th St	0	0	0	0	1	1
Aurora Ave N between N 95th St & N 96th S St	0	2	3	3	0	8
Aurora Ave N between N 96th S St & N 96th N St	0	0	0	0	1	1
Aurora Ave N between N 96th N St & N 97th St	0	0	0	3	0	3
Aurora Ave N between N 97th St & N 98th St	0	0	2	2	0	4
Aurora Ave N between N 98th St & N 100th St	0	1	2	4	1	8
Aurora Ave N between N 100th St & N 101st St	0	1	2	10	1	14
Aurora Ave N between N 101st St & N 102nd St	0	0	1	0	0	1
Aurora Ave N between N 102ndth St & N 103rd S St	0	0	2	1	0	3
Aurora Ave N between N 103rd S St & N 103rd N St	0	0	2	0	0	2
Aurora Ave N between N 103rd N St & N 104th St	0	0	0	3	0	3

Table 6-5. Segment 4 Mid-Block Crashes by Severity (2018-2022) (continued)

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N between N 104th St & N 105th St/N Northgate Way	0	0	5	9	1	15
Aurora Ave N between N 105th St/N Northgate Way & N 107th S St	0	2	15	14	1	32
Aurora Ave N between N 107th S St & N 107th N St	1	0	0	4	0	5
Aurora Ave N between N 107th N St & N 109th St	0	0	3	1	0	4
Aurora Ave N between N 109th St & N 112th St	0	1	2	4	0	7
Aurora Ave N between N 112th St & N 115th St	0	0	6	3	0	9
Total Segment Crashes	*2*	*7*	*67*	*94*	*8*	*178*

Two fatal crashes occurred on two different blocks. There were 7 serious injury crashes including 5 pedestrian-involved crashes and 1 bicyclist-involved crash. The block between N 105th Street/N Northgate Way and N 107th S Street experienced the most crashes with 32 (18%), including 2 of the serious injury crashes. About 53% of the mid-block crashes in Segment 4 were property damage only crashes. Figure 6-18 displays fatal and serious injury collisions on Segment 4 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-17. Segment 4 Total Collisions

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King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-18. Segment 4 Fatal and Serious Injury Collisions

Seattle Department of Transportation

King County METRO

6.5.2 Crashes by Type

In Segment 4, there were 37 pedestrian-involved crashes and 3 bicyclist-involved crashes. Sixteen pedestrian-involved crashes and 1 bicyclist-involved crash occurred mid-block, and 21 pedestrian-involved crashes and two bicyclist-involved crashes occurred at intersections. Table 6-6 summarizes the locations and severities of these non-motorist-involved crashes.

Table 6-6. Segment 4 Non-Motorized Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**2**	**11**	**21**	**3**	**0**	**37**
Aurora Ave N between N 85th St & N 86th St	1	0	2	0	0	3
Aurora Ave N between N 88th N St & N 89th St	0	0	1	0	0	1
Aurora Ave N between N 89th St & N 90th St	0	0	0	1	0	1
Aurora Ave N between N 95th St & N 96th S St	0	2	0	0	0	2
Aurora Ave N between N 96th N St & N 97th St	0	0	0	1	0	1
Aurora Ave N between N 98th St & N 100th St	0	1	0	0	0	1
Aurora Ave N between N 100th St & N 101st St	0	1	1	0	0	2
Aurora Ave N between N 103rd N St & N 104th St	0	0	0	1	0	1
Aurora Ave N between N 105th St/N Northgate Way & N 107th S St	0	1	3	0	0	4
Aurora Ave N & N 85th St	0	2	3	0	0	5
Aurora Ave N & N 90th St	0	0	2	0	0	2
Aurora Ave N & N 91st St	0	0	1	0	0	1
Aurora Ave N & N 95th St	0	0	2	0	0	2
Aurora Ave N & N 96th S St	0	0	1	0	0	1
Aurora Ave N & N 96th N St	0	1	0	0	0	1
Aurora Ave N & N 98th St	1	1	0	0	0	2
Aurora Ave N & N 100th St	0	1	2	0	0	3
Aurora Ave N & N 104th St	0	1	0	0	0	1
Aurora Ave N & N 105th St/N Northgate Way	0	0	3	0	0	3
Bicyclist-Involved Crashes	**0**	**1**	**2**	**0**	**0**	**3**
Aurora Ave N between N105th St/N Northgate Way & N 107th S St	0	1	0	0	0	1
Aurora Ave N & N 85th St	0	0	1	0	0	1
Aurora Ave N & N 97th St	0	0	1	0	0	1
Total Non-Motorized Crashes	*2*	*12*	*23*	*3*	*0*	*40*

Two of the 40 non-motorized crashes were fatal crashes, 12 were serious injury crashes, 23 were other injury crashes, and 3 were no injury crashes. Both fatal crashes involved pedestrians who did not yield the right-of-way to vehicles. Three of the serious injury crashes involved pedestrians under the influence of alcohol, two involved a pedestrian crossing outside of a crosswalk, and three involved a failure to yield the right-of-way to vehicles or obey the traffic control. The remaining serious injury crashes did not provide additional contributing factor information. Four of the injury crashes involved crossing outside of a crosswalk, two involved

non-motorists under the influence of alcohol, and four involved drivers who failed to yield the right-of-way to non-motorists. The remaining crashes did not provide additional contributing factor information. Figure 6-19 displays pedestrian and bicyclist collisions on Segment 4 of Aurora Avenue N.

The other 289 crashes in Segment 4 were all vehicle-only crashes. Table 6-7 summarizes the mid-block and intersection vehicle-only crashes by crash type.

Table 6-7. Segment 4 Motorized Crashes by Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block	68	17	36	1	7	8	24	161
Intersections	14	71	9	0	1	8	25	128
Total Motorized Crashes	*82*	*88*	*45*	*1*	*8*	*16*	*49*	*289*

Mid-block, the most common crash type was rear end (42%) followed by sideswipe crashes (22%). Just under 20% of mid-block crashes were categorized as other or unknown. At intersections, the most common crashes were angle or turning crashes (55%) followed by rear end crashes (11%). Over 25% of intersection crashes were categorized as other or unknown.

6.5.3 Crash Contributing Factors

Table 6-8 summarizes the primary contributing factors for the Segment 4 crashes. Ninety-one crashes (28%) did not have a documented contributing factor and are excluded from the summary.

Table 6-8. Segment 4 Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Segment 4 Crashes
Did not grant right-of-way to vehicle	39	12%
Improper maneuver	33	10%
Distracted	29	9%
Inattention	28	9%
Following too closely	19	6%
Disregard traffic control	12	4%
Fatigued/Ill	12	4%
Alcohol/drug impaired	10	3%
Improper non-motorist behavior	8	2%
Speeding	7	2%
Did not grant right-of-way to non-motorist	4	1%
Operating defective equipment	3	1%
Other (does not include none)	42	13%
Total	*238*	*72%*



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-19. Segment 4 Pedestrian and Bicyclist Collisions

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In Segment 4, failure to grant right-of-way to a vehicle was the most common primary contributing factor (12%) followed by improper maneuver (10%) and distracted and inattention (both with 9%). The "other" contributing factor category collectively accounted for 13% of Segment 4 crashes as well.

6.5.4 Crashes by Time of Day

Figure 6-20 shows the total Segment 4 crashes by time of day, aggregated by the hour of the day.

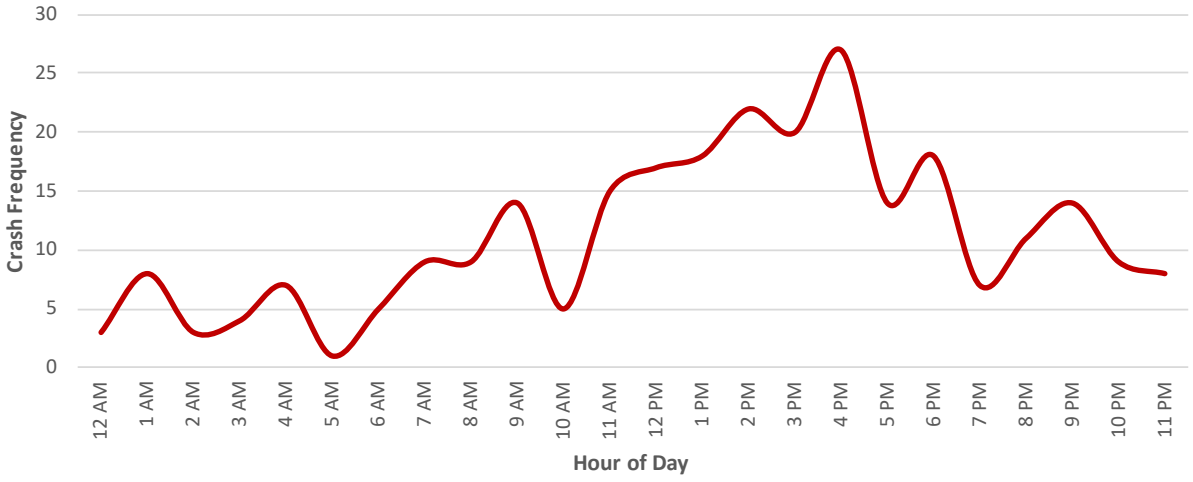


Figure 6-20. Segment 4 Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak, during the 4 PM hour. Crashes generally increase throughout the day from the start of the AM peak period before decreasing again after the peak at 4 PM. Figure 6-21 summarizes the total corridor crashes by lighting condition.

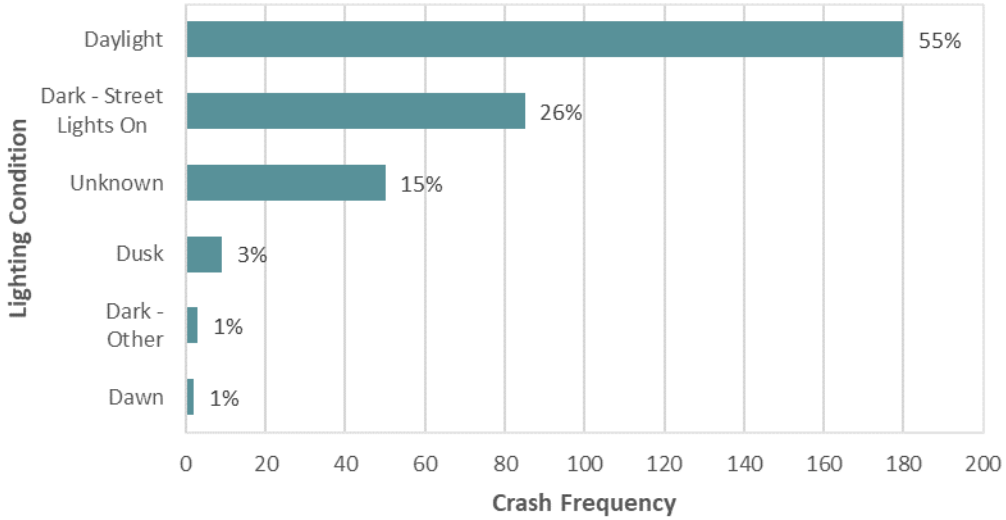


Figure 6-21. Segment 4 Crashes by Lighting Condition (2018-2022)

The majority of corridor crashes (55%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (97% of dark condition crashes).

6.5.5 Segment and Signalized Intersection Crash Rates

Crash rates were calculated for the individual mid-block locations and signalized intersections within Segment 4 and are summarized in Table 6-9 and Table 6-10, respectively.

Table 6-9. Segment 4 Mid-Block Crash Rates (2018-2022)

Mid-Block Location	Length (miles)	ADT (vpd)	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N between N 85th St & N 86th St	0.05	27,300	14	5.62
Aurora Ave N between N 86th St & N 87th St	0.05	27,300	6	2.41
Aurora Ave N between N 87th St & N 88th S St	0.03	27,300	4	2.68
Aurora Ave N between N 88th S St & N 88th N St	0.02	27,300	3	3.01
Aurora Ave N between N 88th N St & N 89th St	0.05	27,300	4	1.61
Aurora Ave N between N 89th St & N 90th St	0.05	27,300	9	3.61
Aurora Ave N between N 90th St & N 91st St	0.05	27,300	7	2.81
Aurora Ave N between N 91st St & N 92nd St	0.05	27,300	4	1.61
Aurora Ave N between N 92nd St & N 93rd St	0.05	27,300	5	2.01
Aurora Ave N between N 93rd St & N 94th St	0.05	27,300	2	0.80
Aurora Ave N between N 94th St & N 95th St	0.05	27,300	1	0.40
Aurora Ave N between N 95th St & N 96th S St	0.05	27,300	8	3.21
Aurora Ave N between N 96th S St & N 96th N St	0.01	27,300	1	2.01
Aurora Ave N between N 96th N St & N 97th St	0.06	27,300	3	1.00
Aurora Ave N between N 97th St & N 98th St	0.06	27,300	4	1.34
Aurora Ave N between N 98th St & N 100th St	0.06	27,300	8	2.68
Aurora Ave N between N 100th St & N 101st St	0.05	27,300	14	5.62
Aurora Ave N between N 101st St & N 102nd St	0.05	27,300	1	0.40
Aurora Ave N between N 102ndth St & N 103rd S St	0.03	27,300	3	2.01
Aurora Ave N between N 103rd S St & N 103rd N St	0.03	27,300	2	1.34
Aurora Ave N between N 103rd N St & N 104th St	0.05	27,300	3	1.20
Aurora Ave N between N 104th St & N 105th St/N Northgate Way	0.05	27,300	15	6.02
Aurora Ave N between N 105th St/N Northgate Way & N 107th S St	0.10	27,300	32	6.42
Aurora Ave N between N 107th S St & N 107th N St	0.02	27,300	5	5.02
Aurora Ave N between N 107th N St & N 109th St	0.08	27,300	4	1.00
Aurora Ave N between N 109th St & N 112th St	0.14	27,300	7	1.00
Aurora Ave N between N 112th St & N 115th St	0.15	27,300	9	1.20

The blocks with the highest crash rates in Segment 4 include between N 104th Street and N 105th Street/N Northgate Way (6.42 crashes/MVMT), between N 104th Street and N 105th Street/N Northgate Way (6.02 crashes/MVMT), between N 85th Street and N 86th Street and

between N 100th Street and N 101st Street (5.62 crashes/MVMT each), and between N 107th S Street and N 107th N Street (5.02 crashes/MVMT). All other blocks in Segment 4 have a crash rate less than 5 crashes/MVMT. The average mid-block crash rate for Segment 4 is 2.52 crashes/MVMT.

Table 6-10. Segment 4 Signalized Intersection Crash Rates (2018-2022)

Intersection	Total Entering Vehicles (vpd)	Total Crashes	Crash Rate (Crashes/MEV)
Aurora Ave N & N 85th St	37,650	21	0.31
Aurora Ave N & N 90th St	26,250	10	0.21
Aurora Ave N & N 95th St	23,050	11	0.26
Aurora Ave N & N 100th St	23,450	6	0.13
Aurora Ave N & N 105th St/N Northgate Way	25,200	38	0.53
Aurora Ave N & N 112th St	39,550	1	0.02

The intersection with the highest crash rate in Segment 4 is Aurora Avenue N and N105th Street/N Northgate Way (0.53 crashes/MEV. All of the other signalized intersections in Segment 4 have a crash rate less than 0.31 crashes/MVMT. The average intersection crash rate for Segment 4 is 0.24 crashes/MVMT.

6.6 Transit

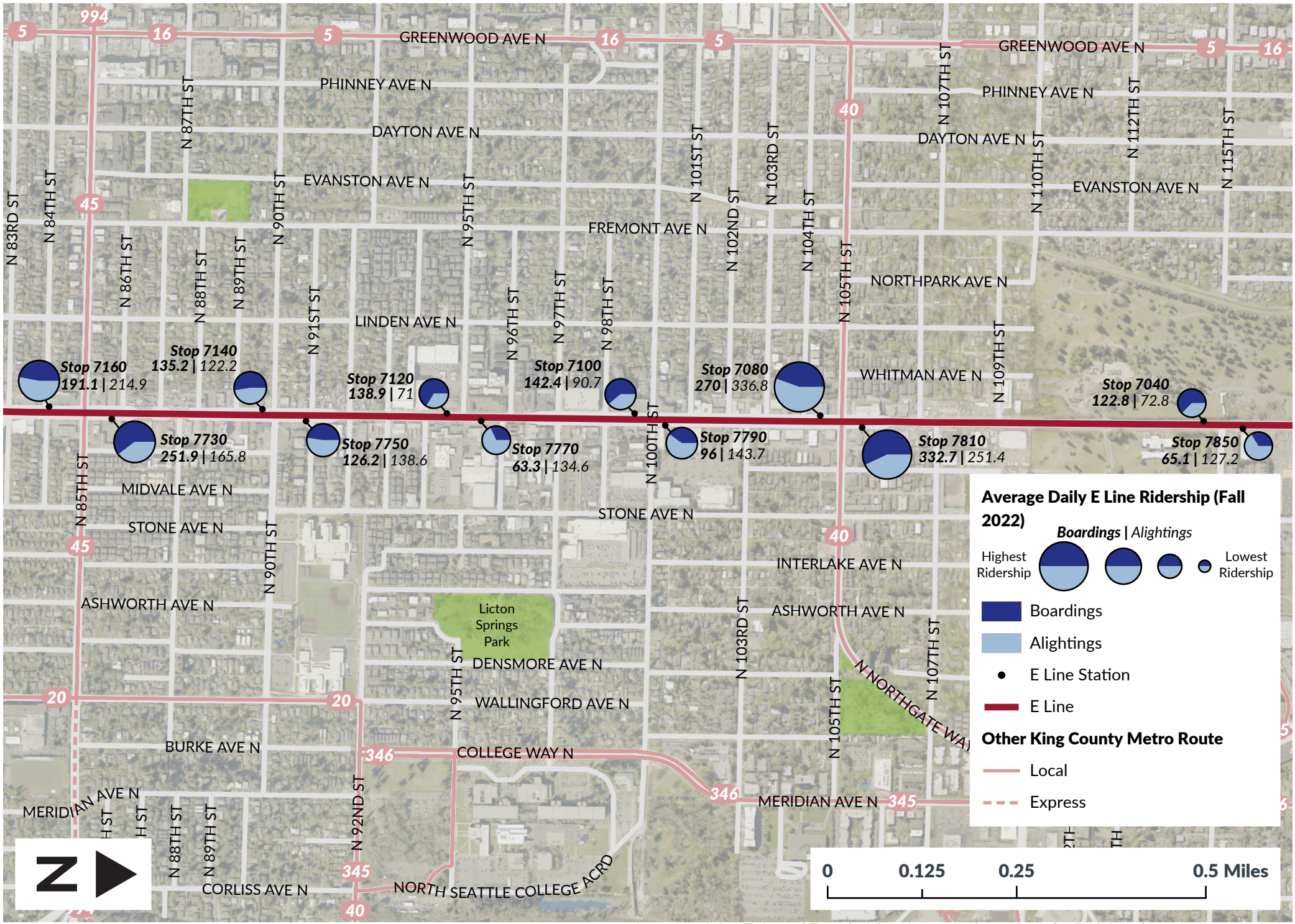
Bus lines that currently travel on Aurora Avenue N within Segment 4 include the E Line (RapidRide). Route 40 (frequent all-day route) crosses Aurora Avenue N at N 105th Street/N Northgate Way.

The E Line has six stations within Segment 4. In fall 2022, average daily boardings at these stations ranged from 63 to 332 riders and average daily alightings ranged from 71 to 336 riders. The southbound stop in between N 104th Street and N 105th Street/N Northgate Way (Stop ID 7080) has the highest level of overall activity within Segment 4. Route 40 intersects Aurora Avenue N at N 105th Street/N Northgate Way and may contribute to higher boardings and alightings at stations around the intersection.

Figure 6-22 displays average daily E Line ridership and transit lines that travel on or intersect with Aurora Avenue N in Segment 4.

Nine out of eleven stations within Segment 4 are equipped with at least 1 shelter; 2 stations have no shelters. No layover or comfort stations are located in Segment 4.

Figure 6-23 shows passenger amenities at transit stops along Segment 4 of Aurora Avenue N.

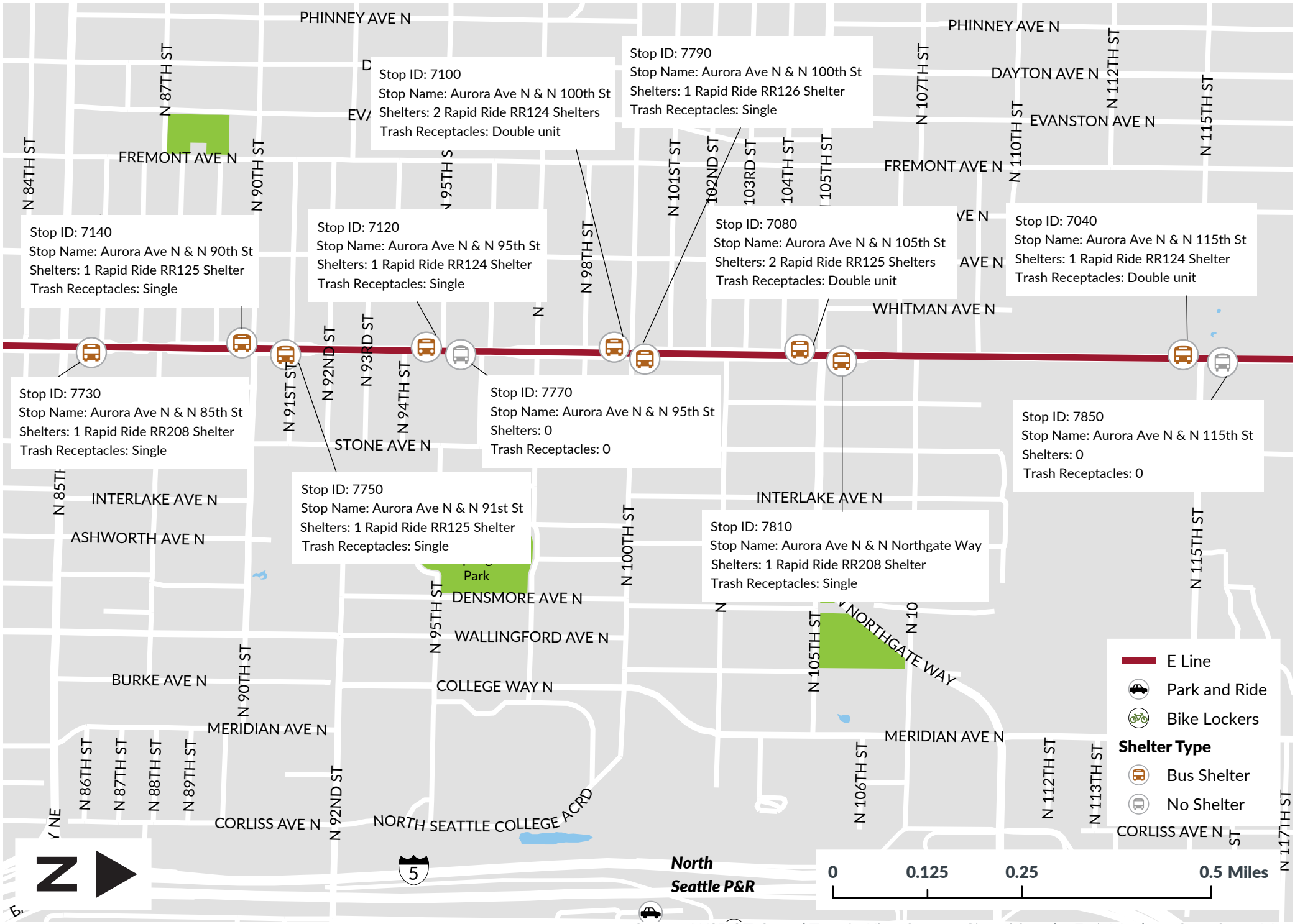


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-22. Segment 4 Average Daily E Line Ridership

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-23. Segment 4 Passenger Amenities

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King County METRO

6.6.1 Transit travel time

Six TSP systems exist in Segment 4. They are located at N 90th Street, N 95th Street, N 100th Street, N 105th Street/N Northgate Way, approximately N 112th Street, and N 115th Street. Figure 6-24 depicts TSP systems on Segment 4 of Aurora Avenue N.

Average transit travel speeds vary within Segment 4 of Aurora Avenue N. Table 6-11 and Table 6-12 display the various average transit speeds within Segment 4 during the AM and PM hours, respectively. Figure 6-25and Figure 6-26 display transit travel speeds in Segment 4 in the AM and PM peak periods, respectively. Transit travel speeds do not include dwell time at stops.

Table 6-11 Segment 4 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 85th Street – N 90th/91st Street	21 – 30 mph	0 – 20 mph
N 90th/91st Street – N 95th Street	21 – 30 mph	21 – 30 mph
N 95th Street – N 100th Street	21 – 30 mph	21 – 30 mph
N 100th Street – N 105th Street/N Northgate Way	0 – 20 mph	21 – 30 mph
N 105th Street/N Northgate Way – N 115th Street	21 – 30 mph	0 – 20 mph

Table 6-12 Segment 4 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 85th Street – N 90th/91st Street	0 – 20 mph	0 – 20 mph
N 90th/91st Street – N 95th Street	21 – 30 mph	0 – 20 mph
N 95th Street – N 100th Street	21 – 30 mph	21 – 30 mph
N 100th Street – N 105th Street/N Northgate Way	0 – 20 mph	0 – 20 mph
N 105th Street/N Northgate Way – N 115th Street	21 – 30 mph	0 – 20 mph

6.6.2 Bus collisions

Between January 2019 and February 2023, there were twenty-four bus collisions along Aurora Avenue N in Segment 4. All collisions except five were with other non-transit vehicles. One collision with a person riding a bicycle occurred at N 107th Street. The collisions tended to cluster around N 90th Street and N 105th Street/N Northgate Way.

Figure 6-27 displays bus collisions from 2021 and 2022 along Segment 4 of Aurora Avenue N.

