

## **Moving Forward with Winnipeg's Downtown Protected Cycling Network**

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Paper prepared for presentation  
at the ***Cycling in Canadian Communities: From Planning to Implementation*** Session

of the 2017 Conference of the  
Transportation Association of Canada  
St. John's, NL

## Abstract

Winnipeg City Council adopted the Pedestrian and Cycling Strategies in 2015 which provides a vision and long-range policy framework for walking and cycling in Winnipeg over the next 20 years. The City immediately began a series of projects to implement the strategies identified in the approved plan, one of these was a downtown corridor study with two sub-projects awarded to MMM in 2015. The sub-projects included:

- The functional design of a north-south bicycle facility along the Fort Street and/or Garry Street one-way couplet from the City's first cycle track on Assiniboine Avenue to north of Portage Avenue, connecting The Forks National Historic Site and mature neighborhoods to the Exchange National Historic District.
- The construction of a pedestrian and cyclist controlled connection across Main Street from The Forks to the Assiniboine Avenue cycle track.

The goal of the project was to develop a design for upgrading the existing on-street bike lanes on Fort Street and/or Garry Street to protected bike lanes in consultation with stakeholders and the public. Multiple options were developed and evaluated and a recommended option was identified. The City is now moving forward with implementation starting in 2017 for the permanent protected bike lanes in addition to renewing downtown infrastructure. This major project will be a milestone for mobility and infrastructure renewal in Winnipeg's downtown.

The project started with substantial public opposition that was overcome through an adaptive and significant public engagement process. The public engagement process as well as solutions to overcoming the technical challenges will be discussed in this paper.

## Introduction

Winnipeg City Council adopted the Pedestrian and Cycling Strategies in 2015 which provides a vision and long-range policy framework for walking and cycling in Winnipeg over the next 20 years. The City immediately began a series of projects to implement the strategies identified in the approved plan, one of these was a downtown corridor study with two sub-projects awarded to MMM in 2015. The sub-projects included:

- The functional design of a north-south bicycle facility along the Fort Street and/or Garry Street couplet from the City's first cycle track on Assiniboine Avenue to north of Portage Avenue, connecting people from The Forks National Site and mature neighborhoods to the Historic Exchange District.
- The construction of a pedestrian and cyclist controlled connection across Main Street from the Fort Gibraltar Trail at The Forks to the Assiniboine Avenue Cycle Track.

One of the main goals of the Pedestrian and Cycling Strategies is to address gaps in the cycling network. Fort Street and Garry Street were identified in the Pedestrian and Cycling Strategies as a priority connection to achieve this goal and close the gap between the Assiniboine Avenue Cycle Track and the Exchange District. The pedestrian and cyclist controlled connection across Main Street also achieves this goal as it provides a logical and necessary connection from the Assiniboine Avenue Cycle Track to Fort Gibraltar Trail at The Forks. The study area is illustrated in **Figure 1**.

The scope of the Fort Street and Garry Street project included a vehicular needs assessment, a pedestrian facilities needs assessment, a cycling facilities needs assessment, development of conceptual design options for Fort Street and Garry Street, and the functional design of the recommended option. The scope of the Fort Gibraltar Trail at The Forks to Assiniboine Avenue Cycle Track Connection project was preliminary design, detailed design, and construction administration.

The projects started with substantial public opposition due to anticipated impacts to traffic and on-street parking and loading in the downtown. The opposition was overcome through a significant public engagement process that included the following five phases:

- **Phase 1 Project Kick-off:** Publicized the project and met with stakeholders.
- **Phase 2 Issue Identification:** Presented the project, existing conditions, and various types of bike lanes and buffers. Input was collected from the public at an open house and by using an online survey and mapping tool.
- **Phase 3 Stakeholder Engagement:** Hosted on-site "tire talks" and a stakeholder workshop. For the "tire talks", project staff set up a tent (with refreshments) at a high volume walking and cycling location within the study area to discuss project issues and opportunities with users of the study area.
- **Phase 4 Functional Design Options:** Presented the results of Phases 1 to 3 and the design options online, at pop-up public events, and stakeholder meetings. The pop-up public events included setting up a small display at locations within the study area with high volumes of pedestrians. Feedback was collected from the public at these events and via an online survey.
- **Phase 5 Recommended Design:** Presented the recommended design online and at a pop-up public event.

This paper will discuss opportunities and challenges within the study area, the development of options, the recommended design, and the public engagement that took place throughout the project.

## Opportunities and Challenges

### Land Use

The predominant land uses in the portion of Downtown Winnipeg that forms the study area (**Figure 1**) include commercial offices and parking lots and structures as well as a number of restaurants, bars, hotels, retail outlets and five multi-family residential buildings. The study area is in close proximity to regional attractions including The Forks, the Exchange District and the Sports, Hospitality and Entertainment District (SHED). The study area is also adjacent to dense multi-family residential development south of Broadway between Main Street and the Manitoba Legislature. The existence of this variety of land uses presents both opportunities and challenges associated with pedestrian activity, vehicular traffic, on-street parking and loading, transit, and cycling connectivity.

### Pedestrian Activity

Pedestrian activity on Fort Street and Garry Street is variable depending upon the time of day. During weekday business hours (generally 8:00 am to 5:00 pm), pedestrian activity is associated with employees and visitors to the adjacent businesses. In the evening, there is some concentration of pedestrian activity at the restaurants and bars along Fort Street and Garry Street as well as in the vicinity of the Hotel Fort Garry. There is less pedestrian activity on the remaining sections of Fort Street and Garry Street during the evening.

On both Fort Street and Garry Street there is opportunity to benefit from the mature tree canopy, grass boulevards, a narrower roadway, taller buildings, more engaging street level architecture, and more street life due to apartment and hotel activity in the area south of Broadway. Also, on Garry Street, there is high quality architecture north of Portage Avenue and in the first block south of Portage Avenue that provides lots of visual interest for pedestrians. The plazas at Fort Street and Portage Avenue and at Garry Street and St. Mary Avenue provide meeting places for pedestrians and attract a lot of pedestrian activity throughout the day.

### Vehicular Traffic

A major challenge in the design of the Fort Street and Garry Street protected bike lanes is limiting the impact to existing traffic. Fort Street and Garry Street run parallel to one another in the north-south direction and are the first two streets west of Main Street. Fort Street and Garry Street are lower volume one-way streets in the downtown as they both end at Assiniboine Avenue. The primary functions of Fort Street and Garry Street are to provide local access for businesses and residents, and provide alternative routes through the downtown. Truck activity on Fort Street and Garry Street is primarily delivery vehicles accessing businesses within the study area. Trucks generally use on-street loading areas or back lanes to service businesses. Fort Street between St. Mary Avenue and Portage Avenue accommodates high volumes of Winnipeg Transit busses throughout the day.

The existing average annual daily traffic (AADT) volumes throughout the study area are based on traffic counts conducted by the City of Winnipeg's Public Works Department (Public Works) between 2011 and 2015. The AADT on Fort Street ranges from 4,220 to 9,120 vehicles per day and the AADT on Garry Street ranges from 1,020 to 5,420 vehicles per day. As a comparison, the AADT on Main Street ranges from 31,830 to 51,050 vehicles per day and the AADT on Smith Street ranges from 11,400 to 14,280 vehicles per day. The daily traffic volumes are illustrated in **Figure 2**.

