Appendix 2

City of Saskatoon

Connecting Victoria Avenue

Reference: 24-0159

FUNCTIONAL REPORT

CIMA+ file number: Z0012729
28 April 2025 – Revision 007

City of Saskatoon

Connecting Victoria Avenue

Reference: 24-0159

FUNCTIONAL REPORT

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Table of involved resources

In addition to the signatories of this report, the following individuals have also been involved in the study and writing of the report as technical experts within the project team:

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Register of issues			
Issue No.	Reviewed by	Date	Description of the review
1	EM/JM	July 10, 2024	Initial submission of existing conditions report
2	EM/AB/JM	August 30, 2024	Addition of Opportunities and Constraints, and Potential Facility Types report sections
3	EM/AB/JM	December 6, 2024	Addition of Options Development, Evaluation, and Preferred Alternative
4	EM/AB/JM	January 17, 2025	Address COS comments provided on December 20 ,2025
5	EM/AB/JM	March 31, 2025	Updated Report
6	EM/AB/JM	April 17, 2025	Address COS comments provided on April 16 ,2025
7	EM/AB/JM	April 28, 2025	Final Report

Confidentiality and ownership

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1. Introduction

The City of Saskatoon (City) engaged CIMA+ Canada Inc. (CIMA+) to complete a planning study for the functional design of an All Age and Abilities (AAA) cycling facility and pedestrian improvements along Victoria Avenue from Ruth Street to Taylor Street East. The project corridor is approximately 800 m in length and falls within the Queen Elizabeth neighbourhood. This project corridor is an extension of the planning work that was previously completed by the City for an AAA cycling facility on Victoria Avenue from Taylor Street East to 8th Street. The study area is illustrated in **Figure 1.1**.

Figure 1.1: Project Study Area

1.1 Study Process

The study process consists of the following steps:

- Existing Conditions
  - Assemble background information, complete site visits, collect data, and prepare a report to document the existing conditions for the corridor, including street characteristics, traffic conditions, parking inventory, and routing opportunities.
- Opportunities and Challenges Assessment
  - Document opportunities, challenges, and nonstarter issues as they relate to AAA cycling facilities along Victoria Avenue and identify potential facility treatments.

- Options Development and Evaluation
  - Develop a minimum of two alternatives along Victoria Avenue for active modes. Use a multi-criteria evaluation matrix to identify a preferred alternative.
- Functional Design Drawings
  - Prepare base plans for preferred corridor treatment in accordance with City of Saskatoon drawing standards.
- Public Consultation
  - Keep stakeholders and the public informed, understand resident, user group, and equity deserving communities' relationship to Victoria Avenue and cycling facilities, gather feedback on proposed alternatives.
- Final Report
  - To document all the project activities, preferred corridor alternative, and implementation plan. Present and participate at the Standing Policy Committee on Transportation and City Council.

1.2 Reference Material

References that were consulted for the functional design include:

- Transportation Association of Canada (TAC) Geometric Design Guide (GDG)
- TAC Manual of Uniform Traffic Control Devices for Canada (MUTCDC)
- TAC Pedestrian Crossing Control Guide, 3rd Edition
- TAC Vision Zero and Safe System Approach primer:
- Gender Based Analysis + (GBA+) tools
- Highway Capacity Manual (HCM), 2000
- The Ontario Traffic Council Multi-Modal Level of Service Guide (OTC MMLOS Guide)
- City of Ottawa Protected Intersection Design Guide (PIDG)
- National Association of City Transportation Officials (NACTO) Designing for All Ages and Abilities
- NACTO Don't Give Up at the Intersection

2. Existing Conditions

2.1 Surrounding Land Use

The Victoria Avenue project corridor is in the Queen Elizabeth neighbourhood. This neighbourhood largely features single family residential homes, parks, and schools. This includes Weaver Park and Queen Elizabeth School on Eastlake Avenue and Aden Bowman Collegiate located at the intersection of Taylor Street East and Clarence Avenue. The existing land use designations for the Queen Elizabeth neighbourhood are shown below in

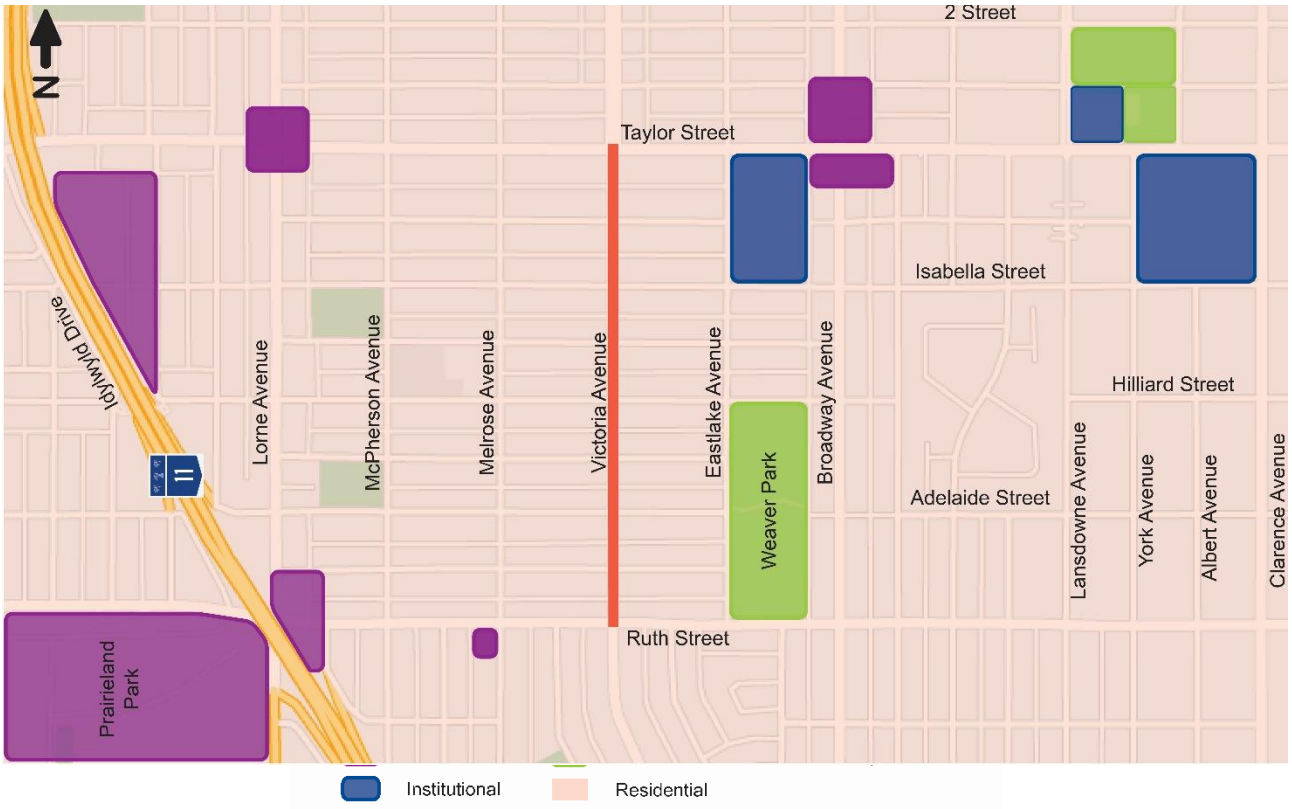


Figure 2.1**.**

Figure 2.1: Area Land Uses

2.2 Route Context

In June 2016, Saskatoon City Council approved the Active Transportation Plan (AT Plan). The purpose of the AT Plan was to increase transportation choices within the city and establish a long-term vision for active transportation that complements the City's Plan for Growth. The AT Plan also established a proposed AAA Bicycle Network which included a north-south corridor on Victoria Avenue. The proposed AAA network for Victoria Avenue and surrounding area is shown below in **Figure 2.2.**

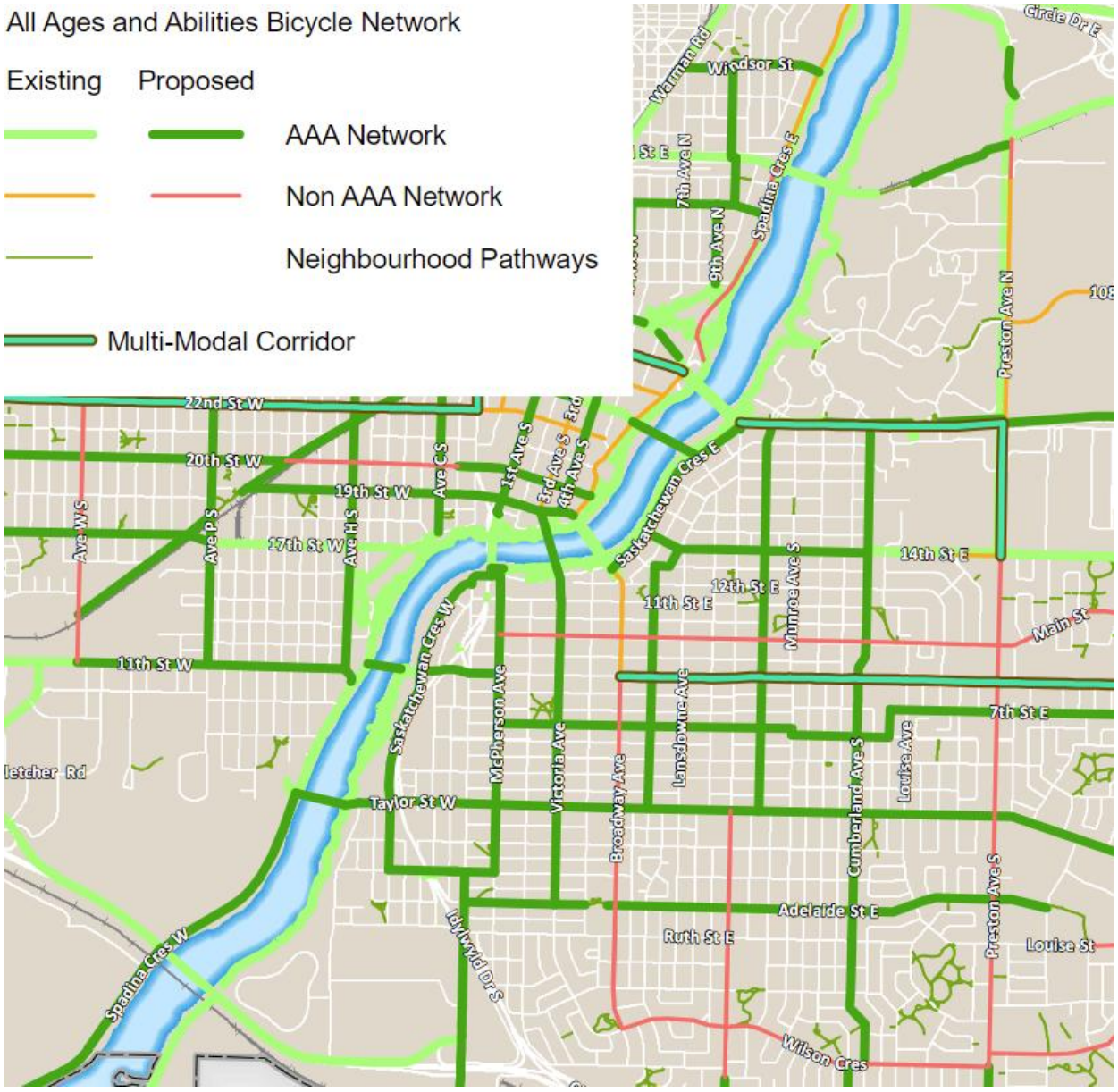


Figure 2.2: Victoria Avenue AAA route (AT Plan Appendix A)

The segment of Victoria Avenue included in this study extends from Ruth Street to Taylor Street East. Previous planning and design work has been undertaken to the north of this project, on Victoria Avenue from Taylor Street East to 8th Street East and summarized in the Neighbourhood Bikeways Project – Victoria Avenue report. On April 26, 2021, City Council voted to approve a protected street-level bike lane with on-street parking on both sides of the street from Taylor Street East to 7th Street East and a protected street-level bike lane with no on-street parking from 7th Street East to 8th Street East. The typical proposed cross section from that project is shown below in **Figure 2.3**.

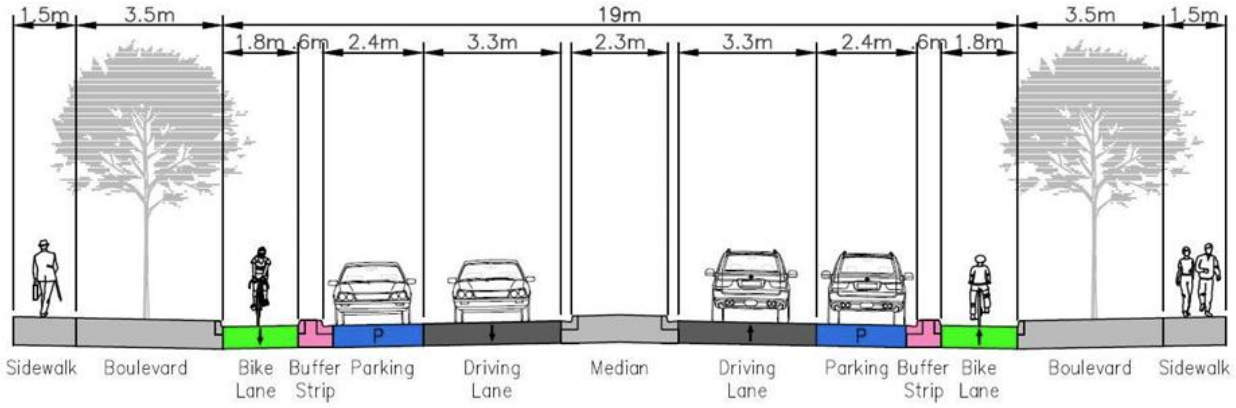


Figure 2.3: Approved Design for Victoria Avenue from Taylor Street East to 7th Street East – Protected Street-Level Bike Lanes with Parking

North of 8th Street East, an existing sidewalk level cycle track completes the corridor, connecting Victoria Avenue to the Traffic Bridge, 3rd Avenue (an extension of Victoria Avenue north of the river) through the Downtown, and the Meewasin Valley Trails.

2.3 Existing Roadway Characteristics

2.3.1 Existing Cross Section

The typical cross section along the Victoria Avenue project corridor is comprised of two undivided travel lanes and two parking lanes, curb and gutter, and a grassy boulevard space. Sidewalks currently exist along 70% of the study corridor located adjacent to the curb and gutter, with a grassy and treed boulevard between the back of walk and the property line. Functional design plans are available for missing sidewalks on Victoria Avenue between Taylor Street East and Ruth Street. Sidewalks between Elm Street and Ruth Street were recently constructed based on this plan, prior to which sidewalk only existed along 40% of the corridor. A typical existing Victoria Avenue cross section is shown below in **Figure 2.4**.

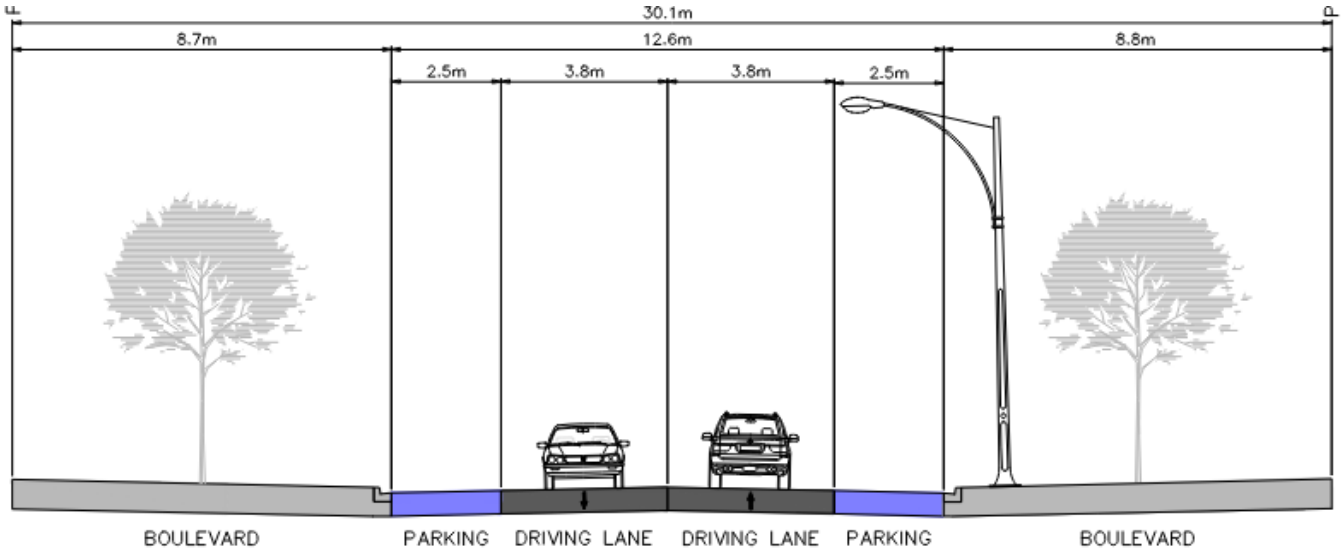


Figure 2.4: Existing Victoria Avenue Cross Section

Streetlighting is consistently provided on the west side of the street while above ground utilities run along the east side of the street. Street parking is restricted in the northbound direction between Maple Street and Taylor Street East to provide a dedicated right turn lane for vehicle traffic.

2.3.2 Road Classification

Victoria Avenue is classified as a collector street[1] and provides a direct north-south route through the neighbourhoods of Queen Elizabeth, Buena Vista, and Nutana. There is a traffic signal at the intersection of Victoria Avenue and Taylor Street East. Victoria Avenue is stop-controlled at the intersection of Victoria Avenue and Ruth Street. The east-west streets along the corridor between Taylor Avenue East and Ruth Street are stop controlled, assigning right-of-way to Victoria Avenue.

2.3.3 Pavement Condition

The existing roadway surface was evaluated based on a visual assessment. The intent of the visual assessment was to identify any fatigue cracking, rutting, general roughness, and deterioration.

In general, the existing asphalt surface appears to be in good condition with limited cracking and deterioration present.

[1] City of Saskatoon Roadway Classification Map

2.3.4 Parking Demand

Parking demand counts were completed to determine the parking utilization rate along the project corridor. The counts were completed at the following times:

- Tuesday – May 28, 2024 – 7:00 PM
- Wednesday – May 29, 2024 – 6:00 AM
- Wednesday – May 29, 2024 – 4:00 PM

In addition to counting parked vehicles along the project corridor, CIMA+ staff also recorded any disabled parking zones and/or vehicles displaying disabled parking placards.

A summary of the results of the on-street parking study is shown in **Table 2.1.**

Table 2-1 On-Street Parking Demand

Block	Side of the Street	Utilization			
		Tuesday - May 28, 2024 7:00 PM	Wednesday - May 29, 2024 6:00 AM	Wednesday - May 29, 2024 4:00 PM	Average
Taylor to Maple	East Side	0%	0%	0%	0%
	West Side	0%	0%	0%	0%
Maple to Isabella	East Side	14%	14%	14%	14%
	West Side	0%	29%	0%	10%
Isabella to Willow	East Side	0%	14%	0%	5%
	West Side	0%	0%	0%	0%
Willow to Hilliard	East Side	0%	33%	0%	11%
	West Side	0%	0%	0%	0%
Hilliard to Elm	East Side	0%	0%	0%	0%
	West Side	0%	0%	0%	0%
Elm to Adelaide	East Side	0%	0%	0%	0%
	West Side	0%	0%	0%	0%
Adelaide to Ash	East Side	0%	0%	0%	0%
	West Side	0%	0%	0%	0%
Ash to Ruth	East Side	0%	0%	0%	0%
	West Side	0%	0%	0%	0%

Legend	0%-25%	26%-50%	51%-75%	76%-100%

In general, on-street parking demand appears to be very low. There were no disabled parking zones identified or placards present in parked vehicles during any of the counts.

2.3.5 Traffic Counts

The City of Saskatoon provided the study team with 7-hour multi-modal traffic counts collected on Wednesday September 13, 2023, and Tuesday April 9, 2024 at the intersections of Victoria Avenue with Taylor Street East and Ruth Street. The AM peak for vehicles occurred from 8:00 am to 9:00 am and the PM peak occurred from 4:15 pm to 5:15 pm. Data is not disaggregated in a way to determine when the cyclist peak hours occurred. At Taylor Street East, the PM peak hour for pedestrians occurred from 3:15 pm to 4:15 pm, aligning with the end of the school day. Traffic counts for vehicles, cyclists, and pedestrians are illustrated in **Figure 2.5** for the AM Peak and **Figure 2.6** for the PM Peak periods. Cyclists travelling in mixed street traffic are noted using grey left / through / right turn arrows while cyclists using the sidewalk are noted directionally using orange arrows.

Traffic data is not available at the seven intermediate study intersections. Of the remaining intersections, Isabella Street is the only continuous road. Traffic volumes at Maple Street, Willow Street, Hilliard Street, Elm Street, Adelaide Street, and Ash Street serve no more than three blocks to the east and west of the study corridor. Turning volumes are expected to be low at these locations.

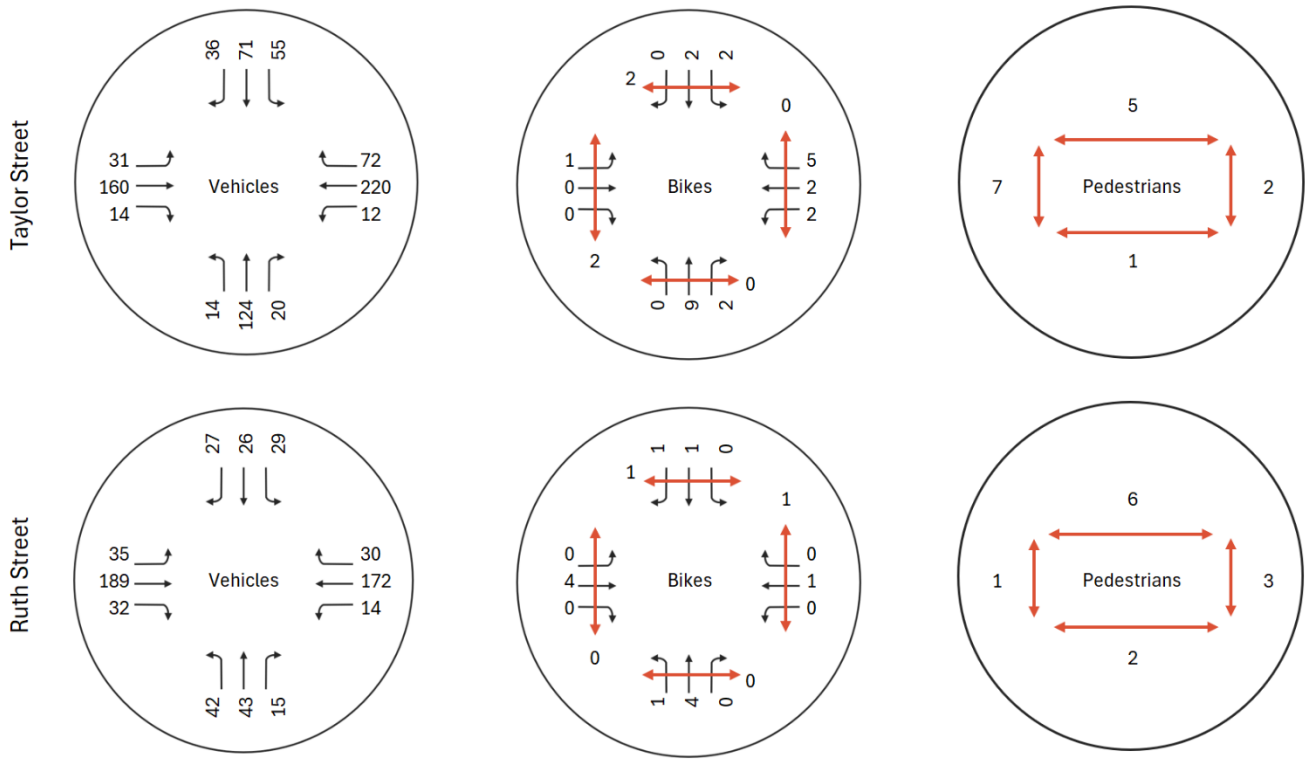


Figure 2.5 AM Peak Traffic Counts

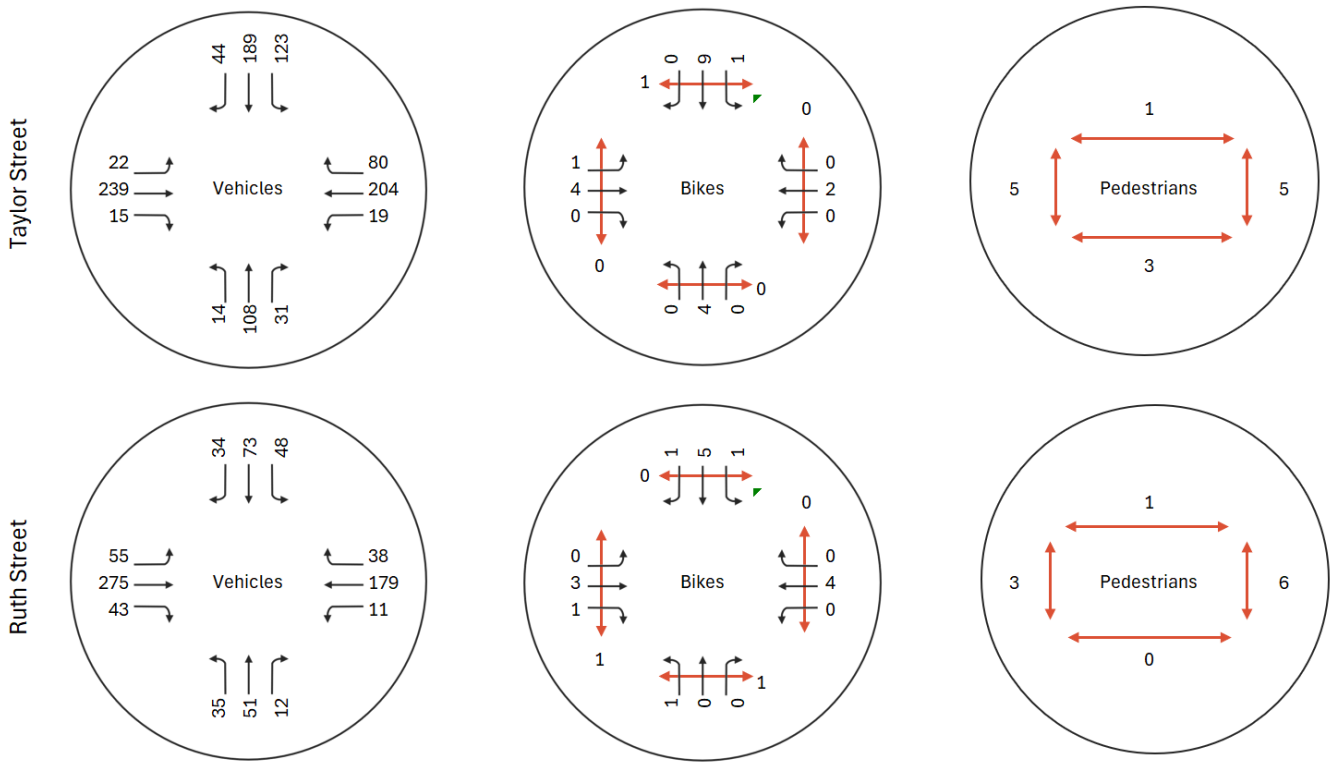


Figure 2.6 PM Peak Traffic Counts

The Average Daily Traffic (ADT) was calculated from the week of 24-hr traffic data collected as part of the speed study Victoria Avenue between Isabella Street and Willow Street. Daily traffic volumes range from 2,300 vehicles per day (vpd) to 3,200 vpd from the south to the north.

2.3.6 Vehicle Travel Speed

The posted speed limit on Victoria Avenue is 50 km/hr. The City collected speed data on Victoria Avenue between Isabella Street and Willow Street continuously from April 25 to May 3, 2024. The 85th percentile speed was calculated to be 52 km/hr throughout much of the day. Vehicle travel speeds collected during this period ranged from 35 km/hr to 75 km/hr.

Speeding above the posted speed limit occurred throughout the day but peaked during the AM, midday, and PM peak hours. Speed differentials can be a safety concern for all travel modes, but particularly for vulnerable road users. Vehicle speeds 70 km/hr and above or 35 km/hr and below occurred throughout the day, but most instances of excessively high and low speeds occurred between 7:00 am and 7:00 pm.

2.4 Operational Review

The capacity and operating characteristics of the study intersections were evaluated using Cubic|Trafficware's Synchro 11 software.

Synchro 11 implements the methodology of the 2016 Transportation Research Board's Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis. SIM Traffic, a software within Synchro, was used to record 95th percentile queues. Synchro can be used to analyse signalized and unsignalized intersections, and the software provides several measures of effectiveness to assess the operations of an intersection, including Level-of-Service (LOS), average vehicle delay, queue lengths, and volume-to-capacity (v/c) ratios. LOS analysis assesses the effectiveness of traffic operations alphabetically from A to F, based on average delay per vehicle. Grading criteria for signalized intersections differ from unsignalized intersections as drivers expect signalized intersections to carry higher volumes and will therefore tolerate longer control delays. The LOS criteria for signalized and unsignalized intersections are summarized in **Table 2-2**.

Table 2-2 : HCM Level of Service Criteria

Level of Service	Average Total Delay at Stop Sign (seconds)	Average Total Delay at Signalized Intersections (seconds)
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

Generally, the City prefers to avoid LOS 'E' and 'F'. However, a LOS 'E' or 'F' does not indicate the need for, or trigger, improvements. Other considerations include: the traffic volume making the problematic movement with LOS 'E' or 'F', intersection geometrics and signal operation, intersection spacing, road classification, availability of alternate routes, pedestrian movements, access management, type of adjacent land use, future development in the area and of course, cost.

Further, the Ontario Traffic Council (OTC) Multi-Modal Level of Service (MMLOS) Guidelines note "Since traditional LOS evaluations focus on vehicle delay and congestion (through metrics like intersection delay and volume-to-capacity ratios), they classify intersections that enable efficient and convenient conditions for drivers as well performing and intersections that are congested as poorly performing. But this approach does not take into consideration how any other users experience the intersection or if the efficient movement of vehicles is even aligned with the intent of that intersection within a municipality's larger planning context.

As a result, the traditional LOS leads to design decisions that consistently prioritize the car above all other modes of travel. In response, an MMLOS approach offers municipalities a tool to evaluate and build streets that enable and encourage travel by modes other than the car."

Given the multi-modal nature of this project, we recommend using the OTC MMLOS guidelines when considering the overall operation of the Victoria Avenue planning study corridor.

The OTC toolkit can help contextualize LOS within the experiences of other road users. We recommend using the OTC LOS targets for a 'Neighbourhood Boulevard' – defined as a multimodal corridor through a suburban neighbourhood comprised of varying land uses including residential, light commercial, schools, and parks, which moves low to moderate volumes of cycling and vehicle movements. There is a priority placed on cycling and pedestrian modes, while balancing other modes. Suggested LOS targets for a Neighbourhood Boulevard are summarized in **Table 2-3**. Pedestrian LOS has been adjusted upwards to capture the priority placed on both pedestrian and cycling improvements. Vehicle LOS has been adjusted upwards to reflect the City's preferred LOS targets.

Table 2-3 OTC Level of Service Targets

Road User	Suggested LOS Target	Description
Pedestrians	LOS C ***Adjusted upwards. Neighbourhood Boulevard uses LOS D*	• Pedestrians often have sufficient space to walk or roll in a social manner that is removed from traffic nuisance. • Crossing distance and delay at intersections is often optimized for pedestrians. • Crossing locations are often located with sufficient frequency to minimize detour.
Cyclists	LOS B	• Cyclists very often have sufficient space to ride in a social manner that is removed from traffic nuisance. • Delay at intersections is very often optimized for cyclists. • Exposure to conflict at intersections is very often minimized.
Cars	LOS D ***Adjusted upwards. Neighbourhood Boulevard uses LOS E*	• Drivers often experience delay due to congestion. • Parking and loading options are occasionally available where appropriate. • Dedicated turn lanes are occasionally provided when warranted.

Other measures, such as queue length, and volume-to-capacity (v/c) ratio are also assessed to identify traffic capacity issues. The v/c ratio represents the amount of congestion and available capacity at an intersection and for each individual movement and is generally indicative of an intersection's ability to accommodate fluctuations in traffic flow. Volume-to-capacity has a theoretical maximum of 1.00; a value of 0.90 is generally accepted as the maximum desirable for design of intersection modifications. Synchro is also used to estimate queuing lengths for individual movements at at-grade intersections. Estimated 95th Percentile Queue Lengths are reviewed on a movement-by-movement basis. Queuing calculations are used to design appropriate turn bay storage lengths, and to ensure that spillback into adjacent intersections is not a problem.

Analysis parameters were programmed in accordance with site conditions or typical industry practices. Peak Hour Factors (PHF) were calculated and applied for each intersection. Heavy vehicle percentages were assumed to be 1% along Victoria Avenue (the minor roadway) and 2% at Taylor Street East and Ruth Street (the major roadways).

Summaries of the AM and PM peak hour analyses for the existing conditions are provided in **Table 2-4**. Synchro reports and OTC MMLOS worksheets are included in **Appendix A** and **B**, respectively.

Table 2-4: Capacity Analysis Results Summary

Intersection	Traffic Control	Measure of Effectiveness	Eastbound			Westbound			Northbound			Southbound			Overall
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
AM Peak - Existing															
Victoria Ave / Wilson Crescent & Ruth Street	TWSC (N/S)	Volume	35	189	32	14	172	30	42	43	15	29	26	27	654
		v/c Ratio	0.03			0.01			0.27			0.20			
		LOS	A			A			C			B			A
		Delay (s)	1.1			0.5			16.6			14.8			5.0
		95th % Queue (m)	12.2			-			16.6			9.7			
Victoria Ave & Taylor Street East	Signalized (2-Phase)	Volume	31	160	14	12	220	72	14	124	20	55	71	36	829
		v/c Ratio	0.22			0.38			0.03	0.37		0.38			
		LOS	A			A			B	B		B			A
		Delay (s)	5.6			6.7			13.8	15.4		15.6			9.8
		95th % Queue (m)	27.0			42.8			7.5	22.8		29.3			
		Queue>Storage?	-			-			-	No		-			
PM Peak - Existing															
Victoria Ave / Wilson Crescent & Ruth Street	TWSC (N/S)	Volume	35	189	32	14	172	30	42	43	15	29	26	27	654
		v/c Ratio	0.04			0.01			0.30			0.45			
		LOS	A			A			C			C			A
		Delay (s)	1.2			0.4			20.9			22.4			7.1
		95th % Queue (m)	34.0			5.6			21.5			28.3			
Victoria Ave & Taylor Street East	Signalized (2-Phase)	Volume	22	239	15	17	204	75	14	103	29	122	196	44	1080
		v/c Ratio	0.29			0.32			0.03	0.24		0.64			
		LOS	A			A			B	B		B			B
		Delay (s)	7.8			8.8			12.6	13.6		17.1			12.0
		95th % Queue (m)	38.6			37.1			18.8	15.2		59.5			
		Queue>Storage?	-			-			-	No		-			

In the AM peak hour, the intersections along the corridor operate with an overall LOS 'A', corresponding to relatively low delays at the intersections. Individual approaches and movements operate with an LOS 'C' or better, which represents low to moderately low delays. V/C ratios are less than 0.40 for all movements. In the PM peak hour, the intersections along the corridor operate with an overall LOS 'B' or better, corresponding to relatively low delays at the intersections. Individual approaches and movements operate with a LOS 'C' or better, which represents low to moderately low delays. V/C ratios are less than 0.65 for all movements. Queuing is not a concern at either intersection during the AM or PM peak periods. Both intersections operate well within the LOS targets outlined by the City of Saskatoon. When considering the OTC MMLOS standards for automobile traffic, the actual LOS of the Taylor Street East and Ruth Street intersections are 'C' and 'A' respectively, which exceeds the LOS 'D' target.

Based on the OTC MMLOS worksheets, the pedestrian MMLOS at Taylor Street East is theoretically a LOS 'D'; however, pedestrian actuation is not accessible on all approaches and sidewalks are missing on Victoria Avenue south of Taylor Street East resulting in a LOS failure. The pedestrian MMLOS at Ruth Street is a LOS 'D' which does not meet the target LOS 'C'.

Based on the OTC MMLOS worksheets, cyclist LOS is theoretically LOS 'D' at both intersections but fails since the intersections do not currently have cycling facilities that meet OTC recommended targets.

At a corridor level, the OTC MMLOS produces the results in **Table 2-5**. Pedestrian LOS automatically fails because an estimated 30% of the corridor does not have sidewalk. Cycling LOS automatically fails because an appropriate cycling facility is not provided for people of all ages and abilities based on current vehicle speeds and volumes.

Table 2-5: MMLOS Results

	Mode		
	Pedestrian	**Cyclist**	**Car**
Target	C	B	D
Ruth Street (intersection)	D	D	A
Taylor Street East (intersection)	D	D	C
Victoria Avenue (segment)	E	D	B

2.5 Collision Assessment

The City of Saskatoon provided collision records for the years 2018 through 2022 for the study corridor available from SGI's Traffic Accident Information System (TAIS). These records for the 5-year period were reviewed to understand the existing safety performance of the project corridor. A high-level review of the existing infrastructure was also completed with a safety lens to identify concerns and potential opportunities for improvement to consider in the development of design options.

The Safe System Approach was considered in the review of the collision records and existing infrastructure. The Safe System Approach is a framework for improving safety that acknowledges potential for human error and limitations of the ability of the human body to absorb energy from a crash. It is focused on eliminating transportation-related injuries and deaths by proactively mitigating risks and introducing overlapping safety measures within the transportation system. In a system with redundancies, if failure occurs in one part of the system, other protections remain to prevent serious injury due to a collision.

2.5.1 Collision History

There were 30 collisions recorded along the project corridor during the five-year period between 2018 and 2022, including 4 collisions that resulted in injuries, and 26 collisions that resulted in property damage. No fatalities were recorded.

Based on the information available, it appears that none of the collisions recorded during this time involved pedestrians or cyclists. A motorcycle was involved in one collision that occurred in 2018.

A summary of the 30 collisions recorded along the project corridor by location is shown in **Figure 2.7**. The data points are scaled to reflect the collision frequency at each location. Of the 30 collisions, 28 of the collisions occurred at intersections and 2 occurred on road segments of Victoria Avenue between intersections (i.e., mid-block).

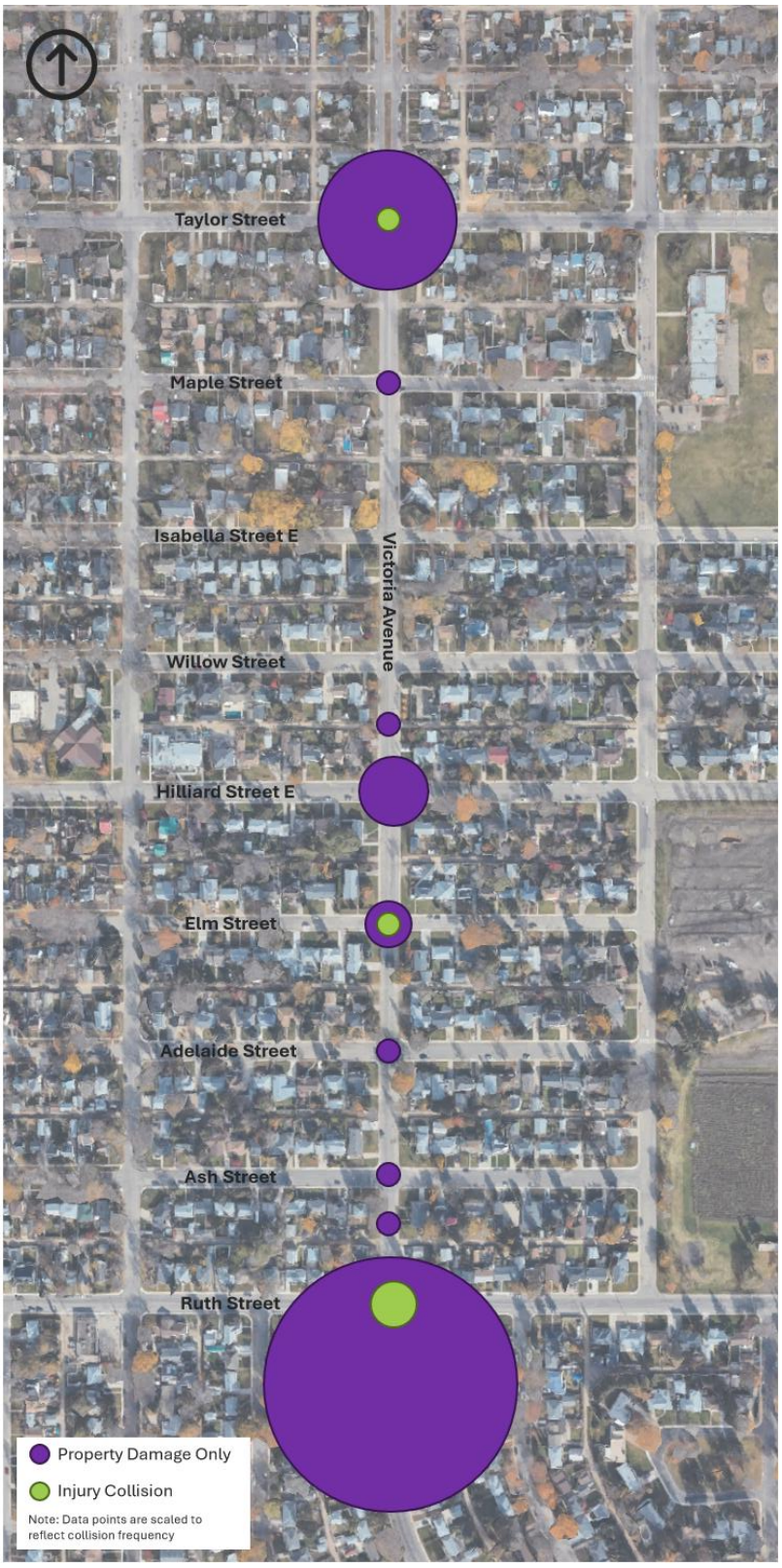


Figure 2.7 Collisions by Location

The collision types observed by intersection and road segment location are summarized in **Figure 2.8** and **Figure 2.9**.