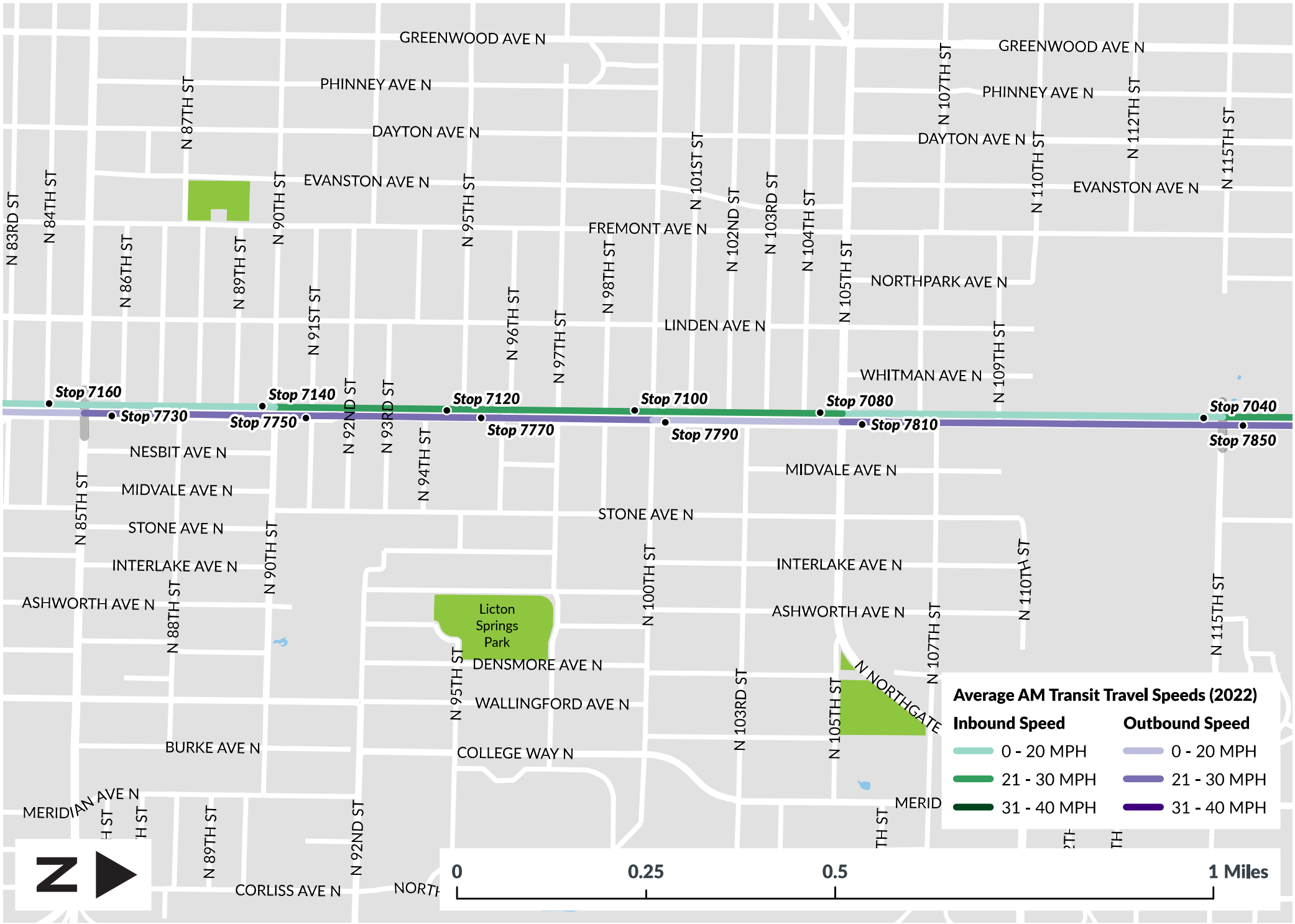


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-24. Segment 4 Transit Signal Priority

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King County METRO

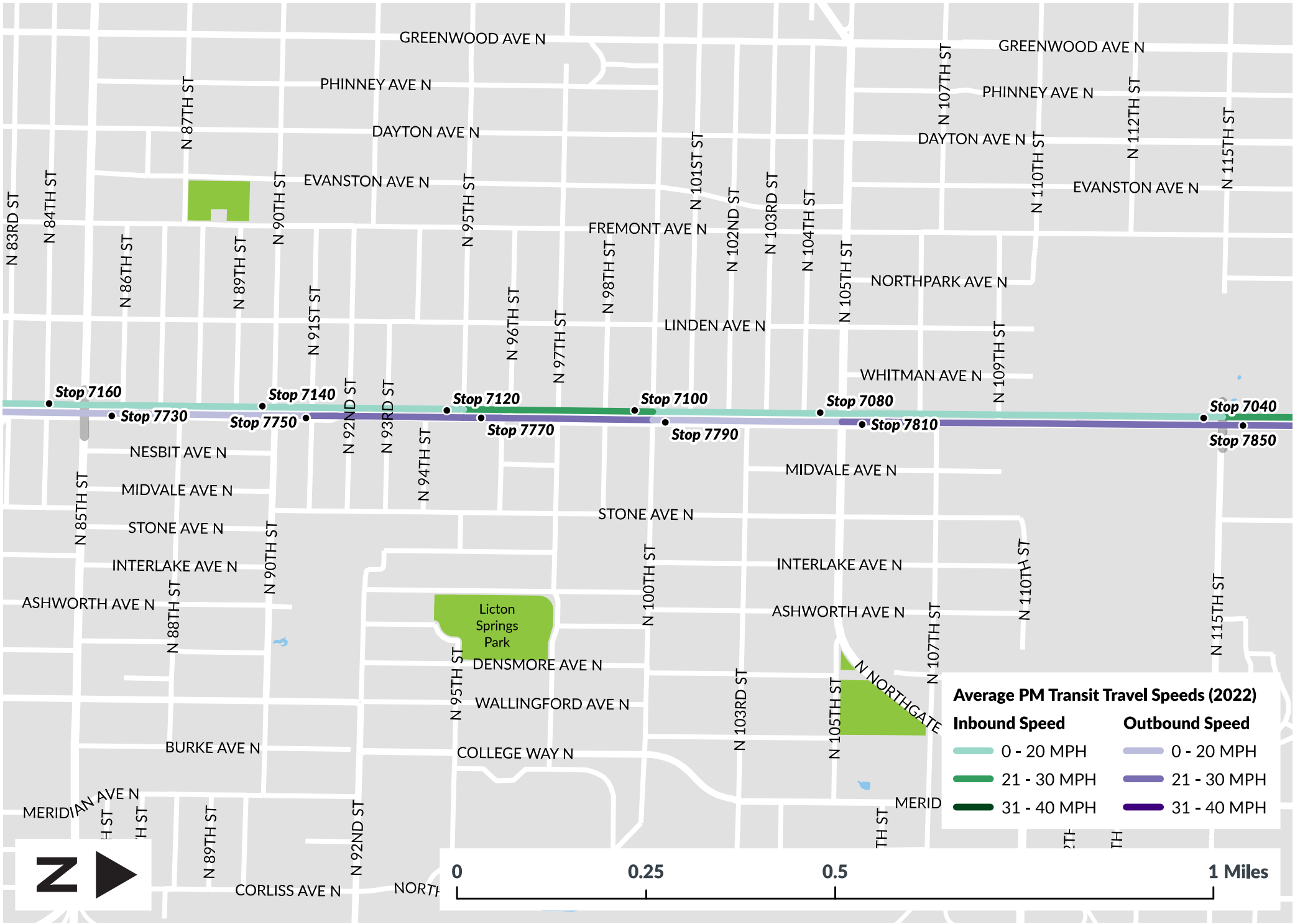


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-25. Segment 4 AM Transit Travel Speeds

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-26. Segment 4 PM Transit Travel Speeds

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-27. Segment 4 Bus Collision Locations

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6.7 Transportation Plans

The PMP's Arterial Priority Investment Network assigned Segment 4 of Aurora Avenue N a score of largely Tier 3 north of N 96th Street and Tier 4 south of N 96th Street. The PMP's Priority Crossings gave Segment 4 of Aurora Avenue N Tier 1 and Tier 2 ratings north of N 94th Street, while the crossings south of N 94th Street received largely Tier 2 and Tier 3 ratings.

Figure 6-28 depicts the PMP's Arterial Priority Investment Network and Priority Crossings along Segment 4 of Aurora Avenue N.

N 90th Street is the only road with planned bicycle facilities to intersect Aurora Avenue N in Segment 4. N 90th Street is scheduled to become a neighborhood greenway west of Aurora Avenue N and to receive painted bike lanes east of Aurora.

Figure 6-29 displays planned bicycle facilities and WSDOT's Bicycle Level of Traffic Stress on Segment 4 of Aurora Avenue N.

6.7.1 In-process, planned, and potential future transportation and infrastructure improvements

Several in-process, planned, and potential future improvements are located along Segment 4 of the Aurora corridor:

- **Active transportation**
    - N 102nd Street Pedestrian Bridge Seismic Retrofit: seismic retrofit improvements of the existing pedestrian bridge over Aurora Avenue N.
    - N 102nd Street Dedicated Pedestrian Space: implementation of a dedicated pedestrian space along N 102nd Street.
    - N 103rd Street Sidewalks: installation of new sidewalks along N 103rd Street.
- **Transit**
    - Transit Zone Improvement – Bus Stop Shelters: installation of bus shelter footings (concrete foundations) at select bus stops. Applicable locations include Aurora Avenue N at N 95th Street.
    - Route 40 Transit-Plus Multimodal Corridor:
        - Implementation of transit speed and reliability improvements along King County Metro Route 40 between Denny Triangle and Northgate. Investments will focus on bus lanes, channelization and signal optimization for buses, transit signal priority, and limited stop consolidation. Where transit improvements are implemented, access to transit and improved safety will be supported within financial constraints.
        - Relocation of eastbound bus stop on Aurora Avenue N at N 105th Street/N Northgate Way to increase bus zone length and provide new amenities.

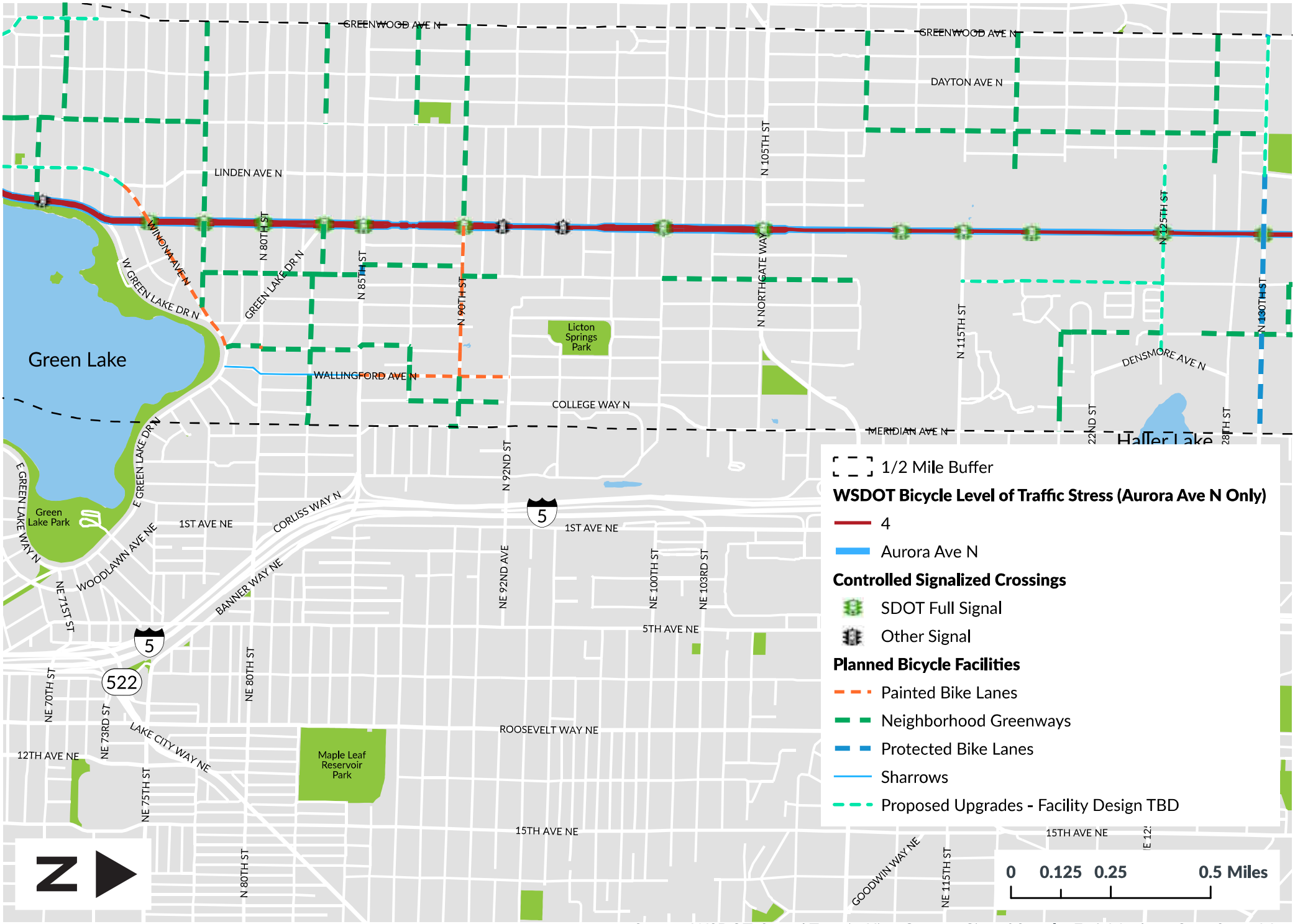


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-28. Segment 4 Pedestrian Master Plan Corridor Designation

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-29. Segment 4 Planned Bicycle Facilities

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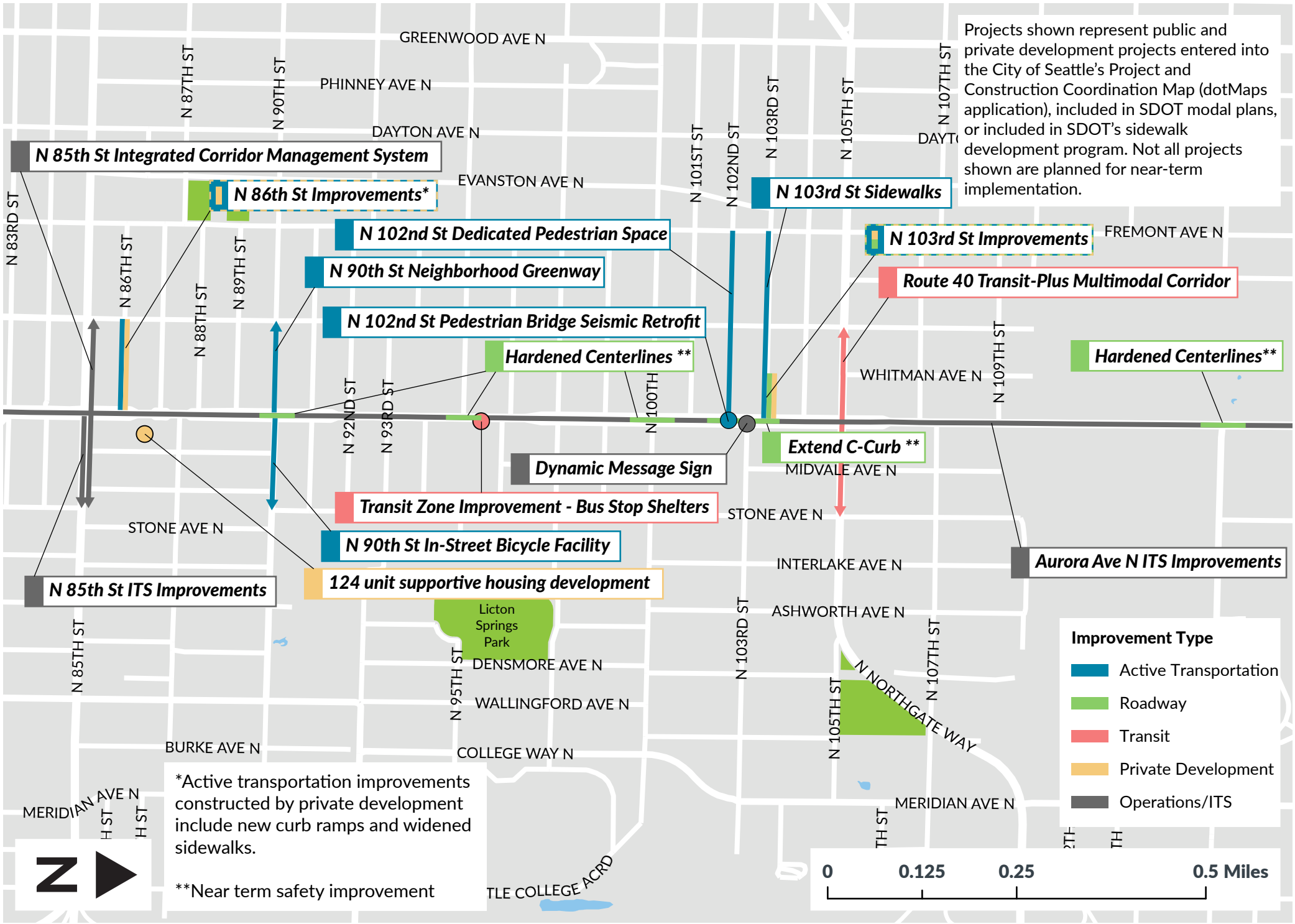
- **Private development**
    - N 103rd Street Improvements: improvement of N 103rd Street with new curb, sidewalk, landscape strip, utility restoration, and street trees. Corresponds with a private development project along N 103rd Street.
- **Operations/ITS**
    - Aurora Avenue N ITS Improvements: modifications to signal timing on northbound Aurora Avenue N to improve freight traffic during the morning peak period.
    - Dynamic Message Sign: implementation of integrated corridor management by installation of dynamic message signs ahead of major connections between I-5, SR 99 and SR 522 that would provide the opportunity for freight to avoid congestion on a given facility when it is present.
- **Near Term Spot Safety Improvements**
    - SDOT is planning a series of near term improvements intended to improve safety for active transportation users. Near term safety improvements planned in Segment 4 are shown in Table 6-13.

Table 6-13. Near Term Safety Improvements Planned in Segment 4

Location	Improvement Type	Project Elements
N 112th Street	Hardened centerlines	Hardened centerline
N 103rd Street	Extend C-curb to prohibit left turns (right in/right out for 103rd Street)	New c-curb
N 100th Street	Hardened centerlines	Hardened centerline
N 95th Street	Hardened centerlines	Hardened centerline
N 90th Street	Hardened centerlines	Hardened centerline

Figure 6-30 displays in-process, planned, and potential future transportation and infrastructure improvements along Segment 4 of the Aurora corridor.[4]

[4] Projects shown represent public and private development projects entered into the City of Seattle's Project and Construction Coordination Map (dotmaps application), included in SDOT modal plans, or included in SDOT's sidewalk development program. Not all projects shown are planned for near-term implementation.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-30. Segment 4 In-Process, Planned, and Future Improvements

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6.8 Land Use

6.8.1 Land Use

While Segment 4 of Aurora Avenue N falls within the high-density, mixed-use Aurora-Licton Springs Residential Urban Village, existing commercial uses lying directly along the roadway are auto-oriented, with structures separated from the sidewalk edge by surface parking lots. Within one block of the Aurora Avenue N corridor to the east and west lie primarily moderate- and low-density residential areas contained within the urban village. Few structures are present along the far northern portion of Segment 4 as the Aurora Avenue N corridor traverses Evergreen Washelli Cemetery.

Planned land uses from the Future Land Use 2035 map along Segment 4 of Aurora Avenue N include exclusively Commercial/Mixed Use Areas from N 110th Street to N 115th Street.

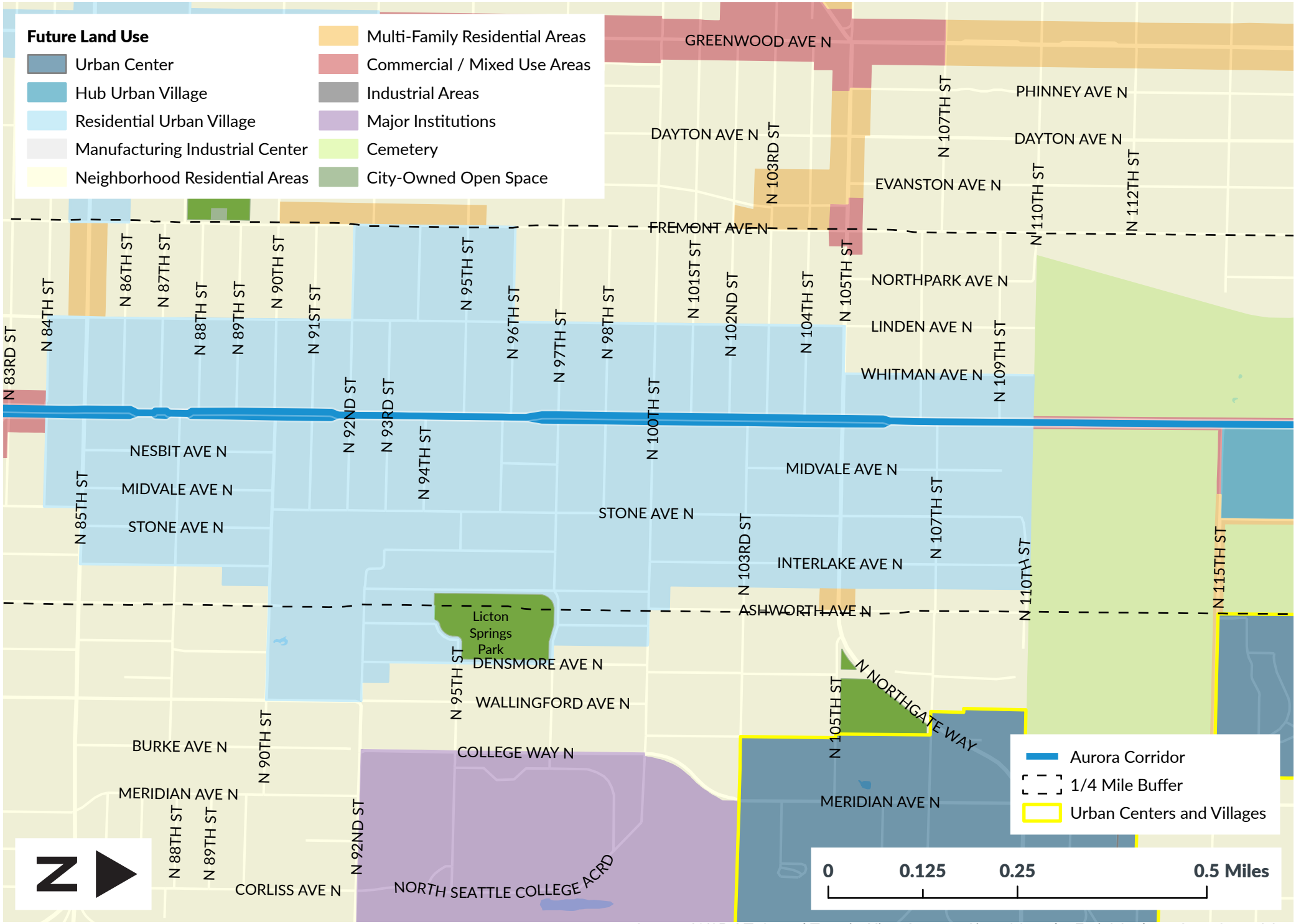
Urban villages are designated in one location along Aurora Avenue N in Segment 4. The Residential Urban Village designation is applied from N 85th Street to N 110th Street.

Figure 6-31 illustrates future land use and Urban Village designations along Segment 4 of Aurora Avenue N.

6.8.2 Zoning

Zoning along Aurora Avenue N in Segment 4 is exclusively mixed use. Segment 4 is exclusively zoned Neighborhood Commercial 3. Zoning in neighborhoods near Aurora Avenue N in Segment 4 is primarily low density residential. A Major Institutional Overlay for North Seattle College exists several blocks to the east of Aurora Avenue N.

Figure 6-32 displays existing zoning along Segment 4 of Aurora Avenue N.

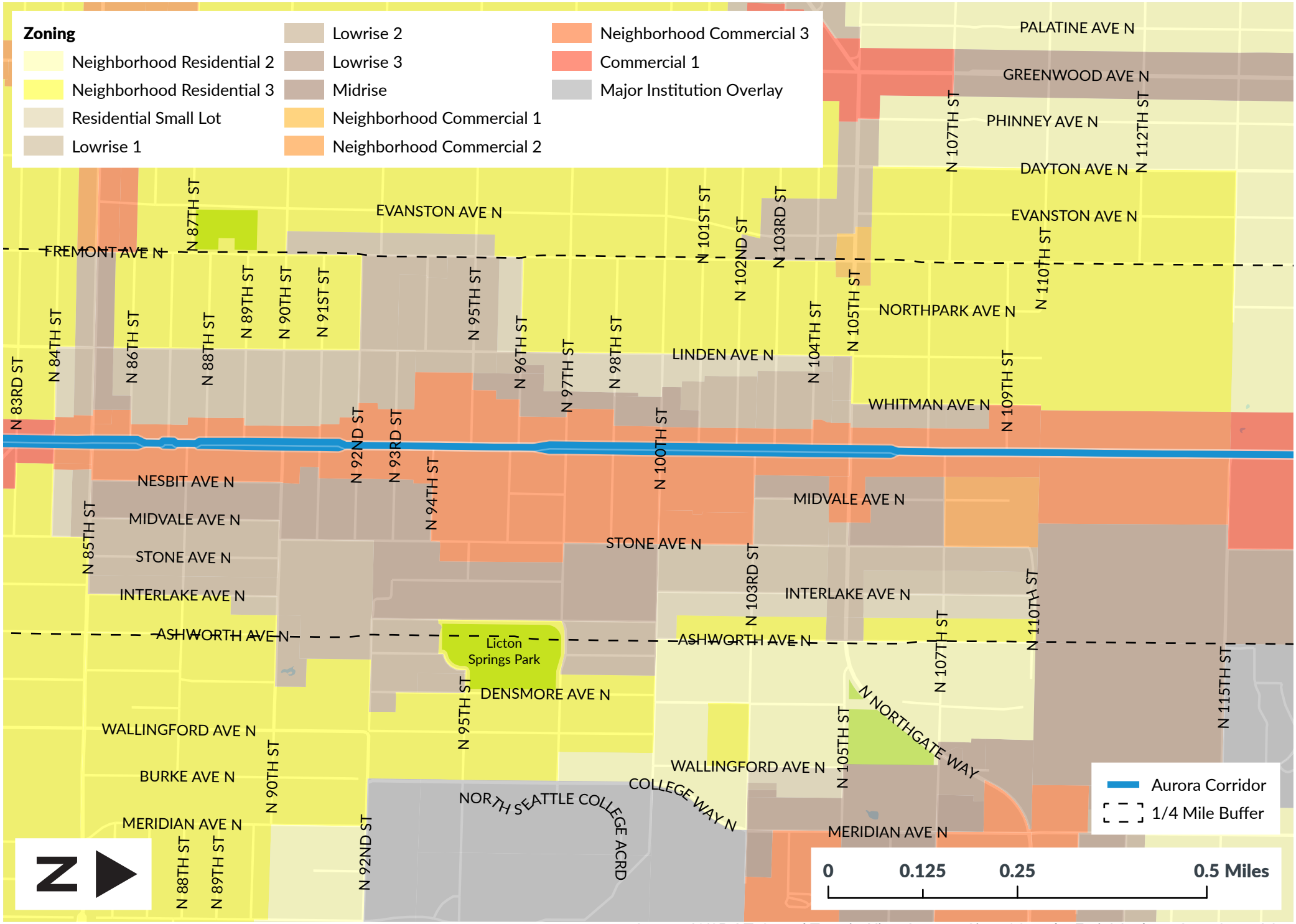


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-31. Segment 4 Land Use

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-32. Segment 4 Zoning

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6.9 Underground Utilities

6.9.1 Water

Existing water lines in Segment 4 run along both sides of Aurora Avenue N from N 85th Street to N 110th Street. Water lines run on only Aurora's east side from N 110th Street to N 115th Street. Water lines branch from Aurora Avenue N at a perpendicular angle at intervals roughly corresponding to the existing street grid. A short portion of water line just north of N 85th Street has been abandoned.

Figure 6-33 illustrates existing, new, and abandoned water lines on Segment 4 of Aurora Avenue N.

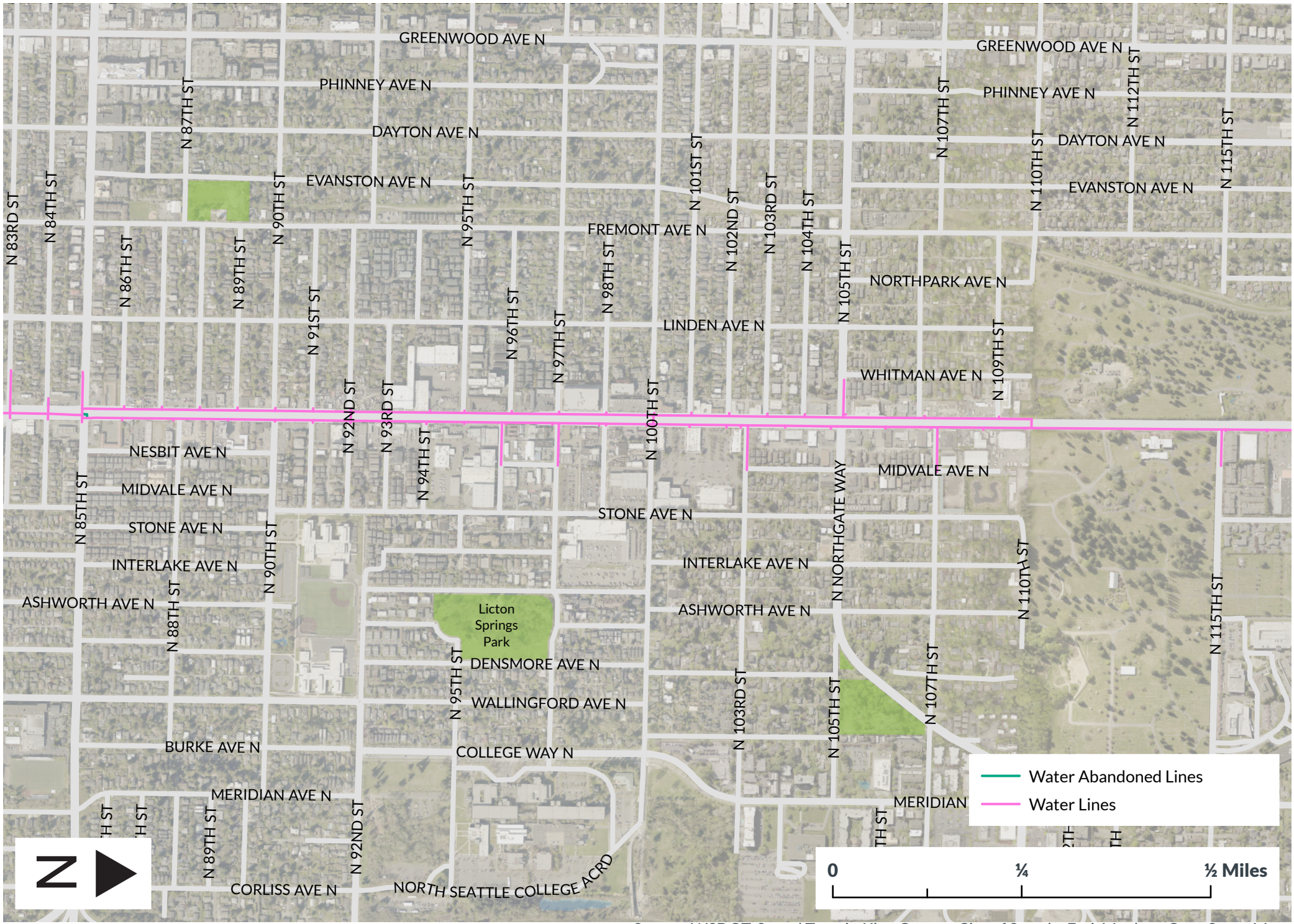
6.9.2 Sewer and Drainage

Sewer facilities are present along nearly all of Segment 4. Sewer mainlines largely alternate between the west and east side of Aurora Avenue N. Drainage mainlines are present on both sides of Aurora Avenue N in between N 90th Street and N 93rd Street, with a sewer mainline close to the western curb line. Mainline endpoints are spaced at approximately one per block but are spaced more infrequently north of N 100th Street. There are no sewer mainlines from N 93rd Street to N 115th Street. A ditch and culvert drainage system sitting in/under the curb line handles drainage mainline duties north of N 100th Street. The ditch and culvert drainage system is present on both sides of Aurora Avenue N in some locations and only on one side in other locations. Side sewers branch east and west from the mainlines at regular intervals but are present less frequently than in Segments 1 – 3.

