

October 31, 2019

Bikeway Concept Designs

Cross-Town Connector and
North-South Link

*Phase 3 of the Blue Route Hubs Bikeway
Project in the Town of Lunenburg*

Prepared by:



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1.0 Introduction

1.1 Background

The Blue Route Hubs Bikeway Project is a collaboration between Bicycle Nova Scotia (BNS) and several communities in Lunenburg County, including the Town of Lunenburg. The project is intended to help communities evaluate their potential to develop bicycle routes that make residents of all ages and abilities feel comfortable cycling in their community and encourage active transportation. The project is broken down into three distinct phases:

- *Phase 1: Develop a proposed bicycle minimum grid*
This phase of the project took place from February 2019 to May 2019. Three projects were proposed to be priorities for improving conditions for cycling within the Town of Lunenburg. Public engagement was conducted twice in this process and feedback from those sessions was used in the development and refinement of the proposed minimum grid.
- *Phase 2: Selection of one route to go forward for concept design*
In August 2019, town staff presented a summary of the first phase of the project to council and recommended a route to go forward for concept design. Town council voted to approve the recommended route, which proposed a cross-town connector route, running through the Old and New Towns, as well as a north-south link for further study.
- *Phase 3: Concept designs for the selected route*
This phase of the project extended from September to October 2019. Draft concepts were presented to town staff in early October. The concepts were then refined based on this feedback as well as the traffic data. Plan view and cross-sections were developed for the corridor and are shown in Appendix A.

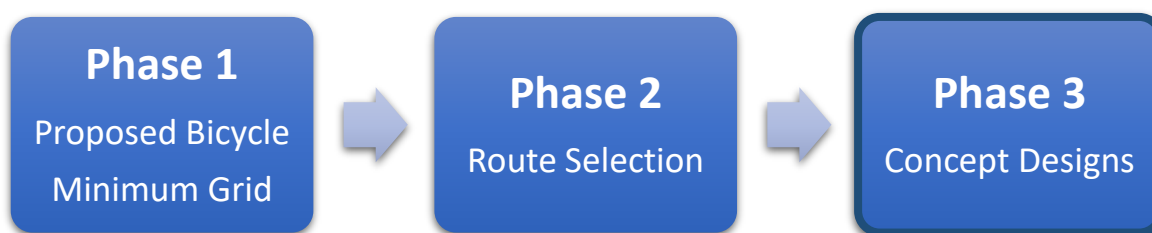


Figure 1- Blue Route Hubs Bikeway Project Process

1.2 Study Area: Cross Town Connector and North South Link

The cross-town connector bikeway was selected in Phase 2 as the priority route for concept design. The connector is an important axis of the Blue Route Hubs Bikeway network plan. Its purpose is to provide a comfortable cycling connection between the Old Town and New Town, link the Front Harbour Trail to the Back Harbour Trail, and improve access from the town to the regional Blue Route corridor on the Bay to Bay Trail and beyond. Figure 2 shows the original proposal for the cross-town connection, along with alternative routing options. Broad Street, the Front Harbour Trail and Montague Street make up the bulk of the route. A North South Link was also proposed for Lorne Street or Falkland Street to finish the connection to the Back Harbour Trail and the community centre. The North-South Link would also connect to the future bikeway proposed for Victoria Road.

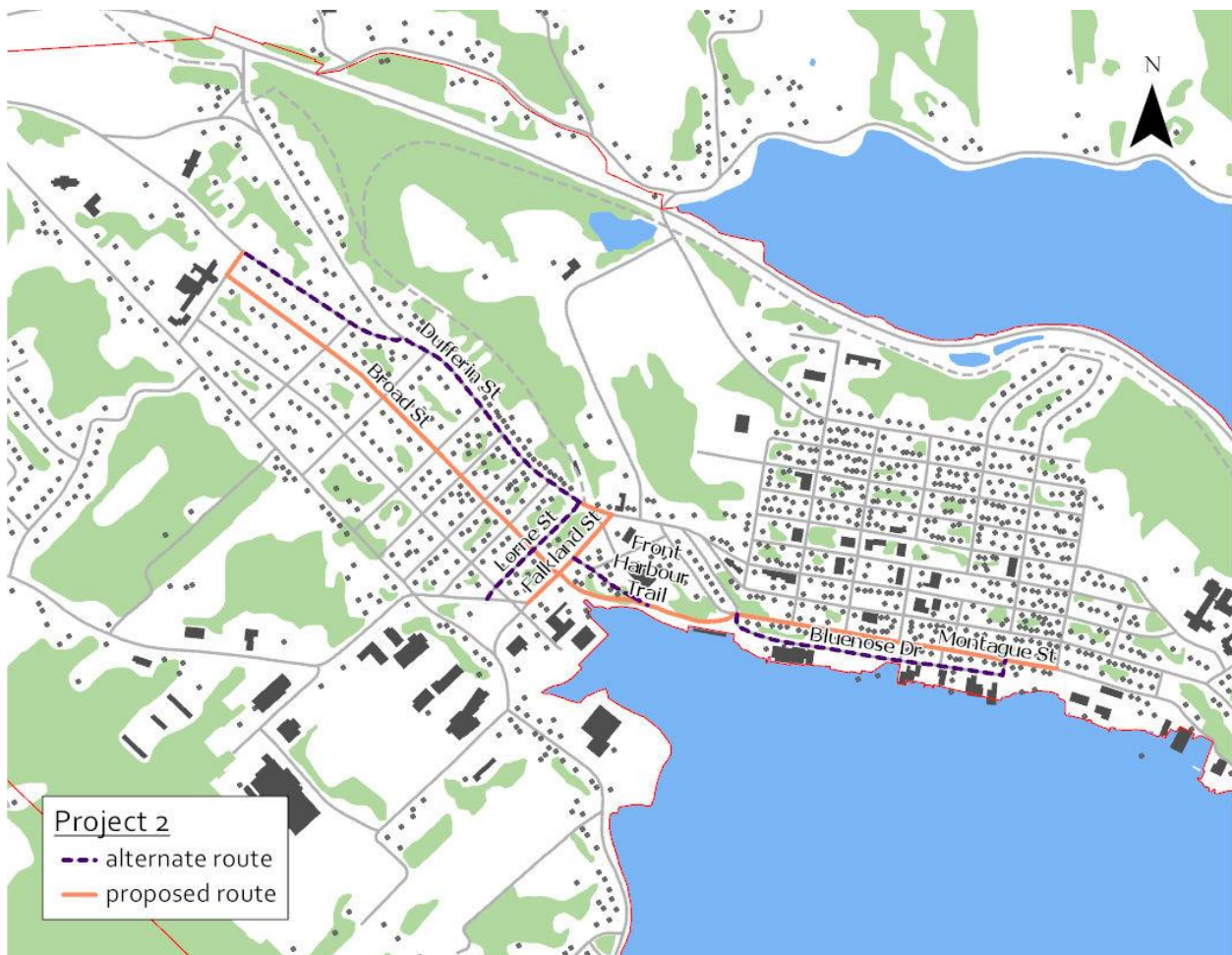


Figure 2- Cross-town Connector and North-South Link Proposal

1.3 Routing Refinement and Study Area Overview

Figure 3 shows the routing explored in the concept designs. Broad Street was selected over Dufferin Street for its connectivity to the Front Harbour Trail and its overall feasibility. Broad Street can likely be developed as a bicycle boulevard, and has strong potential for making low-cost change in the short-term. Montague Street was selected over Bluenose Drive as it provides better connections within the Old Town, with five intersections that allow cyclists to travel north. Bluenose Drive is comparatively less connected to residences and businesses within the town as it only has one access that extends continuously north. Bluenose Drive is also a more challenging environment for bikeway development as it currently has significant parking for tourists, including tour buses, and also provides access to the working waterfront.



Figure 3- Proposed Study Area

For the north-south link, connectivity was evaluated in Section 5.1 to determine the preferred route to both the trail connection and the connection to the community centre parking lot. The

north-south link highlights the potential of connecting to the town's community centre parking lot. This parking lot is frequently used as a cycling shortcut to the grocery store and to the town school. While the parking lot should not be considered an official bikeway, it does present a comparatively low-stress environment compared to the road network, which would require use of Victoria Road. In Phase 1, Victoria Road was recommended for future bikeway development due to its connectivity and the barrier it poses under existing conditions. In the short-term, developing a bikeway on Falkland Street or Lorne Street to Green Street, which leads to the community centre parking lot, will allow the town to create a continuous network in the short-term. Figure 3 shows the overall proposed study area.

The development of the cross-town connector route and north-south link is an expansion of proposed bikeway development in the Town of Lunenburg's 2014 Active Transportation Plan. The plan identified Lorne Street from Dufferin Street to Victoria Road and Broad Street from Lorne Street to Falkland Road as a key cycling and walking connection. The plan similarly identified the connection from Lorne Street to the community centre parking lot as important and proposed a multi-use path near the playground to make that connection.

1.4 Project Objectives

The following project objectives were identified:

1. Develop a bicycle route that improves the attractiveness, safety and comfort of cycling for people of all ages and abilities.
2. Provide an intuitive connection to the Blue Route, which is the Bay-to-Bay Trail.
3. Identify improvements that can be made as part of this project for pedestrians including those with mobility aides.

2.0 General Principles of Bikeway Design

In most situations in Lunenburg, cyclists share the road with motor vehicles and do not have any designated space. Under such conditions, traffic speeds and volumes generally provide a good indicator of the comfort and safety of cyclists sharing the road, and what types of infrastructure change should be considered. The following principles generally apply:

- Cyclists can be mixed with motor vehicles when traffic volumes and speeds are low (30 km/h).
- Cyclists should be separated from motor vehicles when motor vehicle volumes are high and/or speeds are high, typically over 30 km/h.
- Higher comfort is needed for accommodating younger or otherwise more vulnerable cyclists.
- There is a significant gain in safety for both pedestrians and cyclists when motor vehicle speeds are low. According to the World Health Organization, "pedestrians have been shown to have a 90% chance of survival when struck by a car travelling at 30 km/h or below, but less than 50% chance of surviving an impact at 45 km/h."¹

For this study, guidance from the Transportation Association of Canada will be considered in proposing roadway changes. Both TAC guidance and NACTO's All Ages and Abilities guidance will be considered for facility selection.



Figure 4- Chapter 5 of TAC's *Geometric Design Guide for Canadian Roads* (left) and NACTO's *Designing for All Ages and Abilities* (right)

¹ World Health Organization. Road Safety Facts-Speed. Available from: https://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/speed_en.pdf. [accessed June 13, 2019].

3.0 Data Collection

3.1 Traffic Volumes and Speeds

Traffic volume and speed data is needed in order to inform bicycle facility selection as well as crossing treatments at major roads. Bicycle Nova Scotia retained WSP to collect Average Annual Daily Traffic (AADT), Average Daily Traffic (ADT) and operating speed data to inform the recommendations in this report. Appendix B has the full results of this data collection.

3.2 Other Data

Mapping data from Geonova was available including orthophotos and property data. Topographic survey was not available for any of the study roads. Bicycle Nova Scotia took physical measurements at the site for each of the roads, and these were used to develop the high-level concept designs in this study.

4.0 Cross-Town Connector

4.1 Montague Street

Existing Characteristics

Montague Street is an east-west road through the Old Town that is fronted by many small shops as well as residences. Despite its development, it currently acts as a through road, with vehicles travelling from Linden Avenue or other connecting streets into the town, often to find parking. The road is one-way eastbound from Lower Street to King Street. Parking is allowed on both sides of the road from Lower Street to the far east connection to Bluenose Drive. One of the key challenges of using Montague Street as the connection to the Front Harbour Trail is developing a design that will allow cyclists to travel two-way, along the existing one-way stretch.



Figure 5- Montague Street

Montague Street has a continuous sidewalk on the south side of the street from the Lower/Bluenose Drive intersection to Kempt Street. The south side sidewalk is typically wider than 2.0 m; however, the effective width is much lower due to utility poles, sandwich boards and

other items on the sidewalk. On the north side, the sidewalk is intermittent, which seems to be due to the presence of steep slopes.

Traffic Conditions

Traffic data was collected at three locations on Montague Street. Tables 1 and 2 presents a summary, with the full results in Appendix B. Table 1 shows the estimated AADT and 85th percentile speeds at three locations. The estimated Average Annual Daily Traffic was below 1000 vehicles/day with 85th percentile speeds going up to 35 km/h. While the estimated AADT was below 1000 vehicles/day, the daily counts showed that the Average Daily Traffic was sometimes above 1000 vehicles/day between Duke Street and King Street and between Prince Street and Bluenose Drive. At both these locations, the hourly volumes sometimes exceeded 50 vehicles/hour/direction, which is the threshold that NACTO considers to be the maximum for cyclists of all ages and abilities to share the road with vehicles. The operating speeds presented favourable conditions for cyclists to share the road with vehicles, especially near Cornwallis Street, where 85% of drivers were travelling at or below 29 km/h. Between Prince Street and Bluenose Drive, the 85th percentile is slightly higher than desirable at 35 km/h.