Figure 2.8 Intersection Collision Configuration by Location

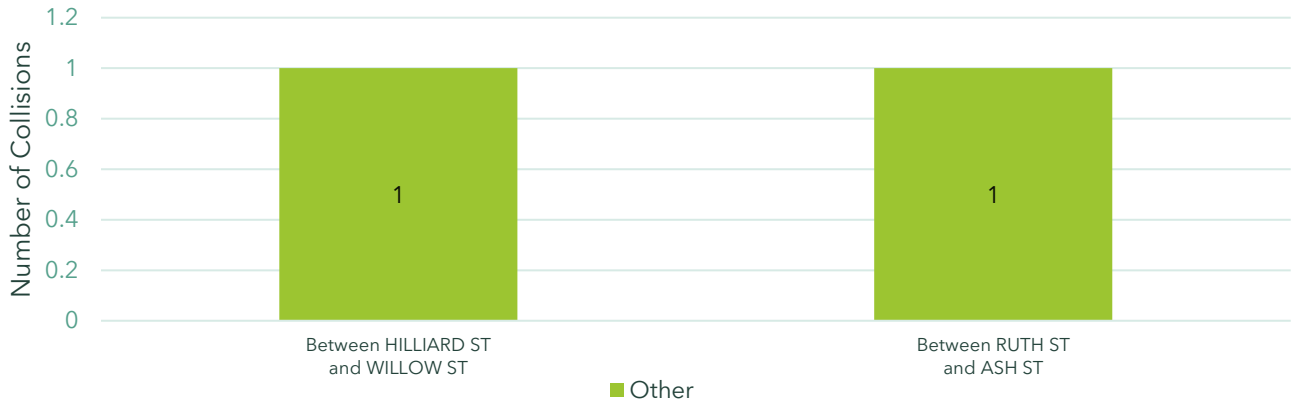


Figure 2.9 Road Segment Collision Configuration by Location

As identified in the figures above, the highest number of collisions were observed at Ruth Street, including 13 of the total 30 collisions along the project corridor.

The severities of all collision types observed along the project corridor (at and between intersections) are summarized in **Figure 2.10**. Details of the 4 injury collisions are summarized in **Table 2-6**.

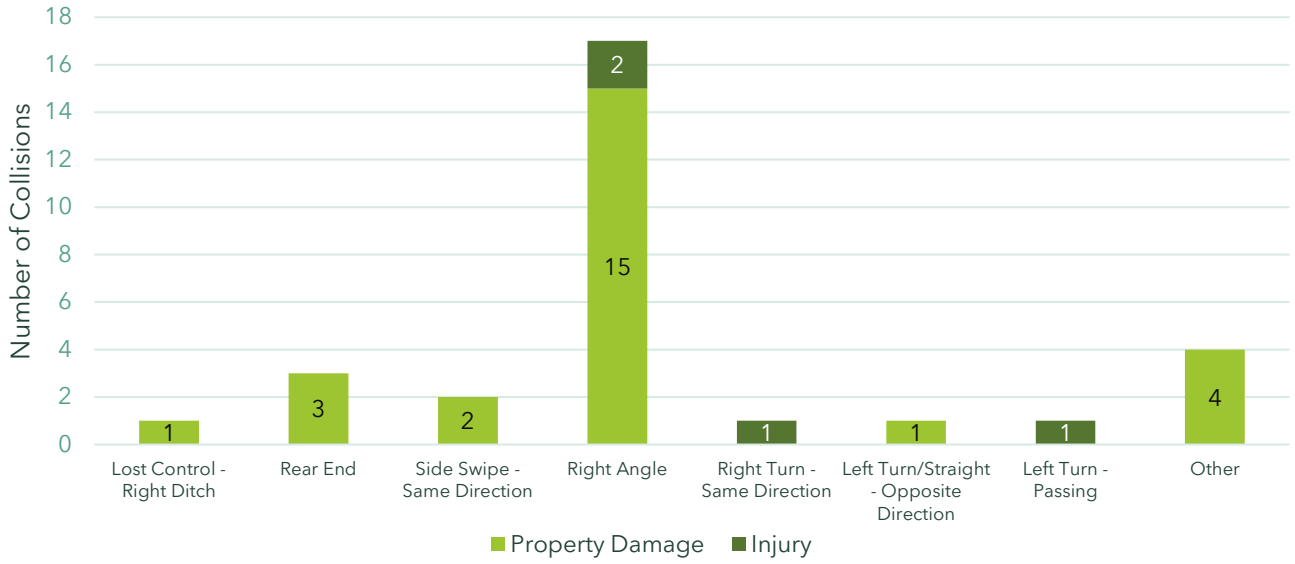


Figure 2.10 Collision Severity by Collision Configuration

Table 2-6 Summary of Injury Collisions 2018-2022

Year	Location	Details
2018	Victoria Avenue and Elm Street	• Left turn passing collision (two vehicles travelling in the same direction where one attempts to conduct a left turn in front of the other) • A passenger car and a motorcycle were involved • 1 person was injured (moderate non-incapacitating injury) • Occurred in the month of June during the daytime with good weather and dry road surface conditions
2019	Victoria Avenue and Ruth Street	• Right turn same direction collision (two vehicles involved in a right-angle collision with one vehicle attempting a right turn and one vehicle travelling straight through) • A transit bus and a passenger car were involved • Transit bus driver failed to yield to right of way • 1 person was injured (moderate non-incapacitating injury) • Occurred in the month of July during the daytime with good weather and dry road surface conditions
2019	Victoria Avenue and Taylor Street East	• Right angle collision • 3 passenger vehicles were involved • An impaired westbound driver failed to stop at the traffic signal and hit a northbound vehicle and a southbound vehicle • The impaired driver was charged by police • 2 people were injured (1 major incapacitating injury and 1 minor injury) • Occurred in the month of December during darkness (2 a.m.) with good weather and dry road surface conditions

Year	Location	Details
2021	Victoria Avenue and Ruth Street	• Right angle collision • 2 passenger vehicles were involved • A northbound driver failed to stop at the stop sign and struck an eastbound driver • The northbound driver was charged by police • 1 person was injured (major incapacitating injury resulting in loss of consciousness) • Occurred in the month of June during daytime with good weather and dry road surface conditions

The collision records were also reviewed to identify any trends associated with the temporal or environmental conditions. These are shown in **Figure 2.11** through **Figure 2.15**. The following findings were identified. Any "blank" category noted in the figures represents collision records that did not include information for the noted period or condition.

- The highest number of collisions were observed during January and June. No collisions occurred in March, August, or November.
- The proportion of collisions observed between Tuesdays and Saturdays was relatively consistent, with fewer collisions observed on Mondays and none on Sundays.
- A higher number of collisions occurred during the mid-afternoon and the late afternoon compared to other times of the day.
- Most collisions occurred in daylight.
- Approximately one third of the collisions recorded occurred with wet or snowy/icy road conditions. All the injury collisions occurred under dry road surface conditions.

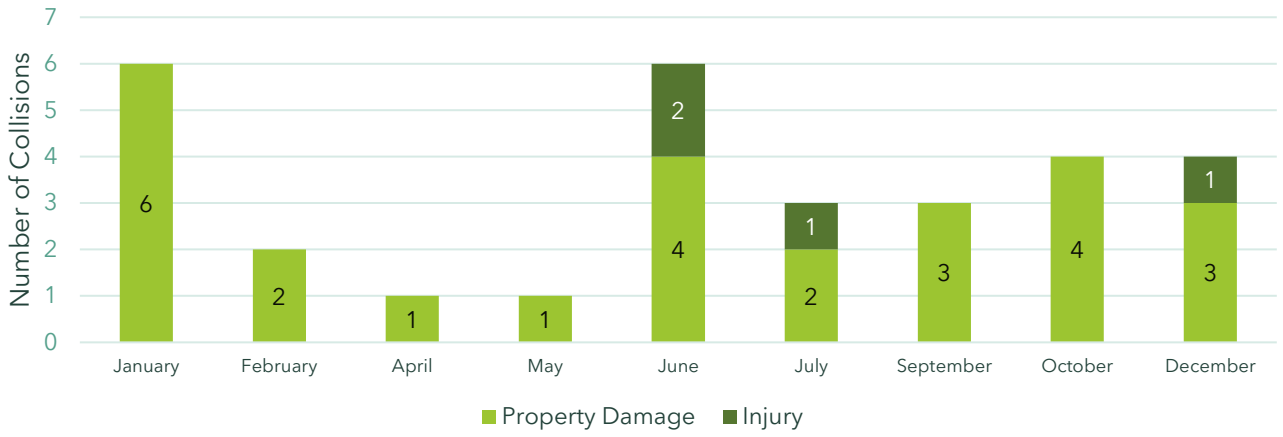


Figure 2.11 Collisions by Month

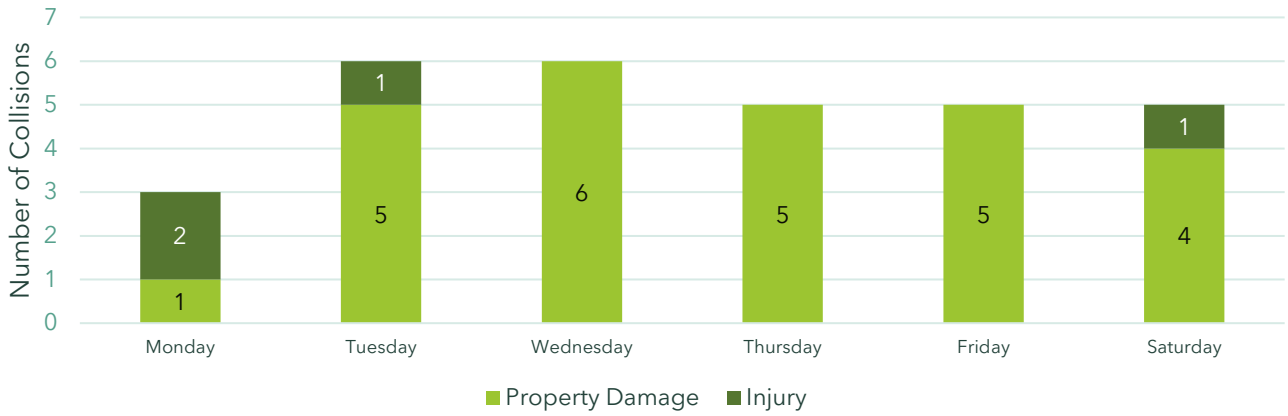


Figure 2.12 Collisions by Day of Week

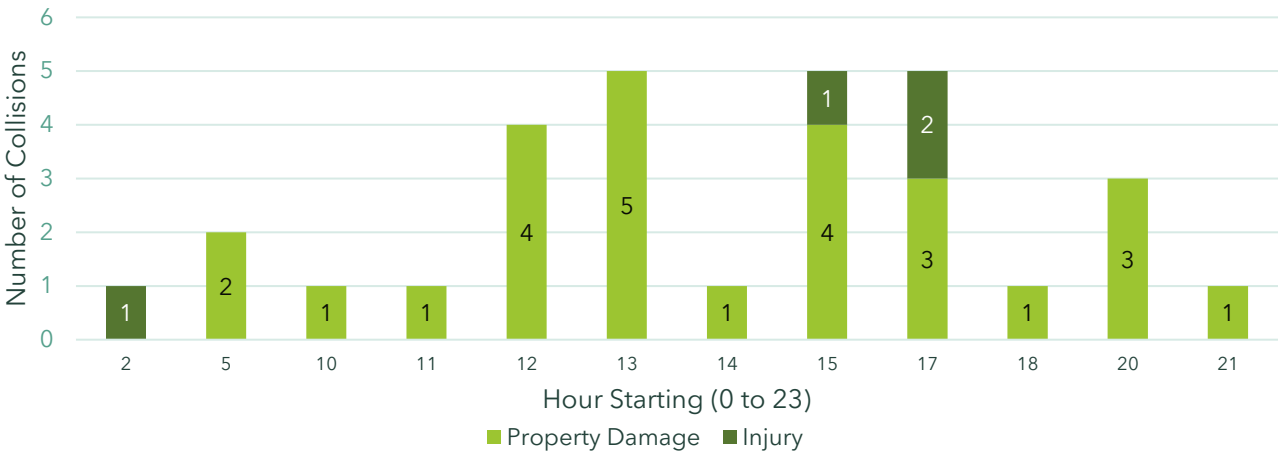


Figure 2.13 Collisions Hour of Day

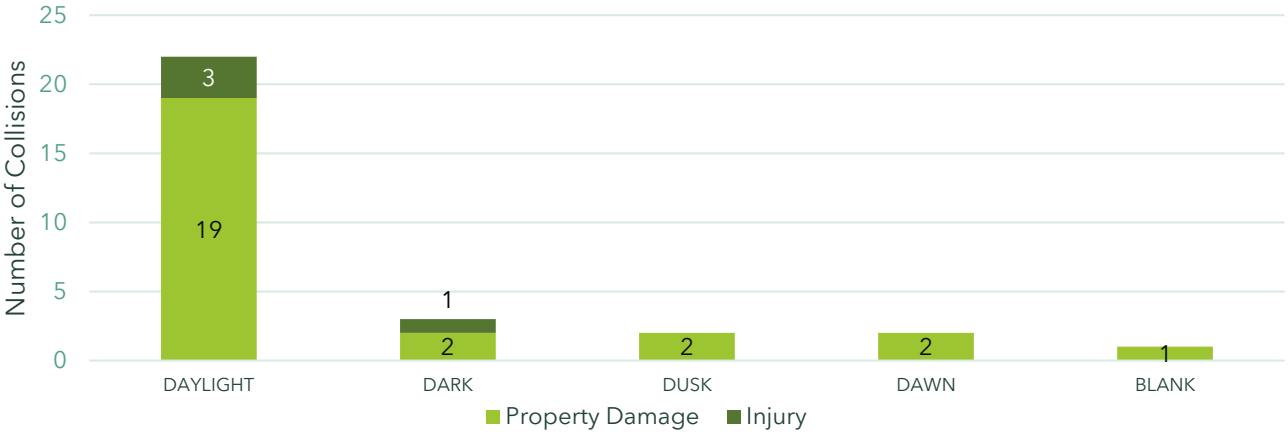


Figure 2.14 Collisions by Natural Light Condition

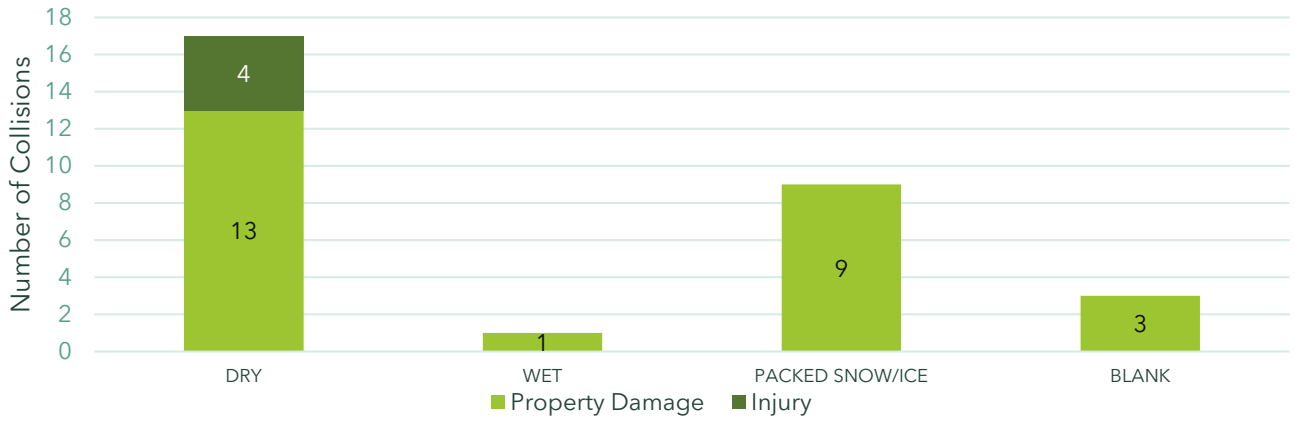


Figure 2.15 Collisions by Road Surface Condition

Based on the collision history available, the existing safety performance issues are concentrated at intersections along the project corridor. The implementation of safety measures at intersections will be an important element of the design to enhance safety for all users. The high proportion of right angle and left turning collision types observed at intersections along the project corridor is a concern due to the high angle of impact associated with these collisions and the resulting higher energy transfer / high potential for injuries.

2.5.2 Existing Infrastructure

The following observations were made regarding the existing infrastructure along the project corridor by applying a Safe System Approach lens:

- The width of the road on Victoria Avenue may encourage higher vehicle speeds, which increases risk for all users, particularly at intersections.
- The existing curb radii and the width of the road result in long crossing distances for pedestrians at intersections, which increases the exposure time for people walking and using mobility aids and may result in limited visibility of approaching pedestrians for people driving.
- Curb ramps are not currently present at all intersections along Victoria Avenue. Some of the existing curb ramps appear to direct users into the centre of the intersection rather than the crosswalk, and do not include tactile walking surface indicators. This contributes to both safety and accessibility concerns.

- The east and west crosswalks at the intersection of Victoria Avenue and Taylor Street East are currently aligned on an angle due to the change in the cross section of Victoria Avenue north of Taylor Street East, illustrated in Figure 2.16. This may restrict visibility of pedestrians for turning vehicles.

Figure 2.16 Crosswalk Alignment at Victoria Avenue and Taylor Street East

The separation of users in time and space and increasing safety outcomes for all users are key elements to consider in anticipating human error. Strategies to reduce speeds should be considered to reduce impact forces in the event of a collision. These concepts associated with anticipating human error and mitigating impact forces should be incorporated in the design to improve safety on Victoria Avenue and address issues observed in the collision records and infrastructure review.

Strategies to increase the safety outcomes for users should include the provision of improved pedestrian facilities to enhance visibility and increase driver expectation for pedestrians. Opportunities to improved separation of modal conflicts in time and space, and to reduce speeds through the physical configuration of the corridor should also be explored.

2.6 Preliminary Routing Assessment

A preliminary routing assessment was completed to identify potential crossing locations that would benefit from pedestrian and cyclist-oriented safety features.

Figure 2.17 highlights various destinations in the surrounding neighbourhood such as transit routes, access to the Meewasin Valley trail system, schools, parks, community / event centres, and libraries. Clusters of attractions can be found every two blocks at Taylor Street East, Isabella Street, Hilliard Street, Adelaide Street, and Ruth Street. These locations correspond with existing crosswalks.

Figure 2.17 Destination and Routing Map

This data was compared to Strava heat maps that log frequently used travel routes for a variety of active modes. While not representative of the entire walking and cycling community, this self reported data can provide rudimentary view into route selection. Common routes are summarized by frequency of use in **Table 2-7**.

Table 2-7 Common Strava Routes

Routes	Walking	Cycling
Primary	• Eastlake Avenue	• Victoria Avenue • Taylor Street East • Ruth Street
Secondary	• Victoria Avenue • Taylor Street East • Ruth Street	• Lorne Avenue • Broadway Avenue
Tertiary	• Broadway Avenue • Melrose Avenue • McPherson Avenue • Hilliard Street	• Melrose Avenue • Eastlake Avenue • Isabella Street • Hilliard Street • Adelaide Street

2.7 Site Visit

Members of the project team visited Victoria Avenue on Wednesday May 29, 2024 from 5:00 pm to 5:30 pm. The following observations were made:

- Vehicles were parked up to the stop bar on the north leg of Victoria Avenue at Taylor Street East, blocking the view of crossing pedestrians for approaching drivers. This behaviour may influence intersection crossing plans at the north tie-in.
- Sightlines from each minor road appear adequate and will be confirmed during the development of functional plans. Sightlines from the north leg of Victoria Avenue at Ruth Street may be constrained by a coniferous tree in the northeast quadrant.
- Traffic volumes were very low and level of service appeared to be adequate.
- Seven cyclists and an e-scooter user were observed in addition to a number of pedestrians. Two cyclists are pictured in Figure 2.18.

Figure 2.18 Cyclists on Victoria Avenue

3. Opportunities and Challenges

The project corridor is a relatively unconstrained physical environment, not typical of most retrofit projects. The following section documents existing opportunities and constraints on Victoria Avenue. The Round 1 engagement event for the project was held on July 23, 2024. Findings from the Round 1 engagement event were not yet available when this section was prepared, therefore the information presented is based on technical analysis. The options development phase will incorporate input from the engagement.

3.1 Opportunities

The following is a summary of site-specific opportunities that can be enhanced or featured when developing corridor alternatives.

- The current right-of-way on Victoria Avenue is 30 m, with 12.6 m of pavement currently allocated to parking and vehicle travel lanes. This provides opportunity to reallocate space to the cyclist facilities without significantly impacting the motor vehicle access and without requiring property acquisition.
- The existing travel lanes on Victoria Avenue are 3.8 m wide. The City of Saskatoon's design guidance for residential collector roads indicates a travel lane width of 3.2 m to 3.6 m. This guidance accounts for the presence of transit vehicles, but there are currently no transit routes or plans for transit service along the project corridor. However, this guidance does not account for snow storage. Therefore, there is an opportunity to reduce the vehicle travel lane width and reallocate this space for the cycling facilities but winter maintenance will require consideration.
- Many sections of the project corridor are lined with mature trees, which provide shade, windbreak, and contribute to a pleasant environment for people walking or biking. By introducing cycling facilities and sidewalks, the existing mature trees will further enhance Victoria Avenue as an attractive corridor for active mode commuters and residents. Providing attractive facilities may also help to attract more users and promote active transportation. The tree-lined section of the existing corridor between Ruth Street and Ash Street is shown below in Figure 3.1. Adding trees along segments within the project area where there are not currently trees could also be considered to provide benefit along the entire project.

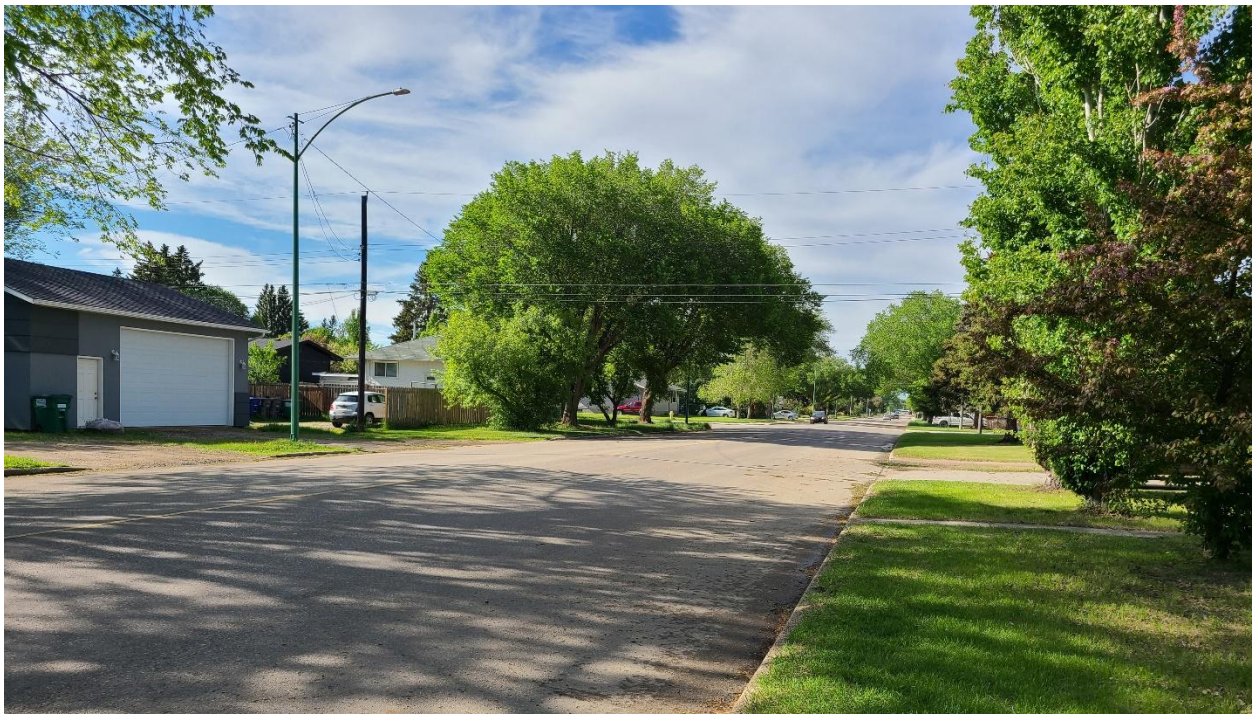


Figure 3.1 Looking north to Ash Street on Victoria Avenue

- The parking demand assessment for on-street parking along Victoria Avenue found that 0 to 15% of total available space was used. Sections where parked vehicles were observed included between Maple Street and Isabella Street, between Isabella Street and Willow Street, and between Willow Street and Hilliard Street. Vehicles were only observed on the east side of Victoria Avenue at each of these locations except between Maple Street and Isabella Street where vehicles were also observed on the west side of Victoria Avenue. Due to the low parking demand, reallocation of a portion of the curb-to-curb space currently dedicated to parking is not expected to have a significant impact on existing parking operations. The reallocated space could be used to support cycling facilities that align with those suitable for users of all ages and abilities.
- There is currently a dedicated northbound right turn lane at the intersection of Victoria Avenue and Taylor Street East, as shown below in Figure 3.2. The existing AM and PM peak hour traffic volumes for the northbound right turn movement were identified to be 20 and 31 vehicles per hour. Capacity analysis indicates that the LOS for this movement was 'B' during both peak hours. The turning vehicle volumes and the existing operation suggest that this dedicated turn lane is not necessary. Removal of the right turn lane and reallocation of the space could be used in the design to enhance the safety of this intersection.

Figure 3.2 Northbound Lane Configuration at Victoria Avenue and Taylor Street East

3.2 Challenges and Potential Mitigation Measures

The following is a summary of challenges related to safety and operational issues along Victoria Avenue that will require mitigation when developing corridor alternatives. Mitigation measures are listed that could be used to address safety and operations issues identified at intersections, crosswalks, driveways, laneways, and parking areas. The specific implementation of these measures will depend on the cycling facility type selected; however, visuals are provided to demonstrate potential configurations.

Long Distances and Conspicuity of Pedestrian Crossings at Intersections

Challenge: The existing curb radii and the width of the road result in long crossing distances for pedestrians at intersections, which increases the exposure time for pedestrians and may result in limited visibility of approaching pedestrians for vehicles. The existing crossing at Isabella Street is illustrated in **Figure 3.3**.

Figure 3.3 Looking South at pedestrian crossing on Victoria Avenue at Isabella Street

Potential Mitigation: The potential implementation of curb extensions at intersections, would enhance the safety of pedestrians by increasing their visibility and reducing crossing distances. The configuration of the curb extensions depends on the cycling facility selected. Other measures to enhance the visibility of crosswalks that will also be considered in the design include:

- Improved pavement markings such as zebra crosswalk markings instead of twin parallel lines to increase visibility of the marked pedestrian crossings.
- Implementation of raised crossings to slow vehicle speeds and emphasize priority for pedestrians.
- An example of curb extensions is shown in Figure 3.4 and an example of a raised crossing is shown in Figure 3.5

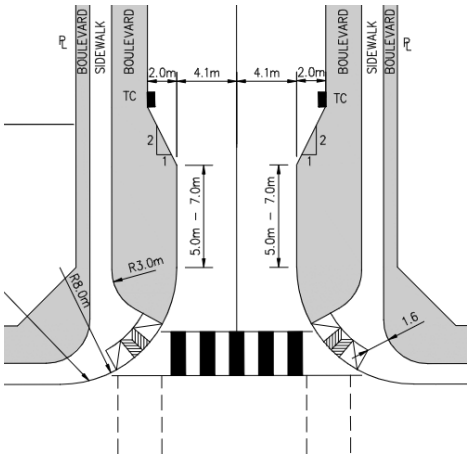


Figure 3.4 Curb Extensions

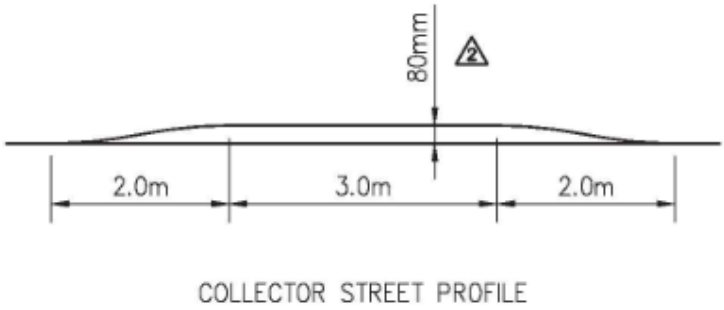


Figure 3.5 Raised Crosswalk

Road Design Encourages High Speed Motor Vehicle Travel

Challenge: The width of the road on Victoria Avenue may encourage higher vehicle speeds, which increases risk for all users.

Potential Mitigation: The implementation of a separated cycling facility could reduce the width of the roadway dedicated to vehicles and is expected to provide some traffic calming effects to better align driving speeds with the residential context along the project area. Other potential traffic calming measures such as median islands, chicanes, or raised intersections could be considered in the design.

Accessibility of Intersections

Challenge: Curb ramps are not currently present at all intersections along Victoria Avenue. Some of the existing curb ramps appear to direct users into the centre of the intersection rather than the crosswalk, and do not include tactile warning surfaces. This contributes to both safety and accessibility concerns for the corridor.

Potential Mitigation: The project could include curb ramps where they are currently missing and replace deficient curb ramps to improve universal accessibility. The provision of textured accessible ramps such as grooved concrete or tactile walking surface indicators would improve accessibility for people with mobility challenges and those with vision loss.

Skew of Crosswalks

Challenge: The east and west crosswalks at the intersection of Victoria Avenue and Taylor Street East are currently aligned on an angle due to the change in the cross section of Victoria Avenue north and south of Taylor Street East, as shown in **Figure 3.6**. This may restrict visibility of pedestrians for turning vehicles.

Figure 3.6 Victoria Avenue and Taylor Street East

Potential Mitigation: The implementation of protected intersection elements as part of the cycling facility could be included in the design and opportunities to improve the crosswalks will also be reviewed at this intersection. Protected intersection designs help address pedestrian and cyclist visibility at intersections by laterally separating movements by mode. Protected intersection elements may also include cyclist queueing areas with corner refuge islands, setback of cyclist and pedestrian crossings, pedestrian refuge islands, conflict zone pavement markings, leading pedestrian and bike intervals or protected phases. Specific mitigations for this intersection will be explored and refined further during the development of options. Potential protected intersection elements from the Montgomery County Planning Department Bicycle Facility Design Toolkit are shown in **Figure 3.7** through **Figure 3.9**.

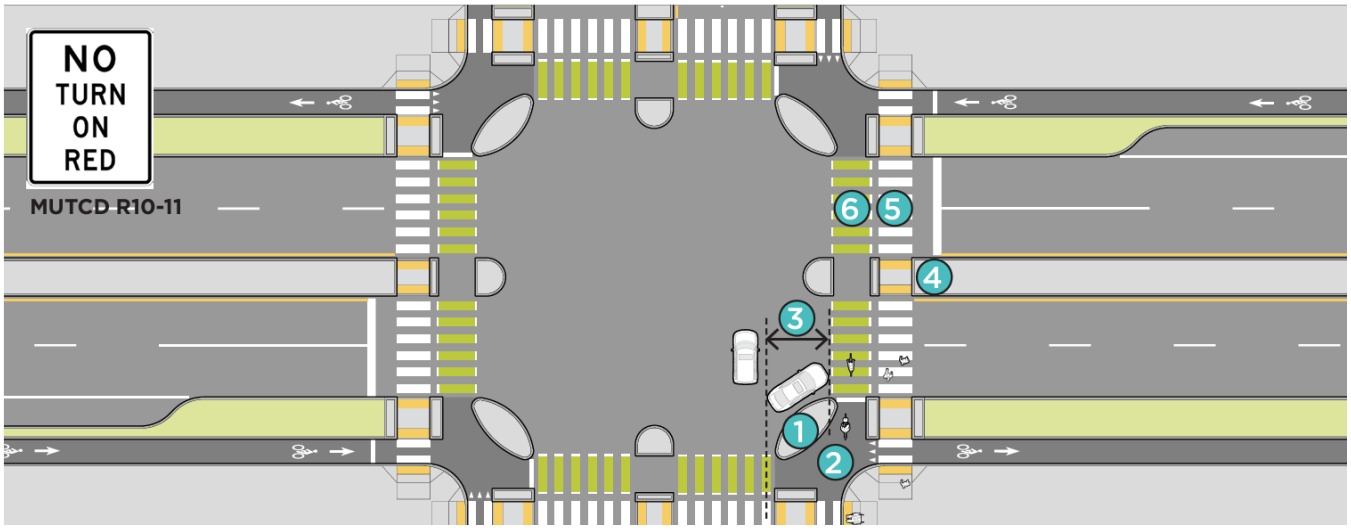


Figure 3.7 Protected Intersection Elements (One-way to One-way)

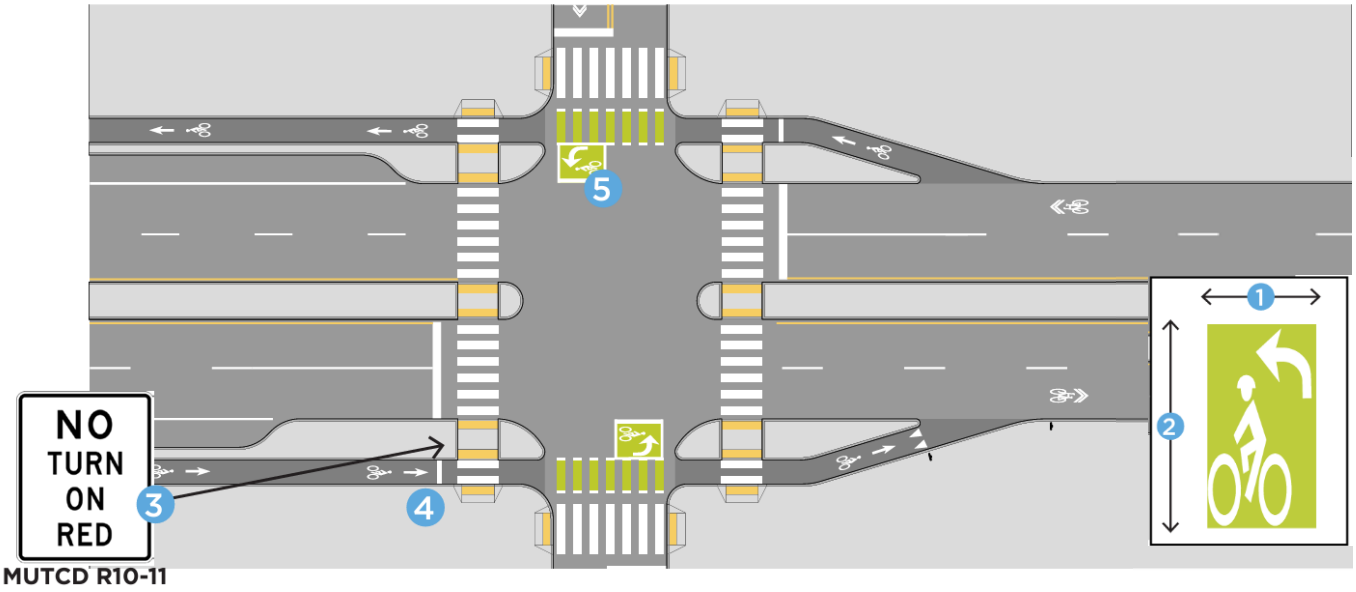


Figure 3.8 Protected Intersection Elements (One-way to Neighbourhood Bikeway)

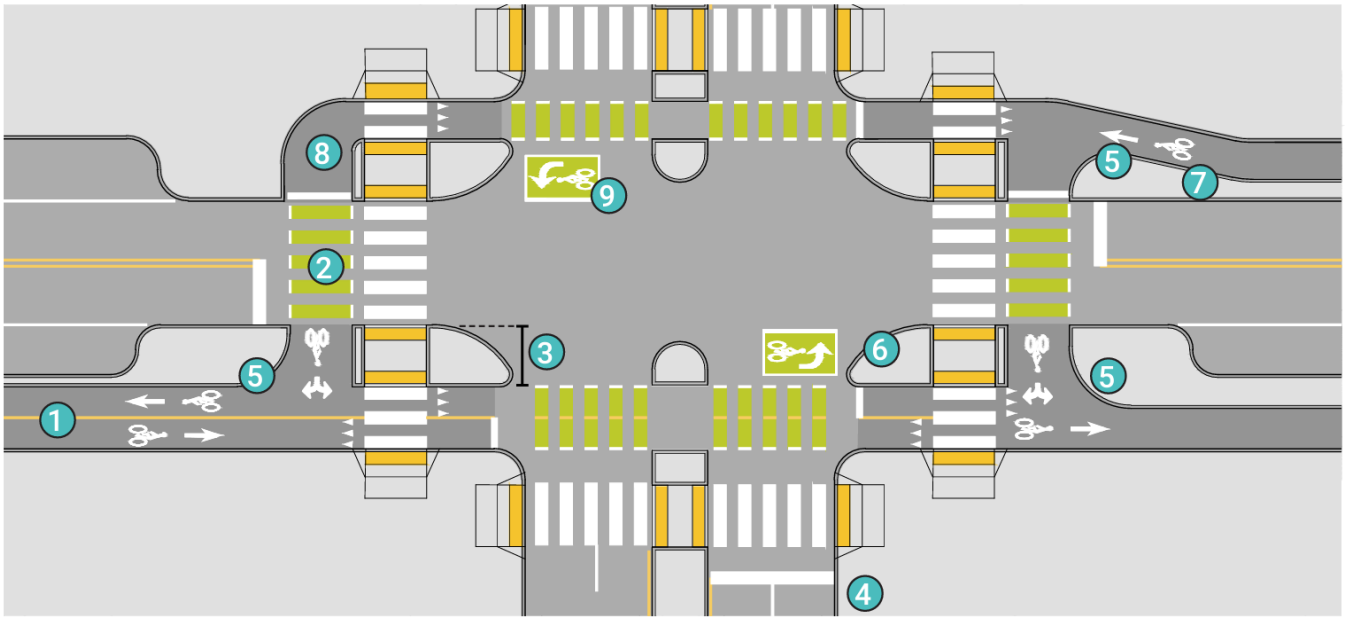


Figure 3.9 Protected Intersection Elements (One-way to Bi-directional Bike Lane)

Safe Crossings for People Walking and Biking

Challenge: Intersections and driveways represent the highest concentration of conflict points between vehicles and cyclists, NACTO Don't Give Up at the Intersection notes that "in 2017, 43% of [US based] urban bicyclist fatalities occurred at intersections. Safety at crossing points at intersections is concern and should be considered in the design of the AAA facility within the project area.

Potential Mitigation: Measures to enhance the safety of intersections and crossings that reduce conflict points, decrease driving speeds at remaining conflict points, and enhance visibility of users could be included in the project design. This may include protected and/or dedicated intersection elements such as refuge islands for pedestrians and cyclist, cyclist queueing areas, corner wedges / speed bumps. These will be explored further during the development of options.

High Speed Observed on Victoria Avenue

Challenge: The 85th percentile vehicle speeds recorded on Victoria Avenue are 52 km/hr. Vehicle speeds observed on Victoria Avenue within the project corridor range from 35 km/hr to 75 km/hr during peak periods. Speed differentials should be considered during facility design and selection.

Potential Mitigation: Traffic calming measures could be recommended as part of the functional plans to mitigate vehicle speeds along mid-block segments and at intersections. These could include elements mentioned above such as curb extensions and raised crossings. Mini roundabouts could also be considered to limit speeds.

Driveway Access onto Victoria Avenue

Challenge: In addition to the intersections and alleys along Victoria Avenue, most properties along the corridor have driveway access from the side-yard, resulting in potential conflicts between vehicles and cyclists / pedestrians. The spacing between driveways is approximately every 25 m. There are a total of 25 private driveways on Victoria Avenue between Ruth Street and Taylor Street East, including 11 on the east side of the street and 14 on the west side. The spacing of crossings introduces challenges due to the need for interruptions in physical barriers that could be part of a protected cycling facility design.

Potential Mitigation: Opportunities to consolidate or relocate garage accesses to the alley could be explored. It should also be noted, however, that the driveways provide access to single-family homes. The frequency of potential conflicts between vehicles at driveways and cyclists will be low due to the low residential development density.

Other potential mitigations to address the driveway and alley crossings include:

- If on-street parking is provided, prohibit parking at least 6 m from the edge of a driveway and use physical measures such as curb extensions, delineator posts, or large planters to ensure the area remains clear.
- Implement signage to indicate that turning vehicles must yield to bicycles.
- Implement raised crossings to emphasize that right-of-way priority is given to pedestrians and cyclists across the driveway/access (only applicable to raised cycle tracks).

Examples of some of the above mitigation measures are shown in **Figure 3.10** from the Federal Highway Administration (FHWA) Separated Bike Lane Planning and Design Guide.

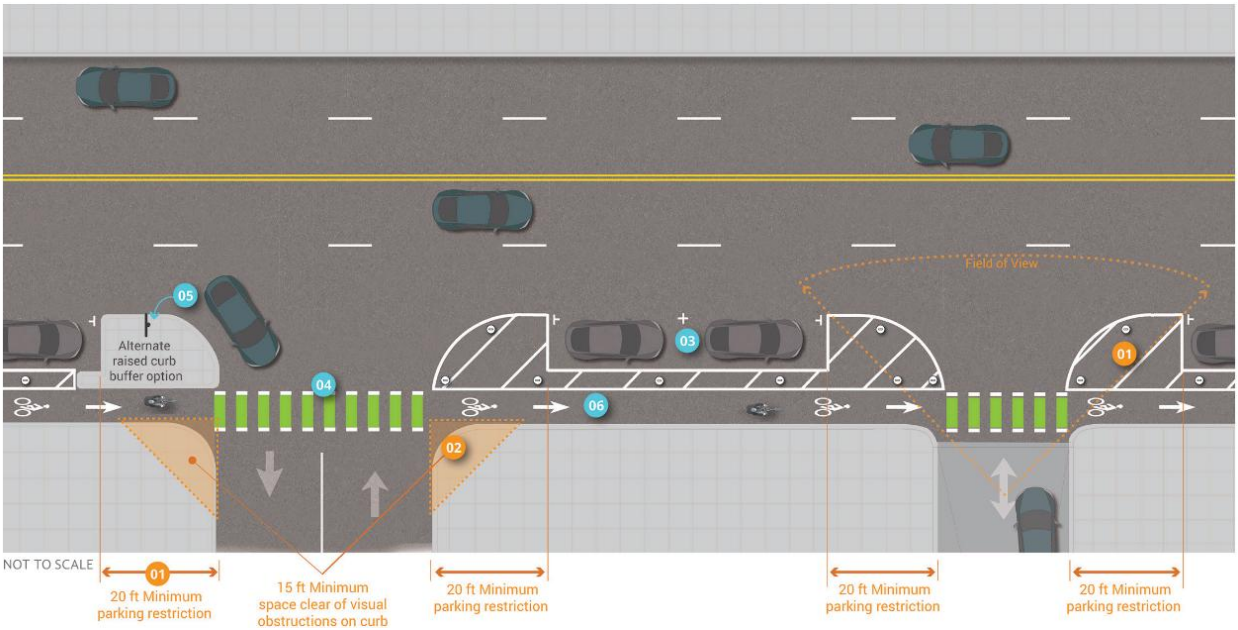


Figure 3.10 Potential Driveway Mitigations

Constraints Due to Sidewalk Construction

Challenge: The options for potential cycling facility types are limited due to the sidewalk construction on Victoria Avenue between Ruth Street and Elm Street. This is discussed further in **Section 1.1**.

