

# Existing and Future Traffic and Safety Analysis NE 112th Avenue Safety and Mobility Project

*Prepared for*

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- C Safety Analysis - Corridor Detail

## ACRONYMS AND ABBREVIATIONS

HSM	Highway Safety Manual
LOS	Level of Service
LRSP	Local Road Safety Plan
PSI	Potential for Safety Improvement
TSP	Transportation System Plan
TSSA	Transportation System Safety Analysis





## EXECUTIVE SUMMARY

This memorandum documents existing (2023) and future (2040) baseline traffic and safety conditions on NE 112th Avenue from SE McGillivray Boulevard to NE 51st Street in Vancouver, Washington. This baseline traffic and safety information, in addition to prior plan recommendations, will inform development of lane reconfiguration alternatives and other corridor safety improvement recommendations.

This project team will use information contained in this report, along with community input and feedback, to develop improvement concepts for the corridor. The selected improvement concepts will become project recommendations that will be advanced by the City in part through a preservation and resurfacing project on NE 112th Avenue in 2025 and 2026. Some recommendations that are outside the paving scope may be advanced as part of other capital investment safety or redevelopment projects in the future. Phase 1 of the resurfacing will take place in 2025 from Mill Plain Boulevard to NE 28th Street. Phase 2 will take place in 2026 and will extend from NE 28th Street north to the city boundary. The study area south of Mill Plain Boulevard is not on the list for preservation and resurfacing. However, the section of NE 112th Avenue between Mill Plain Boulevard and McGillivray Boulevard was included in the study area because the City is currently conducting a Complete Streets project on McGillivray Boulevard, so there may be opportunities to create mobility connections in this southern section and have plans in place for the next time that preservation and repaving occurs on this segment of roadway.

### Study Area

The study area for the project is NE 112th Avenue from McGillivray Boulevard to NE 51st Street in Vancouver, Washington, an approximately 3.3-mile-long corridor. Figure ES-1 shows the study area boundaries and key issues along the corridor. In addition to the maps in this report, information can also be viewed on the project's online map.<sup>1</sup>

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<sup>1</sup> <https://parametrix.maps.arcgis.com/apps/webappviewer/index.html?id=6598fbd6f2f44058833bf1a2265d7790>



Figure ES-1. Project Segments and Key Facility Gaps

## Land Use and Demographics

The 3.3-mile study area is an important north-south connector for several neighborhoods, businesses, schools, assisted living facilities, shopping centers, and other community destinations.

A large portion of study-area residents are members of equity populations who may have been historically excluded from transportation decision-making in the past. The City of Vancouver's Equity Index is a tool used to guide policy, program, and public investment priorities based on where equity populations reside in the City. The Equity Index considers the following variables:

- People of color (non-white and/or Hispanic/Latinx)
- Median Family Income
- Renters
- Adults without a 4-year college degree
- Households with limited English proficiency
- Persons with disabilities
- Households with children (below 18 years of age)
- People 65 and over

Neighborhoods north of NE 28th and south of Mill Plain score highest with respect to the equity index.

## Cycling, Walking, and Rolling

The City's updated Transportation System Plan (TSP) identifies the 112th Avenue corridor as a Pedestrian Corridor, meaning the roadway is intended as a low-stress walking and rolling corridor. Additionally, the corridor is part of the Small Mobility Network, prioritized for low-stress cycling and use by people with small mobility devices such as scooters. Today, much of the corridor has sidewalks, but these directly abut the travel lane in most cases (no buffer present) and are 6' or less in width, leading to higher-stress conditions for people walking and rolling the corridor. There are virtually no cycling facilities in the corridor, creating a very stressful environment for cyclists.

Additionally, parallel adjacent streets such as NE 110th Avenue have been identified as low-stress Neighborhood Greenways in the TSP.

Figure ES-1 shows a summary of the major facility gaps in the corridor, summarized below:

### Cycling Facilities

- No bike lanes are present throughout most of the corridor, and where present, are disconnected.
- Several areas along NE 112th Avenue are considered "difficult connections" which is defined by the City of Vancouver as an area with higher speeds and/or volumes, combined with narrow lane widths or other problems for cyclists.

## **Pedestrian Facilities**

- Marked pedestrian crosswalks are present only at signalized intersections throughout the corridor, and in some places, are up to a half mile apart.
- In Segment 3 (NE 9th Street to NE 18th Street), sidewalks are missing on the east side of the street.
- In Segment 6 (39th Street to 51st Street), a fence or wall runs directly parallel to the sidewalk for approximately 900 feet without street lighting. This may result in a less comfortable experience for people walking or using a mobility device, due to the tunnel-like experience of walking between a wall and fast-moving traffic.

## **Transit**

NE 112th Avenue is served by C-TRAN Route 80, which turns north onto NE 112th Avenue at 28th Street and continues along NE 112th Avenue until turning west onto Fourth Plain Boulevard. C-TRAN is planning to introduce a new transit route on 112th Avenue in September 2024, with changes (including construction of new bus stops) to be implemented in summer 2023. The new route will include service south of NE 28th, where no service currently exists.

Existing notable transit conditions include:

- Many stops are not located near marked or enhanced crosswalks, and marked and/or signalized crossings (consisting of crosswalk markings and stop bars at signalized intersections) are available only at NE 28th Street, NE 39th Street, NE 49th Street, and NE 51st Street.
- Many bus stops are not located adjacent to street lighting and likely do not meet industry standards for illumination.

## **Traffic Analysis**

### **Current Traffic Volumes and Corridor Travel Times (2023)**

- The number of trips on the 112th Avenue corridor (northbound and southbound trips) is generally higher north of NE 18th Street and lower south of NE 18th Street. North of NE 18th, the number of weekday vehicle trips is approximately 30,000, increasing to over 45,000 at the SR 500 ramps just north of the study area. South of NE 18th Street, the number of weekday vehicle trips is between approximately 15,000 and 18,500. The Federal Highway Administration (FHWA) advises that roadways with average daily trips of 20,000 or fewer are potential candidates for lane reconfigurations.
- The peak travel hours are from 7:45 to 8:45 a.m. and from 4:30 to 5:30 p.m. The northbound direction accounts for 48% of the trips, while the southbound direction constitutes 52%. Corridor speed data indicates that speeding may be an issue between NE 9<sup>th</sup> and approximately NE 28<sup>th</sup> Street on 112<sup>th</sup> Avenue; data indicates the 85<sup>th</sup> percentile speed (the speed at which 85% of drivers are travelling at or under) is between 41.5 MPH and 44.9 MPH in this section, with a speed limit of 35 MPH.

- Table ES-1 shows corridor travel speeds, both current and future (2040), as they compare to the City’s corridor travel time concurrency standards. The concurrency standards specific a minimum corridor travel speed target. The corridor is forecast to *not* meet concurrency standards between 28th Street and 51st Street in the future year during PM peak hour.

**Table ES-1. PM Peak Hour Travel Speeds and Concurrency Standards**

Time Period	Segment	Concurrency Threshold (mph)	2023 Existing Speed (mph)			2040 No-Build Speed (mph)		
			NB	SB	Average	NB	SB	Average
AM Peak Hour	Mill Plain Blvd to 28th St	11	25	24	24.4	25	24	24.1
	28th St to 51st St	15	20	17	18.3	20	17	18.2
PM Peak Hour	Mill Plain Blvd to 28th St	11	24	23	23.2	23	22	22.6
	28th St to 51st St	15	19	15	17.0	13	14	13.9

Bldv = Boulevard; mph = miles per hour; NB = northbound; SB = southbound; St = Street

### Traffic Operations – Current Year (2023) and Future Year (2040)

The project team conducted intersection traffic operations analysis to understand how much delay and congestion drivers experience in the corridor today and in the future (2040). The future year modeling is based on information from the regional travel model, which projects travel demand out to the year 2040. The following section highlights those intersections that are congested today and/or are anticipated to be congested in the future. Two metrics are used to evaluate traffic congestion:

- Volume to capacity ratio (v/c ratio): This measures the amount of traffic on the roadway or intersection relative to the amount of traffic the roadway or intersection is designed to accommodate. In general, v/c ratios below 0.85 are considered acceptable traffic conditions based on Highway Capacity Manual (HCM) guidance.
- Level of service (LOS): This is a measure of delay for vehicles at intersections, graded on a scale from A (free flow conditions) to F (very heavy congestion). In general, LOS of D or above is considered acceptable traffic conditions.

Table ES-2 highlights those intersections where LOS or v/c ratio exceed LOS D or a v/c ratio of 0.85, respectively.

**Table ES-2. Intersection Operations Results**

112th Avenue Results			2023 Existing				2040 No-Build			
North/South Street	East/West Street	Control Type	Delay (s)	LOS	v/c Ratio	Worst Movement	Delay (s)	LOS	v/c Ratio	Worst Movement
<b>AM Peak Hour</b>										
Chaklov	Mill Plain	Signal	40	D	0.64	SB	41	D	0.69	SB
112th	NE 23rd	TWSC	26	D	0.26	WB	25	C	0.25	WB
112th	NE 28th	Signal	48	D	0.69	EB	47	D	0.71	EB
<b>PM Peak Hour</b>										
Chaklov	McGillivray	Signal	22	C	0.85	NB	22	C	0.91	NB
Chaklov	Mill Plain	Signal	38	D	0.73	NB	40	D	0.79	NB
112th	NE 23rd	TWSC	54	F	0.30	WB	71	F	0.36	WB
112th	NE 28th	Signal	93	F	0.81	NB	105	F	0.86	NB
112th	NE 49th	Signal	33	C	0.76	NB	49	D	0.84	NB
112th	NE 51st	Signal	13	B	0.82	EB	15	B	0.89	EB

EB = eastbound; LOS = level of service; NB = northbound; SB = southbound; TWSC = two-way stop control; WB = westbound

The following intersections have high levels of vehicle delay today and/or in the future (2040):

- Mill Plain Boulevard and Chkalov Drive.
- NE 112th Avenue and NE 23rd Street. This intersection is not signalized today.
- NE 112th Avenue and NE 28th.

All other intersections within the study area operate at a level of service ranging from LOS A to C, which is considered acceptable and does not result in significant delays or congestion during peak hours.

## Safety Conditions

There are a high number of crashes and multiple fatalities in the NE 112th Avenue corridor, indicating that there is significant opportunity for safety improvements overall. Analysis of recent crash data (2017–2021) revealed:

- There were 399 reported crashes in the corridor. Of those, 15 were severe injury and fatal crashes, and 22 were pedestrian- or bicyclist-involved crashes.
- Three of the fatal crashes involved pedestrians, all of which occurred during dusk or dark (with streetlights) conditions. The fatal pedestrian crashes occurred at the following locations:
  - SE Chkalov Drive & SE McGillivray Boulevard intersection
  - SE Chkalov Drive & Mill Plain Boulevard intersection
  - NE 20th Street to NE 23rd Street segment of NE 112th Avenue

Additionally, in March 2023, a fatal crash occurred at the intersection of the 900 block of NE 112th Avenue which involved an automobile and a cyclist.

The project team conducted analysis (using *Highway Safety Manual*<sup>2</sup> [HSM] methods) to understand how 112th Avenue safety performs relative to other roadways with similar conditions. This analysis identified intersections that are experiencing more than one additional crash per year on average than would be predicted for a similar roadway elsewhere, and may represent priority locations for safety countermeasures. These include:

- NE 112th Avenue & NE 18th Street
- NE 112th Avenue & NE 28th Street
- NE 112th Avenue & NE 49th Street
- NE 112th Avenue & NE 51st Street

Overall, the corridor is performing slightly worse than predicted (i.e., compared to similar sites), largely due to the locations identified above. While improvements are possible along the entire corridor, the locations highlighted in the HSM crash analysis represent the areas with the most opportunity to reduce crashes and improve safety performance along the corridor.

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<sup>2</sup> <https://www.highwaysafetymanual.org/Pages/default.aspx>

Finally, the City has conducted previous safety analysis through its *Local Roads Safety Plan*.<sup>3</sup> This plan identified the following three locations for safety investment opportunities:

- *Intersection of Chkalov Drive and Mill Plain Boulevard.* This intersection experienced the most crashes along the corridor under prior analysis, including the greatest number of fatal and severe injury crashes (three) at an intersection.
- *Segment between SE 7th Street and Mill Plain Boulevard.* This segment was the most dangerously ranked segment under a previous analysis, as well as the segment with the greatest total crashes per mile per year.
- *Segment between NE 28th Street and NE 39th Street.* The project team assessed this area with the HSM analysis method noted above and found that this segment is performing better than other roadways with similar characteristics; however, there were two severe injury crashes here during the study period.

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[https://www.cityofvancouver.us/sites/default/files/fileattachments/community\\_development/page/1023/vancouver\\_lrsp\\_09122022.pdf](https://www.cityofvancouver.us/sites/default/files/fileattachments/community_development/page/1023/vancouver_lrsp_09122022.pdf)



# 1. INTRODUCTION

This report documents existing (2023) and future (2040) baseline traffic and safety conditions on NE 112th Avenue from SE McGillivray Boulevard to NE 51st Street. The project team conducted traffic analysis using traffic counts collected in 2023. Safety analysis is derived from existing plans and documents such as the 2018 Transportation System Safety Analysis (TSSA), the 112th Avenue Corridor Traffic Safety Project (2009), the 112th Avenue Corridor Subarea Plan (2011), and the City of Vancouver’s Safety Dashboard, as well as novel analysis conducted by the project team. This baseline traffic and safety information, in addition to prior plan recommendations, will inform development of lane reconfiguration alternatives and other corridor safety improvement recommendations.

In addition to the maps in this report, mapped information can also be viewed in the project’s online map.<sup>4</sup>

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<sup>4</sup> <https://parametrix.maps.arcgis.com/apps/webappviewer/index.html?id=6598fbd6f2f44058833bf1a2265d7790>



## 2. BACKGROUND AND STUDY AREA

This project will develop improvement concepts for the corridor, partner with the community to provide feedback, and make recommendations on striping redesigns as well as other safety and mobility improvements. The recommendations will be advanced by the City through a preservation and resurfacing project on NE 112th Avenue in 2025 and 2026. Some recommendations may be advanced as part of other capital investments outside of the paving projects. Phase 1 of the resurfacing will take place in 2025 from Mill Plain Boulevard to NE 28th Street. Phase 2 will take place in 2026 and will be from 28th Street north to the City boundary. The study area south of Mill Plain Boulevard is not on the list for preservation and resurfacing, however, the section of NE 112th Avenue between Mill Plain Boulevard and SE McGillivray Boulevard was included in the study area because the City is currently conducting a Complete Streets project on SE McGillivray Boulevard. The Project Team will be looking for opportunities to create mobility connections in this southern section when this segment is scheduled for repaving.

The study area is an approximately 3.3-mile-long corridor along NE 112th Avenue from SE McGillivray Boulevard to NE 51st Street in Vancouver, Washington. Figure 2-1 shows the study area boundaries and major intersections in the corridor.