Weekday a.m. and p.m. peak hour traffic counts were also obtained from Public Works for the study area roadways and intersections. The weekday a.m. and p.m. peak hours were both analysed in Synchro 8.0 traffic analysis software as these are generally the busiest times for on-street traffic in the downtown. The most recent available intersection turning movement counts for the study area varied between 2011 and 2015 depending on the intersection. The peak hour traffic volumes are illustrated in **Figure 3**.

### On-Street Parking and Loading

Another major challenge to the design of the Fort Street and Garry Street protected bike lanes is limiting the impact to existing on-street parking and loading. On-street parking on Fort Street and Garry Street is permitted throughout the day with a two-hour time restriction from 8:00 a.m. until 5:30 p.m. There are approximately 222 parking spaces and 92 loading spaces on Fort Street, Garry Street, and Notre Dame Avenue and 111 parking spaces and 16 loading spaces on Assiniboine Avenue, Broadway, York Avenue, and St. Mary Avenue between Main Street and Smith Street. There is one accessible parking area and one accessible loading area on the west side of Garry Street between York Avenue and Broadway and one accessible parking area and two accessible loading areas on the west side of Garry Street between Broadway and Assiniboine Avenue. There is one accessible loading area on the east side of Garry Street between York Avenue and Broadway. There are two accessible parking areas on the west side of Fort Street between Broadway and Assiniboine Avenue.

The Winnipeg Parking Authority (WPA) tracks utilization of on-street metered parking using license plate recognition (LPR) vehicles. An overview of the utilization of on-street parking within the study area is illustrated in **Figure 4**. Parking utilization is highest on the east side of Garry Street, particularly south of York Avenue and north of St. Mary Avenue.

### Transit

Accommodating Winnipeg Transit and limiting conflicts between transit users and cyclists is another challenge the design team faced for both the Fort Street and Garry Street project and the Main Street crossing project.

Winnipeg Transit activity within the Downtown primarily travels north-south on Main Street or east-west along Portage Avenue and Graham Avenue. The high volume Transit routes within the study area are primarily on Main Street, Portage Avenue, Graham Avenue, and Fort Street north of St. Mary Avenue. The stops along these routes have over 1000 riders per day getting on and off the bus. Aside from the high volume corridors, low volume Transit routes exist on Fort Street south of St. Mary Avenue, Garry Street, and Notre Dame Avenue. The stops on these streets have an average of less than 150 riders per days getting on and off the bus.

### Cycling Connectivity

Fort Street and Garry Street currently have painted bicycle lanes between the curb lane and second lane northbound and southbound respectively between Portage Avenue and Broadway. From Broadway to Assiniboine Avenue, Garry Street has a painted bike lane between the curb lane and second lane on the west side and Fort Street has sharrows in the curb lane. The existing on-street painted bike lanes do not provide the safety and comfort necessary to attract cyclists of all ages and abilities. The combination of this and the lack of a safe connection to the Exchange District bike lanes are significant barriers to cycling connectivity on Fort Street and Garry Street and in the downtown as a whole.

The north side of St. Mary Avenue, which is one-way westbound, currently has a painted bicycle lane between the curb lane and the second lane that begins at Fort Street. St. Mary Avenue is the primary westbound bike route through downtown north of Assiniboine Avenue. Graham Avenue is a designated bike route that only allows cyclists and busses between Fort Street and Carlton Street. At the south end of Fort Street and Garry Street, Assiniboine Avenue has a protected two-way cycle track on the south side of the street that provides an east-west connection between Main Street and Kennedy Street and a connection through the Manitoba Legislature grounds to Osborne Street.

Historically, , the majority of cyclists used the pedestrian corridor on the north side of the intersection of Main Street and Assiniboine Avenue and then travelled north in the Main Street diamond lane or on the sidewalk to gain access to/from Fort Gibraltar Trail at The Forks. There was a lack of connectivity between the two-way cycle track on the south side of Assiniboine Avenue and the pedestrian corridor across Main Street on the north side of Assiniboine Avenue. The use of the existing pedestrian corridor also caused a conflict between cyclists and pedestrians on the east sidewalk of Main Street.

An overview of the existing cycling facilities within the study area is illustrated in **Figure 5**.

### Public Engagement – Phases 1-3: Opportunities and Challenges

The Project Team’s review of the study area opportunities and challenges was presented to the public at stakeholder meetings, a public open house, and online. The public was given the opportunity to provide input on the issues facing pedestrians, cyclists, and vehicles in the study area and provide suggestions for improvements. The following are key themes provided by stakeholders in the study area and the public:

- Promote cyclist safety;
- Maintain parking and loading;
- Create interconnected bike lanes;
- Way finding signage is important;
- Support for a half signal at Main Street;
- Support for a protected bike lane;
- Ensure sidewalks and bike lanes are well maintained – pavement condition, leaves, sand and snow;
- Driver and cyclist education is important;
- Design facilities intended for all users;
- Consider traffic demands; and
- Include pedestrian enhancements and amenities.

## Development of Options

### Design Considerations

A guiding document in the development of design options was the City of Winnipeg’s development plan, Complete Communities, which designates the downtown as a Transformative Area. These are defined as areas with the best opportunity for growth and change. The plan identifies a number of strategies for improving the downtown and attracting growth related to residential, commercial, public space, recreation and transportation. Direction strategies related to transportation include:

- Prioritize pedestrian-oriented travel;
- Support active transportation and public transit;

- Support parking from an economic development and transportation demand management perspective;
- Support movement of commercial goods; and
- Optimize the efficiency of existing infrastructure.

Cyclist safety was a key concern for the public. Participants in the public engagement components indicated they felt safer riding on protected facilities. Other challenges for safety that were noted related to turning movement conflicts for both vehicles and bikes. Therefore, all of the options include protected bike lanes and recommend bike signals to make the intersections safer. The inclusion of protected bike lanes and bike signals will also provide comfort for users of all ages and abilities.

Maintaining parking and loading spaces for vehicles was also a concern for the public. The options were designed to maintain as much parking and loading as possible and maintain existing accessible parking spaces, without compromising the safety of the bicycle facility.

Another concern for the public was accommodating traffic demands. Traffic analyses of all options were undertaken using Synchro 8.0 traffic analysis software and the relative performance of each intersection was measured in terms of level of service, intersection capacity utilization, and volume to capacity ratio. Since the intersections along Fort Street and Garry Street are highly influenced by the traffic volumes and signal timings on Main Street and Portage Avenue the Synchro results for each intersection along Fort Street and Garry Street were viewed as relative measures for each option and the existing conditions. Protected left-turn phases were modelled at locations due to the concern for the conflict between cyclists and left-turning vehicles. Parking was also identified to be removed as necessary to improve the performance of each intersection.

