PUBLIC AGENDA
TRAFFIC SAFETY COMMITTEE

Tuesday, January 9, 2018, 8:45 a.m.
Committee Room E, Ground Floor, City Hall
Members

Councillor S. Gersher
Mr. A. Anwar
Mr. J. Chan
Mr. K. Claffey
Mr. D. Cook
Mr. W. Gherasim
Mr. B. Girling
Sergeant D. Hoover
Ms. C. Janzen
Mr. A. Kamboh
Mr. A. Reichert
Mr. S. Shannon

Pages

1. CALL TO ORDER

1.1 Appointment of Chair and Vice Chair [File No. CK 225-8]

The Committee is requested to appoint a Chair and Vice Chair for 2018. Cora Janzen was Chair for 2017 and Carl Kuhnke was Vice Chair until August 2017 when he resigned from the Committee.

Recommendation
That the Traffic Safety Committee appoint a Chair and Vice Chair for 2018.

1.2 2018 Membership - Traffic Safety Committee [File No. CK 225-8]

City Council, at its meeting held on November 20, 2017, adopted a recommendation of its Governance and Priorities Committee that the following be appointed and reappointed to the Traffic Safety Committee for the terms indicated:

For 2018:

Councillor S. Gersher

To the end of 2019:

Mr. Ammad Anwar, Public representative

Mr. Ken Claffey, Board of Education, Saskatoon Public Schools - Driver Education

Mr. Al Reichert, Saskatoon and District Safety Council

Mr. Steve Shannon, Board of Education, Saskatoon Public Schools - School Community Council Assembly

The following were previously appointed by City Council to the end of 2018:

Mr. David Cook, Public representative

Mr. Warren Gherasim, Public representative

Mr. Ahsan Kamboh, Public representative

Mr. Brock Girling, Saskatchewan Trucking Association

Ms. Cora Janzen, Saskatchewan Health Authority

Mr. Joseph Chan, SGI - Traffic Safety Promotion Division

Sergeant Dean Hoover, Saskatoon Police Service

Recommendation
That the information be received.

1.3 Committee Process [File No. CK 225-8]

Deputy City Clerk Bryant will be in attendance to provide an overview of Committee process.

Recommendation
That the information be received.

2. CONFIRMATION OF AGENDA

Recommendation
That the agenda be confirmed as presented.

3. DECLARATION OF CONFLICT OF INTEREST

4. ADOPTION OF MINUTES

Recommendation
That the minutes of regular meeting of the Traffic Safety Committee held on November 14, 2017 and special meeting held on December 19, 2017, be approved.

5. REPORT OF THE CHAIR

6. TRAFFIC SAFETY COMMUNICATION/EDUCATION (File No. CK. 225-8)

The Committee has a budget of $6,500 for traffic safety education and awareness for 2018. As an advisory committee, the Traffic Safety Committee may provide education and awareness programs within its mandate, provided that the Administration is consulted prior to the implementation of each program to ensure there is no duplication of services, and that the proposed program supports the City's policies and programs relating to traffic safety.

In the past the Committee has undertaken programs such as school zone safety public service ads, transit bus tailboard advertisements, talking/texting while driving billboard campaigns, a child car seat initiative, the purchase and distribution of bicycle bells and lights, as well as the purchase of bicycle helmets for distribution through the School Resource Officers.

Recommendation

That the Traffic Safety Committee determine a 2018 traffic safety initiative.

7. REPORTS FROM ADMINISTRATION

7.1 Protected Bike Lane Demonstration Project - Evaluation and Next Steps [File No. CK 6000-5] 5 - 142

City Council, at its Regular Business meeting held on November 20, 2017, considered the attached report and resolved:

1. That a provision for protected bike lanes be included in the Downtown All Ages and Abilities cycling network;
2. That the Administration develop a Downtown All Ages and Abilities cycling network (including protected bike lanes) in concert with other downtown policy and planning initiatives in 2018;
3. That the existing protected bike lanes on 23rd Street (from Spadina Crescent to Idylwyld Drive) and 4th Avenue (from 20th Street to 24th Street) be retained until the Downtown All Ages and Abilities cycling network plan is presented to City Council;
4. That the report of the A/General Manager, Transportation & Utilities Department dated November 6, 2017 be forwarded to the Traffic Safety Committee for information; and
5. That the Administration look at opportunities to improve egress from the parkade on 100 block of 4th Avenue South.

The Appendices to the report are not being reproduced due to size. The entire report is available on the City's website.

Recommendation
That the information be received.

8. NEW ISSUES RAISED BY COMMITTEE MEMBERS (File No. CK. 225-8)

9. ADJOURNMENT

Protected Bike Lane Demonstration Project – Evaluation and Next Steps

Recommendation

That the Standing Policy Committee on Transportation recommend to City Council:

1. That a provision for protected bike lanes be included in the Downtown All Ages and Abilities cycling network;
2. That the Administration develop a Downtown All Ages and Abilities cycling network (including protected bike lanes) in concert with other downtown policy and planning initiatives in 2018; and
3. That the existing protected bike lanes on 23rd Street (from Spadina Crescent to Idylwyld Drive) and 4th Avenue (from 20th Street to 24th Street) be retained until the Downtown All Ages and Abilities cycling network is developed.

Topic and Purpose

This report provides an evaluation of the Protected Bike Lane Demonstration Project and outlines the next steps for the provision of the All Ages and Abilities (AAA) cycling network in the Downtown.

Report Highlights

1. The demonstration project created a 1.6 km network of protected bike lanes to improve cycling as a strategy to increase the attractiveness of, and access to, the Downtown for businesses, residents, visitors, employers, and their employees.
2. The Protected Bike Lane Demonstration Project showed that bike lanes could be implemented successfully in a temporary, retrofit situation.
3. Opportunities to make further improvements to the protected bike lanes have been identified in order to improve operations and address some of the concerns identified through the demonstration project.
4. A Downtown Cycling Network Plan, to be complete in 2018, will recommend the locations and designs for a permanent AAA cycling network in the Downtown.

Strategic Goals

This report supports the Strategic Goal of Moving Around, Environmental Sustainability and Quality of Life, as well as the Active Transportation Plan and the City Centre Plan which identified the need for improved facilities for people who want to cycle in the Downtown.

Background

City Council, at its meeting held on March 23, 2015, resolved:

> "1. That the protected bike lanes be installed on 23rd Street (from Spadina Crescent to Idylwyld Drive) as a demonstration projects in 2015;

2. That the protected bike lanes be installed on 4th Avenue (from 19th Street to 24th Street) as a demonstration project in 2016; and
3. That the curb parking be installed on the north side of 24th Street between Ontario Avenue and Idylwyld Drive."

The need for improved cycling facilities within the Downtown was identified through several City plans and initiatives. The City Centre Plan, approved by City Council in 2013, identified the need to improve cycling as a strategy to increase the attractiveness of, and access to, the downtown for businesses, residents, visitors, employers and their employees. The Growth Plan, endorsed by City Council in 2016, provides guidance for civic investments in infrastructure and support programs over the short, medium, and long term that will shape growth patterns and increase transportation choices, in order to achieve the social, economic, and environmental aspirations of the community. The Active Transportation (AT) Plan, endorsed by City Council in 2016, also identified the need to improve cycling for people of all ages and abilities, and recommended the Administration develop a Downtown AAA network.

Report

Demonstration Project

The demonstration project created a 1.6 km network and showed that bike lanes could be implemented successfully in a temporary, retrofit situation. The demonstration period allowed sufficient time to install the protected bike lanes, obtain feedback from stakeholders and the community, and apply changes to the protected bike lanes based on the feedback received. This process proved to be very effective as the changes to the bike lanes in the spring of 2017 further improved their operation. Some of the notable changes included:

- Replacing the "No Right Turn on Red" restriction with a "Drivers Yield to Cyclists" warning to improve the Level of Service (LOS) for motorists making right turns while maintaining cyclist safety.
- Shifting the bike lane closer to the traffic lane at intersections along 4th Avenue in order to improve visibility of cyclists.
- Improving the alignment of traffic lanes at the intersection of 4th Avenue and 23rd Street to reduce the offset of the northbound through lane.

The Administration has identified additional improvements to further improve their operations and address issues identified through the demonstration as outlined in Attachment 1.

Evaluation

The purpose of the demonstration project was to assess the feasibility of installing permanent protected bike lanes in the Downtown (see Attachment 1 for Project Background). Part of determining feasibility was to identify areas in the design of the protected bike lanes that may require refinement, identify gaps in the City's policies and operations, and provide flexibility to apply those changes as the project progressed. In addition to providing an opportunity to trial changes to the bike lanes, the demonstration period provided sufficient time to evaluate and determine if the objectives of the project

were being met. A set of criteria was developed to assist with the evaluation and provide information to help inform the final decision on the demonstration project.

Satisfaction among all road users is divided; however, all other criterion has demonstrated success and the following objectives of the demonstration project have been achieved:

- The majority of people cycling in the protected bike lanes report their Downtown trips are more comfortable and they feel safer cycling in the Downtown;
- The overall trends for the frequency and severity of collisions between all modes are decreasing along these corridors;
- An increase in the number of people cycling along the protected bike lanes was observed;
- The impacts to people walking or driving have been modest or neutral;
- The impacts to businesses have been largely neutral, with the exception of concerns over parking availability;
- Gaps in civic operations were identified and rectified, where possible; and
- Cost to install and maintain is in-line when compared to bike lane demonstration projects in other Canadian cities (lower than Calgary, Edmonton, Ottawa, and higher than Halifax and Toronto.)

Additional information on the evaluation criteria can be found in Attachment 1.

Public satisfaction with the protected bike lanes remains largely divided. Motorists frequently report increased traffic delays along 4th Avenue, confusion when travelling along these corridors and challenges with finding parking. The impact to pedestrians remains largely unchanged, however, challenges for persons with mobility aids accessing parking and businesses have been noted. Cyclists largely support the protected bike lanes, but feel that improvements to the surrounding network (improving their access to the Downtown network), as well as increased visibility at conflict points would improve their experience. Additional information on the public input received can be found in Appendix A of Attachment 1.

Highlights of the evaluation analysis indicate:

- A slight increase in delay to motorists, however, the Level-of-Service remains at B, which is consistent with the prior condition.
- Additional overhead signage is recommended to improve driving lane clarity for motorists.
- Parking availability has decreased along 4th Avenue and 23rd Street by 17%. However, in the downtown parking demand during the afternoon peak period is only 60% of the parking supply. There is some loss of ‘convenient’ parking on 4th Avenue and 23rd Street, however, sufficient parking remains available in the downtown.
- Generally, there is a decreasing trend in the frequency and severity of collisions (for all modes) along 4th Avenue and 23rd Street.

Post-Demonstration Improvements

Opportunities to make further modifications to the protected bike lanes have been identified in order to improve operations and address some of the concerns identified through the demonstration project. These issues were not addressed during the demonstration as the work was more costly or substantial than the limitations of a temporary installation would permit, but can be upgraded after the demonstration. The recommended improvements have been informed by a review of best practices for protected bike lanes and are summarized in Appendix D of Attachment 1. These include:

- Improving disabled person parking and loading zones;
- Improving transit stops;
- Installing overhead signage to improve driver clarity of the lane assignments along 4th Avenue; and
- Modifying the barrier in the buffer.

These improvements will be incorporated into the permanent design of the protected bike lanes.

Some concerns identified indicate that further education of all road users would be of benefit. A review of the Saskatchewan Government Insurance (SGI) Driver's Handbook identified an educational gap as there does not appear to be any instruction identified on how motorists are to interact with people using protected bike lanes. Going forward, the Administration recommends increased education and awareness for all road users on how to safely navigate streets with protected bike lanes. The Administration intends to produce and deliver an educational campaign to coincide with the bike lane improvements in the spring of 2018 and will work with SGI to include information regarding protected bike lines in future editions of the Driver's Handbook.

Downtown AAA Cycling Network Plan

Several comments were received from all road users that questioned if the protected bike lanes are on the 'right' Downtown streets, citing other streets may be more appropriate for a variety of reasons. Additionally, the Administration notes that there are several imminent changes to City Centre streets that could impact how all users get around in the Downtown, notably the Traffic Bridge that will be reopened in fall of 2018 and the Bus Rapid Transit Implementation project that has begun and will identify street redesigns and station area designs. The AT Plan identified the need to complete a Downtown AAA Cycling Network Plan as a foundational action in achieving improved cycling in Saskatoon. This fall, the Administration began working on the Downtown AAA Cycling Network Plan and intends to continue this work into 2018. The Downtown AAA Cycling Network Plan will take into consideration the public input obtained through the Protected Bike Lane Demonstration Project, the operational lessons learned, and the imminent changes to Downtown's transportation network to ensure that the most appropriate streets host AAA facilities. Further engagement to determine permanent locations for protected bike lanes will be undertaken in 2018 and help to form the recommendations for the Downtown AAA Cycling Network Plan.

Options to the Recommendation

City Council may choose to remove the protected bike lanes from Downtown streets until the Downtown AAA cycling network analysis is complete. The Administration does not recommend this option as it would remove the only AAA cycling facilities currently available in the Downtown. The cost to remove the protected bike lanes is estimated to be $37,000. Removal could take place in the spring of 2018.

Public and/or Stakeholder Involvement

Extensive and thorough engagement with external stakeholder groups, internal civic divisions, and the general public has occurred throughout the entirety of the project. Engagement occurred primarily in three phases: before the demonstration project, during the demonstration project, and near the end of the demonstration period. In addition, community input was received throughout the project via emails to the City's cycling@saskatoon.ca email account. Consultation with the Cycling Advisory Group also occurred at their regular business meetings throughout the demonstration project.

A variety of tools were used in order to provide stakeholders and the community with options to participate in ways that were convenient for them. This included open houses, stakeholder meetings, online surveys, and intercept surveys. A total of 25 engagement events occurred from August 2014 to September 2017. Public input was utilized throughout the process to improve the demonstration project. Many of these changes were implemented in the spring of 2017, with some operational changes taking place as the project evolved.

Public and stakeholder input on the demonstration project has been mixed. The majority of people who use the bike lanes commonly reported that they appreciated having their own space to ride in, making their trip downtown feel more safe and comfortable. Many users also cited that they would often go out of their way to use the bike lane as it improved their experience riding Downtown. A minority of cyclists reported that they did not like the bike lanes stating that they preferred to cycle with traffic. The majority of people who drive along these streets were dissatisfied with the protected bike lanes, commonly citing concerns such as decreased availability of parking along 4th Avenue, increased traffic delays along 4th Avenue, and that the number of cyclists observed was too low to warrant the costs to install and maintain the protected bike lane. Impact to pedestrians largely remained unchanged, with the notable exception of persons with mobility aids accessing parking along this corridor. Feedback from businesses located in the Downtown at the end of the demonstration project indicated that the bike lanes had little impact on their operations.

A summary of all the engagement events and the results of the final phase of engagement can be found in Appendix A of Attachment 1. Further engagement to determine the permanent locations for bike lanes will be undertaken in 2018 as part of the development of the Downtown AAA cycling network.

Communication Plan

Communication going forward on the protected bike lanes will focus on educational elements to improve awareness for all road users. Commonly cited concerns that will be addressed in the education plan include: how to use bike boxes, how to treat conflict points, parking next to bike lanes, and what to look for when making right-turns as a motorist. This educational campaign will be produced and delivered in spring 2018.

Future communications will also put an emphasis on fostering a forward-thinking vision for the City of Saskatoon that considers many modes of transportation for a growing population.

Policy Implications

There are no policy implications as a direct result of this report. As the Administration continues to work toward providing an AAA cycling network in the Downtown, any policies requiring changes or new policies identified will be brought forward to City Council at the appropriate time.

Financial Implications

The cost to retain the existing protected bike lanes until the Downtown AAA cycling network is developed is estimated at approximately $80,000. These costs relate to ongoing maintenance including snow clearing and sweeping. Funding for this maintenance is included in Capital Project #2468 - Active Transportation Plan Implementation.

Other Considerations/Implications

There are no privacy, environmental or CPTED implications or considerations.

Due Date for Follow-up and/or Project Completion

The Administration will report back to City Council in 2018 with the Downtown AAA Cycling Network Plan.

Public Notice

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

Attachment

1. Downtown Protected Bike Lane Demonstration Project – Project Summary – November 2017

Report Approval

Written by:	Danae Balogun, Active Transportation Program Manager Mariniel Flores, Transportation Engineer, Transportation
Reviewed by:	David LeBoutillier, Acting Engineering Manager, Transportation Jay Magus, Acting Director of Transportation
Approved by:	Angela Gardiner, Acting General Manager, Transportation & Utilities

Downtown Protected Bike Lane Demonstration Project

Project Summary | November 2017

Contents

Current Downtown Cycling Network

Legend:

- Protected Bike Lanes
- Shared-Use On-Road Cycling Lane
- Multi-Use Trails or Pathways
- Exclusive Bike Lanes
- Sharrows Wide Lane and Narrow Lanes
- On Road, Sharing the Road or Bike Route

Project Background

The City's Strategic Plan and the City Centre Plan identified the need to improve cycling as a strategy to increase the attractiveness of, and access to, the Downtown for businesses, residents, visitors, employers, and their employees.

The Protected Bike Lanes Demonstration Project was established with the goal of assessing the feasibility of installing permanent protected bike lanes in the Downtown as a means to create a more accessible, attractive and friendly Downtown and promote active transportation.

Rather than committing to permanent infrastructure at the start, City Council endorsed a demonstration period to allow for the flexibility to make changes and apply lessons learned during the demonstration period. Downtown is a complex neighbourhood and getting the balance right between traffic, pedestrian, transit and cyclist circulation; parking location and availability; and business success is a part of that complexity.

In July, 2015 the protected bike lane was installed along 23rd Street from Spadina Crescent to Idylwyd Drive in both directions. This route was chosen because of its capacity to accommodate the lane with little disruption to Saskatoon Transit buses and parking. The lane also brings people who bike directly to the centre of downtown and connects with other popular cycling routes. In May of 2016, the protected bike lane along 4th Avenue was installed. This lane runs between 20th Street East and 24th Street East in both directions, and connects to the Broadway Bridge. This route was chosen because it connects to the Broadway Bridge and replaced the existing conventional bike lanes along 4th Avenue.

The implementation of the protected bike lanes required some changes to the configuration of the traffic lanes, with most of those changes occurring along 4th Avenue. 4th Avenue was reconfigured with a bidirectional (two-way) left-turn lane and one lane of traffic in each direction for the duration of the project. In addition to reconfiguration, new signs and pavement markings were installed to communicate to road users the new operations of the street. Radio advertisements, media advisories, Public Service Announcements, and instructional videos were utilized to communicate and educate road users on the changes.

In spring of 2017, the Administration made improvements to the bike lanes prior to the final summer of the demonstration utilizing feedback obtained from stakeholders and the public throughout the demonstration period. In fall of 2017, the demonstration project will conclude and City Council will make a decision on how to proceed with providing 'All Ages and Abilities' cycling facilities in the Downtown.

Engagement Summary

Extensive and thorough engagement with external stakeholder groups, internal civic divisions, and the general public has occurred throughout the entirety of the project.

Engagement occurred primarily in three phases: before the demonstration project, during the demonstration, and near the end of the demonstration period. The following targeted audiences were identified at the outset of the project. These groups were identified as having an interest in the project and were seen as valuable players to engage with in order to achieve a successful project outcome.

1. **City of Saskatoon Residents/General Public**
2. **External Stakeholders**

- Downtown Business Improvement District (BID)
- Saskatoon Cycles
- Cycling Advisory Group
- Tourism Saskatoon
- Combined Business Group
- Business & Property Owners along 23rd Street and 4th Avenue
- Riversdale BID
- Broadway BID
- Meewasin Valley Authority
- Saskatoon Chamber of Commerce
- North Saskatoon Business Association

3. **Internal Stakeholders**

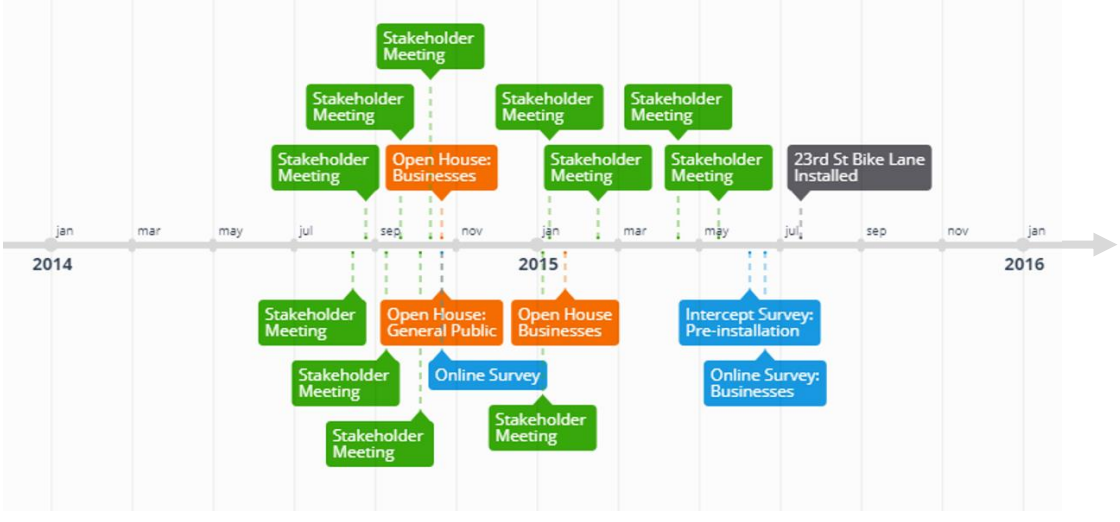
- Fire Department
- Roadways Division
- Transportation Division
- Saskatoon Transit Services
- Saskatoon Police Service
- Community Services Department

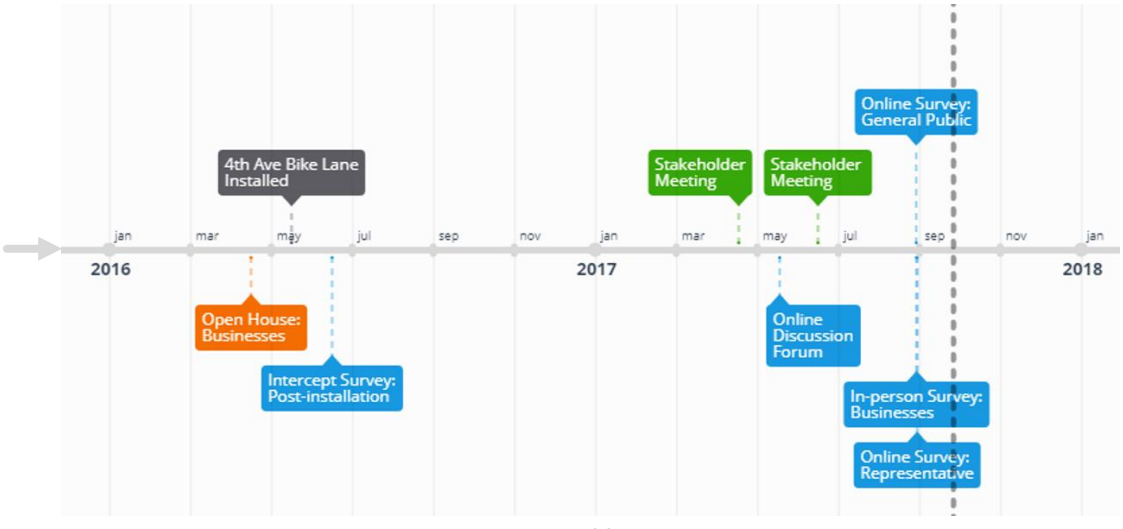
In addition, community input was received throughout the project via emails to the City's cycling@saskatoon.ca email account. Consultation with the Cycling Advisory Group also occurred at their regular business meetings throughout the demonstration project. A variety of tools were used to in order to provide options for people to participate in a way that was convenient for them. This included open houses, stakeholder meetings, online surveys, and intercept surveys. A total of 25 engagement events occurred from August 2014 to September 2017. Public input was utilized throughout the process to make changes to the demonstration project. Many of these changes were implemented in the spring 2017, with some operational changes happening as the project evolved.

Public and stakeholder input on the demonstration has been mixed. The majority of people who use the bike lanes commonly reported that they appreciated having their own space to ride in, making their trip Downtown feel more safe and comfortable. Many users also cited that they would often go out of their way to use the bike lane as it improved their experience riding Downtown. A minority of cyclists reported that they did not like the bike lanes stating that they preferred to cycle with traffic. The majority of people who drive along these streets were dissatisfied with the protected bike lanes, commonly citing concerns such as decreased availability of parking along 4th Avenue, increased traffic delays along 4th Avenue, and that the number of cyclists observed was too low to warrant the costs to install and maintain the protected bike lanes. Impact to pedestrians largely remained unchanged, with the notable exception of persons with mobility aids accessing parking along this corridor. Feedback from businesses located in the Downtown at the end of the demonstration project indicated that the bike lanes had little impact on their operations. The Engagement Summary (Appendix A) contains additional detail on each of the events identified below.

25 Total Events

- **13** Stakeholder Meetings
- **4** Open Houses
- **4** Online Surveys
- **2** Intercept Surveys
- **1** In-person Survey
- **1** Online Community Discussion





Evaluation Plan

To help evaluate the success of the demonstration project, an evaluation plan was put together.

The primary success factors are related to increasing the accessibility and attractiveness of the Downtown by providing safe and viable cycling facilities. The following measures were used to evaluate the success of the demonstration project. Additional details on how each of the measures were evaluated are on the following pages.

Accessibility

Measure	Desired Outcome	Project Outcome
Collision Rates	Collison rates involving cyclists are neutral or decreasing	On track
Bicycle Volumes	Bicycle volumes along the Project are increasing	On track
Automobile Travel Time	Automobile travel time is neutral	On track
Unlawful Sidewalk Riding	Unlawful sidewalk riding is neutral or decreasing	Watching

Attractiveness

Measure	Desired Outcome	Project Outcome
Satisfaction with the Project	Satisfaction with the Project amongst road users is neutral or positive	Needs Improvement
Perceptions of Safety by Protected Bike Lane Users	Perceptions of Safety by Protected Bike Lane Users are positive	On track
Economic Vitality	Businesses are neutrally or positively impacted by the Project	On track

Measuring Accessibility: Collision Rates

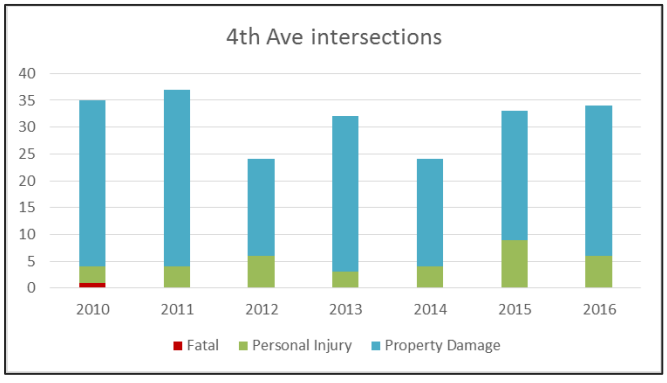
The frequency and severity of collisions are decreasing

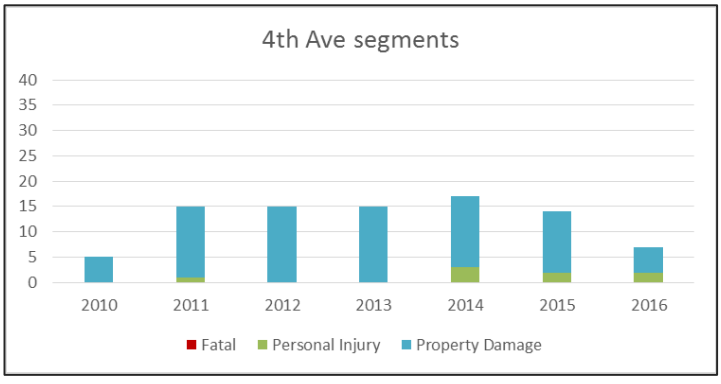
Collisions reported along the protected bike lane routes are shown in the charts in below. Collision data is provided by SGI and includes data for all modes. 2017 data is not included as it is not yet complete (only available up to February 2017).

Collisions Reported For All Modes

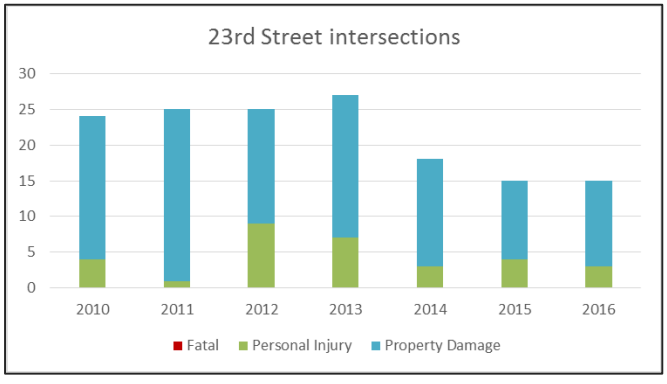
Generally, there is a decreasing trend in the frequency and severity of collisions along 23rd Street and 4th Avenue as shown in the graphs below. The data has been categorized into incidents occurring at intersections and incidents occurring in segments (between intersections).

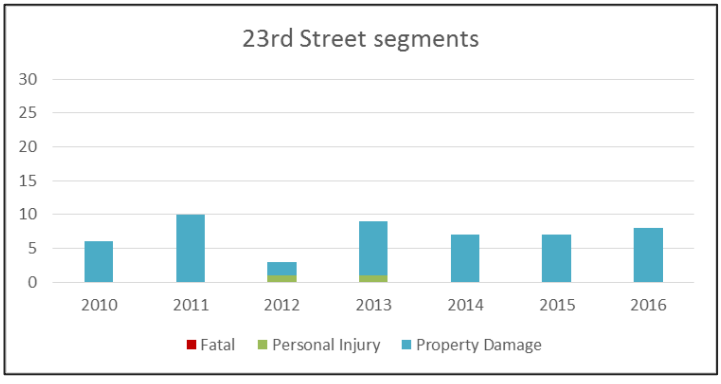
4th Avenue Collision Data (all modes)





23rd Street Collision Data (all modes)



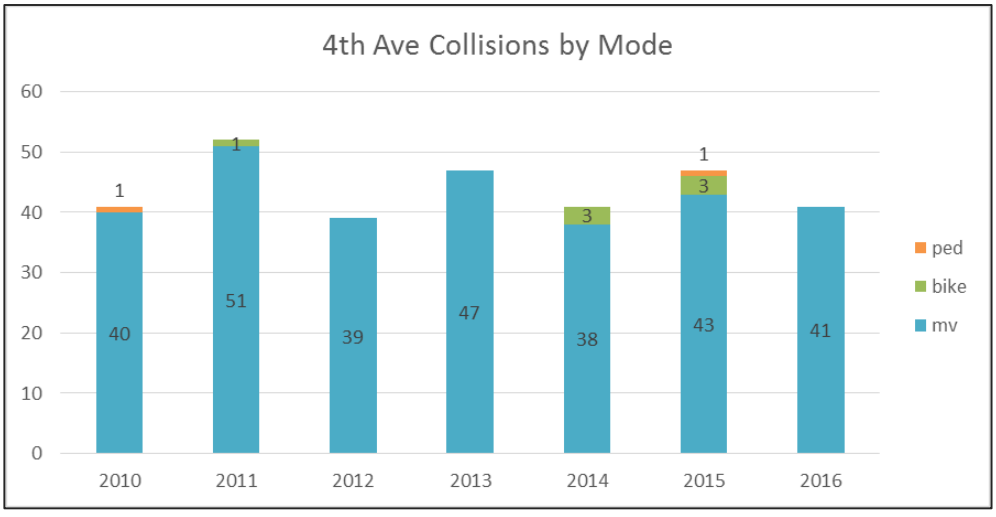


Measuring Accessibility: Collision Rates

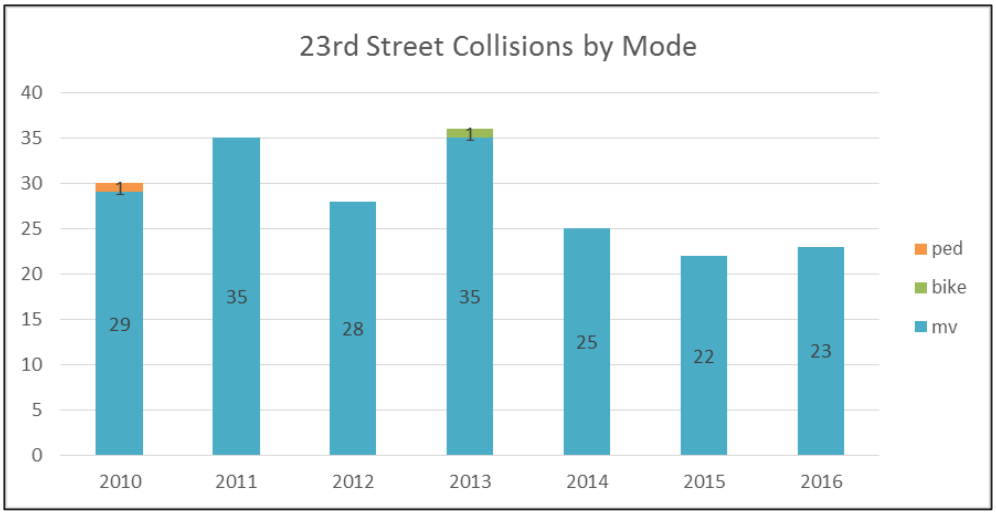
Collisions Reported by Mode

Generally, there is a decreasing trend in the frequency of collisions along 23rd Street and 4th Avenue involving cyclists as shown in the graphs below.

4th Avenue Collision Data by Mode



23rd Street Collision Data by Mode



Measuring Accessibility: Protected Bike Lane Volumes

Bicycle volumes along the Project are increasing

As the table indicates below, the average volume of cyclists per day counted along 23rd Street and 4th Avenue has increased every year since the lanes were installed.

Count data was collected throughout the duration of the project to monitor the volume of people using the bike lanes. Two different types of counters have been installed in the protected bike lanes along 23rd Street and 4th Avenue to measure cyclist volumes. Both of these counters use the same technology as the counters used to monitor motor vehicle volumes, but are more sensitive to bicycles. As with motor vehicle counts, counters do not distinguish between unique users. In other words, any time a bicycle crosses the counter, it is recorded.

During the demonstration, annual average daily bicycle traffic (AADBT) was calculated for data collected in 2014 and 2016. The 2017 AADBT will be calculated once data collection is complete for the year. For 2017, the Average Daily Bike Traffic (ADBT) is determined as the average of daily totals during the period in which data was collected.

Average Cyclists per Day (in both directions)

	AADBT (factored)		ADBT Average (unfactored)
	2014	2016	2017
23rd Street			
Wall St to Pacific Ave		140	
Ontario Ave to 1st Ave	60	120	150
1st Ave to 2nd Ave		80	
* 3rd St to 4th St	30	90	110
4th Ave to 5th Ave		70	
5th Ave to Spadina Cres		70	80
4th Avenue			
20th St to 21st St	50	190	310
21st St to 22nd St	40	160	
* 22nd to 23rd St		170	230
23rd St to 24th St		110	220

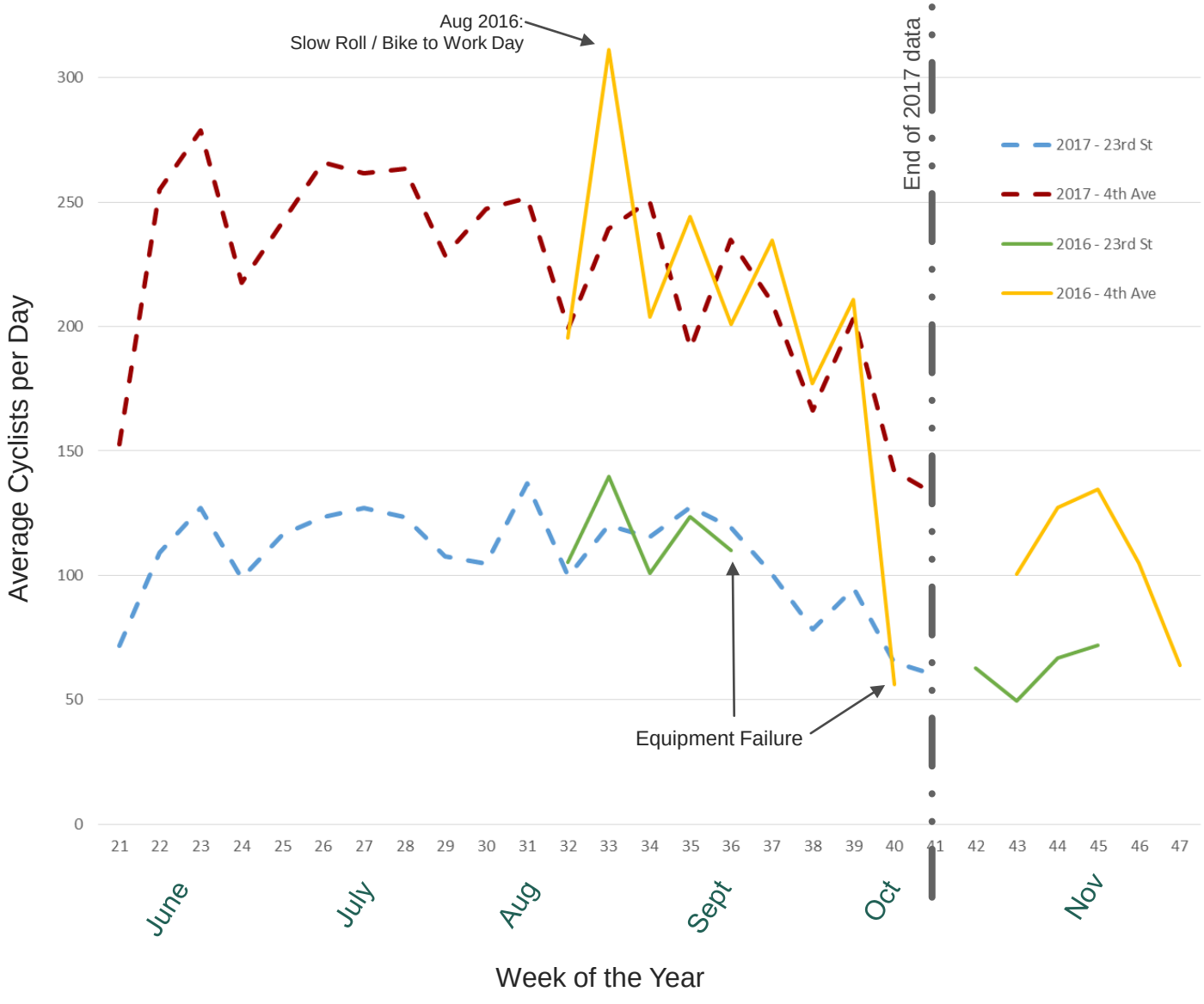
*Continuous Bicycle Counters

Count data is collected through the spring, summer and fall, but cannot be collected in snow conditions as the tubes interfere with snow removal. To determine the annual average daily bicycle volumes for the months without count data, counts are factored by tying into the permanent counters along the MVA trail. More information on the count data is included in Appendix B.

Measuring Accessibility:
Protected Bike Lane Volumes

The graph below shows the average cyclists counted per day on a given week of the year. The data shows that while there are weekly fluctuations in the average number of people using the lanes, in the late spring, summer and early fall of 2017 the average number of cyclists recorded along 4th Avenue oscillated between 200 and 250, with a few days exceeding 250. Along 23rd Street, these volumes are lower, but still remain fairly constant between 100 and 125 average cyclists per day.

Average Cyclists per Day (in both directions)



Measuring Accessibility: Automobile Travel Time

Increases in automobile travel time are modest or neutral

Traffic conditions before and after the installation of protected bike lanes were assessed and compared. Two metrics of the analysis are presented below:

- **Level of service (LOS)** ratio is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, manoeuverability, delay, and safety. The LOS of a facility is designated with a letter A to F, with A representing the best operating conditions and F the worst.
- **Average travel time** is the average time it takes a driver to travel the length of the corridor.

The table below shows that the overall intersection LOS remained at LOS B for both 4th Avenue and 23rd Street in the p.m. peak hour. LOS B indicates that traffic is flowing well with little delay.

Additionally, the table below indicates that the average travel time for motorized vehicles traveling along 4th Avenue and 23rd Street has increased by approximately 20 seconds during the p.m. peak hour.

Although travel times for motorists have increased along these streets, the increase has not resulted in any change to the level of service along 4th Avenue and 23rd Street.

Motorized Traffic Summary (p.m. peak hour)

Street	2014 Pre-Installation		2017 Post-Installation		Difference	
4th Avenue (19th Street to 24th Street)						
	NB	SB	NB	SB	NB	SB
Intersection Level of Service (LOS)	B or better		B or better			
Average Travel Time	154.2 s	156.5 s	173.2 s	178.1 s	+ 19 s	+21.6 s
23rd Street (Idylwyld Drive to Spadina Crescent)						
	EB	WB	EB	WB	EB	WB
Intersection Level of Service (LOS)	B or better		B or better			
Average Travel Time	130.4 s	127.7 s	149.4 s	151.5 s	+ 19 s	+23.8 s

Detailed results from the traffic analysis can be found in Appendix C.

12

Measuring Accessibility: Unlawful Sidewalk Riding

Unlawful sidewalk riding remains unchanged

Sidewalk riding in Downtown largely remains unchanged with the installation of the bike lanes. However, these incidences of sidewalk riding are low. Education and enforcement are suggested approaches to continuing to reduce the occurrence of sidewalk riding in the Downtown. Incidences of sidewalk riding was anecdotally collected through staff observation during the Project.

Measuring Attractiveness: Road User Satisfaction

Satisfaction with the Project amongst road users is divided

Community feedback indicated that motorists feel that the protected bike lane have disrupted traffic flow along 4th Avenue, often citing increased congestion, discomfort making right turns across the bike lanes, and increased challenges with finding parking along 4th Avenue. Similar sentiments were expressed for 23rd Street, although less so than 4th Avenue. Pedestrian experience seems to be largely unchanged due the bike lanes, although a slight majority of the survey respondents indicate that the bike lanes have improved the safety of people walking Downtown (53%). People using the bike lanes did indicate that they found the bike lanes improved their accessibility through the Downtown, with some stating that they go out of their way to use the bike lanes when travelling to or through Downtown. Users did note that the transit mall on 23rd Street decreased the accessibility of the east-west route. Several comments were received that indicated improved network connections beyond the Downtown protected bike lanes would improve their ability to access the Downtown, asking that more protected bike lanes be installed in areas outside the Downtown.

Additional information on feedback obtained through the Project can be found in Appendix A.

Representative Survey

Thoughts on Protected Bike Lane Demonstration:
(Open-ended question)

Positive Sentiments
41%

Top Positives:
- **Good idea/like it (24%)**
- **Safety of cyclists from motorists (12%)**
- **Promotes alternative transportation (6%)**

Negative Sentiments
66%

Top Negatives:
- **Poorly planned/confusing (16%)**
- **Never or rarely used (14%)**
- **Waste of taxpayer money (14%)**

Measuring Attractiveness:
Bike Lane User Perception of Safety

Protected bike lane users feel safer using the bike lanes

The majority of comments received from people using the protected bike lanes indicated that the bike lanes have made their trips Downtown by bicycle more comfortable and safe. They attribute this increased feeling of safety to the added protection provided by being physically separated from moving traffic, the provision of their own space where they can travel at their own pace, and a reduced fear of being passed too closely by a vehicle or dodging a car door. Further supporting these comments, 73% of Representative Survey respondents who ride their bike downtown felt that the bike lanes have had a positive impact on safety. A minority of bike lanes users feel that the lanes make them feel unsafe, especially at conflict points such as driveway crossings and intersections, as they feel 'hidden' behind parked cars.

Measuring Attractiveness:
Economic Vitality

Businesses are neutrally or positively impacted by the Project

Broadly speaking, six in ten businesses believe the protected bike lanes have had a positive impact on downtown, whereas three in ten feel that it has had a negative impact. A majority of downtown businesses believe that protected bike lanes have had no impact on their business. Modest proportions believe the bike lanes have had a positive impact in specific areas noted below, with the exception of parking availability.

Additional information on feedback obtained through the Project can be found in Appendix A.

	Positive	Negative	No Change	Not Sure
Overall impact	33%	18%	47%	2%
Your employees	27%	6%	59%	8%
Foot traffic in general	26%	5%	65%	4%
Reaching new customers that you wouldn't have otherwise	25%	0%	70%	5%
Ease of accessing your business	24%	14%	59%	3%
Customer mood	19%	15%	61%	5%
Parking availability for customers	11%	26%	60%	3%
Curb appeal of your business	9%	5%	80%	6%

Project Adjustments

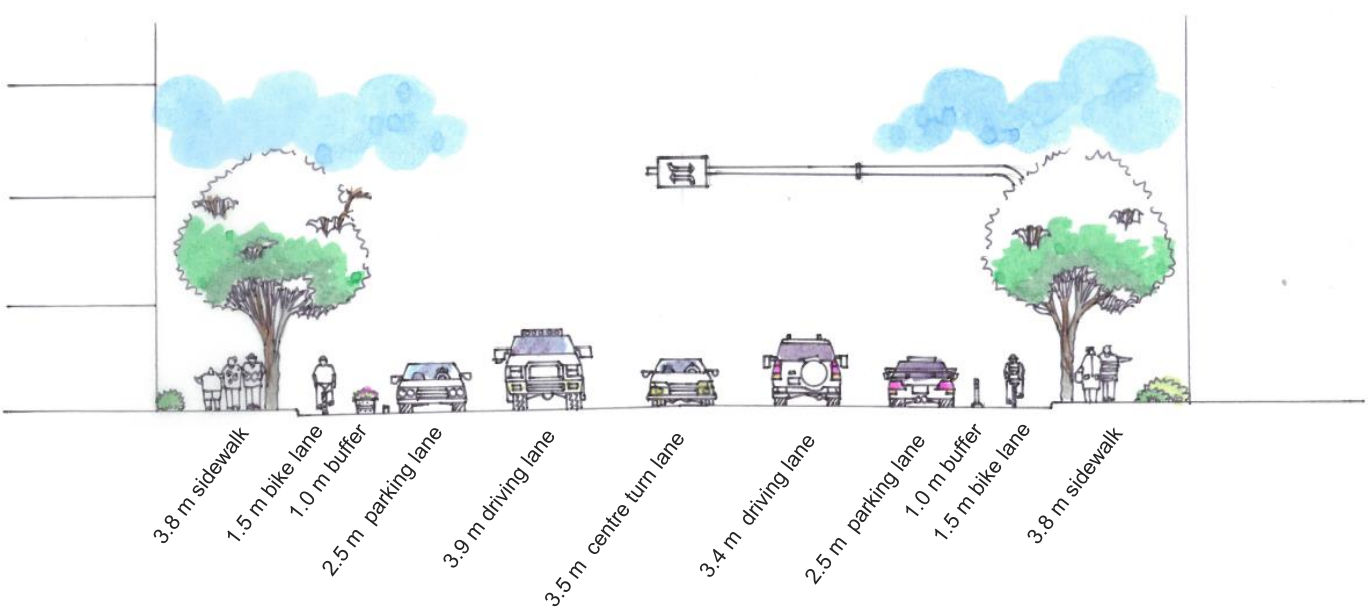
Adjustments were made to the bike lanes during the demonstration period based on public input and monitoring by the Administration.