Potential Mitigation: Facility types that extend beyond the existing pavement width or require rework of the newly constructed sidewalk will not be considered, including various configurations of on-street cycling facilities.

Winter Snow and Ice Control

Challenge: Parking lanes on Victoria Avenue are currently used for snow storage during the winter. Winter bike lane maintenance and potential changes to snow storage should be considered in facility selection.

Potential Mitigation: Winter maintenance and operations impacts will be included in the evaluation of options and City operations staff will be engaged to provide input.

4. Potential Facility Types

4.1 Initial Review of Potential Facility Types

The National Association of City Transportation Officials (NACTO)'s document Designing for All Ages and Abilities was reviewed for initial guidance in selecting an AAA cycling facility based on the existing characteristics of the Victoria Avenue project corridor as shown in **Figure 4.1** below.

The guidance provided in this NACTO document was published more recently as compared to the guidance included in the Transportation Association of Canada's document Geometric Design Guide for Canadian Roads and includes more recent evidence-based best practices for the selection of suitable bikeways that align with the needs of users of all ages and abilities.

Based on the current traffic volumes (2,300 to 3,200 average daily vehicles), vehicle speeds (85th percentile speed of 52 km/hr), number of lanes (2), and operational considerations (low curbside activity), a protected bike lane is identified as the most appropriate AAA facility; however, based on similar projects, we anticipate the community and other stakeholders may want to explore other options such as a neighbourhood bikeway (bike boulevard).

Contextual Guidance for Selecting All Ages & Abilities Bikeways

Roadway Context				All Ages & Abilities Bicycle Facility
Target Motor Vehicle Speed*	Target Max. Motor Vehicle Volume (ADT)	Motor Vehicle Lanes	Key Operational Considerations	
Any		*Any*	*Any of the following:* high curbside activity, frequent buses, motor vehicle congestion, or turning conflicts‡	**Protected Bicycle Lane**
< 10 mph	Less relevant	No centerline, or single lane one-way	Pedestrians share the roadway	**Shared Street**
≤ 20 mph	≤ 1,000 – 2,000		< 50 motor vehicles per hour in the peak direction at peak hour	**Bicycle Boulevard**
≤ 25 mph	≤ 500 – 1,500			
	≤ 1,500 – 3,000	Single lane each direction, or single lane one-way	Low curbside activity, or low congestion pressure	**Conventional or Buffered Bicycle Lane, or Protected Bicycle Lane**
	≤ 3,000 – 6,000			**Buffered or Protected Bicycle Lane**
	Greater than 6,000			**Protected Bicycle Lane**
	Any	Multiple lanes per direction		
Greater than 26 mph†	≤ 6,000	Single lane each direction	Low curbside activity, or low congestion pressure	**Protected Bicycle Lane, or Reduce Speed**
		Multiple lanes per direction		**Protected Bicycle Lane, or Reduce to Single Lane & Reduce Speed**
	Greater than 6,000	*Any*	*Any*	**Protected Bicycle Lane, or Bicycle Path**
High-speed limited access roadways, natural corridors, or geographic edge conditions with limited conflicts		*Any*	High pedestrian volume	**Bike Path with Separate Walkway or Protected Bicycle Lane**
			Low pedestrian volume	**Shared-Use Path or Protected Bicycle Lane**

* While posted or 85th percentile motor vehicle speed are commonly used design speed targets, 95th percentile speed captures high-end speeding, which causes greater stress to bicyclists and more frequent passing events. Setting target speed based on this threshold results in a higher level of bicycling comfort for the full range of riders.

† Setting 25 mph as a motor vehicle speed threshold for providing protected bikeways is consistent with many cities' traffic safety and Vision Zero policies. However, some cities use a 30 mph posted speed as a threshold for protected bikeways, consistent with providing Level of Traffic Stress level 2 (LTS 2) that can effectively reduce stress and accommodate more types of riders.[18]

‡ Operational factors that lead to bikeway conflicts are reasons to provide protected bike lanes regardless of motor vehicle speed and volume.

Figure 4.1 NACTO Guidance for Selecting AAA Bikeways

4.2 Non-Starter Assessment

A non-starter assessment was completed to rule out potential cycling facility treatments and / or crossing types for Victoria Avenue based on any physical, technical, or financial constraints or inability to meet the project objectives. This assessment was intended to narrow the focus for the project and ensure only feasible solutions are developed and evaluated further. The only designs that were considered a non-starter for this project were those that extend beyond the existing pavement width and/or requires rework of recent sidewalk construction.

Functional design plans were recently completed for the implementation of missing sidewalks on Victoria Avenue between Ruth Street and Taylor Street East as part of the City's Sidewalk Infill Program. At the time of this report, construction on the section of Victoria Avenue between Ruth Street and Elm Street was just completed. Sidewalks with widths varying between 1.5 and 1.8 m were installed. The 1.5 m width was required in some sections to accommodate existing mature trees.

Due to ongoing construction activities and cost implications of reconstruction, options for cycling facilities that extend beyond the existing pavement width will not be considered.

This eliminates the following potential cycling facility types from consideration:

- Raised cycle track (one-way or two-way)
- Off-street shared-use pathway

The sidewalk installation plan is shown in **Figure 4.2**.

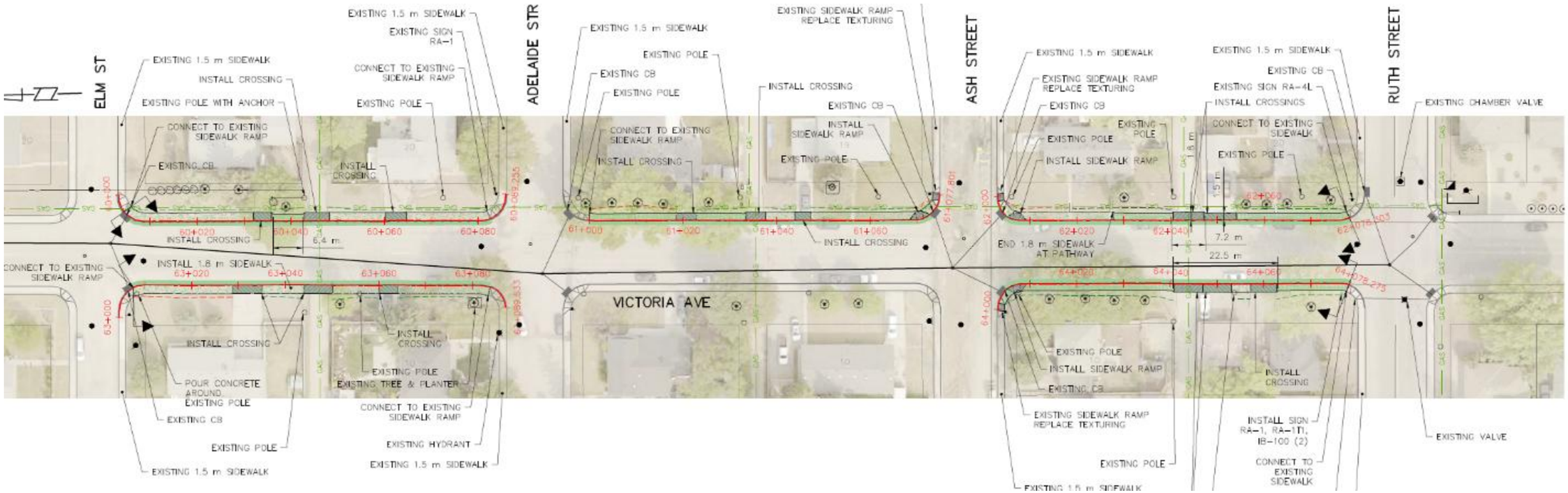


Figure 4.2 Sidewalk Installation Plan for Victoria Avenue

4.3 Potential Facility Type Options

Given the existing motor vehicle volumes and speeds, a protected facility is expected to be the most appropriate for the Victoria Avenue corridor to achieve the comfort and safety of an AAA route. As discussed in the Non-Starter Assessment, any option that extends beyond the existing pavement width and/or requires rework of the newly constructed sidewalk will not be reviewed further. Therefore, due to impacts to the sidewalk construction, an off-street shared-use pathway or a raised cycle track configuration are not considered as viable for Victoria Avenue.

However, other potential facility options have been considered that could be successful in achieving similar outcomes with the implementation of significant supplemental safety mitigation measures. Protected facility options are summarized in **Section 4.4**, and other options requiring supplemental mitigation are discussed in **Section 4.5**.

4.4 Protected Facility Options

Each of the following options would involve separation of the cycling facility from the vehicle travel and/or parking lanes with a physical barrier. Types of physical barriers commonly used for separation that could be considered are listed below. Some of these elements could be considered in combination, such as a raised median with flexible delineators.

- Raised median
- Bollards
- Parking / Curb stops
- Concrete barriers
- Planters
- Flexible delineators

Potential protected cycling facility types for Victoria Avenue between Ruth Street and Taylor Street East include:

One-way protected bike lane

Consists of separate bike lanes for each direction of travel on each side of the roadway, illustrated in **Figure 4.3**. Two general purpose travel lanes are provided, and parking would be removed.

The approved plan for a cycling facility north of the project area on Victoria Avenue between Taylor Street East and 8th Street East consists of this type of facility, therefore this facility type would have a seamless transition at the Taylor Street East intersection.

This configuration would require changes to the existing layout of the corridor following long-range access management / mitigation of these conflicts and removal of on-street on Victoria Avenue.

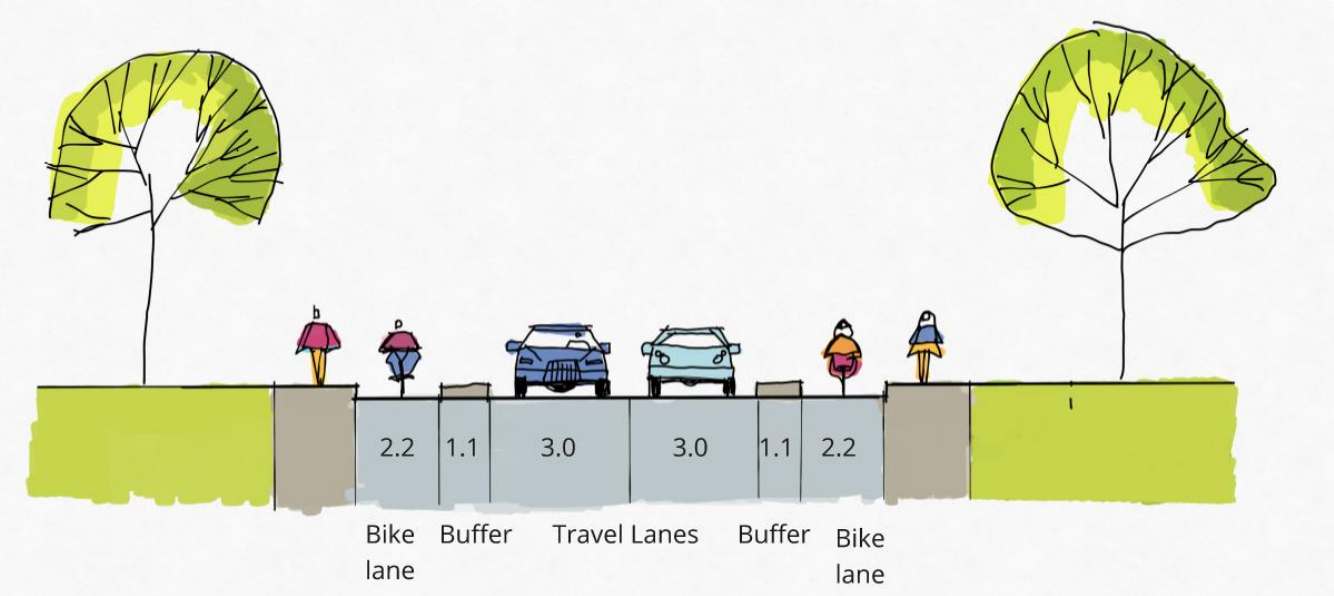


Figure 4.3 One-way Protected Bike Lane without Parking

Two-way protected bike lane

Consists of bike lanes for each direction of travel adjacent to each other on one side of the roadway, illustrated in **Figure 4.4**. Two general purpose travel lanes are provided, and parking is maintained on one side of the street.

This configuration would limit the potential conflict points with driveways and laneway accesses to one side of the road. Cyclists travelling contraflow may initially violate driver expectations. Targeted information may be provided to residents whose driveways cross the cycling facility to establish new driver expectations.

Intersection/driveway crossings and transition to the planned facility north of Taylor Street East would be more complicated.

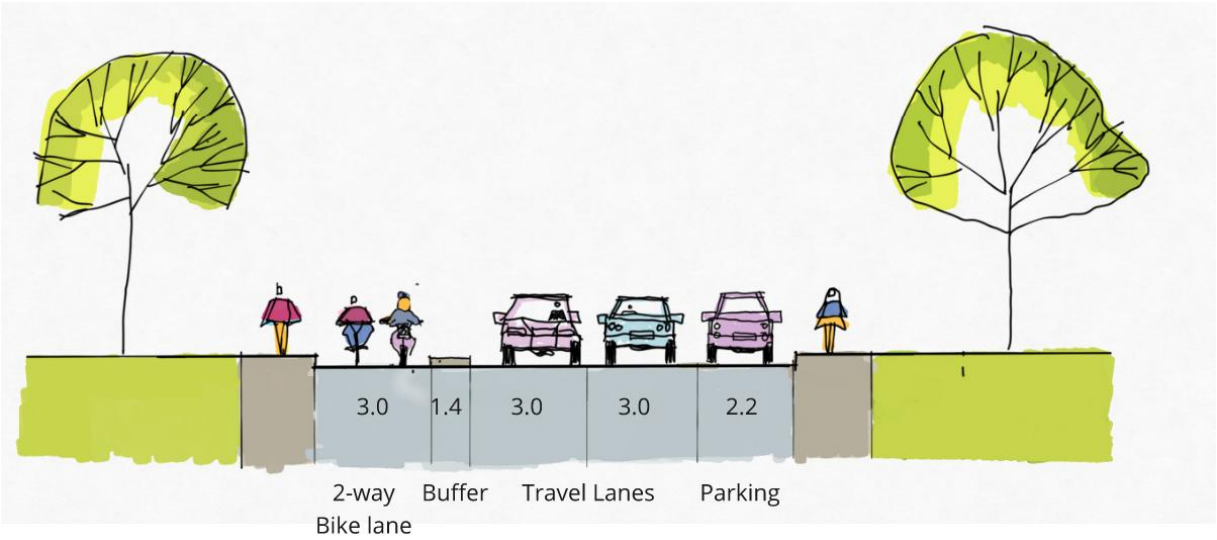


Figure 4.4 Two-way Protected Bike Lane

4.5 Options Requiring Significant Supplemental Mitigations

Neighbourhood Bikeway

Another potential cycling facility type for Victoria Avenue between Ruth Street and Taylor Street East is a neighbourhood bikeway; however, this treatment would require significant supplemental mitigations. A neighbourhood bikeway is illustrated in **Figure 4.5**.

A neighbourhood bikeway (bike boulevard) is a shared facility that is made comfortable for cyclists due to slow vehicle speeds and low vehicle volumes, which is typically achieved through the implementation of traffic calming elements. Neighbourhood bikeways are often implemented on local streets.

Guidance from the Bicycle Integrated Design chapter of the TAC Geometric Design Guide for Canadian Roads states that neighbourhood bikeways are appropriate for ADT vehicle volumes less than 2,500 vpd at speeds up to 30 km/hr or ADT vehicle volumes less than 1,000 vpd at speeds of 40 km/hr or less.

The ADT vehicle volumes on Victoria Avenue range from 2,300 to 3,200 vpd within the project corridor and the 85th percentile vehicle speed was observed to be 52 km/hr. Based on the current operating conditions, significant interventions (e.g. access restrictions) would be required to reduce motor vehicle volumes and speeds to be within the thresholds noted by NACTO or TAC.

In addition, Victoria Avenue is classified as a collector street according to the Saskatoon Transportation Master Plan, which does not align with the street classification typically suitable for a neighbourhood bikeway.

A neighbourhood bikeway may also be problematic for accessibility and use in all seasons. To allow the facility to be used by users of all ages and abilities in the winter months, higher levels of snow and ice control are required along neighbourhood bikeways than are typically applied to local streets in winter cities.

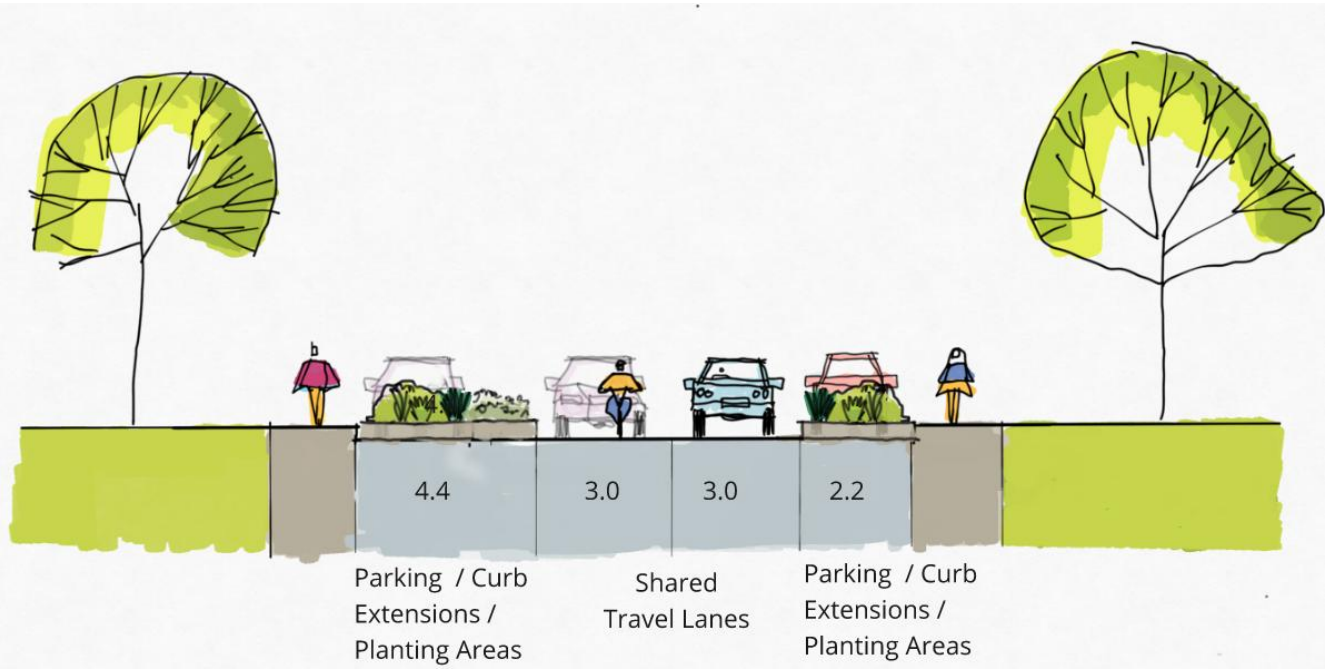


Figure 4.5 Neighbourhood Bikeway

Conventional / Painted Bike Lanes

Conventional or painted bike lanes consist of pavement markings to delineate space for cyclists separate from motor vehicle traffic and do not include any physical separation beyond the lane markings. An example of this configuration from the NACTO Urban Bikeway Design Guide is illustrated in **Figure 4.6**.

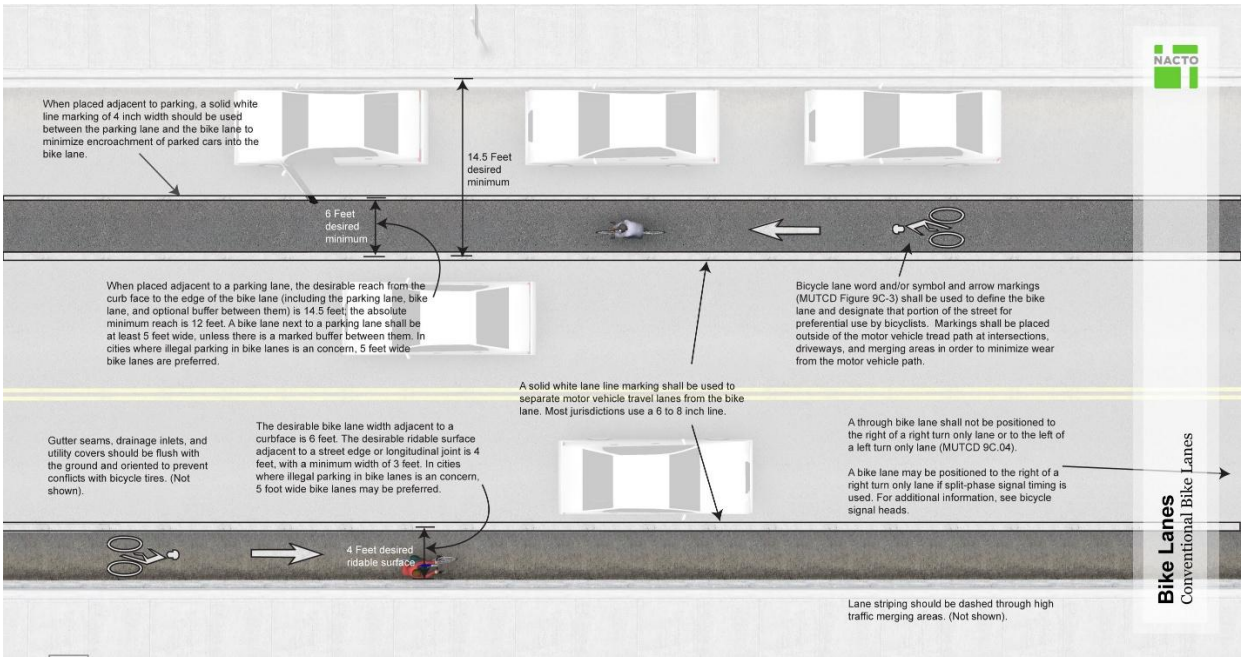


Figure 4.6 Conventional / Painted Bike Lane

Similar concerns to those listed above associated with the bike boulevard facility type would be present with painted bike lanes. According to TAC guidance, vehicle speeds on Victoria Avenue would need to be reduced to approximately 30 km/hr or less, and average daily motor vehicle volumes should be within the range of 2,000 to 3,000 vpd. Therefore, significant traffic calming measures would be required to restrict vehicle traffic, such as diverters and / or closures, as well as other elements such as raised crossings and mini roundabouts to reduce vehicle operating speeds.

Painted bike lanes are generally not considered to be AAA facilities.

Buffered Bike Lanes

Buffered bike lanes consist of pavement markings to delineate space for cyclists separate from motor vehicle traffic with an adjacent painted buffer area to provide some separation between the bike and vehicle lanes. An example of this configuration from the NACTO Urban Bikeway Design Guide is illustrated in **Figure 4.7**.

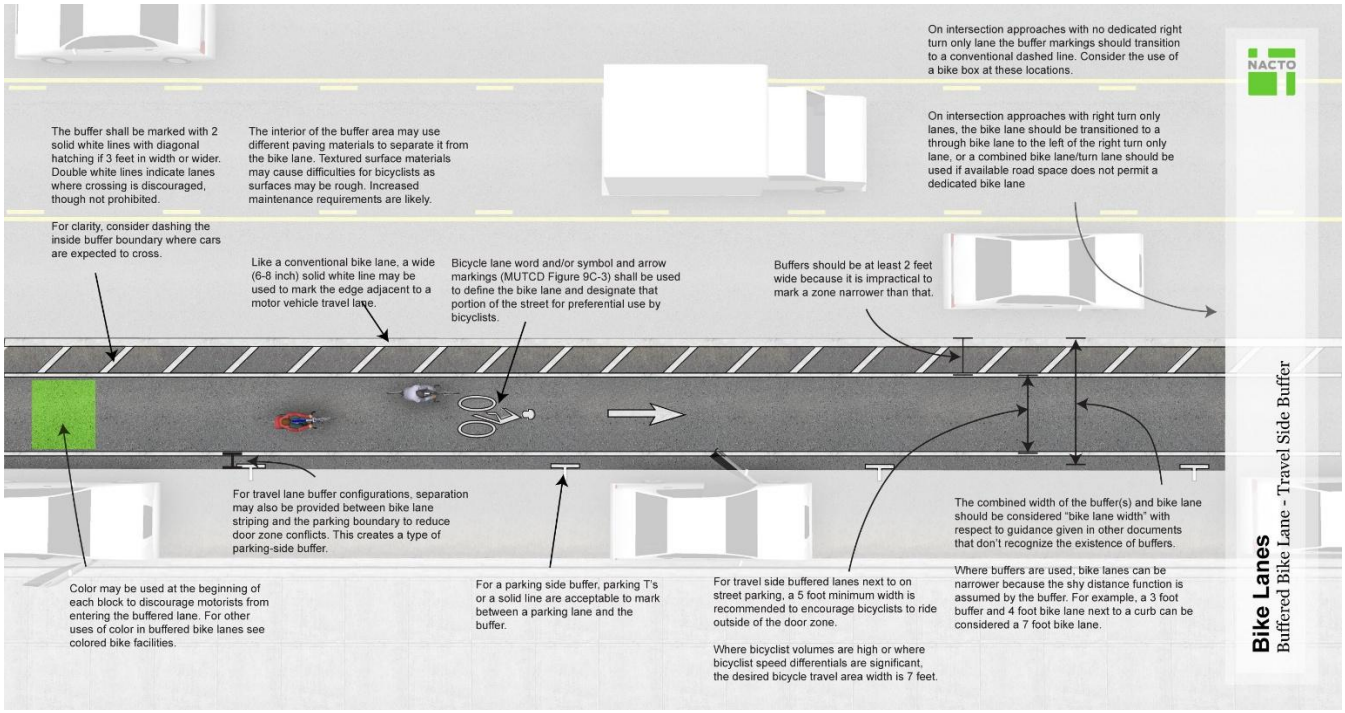


Figure 4.7 Buffered Bike Lane

The TAC guidance for buffered bike lanes also suggests that speeds would need to be reduced to approximately 30 km/hr or less, and average daily motor vehicle volumes should be within the range of 2,000 to 3,000 vpd. Therefore, significant traffic calming measures would be required to restrict vehicle traffic, such as diverters and / or closures, as well as other elements such as raised crossings and mini roundabouts to reduce vehicle operating speeds.

5. Options Development

The project team developed three cross section alternatives that were deemed technically viable and brought forward to the evaluation process.

5.1 Option 1 – One-Way Protected Bike Lane

The first option consists of a one-way protected bike lane, illustrated in **Figure 5.1**.

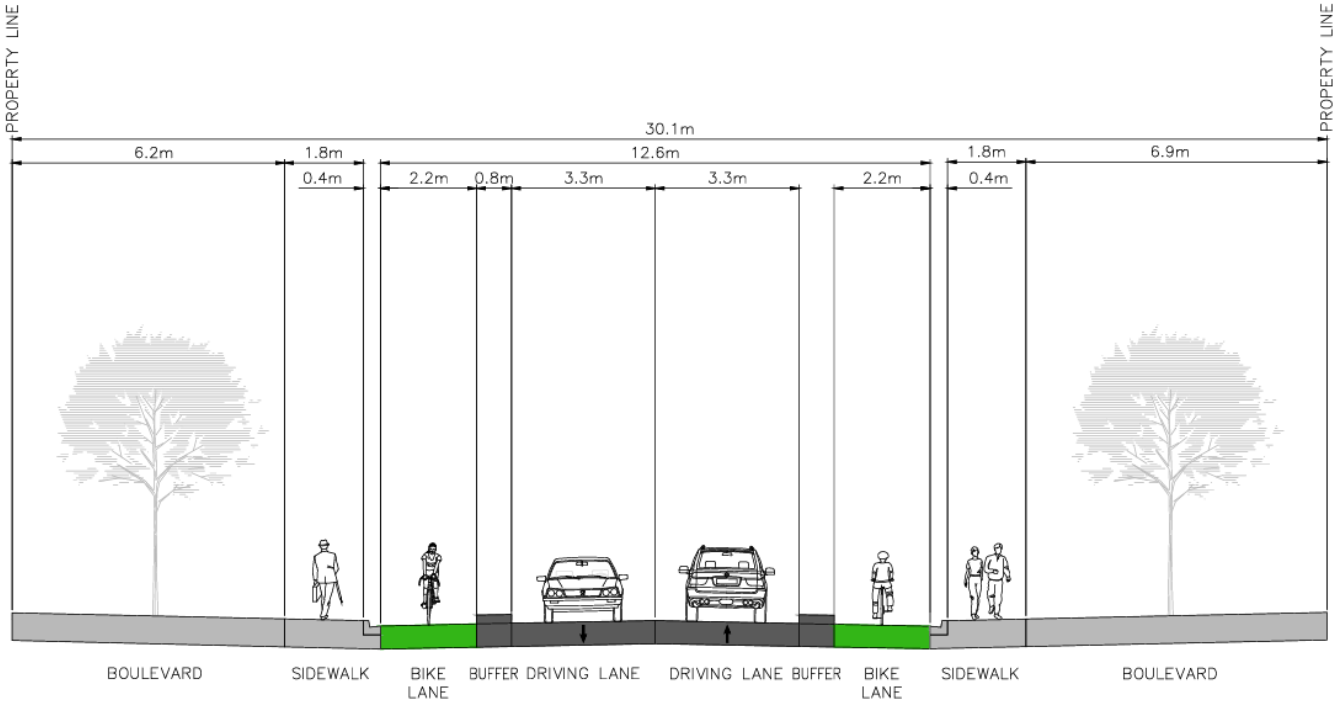


Figure 5.1 One-Way Bike Lane

Key Design Elements:

- Separate bike lanes for each direction on each side of the roadway.
- Physical barrier between vulnerable road users and vehicles.
- On-street parking is removed from Victoria Avenue.

Intersection / Crossings:

- Ruth Street – Dedicated bike and pedestrian crossing using actuated traffic signal, and transition to on-street cycling to the south.
- Adelaide Street – Pedestrian crossing control (standard crosswalks). Adelaide Street has been identified as a future AAA cycling route though timing of design and construction are unknown. Intersection treatment should be finalized during the design of the Adelaide

Street AAA corridor, this could include all-way stop-control and a raised intersection to emphasize the movement of pedestrians and cyclists.

- Hilliard Street – Pedestrian crossing control (standard crosswalks).
- Isabella Street – Pedestrian crossing control (standard crosswalks).
- Taylor Street East – Protected intersection and pedestrian crossings.
- Cross ride pavement markings for bike lanes at all minor street, driveway, and laneway crossings.
- Other minor streets – Optional curb extensions.

Benefits:

- Comfort – Protected facility with adequate space that reduces the risk of pedal strikes and accommodates a variety of bike configurations (e.g. cargo, trailers for children), and space for passing.
- Connectivity - Fits well with the approved protected bike lane on Victoria Avenue north of Taylor Street East.
- Access – Cycling facility is provided on both sides of the street.
- Safety – Same direction of travel for road users creates more predictable behaviour. Greater horizontal offsets between bike lanes and vehicles lanes can be provided at intersections, a typical design element of protected intersections.

Trade-offs:

- Parking – On-street parking removed from Victoria Avenue. On-street parking is available on side streets. A total of 93 on-street parking spots will be removed with this option. However, it is important to note that the majority of these spots have very low utilization. As observed during multiple parking surveys completed, a maximum of 6 parked vehicles were observed.
- Safety – Greater number of conflict points with driveways and laneways compared to a two-lane facility.

Considerations:

- Width of the protected bike lane is suitable for snow clearing operations. Some snow storage will be possible on the roadside buffer between the protected bike lane and the vehicle travel lane. When compared to the existing street configuration, snow clearing operations will be more complex and will require smaller equipment to clear the bike lane.

- Optional traffic calming measures which could be implemented to reinforce slow speeds: no centre line, raised crossings and intersections, or curb extensions (concrete, bollards, planters, etc.).
- This option is proposed as having the existing road surface minimally disturbed. The sidewalks, bike lanes, and buffer strip would require the removal of the existing curb and gutter, and roadway surface structure. During detailed design existing lane cross slopes and longitudinal drainage along the buffer strips will need to be confirmed.

5.2 Option 2 – Two-Way Protected Bike Lane

The second option consists of a two-way protected bike lane, illustrated in **Figure 5.2**.

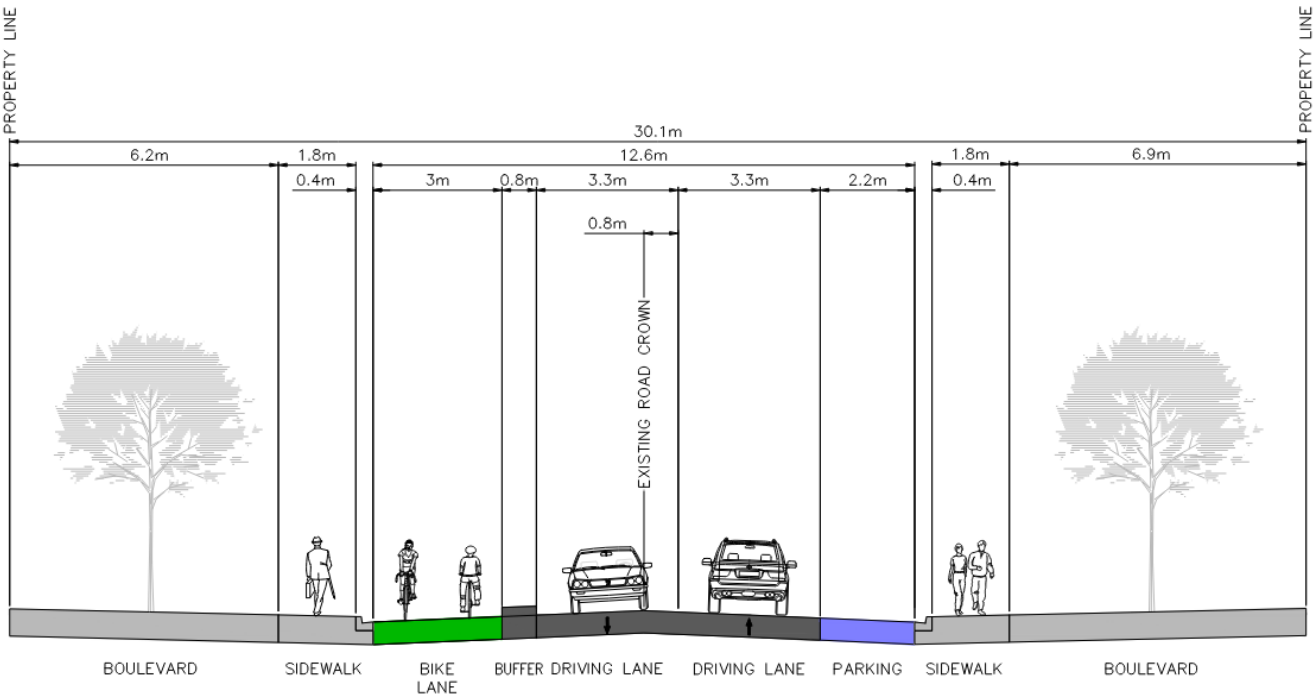


Figure 5.2 Two-Way Bike Lane (Looking south)

Key Design Elements

- Bike lanes for each direction of travel provided on east side of the street. This side of the street was selected because there are fewer driveway accesses.
- Physical barrier between vulnerable road users and vehicles.
- On-street parking provided on west side of the street.

Intersection / Crossings

- Ruth Street – Dedicated bike and pedestrian crossing using actuated traffic signal, and transition to on-street cycling to the south.
- Adelaide Street – Pedestrian crossing control (standard crosswalks). Adelaide Street has been identified as a future AAA cycling route though timing of design and construction are unknown. Intersection treatment should be finalized during the design of the Adelaide Street AAA corridor, this could include all-way stop-control and a raised intersection to emphasize the movement of pedestrians and cyclists.
- Hilliard Street – Pedestrian crossing control (standard crosswalks).
- Isabella Street – Pedestrian crossing control (standard crosswalks).
- Taylor Street East – Protected intersection and pedestrian crossings. Protected intersection may be constrained given central median, may require use of pedestrian boulevard space.
- Cross ride pavement markings for the bike lane at all minor street, driveway, and laneway crossings.
- Other minor streets – Optional curb extensions.

Benefits

- Comfort – Protected cycling facility with space for passing.
- Safety – Fewer number of conflict points with driveways and laneways. The east side of the street has fewer total driveway conflicts than the west side of the street.
- Parking – Provided on west side of the street.
- Construction – Lower effort with construction limited to east side of the street.

Trade-offs

- Connectivity – More complicated transition to one- way protected bike lanes north of Taylor Street East and on street cycling south of Ruth Street.
- Parking – East side of on-street parking is removed. A total of 47 on-street parking spots will be removed with this option. However, it is important to note that the majority of these spots have very low utilization. As observed during multiple parking surveys completed, a maximum of 6 parked vehicles were observed.
- Safety – Contraflow bike lanes may increase collision risk between vehicles and cyclists due to possibility of cyclists approaching from both directions.
- Access – Cycling limited to one side of the street.

Considerations

- Snow storage can be provided in on-street parking area.
- This option is proposed as having the existing road surface minimally disturbed. The sidewalks, bike lane, and buffer strip would require the removal of the existing curb and gutter, and roadway surface structure. However, the travelled lanes and parking lanes would use the existing roadway surface, which would create an offset between the existing crown of the roadway and the marked centreline. This is not expected to create any concerns with vehicle operation or maintenance of the roadway. During detailed design existing lane cross slopes and longitudinal drainage along the buffer strip will need to be confirmed.

5.3 Option 3 – Neighbourhood Bikeway

The third option consists of a neighbourhood bikeway, illustrated in **Figure 5.3**.

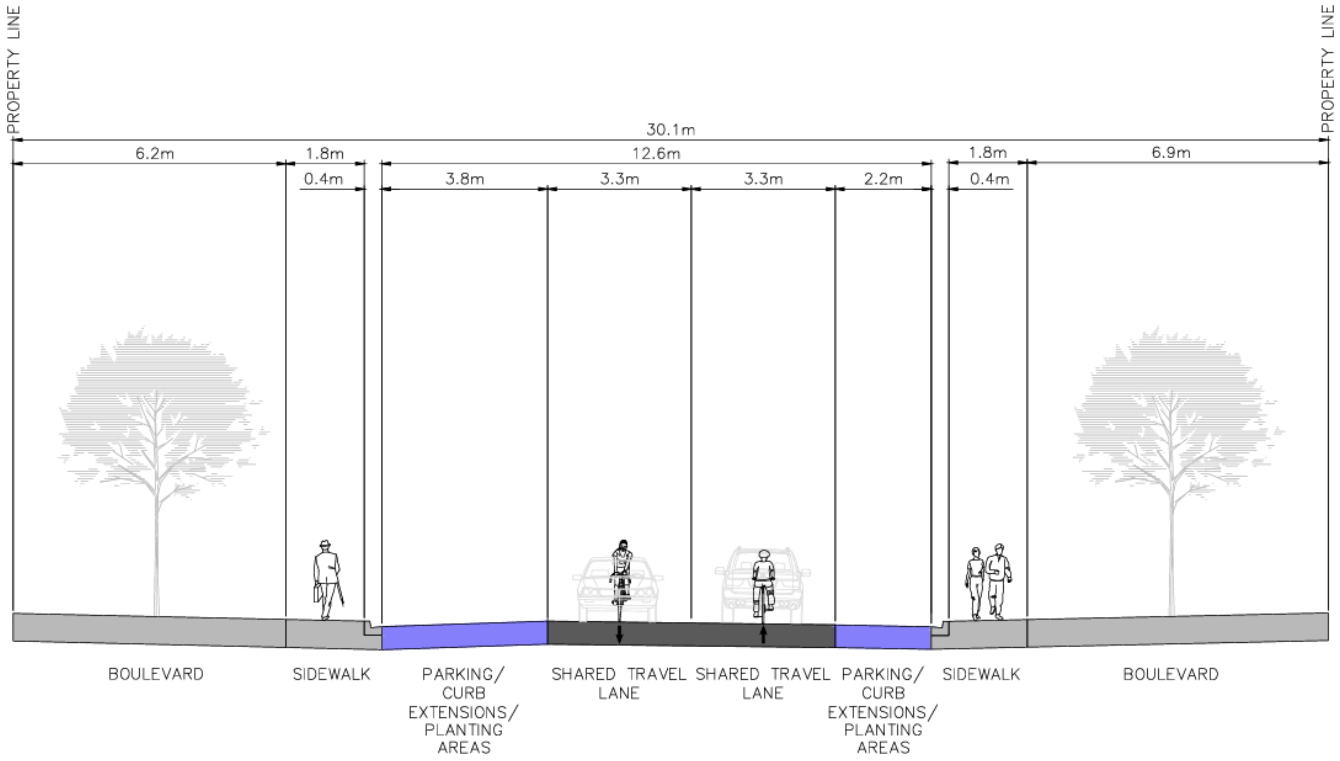


Figure 5.3 Neighbourhood Bikeway

Key Design Elements

- Reduced posted speed limit.

- Access and turn restrictions required to limit volumes, resulting in traffic circulation changes. Diverted traffic may trigger the need for a signal at Ruth Street and Broadway Avenue.
- Raised and horizontal deflections to reduce speed.
- Curb extensions and planting space along the corridor on alternating sides of the street.
- On-street parking is retained except at locations with traffic calming measures.

Intersection / Crossings

- Ruth Street – Marked bike and pedestrian crossings. Likely also requires median, diverter, or turning restrictions to help reduce volumes.
- Adelaide Street – All-way stop-control or mini roundabout.
- Hilliard Street – Pedestrian crossing control (standard crosswalks). Likely requires median, diverter, or turning restrictions to help reduce volumes if diverters are not implemented at Ruth Street and Taylor Street East.
- Isabella Street – Pedestrian crossing control (standard crosswalks).
- Taylor Street East – Protected intersection and pedestrian crossing to transition from neighbourhood bikeway to one-way bike lanes north of Taylor Street East. Likely also requires median, diverter, or turning restrictions to help reduce volumes.
- Other minor streets – Curb extensions.