Sewer and drainage infrastructure in Segment 4 are separated systems, with wastewater conveyed in sewer mains and stormwater conveyed in storm drains and culverts. Portions of Aurora Avenue N in Segment 4 contribute to sewer capacity risk areas, and are in and contribute to a drainage capacity risk areas, as identified in SPU's Wastewater System Analysis (2020) and Drainage System Analysis (2019).

This segment is part of SPU's current system layout analysis for Aurora Avenue N. As conveyance is improved on Aurora Avenue N, it will likely increase peak flows to the downstream system, necessitating a new or improved connection between Aurora Avenue N and the existing outfall at Green Lake.

Figure 6-34 depicts sewage systems along Segment 4 of Aurora Avenue N.

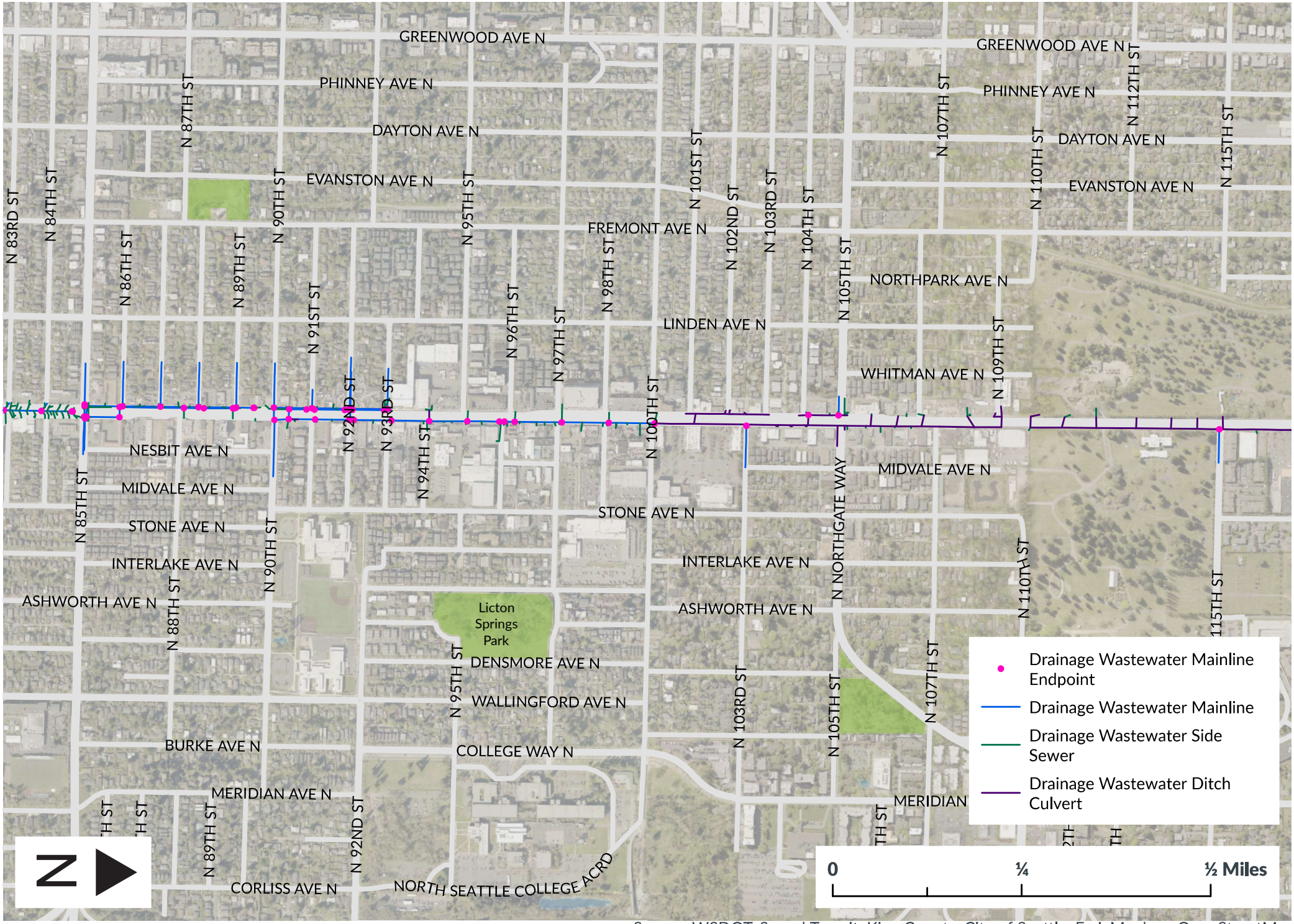


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-33. Segment 4 Utilities: Water

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 6-34. Segment 4 Utilities: Drainage Wastewater

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6.10 Key Takeaways

- Segment 4 falls within the high-density, mixed-use Aurora-Licton Springs Residential Urban Village, however existing commercial uses lying directly along the roadway are auto-oriented, with structures separated from the sidewalk edge by surface parking lots.
- The junction of Aurora Avenue N and N 105th Street/N Northgate Way represents a high-ridership transfer point between the E Line and Route 40.
- Sidewalk gaps are present along the west side of Aurora Avenue N adjacent to Evergreen Washelli Cemetery.
- Limited controlled crossing opportunities are present in in Segment 4, which reflect lower land use densities that characterize this portion of the corridor. These limited opportunities for bicyclists and pedestrians to cross Aurora Avenue N contribute to the high number of pedestrian-vehicle crashes outside of marked crossings.
- The character of the roadway and surrounding development patterns lend to an urban highway-like feel with speeds regularly reaching over 10 mph higher than the posted limit of 30-35 mph.
- People walking or biking were involved in over 85% of all fatal and serious injury crashes within Segment 4.
- Not granting right-of-way to vehicles, improper driver maneuvers, and distractions represent key factors contributing to collisions.

7. Segment 5

7.1 Segment Description

Segment 5 of Aurora Avenue N is approximately 1.5 miles long, extending from N 115th Street in the south to N 145th Street in the north and is at-grade for its entire length. There are discontinuous sidewalks along the segment. Signalized, marked crosswalks are located at five intersections along the segment. At the N 130th Street intersection, there is a pedestrian bridge that provides an above-grade crossing with stairs and no ramp. The length of Segment 5 is zoned as a hub urban center, neighborhood residential areas, cemetery, and some multi-family residential and commercial/mixed use areas. There are many big box stores and car dealerships along Segment 5. The overall lack of continuous pedestrian and bicyclist facilities make for a car-centric environment. Table 7-1 summarizes key characteristics of Segment 5.

Table 7-1. Segment 5 At a Glance

Segment Extents	N 115th Street to N 145th Street
Segment Length	1.5 miles
Annual Average Daily Traffic	31,300
Measured 85th Percentile Traffic Speeds	40 mph (posted speed limit: 35 mph)
Average Distance Between Pedestrian Crossings	1,560 feet
Crashes Per Mile (2018-2022)	363
Crashes Involving Vulnerable Users (2018-2022)	43
Bus Routes Serving the Segment	E Line, 304, 345
Bus Stops	8
Total Average Daily E Line Boardings/Alightings in Segment 5	Boardings: 1,507/Alightings: 1,400

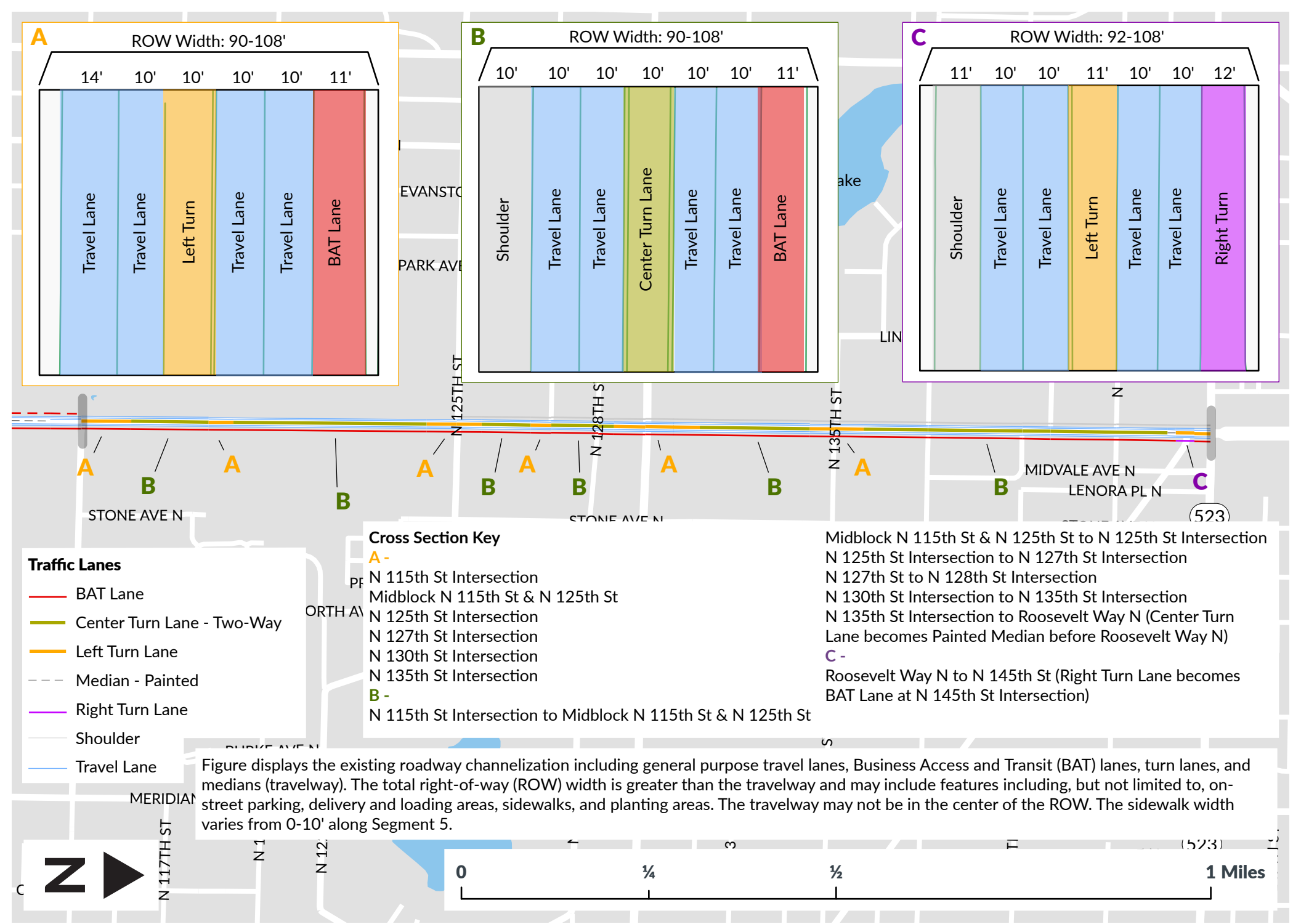
7.2 Roadway Characteristics

Segment 5 is six lanes with a shoulder for most of the segment. The ROW in Segment 5 ranges from 90 to 108 feet in width. This includes four general purpose lanes and a northbound 24/7 BAT lane for the entirety of the segment and a left turn lane or center turn lane intermittently. A painted center turn lane exists along much of the segment, occasionally transitioning to a c-curb to provide room for a dedicated left turn lane.

Figure 7-1 illustrates travel lane characteristics, existing medians, access management, and ROW width on Segment 5 of Aurora Avenue N.

Aurora Avenue N is classified entirely as a Principal Arterial in Segment 5. Principal arterials that intersect with Aurora Avenue N include N 130th Street and N 145th Street. Figure 7-2 illustrates the roadway network surrounding Aurora Avenue N in Segment 5.

On-street parking is not permitted along the east side of Aurora Avenue N from N 115th Street to N 145th Street nor on the west side from N 115th Street to N 125th Street. There are no restrictions on parking on the west side of Aurora from N 125th Street to N 145th Street. Figure 7-3 illustrates peak hour parking restrictions.

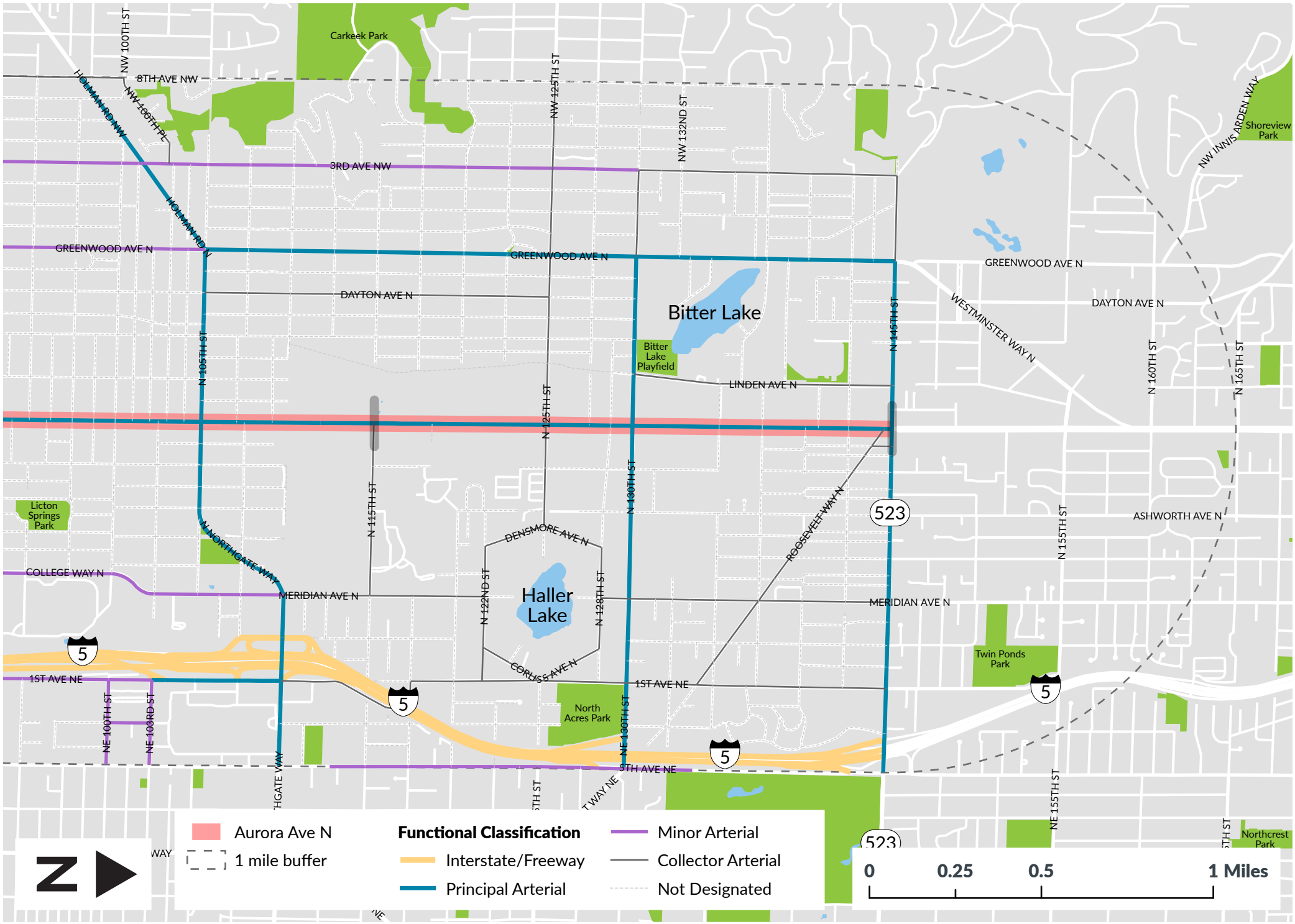


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-1. Segment 5 Channelization and Cross Sections

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-2. Segment 5 Functional Classification

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-3. Segment 5 Existing Peak Hour Parking Restrictions

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7.3 Traffic Operations

7.3.1 Traffic Volumes

Based on March 2023 traffic counts, the ADT volumes in Segment 5 are 29,700 vehicles, with 15,100 vehicles in the northbound direction and 14,600 vehicles in the southbound direction. The AWDT volumes in Segment 5 are 31,200 vehicles, with 15,800 vehicles in the northbound direction and 15,400 vehicles in the southbound direction. A profile of the AWDT volumes by 15-minute intervals are shown in Figure 7-4 below for Segment 5. The southbound traffic volumes increase more quickly in the morning and then continue to remain relatively stable into the afternoon. The northbound traffic volumes increase steadily throughout the day and are substantially higher than the southbound volumes during the afternoon and evening. Figure 7-5 illustrates the average daily volumes in the Segment 5 extent of Aurora Avenue N.

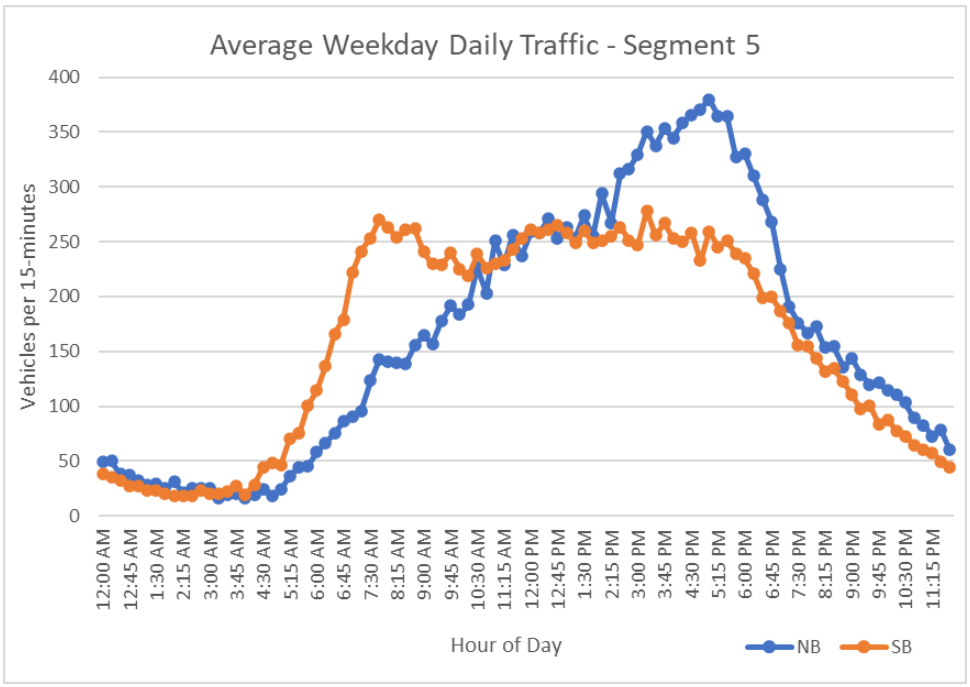


Figure 7-4. Segment 5 Average Weekday Daily Traffic by Hour of Day

Turning movement counts of the study intersections in Segment 5 were collected in March 2023. The Aurora Avenue N and N 130th Street intersection has the highest vehicular entering volumes during the AM peak with approximately 3,000 vehicles; the Aurora Avenue N and N 145th Street has the highest entering volumes during the PM peak with about 4,100 vehicles. Figure 7-6 summarizes the TMCs for the study intersections in Segment 5 of the project.

7.3.2 Freight Network and Vehicle Volumes

As shown in Figure 7-6, the heavy vehicle percentage in the northbound direction ranges from 5% to 9% during the AM peak period and 3% to 4% during the PM peak period; the southbound heavy vehicle percentage ranges from 5% to 9% during the AM peak period and 2% to 5% during the PM peak period. Figure 7-7 displays the freight network in Segment 5.

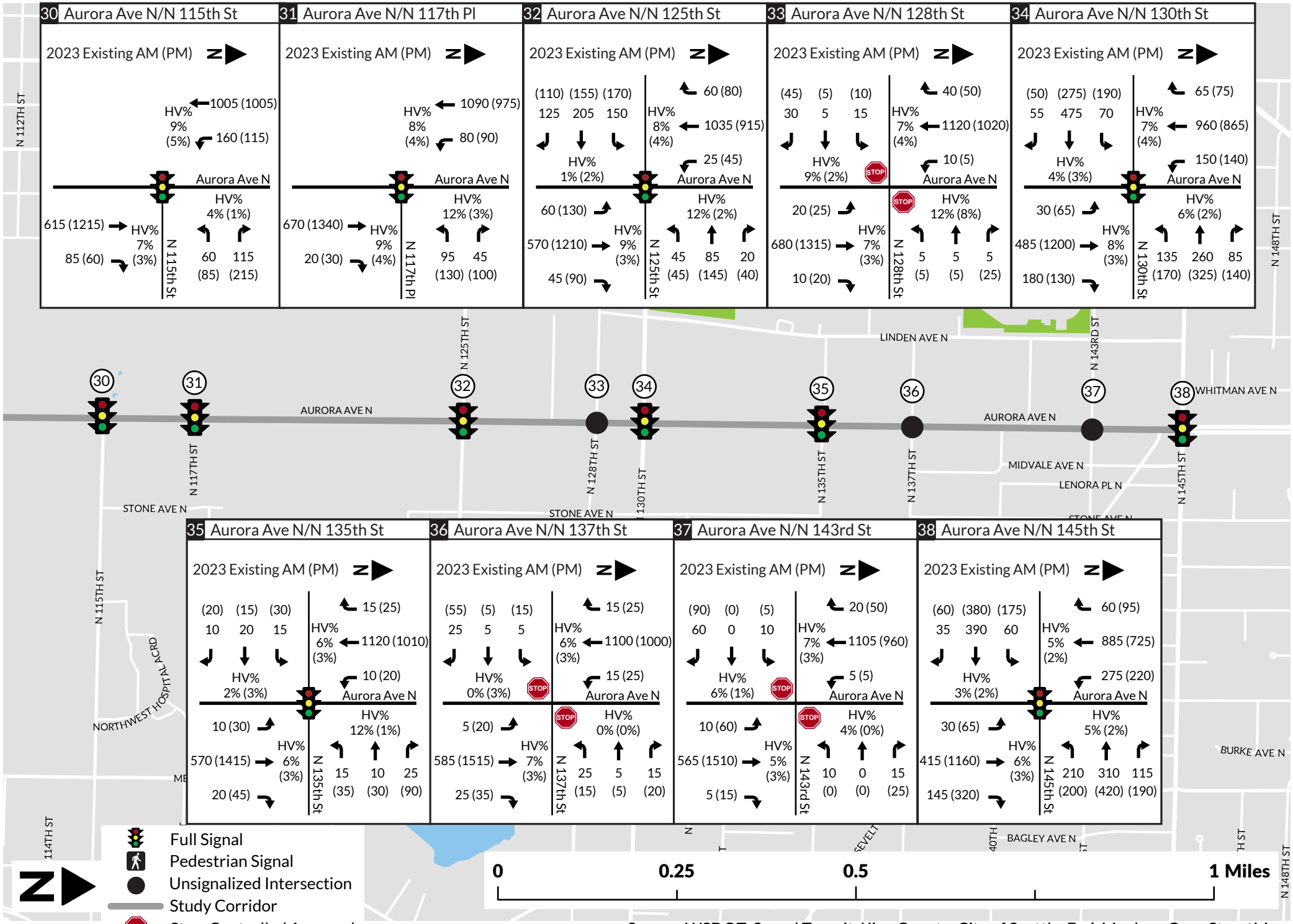


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-5. Segment 5 Average Annual Daily Traffic (AADT)

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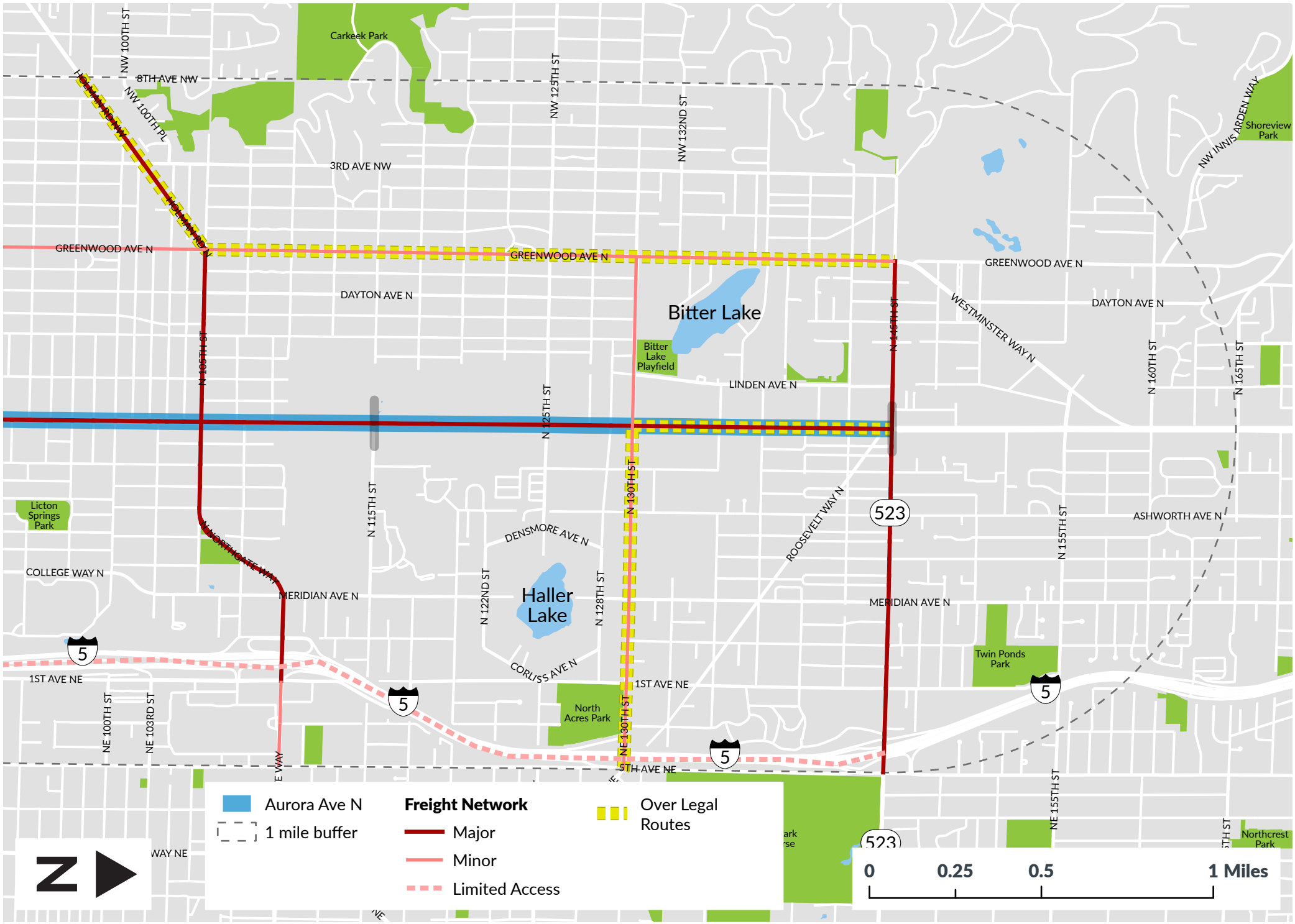


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-6. Segment 5 Traffic Volumes

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-7. Segment 5 Freight Network

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7.3.3 Measured 85th Percentile Traffic Speeds

The posted speed limit is 35 mph between N 115th Street and N 145th Street in both the northbound and southbound directions. The 85th percentile speeds measured from 24-hour tube counts collected in March 2023 are 40 mph in both the northbound and southbound directions within Segment 5, 14% above the speed limit. Figure 7-8 shows the 85th percentile northbound and southbound traffic speeds and the posted speed limit of Segment 5.

7.3.4 Vehicle Travel Time

The average travel time traveling northbound is 4.1 minutes during AM peak and 6.0 minutes during the PM peak periods. The average travel time traveling southbound is 4.6 minutes during the AM peak and 5.3 minutes during PM peak periods in Segment 5.

7.3.5 Intersection Operation Metrics

The existing operation metrics of the study intersections in Segment 5 are shown in Table 7-2. The LOS of the overall intersection for signalized intersections are illustrated in Figure 7-9 and approach LOS of the unsignalized intersections are displayed in Figure 7-10.