CONCERN	WHAT WE HEARD	WHAT WE'VE CHANGED
Signs for motorists are not easily visible	Signs reminding motorists making right-turns to yield to people riding in the bike lanes are hard for drivers to see.	The signs were originally placed on the curb on the sidewalk. To improve visibility of these signs for motorists on 4th Avenue, these signs were moved in the buffer between the bike lane and the driving lane. These changes were not made to 23rd Street because transit bus stops near the corner does not allow this adjustment.
Driving lane shifts through intersections (driving lanes don't match)	After installation, the driving lane lines at some intersections on 4th Avenue did not line up perfectly.	The driving lane widths were adjusted to improve the traffic lane transitions.
Poor visibility of cyclists at intersections	Right turning motorists have found it difficult to see cyclists approaching intersections, especially if there are several parked cars.	To improve visibility, the bike lanes on 4th Avenue have been reconfigured. A "bend-in" design at the intersection moves the cyclists in line with the traffic lanes and provides better sight-lines for all users. The "bend-in" design was not applied to 23rd Street as the current conditions of the street facilitate visibility at intersections.
Motorists turning in and out of driveways	Motorists and cyclists had safety and visibility concerns at driveways.	The painted buffer at driveways were changed from a 20 degree angle to a 90 degree angle to promote a slower turn and improve visibility. This change encourages drivers to approach the driving lane at a right angle, improving sight lines and reducing right turn speeds.
Delays due to No Right Turn on Red restriction	The "No Right Turn on Red" restrictions on cross-streets were put in place to prevent motorists from entering the bike boxes where cyclists may be waiting. Motorists found this restriction unnecessarily increased delay, especially when the bike box was unoccupied.	The "No Right Turn on Red" restriction was removed. Motorists are now permitted to turn right at a red light. A "Turning Vehicles Yield to Bikes" sign has been put up in its place. This sign still requires motorists turning right at a red light to yield to a cyclist in the bike box. If a cyclist isn't present, motorists may proceed with their right turn.
Confusion about parking next to the protected bike lanes	Although most people are now familiar with how to park next to the protected bike lanes, those encountering the bike lanes for the first time may require additional instruction.	Additional signs have been installed on bike lane delineator poles, which have been effective in marking "No Parking" areas.

Proposed Project Adjustments

Opportunities to make further improvements to the protected bike lanes have been identified in order to improve operations and address some of the concerns identified through the demonstration project.

These issues were not addressed during the demonstration because the work was more costly or substantial than the limitations of a temporary demonstration would allow, but can be upgraded after the demonstration. The cost to improve the existing protected bike lanes along 23rd Street and along 4th Avenue is estimated at $150,000. This would include costs for overhead signage, concrete parking curbs, planters, and transit platforms. Additional details on the proposed design elements can be viewed in Appendix E.



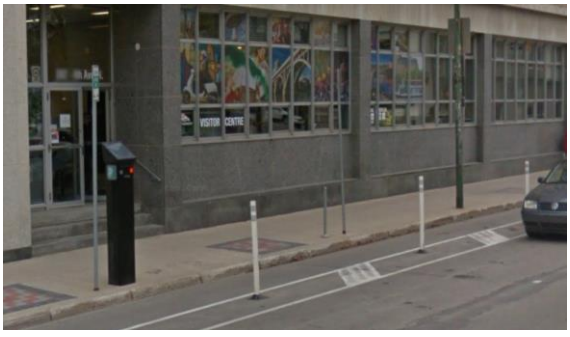
1. Overhead Sign & Structure

Overhead signs and structures can be added to clearly mark the lane designations, improving clarity of lane assignments for motorists.

2. Concrete Parking Curb

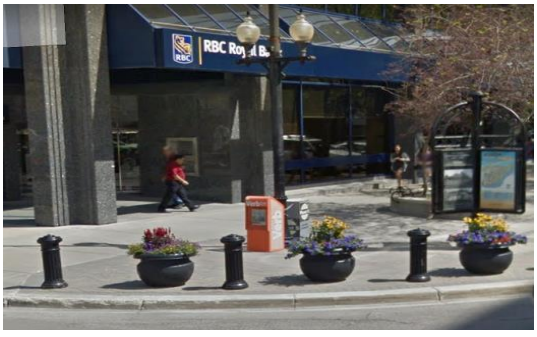
The addition of pre-cast curbing placed in the existing painted buffer area provides additional guidance for people parking, as well as additional protective barrier for people using the bike lane.

3. Delineator Post



The white delineator posts would be used primarily at conflict points to provide guidance for motorist turning movements and additional protection for cyclists.

4. Planter



At intersections, decorative planters could be used instead of white delineator poles to guide traffic movements and provide protection for cyclists, as well as making the bike lanes more visually appealing.

5. Transit Platform

Transit platforms provide a raised landing area for passengers boarding and alighting transit. The platform eliminates grade changes for pedestrians, while proving a ramp on either end to accommodate cyclists passing over the platform. Shown is a temporary transit platform.

6. Accessible Parking Space

Improvements include a wider parking space to permit adequate space for ramps to be deployed, a buffered connection to an existing curb ramp, and a narrowed bike lane to slow cyclists adjacent to the accessible parking stall.

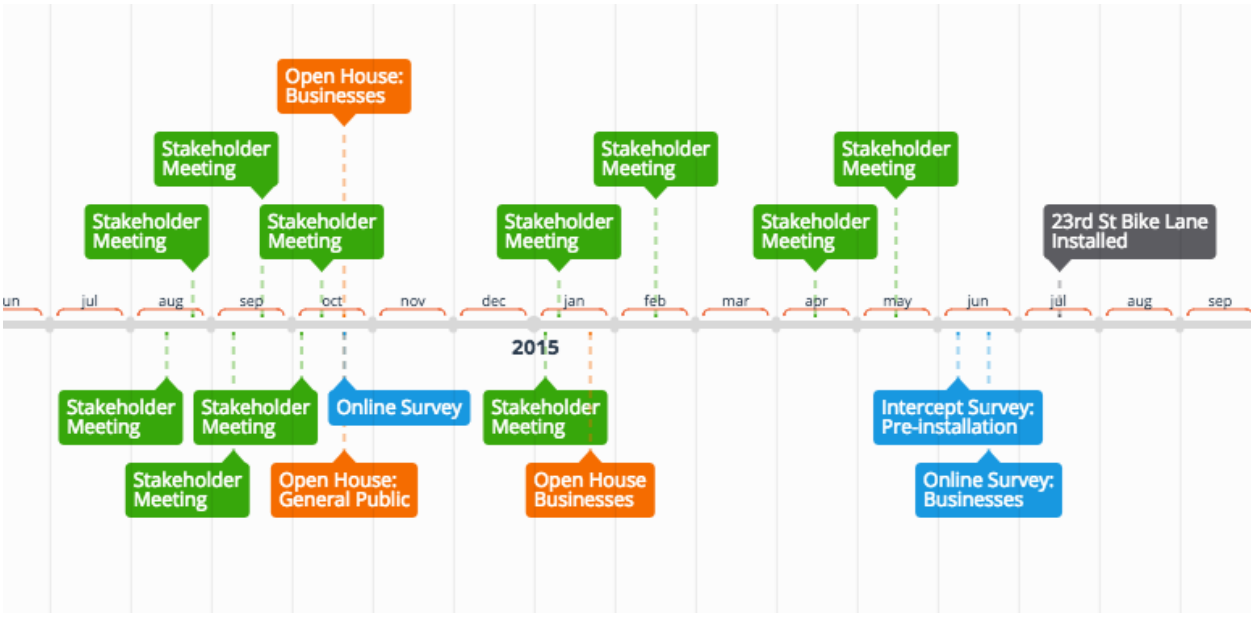
Appendices

Appendix A Engagement Summary
Appendix B Count Methodology
Appendix C Detailed Traffic Analysis
Appendix D Best Practices
Appendix E Design Elements
Appendix F Maintenance Summary

A variety of tools were used to in order to provide options for people to participate in a way that was convenient for them. This included open houses, stakeholder meetings, online surveys, and intercept surveys. The following sections discuss each phase in more detail.

Pre-Demonstration Phase
August 2014-July 2015
The purpose of engaging prior to the installation of the protected bike lanes was to work with key stakeholders and civic divisions to identify potential issues, possible solutions, discuss communication strategies, and establish project success factors. Open Houses were also held to gauge community support for the project prior to installation.

A total of 17 different engagement events occurred prior to the installation of the protected bike lanes on 23rd St. Below is a summary of those events.



Engagement Events Aug 2014 - Jul 2015

Open Houses
Approximately 70 people attended the two public open houses in October 2014: one in the afternoon for businesses and stakeholders, a second in the evening advertised to the general public. Twelve comment forms were received from stakeholders or businesses. 43 comments forms were received at the public open house in the evening.

A third open house was held in January 2015 to report back to the businesses on what the installation along 23rd Street would look like.

Online Survey
The content at the open houses in October 2014 was also made available on the *Shaping Saskatoon* website. The online forum generated another 15 comments, and a survey posted on the website was completed by 482 respondents.

Stakeholder Meetings

A total of 11 stakeholders meeting occurred in the first phase of engagement. Eight of these stakeholder meetings were presentations and discussions with individual organizations to address specific questions or concerns, while the remaining three involved all stakeholders to the table at the same time to ensure effective issue identification and problem solving.

Street Intercept Survey – Pre-installation

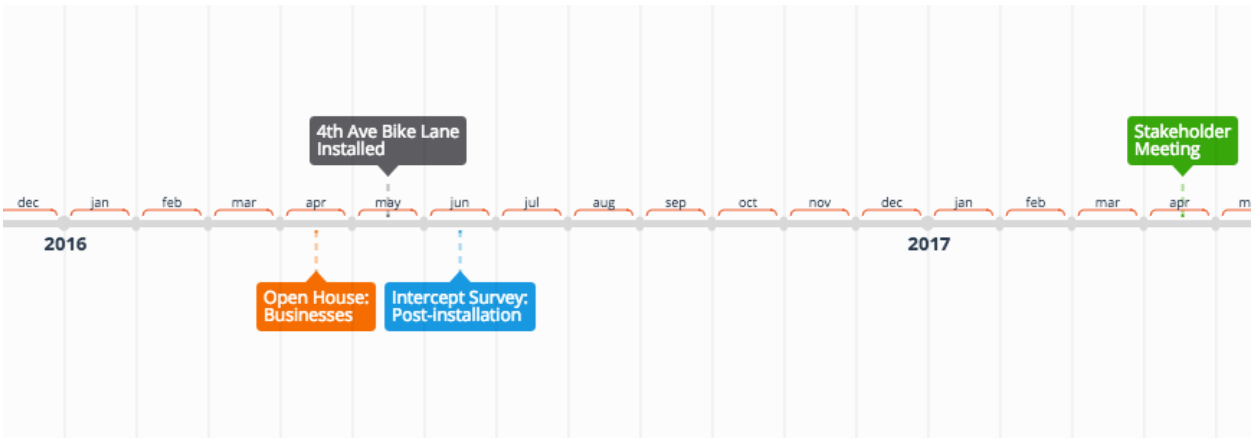
Intercept surveys were conducted by City staff to determine why and how people currently access 23rd and 24th streets and to determine perceptions of safety, accessibility and vibrancy of 23rd Street and 24th Street pre-project. A total of 61 people were interviewed.

Online Survey – Businesses

As part of the Demonstration Project, we asked business owners in the Downtown area to complete a short online survey prior to the opening of the 23rd Street protected bike lane. The survey was designed to measure businesses' perceptions of how protected bike lanes in the Downtown may impact various aspects of their business. A total of 59 businesses completed the online survey.

Mid-Demonstration Phase
April 2016-April 2017

The purpose of engagement during the demonstration project was to provide a mechanism for sharing updates on how the demonstration was proceeding as well as provide an opportunity to discuss with key stakeholders improvements that could be made mid-project. One open house for businesses, one intercept survey, and one stakeholder meeting occurred during this phase. In addition to these scheduled tools, a number of email communications were received throughout the duration of the project. It should also be noted that during the mid-demonstration phase, a number of changes were made to the bike lanes as a result of the feedback obtained throughout the demonstration project (see Attachment 1).



Engagement Events Apr 2016 - Apr 2017

Open House: Businesses

An information meeting was held in April 2016 prior to the installation of the protected bike lane along 4th Avenue. The purpose of this meeting was for businesses along 4th Avenue to have an

opportunity to learn about the project, ask questions prior to installation, and provide an update on the timelines for installation.

Intercept Survey – Post Installation

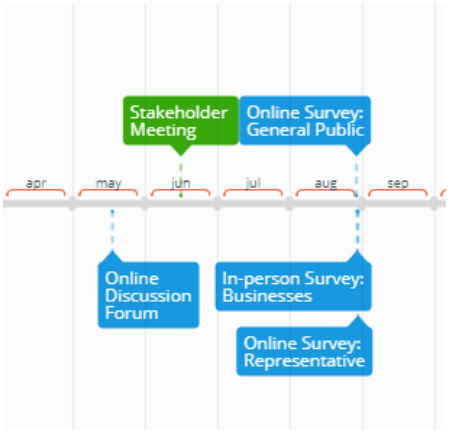
Intercept surveys were conducted by City staff to learn what transportation mode they used to arrive Downtown and to determine their perceptions of accessibility and vibrancy of 23rd Street and 4th Avenue. A total of 290 pedestrians were interviewed.

Stakeholder Meeting

A stakeholder meeting was held in April 2017 to present what the City had heard so far, the changes were being implemented to address comments and concerns received during the demonstration period, as well present the findings of the data collection to date. Following this meeting, a follow up presentation was requested by the North Sask Business Association.

Final Demonstration Phase
May 2017-September 2017

The purpose of engagement during the final phase of the demonstration was to provide an opportunity for the community to share their comments on the project after improvements had been made based on what we learned through the demonstration. A total of 4 tools were used in this phase to receive feedback from the community and included an online community discussion on Shaping Saskatoon, an online survey open to the public, a statistically representative survey, and in-person interviews with businesses near the demonstration project area. It should also be noted that 79 emails were received during the period of the discussion forum as some individuals had technical difficulties accessing the online forum.



Engagement Events May 2017 - Sep 2017

Shaping Saskatoon Online Discussion

Near the end of the demonstration and evaluation period of the project, two questions were posted on the Shaping Saskatoon website. The City asked the community to comment on what they liked about the protected bike lanes, and what could be improved. 115 people participated on the forum, leaving 252 comments. A summary of the findings is contained in Attachment 2.

Online Survey: Public Input Survey

To wrap up the demonstration project, the City conducted a survey to identify the best ways that people can share the streets, whether they choose to drive, cycle, or walk. The purpose of this survey was to help the City plan the Downtown transportation network and active transportation infrastructure.

1,363 people responded to the survey. The input received through this survey will be used to inform the Active Transportation Plan and Downtown 'All Ages and Abilities' (AAA) cycling network, help make decisions about any desired tweaks to the current temporary protected bike lanes, and understand design preferences for permanent protected bike lanes in the future.

Online Survey: Representative Survey

The same survey that was made available to the public was also administered to Insightrix's SaskWatch Panel. The purpose of this survey was to obtain input from a population sample that is representative of Saskatoon's residents. 1004 people completed this survey.

The results of both the Public Input Survey and the Representative Survey can be found in Attachment 3.

Business Intercept Survey

To collect opinions from downtown businesses, intercept interviews were conducted. Specifically, Insightrix Research interviewers entered randomly selected businesses located in the downtown core (between the river, 25th Street and Idylwyld Drive) and approached business decision makers to participate in a short interview. The purpose of this survey was to understand the businesses' perceptions of the protected bike lanes and understand any impacts that the demonstration project may have had on their business operations. 100 businesses were interviewed.

The results of the Business Intercept Survey can be found in Attachment 4.

Protected Bike Lane Demonstration Project: Recent Improvements

Based on feedback obtained from stakeholders and the public before May 2017, some improvements have been made to the bike lanes for the final summer of the demonstration. The following information outlines what we heard, and what has been changed to address the concerns.

CONCERN	WHAT WE HEARD	WHAT WE'VE CHANGED
Signs for motorists are not easily visible	Signs reminding motorists making right-turns to yield to people riding in the bike lanes are hard for drivers to see.	The signs were originally placed on the curb on the sidewalk. To improve visibility of these signs for motorists on 4th Avenue, these signs were moved in the buffer between the bike lane and the driving lane. These changes were not made to 23rd Street because transit bus stops near the corner does not allow this adjustment.
Driving lane shifts through intersections (driving lanes don't match)	After installation, the driving lane lines at some intersections on 4th Avenue did not line up perfectly.	The driving lane widths were adjusted to improve the traffic lane transitions.
Poor visibility of cyclists at intersections	Right turning motorists have found it difficult to see cyclists approaching intersections, especially if there are several parked cars.	To improve visibility, the bike lanes on 4th Avenue have been reconfigured. A "bend-in" design at the intersection moves the cyclists in line with the traffic lanes and provides better sight-lines for all users. The "bend-in" design was not applied to 23rd Street as the current conditions of the street facilitate visibility at intersections.
Motorists turning in and out of driveways	Motorists and cyclists had safety and visibility concerns at driveways.	The painted buffer at driveways were changed from a 20 degree angle to a 90 degree angle to promote a slower turn and improve visibility. This change encourages drivers to approach the driving lane at a right angle, improving sight lines and reducing right turn speeds.
Delays due to No Right Turn on Red restriction	The "No Right Turn on Red" restrictions on cross-streets were put in place to prevent motorists from entering the bike boxes where cyclists may be waiting. Motorists found this restriction unnecessarily increased delay, especially when the bike box was unoccupied.	The "No Right Turn on Red" restriction was removed. Motorists are now permitted to turn right at a red light. A "Turning Vehicles Yield to Bikes" sign has been put up in its place. This sign still requires motorists turning right at a red light to yield to a cyclist in the bike box. If a cyclist isn't present, motorists may proceed with their right turn.
Confusion about parking next to the protected bike lanes	Parking next to the bike lanes can be confusing. Although most people are now familiar with how to park next to the protected bike lanes, those encountering the bike lanes for the first time may require additional instruction.	Additional signs have been installed on bike lane delineator poles, which have been effective in marking "No Parking" areas.

Protected Bike Lane Demonstration Project: Potential Improvements

If the bike lanes become permanent, additional improvements may be made in the future. The following information outlines what we heard prior to spring 2017 and what could be considered for future improvements.

CONCERN	WHAT WE HEARD	WHAT COULD BEEN DONE IN THE FUTURE
The bidirectional (two-way) left-turn lane on 4th Avenue is confusing	The two-way left-turn lane on 4th Ave was causing confusion. People driving were not sure if the lane was available for all purposes (left turns, passing, driving) or designated for specific functions.	Overhead signs can be added to clearly mark the lane designations.
Cyclist delay due to two-stage left turns in bike boxes	Two-stage left turn bike boxes are complicated and inconvenient for both cyclists and motorists.	One-stage left turns in bike boxes may be considered to reduce cyclist delay in the bike boxes. However, these would require cyclists to move into the traffic stream, thereby reducing safety.
Inability to park adjacent to the curb for people with disabilities	The installation of the bike lane prevents people with disabilities from being able to park adjacent to the curb in the protected bike lane locations.	Accessible parking can be provided next to a raised platform that connects to the sidewalk. This would include a highly visible crosswalk with warning signs for cyclists to slow down.
The paint for the bike lane wears off	The paint used for the demonstration project wore away quickly.	Durable pavement markings can be used.
The bike lanes do not connect to other cycling infrastructure.	• **4th Avenue** Although the bike lane connects to the shared pathway at the bottom of the Broadway Bridge at the south end, it ends abruptly at 19th and 24th streets. • **23rd Street** At the east end, the bike lanes connect to Spadina Crescent's on-street bike lanes. At the west end, the bike lanes end abruptly at Idylwyld Drive.	• Planning for a downtown All Ages and Ability network was identified as a high priority in the Active Transportation Plan. • Intersection improvements at 19th Street and 3rd Avenue and 4th Avenue are being developed and will include cycling accommodation. • The Imagine Idylwyld project is redesigning the intersection at 23rd Street to provide cycling facilities to connect to the Blairmore Bikeway (23rd Street bike boulevard).

Protected Bike Lane Demonstration Project: Ongoing Improvements and Education

Traffic seems to move slower on 4th Avenue	• Monitoring of traffic flow has shown that travel times increased about 20 seconds for the average trip along 4th Avenue during a peak period. Queuing time for motorists at intersections has not increased beyond an average of 25 seconds per vehicle during the afternoon peak hour. • Although the amount of road space devoted to motor vehicles is reduced, the assignment of left-turn lanes increases traffic predictability throughout the corridor. • Turning in and out of driveways during the evening rush hour may take longer for drivers to find a gap in traffic.
Snow / Ice / Water	The City's goal is to have the bike lanes cleared 48 hours after the end of a major snowfall event. The lanes are cleared and treated with sand as needed between snow events. • **Businesses pushing snow into bike lanes** In the downtown, snow removal is timed to allow properties to push their snow onto roadways - parking or bike lane – up to 24 hours after a snow event. The City then removes this snow during clean-up. Most downtown businesses are able to comply. Notices were issued to several businesses this winter who were repeatedly piling snow into the lanes that had already been cleared by the City. The City relies on calls to Public Works Dispatch to identify these locations and proceed with getting them cleared. • **Water/ice accumulating in the bike lane** This is a function of the bike lane placement adjacent to curb as well as pavement condition. Water drains to gutters and catch basins on either side of the street and are the lowest points on the road. Typically, accumulated water and ice is covered by parked vehicles. During the spring thaw, some accumulation is natural although catch basins may become obstructed and need City intervention. Pavement deterioration on 23rd Street has definitely contributed to drainage issues. Resurfacing is planned for 2018 between 4th Avenue and Spadina Crescent.
Debris in the bike lanes	The gutters will naturally accumulate natural debris including grass clipping and leaves. The City is pleased to partner with the Downtown Saskatoon Business Improvement District (DTN YXE) in sweeping the bike lanes in 2017.
Missing/damaged Poles	Poles near bus stops and some corners were being hit repeatedly and were removed. The City relies on notification of damaged poles so that they can be repaired quickly.

Immediate response to maintenance issues	Every block of the bike lanes cannot be inspected daily. The City requests that people call Public Works Dispatch to identify hazardous conditions and their specific location in order to get the problem fixed quickly. This includes: • Snow pushed into the bike lanes after they have been cleared • Clogged catch basins • Dangerous glass or debris in the bike lanes • Poles damaged or knocked down
White delineator poles	White "delineator" poles along with a painted buffer were used to physically separate and protect people cycling in the bike lanes. Since this is a demonstration project, this separation treatment was selected as it was the quickest and least expensive. If the protected bike lanes become permanent, different separation options will be considered. Different types of barriers that can be used between the parking and bike lane include: planters, raised concrete curbs and different pole or bollard designs.
Vehicles blocking the bike lanes	While protected bike lanes separate cyclists from motor vehicles, conflict points will remain as people need access to back lanes and parkades in a busy downtown centre. Everyone needs to remain alert.
Continuing education	Motorists, cyclists, pedestrians and transit users are still adjusting to the introduction of the protected bike lanes. Flyers/pamphlets or other communications can be considered to further educate road users.
Transit terminal location	Cyclists are required to dismount and walk their bike across the transit terminal. However, the transit terminal is expected to be relocated in the not too distant future with the implementation of Bus Rapid Transit.
Buses stopping in the protected bike lanes	Cyclists are required to wait behind a bus that is stopped in the bike lane to load/unload passengers. Transit platforms could be installed outside the bike lanes so that buses would no longer block the bike lane.
People with mobility limitations (wheelchairs and scooters) using bike lanes	People may find that the bike lanes offer a smoother path. The City will look into the bylaw ramifications and how best to accommodate all users.
Proper work zones	It is important that proper work zones are set up when there is construction in the protected bike lane. Guidelines will be developed to ensure proper work zones are barricaded and signed appropriately.

Shaping Saskatoon Online Discussion: Summary

May 15 – June 15, 2017

Total Participants: 115

Total Comments: 252

Introduction

The online discussion forum was an opportunity for Saskatoon residents to tell us what they liked about the protected bike lane demonstration project, and what the City could improve. 252 comments were received. Two primary questions were asked, 'What do you like about the bike lanes?' and 'What could be improved?'. Below is a summary of all comments received, categorized by question.

Common Goals for All Users

Upon reviewing the comments received from all users of 4th Avenue and 23rd Street, the following are common goals that all users would like to see achieved on these streets:

Safe: All users want to arrive at their destination safely.

Efficient: All users want to arrive at their destination as efficiently as possible.

Predictable: All users want to know and understand how to interact with one another.

Cost-Effective: All users would like civic dollars allocated in an efficient manner.

Access to Parking: All users want access to convenient end-trip facilities (parking).

Respect: All users wasn't to be treated respectfully while commuting to their destination.

What do you like about the protected bike lanes?

Safety and comfort were the two most commonly noted items for what people liked about the bike lanes. Below is a summary of what respondents told us they liked about the protected bike lanes.

SAFETY

A common theme among those who used the bike lanes indicated that the bike lanes made them feel safer cycling on the downtown streets. Reported reasons for feeling safe included:

- being physically separated from traffic
- having a physical barrier between the bike lane and the driving lane

It is important to note that some users felt less safe due to being hidden behind parked cars and less visible to motorists at intersections and driveway crossings.

COMFORT

Users indicated that the protected bike lanes made their ride through the downtown more comfortable. They stated that the protected bike lane made their ride less stressful, as they did

not feel pressure from motorists because they had their own space where they could travel at their preferred speed.

Others commented that riding in the bike lanes was less intimidating that riding on downtown streets, and the protected bike lanes provided them with the opportunity to have their children, and less experienced riders accompany them downtown.

Other reasons people cited for liking the lanes include:

- the northbound connection off of Broadway onto the protected bike lane improved from the previous painted bike lane
- those that acknowledged that they rode on the sidewalk previously appreciated being able to be away from pedestrians
- that the protected bike lanes promoted healthy alternatives for moving around the city
- that having a protected lane prevented vehicles from stopping or parking in the bike lane, as was noted previously by some users on standard bike lanes.

What would you like to see improved?

A number of improvements were identified through the forum. These included:

CONNECTIVITY

- Better connections from the protected bike lanes to the surrounding network (more 'AAA" facilities leading to the downtown)
    - Specific connections identified included:
        - Spadina Cres @ 23rd St
        - 4th Ave @ 25th St
        - Southbound on 4th Ave @ 19th St
        - Connection by bicycle through the transit mall
- Different streets were suggested as potential alternatives
    - 2nd Ave was suggested as it is already a slow moving street
    - 24th Ave was suggested as it connects more directly with the University Bridge access
    - 3rd Ave was suggest at it will connect with the new multi-use pathways on the Traffic Bridge
- Overall, more 'AAA' facilities that connect throughout the city

SAFETY

- More visibility at intersections and driveway crossings.
- Improvements for motorist visibility making right turns. Many respondents indicated that shoulder checking for oncoming motor vehicles, pedestrians, and cyclists approaching from behind was difficult
- Better options for accessible parking spots adjacent to bike lanes

MAINTENANCE + OPERATIONS

- Clearer Pavement Markings / Lane alignments
    - Lane designations were unclear along 4th Avenue creating driver confusion

    - Lane alignment along 4th Avenue was unclear and could be improved
    - Pavement markings could be applied earlier in the season
- Improvements to Year-round Maintenance
    - Snow clearing into the bike lanes
    - Reduce the volume of gravel and debris in the bike lanes by regularly clearing the lanes
- Improved pavement quality. Users cited poor pavement conditions, especially along 23rd Street.
- Improved delineator treatments, such as planters or different type of post
- Improved signage. Respondents for indicated confusion over what certain signs mean
- Improved transit/bike integration treatments
- A number of respondents indicated that they found the No Right Turn on Red unnecessary (this restriction was removed Spring 2017)

EDUCATION + PROMOTION

- More education for all road users on how all road users should interact
- Clearer explanations or revisions to the street signs to make them more easily understood
- More promotion for cycling in general
- Enforcement of all road users
- Increase awareness for pedestrians of the bike lanes

CONVENIENCE

- Improvements to left turns for cyclists where bike boxes are not present
- More secure bike parking facilities in the downtown

Additional Feedback

A number of comments were also received that did not relate directly to the two questions asked. These primarily included the following observations:

PARKING

- Bike lanes have reduced parking opportunities in the Downtown
- Parking along 4h Avenue is more difficult since the bike lanes were installed

TRAFFIC DELAYS

- Traffic delays occur along 4th Avenue

COSTS

- The protected bike lanes cost too much to install
- The protected bike lanes cost too much to maintain
- The protected bike lanes are not a good use of civic dollars

VOLUME OF USERS

- The volume of people using the bike lane is too low

City of Saskatoon

2017 Protected Bike Lane Survey

insightrix®

City of Saskatoon

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Executive Summary

Study Background & Key Findings

Study Background:
The City of Saskatoon (the City) was interested in gathering feedback from Saskatoon residents about their perceptions and experiences with the bike lanes located on 23rd Street and 4th Avenue. Key objectives included understanding primary modes of transportation used to travel to and from downtown, incidence of cycling into downtown and barriers to doing so more frequently, perceptions of cycling safety, opinions and experiences with respect to the protected bike lanes and preferences for future downtown bike lanes.

To achieve these research objectives, Insightrix conducted two research studies:

a) a representative online study with 1,004 randomly selected residents
b) a public input survey placed on the City's website, resulting in 1,363 responses, and

Data were collected at the end of August and in the first half of September 2017. Key findings are outlined below.

Incidence of Cycling & Project Awareness:
- Seven in ten residents have access to a bicycle and six in ten report riding a bicycle at least occasionally.
- Three in ten report cycling into downtown at least occasionally (six in ten among those who answered the public survey), most commonly on weekends.
- Nearly all are aware of the current Protected Bike Lane Demonstration Project.

Key Findings (cont'd)

Protected Bike Lane Demonstration Project Impressions:

- Top of mind impressions of the protected bike lanes are mixed with several residents offering negative sentiments related to poor planning, limited use, cost and traffic disruptions. Those positive about the project cite it is a good initiative and is safer for cyclists.
- Motorist experiences as they relate to the protected bike lanes on both 4th Ave and 23rd Street vary, although with some attributes there are a high proportion of "poor" assessments. Cyclist and pedestrian experiences with the two roads are also divided although many are uncertain.
- A majority believe the protected bike lanes have improved cyclist and pedestrian safety, although a minority believe the lanes are visually pleasing.

Downtown Cycling:

- Common reasons for cycling downtown include recreation and exercise, social engagements or passing through the city core. Few downtown cyclists are commuters.
- Barriers to cycling downtown include preferring other methods, distance from downtown and safety, reportedly mostly due to careless drivers and busy streets.

Future Downtown Bike Lane Preferences:

- There is moderate support for most forms of proposed future bike lanes presented to respondents although opposition to painted sharrows is high.
- When asked where residents would like to see future bike lanes in the downtown core, opinions are mixed with Spadina Crescent emerging as the most popular, along with 20th Street, 1st Ave and 2nd Ave. Sizable proportions feel there should be no future lanes at all or are uncertain where lanes should be created.

Key Findings (cont'd)

Demographic Differences:

- Broadly speaking, those more positive and supportive of protected bike lanes include:
  - Younger residents
  - Those who cycle more frequently
  - Those who cycle downtown
  - Winter cyclists (most extreme support)
- Of note, those who cycle but do not do so downtown tend to be less positive towards current protected bike lanes and future bike lane options.

Background & Methodology

Study Background & Objectives

In March 2015, Saskatoon City Council approved a recommendation to proceed with a Protected Bike Lane Demonstration Project in the downtown area. The purpose of the demonstration project is to assess the feasibility of installing permanent protected bike lanes in downtown as proposed in the City Centre Plan and by Saskatoon Cycles through the Better Bike Lanes initiative. Expanding and enhancing Saskatoon's bicycle network is also part of the City's Active Transportation Plan. The strategic goal of the project is to create a vibrant and healthy downtown by promoting cycling as a safe and accessible mode of transportation to downtown destinations for businesses, residents, visitors, employers and their employees.

As the Protected Bike Lane Demonstration Project entered its final summer this year, the City was interested in gathering feedback from Saskatoon residents about their perceptions and experiences with the bike lanes located on 23rd Street and 4th Avenue in the downtown.

Specific research objectives included:

- ✓ Determine primary modes of transportation used to travel to and from the downtown
- ✓ Incidence of cycling into downtown and barriers to doing so more frequently
- ✓ Perceptions of safety when cycling into and within downtown
- ✓ Measure awareness of the Protected Bike Lane Demonstration Project
- ✓ Assess motorist, cyclist, pedestrian, and transit-user opinions and experiences with respect to the protected bike lanes
- ✓ Understand preferences for future downtown bike lanes

To achieve these research objectives, Insightrix conducted two research studies that gathered feedback from the general public. Saskatoon residents were surveyed through a **representative study** to provide an accurate perspective of opinions from the general population and a **public input** survey placed on the City's website, enabling those interested in voicing their opinions on the topic to provide their feedback to the City.

Methodology

To collect opinions from a representative sample of Saskatoon residents, a quantitative online survey was conducted through the Insightrix Research online panel, SaskWatch Research®, in addition to a link to the same survey on the City website. A comprehensive questionnaire was developed in collaboration with City representatives to meet the study objectives.

Data were collected between August 29 and September 14, 2017. In total, 1,004 residents completed the survey through the online panel (referred to as the representative survey in the report). Another 1,363 residents completed the survey through the City website (referred to as the public input in the report). For the representative sample, quotas were set by gender, age and SDA neighborhoods to ensure a representative mix of respondents was achieved. Because the studies were conducted online, margins of error are not applicable.

Representative Survey

Demographics		Count	Percent
Gender	Male	459	46%
	Female	543	54%
	Other	2	<1%
Age Range	18-34	328	33%
	35-54	364	36%
	55 or older	312	31%
Total		1004	100%

Public Input

Demographics		Count	Percent
Gender	Male	717	53%
	Female	640	47%
	Other	6	<1%
Age Range	18-34	510	37%
	35-54	625	46%
	55 or older	228	17%
Total		1363	100%

Reporting Notes

- Data have been rounded to zero decimal places; therefore, percentages may not add up precisely to 100% on some graphs.
- Open-ended questions have been themed and coded into categories. The percentages from individual codes could total more than 100%, as comments from each respondent could be relevant to more than one code.
- Questions that have multiple response options will result in percentages that could add up to more than 100%.
- Each survey question on the representative study was analyzed by appropriate demographic variables, such as region, age, gender, etc. Significant differences have been highlighted in this report with a ↑ or ↓. A standard alpha value of less than 0.05 is considered statistically significant. This means there is less than a 5% chance the results would have occurred by chance.
- In some cases, themes have been organized into 'Net themes' based on overarching commonalities in the content of responses (i.e., positive or negative mentions). The percentages of individual codes will add up to more than the Net total as multiple comments from each respondent are possible within each Net.
- Color coding has been implemented to visually differentiate between data from the representative and public input surveys, as outlined below:

Representative Survey **Public Input**

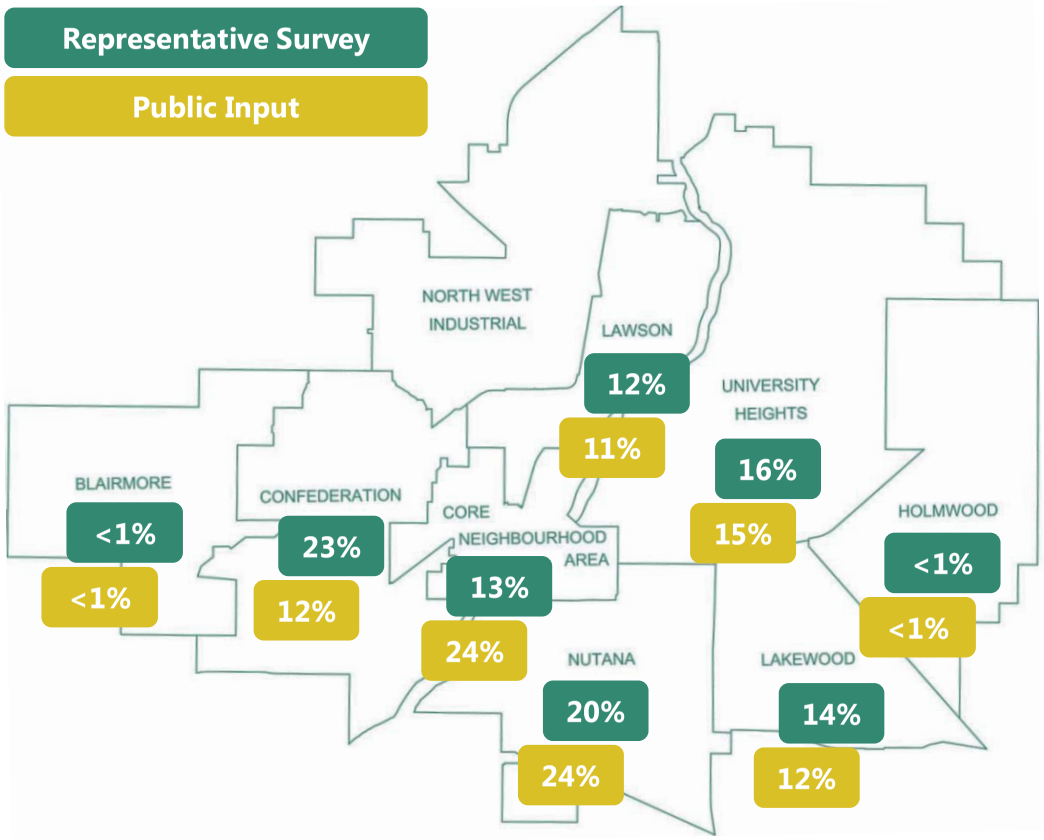
- Opinions from the representative study can be considered accurate for the broader Saskatoon population (i.e. the findings within the survey are reflective of opinions of all Saskatoon residents has a census survey had been conducted), whereas the findings from the public input survey are subject to a self-selection bias and should only be considered as reflective of those who completed this survey rather than the broader population.

48

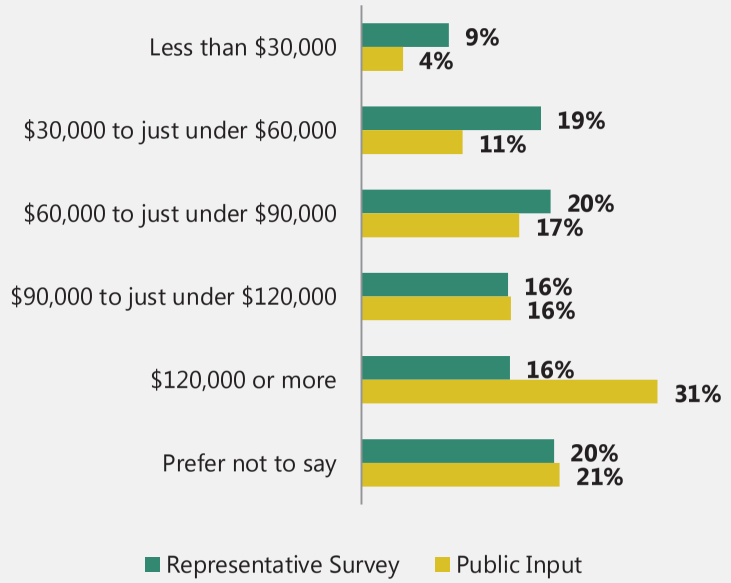
Resident Profile

Respondent Profile

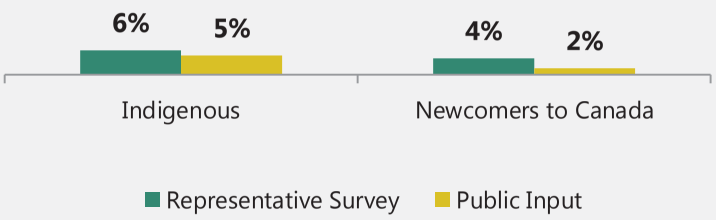
Suburban Development Area (SDA)*



Household Income



Minority Group



* Suburban development areas (SDA) are a consolidation of several neighbourhoods

5. What neighbourhood do you live in? Base: All respondents, Representative: n=1004, Public: n=1363.

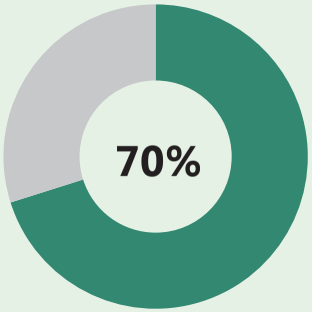
30. Into which of the following categories does your annual household income fall, before taxes and deductions? Base: All respondents, Representative: n=1004, Public: n=1363.

28. Indigenous people are those who identify themselves as First Nations, Métis, Non-status Indian, or Inuit. Do you self-declare as an Indigenous person under this definition? Base: All respondents, Representative: n=1004, Public: n=1363.

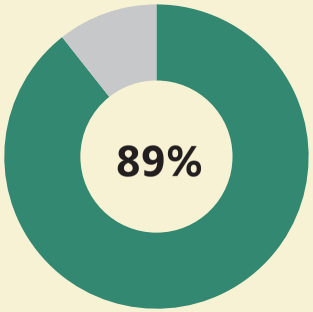
29. Have you moved to Canada within the past five years? Base: All respondents, Representative: n=1004, Public: n=1363.

A majority of Saskatoon residents who completed the representative survey say they have access to a bicycle while the incidence of bicycle access is much higher among those who participated in the public input survey. Most also have access to a motor vehicle.

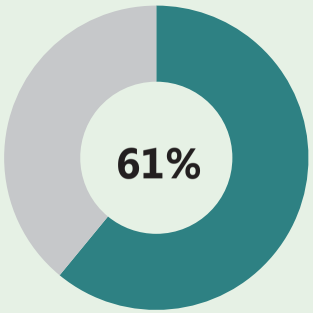
Access to Bicycle: Representative Survey



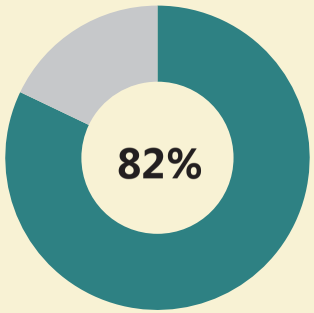
Access to Bicycle: Public Input



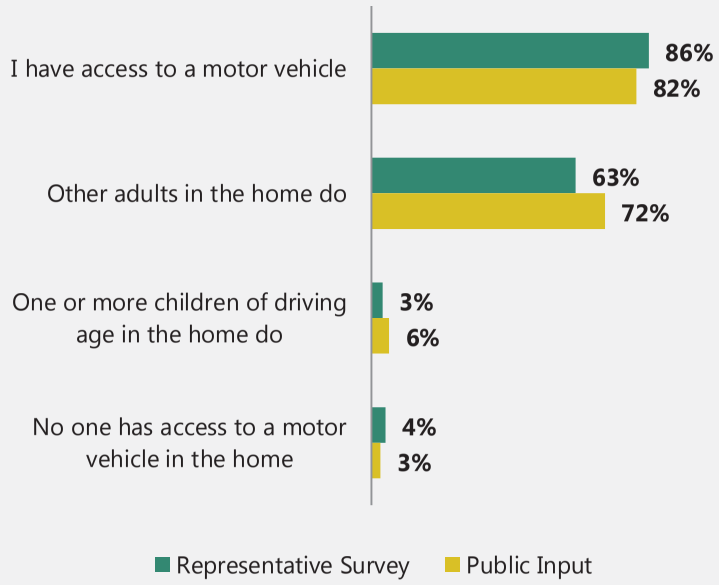
% of Residents that Cycle



% of Residents that Cycle



Access to Motor Vehicle

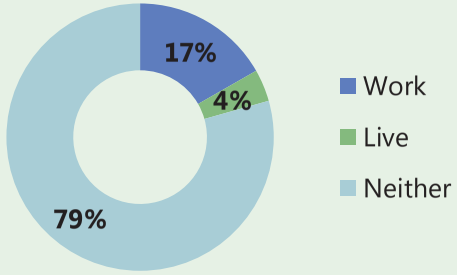


14. Do you own or have access to a bicycle? Base: All respondents, Representative: n=1004, Public, n=1363.

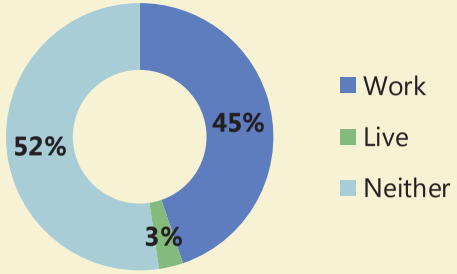
27. Who in your household has access to a motor vehicle? (select all that apply) Base: All respondents, Representative: n=1004, Public, n=1363.

Roughly two in ten Saskatoon residents from the representative study live or work downtown, lower than that of those who completed the public input survey. Nearly one half of residents from the representative study travel into the downtown core at least a few times per week vs. three quarters from the public input survey. Younger residents travel downtown more frequently.