Benefits

- Parking – Maintains most of existing on- street parking provision.
- Access – Cycling facility is provided on both sides of the street.

Trade-offs

- Safety – Greater exposure with motor vehicles and active modes.
- Connectivity – Could divert motor vehicle traffic onto adjacent local roads. Pedestrian and cyclist connectivity is not affected.
- Comfort – Not all people may be comfortable riding their bike in shared traffic. This option relies on reductions to traffic volumes and speeds.
- Access –Introduces turning restrictions and circulation changes for motor vehicles.
- Construction – Would require curb and gutter work for curb extensions.

Considerations

- Neighbourhood bikeways are not currently prioritized for snow clearing at an equivalent level compared to protected bike lanes. Lack of snow clearing creates challenges for cyclists wishing to use the street during winter months.
- Turning restrictions, medians and diverters are likely needed at both ends and within the corridor to reduce traffic volumes to best practice levels.
- Low parking utilization reduces the effectiveness to operate as a neighbourhood bikeway. A well used parking lane creates friction in drivers' peripheral vision and narrows the perceived width of travel lanes, resulting in lower travelled speeds. Without significant parking demand, drivers do not perceive a narrowed travelled lane and vehicle speeds are not likely to be reduced within acceptable margins for a neighbourhood bikeway.
- The lack of perceived friction due to low parking demand can be partially addressed by other horizonal deflection. Extended curb extensions / boulevard space with planting areas could be used to narrow the road and condense parking demand. Chicanes could be used to increase perceived friction to drivers, alternating the side of the street where parking is provided and slowing drivers through horizontal deflection.
- Depending on the level of traffic diversion implemented at Ruth Street and Taylor Street East, raised deflections may be required (speed bumps, raised crossings) to reduce vehicle speeds. Exact placement would be determined during detailed design.

6. Evaluation Criteria

Evaluation criteria, outlined in **Table 6-1**, were developed based on industry best practice, City priorities, and feedback from public consultation. Initial weighting, outlined in **Table 6-2**, was established by the project team to align with current City of Saskatoon municipal and transportation goals. Evaluation criteria and prioritization were reviewed with the City in a workshop on October 9, 2024.

Many of these evaluation criteria overlap or are symbiotic. The descriptions are structured to clearly define each aspect of the evaluation criteria and remove as much ambiguity as possible; however, this is a qualitative assessment and engineering judgement was applied throughout.

Table 6-1 Evaluation Criteria

Category	Criteria	Description
Safety and Security	Conflict Points	Does the proposed facility minimize conflict points (i.e. intersections, driveways)?
	Safety and Comfort of Facility	Do the design elements and facility type provide a safe and comfortable environment for pedestrians and cyclists while appropriately accounting for the existing and future expected motor vehicle speeds and volumes?
	Personal Security	Does the design improve or consider the personal security of the users or feelings of safety?
	Intuitive Design	Is the design of the proposed facility intuitive and recognizable for users (i.e. is the facility consistent with other bike facilities nearby and within Saskatoon)?
	User Adherence	Will active mode users and drivers comply with the traffic control measures that are in place (i.e. adherence to the design)?
Community Context	Parking	Does the proposed facility adequately maintain parking for residents and visitors based on community needs?
	Loading	Does the design adequately support delivery of goods and services to residents and businesses along the corridor?
	Network Operations	How well does the proposed facility support network connectivity and operations for all modes?
	Community Livability	Does the proposed facility support community placemaking and/or enhance livability of the existing community including trees and landscaping?
	Community Support	Does the facility meet the expectations and needs identified from the public and stakeholder feedback?
Accessibility	All Seasons	Does the design support year-round use the proposed facility?
	Accessibility	Does the design support access for people with disabilities?

Category	Criteria	Description
Cost and Constructability	Constructability/ Implementability	What is the ease of implementation of the proposed design? What are the impacts to overall network operations?
	Operating Cost	What are the costs to operate and maintain the facility?
	Capital Cost	What is the capital cost of construction of the facility?

Table 6-2 Criteria Weighting

Category	Category Weighting	Criteria	Criteria Weighting
Safety and Security	40%	Conflict Points	25%
		Safety and Comfort of Facility	25%
		Personal Security	10%
		Intuitive Design	20%
		User Adherence	20%
Community Context	20%	Parking	20%
		Loading	10%
		Network Operations	25%
		Community Livability	20%
		Community Support	25%
Accessibility	20%	All Seasons	50%
		Accessibility	50%
Cost and Constructability	20%	Constructability / Implementability	20%
		Operating Cost	40%
		Capital Cost	40%

Each facility type criterion was given a score of 1 to 3, where 1 is the least desirable / lowest support of each criterion and 3 is the most desirable / strongest support of the criterion. A score of 0 was given to a facility type criterion if the project team felt it failed to meet basic requirements. For criteria related to costs, a score of 3 corresponds to lowest cost and 1 corresponds to highest cost. The facility option with the highest score was selected as the preferred alternative.

Table 6-3 Options Evaluation

Criteria	Options					
	One-Way Protected Bike Lane		Two-Way Protected Bike Lane		Neighbourhood Bikeway	
	Score	Comments	Score	Comments	Score	Comments
Conflict Points	3	Higher number of conflict points to mitigate at intersections, alleys, and driveways on both sides of Victoria Avenue, but conflict points are more predictable since bicycles and motor vehicles are travelling in the same direction.	1	Fewer conflict points with laneways and driveways, but greater workload for motor vehicles and increased collision risk at facility crossing points due to possibility of cyclists approaching from both directions.	2	More exposure between motor vehicles and active mode users but conflicts are consistent with mixed operation.
Safety and Comfort of Facility	3	Physical barrier to separate modes.	3	Physical barrier to separate modes.	0	Low confidence in ability to achieve target vehicle volumes and speeds for an all ages and abilities facility. It is unlikely that a neighbourhood bikeway would provide the desired level of safety and comfort.
Personal Security	3	On street facilities provide better natural surveillance and lighting compared to off-street, no enclosed areas along route.	3	On street facilities provide better natural surveillance and lighting compared to off-street, no enclosed areas along route.	1	Cyclists in shared traffic may feel more vulnerable to hostility or aggression from drivers.
Intuitive Design	3	Consistent with plans for facility on Victoria Avenue north of Taylor Street East and familiar to public.	2	Navigation of more complicated intersections/ conflict points associated with the two-way facility. Drivers may attempt to drive into bike lane due to larger width. Cyclist access is limited to east side of the street.	2	Consistent with other neighbourhood bikeway facilities on local roadways but it can be difficult for users to identify/ recognize a neighbourhood bikeway.

Criteria	Options					
	One-Way Protected Bike Lane		Two-Way Protected Bike Lane		Neighbourhood Bikeway	
	Score	Comments	Score	Comments	Score	Comments
User Adherence	2	Motorists may fail to yield to cyclists at conflict points.	1	Motorists may fail to yield to cyclists at conflict points due to unexpected direction. Cyclists may have difficulty navigating conflict points, transition between one-way facilities north of project to two-way may result in wrong-way riding outside of the project limits.	1	Motorists may not fully comply with reduced speed if higher speeds are comfortable (low confidence in ability to achieve volume/speed thresholds for all ages and abilities).
Parking	1	All on-street parking removed from Victoria Avenue.	2	Maintains on-street parking on west side of Victoria Avenue.	2	On-street parking is retained except at locations with traffic calming measures.
Loading	1	Areas for loading/unloading on Victoria Avenue will be eliminated. All private driveway access will remain, impacted homes have access along side streets and alleys.	2	Areas for loading/unloading will be removed on one side of Victoria Avenue. All private driveway access will remain, impacted homes will also have access along side streets and alleys.	3	Maintains areas available for loading for deliveries, convenience of access may be impacted by traffic diversions/ access restriction.
Network Operations	3	Limited impacts to drivers unless turn restrictions are needed at select locations. Good cyclist connectivity and operations.	2	Limited impacts to drivers. The transition from one-way bike lanes north of Taylor Street East to a two-way bike lane is not efficient (two-stage crossing) and may present operational problems for cyclists.	1	Diverters required and would impact driving connectivity/ travel patterns. Local access would be maintained. Cyclist connectively is not affected by diverters.
Community Livability	2	Enhances existing amenities, placemaking is limited to curb extensions.	2	Enhances existing amenities, placemaking is limited to curb extensions.	3	Enhances existing amenities, additional landscaping elements provide some placemaking.

Criteria	Options					
	One-Way Protected Bike Lane		Two-Way Protected Bike Lane		Neighbourhood Bikeway	
	Score	Comments	Score	Comments	Score	Comments
Community Support	3	Option 1 was explicitly supported by the majority of stakeholders and the public that participated in the consultation. This was confirmed in the results of both the open house and online survey.	2	Option 2 was not preferred by the public as it forced cyclists to switch which side of the road they travelled on. Switching between one- and two-way facilities was thought to be less safe and less effective.	1	Option 3 was not preferred by the public. The need to reduce the posted speed limit was not popular and attendees did not feel this option provided adequate protection for cyclists.
All Seasons	3	Based on snow route priority as a separated bike lane, snow would be graded within 48 hours of a snowfall event; bikeway widths support snow clearing and sweeping equipment.	3	Based on snow route priority as a separated bike lane, snow would be graded within 48 hours of a snow fall event.	1	Based on Victoria Avenue's current snow route priority, snow will be graded within 72 hours of a snow event. This may present challenges in providing adequate year-round maintenance for AAA use.
Accessibility	2	Barrier reduces exposure between motor vehicles and active mode users and increases comfort for active mode users. Facility may introduce additional challenges for people with physical disabilities.	1	Barrier reduces exposure between motor vehicles and active mode users and increases comfort for active mode users. Facility may introduce additional challenges for people with physical disabilities. A two-way bike lane may be more challenging for a person with visual impairment to cross.	3	May not be as comfortable for all ages and abilities due to more exposure between motor vehicles and active mode users; intersections and crossing points may be easier to navigate for people with physical disabilities / visual impairments.

Criteria	Options					
	One-Way Protected Bike Lane		Two-Way Protected Bike Lane		Neighbourhood Bikeway	
	Score	Comments	Score	Comments	Score	Comments
Construct-ability / Implement-ability	3	Requires two curbs to be constructed; curb extensions may require additional catch basins; continuous crossings may require drainage changes.	2	Requires one curb to be constructed; curb extensions may require additional catch basins; continuous crossings may require drainage changes.	1	Traffic calming and diverters required to reduce traffic volumes and speeds; may require investments in other parts of the network related to diverted traffic; curb extensions may require additional catch basins.
Operating Cost	2	Bike lanes require sweeping and snow clearing. Bike lane pavement markings would require periodic repainting. Surfacing rehabilitation within bike lanes would be challenging due to constrained width.	2	Bike lane requires sweeping and snow clearing. Bike lane pavement markings would require periodic repainting. Surfacing rehabilitation within bike lanes would be challenging and costly due to constrained width.	3	Neighbourhood Bikeway pavement markings would require periodic repainting. Landscaping would require increased maintenance costs.
Capital Cost	1	$ 3.1 Million	2	$ 2.3 Million	3	$1.8 Million
TOTAL		**81**		**65**		**58**

7. Preferred Alternative

The one-way, protected bike lane (Option 1) was selected as the preferred alternative. This option meets all technical requirements, integrates well with approved cycling facility plans on Victoria Avenue north of Taylor Street East, and meets user expectations.

7.1 Functional Plan

Functional plans are illustrated in **Figure 7.1** on the following page. A summary of traffic control, pavement markings, and traffic calming measures are presented by intersection in **Table 7-1**.

Table 7-1 Changes by Intersection

Intersection	Traffic Control	Other Treatment
Ruth Street	Pedestrian / cyclist actuated signal. Note: Ground mounted signs are warranted based on a review of the TAC Pedestrian Crossing Control Guide, but actuated signals serve dual purposes by addressing the transition between one-way protected bike lanes and on-street cycling south of Ruth Street.	
Ash Street	Two-way stop (Ash Street), cross-ride pavement markings.	
Adelaide Street	Two-way stop (Adelaide Street), standard pedestrian crosswalk, cross-ride pavement markings.	To be finalized as part of future AAA facility on Adelaide Street – consider raised intersection and curb extensions across minor road.
Elm Street	Two-way stop (Elm Street), cross-ride pavement markings.	
Hilliard Street	Two-way stop (Hilliard Street), standard pedestrian crosswalk, cross-ride pavement markings.	Curb extensions across minor road (optional).
Willow Street	Two-way stop (Willow Street), cross-ride pavement markings.	
Isabella Street	Two-way stop (Isabella Street), standard pedestrian crosswalk, cross-ride pavement markings.	Curb extensions across minor road (optional).

Intersection	Traffic Control	Other Treatment
Maple Street	Two-way stop (Maple Street), cross-ride pavement markings.	
Taylor Street East	Signalized intersection, leading pedestrian / bike interval, standard pedestrian crosswalk, cross-ride pavement markings.	Protected intersection design elements.

When detailed design progresses for Connecting Victoria Avenue, the project team recommends considering the following:

- Crossride pavement markings and / or green painted conflict zones are recommended at all mixed traffic crossing locations.
- Tactile Walking Surface Indicators (TWSI) used to warn pedestrians with vision impairment that they are entering a conflict zone, should be installed at all curb cuts to align with current accessibility best practice.
- According to City of Saskatoon standards, all active crossing control (traffic signals) should be equipped with auditory signals (chirpers and the Canadian Melody depending on the crossing direction) to help guide pedestrians with vision impairment through the crossing. The City also uses vibro-tactile warning devices at all new signals.
- The need for curb extensions across Isabella and Hilliard Streets. Additional traffic calming may be desired to reduce vehicle speeds turning across the pedestrian and cyclist path of travel. These items have been highlighted as an optional item in the cost estimate and can be included, budget permitting.

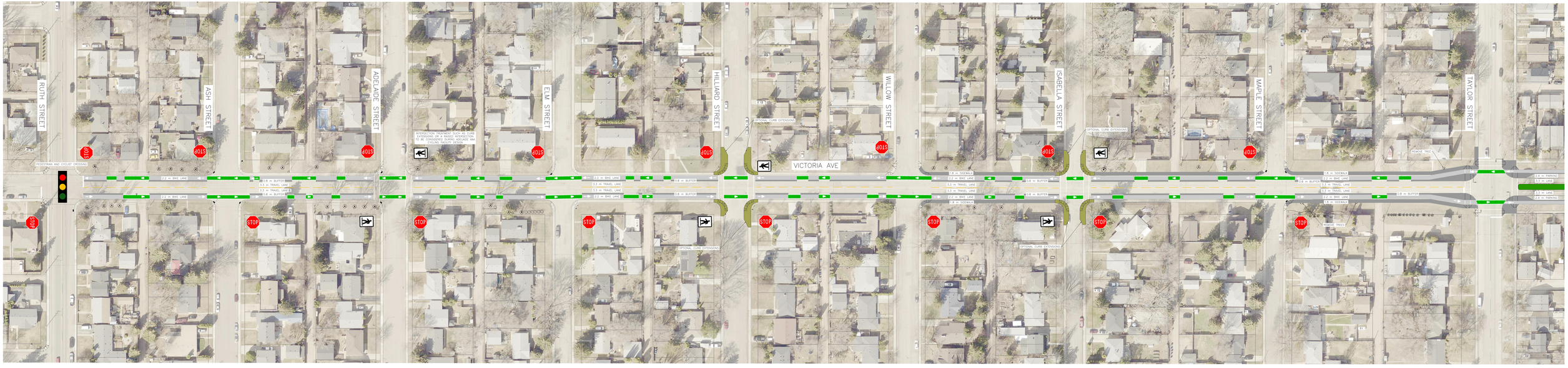


Figure 7.1 Victoria Avenue Functional Plan

7.2 Proposed Operational Assessment

The capacity and operating characteristics of the proposed study intersections were evaluated using Cubic|Trafficware's Synchro 11 software. Operational results are summarized in **Table 7-2** and full Synchro reports are included in **Appendix C**.

Synchro is not designed to assess pedestrian actuated signals. As such, the intersection of Victoria Avenue and Ruth Street has been assessed as a two-way stop-controlled intersection. Impacts to pedestrian and cyclist operations are captured in the MMLOS analysis that follows.

The operations of Victoria Avenue and Taylor Street East includes the implementation of a 5 second Leading Pedestrian (and bike) Interval (LPI) across Taylor Street East which cannot be evaluated using HCM 6th Edition reporting; HCM 2000 was used instead to evaluate the intersection.

Table 7-2 Proposed Capacity Analysis Results Summary

Intersection	Traffic Control	Cycle Length	Measure of Effectiveness	Eastbound			Westbound			Northbound			Southbound			Overall Intersection
				LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
AM Peak - Proposed																
Victoria Ave & Ruth Street	TWSC (N/S)	N/A	Volume	35	189	32	14	172	30	42	43	15	29	26	27	654
			v/c Ratio	0.03			0.01			0.27			0.20			
			LOS	A			A			C			B			A
			Delay (s)	1.1			0.5			16.6			14.8			5.0
			95th % Queue (m)	11.8			7.70			14.7			14.0			
Victoria Ave & Taylor Street East	No LPI	65	Volume	31	160	14	12	220	72	14	124	20	55	71	36	829
			v/c Ratio	0.22			0.30			0.50			0.59			0.37
			LOS	A			A			B			C			B
			Delay (s)	4.9			6.2			19.9			22.8			11.7
			95th % Queue (m)	29.5			34.8			24.3			30.5			
	LPI	75	Volume	31	160	14	12	220	72	14	124	20	55	71	36	829
			v/c Ratio	0.29			0.41			0.46			0.56			0.40
			LOS	B			B			C			C			B
			Delay (s)	10.9			13.4			22.2			24.5			16.6
			95th % Queue (m)	39.3			35.9			22.5			44.2			
PM Peak - Proposed																
Victoria Ave & Ruth Street	TWSC (N/S)	N/A	Volume	55	274	44	11	182	38	35	47	12	49	77	34	858
			v/c Ratio	0.04			0.01			0.30			0.45			
			LOS	A			A			C			C			A
			Delay (s)	1.2			0.4			20.9			22.4			7.1
			95th % Queue (m)	33.8			5.4			20.9			28.0			
	No LPI	60	Volume	22	239	15	17	204	75	14	103	29	122	196	44	1080
			v/c Ratio	0.32			0.33			0.26			0.79			0.51

Victoria Ave & Taylor Street East			LOS	A			B			B			C			B		
			Delay (s)	8.9			10.2			14.5			26.2			15.8		
			95th % Queue (m)	49.4			32.3			29.4			68.3					
	LPI	80	Volume	22	239	15	17	204	75	14	103	29	122	196	44	1080		
			v/c Ratio	0.39			0.42			0.27			0.81			0.53		
			LOS	B			B			B			C			C		
			Delay (s)	15.7			17.9			18.9			33.3			22.6		
			95th % Queue (m)	45.9			41.9			34.9			90.3					

Victoria Ave & Ruth Street continues to operate well within the LOS targets outlined by the City of Saskatoon:

- In the AM peak hour, the intersection operates with an overall LOS 'A', corresponding to relatively low delays. Approaches on Victoria Avenue operate with an LOS 'C' or better, which represents low to moderately low delays. V/C ratios are less than 0.30 for all approaches. Queueing is not a concern.
- In the PM peak hour, the intersection operates with an overall LOS 'A' corresponding to relatively low delays at the intersections. Approaches on Victoria Avenue operate with an LOS 'C' or better, which represents low to moderately low delays. V/C ratios are 0.45 or less for all approaches. Queuing is not a concern.

Victoria Ave & Taylor Street East continues to operate well within the LOS targets outlined by the City of Saskatoon:

- In the AM peak hour, the intersection operates with an overall LOS 'B' both with and without an LPI, corresponding to relatively low delays at the intersections. Individual approaches operate with an LOS 'C' or better, which represents low to moderately low delays. V/C ratios are less than 0.60 for all approaches. Queuing is not a concern.
- In the PM peak hour, the intersection operates with an overall LOS 'B' (without LPI) or LOS 'C' (with LPI), corresponding to low to moderately low delays at the intersection. Individual approaches operate with a LOS 'C' or better, which represents low to moderately low delays. V/C ratios are less than 0.85 for all movements. Queuing is not a concern.

The OTC MMLOS results based on the functional plan are summarized in **Table 7-3** for intersection and segment operations. OTC MMLOS worksheet are included in **Appendix D**.

Table 7-3: MMLOS Results

	Mode		
	Pedestrian	**Cyclist**	**Car**
Target	C	B	D
Ruth Street (intersection)	C	C	A
Taylor Street East (intersection)	B	B	D
Victoria Avenue (segment)	B	B	A

Based on the OTC MMLOS worksheets, the pedestrian MMLOS at Ruth Street is a LOS 'C', meeting the LOS target only if a pedestrian actuated signal provided. The pedestrian MMLOS at Taylor Street East is LOS 'B' following the implementation of an LPI which meets the target LOS.

Based on the OTC MMLOS worksheets, cyclist MMLOS is LOS 'C' at Ruth Street, this score is primarily affected by the termination of cycling infrastructure. Given this context and the availability of low volume cycling routes parallel to Ruth Street, this score may be considered acceptable. The cyclist MMLOS at Taylor Street East is LOS 'B' and meets the target LOS. The LPI at Taylor Street East provides additional safety benefit to cyclists crossing Taylor Street East.

Segment MMLOS along Victoria Avenue is LOS 'B' for pedestrians and cyclists. The provision of protected cycling facilities improved cyclist operations. Vehicle LOS is expected to improve to LOS 'A' along the segment as there are fewer curbside conflicts following the removal of on-street parking.

7.3 Cost Estimate

In preparation of the cost estimates for the options, unit pricing was taken from recent tender closings for projects undertaken by the City of Saskatoon. This includes the Sidewalk Infill Project and the LINK (BRT) project. These unit prices were averaged, and engineering judgment was applied in an effort to develop accurate preliminary cost estimates.

An overall project cost estimate has been prepared with a summary shown in **Table 7-4** below. A detailed break of costs is shown in **Appendix E**.

Table 7-4: Preliminary Cost Estimates

Option	Total Cost
Option 1 - One - Way Protected Bike Lane	$3.1 M
Option 2 - Two - Way Protected Bike Lane	$2.3 M
Option 3 - Neighbourhood Bikeway	$1.6 M

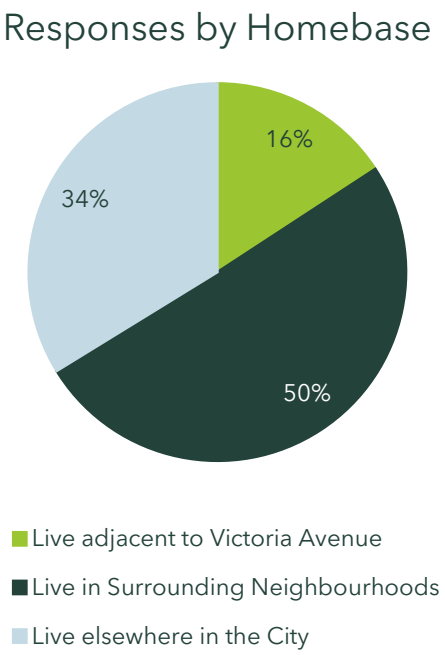
The above cost estimate is considered Class D which is historically considered to be +/- 30% at the feasibility design stage. Given the uncertainty of inflation and market volatility over the past year, the above estimate has been based on current market trends and should be considered +40%/-20%.

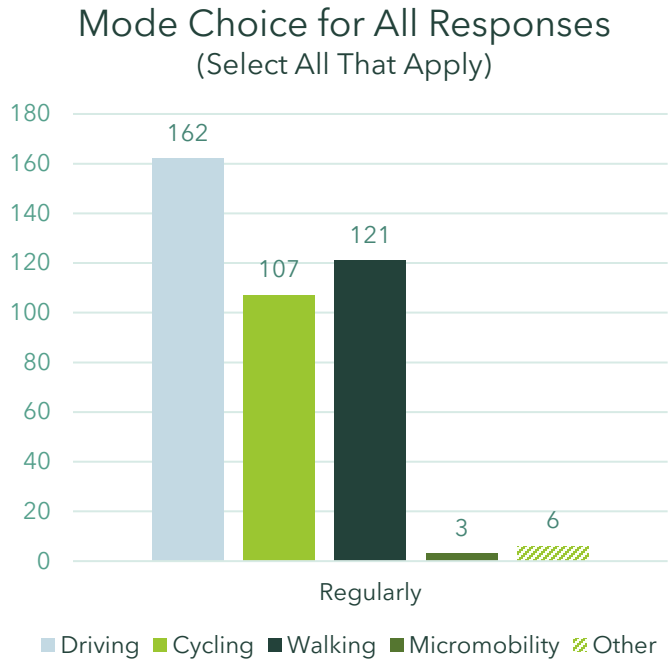
8. Public Consultation

8.1 Round 1 - Engagement

The project team completed Round 1 of public engagement through an online survey and an open house to determine current traffic safety and operational issues along Victoria Avenue for people of all ages and abilities using all modes of transportation. Both engagement activities asked participants what they would like changed and what they would like to remain the same on Victoria Avenue.

The survey received 228 valid responses, predominantly originating from neighbourhoods near the project area (Queen Elizabeth, Buena Vista, Avalon, and Exhibition). Driving was the most common mode of travel from all respondents; walking and cycling made up 53% and 47% of regular (daily and weekly) mode choice on the corridor, respectively.

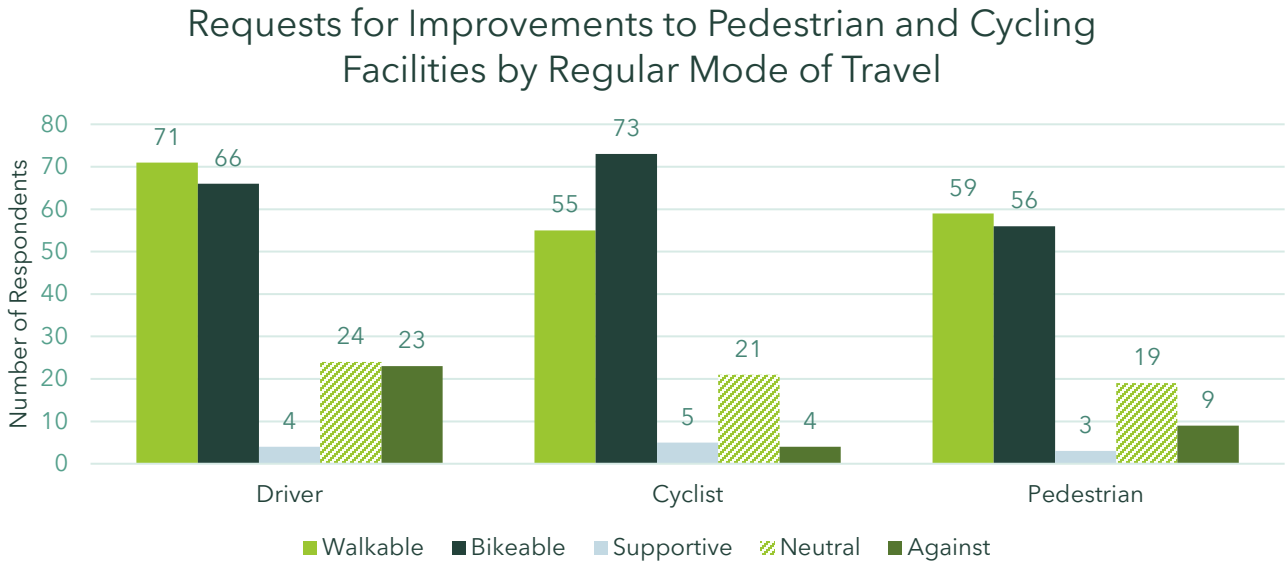




When asked what respondents would like changed and what they would like to remain the same on Victoria Avenue five categories of responses emerged, coded manually based on written responses. The five categories include:

- Explicitly requested sidewalk improvements (termed 'walkable' in subsequent graphs).
- Explicitly requested cycling infrastructure (termed 'bikeable').
- Generally supported a more walkable and bikeable environment (termed 'supportive').
- Displayed ambivalence or indifference (termed 'neutral'). This category was made up of respondents who stated they were confident cyclists and saw no issues with the current infrastructure or respondents who offered no comments at all.
- Explicitly rejected a walkable and bikeable environment (termed 'against').

Improvements to pedestrian and cycling facilities on Victoria Avenue were requested regardless of homebase. Improvements to pedestrian and cycling facilities were also broadly requested by respondents regardless of mode choices. Responses were categorized by regular mode choice; as a result, responses may be reported under multiple mode choices if a respondent walked, biked, and drove the corridor on a regular (daily or weekly) basis.



Respondents commonly identified six targeted priority areas that should be considered in the development and evaluation of alternatives:

- Reduce speeding but keep current speed limits,
- Diverging opinions on keeping or removing some but not all on-street parking,
- Maintain and plant new vegetation,
- Improve pedestrian crossing control and existing crosswalk locations,
- Resurface the street, and
- Review traffic control at the intersection of Victoria Avenue and Ruth Street.

The public open house drew 17 attendees. Feedback from the open house mirrored the survey. The majority of attendees were very supportive of improvements to the pedestrian realm and generally supportive of cycling facilities that would result in an all ages and abilities network.

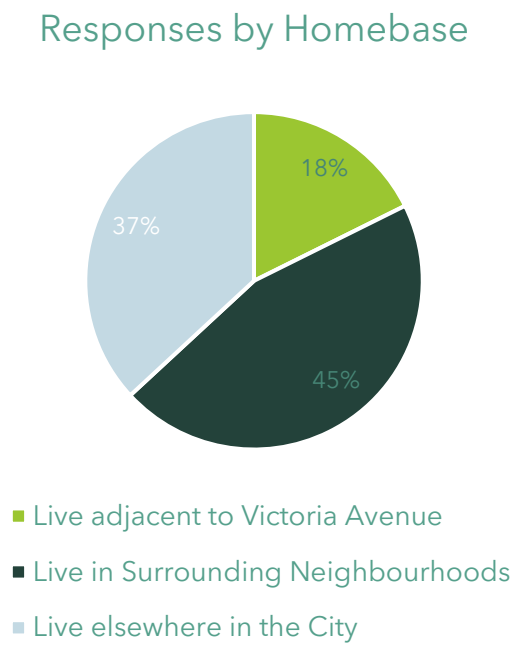
Attendees offered specific feedback about intersection traffic control and detection, travelled speeds, and route preferences that will be incorporated into the development of alternatives and evaluation metrics.

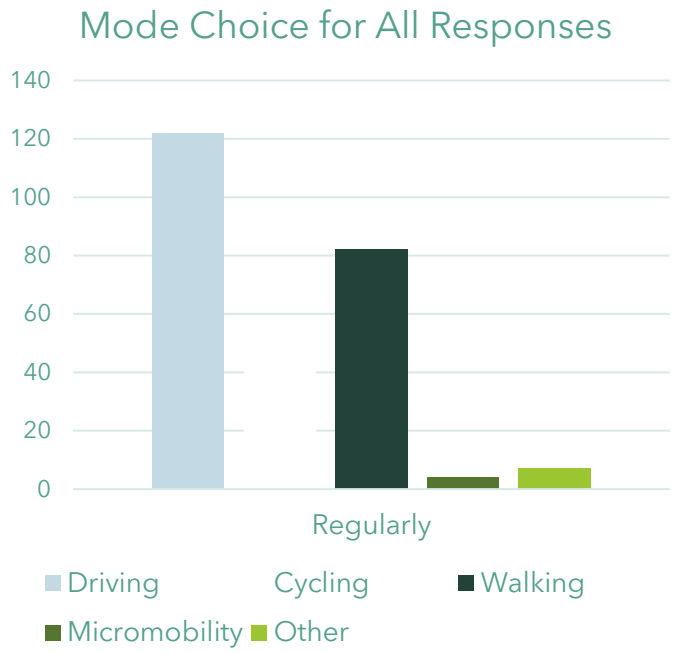
A complete What We Learned report for Round 1 is available in **Appendix F**.

8.2 Round 2 – Engagement

The project team has completed Round 2 of public engagement through an online survey and an open house to determine public feedback on the recommended design. Both engagement activities gathered information from participants on what they liked about the proposed changes and what they would like modified about the proposed changes.

The survey received 193 responses, predominantly originating from neighbourhoods near the project area (Queen Elizabeth, Buena Vista, Avalon, and Exhibition). Driving was the most common mode of travel from all respondents (63%); walking and cycling made up 28% and 42% of regular (daily and weekly) mode choice on the corridor, respectively.

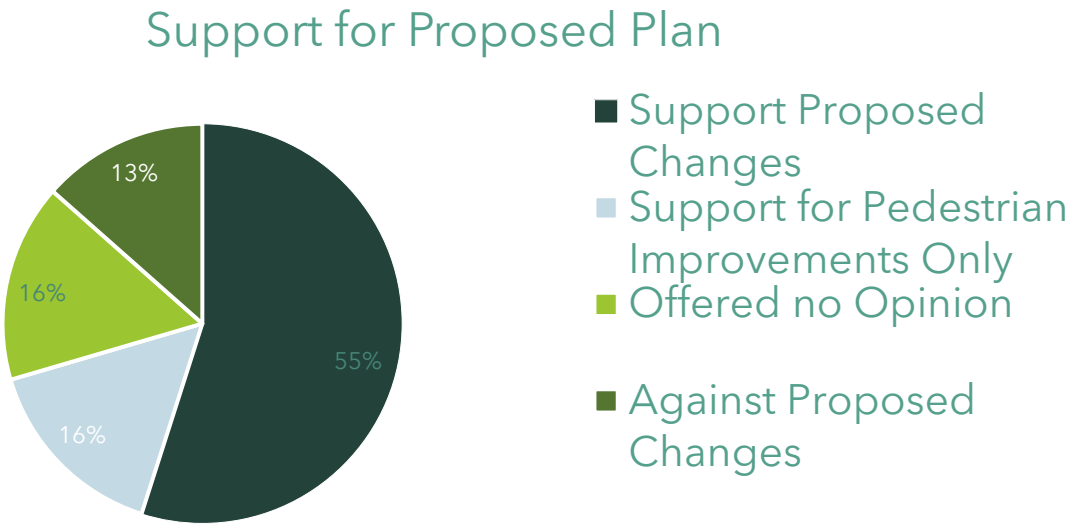




Respondents were presented with the preferred Victoria Avenue cross section and details of planned cycling, walking, and accessibility improvements then asked to provide comments and concerns. Common themes within the responses were broken down into two categories 1) level of support for the proposed plan and 2) targeted concerns the project team should address when presenting information to City Council or consider during detailed design.

Sentiment towards the proposed Victoria Avenue corridor plan can be grouped into four categories, whether respondents:

- Explicitly supported the proposed changes to walkable and bikeable infrastructure.
- Only supported improvements to walkable infrastructure.
- Provided no comments directly related to improvements, or whose comments did not clearly articulate their feelings towards the planned improvements. For example the following quote is neither explicit support or rejection of the proposed improvements "Snow removal. It doesn't get done now with road plows, I doubt separate [bike] lanes will improve that".
- Explicitly rejected a walkable and bikeable infrastructure (termed 'against').



Six targeted areas of concerns were frequently identified for further consideration in the detailed design process:

- Improve sightlines to crossing pedestrians and cyclists at intersections.
- Diverging opinions on parking retention. Notably only 4 of the 25 respondents who specifically mentioned parking retention lived on the corridor within study limits.
- A small number of respondents would prefer a cycling route on Eastlake Avenue, Melrose Avenue, or McPherson Avenue.

- Support for additional pedestrian and cyclist crossing control at the intersection of Victoria Avenue and Ruth Street indicates this item could be staged and prioritized.
- Winter maintenance of the bike lane, road, and sidewalks were core concerns for many.
- Of those who commented on optional curb extensions, opinion was split with a slight preference in favour of curb extensions. Continuous raised crosswalks were also requested by numerous individuals to improve vehicle yielding compliance.

The public open house drew 30 attendees. Feedback from the open house was similar to the feedback received from the survey. Option 1 – 1.8 m wide sidewalks, 2.2 m wide protected bike lanes, and 3.3 m wide traffic lanes with the removal of parking – was the technically and publicly preferred alternative. This option was the most intuitive and provided the best continuity with the future bike lanes on Victoria Avenue between Taylor Street East and 8th Street East.

One attendee who lived on the corridor was not in favour of parking removal but offered specific actions that could be taken to address their concerns.

Winter maintenance was a critical concern among Open House attendees. Attendees were concerned bike lanes would be unusable due to poor winter maintenance. The wide bike lanes were appealing to attendees as it provided additional room for snow clearing operations and storage.

9. Conclusion

The City of Saskatoon (City) engaged CIMA+ Canada Inc. (CIMA+) to complete a planning study for the functional design of an All Age and Abilities (AAA) cycling facility and pedestrian improvements along Victoria Avenue from Ruth Street to Taylor Street East. Based on feedback from stakeholders and the public, three technically viable options were developed and brought back to the community for input. A corridor plan consisting of one-way, protected bike lanes, sidewalks, and active transportation crossing control at the intersection of Victoria Avenue and Ruth Street was selected as the preferred alternative. This option is the most intuitive, directly ties into the planned cycling facility on Victoria Avenue between 8th Street East and Taylor Street East and provides ample space for winter maintenance equipment. While on-street parking is removed from Victoria Avenue, parking use data shows that existing demand is very low and all properties will retain driveway and alley access.

When this project proceeds to detailed design, a number of items will need to be confirmed, including:

- The inclusion or omission of curb extensions across minor streets.
- Drainage along the corridor and intersecting minor streets, specifically the southeast corner of Victoria Avenue and Adelaide Street.

- Potential design tie-ins to an east-west cycling route on Adelaide Street. And,
- All dimensions shown in the functional plan are based on the City's basemap and existing conditions should be confirmed with GPS survey.