Table 1-Vehicle Traffic Data on Montague Street

Montague Street Location	Estimated AADT	85 th Percentile Speed
Between Linden Ave/Lower St intersection and Cornwallis St	395 vehicles/day	29 km/h
Between Duke Street and King Street	945 vehicles/weekday 810 vehicles/weekday	Not collected
Between Prince Street and Bluenose Drive	762 vehicles/day	35 km/h

Pedestrian counts were also taken over a 24-hour period at Duke Street and Montague Street on a weekday and a weekend day in October. Table 2 shows the results of this data. The data shows the number of pedestrians crossing Montague Street at Duke Street and not the number of pedestrians travelling on Montague Street itself. However, with the counts showing 687-723 pedestrians crossing the road at that location, it is evident that pedestrians comprise a large portion of the travel along Montague Street and are critical users of this roadway.

Table 2: 24 Hour Pedestrian Count

Parameter	Weekday Daily Count	Weekend Daily Count
Pedestrian Volume	687 pedestrians	723 pedestrians

Based on the traffic data, a few initial conclusions were drawn about Montague Street:

- Due to the commercial focus on the roadway and existing pedestrian volumes, it is desirable to take a pedestrian-centric approach.
- Some traffic diversion is desirable to reduce the vehicle volumes on Montague Street in order to improve conditions for cyclists.

Recommended Concept

The recommended concept focuses on shifting the use on Montague Street from a place of parking and vehicle travel to one that prioritizes pedestrians and comfortably accommodates two-way cycling. It is made up of three main elements: widening of the pedestrian realm along most of Montague Street, a pedestrian mall or shared space treatment from Duke Street to King Street and a contraflow bicycle lane from Duke Street to the Linden Ave/Lower St intersection. Implementation recommendations were made for both the short-term and long-term. A summary of each of the elements and the rationale behind them is described below. Appendix A has plan view drawings as well as illustrations of typical existing and proposed cross-sections.

Recommendation #1: Widening of the Pedestrian Realm

Montague Street is a shopping street that currently attracts significant pedestrian use. However, the existing pedestrian realm is quite narrow. Widening the sidewalk on the south side and clearly defining different spaces for different uses would provide a comfortable and inviting place to walk. This widening is recommended for Montague Street from the Linden Ave/Lower St intersection to Duke Street, and King Street to Kempt Road. In order to complete this widening, parking would have to be removed on the north side of the road from Linden Ave/Lower St intersection to Duke St, and King Street to Bluenose Drive, and on the south side from Bluenose Drive to Kempt Road.

The widened sidewalk would have three specific zones. The first is a 1.3 m furnishing area, which provides space for utility poles, the opening doors of parked cars, sandwich boards, garbage disposal and other objects. The second is a 2.25 m through area for pedestrians, which should be space clear of obstacles for pedestrians to walk along. The third section is the frontage zone,

which is recommended to be 0.3-0.6 m, in order to provide an offset from buildings along the sidewalk.

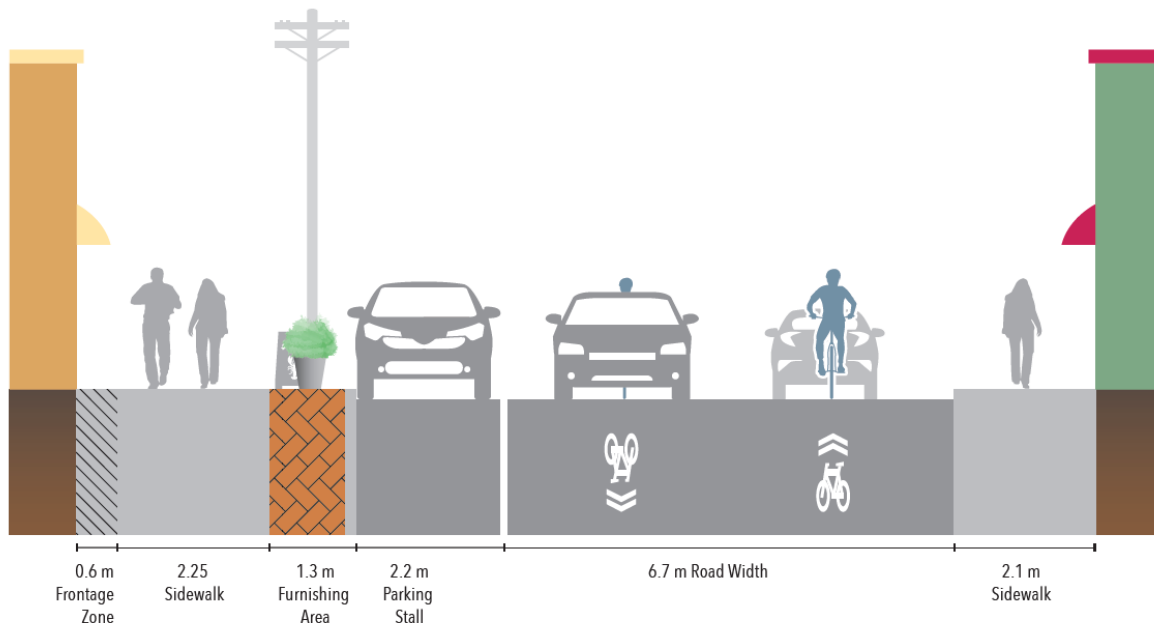


Figure 6- Montague Street, typical cross-section from King Street to Rum Row

Widening of the pedestrian realm has significant construction impacts due to moving the curb as well as utilities. Therefore, this component of the street re-development may be most feasible in conjunction with street reconstruction.

Short-Term Implementation: Montague Street from Rum Row to Shipyard's Landing is currently scheduled for street reconstruction in 2021-2022. If this project goes through, it provides the opportunity for the sidewalk to be widened from Rum Row to Kempt Road in the short-term.

Long-Term Implementation: Along other stretches, the widening of the pedestrian realm should occur when other sections of the roadway are reconstructed.

Recommendation #2: Develop a "Pedestrian Mall" or "Shared Space" along Montague Street from Duke Street to King Street

From Duke to King, and potentially as far as Rum Row, the recommendation is to convert Montague Street to a pedestrian priority street, as either a "pedestrian mall" or "shared space concept". Pedestrian malls are usually exclusive spaces for pedestrians and cyclists while shared

streets prioritize pedestrian and cyclist use but allow cars to mix with other users in a limited way. Along with increased comfort for active transportation, these types of streets are excellent opportunities for placemaking. Pedestrianized streets emphasize public space functions by adding street furniture, patio space and activity areas for open street markets and events. Montague's shopping street character is well suited for this type of treatment, presenting an opportunity to create a special destination. Though the focus of the design should be on pedestrians, the design of the pedestrian mall or shared space should also accommodate cyclist use. Case studies of pedestrian malls and shared space are described below.

CASE STUDIES: PEDESTRIAN MALLS AND SHARED SPACES

Pedestrian malls and shared spaces are common in Europe and becoming common throughout Canada. A few examples are provided below.

Netherlands

In the Netherlands, it is common for streets in city and town centres to be pedestrian zones. These zones exclude cars but often allow usage by cyclists. The Dutch *Design Manual for Bicycle Traffic* provides recommendations on when and how to mix or segregate cycling and walking traffic based on pedestrian volumes. The Netherlands' cycling friendly policies and designs have resulted in one of the highest rates of cycling for transportation in the world.



Pedestrian zone in The Hague, Netherlands
(Photo: Nadia Shardt)

Halifax, NS

Shared Space on Argyle Street

Argyle Street in Halifax is a recent example of a shared space conversion. The municipality converted the road into a curb-less street, that blurs the line between pedestrian space and vehicle space. Wider "sidewalks", permanent patios, pedestrian scale lighting, paving stones and other elements were built in to prioritize pedestrian movement and shopping. Vehicles can travel one-way through a narrow lane that is separated from the pedestrian space by tactile strips, which provide warning to visually impaired pedestrians. Vehicle loading zones are also permitted in bays. The shared space is also a flexible one; sometimes vehicle travel is blocked off with gates in order to accommodate events.

Pedestrian Mall on Granville Street

Granville Street in Halifax is an example of a pedestrian mall. The street is closed to vehicles and prioritizes the pedestrian experience through the use of paving stones, landscaping, benches and patio space. The pedestrian mall creates a quiet and inviting environment for HRM residents to shop and gather. Loading is allowed at specific times of day.



Shared Space in Halifax, NS



Pedestrian Mall in Halifax, NS

Edmonton, AB

Shared Space on 96 Street

96 Street in Edmonton, AB is a shared space treatment that prioritizes pedestrians while also accommodating and encouraging cycling. A widened pedestrian realm, landscaping and seating creates a comfortable and enjoyable space for pedestrians. The street uses paving stones and a mountable curb to blur the line between the pedestrian and vehicle space, promoting the prioritization of pedestrian travel. Vehicles can travel two-way along some sections and one-way along others, with parking allowed on some stretches in bays. The design also encourages cycling as the shared space design allows cyclists to mix more comfortably with what is likely to be a lower volume of vehicles travelling at a slower speed. Cyclist convenience and access is maintained as two-way cycling is allowed on the one-way stretch, as shown below. In order to allow two-way cycling, the road has a subtle contraflow bicycle lane delineated by paving stones and signage. Bicycle racks are also included along the road.



Shared Space in Edmonton, AB
(Photo: Maggie Boeske)

The pedestrian mall or shared space models are both options for this section of the town. The pedestrian mall option, shown in Figure 7, offers some advantages. Montague Street is a narrow road so restricting car usage and parking would provide substantial space for pedestrian travel and programming. If a shared space model is chosen, it is recommended that car use be restricted to certain times of the day (for example, when the shops are closed) to increase comfort during high pedestrian traffic times of the day. These time restrictions will also likely reduce traffic along the entire corridor, which will improve conditions for cyclists sharing the road with cars. For both a shared space or pedestrian mall application, a paving stone application is recommended in the long-term to visually delineate the roadway as a pedestrian-priority space.

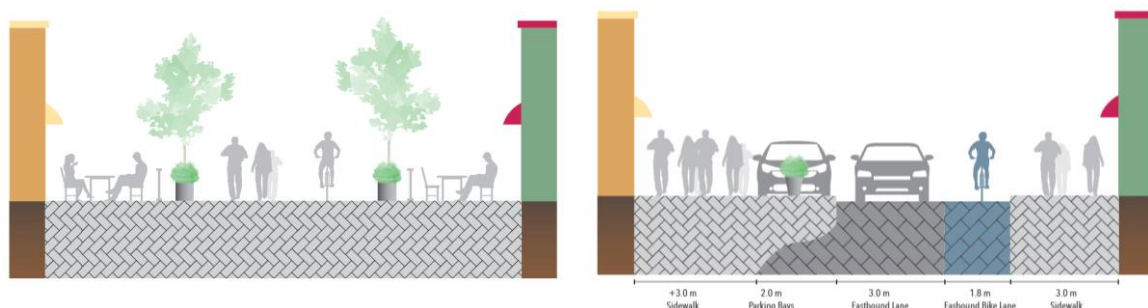


Figure 7: Example of a pedestrian mall (left) and shared space (right) for Montague Street between Duke Street to King Street

Short-Term Implementation: It is recommended that the pedestrian mall or shared space concepts be first implemented as a pilot project using street furniture and unique pavement markings. This would allow greater public discourse and tweaking to the design before permanent installation. Public consultation is a critical component of the pilot project.

Long-Term Implementation: The final design can be developed and constructed after the results of the pilot project.

Recommendation #3: Contraflow Bicycle Lane from Linden Ave/Lower St Intersection to Duke Street

From Duke Street to the Linden Ave/Lower St intersection, it is recommended that a contraflow bicycle lane be developed to allow cyclists to travel two-way along this stretch.

Short Term Implementation: In the short-term, it is recommended that a protected contraflow bicycle lane be built by removing parking on the north side. A 2 m contraflow bicycle lane with a 1.1 m vertical buffer, that could be made with planters or temporary concrete barrier, can be developed on the north side. The EB vehicle lane width is narrowed to 4 m. The purpose of providing the vertical buffer in the short-term is to prevent vehicles from parking in the bike lane.