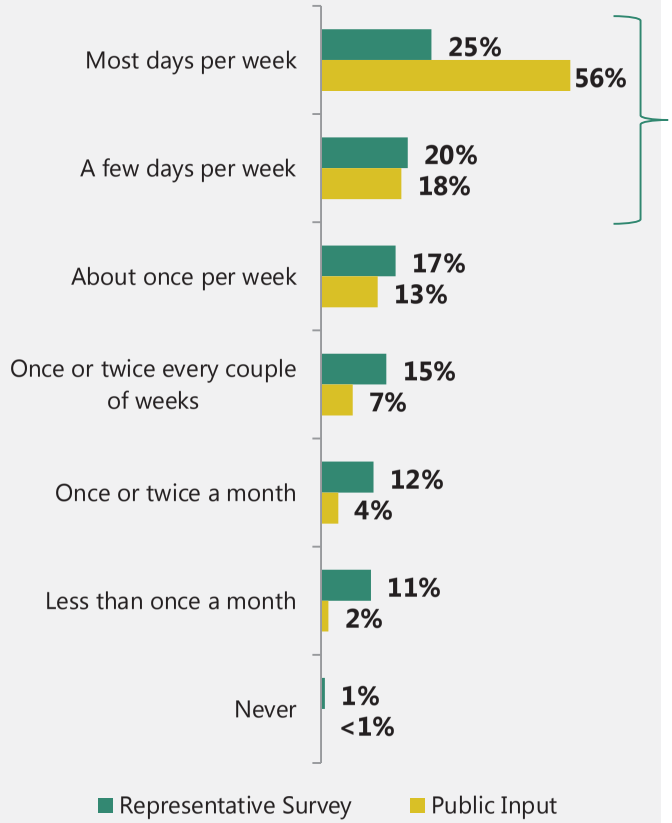
Live or Work Downtown: Representative Survey



Live or Work Downtown: Public Input

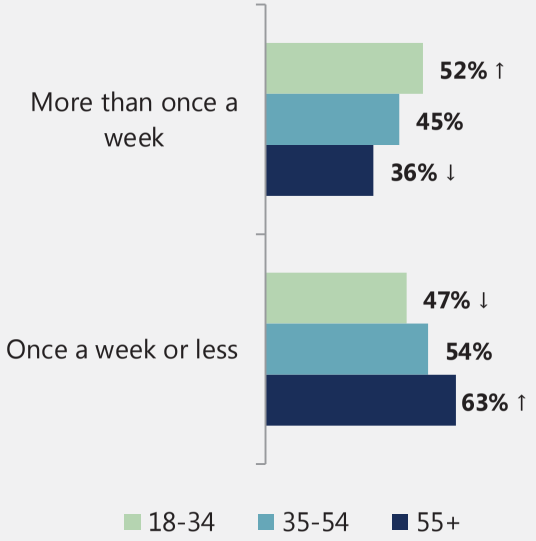


Frequency of Downtown Travel



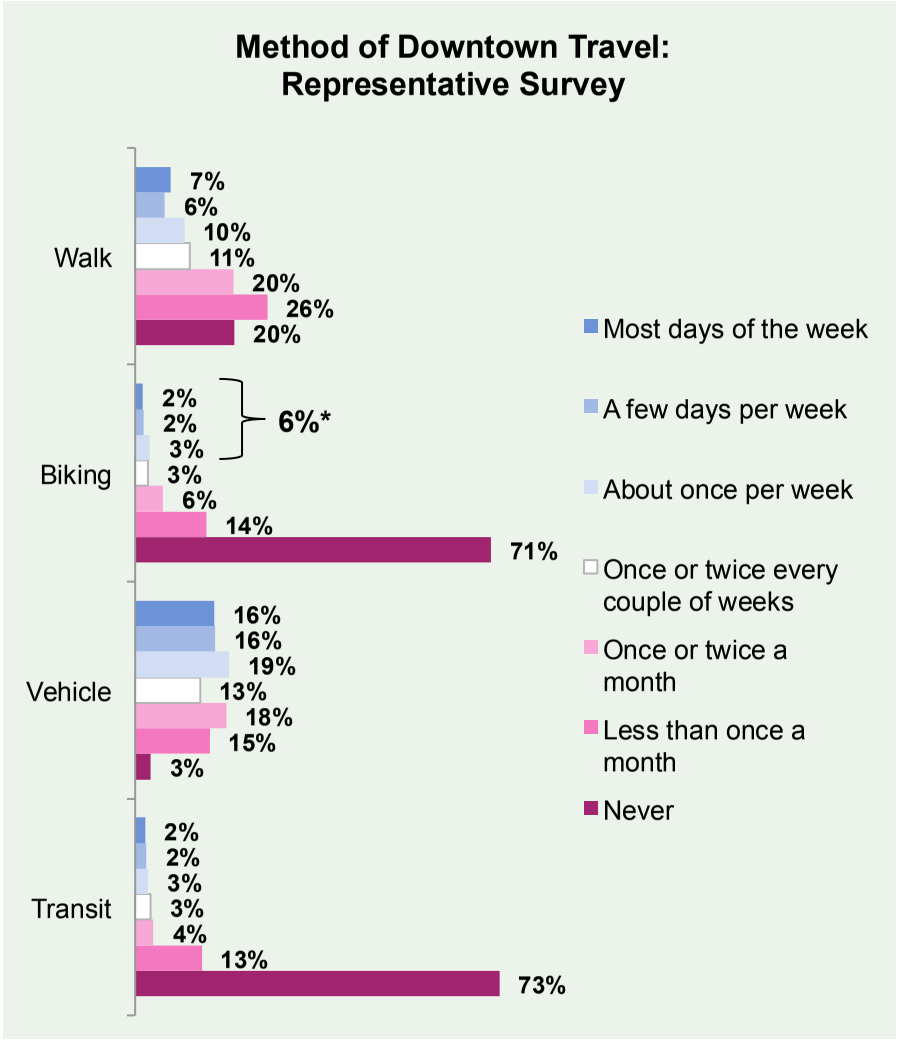
Few days or more often
Representative Survey: 45%
Public Input: 74%

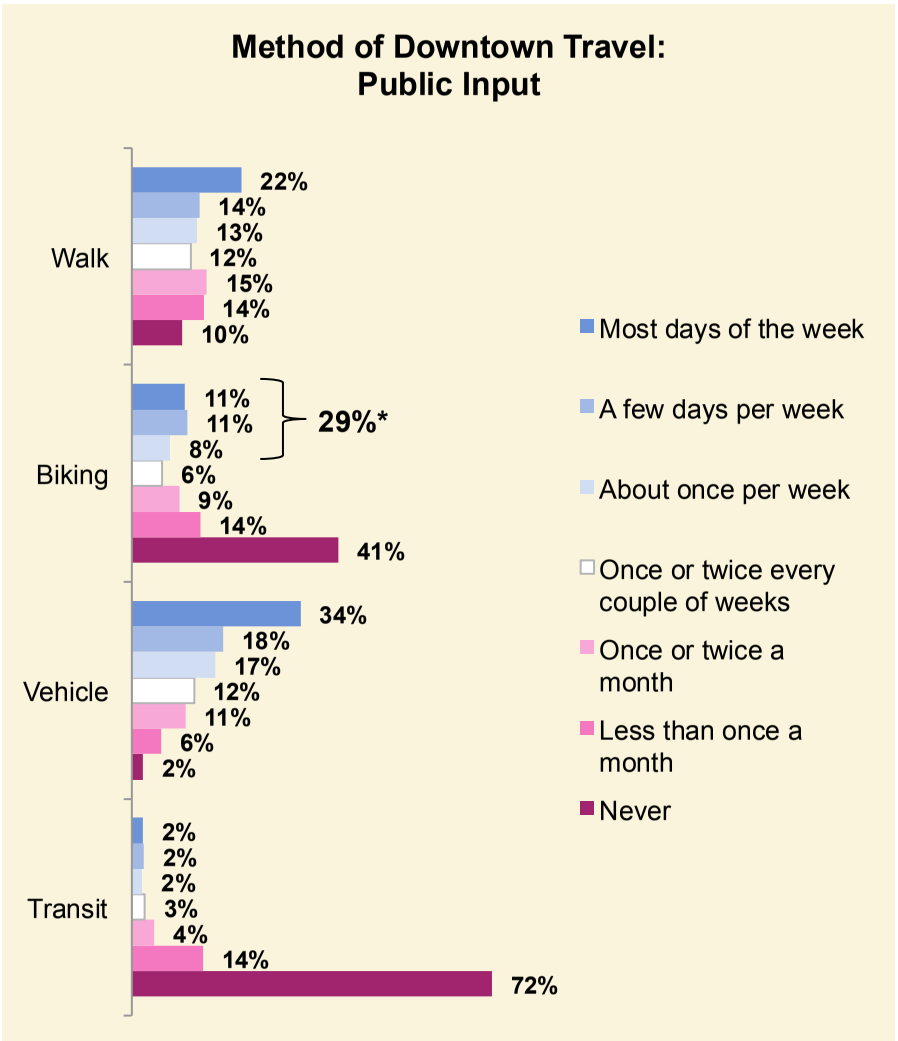
Frequency of Downtown Travel by Age Range



6. Do you work or live within the downtown core (i.e. between the river, 25th Street and Idylwyld Drive)? Base: All respondents, Representative: n=1004, Public: n=1363.
7. How often do you typically travel into the downtown core? Base: All respondents, Representative: n=1004, Public: n=1363.

Most commonly, Saskatoon residents drive downtown. Fewer than one in ten from the representative study say they ride their bicycle downtown at least once per week. Travel to downtown through all methods other than transit is much higher among those who completed the public input survey.



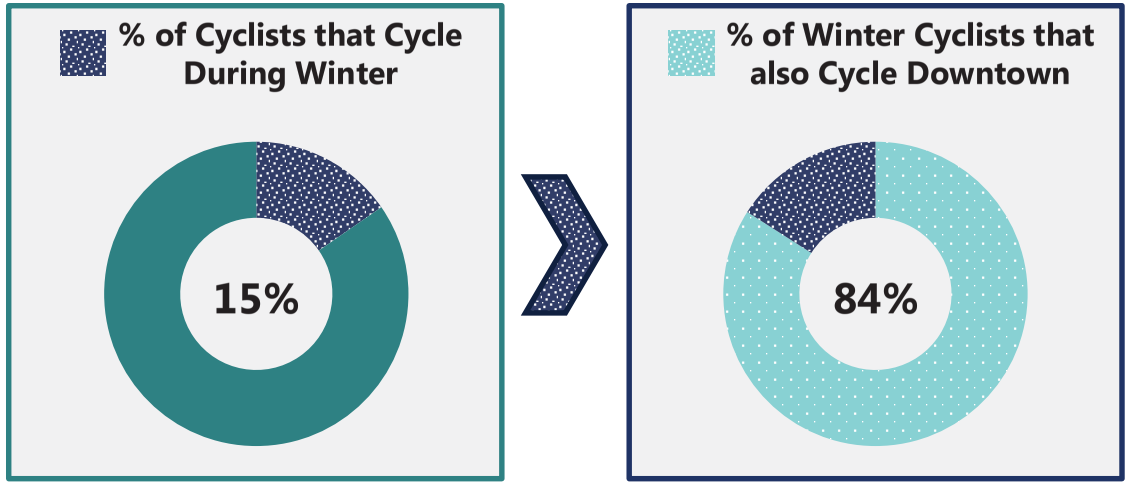


*** Differences in summation are due to rounding**

15. How often are you travelling into and within the downtown core through each of the following methods? Base: Respondents who travel downtown. Representative: n=1004, Public: n=1363.

A small minority of cyclists ride their bicycles during the winter, most of which also cycle downtown.

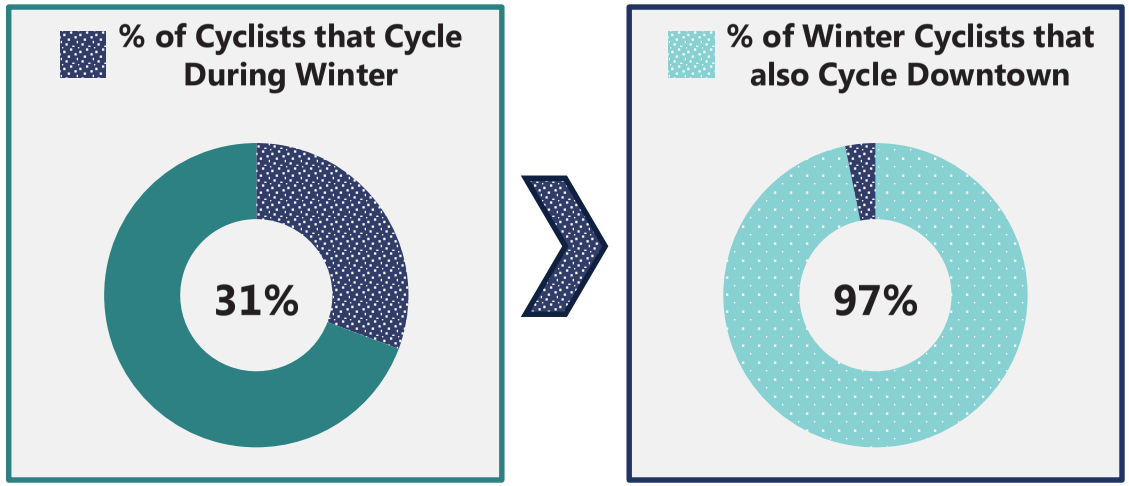
Representative Survey



Cycle during the winter

Cycle downtown & during the winter

Public Input

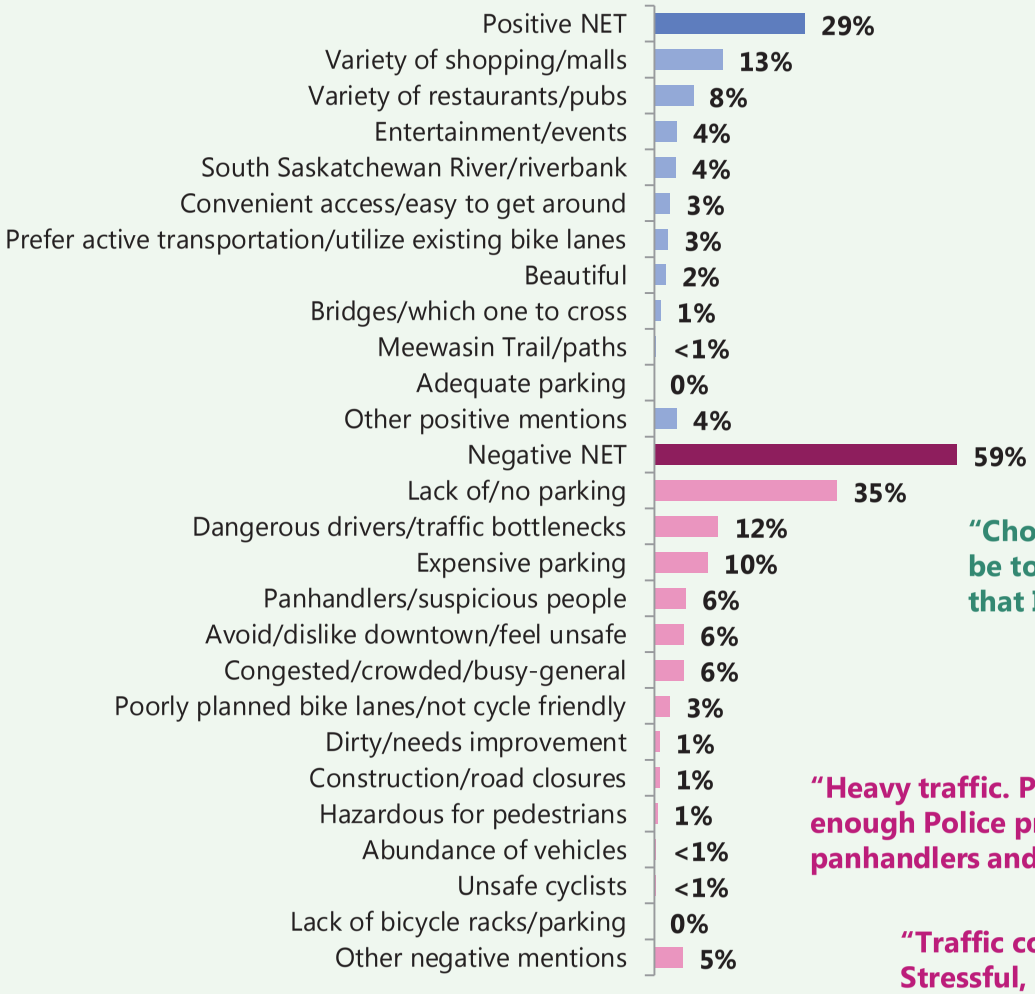


15. How often are you travelling into and within the downtown core through each of the following methods? Base: All respondents, Representative: n=1004.
26. How often do you cycle in the city (not just downtown) during... Base: All respondents that own a bicycle, Representative: n=1004.

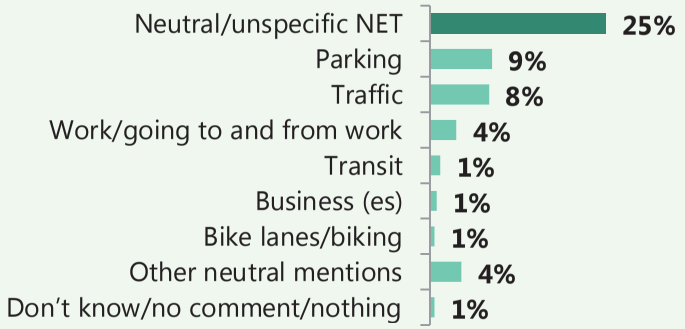
Residents' Top of Mind Impressions of Downtown

When asked to indicate what first comes to mind when thinking about Saskatoon's downtown, six in ten offer negative sentiments, most commonly, lack of parking, traffic and parking costs. Three in ten offer positive sentiments, often mentioning shopping and food options.

Thoughts on Downtown Saskatoon
(Open-ended question)



Representative Survey



"Beautiful scenery with the river, parks, bridges, and buildings such as the Bess."

"Choosing my route to bike downtown that won't be too busy or scary to drive down. Making sure that I leave early so that traffic isn't too bad."

"Crossing the beautiful river and seeing the landscapes of the riverbank and the downtown."

"Heavy traffic. Potholes. My safety, not enough Police presence to deal with panhandlers and such."

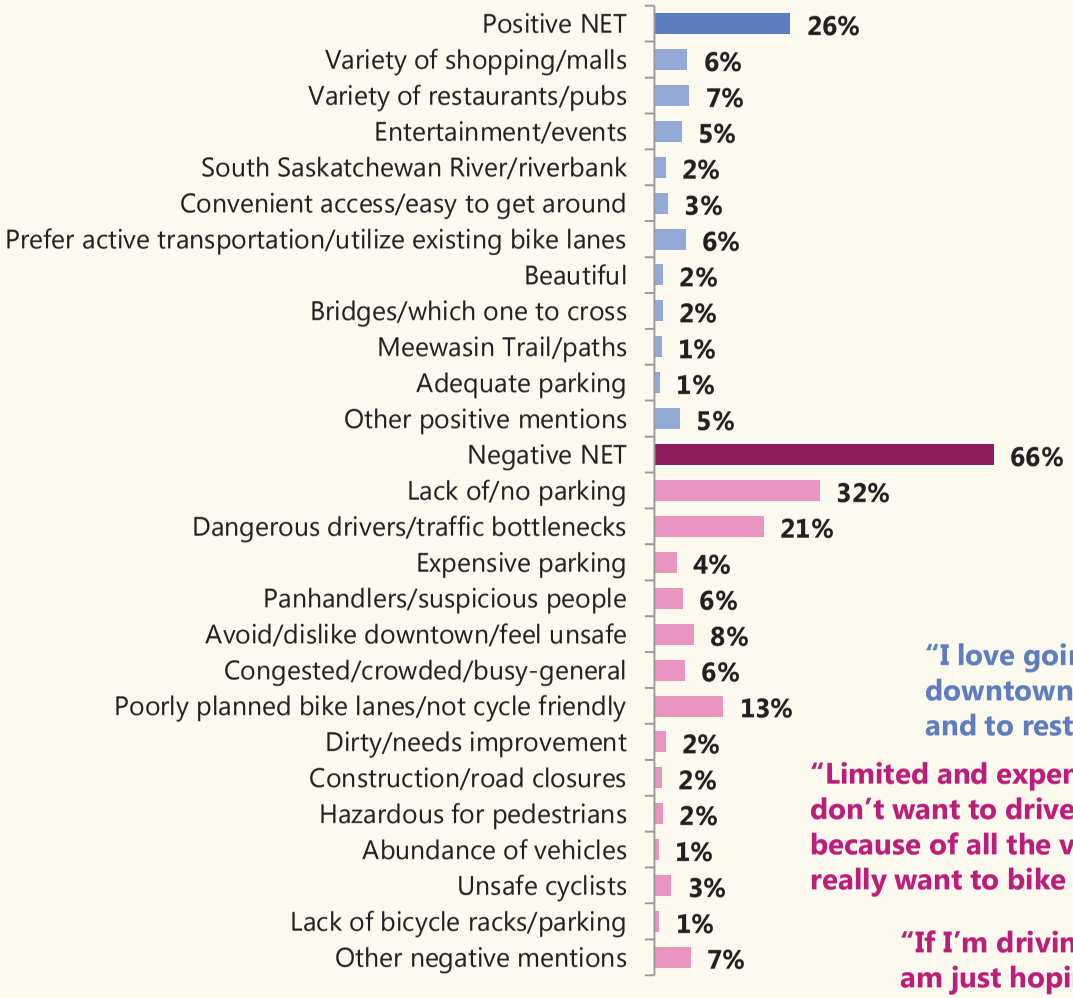
"Busy traffic and lack of parking."

"Traffic congestion. Bad parking. Expensive parking. Stressful, busy, no parking."

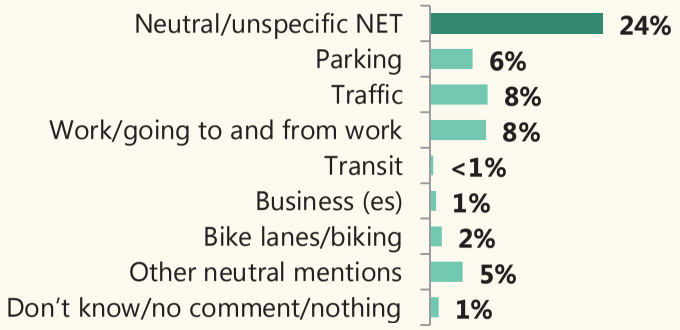
8. What first comes to mind when you think about going downtown? Base: All respondents, except those who live downtown, Representative: n=965.

A larger proportion of respondents to the public input cite negative aspects of the downtown on a top of mind basis, with parking, traffic and poorly planned bike lanes topping the list. One quarter offer a mix of positive opinions about downtown.

Thoughts on Downtown Saskatoon
(Open-ended question)



Public Input



"Fun. Downtown is the site of many attractions and amenities that I enjoy."

"Most of the time it's for work, so I'm not thinking specifically of downtown. I'm thinking about what I have to accomplish for the day."

"I love going downtown. I walk most places, including through the downtown to get to work and back, and I like going to the movies and to restaurants downtown. I like the business and vibrancy…"

"Limited and expensive parking for cars, so I don't want to drive. But unsafe for cycling because of all the vehicle traffic, so I don't really want to bike either."

"Traffic flow, there is none!"

"If I'm driving, parking is the biggest issue. If I'm cycling I am just hoping to get through without injury."

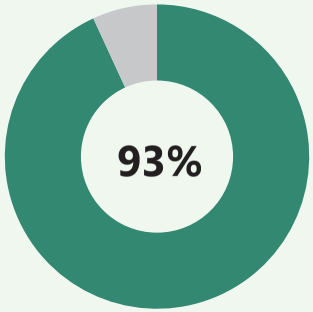
8. What first comes to mind when you think about going downtown? Base: All respondents, except those who live downtown, Representative: n=1323.

Protected Bike Lane Demonstration Project Impressions

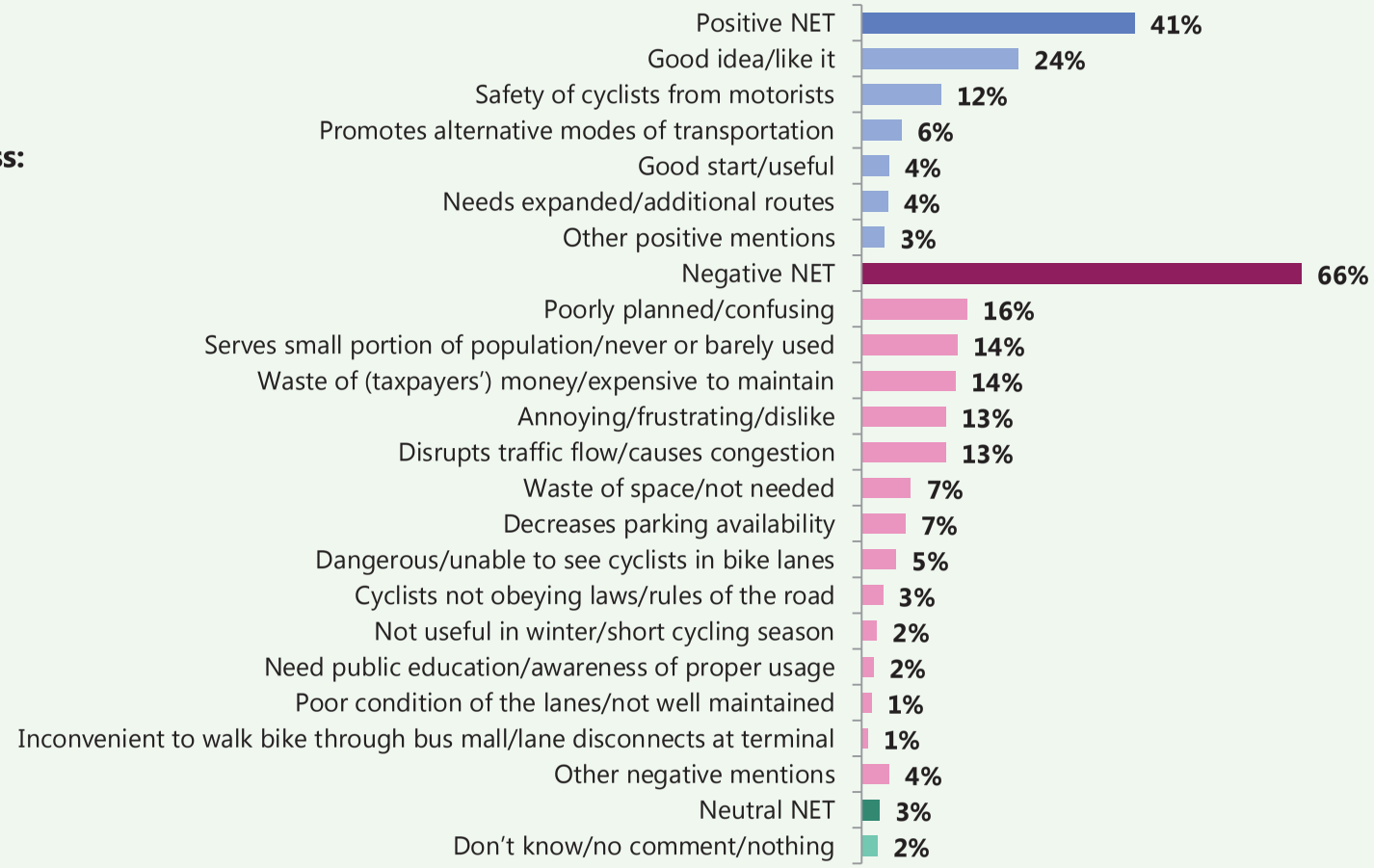
Awareness of the Protected Bike Lane Demonstration Project is very high. Top of mind comments are more commonly negative, with frequent references to poorly planned, underutilized, an unwanted expense and traffic impacts. Four in ten offer positive top of mind sentiments, including that it is generally a good idea and cyclist safety, among other aspects.

Representative Survey

Protected Bike Lane Demonstration Awareness: Representative Survey



Thoughts on Protected Bike Lane Demonstration
(Open-ended question)

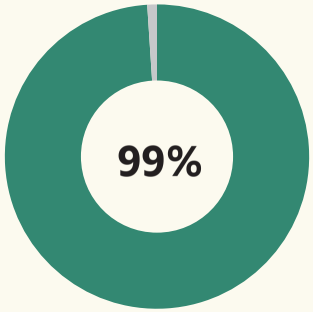


9. Before now, were you aware of the City's downtown Protected Bike Lane Demonstration Project on 4th Ave and 23rd Street? Base: All respondents, Representative: n=1004.
10. What first comes to mind when you think about this Protected Bike Lane Demonstration Project? Base: All respondents, Representative: n=1004.

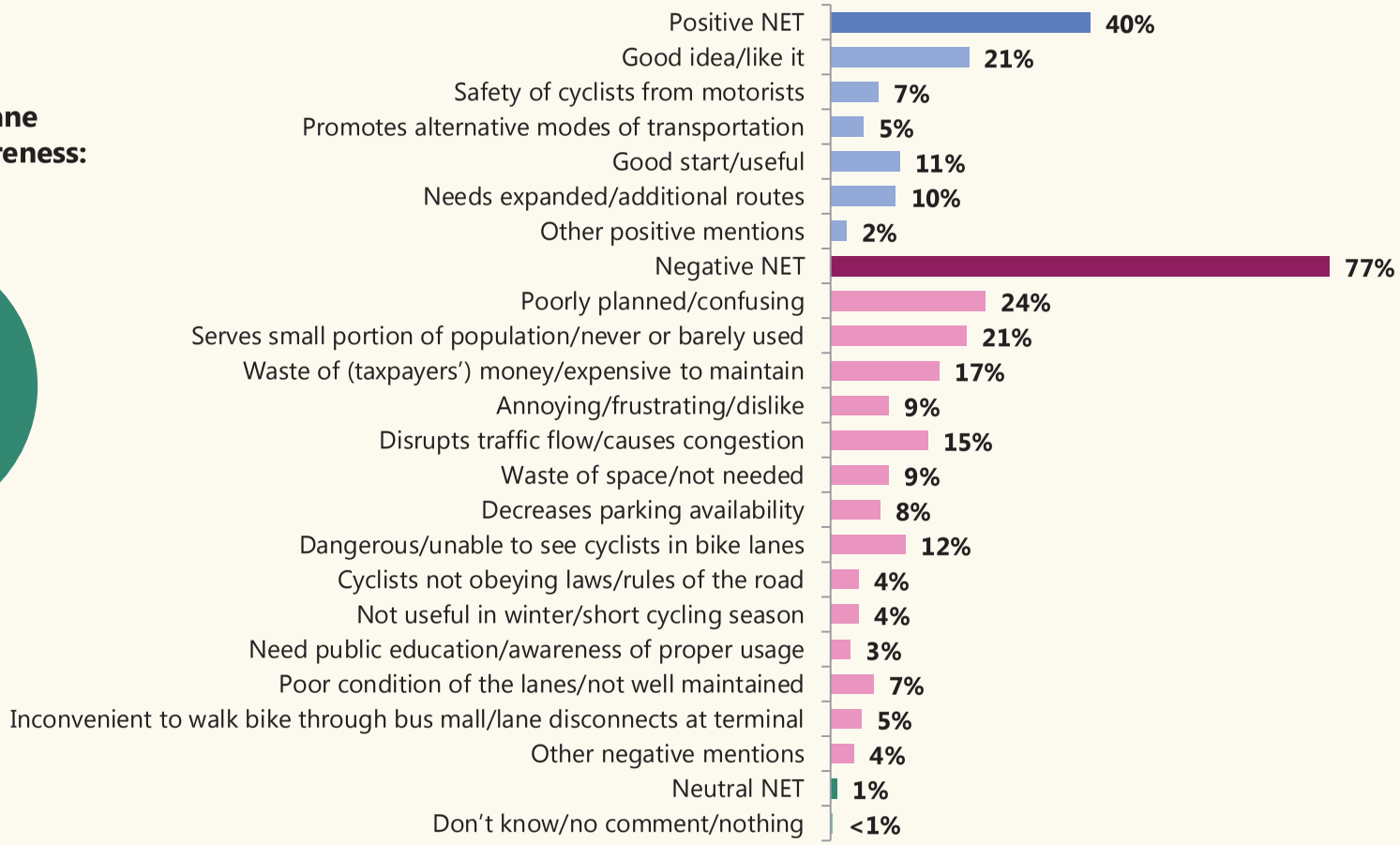
Similarly, virtually all who completed the public input survey are aware of the protected bike lane project. Nearly eight in ten offer negative top of mind sentiments, although four in ten offer positive opinions.

Public Input

Protected Bike Lane Demonstration Awareness: Public Input



Thoughts on Protected Bike Lane Demonstration
(Open-ended question)



9. Before now, were you aware of the City's downtown Protected Bike Lane Demonstration Project on 4th Ave and 23rd Street? Base: All respondents, Public: n=1363.
10. What first comes to mind when you think about this Protected Bike Lane Demonstration Project? Base: All respondents, Public: n=1363.

A selection of positive and negative sentiments offered by residents from the representative sample study are outlined below.

Top of mind thoughts on Protected Bike Lane Demonstration Project

Positive Sentiments

- "Great idea to keep them safe and out of the actual road with motorized vehicles."
- "Excellent idea, gives safety. Promotes fitness and environmental benefits."
- "I think it is a good idea as long as both cyclists and drivers respect them."
- "I like protected bike lanes - I wish there were more and longer extensions to connect core neighborhoods"
- "Innovative support for healthy public transport"
- "I hope it expands. I do not feel safe sharing the road with cars in Saskatoon and the bike lanes make me much more comfortable biking"

Negative Sentiments

- "Never see a biker using them or if they are they aren't obeying traffic laws."
- "A waste of time and money. Half the people still ride in the traffic lanes."
- "These lanes are NOT PROTECTED. Plastic barriers are not protection. I feel unsafe in these lanes (which I use often).
- "It's a hassle, waste of time and space to accommodate the few who bike."
- "A waste of money and resources. The downtown is too crowded and dangerous for bikes. Bike riders tend to disobey signs and traffic lights."
- "Not well planned out. Could lead to accidents as they are behind the parked vehicles."

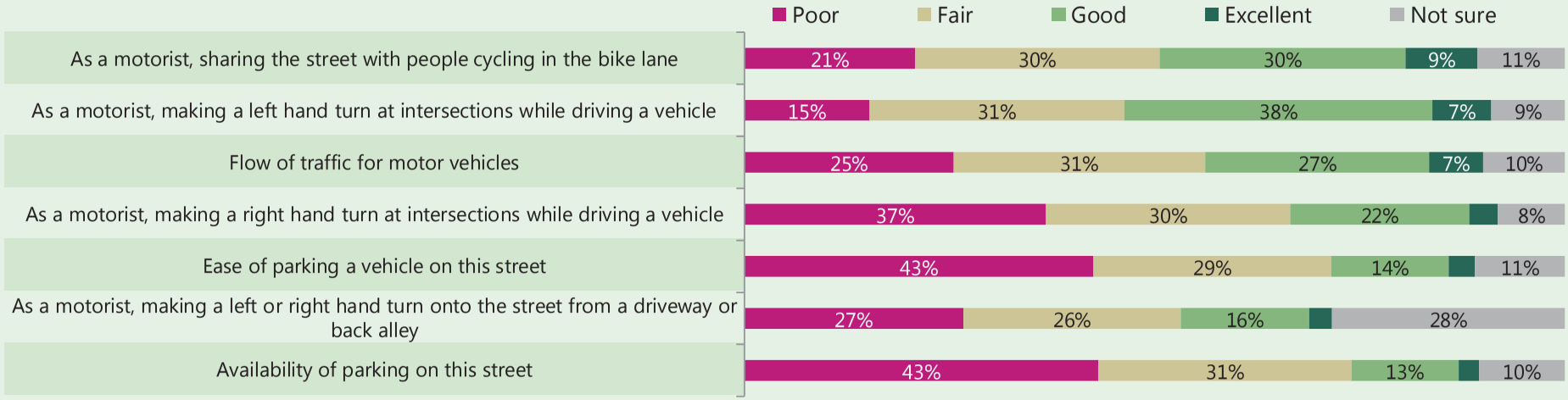
Representative Survey | Public Input

10. What first comes to mind when you think about this Protected Bike Lane Demonstration Project? Base: All respondents, Representative: n=1004.

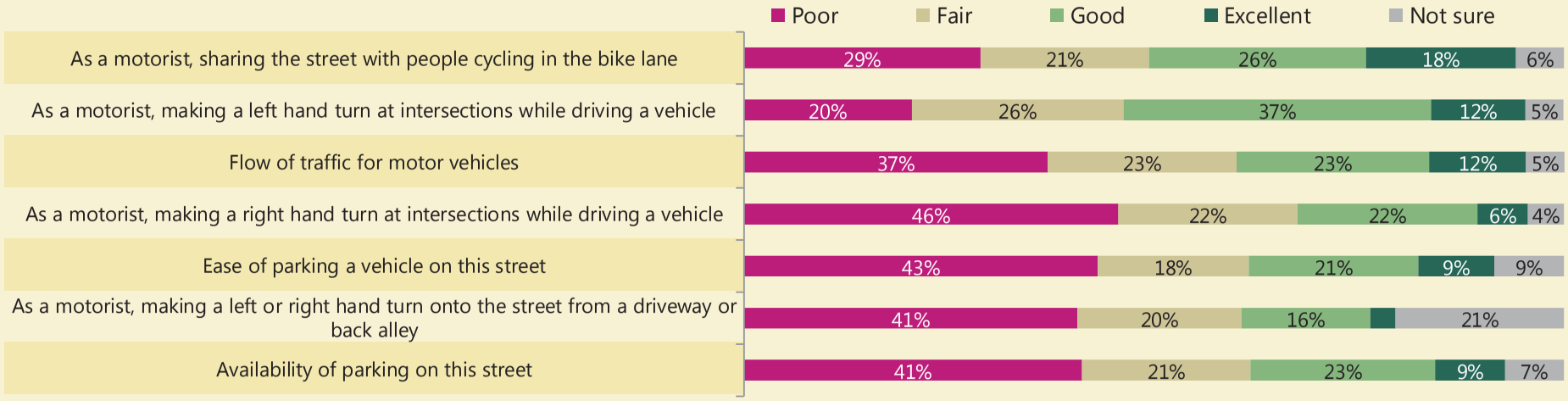
61

4th Ave experiences from motorist perspectives vary, although with some attributes, there are a high proportion of "poor" assessments.

4th Ave Bike Lane Impressions from Motorist Perspectives: Representative Survey



4th Ave Bike Lane Impressions from Motorist Perspectives: Public Input

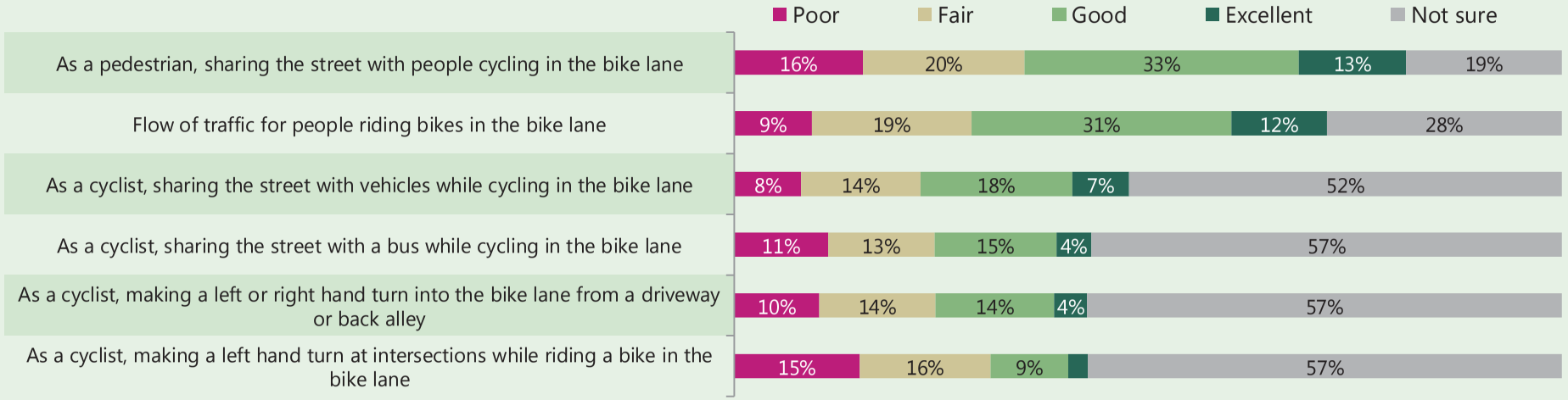


11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street?
Base: All respondents, Representative: n=1004, Public n=1363.

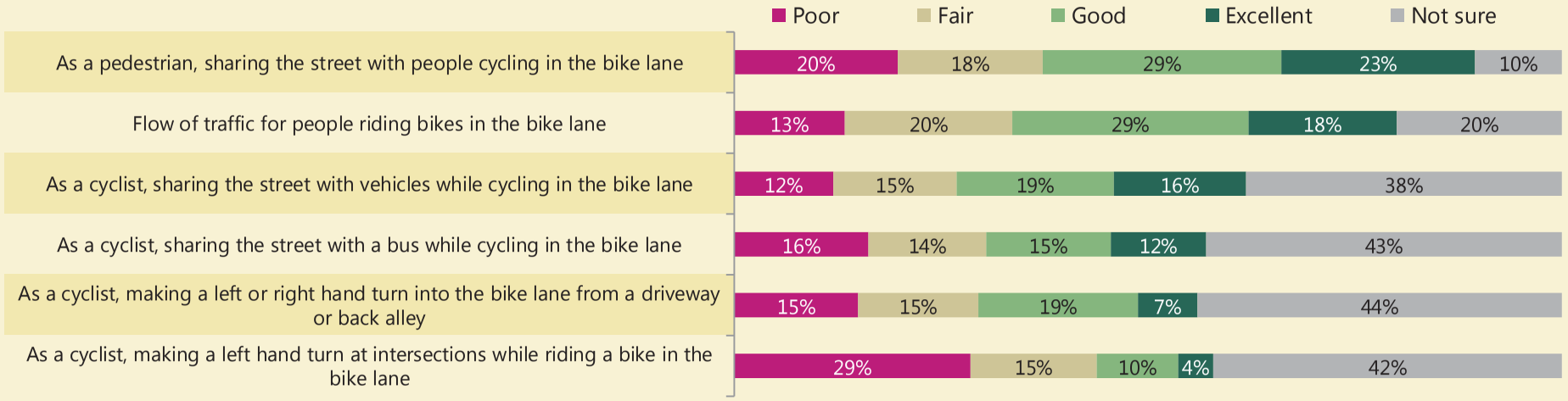
62

4th Ave cyclist and pedestrian experiences are mixed although many are uncertain.

4th Ave Bike Lane Impressions from Cyclists and Pedestrian Perspectives: Representative Survey



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives: Public Input



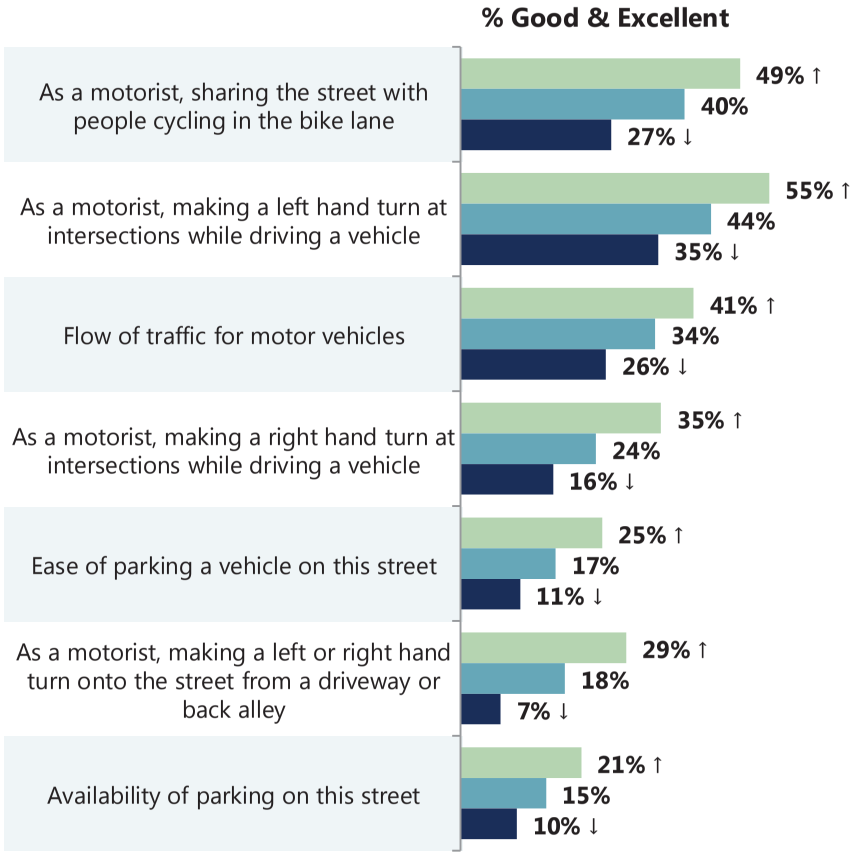
11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street?
Base: All respondents, Representative: n=1004, Public n=1363.

63

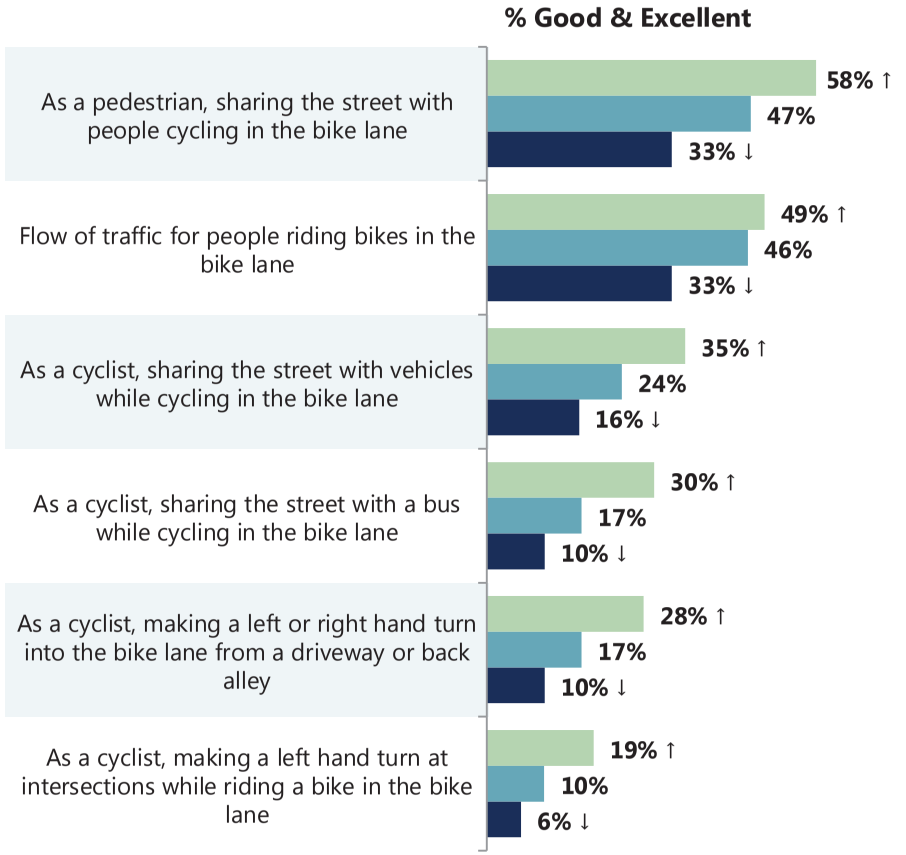
Younger residents tend to have more favourable opinions of 4th Ave travel experiences than their older counterparts.

Representative Survey

4th Ave Bike Lane Impressions from Motorist Perspectives by Age Range



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives by Age Range



18-34 35-54 55+

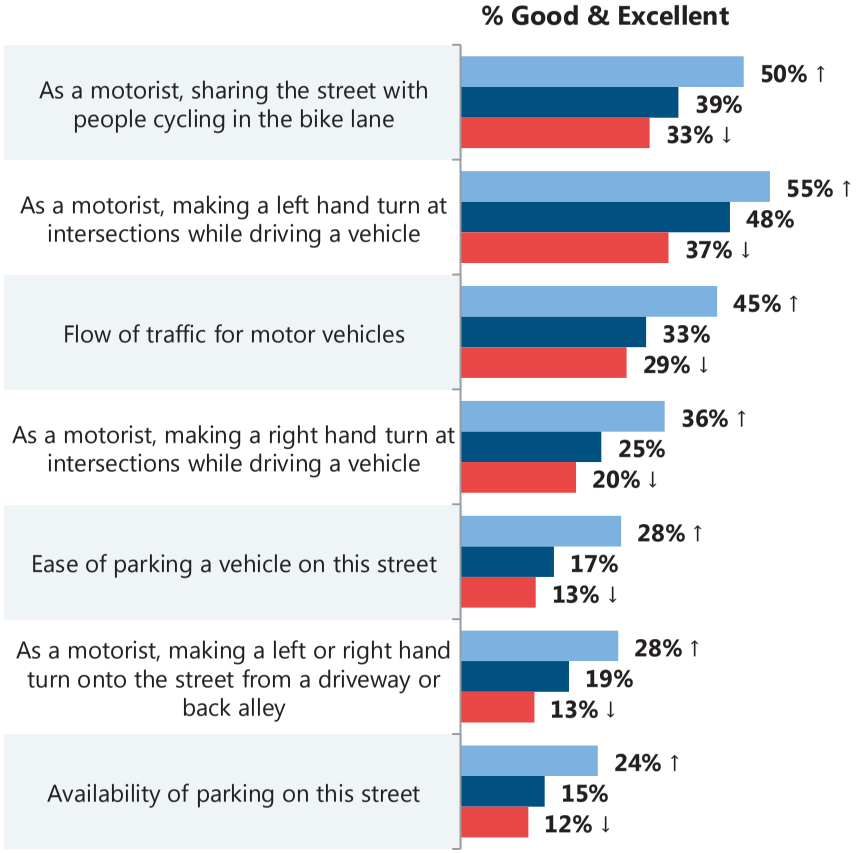
11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street?
Base: All respondents, Representative: n=1004.