Existing and Future  
 Traffic and Safety Analysis  
 NE 112th Avenue Safety and Mobility Project  
 City of Vancouver

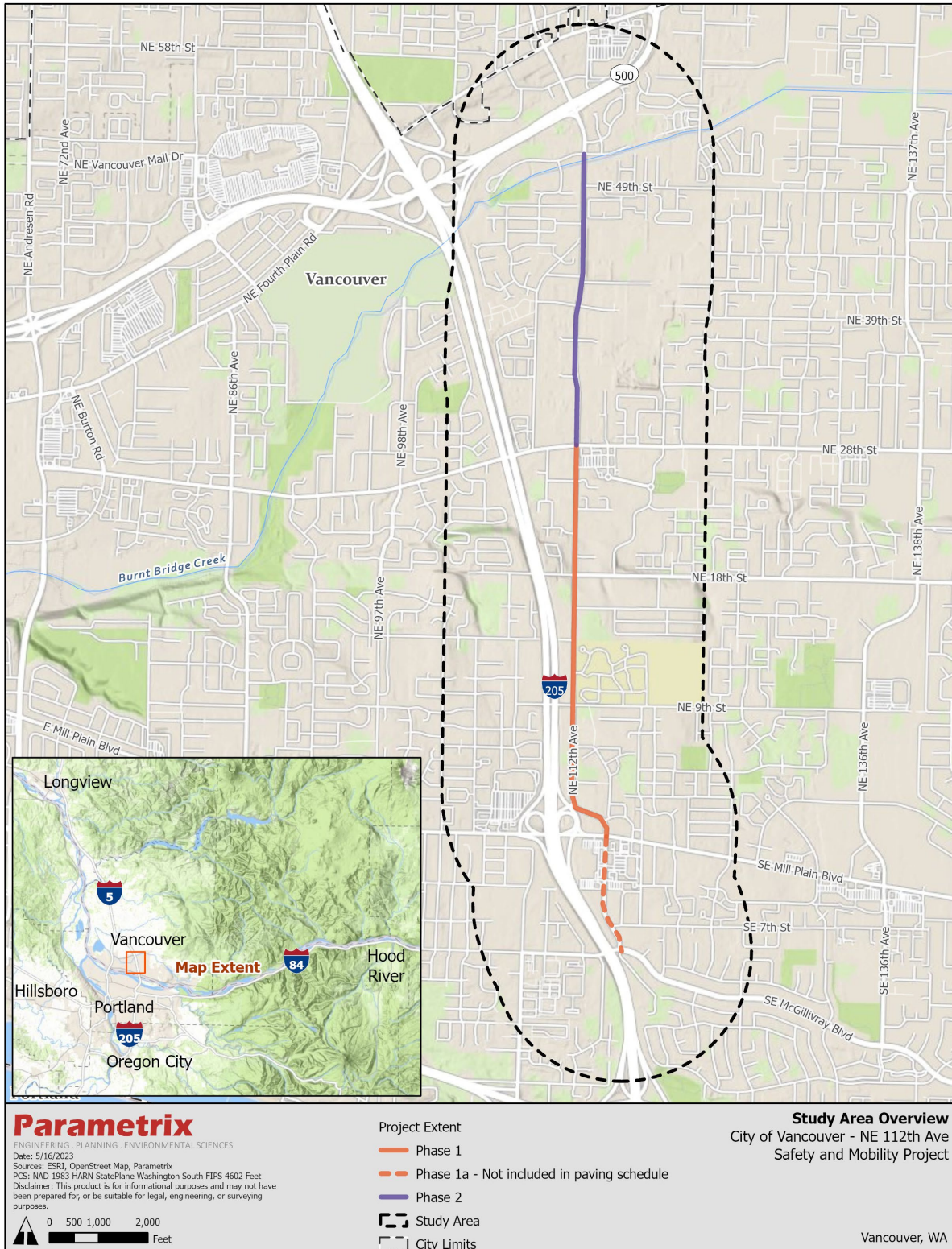


Figure 2-1. Study Area

## 2.1 Study Area Demographics

The 3.3-mile project study area is a vibrant and growing corridor, encompassing several neighborhoods, businesses, schools, assisted living facilities, shopping centers, and other community destinations. 51-73% of housing units are renter-occupied within the project study area. In comparison, approximately 49% of housing units are renter-occupied within the City of Vancouver.

As demonstrated in Figure 1, equity index scores indicate that a large portion of project-area residents are populations who may have been historically excluded from transportation decision-making in the past. The City of Vancouver’s Equity Index Map is a tool used to guide policy, program, and public investment priorities based on where equity populations reside in the City. The map below was created using the City of Vancouver’s Equity Index Map. The Equity Index Map considers the following variables:

- People of color (non-white and/or Hispanic/Latinx)
- Median Family Income
- Renters
- Adults without a 4-year college degree
- Households with limited English proficiency
- Persons with disabilities
- Households with children (below 18 years of age)
- People 65 and over

Neighborhoods in the north and south ends of the project study area contain the highest equity index scores. According to [2021 U.S. Census](#) data and as demonstrated in Table 2, Spanish and Russian/Ukrainian language support will be needed when engaging with residents throughout the project area.

**Table 2-1. Percentage of People Within the Project Study Area Who Speak Languages other than English**

Project Study Area	% of People Who Speak Spanish	% of People Who Speak Russian/Slavic Languages
<b><u>Segment 1</u></b>		
Census Tract 412.07	18.3%	0%
Census Tract 413.22	11%	7.4%
<b><u>Segment 2-4</u></b>		
Census Tract 412.06	8.5%	9.6%
Census Tract 413.17	2.1%	9.7%
<b><u>Segment 5-6</u></b>		
Census Tract 413.13	7.3%	2.1%
Census Tract 413.31	6.6%	9.6%

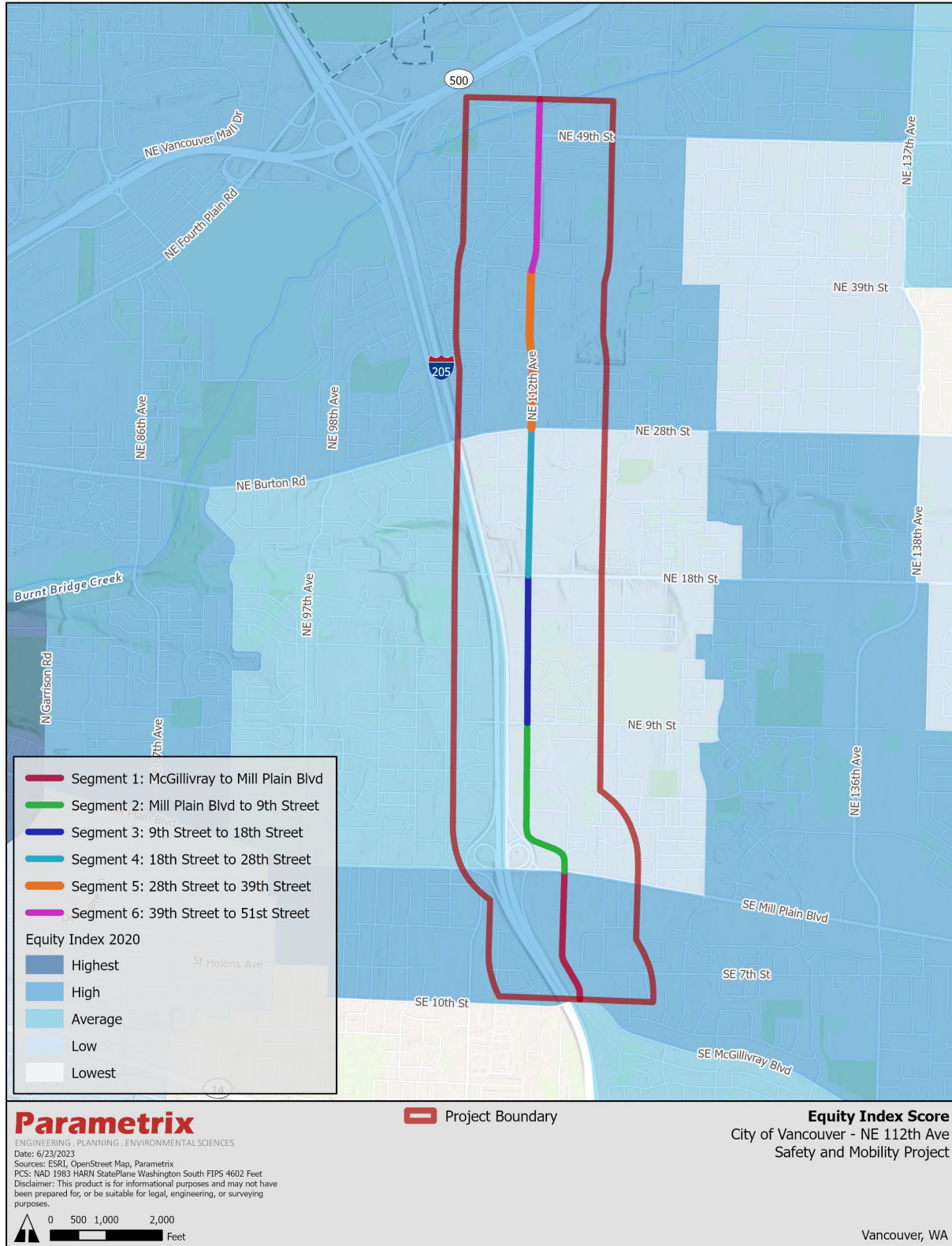


Figure 2-2. Project Study Area Equity Index Scores

## 2.2 Prior Planning Efforts

Due to the corridor’s crash history, NE 112th Avenue has been included in multiple studies, planning efforts, and improvement initiatives over the last decade. Table 2-2 includes a summary of past planning efforts, key findings, and recommendations.

**Table 2-2. Prior Efforts – Key Findings and Recommendations**

Plan/Initiative	Key Findings	Recommendations
112th Avenue Repaving Project (TBD)	<ul style="list-style-type: none"> <li>City’s pavement management section will be repaving NE 112th Avenue from NE 51st Street to Mill Plain Boulevard in 2025 and 2026.</li> </ul>	<ul style="list-style-type: none"> <li>Consider coordinated safety and mobility improvements with the repaving project.</li> </ul>
City of Vancouver Transportation Improvement Program (TIP) - Updated Annually	<ul style="list-style-type: none"> <li>The City of Vancouver TIP identifies capital transportation system improvement projects over a 6-year period.</li> <li>Projects listed in the TIP include planning studies and major street, bicycle, pedestrian, and traffic signal improvements.</li> <li>Complete Streets policies and a citywide collision study were reflected in the plan and helped prioritize future transportation needs.</li> <li>Extensive public outreach, which includes an increased focus on communities underrepresented in previous transportation planning efforts, helped inform the update.</li> </ul>	<p>Projects include:</p> <ul style="list-style-type: none"> <li>NE 112th Avenue Sidewalk: Chkalov Drive to NE 9th Street (2020–2025).</li> <li>Corridor improvements to bring NE 112th Avenue up to urban arterial standards and address safety and accessibility issues for all modes of travel (2023–2028).</li> </ul>
Vancouver Moves – City of Vancouver Transportation System Plan (TSP) Update (2020 – 2022)	<ul style="list-style-type: none"> <li>Safety was identified as the top transportation value to guide the development of TSP policies, goals, and projects.</li> <li>NE 112th Avenue was included as a “Site with potential for safety improvements” for both intersections and segments along the corridor.</li> <li>Mill Plain Boulevard/Chkalov Drive ranked #1 in the Safety Performance Index conducted as part of developing the updated TSP.</li> <li>The entire NE 112th Avenue study area was identified as a “site which may respond to countermeasures.”</li> </ul>	<ul style="list-style-type: none"> <li>As part of the Proposed Pedestrian Network, NE 112th Avenue was identified as a low-stress walking and rolling network; improvements may include better sidewalks, ramps, and crossings in places with higher concentrations of pedestrian destinations and needs (see Figure 2-3).</li> <li>As part of the Proposed Bicycling and Small Mobility Network, NE 112th Avenue was identified as part of the future low-stress bicycling and small mobility network; includes proposed new or upgraded low-stress facilities, which may include protected lanes, striped bike lanes, multiuse paths, and bike routes where people can safely and comfortably travel</li> </ul>

Plan/Initiative	Key Findings	Recommendations
		<p>by bicycle, scooter, or other small mobility devices throughout the city (see Figure 2-4).</p> <ul style="list-style-type: none"> <li>• NE 112th Avenue was proposed as an enhanced transit corridor. The TSP proposes an enhanced transit network to designate streets where the City will prioritize working with C-TRAN to support investments in transit speed and reliability. The enhanced transit network also designates where the City should focus on station access improvements such as pedestrian crossings and sidewalks.</li> <li>• 109th Avenue (parallel to NE 112th Avenue) was identified as a Neighborhood Greenway and a low-stress facility.</li> </ul>
<p>Local Road Safety Plan for 2022–2026 (August 2022)</p>	<ul style="list-style-type: none"> <li>• The 2022 LRSP looks at crashes that resulted in an injury on the City of Vancouver’s locally controlled streets from 2016 through 2020, with a focus on crashes that resulted in a fatality or severe injury.</li> <li>• This plan evaluates crash data from previous years to identify trends, high priority locations, countermeasures, and recommendations for updates to the City’s LRSP.</li> </ul>	<p>Potential safety countermeasures:</p> <ul style="list-style-type: none"> <li>• Convert intersections to roundabouts.</li> <li>• Convert four-lane roadways to three-lane roadways with a center turn lane (road reconfiguration).</li> <li>• Modify signal phasing to implement a leading pedestrian interval.</li> <li>• Install lighting.</li> <li>• Install refuge islands and raised crossings, crosswalk sight distance and visibility enhancements, advance stop marking.</li> <li>• Invest in bike lanes.</li> <li>• Explore options for access management.</li> <li>• Shorten crossing distances with bicycle friendly curb extensions.</li> </ul>



Plan/Initiative	Key Findings	Recommendations
<p>City of Vancouver Transportation System Safety Analysis (TSSA) (2018)</p>	<ul style="list-style-type: none"> <li>• Portions of NE 112th Avenue had some of the highest collision rates across the City. Between 2010 and 2016, two of the top 20 crash intersections are within the study area.</li> <li>• NE 112th Avenue at NE 51st Street ranked twelfth in the City’s safety performance index with 51 total crashes (3 fatal and serious, 1 ped/bike).</li> <li>• NE 112th Avenue at NE 39th Street tied for seventeenth place with 13 total crashes (3 fatal and serious, 5 ped/bike).</li> <li>• In a Segment Prioritization Analysis, NE 112th Avenue from Mill Plain Boulevard to NE 9th Street was identified as a higher-ranking segment for the Principal Arterial classification and was identified as a segment with potential for safety improvements.</li> <li>• Five-lane cross sections such as NE 112th Avenue had higher rates of pedestrian crashes (all severities).</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis revealed countermeasures that could be implemented throughout the city: implement leading pedestrian interval phasing, increase driver compliance with traffic signals, improve wayfinding, reduce speeding, and evaluate opportunities to reconfigure the roadway cross section.</li> <li>• NE 112th Avenue at NE 9th Street Project. Increase all-red clearance interval, review sight distance triangles at intersections, add retroreflective sheeting to signal backplates, install rectangular rapid flashing beacons (RRFBs) at marked pedestrian crossings, install leading pedestrian interval phase at all approaches.</li> </ul>
<p>Complete Streets Program (2016)</p>	<ul style="list-style-type: none"> <li>• Vancouver City Council adopted the City's 2016–2021 Strategic Plan, which includes actions to adopt and implement a Complete Streets program designed to enable safe mobility for all users. In 2017, the City Council adopted a Complete Streets ordinance.</li> </ul>	<p>Complete Streets ordinance vision and intent:</p> <ul style="list-style-type: none"> <li>• A safe, accessible street system that benefits all users, ages, and abilities, regardless of how they choose to travel.</li> <li>• A convenient and interconnected transportation network that improves accessibility to adjacent land uses and fits the dynamics and character of each neighborhood throughout the city.</li> <li>• Leverage local funding for Complete Streets projects with regional, state, and federal grant funding programs.</li> </ul>

Plan/Initiative	Key Findings	Recommendations
112th Avenue Corridor Subarea Plan (2011)	<ul style="list-style-type: none"> <li>The corridor currently contains a mix of land uses and housing types and vacant/underutilized parcels waiting for future development.</li> <li>The challenge is to incorporate newer major transportation facilities, including two I-205 split-diamond interchanges, an improved NE 18th Street &amp; NE 112th Avenue intersection, and a future park and ride, in a way that enhances the livability of the area.</li> <li>Although portions of NE 112th Avenue have been improved with public projects and private development, much of 112th is built to less than full urban standard. Frontage improvements are spotty or substandard in places, and corridor right-of-way width is inconsistent and lacking in several locations.</li> <li>The existing development of the corridor is conducive to high-speed automobile traffic.</li> </ul>	<ul style="list-style-type: none"> <li>Consider small, landscaped medians that enhance safety and appearance at strategic locations.</li> <li>Integrate gateway treatments.</li> <li>Explore lane configuration options south of NE 18th Street to allow for sidewalks, bike lanes, and street trees and other traffic management and safety options.</li> <li>Explore traffic management and safety options.</li> <li>Work with property owners on potential sidewalk options.</li> <li>Encourage mixed-use development.</li> <li>Promote integrated and compatible development with connected, attractive circulation and small, centralized common open spaces.</li> </ul> <p><i>Note: These recommendations have not been completed.</i></p>
112th Avenue Corridor Traffic Safety Project (2009)	<ul style="list-style-type: none"> <li>The Washington State Corridor Safety Program identified NE 112th Avenue as a corridor safety project in 2009.</li> <li>The Corridor Safety Program works to reduce collisions on roadways using low-cost, near-term solutions through the use of partnerships with engineering, enforcement, education, and emergency services.</li> <li>The program was locally coordinated, which included invitations to local leadership to chair steering committee meetings, participation from local government, interested citizens, businesses, schools and any other agencies that had a vested interest in the safety of their roadways.</li> </ul>	<ul style="list-style-type: none"> <li>Short median installation and I-205 ramp signal installation at Chkalov Drive mid-block between NE 2nd Street and I-205 off-ramp.</li> <li>Striping of northbound to westbound left-turn lane modified to reduce queue length at Mill Plain Boulevard/Chkalov Drive.</li> <li>Left-turn signal upgraded to protected (green arrow) phasing at the Chkalov Drive/Fred Meyer traffic signal.</li> <li>Radar sign installed between Chkalov Drive and NE 7th Street.</li> <li>18th Street intersection widened and upgraded.</li> </ul> <p><i>Note: These recommendations have not been completed</i></p>