Long Term Implementation: The long-term recommendation also includes widening the south sidewalk, which reduces the available width. Therefore, the long-term option removes the vertical buffer between the contraflow bicycle lane and cars in favour of using a painted yellow line.

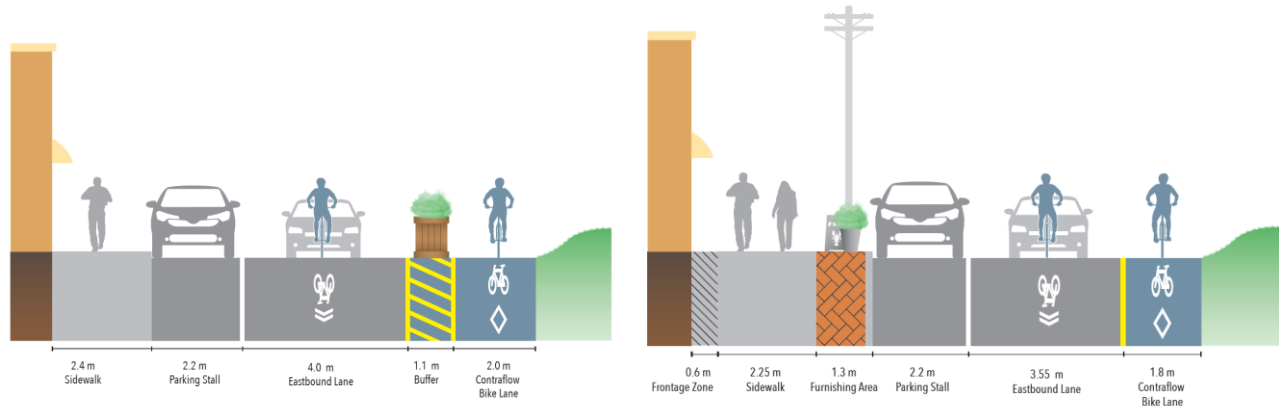


Figure 8: Short Term (Left) and Long Term (Right) Implementation of Contraflow Bicycle Lane

Additional Design Considerations

Accessibility

When developing the street reconstruction designs, it is recommended that accessible curb ramps and other universal design components be incorporated. These elements are critical to accommodating pedestrians of all abilities. Forthcoming standards for the built environment under the Nova Scotia *Accessibility Act* may affect plans for this route development.

Curb Extensions

Curb extensions are recommended along four locations, as shown in Appendix A, in order to organize parking and reduce crossing distance for pedestrians.

30 km/h speed limit

Generally, when cyclists share the road with cars, it is desirable to design the road for 30 km/h and post this speed limit. On Montague Street, the 85th percentile speeds at the measured locations were close to 30 km/h, indicating that the road characteristics already support a reduced speed limit. The town could work with TIR, as per Section 8.0 to post a 30 km/h speed limit along Montague Street.

However, another option, which is recommended, is that the town could look at changing the speed limit to 30 km/h in all of the Old Town and posting this speed at only entrances. The 2013 Active Transportation Plan recommended reducing the speed limit on most roads in the Old Town to 30 km/h. A blanket speed reduction with signs posted at entrances in the Old Town has the advantage of addressing issues on other roads within the Old Town, in addition to Montague Street, while minimizing sign clutter.

4.2 Front Harbour Trail

Context

The Front Harbour Trail is an unpaved pedestrian and cyclist trail that provides a scenic and direct connection between the Old and New Towns. The Front Harbour Trail follows the waterfront and along some sections, is along an eroding bank. The trail width varies from approximately 1.5-2.2 m and the surface varies from crusher dust in some sections to wider aggregates in others.



Figure 9: Front Harbour Trail in the Town of Lunenburg

Recommendations

1. Trail width: The TAC *Geometric Design Guide for Canadian Roads* considers 3 m to be the recommended lower limit for a multi-use path, which provides space for two cyclists to comfortably pass each other as well as space for one cyclist to pass two pedestrians walking side-by-side. TAC indicates that 2.4 m is the absolute lower limit, as it is the minimum space required for two cyclists to pass each other. At widths of 1.5-2.2 m, the Front Harbour Trail is substantially below the recommended lower limit and below the absolute lower limit. Given the existing bank erosion, it is unlikely that the path can be widened to the desirable width in the short term. However, it is recommended that the town selectively widen the path where space is available, ideally to 3 m. Even though it would only be for short sections, this would provide greater comfort as well as the occasional opportunity for passing.
2. Surface: A paved asphalt surface is recommended for the path. This will improve the surface for all wheeled users, such as cyclists and wheelchair users, as well as make winter maintenance easier.
3. Connection on the east side: Install a universally accessible curb ramp, with the same width as the widened trail (ideally 3.0 m).

4. Connection on the west side: Delineate the trail from the driveway access. Pave a 3 m pathway for trail users and separate it from the driveway by using a 1.3 m grass buffer. Two utility poles as well as the existing wayfinding sign will need to be moved into the grass buffer to accommodate the pathway. Moving the utility poles and wayfinding sign will also provide vertical separation between pathway users and cars entering and exiting the driveway. Additional vertical objects such as trees or bollards may also need to be added to the buffer in order to prevent cars from parking on the pathway.
5. Lighting: The addition of lighting is also recommended as it would improve the usability of the pathway at all hours.
6. Connection through Young Street: There is an existing desire line from the Front Harbour Trail to Young Street. It is recommended that this desire line be formalized by providing a 2.4 m to 3.0 m paved path. Currently, the access to Young Street has concrete barriers that provides enough space for cyclists and pedestrians to enter Young Street but not enough for cars to drive into this area. These concrete barriers should be replaced with flexible bollards, which should similarly restrict vehicle access while being more forgiving in the event of a cyclist colliding with it. While the Front Harbour Trail will still be the primary corridor and main crossing of Falkland Street for the cross-town connector, formalizing this connection will effectively accommodate an existing desire line.

4.3 Broad Street

Bicycle Facility Selection

Broad Street is a residential road that covers around 0.9 km, extending from Falkland Street to High Street. On the east side, the road is directly across from the Front Harbour Trail access. The average grades for each block range from 1-4%, with maximum slopes reaching around 6%. These slopes will likely impact cyclist speeds but should be rideable for many cyclists.

Traffic data was collected on Broad Street, between McKenzie Street and Archibald Street. The estimated AADT was 171 vehicles/day and the 85th percentile speed was 45 km/h. For a local street bikeway, which is shared bicycle-car operation, volumes should be below 1000 vehicles per day with speeds around 30 km/h. Based on this data, Broad Street carries a volume of traffic that is suitable for bicycles to share the road with cars. The operating speeds are higher than desirable but could be reduced through traffic calming. Due to these traffic conditions as well as Broad Street's residential function, it is recommended that Broad Street be developed into a local street bikeway.

Recommendations

Local street bikeways focus on designing the roadway to have traffic conditions suitable for bicycles and cars to share the road, while also prioritizing cyclist travel through wayfinding and intersection treatments. In order to convert Broad Street into a local street bikeway, several

changes are recommended. The first is the addition of “sharrow” pavement markings and wayfinding signage (as described in Section 7.0) to identify the road as a bike route and provide wayfinding. The connection between Broad Street and the Front Harbour Trail should also be enhanced, as described in Section 6.0.

While vehicle speeds on Broad Street are higher than desirable for shared bicycle-car operation, speed reduction measures are ultimately not recommended for the roadway. The traffic volumes on Broad Street are very low, which likely means that cyclists will not encounter many motorists while travelling on the road. Broad Street has a rural cross-section (i.e. no curb), which limits the types of feasible traffic calming. The speed reduction measure that was considered for Broad Street was speed humps because they can be applied on a rural cross-section road and are relatively low-cost. However, speed humps also have disadvantages including potential discomfort for cyclists and more complicated winter maintenance. Given the low traffic volumes, these disadvantages, and the overall cost-benefit, speed humps were ultimately not recommended for the roadway.

5.0 North-South Link

5.1 Route Selection

A north-south connection is needed for cyclists to travel between the cross-town connector to existing cycling routes. The first connection that should be made is to the Back Harbour Trail. The Back Harbour Trail is primarily used as a recreational pathway and connects to the regional trail network. For the Back Harbour Trail, it is recommended that Lorne Street be used as the connector as the trail currently directly leads there.

For residents of the town, a key area of destinations is on and around Victoria Road, where the town school, grocery store, and several businesses are located. Phase 1 of the project identified the need for a separated bikeway on Victoria Road in the long term. In the short-term, many cyclists use an informal route through the community centre parking lot to reach these destinations. For transportation purposes, connecting the cross-town connector to the community centre parking lot will greatly enhance the comfort of local cyclists conducting utilitarian trips.

There are two potential routing options from the Front Harbour Trail to the parking lot. The 2014 Active Transportation Plan suggested using Lorne Street along with a multi-use path near the tennis courts to make that connection. The town owns the property between the parking lot, which is home to a playground and a tennis court; however, there is limited space to develop a pathway. There are two potential locations where it could be developed, as shown in Figure 10. The first would be to develop it between the building and the tennis court, which would provide a fairly direct connection to the parking lot. The second option would be to route it between the back of the building and the playground zone, which could be a windy and less intuitive route.



Figure 10: Routing Options for the North-South Link

The alternate option to Lorne Street and the multi-use path would be to use Falkland Street, an arterial roadway that parallels Lorne Street but continues further south. Between the two options, Falkland Street is a more direct and intuitive option. It is also likely a safer option. Using Lorne Street to get to the community centre parking lot requires cyclists to cross two major roads (Falkland St and Victoria Road) for every trip. This not only creates delay but also increases the safety risk. As well, in the Lorne Street option, developing the multi-use path from Brook Street to the community centre parking lot could be a challenge. Both routing options would require moving or modifying the fence to allow for pathway development and could create conflicts between existing users of the tennis court or playground. For these reasons, Falkland Street is recommended as the connection to the parking lot.

5.2 Connection to the Back Harbour Trail: Lorne Street Concept

Context

Lorne Street is a residential road that covers two blocks, connecting Brook Street to Dufferin Street. On the north side, Lorne Street connects directly to the Back Harbour Trail, and on the south side, it connects to Victoria Road. Lorne Street is a hilly road, with the average grade for each block at 3.6-3.8%, and maximum slopes that go up to 7.6%. These grades are likely to be rideable for many cyclists though travel speed will be affected.

In order to make the connection between the Back Harbour Trail and Front Harbour Trail, one block of Lorne Street should be used. The traffic conditions of Lorne Street indicate that it would be comfortable for cyclists to share the road with cars, as the estimated AADT is 70 vehicles per day, and the 85th percentile speeds are 31 km/h. Due to these traffic conditions and residential nature, the road should be suitable for cyclists to share the road with cars, which would be a local street bikeway treatment.

Recommendations

In order to convert Lorne Street into a local street bikeway, several changes are recommended. The first is the addition of “sharrow” pavement markings and signage (as per Section 7.0) to identify the road as a bike route and provide wayfinding. The posted speed limit should be changed to 30 km/h by following the process described in Section 8.0. Finally, the crossing at Dufferin Street should be improved as described in Section 6.0.

5.3 Connection to Green Street: Falkland Street Concept

Falkland Street is an arterial road that acts as an important connection to destinations within town and outside of it. Like Lorne, Falkland Street is hilly, with average grades for each block varying from 1.2-4.4% and maximum slopes going up to 6.2%. The Average Annual Daily Weekday Traffic was estimated at 6,986 vehicles per day, and the Average Annual Daily Weekend Traffic was estimated at 5,422. Given these traffic volumes, a bikeway would need to be physically separated to be comfortable for users of all ages and abilities. The recommended option for Falkland Street would be developing unidirectional bicycle paths adjacent to the sidewalk on both sides of the road. The bicycle paths could be built from Young Street down to Green Street, which leads to the parking lot. For pedestrians, the recommendation is to widen the sidewalk to 1.8 m and to fill in the existing sidewalk gap on the east side. Figures 11 and 12 show the existing and proposed cross-section on Falkland Street. Developing bicycle paths would be a significant change for the town, and would likely involve removal of some parking and several trees. However, it would provide a direct, comfortable, and intuitive route for cyclists. New trees can be added to the buffer on the west side, which will improve the streetscape and provide a vertical buffer from moving traffic. Ideally, the spacing of trees and utility poles on the west side will also prevent drivers from parking in the buffer, which is a common occurrence in the current cross-section.