Another key factor was pedestrian enhancements and amenities or pedestrian walkability. Pedestrian walkability is emerging as an important measure of success in urban design for its contribution to property values, economic activity, health, security, and vibrancy. Pedestrian facilities within the study area need to be coherent, safe, dynamic and flexible. Modest, strategic improvements in pedestrian facilities can help the neighbourhood reach its full potential as a walkable urban environment. All options include the renewal of the sidewalks and prioritize the pedestrian right-of-way over cyclists and vehicles.

The functional design options were developed to address the Downtown development strategies, the study area's identified opportunities and challenges, and the public's concerns identified during Phases 1 to 3 of the public engagement program as much as possible.

## Functional Design Options

### Main Street and Assiniboine Avenue

Due to the characteristics and constraints of the intersection of Main Street and Assiniboine Avenue, one design option was presented to the public for input. The high volume of traffic on Main Street and the existence of the protected bike lane on the south side of Assiniboine Avenue led to the recommendation of a half signal with a bicycle cross-ride on the south side of the intersection. The existing pedestrian corridor would be removed and pedestrians would be able to cross Main Street on both the north and south sides of the intersection. The design of The Forks to the Assiniboine Bicycle Connection project is shown in **Figure 6**.

### Fort Street and Garry Street

For Fort Street and Garry Street, all options were designed to accommodate users of all ages and abilities, traffic demands, pedestrian and cyclist safety, and minimize impact to on-street

parking and loading. Conceptual design options were reviewed by the Technical Steering Committee and three options were presented to the public for consideration:

Option 1: Two-Way Protected Bike Lane on the Left Side of Garry Street;

Option 2: One-Way Left Side Protected Bike Lanes on Fort Street and Garry Street; and

Option 3: Wide One-Way Left Side Protected Bike Lanes on Fort Street and Garry Street.

All three options for the Fort/Garry Streets downtown protected bike lane system had the following design features in common:

- The installation of the bike lane on the left side of the street to eliminate the conflict between Transit and cyclists and the conflict between accessible parking and loading areas and cyclists. Bicycle signals and protected phases are proposed to alleviate the conflict between cyclists and turning vehicles at intersections.
- A connection to a proposed facility on Arthur Street via the Garry Street-Notre Dame Avenue-Ellice Avenue intersection.
- The removal of parking on one side of Garry Street south of Broadway.
- The conversion of approximately 15% of the parking and loading spaces within the study area to accommodate the installation of the protected bike lanes.
- Street renewal to rehabilitate the road surface and improve the pedestrian environment.
- Improved emergency access on Garry Street south of Broadway.
- Curb separation from traffic similar to Assiniboine Avenue was preferred as it provides more confidence for users and addresses the public's comments related to providing bike lanes accessible to all users.

#### Option 1 - Two-Way Protected Bike Lane on the Left Side of Garry Street

This option included two travel lanes and one parking lane on Garry Street north of Broadway and one travel lane and one parking lane on Garry Street south of Broadway. A 3.3 metre wide (all measurements are to the back of curb) two-way bike lane was proposed for the left side (east side) of Garry Street with a 0.9 metre raised curb between the travel lane and the bike lane. This option would have a significantly lower cost and could be implemented faster since construction is only required on Garry Street; however, it does not provide any direct connections to destinations on Fort Street. Parking is removed along the left side of Garry Street, but is maintained throughout the remainder of the study area.

A rendering of the proposed cross-section of Option 1 is illustrated in **Figure 7**.

#### Option 2 - One-Way Left-Side Protected Bike Lanes

This option included two travel lanes and two parking lanes on Fort Street and Garry Street north of Broadway and one travel lane and one parking lane on Fort Street and Garry Street south of Broadway. A 1.8 metre wide one-way bike lane was proposed for the left side of both Fort Street and Garry Street with a 0.6 metre raised curb between the parking lane and the bike lane. On Fort Street south of Broadway, the bike lane was proposed to be a 2.0 metre wide painted bike lane due to the accessible parking and loading located on the west side of Fort Street. Although this option maintains parking on both sides of each street, the removal of parking to accommodate sight lines results in approximately the same amount of lost parking spaces as Option 1. In order to maintain two travel lanes and two parking lanes, the widths of each vehicle lane, bike lane, and the curb separation are all at minimum widths.



A rendering of the proposed cross-section of Option 2 is illustrated in **Figure 8**.

### Option 3 - Wide One-Way Left-Side Protected Bike Lanes

This option included one travel lane and two parking lanes on Fort Street and Garry Street north of Broadway and one travel lane and one parking lane on Fort Street and Garry Street south of Broadway. A 2.3 metre wide one-way bike lane is proposed for the left side of both Fort Street and Garry Street with a 0.6 metre raised curb between the parking lane and the bike lane. On Fort Street south of Broadway, a 2.0 metre wide painted bike lane is proposed due to the accessible parking and loading located on the west side of Fort Street. Although this option maintains parking on both sides of each street, the removal of parking to accommodate sight lines results in approximately the same amount of lost parking spaces as Option 1.

A rendering of the proposed cross-section of Option 3 is illustrated in **Figure 9**.

## Evaluation of the Functional Design Options

### Public Engagement – Phase 4: Functional Design Options

The three functional design options were presented to the public via stakeholder meetings, “pop-up” public events, and an online survey. The pop-up public events were held at locations within the study area with high volumes of foot-traffic. The public was generally in support of a protected bike lane but there was a mixed response in terms of which option was preferred. Common themes resulting from the public engagement are summarized below:

- Participants questioned locating the bike lane on the left side of the street and indicated there will be a learning curve associated with this for both cyclists and drivers.
- There were concerns over the reallocation of parking and loading space in all options.
- The reallocation of parking on the east side of Garry Street required by the two-way bike lane on Garry Street (Option 1) was a specific concern related to parking that was raised.
- The loss of one travel lane in the extra wide one-way bike lane on Fort and Garry Street (Option 3) was also of concern.
- It was noted that ease of maintenance should be a key component when selecting an option.
- Participants recognized the importance of beautifying the street and suggested adding amenities such as vegetation, bike parking, lighting and seating.

There were similar levels of support and opposition for all three options. Between 61% and 73% of survey respondents indicated they somewhat or strongly support each option, while the range of those who indicated they somewhat or strongly opposed the options was between 18% and 29%. The breakdown of support is depicted in **Figure 10**. When choosing which option was supported or opposed, respondents were prompted to indicate why or what they liked or disliked about each option. These reasons are summarized into common themes in **Tables 1** and **2**.

### Technical Evaluation

With the public feedback in mind, each option was graded on a scale of 0 (poor) to 3 (good) for each criterion and multiplied by the weighting of each criterion to determine the weighted total and rank for each option. The following technical criteria were used to evaluate the design options.

- Operational Safety (10%)
  - How well does the option address safety issues for all users of the facility, including vehicles, pedestrians, and cyclists?