64

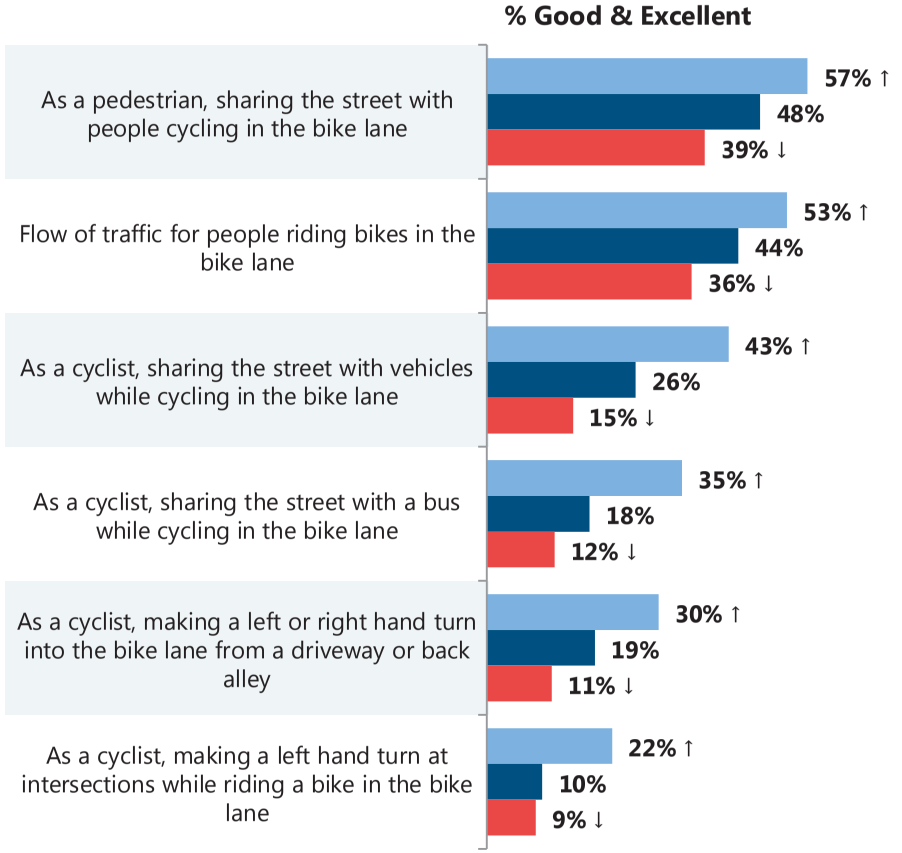
Residents who cycle frequently tend to have more favourable opinions of 4th Ave travel experiences than those who never cycle.

Representative Survey

4th Ave Bike Lane Impressions from Motorist Perspectives by Overall Cycling Frequency



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives by Overall Cycling Frequency

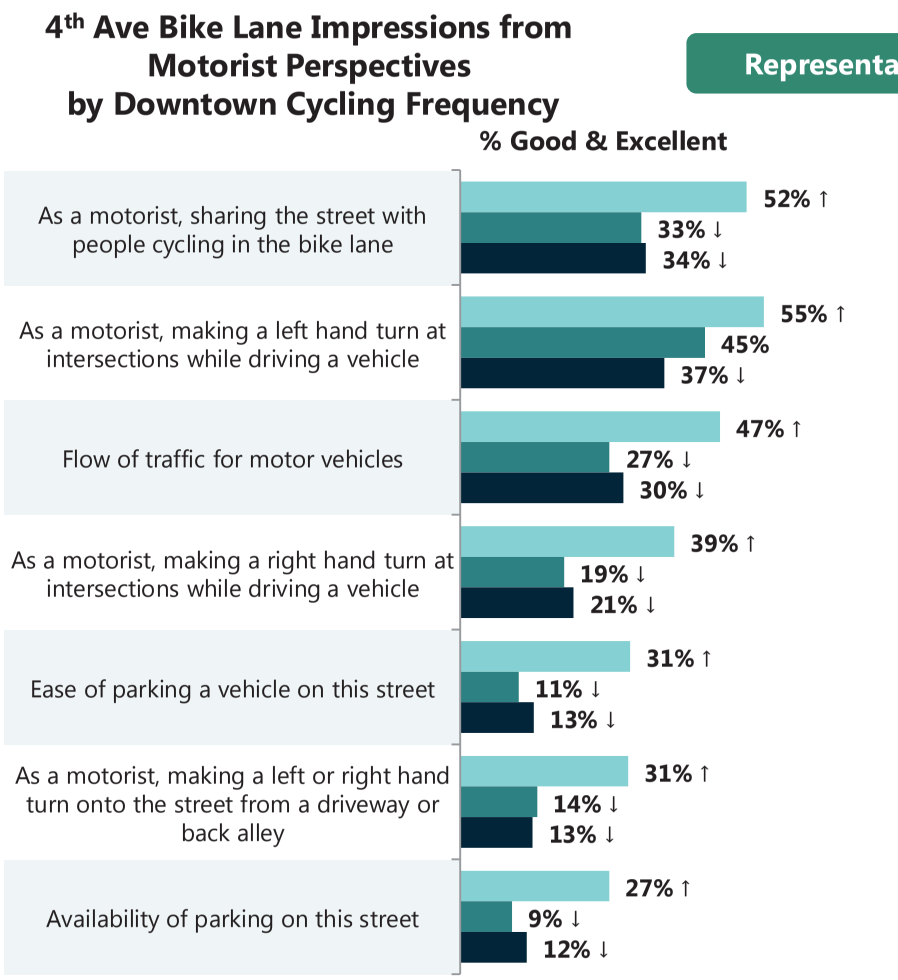


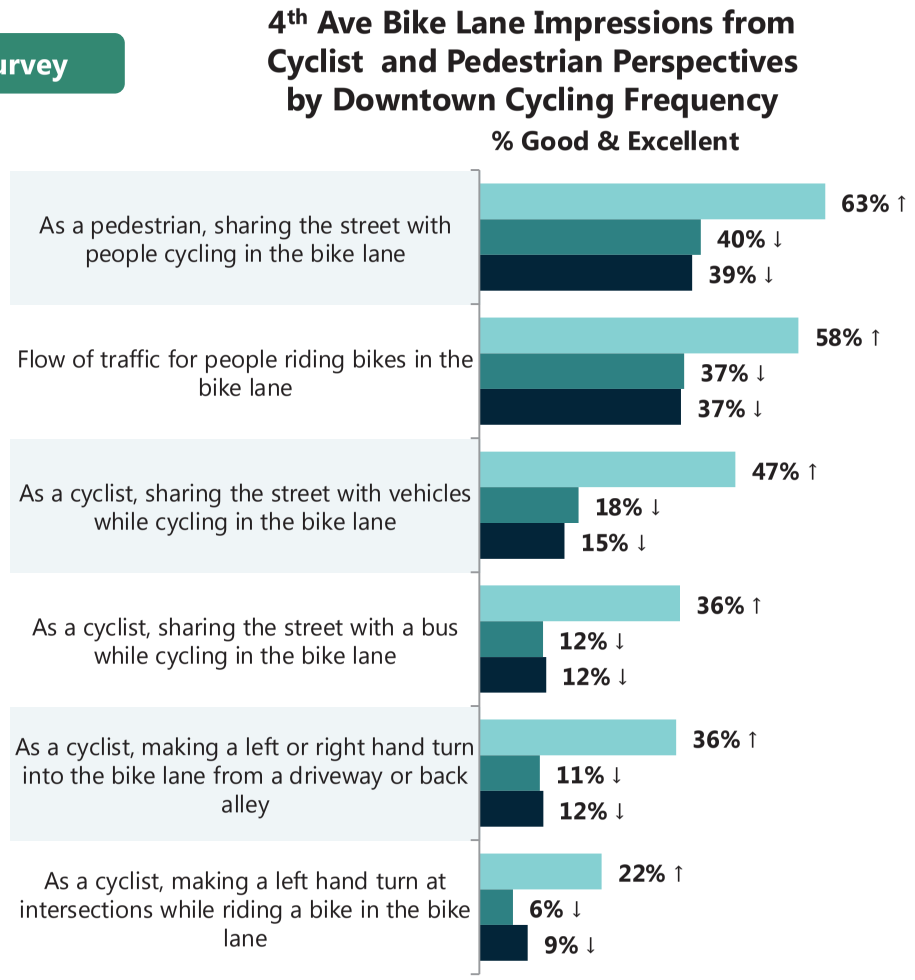
More than once a week | Once a week or less | Never

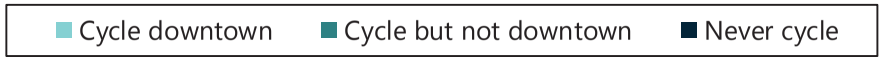
11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street?
Base: All respondents, Representative: n=1004.

Residents who cycle downtown tend to have more favourable opinions of 4th Ave travel experiences than those who never cycle downtown or never cycle in general.

Representative Survey



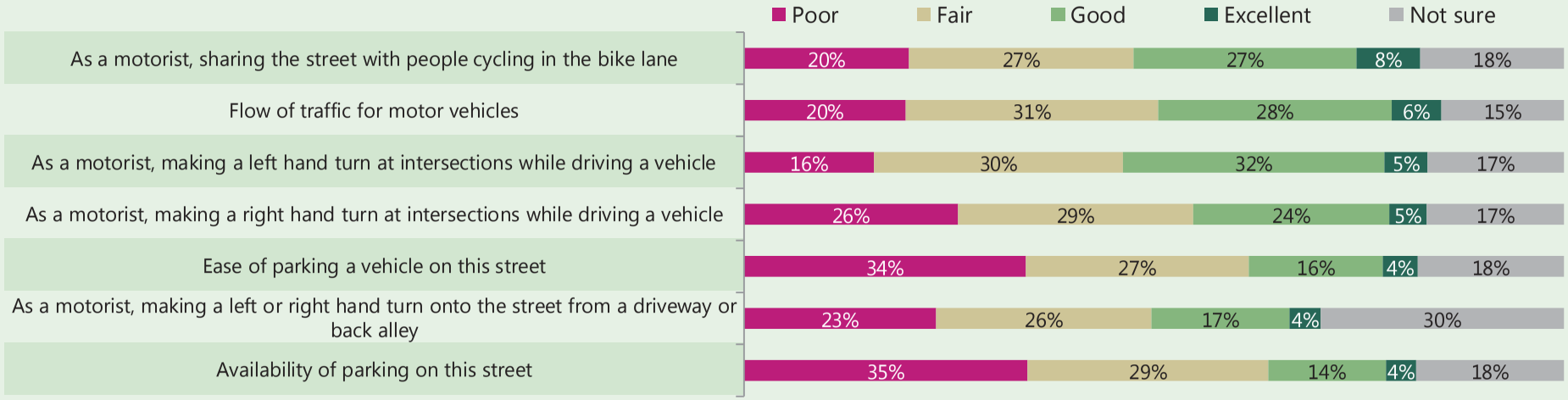




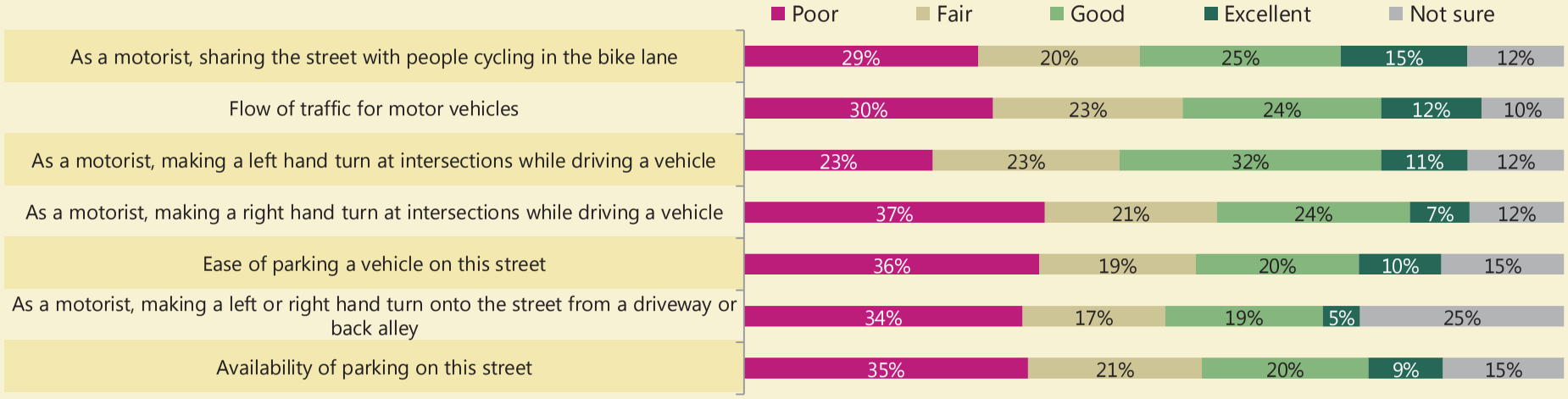
11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street?
Base: All respondents, Representative: n=1004.

23rd Street experiences from motorist perspectives vary, although with some attributes, there are a high proportion of "poor" assessments.

23rd Street Bike Lane Impressions from Motorist Perspectives: Representative Survey



23rd Street Bike Lane Impressions from Motorist Perspectives: Public Input

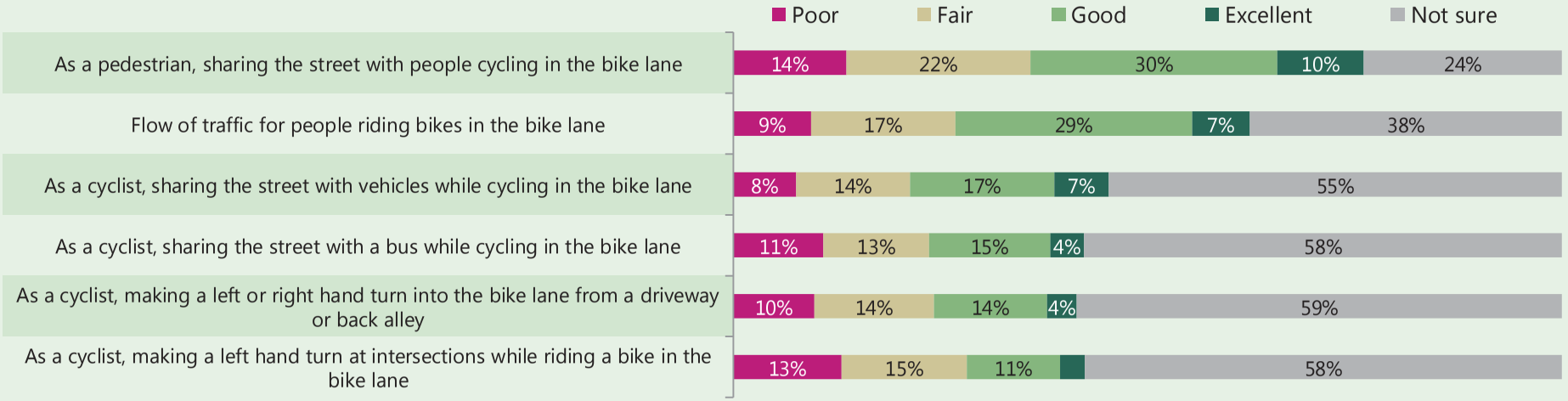


12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive?
Base: All respondents, Representative: n=1004, Public: n=1363.

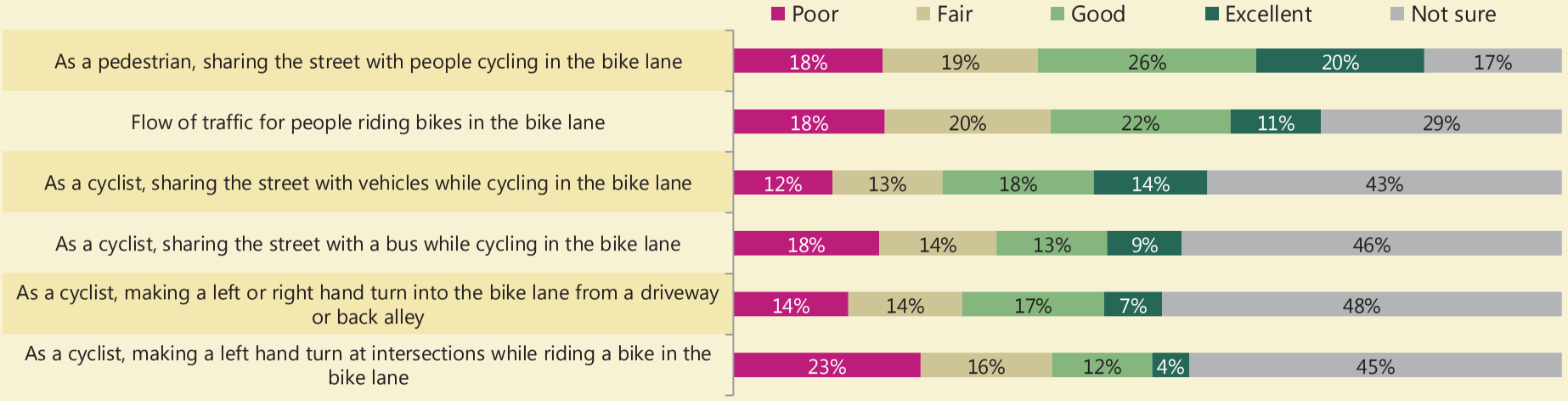
67

23rd Street cyclist and pedestrian experiences are mixed although many are uncertain.

23rd Street Bike Lane Impressions from Cyclists and Pedestrian Perspectives: Representative Survey



23rd Street Bike Lane Impressions from Cyclist and Pedestrian Perspectives: Public Input



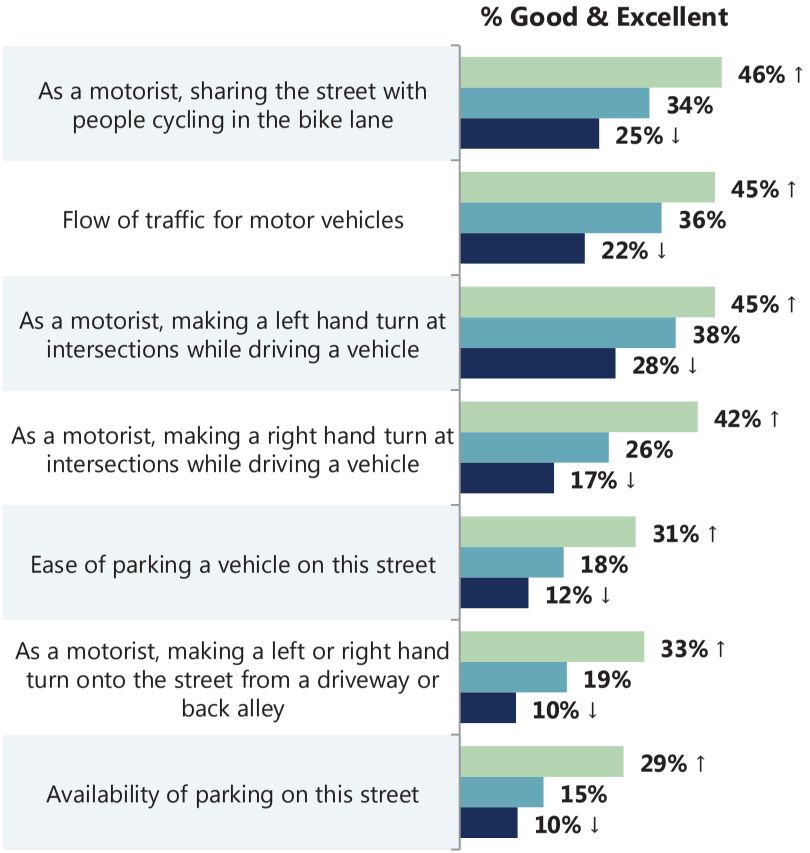
12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive?
Base: All respondents, Representative: n=1004, Public: n=1363.

68

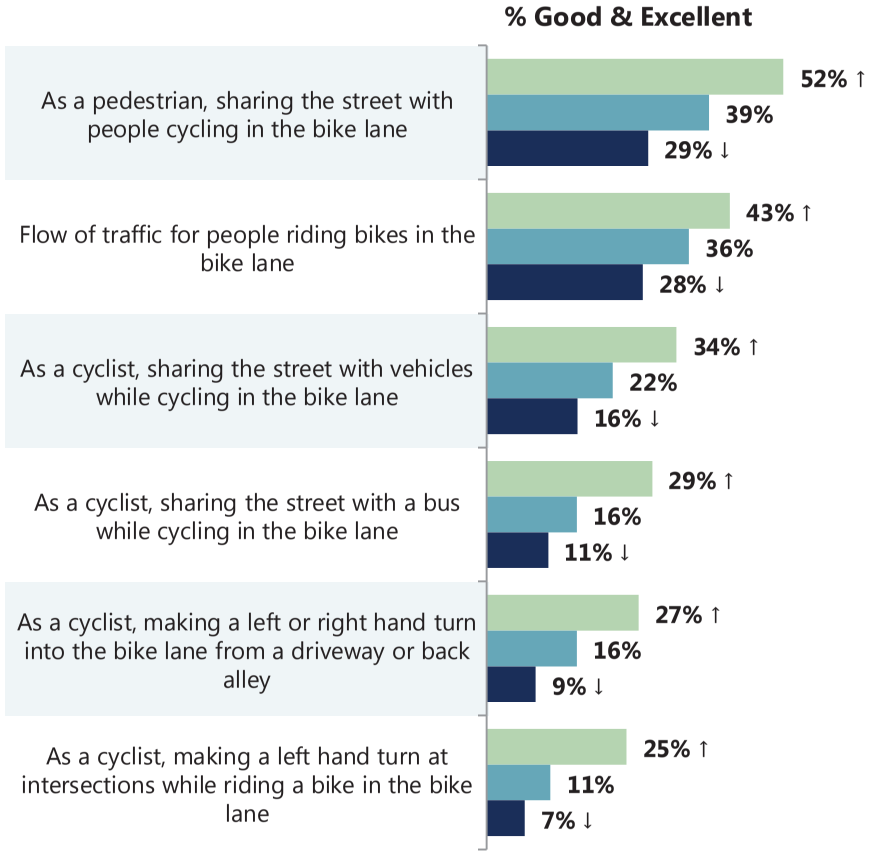
Younger residents tend to have more favourable opinions of 23rd Street travel experiences than their older counterparts.

Representative Survey

4th Ave Bike Lane Impressions from Motorist Perspectives by Age Range



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives by Age Range



18-34 35-54 55+

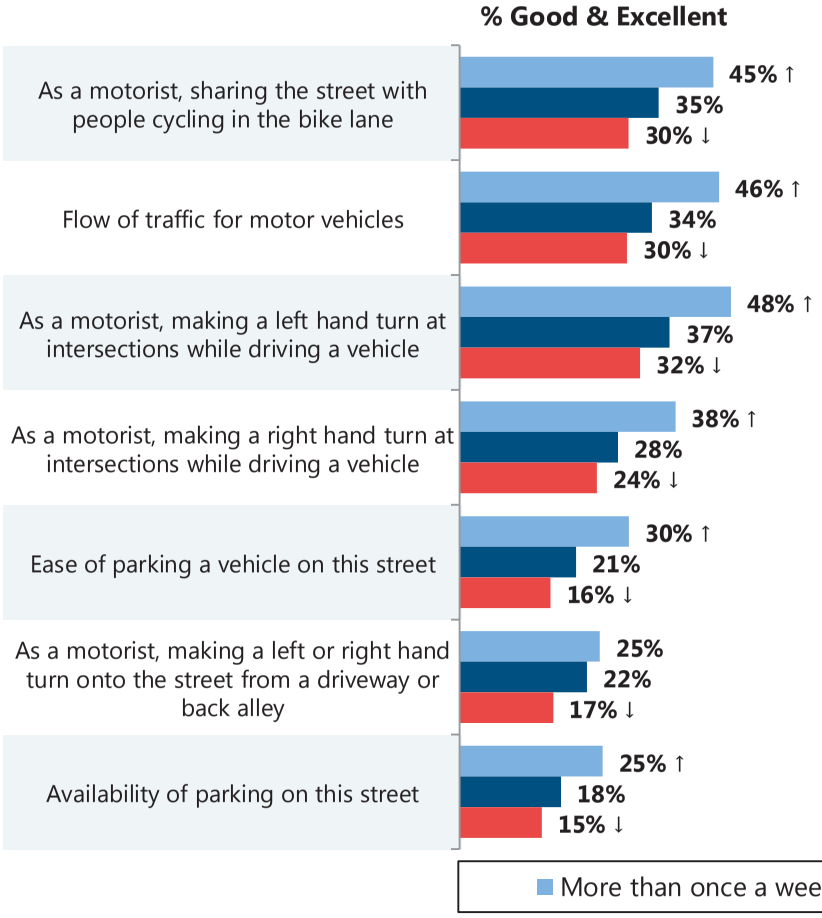
12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive?
Base: All respondents, Representative: n=1004.

69

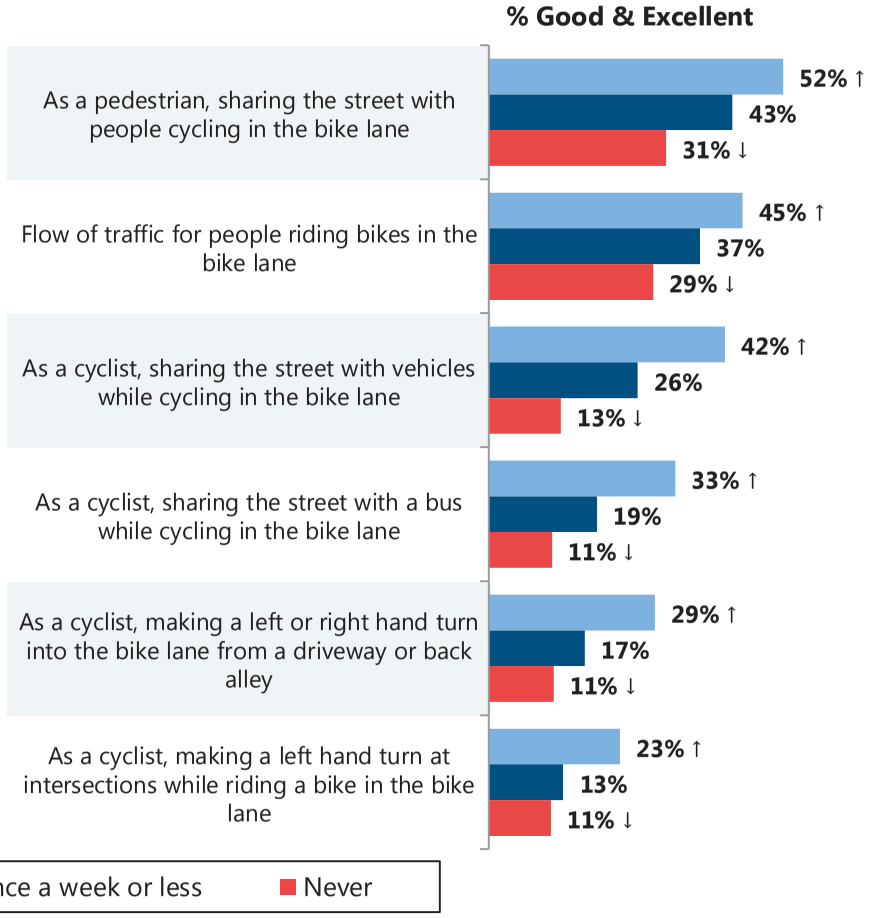
Residents who cycle frequently tend to have more favourable opinions of 23rd Street travel experiences than those who never cycle.

Representative Survey

4th Ave Bike Lane Impressions from Motorist Perspectives by Overall Cycling Frequency



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives by Overall Cycling Frequency



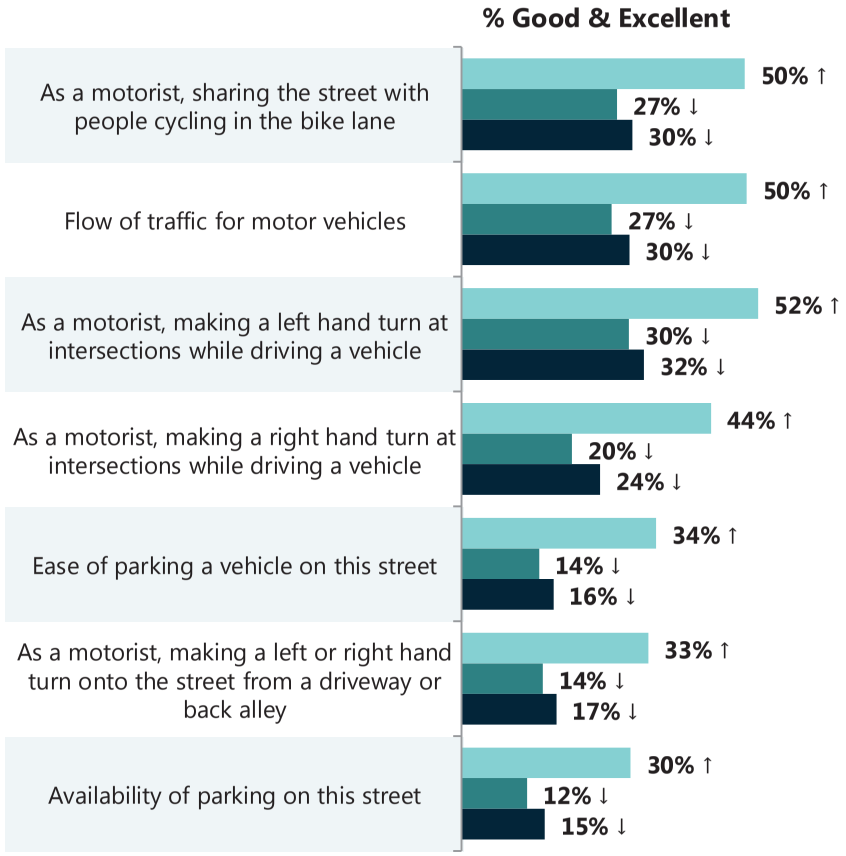
12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive?
Base: All respondents, Representative: n=1004.

70

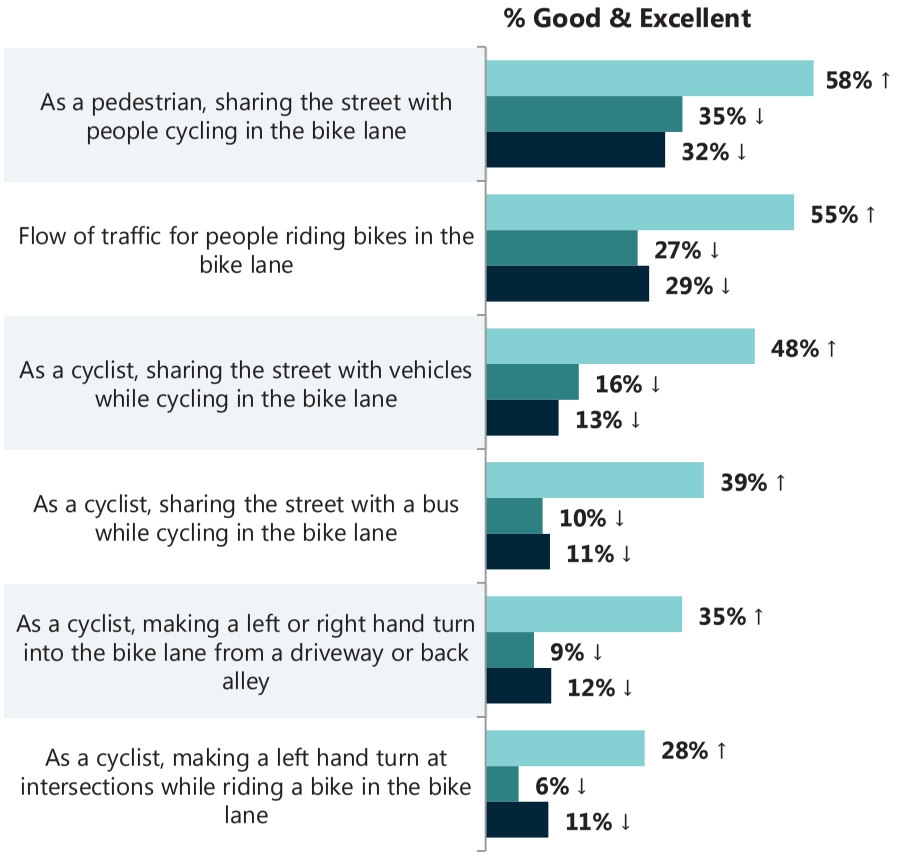
Residents who cycle downtown tend to have more favourable opinions of 23rd Street travel experiences than those who never cycle downtown or never cycle in general.

Representative Survey

4th Ave Bike Lane Impressions from Motorist Perspectives by Downtown Cycling Frequency



4th Ave Bike Lane Impressions from Cyclist and Pedestrian Perspectives by Downtown Cycling Frequency

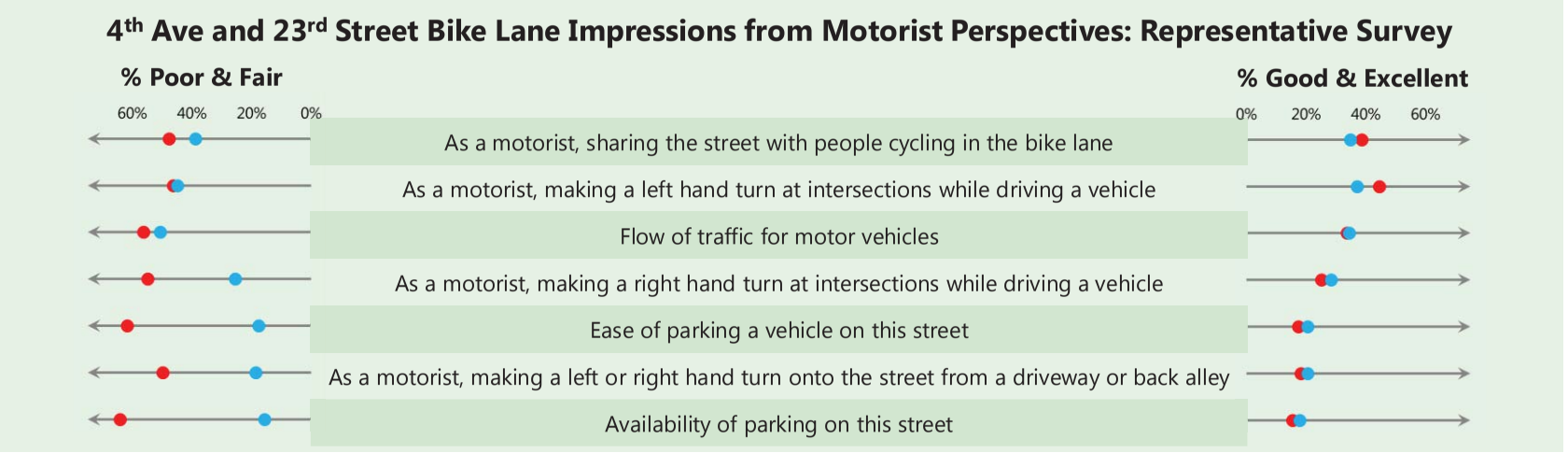


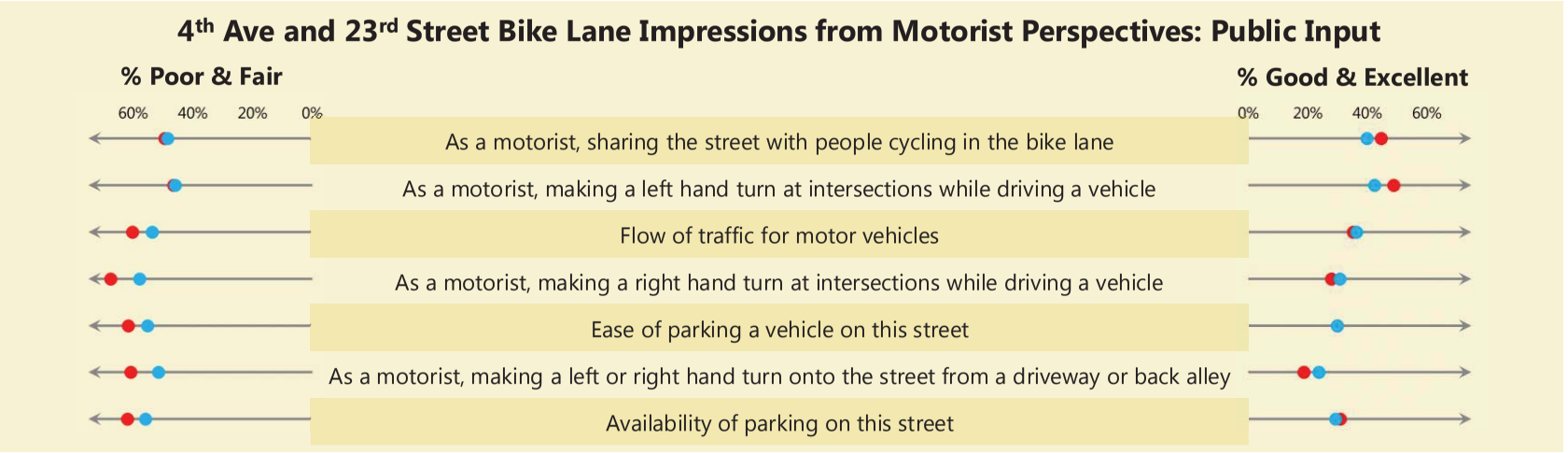
Cycle downtown | Cycle but not downtown | Never cycle

12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive?
Base: All respondents, Representative: n=1004.

71

Comparing motorist experiences of 4th Ave and 23rd Street, opinions on both streets are largely consistent, although poor and fair assessments are fewer in select cases for 23rd Street.

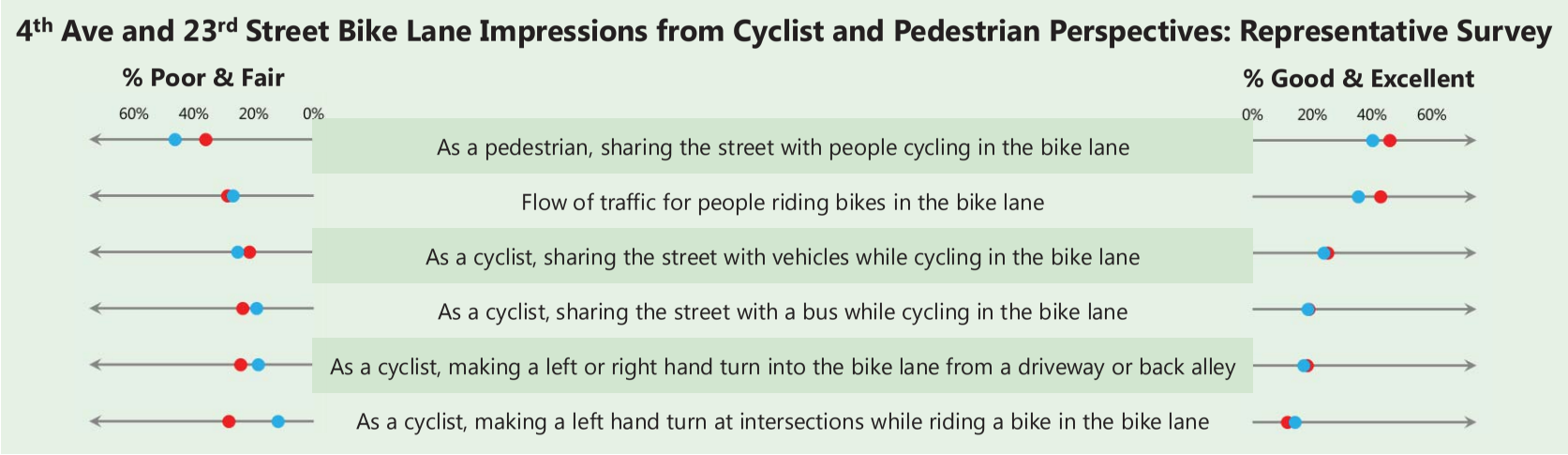


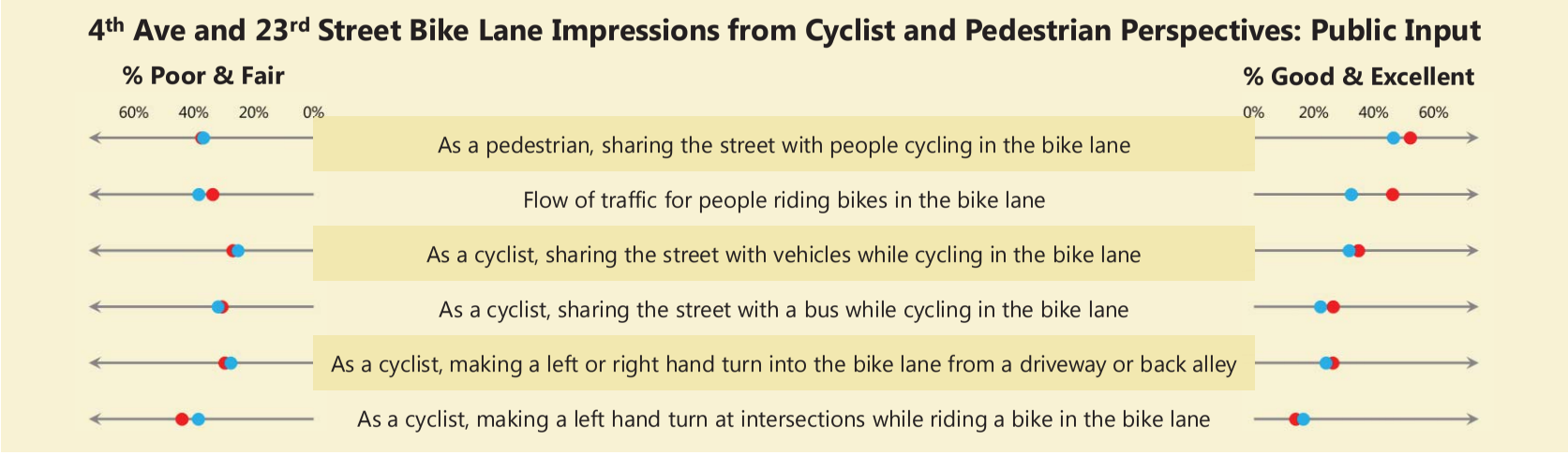


11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street? Base: All respondents, Representative: n=1004, Public: n=1363. Not shown: "Not sure".

12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive? Base: All respondents, Representative: n=1004, Public: n=1363. Not shown: "Not sure".

Comparing pedestrian and cyclist experiences of 4th Ave and 23rd Street, opinions on both streets are also largely consistent.





11. How would you rate your impressions of each of the following as it relates to the protected bike lanes along 4th Ave, from 20th to 24th Street? Base: All respondents, Representative: n=1004, Public: n=1363. Not shown: "Not sure".

12. How would you rate your impressions of each of the following as it relates to the protected bike lanes along and 23rd Street, from Spadina Crescent to Idylwyld drive? Base: All respondents, Representative: n=1004, Public: n=1363. Not shown: "Not sure".

73

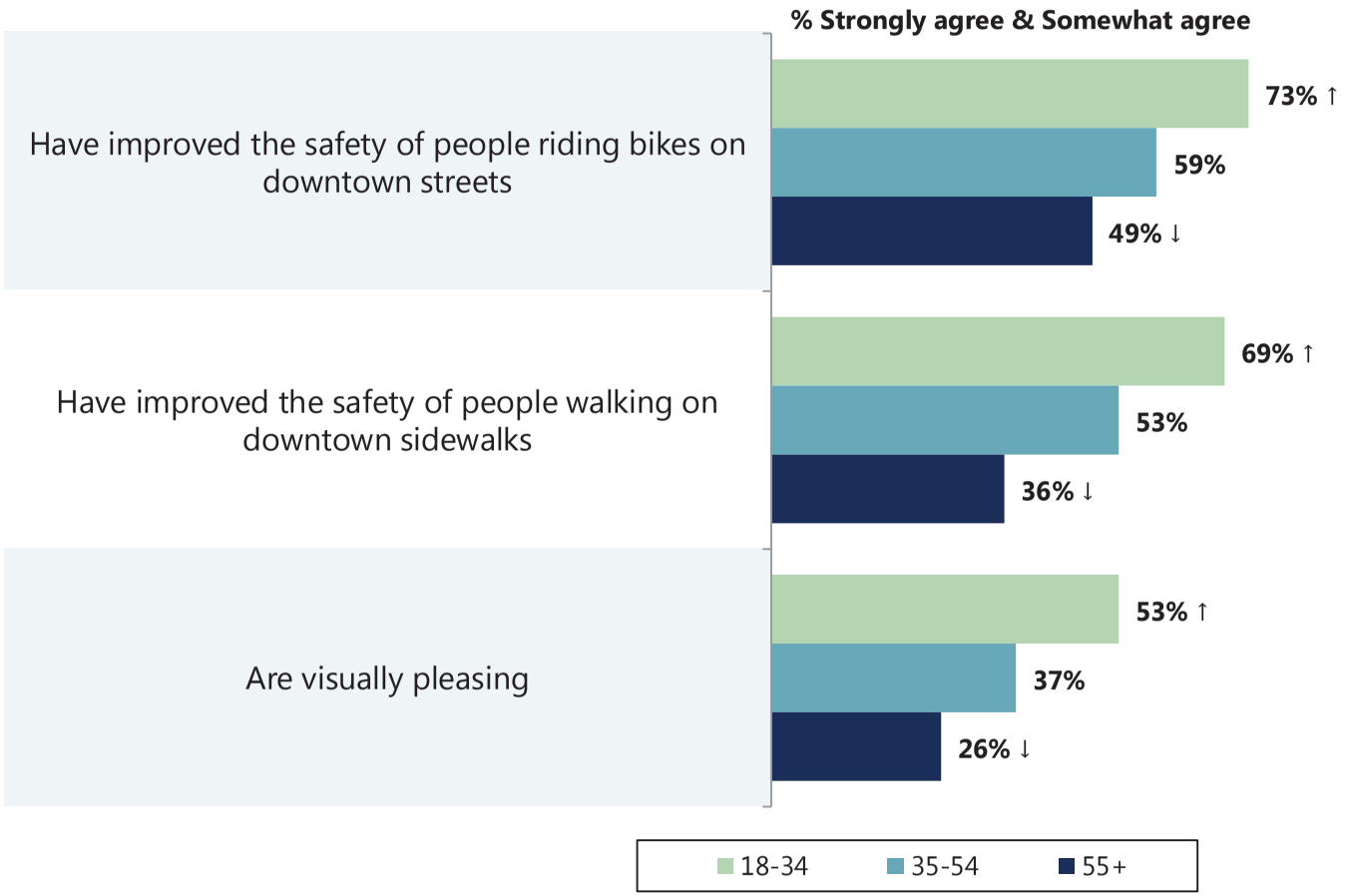
A small majority believe the protected bike lanes have improved safety of those riding bicycles downtown, while roughly one half believe pedestrian safety has been improved. Many do not find the bike lanes visually pleasing.