Table 7-2. Segment 5 Intersection Operation Metrics

Intersection	Traffic Control	AM Peak			PM Peak		
		Delay	LOS	V/C	Delay	LOS	V/C
Aurora Ave N and N 115th St	Full Signal	11.1	B	0.69	15.8	B	0.81
Aurora Ave N and N 117th St	Full Signal	13.2	B	0.76	19.3	B	0.86
Aurora Ave N and N 125th St	Full Signal	61.4	E	1.04	46.6	D	0.86
Aurora Ave N and N 128th St	TWSC	13.3	B	0.03 (WB)	13.1	B	0.07 (WB)
Aurora Ave N and N 130th St	Full Signal	47.3	D	1.03	54.7	D	1.10
Aurora Ave N and N 135th St	Full Signal	15.2	B	0.62	17.0	B	0.72
Aurora Ave N and N 137th St	TWSC	16.5	C	0.10 (EB)	20.7	C	0.15 (WB)
Aurora Ave N and N 143rd St	TWSC	11.5	B	0.04 (WB)	13.9	B	0.01 (SBL)
Aurora Ave N and N 145th St	Full Signal	45.9	D	0.92	59.3	E	1.19

Notes:
SBL – Southbound left

The Aurora Avenue N/N 125th Street intersection operates at a LOS E during the AM peak period. The Aurora Avenue N/N 145th Street intersection operates at a LOS E during the PM peak period. Other study intersections within Segment 5 operate at a LOS D or better during both AM and PM peak periods. The stop-controlled intersections in Segment 5 are reporting results for the stop-controlled movements of the side streets to Aurora Avenue N and do not contribute to queuing or delays for northbound or southbound traffic. Avenue N/N 125th Street receive a V/C ratio greater than 1.0 in the AM peak period, and Aurora Avenue N/N145th Street receive a V/C ratio greater than 1.0 in the PM peak period. Aurora Avenue N/N 130th Street receives a V/C ratio greater than 1.0 during both the AM and PM peak periods in Segment 5.

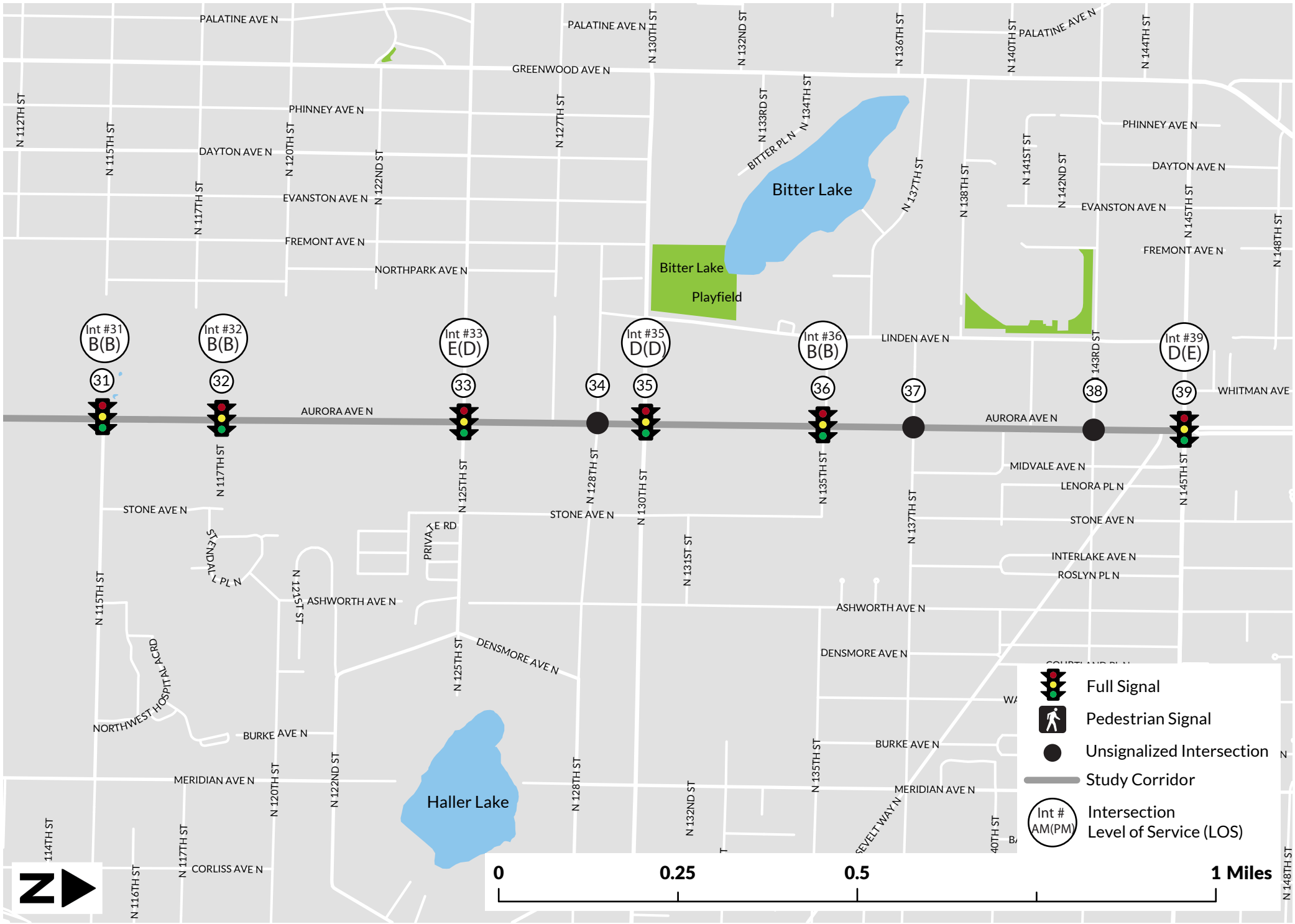


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-8. Segment 5 85th Percentile Speed

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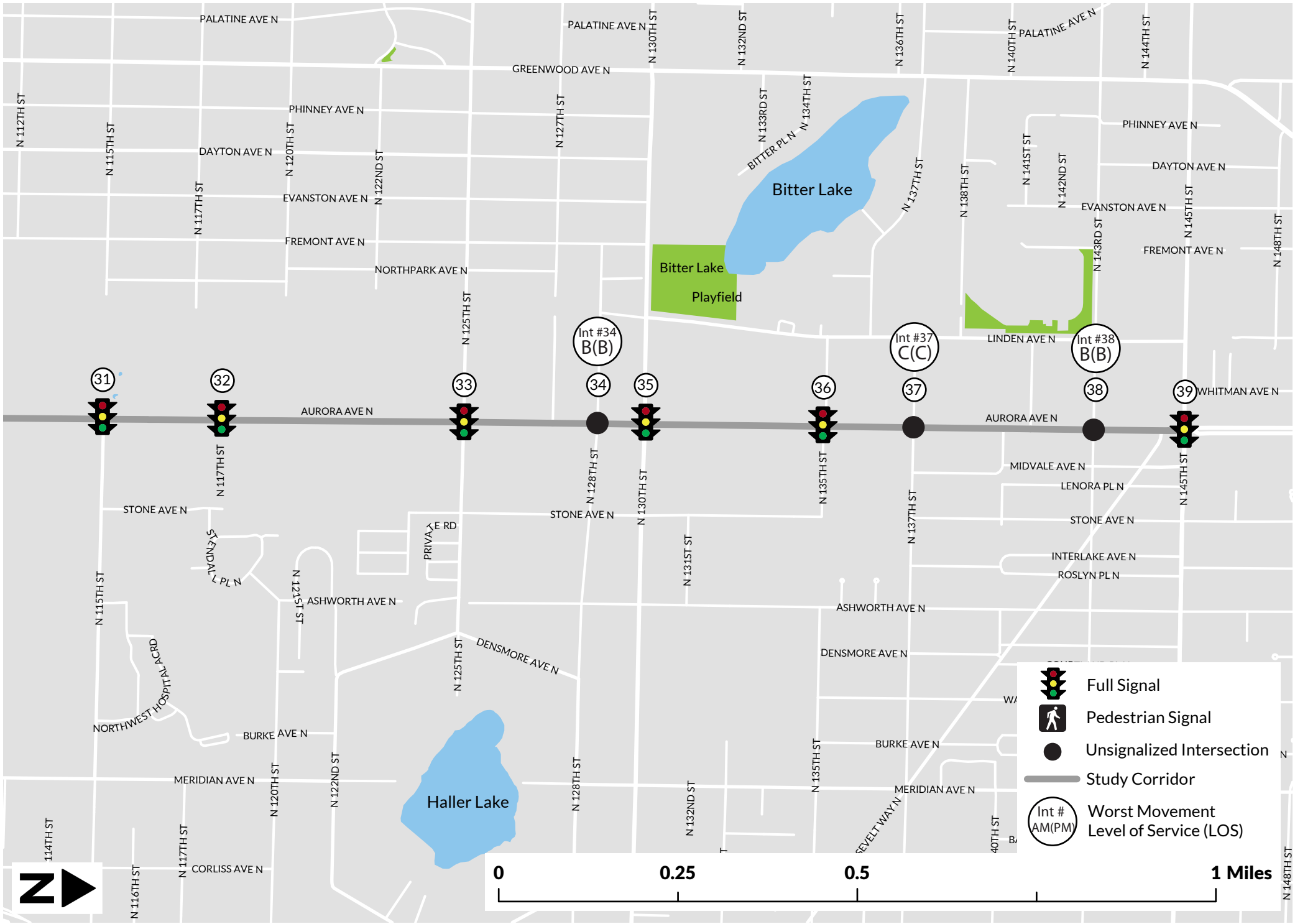


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-9. Segment 5 Signalized Intersection Overall LOS

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-10. Segment 5 Approach LOS for Unsignalized Intersections

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7.4 Nonmotorized Facilities

7.4.1 Pedestrian Facilities

Aurora Avenue N has sidewalks present along approximately 60% of the length of Segment 5. Paved sidewalks are lacking around N 128th Street and north of N 137th Street. When present, sidewalk width are generally 5 – 6 feet. Large blocks of unrecorded sidewalk width intermittently exist north of N 125th Street on both sides of Aurora Avenue N. The WSDOT Pedestrian LTS on Aurora Avenue N is rated "4" for the entirety of Segment 5.

Figure 7-11 illustrates sidewalk width and WSDOT's Pedestrian Level of Traffic Stress along Segment 5 of Aurora Avenue N.

The condition of sidewalks along Aurora Avenue N in Segment 5 is primarily "fair" or "unreported." Stretches of road, particularly north of N 137th Street, are marked "unreported" or lack record of condition.

Figure 7-12 depicts existing sidewalk conditions on Segment 5 of Aurora Avenue N.

Segment 5 contains 6 marked and signalized crosswalks, spaced approximately 5 – 10 blocks apart. A pedestrian bridge is located at N 130th Street.

Figure 7-13 displays at-grade and grade-separated pedestrian crossings in Segment 5 of Aurora Avenue N.

SDOT's Compliant Curb Ramp App revealed ADA-compliant curb ramps to be present at nearly every intersection in Segment 5. N 141st Street lacks any ADA-compliant curb ramps, while Roosevelt Way N at Aurora Avenue N had 2 ADA-compliant curb ramps removed. Accessible pedestrian signals are present at N 130th Street and N 135th Street. The pedestrian bridge at N 130th Street is not ADA accessible.

Figure 7-14 shows accessible pedestrian signals and in-service ADA-compliant curb ramps in Segment 5 of Aurora Avenue N.

The only SDOT street type present on Aurora Avenue N in Segment 5 is Urban Village Main. Total minimum width without frontage required for this street type according to Streets Illustrated is 12 feet. Sidewalk facilities along Aurora Avenue N are compliant with SDOT's standards for approximately 25% of Segment 5. The west side of Aurora Avenue N possesses more stretches in compliance; these are located between approximately N 117th Street/N 125th Street and N 130th Street/N 135th Street.

Figure 7-15 depicts existing sidewalks' consistency with SDOT's minimum sidewalk standards for roadways in Segment 5 of Aurora Avenue N.

7.4.2 Bicycle Facilities

No bicycle facilities currently exist on Aurora Avenue N in Segment 5. N 125th Street is the only street with existing bicycle facilities that intersects Aurora Avenue N along Segment 5. It contains painted bike lanes east of Aurora Avenue N and sharrows west of Aurora. WSDOT ranks the Bicycle LTS along the entirety of Aurora Avenue N's Segment 5 as "4."

Figure 7-16 illustrates the presence of bicycle facilities in the Segment 5 extent of Aurora Avenue N.

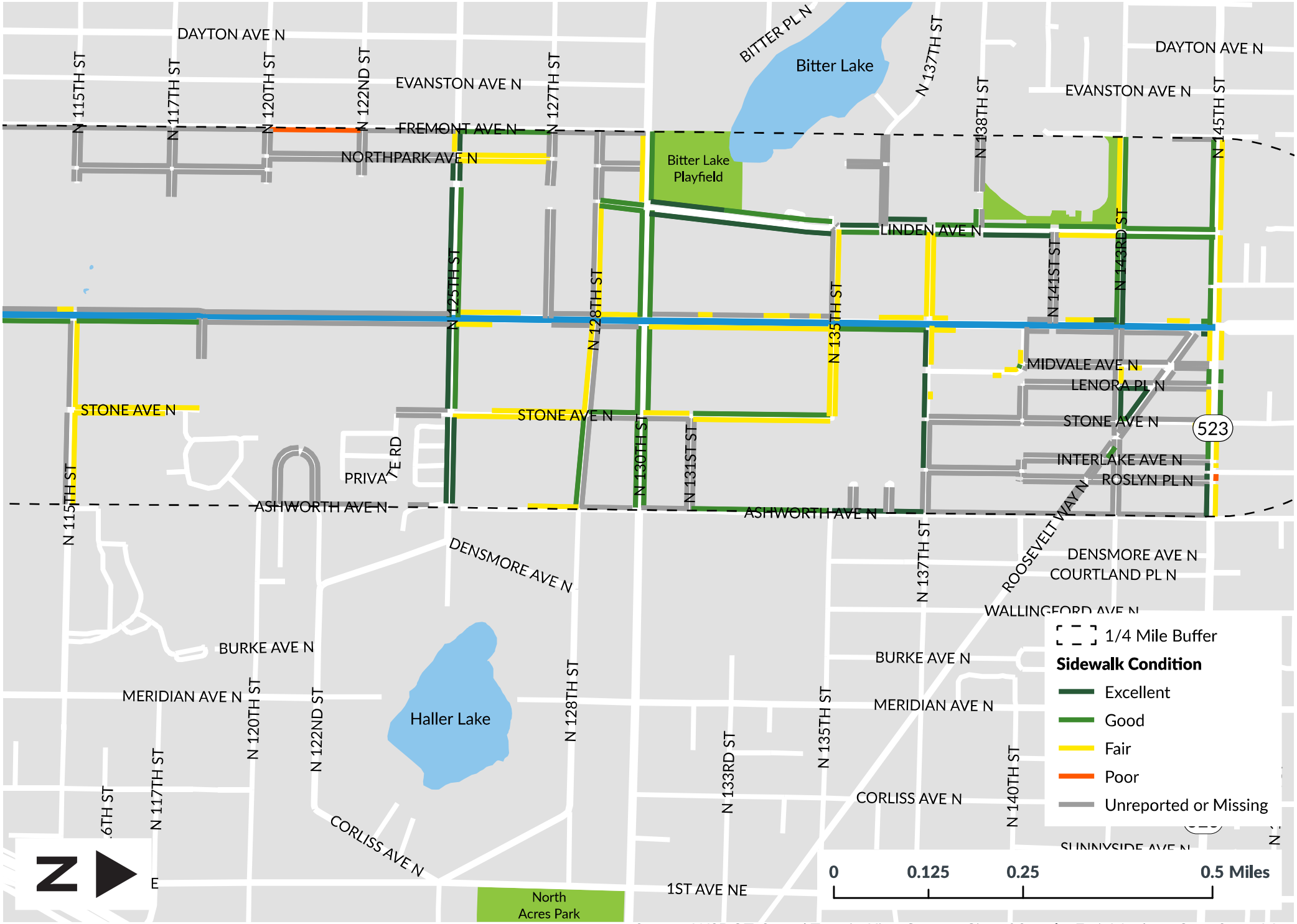


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-11. Segment 5 Sidewalk Consistency with WSDOT Standards

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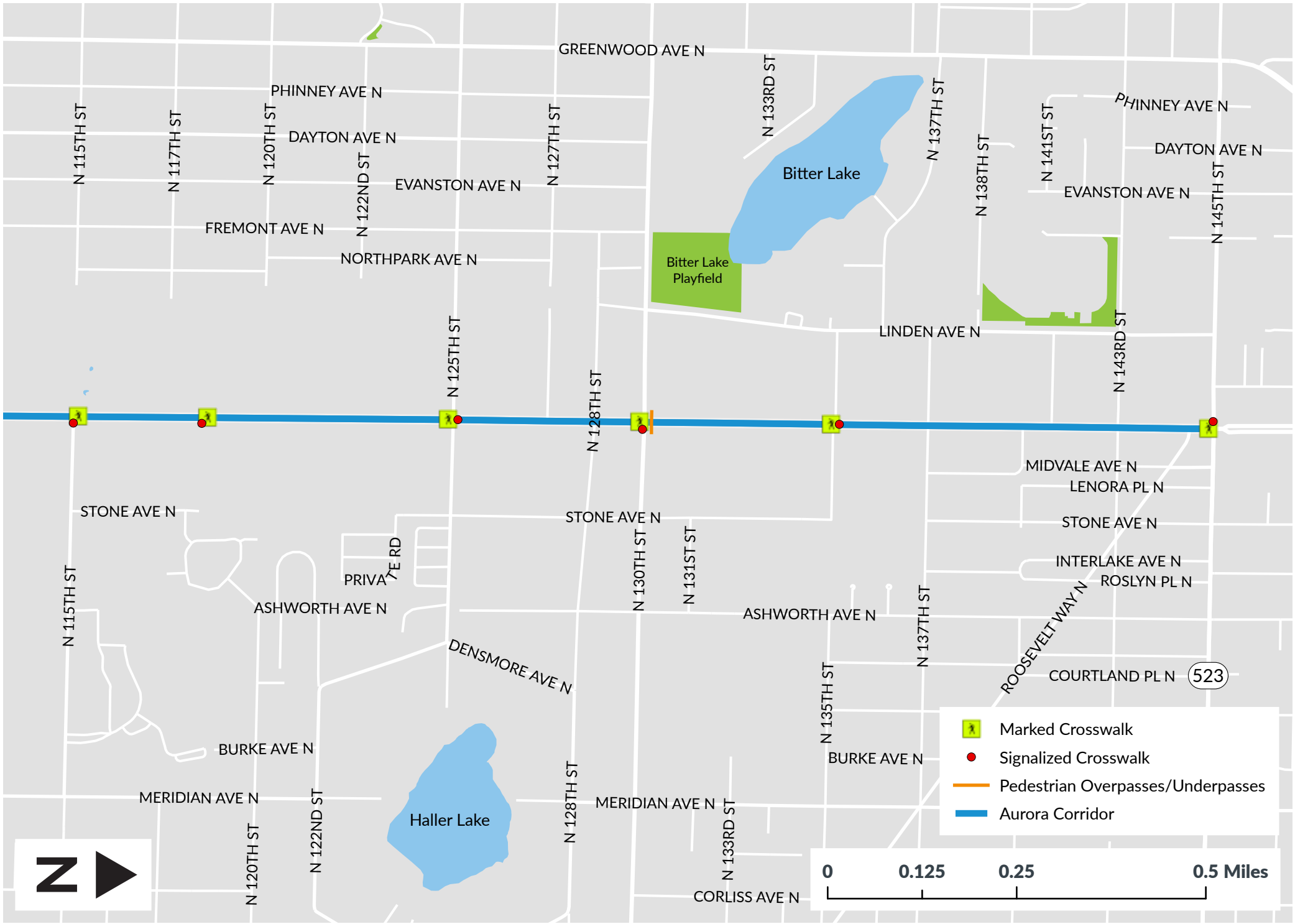


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-12. Segment 5 Existing Sidewalk Condition

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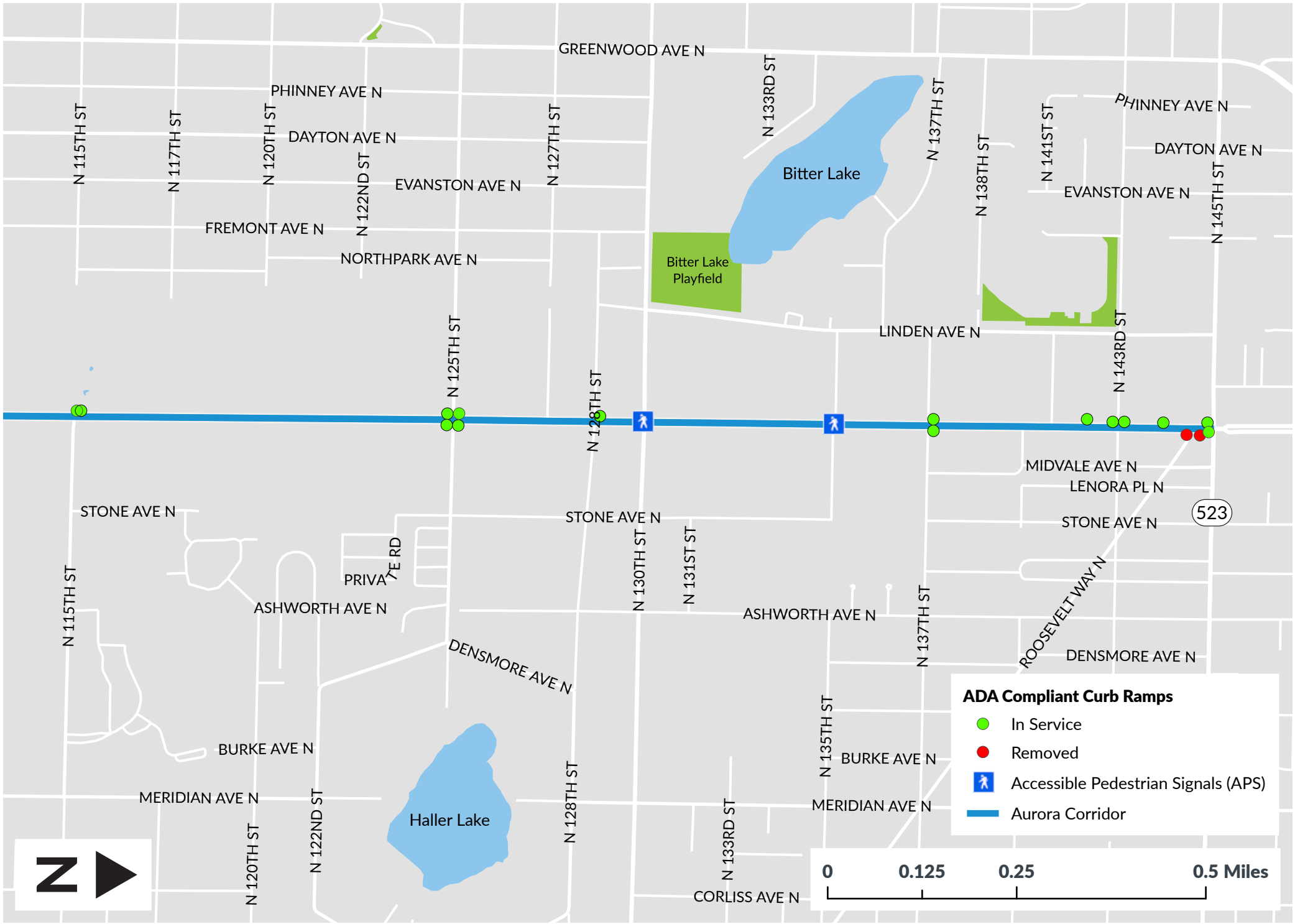


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-13. Segment 5 Pedestrian Crossings

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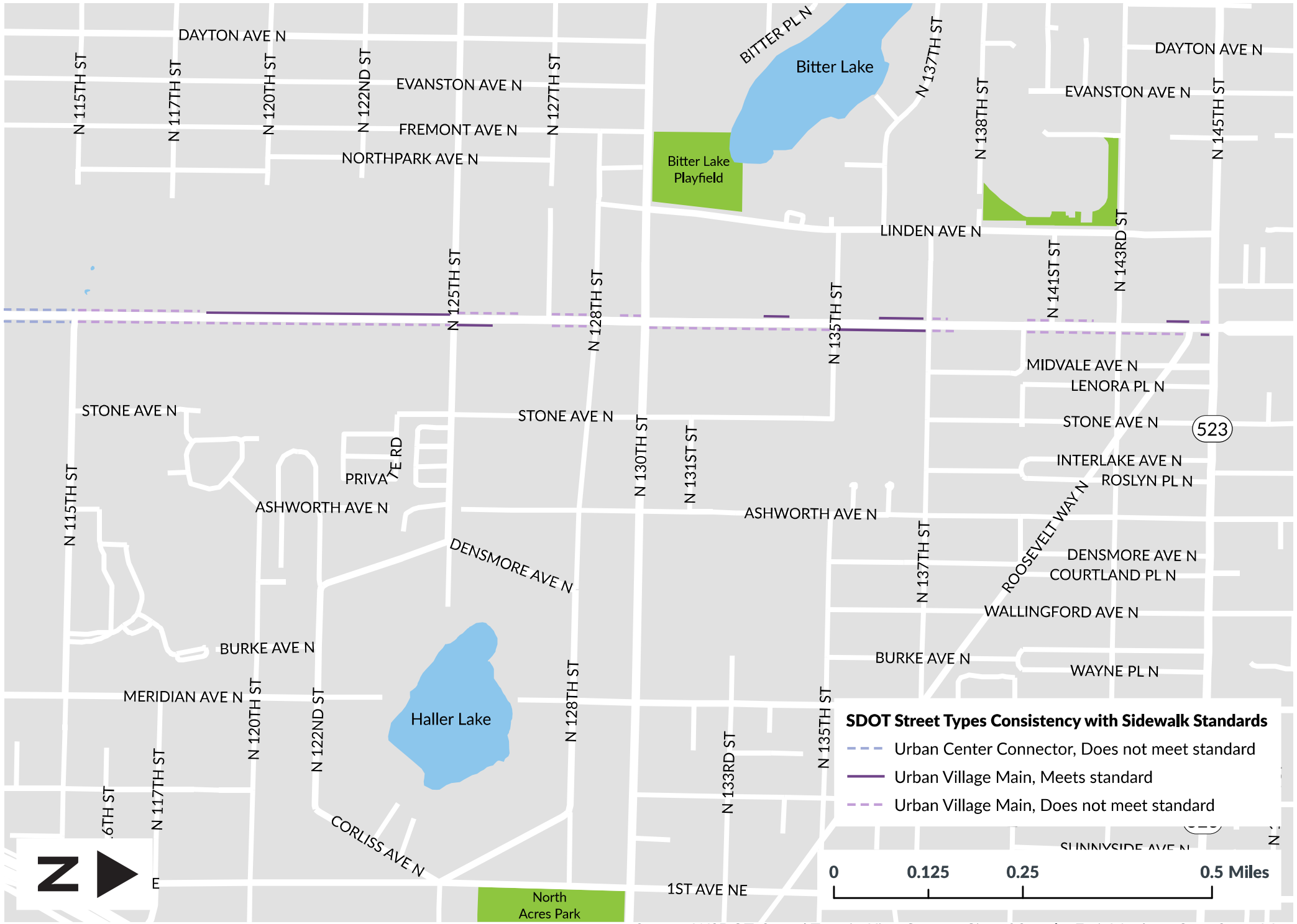


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-14. Segment 5 Pedestrian ADA Features

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-15. Segment 5 Sidewalk Consistency with SDOT Street Types

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-16. Segment 5 Existing Bicycle Facilities

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7.5 Safety

A total of 544 crashes occurred in Segment 5 between 2018 and 2022. Table 7-3 summarizes these crashes by severity.

Table 7-3. Segment 5 Crashes by Severity (2018-2022)

Crash Severity	Crash Frequency
Fatal Crashes	7
Serious Injury Crashes	21
Injury Crashes	213
Property Damage Only Crashes	280
Unknown Crashes	23
Total Segment Crashes	*544*

7.5.1 Crashes by Location – Intersections and Mid-Blocks

Segment 5 included 202 intersection crashes and 342 segment crashes during the study period. Table 7-4 summarizes the intersection crashes by location and severity.