- Amount of Separation (5%)
  - What is the relative degree of separation between cyclists and the vehicle travel lane?
- Access for Emergency Services (5%)
  - How well does the option accommodate emergency vehicles?
- Cycling Facilities (15%)
  - What level of comfort does the option provide for cyclists?
  - How well does the option improve cycling operations within the study area?
  - How well does the option provide connections to existing cycling facilities?
- Pedestrian Realm and Accessibility (15%)
  - How well does the option accommodate public access to businesses?
  - How does the option impact pedestrian comfort (separation of sidewalk zone from active traffic)?
  - How well does the option address accessibility concerns?
- Streetscaping and Amenities (5%)
  - How well does the option provide opportunities for streetscaping and amenities?
  - How well does the option accommodate pop-up patios?
- Traffic Operations (10%)
  - How well does the option maintain traffic operations?
- Transit (5%)
  - How does the option impact transit operations?
- Parking and Loading (15%)
  - How does the option impact on-street parking and loading?
  - How does the option impact access to/from on-street parking and loading areas?
- Costs (10%)
  - What are the capital costs associated with the option?
  - How expensive will the option be to maintain?
- Ease of Construction and Maintenance (5%)
  - How difficult is the option to construct and stage?
  - How difficult will the option be to maintain?

The results of the evaluation are illustrated in **Table 3**

## The Forks to Assiniboine Avenue Connection Recommended Design

The intent of The Forks to Assiniboine Avenue Connection project was to develop a detailed design for an appropriate connection between the Assiniboine Avenue Cycle Track and the Fort Gibraltar Trail in The Forks.

The design included the removal of the pedestrian corridor on the north side of the intersection of Main Street and Assiniboine Avenue and installation of a half-signal at the intersection. The design includes a pedestrian crossing on the north side of the intersection and a cyclist cross-ride and a pedestrian crossing on the south side of the intersection. The cross-ride on the south side of the intersection provides a connection to the existing two-way bike lane on Assiniboine Avenue and, with the installation of a two-way bike lane behind the sidewalk on the east side of Main Street, a connection to the two-way bike lane on Fort Gibraltar Trail. The design of The Forks to the Assiniboine Bicycle Connection project is shown in **Figure 6**.

## Public Engagement – Phase 5: Recommended Design

Feedback for the recommended design of The Forks to Assiniboine Avenue Connection was generally positive with respondents indicating support for the half-signal. The only major concern

was related to potential wait times as this is an ongoing concern with other half signal locations in Winnipeg. The timing of the signal will be determined by the City of Winnipeg Traffic Signals Branch and will be linked to the adjacent intersections on Main Street. The intersection will be monitored and adjusted as required.

## Implementation

Construction of the half-signal, extension of the Assiniboine Avenue bike lane, and the cross-ride and pedestrian crossings began in June 2016 and was completed in July 2016.

## Fort Street and Garry Street Recommended Option - Two-Way Protected Bike Lane on the east (left) side of Garry Street

The recommended option for Fort Street and Garry Street is Option 1 – Two-Way Protected Bike Lane on the east (left) side of Garry Street. This option was selected primarily due to the following factors:

- The width of the curb separation provides the most separation from vehicles and the most space for streetscaping amenities.
- Emergency services are not impacted as two lanes of traffic are maintained.
- The impacts to traffic operations are less significant compared to Option 3 as two travel lanes are maintained.
- Least impact to Transit vehicles as the lanes are wide enough and the buses do not need to block traffic at stops.
- The wide bike lane will allow cyclists to pass each other within the bike lane and will be easier for snow clearing in the winter.
- The costs to construct a protected bike lane on one street rather than on two streets is significantly less.
- The construction and maintenance is simplified with a protected facility on one street rather than on two streets.
- Similar facilities exist and are popular in other Cities in Canada and the USA.

The recommended option includes a 3.3 metre wide bike lane, a 0.9 metre median between the bike lane and the travel lane, two travel lanes, and a parking lane. The proposed cross-sections for Garry Street are illustrated in **Figure 7** and a segment of the functional design is illustrated in **Figure 11**.

This option provides a connection to the Exchange District with a proposed contra-flow parking-protected bike lane on Arthur Street. The two-way bike lane is proposed to terminate on Notre Dame Avenue at Adelaide Street due to the low volume of vehicular traffic on Adelaide Street.

This option removes the conflict between Winnipeg Transit users and cyclists by placing the two-way bicycle facility on the left-hand side of the one-way street. To address the conflict between left-turning vehicles and cyclists, the installation of protected left-turn signal phases for vehicles was recommended along Garry Street. To aid in the connection to existing cycling facilities, two-stage turn queue boxes were proposed to allow cyclists to turn west from the two-way bike lane at Graham Avenue and at St. Mary Avenue. Also included in the proposed design was the use of green surface treatments at all intersections to raise awareness of the bicycle facility.

As parking is being removed along the east side of Garry Street, a proposed reconfiguration of the parking on the west side of Garry Street was developed through consultation with Public

Works and the Winnipeg Parking Authority. Loading zones are proposed to be consolidated and primarily located near intersections to provide easy access to the pedestrian crosswalks to cross to the east side of the street. In areas with long blocks it may be desirable to locate a loading zone midblock such that loading can be done by crossing Garry Street during off-peak hours.

Garry Street currently has long stretches that are devoid of colour, trees, or street level interest. Additionally, sidewalk space is limited, resulting in minimal (but compliant) clear paths of travel, planting spaces, and other amenity zones. In response to these two conditions, the recommended streetscape design clustered planting and amenity elements, rather than spreading them thinly down the corridor. Proposed bike racks are strategically located at businesses and near residential developments. The limited sidewalk space also spurred a suggestion that with the assistance of the Downtown Business Improvement Zone and the downtown economic development agency, CentreVenture, a public/private program could be launched to encourage property owners to upgrade the many parking lot screen fences with hedges or other plantings, providing more much needed green space along Garry Street. Pedestrian scale lighting is also proposed along the east side of Garry Street between the protected bikeway and the sidewalk. The intent of this lighting is to help highlight the enhancements and bring some unity and a sense of identity to the corridor.

### Public Engagement – Phase 5: Recommended Design

The final phase of public engagement included a pop-up public event and an online survey. Respondents were asked to comment openly on the recommended design. The following are common themes that arose from these comments:

- Some respondents were in support of the recommended design indicating it would increase safety and they would use the facility.
- There was support for cycling infrastructure in general and suggestions for cycling improvements elsewhere in Winnipeg.
- Some respondents indicated that they felt the recommended design would make cycling on Garry Street safe.
- Some respondents indicated that they were concerned over cyclists traveling against the flow of automobile traffic. They cited potential conflicts at intersections and driveway approaches as motorists and pedestrians might be surprised by cyclists travelling against the flow of automobile traffic.
- Some respondents indicated they preferred protected one-way bike lanes on both Fort Street and Garry Street.
- Some respondents indicated concern over the conversion of parking space for existing and future residents in the area and loading space for deliveries and pick-ups/drop-offs.
- Some respondents were opposed to cycling infrastructure in general, citing concerns over cost.

### Implementation

The City of Winnipeg is beginning construction of the two-way protected bike lane on Garry Street in 2017. The project will be constructed in two phases with completion anticipated in 2018. The first phase of construction will include the portion of Garry Street north of Portage Avenue with additional active transportation improvements planned on Notre Dame Avenue, Princess Street, and Arthur Street.