A

Appendix A
Existing Synchro Reports

HCM 6th Signalized Intersection Summary
3: Victorial Ave/Victoria Ave & Taylor Street E

12-02-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	160	14	12	220	72	14	124	20	55	71	36
Future Volume (veh/h)	31	160	14	12	220	72	14	124	20	55	71	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	0.99		0.95	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1961	1961	1961	1961	1961	1961
Adj Flow Rate, veh/h	35	180	16	13	247	81	16	139	22	62	80	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	176	820	67	93	747	236	497	379	60	191	209	83
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	159	1515	125	22	1380	437	1319	1639	259	375	903	360
Grp Volume(v), veh/h	231	0	0	341	0	0	16	0	161	182	0	0
Grp Sat Flow(s),veh/h/ln	1798	0	0	1840	0	0	1319	0	1898	1637	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.9	0.0	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	4.8	0.0	0.0	0.3	0.0	3.3	4.2	0.0	0.0
Prop In Lane	0.15		0.07	0.04		0.24	1.00		0.14	0.34		0.22
Lane Grp Cap(c), veh/h	1063	0	0	1077	0	0	497	0	440	484	0	0
V/C Ratio(X)	0.22	0.00	0.00	0.32	0.00	0.00	0.03	0.00	0.37	0.38	0.00	0.00
Avail Cap(c_a), veh/h	1063	0	0	1077	0	0	1048	0	1233	1147	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.5	0.0	0.0	6.0	0.0	0.0	13.8	0.0	14.9	15.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	2.2	0.0	0.0	0.1	0.0	1.6	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.6	0.0	0.0	6.7	0.0	0.0	13.8	0.0	15.4	15.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		231			341			177			182	
Approach Delay, s/veh		5.6			6.7			15.3			15.6	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.5		15.7		30.5		15.7				
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0				
Max Green Setting (Gmax), s		25.0		30.0		25.0		30.0				
Max Q Clear Time (g_c+I1), s		4.9		6.2		6.8		5.3				
Green Ext Time (p_c), s		0.4		1.3		0.6		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			9.8									
HCM 6th LOS			A									

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	35	189	32	14	172	30	42	43	15	29	26	27
Future Vol, veh/h	35	189	32	14	172	30	42	43	15	29	26	27
Conflicting Peds, #/hr	6	0	2	2	0	6	1	0	3	3	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	1	1	1
Mvmt Flow	39	212	36	16	193	34	47	48	17	33	29	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	233	0	0	250	0	0	583	575	235	592	576	217
Stage 1	-	-	-	-	-	-	310	310	-	248	248	-
Stage 2	-	-	-	-	-	-	273	265	-	344	328	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1335	-	-	1316	-	-	425	430	807	419	429	825
Stage 1	-	-	-	-	-	-	702	661	-	758	703	-
Stage 2	-	-	-	-	-	-	735	691	-	673	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1328	-	-	1314	-	-	372	406	803	357	405	820
Mov Cap-2 Maneuver	-	-	-	-	-	-	372	406	-	357	405	-
Stage 1	-	-	-	-	-	-	677	637	-	728	689	-
Stage 2	-	-	-	-	-	-	668	677	-	587	626	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.5	16.6	14.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	421	1328	-	-	1314	-	-	460
HCM Lane V/C Ratio	0.267	0.03	-	-	0.012	-	-	0.2
HCM Control Delay (s)	16.6	7.8	0	-	7.8	0	-	14.8
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0	-	-	0.7

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	LTR
Maximum Queue (m)	28.5	41.8	8.7	21.3	27.9
Average Queue (m)	17.0	24.1	1.7	11.2	16.9
95th Queue (m)	27.0	42.8	7.5	22.8	29.3
Link Distance (m)	178.8	174.2	143.2		129.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				40.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Wilson Crescent/Victoria Ave & Ruth Street E

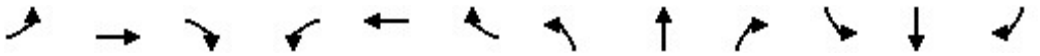
Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	9.1	15.6	9.1
Average Queue (m)	5.2	11.6	8.6
95th Queue (m)	12.2	16.6	9.7
Link Distance (m)	175.9	148.1	171.1
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

HCM 6th Signalized Intersection Summary
3: Victorial Ave/Victoria Ave & Taylor Street E

12-02-2024



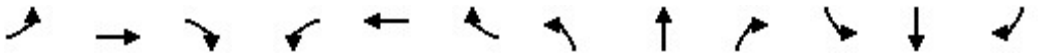
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	239	15	17	204	75	14	103	29	122	196	44
Future Volume (veh/h)	22	239	15	17	204	75	14	103	29	122	196	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1961	1961	1961	1961	1961	1961
Adj Flow Rate, veh/h	23	249	16	18	212	78	15	107	30	127	204	46
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	107	841	51	94	648	226	450	442	124	232	301	61
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	62	1715	105	40	1320	461	1180	1458	409	452	992	201
Grp Volume(v), veh/h	288	0	0	308	0	0	15	0	137	377	0	0
Grp Sat Flow(s),veh/h/ln	1881	0	0	1821	0	0	1180	0	1867	1645	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.7	0.0	0.0
Cycle Q Clear(g_c), s	4.6	0.0	0.0	5.2	0.0	0.0	0.6	0.0	2.8	10.5	0.0	0.0
Prop In Lane	0.08		0.06	0.06		0.25	1.00		0.22	0.34		0.12
Lane Grp Cap(c), veh/h	999	0	0	968	0	0	450	0	566	593	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.32	0.00	0.00	0.03	0.00	0.24	0.64	0.00	0.00
Avail Cap(c_a), veh/h	999	0	0	968	0	0	786	0	1099	1061	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.8	0.0	0.0	7.9	0.0	0.0	12.6	0.0	13.3	16.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.2	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	2.5	0.0	0.0	0.1	0.0	1.3	4.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.8	0.0	0.0	8.8	0.0	0.0	12.6	0.0	13.6	17.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		288			308			152			377	
Approach Delay, s/veh		7.8			8.8			13.5			17.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.5		20.5		30.5		20.5				
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0				
Max Green Setting (Gmax), s		25.0		30.0		25.0		30.0				
Max Q Clear Time (g_c+I1), s		6.6		12.5		7.2		4.8				
Green Ext Time (p_c), s		0.5		2.7		0.5		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
3: Victorial Ave/Victoria Ave & Taylor Street E

12-02-2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	239	15	17	204	75	14	103	29	122	196	44
Future Volume (veh/h)	22	239	15	17	204	75	14	103	29	122	196	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1945	1945	1945	1945	1945	1945	1961	1961	1961	1961	1961	1961
Adj Flow Rate, veh/h	23	249	16	18	212	78	15	107	30	127	204	46
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	1	1	1	1	1	1
Cap, veh/h	107	841	51	94	648	226	450	442	124	232	301	61
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	62	1715	105	40	1320	461	1180	1458	409	452	992	201
Grp Volume(v), veh/h	288	0	0	308	0	0	15	0	137	377	0	0
Grp Sat Flow(s),veh/h/ln	1881	0	0	1821	0	0	1180	0	1867	1645	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	7.7	0.0	0.0
Cycle Q Clear(g_c), s	4.6	0.0	0.0	5.2	0.0	0.0	0.6	0.0	2.8	10.5	0.0	0.0
Prop In Lane	0.08		0.06	0.06		0.25	1.00		0.22	0.34		0.12
Lane Grp Cap(c), veh/h	999	0	0	968	0	0	450	0	566	593	0	0
V/C Ratio(X)	0.29	0.00	0.00	0.32	0.00	0.00	0.03	0.00	0.24	0.64	0.00	0.00
Avail Cap(c_a), veh/h	999	0	0	968	0	0	786	0	1099	1061	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.8	0.0	0.0	7.9	0.0	0.0	12.6	0.0	13.3	16.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.2	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	0.0	0.0	2.5	0.0	0.0	0.1	0.0	1.3	4.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.8	0.0	0.0	8.8	0.0	0.0	12.6	0.0	13.6	17.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		288			308			152			377	
Approach Delay, s/veh		7.8			8.8			13.5			17.1	
Approach LOS		A			A			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		30.5		20.5		30.5		20.5				
Change Period (Y+Rc), s		5.5		5.0		5.5		5.0				
Max Green Setting (Gmax), s		25.0		30.0		25.0		30.0				
Max Q Clear Time (g_c+I1), s		6.6		12.5		7.2		4.8				
Green Ext Time (p_c), s		0.5		2.7		0.5		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			12.0									
HCM 6th LOS			B									

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	LTR
Maximum Queue (m)	33.5	34.2	14.6	14.1	54.2
Average Queue (m)	24.1	26.7	7.9	7.4	39.7
95th Queue (m)	38.6	37.1	18.8	15.2	59.5
Link Distance (m)	178.8	174.2	143.2		129.2
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				40.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Wilson Crescent/Victoria Ave & Ruth Street E

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	35.7	6.5	21.3	27.1
Average Queue (m)	12.2	1.3	14.0	16.6
95th Queue (m)	34.0	5.6	21.5	28.3
Link Distance (m)	175.9	184.5	148.1	171.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

B

Appendix B
Existing OTC MMLOS Reports

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	D	D	B	C	D
SCENARIO:	*Connecting Victoria - Ruth Street Existing*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	UNSIGNALIZED INTERSECTIONS				
Target (Custom if necessary)	C	B	D		D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cycling Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	D	D	B	C	D

Active Transportation Design Check	
Are marked pedestrian crossings provided to connect all approaching pedestrian facilities?	Yes
Does the approaching bike facility continue at a consistent width up to the edge of the intersection (crosswalk or curb edge of intersecting roadway)?	No
Is a continuous amount of space and accompanying pavement makings delineated for cyclists through the intersection?	Yes
Does the intersection design provide features which facilitate all the intended turn movements for cyclists (e.g. bike boxes, queuing space, protected intersection, etc)?	No
Have Accessibility for Ontarians with Disabilities Act (AODA) and municipal accessibility standards (if applicable) been considered?	No

MMLOS Evaluation

Measure 1	Average Crossing Distance (m)	Presence of Bicycle Facilities	Transit Movement Delay (s)	Average Effective Turning Radius (m)	Intersection Delay (s)
	Greater than 11	No bike facility	0 - 10	Less than 11	0 - 10
Measure 2	Marked Crossings	Requirement to stop	Pedestrian Level of Service	Car Level of Service	-
	Greater than or Equal to 50% of movements	31 - 50 %	D	A	
Measure 3	Average Effective Turning Radius (m)	Average Effective Turning Radius (m)	-	-	-
	9.0 - 10.9	9.0 - 10.9			
Measure 4		-	-	-	-

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	D	D	D	C	C
SCENARIO:	*Connecting Victoria - Taylor Street E Existing Conditions*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	SIGNALIZED INTERSECTIONS				
Target (Custom if necessary)	C	B	D		D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cyclist Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	D	D	D	C	C

Active Transportation Design Check	
Are marked pedestrian crossings provided to connect all approaching pedestrian facilities?	Yes
Does the approaching bike facility continue at a consistent width up to the edge of the intersection (crosswalk or curb edge of intersecting roadway)?	No
Is a continuous amount of space and accompanying pavement makings delineated for cyclists through the intersection?	Yes
Does the intersection design provide features which facilitate all the intended turn movements for cyclists (e.g. bike boxes, queuing space, protected intersection, etc)?	No
Have Accessibility for Ontarians with Disabilities Act (AODA) and municipal accessibility standards (if applicable) been considered?	No

MMLOS Evaluation

Measure 1	Enhanced Pedestrian Measures	Enhanced Bicycle Facilities	Transit Priority Measures	Average Effective Turning Radius (m)	% of Movements with Dedicated Turn Lanes
	0	0	No transit priority measures at any approaches for transit	11 - 12	10 - 34%
Measure 2	Average Effective Turning Radius (m)	Average Effective Turning Radius (m)	Transit Movement Delay (s)	Car Level of Service	Intersection Delay (s)
	11.0 - 12.9	11.0 - 12.9	11 - 20	B	11 - 20
Measure 3	Signal Cycle Length (s)	Signal Cycle Length (s)	Pedestrian Level of Service	-	-
	61 - 75	61 - 75	D		
Measure 4	Number of Uncontrolled Conflicts (conflicts/approach)	Number of Uncontrolled Conflicts (conflicts/approach)	-	-	-
	2.6 - 3.0	2.6 - 3.0			

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	E	D	F	B	B
SCENARIO:	*Connecting Victoria - Segment Existing*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	SEGMENTS				
Target (Custom if necessary)	C	B			D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cycling Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	E	D	F	B	B

Active Transportation Design Check	
Do the pedestrian facilities provide direct access to all properties along the segment? (Direct access can be provided by an adjacent facility or designated crossing to the property in question)	No
Does the bicycle facility selected correspond with the minimum appropriate facility type identified in the context appropriate nomograph (Figure 6.1, 6.2)?	No

-

-

-

MMLOS Evaluation

Measure 1	Pedestrian Facility Width (m)	Bike Facility Width per Direction (m)	Transit Facility Type	Width of Curb Lane (m)	Mid-block V/C Ratio
	1.8 - 2.0	Greater than 2.4		3.7 - 3.8	Less than 0.60
Measure 2	Pedestrian Buffer Width (m)	Bike Buffer Width (m)	Transit Passenger Amenities	Car Level of Service	Curb Lane Conflicts
	Less than 1.0	Has no physical measures and buffer width is < 0.5		A	3-4
Measure 3	Max Distance Between Controlled Crossings (m)	Conflicts with Other Modes (in-lane conflicts and cross point conflicts)	Pedestrian Level of Service	-	-
	Greater than 320	Two "high" conflict indicators	D		
Measure 4		-	-	-	-

C

Appendix C
Proposed Synchro Reports

HCM 6th TWSC
8: Wilson Crescent/Victoria Ave & Ruth Street E

12-06-2024

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	35	189	32	14	172	30	42	43	15	29	26	27
Future Vol, veh/h	35	189	32	14	172	30	42	43	15	29	26	27
Conflicting Peds, #/hr	6	0	2	2	0	6	1	0	3	3	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	1	1	1
Mvmt Flow	39	212	36	16	193	34	47	48	17	33	29	30

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	233	0	0	250	0	0	583	575	235	592	576	217
Stage 1	-	-	-	-	-	-	310	310	-	248	248	-
Stage 2	-	-	-	-	-	-	273	265	-	344	328	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1335	-	-	1316	-	-	425	430	807	419	429	825
Stage 1	-	-	-	-	-	-	702	661	-	758	703	-
Stage 2	-	-	-	-	-	-	735	691	-	673	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1329	-	-	1314	-	-	372	407	804	357	406	820
Mov Cap-2 Maneuver	-	-	-	-	-	-	372	407	-	357	406	-
Stage 1	-	-	-	-	-	-	677	637	-	729	690	-
Stage 2	-	-	-	-	-	-	668	678	-	587	626	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.5	16.6	14.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	422	1329	-	-	1314	-	-	460
HCM Lane V/C Ratio	0.266	0.03	-	-	0.012	-	-	0.2
HCM Control Delay (s)	16.6	7.8	0	-	7.8	0	-	14.8
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0	-	-	0.7

HCM Signalized Intersection Capacity Analysis
3: Victorial Ave/Victoria Ave & Taylor Street E

12-03-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	160	14	12	220	72	14	124	20	55	71	36
Future Volume (vph)	31	160	14	12	220	72	14	124	20	55	71	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.0	4.0	4.0	4.0	4.0	4.0	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)		5.5			6.0			5.5			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.97	
Flt Protected		0.99			1.00			1.00			0.98	
Satd. Flow (prot)		1909			1868			1770			1722	
Flt Permitted		0.92			0.99			0.96			0.85	
Satd. Flow (perm)		1775			1848			1707			1480	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	35	180	16	13	247	81	16	139	22	62	80	40
RTOR Reduction (vph)	0	3	0	0	12	0	0	10	0	0	21	0
Lane Group Flow (vph)	0	228	0	0	329	0	0	167	0	0	161	0
Confl. Peds. (#/hr)	5		1	1		5	7		2	2		7
Confl. Bikes (#/hr)						2			9			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		30.7			30.2			10.0			9.5	
Effective Green, g (s)		30.7			30.2			10.0			9.5	
Actuated g/C Ratio		0.59			0.58			0.19			0.18	
Clearance Time (s)		5.5			6.0			5.5			6.0	
Vehicle Extension (s)		0.2			0.2			3.0			3.0	
Lane Grp Cap (vph)		1054			1079			330			271	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.18			0.10			c0.11	
v/c Ratio		0.22			0.30			0.50			0.59	
Uniform Delay, d1		4.9			5.4			18.6			19.3	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.0			0.7			1.2			3.5	
Delay (s)		4.9			6.2			19.9			22.8	
Level of Service		A			A			B			C	
Approach Delay (s)		4.9			6.2			19.9			22.8	
Approach LOS		A			A			B			C	

Intersection Summary			
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Victorial Ave/Victoria Ave & Taylor Street E

12-03-2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	160	14	12	220	72	14	124	20	55	71	36
Future Volume (vph)	31	160	14	12	220	72	14	124	20	55	71	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.0	4.0	4.0	4.0	4.0	4.0	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)		5.5			6.0			5.5			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.98			0.97	
Flt Protected		0.99			1.00			1.00			0.98	
Satd. Flow (prot)		1909			1867			1770			1719	
Flt Permitted		0.92			0.99			0.96			0.82	
Satd. Flow (perm)		1761			1844			1704			1428	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	35	180	16	13	247	81	16	139	22	62	80	40
RTOR Reduction (vph)	0	3	0	0	13	0	0	9	0	0	17	0
Lane Group Flow (vph)	0	228	0	0	328	0	0	168	0	0	165	0
Confl. Peds. (#/hr)	5		1	1		5	7		2	2		7
Confl. Bikes (#/hr)						2			9			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		27.6			27.1			13.2			12.7	
Effective Green, g (s)		27.6			27.1			13.2			12.7	
Actuated g/C Ratio		0.45			0.44			0.21			0.21	
Clearance Time (s)		5.5			6.0			5.5			6.0	
Vehicle Extension (s)		0.2			0.2			3.0			3.0	
Lane Grp Cap (vph)		786			808			363			293	
v/s Ratio Prot												
v/s Ratio Perm		0.13			c0.18			0.10			c0.12	
v/c Ratio		0.29			0.41			0.46			0.56	
Uniform Delay, d1		10.9			11.9			21.2			22.1	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			1.5			0.9			2.5	
Delay (s)		10.9			13.4			22.2			24.5	
Level of Service		B			B			C			C	
Approach Delay (s)		10.9			13.4			22.2			24.5	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	61.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E Signalized AM - no LPI

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	27.5	32.7	21.9	28.5
Average Queue (m)	18.5	24.7	15.3	19.4
95th Queue (m)	29.5	34.8	24.3	30.5
Link Distance (m)	179.4	173.7	143.4	129.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Wilson Crescent/Victoria Ave & Ruth Street E TWSC AM

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	8.6	9.0	15.7	14.8
Average Queue (m)	5.0	1.8	10.4	10.1
95th Queue (m)	11.8	7.7	14.7	14.0
Link Distance (m)	175.8	184.5	148.1	171.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E Signalized AM - LPI

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	40.1	33.3	21.3	40.4
Average Queue (m)	23.6	21.0	14.8	23.6
95th Queue (m)	39.3	35.9	22.5	44.2
Link Distance (m)	179.4	173.7	143.4	129.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM 6th TWSC
8: Wilson Crescent/Victoria Ave & Ruth Street E

12-06-2024

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	55	274	44	11	182	38	35	47	12	49	77	34
Future Vol, veh/h	55	274	44	11	182	38	35	47	12	49	77	34
Conflicting Peds, #/hr	1	0	0	0	0	1	3	0	6	6	0	3
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	1	1	1	1	1	1
Mvmt Flow	58	288	46	12	192	40	37	49	13	52	81	36

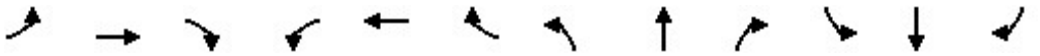
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	233	0	0	334	0	0	725	684	317	701	687	216
Stage 1	-	-	-	-	-	-	427	427	-	237	237	-
Stage 2	-	-	-	-	-	-	298	257	-	464	450	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1335	-	-	1225	-	-	342	372	726	355	371	826
Stage 1	-	-	-	-	-	-	608	587	-	768	711	-
Stage 2	-	-	-	-	-	-	713	697	-	580	573	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1334	-	-	1225	-	-	255	348	722	294	347	823
Mov Cap-2 Maneuver	-	-	-	-	-	-	255	348	-	294	347	-
Stage 1	-	-	-	-	-	-	575	555	-	726	702	-
Stage 2	-	-	-	-	-	-	595	689	-	488	542	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0.4	20.9	22.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	325	1334	-	-	1225	-	-	372
HCM Lane V/C Ratio	0.304	0.043	-	-	0.009	-	-	0.453
HCM Control Delay (s)	20.9	7.8	0	-	8	0	-	22.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	-	2.3

HCM Signalized Intersection Capacity Analysis
3: Victorial Ave/Victoria Ave & Taylor Street E

12-03-2024



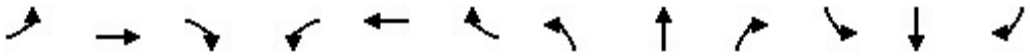
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	239	15	17	204	75	14	103	29	122	196	44
Future Volume (vph)	22	239	15	17	204	75	14	103	29	122	196	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.0	4.0	4.0	4.0	4.0	4.0	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)		5.5			6.0			5.5			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		1921			1863			1748			1750	
Flt Permitted		0.96			0.97			0.94			0.85	
Satd. Flow (perm)		1855			1820			1659			1509	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	249	16	18	212	78	15	107	30	127	204	46
RTOR Reduction (vph)	0	3	0	0	19	0	0	16	0	0	9	0
Lane Group Flow (vph)	0	285	0	0	290	0	0	136	0	0	368	0
Confl. Peds. (#/hr)	1		3	3		1	5		5	5		5
Confl. Bikes (#/hr)						2			9			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		27.4			26.9			18.0			17.5	
Effective Green, g (s)		27.4			26.9			18.0			17.5	
Actuated g/C Ratio		0.49			0.48			0.32			0.31	
Clearance Time (s)		5.5			6.0			5.5			6.0	
Vehicle Extension (s)		0.2			0.2			3.0			3.0	
Lane Grp Cap (vph)		901			868			529			468	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.16			0.08			c0.24	
v/c Ratio		0.32			0.33			0.26			0.79	
Uniform Delay, d1		8.8			9.2			14.2			17.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			1.0			0.3			8.5	
Delay (s)		8.9			10.2			14.5			26.2	
Level of Service		A			B			B			C	
Approach Delay (s)		8.9			10.2			14.5			26.2	
Approach LOS		A			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Victorial Ave/Victoria Ave & Taylor Street E

12-03-2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	239	15	17	204	75	14	103	29	122	196	44
Future Volume (vph)	22	239	15	17	204	75	14	103	29	122	196	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	4.0	4.0	4.0	4.0	4.0	4.0	3.3	3.3	3.3	3.3	3.3	3.3
Total Lost time (s)		5.5			6.0			5.5			6.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		1.00			0.99			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			0.97			0.97			0.98	
Flt Protected		1.00			1.00			1.00			0.98	
Satd. Flow (prot)		1921			1862			1747			1748	
Flt Permitted		0.96			0.97			0.95			0.84	
Satd. Flow (perm)		1850			1817			1664			1496	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	23	249	16	18	212	78	15	107	30	127	204	46
RTOR Reduction (vph)	0	2	0	0	14	0	0	12	0	0	7	0
Lane Group Flow (vph)	0	286	0	0	295	0	0	140	0	0	370	0
Confl. Peds. (#/hr)	1		3	3		1	5		5	5		5
Confl. Bikes (#/hr)						2			9			2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		28.7			28.2			22.6			22.1	
Effective Green, g (s)		28.7			28.2			22.6			22.1	
Actuated g/C Ratio		0.40			0.39			0.31			0.31	
Clearance Time (s)		5.5			6.0			5.5			6.0	
Vehicle Extension (s)		0.2			0.2			3.0			3.0	
Lane Grp Cap (vph)		734			708			520			457	
v/s Ratio Prot												
v/s Ratio Perm		0.15			c0.16			0.08			c0.25	
v/c Ratio		0.39			0.42			0.27			0.81	
Uniform Delay, d1		15.5			16.1			18.6			23.2	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.1			1.8			0.3			10.2	
Delay (s)		15.7			17.9			18.9			33.3	
Level of Service		B			B			B			C	
Approach Delay (s)		15.7			17.9			18.9			33.3	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E

Signalized PM - no LPI

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	52.6	27.7	28.7	68.0
Average Queue (m)	31.1	24.2	16.7	47.6
95th Queue (m)	49.4	32.3	29.4	68.3
Link Distance (m)	179.4	173.7	143.4	129.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: Wilson Crescent/Victoria Ave & Ruth Street E

TWSC PM

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	35.5	6.3	21.2	26.6
Average Queue (m)	12.1	1.3	12.8	16.5
95th Queue (m)	33.8	5.4	20.9	28.0
Link Distance (m)	175.8	184.5	148.1	171.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

Intersection: 3: Victorial Ave/Victoria Ave & Taylor Street E Signalized PM - LPI

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	46.9	39.7	33.6	92.8
Average Queue (m)	41.1	31.1	24.4	58.9
95th Queue (m)	45.9	41.9	34.9	90.3
Link Distance (m)	179.4	173.7	143.4	129.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

D

Appendix D
Proposed OTC MMLOS Reports

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	C	C	B	C	D
SCENARIO:	*Connecting Victoria - Ruth Street Proposed*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	UNSIGNALIZED INTERSECTIONS				
Target (Custom if necessary)	C	B	D		D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cycling Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	C	C	B	C	D

Active Transportation Design Check	
Are marked pedestrian crossings provided to connect all approaching pedestrian facilities?	Yes
Does the approaching bike facility continue at a consistent width up to the edge of the intersection (crosswalk or curb edge of intersecting roadway)?	Yes
Is a continuous amount of space and accompanying pavement makings delineated for cyclists through the intersection?	Yes
Does the intersection design provide features which facilitate all the intended turn movements for cyclists (e.g. bike boxes, queuing space, protected intersection, etc)?	Yes
Have Accessibility for Ontarians with Disabilities Act (AODA) and municipal accessibility standards (if applicable) been considered?	Yes

MMLOS Evaluation

Measure 1	Average Crossing Distance (m)	Presence of Bicycle Facilities	Transit Movement Delay (s)	Average Effective Turning Radius (m)	Intersection Delay (s)
	Greater than 11	Bike facility on 1/2 or 1/3 approaches	0 - 10	Less than 11	0 - 10
Measure 2	Marked Crossings	Requirement to stop	Pedestrian Level of Service	Car Level of Service	-
	100% of movements	16 - 30 %	C	A	
Measure 3	Average Effective Turning Radius (m)	Average Effective Turning Radius (m)	-	-	-
	9.0 - 10.9	9.0 - 10.9			
Measure 4		-	-	-	-

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	B	B	C	D	D
SCENARIO:	*Connecting Victoria - Taylor Street E Proposed Conditions*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	SIGNALIZED INTERSECTIONS				
Target (Custom if necessary)	C	B	D		D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cyclist Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	B	B	C	D	D

Active Transportation Design Check	
Are marked pedestrian crossings provided to connect all approaching pedestrian facilities?	Yes
Does the approaching bike facility continue at a consistent width up to the edge of the intersection (crosswalk or curb edge of intersecting roadway)?	Yes
Is a continuous amount of space and accompanying pavement makings delineated for cyclists through the intersection?	Yes
Does the intersection design provide features which facilitate all the intended turn movements for cyclists (e.g. bike boxes, queuing space, protected intersection, etc)?	Yes
Have Accessibility for Ontarians with Disabilities Act (AODA) and municipal accessibility standards (if applicable) been considered?	Yes

MMLOS Evaluation

Measure 1	Enhanced Pedestrian Measures	Enhanced Bicycle Facilities	Transit Priority Measures	Average Effective Turning Radius (m)	% of Movements with Dedicated Turn Lanes
	0.76 - 1	> 1	No transit priority measures at any approaches for transit	Less than 11	Less than 10%
Measure 2	Average Effective Turning Radius (m)	Average Effective Turning Radius (m)	Transit Movement Delay (s)	Car Level of Service	Intersection Delay (s)
	Less than 9	Less than 9	11 - 20	C	11 - 20
Measure 3	Signal Cycle Length (s)	Signal Cycle Length (s)	Pedestrian Level of Service	-	-
	76 - 90	76 - 90	B		
Measure 4	Number of Uncontrolled Conflicts (conflicts/approach)	Number of Uncontrolled Conflicts (conflicts/approach)	-	-	-
	2.1 - 2.5	2.1 - 2.5			

LOS AND DATA ENTRY - Use this to enter what you know and for detailed or summary results presentation

Actual	B	B	E	C	A
SCENARIO:	*Connecting Victoria - Segment Proposed*				
Area Type:	*Neighbourhood Boulevard*				
MODE					
Type	**SEGMENTS**				
Target (Custom if necessary)	C	B			D
Adjustment for Planning Direction	Upwards	None	None	None	Upwards
Reasons for adjustment (if applicable)	Pedestrian and Cycling Improvement Project				
Adjustment for Strategic Policy	None	None	None	None	None
Reasons for adjustment (if applicable)					
Actual	B	B	E	C	A

Active Transportation Design Check	
Do the pedestrian facilities provide direct access to all properties along the segment? (Direct access can be provided by an adjacent facility or designated crossing to the property in question)	Yes
Does the bicycle facility selected correspond with the minimum appropriate facility type identified in the context appropriate nomograph (Figure 6.1, 6.2)?	Yes

-

-

-

MMLOS Evaluation

Measure 1	Pedestrian Facility Width (m)	Bike Facility Width per Direction (m)	Transit Facility Type	Width of Curb Lane (m)	Mid-block V/C Ratio
	1.8 - 2.0	2.2 - 2.4		Less than 3.4	Less than 0.60
Measure 2	Pedestrian Buffer Width (m)	Bike Buffer Width (m)	Transit Passenger Amenities	Car Level of Service	Curb Lane Conflicts
	2.1 - 2.5	Has physical measures AND buffer width is 0.5 - 1		A	1-2
Measure 3	Max Distance Between Controlled Crossings (m)	Conflicts with Other Modes (in-lane conflicts and cross point conflicts)	Pedestrian Level of Service	-	-
	200	One "low" conflict indicator and one "moderate" conflict indicator	B		
Measure 4		-	-	-	-

E

Appendix E
Cost Estimate

Item	Description	Unit	Unit Price	Approximate Quantity	Total Cost
Option 1 - One Way Protected Bike Lane					**$ 3,092,500.00**
1.1	Concrete Buffer Strip (0.8 m)	lin.m.	$ 750.00	900	$ 675,000.00
1.2	Concrete Curb and Gutter (150 mm)	lin.m.	$ 200.00	475	$ 95,000.00
1.3	Catchbasin Relocation and Adjustment	Lump Sum	$ 15,000.00	6	$ 90,000.00
1.4	Concrete Sidewalk	sq.m.	$ 250.00	850	$ 212,500.00
1.5	Pedestrian Ramps	each	$ 2,500.00	2	$ 5,000.00
1.6	Asphalt Concrete	sq.m.	$ 175.00	3500	$ 612,500.00
1.7	Signage	each	$ 250.00	16	$ 4,000.00
1.8	Pavement Markings	Lump Sum	$ 250,000.00	1	$ 250,000.00
1.9	Pedestrian Activated Signal	each	$ 75,000.00	1	$ 75,000.00
1.10	Intersection Improvements at Taylor Street	Lump Sum	$ 185,000.00	1	$ 185,000.00
1.11	Tree Removal & Tree Value	each	$ 1,500.00	3	$ 4,500.00
				Subtotal	**$ 2,208,500.00**
	Engineering and Contract Administration	percentage	10%		$ 221,000.00
	Contingency	percentage	30%		$ 663,000.00
Option 2 - Two Way Protected Bike Lane					**$ 2,341,500.00**
1.1	Concrete Buffer Strip (0.8 m)	lin.m.	$ 750.00	450	$ 337,500.00
1.2	Concrete Curb and Gutter (150 mm)	lin.m.	$ 200.00	475	$ 95,000.00
1.3	Catchbasin Relocation and Adjustment	Lump Sum	$ 15,000.00	5	$ 75,000.00
1.4	Concrete Sidewalk	sq.m.	$ 250.00	850	$ 212,500.00
1.5	Pedestrian Ramps	each	$ 2,500.00	2	$ 5,000.00
1.6	Asphalt Concrete	sq.m.	$ 175.00	2400	$ 420,000.00
1.7	Signage	each	$ 250.00	8	$ 2,000.00
1.8	Pavement Markings	Lump Sum	$ 195,000.00	1	$ 195,000.00
1.9	Pedestrian Activated Signal	each	$ 75,000.00	1	$ 75,000.00
1.10	Intersection Improvements at Taylor Street	Lump Sum	$ 250,000.00	1	$ 250,000.00
1.11	Tree Removal & Tree Value	each	$ 1,500.00	3	$ 4,500.00
				Subtotal	**$ 1,671,500.00**
	Engineering and Contract Administration	percentage	10%		$ 168,000.00
	Contingency	percentage	30%		$ 502,000.00
Option 3 - Neighbourhood Bikeway					**$ 1,599,750.00**
1.1	Concrete Curb Extensions	sq.m.	$ 500.00	800	$ 400,000.00
1.2	Concrete Curb and Gutter (150 mm)	lin.m.	$ 200.00	880	$ 176,000.00
1.3	Catchbasin Relocation and Adjustment	Lump Sum	$ 15,000.00	4	$ 60,000.00
1.4	Concrete Sidewalk	sq.m.	$ 275.00	850	$ 233,750.00
1.5	Pedestrian Ramps	each	$ 5,000.00	2	$ 10,000.00
1.6	Landscaping	Lump Sum	$ 100,000.00	1	$ 100,000.00
1.7	Signage	each	$ 250.00	16	$ 4,000.00
1.8	Pavement Markings	Lump Sum	$ 80,000.00	1	$ 80,000.00
1.9	Pedestrian Activated Signal	each	$ 75,000.00	1	$ 75,000.00
1.10	Tree Removal & Tree Value	each	$ 1,500.00	2	$ 3,000.00
				Subtotal	**$ 1,141,750.00**
	Engineering and Contract Administration	percentage	10%		$ 115,000.00
	Contingency	percentage	30%		$ 343,000.00

Optional Curb Extensions at Hillard and Isabella					**$ 540,000.00**
1.1	Concrete Curb Extensions	sq.m.	$ 500.00	400	$ 200,000.00
1.2	Pedestrian Ramps	each	$ 5,000.00	16	$ 80,000.00
1.3	Catchbasin Relocation and Adjustment	Lump Sum	$ 15,000.00	7	$ 105,000.00
				Subtotal	**$ 385,000.00**
	Engineering and Contract Administration	percentage	10%		$ 39,000.00
	Contingency	percentage	30%		$ 116,000.00

F

Appendix F
What We Learned Reports

City of Saskatoon

Connecting Victoria Avenue

WHAT WE LEARNED REPORT

Round 1 – Public Engagement

City of Saskatoon

Connecting Victoria Avenue

WHAT WE LEARNED REPORT

Prepared by: _____
Ellen McLaughlin, P. Eng.

Verified by: _____
Adrien Blais, P. Eng.

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CIMA+ file number: Z0012729
14 November 2024 – Revision No. 2

Register of issues			
Issue No.	Reviewed by	Date	Description of the review
0	JM	2024-09-13	Initial draft for COS Review
1	JM	2024-10-24	Revised version
2	JM	2024-11-14	Final version

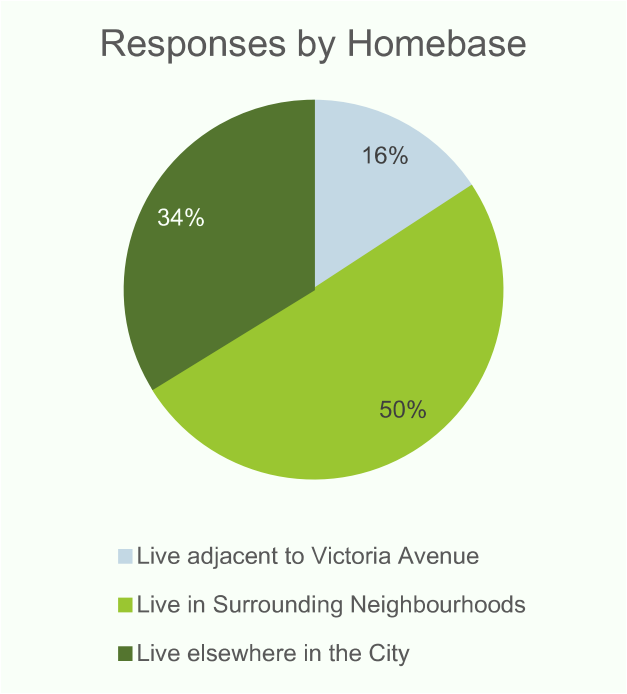
Confidentiality and ownership

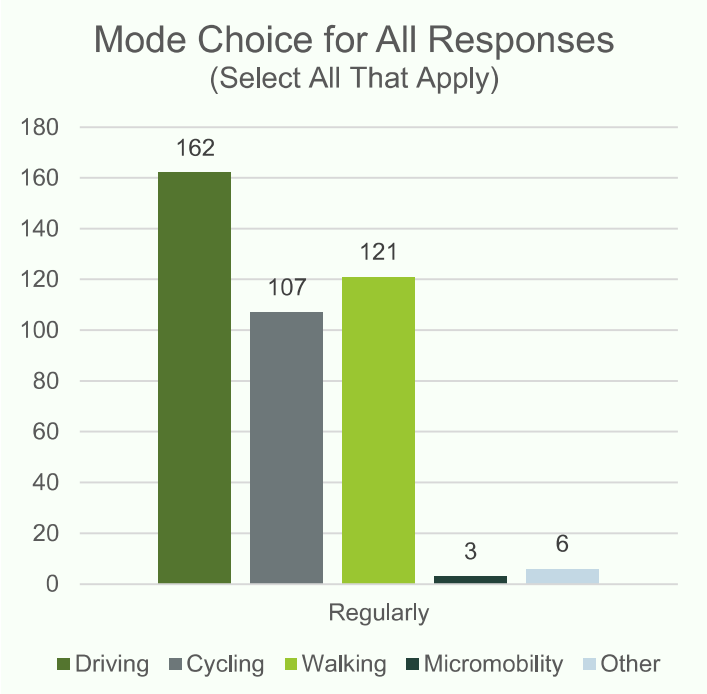
Executive Summary

Connecting Victoria Avenue is a functional planning study for walkable and bikeable infrastructure improvements on Victoria Avenue between Taylor Street East and Ruth Street in Saskatoon.

The project team has completed Round 1 of public engagement through an online survey and an open house to determine current traffic safety and operational issues along Victoria Avenue for people of all ages and abilities using all modes of transportation. Both engagement activites asked participants what they would like changed and what they would like to remain the same on Victoria Avenue.

The survey received 228 valid responses, predominantly originating from neighbourhoods near the project area (Queen Elizabeth, Buena Vista, Avalon, and Exhibition). Driving was the most common mode of travel from all respondents; walking and cycling made up 53% and 47% of regular (daily and weekly) mode choice on the corridor, respectively.



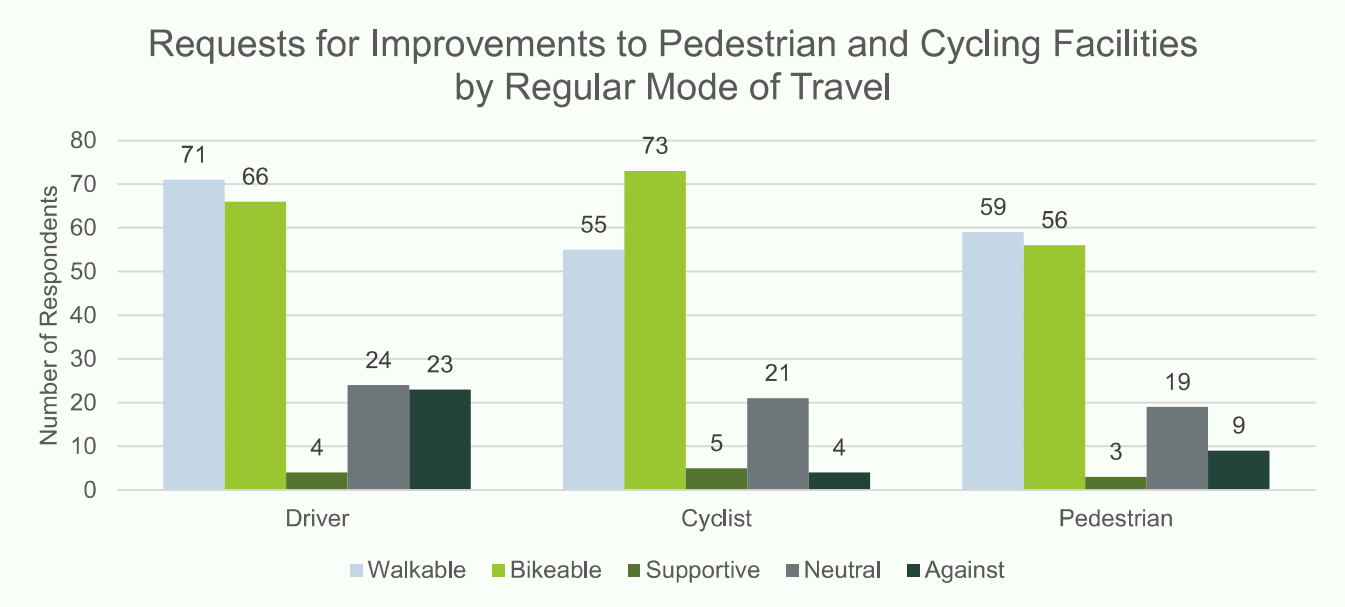


When asked what respondents would like changed and what they would like to remain the same on Victoria Avenue five categories of responses emerged, coded manually based on written responses. The five categories include:

- Explicitly requested sidewalk improvements (termed 'walkable' in subsequent graphs).
- Explicitly requested cycling infrastructure (termed 'bikeable').
- Generally supported a more walkable and bikeable environment (termed 'supportive').
- Displayed ambivalence or indifference (termed 'neutral'). This category was made up of respondents who stated they were confident cyclists and saw no issues with the current infrastructure or respondents who offered no comments at all.

- Explicitly rejected a walkable and bikeable environment (termed 'against').

Improvements to pedestrian and cycling facilities on Victoria Avenue were requested regardless of homebase. Improvements to pedestrian and cycling facilities were also broadly requested by respondents regardless of mode choices. Responses were categorized by regular mode choice; as a result, responses may be reported under multiple mode choices if a respondent walked, biked, and drove the corridor on a regular (daily or weekly) basis.



Respondents commonly identified six targeted priority areas that should be considered in the development and evaluation of alternatives:

- Reduce speeding but keep current speed limits,
- Diverging opinions on keeping or removing some but not all on-street parking,
- Maintain and plant new vegetation,
- Improve pedestrian crossing control and existing crosswalk locations,
- Resurface the street, and
- Review traffic control at the intersection of Victoria Avenue and Ruth Street.

The public open house drew 17 attendees. Feedback from the open house mirrored the survey. The majority of attendees were very supportive of improvements to the pedestrian realm and generally supportive of cycling facilities that would result in an all ages and abilites network.

Attendees offered specific feedback about intersection traffic control and detection, travelled speeds, and route preferences that will be incorporated into the development of alternatives and evaluation metrics.

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1. Background

1.1 Strategic Goals

The City of Saskatoon is committed to promoting active transportation and providing transportation choices that are safe and comfortable for people of all ages and abilities year-round. Saskatoon's Active Transportation Plan (2016) identified Victoria Avenue as a future all ages and abilities (AAA) cycling route. Victoria Avenue provides an important connection to existing and future walking and cycling facilities.

1.2 Summary of Engagement Strategy

Table 1: Summary of Engagement Strategy

Round	Participants	Level of Participation	Objective	Engagement Goal	Engagement Activity
1	Impacted Groups Internal Stakeholders Subject Matter Experts	Inform / Consult	Consult with the community, identify local knowledge on existing challenges and opportunities	Inform, consult and understand opportunities and challenges	Public open house Online Survey Engage Page
2	Impacted Groups Internal Stakeholders Subject Matter Experts	Inform / Consult	Inform the community, demonstrate how round 1 feedback influence recommended design.	Close the loop	Public open house Online Survey Engage Page

2. Engagement Activities

2.1 Round 1 – Online Survey

An online survey was prepared using the Microsoft Forms platform to help solicit feedback on public concerns and desires with the project corridor. The survey was open from July 8th, 2024 to August 20th, 2024 for a total of 44 days. The online survey had a total of 228 valid respondents. Survey questions are provided in **Appendix A**.

2.1.1 Intended Audience

The online survey was developed to build a strong understanding of user groups, general community concerns with the current corridor, and participant desires for future improvements.

2.1.2 Marketing Techniques

The survey was advertised on the City's Engage page website and through the City's social media channels. The engagement was advertised on the City's Facebook, X (Twitter), and Instagram pages with posts on July 11th, August 6th, and August 20th.

Flyers were also distributed throughout the neighbourhoods surrounding the project area. The approximate limits of the flyer drop were from Lorne Avenue to Lansdowne Avenue as the east-west boundaries and Taylor Street East to Ruth Street East as the north-south boundaries. A total of 1638 flyers were distributed throughout this area.

Specific stakeholders identified in **Appendix C** were also emailed directly to advise them of the project, online survey and open house.

2.1.3 Data Limitations

It should be noted that survey was self-administered and non-random, and as such the results should not be considered statistically significant or representative of all residents in the City.

Context clues from some respondent comments indicate they completed this survey for cycling improvements planned to the north of the study area on Victoria Avenue from 8th Street East to Taylor Street East. The exact number of respondents that completed the survey thinking it was meant for another project is unknown and may skew results. Examples of possible misinterpretation include respondents who:

- Opposed any cyclist infrastructure and referenced existing designs with a median, or
- Who identified cycling safety issues at the transition from the cycle track to mixed traffic lanes through the Victoria Avenue and 8th Street East intersection.

2.1.4 What We Learned

2.1.4.1 Demographics

Responses were received from 38 neighbourhoods around Saskatoon, the majority of which originated from neighbourhoods adjacent to the project corridor: Queen Elizabeth, Buena Vista, Exhibition, Avalon, Nutana, and Haultain. Responses by neighbourhood are illustrated in **Figure 2-1**.