Table 7-4. Segment 5 Intersection Crashes by Severity (2018-2022)

Intersection	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N & N 115th St	0	0	6	4	3	13
Aurora Ave N & N 117th Pl	0	0	8	13	0	21
Aurora Ave N & N 125th St	1	1	12	10	1	25
Aurora Ave N & N 127th St	0	0	5	7	0	12
Aurora Ave N & N 128th St	1	0	9	11	0	21
Aurora Ave N & N 130th St	0	2	11	18	2	33
Aurora Ave N & N 135th St	0	0	7	7	0	14
Aurora Ave N & N 137th St	1	1	5	8	0	15
Aurora Ave N & N 140th St	0	0	3	2	0	5
Aurora Ave N & N 141st St	0	0	3	1	0	4
Aurora Ave N & N 143rd St	0	1	4	4	0	9
Aurora Ave N & Roosevelt Way N	0	0	0	4	0	4
Aurora Ave N & N 145th St	0	0	4	22	0	26
Total Intersection Crashes	*3*	*5*	*77*	*111*	*6*	*202*

Segment 5 had three fatal crashes at an intersection, two of which involved a pedestrian, and five serious injury crashes. The intersection of Aurora Avenue N and N 130th Street had the most crashes with 33 and Aurora Avenue N and N 145th Street had the next highest with 26 crashes. Just over 55% of crashes were property damage only crashes. Figure 7-17 displays total collisions on Segment 5 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-17. Segment 5 Total Collisions

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Table 7-5 summarizes the mid-block crashes by location and severity for Segment 5.

Table 7-5. Segment 5 Mid-Block Crashes by Severity (2018-2022)4

Mid-Block Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Aurora Ave N between N 115th St & N 117th Pl	0	1	6	13	2	22
Aurora Ave N between N 117th Pl & N 125th St	0	6	27	20	1	54
Aurora Ave N between N 125th St & N 127th St	0	0	21	32	1	54
Aurora Ave N between N 127th St & N 128th St	0	0	6	9	1	16
Aurora Ave N between N 128th St & N 130th St	1	1	9	8	0	19
Aurora Ave N between N 130th St & N 135th St	0	2	25	36	6	69
Aurora Ave N between N 135th St & N 137th St	0	0	5	9	3	17
Aurora Ave N between N 137th St & N 140th St	1	2	12	5	1	21
Aurora Ave N between N 140th St & N 141st St	0	1	2	6	0	9
Aurora Ave N between N 141st St & N 143rd St	1	0	8	7	0	16
Aurora Ave N between N 143rd St & Roosevelt Way N	1	2	11	15	2	31
Aurora Ave N between Roosevelt Way N & N 145th St	0	1	4	9	0	14
Total Segment Crashes	*4*	*16*	*136*	*169*	*17*	*342*

Four fatal crashes occurred on four different blocks, including 3 pedestrian-involved crashes. There were 16 serious injury crashes including 6 pedestrian-involved crashes and 1 bicyclist-involved crash. The blocks between N 117th Street and N 125th Street and between N 125th Street and N 127th Street experienced the most crashes with 54 each (16%), the former including 6 serious injury crashes as well. About 49% of the mid-block crashes in Segment 5 were property damage only crashes. Figure 7-18 displays fatal and serious injury collisions on Segment 5 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-18. Segment 5 Fatal and Serious Injury Collisions

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7.5.2 Crashes by Type

In Segment 5, there were 36 pedestrian-involved crashes and 6 bicyclist-involved crashes. Twenty-two pedestrian-involved crashes and 2 bicyclist-involved crash occurred mid-block, and 15 pedestrian-involved crashes and 4 bicyclist-involved crashes occurred at intersections. Table 7-6 summarizes the locations and severities of these non-motorist-involved crashes.

Table 7-6. Segment 5 Non-Motorized Crashes by Location and Severity (2018-2022)

Location	Crash Frequency					
	Fatal	*Serious Injury*	*Injury*	*PDO*	*Unknown*	*Total*
Pedestrian-Involved Crashes	**5**	**6**	**22**	**4**	**0**	**37**
Aurora Ave N between N 115th St & N 117th Pl	0	0	1	0	0	1
Aurora Ave N between N 117th Pl & N 125th St	0	4	0	0	0	4
Aurora Ave N between N 128th St & N 130th St	1	0	0	0	0	1
Aurora Ave N between N 130th St & N 135th St	0	1	3	1	0	5
Aurora Ave N between N 135th St & N 137th St	1	1	0	0	0	2
Aurora Ave N between N 141st St & N 143rd St	1	0	5	0	0	6
Aurora Ave N between N 143rd St & Roosevelt Way N	0	0	1	0	0	1
Aurora Ave N between Roosevelt Way N & N 145th St	0	0	1	1	0	2
Aurora Ave N & N 115th St	0	0	3	0	0	3
Aurora Ave N & N 125th St	1	0	2	0	0	3
Aurora Ave N & N 127th St	0	0	1	0	0	1
Aurora Ave N & N 135th St	0	0	3	0	0	3
Aurora Ave N & N 137th St	1	0	1	0	0	2
Aurora Ave N & N 141st St	0	0	1	0	0	1
Aurora Ave N & N 145th St	0	0	0	2	0	2
Bicyclist-Involved Crashes	**0**	**2**	**4**	**0**	**0**	**6**
Aurora Ave N between N 117th Pl & N 125th St	0	0	1	0	0	1
Aurora Ave N & N 117th Pl	0	1	1	0	0	2
Aurora Ave N & N 125th St	0	0	1	0	0	1
Aurora Ave N & N 135th St	0	1	1	0	0	2
Total Non-Motorized Crashes	*5*	*8*	*26*	*4*	*0*	*43*

Five of the 43 non-motorized crashes were fatal crashes (12%), 8 were serious injury crashes, 26 were other injury crashes, and 4 were no injury crashes. Two of the fatal crashes involved alcohol and speeding, while the other three did not list a contributing factor. Two of the serious injury crashes involved pedestrians crossing outside of a crosswalk including one under the influence of alcohol as well, two involved a distraction, and one involved speeding. The remaining serious injury crashes did not provide additional contributing factor information. Four of the injury crashes involved crossing outside of a crosswalk, five involved drivers who failed to yield the right-of-way to non-motorists, and one driver under the influence of drugs. The remaining crashes did not provide additional contributing factor information or were listed as other. Figure 7-19 displays pedestrian and bicyclist collisions on Segment 5 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-19. Segment 5 Pedestrian and Bicyclist Collisions

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The other 501 crashes in Segment 5 were all vehicle-only crashes. Table 7-7 summarizes the mid-block and intersection vehicle-only crashes by crash type.

Table 7-7. Segment 5 Motorized Crashes by Crash Type (2018-2022)

Location	Crash Frequency							
	Rear End	*Angle*	*Sideswipe*	*Head On*	*Parked Car*	*Other*	*Unknown*	*Total*
Mid-Block	114	81	37	4	10	26	46	318
Intersections	31	101	13	2	0	16	20	183
Total Motorized Crashes	*145*	*182*	*50*	*6*	*10*	*42*	*66*	*501*

Mid-block, the most common crash type was rear end (36%) followed by angle or turning crashes (25%). Just under 23% of mid-block crashes were categorized as other or unknown. At intersections, the most common crashes were angle or turning crashes (55%) followed by rear end crashes (10%). Just under 20% of intersection crashes were categorized as other or unknown.

7.5.3 Crash Contributing Factors

Table 7-8 summarizes the primary contributing factors for the Segment 5 crashes. One hundred and nineteen crashes (22%) did not have a documented contributing factor and are excluded from the summary.

Table 7-8. Segment 5 Crashes by Primary Contributing Factor (2018-2022)

Primary Contributing Factor	Crash Frequency	Percent of Segment 5 Crashes
Did not grant right-of-way to vehicle	70	13%
Distracted	56	10%
Inattention	49	9%
Improper maneuver	43	8%
Following too closely	31	6%
Alcohol/drug impaired	31	6%
Speeding	22	4%
Disregard traffic control	21	4%
Improper non-motorist behavior	7	1%
Did not grant right-of-way to non-motorist	5	1%
Fatigued/Ill	4	1%
Operating defective equipment	3	1%
Other (does not include none)	83	15%
Total	*425*	*78%*

In Segment 5, failure to grant right-of-way to a vehicle was the most common primary contributing factor (13%) followed distracted and inattention (10% and 9%, respectively), and improper maneuver (8%). The "other" contributing factor category collectively accounted for 15% of Segment 5 crashes as well.

7.5.4 Crashes by Time of Day

Figure 7-20 shows the total Segment 5 crashes by time of day, aggregated by the hour of the day.

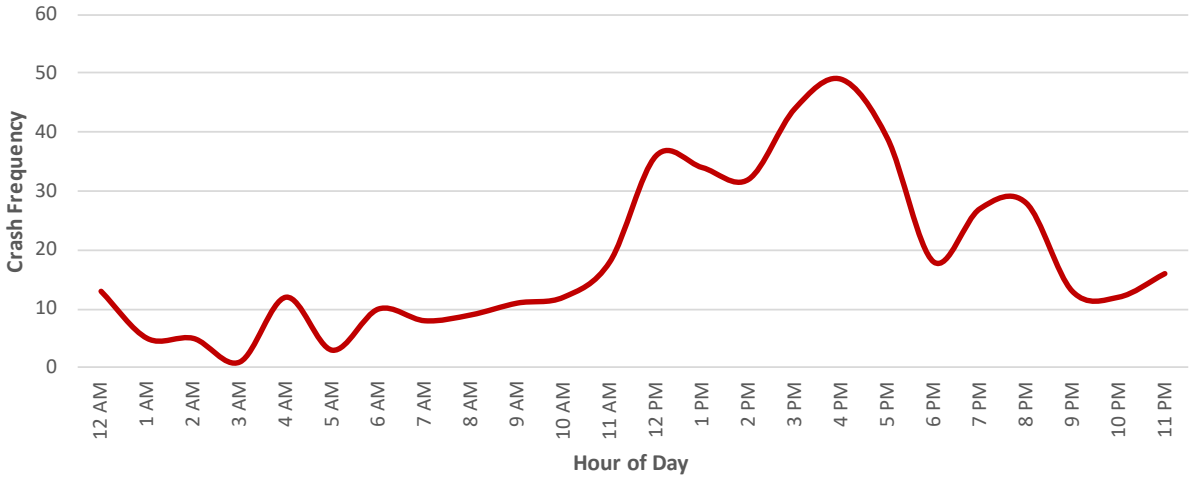


Figure 7-20. Segment 5 Crashes by Time of Day (2018-2022)

The highest concentration of crashes occurred during the PM peak, during the 4pm hour. Crashes generally increase throughout the day from the start of the AM peak period before decreasing again after the peak at 4pm. Figure 7-21 summarizes the total corridor crashes by lighting condition.

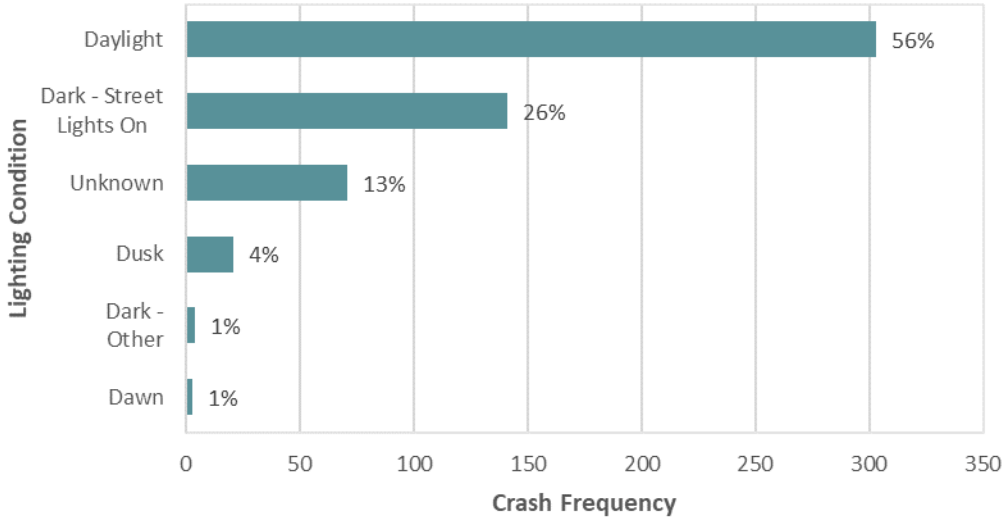


Figure 7-21. Segment 5 Crashes by Lighting Condition (2018-2022)

The majority of corridor crashes (56%) occurred during daylight conditions. Additionally, streetlights were on for the majority of the crashes that occurred during dark conditions (97% of dark condition crashes).

7.5.5 Mid-Block and Signalized Intersection Crash Rates

Crash rates were calculated for the individual mid-block locations and signalized intersections within Segment 5 and are summarized in Table 7-9 and Table 7-10, respectively.

Table 7-9. Segment 5 Mid-Block Crash Rates (2018-2022)

Mid-Block Location	Length (miles)	ADT (vpd)	Total Crashes	Crash Rate (Crashes/MVMT)
Aurora Ave N between N 115th St & N 117th Pl	0.14	29,700	22	2.90
Aurora Ave N between N 117th Pl & N 125th St	0.37	29,700	54	2.69
Aurora Ave N between N 125th St & N 127th St	0.13	29,700	54	7.66
Aurora Ave N between N 127th St & N 128th St	0.06	29,700	16	4.92
Aurora Ave N between N 128th St & N 130th St	0.06	29,700	19	5.84
Aurora Ave N between N 130th St & N 135th St	0.25	29,700	69	5.09
Aurora Ave N between N 135th St & N 137th St	0.12	29,700	17	2.61
Aurora Ave N between N 137th St & N 140th St	0.13	29,700	21	2.98
Aurora Ave N between N 140th St & N 141st St	0.04	29,700	9	4.15
Aurora Ave N between N 141st St & N 143rd St	0.09	29,700	16	3.28
Aurora Ave N between N 143rd St & Roosevelt Way N	0.09	29,700	31	6.35
Aurora Ave N between Roosevelt Way N & N 145th St	0.03	29,700	14	8.61

The blocks with the highest crash rates in Segment 5 include between Roosevelt Way N and N 145th Street (8.61 crashes/MVMT), between N 125th Street and N 127th Street (7.66 crashes/MVMT), and between N 143rd Street and N Roosevelt Way N (6.35 crashes/MVMT). All other blocks in Segment 5 have a crash rate less than 6 crashes/MVMT. The average mid-block crash rate for Segment 5 is 4.76 crashes/MVMT.

Table 7-10. Segment 5 Signalized Intersection Crash Rates (2018-2022)

Intersection	Total Entering Vehicles (vpd)	Total Crashes	Crash Rate (Crashes/MEV)
Aurora Ave N & N 115th St	24,500	1	0.02
Aurora Ave N & N 117th Pl	27,300	13	0.26
Aurora Ave N & N 125th St	27,000	21	0.43
Aurora Ave N & N 130th St	31,750	25	0.43
Aurora Ave N & N 135th St	36,850	33	0.49
Aurora Ave N & N 145th St	28,300	14	0.27

The intersection with the highest crash rate in Segment 5 is Aurora Avenue N & N 135th Street (0.49 crashes/MEV. All of the other signalized intersections in Segment 5 have a crash rate less than 0.45 crashes/MVMT. The average intersection crash rate for Segment 5 is 0.32 crashes/MVMT.

7.6 Transit

Bus lines that currently travel on Aurora Avenue N within Segment 5 include the E Line (RapidRide). Routes 345 (all-day route) and 304 (peak-only route) cross Aurora Avenue N at N 130th Street and N 145th Street, respectively.

The E Line has 3 station pairs and 1 stand-alone station within Segment 5. In fall 2022, average daily boardings at these stations ranged from 63 to 354 riders and average daily alightings ranged from 91 to 313 riders. The southbound stop at Roosevelt Way N (Stop ID 6950) has the highest level of overall activity within Segment 5. Route 345 intersects Aurora Avenue N at N 105th Street/N Northgate Way which may contribute to higher boardings and alightings at stations around the intersection.

Figure 7-22 displays average daily E Line ridership and transit lines that travel on or intersect with Aurora Avenue N in Segment 5.

Six out of seven stations in Segment 5 are equipped with at least 1 shelter; 1 station has no shelters. No layover or comfort stations are located in Segment 5.

Figure 7-23 shows passenger amenities at transit stops along Segment 5 of Aurora Avenue N.

7.6.1 Transit Travel Speeds

Five TSP systems exist in Segment 5. They are located at approximately N 116th Street, N 125th Street, N 130th Street, N 135th Street, and N 145th Street. Figure 7-24 depicts TSP systems on Segment 5 of Aurora Avenue N.

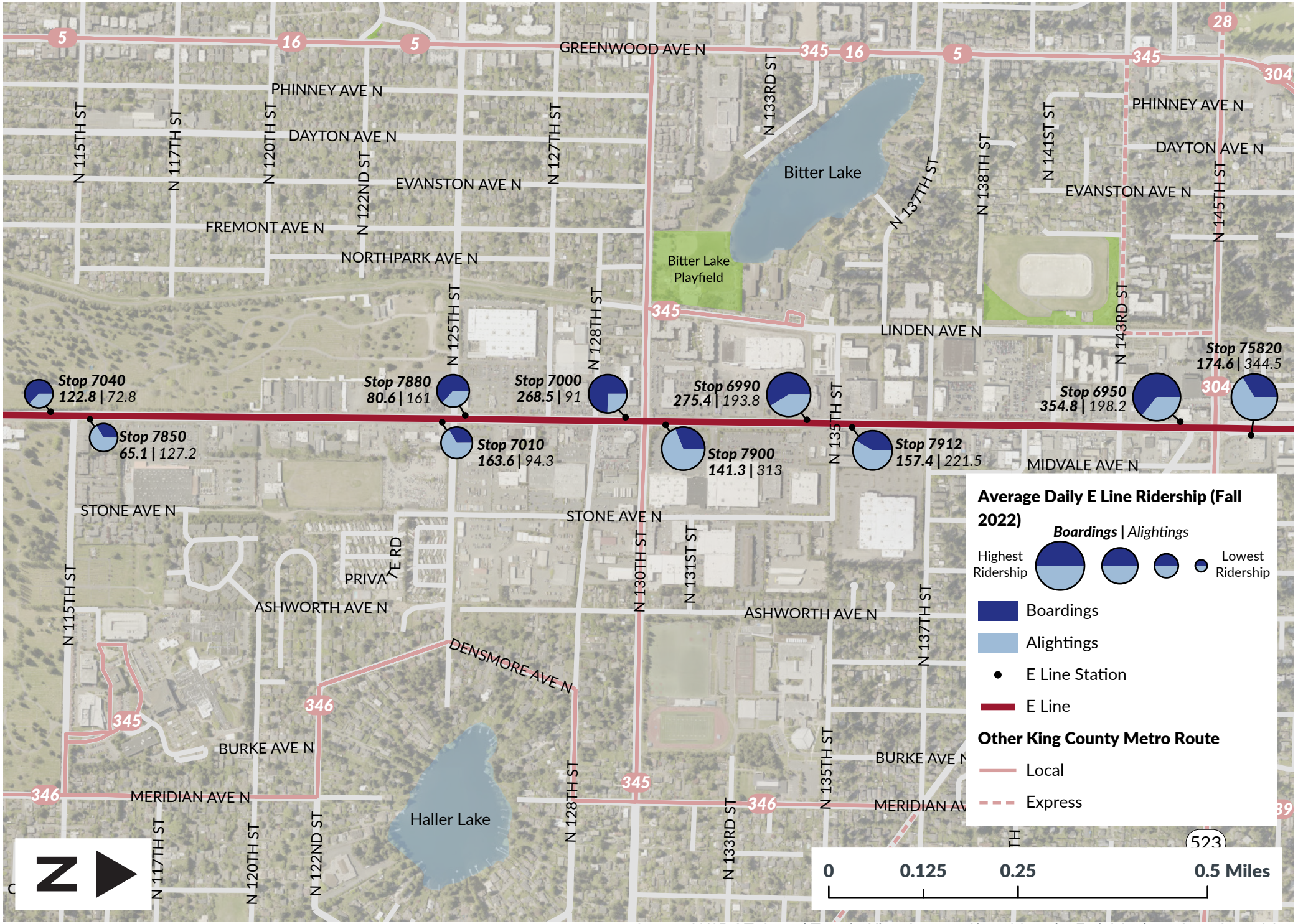
Average transit travel speeds vary within Segment 5 of Aurora Avenue N. Table 7-11 and Table 7-12 display the various average transit speeds within Segment 5 during the AM and PM hours, respectively. Figure 7-25 and Figure 7-26 display transit travel speeds in Segment 5 in the AM and PM peak periods, respectively. Transit travel speeds do not include dwell time at stops.

Table 7-11 Segment 5 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 115th Street – N 125th Street	21 – 30 mph	21 – 30 mph
N 125th Street – N 135th Street	0 – 20 mph	0 – 20 mph
N 135th Street – N 145th Street	21 – 30 mph	21 – 30 mph

Table 7-12 Segment 5 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 115th Street – N 125th Street	21 – 30 mph	21 – 30 mph
N 125th Street – N 135th Street	0 – 20 mph	0 – 20 mph
N 135th Street – N 145th Street	0 – 20 mph	21 – 30 mph

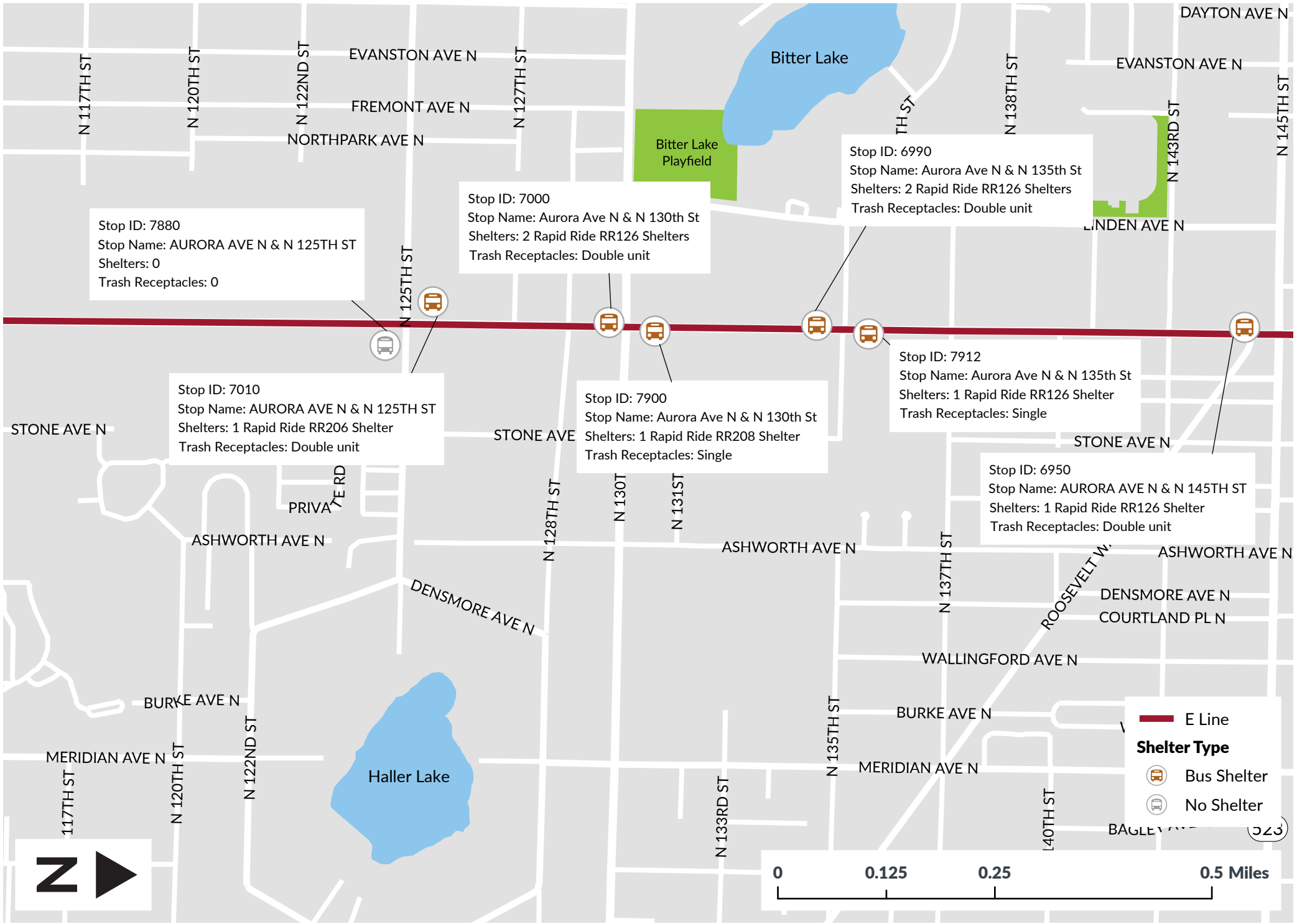


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-22. Segment 5 Average Daily E Line Ridership

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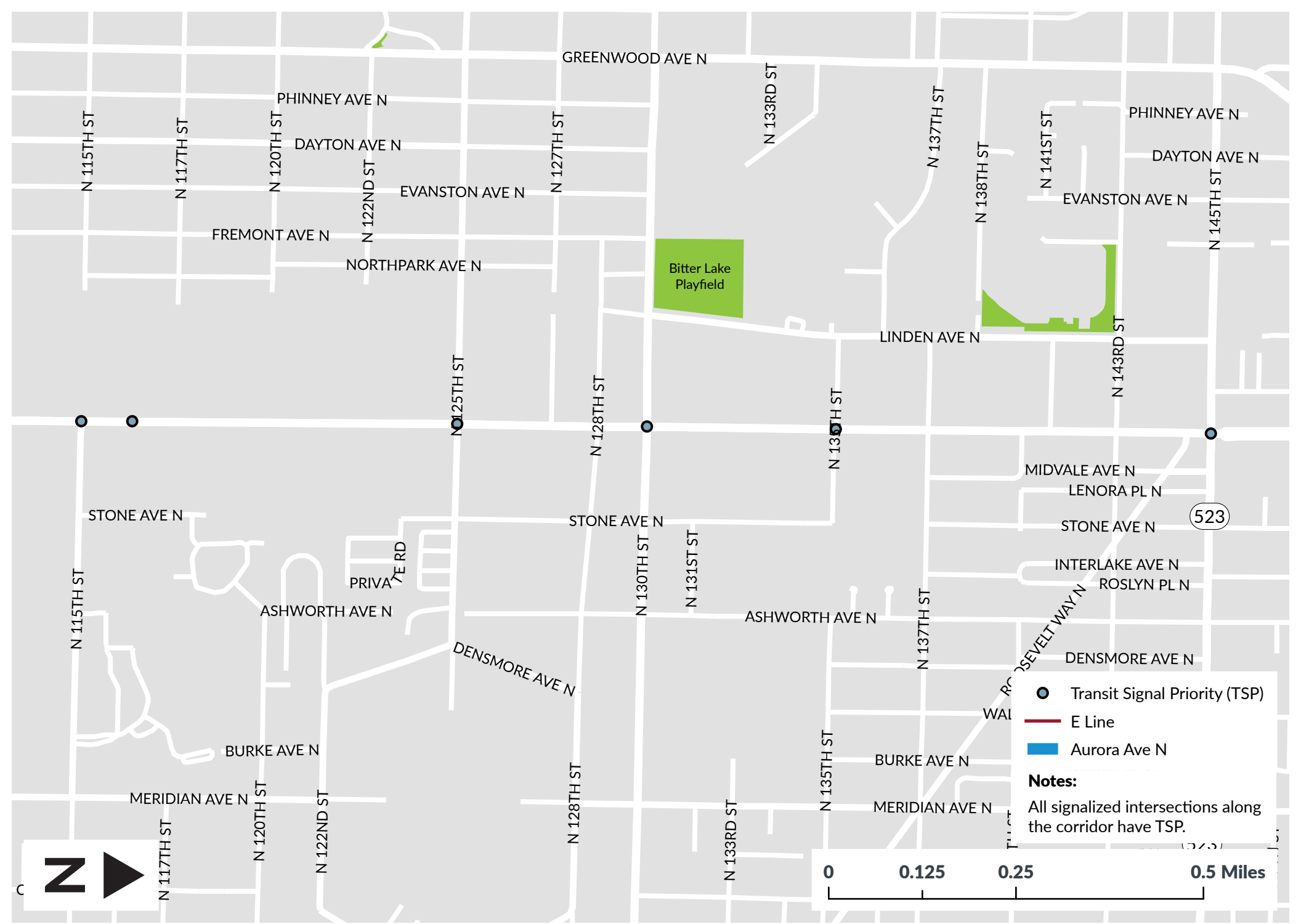


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-23. Segment 5 Passenger Amenities

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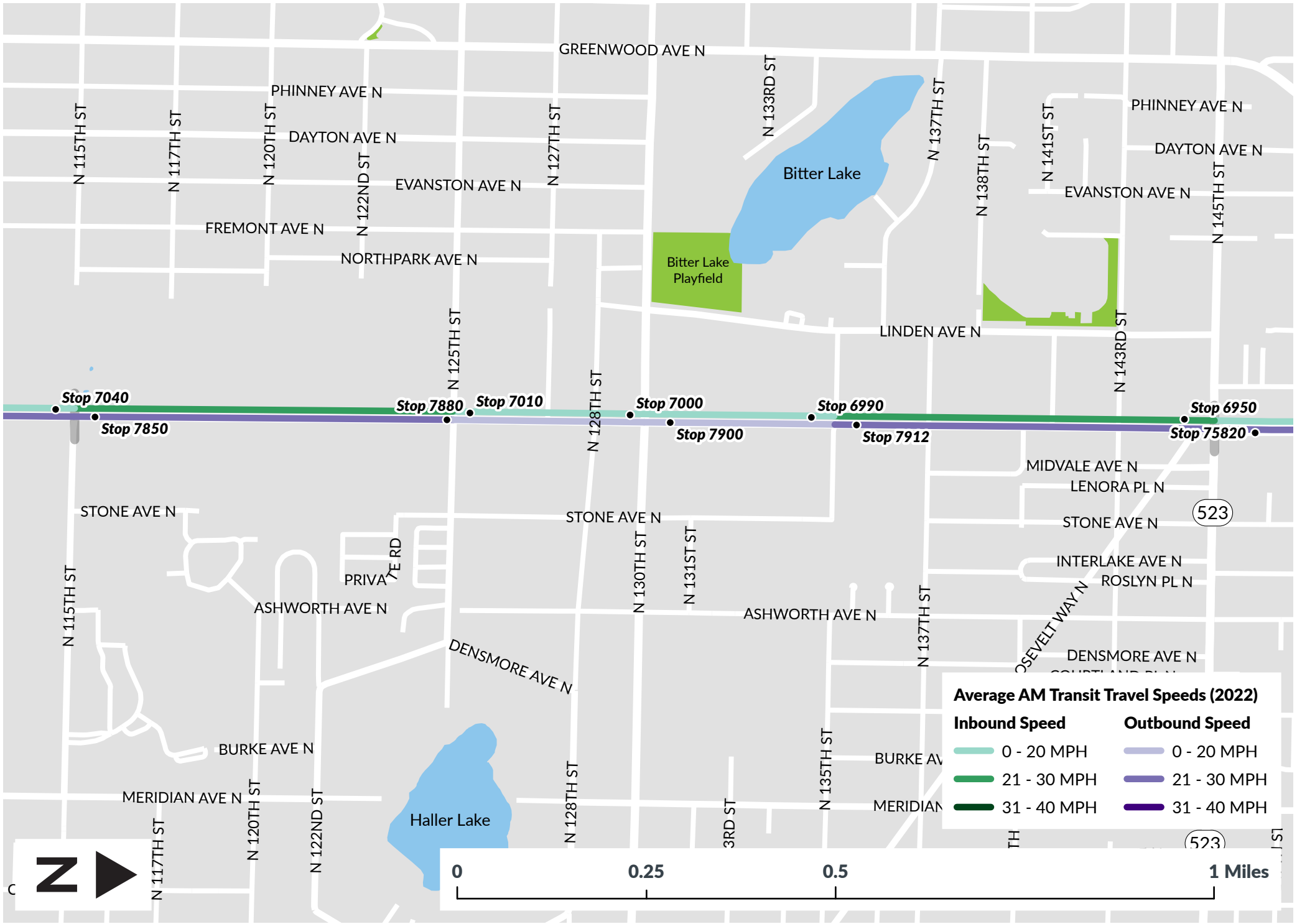


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-24. Segment 5 Transit Signal Priority

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-25. Segment 5 AM Transit Travel Speeds

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-26. Segment 5 PM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

7.6.2 Bus collisions

Between January 2019 and February 2023, there were twenty-two bus collisions along Aurora Avenue N in Segment 5. All collisions except two were with other non-transit vehicles. One collision with a person riding a bicycle occurred at approximately N 117th Street, and one collision with a person walking occurred in between N 141st Street and N 143rd Street. The collisions tended to cluster around the Home Depot located south of N 125th Street and at streets running perpendicular to Aurora Avenue N such as N 125th Street and N 135th Street.