Figure 1: Study Area



Figure 2: Existing Daily Traffic Volumes

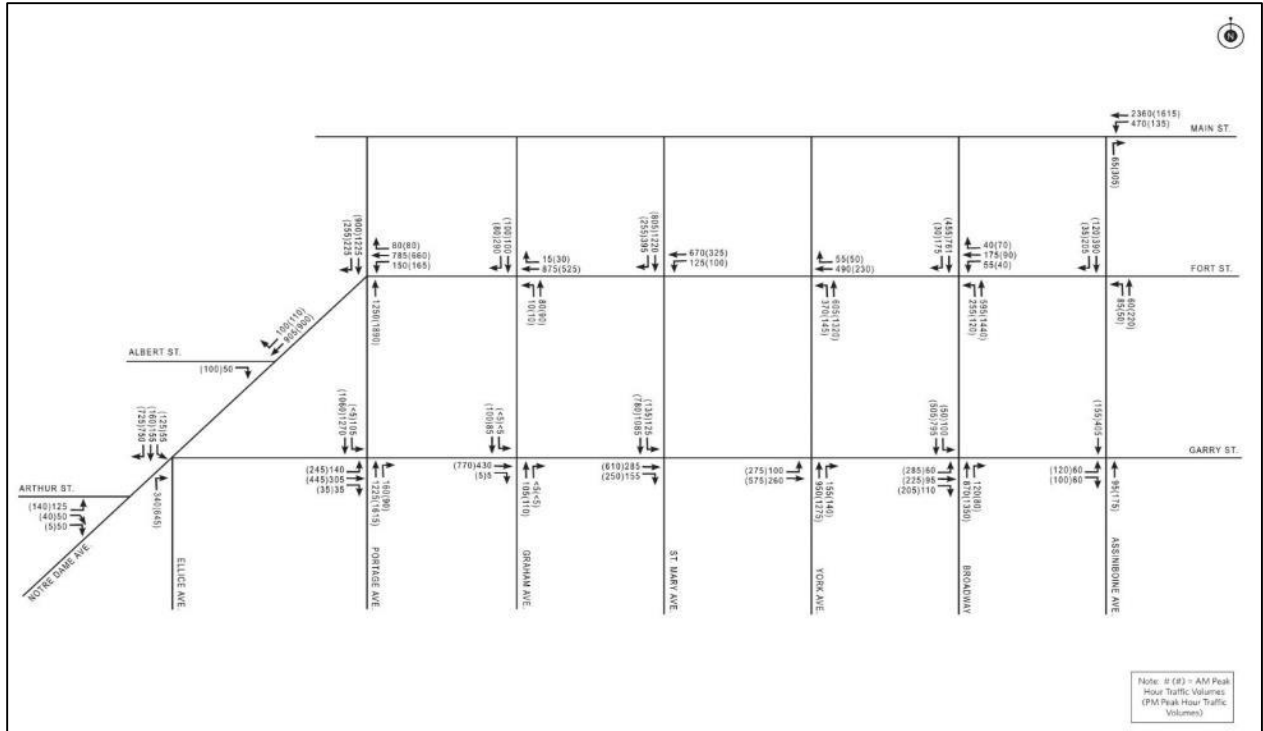


Figure 3: 2015 Peak Hour Traffic Volumes



Figure 4: Existing Parking Utilization

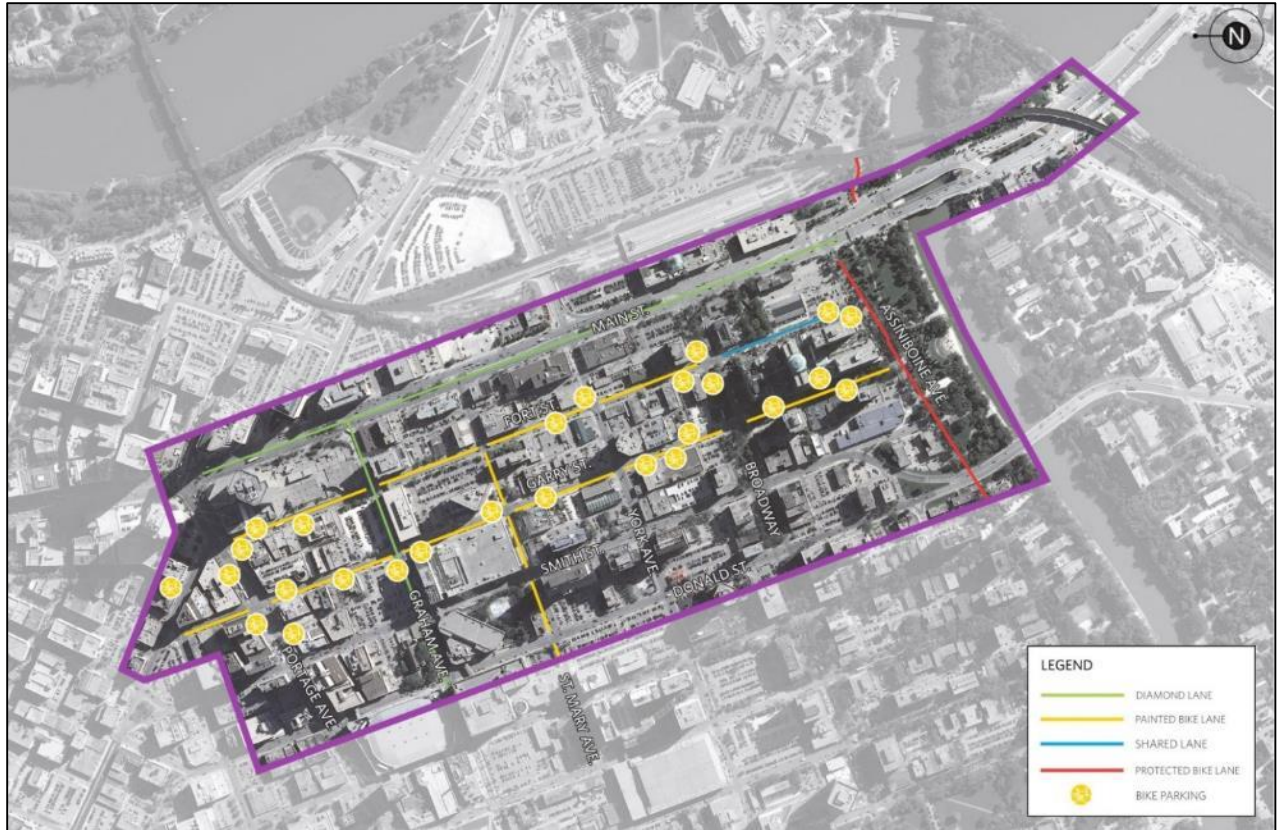


Figure 5: Existing Cycling Facilities

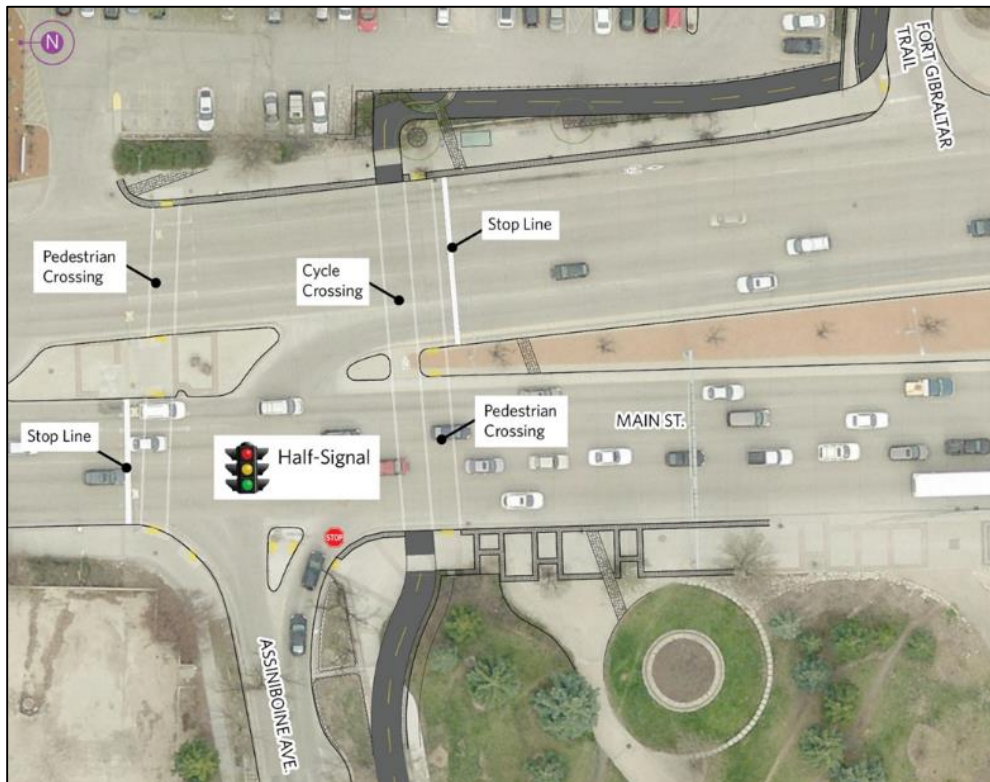