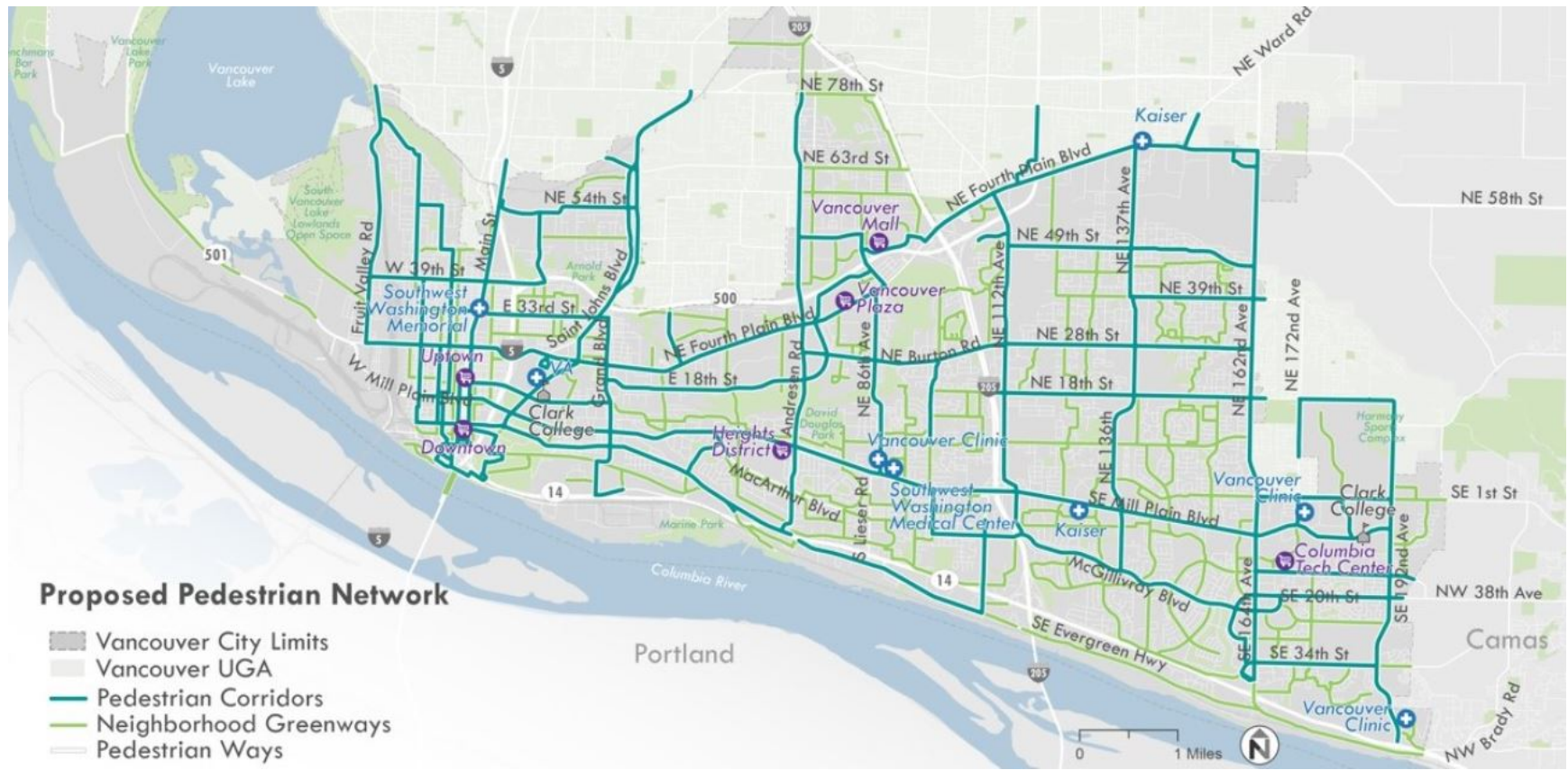


Figure 2-3. Vancouver TSP Proposed Pedestrian Network



## 2.3 General Study Area Conditions

Figure 2-5 shows the study area boundaries and segments. All segments within the study area consist of four travel lanes—two northbound, two southbound—and a center turn lane. The travel lanes are approximately 10 to 13 feet wide.

### Major Destinations

Key destinations within or adjacent to the corridor are listed below and shown in Figure 2-5.

- Mannahouse Christian Academy
- Endeavour Elementary School
- Evergreen Memorial Gardens
- Endeavor Neighborhood Park
- Lauren Park
- Safeway shopping plaza
- Salvation Army
- Fred Meyer
- Trader Joe's
- Legacy-GoHealth Urgent Care
- Commercial areas between NE McGillivray Boulevard and NE Mill Plain Boulevard
- Industrial employment corridor

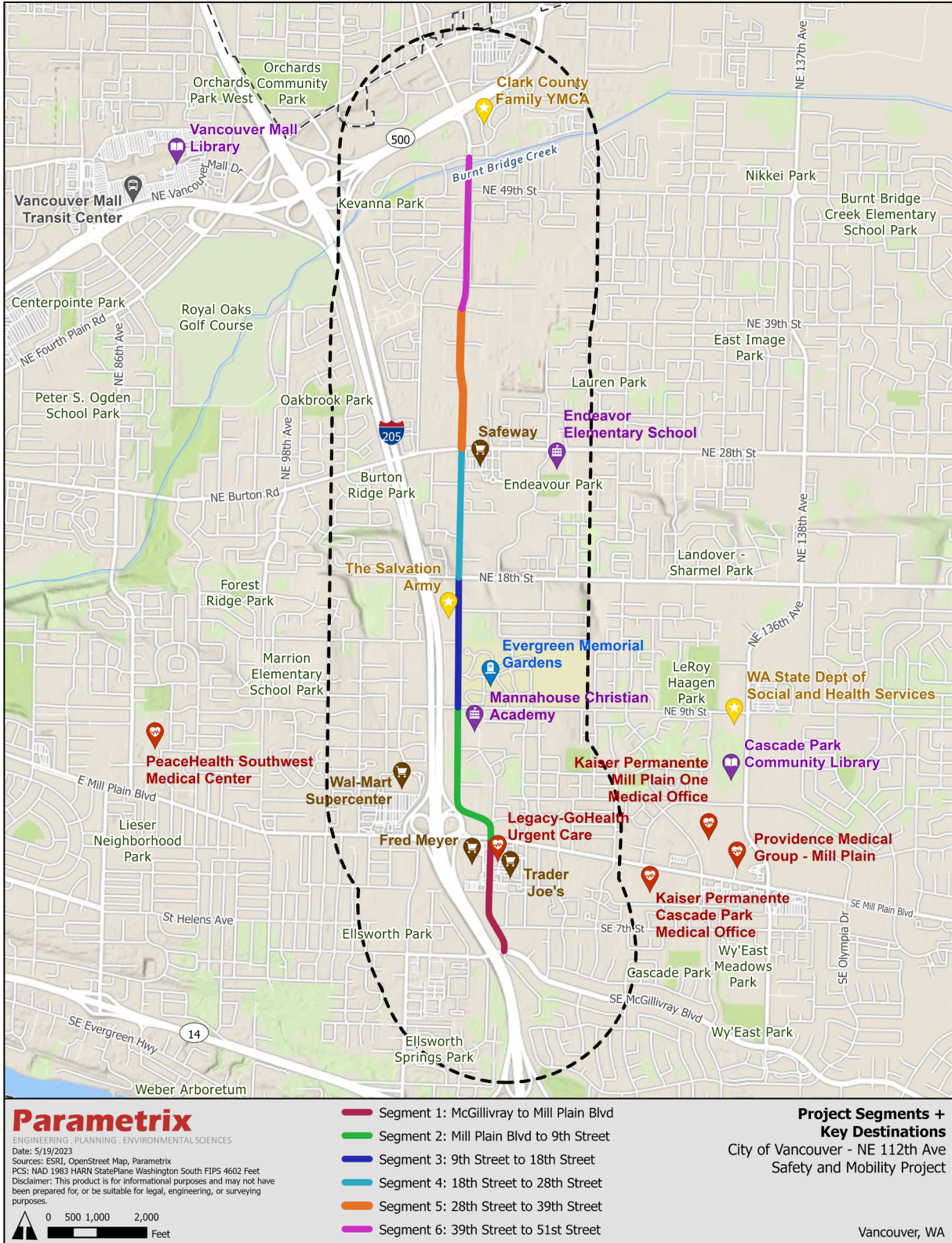


Figure 2-5. Project Segments and Key Destinations

**Table 2-3. Corridor Segment Existing Conditions**

Segment	Land Use	Major Destinations	Roadway	Sidewalks	Intersections	Bike Lanes	Transit Stops
1: SE McGillivray to Mill Plain Boulevard	Primarily commercial including several grocery stores, restaurants, and businesses (Figure 2-5).	Cascade Inn Assisted Living Community.	Four travel lanes: two northbound two southbound lanes, and a center turn lane. Travel lanes: 10 to 12 feet wide. Approaching the intersection of Mill Plain Boulevard from either direction, there are two left- and a right-turn- lane.	Both sides of the street, approximately 5 to 8 feet wide.	<i>Signalized</i> <ul style="list-style-type: none"> <li>SE McGillivray Boulevard</li> <li>SE 7th Street</li> <li>Cascade Park Plaza/Fred Meyer entrance</li> <li>Mill Plain Boulevard</li> </ul>	None.	<i>Existing:</i> None <i>Planned:</i> <ul style="list-style-type: none"> <li>SE 7th Street (east side of street)</li> <li>Fred Meyer entrance (both sides of street)</li> </ul>
2: Mill Plain Boulevard to NE 9th Street	Primarily commercial and residential, including several restaurants and a hotel (Figure 2-5).	Mannahouse Christian Academy Vancouver and several residential complexes are at the north end of the segment.	Four travel lanes: two northbound, two southbound lanes, and a center turn lane. Travel lanes: 10 to 12 feet wide. Approaching the intersection of Mill Plain Boulevard from either direction, there are two left turn- lanes and a right turn- lane. An I-205 off-ramp lets off onto NE 112th Avenue near the Mill Plain Boulevard intersection.	Both sides of the street, approximately 5 to 6 feet wide.	<i>Signalized</i> <ul style="list-style-type: none"> <li>Mill Plain Boulevard</li> <li>I-205 off-ramp</li> <li>NE 9th Street</li> </ul> <i>Unsignalized</i> <ul style="list-style-type: none"> <li>NE 2nd Street</li> <li>NE 4th Street</li> <li>NE 7th Street</li> </ul>	None.	<i>Existing:</i> None <i>Planned:</i> <ul style="list-style-type: none"> <li>Mill Plain Boulevard (east side of street)</li> <li>I-205 off-ramp (both sides of street)</li> <li>South of NE 7th Street (both sides of street)</li> <li>NE 9th Street (both sides of street)</li> </ul>
3: NE 9th Street to NE 18th Street	Primarily residential complexes, a cemetery, small businesses, and clinics, including health service clinics and a veterinary clinic. The largest land use is Evergreen Memorial Gardens.	The Salvation Army. Single-family homes and apartment complexes are located at the north end of this segment, on both sides of the street.	Four travel lanes: two northbound two southbound lanes, and a center turn lane. Travel lanes: 10 to 12 feet wide. Approaching the intersection of NE 18th Street from either direction, there are two left turn- lanes and a right turn- lane.	Present on west side of the street, approximately 4 to 6 feet wide. No sidewalks on east side of the street except for a short section directly south of the 18th Street intersection.	<i>Signalized</i> <ul style="list-style-type: none"> <li>NE 9th Street</li> <li>NE 18th Street</li> </ul> <i>Unsignalized</i> <ul style="list-style-type: none"> <li>NE 14th Street</li> <li>NE 16th Street</li> </ul>	Present directly north and south of the 18th Street intersection; bicycle facilities end approximately 300 feet south of the intersection (see Photograph 2-9). Bike lanes are not buffered from vehicle traffic.	<i>Existing:</i> None <i>Planned:</i> <ul style="list-style-type: none"> <li>NE 16th Street (both sides of street)</li> <li>NE 18th Street (both sides of street)</li> </ul>
4: NE 18th Street to NE 28th Street	Primarily single-family residential, multifamily residential, and commercial. At the north end of this segment, the residential zone transitions into predominantly commercial uses.	Pacific Senior Living. Safeway shopping plaza includes multiple businesses and restaurants. Single-family homes and apartment complexes are located on both sides of the street.	Four travel lanes: two northbound two southbound lanes, and a center turn lane. Travel lanes: 10 to 12 feet wide. The lane configuration varies at intersections and includes two left turn- lanes and a right turn- lane at the NE 18th Street and NE 28th Street intersections.	Both sides of the street, approximately 5 to 6 feet wide.	<i>Signalized</i> <ul style="list-style-type: none"> <li>NE 18th Street</li> <li>NE 28th Street</li> </ul> <i>Unsignalized</i> <ul style="list-style-type: none"> <li>NE 20th Street</li> <li>NE 22nd Street</li> <li>NE 23rd Street</li> <li>NE 25th/26th Street</li> </ul>	Present directly north and south of the 18th Street intersection, but bicycle facilities end approximately 300 feet north of the intersection. Present from 25th/26th Street to 28th Street. Bike lanes in this segment are approximately 5 feet wide and are not buffered from vehicle traffic.	<i>Existing:</i> None <i>Planned:</i> <ul style="list-style-type: none"> <li>NE 23rd Street (both sides of street)</li> <li>NE 28th Street (west side of street)</li> </ul>

Segment	Land Use	Major Destinations	Roadway	Sidewalks	Intersections	Bike Lanes	Transit Stops
5: NE 28th Street to NE 39th Street	Commercial and light industrial.	Vancouver Fire Department Station 6. Businesses along the segment are limited to furniture and medical supply stores	Four travel lanes: two northbound two southbound lanes, and a center turn lane. Travel lanes: 11 to 13 feet wide. The lane configuration varies at intersections and includes two left turn lanes and a right turn lane at the 28th Street intersection.	Both sides of the street, approximately 5 to 7 feet wide.	<i>Signalized</i> <ul style="list-style-type: none"> <li>NE 28th Street</li> <li>NE 39th Street</li> </ul> <i>Unsignalized</i> <ul style="list-style-type: none"> <li>NE 34th Circle</li> <li>NE 37th Circle</li> </ul>	None	<i>Existing:</i> 6 C-TRAN bus stops (Route 80) <ul style="list-style-type: none"> <li>28th Street (east side of street)</li> <li>3300 block near 34th Circle (both sides of street)</li> <li>39th Street (both sides of street)</li> <li>42nd Street (west side of street)</li> </ul>
6: NE 39th Street to NE 51st Street	Primarily single-family residential, multifamily residential, and commercial. At the south end of this segment near NE 42nd Street, there is a large industrial lot and several industrial sites near NE 39th Street.	Single-family homes and apartment complexes are located on both sides of the street. Shopping plaza with a large Asian supermarket, a restaurant, several small businesses, and two convenience stores. Just beyond the northern extent of the study area, destinations include convenience stores, restaurants, YMCA, and a state patrol police department.	Four travel lanes: two northbound two southbound lanes, and a center turn lane. Travel lanes: 11 to 13 feet wide. The lane configuration includes two left turn- lanes and a right turn- lane approaching the NE 49th Street intersection southbound.	Both sides of the street, approximately 5 to 6 feet wide.	<i>Signalized</i> <ul style="list-style-type: none"> <li>NE 49th Street</li> <li>NE 51st Street</li> </ul> <i>Unsignalized</i> <ul style="list-style-type: none"> <li>NE 46th Street</li> <li>NE 51st Circle</li> </ul>	None	<i>Existing:</i> Seven C-TRAN bus stops (Route 80) <ul style="list-style-type: none"> <li>44th Street (east side of street)</li> <li>46th Street (both sides of street)</li> <li>39th Street (west side of street)</li> <li>49th Street (both sides of street)</li> <li>51st Street (west side of street)</li> </ul> There are three additional C-TRAN bus stops on NE 51st Street that are served by Route 80, including a stop at the C-TRAN corporate office.

Note: Pedestrian crosswalks are only present at signalized intersections throughout the corridor.