Figure 7-27 displays bus collisions from 2021 and 2022 along Segment 5 of Aurora Avenue N.

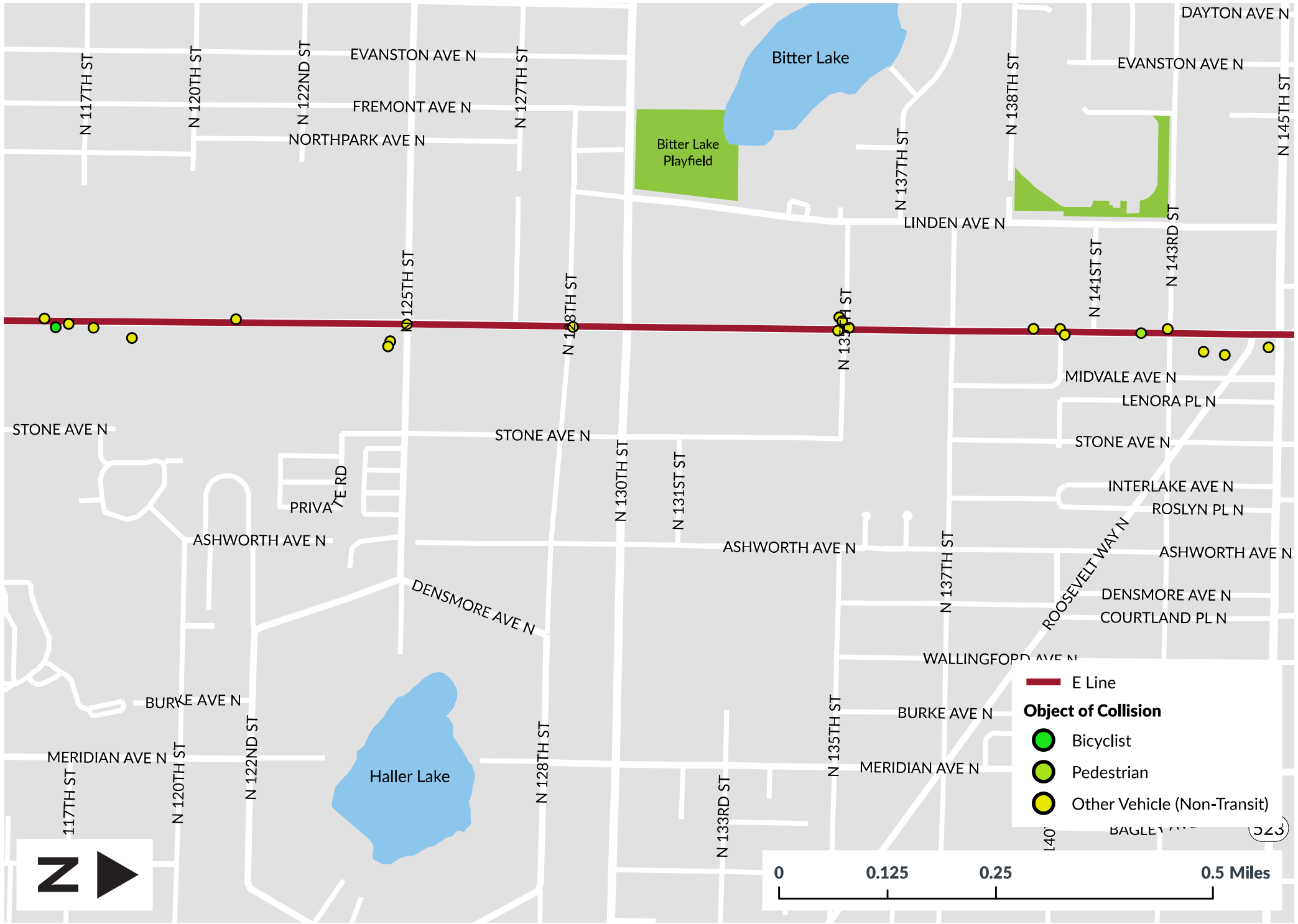
7.7 Transportation Plans

The PMP's Arterial Priority Investment Network assigned Aurora Avenue N a score of Tier 3 for all of Segment 5 except the stretch between N 141st Street and N 143rd Street, which received a score of Tier 2. The PMP's Priority Crossings gave Segment 5 of Aurora Avenue N exclusively Tier 1 ratings.

Figure 7-28 depicts the PMP's Arterial Priority Investment Network and Priority Crossings along Segment 5 of Aurora Avenue N.

Six streets with planned bicycle facilities intersect Aurora Avenue N along Segment 5. N 130th Street will receive protected bike lanes and N 135th Street will become a neighborhood greenway. N 126th Street, N 137th Street, N 143rd Street, and Roosevelt Way N are all proposed to receive upgrades (exact design to be determined).

Figure 7-29 displays planned bicycle facilities and WSDOT's Bicycle Level of Traffic Stress on Segment 5 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-27. Segment 5 Bus Collision Locations

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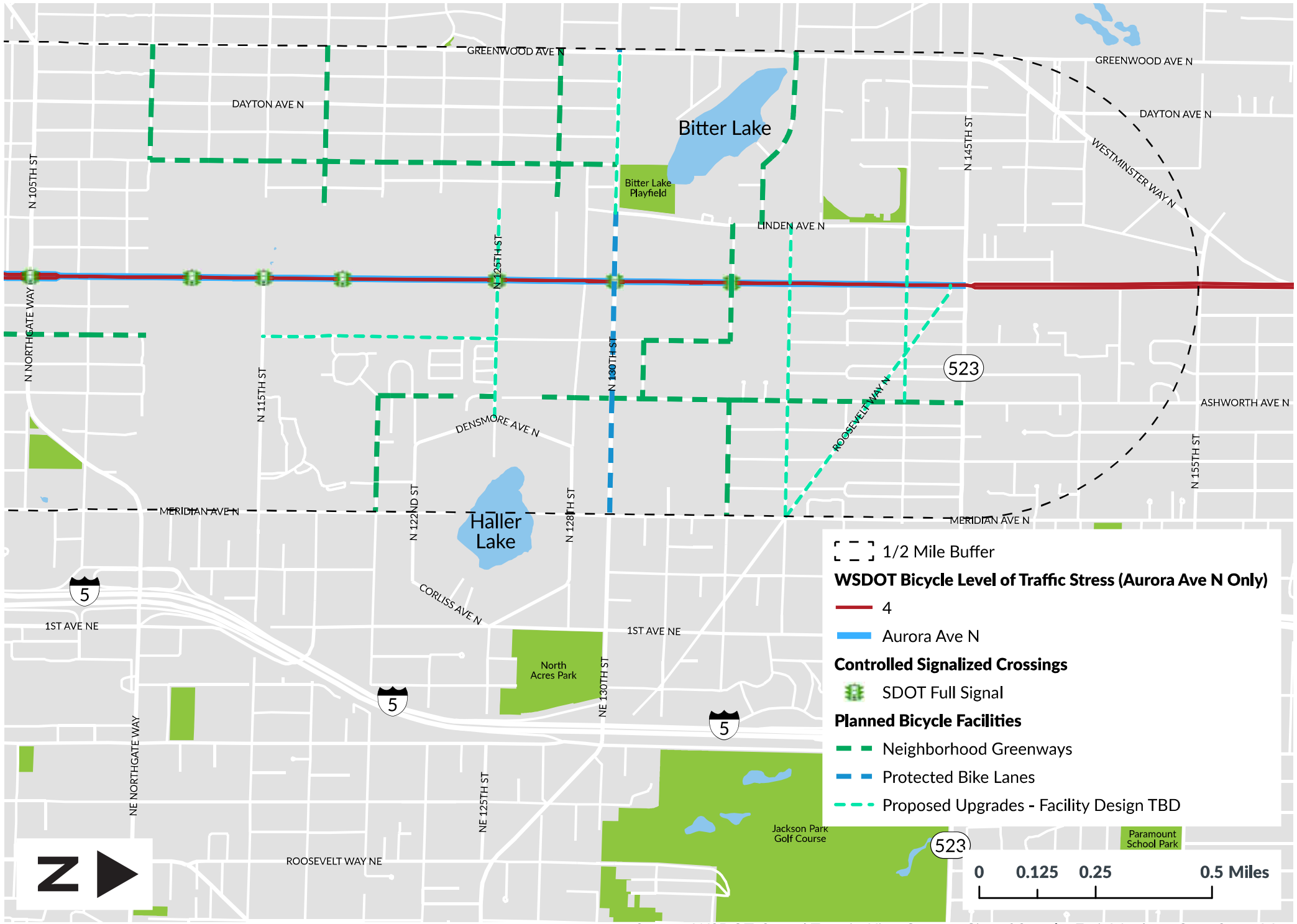


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-28. Segment 5 Pedestrian Master Plan Corridor Designation

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-29. Segment 5 Planned Bicycle Facilities

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7.7.1 In-process, Planned, and Potential Future Transportation and Infrastructure Improvements

Several in-process, planned, and potential future improvements are located along Segment 5 of the Aurora corridor:

- **Active transportation**
    - N 128th Street New Sidewalk: installation of new sidewalk along the south side of N 128th Street.
- **Roadway**
    - N 130th Street Corridor Improvements: implementation of transit speed and reliability, safety, access, and amenity improvements along the N 130th Street corridor. Improvements may include paving, RTIS and ORCA readers, signal upgrades such as TSP capability, queue jumps, channelization and intersection changes, new pedestrian signals, pedestrian crossing improvements, sidewalk repair and improvements, accessible pedestrian signals, and a shared use bicycle and pedestrian path along the north side of N 130th Street.
    - SR 523 Aurora to I-5 Improvements: improvement of SR 523/N 145th Street, focusing on intersections and sidewalks to increase safety, accessibility, and multimodal mobility.
- **Transit**
    - Transit Zone Improvement – Bus Stop Shelters: installation of bus shelter footings (concrete foundations) at select bus stops. Applicable locations include Aurora Avenue N at N 125th Street.
- **Private development**
    - 226 unit multifamily development: construction of a 226 unit multifamily development. Two cul-de-sacs to provide vehicular and pedestrian access to the proposed development on Stone Avenue N. Street improvements on Aurora Avenue N include new sidewalk and curb ramps as well as utility trenching for water service to the site.
- **Operations/ITS**
    - Aurora Avenue N ITS Improvements: modifications to signal timing on northbound Aurora Avenue N to improve freight traffic during the morning peak period.
    - Dynamic Message Sign an N 145th Street
- **Utilities**
    - Water Main Installation: installation of 1,200 linear feet of 12" water main along N 125th Street between Aurora Avenue N and Stone Avenue N.
    - 145th Corridor – Phase 3: relocation of Seattle City Light's overhead 26kV electrical distribution facilities in support of the City of Shoreline's transportation driven relocation project. Electrical work will consist of installing new poles in approved locations, installing transformers and associated equipment, stringing

overhead conductor, making required terminations and energization, as well as wreck out of the old system.

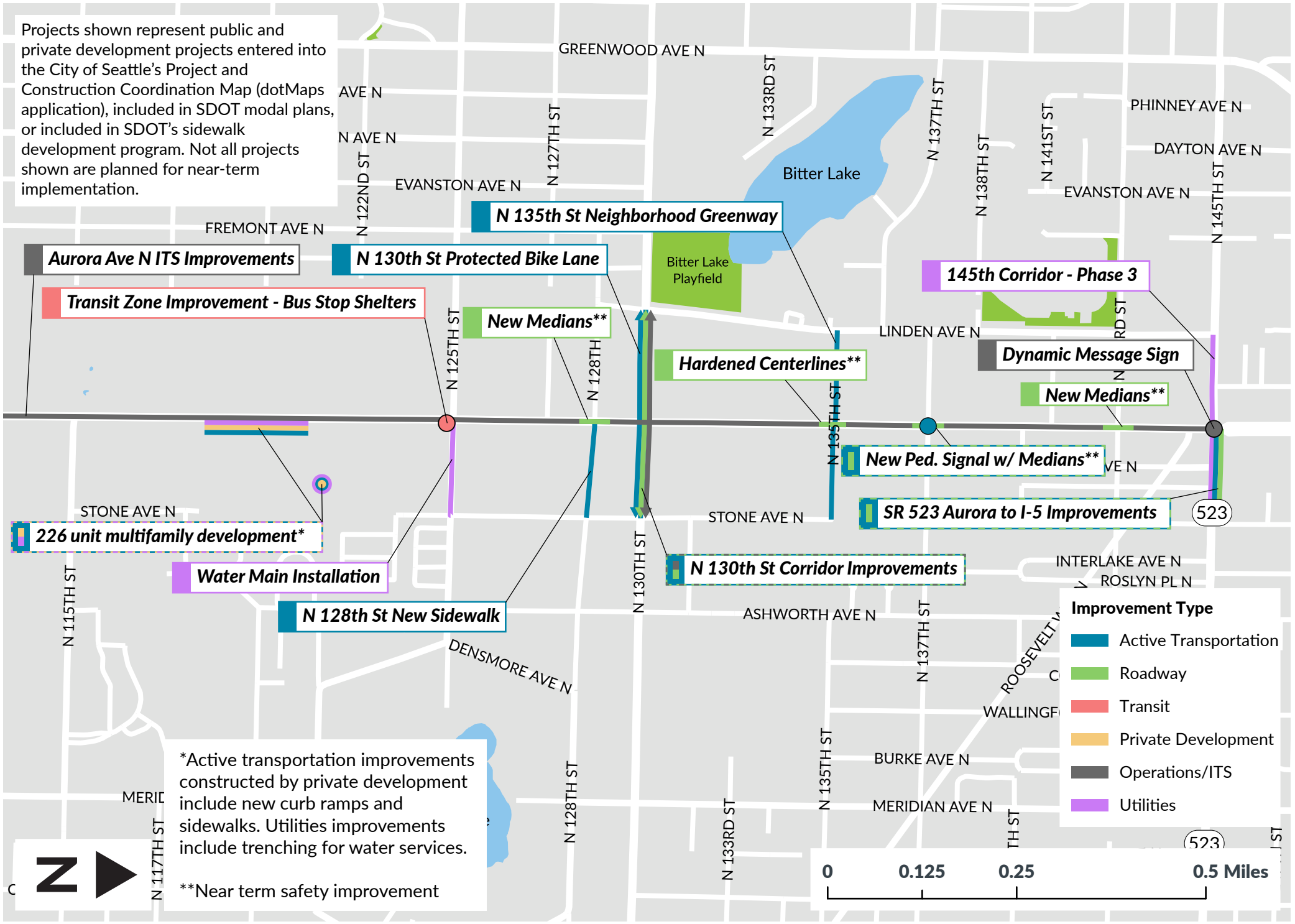
- **Near Term Spot Safety Improvements**
  - SDOT is planning a series of near term improvements intended to improve safety for active transportation users. Near term safety improvements planned in Segment 5 are shown in Table 7-13.

Table 7-13. Near Term Safety Improvements Planned in Segment 5

Location	Improvement Type	Project Elements
N 128th Street	New medians to prohibit left turns (right in/right out for 128th Street)	New median
N 135th Street	Hardened centerlines	Hardened centerline
N 137th Street	A new pedestrian signal with medians to prohibit left turns (right in/right out for 137th Street)	• New signal, including bicycle signal head • Medians • Crosswalk striping • Bicycle detection loop and pavement markings • Curb ramps
N 143rd Street	New medians to prohibit left turns (right in/right out for 143rd Street)	New median

Figure 7-30 displays in-process, planned, and potential future transportation and infrastructure improvements along Segment 5 of the Aurora corridor.[5]

[5] Projects shown represent public and private development projects entered into the City of Seattle's Project and Construction Coordination Map (dotmaps application), included in SDOT modal plans, or included in SDOT's sidewalk development program. Not all projects shown are planned for near-term implementation.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-30. Segment 5 In-Process, Planned, and Future Improvements

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7.8 Land Use

7.8.1 Land Use

Only one urban village, the Bitter Lake Hub Urban Village, is designated along Aurora Avenue N in Segment 5. It is applied from N 115th Street to N 145th Street. While Segment 5 of Aurora Avenue N falls within the high-density, mixed-use Bitter Lake Hub Urban Village, existing commercial uses lying directly along the roadway are heavily auto-oriented, with structures separated from the sidewalk edge by large surface parking lots, occasionally set back several hundred feet from the roadway or sidewalk edge. Within one block of the Aurora Avenue N corridor to the east and west lie a mix of high-density multi-family residences, auto-oriented commercial uses, and lower-density residential uses.

Planned land uses from the Future Land Use 2035 map along Segment 5 of Aurora Avenue N include exclusively Commercial/Mixed Use Areas from N 115th Street to approximately N 120th Street.

Figure 7-31 illustrates future land use and Urban Village designations along Segment 5 of Aurora Avenue N.

7.8.2 Zoning

Zoning along Aurora Avenue N in Segment 5 is primarily mixed use. Commercial 1 zoning is present from N 115th Street to approximately N 128th Street and from N 130th Street to N 145th Street. Short sections of Neighborhood Commercial 3 and Commercial 2 are present at approximately N 128th Street and N 125th Street, respectively. Zoning in neighborhoods near Aurora Avenue N in Segment 5 is primarily low density residential.

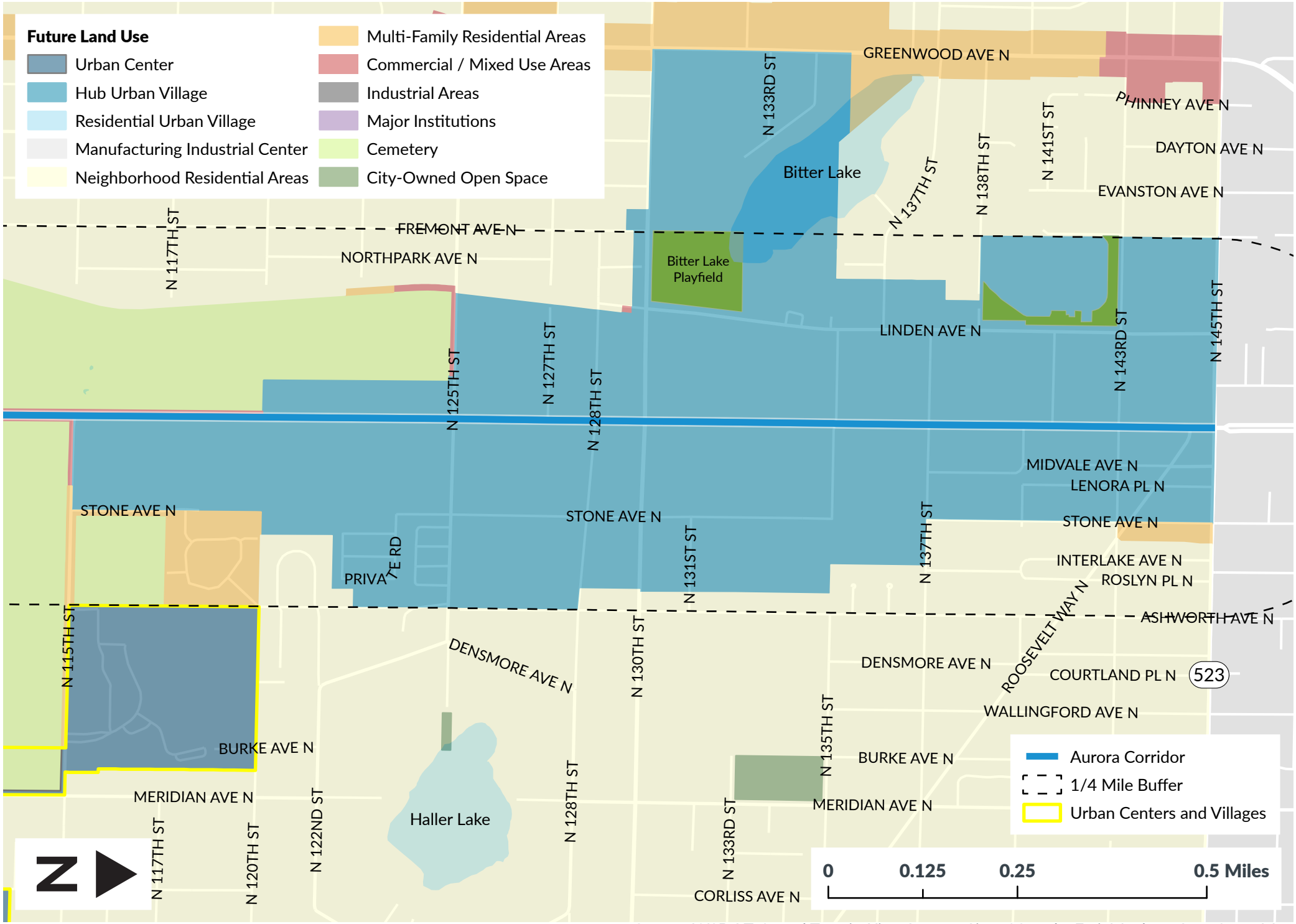
Figure 7-32 displays existing zoning along Segment 5 of Aurora Avenue N.

7.9 Underground Utilities

7.9.1 Water

Existing water lines in Segment 5 run along both sides of Aurora Avenue N from N 120th Street to N 145th Street. Water lines run on only Aurora Avenue N's east side from N 115th Street to N 120th Street. Water lines branch from Aurora Avenue N at a perpendicular angle at intervals roughly corresponding to the existing street grid.

Figure 7-33 illustrates existing, new, and abandoned water lines on Segment 5 of Aurora Avenue N.