13. Broadly speaking, please indicate your level of agreement with the following statements about the protected bike lanes currently installed in the downtown. Would you say they... Base: All respondents, Representative: n=1004, Public, n=1363.

Younger residents are more likely to agree with all three safety and visual statements than their older counterparts.

Representative Survey

Safety and Aesthetics of Protected Bike Lane Demonstration by Age Range



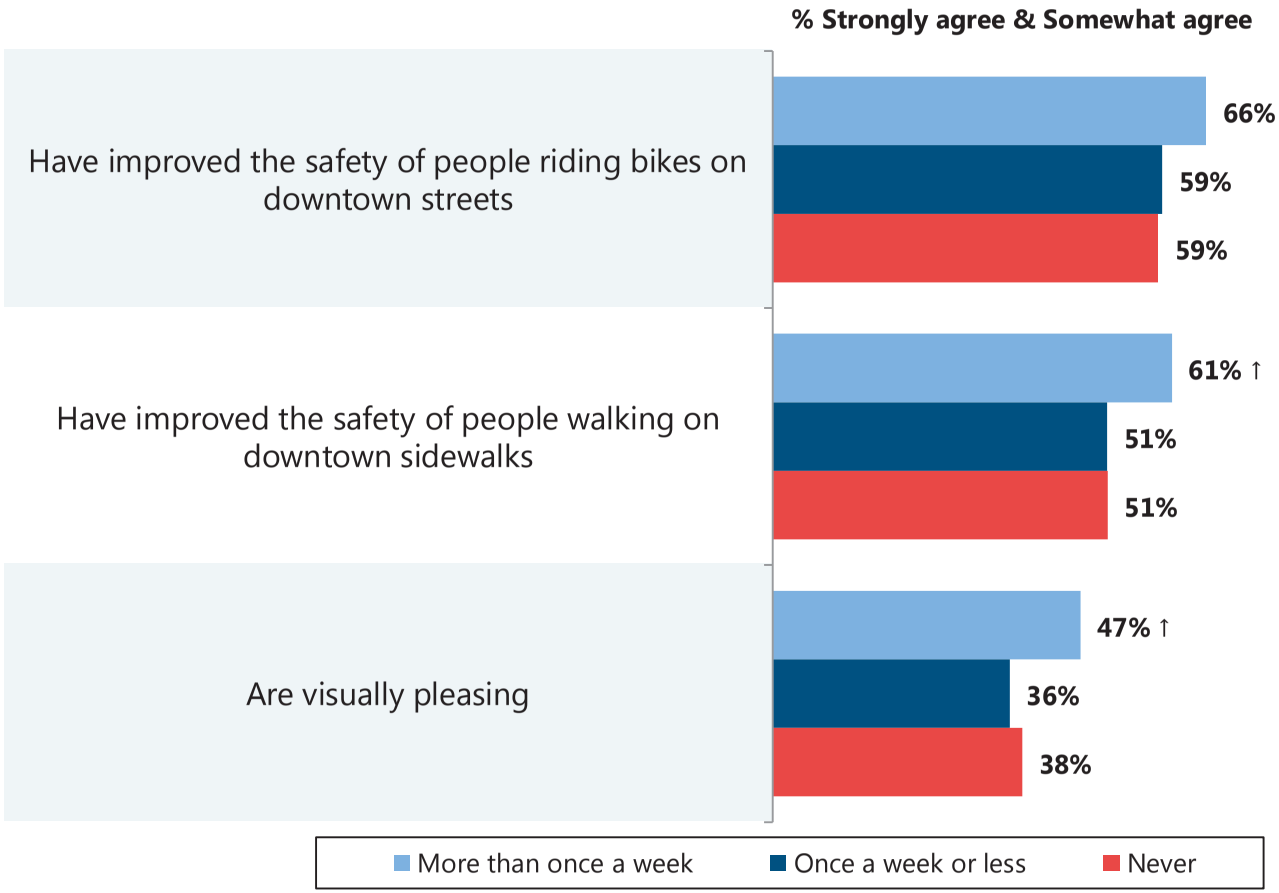
13. Broadly speaking, please indicate your level of agreement with the following statements about the protected bike lanes currently installed in the downtown. Would you say they... Base: All respondents, Representative: n=1004.

75

Frequent cyclists are more likely to agree that the bike lanes have improved pedestrian safety and are visually pleasing.

Representative Survey

Safety and Aesthetics of Protected Bike Lane Demonstration by Overall Cycling Frequency

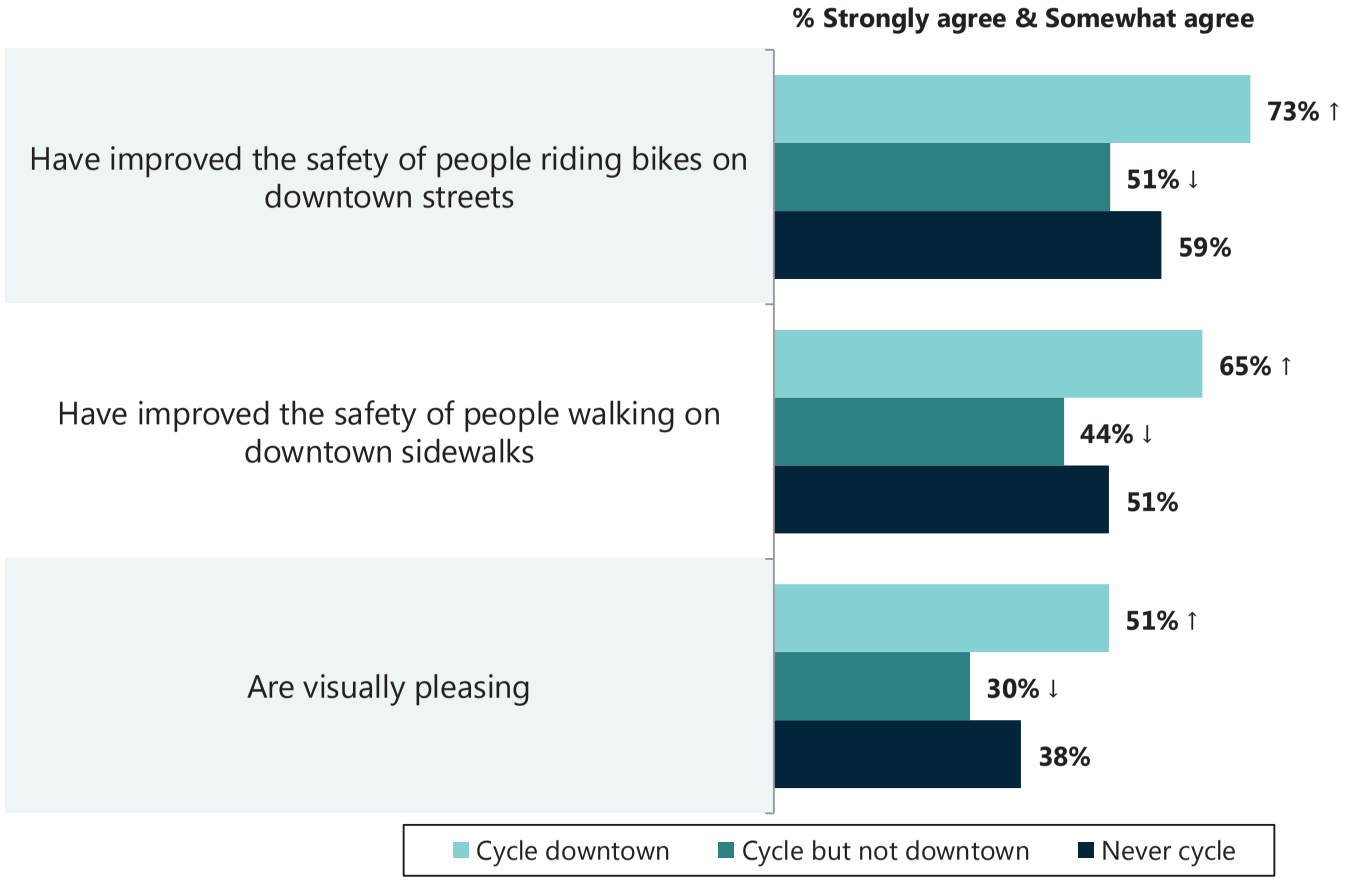


13. Broadly speaking, please indicate your level of agreement with the following statements about the protected bike lanes currently installed in the downtown. Would you say they... Base: All respondents, Representative: n=1004.

Downtown cyclists are more likely to agree with all three safety and visual statements than those who do not cycle downtown or never cycle. In fact, those who cycle but not downtown are least likely to agree with each statement.

Representative Survey

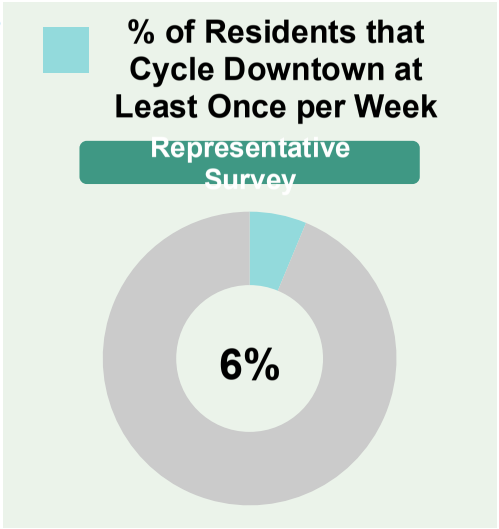
Safety and Aesthetics of Protected Bike Lane Demonstration by Downtown Cycling Frequency

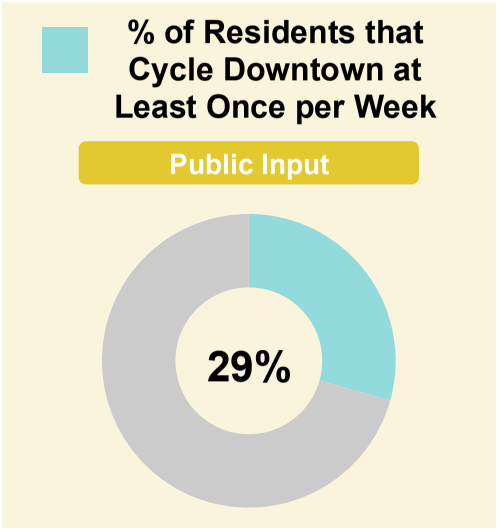


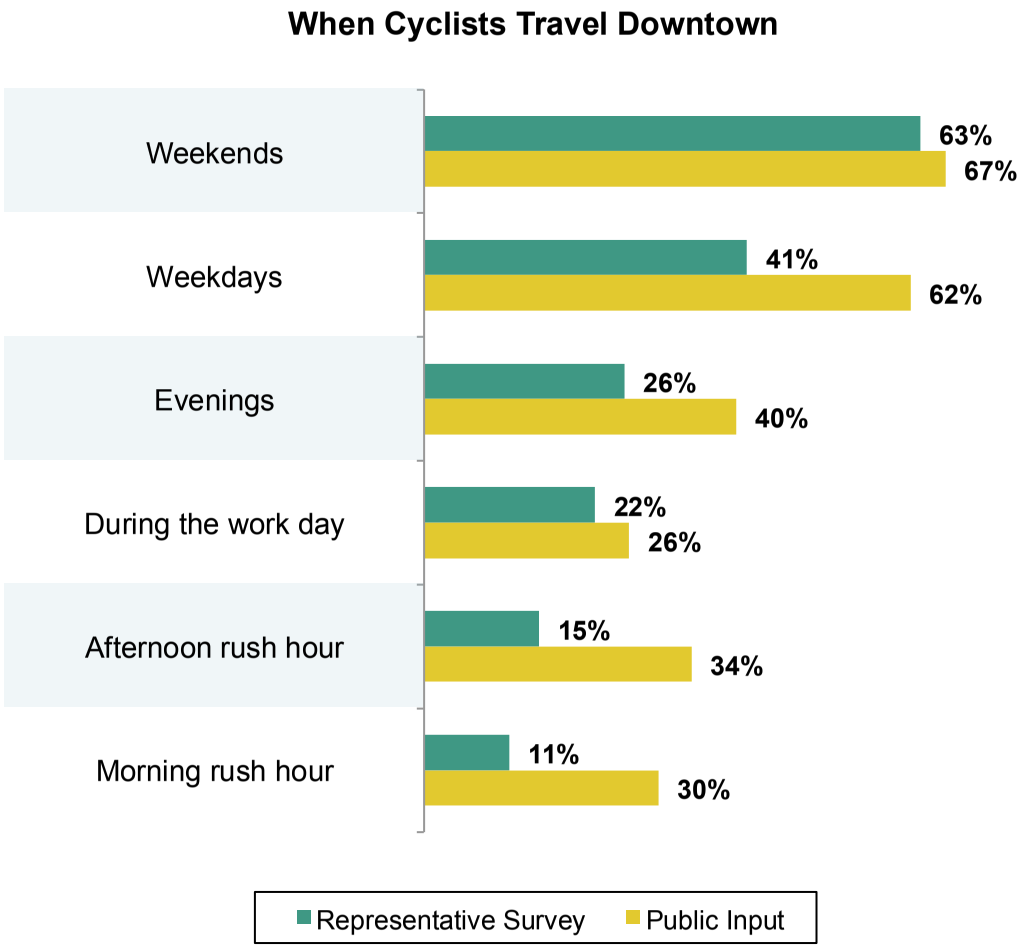
13. Broadly speaking, please indicate your level of agreement with the following statements about the protected bike lanes currently installed in the downtown. Would you say they... Base: All respondents, Representative: n=1004.

Downtown Cycling

Among those who cycle downtown, weekend activity is most common, although weekday activity is also prominent, especially among the public input respondent bas





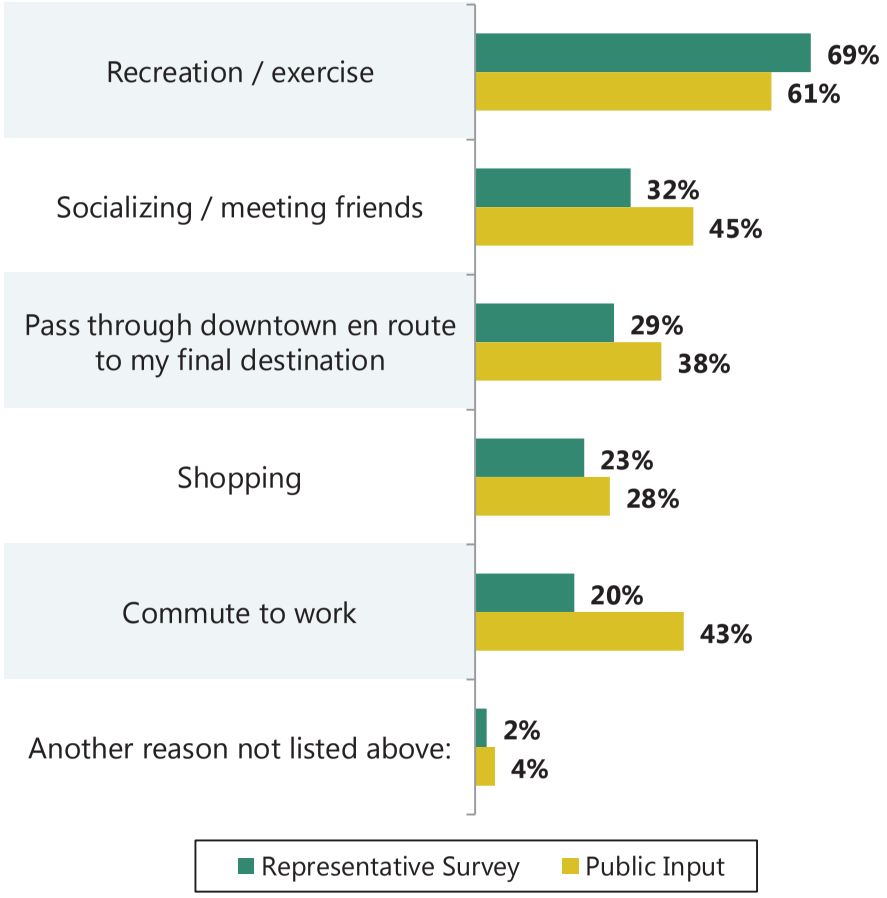


15. How often are you travelling into and within the downtown core through each of the following methods? Base: Respondents that cycle, Representative: n=616.
16. When are you typically cycling into and within downtown? (select all that apply) Base: Respondents that cycle downtown, Representative: n=293, Public, n=801.

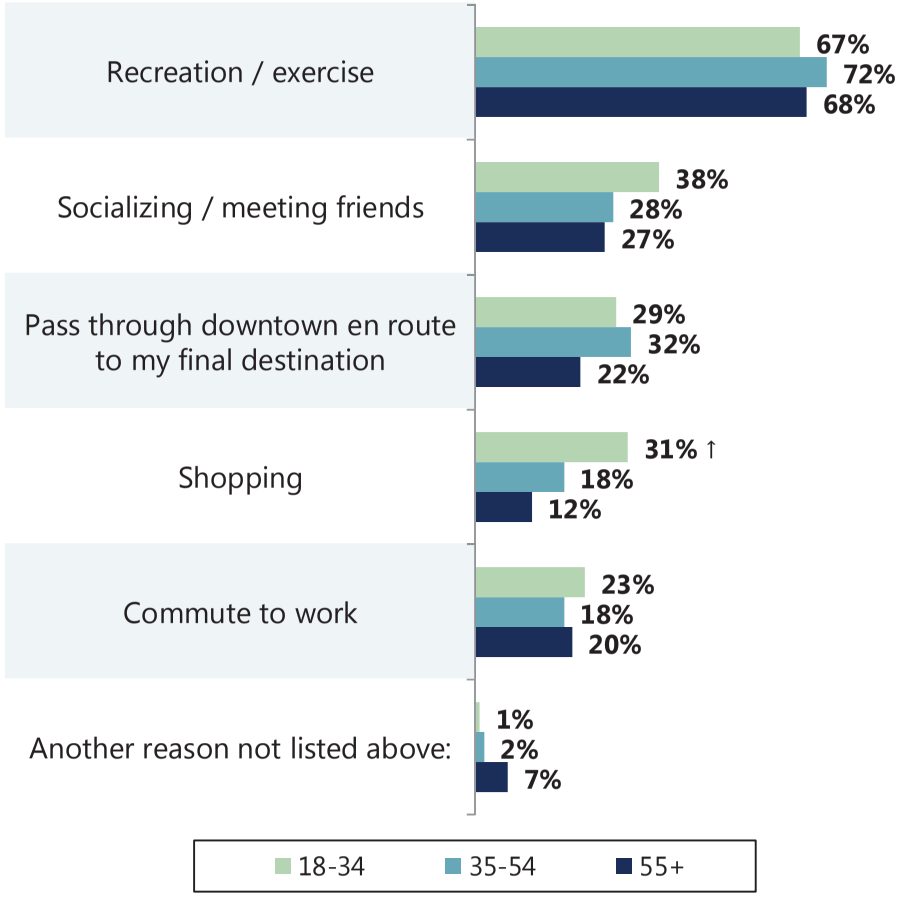
Common reasons for downtown cycling include recreation, social engagements, passing through, shopping or commuting to work. Younger cyclists are more likely than older cyclists to cycle downtown for shopping.

Representative Survey

Reasons for Cycling Downtown

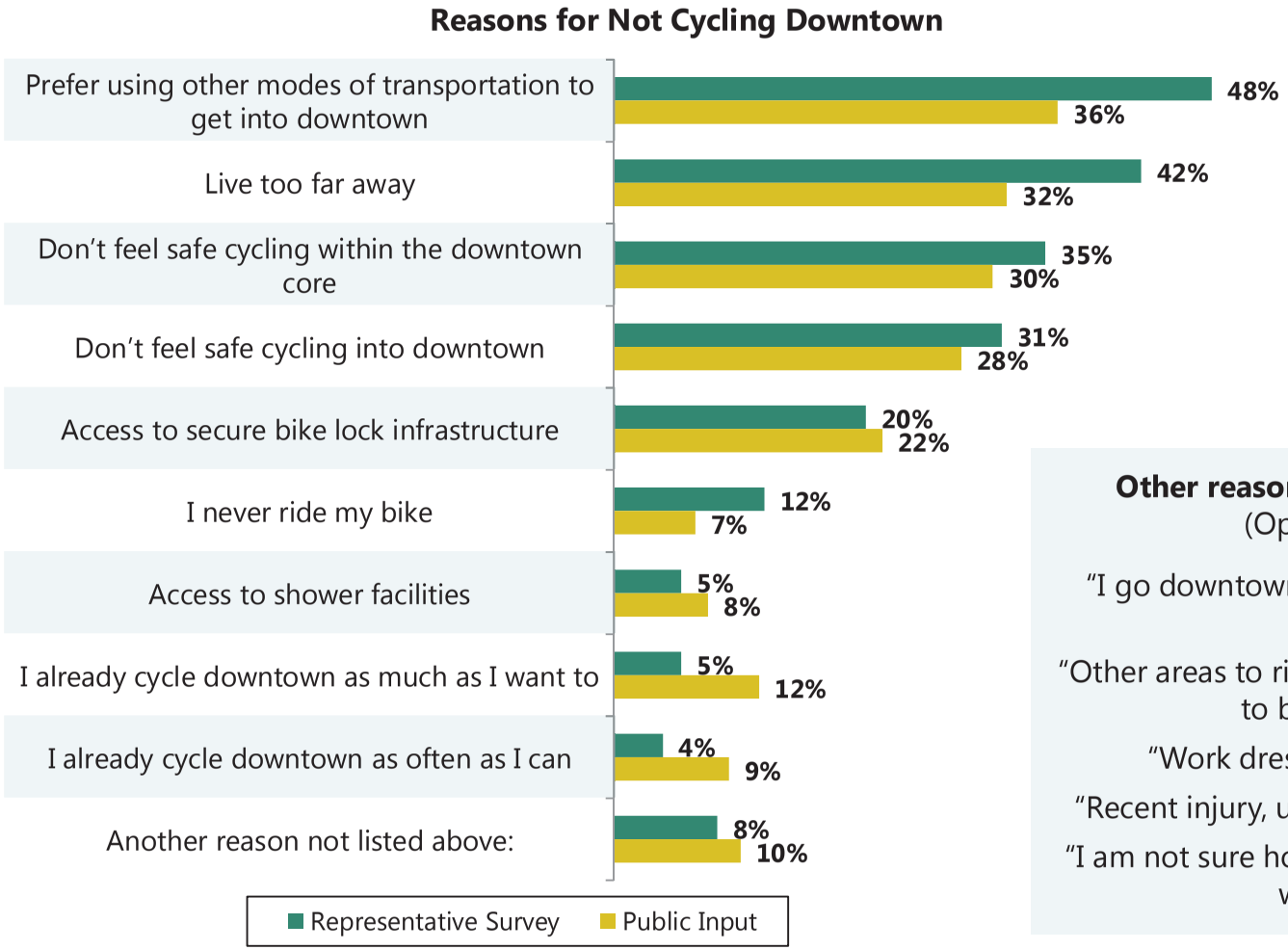


Reasons for Cycling Downtown by Age Range



17. When you cycle into or within downtown what are the common purposes of your trips? (select all that apply) Base: Respondents that cycle downtown, Representative: n=293, Public: n=801.

Common reasons for not cycling downtown include preference, distance from downtown, safety and access to bicycle lock infrastructure.



Other reasons for not cycling downtown:
(Open-ended responses)

"I go downtown to shop, hard to carry packages home on a bike"

"Other areas to ride bike that are more suited/scenic to biking as a recreation."

"Work dress code not ideal for cycling."

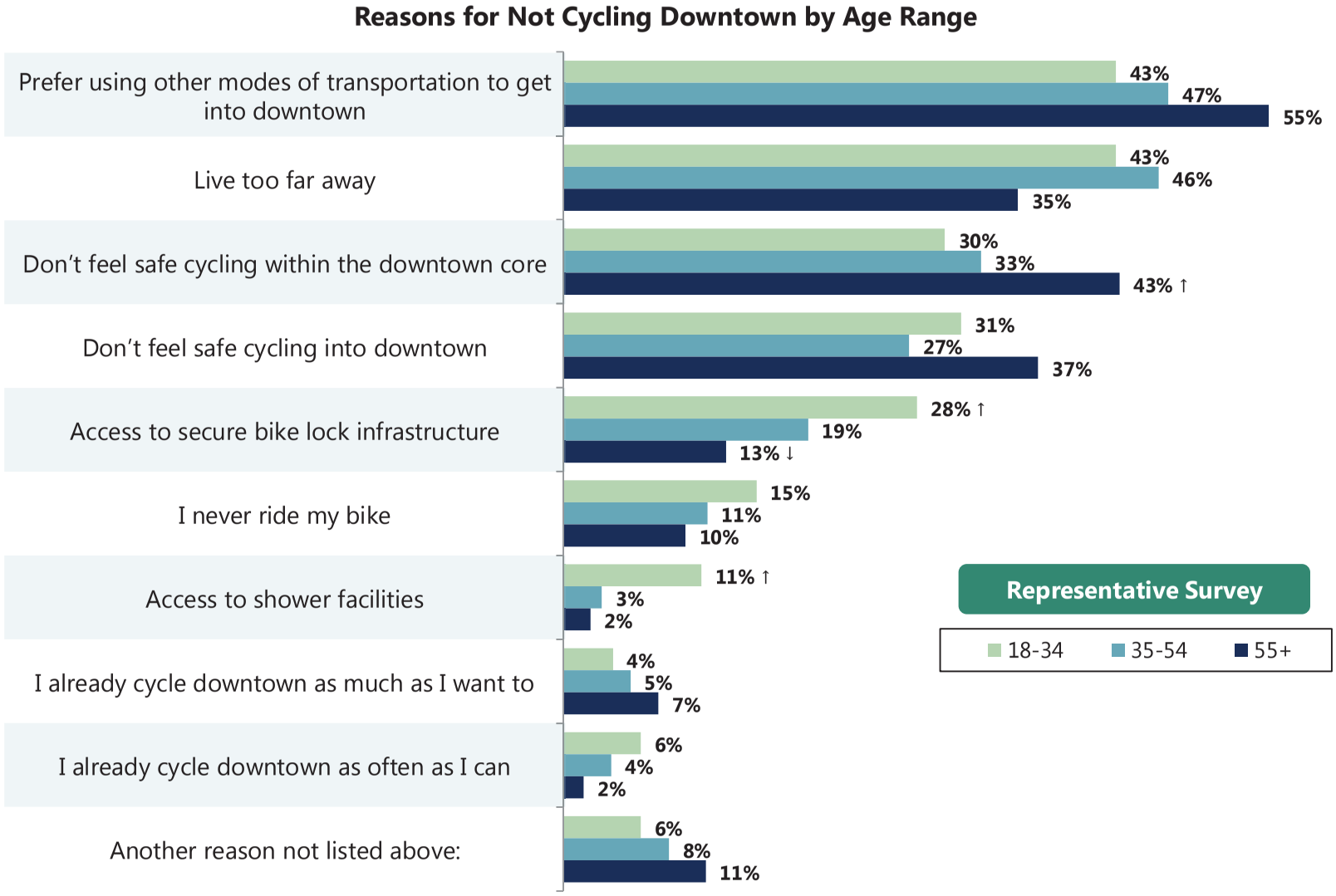
"Recent injury, unable to cycle as much as before."

"I am not sure how to turn left on a bike downtown with the new lanes."

81

15. How often are you travelling into and within the downtown core through each of the following methods? Base: Respondents that cycle, Representative: n=616.
18. What are some of the reasons you don't bike [downtown/downtown more often]? (select all that apply) Base: Respondents that have access to a bicycle, Representative: n=688, Public: n=1073.

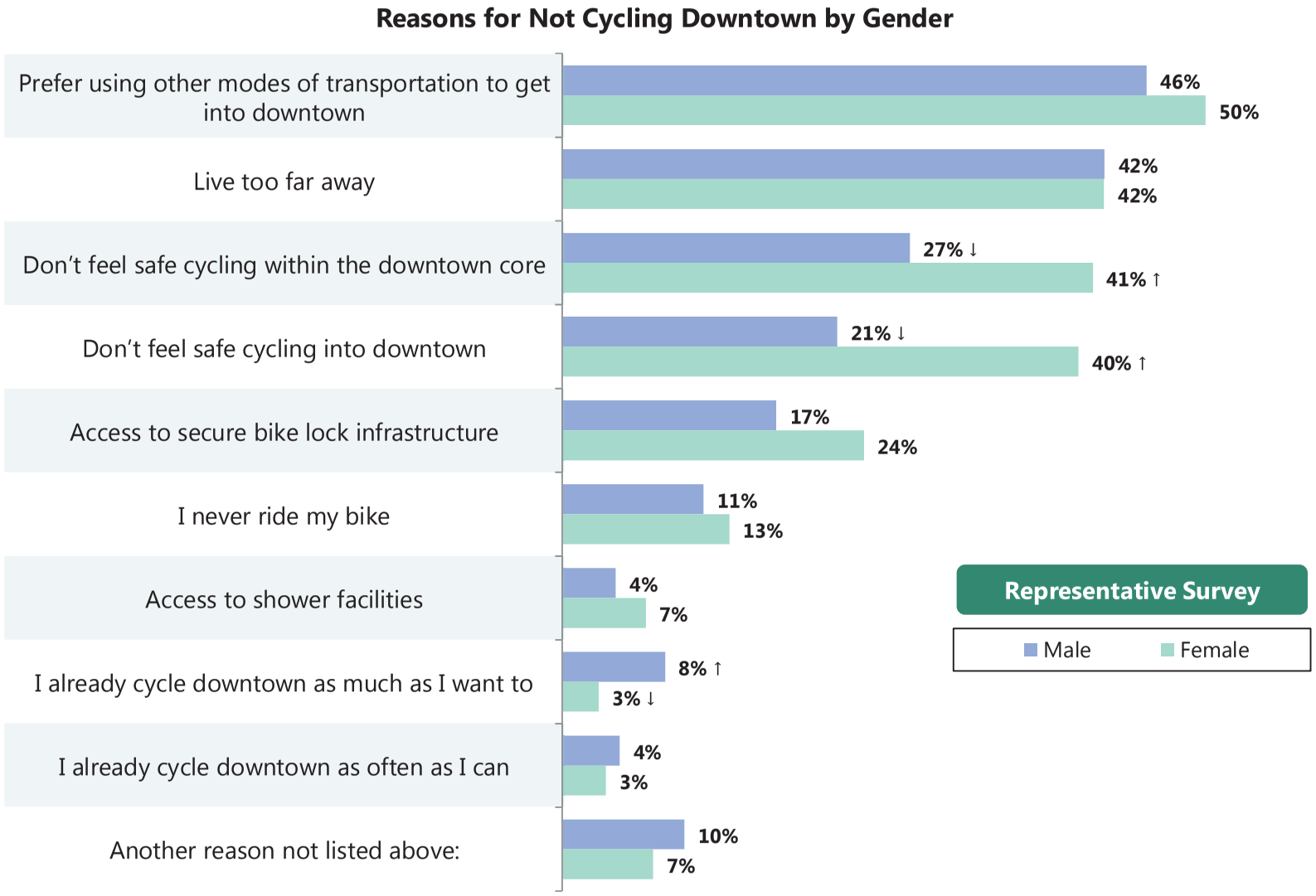
Younger cyclists are more concerned about access to secure bicycle lock infrastructure and access to shower facilities. Older cyclists feel less safe cycling into downtown.



18. What are some of the reasons you don't bike [downtown/downtown more often]? (select all that apply) Base: Respondents that have access to a bicycle, except those who cycle downtown most days of the week, Representative: n=688.

82

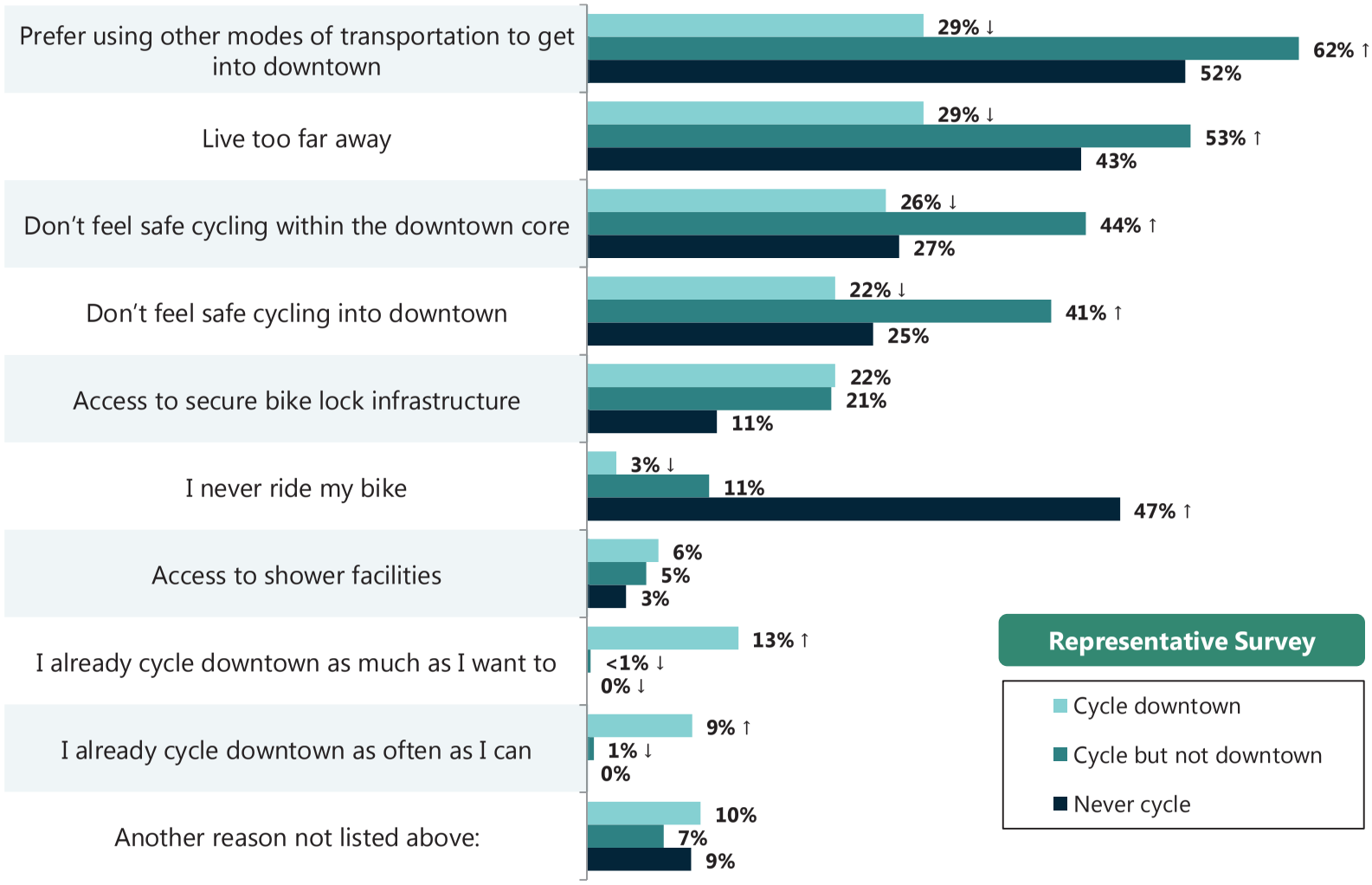
Female cyclists are more likely to feel unsafe cycling into and within the downtown core.



18. What are some of the reasons you don't bike [downtown/downtown more often]? (select all that apply) Base: Respondents that have access to a bicycle, except those who cycle downtown most days of the week, Representative: n=688.

Those with a bicycle who do not cycle downtown are more likely to report living too far away and not feeling safe as reasons for not biking into or within downtown.

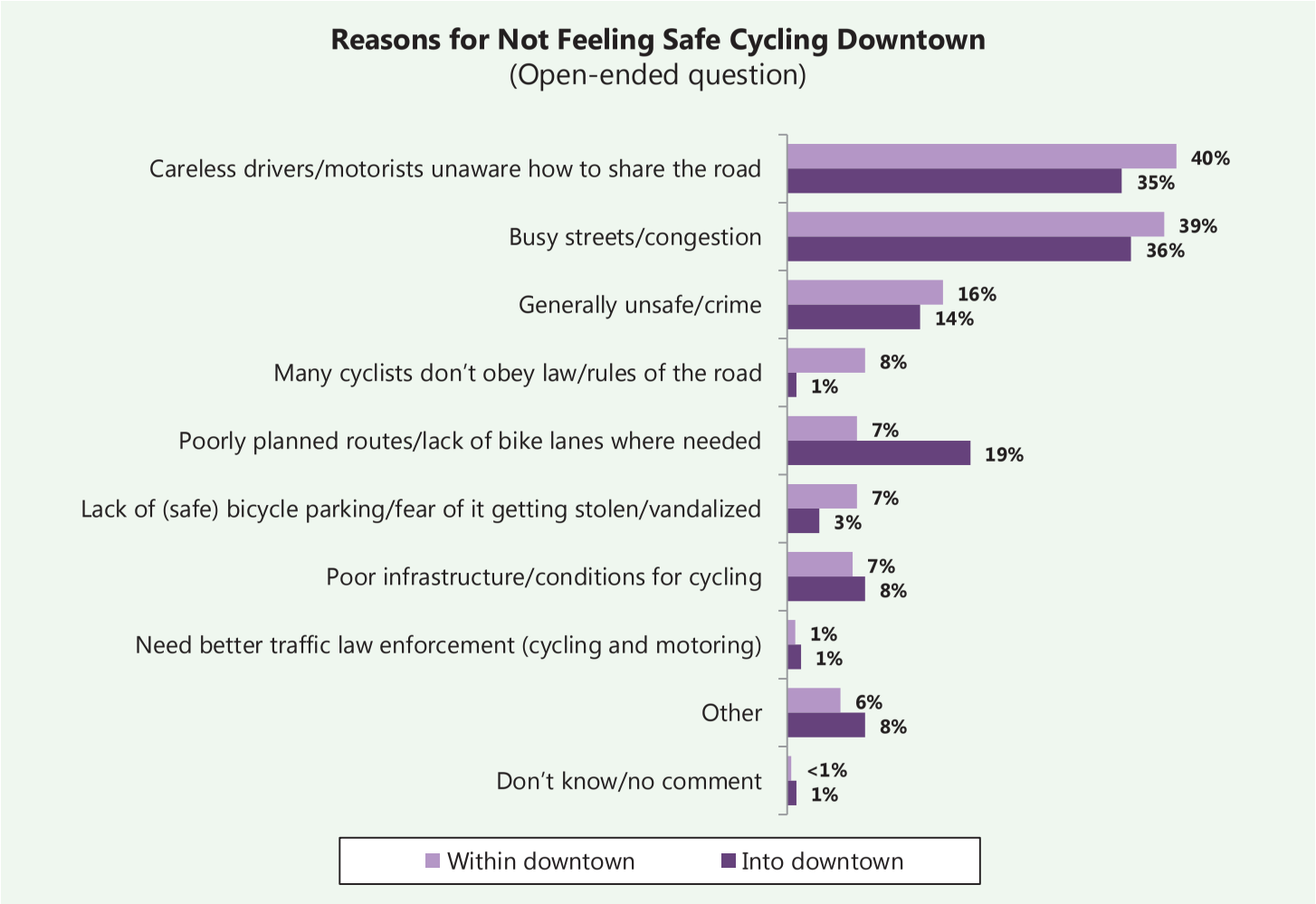
Reasons for Not Cycling Downtown by Downtown Cycling Frequency



18. What are some of the reasons you don't bike [downtown/downtown more often]? (select all that apply) Base: Respondents that have access to a bicycle, except those who cycle downtown most days of the week, Representative: n=688.

Common safety concerns with cycling into and within downtown from the representative survey include sharing traffic with dangerous drivers, heavy traffic, crime and poorly planned routes.

Representative Survey

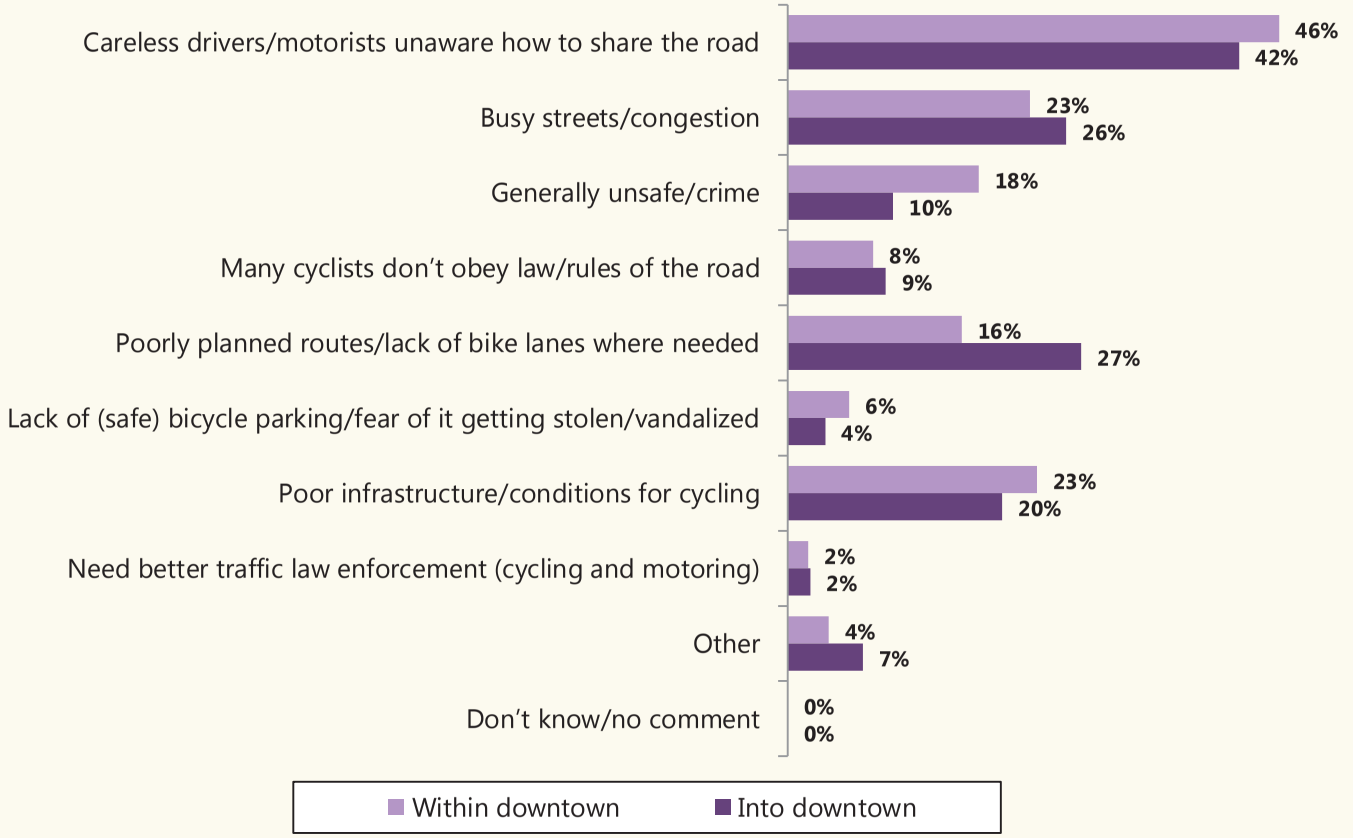


19. Why don't you feel safe cycling... Base: Respondents who answered "Don't feel safe cycling within/into the downtown core" in question 18, Representative: n=211 to 236.

Common safety concerns with cycling into and within downtown from the public input survey are consistent with the representative study.

Public Input

Reasons for Not Feeling Safe Cycling Downtown: Public Input
(Open-ended question)



19. Why don't you feel safe cycling... Base: Respondents who answered "Don't feel safe cycling within/into the downtown core" in question 18, Public: n=284 to 313.

Select comments from those who do not feel safe cycling into or within downtown are featured below.

Into Downtown

- "Because there are no protected bike lanes anywhere outside of downtown and getting over and onto the bridges is a pain."
- "Drivers and cyclists are not good at sharing the roads. Not enough bike paths between home and downtown."
- "There is no good option to get across the river by the Broadway Bridge. Vehicles drive in and out around bikers going on the road, and there are many pedestrians on the walking path."
- "Traffic to get to downtown is heavy and motorists don't pay enough attention."
- "There's no dedicated lanes into downtown. I refuse to ride on the street because it's not safe. The sidewalk is for pedestrians. So where does a person ride their bike to feel safe?"
- "Cars on the street don't give room. This is an issue largely because bicycles cannot travel fast enough to be part of the flow of traffic."

Within the Downtown Core

- "Dangerous. Bike lanes are inconsistent, designated lanes for a couple of blocks then nothing. Motorists do not look when opening car doors into the bike lane. In winter, the lanes are not always visible."
- "Traffic and lack of secure lock up facilities."
- "Too many motorists unwilling to share the road, not paying attention to cyclists."
- "Very easy for bikes to be stolen downtown. People run traffic lights. Roads are very tight and narrow."
- "Vehicles making turns do not yield to cyclists. Also, people use the bike lanes riding against the flow of traffic – bike lanes are not wide enough for that."
- "Icy roads, and bad drivers which I do not feel the bike lanes help."