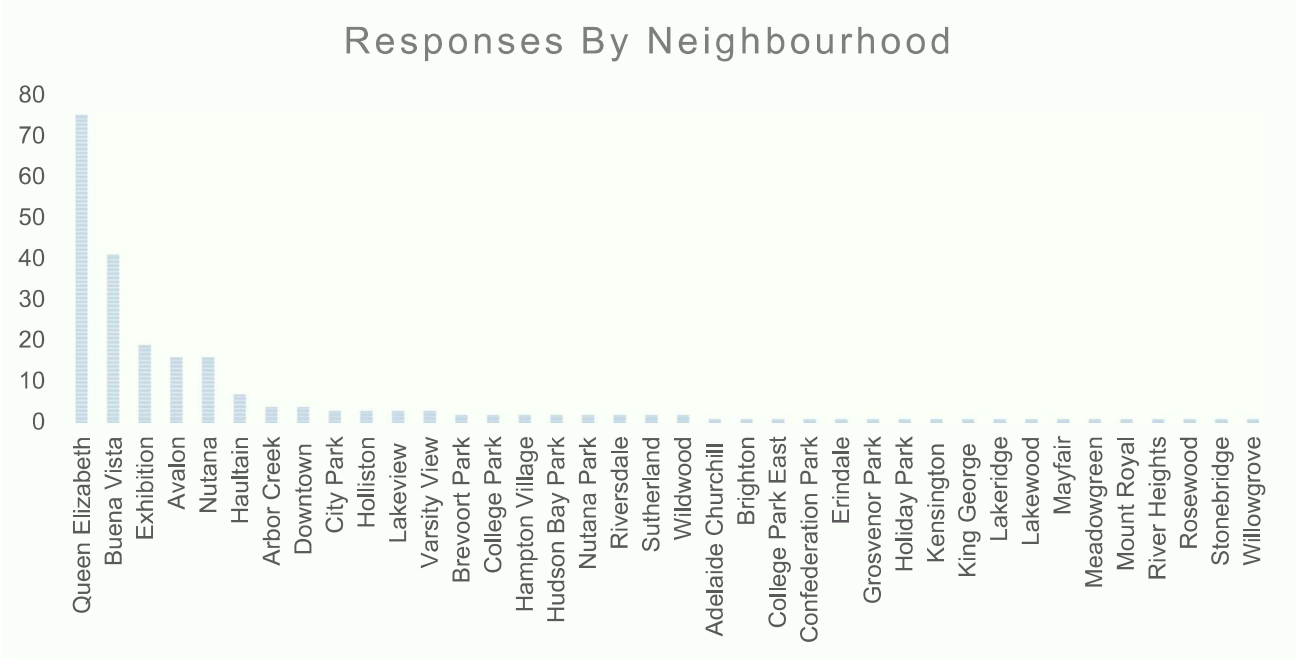


Figure 2-1 Responses by Neighbourhood

Later assessments compare responses by neighbourhood groups to determine if proximity shaped responses. Place was separated into respondents who lived on Victoria Avenue within the study area, those who lived within the surrounding neighbourhoods (Queen Elizabeth, Buena Vista, Exhibition, and Avalon), and those who lived elsewhere in the City.

Of the 228 responses, 16% lived along Victoria Avenue within the study area, 50% lived in nearby neighbourhoods, while the remaining 34% lived elsewhere in the City, illustrated in **Figure 2-2**.

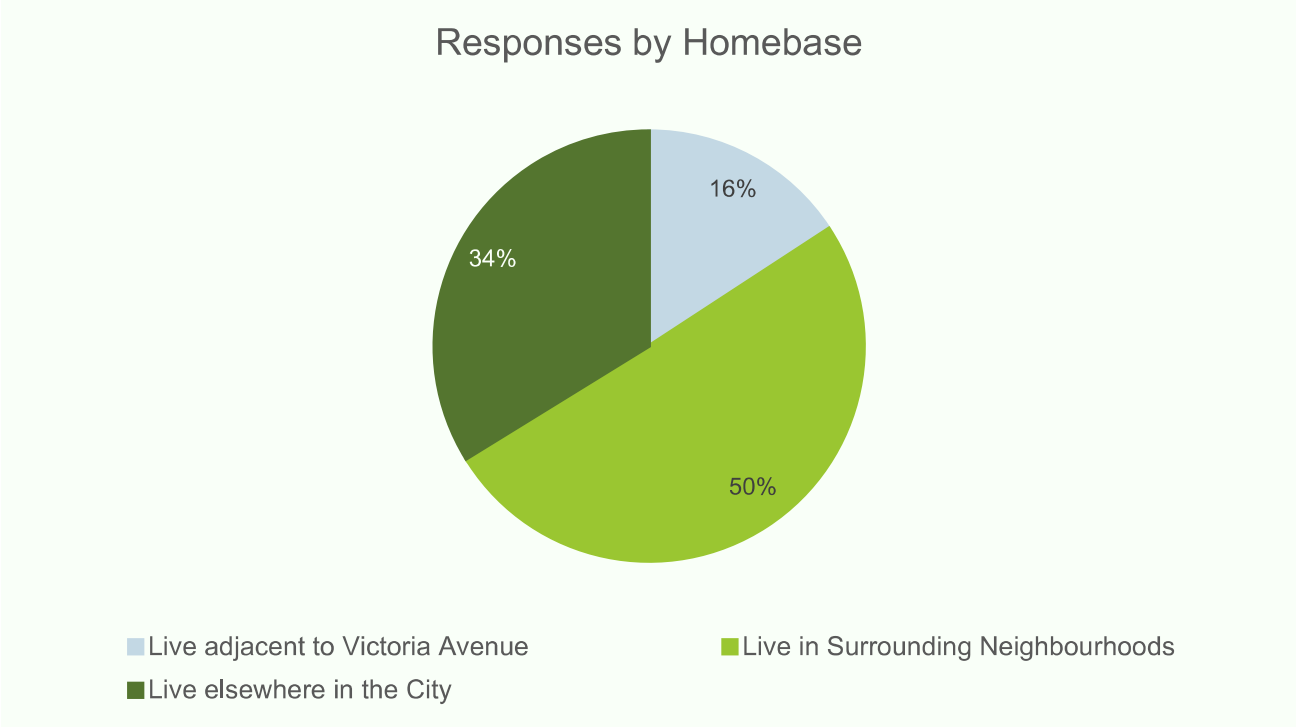


Figure 2-2 Responses by Homebase

Responses were received by residents of all ages, illustrated in **Figure 2-3**. The largest cohort were respondents aged 35 to 44.

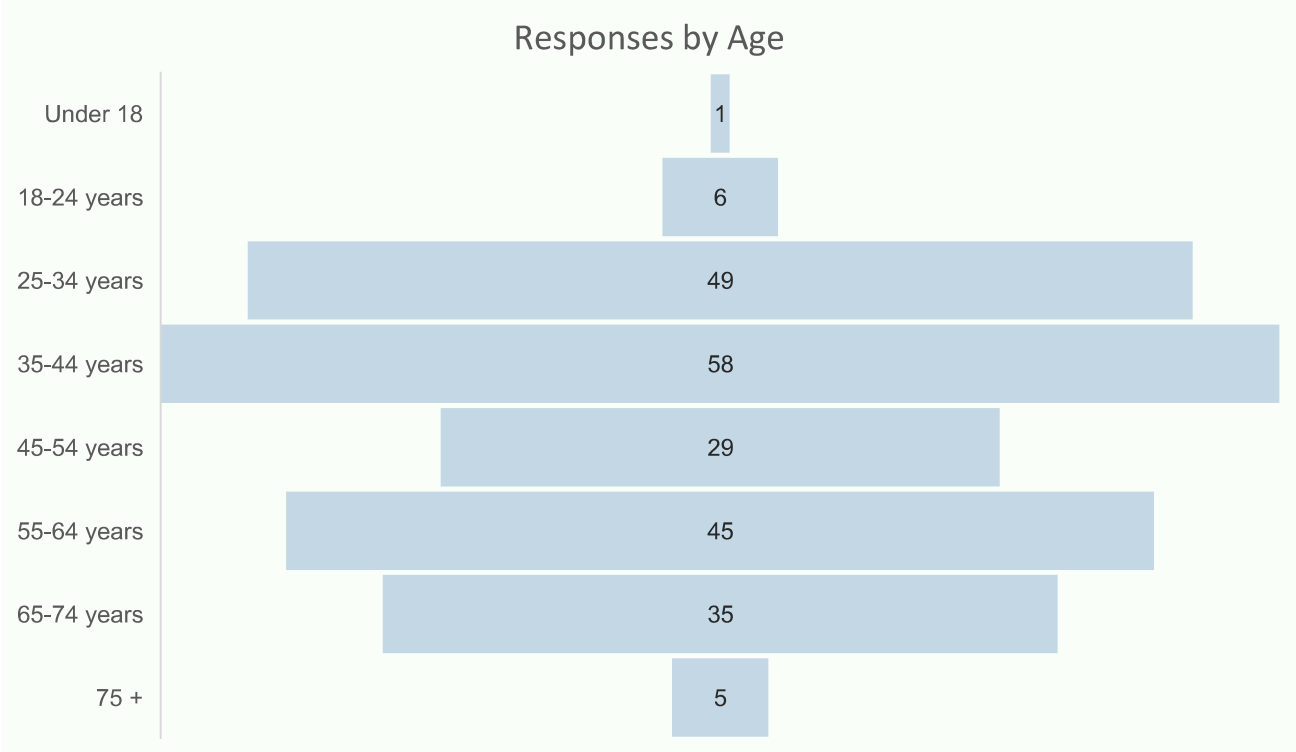


Figure 2-3 Responses by Age

Respondents were asked to indicate their mode choice – driving, cycling, walking, micromobility, and other – when travelling along Victoria Avenue by frequency of use – daily, weekly, monthly, occasionally, only in the summer, and never. Responses were grouped into regular use (daily and weekly), occasional use (monthly and occasional) and seasonal use (only in the summer), illustrated in **Figure 2-4**. Driving was the predominant mode choice among respondents (71%); however, 47% of respondents regularly biked and 53% regularly walked along the corridor. Because respondents could choose multiple modes of travel, responses to this question do not add up to 228.

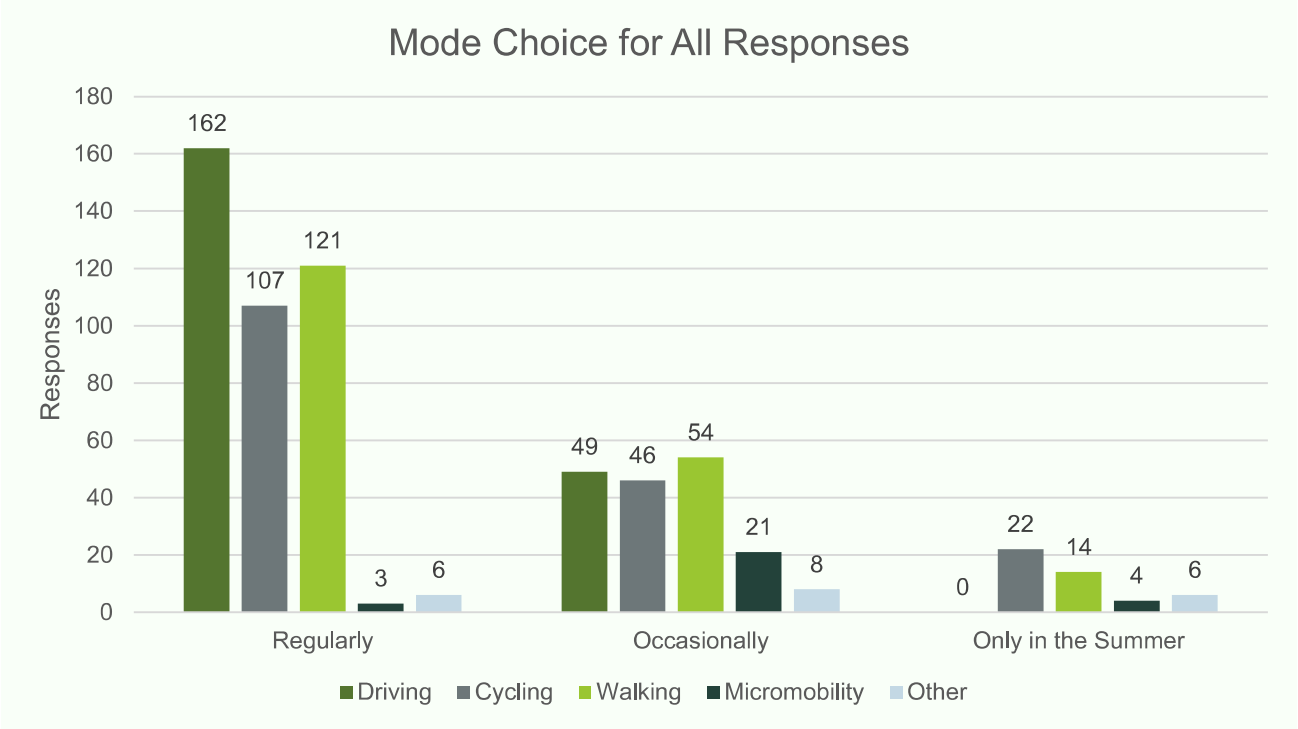


Figure 2-4 Mode Choice for all Respondents

Trip purpose was examined by respondent homebase and illustrated in **Figure 2-5**. Trip purpose for residents who lived on Victoria Avenue within the study area were evenly distributed among the top destinations – access to the downtown, the river, work, and shopping – indicating that Victoria Avenue is a primary access road to the community and amenities for these residents. Trip purpose distribution for residents who lived in the surrounding neighbourhoods was more spread-out but the top four trip destinations were still ranked as highly as residents who lived on Victoria Avenue. Respondents who lived elsewhere in the City where more likely to travel on Victoria Avenue to access Prairieland / Diefenbaker Park or visit family and friends in the area.

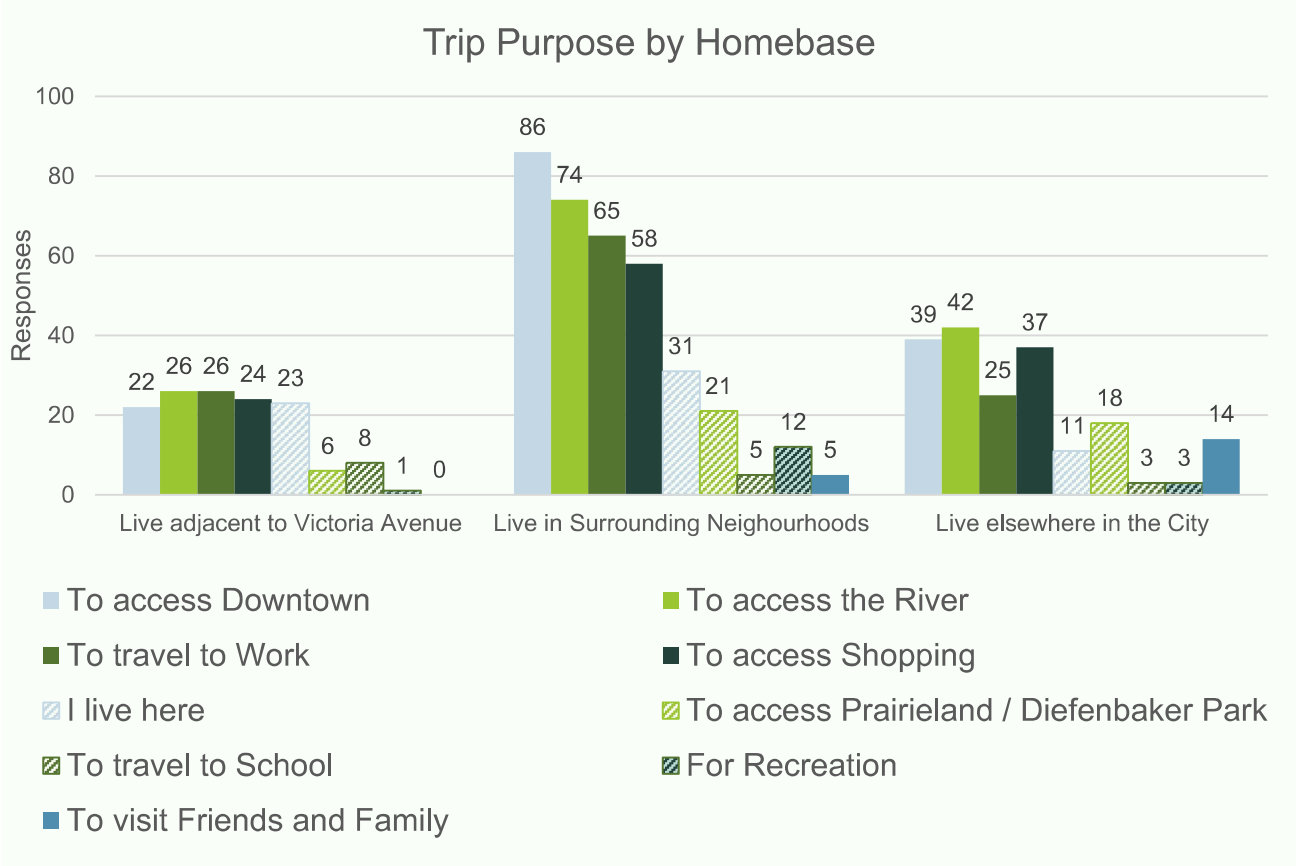


Figure 2-5 Trip Purpose by Homebase

2.1.4.2 Themes

Respondents were asked about current traffic safety issues on Victoria Avenue from Taylor Street East to Ruth Street, elements of the street they would like to see changed, and elements they would like to remain the same. Common themes within the responses were broken down into two categories 1) requests to improve pedestrian and cyclist facilities and 2) targeted priorities the project team should consider in the development and evaluation of alternatives.

Requests to improve pedestrian and cyclist facilities can be expressed in five categories, whether respondents:

- Explicitly requested sidewalk improvements (termed 'walkable' in subsequent graphs).
- Explicitly requested cycling infrastructure (termed 'bikeable').
- Generally supported a more walkable and bikeable environment (termed 'supportive').
- Displayed ambivalence or indifference (termed 'neutral'). This category was made up of respondents who stated they were confident cyclists and saw no issues with the current infrastructure or respondents who offered no comments at all.
- Explicitly rejected a walkable and bikeable environment (termed 'against').

Responses were coded to multiple categories where appropriate (ex. Requested both the installation of sidewalks and cycling facilities, or requested the installation of sidewalks but opposed cycling facilities). Requests for improvements to pedestrian and cycling facilities on Victoria Avenue are illustrated in **Figure 2-6** by responded homebase and in **Figure 2-7** by respondent mode choice. Because respondents could enter numerous safety concerns, aspects of the street they'd like to see changed, and aspects they'd like to remain the same, responses to this question do not add up to 228.

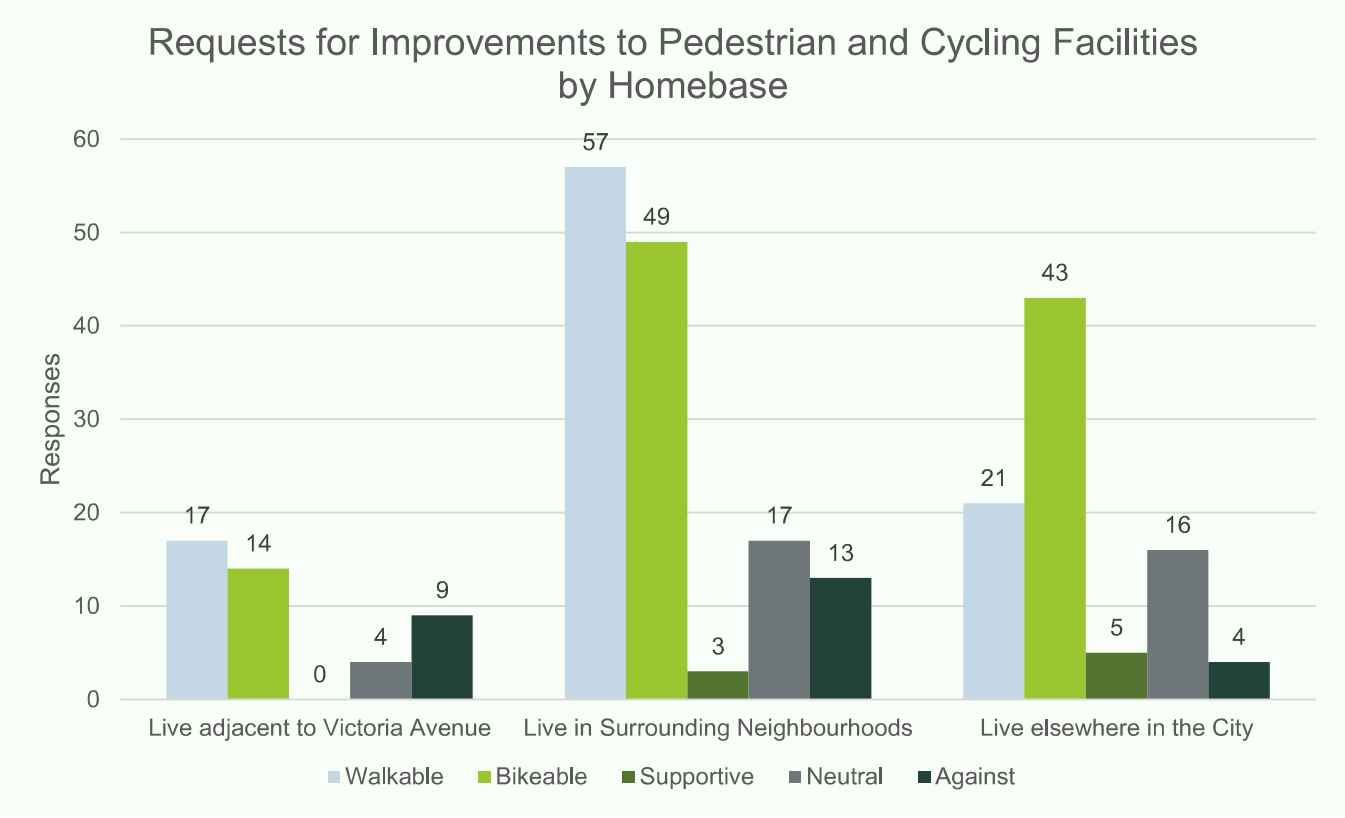


Figure 2-6 Requests to Improve Pedestrian and Cyclist Facilities by Homebase

An improved pedestrian realm was the top theme, specifically filling current gaps in sidewalk infrastructure. This was followed by requests for cycling infrastructure, specifically separated infrastructure. When considered as a percentage, respondents who lived on Victoria Avenue were most likely to oppose to cycling infrastructure (20% of responses) compared to those who lived in the surrounding neighbourhoods (9% of responses) or elsewhere in the City (5% of responses). Understandably, the day-to-day lives of these residents would be most affected by any changes to the street. Opponents felt changes would impact their ability to enter and exit driveways or that cycling infrastructure was a "waste of taxes".

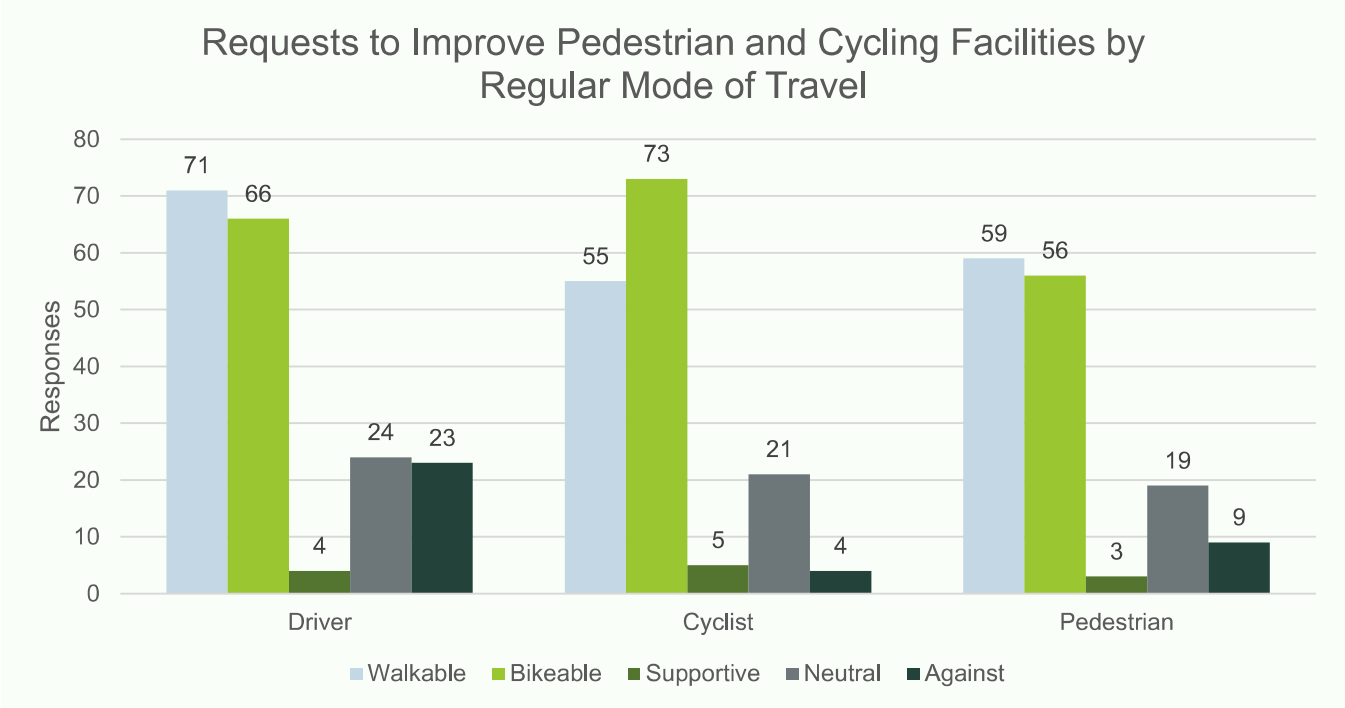


Figure 2-7 Requests to Improve Pedestrian and Cyclist Facilities by Mode Choice

Improvements to pedestrian and cycling facilities were requested regardless of mode choices. Considered as a percentage, drivers were most likely to oppose improvements (12% of responses compared for 3% opposition by cyclists, and 6% opposition by pedestrians). Quotes calling for improvements include:

"I do not feel safe [cycling] until I can get on the bike path that begins at 8th Street East and Victoria Avenue. Victoria Avenue is the street we use most to navigate around our area and to go to work daily."

"I live very close to Victoria Avenue, and I stopped walking it daily since I had a baby. I do not feel safe walking along Victoria Avenue with a stroller as there is not sidewalk the whole way."

"Every day in the summer we see many young families walking or cycling on Victoria Avenue. I worry that someone is going to be badly hurt or killed due to the poor design of the stretch of Victoria Avenue."

Respondents commonly identified six targeted priority areas that should be considered in the development and evaluation of alternatives:

- Requests to reduce speeding (27 total) vs. maintain current speed limits (9 total),
- Requests to remove vs. maintain on-street parking (respectively, 12 and 8 total),
- Maintain vegetation (26 total),
- Improve pedestrian crossing control (15 total),
- Resurface the street (12 total), and
- Review traffic control at the intersection of Victoria Avenue and Ruth Street (6 total).

Individual respondents may have noted numerous concerns or no concerns, as a result priorities do not add up to 228. Priorities by respondent homebase and mode choice are illustrated in **Figure 2-8** and **Figure 2-9** respectively.

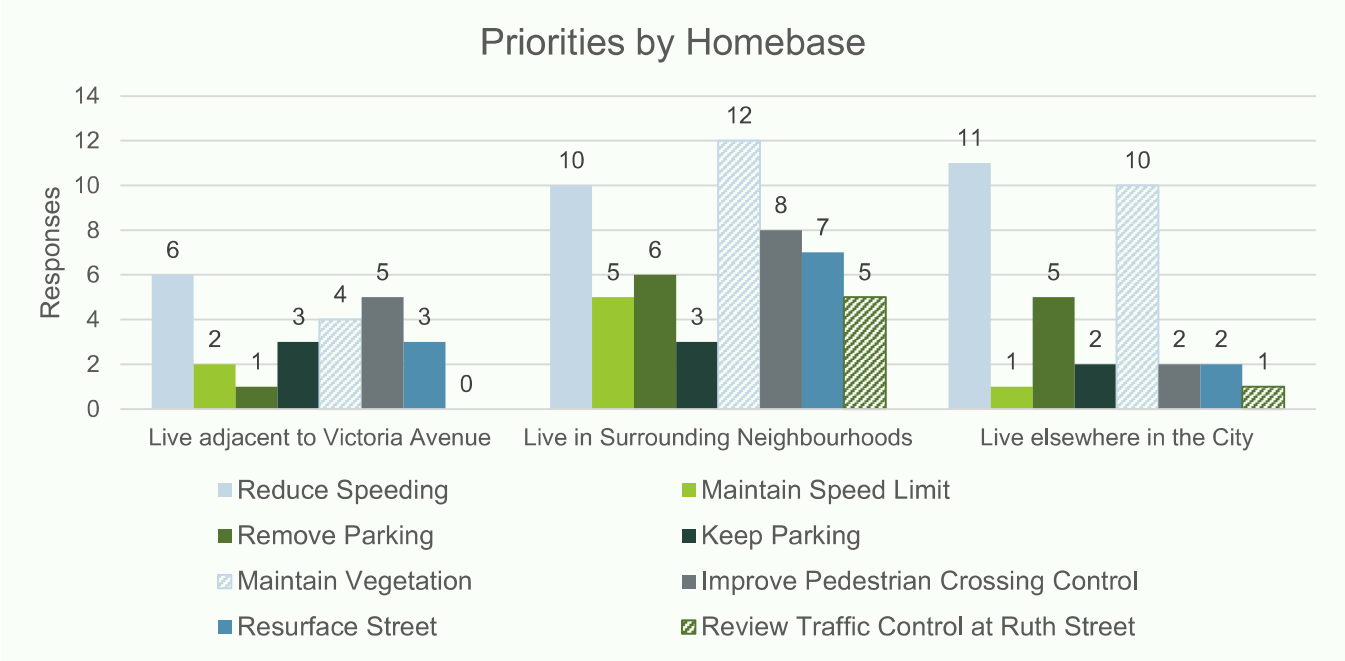


Figure 2-8 Priorities by Homebase

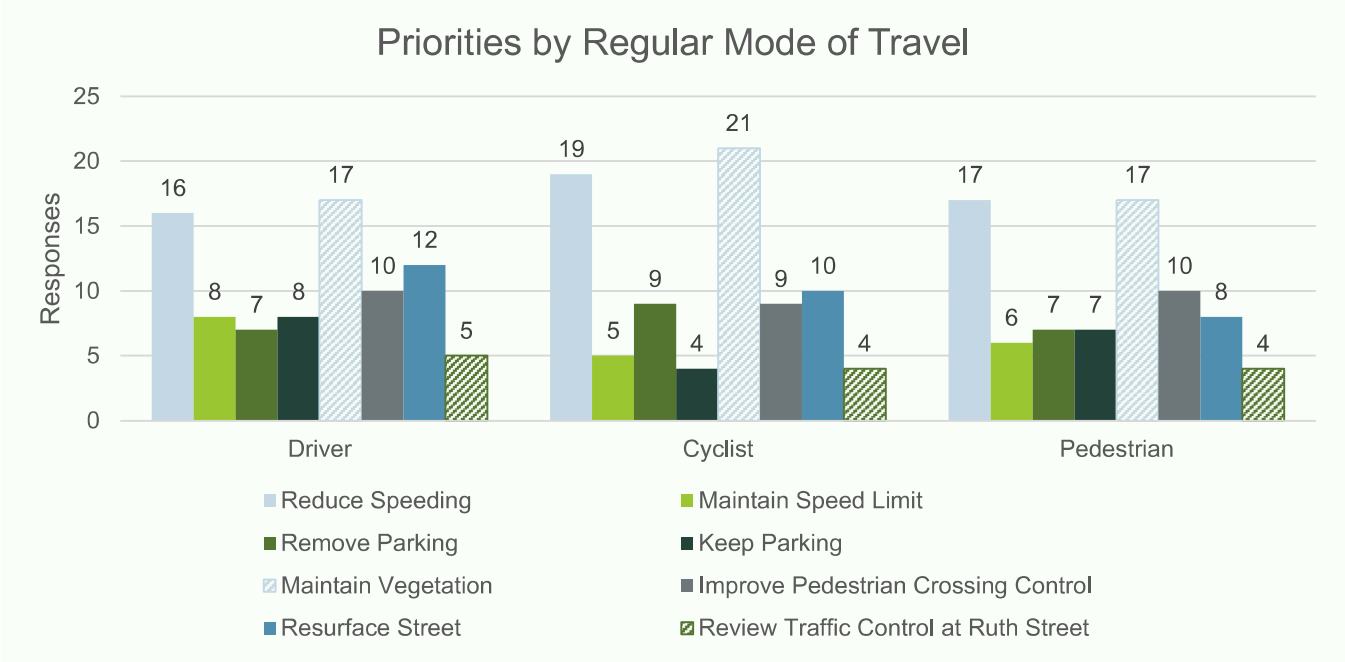


Figure 2-9 Priorities by Mode Choice

Vehicle travel speeds were cited as an issue for cyclists and pedestrians forced to walk on the street. Comments on speeding were typically combined with vehicles passing cyclists in an unsafe manner. There was an appetite for traffic calming devices including curb extensions, raised crosswalks, speed bumps / tables, and medians islands; however, the added burden on residents to provide winter maintenance at curb extensions was a concern.

Respondents identified that on-street parking was not well utilized along the study corridor and parking could be reduced (not eliminated) to accommodate other modes. Residents who lived on Victoria Avenue were more likely to request that parking be kept as-is, but this wasn't a unanimous sentiment.

Street trees and other vegetation were prioritized across respondent homebase and mode choice. Comments ranged from specific requests to keep existing vegetation to hopes to add more greenery to the streetscape.

Improved pedestrian crossing control was expressed most often by residents of the corridor and pedestrians but echoed by other modes and homebase locations. One respondent articulated the problem by noting that current signed pedestrian crossing locations at Hilliard Street and Isabella Street are well positioned but driver compliance is lacking.

Residents who use Victoria Avenue to access nearby destinations noted that it was often difficult to find gaps in traffic at the two-way stop controlled intersection of Victoria Avenue and Ruth Street.

2.2 Round 1 - Open House

A come-and-go format Open House was hosted on July 23, 2024, from 6:00 pm to 8:00 pm at the Avalon Alliance Church to solicit feedback on public concerns and desires with the project corridor. Seventeen members of the public attended the session. Open House boards are provided in **Appendix B**.

2.2.1 Intended Audience

The Open House was planned as an opportunity for targeted stakeholder groups and the general community to attend an in-person event and have the opportunity to articulate concerns and desires for the project corridor. Display boards included information on the project background, existing road characteristics, AAA facilities and possible walking and cycling improvements.

The Open House also served as an opportunity for individuals with the inability to access internet information or who are unfamiliar with technology to engage with the project team and provide feedback in person.

2.2.2 Marketing Techniques

The Open House was advertised on the City's Engage page website and through the City's social media channels. The engagement was advertised on the City's Facebook, X (Twitter), and Instagram pages with a post on July 11th.

A mini billboard was also placed near Victoria Avenue to promote the engagement activities. Flyers were also distributed throughout the neighbourhoods surrounding the project area. The approximate limits of the flyer drop were from Lorne Avenue to Lansdowne Avenue as the east-west boundaries and Taylor Street East to Ruth Street East as the north-south boundaries. A total of 1638 flyers were distributed throughout this area.

Specific stakeholders identified in **Appendix C** were also emailed directly to advise them of the project, the Open House, and the online survey.

2.2.3 What We Learned

Attendees were presented with a series of boards documenting the study location, history and context as well as the project goals. Attendees were asked to provide their thoughts on street elements that should change and elements that should remain the same. A roll plan of the corridor was provided to support discussion and for attendees to markup with site-specific safety concerns and opportuities.

Comments are summarized as follows:

- It is difficult to make a southbound left turn from Victoria Avenue onto Ruth Street. Sightlines could be improved by removing a tree on the northeast corner and increasing parking restrictions near the intersection.
  - Additionally, pedestrians and cyclists had a hard time crossing Ruth Street.
- Add curb extensions to improve pedestrian safety without compromising parking supply.
  - Attendees resistant to curb extentions were concerned that the burden of winter maintenance will fall to residents who may already struggle to clear their walk.
- Attendees appreciated the sidewalks installed at the south end of the project area and indicated that additional sidewalks are needed along the entire corridor.
- The crosswalk at Hilliard Street is used to access the Hilliard pedestrian overpass and Meewasin Valley trail system.
- Vehicle compliance is poor at signed pedestrian crossing locations (Hilliard Street and Isabella Street). Active pedestrian crossing control is desired.
- Victoria Avenue is a popular cycling route to access downtown and an all ages and abilities facility was popular among attendees. Some attendees requested neighbourhood bikeways, some attendees requested directional bike lanes, and some attendees requested bi-directional protected bike lanes.
- All ages and abilities infrastructure must not overlook the 'abilities' portion of AAA design.
- Cyclists struggle with detection at Taylor Street East traffic signals. Some attendees suggested that signal phases and detection specific to cyclists would be ideal.
- Attendees noted that the speed limit could be maintained at 50 km/hr if separated / protected cycling facilities were constructed.
- Driveway access and on-street parking should remain.
- Keep vegetation, especially privately planted vegetation, and increase planting opportunities.

Five attendees left feedback forms. Four attendees rated the event 'Great' on a scale of 'Poor (1)' to 'Great (5)' while one attendee rated the event neutrally.

The attendees who rated the event highly were supportive of sidewalks and all ages and abilities cycling infrastructure. The attendee who rated the event as 'neutral' did not favour walkable and bikeable improvements and expected information typically available later in the design process such as alternatives and cost estimates.

3. Next Steps

The project team will begin developing alternatives and incorporate the findings from the public survey and open house into the design and evaluation metrics. A second open house is planned to present the recommended alternative to the public.

A

Appendix A
Survey Questions

Connecting Victoria: Walking and Cycling Improvements

The City of Saskatoon (City), along with CIMA+, is exploring the opportunities and challenges for improving walking and cycling facilities along Victoria Avenue between Taylor Street and Ruth Street. The project aims to improve the accessibility, comfort, convenience, and safety of walking and cycling facilities.

This project is funded in part by the Government of Canada.

The study is in the early stages and the project team is currently working to gather feedback from property owners, members of the public and community groups. To help the study team better understand local uses and conditions for the corridor, kindly complete this survey by August 20, 2024.

1. What is your age range?

- ◯ Under 18
- ◯ 18-24 years
- ◯ 25-34 years
- ◯ 35-44 years
- ◯ 45-54 years
- ◯ 55-64 years
- ◯ 65-74 years
- ◯ 75 +

2. Do you live on Victoria Avenue between Taylor Street and Ruth Street?

- ◯ Yes
- ◯ No

3. What neighbourhood do you live in?

4. What mode of transportation do you use on Victoria Avenue and how often do you use it?

	Daily	Weekly	Monthly	Occasionally
Walking	◯	◯	◯	◯
Cycling	◯	◯	◯	◯
Driving	◯	◯	◯	◯
Micromobility (scooter, skateboard, etc)	◯	◯	◯	◯
Other	◯	◯	◯	◯

5. Why do you travel on Victoria Avenue? (select all that apply)

- ☐ To travel to work
- ☐ To travel to school
- ☐ To access shopping
- ☐ I live along the corridor
- ☐ To access the river
- ☐ To access Prairieland or Diefenbaker Park
- ☐ To access downtown
- ☐ I rarely travel on Victoria Avenue
- ☐ Other

6. What are the total number of cars in your household?

- ◯ 0
- ◯ 1
- ◯ 2
- ◯ 2+

7. Do you have any transportation safety concerns along Victoria Avenue between Taylor Street to Ruth Street? Please share your concerns and include the location where applicable.

8. What would you like to see improved for walking and cycling on Victoria Avenue from Taylor Street to Ruth Street?

9. What would you like to see remain the same on Victoria Avenue from Taylor Street to Ruth Street?

10. Do you have any other information you would like to share?

11. How did you hear about this survey opportunity?

- ◯ Flyer delivered to my home
- ◯ A friend/colleague notified me
- ◯ Social media
- ◯ City of Saskatoon Website
- ◯ Mini billboard
- ◯ Other

B

Appendix B
Open House Presentation Boards

saskatoon.ca/**engage**

Connecting Victoria Avenue

WALKING AND CYCLING IMPROVEMENTS

Saskatoon
TRANSPORTATION
MASTER PLAN

ABOUT THE PROJECT

- The City of Saskatoon is committed to developing a complete and connected network of walking and cycling facilities for people of all ages and abilities.
- To support this commitment, the City is exploring infrastructure improvements for people walking and cycling on Victoria Avenue from Taylor Street to Ruth Street.
- There is currently no funding available to construct any recommendations made through this project.
- This study is funded in part by the Government of Canada.

Saskatoon
TRANSPORTATION
MASTER PLAN

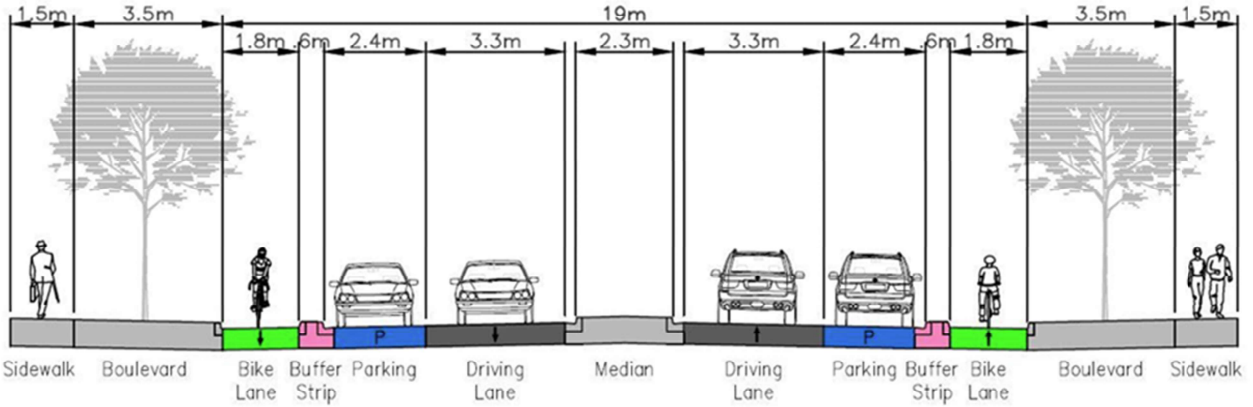
STUDY AREA MAP

Saskatoon
TRANSPORTATION
MASTER PLAN

CYCLING INFRASTRUCTURE ON VICTORIA AVENUE

NORTH OF THE STUDY LIMITS

- Traffic Bridge to 8th Street
  - Existing Raised Cycle Track, built in 2018.
- 8th Street to Taylor Street
  - Street Level Protected Bike Lane, approved by Council in 2021.
  - Construction is currently unfunded.
  - This project is included on the Prioritized Transportation Infrastructure Project List with a current ranking of 15.