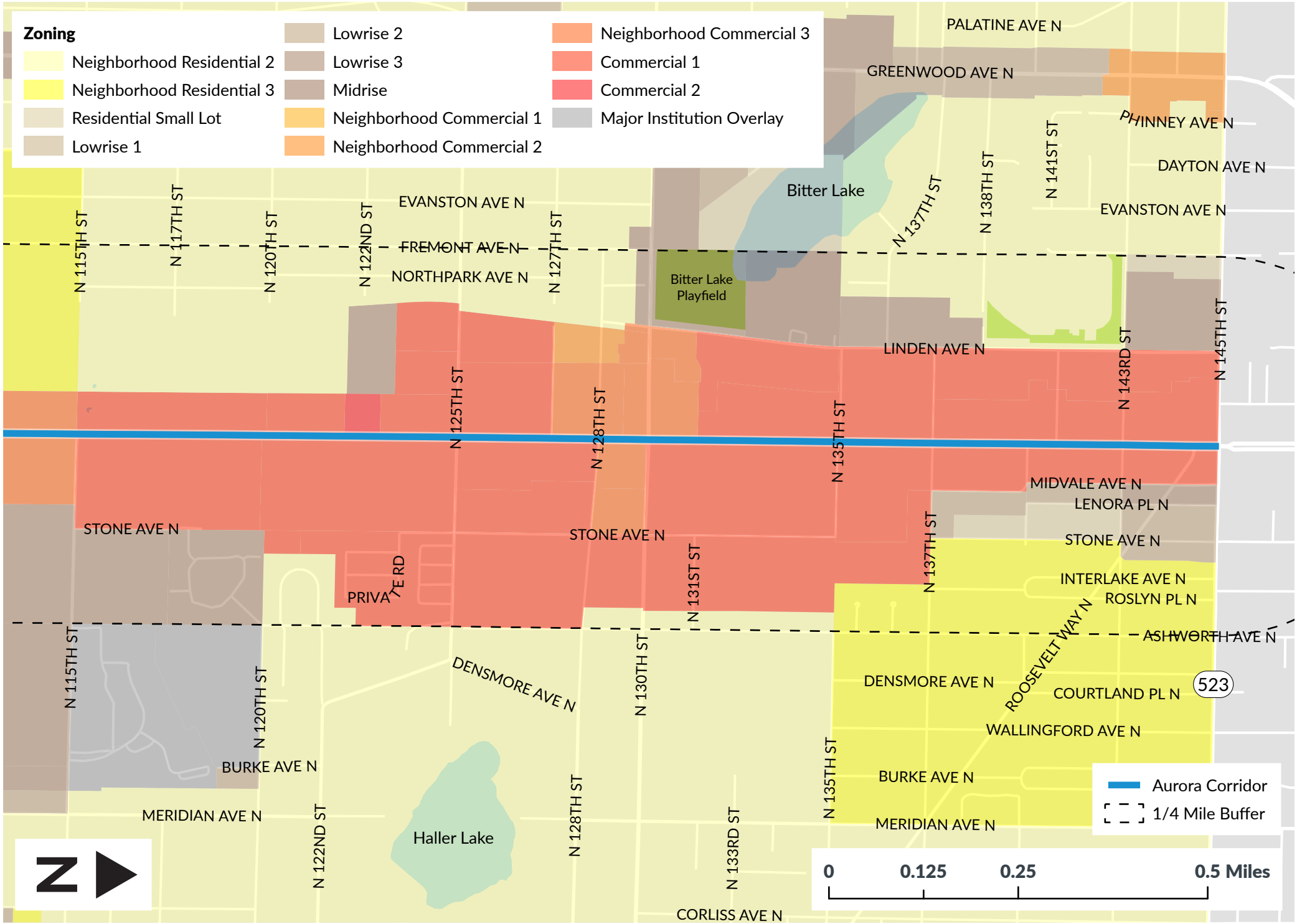


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-31. Segment 5 Land Use

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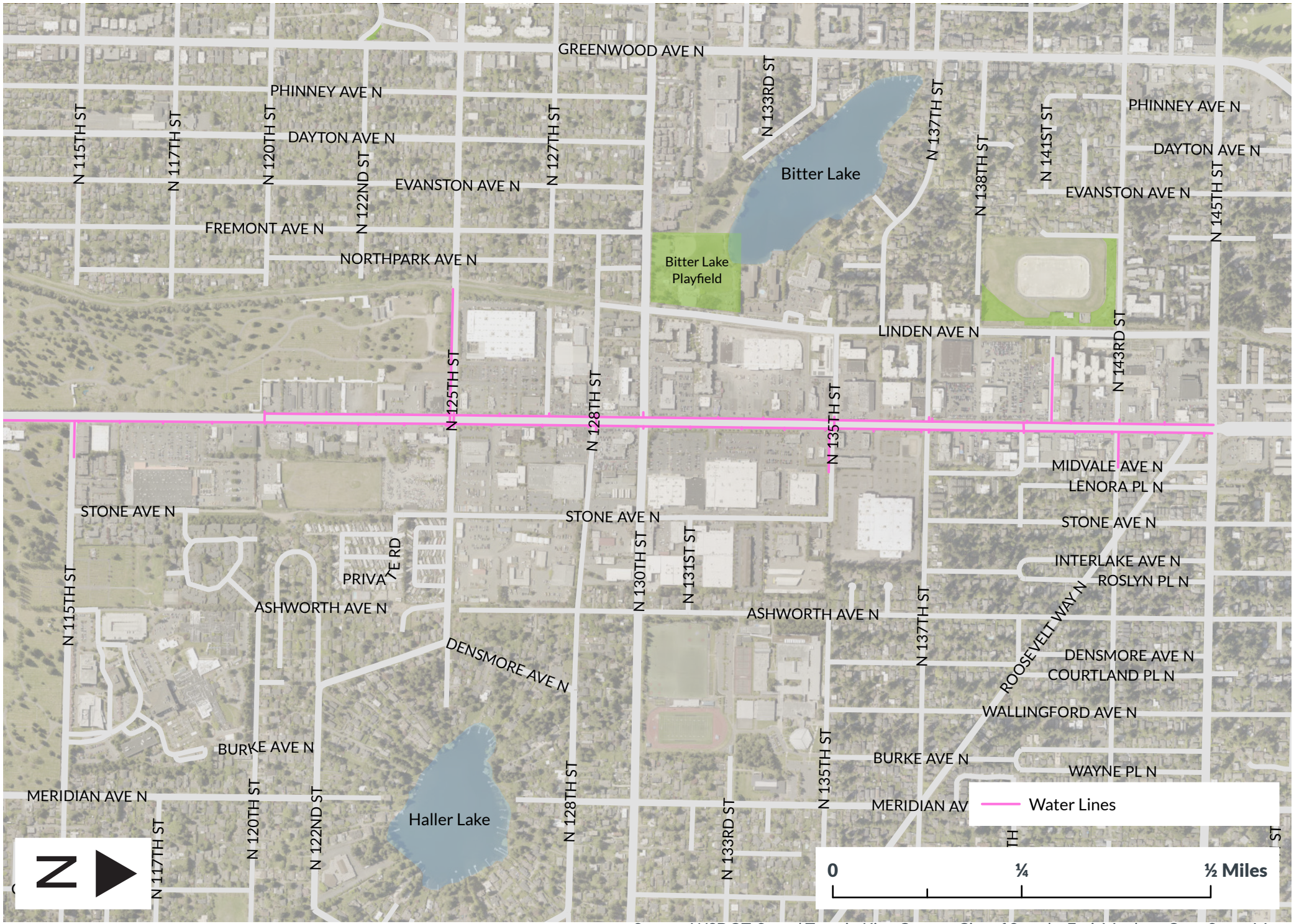


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-32. Segment 5 Zoning

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-33. Segment 5 Utilities: Water

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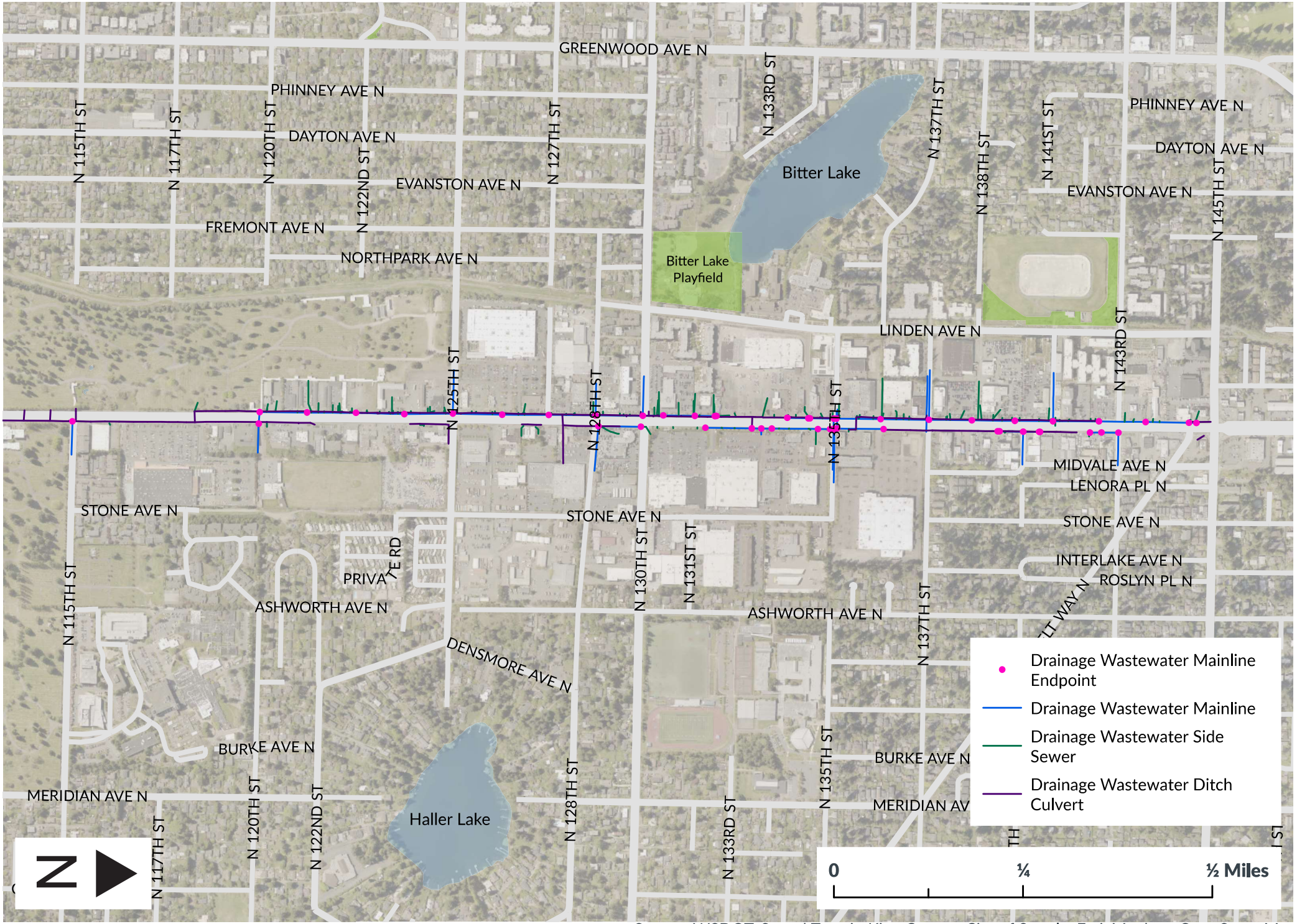
7.9.2 Sewer and Drainage

Sewer facilities are present along nearly all of Segment 5. Sewer mainlines alternate between the west side and both sides of Aurora Avenue N, although the majority are in a non-standard location along the western curb line. Mainlines are present on both sides of Aurora Avenue N for brief stretches north and south of N 130th Street. Mainline endpoints are spaced at approximately one per block but are spaced more infrequently north of N 130th Street. Side sewers branch east and west from the mainlines at regular intervals but are present less frequently than in Segments 1 – 3. A ditch and culvert system provides drainage services for the majority of Segment 5, with no drainage system north of N 140th Street. A culvert on Roosevelt Way N handles street runoff from N 145th Street. Ditches are lined with grass or concrete, with a grass-lined ditch as far north as N 132nd Street. A drainage mainline from N 131st Street to N 136th Street exists inline with the culvert system and is in a non-standard position.

Sewer and drainage infrastructure in Segment 5 are separated systems, with wastewater conveyed in sewer mains and stormwater conveyed in storm drains and culverts. Portions of Aurora Avenue N in Segment 5 are in and contribute to critical sewer capacity risk areas, and are in and contribute to a critical drainage capacity risk areas, as identified in SPU's Wastewater System Analysis (2020) and Drainage System Analysis (2019).

This segment is part of SPU's current system layout analysis for Aurora Avenue N. As conveyance is improved on Aurora Avenue N, it will likely increase peak flows to the downstream system, necessitating a new or improved connection between Aurora Avenue N and the existing outfall at Green Lake.

Figure 7-34 depicts sewage systems along Segment 5 of Aurora Avenue N.



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 7-34. Segment 5 Utilities: Drainage Wastewater

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7.10 Key Takeaways

- Segment 5 falls within the high-density, mixed-use Bitter Lake Hub Urban Village, however existing commercial uses lying directly along the roadway are auto-oriented, with structures separated from the sidewalk edge by surface parking lots, occasionally set back several hundred feet from the roadway or sidewalk edge.
- The junctions of Aurora Avenue N with N 130th Street and N 145th Street represent high-ridership transfer points between the E Line and Routes 345 and 304, respectively.
- Sidewalk gaps are present along approximately 40% of Aurora Avenue N within Segment 5.
- Limited controlled crossing opportunities are present in in Segment 5, which reflect lower land use densities that characterize this portion of the corridor. These limited opportunities for bicyclists and pedestrians to cross Aurora Avenue N contribute to the high number of pedestrian-vehicle crashes outside of marked crossings.
- The character of the roadway and surrounding development patterns lend to an urban highway-like feel with speeds regularly reaching over 5 mph higher than the posted limit of 35 mph.
- Over 30% of crashes involving a person walking or biking within Segment 5 resulted in a fatal or serious injury.
- Not granting right-of-way to vehicles, distractions, and inattention represent key factors contributing to collisions.

8. Segment 6

8.1 Segment Description

Segment 6 of Aurora Avenue N is within the City of Shoreline and approximately 2.9 miles long, extending from N 145th Street in the south to the northern terminus of the E Line at AVTC.[6] There are four general purpose lanes, two 24/7 BAT lanes, and a raised center median with turn pockets. The Sound Transit Lynnwood Link Extension, located adjacent to I-5 approximately 1 mile east of Aurora Avenue N, will include two new stations in Shoreline and one in Mountlake Terrace. Table 8-1 summarizes key characteristics of Segment 6.

Table 8-1. Segment 6 At a Glance

Segment Extents	N 145th Street to AVTC
Segment Length	3 miles
Annual Average Daily Traffic	N/A
Measured 85th Percentile Traffic Speeds	N/A
Average Distance Between Pedestrian Crossings	N/A
Crashes Per Mile	N/A
Crashes Involving Vulnerable Users	N/A
Bus Routes Serving the Segment	King County Metro: E Line, 301, 302, 303, 304, 330, 331, 342, 346, 348 Community Transit: Swift Blue Line, 101, 115, 130
Bus Stops	23
Total Average Daily E Line Boardings/Alightings in Segment 6	Boardings: 3,118/Alightings: 3,130

8.2 Transit

Bus lines that currently travel on Aurora Avenue N within Segment 6 include the E Line (RapidRide), Route 330 (all-day route), and three peak-only routes (301, 304, and 342). Routes 330, 301, 348, and 304 cross Aurora Avenue N at N 155th/160th Street, N 175th/185th Street, 185th Street, and N 185th/192nd Street, respectively. Routes 302, 303, and 331 all cross Aurora Avenue N at N 200th Street. Lines that transfer at the AVTC include Metro's 301, 302, 303X, 331, 342, 346, and Community Transit's 111, 112, 119, 130, 410, 413, 415, 435, 810, and 871.

The E Line has 11 station pairs and 1 stand-alone station within Segment 6. In fall 2022, average daily boardings at these stations ranged from 3 to 823 riders and average daily alightings ranged from 13 to 855 riders. The northbound stop at AVTC (Stop ID 16103) has the highest level of overall activity within Segment 6. Multiple bus lines intersect Aurora Avenue N at N 155th/160th Street, N 175th Street, N 185th Street, N 192nd Street, and N 200th Street.

[6] Segment 6 has been subdivided into three sub-segments for scale purposes

Figure 8-1, Figure 8-2, and Figure 8-3 display average daily E Line ridership and transit lines that travel on or intersect with Aurora Avenue N in Segment 6.

Twenty out of twenty-three stations within Segment 6 are equipped with at least 1 shelter; 3 stations have no shelters. The AVTC at the north end of Segment 6 is equipped with 12 shelters and additional amenities including two layover bays for the E Line, a customer information hub, and a pay phone.

Figure 8-4, Figure 8-5, and Figure 8-6 show passenger amenities at transit stops along Segment 6 of Aurora Avenue N.

8.2.1 Transit Travel Speeds

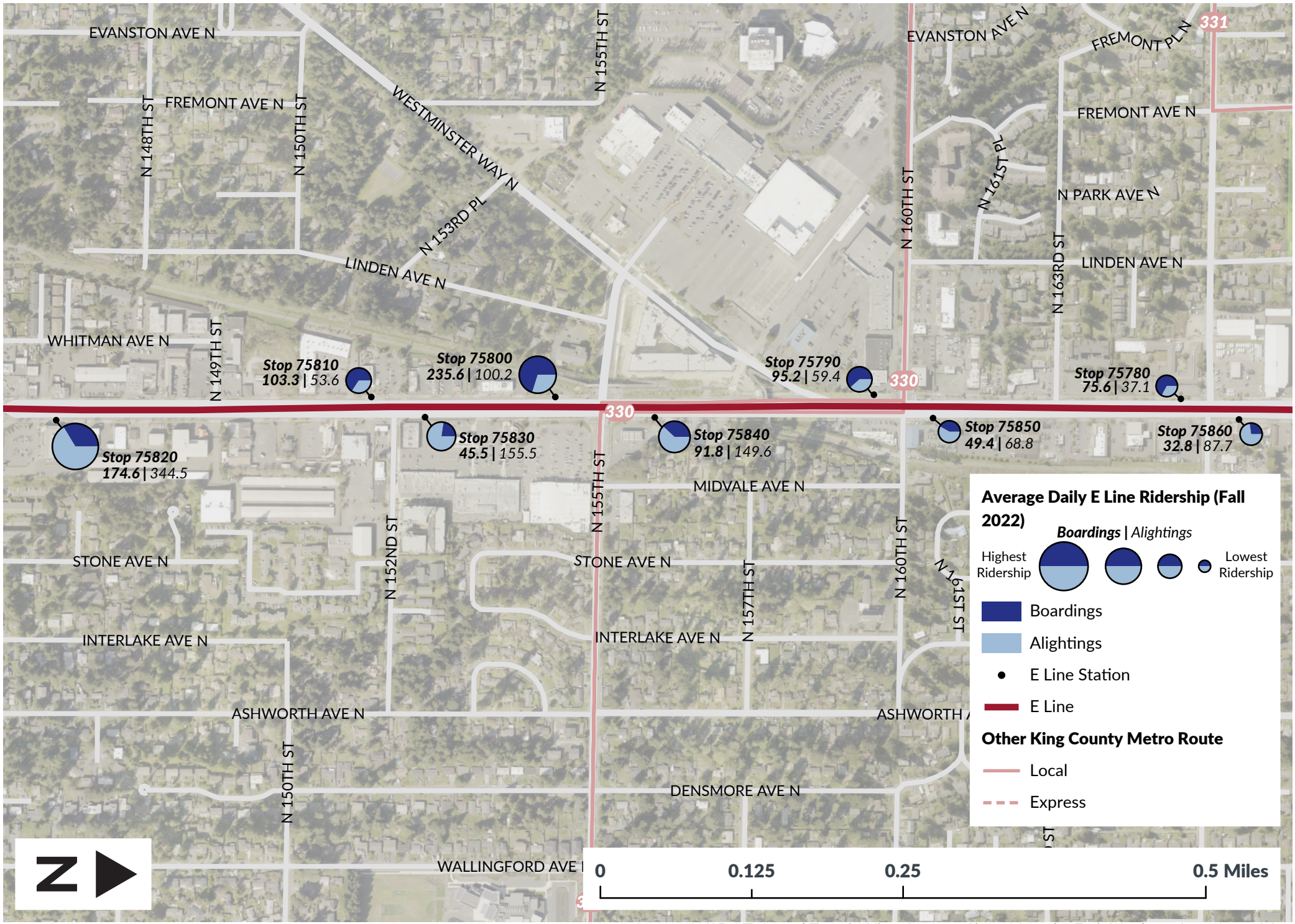
Average transit travel speeds vary within Segment 6 of Aurora Avenue N. Table 8-2 and Table 8-3 display the various average transit speeds within Segment 6 during the AM and PM hours, respectively. Figure 8-7 through Figure 8-12 display transit travel speeds in Segment 6 in the AM and PM peak periods, respectively.

Table 8-2 Segment 6 Average AM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 145th Street – N 152nd Street	21 – 30 mph	0 – 20 mph
N 152nd Street – N 155th Street	0 – 20 mph	21 – 30 mph
N 155th Street – N 165th Street	21 – 30 mph	21 – 30 mph
N 165th Street – N 170th Street	21 – 30 mph	21 – 30 mph
N 170th Street – N 175th Street	0 – 20 mph	21 – 30 mph
N 175th Street – N 180th Street	21 – 30 mph	0 – 20 mph
N 180th Street – N 185th Street	21 – 30 mph	21 – 30 mph
N 185th Street – N 192nd Street	21 – 30 mph	0 – 20 mph
N 192nd Street – N 200th Street	21 – 30 mph	21 – 30 mph
N 200th Street – AVTC	0 – 20 mph	0 – 20 mph

Table 8-3 Segment 6 Average PM Transit Travel Speeds

Extent	Outbound/Northbound Speed	Inbound/Southbound Speed
N 145th Street – N 155th Street	0 – 20 mph	0 – 20 mph
N 155th Street – N 165th Street	21 – 30 mph	0 – 20 mph
N 165th Street – N 170th Street	21 – 30 mph	21 – 30 mph
N 170th Street – N 175th Street	0 – 20 mph	21 – 30 mph
N 175th Street – N 180th Street	21 – 30 mph	0 – 20 mph
N 180th Street – N 185th Street	0 – 20 mph	21 – 30 mph
N 185th Street – N 192nd Street	21 – 30 mph	0 – 20 mph
N 192nd Street – N 200th Street	21 – 30 mph	21 – 30 mph
N 200th Street – AVTC	0 – 20 mph	0 – 20 mph



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-1. Segment 6a Average Daily E Line Ridership

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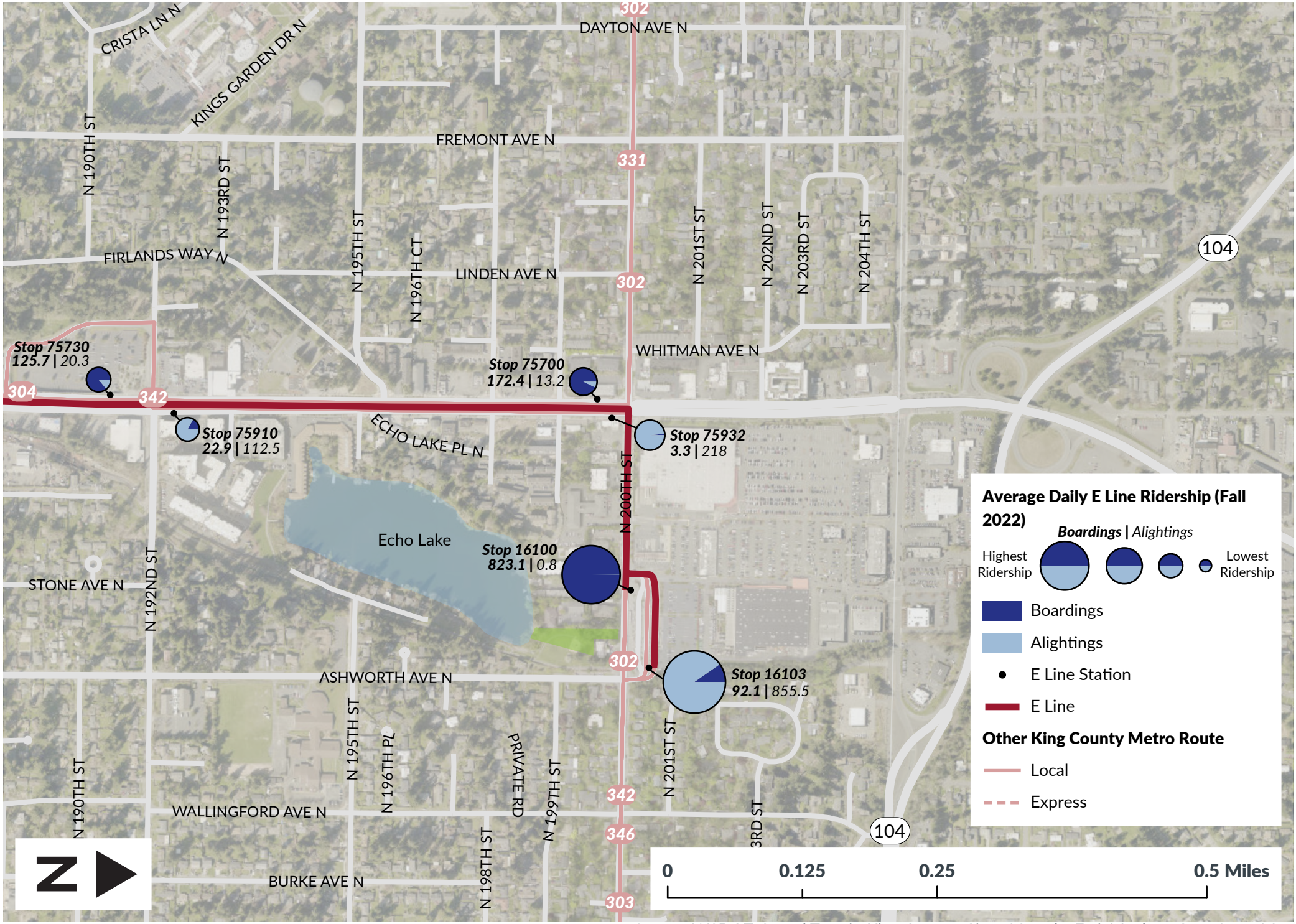


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-2. Segment 6b Average Daily E Line Ridership

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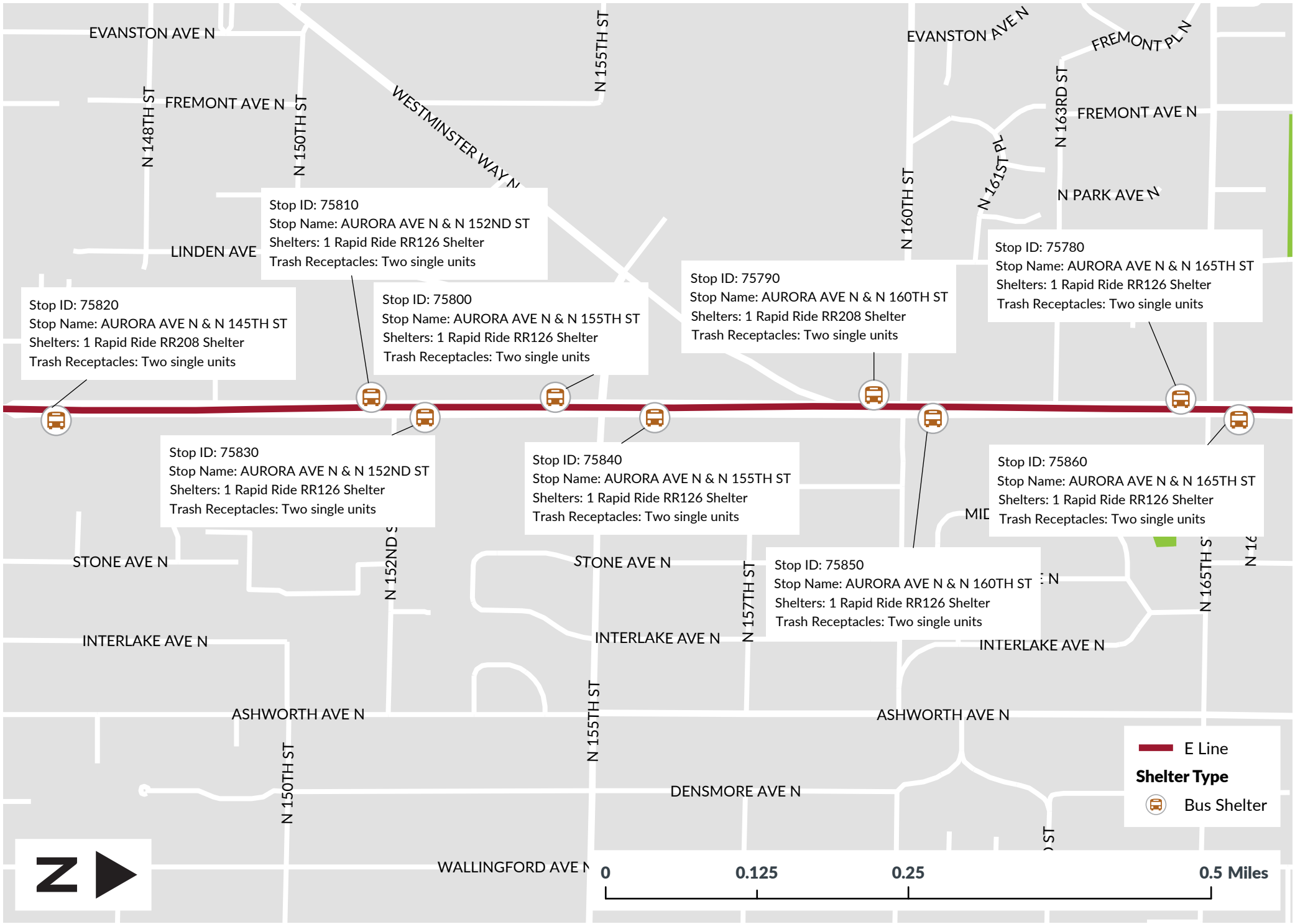


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-3. Segment 6c Average Daily E Line Ridership

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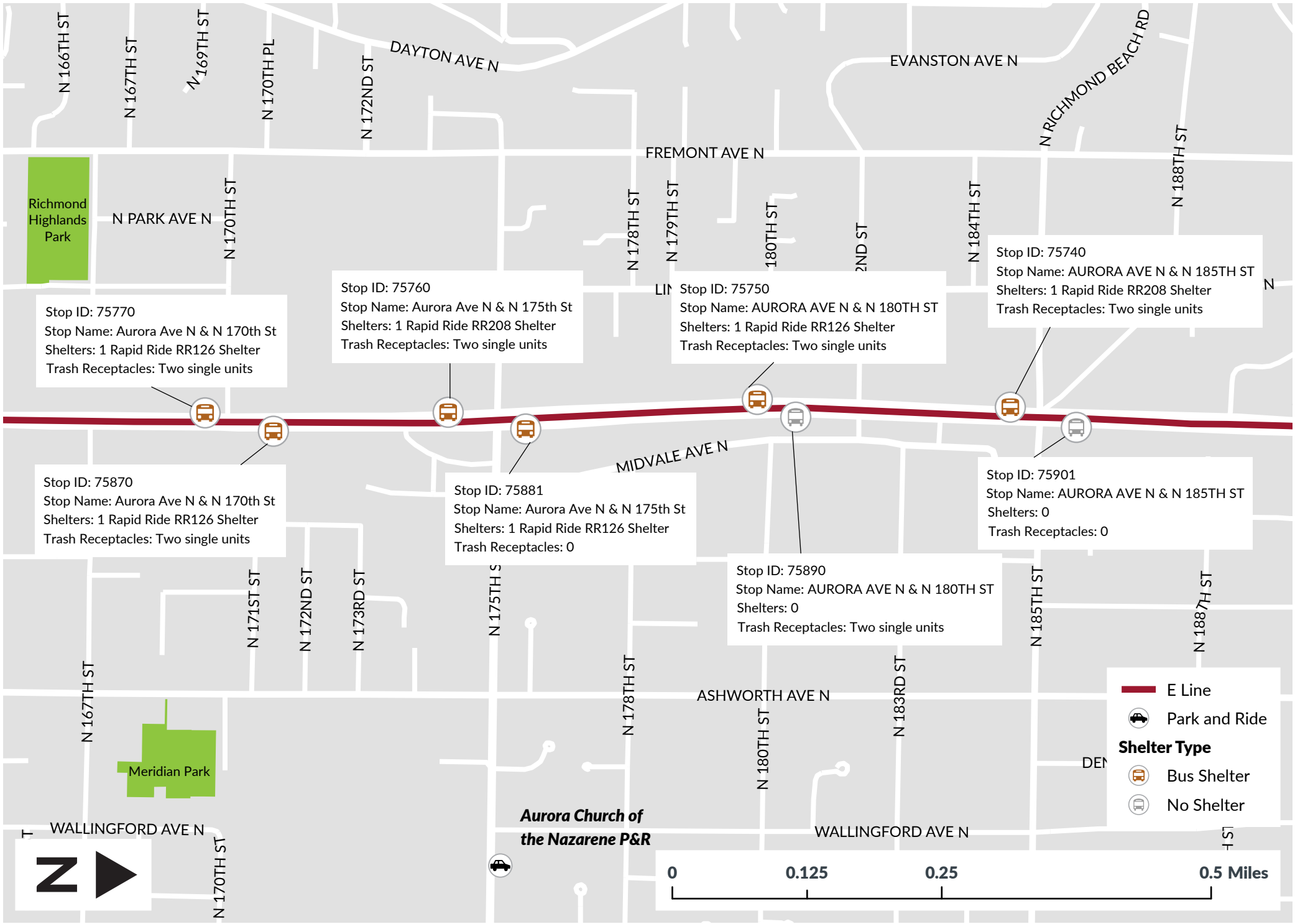