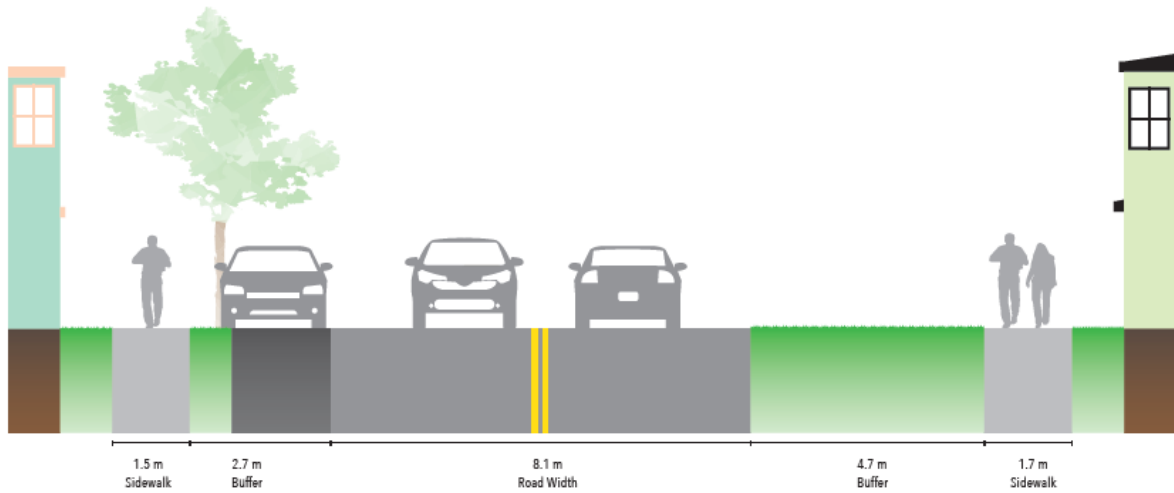


Figure 11: Existing typical cross-section on Falkland Street

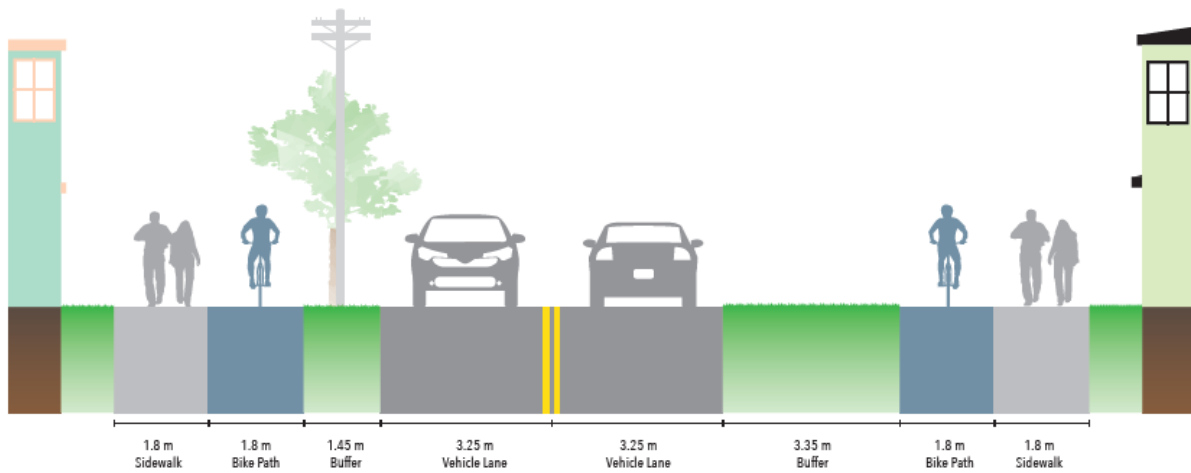


Figure 12: Proposed typical cross-section on Falkland Street

6.0 Major Road Crossings

The development of this route involves crossing three major roads in the town: Falkland Road (at the Front Harbour Trail and Green Street), Dufferin Street (at the Back Harbour Trail) and Bluenose Drive (at Montague Street). The following changes are recommended for each of the intersections:

Front Harbour Trail crossing at Bluenose Drive/Lower St intersection

This intersection is currently a 4-way stop. The following changes are recommended:

- "All-way" Tabs should be added to the existing stop signs to clearly indicate to drivers that they are at an all-way stop controlled intersection.
- A new "Stop" sign and "All-way" tab should be added for the contraflow bicycle lane.

Dufferin Street at the Back Harbour Trail

The average annual weekday daily traffic at Dufferin Street was counted at 2,708 vehicles per day. At these volumes, it is likely feasible for cyclists to cross by waiting for a gap. Therefore, the following two changes were recommended:

- Add a curb ramp at the Back Harbour Trail crossing, in order to allow cyclists to easily enter the trail from Lorne Street. It is recommended that the curb ramp be developed by wrapping the sidewalk to the back of the ramp, in order to allow the sidewalk to continue to be level, as shown in Figure 13.
- Add a yield sign for cyclists, indicating that they have to wait for a gap to crossing the road.



Figure 13: Proposed intersection treatment at Dufferin Street

Falkland Street at the Front Harbour Trail

The intersection of the Front Harbour Trail at Falkland Street is a critical crossing in the Cross-Town Connector Route. Falkland Street has an estimated average annual weekday daily traffic of 6,986 vehicles/day, which makes it one of the more difficult roads to cross within the town. At this location, it is recommended that an RRFB crosswalk be installed, with push-buttons located where cyclists and pedestrians can easily activate them.

Falkland Street at Green Street

The intersection of Falkland Street at Green Street is another critical crossing as it allows cyclists to travel to and from the community centre parking lot. Traffic data was not collected at this location during this stage but should be collected during the next stage of design.

7.0 Wayfinding Signage

Wayfinding signage should be added on Broad Street and Lorne Street to identify these local streets as bikeways. Additional wayfinding signs should be added to provide cyclists with directions from the Old Town to the Bay-to-Bay Trail, which is the designated Blue Route. The forthcoming *Nova Scotia Bicycle Wayfinding Guide*, which is being developed by Bicycle Nova Scotia in collaboration with provincial and municipal stakeholders, provides guidance for bicycle wayfinding signage.

8.0 Legislation

The recommendation to apply 30 km/h posted speed limits on Lorne Street and on most Old Town roads requires special consideration in order to comply with existing provincial legislation. In Nova Scotia, permission from the province is needed to post speed limits below 50 km/h. Nova Scotia Transportation and Infrastructure Renewal (NSTIR) has outlined the following process for applying for reduced speed limits:

- The Local Traffic Authority for the town must make the request in writing.
- The streets must be classified as “local” and the current speed limit on the streets must be 50 km/h.
- There must be plans to make physical changes to the street to reduce travel speeds (85th percentile) to be close to the requested speed limit or current travel speeds (85th percentile) must already be close to the requested speed limit.

Further discussion with TIR will be needed to determine the process for applying a blanket speed limit reduction on most Old Town roads. Additional speed data may need to be collected.

9.0 Next Steps

Short-Term

1. Conduct public consultation with town residents on the proposed changes.

2. Develop a pedestrian mall or shared space pilot project plan for implementation in summer 2020 or 2021. Business owners along Montague Street are among the stakeholders that should be consulted during this development.
3. Complete detailed design work for the short-term changes and tender for construction. This includes all elements of the proposed concepts except for sidewalk widening on Montague Street, which should be completed in conjunction with street reconstruction. Montague Street from Rum Row to Kempt Road is already scheduled for street reconstruction in the near future and should be considered as part of the short-term changes.
4. Make an application to TIR for posting a 30 km/h speed limit on Lorne Street. Work with TIR to determine the feasibility and process for posting a blanket 30 km/h speed limit (with some exceptions) in the Old Town.

Long-Term

1. Complete detailed design work for the long-term changes and tender for construction. The long-term changes include sidewalk widening on Montague Street, which should be conducted in conjunction with street reconstruction plans, as well as the final design for the "shared space" or "pedestrian mall" concept on Montague Street between Duke Street to King Street.

APPENDIX A

Cross-Town Connector / North - South Link Concept: Short-Term

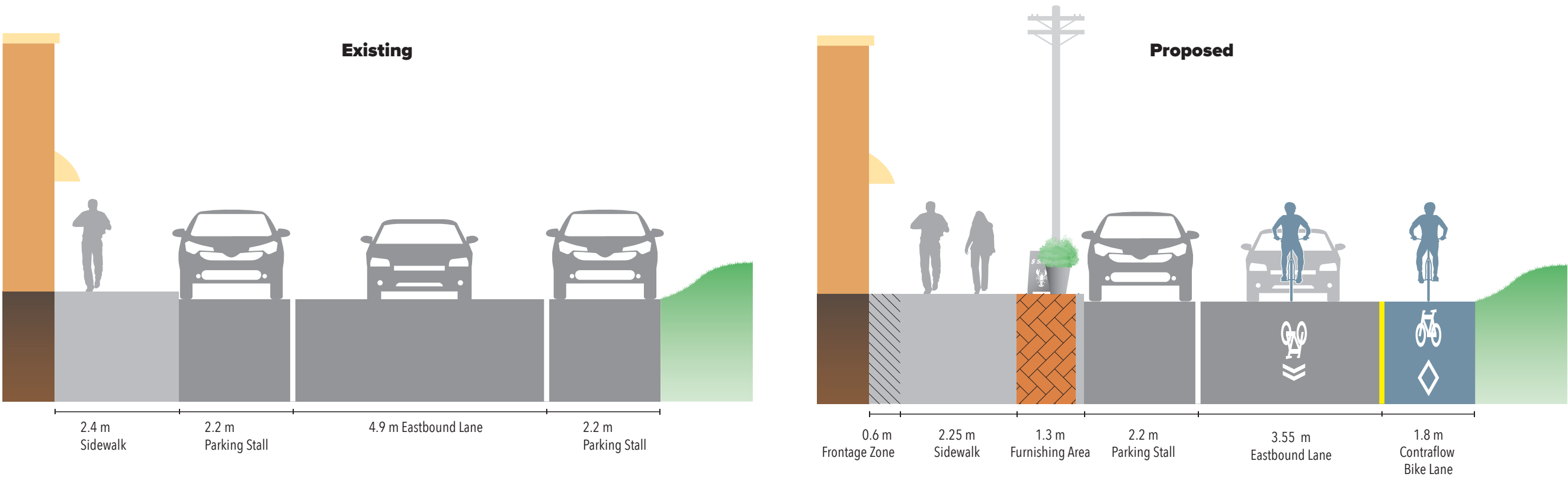
Montague St. Short-Term Page 1



LEGEND

- Sharrow Marking
- Conflict Marking
- Asphalt
- Sidewalk
- Bollards
- Property Line