Saskatoon TRANSPORTATION MASTER PLAN

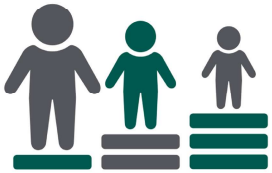
GENERAL DESIGN CONSIDERATIONS

Several key factors will be considered in planning and designing improvements for walking and cycling on Victoria Avenue, including:

Existing Active Transportation Network

Safety and comfort for all users

Public and stakeholder input



Equity and accessibility

Parking and driveway access

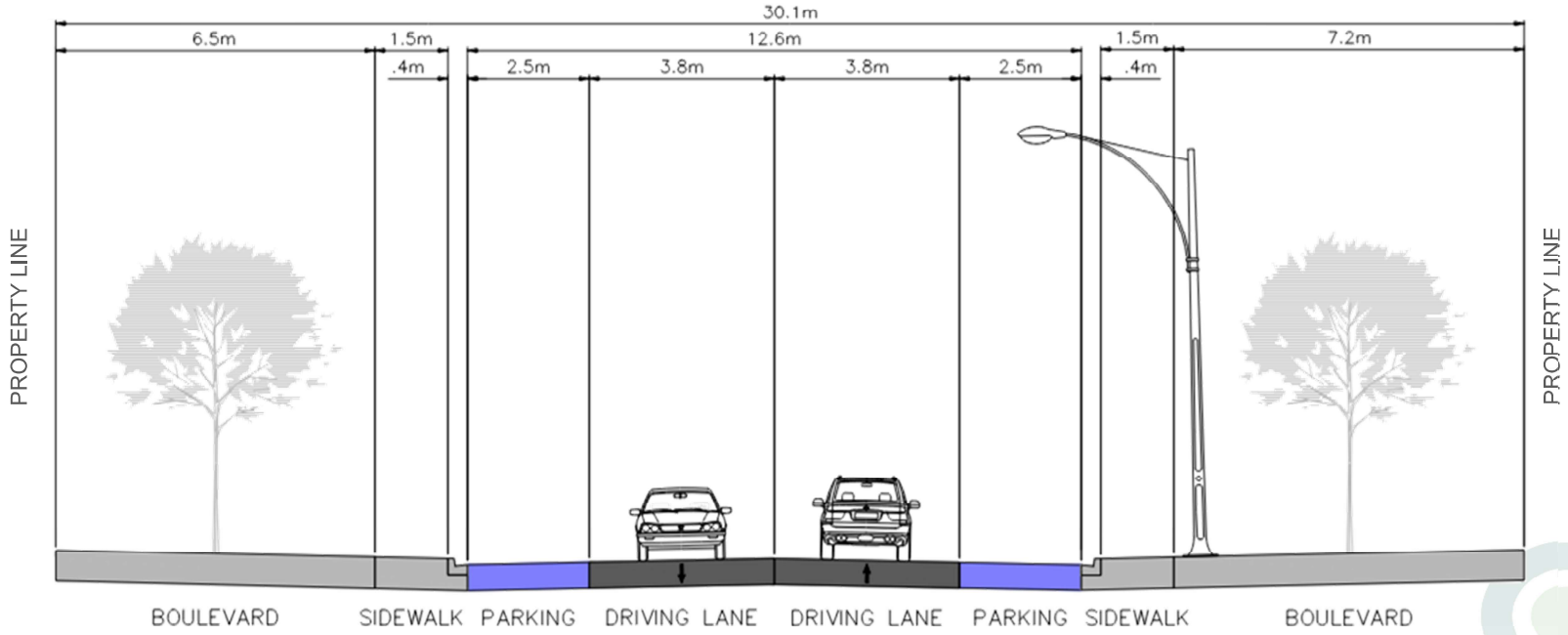
Traffic Operations

Snow clearing and maintenance

Environmental impacts

Saskatoon TRANSPORTATION MASTER PLAN

EXISTING ROAD CHARACTERISTICS



**Note – Some sections of the project corridor are currently missing sidewalks. Three blocks are already being addressed through the City's Sidewalk Infill Program while another three blocks will be addressed through this project.*

Saskatoon
TRANSPORTATION
MASTER PLAN

EXISTING ROAD CHARACTERISTICS

- The posted speed limit is 50 km/h.
- Traffic volumes range from 3,000 to 3,750 vehicles per day.
- Pedestrian crossings are installed at Isabella Street and Hilliard Street using signs and pavement markings.

EXISTING ROAD CHARACTERISTICS

Less than 20% of on-street parking spaces are regularly being used.

represent observed parking use over a typical 24-hour period.

Saskatoon TRANSPORTATION MASTER PLAN

WHAT IS AN ALL AGES AND ABILITIES FACILITY

- An All Ages and Abilities (AAA) cycling network serves users from ages 8 to 80 across diverse mobility levels.
- Ideally, the route should offer a practical cycling facility for those who are interested in cycling but may not be comfortable riding on busy streets with high traffic volumes and speeds.
- An AAA cycling network needs to be comfortable, continuous, and connected between destinations and neighbourhoods.

Multi-Use Paths

Neighbourhood Bikeways

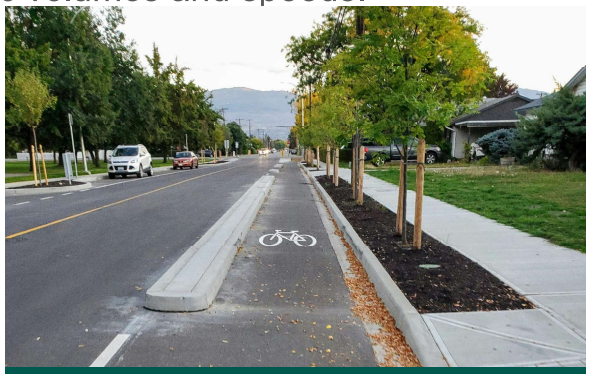
Protected Bike Lanes

Raised Cycle Tracks

Saskatoon TRANSPORTATION MASTER PLAN

POSSIBLE IMPROVEMENTS FOR CYCLING

Opportunities to improve cyclist safety and comfort for people of all ages and abilities. Ideally the route should offer a practical cycling facility for those who are interested in cycling but may not be comfortable riding on busy streets with high traffic volumes and speeds.



Protected Bike Lanes

Two-way Bike Lanes

Raised Cycle Track

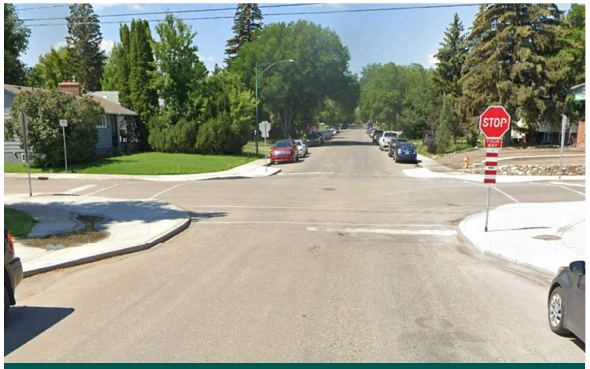
Neighbourhood Bikeways

Saskatoon TRANSPORTATION MASTER PLAN

POSSIBLE IMPROVEMENTS FOR WALKING

Opportunities to improve pedestrian safety and accessibility

Pedestrian Crossing Devices



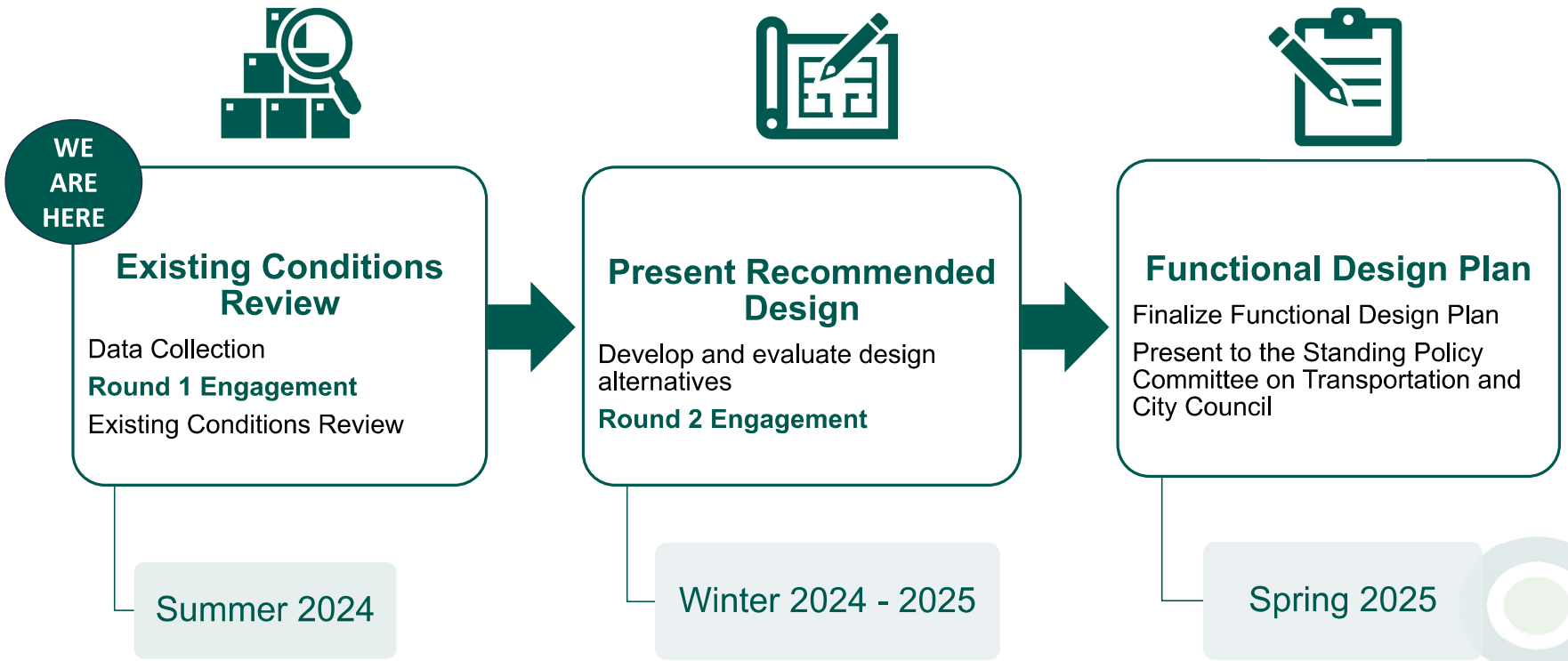
Curb Extensions

Accessibility Ramps

Sidewalks

Saskatoon TRANSPORTATION MASTER PLAN

PROJECT SCHEDULE AND SCOPE



Saskatoon TRANSPORTATION MASTER PLAN

SHARE YOUR FEEDBACK

What would you like to see improved on Victoria Avenue?	What would you like to see stay the same on Victoria Avenue?

HAVE YOUR SAY!

Feedback can be provided on the online survey, by **phone, email, or mail using the information below.**

Please complete the online survey before August 20, 2024

Saskatoon.ca /ConnectingVictoriaAve

306-975-2476

TransportationSurvey@saskatoon.ca

City of Saskatoon
Attn: Transportation & Construction – Connecting Victoria Avenue Project
222 3rd Avenue North, Saskatoon, SK S7K 0J5

On behalf of the Project Team, thank you for your attendance and participation!

Saskatoon TRANSPORTATION MASTER PLAN

C

Appendix C
Stakeholder List

TABLE 1- STAKEHOLDER IDENTIFICATION LIST

Stakeholder
Victoria Avenue Residents (along project corridor)
Queen Elizabeth Neighbourhood Residents
Saskatoon Cycles
Walking Saskatoon
City of Saskatoon Active Transportation Advisory Group
Queen Elizabeth Exhibition Haultain Community Association (QEXCA)
Avalon Community Association
Buena Vista Community Association
City of Saskatoon Roadway Operations Group
General Public
Saskatchewan Health Authority
Saskatoon Council on Aging
Queen Elizabeth School
Canadian National Institute for the Blind
St. Francis Cree School
The Navigators
SOS Trees

City of Saskatoon

Connecting Victoria Avenue

WHAT WE LEARNED REPORT

Round 2 – Public Engagement

City of Saskatoon

Connecting Victoria Avenue

WHAT WE LEARNED REPORT

Prepared by:

Ellen McLaughlin, P. Eng.

Verified by:

Adrien Blais, P. Eng.

Register of issues			
Issue No.	Reviewed by	Date	Description of the review
0	AB	2025-03-28	Draft Report
1	AB	2025-04-17	Revised Report
2	AB	2025-04-28	Final Report

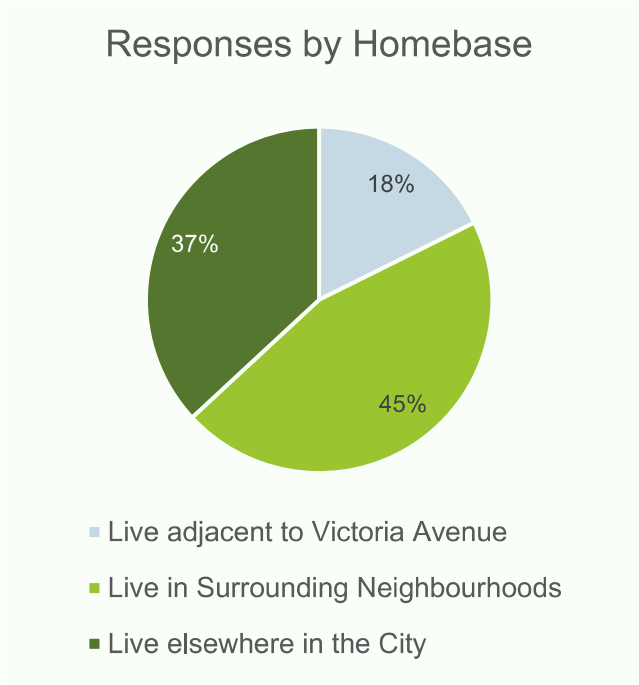
Confidentiality and ownership

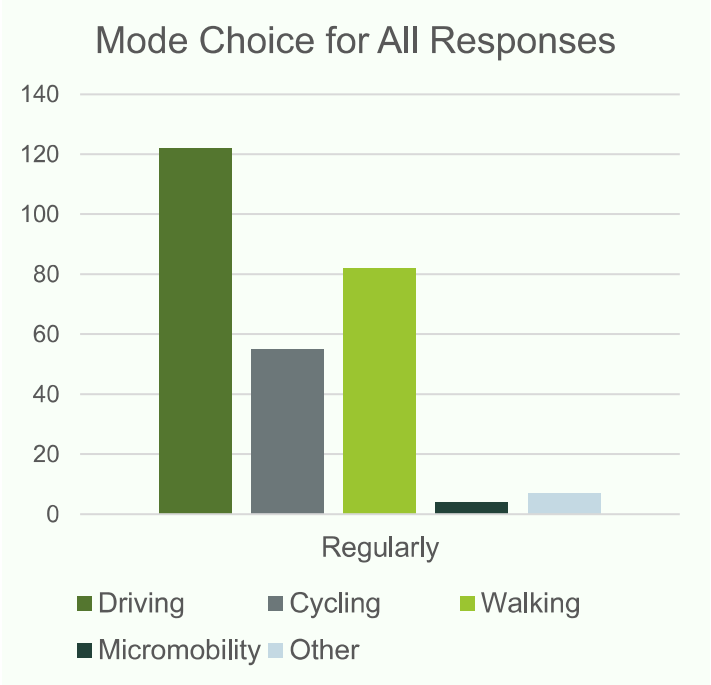
Executive Summary

Connecting Victoria Avenue is a functional planning study for walkable and bikeable infrastructure improvements on Victoria Avenue between Taylor Street East and Ruth Street in Saskatoon.

The project team has completed Round 2 of public engagement through an online survey and an open house to determine public feedback on the recommended design. Both engagement activities gathered information from participants on what they liked about the proposed changes and what they would like modified about the proposed changes.

The survey received 193 responses, predominantly originating from neighbourhoods near the project area (Queen Elizabeth, Buena Vista, Avalon, and Exhibition). Driving was the most common mode of travel from all respondents (63%); walking and cycling made up 28% and 42% of regular (daily and weekly) mode choice on the corridor, respectively.



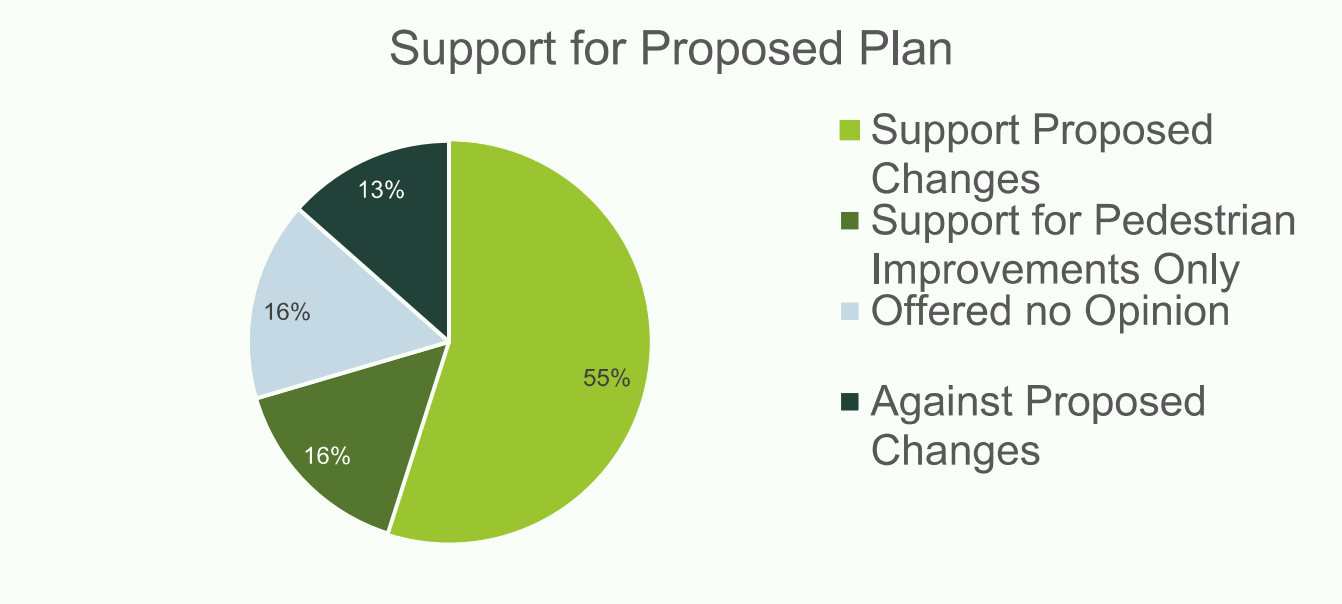


Respondents were presented with the preferred Victoria Avenue cross section and details of planned cycling, walking, and accessibility improvements then asked to provide comments and concerns. Common themes within the responses were broken down into two categories 1) level of support for the proposed plan and 2) targeted concerns the project team should address when presenting information to City Council or consider during detailed design.

Sentiment towards the proposed Victoria Avenue corridor plan can be grouped into four categories, whether respondents:

- Explicitly supported the proposed changes to walkable and bikeable infrastructure.
- Only supported improvements to walkable infrastructure.

- Provided no comments directly related to improvements, or whose comments did not clearly articulate their feelings towards the planned improvements. For example the following quote is neither explicit support or rejection of the proposed improvements "Snow removal. It doesn't get done now with road plows, I doubt separate [bike] lanes will improve that".
- Explicitly rejected a walkable and bikeable infrastructure (termed 'against').



Six targeted areas of concerns were frequently identified for further consideration in the detailed design process:

- Improve sightlines to crossing pedestrians and cyclists at intersections.
- Diverging opinions on parking retention. Notably only 4 of the 25 respondents who specifically mentioned parking retention lived on the corridor within study limits.
- A small number of respondents would prefer a cycling route on Eastlake Avenue, Melrose Avenue, or McPherson Avenue.
- Support for additional pedestrian and cyclist crossing control at the intersection of Victoria Avenue and Ruth Street indicates this item could be staged and prioritized.
- Winter maintenance of the bike lane, road, and sidewalks were core concerns for many.
- Of those who commented on optional curb extensions, opinion was split with a slight preference in favour of curb extensions. Continuous raised crosswalks were also requested by numerous individuals to improve vehicle yielding compliance.

The public open house drew 30 attendees. Feedback from the open house was similar to the feedback received from the survey. Option 1 – 1.8 m wide sidewalks, 2.2 m wide protected bike lanes, and 3.3 m wide traffic lanes with the removal of parking – was the technically and publicly preferred alternative. This option was the most intuitive and provided the best continuity with the future bike lanes on Victoria Avenue between Taylor Street East and 8th Street East.

One attendee who lived on the corridor was not in favour of parking removal but offered specific actions that could be taken to address their concerns.

Winter maintenance was a critical concern among Open House attendees. Attendees were concerned bike lanes would be unusable due to poor winter maintenance. The wide bike lanes were appealing to attendees as it provided additional room for snow clearing operations and storage.

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1. Background

1.1 Strategic Goals

The City of Saskatoon is committed to promoting active transportation and providing transportation choices that are safe and comfortable for people of all ages and abilities year-round. Saskatoon's Active Transportation Plan (2016) identified Victoria Avenue as a future all ages and abilities (AAA) cycling route. Victoria Avenue provides an important connection to existing and future walking and cycling facilities.

1.2 Summary of Engagement Strategy

Table 1.1: Summary of Engagement Strategy

Round	Participants	Level of Participation	Objective	Engagement Goal	Engagement Activity
1	Impacted Groups Internal Stakeholders Subject Matter Experts	Inform / Consult	Consult with the community, identify local knowledge on existing challenges and opportunities	Inform, consult and understand opportunities and challenges	Public Open House Online Survey Engage Page
2	Impacted Groups Internal Stakeholders Subject Matter Experts	Inform / Consult	Inform the community, demonstrate how Round 1 feedback influenced recommended design.	Close the loop	Public Open House Online Survey Engage Page

2. Engagement Activities

2.1 Round 2 – Online Survey

An online survey was prepared using the Microsoft Forms platform to help solicit feedback on public concerns and desires with the recommended design. The survey was open from February 18th, 2025, to March 21st, 2025 for a total of 35 days. The online survey had a total of 193 responses. Survey questions are provided in **Appendix A**.

2.1.1 Intended Audience

The online survey was developed to build a stronger understanding of user groups, general community concerns with the recommended design, and participant desires for future improvements.

2.1.2 Marketing Techniques

The survey was advertised on the City's Engage page website and through the City's social media channels. The engagement was advertised on the City's Facebook, X (Twitter), and Instagram pages with posts on February 19th, March 3rd, and March 12th.

Flyers were also distributed throughout the neighbourhoods surrounding the project area and a mini-billboard in Weaver Park adjacent to Ruth Street. The approximate limits of the flyer drop were from Lorne Avenue to Lansdowne Avenue as the east-west boundaries and Taylor Street East to Ruth Street East as the north-south boundaries. A total of 1,417 flyers were distributed throughout this area.

Specific stakeholders identified in **Appendix C** were also emailed directly to advise them of the project, online survey and open house.

2.1.3 Data Limitations

It should be noted that the survey was self-administered and non-random, and as such the results should not be considered statistically significant or representative of all residents in the City.

Various references in some respondent comments indicate they completed this survey for cycling improvements planned to the north of the study area on Victoria Avenue from 8th Street East to Taylor Street East. The exact number of respondents that completed the survey thinking it was meant for another project is unknown and may skew results. Examples of possible misinterpretation include respondents who:

- Referenced existing designs with a median and connections to Buena Vista Park, or
- Who identified cycling safety issues at the transition from the cycle track to mixed traffic lanes through the Victoria Avenue and 8th Street East intersection.

2.1.4 What We Learned

2.1.4.1 Demographics

Responses were received from 31 neighbourhoods around Saskatoon, the majority of which originated from neighbourhoods adjacent to the project corridor: Queen Elizabeth, Buena Vista, Exhibition, Avalon, Nutana, and Haultain. Responses by neighbourhood are illustrated in **Figure 2-1**.

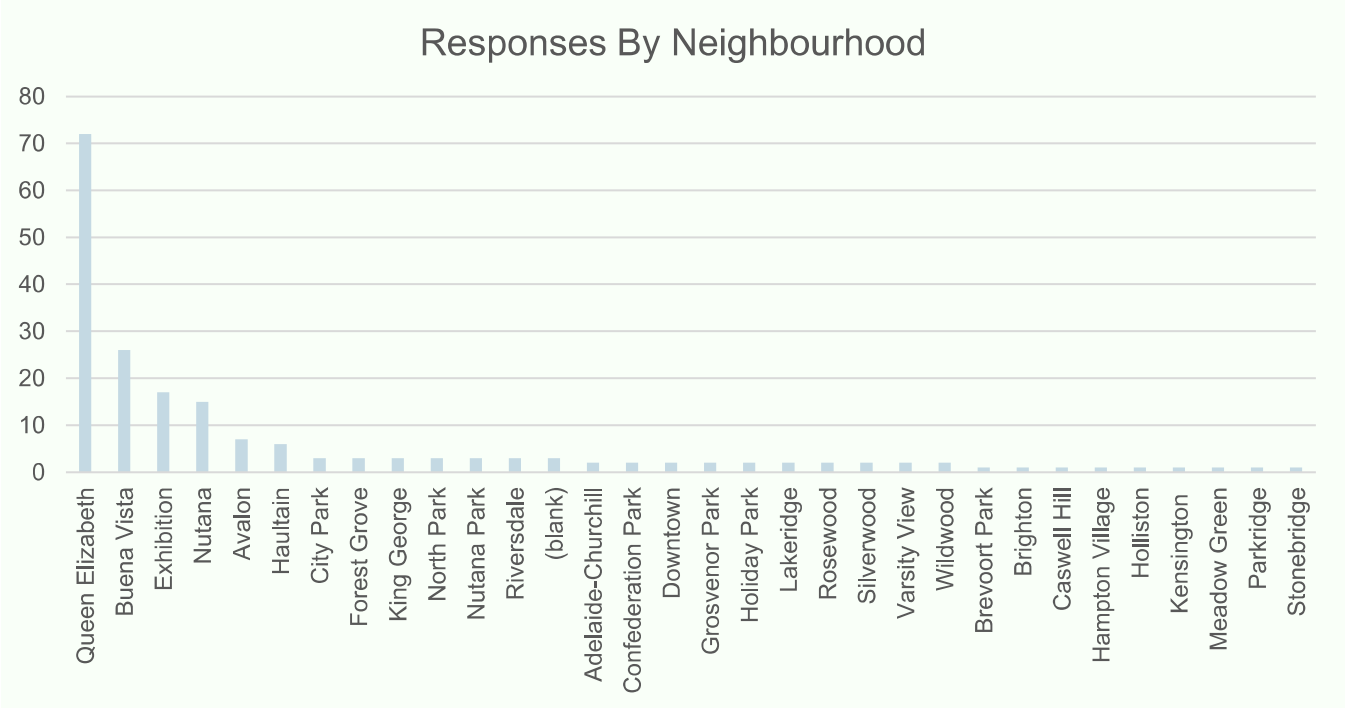


Figure 2-1 Responses by Neighbourhood

Later assessments compare responses by neighbourhood groups to determine if proximity shaped responses. Place was separated into respondents who lived on Victoria Avenue within the study area, those who lived within the surrounding neighbourhoods (Queen Elizabeth, Buena Vista, Exhibition, and Avalon), and those who lived elsewhere in the City.

Of the 193 responses, 18% lived along Victoria Avenue within the study area, 45% lived in nearby neighbourhoods, while the remaining 37% lived elsewhere in the City, illustrated in **Figure 2-2**.

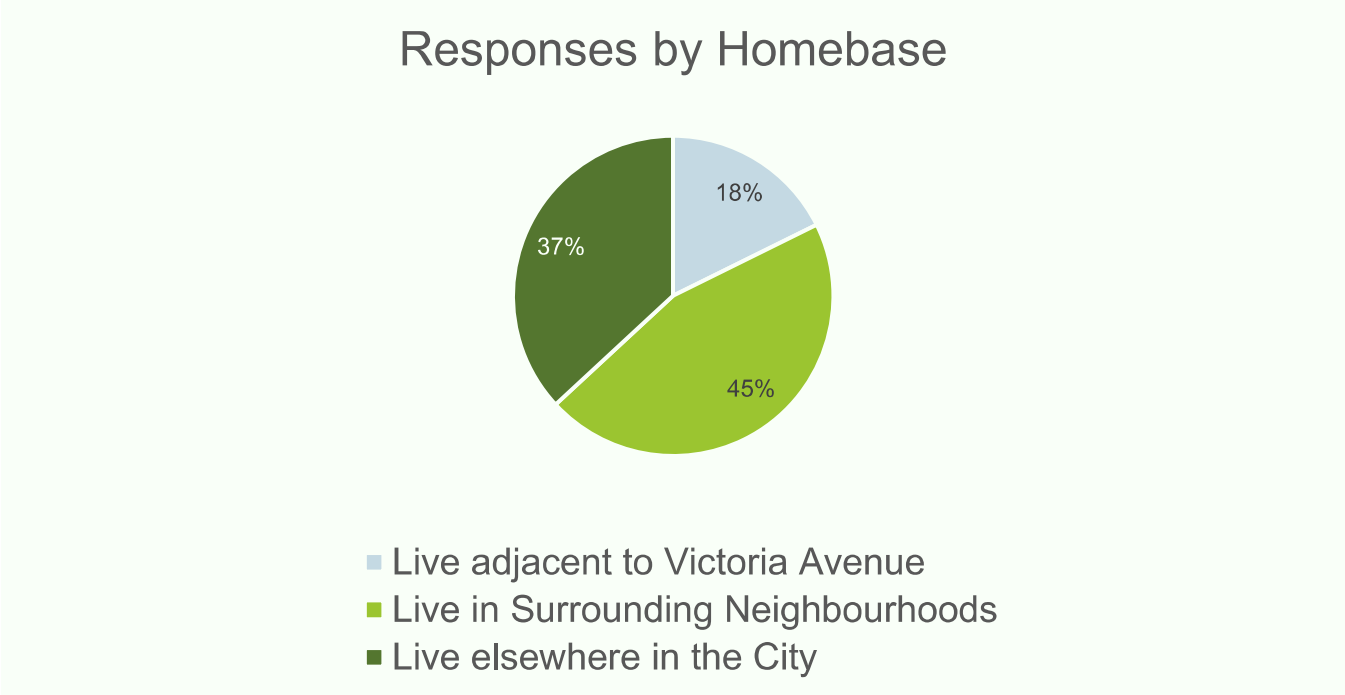


Figure 2-2 Responses by Homebase

Responses were received by residents of all ages, illustrated in **Figure 2-3**. The largest cohort were respondents aged 35 to 44.

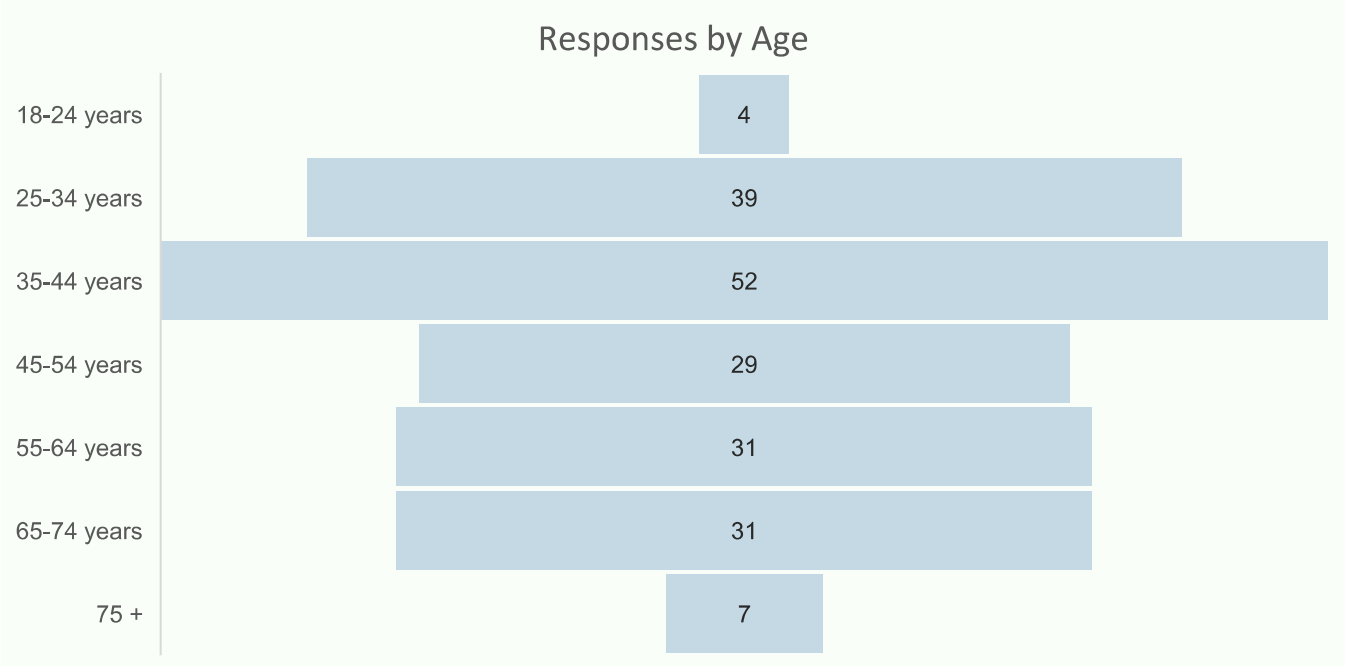


Figure 2-3 Responses by Age

Respondents were asked to indicate their mode choice – driving, cycling, walking, micromobility, and other – when travelling along Victoria Avenue by frequency of use – daily, weekly, monthly, occasionally, only in the summer, and never. Responses were grouped into regular use (daily and weekly), occasional use (monthly and occasional) and seasonal use (only in the summer), illustrated in **Figure 2-4**. Driving was the predominant mode choice among respondents (63%); however, 28% of respondents regularly biked and 42% regularly walked along the corridor. Because respondents could choose multiple modes of travel, responses to this question do not add up to 193.

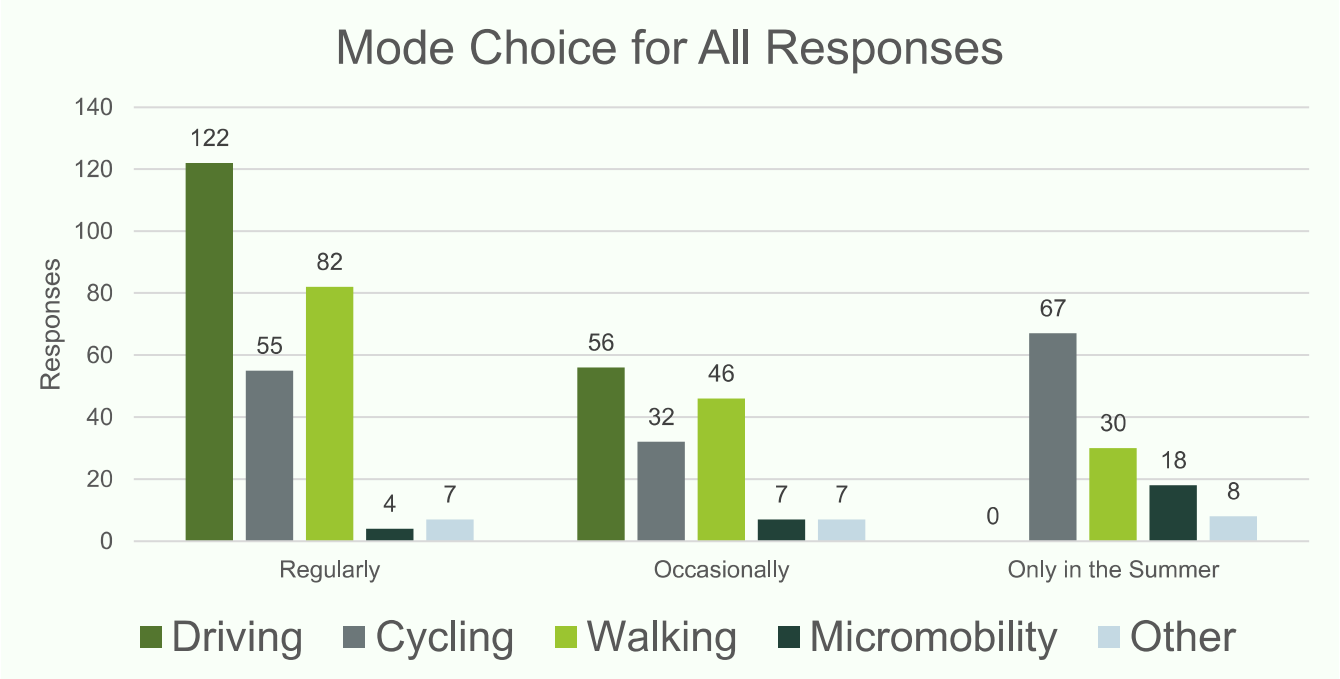


Figure 2-4 Mode Choice for all Respondents

2.1.4.2 Themes

Respondents were presented with the preferred Victoria Avenue cross section and details of planned cycling, walking, and accessibility improvements then asked to provide comments and concerns. Common themes within the responses were broken down into two categories 1) level of support for the proposed plan and 2) targeted concerns the project team should address when presenting information to City Council or consider during detailed design.

Sentiment towards the proposed Victoria Avenue corridor plan can be grouped into four categories, whether respondents:

- Explicitly supported the proposed changes to walkable and bikeable infrastructure.
- Only supported improvements to walkable infrastructure.

- Provided no comments directly related to improvements, or whose comments did not clearly articulate their feelings towards the planned improvements. For example the following quote is neither explicit support or rejection of the proposed improvements "Snow removal. It doesn't get done now with road plows, I doubt separate [bike] lanes will improve that".
- Explicitly rejected a walkable and bikeable infrastructure (termed 'against').

Sentiments towards the proposed Victoria Avenue corridor plan are illustrated in **Figure 2-5** for all respondents, **Figure 2-6** by responded homebase, and **Figure 2-7** by respondent primary mode choice.

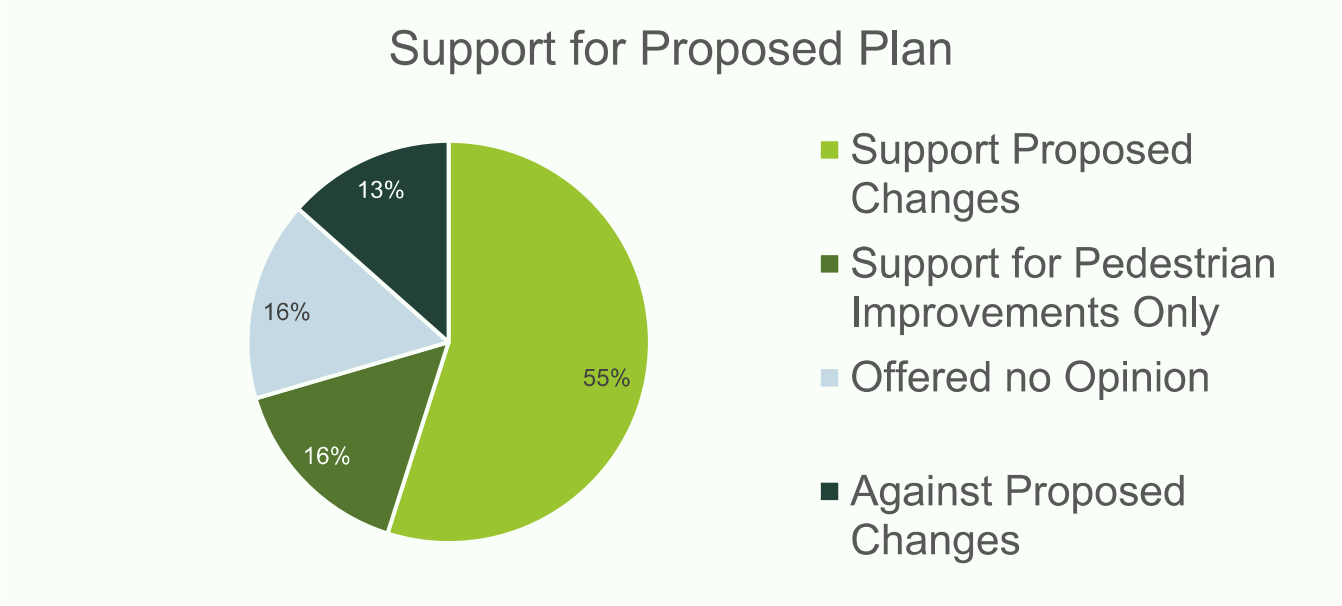


Figure 2-5 Support for Proposed Plan for all Respondents

The proposed cross section, consisting of 1.8 m wide sidewalks, 2.2 m wide buffered bike lanes, and 3.3 m wide travel lanes was explicitly supported by 55% of respondents while 16% of respondents would prefer only improvements to the pedestrian realm.

Approximately 16% of respondents did not offer any feedback on the proposed design or offered feedback that did not indicate a preference towards certain elements of the proposed design.