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-4. Segment 6a Passenger Amenities

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Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-5. Segment 6b Passenger Amenities

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King County METRO

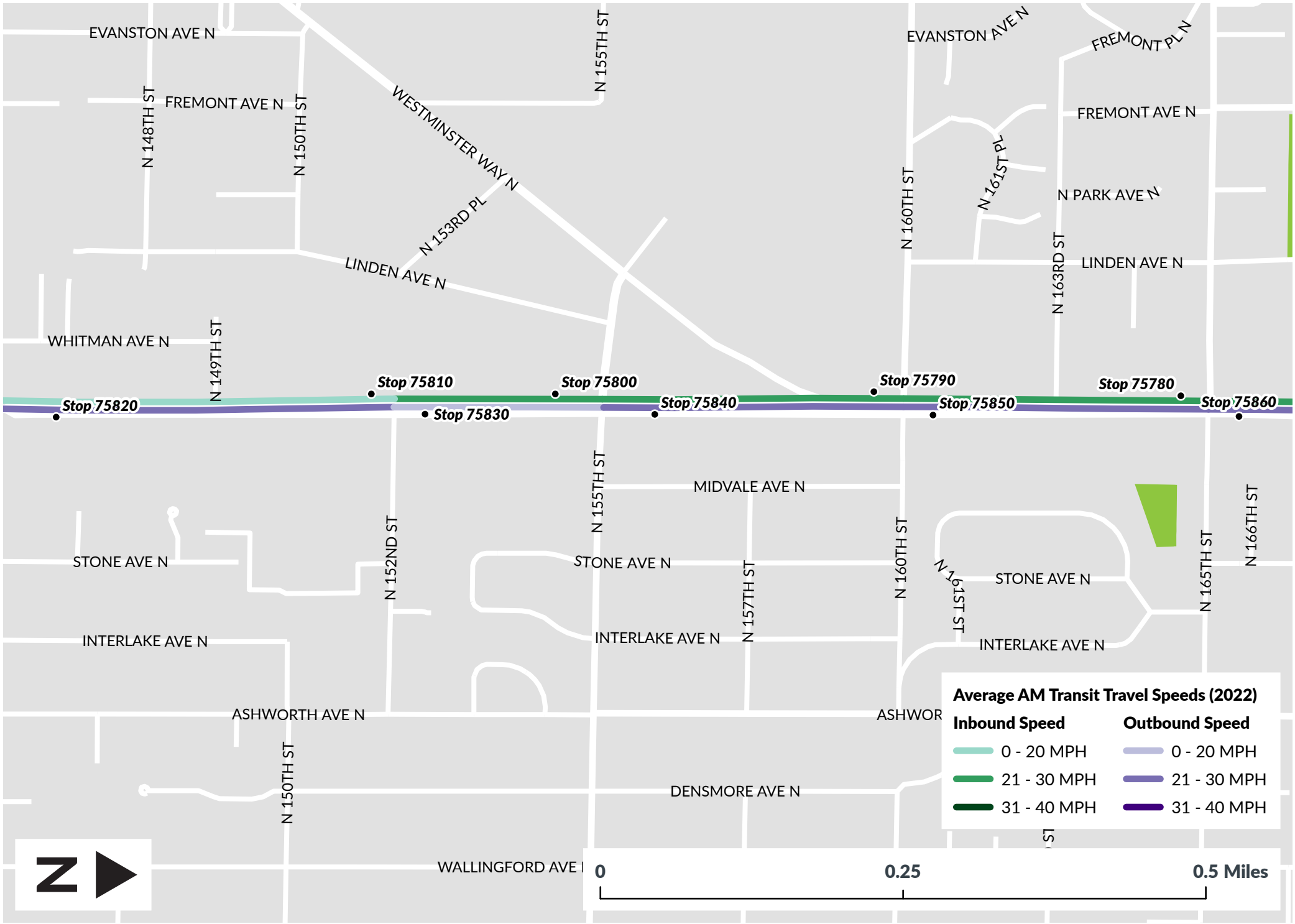


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-6. Segment 6c Passenger Amenities

Seattle Department of Transportation

King County METRO

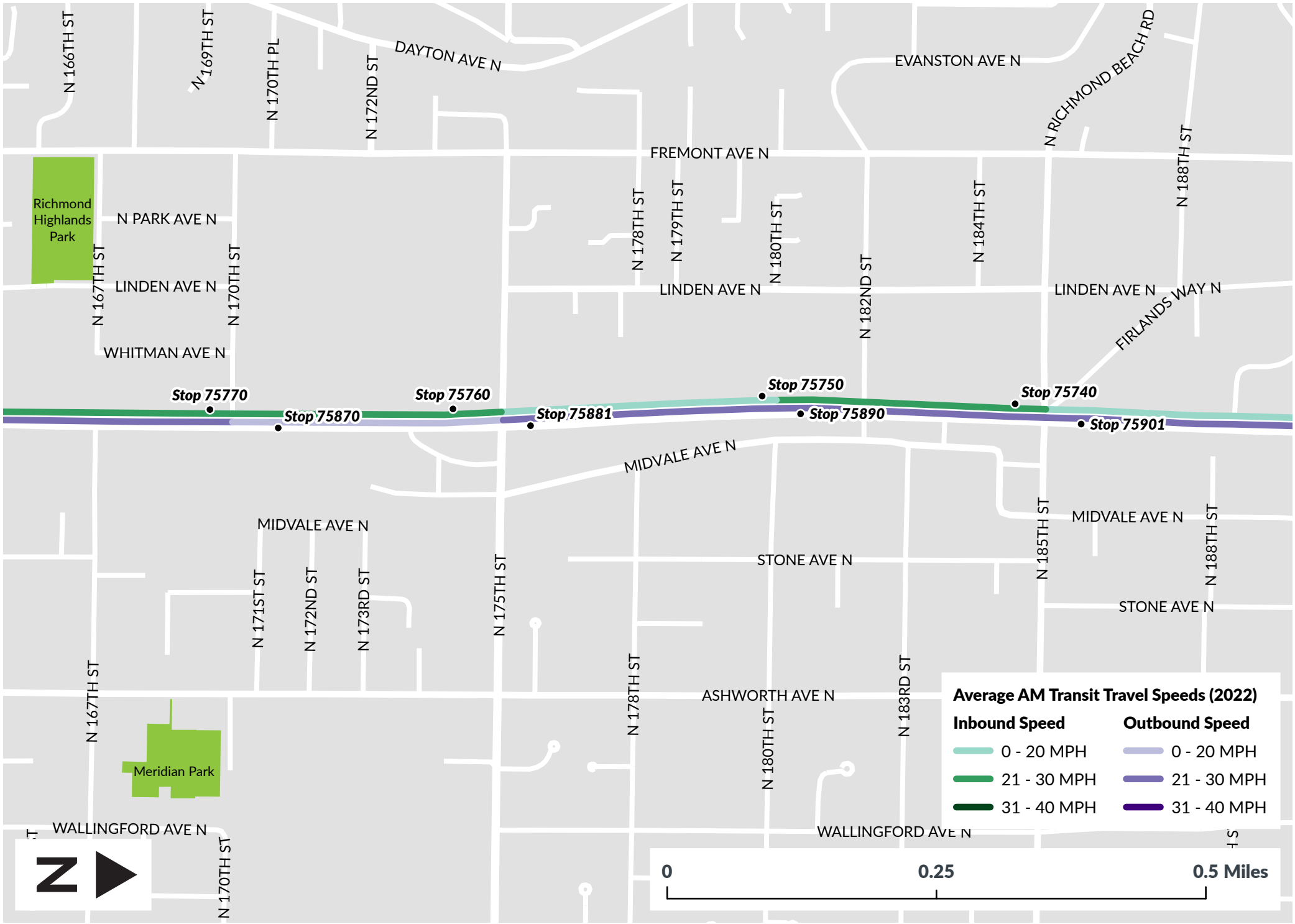


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-7. Segment 6a AM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

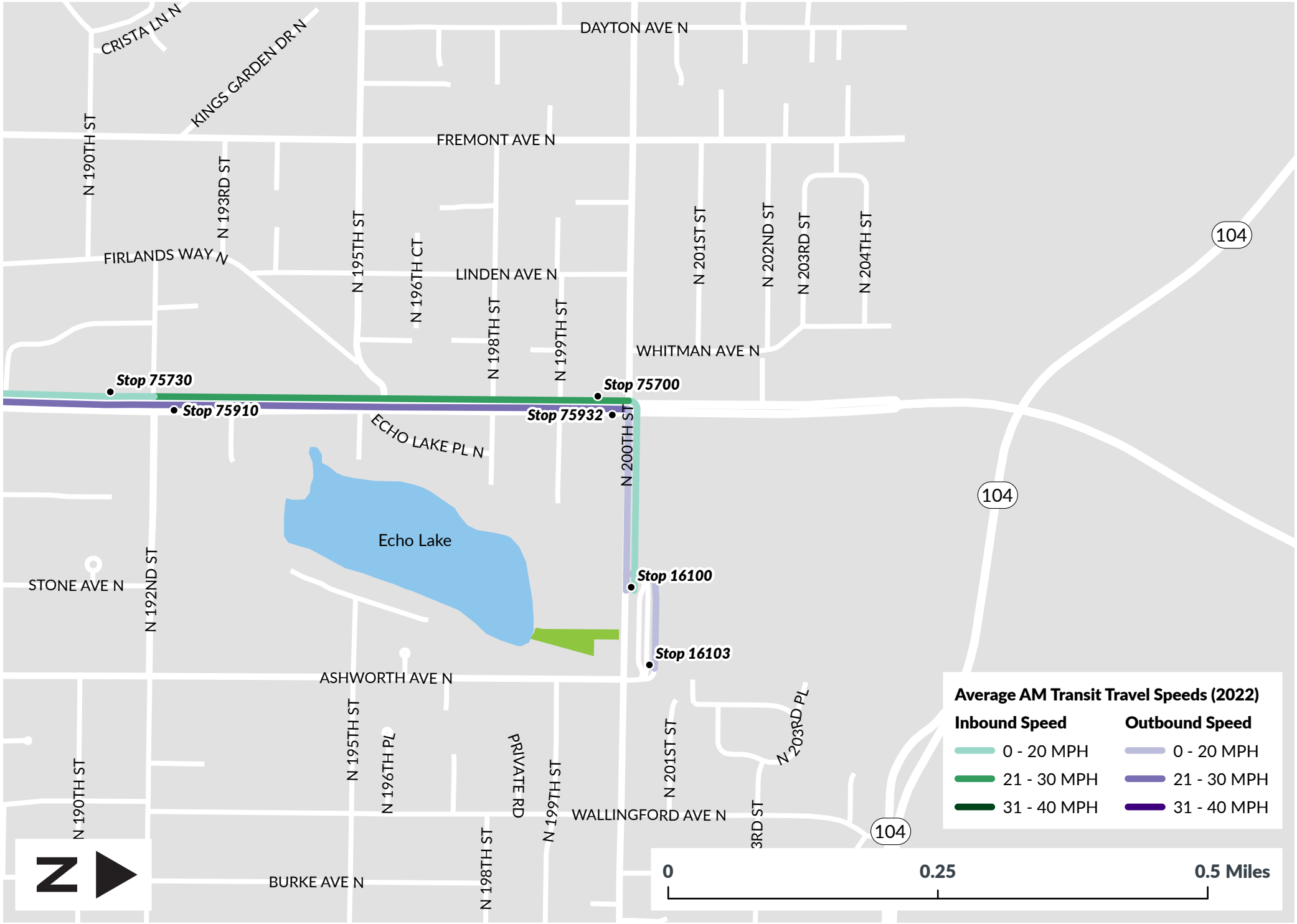


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-8. Segment 6b AM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

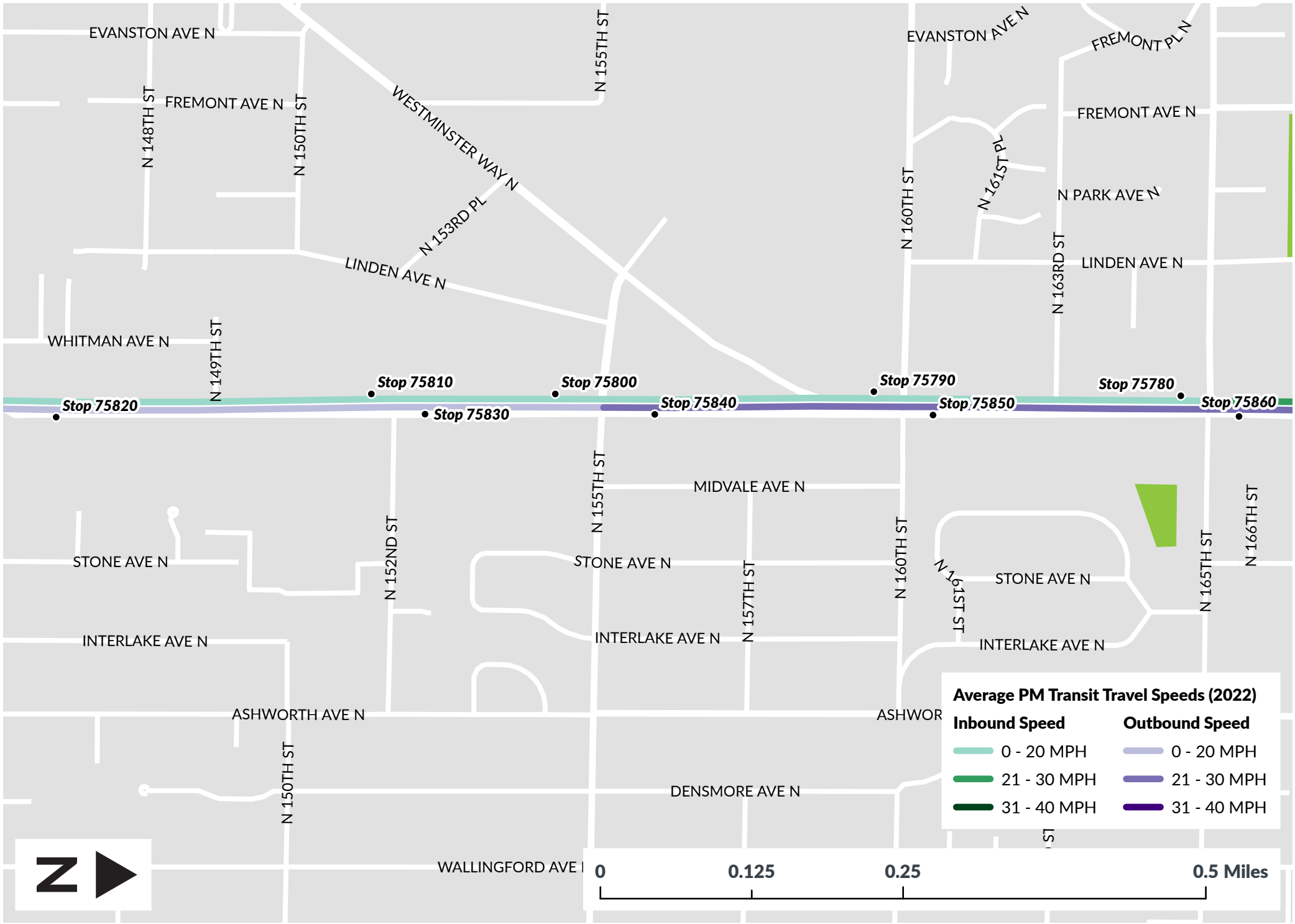


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-9. Segment 6c AM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

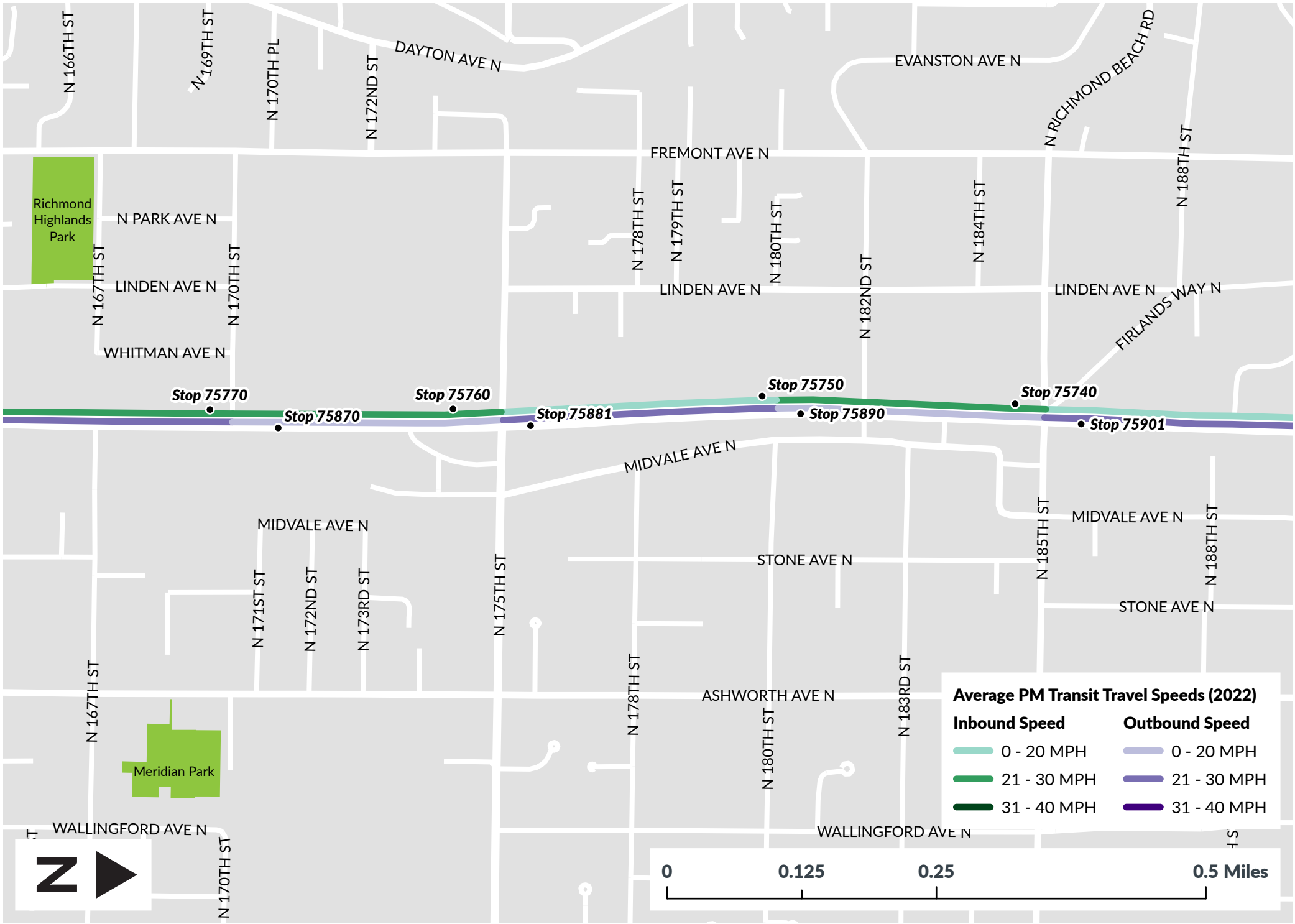


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-10. Segment 6a PM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

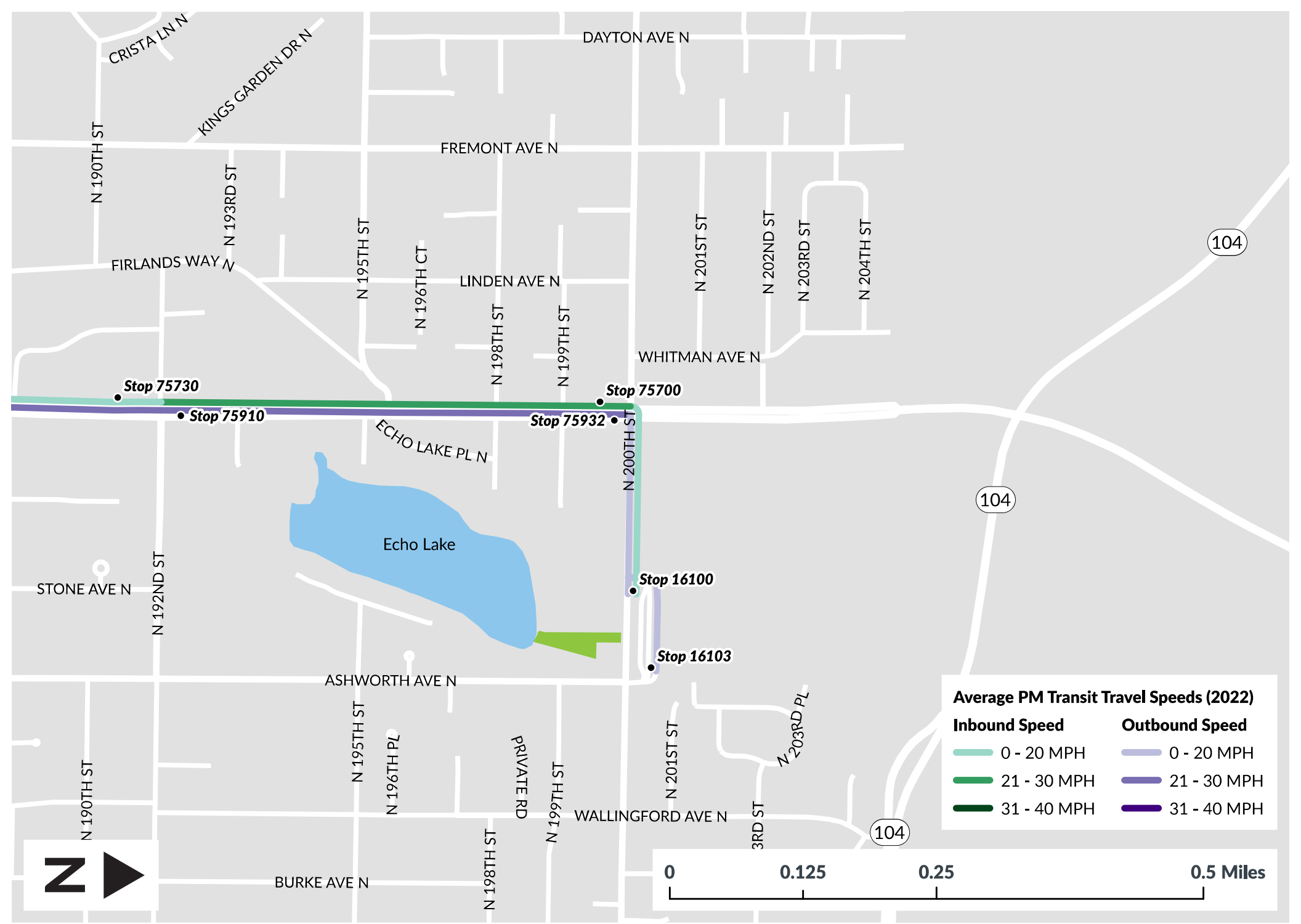


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-11. Segment 6b PM Transit Travel Speeds

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-12. Segment 6c PM Transit Travel Speeds

Seattle Department of Transportation

King County METRO

8.2.2 Bus collisions

Between January 2019 and February 2023, there were seventeen bus collisions along Aurora Avenue N in Segment 6. All collisions except five were with other non-transit vehicles. AVTC was the location of one collision with a fixed object, two collisions with revenue transit vehicles, and two cases of buses that received damage from unknown sources. Other groupings of collisions generally tended to cluster around streets running perpendicular to Aurora Avenue N such as N 199th Street.

Figure 8-13, Figure 8-14, and Figure 8-15 display bus collisions from 2021 and 2022 along Segment 6 of Aurora Avenue N.

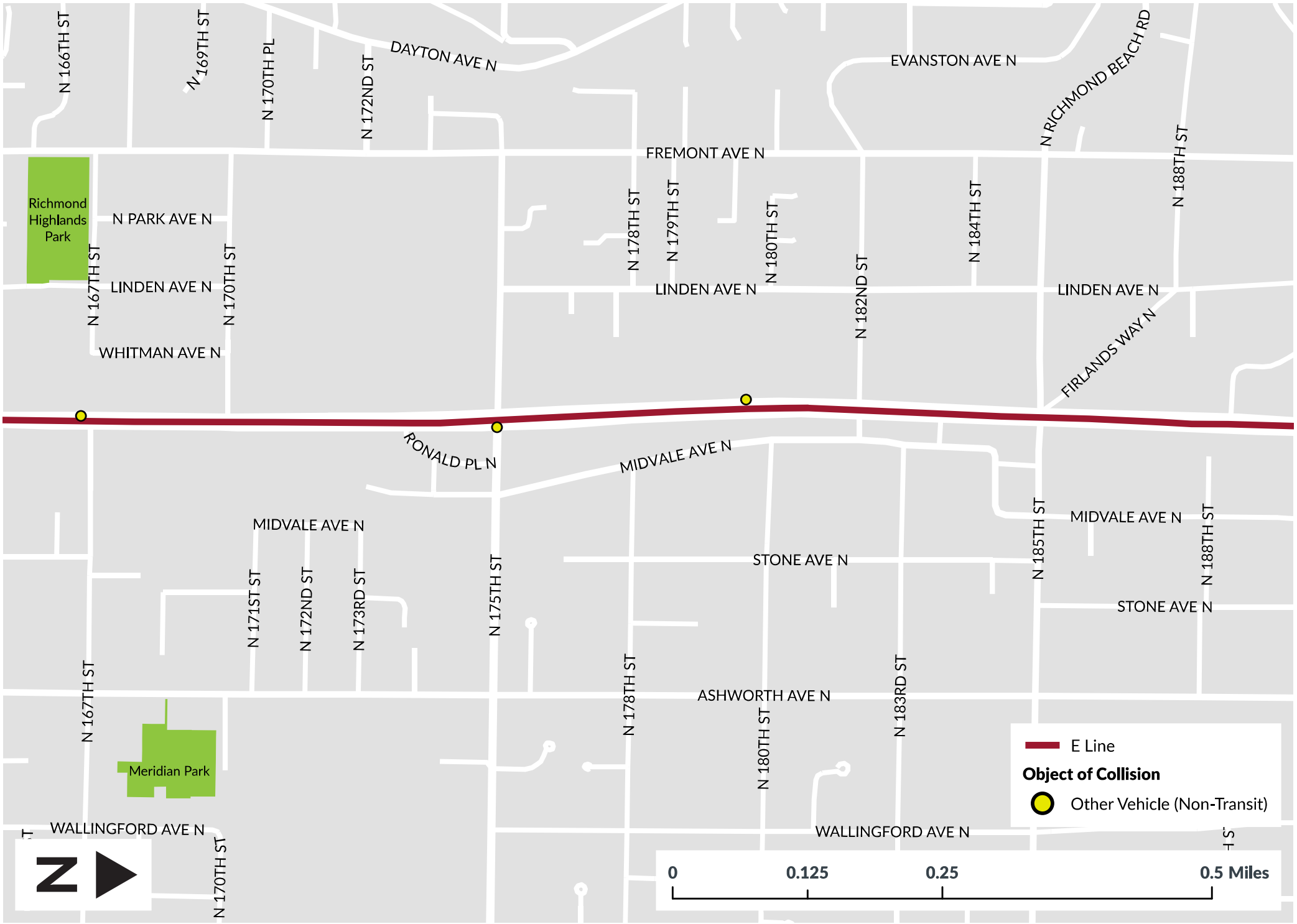


Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-13. Segment 6a Bus Collision Locations

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-14. Segment 6b Bus Collision Locations

Seattle Department of Transportation

King County METRO



Source: WSDOT, Sound Transit, King County, City of Seattle, Esri, Mapbox, OpenStreetMap

Figure 8-15. Segment 6c Bus Collision Locations

Seattle Department of Transportation

King County METRO