Section A | Looking West : Typical Cross Section

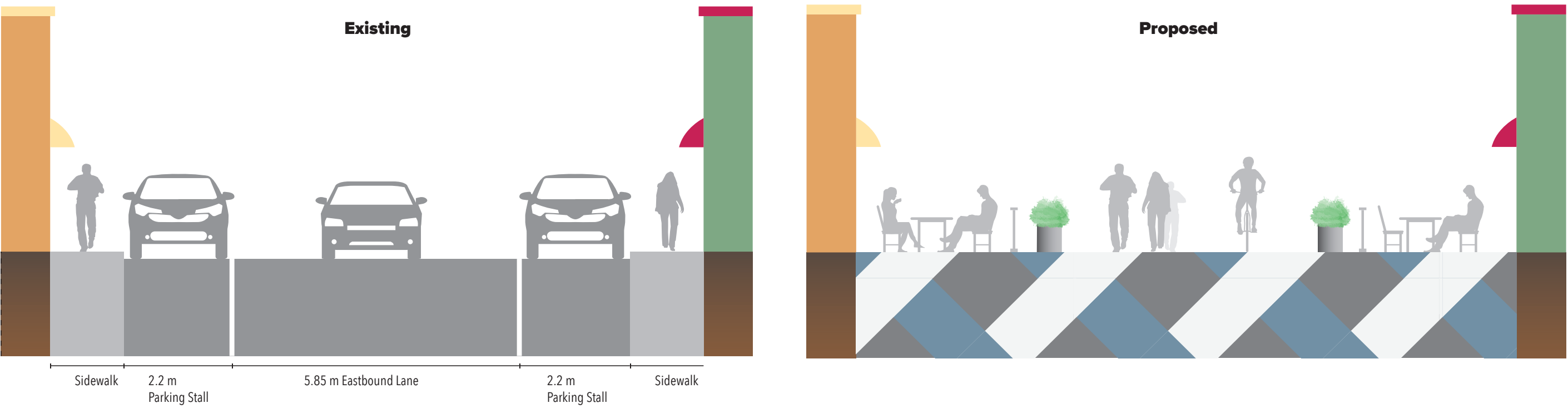


Cross-Town Connector / North - South Link Concept: Short-Term

Montague St. Short-Term Page 2

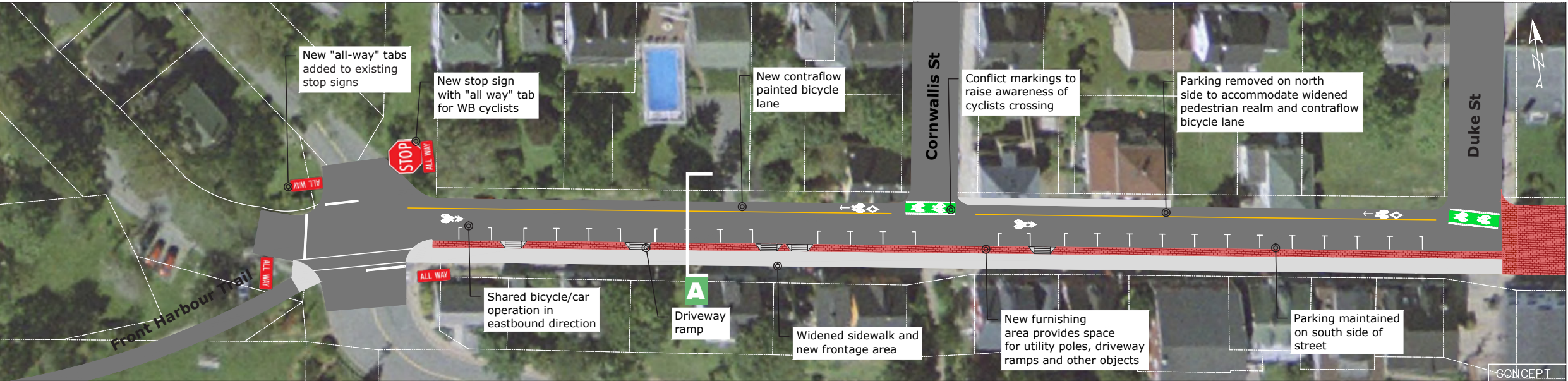


Section A | Looking West : Typical Cross Section



Cross-Town Connector / North - South Link Concept: Long-Term

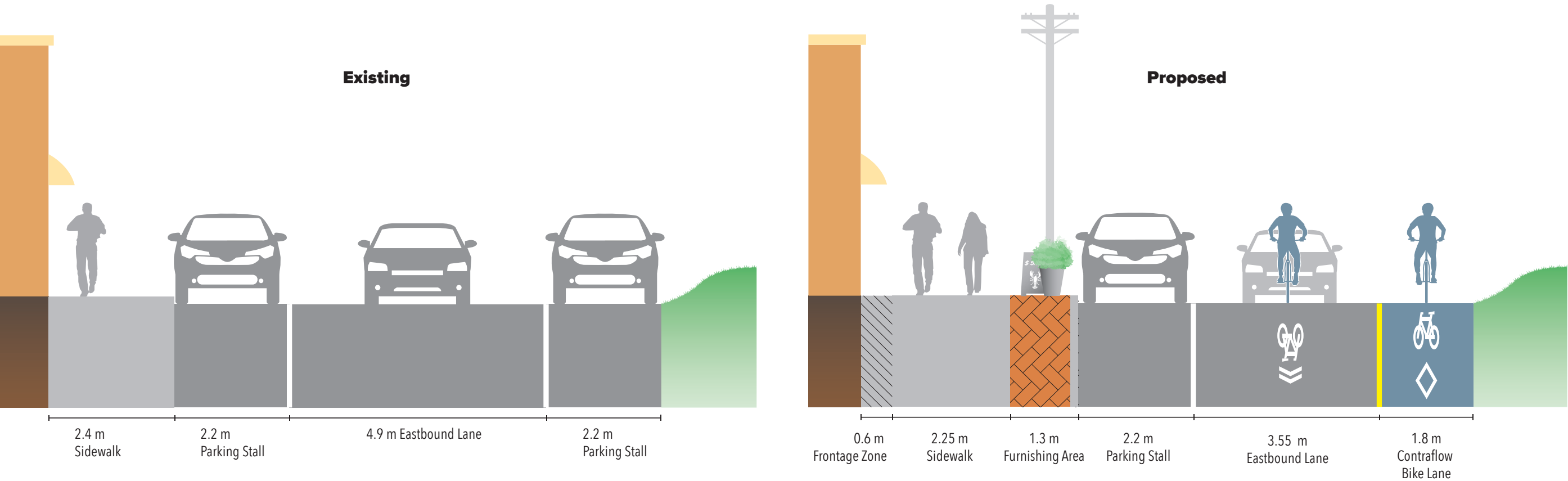
Montague St. Long-Term Page 1



LEGEND

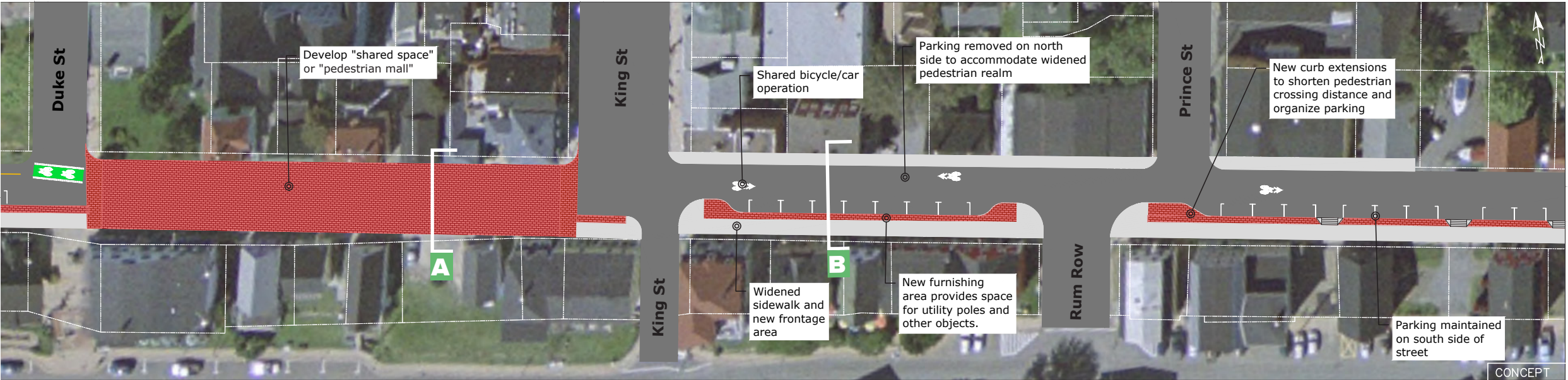
-  Bike Lane Marking
-  Sharrow Marking
-  Conflict Marking
-  Asphalt
-  Sidewalk
-  Paving Stones
-  Property Line

Section A | Looking West : Typical Cross Section



Cross-Town Connector / North - South Link Concept: Long-Term

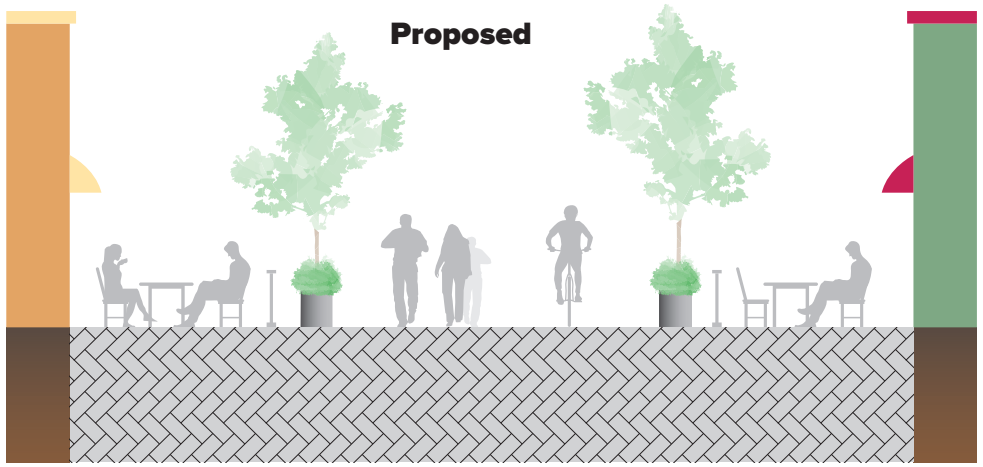
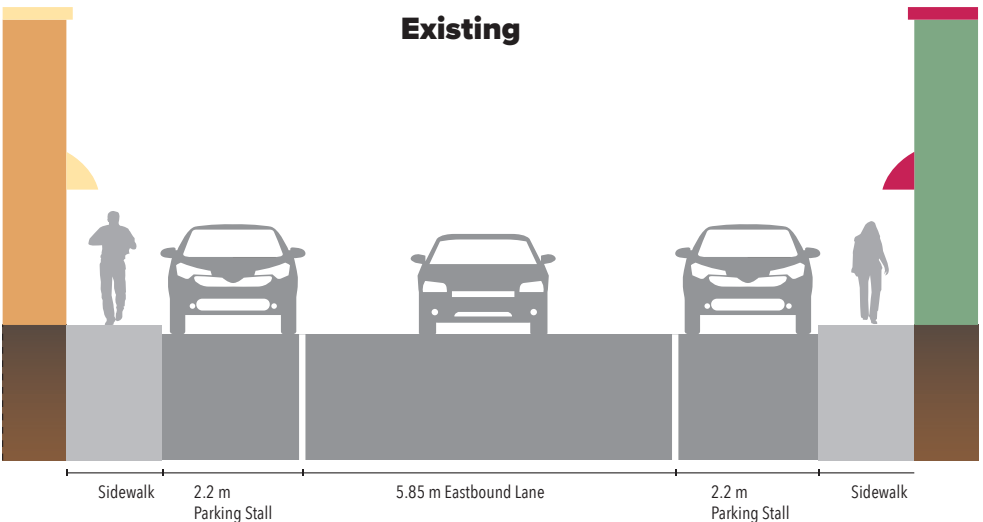
Montague St. Long-Term Page 2



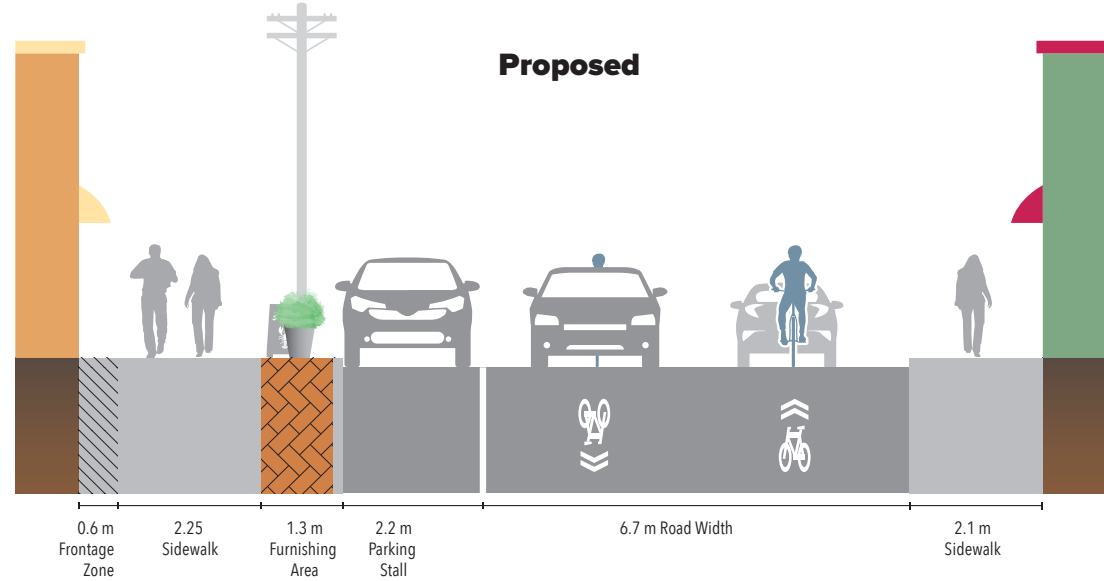
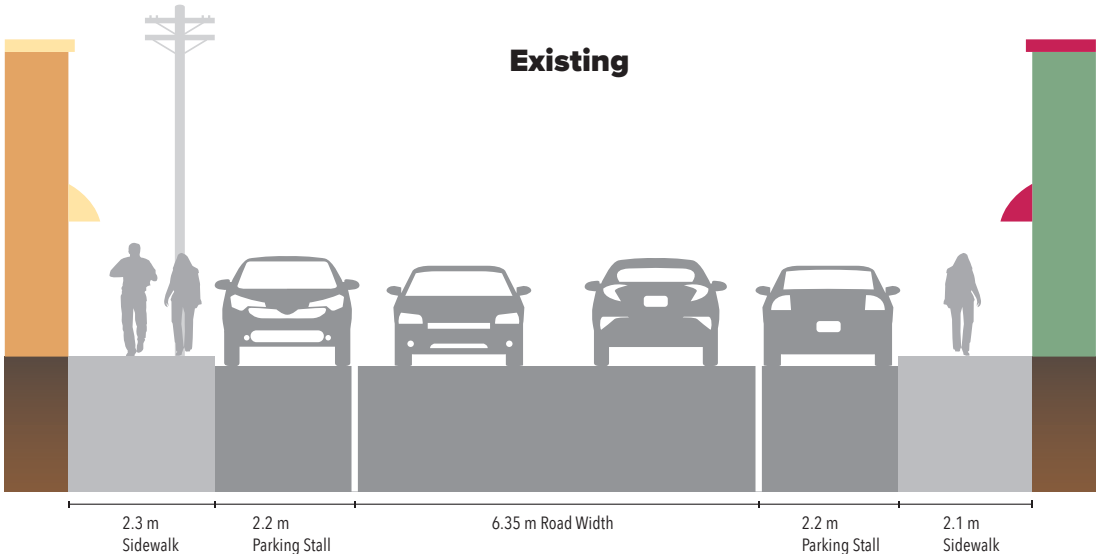
LEGEND