### 2.3.1 Segment 1: McGillivray to Mill Plain Boulevard

The typical cross section in Segment 1 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center turn lane. The travel lanes range in width from 10 to 12 feet. Approaching the intersection of Mill Plain Boulevard from either direction, there are two left-turn lanes and a right-turn lane. Figure 2-6 shows a typical cross section of Segment 1. Figure 2-7 displays Segment 1 roadway elements. Photograph 2-1 and Photograph 2-2 show conditions at the Mill Plain Boulevard Intersection.

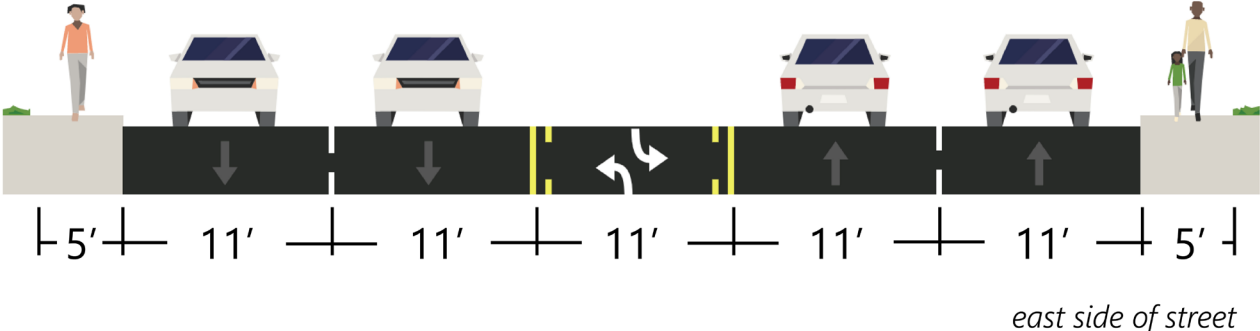


Figure 2-6. Typical Cross Section, Segment 1: SE McGillivray to Mill Plain Boulevard (looking north)

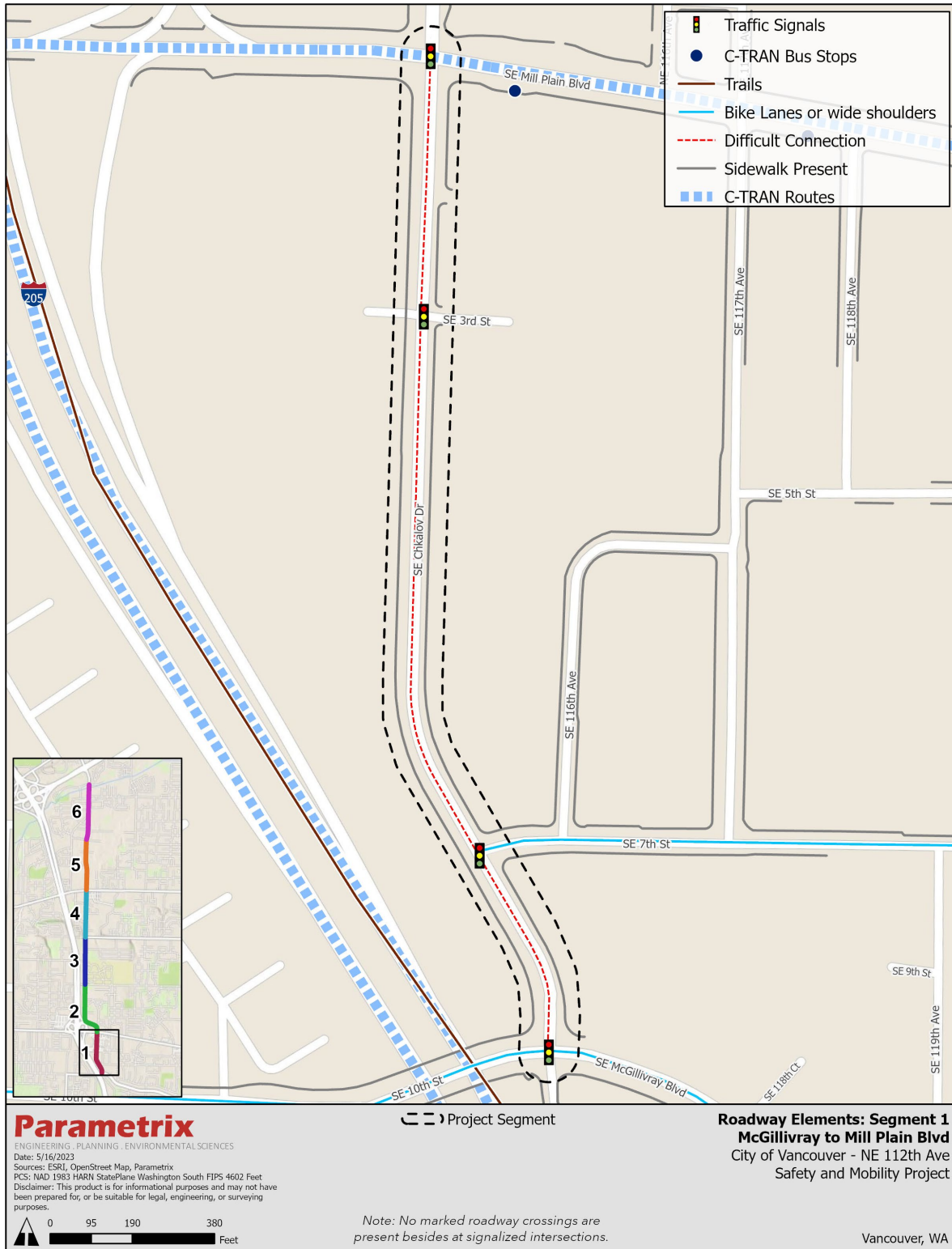


Figure 2-7. Segment 1 Roadway Elements



Photograph 2-1. Segment 1: Mill Plain Boulevard Intersection (looking north)

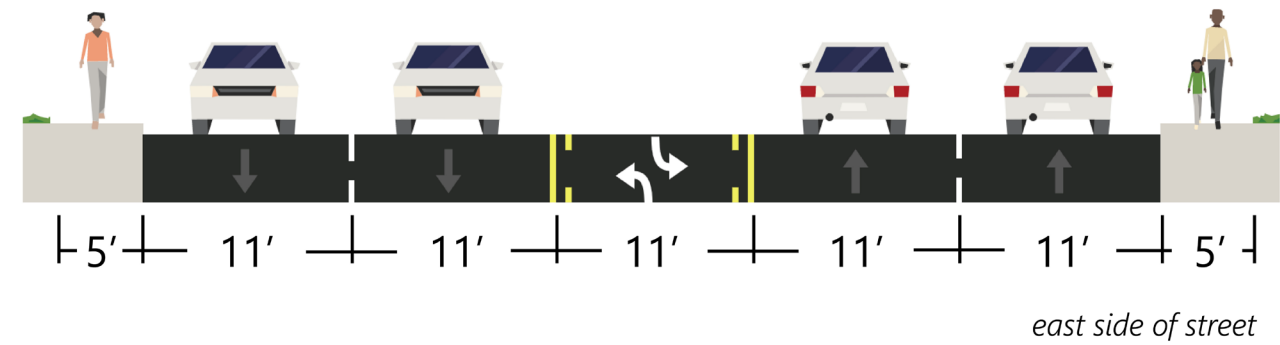


Photograph 2-2. Segment 1: Mill Plain Boulevard Intersection (looking south)

### 2.3.2 Segment 2: Mill Plain Boulevard to 9th Street

The typical cross section in Segment 2 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center-turn lane. The travel lanes range in width from 10 to 12 feet. Approaching the intersection of Mill Plain Boulevard from either direction, there are two left turn-lanes and a right turn-lane. An I-205 off-ramp exits onto NE 112th Avenue near the Mill Plain Boulevard intersection.

Figure 2-8 shows the typical cross section for this segment. Figure 2-9 shows the roadway elements of this segment. Photograph 2-3 and Photograph 2-4 show typical conditions along the corridor. In several places, the sidewalk changes direction at a 90-degree angle, creating a C shape, as shown in Photograph 2-5.



**Figure 2-8. Typical Cross Section Segment 2: Mill Plain Boulevard to NE 9th Street (looking north)**

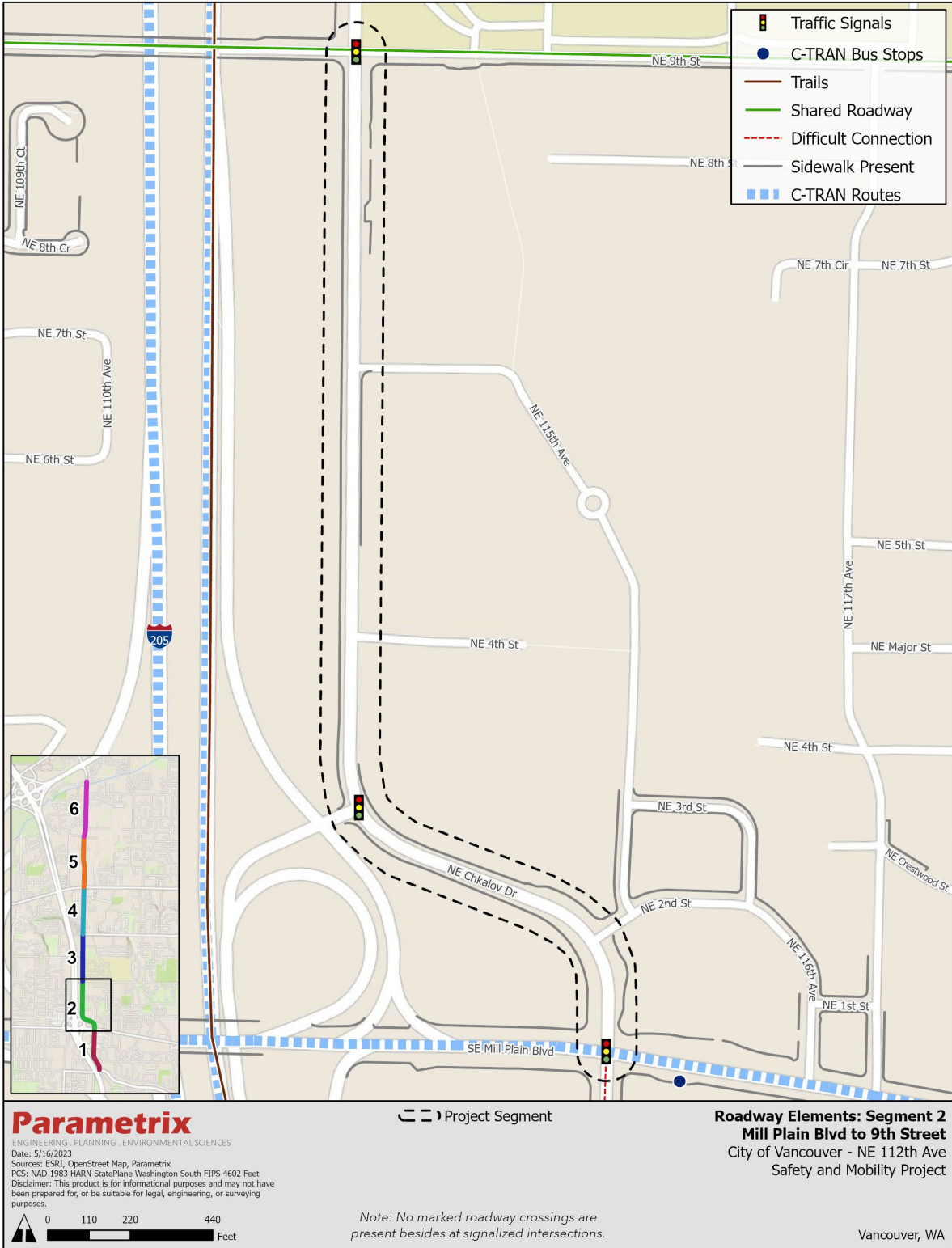


Figure 2-9. Segment 2 Roadway Elements



**Photograph 2-3. Segment 2: Between NE 4th Street and NE 7th Street (looking north)**



**Photograph 2-4. Segment 2: Near I-205 Off-ramp (looking north)**



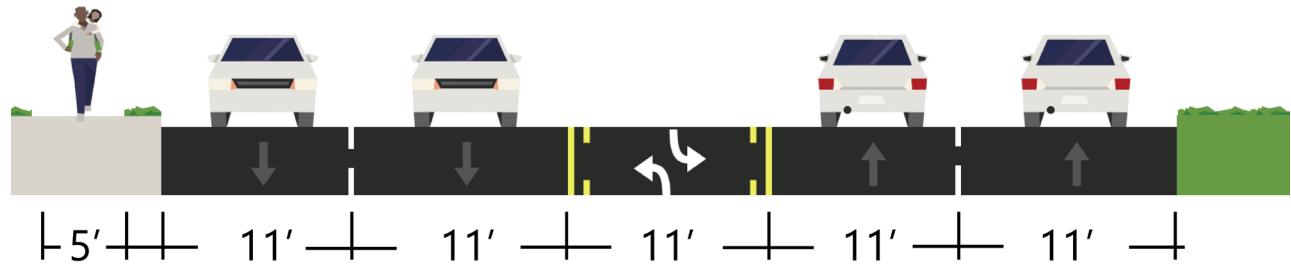
**Photograph 2-5. Segment 2: Sharply angled sidewalk configuration (looking north)**

### 2.3.3 Segment 3: 9th Street to 18th Street

The typical cross section in Segment 3 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center turn lane. The travel lanes range in width from 10 to 12 feet. Approaching the intersection of NE 18th Street from either direction, there are two left turn- lanes and a right turn- lane.

Figure 2-10 shows a typical cross section of Segment 3. Figure 2-11 displays Segment 3 roadway elements. Photograph 2-6, Photograph 2-7, and Photograph 2-9 show typical conditions along the

corridor. Photograph 2-8 displays how the sidewalk along the east side of the street abruptly terminates in this segment.



**Figure 2-10. Typical Cross Section, Segment 3: 9th Street to 18th Street (looking north)**



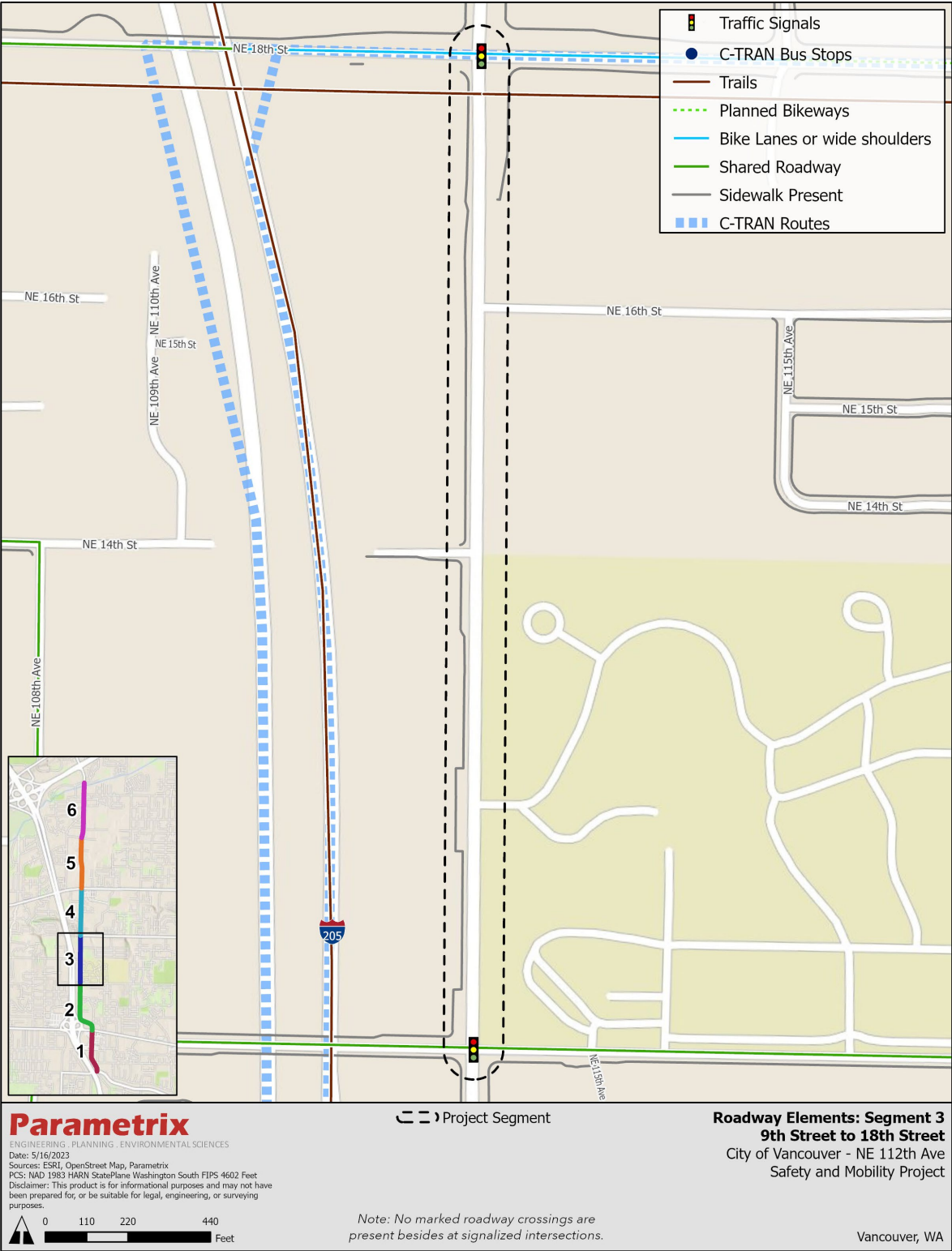


Figure 2-11. Segment 3 Roadway Elements



**Photograph 2-6. Segment 3: 112th Avenue near Evergreen Memorial Gardens (looking north)**



**Photograph 2-7. Segment 3: Approaching 18th Street Intersection (looking north)**



**Photograph 2-8. Segment 3: Sidewalk Ends on East Side of Street (looking south)**



**Photograph 2-9. Segment Leaving NE 18th Street Intersection (looking south)**

### 2.3.4 Segment 4: 18th Street to 28th Street

The typical cross section in Segment 4 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center turn lane. The travel lanes range in width from 10 to 12 feet. The lane configuration varies at intersections and includes two left-turn lanes and a right-turn lane at the NE 18th Street and NE 28th Street intersections.