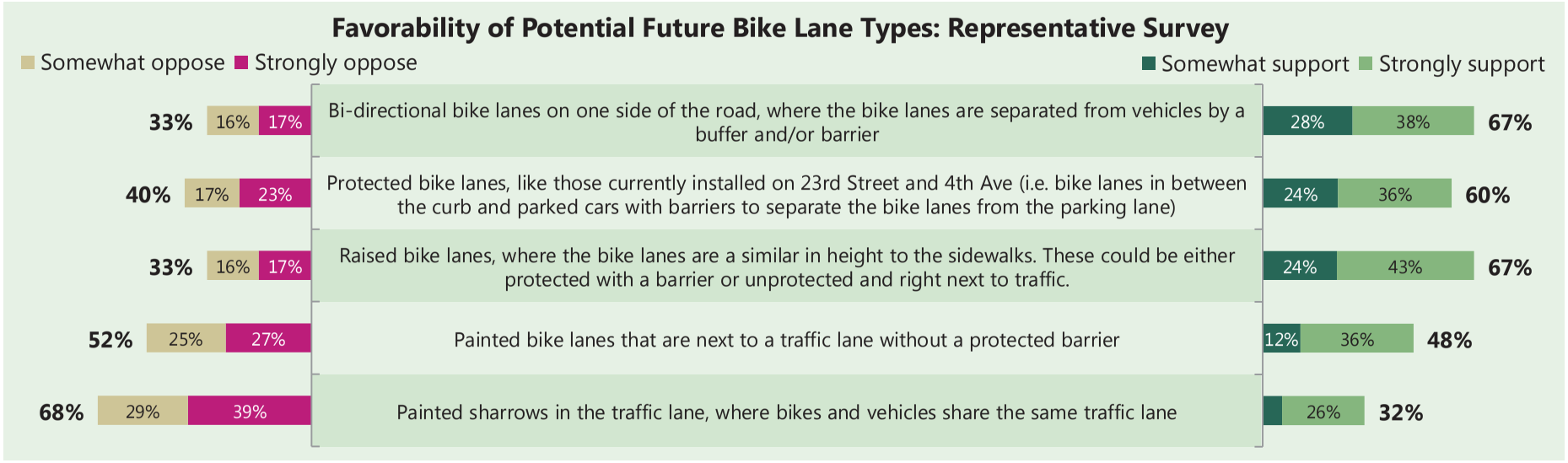
Representative Survey | Public Input

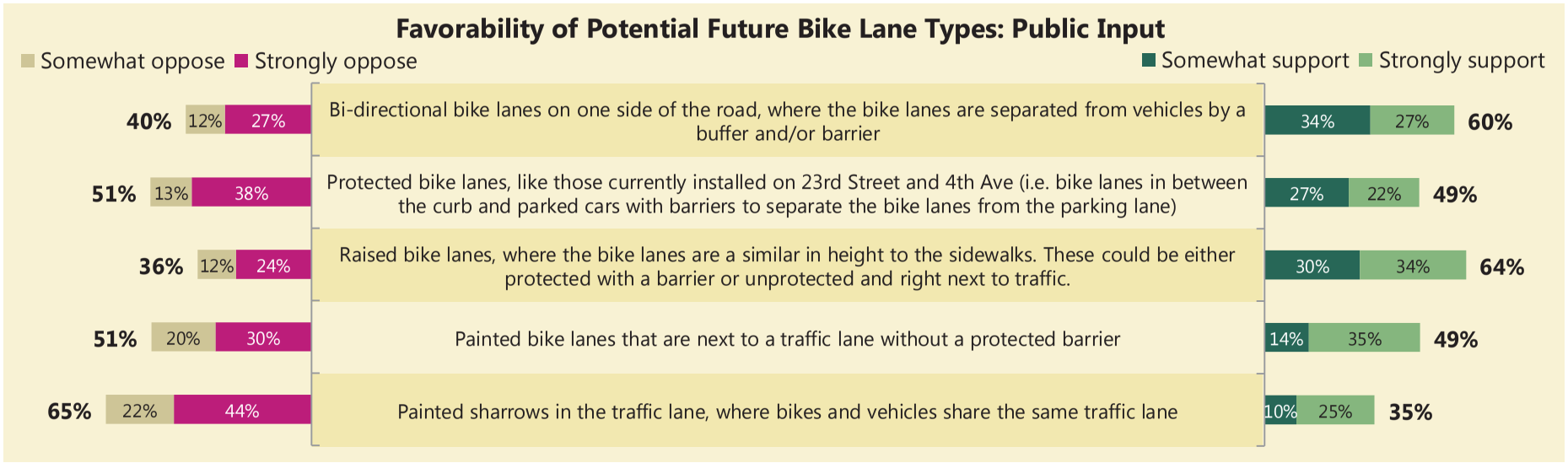
87

19. Why don't you feel safe cycling... Base: Respondents who answered "Don't feel safe cycling within/into the downtown core" in question 18, Representative: n=211 to 236.

Future Downtown Bike Lane Preferences

There is moderate support for most forms of proposed future bike lanes, with options that physically separate bicycles from traffic emerging as most popular.



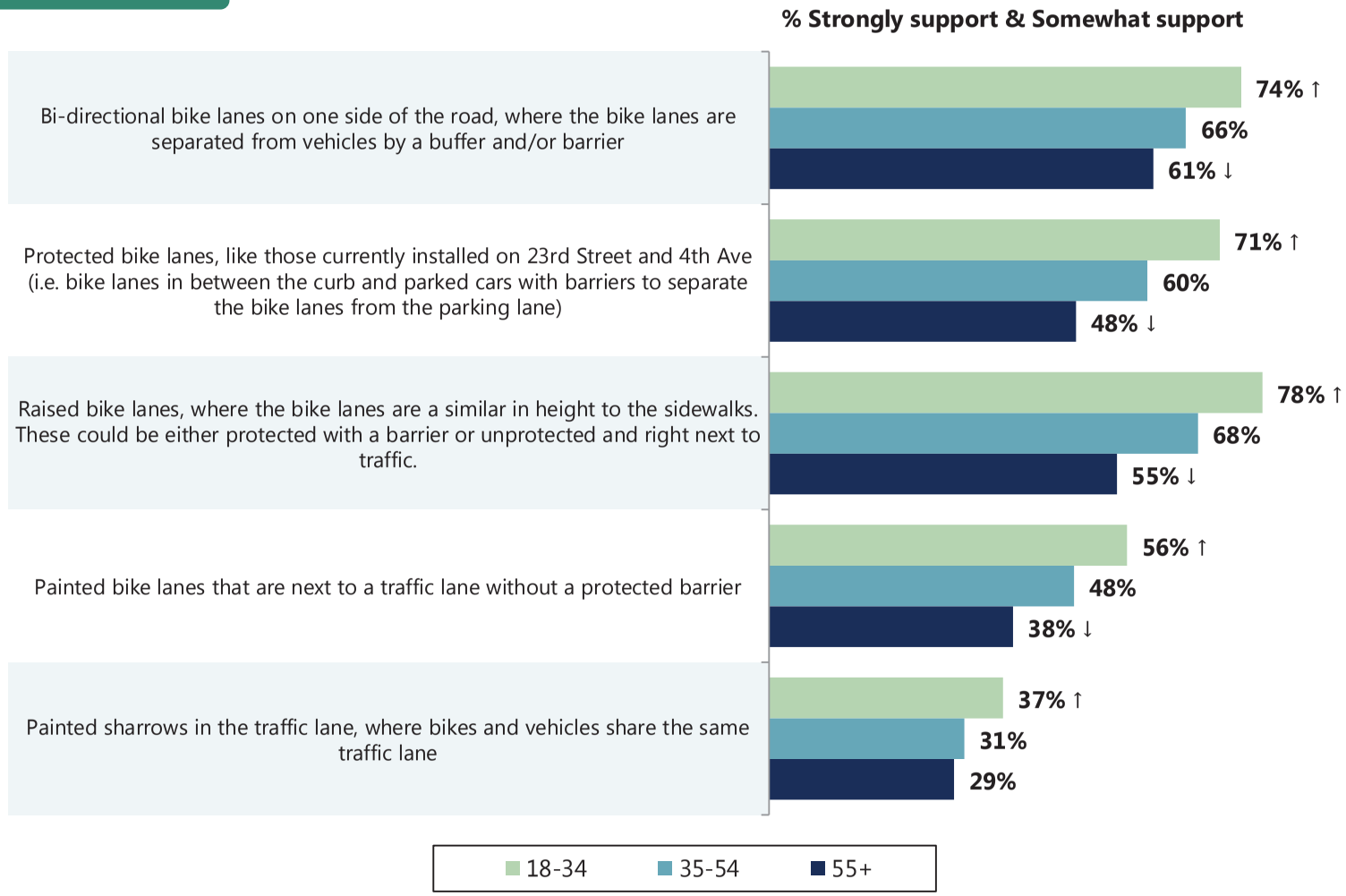


20. Thinking for a moment about all the different users of streets in downtown, not just yourself, please rate your level of support for each of the following types of bike lanes. Base: All respondents, Representative: n=1004, Public: n=1363.

Younger residents are more supportive of all potential bike lane types, although support for painted sharrows remains low among all age ranges.

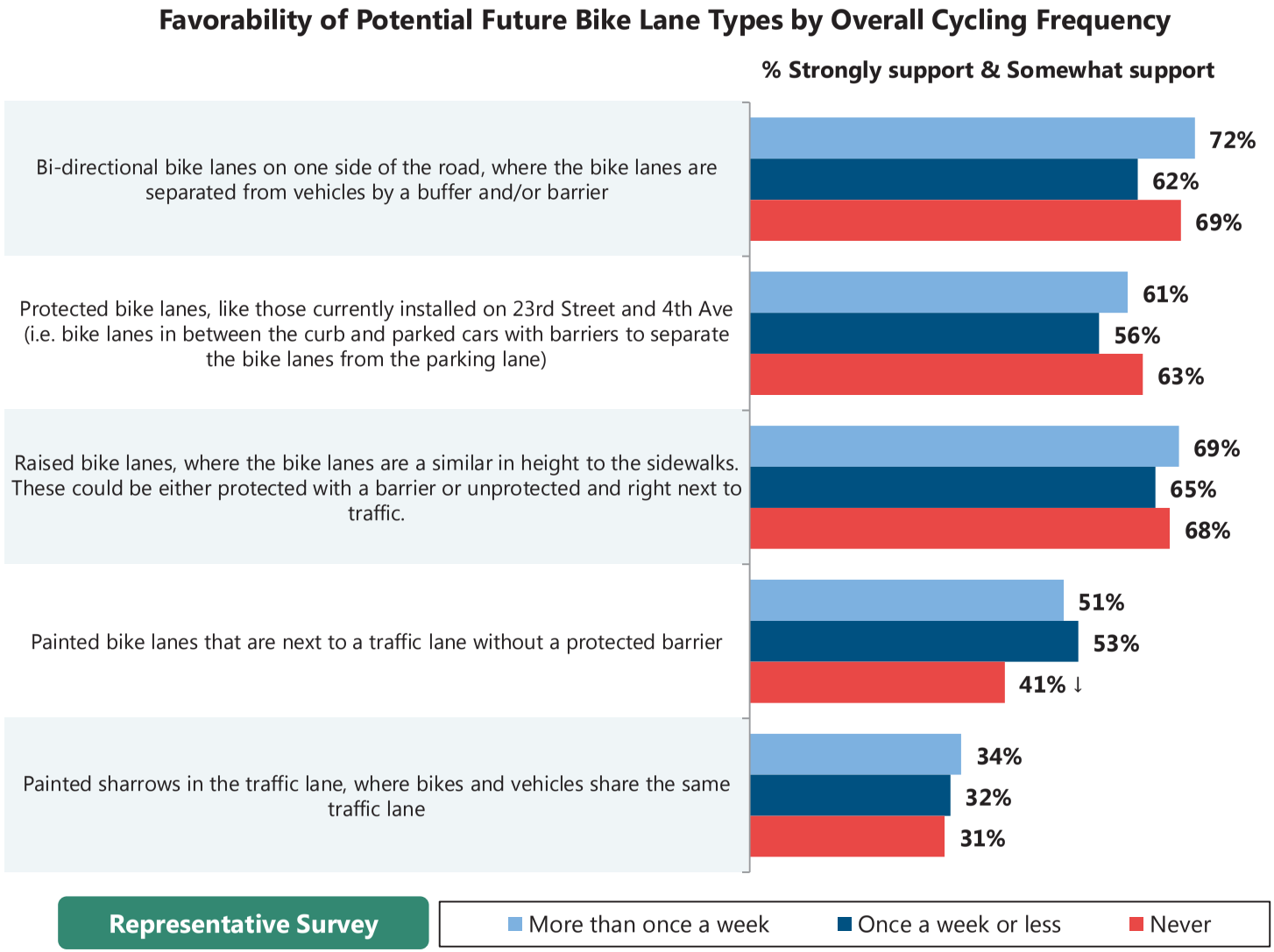
Representative Survey

Favorability of Potential Future Bike Lane Types by Age Range



20. Thinking for a moment about all the different users of streets in downtown, not just yourself, please rate your level of support for each of the following types of bike lanes. Base: All respondents, Representative: n=1004.

Residents who never cycle are less supportive of unprotected painted bike lanes.

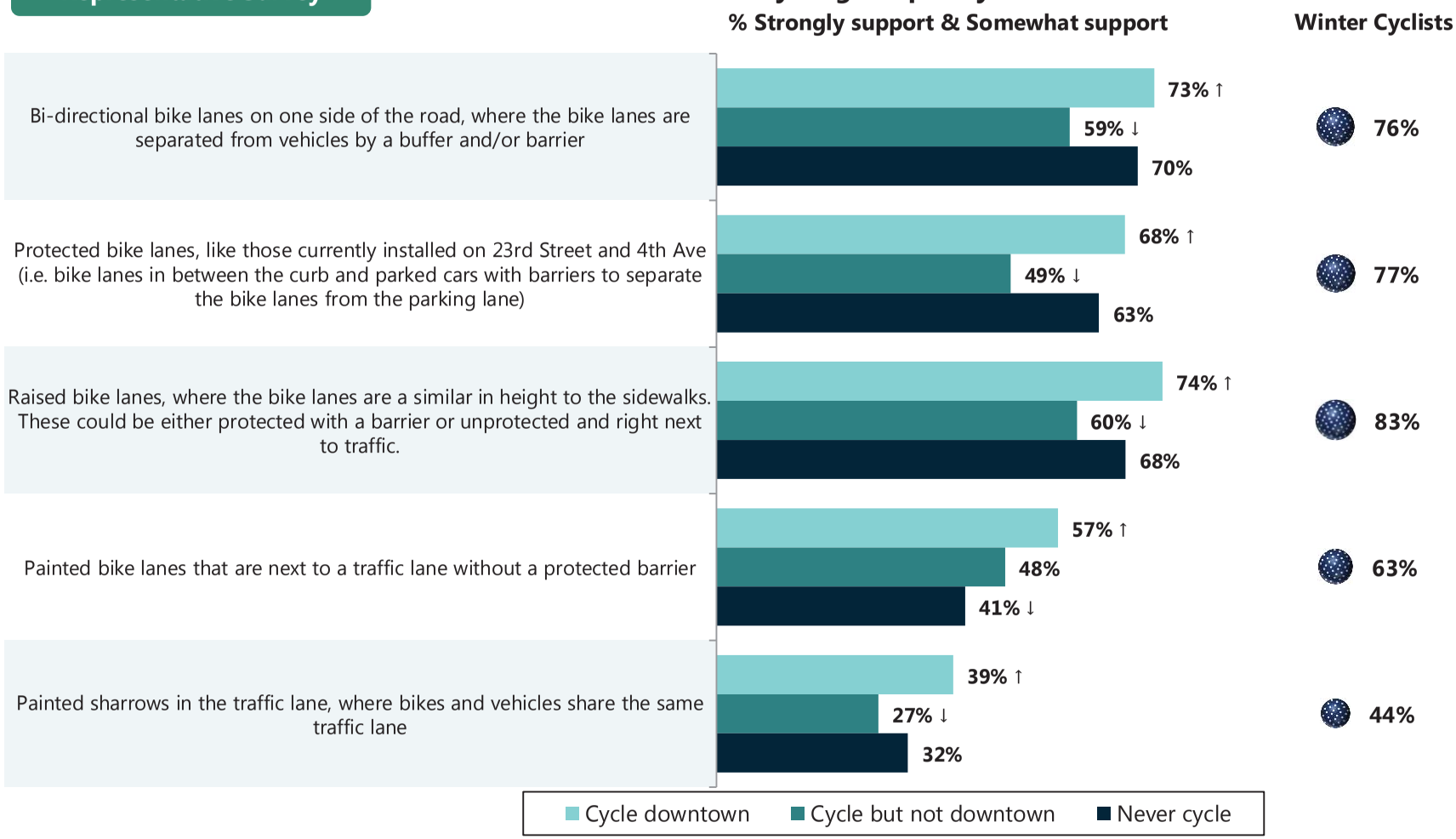


20. Thinking for a moment about all the different users of streets in downtown, not just yourself, please rate your level of support for each of the following types of bike lanes. Base: All respondents, Representative: n=1004.

Downtown cyclists are more supportive of all potential bike lane types, while those who cycle but not downtown are least supportive. Winter cyclists strongly support bike lanes that separate cyclists from vehicle traffic.

Representative Survey

Favorability of Potential Future Bike Lane Types by Downtown Cycling Frequency

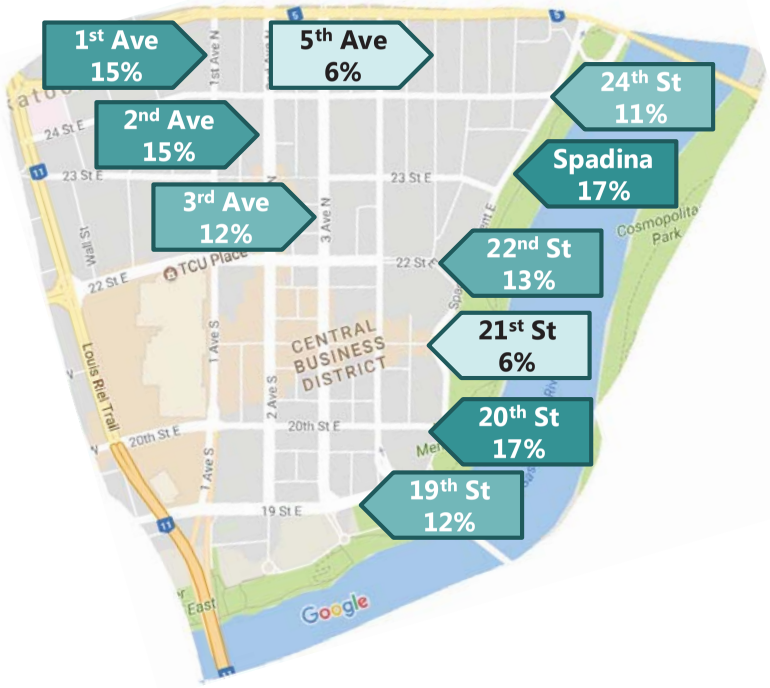


20. Thinking for a moment about all the different users of streets in downtown, not just yourself, please rate your level of support for each of the following types of bike lanes. Base: All respondents, Representative: n=1004.

92

When asked where residents would like to see additional future bike lanes in the downtown core, opinions are mixed, with Spadina Crescent emerging as the most popular, along with 20th Street, 1st Ave and 2nd Ave. Sizable proportions feel there should be no future lanes at all, or are uncertain where future lanes should be created.

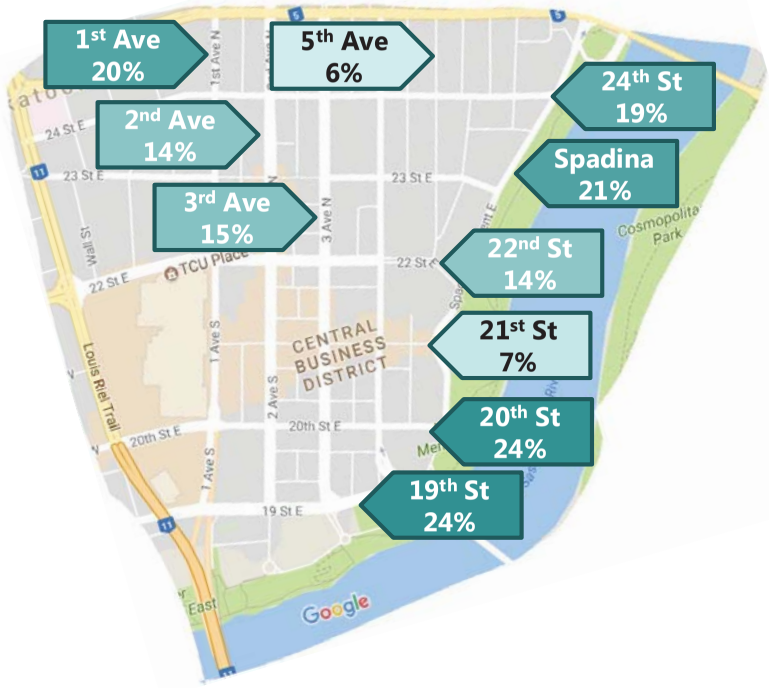
Preferred Future Bike Lane Locations: Representative Survey



I don't think there should be additional dedicated bike lanes downtown 36%

Not sure 24%

Preferred Future Bike Lane Locations: Public Input

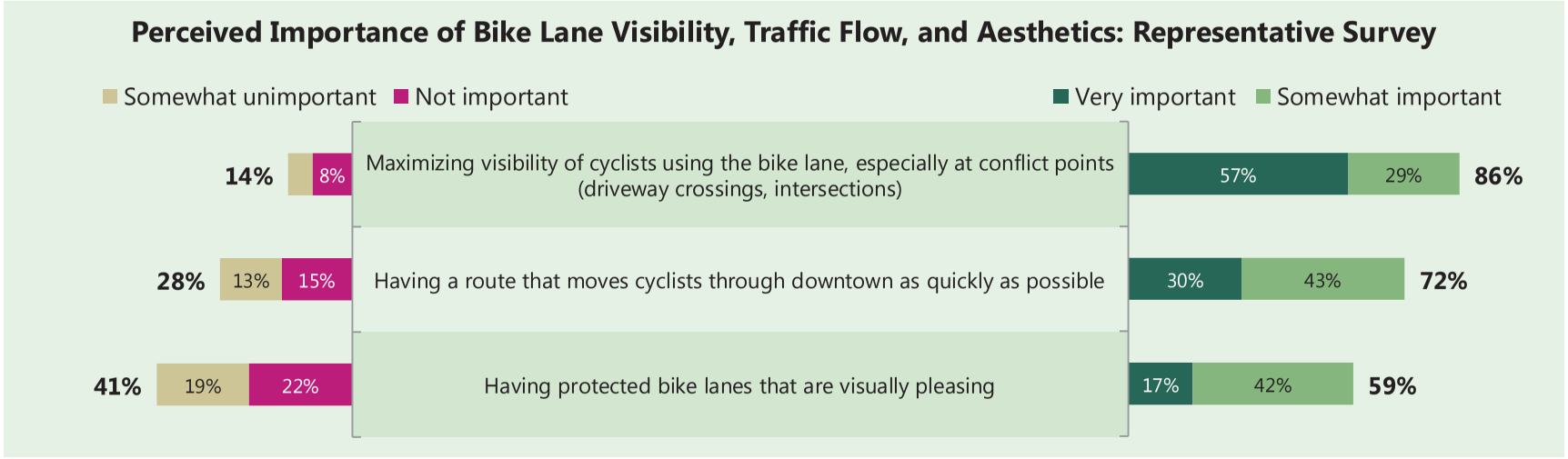


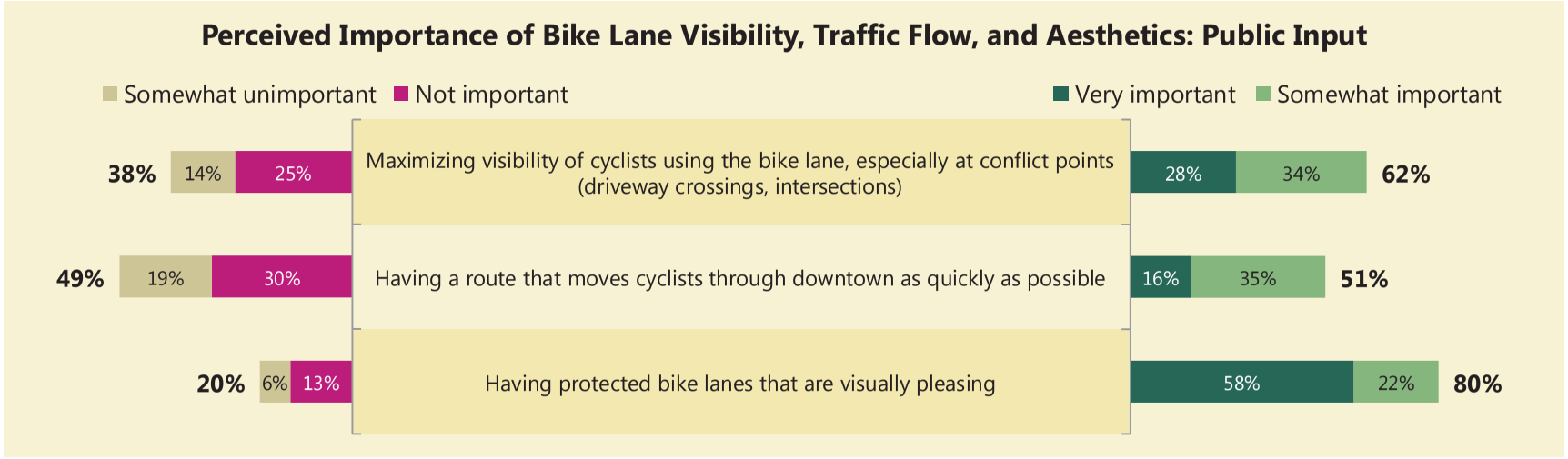
I don't think there should be additional dedicated bike lanes downtown 41%

Not sure 11%

21. Thinking about the City's goal of providing a complete and connected network for people of all ages and abilities across all modes of transportation, where else in the downtown core do you believe bike lanes should be placed? Base: All respondents, Representative: n=1004, Public: n=1363.

Perceived importance of maximizing cyclist visibility is high among the representative sample while fast routes and visually pleasing protected bike lanes are of comparatively less importance. Respondents to the public input survey largely feel the opposite on the latter item.





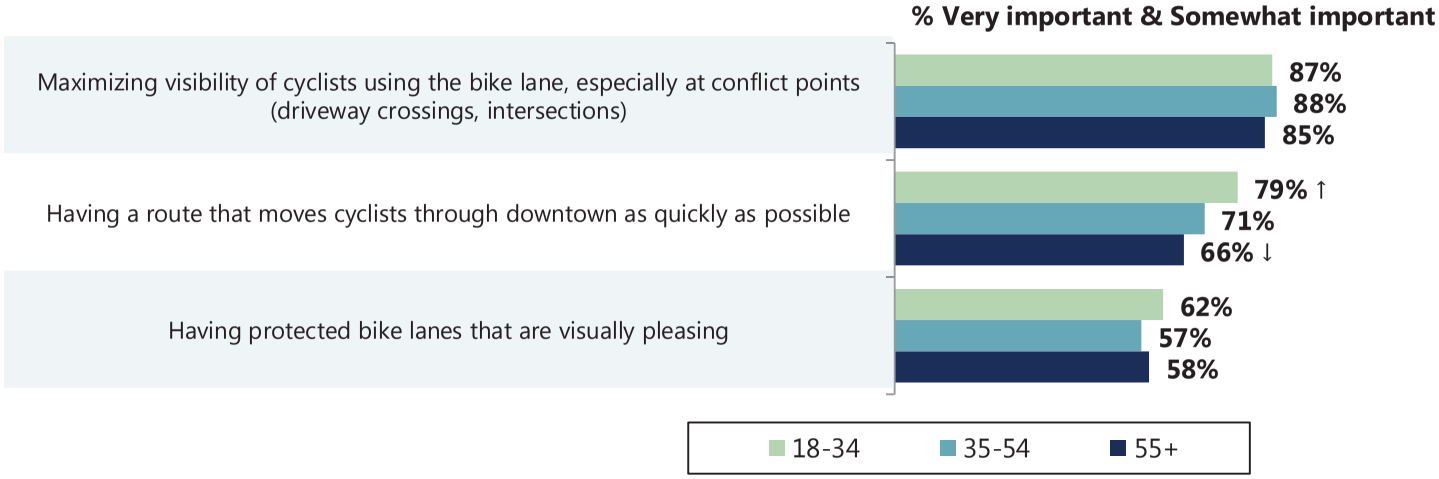
22. Broadly speaking, how important are each of the following as they relate to protected bike lanes in downtown Saskatoon... Base: All respondents, Representative: n=1004, Public: n=1363.

94

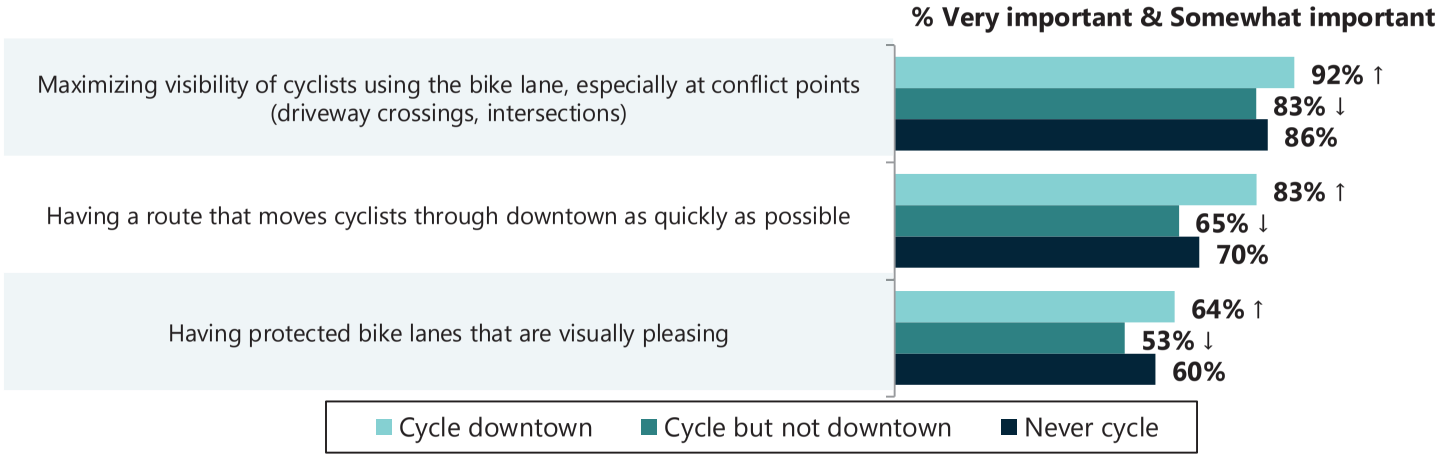
Younger residents place more value on cyclist traffic flow than older residents. Downtown cyclists value all aspects more than those who do not cycle downtown.

Representative Survey

Perceived Importance of Bike Lane Visibility, Traffic Flow, and Aesthetics by Age Range



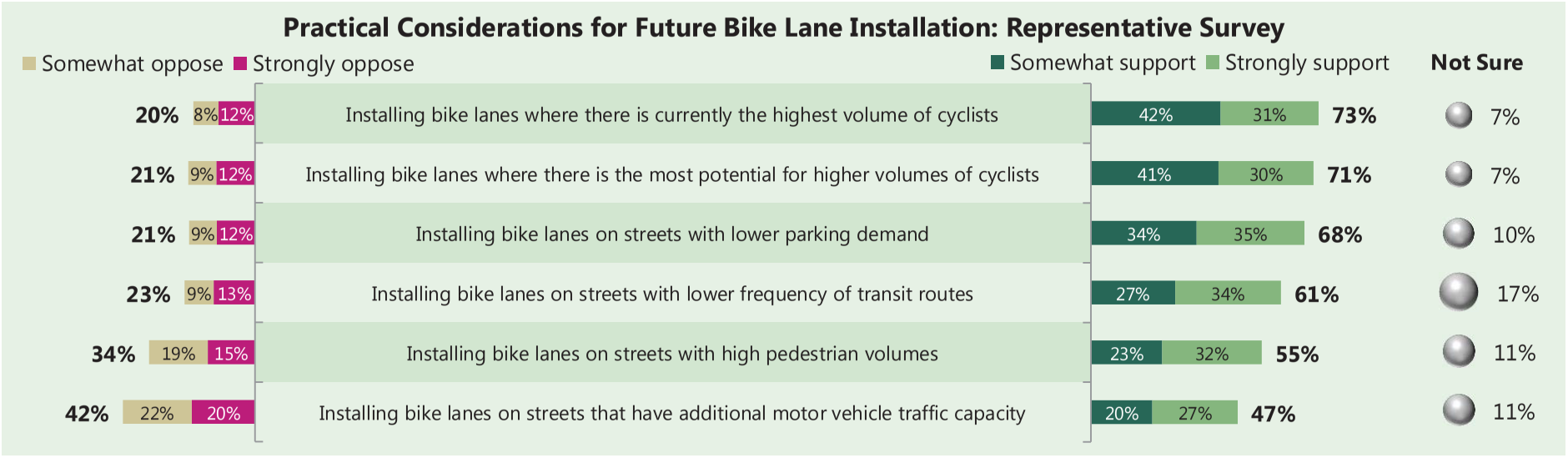
Perceived Importance of Bike Lane Visibility, Traffic Flow, and Aesthetics by Downtown Cycling Frequency

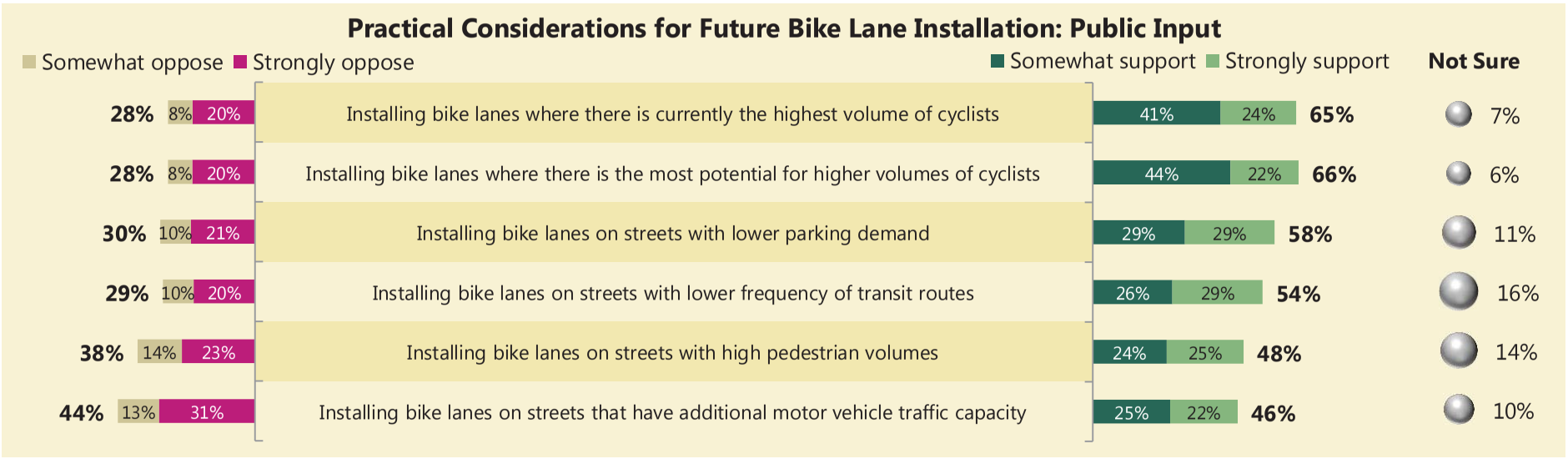


22. Broadly speaking, how important are each of the following as they relate to protected bike lanes in downtown Saskatoon... Base: All respondents, Representative: n=1004.

95

Support is generally high for installing bike lanes based on most criteria, especially in cases where there is high cyclist traffic volume.





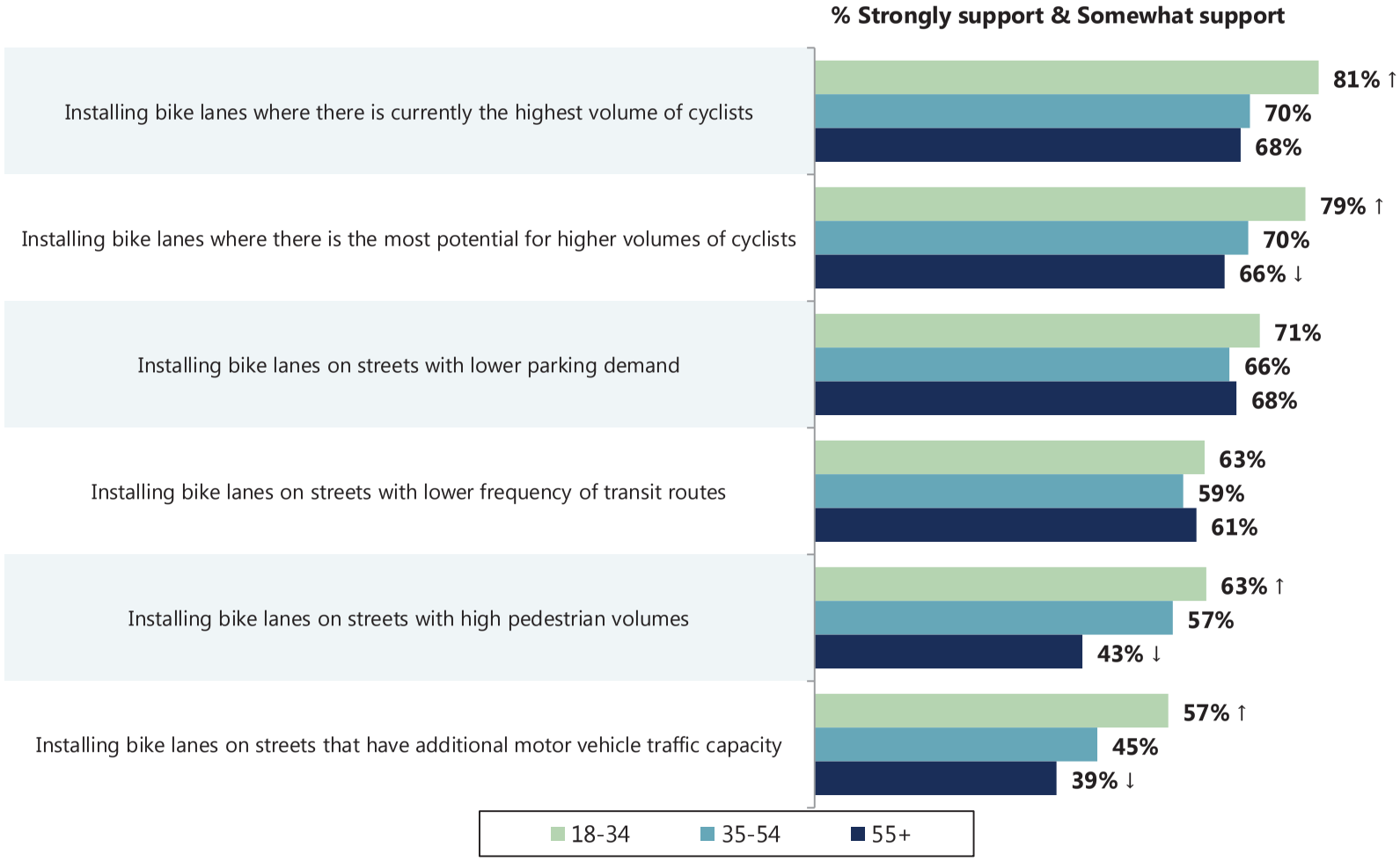
22.1. Broadly speaking, would you support or oppose each of the following as they relate to protected bike lanes in downtown Saskatoon...
Base: All respondents, Representative: n=1004, Public, n=1363.

96

Younger residents are more supportive of most criteria than their older counterparts.

Representative Survey

Practical Considerations for Future Bike Lane Installation by Age Range



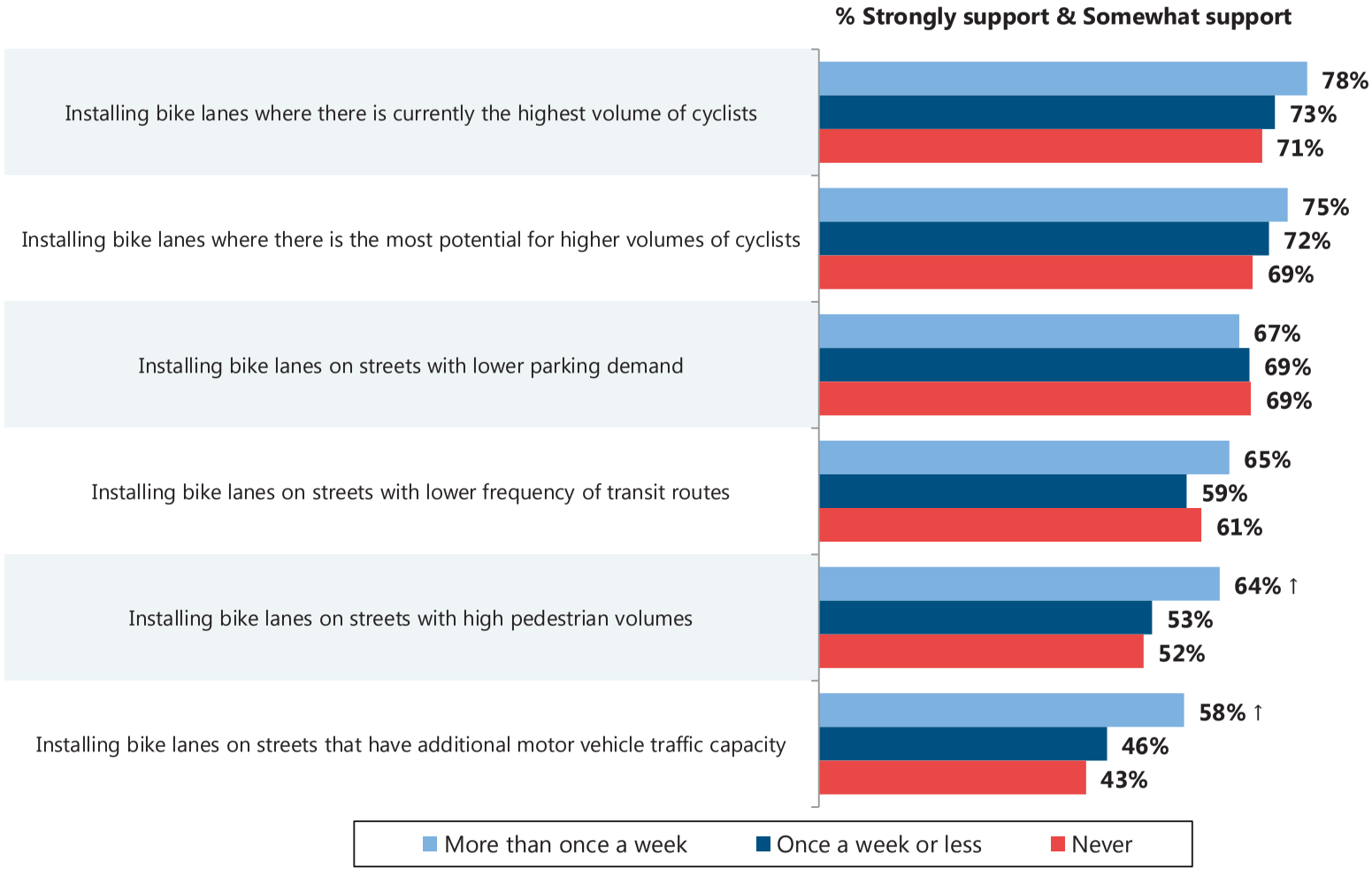
22.1. Broadly speaking, would you support or oppose each of the following as they relate to protected bike lanes in downtown Saskatoon...
Base: All respondents, Representative: n=1004.

97

Frequent cyclists are more supportive of select criteria than those who ride infrequently or never.

Representative Survey

Practical Considerations for Future Bike Lane Installation by Overall Cycling Frequency



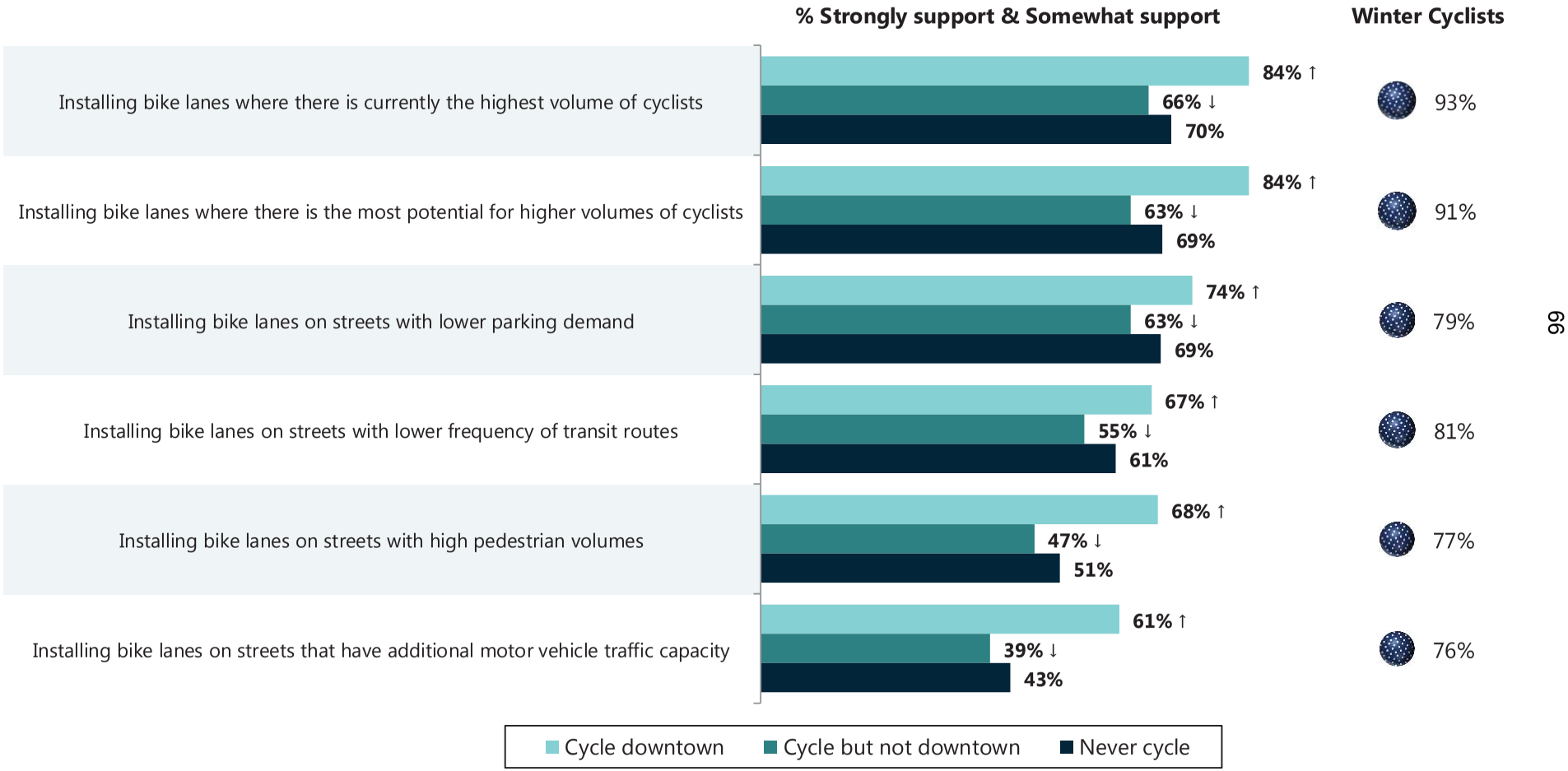
22.1. Broadly speaking, would you support or oppose each of the following as they relate to protected bike lanes in downtown Saskatoon...
Base: All respondents, Representative: n=1004.

98

Downtown cyclists are more supportive of all criteria vs. those who cycle but not downtown. Winter cyclists strongly support all criteria.