-  Sharrow Marking
-  Conflict Marking
-  Asphalt
-  Sidewalk
-  Paving Stones
-  Property Line

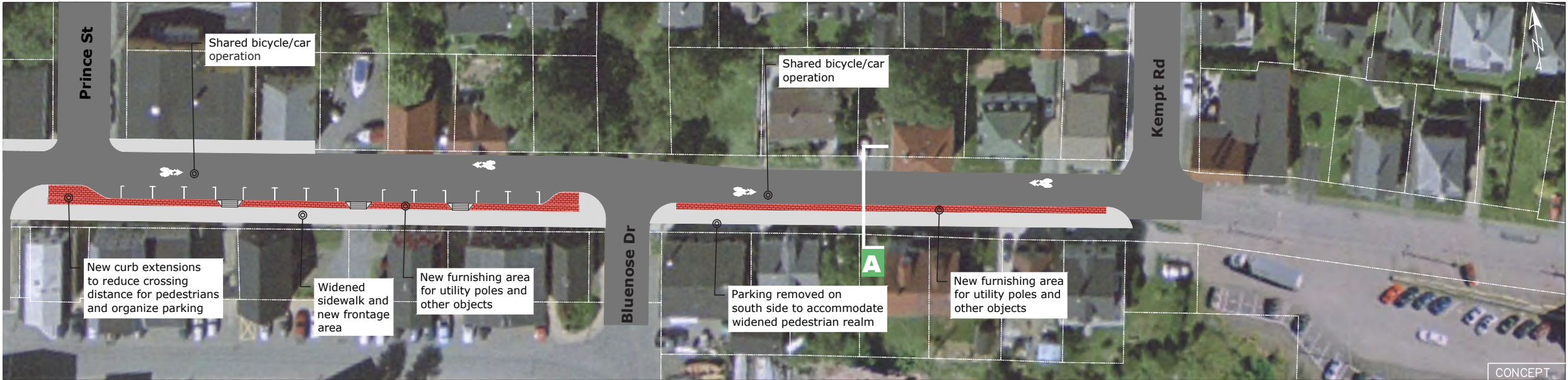
Section A | Looking West : Typical Cross Section



Section B | Looking West: Typical Cross-Section



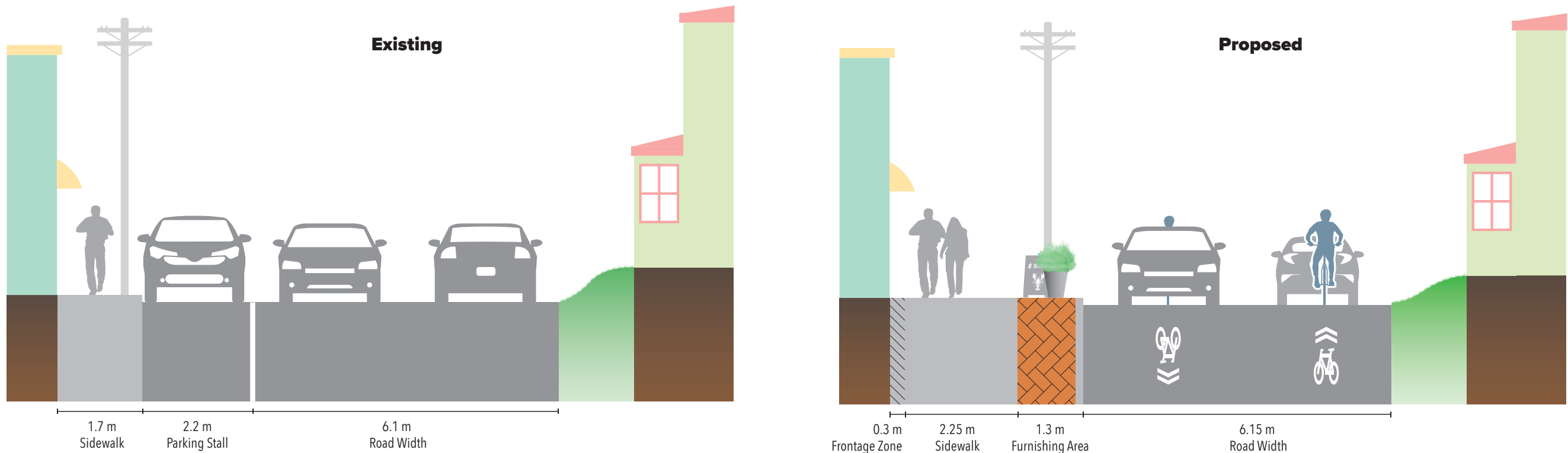
Montague St. Long-Term Page 3



LEGEND

- Sharrow Marking
- Asphalt
- Sidewalk/Concrete
- Paving Stones
- Property Line

Section A | Looking West : Typical Cross Section

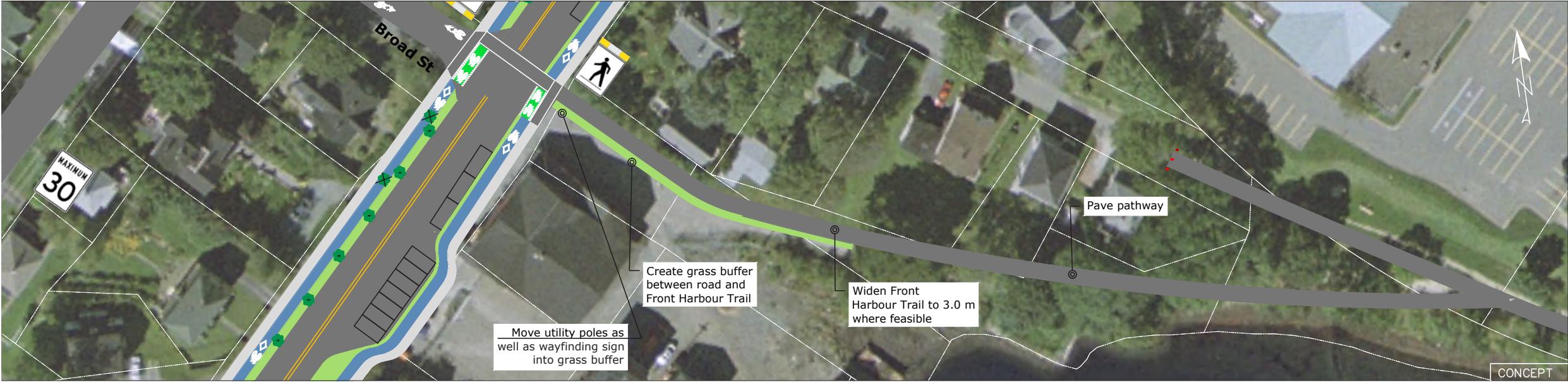


Cross-Town Connector / North - South Link Concept: Long-Term

Front Harbour Trail, Part 1

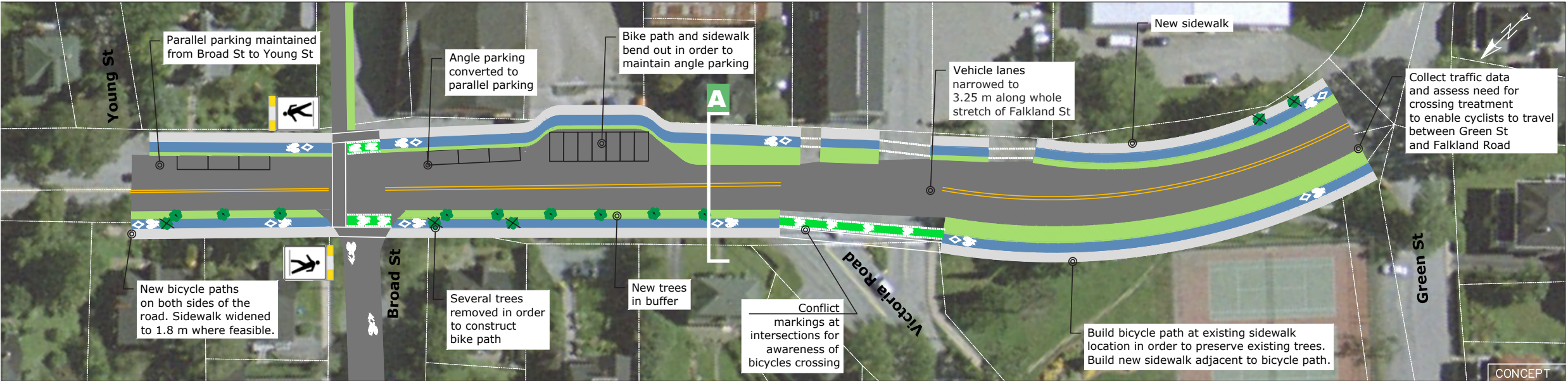


Front Harbour Trail, Part 2



Cross-Town Connector / North - South Link Concept: Long-Term

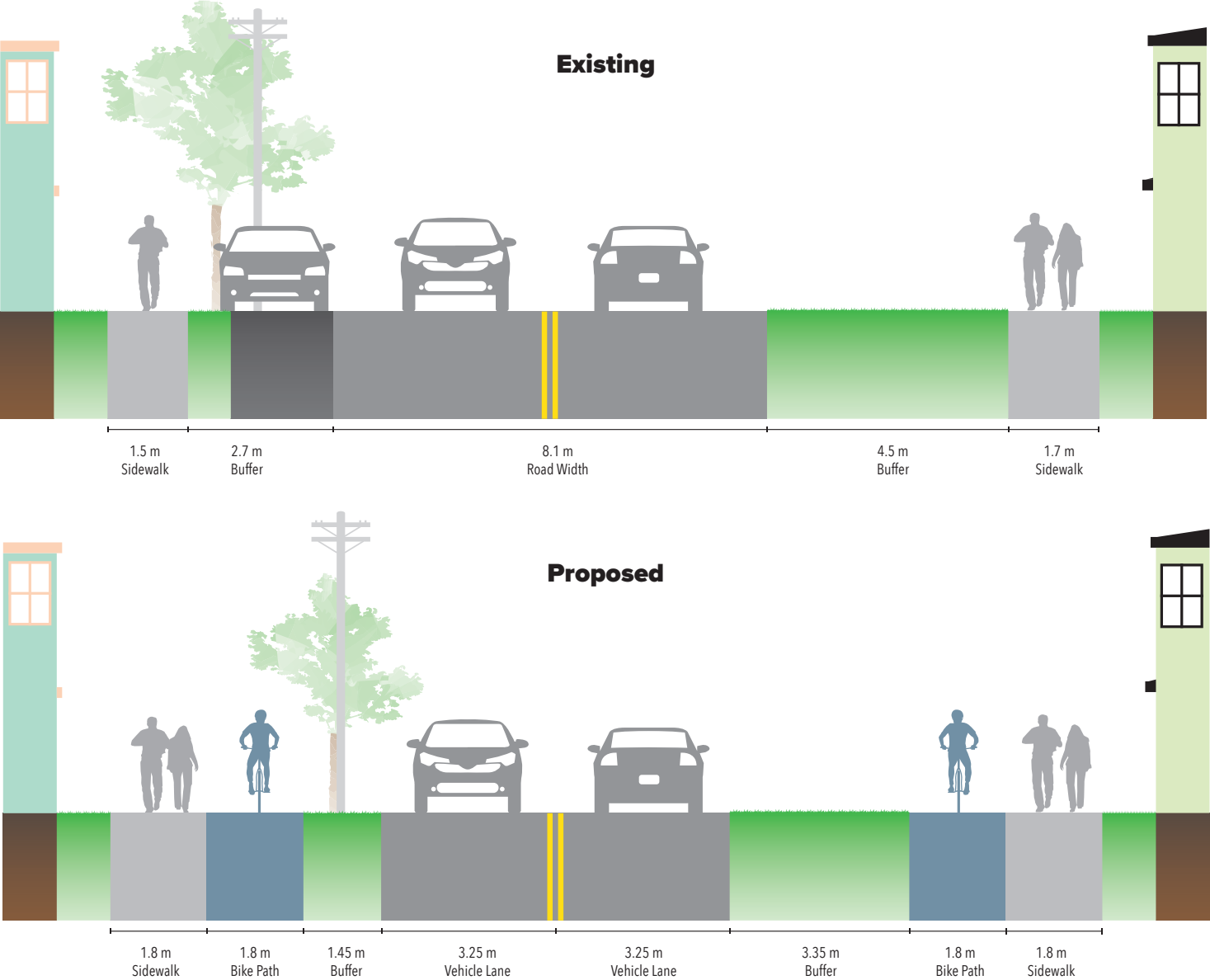
Falkland Street



LEGEND

-  Bike Lane
-  Conflict Marking
-  Asphalt
-  Sidewalk./Concrete
-  Grass Buffer
-  Property Line