Figure 6: The Forks to Assiniboine Avenue Connection

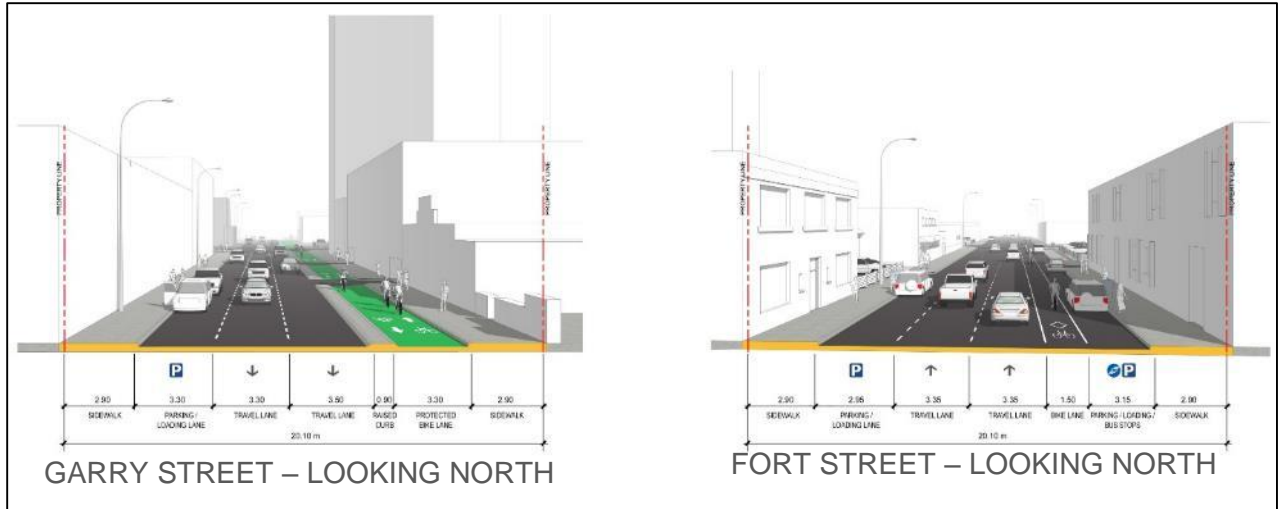


Figure 7: Option 1 - Two-Way Protected Bike Lane on the Left Side of Garry Street

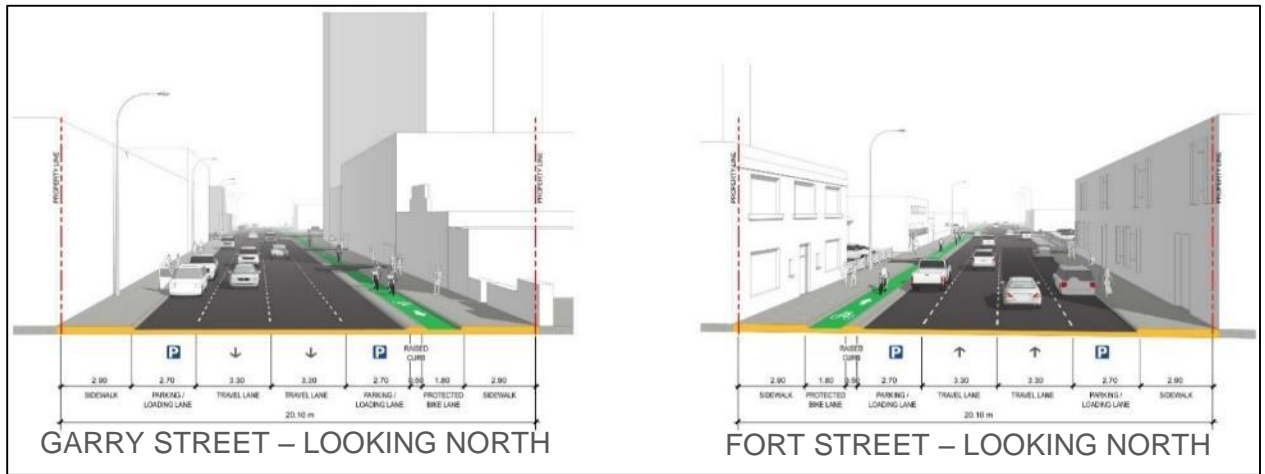


Figure 8: Option 2 - One-Way Left Side Protected Bike Lanes on Fort Street and Garry Street