Of the 26 respondents (13%) opposed to changes to Victoria Avenue, most expressed concerns relating to cost, on-street parking or current cycling demand. This is discussed further in **Table 2.1.**

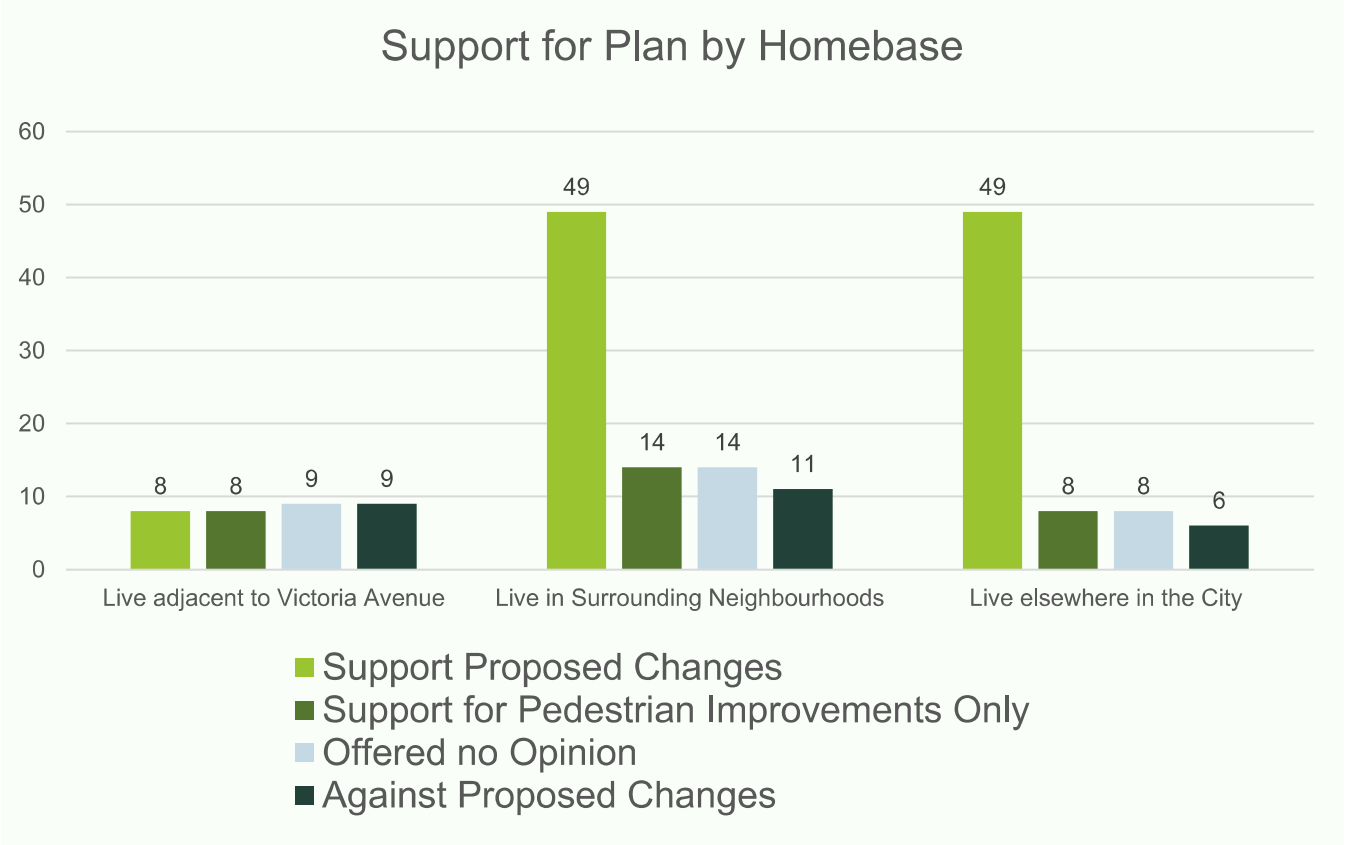


Figure 2-6 Support for Proposed Plan by Homebase

Respondents who lived directly on Victoria Avenue within the study area were most likely to oppose the proposed corridor plan. Conversely, the residents who lived on Victoria Avenue and supported the proposed corridor plan noted that these changes would allow their children to safely walk to school and that a loss in on-street parking was acceptable.

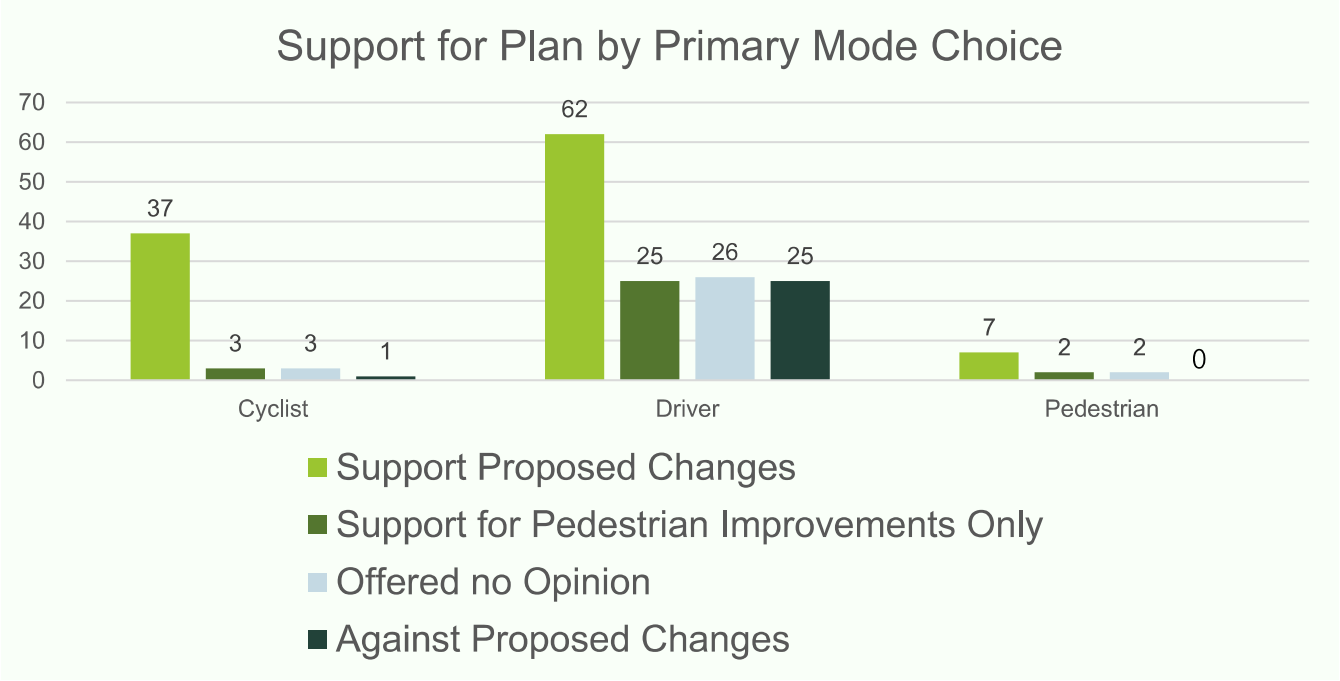


Figure 2-7 Support for Proposed Plan By Primary Mode Choice

Regardless of the respondents primary mode choice when travelling along Victoria Avenue, support for the proposed corridor plan continued to make up the majority survey feedback. Experience also plays a large role in responses as folks who never or rarely bike were much more likely to oppose investing in cycling infrastructure.

Fifty six respondents opposed the corridor plan or supported only improvements made to the pedestrian realm. Their reasons are grouped into four themes in shown in **Table 2.1**.

Table 2.1 Themes of Opposition

Theme	
Cost	Thirteen respondents cited cost as a factor, specifically a 'waste of tax payer money'.
Parking	Seventeen respondents cited changes to parking as a factor. Of the 17, two respondents lived on the corridor, ten respondents lived in adjacent neighbourhoods, and the remaining five lived elsewhere in the city.
Need	Eight respondents, often seasoned and confident cyclists, did not feel that protected bike lanes were warranted based on the currently available space and multi-modal traffic volumes.
General Opposition	Thirteen respondents opposed the idea of bike lanes, in any form and in any location.

In addition to general sentiment towards the proposed corridor plan, respondents voiced their concern or support for the following items:

- Numerous people noted that it is difficult to see pedestrians and cyclists at crosswalks because the drivers view is blocked by cars parked too close to the intersection.
- Respondents that supported the cycling improvements often noted their appreciation for – or the importance of – the physical barrier between vehicle and cycling spaces.
- Of the 25 respondents concerned with parking, only four lived on the corridor within the study limits.
- A minority of responses that identified as regular cyclists would prefer a cycling route on Eastlake Avenue, Melrose Avenue, or McPherson Avenue.
- Twenty three respondents explicitly supported active pedestrian and cycling crossing control at the intersection of Victoria Avenue and Ruth Street.
- Twenty five respondents were concerned that bike lanes would not be appropriately maintained through the winter.
- Optional curb extensions were presented to the public. Eleven respondents explicitly supported this traffic calming feature while eight felt that they were excessive given the low traffic volume on minor streets. At least four respondents requested continuous raised crosswalks across minor streets intersections to slow entering vehicles and prevent exiting vehicles from carelessly entering the crosswalk and bike lane.
- There were individual comments requesting street lighting appropriately designed to direct light towards the bike lane and opportunities to increase vegetation / trees along the corridor.

The public survey received some comments that were unrelated to Victoria Avenue but have been recorded here for posterity:

- One person has suggested converting Broadway Avenue into a pedestrian zone during Sundays similar to its treatment during the Fringe Festival. *"Please consider a pilot project of turning Broadway Avenue into a fully pedestrian zone now that the bridge will be closed this year. Like every 2nd Sunday or something. The business owners might be peeved but it'll help increase foot traffic (people buy stuff, NOT CARS!!!)"*
- There is no sidewalk on Lansdowne Avenue south of 8th Street. *"[These improvements are] very needed in the area as a lot of the north-south streets are not only lacking bike lanes but sidewalks as well. Most people have to walk in the streets which is silly concerting they are 99% roads. Lansdowne Avenue being the best example having a crosswalk that leads to no sidewalk south of 8th Street."*
- One person would like to see a complete cycling network along Circle Drive *"Need to build bike paths along Circle Drive connecting to Stonebridge, Greenbrier, Rosewood, and the Meadows. Make the paths like Calgary, more accessible to get around the City on bikes or walking/running."*

- Traffic calming is desired on Eastlake Avenue through the school zone. *"I am not opposed to [these improvements]. However, some car traffic will go to Eastlake Avenue. Eastlake Avenue has a school zone that is constantly sped through. Speed bumps or [similar] should be installed."*
- Traffic calming is desired on Adelaide Street *"I live on Adelaide Street which has western access to [Idylwyld Drive] so I find traffic can be fast and intense on this family street at times. A possible road bump or indentation might slow the traffic to a neighborhood speed."*

2.2 Round 2 - Open House

A come-and-go format open house was hosted on Wednesday March 5, 2025, from 6:00 pm to 8:00 pm at the Aden Bowman Collegiate to solicit feedback on public concerns and desires with the project corridor. Thirty members of the public attended the session. Open House boards are provided in **Appendix B**.

2.2.1 Intended Audience

The Open House was planned as an opportunity for targeted stakeholder groups and the general community to attend an in-person event and have the opportunity to articulate concerns and desires for the project corridor. Display boards included information on the project background, a summary of Round 1 engagement, cycling facility options, pedestrian improvements, a summary of the evaluation criteria and results, and the preferred cycling facility option.

The Open House also served as an opportunity for individuals with the inability to access internet information or who are unfamiliar with technology to engage with the project team and provide feedback in person.

2.2.2 Marketing Techniques

The Open House was advertised on the City's Engage page website and through the City's social media channels. The engagement was advertised on the City's Facebook, X (Twitter), and Instagram pages with posts on February 19th and March 3rd.

A mini billboard was placed in Weaver Park near Ruth Street to promote the engagement activities. Flyers were distributed throughout the neighbourhoods surrounding the project area. The approximate limits of the flyer drop were from Lorne Avenue to Lansdowne Avenue as the east-west boundaries and Taylor Street East to Ruth Street East as the north-south boundaries. A total of 1,417 flyers were distributed throughout this area.

Specific stakeholders identified in **Appendix C** were also emailed directly to advise them of the project, the Open House, and the online survey.

2.2.3 What We Learned

Attendees were presented with a series of boards documenting the study location, options development, evaluation, and recommended cycling facility. Attendees were asked to provide their thoughts on what they liked about the proposed changes and what they thought should be modified with the proposed changes. A roll plan of the corridor was provided to support discussion and for attendees to markup with site-specific safety concerns and opportunities.

Comments are summarized as follows:

- Option 1 (One-way Protected Bike Lanes) was the technically preferred alternative. This option was also preferred by the public as it was the most intuitive and provided continuity with the existing bike lanes on Victoria Avenue north of 8th Street East and the planned bike lanes between 8th Street East and Taylor Street East. Though not universal, the majority of attendees supported the removal of on-street parking on Victoria Avenue for the sake of a protected cycling facility and sidewalks.
- Option 2 (Two-way Protected Bike Lane) was not preferred by the public as it forced cyclists to switch which side of the road they travelled on. Switching between one- and two-way facilities was thought to be less safe and less effective.
- Option 3 (Neighbourhood Bikeway) was not preferred by the public. The need to reduce the posted speed limit was not popular and attendees did not feel this option provided adequate protection for cyclists.
- Snow clearing through the protected bike lane (both one- and two-way options) was the top concern. Attendees were concerned that the bike lanes would not be useable during the winter months if they were not properly maintained.
- Common to all options, the installation of sidewalk along the entire corridor length was valued.

A NOTE: Attendees weren't concerned that bike lanes would go unused in the winter, they were concerned bike lanes would be unusable due to poor winter maintenance. The wide bike lanes were appealing to attendees as it provided additional room for snow clearing operations and storage.

Location specific comments include:

- An optional four-way stop was discussed at Adelaide Street as a traffic calming measure tied to the potential AAA neighbourhood bikeway on this street. A mini roundabout was suggested as an alternative to the four-way stop.
- The addition of a marked pedestrian crossing at Adelaide Street was valued by the public.
- Optional curb extensions were valued by the public, comments ranged from 'good' to 'excellent'. Attendees would like to see additional planting and greenery in these spaces.
- The pedestrian and cyclist crossing control at Victoria Avenue and Ruth Street was highly valued by attendees.

- At least one attendee suggested embedded markings or coloured pavement where the bike lane crosses an intersection as traditional pavement marking wear off too quickly and can be obscured by snow coverage.
- One attendee who lived on the corridor was not in favour of parking removal but offered specific actions that could be taken to address their concerns.

Seven attendees left feedback forms. All seven attendees rated the event 'Good' on a scale of 'Poor (1)' to 'Good (3)'.

Of the attendees who submitted feedback forms, 2 attendees were explicitly in support of Option 1 – One Way Protected Bike Lanes, 1 attendee was explicitly opposed to the project, and 4 attendees left what could be referred to as neutral comments.

2.3 Emails From Public

A total of three emails were received by the City of Saskatoon Transportation group.

One email was directed to Ward 7 Councillor Kelleher; the citizen had some questions regarding active transportation project prioritization. The citizen attributed $8 Million (erroneously) to the Connecting Victoria Avenue project and would prefer to see this money used to address major physical barriers to cycling connectivity.

The other two emails referenced or sought clarification on the Council approved-in-principle pedestrian improvements and on-street protected bike lanes planned on Victoria Avenue from 8th Street East to Taylor Street East.

3. Next Steps

Option 1 (One-way Protected Bike Lanes) is considered the preferred technical option and received strong public support amongst those who participated in the public engagement. The project team will make note of action items brought forward by the public that should be considered when detailed design commences. Option 1 will be presented to the Standing Policy Committee on Transportation and City Council for approval.

A

Appendix A
Survey Questions

Connecting Victoria: Walking and Cycling Improvements - Round 2 Engagement

The City of Saskatoon (City), along with CIMA+, have developed a functional plan for improving walking and cycling facilities along Victoria Avenue between Taylor Street East and Ruth Street. The project aims to improve the accessibility, comfort, convenience, and safety of walking and cycling facilities.

People shared opportunities and challenges for walking and cycling along Victoria Avenue in July 2024 that we considered while developing the recommended design. Thank you to everyone who has provided input so far. The recommended design for Victoria Avenue is now available for your feedback and we'd love to hear what you think. Your feedback will assist with finalizing the recommended design.

To help the study team better understand any concerns there may be with the proposed

1

What is your age range?

- ◯ Under 18
- ◯ 18-24 years
- ◯ 25-34 years
- ◯ 35-44 years
- ◯ 45-54 years
- ◯ 55-64 years
- ◯ 65-74 years
- ◯ 75 +

2

Do you live on Victoria Avenue between Taylor Street East and Ruth Street?

- ◯ Yes
- ◯ No

3

What neighbourhood do you live in?

4

What mode of transportation do you use on Victoria Avenue and how often do you use it?

	Daily	Weekly	Monthly	Occasionally	Never	Only in the summer
Walking	◯	◯	◯	◯	◯	◯
Cycling	◯	◯	◯	◯	◯	◯
Driving	◯	◯	◯	◯	◯	◯
Micromobility (scooter, skateboard, etc)	◯	◯	◯	◯	◯	◯
Other	◯	◯	◯	◯	◯	◯

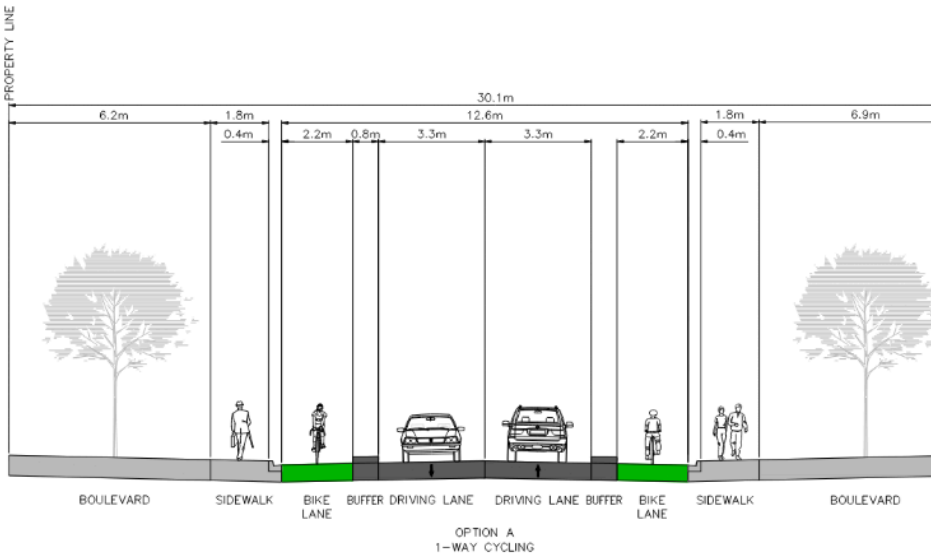
5

The proposed design cross section includes: 1.8 m wide sidewalks on both sides of Victoria Avenue, 2.2 m wide protected bike lanes on both sides of Victoria Avenue, and 3.3 m wide driving lanes. (Refer to image below)

Key design elements include:

- Separate bike lanes for each direction on each side of the roadway.
- A physical barrier between vulnerable road users and vehicles.
- Current speed limit is maintained.
- Protected intersection design proposed for intersection of Taylor Street East and Victoria Avenue.
- Requires removal of on-street parking along Victoria Avenue.
- Driveways and alleys onto Victoria Avenue are not affected.
- Provides continuity with approved bike lane design north of Taylor Street East.
- Incorporates the recently constructed sidewalk on Victoria Avenue between Elm Street and Ruth Street.

Please share any comments or concerns you may have with this design.



6

The following walking and accessibility improvements are planned for this project:

- 1.8 m wide sidewalks and accessibility ramps are proposed through the project corridor in locations where none currently exist.
- Standard crosswalks for crossing Victoria Avenue at Isabella Street, Hilliard Street, and Adelaide Street.
- Optional curb extensions across Isabella Street and Hilliard Street. The decision to include them will be dependent on feedback received during this round of public engagement.
- Pedestrian activated traffic signal at the intersection of Ruth Street and Victoria Avenue.

Please share any comments or concerns you may have with this design.

7

Do you have any other information you would like to share?

8

How did you hear about this survey opportunity?

- ◯ Flyer delivered to my home
- ◯ A friend/colleague notified me
- ◯ Social media
- ◯ City of Saskatoon Website
- ◯ Mini billboard
- ◯ Other

9

What did you think of the survey?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The information was clear and easy to understand.	◯	◯	◯	◯	◯
I was able to provide my opinion fully.	◯	◯	◯	◯	◯
I understand how my input will be used.	◯	◯	◯	◯	◯
It took a reasonable time to complete.	◯	◯	◯	◯	◯

B

Appendix B
Open House Presentation Boards

saskatoon.ca/**engage**

Connecting Victoria Avenue

WALKING AND CYCLING IMPROVEMENTS

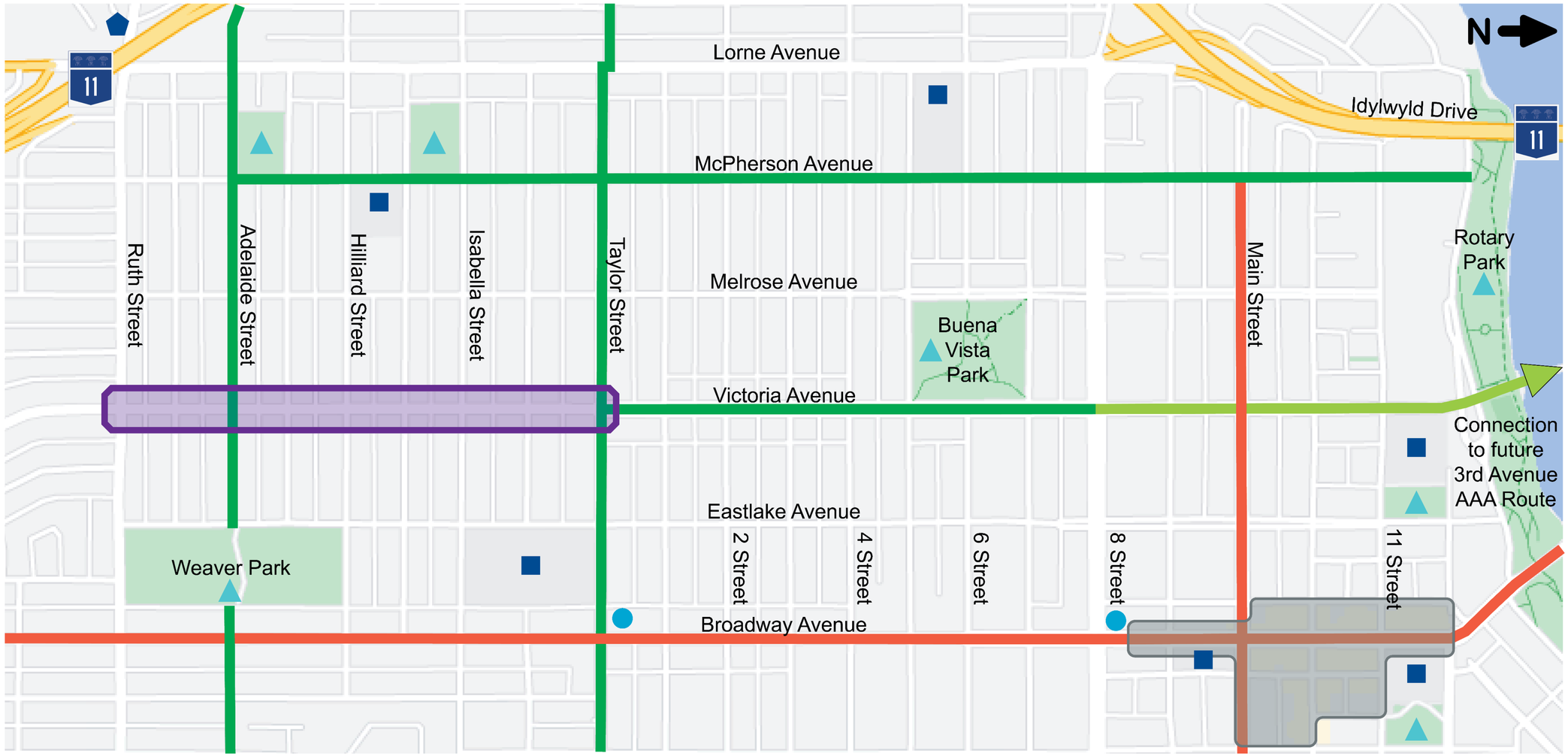
Saskatoon
TRANSPORTATION
MASTER PLAN

ABOUT THE PROJECT

- The City of Saskatoon is committed to developing a complete and connected network of walking and cycling facilities for people of all ages and abilities.
- To support this commitment, the City is exploring infrastructure improvements for people walking and cycling on Victoria Avenue from Taylor Street to Ruth Street.
- There is currently no funding available to construct any recommendations made through this project.
- This study is funded in part by the Government of Canada.

Saskatoon
TRANSPORTATION
MASTER PLAN

STUDY AREA MAP



Saskatoon
TRANSPORTATION
MASTER PLAN

PROJECT SCHEDULE AND SCOPE

Existing Conditions Review

Data Collection

Round 1 Engagement

Existing Conditions Review

Summer 2024

WE ARE HERE

Present Recommended Design

Develop and evaluate design options

Round 2 Engagement

Winter 2025

Functional Design Plan

Finalize Functional Design Plan

Present to the Standing Policy Committee on Transportation and City Council

Spring 2025

Saskatoon TRANSPORTATION MASTER PLAN

SUMMARY OF ROUND 1 ENGAGEMENT

Based on 228 survey responses, feedback from the open house (17 attendees), and email correspondence, the following themes were highlighted:

Support for Active Transportation Facilities

- Many respondents explicitly requested cycling and sidewalk improvements.
- Few respondents were indifferent or did not support proposed improvements.

Specific Targeted Priorities

- Concerns about speeding along Victoria Avenue.
- Comments on under-utilized on-street parking vs. a desire to maintain on-street parking and driveway accesses.
- Concerns about tree removal.
- A desire for improvement in pedestrian crossing control.
- A review of traffic control at the intersection of Victoria Avenue and Ruth Street.

WALKING AND ACCESSIBILITY IMPROVEMENTS

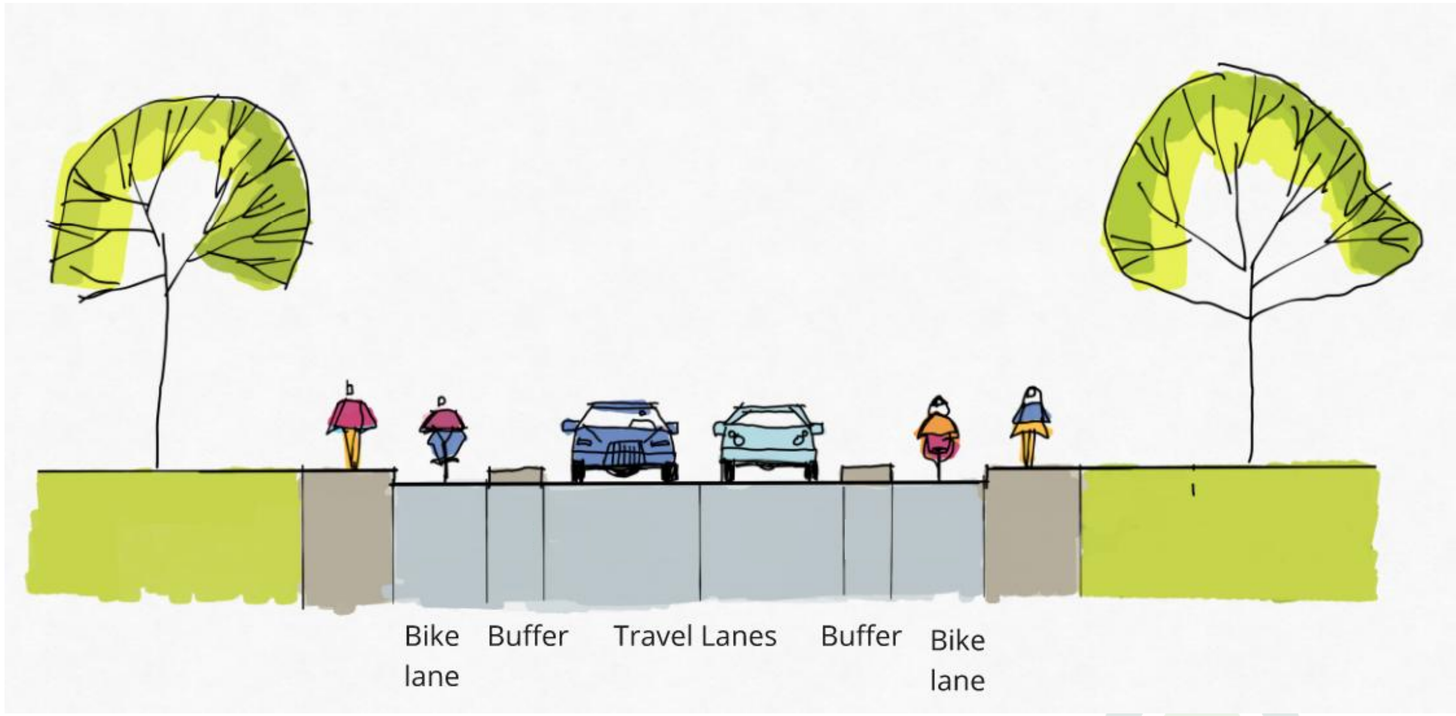
- Sidewalks and pedestrian ramps are proposed throughout the project corridor where none currently exist.
- Standard crosswalks at Isabella Street, Hilliard Street (existing) and Adelaide Street (new).
- Pedestrian and cyclist activated traffic signal to cross Ruth Street on Victoria Avenue.
- Optional curb extensions across Isabella Street and Hilliard Street. The decision to include them will be dependant on feedback received during this round of public engagement.

Saskatoon
TRANSPORTATION
MASTER PLAN

CYCLING FACILITY OPTIONS

Option 1 – One-Way Protected Bike Lane

- Sidewalk on both sides of the street.
- Separate bike lanes in each direction of travel.
- Physical barrier between vulnerable road users and vehicles.
- On-street parking will be removed.



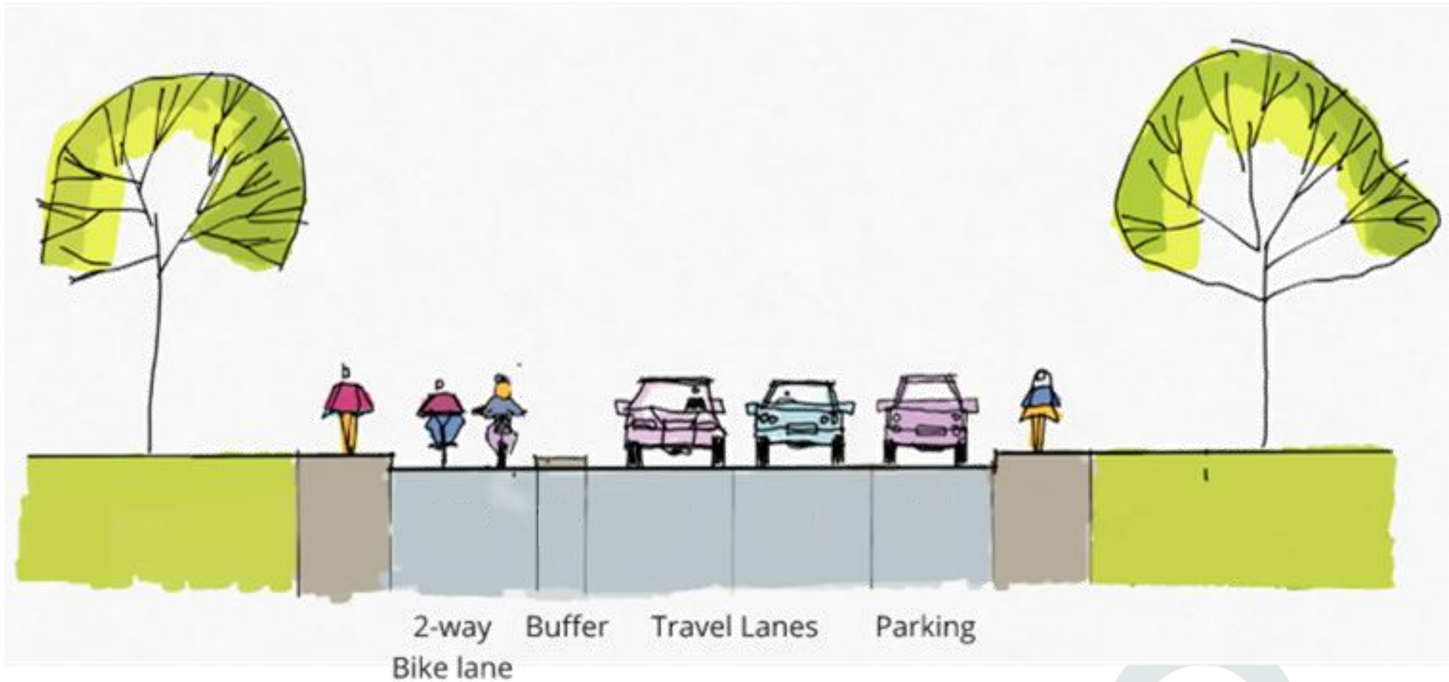
$3.1 Million

Saskatoon TRANSPORTATION MASTER PLAN

CYCLING FACILITY OPTIONS

Option 2 – Two-Way Protected Bike Lane

- Sidewalk on both sides of the street.
- Bike lanes for each direction of travel provided on west side of the street.
- Physical barrier between vulnerable road users and vehicles.
- On-street parking retained on west side of the street.



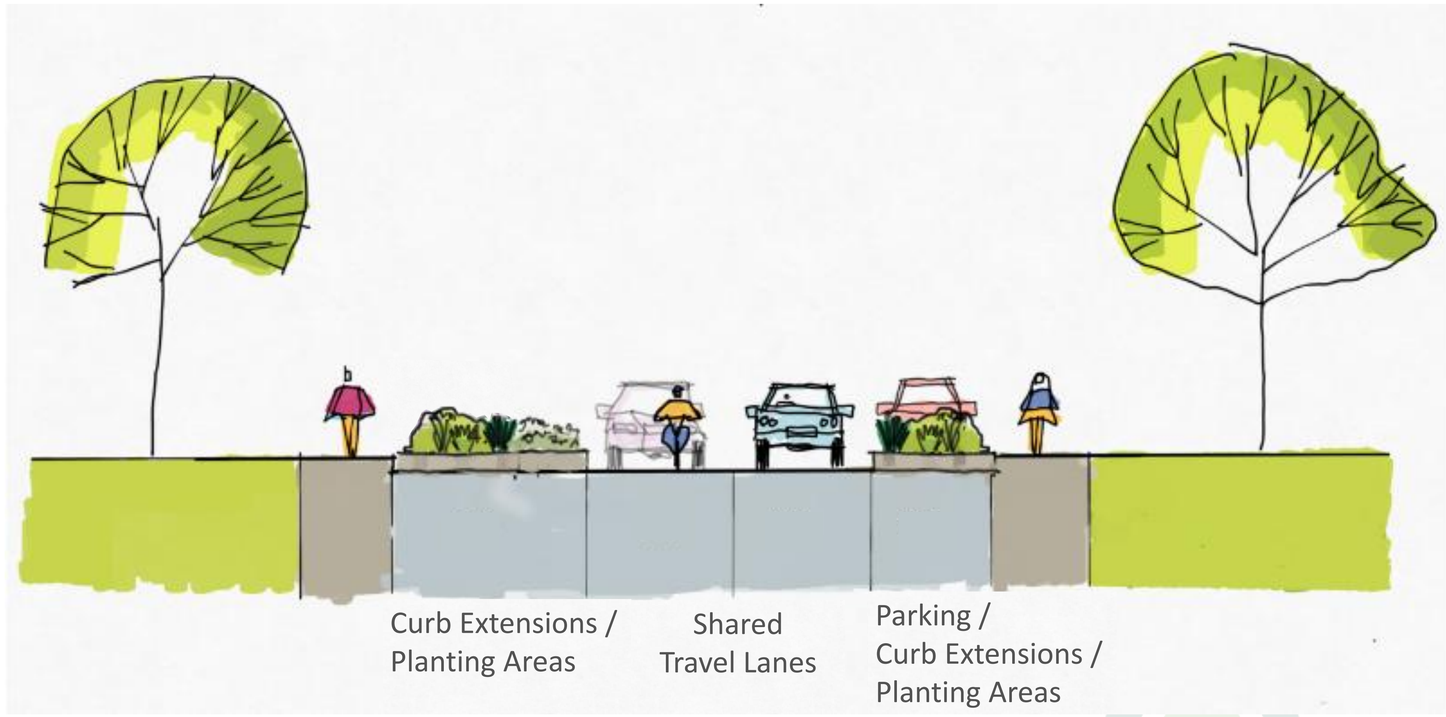
$2.3 Million

Saskatoon TRANSPORTATION MASTER PLAN

CYCLING FACILITY OPTIONS

Option 3 – Neighbourhood Bikeway

- Sidewalk on both sides of the street.
- Reduced posted speed limit.
- Traffic calming and vehicle turning restrictions necessary to reduce vehicle operating speeds.
- Bikes share space with motor vehicles.
- On-street parking will be reduced at locations with traffic calming measures.



$1.6 Million

Saskatoon TRANSPORTATION MASTER PLAN

EVALUATION CRITERIA

Each option was evaluated based on technical requirements and community feedback from the first round of engagement.

Safety and Security

- What is the exposure to potential collisions?
- How safe and comfortable is the facility?
- Is the facility recognizable and intuitive to use?
- Will pedestrians, cyclists, and drivers follow the intended use of the space?

Community Context

- What is the impact to parking and loading zones?
- How does the option impact broader transportation network operations?
- Will this option meet the needs and expectations from public and stakeholder feedback?

Accessibility

- How does the option address barriers to people of all ages and abilities?
- Is the option accessible year-round?

Cost and Constructability

- How easily can the option be built and implemented?
- What are the operational costs?
- What are the capital costs?

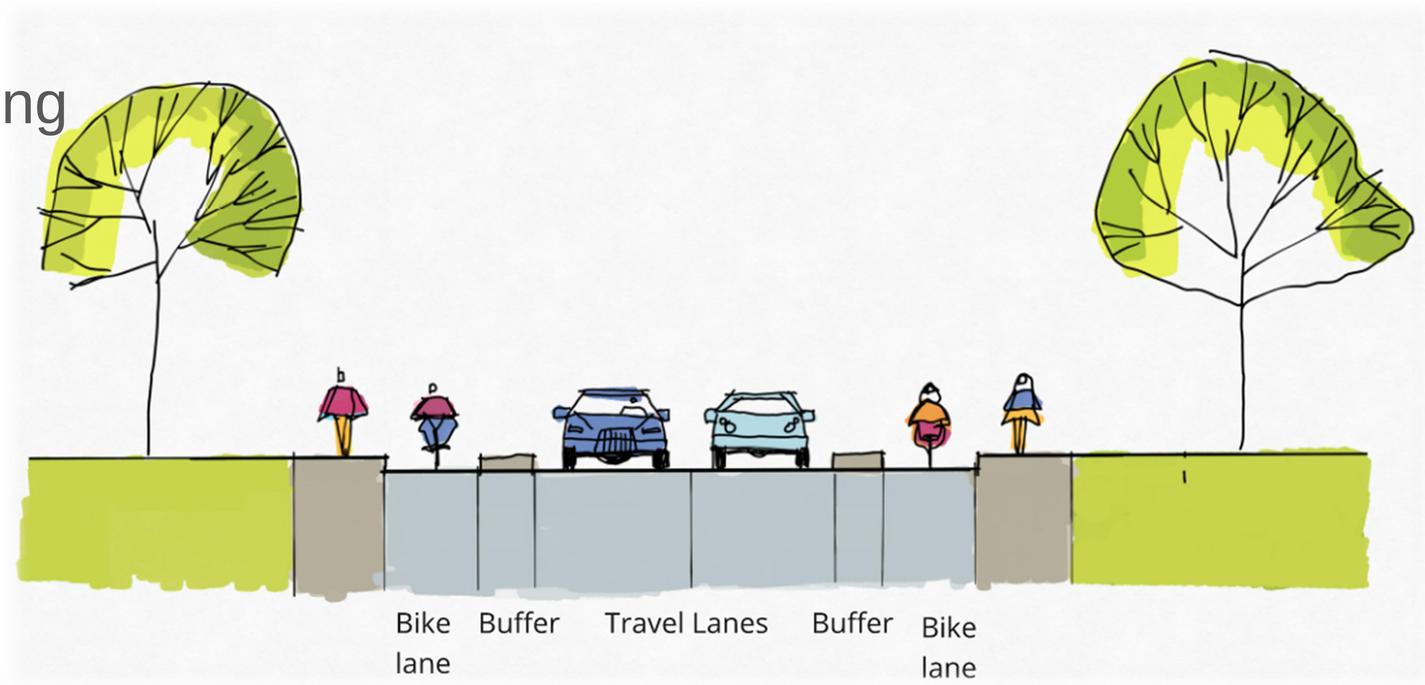
EVALUATION RESULTS

	Option 1 One-Way Protected Facility	Option 2 Two-Way Protected Facility	Option 3 Neighbourhood Bikeway
Safety and Security	• Physically protected cycling facility. • Ties into planned one-way protected bike lanes north of Taylor Street East.	• Physically protected cycling facility. • Cyclists need to navigate from one-way to two-way facility at Taylor Street East. • Drivers may not expect cyclists approaching from both directions.	• Drivers and cyclist of all ages and abilities expected to share the road. • Need to reduce vehicle volumes and speeds to create comfortable environment.
Community Context	• All on-street parking is removed. Current parking demand is very low. Driveways and alleys are not affected.	• On-street parking is retained on the west side of street. Driveways and alleys are not affected.	• On-street parking is maintained except at locations with traffic calming measures. • Commuter traffic would be diverted off Victoria Ave. at Ruth Street and Taylor Street East.
Accessibility	• Bike lanes receive snow clearing within 48 hours of a snowfall event. • Some snow storage in buffer between vehicles and cyclists.	• Bike lanes receive snow clearing within 48 hours of a snowfall event. • Some snow storage in buffer between vehicles and cyclists.	• Neighbourhood bikeways do not receive snow clearing priority. • Easier to navigate for people with physical disabilities or visual impairments.
Cost and Constructability	• Most costly option • Requires the use of specialized equipment to clear snow and debris.	• Moderately costly option • Requires the use of specialized equipment to clear snow and debris.	• Least costly option • Other roads may require investments to accommodate diverted traffic.

PREFERRED FACILITY – ONE-WAY BIKE LANE

Advantages:

- Meets technical requirements.
- Integrates well with planned cycling facilities on Victoria Avenue between 8th Street East and Taylor Street East.
- Intuitive to navigate compared to two-way bike lane.
- Private driveways are unaffected.



Drawbacks:

- On-street parking removed from Victoria Avenue. Residents will be required to use side streets and private driveways for parking.

SHARE YOUR FEEDBACK

What do you like about the proposed changes on Victoria Avenue?	What would you like modified about the proposed changes on Victoria Avenue?

HAVE YOUR SAY!

Feedback can be provided in person, online, or by **phone, email or mail using the information below.**

Please complete the online survey before March 21, 2025

Saskatoon.ca /ConnectingVictoriaAve

306-975-2476

City of Saskatoon
Attn: Transportation & Construction – Connecting Victoria Avenue Project
222 3rd Avenue North, Saskatoon, SK S7K 0J5

TransportationSurvey@saskatoon.ca

On behalf of the Project Team, thank you for your attendance and participation!

Saskatoon TRANSPORTATION MASTER PLAN

C

Appendix C
Stakeholder List

TABLE 1- STAKEHOLDER IDENTIFICATION LIST

Stakeholder
Victoria Avenue Residents (along project corridor)
Queen Elizabeth Neighbourhood Residents
Saskatoon Cycles
Walking Saskatoon
City of Saskatoon Active Transportation Advisory Group
Queen Elizabeth Exhibition Haultain Community Association (QEXCA)
Avalon Community Association
Buena Vista Community Association
City of Saskatoon Roadway Operations Group
General Public
Saskatchewan Health Authority
Saskatoon Council on Aging
Queen Elizabeth School
Canadian National Institute for the Blind
St. Francis Cree School
The Navigators
SOS Trees