Figure 2-12 shows a typical cross section of Segment 4. Figure 2-13 displays Segment 4 roadway elements. Photograph 2-10 and Photograph 2-11 show typical conditions along the corridor.

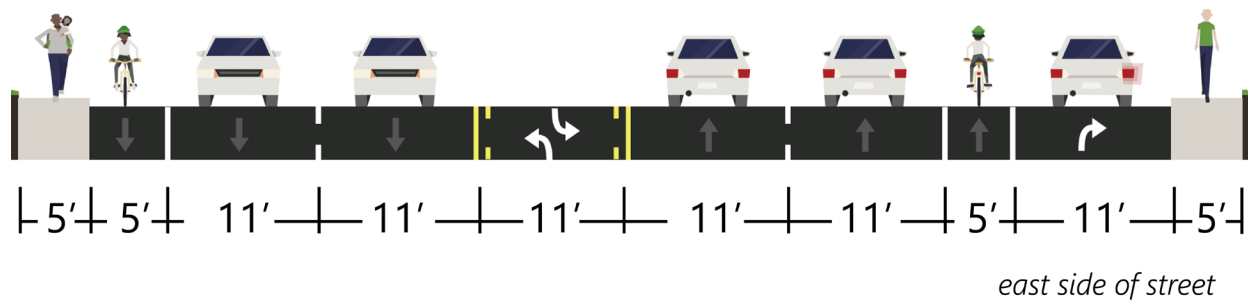


Figure 2-12. Typical Cross Section, Segment 4: 18th Street to 28th Street (looking north)



Figure 2-13. Segment 4 Roadway Elements



**Photograph 2-10. Segment 4 (looking north)**

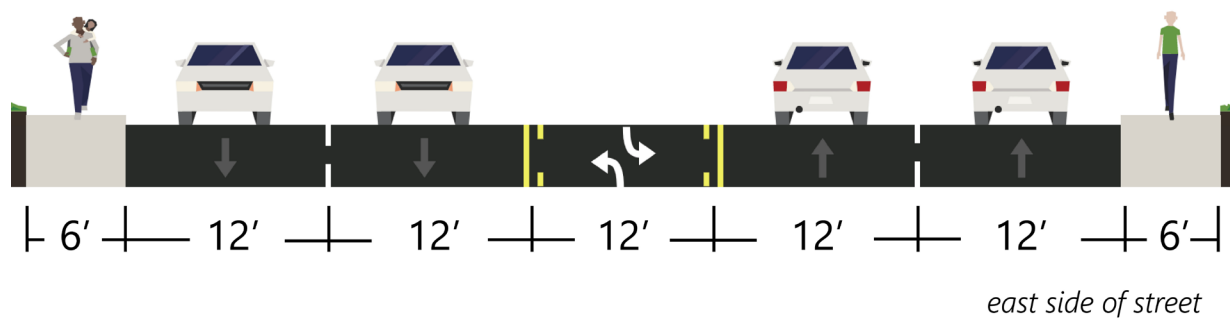


**Photograph 2-11. Segment 4 Approaching NE 28th Street (looking north)**

### 2.3.5 Segment 5: 28th Street to 39th Street

The typical cross section in Segment 5 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center turn lane. The travel lanes range in width from 11 to 13 feet. The lane configuration varies at intersections and includes two left-turn lanes and a right-turn lane at the NE 28th Street intersection.

Figure 2-14 shows a typical cross section of Segment 5. Figure 2-15 displays Segment 5 roadway elements. Photograph 2-12 and Photograph 2-13 show typical conditions along the corridor. In several places in this segment, vegetation and other debris spill onto the sidewalk, potentially making passage more challenging for people using mobility devices, as shown in Photograph 2-13.



**Figure 2-14. Typical Cross Section, Segment 5: 28th Street to 39th Street (looking north)**

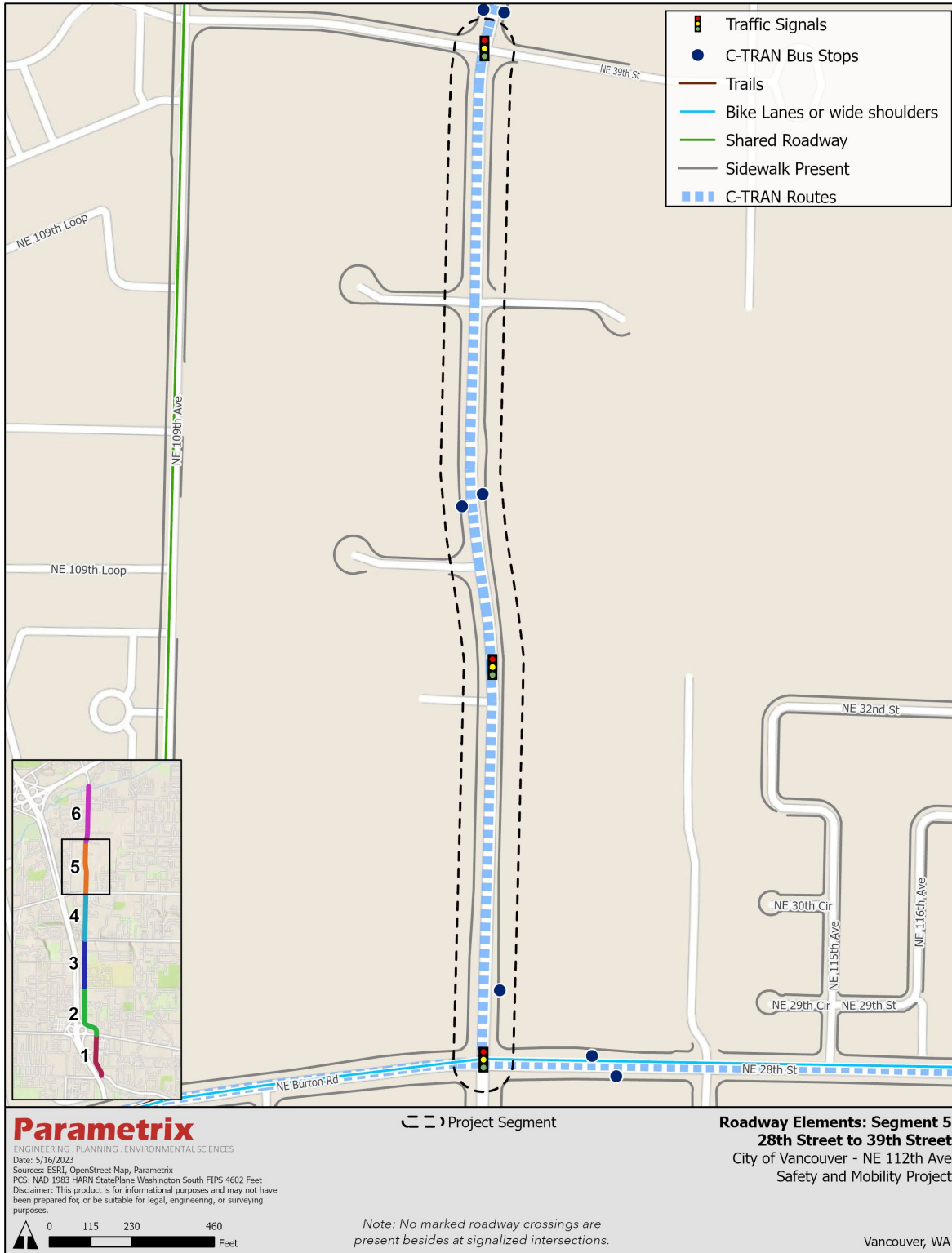


Figure 2-15. Segment 5 Roadway Elements





Photograph 2-12. Segment 5 (looking north)

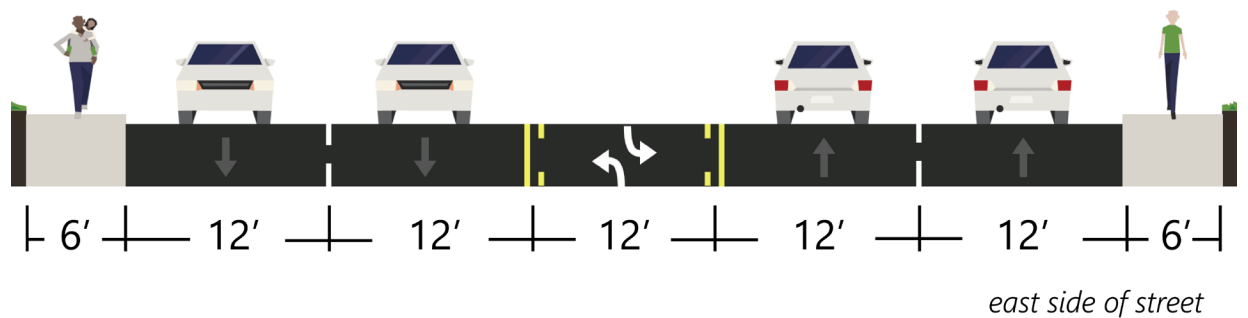


Photograph 2-13. Segment 5: Bus Stop and Vegetation on Sidewalk (looking north)

### 2.3.6 Segment 6: 39th Street to 51st Street

The typical cross section in Segment 6 consists of four travel lanes—two northbound lanes and two southbound lanes—and a center turn lane. The travel lanes range in width from 11 to 13 feet. The lane configuration includes two left-turn lanes and a right-turn lane approaching the NE 49th Street intersection southbound.

Figure 2-16 shows a typical cross section of Segment 6. Figure 2-17 displays Segment 6 roadway elements. In several places in this segment, vegetation and other debris spill onto the sidewalk, potentially making passage more challenging for people using mobility devices. Along the sidewalks on the west side of the street, there are significant distances where a fence or wall runs directly parallel to the sidewalk and there is no street lighting, as shown in Photograph 2-14. For approximately 900 feet in this segment, a fence or wall runs directly parallel to the sidewalk and there is a lack of street lighting. This may result in a less comfortable experience for people walking or using a mobility device, due to both the “tunnel-like” experience of walking between a wall and fast-moving traffic, lack of space between people and cars, and for personal safety and security reasons.



**Figure 2-16. Typical Cross Section, Segment 6: 39th Street to 51st Street (looking north)**





**Photograph 2-14. Segment 6: Fence Parallel to Sidewalk and Lack of Street Lighting (looking west)**



**Photograph 2-15. Bus stop near NE 51st Street (looking north)**



## 2.3.8 Transit Stops

### 2.3.8.1 Existing Route and Stops

NE 112th Avenue is served by C-TRAN Route 80, which turns north onto NE 112th Avenue from 28th Street and continues along NE 112th Avenue until turning west onto Fourth Plain Boulevard. On weekdays, Route 80 begins service at 5:30 a.m. and runs from 6:30 a.m. to 9 p.m. at a 30--minute frequency. On weekends and holidays, Route 80 runs from 7:30 a.m. to 7:30 p.m. at a 30--minute frequency, with a final stop at 8:30 p.m.

Bus stops along NE 112th Avenue are spaced irregularly, with a relatively high density of stops between NE 39th Street and NE 49th Street. Many stops do not have access to safe crosswalks, with basic crossings available only at NE 28th Street, NE 39th Street, NE 49th Street, and NE 51st Street.

**This leaves bus stops near NE 34th Circle and NE 44th Street without access to a crosswalk for nearly a quarter mile.**

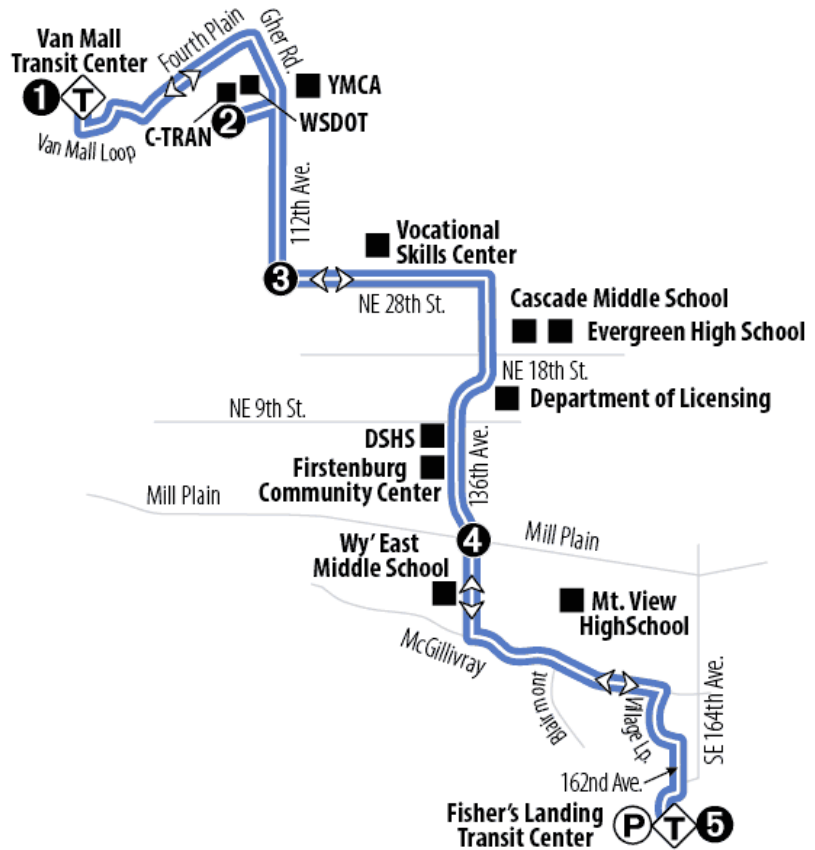


Figure 2-19. C-TRAN Route 80

Several bus stops, as shown in Photograph 2-16 and Photograph 2-17 and mapped in Figure 2-20, consist of a sign with no shelter or seating. Five stops along NE 112th Avenue have a basic covered shelter.



**Photograph 2-16. Bus Stop Lacking a Shelter and with Debris on the Sidewalk**



**Photograph 2-17. Bus Stop Lacking a Shelter**



Figure 2-20. Transit Stops and Street Crossings



### 2.3.8.2 Route 80 – Boardings and Alightings

Route 80 operated by C-TRAN serves the corridor. The stops listed in Table 2-4 have the highest use along the NE 112th Avenue corridor. The table summarizes weekly boardings at individual stops. These stops should be considered in future alternatives analysis for bus stop enhancements and access improvements.

**Table 2-4. C-TRAN Route 80 Stops Along NE 112th Avenue**

Stop Name	Average Dwell Time (Seconds)	Weekly Boardings/Alightings
NE 28th St & 114th Ave EB	34	40.9
NE 112th Ave & 49th St NB	40	30.9
NE 112th Ave & 39th St NB	18	27.8
NE 112th Ave & 49th St SB	23	26.5
NE 112th Ave & 39th St SB	30	22
NE 28th St & 112th Ave WB	54	20.1

Ave = avenue; EB = eastbound; NB = northbound; SB = southbound; St = street; WB = westbound

### 2.3.8.3 Planned Route and Stops

C-TRAN is planning to introduce a new transit route on 112th Avenue in September 2024, with changes (including construction of new bus stops) to be implemented in summer 2023.