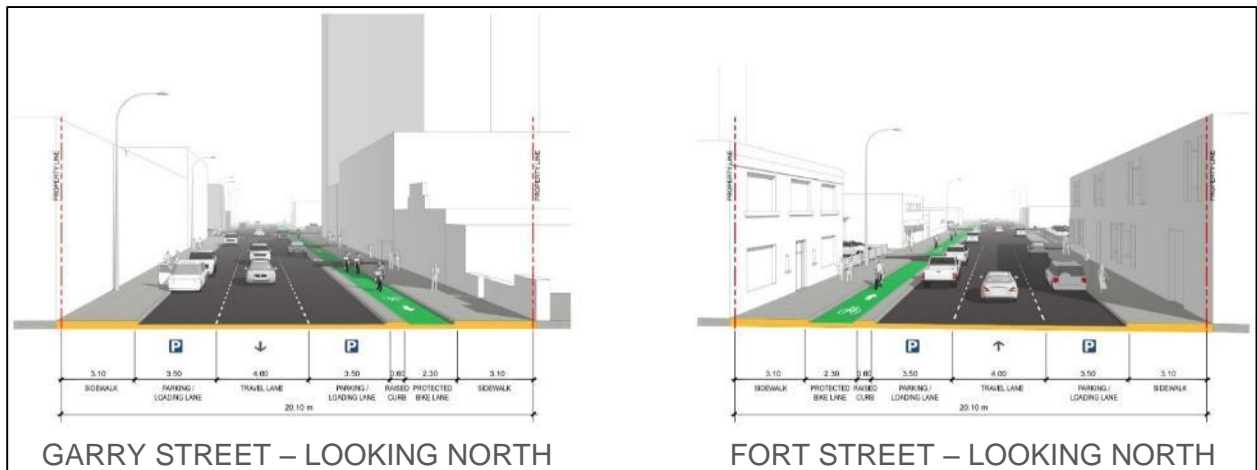


Figure 9: Option 3 - Wide One-Way Left Side Protected Bike Lanes on Fort Street and Garry Street



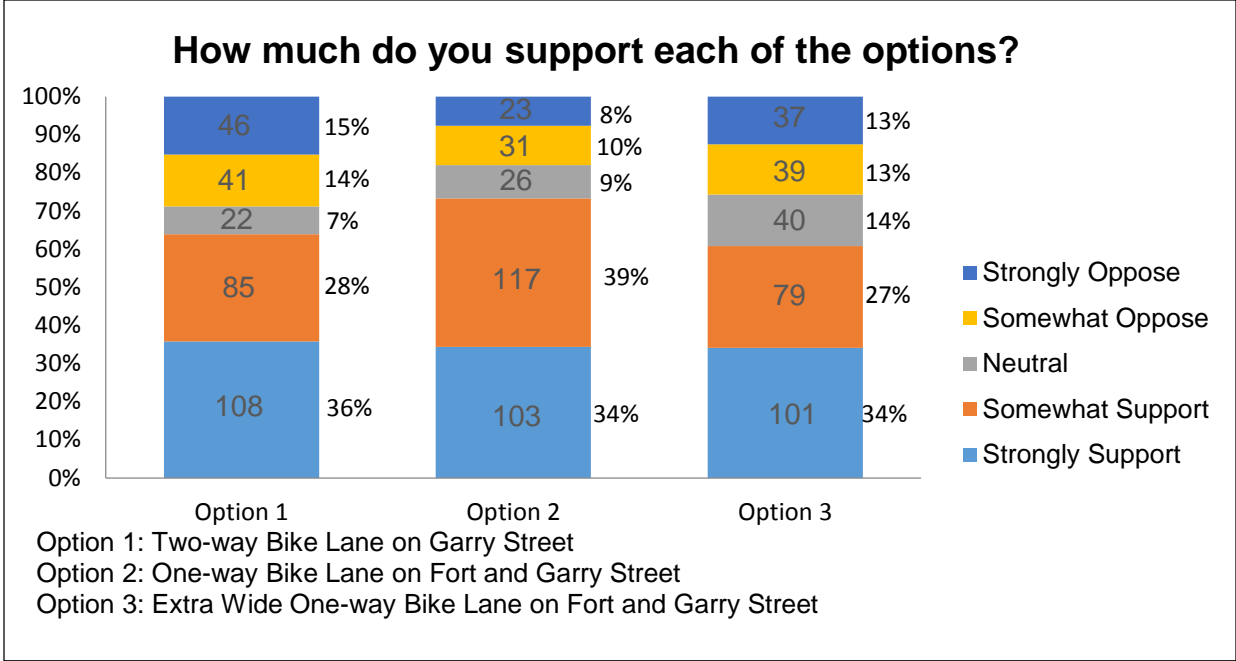


Figure 10: Public Support for the Design Options

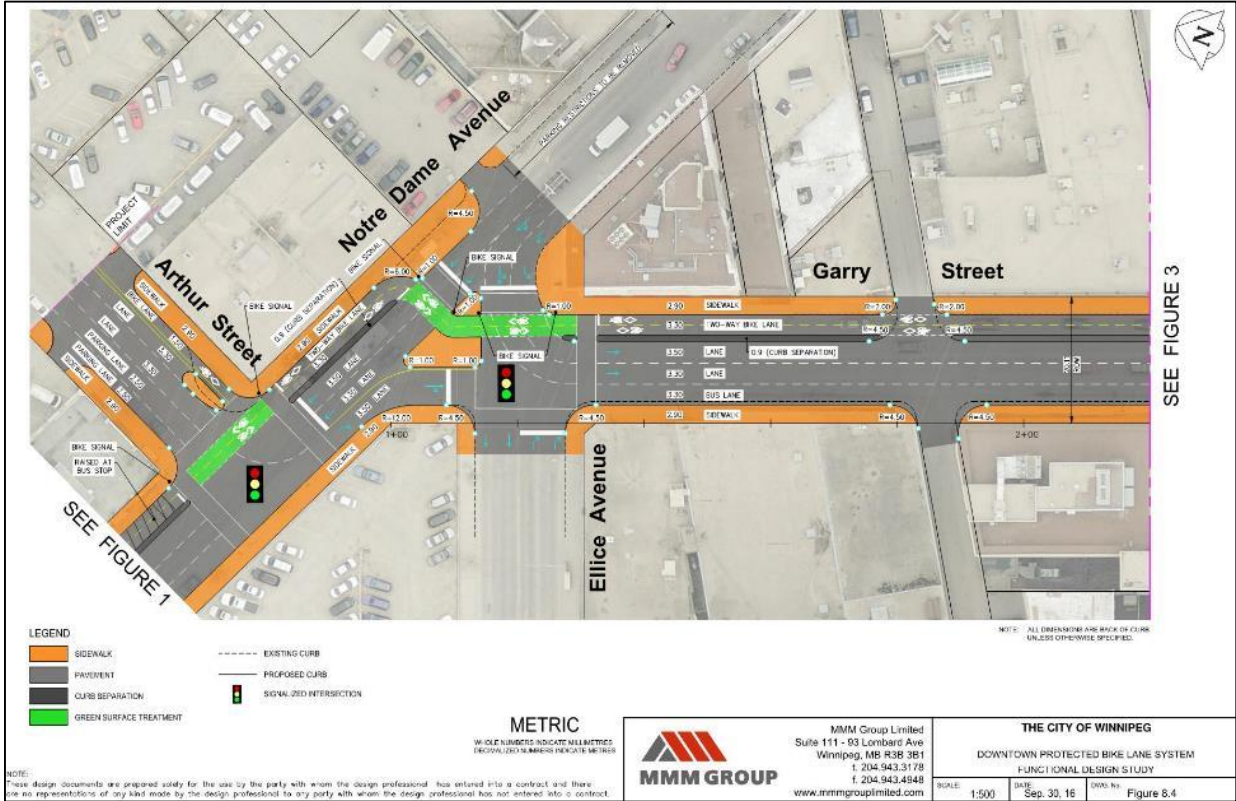


Figure 11: Segment of Recommended Design – Two-Way Bicycle Facility on Garry Street