Representative Survey

Practical Considerations for Future Bike Lane Installation by Downtown Cycling Frequency

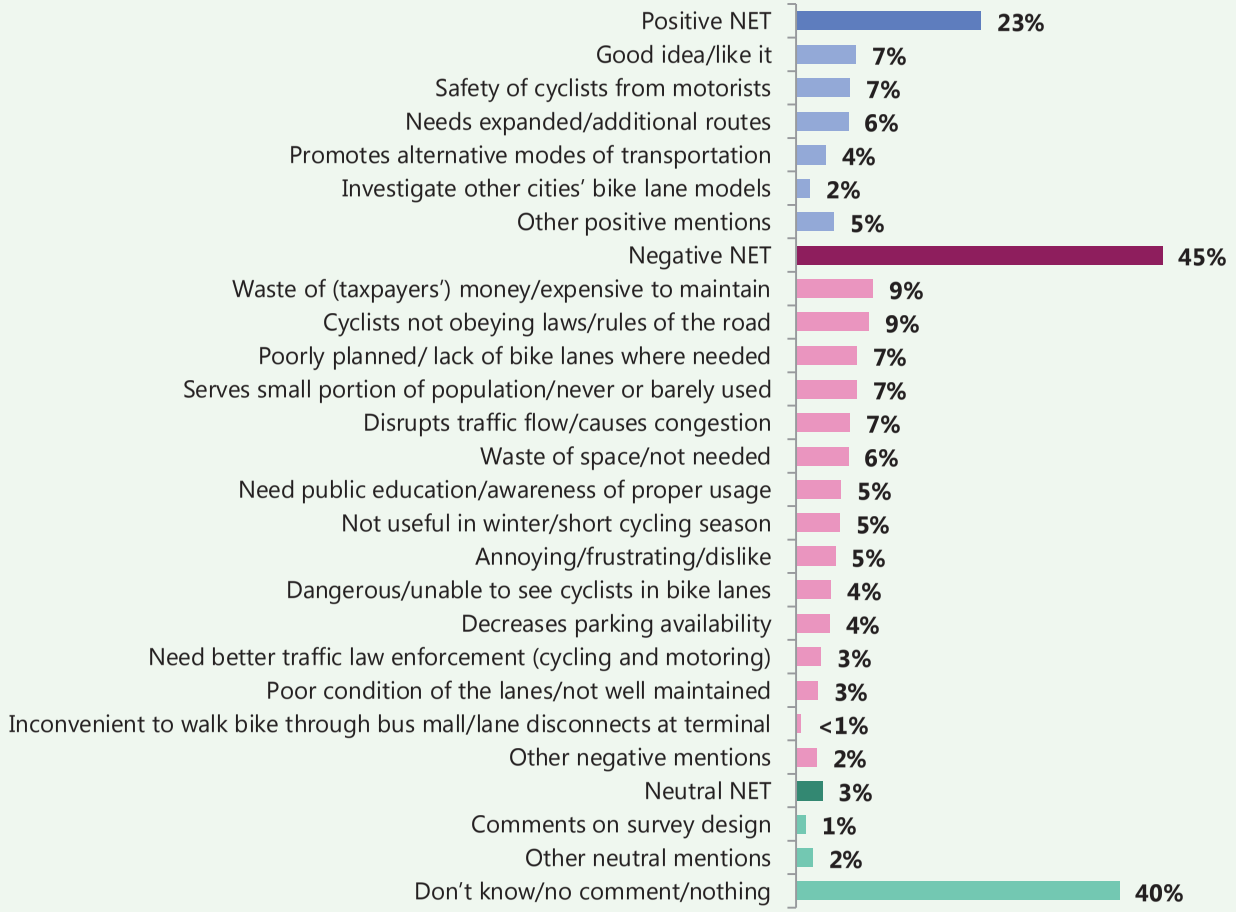


22.1. Broadly speaking, would you support or oppose each of the following as they relate to protected bike lanes in downtown Saskatoon...
Base: All respondents, Representative: n=1004.

When asked to provide closing thoughts, negative comments are more common than positive. Closing thoughts are generally consistent with initial thoughts regarding protected bike lanes.

Representative Survey

Final Thoughts on Downtown Bike Lanes
(Open-ended question)



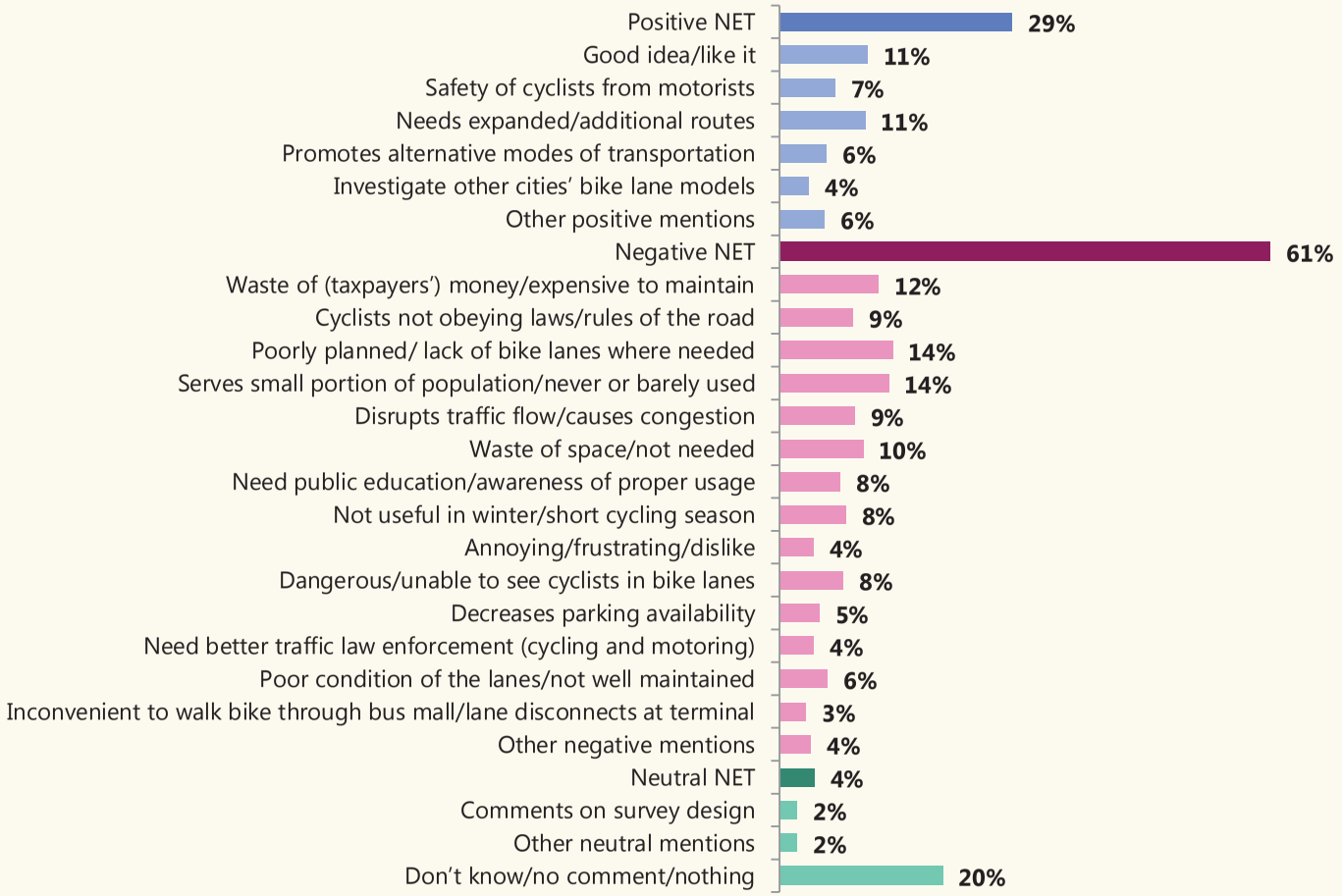
23. Do you have any other comments regarding bike lanes in downtown Saskatoon? Base: All respondents, Representative: n=1004.

100

When asked to provide closing thoughts, negative comments are more common than positive. Closing thoughts are generally consistent with initial thoughts regarding protected bike lanes.

Public Input

Final Thoughts on Downtown Bike Lanes : Public Input
(Open-ended question)



23. Do you have any other comments regarding bike lanes in downtown Saskatoon? Base: All respondents, Public: n=1363.

Select closing comments offered by residents are outlined below.

Closing Comments

Plan Expansion

"We do need to have a more bike friendly city all around. However, the majority of residents still use vehicles or public transportation. There has to be a good way to make bike lanes happen, maybe seasonally?"

"This is a step in the right direction and I am very pleased that the bike lanes will be expanding. The dedicated multi-direction bike lane sounds like an ideal situation. Now we just need more bike lanes outside of the downtown core."

Traffic & Parking

"Need more alternative transportation to reduce cars."

"Lanes should be well marked and a thorough advertising campaign should be implemented."

"Better traffic management and planning."

"More provisions for parking in downtown."

"Maximize lane installation without affecting parking too much or adding parking structures."

Awareness & Safety

"More education to the public on how and when bike lanes are prioritized."

"More monitoring to stop cyclists who come out of lane without signaling and or jump onto sidewalk if other cyclists in front are not moving fast enough. These people need tickets same as a motorists who breaks the law."

"The priority should be safety for cyclist and pedestrians."

102

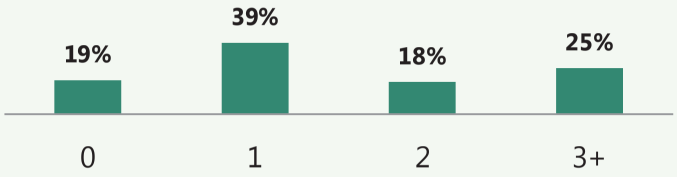
23. Do you have any other comments regarding bike lanes in downtown Saskatoon? Base: All respondents, Representative: n=1004.

Additional Respondent Details

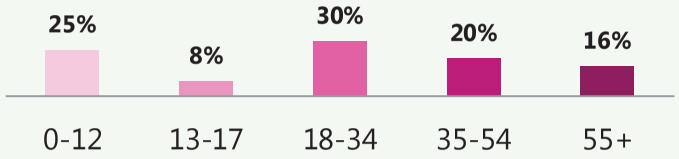
The majority of other household members in the representative survey have access to a bicycle, and one in five of these cyclists ride downtown.

Representative Survey

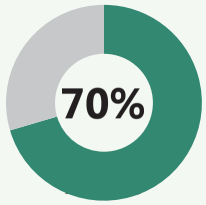
Number of Other People in Household



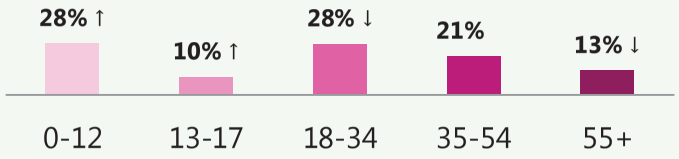
Age Distribution of Other Household Members



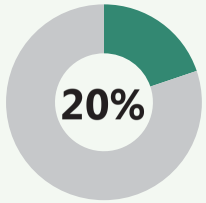
% of Other Household Members that Have Access to a Bike



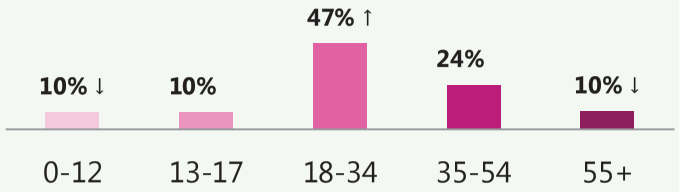
% of Other Household Members that Have Access to a Bike by Age



% of Other Household Cyclists that Bike Downtown



% of Other Household Members that Bike Downtown by Age



104

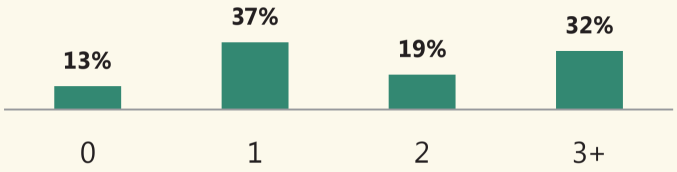
23.1. How many other people live in your home? Base: All respondents, Representative: n=1004.

23.2. Please complete the following table regarding the other members of your household. Base: Other household members, n=231 to 1641.

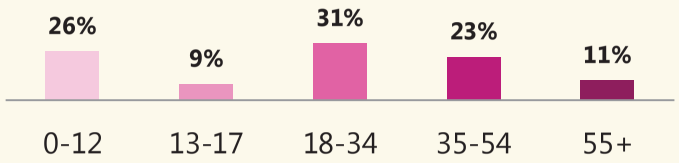
The majority of other household members in the public input survey have access to a bicycle, and more than one third of these cyclists ride downtown.

Public Input

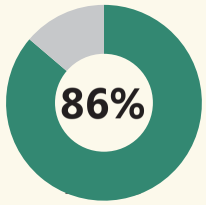
Number of Other People in Household



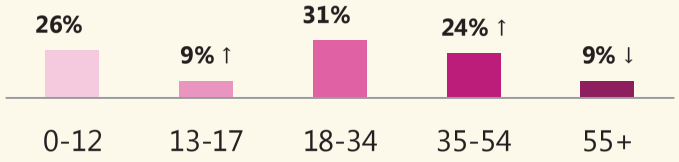
Age Distribution of Other Household Members



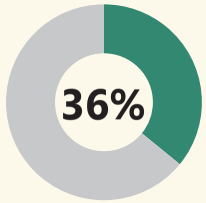
% of Other Household Members that Have Access to a Bike



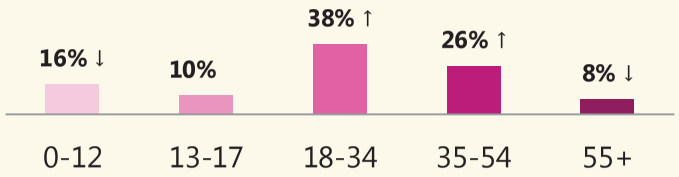
% of Other Household Members that Have Access to a Bike by Age



% of Other Household Cyclists that Bike Downtown



% of Other Household Members that Bike Downtown by Age



23.1. How many other people live in your home? Base: All respondents, Public: n=1363.

23.2. Please complete the following table regarding the other members of your household. Base: Other household members, n=789 to 2542.

City of Saskatoon

2017 Protected Bike Lane Survey

insightrix®

City of Saskatoon

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Study Background & Objectives

In March 2015, Saskatoon City Council approved a recommendation to proceed with a Protected Bike Lane Demonstration Project in the downtown area. The purpose of the demonstration project is to assess the feasibility of installing permanent protected bike lanes in downtown as proposed in the City Centre Plan and by Saskatoon Cycles through the Better Bike Lanes initiative. Expanding and enhancing Saskatoon's bicycle network is also part of the City's Active Transportation Plan. The strategic goal of the project is to create a vibrant and healthy downtown by promoting cycling as a safe and accessible mode of transportation to downtown destinations for businesses, residents, visitors, employers and their employees.

As the Protected Bike Lane Demonstration Project entered its final summer this year, the City was interested in gathering feedback from downtown businesses about their perceptions and experiences with the bike lanes located on 23rd Street and 4th Avenue in the downtown.

Specific research objectives included:

- ✓ Understand perceived modes customers use to travel downtown
- ✓ Determine if businesses have seen an increase or decrease in customers traveling by bicycle
- ✓ Learn impressions that the protected bike lanes have had on downtown businesses overall and on specific attributes such as foot traffic, parking, customer mood, etc.

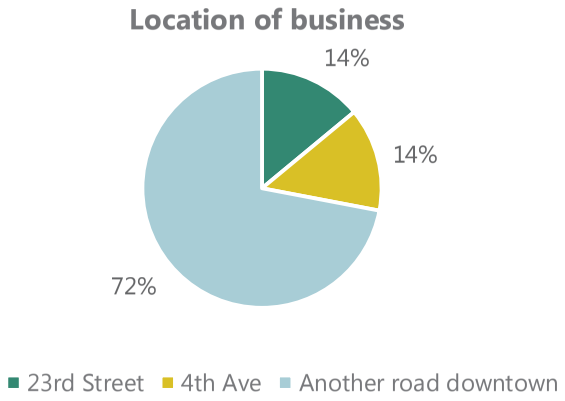
To reach these objectives, Insightrix conducted a series of interviews with downtown businesses.

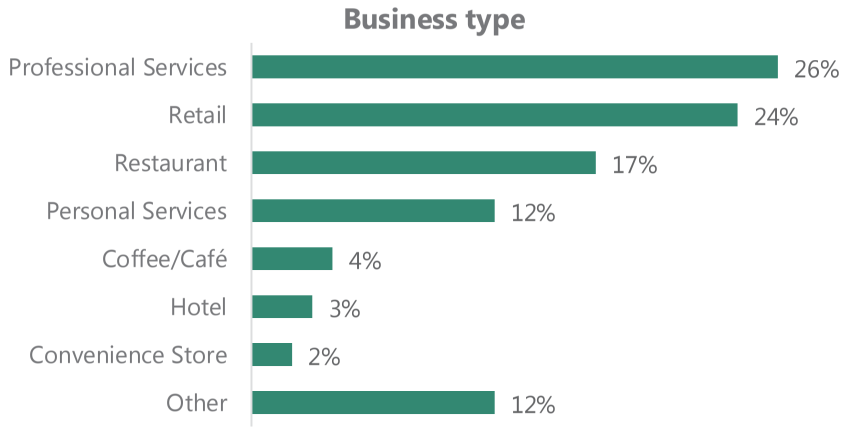
Methodology – Downtown Businesses

- To collect opinions from downtown businesses, intercept interviews were conducted. Specifically, Insightrix Research interviewers entered randomly selected businesses located in the downtown core (between the river, 25th Street and Idylwyld Drive) and approached business decisionmakers to participate in a short interview.

- A brief questionnaire was developed in collaboration with City representatives to address the research objectives outlined earlier. Only for-profit businesses were surveyed with government offices, educational institutes, places of worship, non-profit organizations, etc. being excluded from the study. Further, property owners were not surveyed (but business tenants of such buildings were included). Finally, tenants of Scotia Centre and Midtown Plaza were excluded from the study. Businesses located on both ground floor and above ground were surveyed.

- Interviewers conducted the interviews using iPads to aid with data quality and efficiencies over paper surveying. Interviews were completed between August 31 and September 6, 2017. A total of 100 business were surveyed. A profile of those surveyed is outlined below:





Reporting Notes

- Data have been rounded to zero decimal places; therefore, percentages may not add up precisely to 100% on some graphs.
- Open-ended questions have been themed and coded into categories. The percentages from individual codes could total more than 100%, as comments from each respondent could be relevant to more than one code.
- Questions that have multiple response options will result in percentages that could add up to more than 100%.
- In some cases, themes have been organized into 'Net themes' based on overarching commonalities in the content of responses (i.e., positive or negative mentions). The percentages of individual codes will add up to more than the Net total as multiple comments from each respondent are possible within each Net.

Most commonly, businesses report their customers travel downtown by vehicle. One in five businesses say at least some of their customers cycle to their business.

% that report customers travel to their business via the following modes

Drive 67%

Walk 17%

Transit 7%

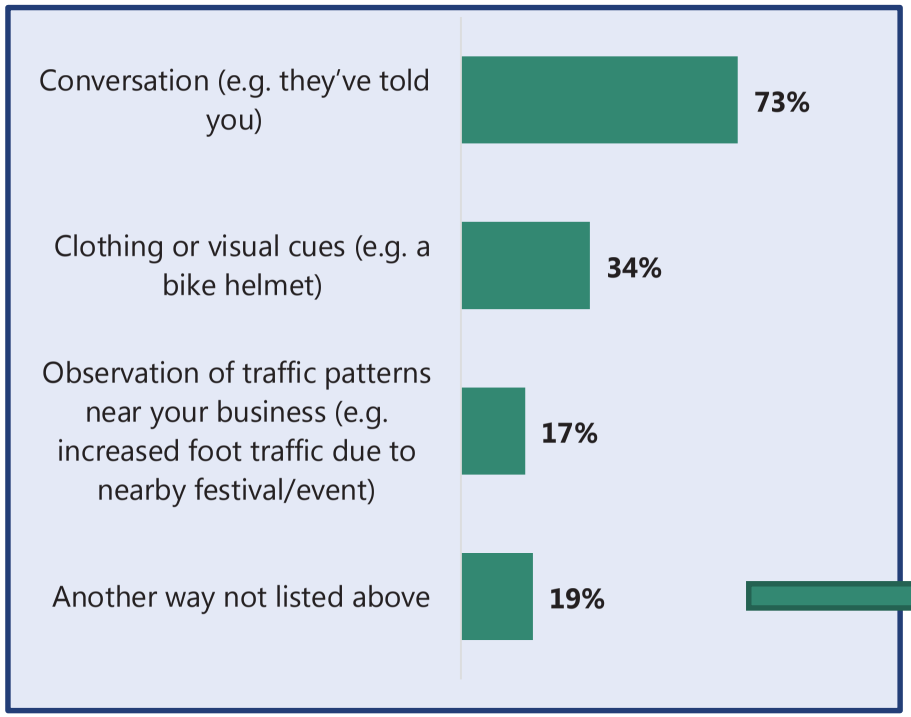
Bike 5%

Get a ride 5%

1. How do you believe the majority of your customers travel to your business? Please enter an estimated percentage in each box (total must add up to 100%). Base: all respondents, n=100.

Most commonly, downtown businesses determine their customers' mode of transportation by speaking with them. Visual cues and observation of traffic patterns near their business are also somewhat commonplace.

Determining mode of transportation of customers



Another way not listed

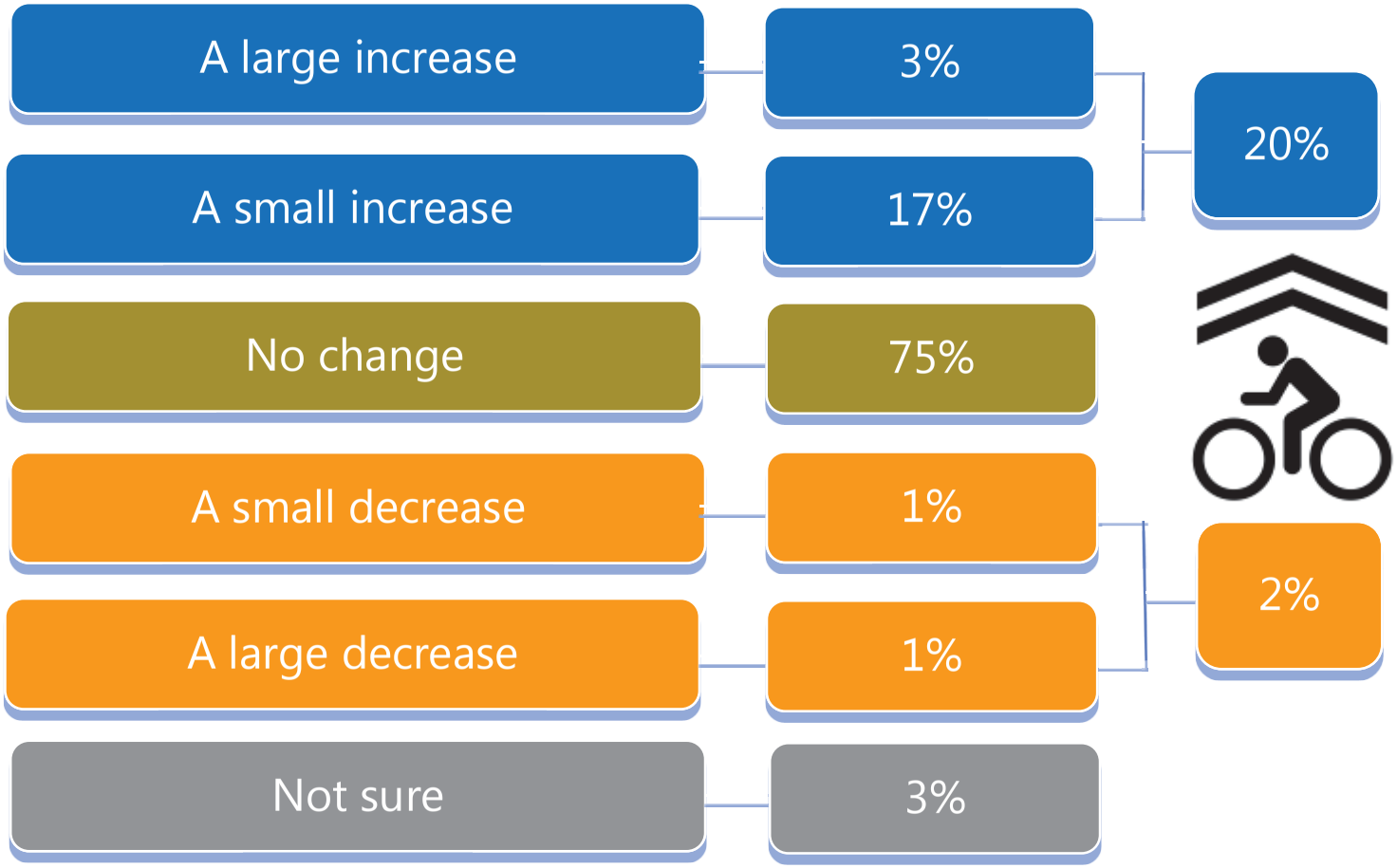
- Assumption
- Look outside
- Seeing a bike locked up
- Social media
- We know them on a personal level

111

2. What information do you use in determining someone's mode of transportation to your place of business, select all that apply; Base: all respondents, n=100.

A modest proportion of businesses believe there are more customers travelling to their business by bike after the introduction of protected bike lanes.

Proportion of customers travelling to downtown businesses by bicycle



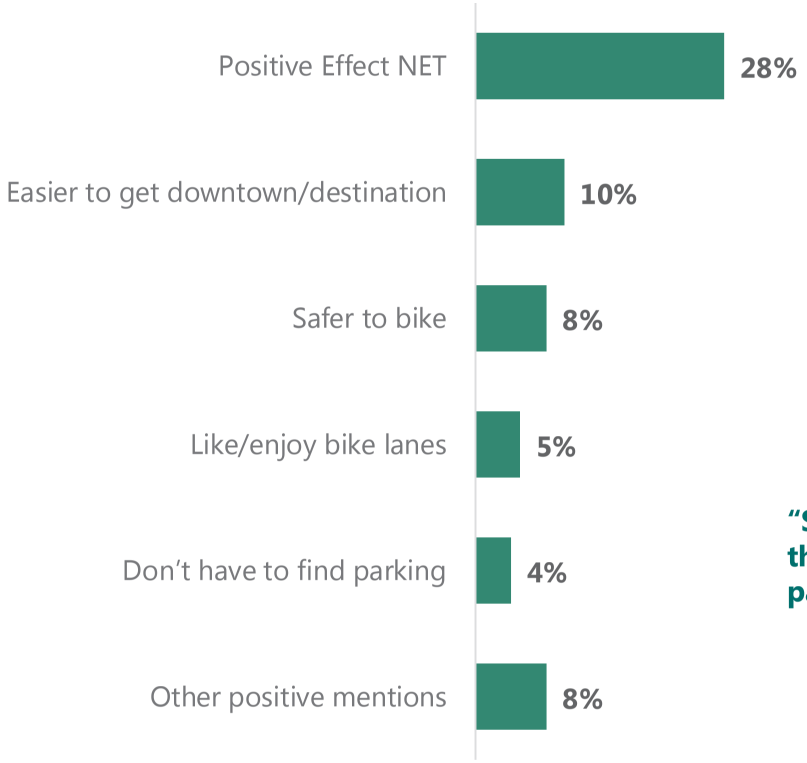
3. Have you seen an increase in the proportion of customers travelling to your businesses by bicycle since the installation of the protected bike lanes? Base: all respondents, n=100.

112

When asked what effect protected bike lanes have on business respondent customers, three in ten cite positive sentiments, most commonly that it is easier to get downtown.

Effect on customers after introduction of protected bike lanes

Positive sentiments



Voice of businesses in Saskatoon downtown

"In the business we are in, it's a wellness center, doing more walking and using your feet is more in tune of what we sell here."

I think they are a positive thing. I feel more people that bike downtown shop at downtown businesses. They can shop longer cause they don't have to worry about paying for parking. We may get more customers, more exposure to the business due to people biking by.

"Some of them are happy that it's there, they won't have to look for parking, which sucks."

"A safer environment to transport themselves and more cost effective."

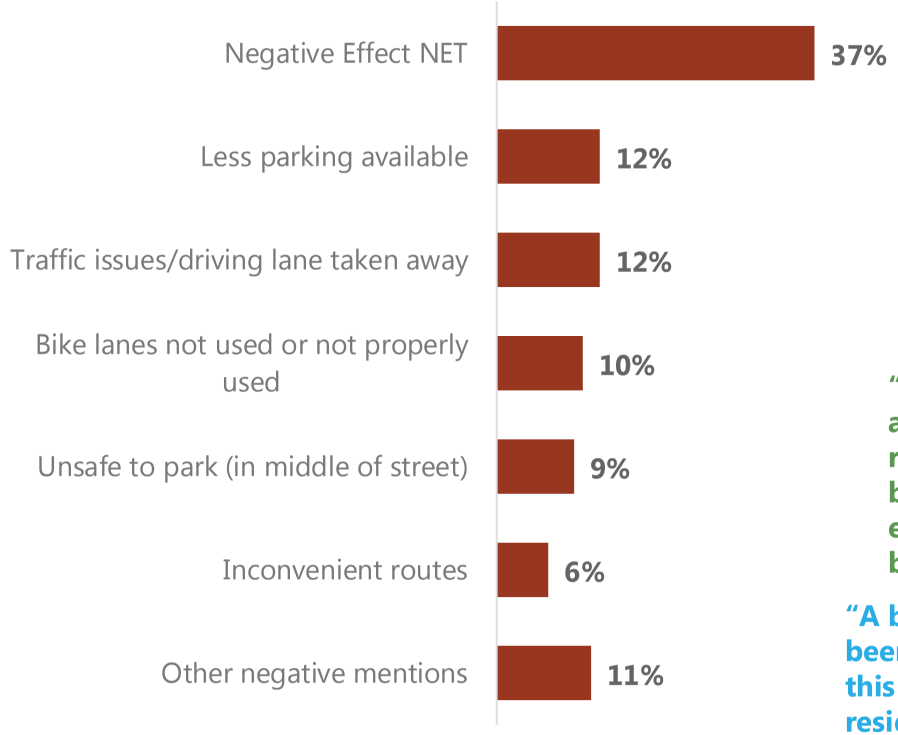
"It's made it easier for them to get down here, they now have an area on the road where they can bike in."

4. Broadly speaking, what effect do you think the protected bike lanes in the downtown have had on your customers? Base: all respondents, n=100.

In contrast, four in ten offer negative sentiments, commonly including issues such as reduced parking availability, traffic issues, improper and infrequent use of the bike lanes.

Effect on customers after introduction of protected bike lanes

Negative sentiments



Voice of businesses in Saskatoon downtown

"The traffic is terrible; it's congested. Because now in front of our building, everyone is parked in the middle of the street because of the bike lane. It's not a good street for a bike lane because it's so narrow. People are confused on how and where to park. They cut back on the parking; busses are not able to get around the corner. I still see people on the sidewalk not using the bike lane. I think the bike lane is a good concept, just makes no sense on how and where they put it."

"Been a nuisance; takes away a lane that doesn't need to be taken away. One of our clients had gotten a ticket for turning right on the red light, then they took the sign away. Saskatoon doesn't need the bike lanes. I drive by and have not seen a bike go across that lane ever. They block off a lane from turning. It's stupid; some bureaucrats like to waste tax payers' money."

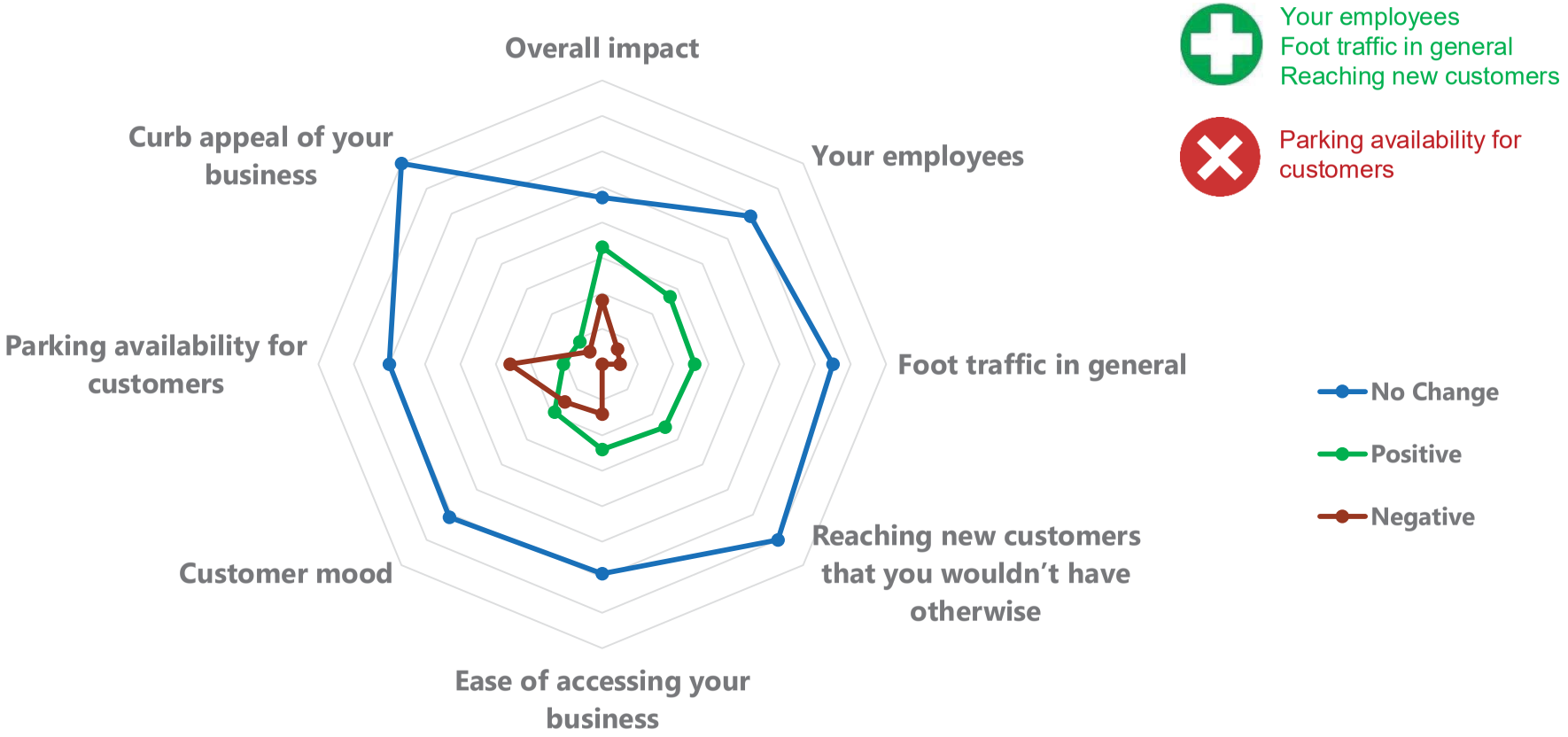
"A bit of an inconvenience; the lane has been taken away. The city needs to know this is not only a business, it's also residential. It shortened the parking spots available. It's creating some confusion."

"Nothing but increase in road rage."

4. Broadly speaking, what effect do you think the protected bike lanes in the downtown have had on your customers? Base: all respondents, n=100.

A majority of downtown businesses believe protected bike lanes have had no impact on their business. Modest proportions believe the bike lanes have had a positive impact in specific areas noted below, with the exception of parking availability.

Protected bike lanes impact on business



115

5. How have the protected bike lanes impacted your business in each of the following ways? Base: all respondents, n=100.

A majority of downtown businesses believe that protected bike lanes have had no impact on their business. Modest proportions believe the bike lanes have had a positive impact in specific areas noted below, with the exception of parking availability.

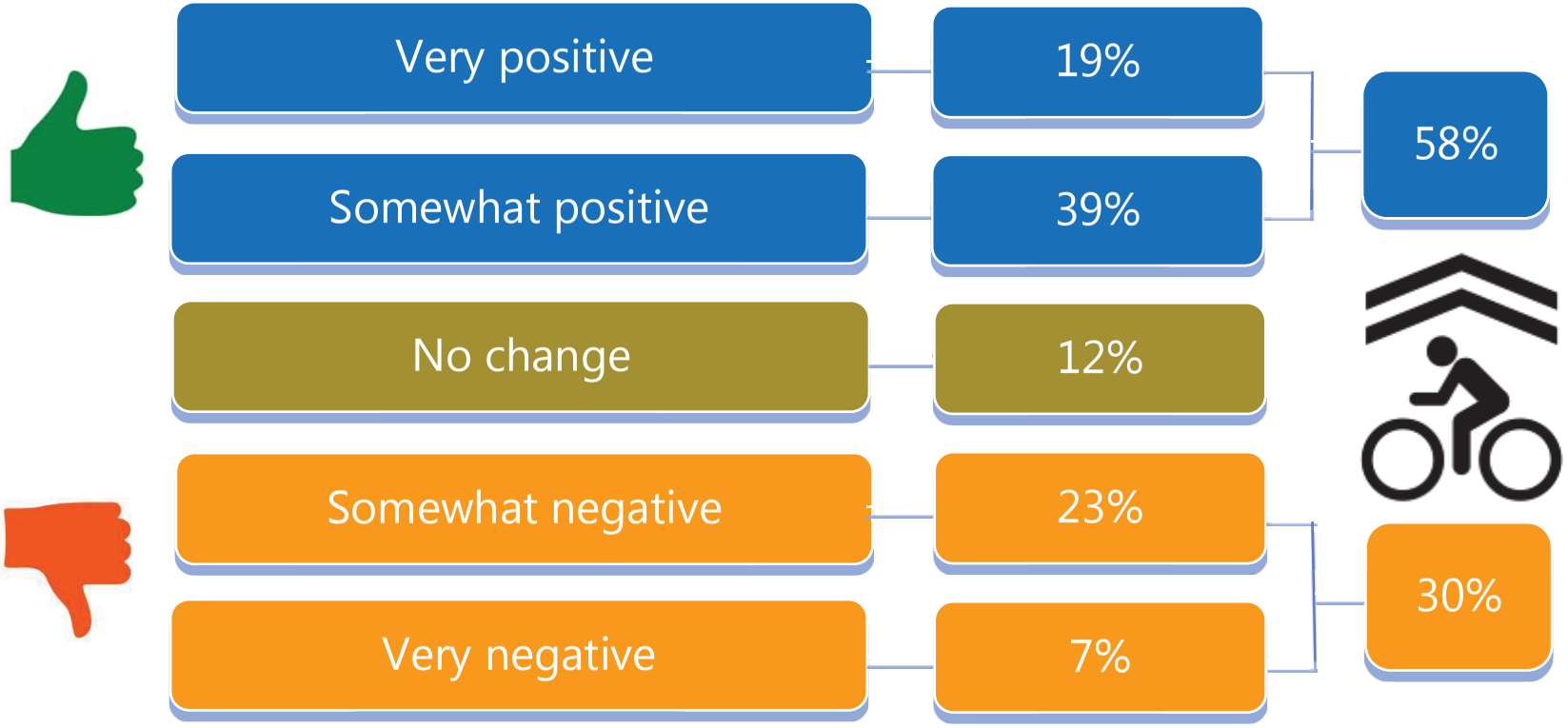
Protected bike lanes impacted business

	Positive	Negative	No Change	Not Sure
Overall impact	33%	18%	47%	2%
Your employees	27%	6%	59%	8%
Foot traffic in general	26%	5%	65%	4%
Reaching new customers that you wouldn't have otherwise	25%	0%	70%	5%
Ease of accessing your business	24%	14%	59%	3%
Customer mood	19%	15%	61%	5%
Parking availability for customers	11%	26%	60%	3%
Curb appeal of your business	9%	5%	80%	6%

5. How have the protected bike lanes impacted your business in each of the following ways? Base: all respondents, n=100.

Six in ten believe the protected bike lanes have had a positive impact on downtown, whereas three in ten feel that it has had a negative impact.

Impact of protected bike lanes on downtown as a whole



6. And overall, would you say the protected bike lanes have had a positive or negative impact on downtown as a whole? Base: all respondents, n=100.

Final business respondent comments are mixed with some offering supportive sentiments, with others citing frustrations in need of improvement.

Final comments

As a downtown business owner, I am in favour of creating incentives for people to use alternative means of transportation. Also, if we want to retain and attract young people who work and play here, we need to be current with the times which means promoting healthy lifestyle choices.

Due to seasons, we have over 6 months of winter, so the bike lanes cannot be used for those months. If the bicycle lanes are taking over parking spots, it will be harder to find parking spots downtown.

I think it's a great idea. It should be something we implement. We have a lot of environmentalists here that appreciate cycling and long boarding. I think it's a good change, especially with our summers here.

Bikers and vehicle drivers still need to be aware of each other. I think bikes have to come off the sidewalk. Overall, I think protected bike lanes are a good idea. We just need more education. Anyone using these pathways needs more education.

I agree with the premise of the bike lanes and what it means to encourage people to utilize other means of transportation. However, due to the width of the lanes between 23rd and 22nd, specifically more towards the rush hour times, creates a little more anger in drivers. People get angry and make mistakes and lose focus. It becomes negative and frustrating.

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7. These are all of my questions. Do you have any final comments? Base: all respondents, n=100.

Key Findings

Downtown Business Findings:

- A modest proportion of businesses believe there are more customers travelling to their business by bicycle after the introduction of protected bike lanes.

- Modest proportions of businesses believe the bike lanes have had a positive impact with their employees, increasing foot traffic, reaching new customers and improving access to their business. However, some feel that parking availability has been compromised.

- Broadly speaking, six in ten believe the protected bike lanes have had a positive impact on downtown, whereas three in ten feel that it has had a negative impact.

Bicycle counts are done using specialized bike counters. Two different types of counters have been installed in the protected bike lanes along 23rd Street and 4th Avenue to measure cyclist volumes. Both of these counters use the same technology as the counters used to monitor motor vehicle volumes, but are more sensitive to bicycles. As with motor vehicle counts, counters do not distinguish bet ween unique users. In other words, any time a bicycle crosses the counter, it is recorded.

Counter Types

Easy ZELT Continuous Bicycle Counters: The system uses induction loops that adhere to the pavement surface and last 4-8 months. These counters analyze the electromagnetic signature of each bicycle. This is the same technology as the City's motorized vehicle traffic counters and in-road vehicle detections at signals, but more sensitive to bicycles. The system is perfect for obtaining trends over time and allows for the comparison of bike trips over consecutive months, seasons or years. These counters collect continuously, in 15-minute increments, 24-hours a day.

There are four continuous counters installed in the protected bike lanes – two on 23rd Street between 3rd and 4th Streets and two on 4th Avenue between 22nd and 23rd Streets. The induction loops are installed in the spring of the year when pavement is dry and when temperature is above freezing. The loops are replaced so that the counters can count into the winter season.

Pneumatic Tube Short-Term Bicycle Counters: The counters use a set of two rubber tubes that are placed perpendicular to traffic flow along the pavement. This is the same technology as the City's short-duration motorized vehicle traffic counters. This system is able to distinguish bicycles from motorized vehicles in mixed traffic, extract directional data, and accurately count the number of cyclists in a group. The City has two of these counters that rotate to different locations from spring to fall. Typically, the counter is set up at a location for about a week and collect continuously, in 15-minute increments, 24-hours a day. These counters are moved along the 4th Avenue and 23rd Street bike lanes to count on different city blocks through the course of the pilot project.

The volumes recorded by the counters are daily volumes (actuals). The City then uses the methodology from the Traffic Monitoring Guide (Federal Highway Administration, 2016) to calculate annual average daily bicycle traffic (AADBT).

Using this methodology helps us understand, on average, how many people use the bike lanes on a daily basis. It is important to determine the annual averages because traffic volumes vary by hour of the day (rush hours vs late at night), day of week (weekend versus weekday), month of year, and season (school versus summer vacation). This is especially the case for trips made by pedestrians and cyclists. The day-to-day variation of people walking or biking is much higher than for motor vehicles as adverse weather, or even a forecast of adverse weather, can alter people's choice to walk or bike.

Annual average daily bicycle traffic (AADBT) was calculated for data collected in 2014 and 2016. The 2017 AADBT will be calculated once data collection is complete for the year. For 2017, the Average Daily Bike Traffic (ADBT) is determined as the average of daily totals during the period in which data was collected.