Section A | Looking North: Typical Cross Section



APPENDIX B

October 28, 2019

Nabila Chatur, EIT
5516 Spring Garden Road, Suite 301
Halifax, NS
B3J 1G6

[via email: nabila.chatur@bicycle.ns.ca]

RE: Traffic Data Collection Summary - Lunenburg, Nova Scotia

Dear Ms. Chatur:

As requested, we have collected traffic data at eight locations in Lunenburg, Nova Scotia (see Figure 1). This letter summarizes the methodology and resulting data.



Figure 1 - Count Locations

INTERSECTION TURNING MOVEMENT COUNTS

Intersection turning movement count (TMC) data were collected using Miovision Scout Units at the Linden/Montague Street at Lower Street/Bluenose Drive intersection (Location 1 in Figure 1). The turning movement counts were collected on Thursday, October 3, 2019, during the morning (7:30 AM to 9:30 AM), midday (11:00 AM to 1:00 PM), and evening (3:30 PM to 5:30 PM) peak periods. The AM and PM peak hour vehicular traffic volumes are summarized in Figure 2. Pedestrian and bicycle data were also collected at the intersection for the count period. The intersection count is tabulated into 15-minute intervals with peak hours indicated by shaded areas (See Table A-1, Appendix A).

Table 1 – Intersection Turning Movement Data Collection

Intersection	Count Date	See Appendix A
#1 Linden/Montague Street at Lower Street/Bluenose Drive	October 3, 2019	Table A-1

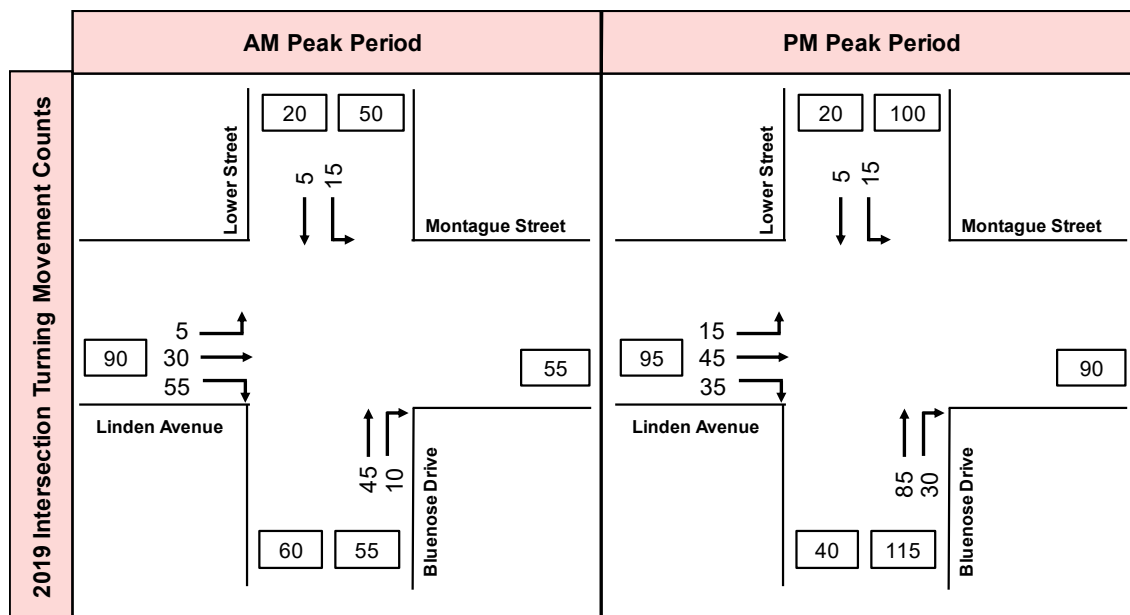


Figure 2 - AM and PM Peak Hour Volumes

AVERAGE DAILY TRAFFIC & PEDESTRIAN COUNTS

Traffic volume data were collected for three road segments using Miovision Scout Units:

- Dufferin Street – between Archibald Street and Lorne Street (Location 6 in Figure 1)
- Falkland Street – between Victoria Street and Lincoln Street (Location 7 in Figure 1)
- Montague Street – between Cornwallis Street and King Street (Location 8 in Figure 1)

Details of the road segment count dates and volume data are summarized in Table 2. Pedestrian and bicycle data were also collected on the road segments for the count period. The volume counts are tabulated into 15-minute intervals with peak hours indicated by shaded areas (See Appendix B).

Table 2 – Road Segment Traffic Data Collection

Road Segment	Weekday Start Date	Weekday End Date	See Appendix B	Weekend Start Date	Weekend End Date	See Appendix B
#6 Dufferin Street	Thursday, October 3, 2019	Friday, October 4, 2019	Table B-1	Saturday, October 5, 2019	Sunday, October 6, 2019	Table B-2
#7 Falkland Street			Table B-3			Table B-4
#8 Montague Street			Table B-5			Table B-6

NSTIR completes traffic counts on various roads and highways throughout the year. To normalize the collected traffic counts completed for different types of roads and to account for seasonal variation in traffic volumes, NSTIR develops average traffic count group factors ranging from ‘AA’ (low variation) to ‘H’ (high variation). There is a factor determined for each week of the year for each road class and considers the type of traffic use carried on a road section. A road section that primarily carries commuter traffic in an urban area does not see as much variation in volumes as a rural road in a tourist area would experience. Dufferin Street and Falkland Street have been assumed to be Class ‘C’ (lower variation), whereas Montague Street has been assumed to be Class ‘E’ (higher variation). Applicable seasonal adjustment factors for the counted periods have been applied to estimate the Annual Average Daily Volume (AADT) for each of the roadways.

The volume data collected/estimated on Dufferin Street, Falkland Street and Montague Street are summarized in Table 3, Table 4 and Table 5, respectively.

Table 3 - Dufferin Street (#6) Volume Data

Volume Item	Weekday	Weekend
Counted Vehicle Volume (vpd)	2,993	2,694
Estimated AADT (vpd)	2,708	2,438
Bicycle Volume (<i>two-way</i>)	21	15
Bicycle Volume (<i>crossing street</i>)	3	0
Pedestrian Volume (<i>crossing street</i>)	20	12

Table 4 - Falkland Street (#7) Volume Data

Volume Item	Weekday	Weekend
Counted Vehicle Volume (vpd)	7,721	5,992
Estimated AADT (vpd)	6,986	5,422
Bicycle Volume (<i>two-way</i>)	33	25
Bicycle Volume (<i>crossing street</i>)	0	3
Pedestrian Volume (<i>crossing street</i>)	140	108

Table 5 – Montague Street (#8) Volume Data

Volume Item	Weekday	Weekend
Counted Vehicle Volume (vpd)	1,047	898
Estimated AADT (vpd)	945	810
Bicycle Volume (<i>one-way</i>)	9	7
Bicycle Volume (<i>crossing street</i>)	0	1
Pedestrian Volume (<i>crossing street</i>)	687	723

SPEED STUDIES & TRAFFIC VOLUME COUNTS

Speed and traffic volume data were collected for four road segments using Black Cat Radar units:

- Broad Street – between McKenzie Street and Archibald Street (Location 2 in Figure 1)
- Lorne Street – between Dufferin Street and Broad Street (Location 3 in Figure 1)
- Montague Street – between Lower Street/Bluenose Drive and King Street (Location 4 in Figure 1)
- Montague Street – between King Street and Kempt Street (Location 5 in Figure 1)

The road segment count dates and the volume data are summarized in Table 6. The speed and volume data are tabulated into one-hour intervals with daily peak hours indicated by bold text (See Appendix C).

Table 6 – Road Segment Speed and Volume Data Collection

Road Segment	Start Date	End Date	Speed and Volume Data (See Appendix C)
#2 Broad Street	Wednesday, October 2, 2019	Monday, October 7, 2019	Table C-1
#3 Lorne Street			Table C-2
#4 Montague Street			Table C-3
#5 Montague Street			Table C-4

The AADT volume for each of the four road segments were estimated using the collected data. Broad Street and Lorne Street were assumed to be Class 'B' (lower variation), whereas Montague Street was assumed to be Class 'E' (higher variation). The collected vehicular volumes and the AADT estimates are summarized in Table 7.

Table 7 – Average Daily Traffic Volume Counts and Estimated AADT

Road Segment	Counted Vehicle Volume (vpd)	Estimated AADT (vpd)
#2 Broad Street	187	171
#3 Lorne Street	77	70
#4 Montague Street	438	395
#5 Montague Street	845	762

At each of the four road segments, the average speed as well as the 15th, 50th, 85th and 95th percentile speed were determined. The calculated speed data is summarized in Table 8.

Table 8 – Average Speed Summary (km/h)

Road Segment	15 th Percentile Speed	50 th Percentile Speed	Average Speed	85 th Percentile Speed	95 th Percentile Speed
#2 Broad Street	26	35	35	45	50
#3 Lorne Street	16	26	25	31	35
#4 Montague Street	18	23	23	29	32
#5 Montague Street	18	26	27	35	43

If you have any questions or comments, please contact me by email at courtney.mccarthy@wsp.com or by telephone at 902-536-0982.

Sincerely,



Courtney McCarthy, P.Eng.
Transportation Engineer
WSP Canada Inc.