The new route will include service south of 28th, where no service currently exists. Bus stops will be spaced approximately a quarter mile apart and will be strategically located near intersections and street crossings. This new route will create connections to important destinations such as the Salvation Army at 112th Avenue and 16th Street. This new route will provide service throughout the day at a 30-minute frequency. To make service more reliable and efficient, several stops from 28th Street to SR 500 will be consolidated. See Figure 2-21 for a map of planned transit stops.

Existing and Future  
 Traffic and Safety Analysis  
 NE 112th Avenue Safety and Mobility Project  
 City of Vancouver

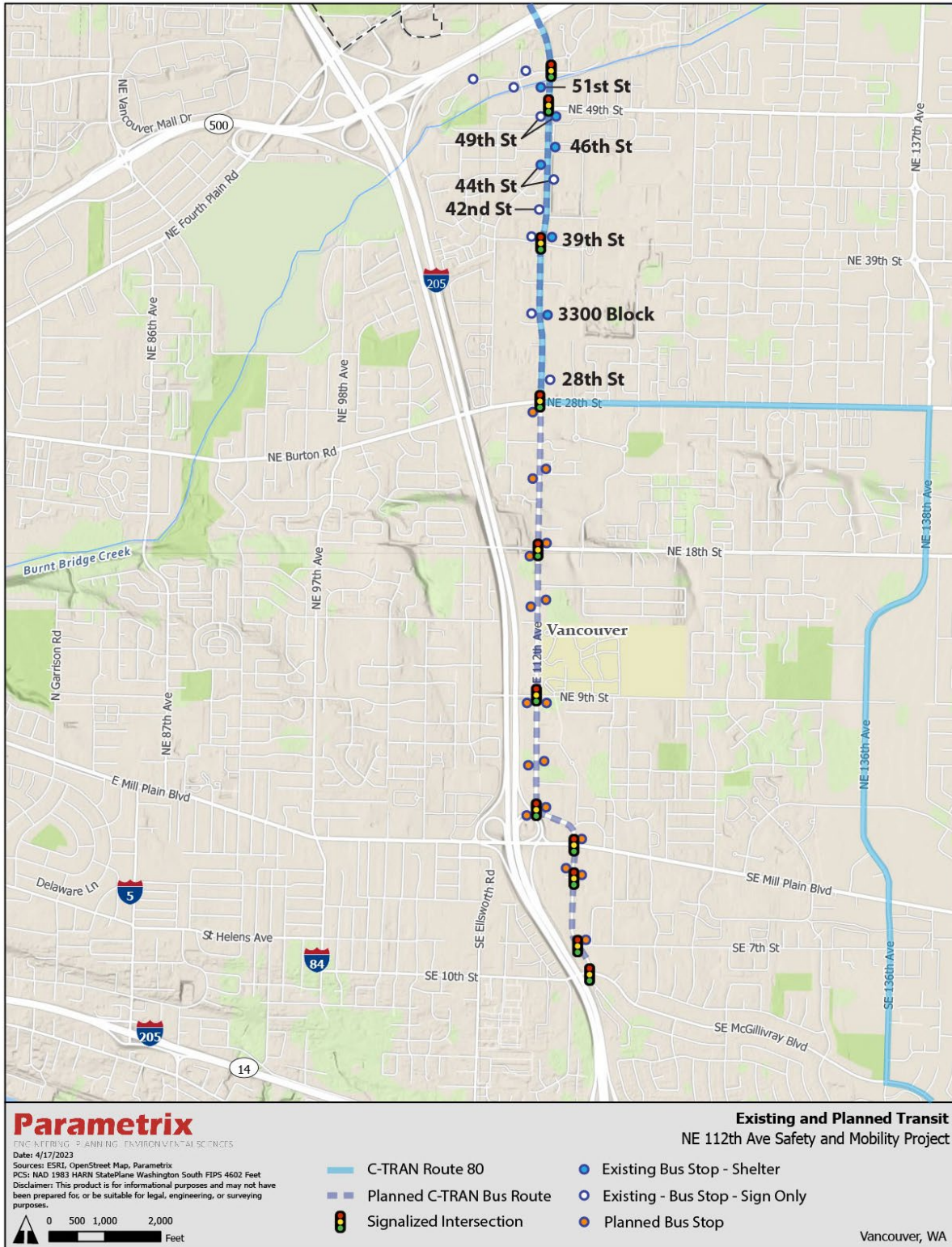


Figure 2-21. Existing and Planned Transit

### 3. TRAFFIC ANALYSIS

This section summarizes the traffic data sources and traffic analysis. The 3.3-mile section of NE 112th Avenue includes 10 signalized intersections:

- SE McGillivray Boulevard
- SE 7th
- Mill Plain Boulevard
- I-205 off-ramp
- NE 9th Street
- NE 18th Street
- NE 28th Street
- NE 39th Street
- NE 49th Street
- NE 51st Street

The following intersections are unsignalized:

- NE 14th Street
- NE 20th Street
- NE 23rd Street

#### 3.1 Methods Summary

The traffic analysis methodology consisted of five main steps including data collection, calculating system peak hour, turning movement counts and peak hour factor calculation, Synchro model inputs, and report generation. Each step is described in detail below.

**Data Collection.** Traffic Operation Project data were collected by IDAX. The data were gathered for 15 intersections during the AM and PM peak periods. The AM counts were collected from 7 am to 9 am, while the PM counts were collected from 4 pm to 6 pm on March 7, 2023. The data collection process allowed crucial information on turning movement counts for each intersection during the peak periods to be obtained.

**Calculating System Peak Hour.** Once the traffic data was obtained, the project team was able to identify the system peak hour. The project team calculated the one-hour peak volume for each intersection, starting at different 15-minute intervals. The project team identified the time frame with the maximum volume by aggregating the peak hour volumes for the entire network. This system's peak hour serves as the basis for the analysis and will be used to evaluate the network's performance.

**Turning Movement Counts and Peak Hour Factor Calculation.** With the system peak hour established, the project team calculated the turning movement counts and peak hour factors for each intersection.

The project team determined the volume and heavy vehicle percentages by direction at each intersection by utilizing the peak hour time for the entire system. The project team then calculated the peak hour factor for each intersection, taking into consideration variations in traffic flow within the peak hour. It is important to note that all volumes have been rounded to the nearest 5 to maintain consistency in the analysis.

**Synchro Model Inputs.** Once the turning movement counts, heavy vehicle percentages and peak hour factors had been obtained, the project team input these data into the Synchro traffic simulation model. By inputting the collected data, the current state of the network can be assessed, and potential areas of improvement can be identified.

**Report Generation.** Upon completion of the Synchro model analysis, the project team will generate comprehensive reports for each intersection. These reports will prioritize the use of the Highway Capacity Manual (HCM) 6th edition methodology, which is the latest and most advanced method for evaluating intersection performance. However, for intersections with U-turns or other unique characteristics that HCM 6 cannot accommodate, the HCM 2000 methodology will be used, which is also a well-established and reliable approach.

Current traffic volumes within the study area are typically highest on weekdays between 7 and 9 a.m. and between 4 and 6 p.m. This trend is expected to continue. The average peak hour for this study is 7:45 to 8:45 a.m. and 4:30 to 5:30 p.m.

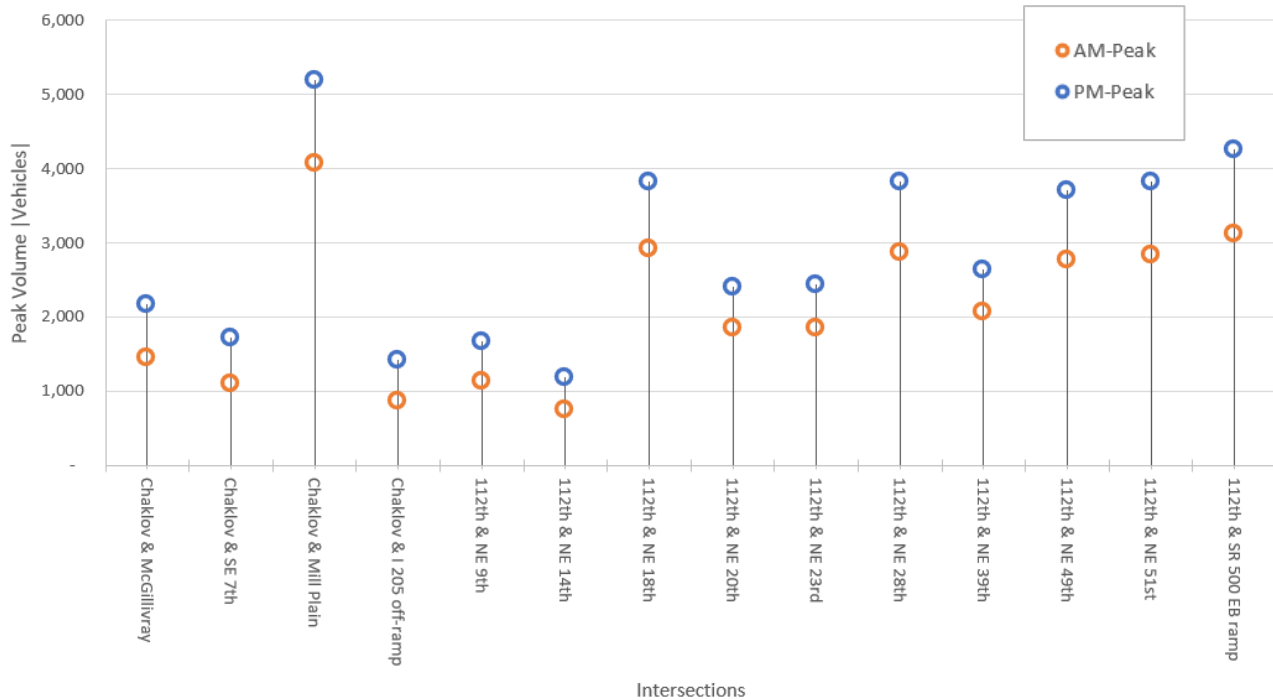
Traffic operations during the AM and PM peak hours were analyzed for the 2023 existing year. The operations analysis for the study intersections used the software program Synchro (version 11) for all the signalized intersections on this corridor. Synchro is a software application for optimizing traffic signal timing and performing intersection capacity analysis. The software optimizes traffic signal splits, offsets, and cycle lengths for individual intersections, an arterial, or a complete network. Synchro supports the Highway Capacity Manual's (HCM) 6th Edition for signalized intersections, unsignalized intersections, and roundabouts.

**2040 No-build Growth Rates and Traffic Implications:** Regional Transportation Council (RTC) conducted a traffic modeling study to predict changes in traffic patterns by the year 2040. The results demonstrate that the extension of NE 18th Street, connecting 112th Street to NE 86th Avenue, will cause a shift in traffic. This shift will result in a drop in peak traffic on some segments of 112th Street. To anticipate these changes and formulate an adequate plan, the project team initiated calculations to determine the growth rates for northbound and southbound directions during both the AM and PM peak hours. However, this calculation excluded the section between I-205 off-ramp and NE 28th Street that caused this shift.

Excluding the aforementioned sections, it was found that the traffic volume along the majority of the corridor is projected to witness an annual growth rate of 0.54% during the AM peak, and a slightly higher rate of 0.64% during the PM peak. Moving forward, these calculated growth rates have been used to calculate the turning movement counts that were collected in 2023, thereby enabling us to project and analyze the traffic volume for the future year 2040.

### 3.2 Existing Baseline Conditions (2023)

Figure 3-1 summarizes 2023 AM and PM peak hour traffic volumes along Chkalov Drive/112th Avenue intersections. The intersection of Chkalov Drive and Mill Plain Boulevard has the highest peak hour volumes. The detailed turning movement counts are included in Appendix A. The City’s mobility standards are based on PM peak hour travel speed, rather than v/c or LOS. Travel speeds will be modeled for future conditions but were not modeled for existing and future no-build conditions.



**Figure 3-1. 2023 AM/PM Peak Hour Volumes**

In addition to the TMC analysis, the Average Daily Traffic (ADT) analysis has been done, contributing to an enhanced comprehension of the traffic dynamics in the corridor study.

The ADT analysis involved data collection from six tube counts over 3 weekdays starting from March 7. These counts were positioned along 112th Street, specifically at the following locations:

- SE Chkalov Drive north of SE McGillivray Boulevard
- NE Chkalov Drive north of Mill Plain Boulevard
- NE 112th Avenue north of NE 9th Street
- NE 112th Avenue north of NE 18th Street
- NE 112th Avenue north of NE 28th Street
- NE 109th Avenue north of NE Burton Road
- SE 112th Avenue south of SR 500 Ramps

This collected data was converted into Average Daily Traffic (ADT) by applying a seasonal factor to address scenarios characterized by higher peaks, thereby ensuring the representation of worst-case conditions.

The total traffic volume on 112th Street in both directions amounted to over 23,500 vehicles. This ADT encompasses all hours that data was collected at the six locations and is the average of the three days when data was collected. Within this volume, 48% of vehicles were travelling in the northbound direction, while 52% proceeded in the southbound direction. Thus, no significant directional preference is revealed by the data. Furthermore, this data collection shows that the ADT increases north of 18th Street and reaches its highest point on 112th Street south of the SR 500 ramps (41,500 vehicles in both directions).

Having gained a comprehensive understanding of the ADT dynamics along 112th Street, the focus now shifts to the results of the modeling process, where the incorporation of turning movement counts brings a new layer of insights to our comprehension of the corridor's traffic dynamics.

The intersection delay column shows the average total delay for the signalized intersection, and it is calculated by taking a weighted average of all total delays. Intersections are graded LOS A through F based on the total intersection delay, shown in Table 3-1.

**Table 3-1. Signalized Intersection Level of Service**

Level of Service	Control Delay Per Vehicle(s)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	10 to 20	10 to 15
C	20 to 35	15 to 25
D	35 to 55	25 to 35
E	55 to 80	35 to 50
F	> 80	> 50

Source: Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis

As shown in Table 3-2, the Mill Plain Boulevard, NE 23rd Street, and NE 28th Street intersection at 112th Avenue operates at LOS D during AM peak hour, showing the worst condition during this time. These three intersections also show the worst conditions in the PM hours, with Mill Plain Boulevard operating at LOS D, and NE 23rd and NE 28th operating at LOS F. All other intersections within the study area operate at LOS A, B, or C, which is within the acceptable performance range. The Synchro output reports are provided in Appendix B.

**Table 3-2. 2023 Existing Condition AM/PM Level of Service and Delay**

Intersection with 112th Ave	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)*	v/c Ratio	LOS	Delay (sec/veh) *	v/c ratio
McGillivray	B	16	0.49	C	22	0.85
SE 7th	B	11	0.44	B	14	0.55
<b>Mill Plain</b>	<b>D</b>	<b>40</b>	0.64	<b>D</b>	<b>38</b>	0.73
I-205 off-ramp	A	4	0.26	A	7	0.35
NE 9th	B	12	0.49	B	13	0.56
NE 14th	A	10	0.01	B	13	0.03
NE 18th	C	26	0.64	C	31	0.66
NE 20th	B	14	0.08	C	17	0.04
<b>NE 23rd</b>	<b>D</b>	<b>26</b>	0.26	<b>F</b>	<b>54</b>	0.30
<b>NE 28th</b>	<b>D</b>	<b>48</b>	0.69	<b>F</b>	<b>93</b>	0.81
NE 39th	B	20	0.57	C	22	0.63
NE 49th	B	16	0.55	C	33	0.76
NE 51st	B	10	0.67	B	13	0.82

Note: Delay is rounded to the nearest second.

LOS = level of service; \*sec/veh = seconds per vehicle

### 3.3 Future Baseline Conditions (2040)

In the Future Baseline Condition analysis, the annual growth rates were employed to project the traffic volume for the year 2040. The annual growth rate of 0.54% was used during the AM peak, while a rate of 0.64% was applied for the PM peak. By utilizing these growth rates, the turning movement counts were determined based on data from the year 2023. Consequently, the traffic volume for the future year 2040 was projected and analyzed. Based on the data and observations from the existing scenario, a similar trend in the ADT is anticipated to be observed in future projections.

The annual rate of 0.64% was utilized to calculate the future ADT numbers for the corridor. This was based on the assumption that the PM growth rate was recognized as the peak growth rate witnessed during the day. As presented in Table 3-3, the ADT at the study corridor is projected to rise to 26,200. Additionally, traffic volume is expected to surpass 46,000 at 112th Street, located south of the SR 500 ramps. Furthermore, the ADT from the northern side of 18th street to the northern side of 28th street is estimated to go beyond 30,000 vehicles in both directions with the highest of over 46,300 in north of SR 500.