Table 1: Common Themes - Likes

Two-way Bike Lane on Garry Street (Option 1)	One-way Bike Lane on Fort and Garry Street (Option 2)	Wide One-way Bike Lane on Fort and Garry Street (Option 3)
<ul style="list-style-type: none"> <li>• The bike lane is wide enough for faster cyclists to pass slower ones.</li> <li>• The width would allow for easy snow clearing and maintenance using existing equipment.</li> <li>• It is likely that implementation and construction would be faster than building two separate facilities.</li> <li>• It may be easier and more affordable to maintain one bike lane, as opposed to two.</li> <li>• The two-way lanes would create a concentration of cyclists on one street, providing increased visibility of cyclists.</li> <li>• The two-way lanes may encourage a friendlier environment, as cyclists could acknowledge each other.</li> <li>• The design continues to accommodate parking and emergency vehicles on both streets.</li> <li>• There is less traffic on Garry Street and this would not impact traffic as significantly as it may on Fort Street.</li> </ul>	<ul style="list-style-type: none"> <li>• This option retains more lanes of traffic and parking on Garry Street.</li> <li>• One-way bike lane is more intuitive for cyclists and drivers than a two-way bike lane, especially on a one-way street and may result in less confusion for motorists and increased safety for cyclists.</li> <li>• Retains parking on both streets.</li> <li>• There is a connection provided to both Arthur and Albert Streets.</li> <li>• Narrow lane width could help reduce cyclist speeds.</li> <li>• The design continues to accommodate parking and emergency vehicles on both streets.</li> <li>• Fort Street is closer to Main Street than Garry Street, and may be used as an alternate cycling route more than Garry Street would be.</li> </ul>	<ul style="list-style-type: none"> <li>• The bike lane is wide enough for faster cyclists to pass slower ones and allow cyclists to ride side-by-side.</li> <li>• The wider bike lane has the capacity to accommodate a larger number of cyclists at the same time.</li> <li>• One-way bike lane is more intuitive for cyclists and drivers than a two-way bike lane, especially on a one-way street, this may result in less confusion for motorists and increased safety for cyclists.</li> <li>• Retains parking on both streets.</li> <li>• There is a connection provided to both Arthur and Albert Streets.</li> <li>• Improved pedestrian experience with more room for trees.</li> <li>• Safer for pedestrians as the crossing distance is shorter.</li> <li>• Reducing the number of vehicle travel lanes may calm traffic.</li> <li>• Fort Street is closer to Main Street than Garry Street, and may be used as an alternate cycling route more than Garry Street would be.</li> </ul>

Table 2: Common Themes - Dislikes

Two-way Bike Lane on Garry Street (Option1)	One-way Bike Lane on Fort and Garry Street (Option 2)	Wide One-way Bike Lane on Fort and Garry Street (Option 3)
<ul style="list-style-type: none"> <li>• Concerns about the potential confusion, safety issues and difficult connections for cyclists traveling against the direction of traffic.</li> <li>• Cycling on the left side of the street is not intuitive for cyclists or drivers.</li> <li>• Loss of on-street parking on Garry Street.</li> <li>• Bike lane connections to Arthur Street, Notre Dame Avenue (westbound) and Ellice Avenue (eastbound) are difficult.</li> <li>• No new bike lanes or street renewal on Fort Street.</li> <li>• A separated bike lane may make it difficult for vehicles to easily access back lanes and parkades.</li> <li>• Concerns about cyclists trying to turn when traveling north, against the flow of traffic.</li> <li>• Two-way lanes can be a challenge with aggressive cyclists trying to pass and weave between lanes.</li> <li>• The width of the bike lane may result in some drivers thinking it is a vehicle lane.</li> <li>• Two-stage right turn at St. Mary Avenue is challenging.</li> <li>• The distance between Main Street and Garry Street is a bit far, and some people may not use the bike lane as an alternate route to Main Street.</li> </ul>	<ul style="list-style-type: none"> <li>• Cycling on the left side of the street is not intuitive for cyclists or drivers.</li> <li>• Challenging to clear snow and sand due to the narrow width of the bike lanes.</li> <li>• The bike lane is too narrow with no room for cyclists to pass each-other.</li> <li>• Longer implementation time and increased cost of construction on two streets.</li> <li>• Difficult to turn on to York Avenue and St. Mary Avenue.</li> <li>• Dangerous to turn left at Fort Street and Portage Avenue.</li> <li>• Not enough buffer between bike lanes and parked cars.</li> <li>• All lanes at minimum acceptable width.</li> <li>• Loss of on-street parking on Fort Street and Garry Street.</li> <li>• Connection to Albert Street is awkward.</li> <li>• Connection to Ellice Avenue is awkward.</li> <li>• Transit mixing with cyclists on Fort Street and Portage Avenue could be challenging.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Cycling on the left side of the street is not intuitive for cyclists or drivers.</li> <li>• Reduced vehicle travel lanes may impact traffic and emergency services.</li> <li>• Difficult to turn on to York Avenue and St. Mary Avenue.</li> <li>• Dangerous to turn left at Fort Street and Portage Avenue.</li> <li>• Connection to Albert Street is awkward.</li> <li>• Longer implementation time and increased cost of construction on two streets.</li> <li>• Bike lane is too wide and takes up too much of the street.</li> <li>• Bike lane may be improperly used as a two-way bike lane.</li> <li>• Not enough of a buffer from parked cars.</li> <li>• Buffer will make it difficult to change lanes.</li> <li>•</li> </ul>

Table 3: Option Evaluation Results

Evaluation Factor		Weighting (Percentage of Overall Score)	Score Scale: Poor 0 → 3 Good		
			Option 1	Option 2	Option 3
			Two-Way Cycle Track: East Side of Garry Street	One-Way Protected Bike Lanes on the Left Sides	Wide One- Way Protected Bike Lanes on the Left Sides
1	Operational Safety	10	2	2	2.5
2	Amount of Buffer	5	3	2	2.5
3	Emergency Services	5	3	3	1
4	Cycling Facilities	15	2.5	1.5	2
5	Pedestrian Realm	15	2	2.5	2.5
6	Streetscaping and Amenities	5	2.5	2	2
7	Traffic Operations	10	2	2	1
8	Transit	5	2.5	2	1.5
9	Parking and Loading	15	2	2	2
10	Costs	10	3	1	1
11	Ease of Construction & Maintenance	5	3	2	2
<b>Option Weighted Total</b>			<b>237.5</b>	<b>195</b>	<b>187.5</b>
<b>Option Rank</b>			<b>1</b>	<b>2</b>	<b>3</b>