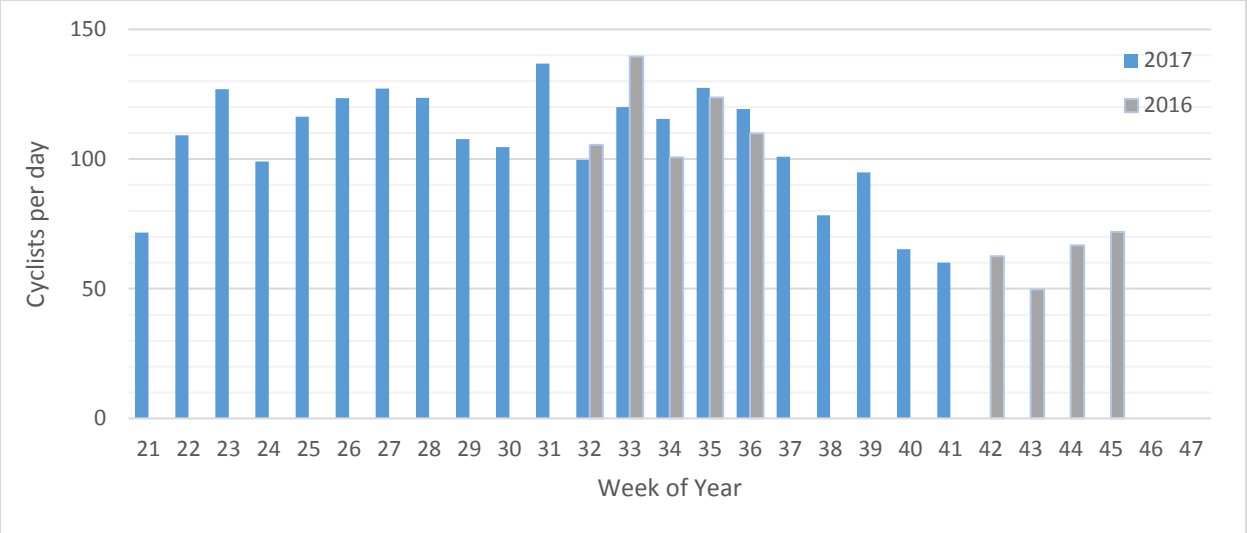
Average Cyclists per Day (in both directions)

	AADBT (factored)		**ADBT Average** (unfactored)
	2014	**2016**	**2017**
23rd Street			
Wall St to Pacific Ave		140	
Ontario Ave to 1st Ave	60	120	150
1st Ave to 2nd Ave		80	
* 3rd St to 4th St	30	90	110
4th Ave to 5th Ave		70	
5th Ave to Spadina Cres		70	80
4th Avenue			
20th St to 21st St	50	190	310
21st St to 22nd St	40	160	
* 22nd to 23rd St		170	230
23rd St to 24th St		110	220

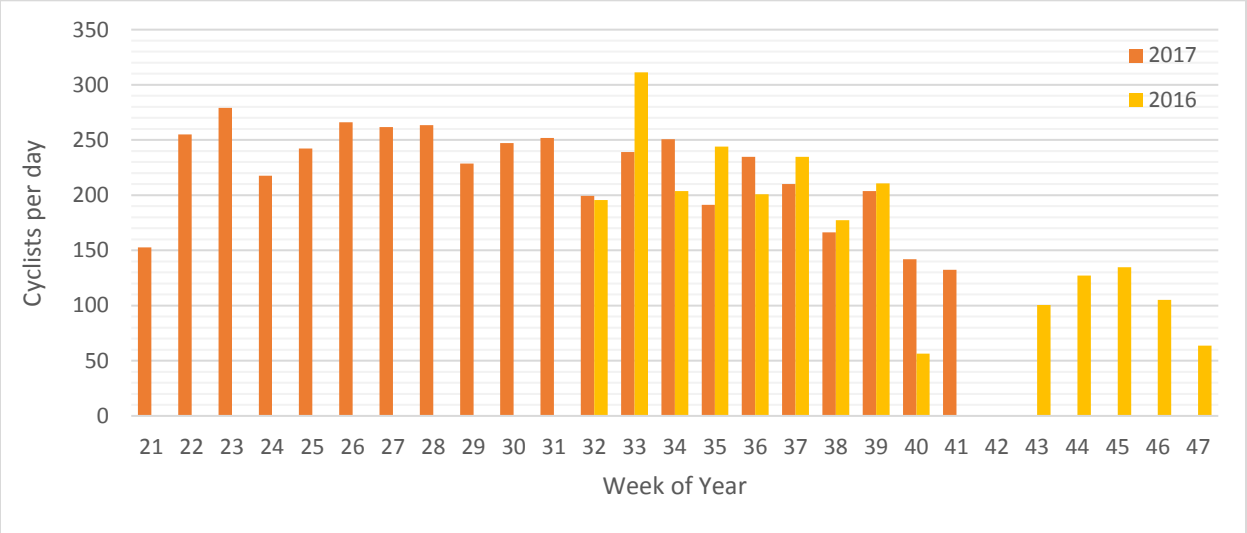
*Continuous Bicycle Counters

Average Number of Cyclist per Day (by Day of the Week)

23rd Street: 3rd Avenue to 4th Avenue



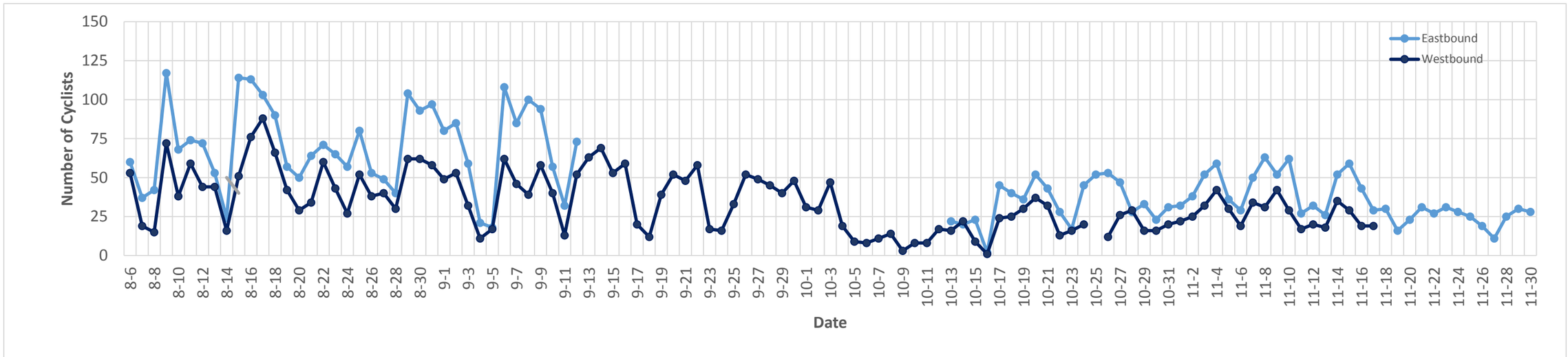
4th Avenue: 22nd Street to 23rd Street



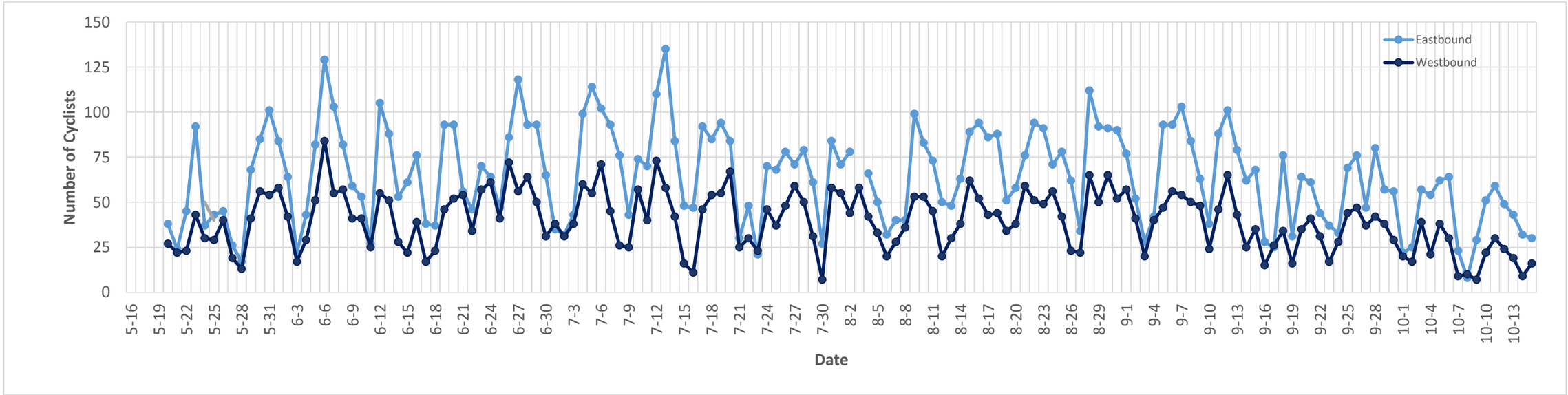
Number of Cyclists per Day by Direction of Travel (Raw Data)

23rd Street: 3rd Avenue to 4th Avenue

2016

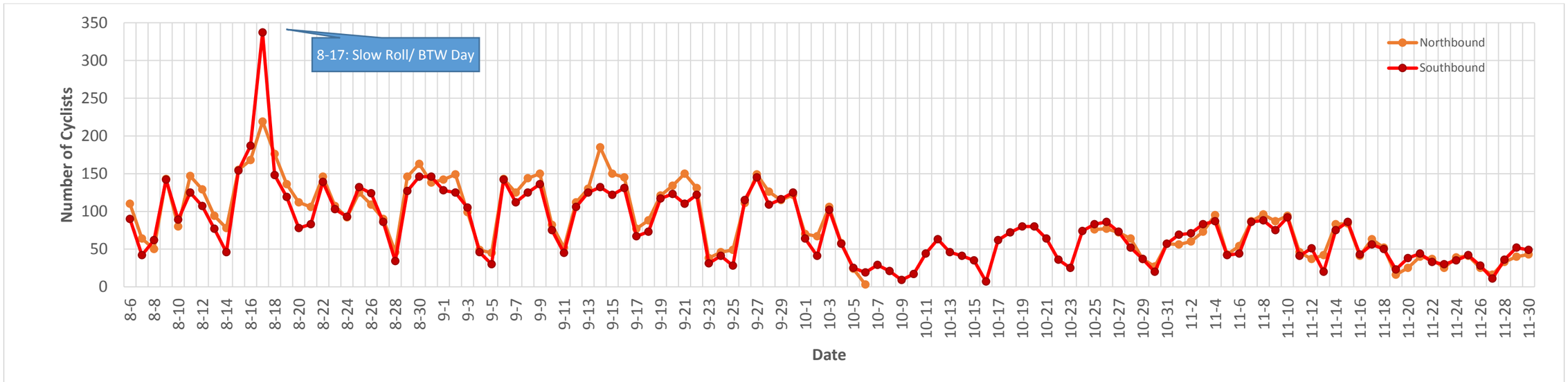


2017

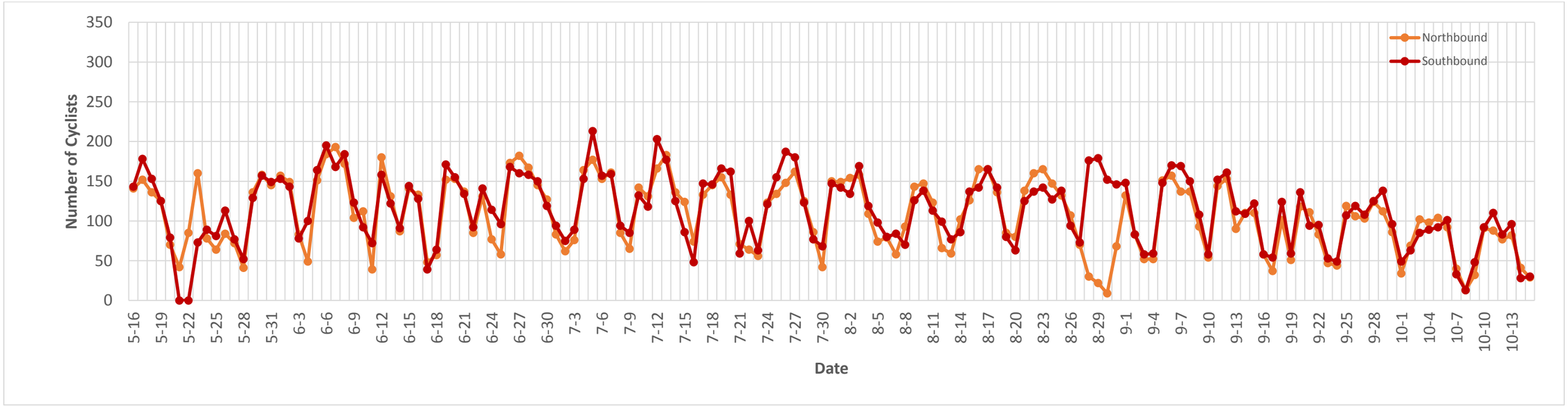


4th Avenue: 22nd Street to 23rd Street

2016



2017



Motorized Vehicle Traffic Analysis

Traffic analysis considers several metrics to determine whether traffic operations are adequate.

Key Terminology

- **Level of service (LOS)** ratio is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, manoeuverability, delay, and safety. The LOS of a facility is designated with a letter A to F, with A representing the best operating conditions and F the worst.
- **Volume to capacity (V/C)** ratio compares the number of vehicles on the road to the available capacity of the roadway. It is an indicator for the amount of congestion. Any V/C ratio greater than or equal to 1 indicates that the approach is operating at or above capacity.
- **Delay** is the average time per vehicle to stop or slow when approaching each intersection. This reported in seconds.
- **The 95th Percentile Queue**, in meters, is the maximum back of queue and indicates that 95 percent of the time, queues will be less than this length.
- **Average travel time** is the average time it takes a driver to travel the length of the corridor.

Traffic Analysis

Traffic analysis of the protected bike lanes for the before and after installation conditions is discussed below.

Table 1 shows that the overall intersection Level of Service (LOS) remained at LOS B for both 4th Avenue and 23rd Street in the p.m. peak hour. LOS B indicates that traffic is flowing well with little delay.

The table below also indicates that the average travel time for motorized vehicles traveling along 4th Avenue and 23rd Street has increased by approximately 20 seconds during the p.m. peak hour.

Table 1: Motorized Traffic Summary (p.m. peak hour)

Street	2014 Pre-Installation		2017 Post-Installation		Difference	
4th Avenue (19th Street to 24th Street)						
	NB	**SB**	**NB**	**SB**	**NB**	**SB**
Intersection Level of Service (LOS)	B or better		B or better			
Average Travel Time	154.2 s	156.5 s	173.2 s	178.1 s	+ 19 s	+21.6 s
23rd Street (Idylwyld Drive to Spadina Crescent)						
	EB	**WB**	**EB**	**WB**	**EB**	**WB**
Intersection Level of Service (LOS)	B or better		B or better			
Average Travel Time	130.4 s	127.7 s	149.4 s	151.5 s	+ 19 s	+23.8 s

Note:

- The lane configuration on 4th Avenue changed from two travel lanes in each direction to one travel lane in each direction to accommodate the installation of the protected bike lanes.
- Northbound and southbound traffic volumes on 4th Avenue decreased slightly between 21st and 23rd Streets compared to the volumes recorded prior to the installation of the protected bike lanes. However, the volumes at 19th and 25th Streets, did not change, indicating that motorists may be avoiding these segments.

Tables 2 and 3 provide a listing of the 2017 traffic operations (post-installation) for the signalized intersections along 4th Avenue and 23rd Street corridors and indicate the operating conditions for each traffic movement at each intersection in the p.m. peak hour.

Table 2: 2017 Traffic Conditions on 4th Avenue with Protected Bike Lanes (p.m. peak hour)

Intersection with 23rdStreet	Movement		Post-Installation Operations			
			v/c ratio	Delay (s)	LOS	Queue (m)
20th Street	EB	Left/Thru/Right	0.62	21.8	C	40.6
	WB	Left/Thru	0.32	18.7	B	30.2
		Right	0.37	5.1	A	12.5
	NB	Left	0.64	32.3	C	35.0†
		Thru/Right	0.33	10.7	B	32.7
			0.21	2.9	A	7
	SB	Left	0.25	10.7	B	8.4*
		Thru	0.86	22.1	C	125.1†*
		Right	0.03	2	A	0
	Intersection Summary		**0.86 (max)**	**17.5**	**B**	
21st Street	EB	Left/Thru/Right	0.32	21.5	C	22.8
	WB	Left/Thru/Right	0.66	32.8	C	52.6†
	NB	Left	0.17	8.8	A	6.2*
		Thru/Right	0.5	10.3	B	49.4
	SB	Left	0.19	8.4	A	8.8*
		Thru/Right	0.82	19.4	B	132.4†
	Intersection Summary		**0.82 (max)**	**18.2**	**B**	
22nd Street	EB	Left	0.56	30.3	C	33.4†
		Thru	0.28	17.9	B	26.9
		Right	0.29	18.9	B	20.8
	WB	Left	0.08	15.9	B	6.7
		Thru/Right	0.55	23.4	C	48.0
	NB	Left	0.15	6.0	A	4.2*
		Thru/Right	0.7	10.5	B	33.5
	SB	Left	0.46	12.3	B	10.4
		Thru/Right	0.49	8.7	A	24.7
	Intersection Summary		**0.70 (max)**	**14.7**	**B**	
23rd Street	EB	Left/Thru/Right	0.17	14.9	B	10.7
	WB	Left/Thru/Right	0.17	14.8	B	11.7
	NB	Left	0.12	10.3	B	4.3*
		Thru/Right	0.56	14.6	B	56.2
	SB	Left	0.12	10.6	B	7.1
		Thru/Right	0.48	14.3	B	50.2
	Intersection Summary		**0.56 (max)**	**14.3**	**B**	

* Note: Volume for 95th percentile queue is metered by upstream signal

† Note: 95th percentile volume exceeds capacity, queue may be longer

Table 3: 2017 Traffic Conditions on 23rd Street with Protected Bike Lanes (p.m. peak hour)

Intersection with 23rdStreet	Movement		Post-Installation Operations			
			v/c ratio	Delay (s)	LOS	Queue (m)
Pacific Avenue	EB	Left/Thru/Right	0.41	13.5	B	20.9
	WB	Left/Thru/Right	0.46	14.8	B	21.8
	NB	Left/Thru/Right	0.42	7.8	A	23.8
	SB	Left/Thru/Right	0.18	5.0	A	10.3
	Intersection Summary		**0.46 (max)**	**11.5**	**B**	
1st Avenue	EB	Left/Thru/Right	0.6	13.8	B	29.4
	WB	Left/Thru/Right	0.34	12.7	B	19.0
	NB	Left	0.23	12.8	B	9.4
		Thru/Right	0.48	11.3	B	30.7
	SB	Left	0.05	9.5	A	3.4
		Thru/Right	0.56	12.6	B	37.6
	Intersection Summary		**0.60 (max)**	**12.5**	**B**	
2nd Avenue	EB	Left	0.68	20.5	C	50.0†
		Thru/Right	0.3	4.50	A	7.6*
	WB	Left/Thru/Right	0.09	10.4	B	6.2*
	NB	Left	0.14	11.8	B	7.6
		Thru/Right	0.63	18	B	52.5
	SB	Left	0.03	10.5	B	1.8
		Through	0.6	17.5	B	49.3
		Right	0.29	3.9	A	9.0
	Intersection Summary		**0.68 (max)**	**15.0**	**B**	
3rd Avenue	EB	Left/Thru/Right	0.10	13.2	B	4.4*
	WB	Left/Thru	0.16	12.1	B	9.6
		Right	0.21	4.9	A	6.8
	NB	Left	0.03	9.5	A	1.7
		Thru/Right	0.37	10.1	B	21.7
	SB	Left	0.17	11.1	B	8.4
		Thru/Right	0.41	11.4	B	25.6
	Intersection Summary		**0.41 (max)**	**10.5**	**B**	
4th Avenue	EB	Left/Thru	0.17	14.9	B	10.7
		Right				
	WB	Left/Thru/Right	0.17	14.8	B	11.7
	NB	Left	0.12	10.3	B	4.3*
		Thru/Right	0.56	14.6	B	56.2
	SB	Left	0.12	10.6	B	7.1
		Thru/Right	0.48	14.3	B	50.2
	Intersection Summary		**0.56 (max)**	**14.3**	**B**	

* Note: Volume for 95th percentile queue is metered by upstream signal

† Note: 95th percentile volume exceeds capacity, queue may be longer

A Protected Bike Lane is a dedicated, marked lane for bicyclists that is physically separated from vehicles and pedestrian traffic.

The following documents were reviewed:

- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (2012);
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide (2012);
- Transportation Association of Canada (TAC) Bikeway Traffic Control Guidelines (2012);
- Federal Highway Administration (FHWA) Separated Bike Lane Planning and Design Guide (2015); and,
- Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (2017).

Direction and Width

One-Way Protected Bike Lane

Winnipeg (Winnipeg.ca)

A one-way protected bike lane on each side of a two-way street creates a predictable design. A potential challenge with this design is it takes up more roadway space. One-way protected bike lanes should have a minimum width of 1.8 metres. A width of 2.1 metres is preferred as they allow for passing or side-by-side riding. Narrow lanes may require special maintenance equipment.

Bicycle lane word, symbol, and/or arrow markings shall be placed at the beginning of a protected bike lane and at periodic intervals along the facility.

Two-Way Protected Bike Lane

Calgary (ibiketo.ca)

A two-way protected bike lane on a two-way street may be desirable to minimize conflicts on high frequency transit corridors or along corridors with a higher number of intersections or driveways on one side of the street. This design does, however, creates some challenges for road user expectancy at intersections and driveways, and limits intersection design options. The width of a two-way protected bike lane should be no less than 3.4 metres.

Forms of Protection

Delineator Posts

Saskatoon (cbc.ca)

Flexible delineator posts are low in cost, visible, and easy to install. However, their durability and aesthetic quality can present challenges. Delineator posts are placed in a painted buffer with a preferred width of 0.3 to 0.9 metres. A buffer width of 0.9 metres allows for passenger loading and to prevent door collisions. Solid white lane line markings shall be used for the buffer. Diagonal crosshatch markings may be placed in the neutral area for special emphasis. Delineator posts are typically spaced 3 to 12 metres apart.

Bollards

Long Beach (bikelongbeach.org)

Bollards provide a rigid barrier solution that provides a strong vertical element to the painted buffer. Bollards are placed in a painted buffer with a preferred width of 0.5 to 1.0 metres. Bollards are typically spaced 3 to 12 metres apart.

Concrete Barriers

Vancouver (bikeportland.org)

Concrete barriers are less expensive than many of the other forms of protection and require little maintenance. However, this barrier type may be less attractive and may require additional drainage and service vehicle solutions. Concrete barriers are typically placed in a painted buffer that is 1.0 metre wide.

Raised Median

Edmonton (globalnews.ca)

Concrete curbs can either be cast in place or precast. This form of protection is more expensive to construct and install but provides a continuous raised buffer that is attractive with little long-term maintenance required. A minimum width of 0.4 metres is preferred for raised medians. The typical curb height is 150 millimetres.

Raised Lane

Halifax (cyclehalifax.ca)

Protected bike lanes may also be designed as raised facilities, either at sidewalk or at an intermediate grade. A minimum width of 0.6 metres is preferred. The typical curb height is 75 to 150 millimetres.

Planters

Victoria (victoria.ca)

Planters provide an aesthetic element, a suitable form of protection, and is quick to install. However, depending on the placement, this treatment is more expensive than other solutions, and requires maintenance of the landscaping. Planters are typically 0.9 metres wide.

Parking Stops

Edmonton (globalnews.ca)

Parking stops and similar low linear forms of protection are inexpensive and offer several benefits. These have a high level of durability, can provide near continuous separation, and are a good solution when minimal buffer width is available. Parking stops are typically 1.8 metres long, 0.3 to 0.6 metres wide and a minimum of 100 millimetres in height. Parking stops are typically spaced 1.8 metres apart.

Parked Cars

Saskatoon (twitter.com)

While parked cars are not a form of protection on its own, parked cars can provide an additional level of protection and comfort for bicyclists. A parking lane width of 2.4 metres is desired to discourage motor vehicle encroachment into the protected bike lane. A minimum buffer width of 0.9 metres is required to allow for the opening of doors and other maneuvers.

Mid-Block Considerations

Driveways

Saskatoon (google.com)

Driveways that intersect with protected bike lanes create a potential crash risk due to the conflict between turning motor vehicles and through bicyclists. On one-way and two-way protected bike lanes, parking should be prohibited at least 6 metres from the edge of a driveway, depending on vehicle speeds and volumes.

Transit Stops

Vancouver
(bicycledutch.wordpress.com)

Island platforms may be used at locations where buses may stop in a travel lane. Pavement markings and signs shall be placed prior to the platform to indicate that bicyclists should yield to pedestrians.

Where bus service is sufficiently infrequent, transit stops can be designed in the protected bike lane.

Mid-Block Curb Ramp

(ibiketo.ca)

Accessible parking should be located mid-block within a parking lane. A crosswalk and curb ramp shall connect to the access aisle to the sidewalk. A widened buffer space may be used to accommodate a side mounted vehicle ramp or lift so that it will not protrude into the protected bike lane and become a hazard to bicyclists. If significant taxi or paratransit service exists along the protected bike lane, providing periodic loading zones to allow the vehicles to pull out of the travel lane should be considered. Tactile surfaces may also be used.

Intersections

Signalization

Seattle (blogs.seattletimes.com)

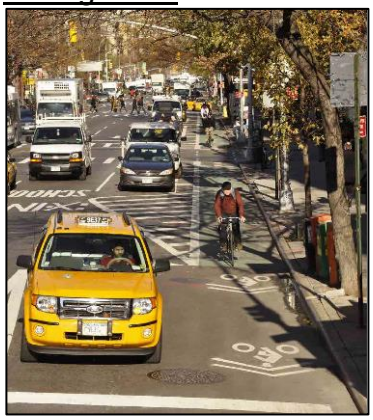
Signalization separates the movements of automobiles and bicyclists through an intersection and removes potential conflict points which are present with other treatments. A separate signal phase allows bicyclists to proceed without right-turning vehicle conflicts and stops bicyclists at times when right-turning automobiles can proceed.

Lateral Shift

Salt Lake City (FHWA, 2015)

A lateral shift moves cyclists to the left of the motor vehicle right turn lane before vehicles can move right. This design allows bicyclists to be more visible to right-turning motorists.

Mixing Zone



New York City (FHWA, 2015)

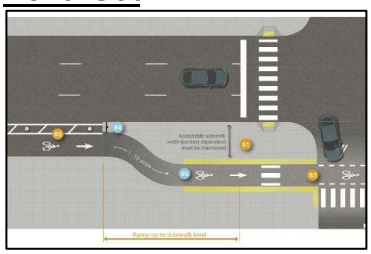
A mixing zone is an area where bicyclists and right-turning motorists merge into one travel lane approaching an intersection. Mixing zones provide a design option in which the potential conflict between right-turning motorists and through bicyclists occurs before the intersection, similar to the Lateral Shift design.

Bend-In

Saskatoon

The bend-in design shifts the protected bike lane closer to the motorized traffic lane to increase the visibility of bicyclists for turning motorists. This design may also accommodate a curb extension which can benefit pedestrians by decreasing crossing distance and providing amenity space.

Bend-Out



(peopleforbikes.org)

The bend-out design shifts the protected bike lane away from the intersection, allowing motorists to complete turning movements before interacting with bicyclists.

Protected Intersection

Salt Lake City (wbur.org)

Protected intersection provide a high level of comfort and safety for bicyclists, especially at large intersections with multiple lanes and complex signal phasing. This design provides dedicated space for bicyclists extending into the intersections and as such can accommodate through, left-turn, and right-turn bicycle movements in a safe and low-stress manner.

White Chevrons and White Lines

Toronto (Google)

White dashed lines may be used to mark extensions of the protected bike lane through intersections or other traffic conflict areas.

Use of Green Coloured Pavement

Saskatoon

Green pavement increases awareness of bicycles and can be used to indicate an area of potential conflict with motor vehicles.

Bike Boxes

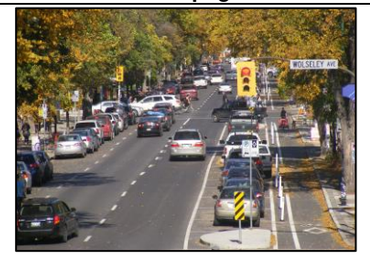
Montreal (connect2edmonton.ca)

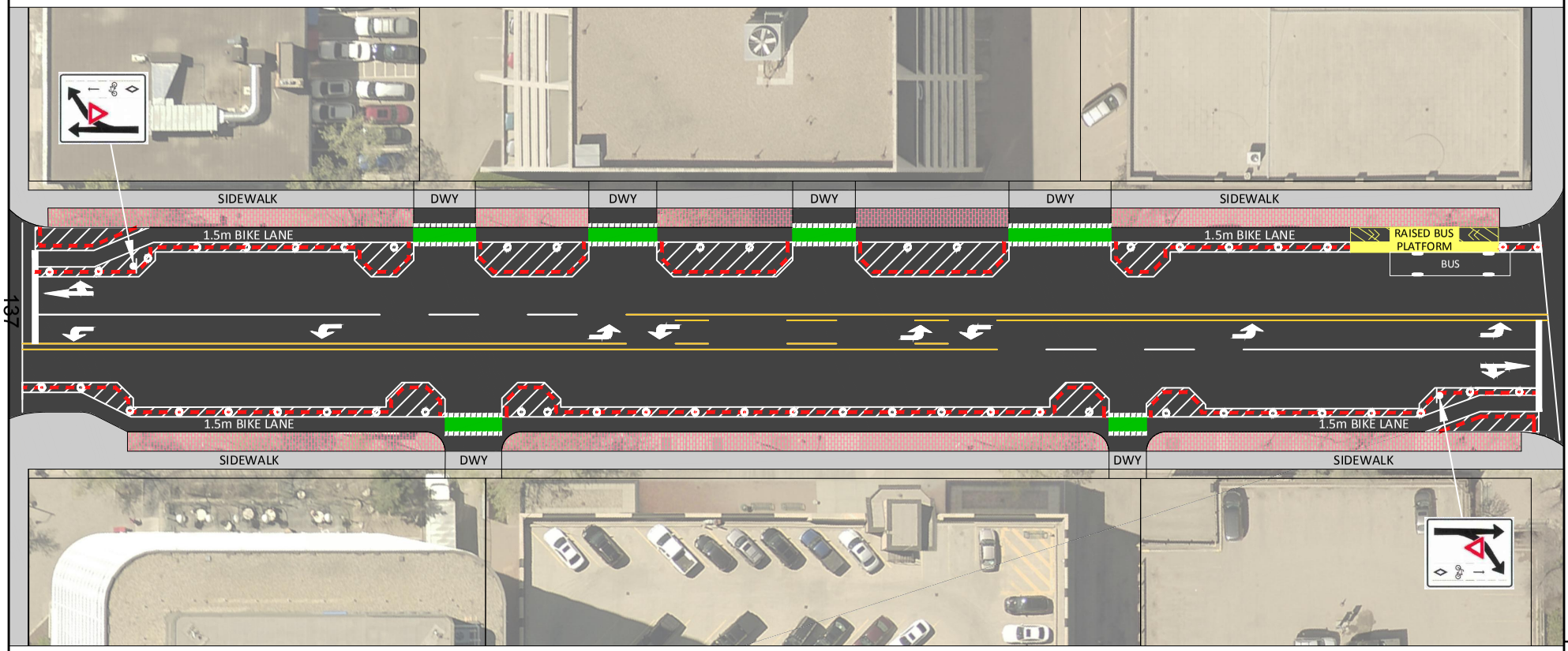
Bike boxes are designated spaces at signalized intersections that allow bicyclists to queue in front of motor vehicles at red lights. Bike boxes are placed between the stop bar and the pedestrian crosswalk. Bike boxes increase the visibility of queued bicyclists and provide them with the ability to start up and enter the intersection in front of motor vehicles when the signal turns green.

Two-Stage Left-Turn Queue Boxes

Saskatoon (globalnews.ca)

Two-stage left-turn queue boxes allow bicyclists to make left turns at multi-lane intersections from a right-side protected bike lane, or right turns from a left-side protected bike lane. Bicyclists who arrive on a green signal proceed through the intersection and wait in the designated two-stage left-turn queue box away from through-moving bicycles and in front of cross-street traffic. Bicyclists complete their left turn when the signal turns green.

Design Elements	Cities				
	Calgary	**Ottawa**	**Toronto**		**Winnipeg**
	 (google.com) 8 Avenue Southwest (4 Street Southwest to 11 Street Southwest)	 (google.com) Laurier Avenue (Elgin Street to Bronson Avenue)	 (toronto.ca) Woodbine Avenue (O'Connor Drive and Queen Street East)	 (toronto.ca) Hoskin Avenue (St. George Street to Queen's Park Crescent West)	 (winnipeg.ca) Sherbrook Street (Wolseley Avenue and Broadway Avenue)
Direction and Width	• One-way on both sides of a two-way street	• One-way on both sides of a two-way street • 1.8 metres wide	• One-way on both sides of a two-way street • 1.7 to 2.0 metres wide	• One-way on both sides of a two-way street	• One-way on one side of a one-way street • 1.5 metres wide
Forms of Protection	• Green delineator posts in painted buffer along some blocks • Green delineator posts on continuous concrete parking curbs in painted buffer along some blocks • Parked cars	• White delineator posts in a 0.3 to 0.5 metres cross-hatched painted buffer along some blocks • White/blue delineator posts on continuous and non-continuous concrete parking curbs in a 0.3 to 0.5 metres painted buffer along some blocks • Planters • Parked cars	• White delineator post in a 0.6 to 1.2 metres cross-hatched painted buffer • Parked cars	• White delineator post in a 0.5 to 1.0 metres cross-hatched painted buffer • Parked cars	• White delineator post in a 0.85 metres painted buffer • Concrete medians at end of parking areas • Planters • Parked cars • Bicycle rack
Driveway	• Dashed white lines, dashed green coloured pavement, and bicycle symbols • Parking is prohibited at least 6 metres	• Dashed white lines • Parking is prohibited at least 6 metres at some locations	• Dashed white lines and bicycle symbol	• White elephants feet pavement marking, bicycle symbol and directional arrow • Parking is prohibited at least 6 metres at some locations	• Parking is prohibited at least 6 metres at some locations
Transit Stop	• Buses stop in bike lane	• Not required since the corridor does not have regular transit service	• Buses stop in bike lane	• Buses stop in traffic lane	• Island platforms with buses stopping in middle of traffic (curb cut to sidewalk provided)
Accessible Parking	• Disabled parking adjacent to concrete parking curbs at start of the block • Disabled parking in bike lane	• Cross-streets or parallel roads used for Para Transpo		• Private vehicles under contract with WheelTrans stop in bike lane	
Intersection	• Dashed white lines, dashed green coloured pavement and bicycle symbols • Bike boxes • Two-stage left-turn queue boxes	• Green coloured pavement • Two-stage left-turn queue boxes with "No Right Turn on Red" restrictions		• Dashed white lines and white chevrons • Bike boxes with "No Right Turn on Red" restrictions	



LEGEND

PRECAST CONCRETE CURB AT 2m SPACING

FIGURE 1
RECOMMENDED DESIGN
TYPICAL BLOCK

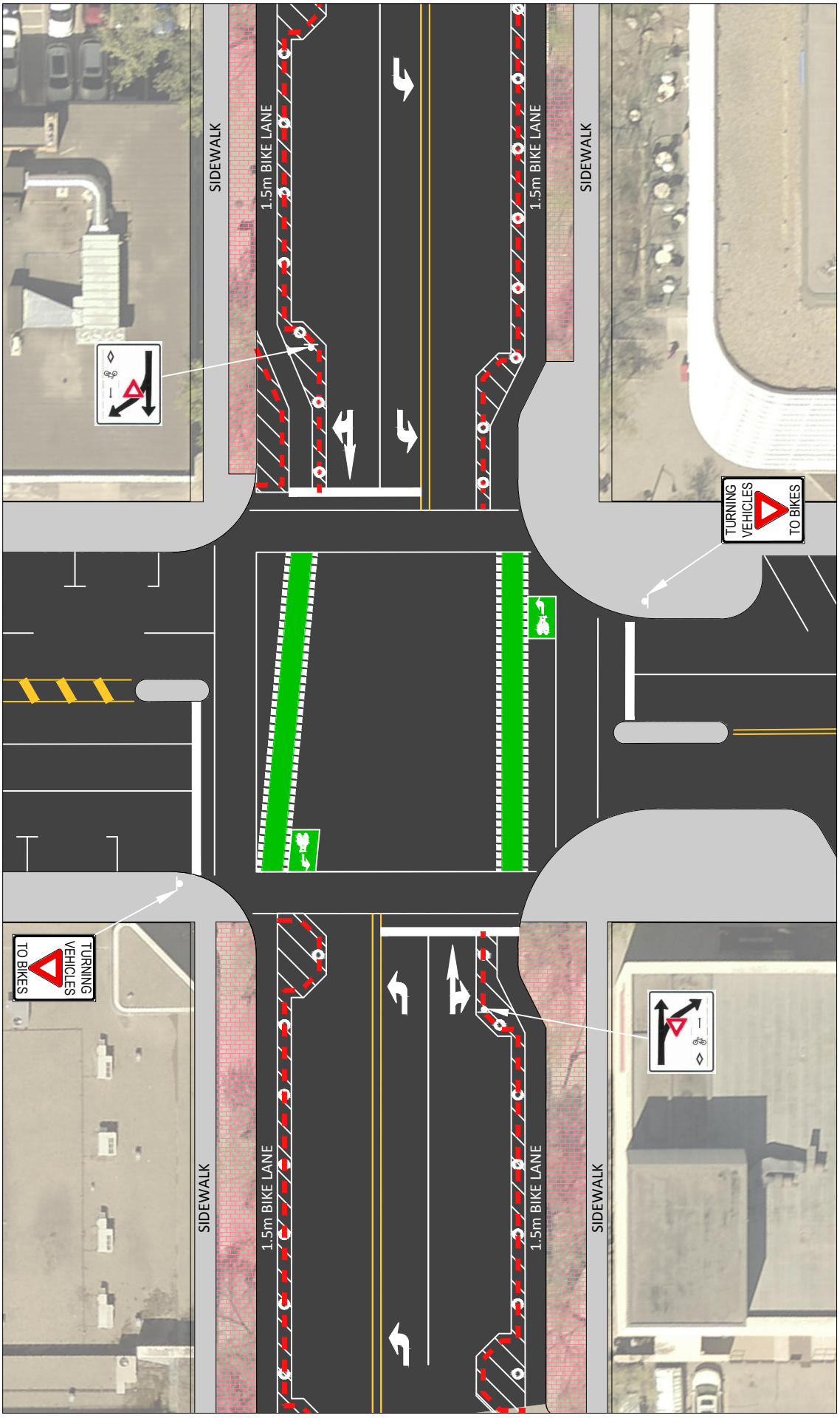


FIGURE 2
RECOMMENDED DESIGN
TYPICAL INTERSECTION

LEGEND

PRECAST CONCRETE CURB AT 2m SPACING

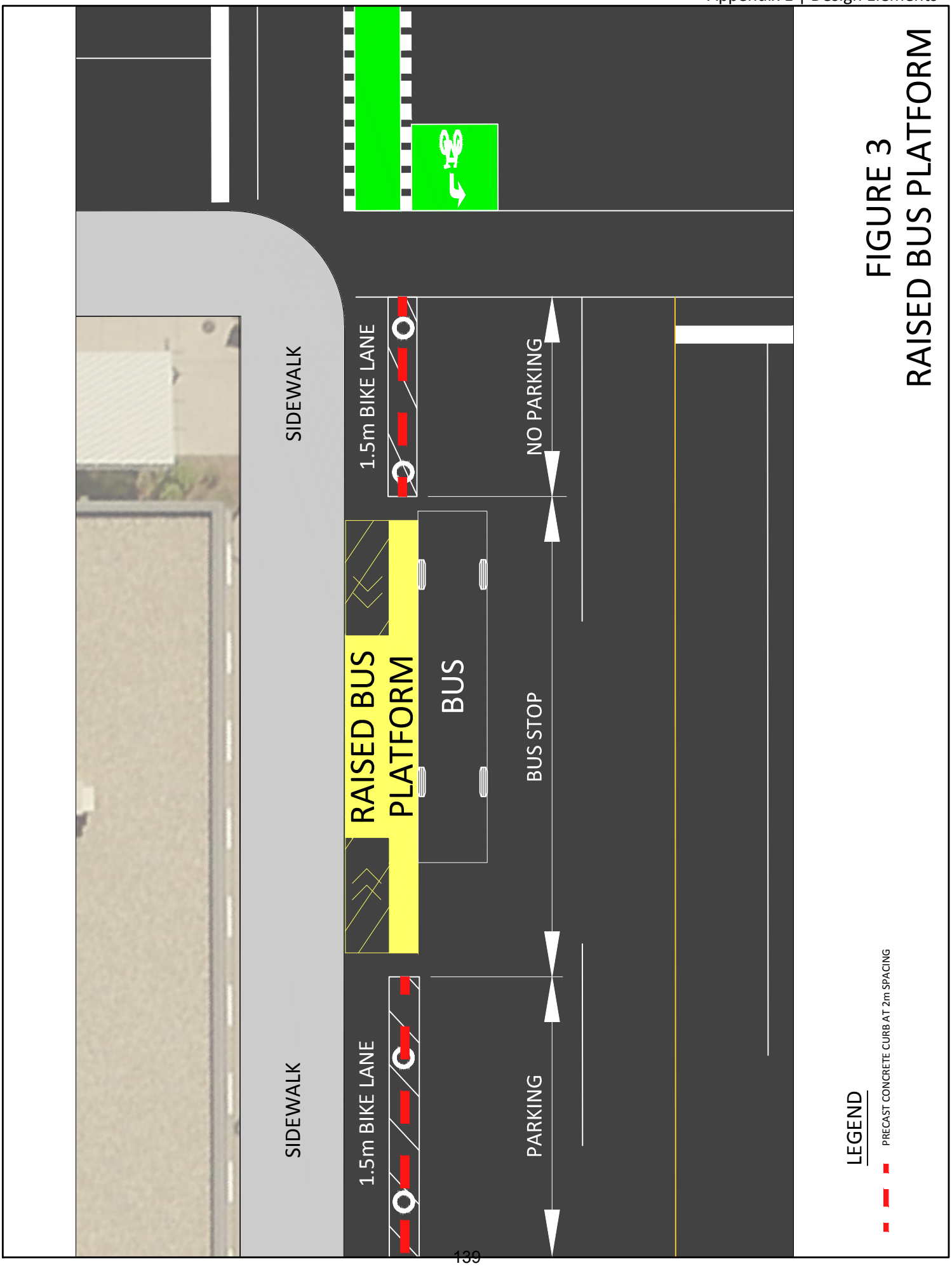


FIGURE 3
RAISED BUS PLATFORM

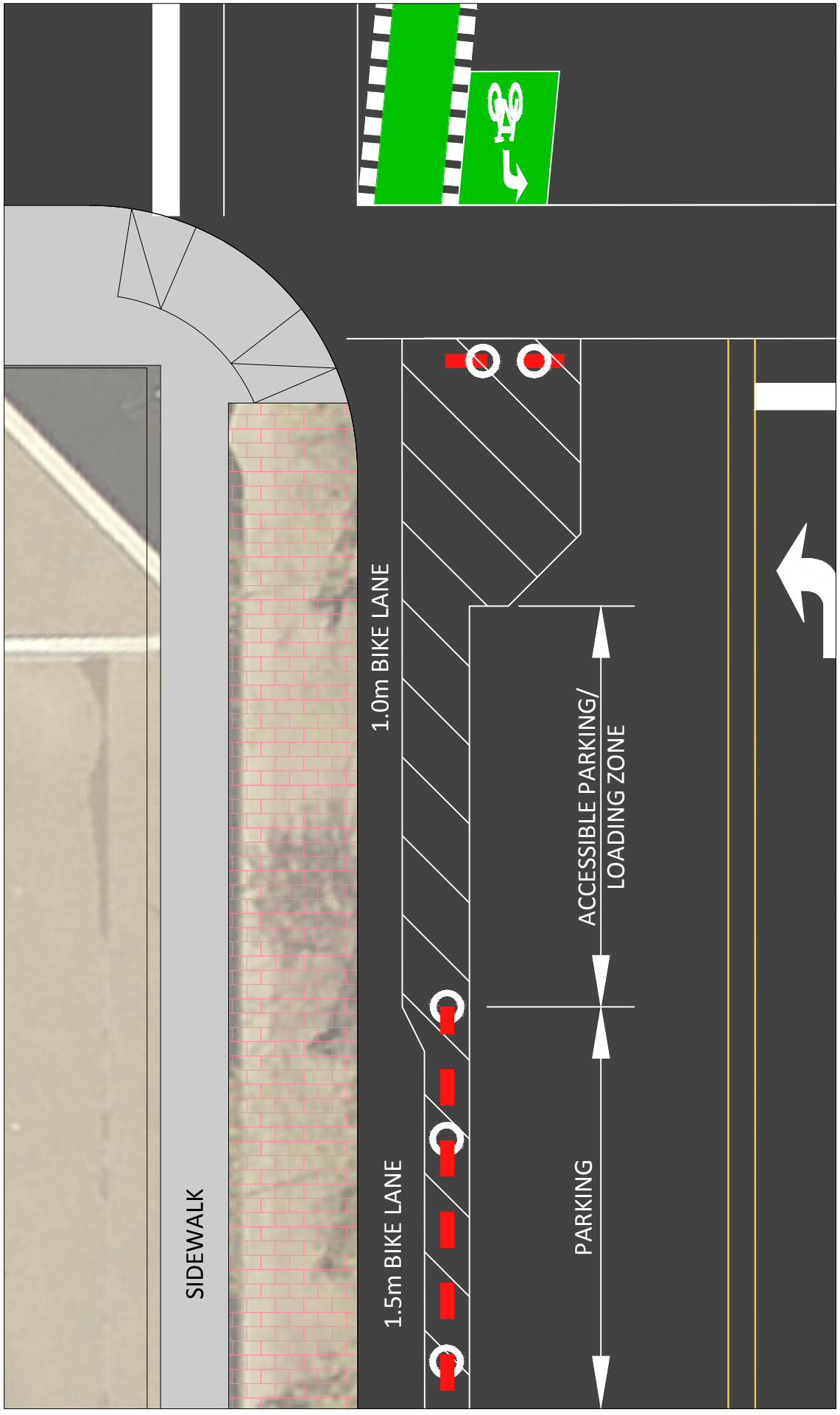


FIGURE 4
ACCESSIBLE PARKING/
LOADING ZONE

Maintenance Summary

A key goal of the Protected Bike Lanes Demonstration Project was to assess the feasibility of installing permanent protected bike lanes and provide the flexibility necessary to apply lessons learned during the demonstration period. This approach proved effective for understanding the maintenance operations for the bike lanes and making improvements during the demonstration period.

Snow Removal

The City of Saskatoon's (City) goal is to have the bike lanes cleared 48 hours after the end of a major snowfall event. Clearing the snow within 48 hours allows businesses along the bike lanes to push the snow off the sidewalk into the bike lanes before it is removed by the City. The lanes are cleared and treated with sand as needed between snow events.

The following lessons were learned in the first year of snow removal:

- A standard that more closely resembled sidewalk clearing was needed because people needed to walk across the bike lanes to access their parked vehicles (level-of-service standard for the clearing of bike lanes was originally proposed to mirror that of the adjacent roadway).
- Maintaining the bike lanes to a clear pavement standard (no tolerance for packed snow or snow accumulation) was needed. This increased the frequency of cleaning to each snowfall rather than being discretionary based on the amount of snowfall.
- A sand strategy was implemented to improve traction on bike lanes (as salt would create ice through dilution and "refreeze" causing ice issues). Consistent weather below -10C was ideal as ice could be managed with sand.
- Ongoing education and communication is necessary to ensure businesses comply with pushing the snow into the bike lanes before the lanes are cleared by the City. While most Downtown businesses are able to comply with clearing their sidewalks in a timely manner, during the demonstration notices were issued to businesses who were repeatedly piling snow into the lanes that had already been cleared by the City.

These changes were identified in 2015/2016 and implemented for the 2016/2017 winter road maintenance season.

Water, Ice and Debris Accumulation

Water and ice accumulation in the bike lane is a function of its placement adjacent to curb as well as pavement condition. Water drains to gutters and catch basins on either side of the street and at the lowest points on the road. The gutters are designed to move water longitudinally along the road to the catch basin, which is within the bike lane. Freeze-thaw cycles also prevent water/ice from flowing and/or evaporating. During the spring thaw, some accumulation is natural although catch basins may become obstructed and need City intervention.

Pavement deterioration on 23rd Street has contributed to drainage and ponding issues. Pavement quality will be addressed through the resurfacing of 23rd Street East which is planned for 2018 between 4th Avenue and Spadina Crescent.

For the 2017 spring, summer and fall seasons of 2017 a pilot study was undertaken to determine the feasibility of the City partnering with DTN YXE for street sweeping utilizing a micro air street sweeper, also known as an air sweeper. The air sweeper is much narrower and utilizes different technology than a traditional street sweeper to clean streets and control dust in high population, narrow and congested locations such as bike lanes, catch basins and the transportation network within the Downtown. The pilot study consists of the City re-tasking a small sweeper to be operated by the DTN YXE. The Air Sweeper is designed for narrow and congested locations such as sidewalks, gutters and bike lanes.

Replacement of Damaged and/or Missing Delineator Poles

Poles near bus stops and some corners were being hit repeatedly and were removed. The City relies on notification of damaged poles so that they can be repaired quickly.

Summary of Maintenance Costs to date, 2015-2017

	Snow & Sweep
2015	60,000
2016	110,000
2017 (est)	80,000
Grand Total	250,000