**Table 3-3. Average Daily Mid-Week Traffic for Existing and Projected Future Conditions**

Location	Existing			Future 2040		
	NB	SB	Total	NB	SB	Total
SE Chkalov Dr N-O SE McGillivray Blvd	7,845	8,821	16,666	8,744	9,832	18,576
NE Chkalov Dr N-O Mill Plain Blvd	6,780	7,075	13,854	7,556	7,885	15,442
NE 112th Ave N-O NE 9th St	6,828	6,470	13,298	7,610	7,211	14,821
NE 112th Ave N-O NE 18th St	13,129	14,993	28,122	14,633	16,710	31,343
NE 112th Ave N-O NE 28th St	13,466	14,122	27,587	15,008	15,739	30,748
SE 112th Ave S-O SR 500 Ramps	20,332	21,249	41,581	22,661	23,683	46,344
<b>Average Total</b>	<b>11,396</b>	<b>12,122</b>	<b>23,518</b>	<b>12,702</b>	<b>13,510</b>	<b>26,212</b>

Ave = avenue; Blvd = boulevard; Dr = drive; NB = northbound; N-O =north of; SB = southbound; St = street; S-O = south of

In the No-Build or Baseline future scenario projected for 2040, the operational conditions on the intersections reveal similar trends, as illustrated in Table 3-4. However, an anomaly surfaces during the AM peak hour on NE 23rd Street. This divergence arises from the adoption of a Peak Hour Factor (PHF) of 1 for the future scenario as opposed to the 0.91 PHF for the existing scenario. The adjustment in PHF influences the flow rate, leading to improved volume particularly for the Eastbound/Westbound movement, which operates under stop sign control. Consequently, there is a slight decrease in delay for the future scenario. This minimal change in delay, however, has the capacity to cause a shift in Level of Service.

Despite this change, the intersections at Mill Plain Boulevard at 112th Avenue and NE 28th Street at 112th Avenue continue to be critical areas of delay, operating at LOS D during AM peak hour, signifying the most strained conditions at this time. During the AM peak hour, the southbound direction on Mill Plain Boulevard and the eastbound direction on NE 28th Street are the main sources of delay at these intersections with 112th Avenue.

The PM peak hours retain these intersections as the worst-performing locations, with Mill Plain Boulevard at LOS D, and NE 23rd and NE 28th at LOS F. During the PM peak hour, the westbound direction on NE 23rd Street is the most problematic for delay, while the northbound direction on NE 28th Street and Mill Plain Boulevard is the main source of delay. All other intersections within the study zone continue to operate at LOS A, B, or C, signifying performance within the acceptable range. For more detailed information, the Synchro output reports can be accessed in Appendix B.



**Table 3-4. Future Condition AM/PM Level of Service and Delay**

Intersection with 112th Ave	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)*	v/c ratio	LOS	Delay (sec/veh)*	v/c ratio
McGillivray	B	15	0.52	C	22	0.91
SE 7th	B	11	0.46	B	13	0.59
<b>Mill Plain</b>	<b>D</b>	<b>41</b>	0.69	<b>D</b>	<b>40</b>	0.79
I 205 off-ramp	A	4	0.28	A	8	0.38
NE 9th	B	12	0.53	B	14	0.59
NE 14th	A	10	0.01	B	13	0.03
NE 18th	C	26	0.68	C	33	0.71
NE 20th	B	14	0.07	C	18	0.08
<b>NE 23rd</b>	C	25	0.25	<b>F</b>	<b>71</b>	0.36
<b>NE 28th</b>	<b>D</b>	<b>47</b>	0.71	<b>F</b>	<b>105</b>	0.86
NE 39th	B	20	0.60	C	23	0.75
NE 49th	B	17	0.59	D	49	0.84
NE 51st	B	10	0.71	B	15	0.89

Note: Delay is rounded to the nearest second.

LOS = level of service; sec/veh = seconds per vehicle

### 3.5 City Mobility Standards/PM Peak Travel Speed

The City’s mobility standards are based on the average PM peak hour travel speed for a given facility, rather than v/c or LOS. According to the City’s 2017 Concurrency Corridors Classification,<sup>5</sup> the concurrency threshold speeds along 112th Avenue are:

- Between Mill Plain Boulevard and 28th Street – 11 mph
- Between 28th Street and 51st Street – 15 mph

Figure 3-2 on the following page displays these segments. Table 3-5 below compares the concurrency standards to existing and future no-build conditions. In general, the corridor is forecast to meet concurrency standards for the Mill Plain Boulevard to NE 28<sup>th</sup> Street segment out into the future year 2040, while the NE 28<sup>th</sup> Street to NE 51<sup>st</sup> Street segment is forecast to fall below the concurrency standard by 2040.

**Table 3-5 PM Peak Hour Travel Speeds and Concurrency Standards**

Time Period	Segment	Concurrency Threshold (mph)	2023 Existing Speed (mph)			2040 No-Build Speed (mph)		
			NB	SB	Average	NB	SB	Average
AM Peak Hour	Mill Plain Blvd to 28th St	11	25	24	24.4	25	24	24.1
	28th St to 51st St	15	20	17	18.3	20	17	18.2
PM Peak Hour	Mill Plain Blvd to 28th St	11	24	23	23.2	23	22	22.6
	28th St to 51st St	15	19	15	17.0	13	14	13.9

Blvd = Boulevard; mph = miles per hour; NB = northbound; SB = southbound; St = Street

Corridor speed data indicates that speeding may be an issue between NE 9<sup>th</sup> and approximately NE 28<sup>th</sup> Street on 112<sup>th</sup> Avenue; data indicates the 85<sup>th</sup> percentile speed is between 41.5 MPH and 44.9 MPH in this section, with a speed limit of 35 MPH.

<sup>5</sup>[https://www.cityofvancouver.us/sites/default/files/fileattachments/public\\_works/page/12038/concurrencyadmi\\_nmanual03-05-2012.pdf](https://www.cityofvancouver.us/sites/default/files/fileattachments/public_works/page/12038/concurrencyadmi_nmanual03-05-2012.pdf)

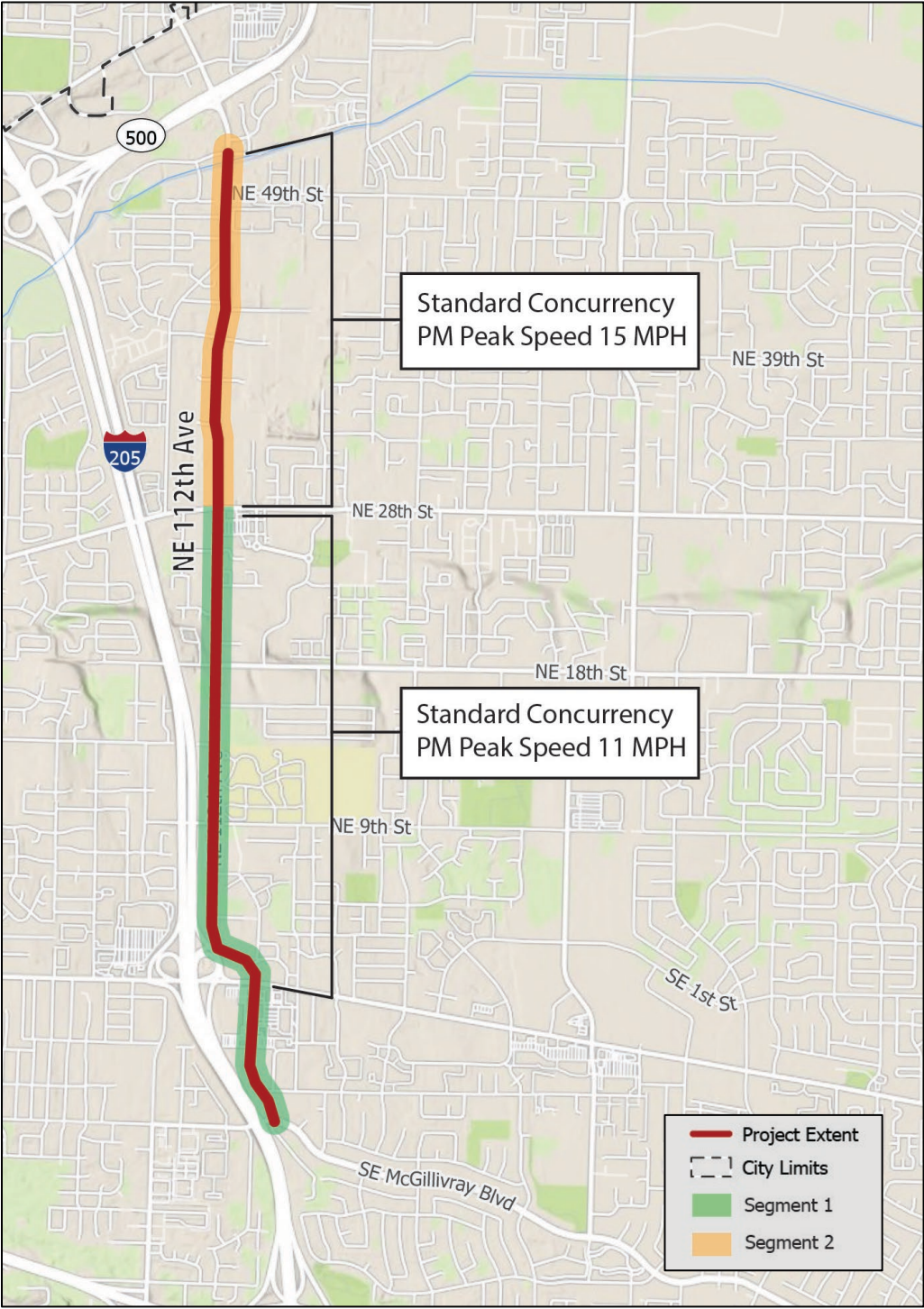


Figure 3-2. City Standard Concurrency Segments

Travel speeds for existing and future no-build conditions were modeled using SimTraffic to assess existing and future no-build PM peak hour travel speeds along the corridor and at each of the study intersections. Existing and future PM peak travel speeds are provided in Table 3-6.

**Table 3-6. Existing and Future No-Build PM Peak Average Speeds – SimTraffic Results**

Intersection with NE 112th Avenue	Segment Length (miles)	Existing		Future No-Build	
		Northbound (mph)	Southbound (mph)	Northbound (mph)	Southbound (mph)
McGillivray	0.10	7	12	6	12
SE 7th	0.35	11	25	11	25
Mill Plain	0.18	5	10	5	10
I-205 off-ramp	0.38	24	22	23	21
NE 9th	0.24	24	23	24	20
NE 14th	0.25	31	30	31	30
NE 18th	0.10	14	10	15	10
NE 20th	0.14	25	31	25	31
NE 23rd	0.22	33	29	32	28
NE 28th	0.53	14	4	13	4
NE 39th	0.45	28	27	16	26
NE 49th	0.12	3	12	3	11
NE 51st	0.17	14	15	13	11
<b>Average Corridor Speed</b>	3.2	18	19	17	18

Note: SimTraffic and Synchro results provided in Appendix B.  
 mph = miles per hour

## 4. SAFETY ANALYSIS

### 4.1 Existing Safety Studies

Four safety studies relevant to the NE 112th Avenue area have been completed within the last fifteen years. First, the Washington State Corridor Safety Program identified NE 112th Avenue as a corridor safety project in 2009. The *112th Avenue Corridor Subarea Plan* was completed in 2011 and intended to incorporate planned major transportation facilities and private developments to envision the area as a walkable (connected, safe, and comfortable) community. The *Transportation System Safety Analysis (TSSA)* completed in November 2018 prepared a holistic look at crash patterns for the City of Vancouver. Most recently, the *Local Road Safety Plan 2022-2026* was completed in August 2022. For a full list of recommendations from each plan, see Table 2-2.

#### 4.1.1 112th Avenue Corridor Traffic Safety Project (2009)

The Corridor Safety Program worked to reduce collisions on roadways using low-cost, near-term solutions through partnerships with engineering, enforcement, education, and emergency services. The program was locally coordinated, which included an invitation to local leadership to chair steering committee meetings, along with involvement from local government, interested citizens, businesses, schools and any other agencies that have a vested interest in the safety of their roadways. The project came to an end in September 2011.

#### 4.1.2 112th Avenue Corridor Subarea Plan (2011)

The Corridor Subarea Plan encompasses a large portion of the study area for the NE 112th Avenue Safety and Mobility Plan. The Subarea Plan focused on NE 112th Avenue from NE 4th Street on the south to NE 33rd Street on the north and from I-205 on the west to roughly one to five blocks from 112th Avenue to the east. The study provided a series of recommendations to develop NE 112th Avenue corridor as a walkable neighborhood in order to provide connectivity, safety, and comfort. The study made general recommendations for the provision of a route between walking points that avoids the risk of physical harm, separation between the pedestrians/bikes and vehicular traffic, and physical and aesthetic accommodations that make walking an enjoyable experience so that residents of all ages and abilities can walk within their neighborhood to community assets.

#### 4.1.3 City of Vancouver Transportation System Safety Analysis (TSSA) (2018)

The TSSA offered a networkwide analysis of safety conditions in the City of Vancouver using crash data from 2010 to 2016. The TSSA identifies the top 20 intersections with the highest safety performance index ranking in the City of Vancouver, two of which occur in the study area: NE 51st Street and NE 39th Street. The potential countermeasures identified include pedestrian and bicycle treatments such as implementing leading pedestrian intervals (where the pedestrian walk signal is active several seconds before a green light, allowing people walking greater visibility and more time to cross), reviewing sight distance triangles at intersections, and installing rectangular rapid flashing beacons at marked

pedestrian crossings. Additionally, NE 112th Avenue from SE Mill Plain Boulevard to NE 9th Street was identified as a higher-ranking segment for the Principal Arterial classification and was identified as a segment with potential for safety improvements.

Finally, the TSSA has general recommendations citywide to improve safety for people walking and biking. The recommendations include installing leading interval pedestrian phasing, increasing compliance with traffic signals and speed limits, and evaluating opportunities to reduce cross sections.

#### 4.1.4 Local Road Safety Plan for 2022-2026 (August 2022)

The 2022 LRSP looks at crashes that resulted in an injury on the City of Vancouver's locally controlled streets from 2016 through 2020, with a focus on crashes that resulted in a fatality or severe injury.

- **Intersections.** The LRSP identifies the Top Ten Intersections by Crash Weight from 2016-2020 and ranks the Chkalov Drive and Mill Plain Boulevard intersection as #4 out of 10. This intersection had a greater number and severity of injury crashes than any other intersection in the 2016-2020 period.
- **Segments.** For the Top Ten Segments by Crash Weight (2016-2020), the LRSP identified Chkalov Drive from Mill Plain Boulevard to 7th Street as the #1 ranked segment. At the intersection with Mill Plain Boulevard, there was one pedestrian fatality and one severe injury crash involving someone bicycling, which took place at one of the driveways at the intersection. Of the remaining 13 injury crashes, 1 involved a bicyclist and 2 involved a pedestrian. The segment of 112th Avenue from 39th Street to 28th Street was ranked as #7.
- **Crash Types.** Crash types on 112th Avenue/Chkalov Drive corridor included pedestrian or bicyclist-related crashes, disregard of signals, left-turning vehicle crashes, fixed objects, angle crashes, crashes after dark, and driveway-related crashes.
- **Countermeasures.** The LRSP provides potential safety countermeasures to address these crash types, including:
  - Converting intersections to roundabouts.
  - Converting four-lane roadways to three-lane roadways with a center turn lane (road diet).
  - Modifying signal phasing to implement a leading pedestrian interval.
  - Installing lighting.
  - Installing refuge islands and raised crossings.
  - Crosswalk visibility enhancements.
  - Advance stop marking.
  - Investing in bike lanes.
  - Access management.
  - Shortening crossing distances with bicycle friendly curb extensions.

## 4.2 Updated Corridor Safety Conditions

### 4.2.1 Corridor Observed Crash History

Crash data was accessed through the City of Vancouver Safety Dashboard. The most recent 5 years (2017 to 2021) of crash data was analyzed for the segments and intersections along the corridor between SE McGillivray Boulevard and NE 51st Street.

A total of 399 crashes occurred in the study area during the 5-year study period. Overall, there were 4 fatal crashes and 11 severe crashes during the study period, 5 of which involved a pedestrian (3 fatal, 2 severe). Four of these fatal and severe crashes involved alcohol and two were attributed to speeding.

The majority of crashes (87%) occurred at intersections or driveways. Table 4-1 and Table 4-2 summarize the segment and intersection crashes, respectively, by severity and location. Driveway crashes and non-study intersections were assigned to the corresponding segment. In March of this year, 2023, a fatal crash occurred at the intersection of the 900 block of NE 112th which involved an automobile and a cyclist.<sup>6</sup>

**Table 4-1. 2017–2021 Segment Crashes by Severity and Location**

Segment	Fatal Crashes	Severe Injury Crashes	Non-Severe Injury Crashes	No-Injury Crashes	Total Crashes	Total Crashes/ mi/yr
SE McGillivray Blvd to SE 7th St	0	0	0	0	0	0.0
SE 7th St to Mill Plain Blvd	0	3	14	22	39	21.7
Mill Plain Blvd to I-205 NB Off	0	0	8	9	17	17.0
I-205 NB Off to NE 9th St	0	0	3	6	9	4.7
NE 9th St to NE 14th St	0	0	0	0	0	0.0
NE 14th St to NE 18th St	0	0	0	1	1	0.8
NE 18th St to NE 20th St	0	0	1	3	4	7.3
NE 20th St to NE 23rd St	1	0	2	6	9	12.9
NE 23rd St to NE 28th St	0	0	1	6	7	5.6
NE 28th St to NE 39th St	0	2	6	8	16	5.9
NE 39th St to NE 49th St	0	2	5	7	14	6.1
NE 49th St to NE 51st St	0	1	2	3	6	10.0
<b>Total</b>	<b>1</b>	<b>8</b>	<b>42</b>	<b>71</b>	<b>122</b>	<b>8.7</b>

The segment with the highest frequency of crashes (39 crashes) is between SE 7th Street and Mill Plain Boulevard. About half of these crashes occurred at the Fred Meyer driveway. This segment also experienced three severe crashes and has the highest number of crashes per mile during the study period with 21.7 crashes/mile/yr.

<sup>6</sup> <https://www.columbian.com/news/2023/mar/01/bicyclist-killed-in-east-vancouver-crash/>

**Table 4-2. 2017-2021 Intersection Crashes by Severity and Location**

Intersection	Fatal Crashes	Severe Injury Crashes	Non-Severe Injury Crashes	No- Injury Crashes	Total Crashes
SE Chkalov Dr & SE McGillivray Blvd	1	0	2	1	4
SE Chkalov Dr & SE 7th St	0	0	2	11	13
SE Chkalov Dr & Mill Plain Blvd	1	0	21	44	66
NE 112th Ave & I-205 NB Off	1	2	1	12	16
NE 112th Ave & NE 9th St	0	0	8	4	12
NE 112th Ave & NE 14th St	0	0	0	0	0
NE 112th Ave & NE 18th St	0	0	9	15	24
NE 112th Ave & NE 20th St	0	0	0	0	0
NE 112th Ave & NE 23rd St	0	0	0	0	0
NE 112th Ave & NE 28th St	0	0	17	20	37
NE 112th Ave & NE 39th St	0	0	5	9	14
NE 112th Ave & NE 49th St	0	1	12	26	39
NE 112th Ave & NE 51st St	0	0	19	33	52
<b>Total</b>	<b>3</b>	<b>3</b>	<b>96</b>	<b>175</b>	<b>277</b>

The intersection of SE/NE Chkalov Drive and Mill Plain Boulevard experienced the highest frequency of crashes (66 crashes) followed by the intersection of NE 112th Avenue and NE 51st Street (52 crashes). The highest frequency of fatal and severe crashes (three crashes) occurred at the intersection of NE 112th Avenue and the I-205 northbound Off-ramp.

Overall, in the corridor, there were 18 pedestrian-involved crashes and 4 bicyclist-involved crashes. More detail regarding crash types, contributing factors, and other crash attributes is provided in Appendix C.

#### 4.2.2 Corridor Existing Conditions Predictive Analysis

In addition to a review of the crash history, a predictive analysis, based on the HSM, was also conducted to further assess the safety performance of the overall corridor as well as for specific segments and intersections. This approach includes a calculation and comparison of the predicted and expected crashes of a facility to determine how the analysis site compares to other similar sites in terms of crashes.

Predicted crashes represent the estimated number of crashes at a site based on a safety performance function (i.e., model) that has been adjusted to represent the geometrics and volumes of the study corridor. In other words, predicted crashes are the number of crashes predicted to occur on the study corridor based on the safety performance of other geometrically and volumetrically similar sites.

Expected crashes adjust the calculated predicted crash frequency by incorporating the observed crash history. This is the number of crashes expected to occur on the study corridor based on the model and the actual crash history of the site.



The delta between expected and predicted crashes represents the potential for safety improvement (PSI). If the expected crash frequency is higher than the predicted crash frequency for a location (a positive PSI), then that location is experiencing more crashes per year on average than peer locations that are similar to it. If the expected crash frequency is lower than the predicted crash frequency for a location (a negative PSI), then that location is experiencing fewer crashes per year on average than peer locations and performing better than predicted.

Table 4-3 summarizes the average predicted and expected crashes per year and PSI for all of the segments and intersections along the corridor.

**Table 4-3. Existing Corridor Predicted and Expected Average Crash Frequencies**

Location	Predicted Average Crash Frequency (crashes/yr)			Expected Average Crash Frequency (crashes/yr)	PSI (crashes/yr) <sup>1</sup>
	Fatal and Injury	PDO	Total		
<b>Segments</b>					
SE McGillivray Blvd to SE 7th St	0.2	0.5	0.6	0.5	-0.1
SE 7th St to Mill Plain Blvd	1.3	3.6	5.0	4.9	0.0
Mill Plain Blvd to I-205 NB Off	0.2	0.4	0.6	1.1	+0.5
I-205 NB Off to NE 9th St	0.6	1.7	2.4	2.0	-0.4
NE 9th St to NE 14th St	0.4	1.1	1.5	1.1	-0.4
NE 14th St to NE 18th St	0.4	1.0	1.4	1.0	-0.4
NE 18th St to NE 20th St	0.3	0.9	1.2	0.9	-0.3
NE 20th St to NE 23rd St	0.4	1.2	1.6	1.4	-0.2
NE 23rd St to NE 28th St	0.8	2.2	3.0	2.0	-1.1
NE 28th St to NE 39th St	2.0	5.6	7.6	4.7	-2.9
NE 39th St to NE 49th St	1.5	4.2	5.7	3.3	-2.4
NE 49th St to NE 51st St	0.2	0.7	1.0	0.8	-0.1
<b>Segments Total</b>	<b>8.3</b>	<b>23.2</b>	<b>31.5</b>	<b>23.8</b>	<b>-7.7</b>
<b>Intersections</b>					
SE Chkalov Dr & SE McGillivray Blvd	0.6	1.4	2.0	1.4	-0.6
SE Chkalov Dr & SE 7th St	0.5	0.9	1.4	1.7	+0.4
SE Chkalov Dr & Mill Plain Blvd	1.7	3.4	5.1	9.8	+4.6
NE 112th Ave & I-205 NB Off	0.4	0.7	1.1	1.1	0.0
NE 112th Ave & NE 9th St	0.6	1.3	1.9	1.9	-0.1
NE 112th Ave & NE 14th St	0.1	0.2	0.3	0.2	0.0
NE 112th Ave & NE 18th St	0.9	1.9	2.8	3.9	+1.1
NE 112th Ave & NE 20th St	0.3	0.4	0.7	0.5	-0.2
NE 112th Ave & NE 23rd St	0.5	0.8	1.2	0.9	-0.3

Location	Predicted Average Crash Frequency (crashes/yr)			Expected Average Crash Frequency (crashes/yr)	PSI (crashes/yr) <sup>1</sup>
	Fatal and Injury	PDO	Total		
NE 112th Ave & NE 28th St	1.2	2.4	3.6	5.4	+1.9
NE 112th Ave & NE 39th St	1.0	1.9	2.9	2.5	-0.3
NE 112th Ave & NE 49th St	1.1	2.1	3.2	5.2	+2.0
NE 112th Ave & NE 51st St	1.6	3.2	4.8	8.4	+3.6
<b><i>Intersections Total</i></b>	<b><i>10.5</i></b>	<b><i>20.4</i></b>	<b><i>30.9</i></b>	<b><i>43.0</i></b>	<b><i>+12.0</i></b>
<b>Corridor Total</b>	<b>18.9</b>	<b>43.6</b>	<b>62.4</b>	<b>66.8</b>	<b>+4.4</b>

PDO = Property Damage Only (i.e., no injury); PSI = potential for safety improvement (expected crashes - predicted crashes)

<sup>1</sup>Positive values indicate location is performing worse than similar sites; negative values indicate location is performing better than similar sites.

Overall, with a PSI of just over +4 crashes per year, the corridor is performing slightly worse than predicted based on similar sites. This is primarily due to the intersections along the corridor, which, collectively, are expected to experience 12 more crashes per year on average than similar sites. Looking at segments only, however, the segments are collectively performing better than predicted with almost 8 fewer crashes per year on average. Figure 4-1 summarizes the PSI values from the HSM analysis for each segment and intersection. Specific locations will be discussed further in the next section.

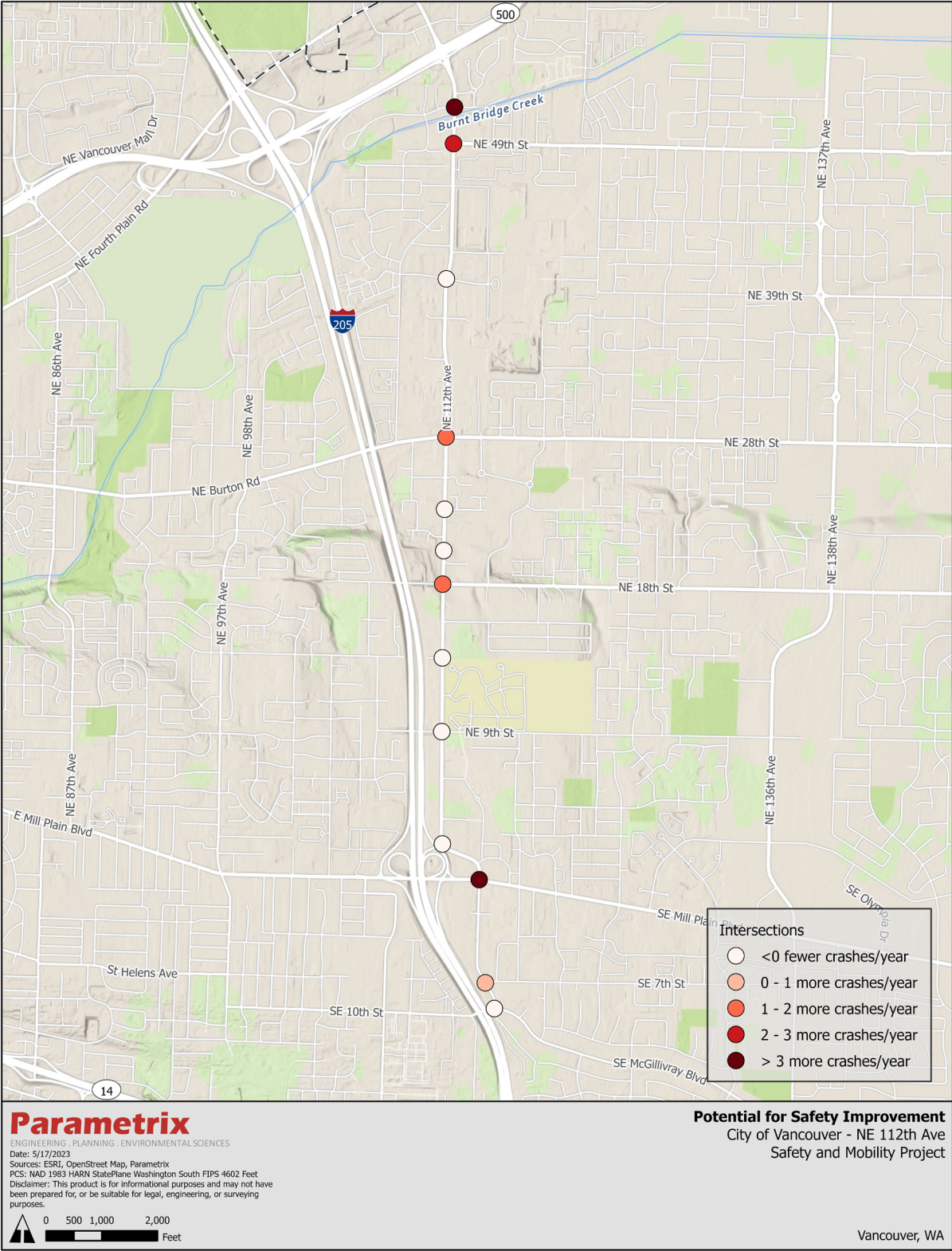


Figure 4-1. Crash Analysis of Intersections – Potential for Safety Improvement

### 4.2.3 Corridor Details

The following provides additional details for specific locations from the observed crashes review and the predictive analysis by corridor segment. A positive value indicates the location is performing worse than similar sites and has a greater potential to improve safety; while a negative value indicates the location is performing better than similar sites and has a lower potential to improve safety as it is already performing better than predicted.

Predictive analysis shows the following segments and intersections of note.

#### **Intersections**

- **SE Chkalov Drive & SE 7th Street.** Experiencing approximately one additional crash every 2.5 years than predicted.
- **SE Chkalov Drive & Mill Plain Boulevard.** Performing worse than predicted, experiencing up to 5 crashes per year more than similar sites (PSI > 0). *This intersection is the worst-performing intersection on the corridor compared to similar sites since it had the highest PSI (4.6 crashes/year).* Additionally, as previously discussed, this intersection was included in the top ten intersections identified in the 2022 LRSP (#4) with the greatest number and severity of injury crashes than any other intersection in Vancouver during the LRSP analysis period.
- **NE 112th Avenue & NE 18th Street.** Performing worse than predicted, experiencing up to about 1 crash more per year than similar sites (PSI > 0).
- **NE 112th Avenue & NE 28th Street.** Performing worse than predicted, experiencing up to about two crashes more per year than similar sites (PSI > 0).
- **NE 112th Avenue & NE 49th Street.** Performing worse than predicted, experiencing up to about two crashes more per year than similar sites (PSI > 0).
- **NE 112th Avenue & NE 51st Street.** Performing worse than predicted, experiencing up to about seven crashes more every two years than similar sites (PSI > 0). *This was the second worst performing intersection according to the predictive analysis.*

#### **Segments**

- **SE 7th Street to Mill Plain Boulevard Segment.** Highest crash frequency per mile (21.7 crashes/mile) of any other segment in the corridor.
- **Mill Plain Boulevard to I-205 NB Off-Ramp Segment.** Performing slightly worse than predicted, experiencing up to one crash more every 2 years than similar sites (PSI > 0). This site had the second highest crash frequency per mile on the corridor and a portion of this segment was ranked as the top segment by crash weight in the 2022 LRSP.
- **NE 28th Street to NE 39th Street Segment.** Performing better than predicted (PSI < 0), with up to 3 fewer crashes every year than predicted. However, this segment was identified in the 2022 LRSP as number 7 on the top ten list of segments by crash weight.

Refer to Appendix C for more information on segment safety analysis.

## 5. NEXT STEPS

This baseline traffic and safety report serves as a basis for understanding present day and future “no-build” conditions in the corridor. Both will be used as a point of comparison for developing and evaluating future design options.

Safety analysis revealed that the corridor is performing slightly worse than predicted (compared to similar sites), largely due to the following locations:

- The intersection of Chkalov Drive and Mill Plain Boulevard
- The segment between SE 7th Street and Mill Plain Boulevard
- The segment between NE 28th Street and NE 39th Street

The HSM analysis identified additional intersections that may be priority locations for safety countermeasures:

- NE 112th Avenue & NE 18th Street
- NE 112th Avenue & NE 28th Street
- NE 112th Avenue & NE 49th Street
- NE 112th Avenue & NE 51st Street

While improvements are possible along the entire corridor, these locations represent the areas likely to possess the greatest opportunity to reduce crashes and improve safety performance along the corridor. In addition to the HSM analysis, the high number of crashes and multiple fatalities in the NE 112th Avenue corridor indicate that there is significant opportunity for safety improvements overall.

Following review of this baseline conditions report, the project team will develop alternatives for different segments of the NE 112th Avenue corridor to address safety concerns and multimodal improvements.

# Appendix A

## Peak-Hour Analysis

AM Peak Hour Analysis

PM Peak Hour Analysis

Table: RTC Modeling Data and AM/PM Growth Rate



# Appendix B

## Synchro/SimTraffic Reports

AM Existing

AM No-Build

PM Existing

PM No-Build



# Appendix C

## Safety Analysis - Corridor Detail