APPENDIX A

INTERSECTION TURNING MOVEMENT COUNT DATA

Table A-1 Linden Avenue/Montague Street @ Lower Street/Bluenose Drive Lunenburg, NS Thursday, October 3, 2019														J K L Linden Avenue Lower Street H G ↓ ↓ Ped 3 Ped 4 Ped 2 Ped 1 ↑ ↑ B C Bluenose Drive Montague Street													
AM Peak Period Volume Data																											
Time		Bluenose Drive Northbound Approach			Montague Street Westbound Approach			Lower Street Southbound Approach			Linden Avenue Eastbound Approach			Total Vehicles													
		A	B	C	D	E	F	G	H	I	J	K	L														
07:30	07:45		6	2				2	0		2	9	8			29											
07:45	08:00		2	3				3	0		3	16	22			49											
08:00	08:15		8	0				6	1		0	7	14			36											
08:15	08:30		10	1				2	0		3	0	13			29											
08:30	08:45		7	2				6	2		2	6	11			36											
08:45	09:00		7	0				3	2		0	9	17			38											
09:00	09:15		17	7				2	1		2	9	16			54											
09:15	09:30		12	2				3	0		1	7	10			35											
AM Peak Hour		0	43	11	0	0	0	14	5	0	5	31	54			163											
07:30	08:30	0	26	6	0	0	0	13	1	0	8	32	57			143											
08:30	09:30	0	43	11	0	0	0	14	5	0	5	31	54			163											
		Ped 1			Ped 2			Ped 3			Ped 4					Total Peds											
07:30	08:30		17			1			0			0				18											
08:30	09:30		16			0			0			0				16											
		Bike NB			Bike WB			Bike SB			Bike EB					Total Bikes											
07:30	08:30		1			1			0			2				4											
08:30	09:30		0			0			0			6				6											
Midday Peak Period Volume Data																											
Time		Bluenose Drive Northbound Approach			Montague Street Westbound Approach			Lower Street Southbound Approach			Linden Avenue Eastbound Approach			Total Vehicles													
		A	B	C	D	E	F	G	H	I	J	K	L														
11:00	11:15		13	3				5	1		0	14	14			50											
11:15	11:30		17	5				1	2		1	14	16			56											
11:30	11:45		20	5				4	2		0	11	18			60											
11:45	12:00		19	4				4	1		0	7	9			44											
12:00	12:15		21	5				3	0		0	9	11			49											
12:15	12:30		12	3				7	2		1	8	12			45											
12:30	12:45		15	5				5	0		1	13	12			51											
12:45	13:00		20	5				2	4		1	13	17			62											
Midday Peak Hour		0	69	17	0	0	0	14	6	0	1	46	57			210											
11:00	12:00	0	69	17	0	0	0	14	6	0	1	46	57			210											
12:00	13:00	0	68	18	0	0	0	17	6	0	3	43	52			207											
		Ped 1			Ped 2			Ped 3			Ped 4					Total Peds											
11:00	12:00		36			1			0			2				39											
12:00	13:00		39			11			0			0				50											
		Bike NB			Bike WB			Bike SB			Bike EB					Total Bikes											
11:00	12:00		0			0			0			2				2											
12:00	13:00		0			0			0			0				0											
PM Peak Period Volume Data																											
Time		Bluenose Drive Northbound Approach			Montague Street Westbound Approach			Lower Street Southbound Approach			Linden Avenue Eastbound Approach			Total Vehicles													
		A	B	C	D	E	F	G	H	I	J	K	L														
15:30	15:45		16	3				3	0		0	14	7			43											
15:45	16:00		25	6				1	0		3	16	11			62											
16:00	16:15		17	6				7	1		5	10	10			56											
16:15	16:30		20	11				2	2		4	8	9			56											
16:30	16:45		25	7				5	0		3	11	3			54											
16:45	17:00		18	5				1	0		5	13	6			48											
17:00	17:15		25	5				2	3		4	13	4			56											
17:15	17:30		20	5				3	1		1	10	10			50											
PM Peak Hour		0	87	30	0	0	0	15	3	0	15	45	33			228											
15:30	16:30	0	78	26	0	0	0	13	3	0	12	48	37			217											
16:30	17:30	0	88	22	0	0	0	11	4	0	13	47	23			208											
		Ped 1			Ped 2			Ped 3			Ped 4					Total Peds											
15:30	16:30		29			2			0			0				31											
16:30	17:30		47			3			0			0				50											
		Bike NB			Bike WB			Bike SB			Bike EB					Total Bikes											
15:30	16:30		0			0			0			2				2											
16:30	17:30		2			1			2			2				7											

* Count completed by WSP



APPENDIX B

AVERAGE DAILY TRAFFIC VOLUME DATA

Table B-1
Dufferin Street
Between
Archibald Street and Lorne Street

Lunenburg, NS
Starting Thursday, October 3, 2019
Ending Friday, October 4, 2019



Volume Data									
Time		Vehicles			Bicycles			Crossing Dufferin Street	
		North-West	South-East	Total	North-West	South-East	Total	Bicycles	Pedestrians
07:00	07:15	7	12	19			0		
07:15	07:30	8	20	28			0		
07:30	07:45	16	19	35			0		
07:45	08:00	11	39	50		1	1		
08:00	08:15	20	36	56			0		
08:15	08:30	30	30	60			0		1
08:30	08:45	17	29	46			0		2
08:45	09:00	21	35	56			0		
09:00	09:15	23	26	49			0		1
09:15	09:30	18	17	35			0		
09:30	09:45	23	13	36			0		
09:45	10:00	28	25	53			0		
10:00	10:15	30	23	53			0		2
10:15	10:30	26	21	47		2	2		1
10:30	10:45	35	26	61	5		5		
10:45	11:00	26	25	51	1		1		
11:00	11:15	27	23	50	2		2		1
11:15	11:30	41	24	65		2	2	1	
11:30	11:45	28	29	57			0		
11:45	12:00	21	20	41			0		
12:00	12:15	37	25	62			0	1	2
12:15	12:30	16	19	35			0		
12:30	12:45	32	31	63			0		1
12:45	13:00	27	23	50			0		1
13:00	13:15	40	27	67		3	3		
13:15	13:30	32	26	58			0		1
13:30	13:45	28	17	45			0		
13:45	14:00	25	17	42		3	3		
14:00	14:15	41	26	67			0	1	
14:15	14:30	39	26	65			0		
14:30	14:45	42	35	77		1	1		1
14:45	15:00	38	16	54			0		
15:00	15:15	31	25	56			0		
15:15	15:30	41	30	71			0		
15:30	15:45	42	27	69			0		
15:45	16:00	38	32	70			0		2
16:00	16:15	38	35	73			0		
16:15	16:30	53	30	83			0		
16:30	16:45	49	34	83			0		
16:45	17:00	39	34	73			0		
17:00	17:15	50	22	72		1	1		
17:15	17:30	46	27	73			0		
17:30	17:45	39	26	65			0		
17:45	18:00	25	20	45			0		4
18:00	18:15	14	18	32			0		
18:15	18:30	20	18	38			0		
18:30	18:45	19	30	49			0		
18:45	19:00	21	28	49			0		
19:00	19:15	19	18	37			0		
19:15	19:30	14	20	34			0		
19:30	19:45	13	12	25			0		
19:45	20:00	7	15	22			0		
20:00	20:15	18	9	27			0		
20:15	20:30	10	8	18			0		
20:30	20:45	13	7	20			0		
20:45	21:00	13	5	18			0		
21:00	21:15	7	1	8			0		
21:15	21:30	9	4	13			0		
21:30	21:45	6	4	10			0		
21:45	22:00	22	3	25			0		
22:00	22:15	17	1	18			0		
22:15	22:30	5	1	6			0		
22:30	22:45	3	3	6			0		
22:45	23:00	6	1	7			0		
23:00	23:15	2	1	3			0		
23:15	23:30	2	3	5			0		
23:30	23:45	3	0	3			0		
23:45	00:00	2	0	2			0		
00:00	00:15	2	0	2			0		
00:15	00:30	1	1	2			0		
00:30	00:45	0	0	0			0		
00:45	01:00	0	0	0			0		
01:00	01:15	0	0	0			0		
01:15	01:30	2	0	2			0		
01:30	01:45	1	0	1			0		
01:45	02:00	0	0	0			0		
02:00	02:15	1	1	2			0		
02:15	02:30	1	0	1			0		
02:30	02:45	1	0	1			0		
02:45	03:00	0	0	0			0		
03:00	03:15	0	0	0			0		
03:15	03:30	0	0	0			0		
03:30	03:45	0	0	0			0		
03:45	04:00	1	0	1			0		
04:00	04:15	1	0	1			0		
04:15	04:30	0	1	1			0		
04:30	04:45	1	1	2			0		
04:45	05:00	1	2	3			0		
05:00	05:15	0	2	2			0		
05:15	05:30	0	2	2			0		
05:30	05:45	0	2	2			0		
05:45	06:00	1	2	3			0		
06:00	06:15	2	1	3			0		
06:15	06:30	2	5	7			0		
06:30	06:45	3	3	6			0		
06:45	07:00	3	5	8			0		
24-Hour Summary		1633	1360	2993	8	13	21	3	20
		Vehicles			Bicycles			Crossing Dufferin Street	
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles	Pedestrians
AM Peak Hour		88	130	218	0	0	0	0	3
Midday Peak Hour		127	98	225	0	2	2	2	2
PM Peak Hour		179	133	312	0	0	0	0	0

* Count completed by WSP

Table B-2
Dufferin Street
Between
Archibald Street and Lorne Street

Lunenburg, NS
 Starting Saturday, October 5, 2019
 Ending Sunday, October 6, 2019



Volume Data									
Time		Vehicles			Bicycles			Crossing Dufferin Street	
		North-West	South-East	Total	North-West	South-East	Total	Bicycles	Pedestrians
07:00	07:15	3	3	6			0		
07:15	07:30	4	10	14			0		
07:30	07:45	8	5	13			0		
07:45	08:00	4	8	12			0		
08:00	08:15	6	15	21			0		
08:15	08:30	4	4	8			0		
08:30	08:45	12	16	28			0		
08:45	09:00	9	13	22		1	1		
09:00	09:15	12	14	26			0		
09:15	09:30	16	24	40			0		
09:30	09:45	16	16	32		1	1		
09:45	10:00	19	23	42			0		
10:00	10:15	21	25	46			0		
10:15	10:30	18	13	31	1		1		1
10:30	10:45	17	28	45			0		
10:45	11:00	22	26	48			0		1
11:00	11:15	23	23	46		1	1		
11:15	11:30	19	22	41			0		1
11:30	11:45	17	48	65			0		
11:45	12:00	30	35	65			0		
12:00	12:15	22	42	64			0		
12:15	12:30	19	24	43		2	2		
12:30	12:45	25	36	61			0		
12:45	13:00	23	21	44			0		
13:00	13:15	34	25	59			0		
13:15	13:30	27	51	78			0		
13:30	13:45	33	32	65			0		
13:45	14:00	31	55	86			0		
14:00	14:15	34	38	72			0		
14:15	14:30	26	38	64			0		1
14:30	14:45	26	31	57			0		1
14:45	15:00	34	36	70	1		1		
15:00	15:15	50	40	90		1	1		
15:15	15:30	28	33	61			0		
15:30	15:45	42	28	70			0		2
15:45	16:00	39	22	61	2		2		
16:00	16:15	29	33	62			0		
16:15	16:30	29	30	59	1	3	4		
16:30	16:45	33	34	67			0		
16:45	17:00	27	34	61			0		
17:00	17:15	35	34	69			0		
17:15	17:30	26	21	47			0		
17:30	17:45	31	18	49			0		
17:45	18:00	21	32	53			0		
18:00	18:15	22	16	38			0		2
18:15	18:30	24	16	40			0		1
18:30	18:45	25	16	41			0		
18:45	19:00	26	10	36			0		
19:00	19:15	16	29	45		1	1		
19:15	19:30	15	31	46			0		
19:30	19:45	11	18	29			0		
19:45	20:00	7	12	19			0		
20:00	20:15	13	6	19			0		
20:15	20:30	10	6	16			0		2
20:30	20:45	9	3	12			0		
20:45	21:00	7	2	9			0		
21:00	21:15	7	8	15			0		
21:15	21:30	5	2	7			0		
21:30	21:45	5	7	12			0		
21:45	22:00	6	9	15			0		
22:00	22:15	10	2	12			0		
22:15	22:30	4	5	9			0		
22:30	22:45	11	1	12			0		
22:45	23:00	33	2	35			0		
23:00	23:15	5	0	5			0		
23:15	23:30	2	4	6			0		
23:30	23:45	6	3	9			0		
23:45	00:00	6	0	6			0		
00:00	00:15	1	0	1			0		
00:15	00:30	2	2	4			0		
00:30	00:45	0	1	1			0		
00:45	01:00	0	0	0			0		
01:00	01:15	0	0	0			0		
01:15	01:30	1	0	1			0		
01:30	01:45	2	0	2			0		
01:45	02:00	1	1	2			0		
02:00	02:15	1	0	1			0		
02:15	02:30	1	0	1			0		
02:30	02:45	0	0	0			0		
02:45	03:00	0	2	2			0		
03:00	03:15	0	0	0			0		
03:15	03:30	0	0	0			0		
03:30	03:45	0	0	0			0		
03:45	04:00	0	0	0			0		
04:00	04:15	0	0	0			0		
04:15	04:30	1	1	2			0		
04:30	04:45	0	0	0			0		
04:45	05:00	1	0	1			0		
05:00	05:15	0	1	1			0		
05:15	05:30	0	0	0			0		
05:30	05:45	1	4	5			0		
05:45	06:00	0	1	1			0		
06:00	06:15	0	2	2			0		
06:15	06:30	2	2	4			0		
06:30	06:45	0	0	0			0		
06:45	07:00	4	3	7			0		
24-Hour Summary		1307	1387	2694	5	10	15	0	12
		Vehicles			Bicycles			Crossing Dufferin Street	
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles	Pedestrians
AM Peak Hour		49	67	116	0	1	1	0	0
Midday Peak Hour		88	149	237	0	2	2	0	0
PM Peak Hour		124	132	256	1	3	4	0	0

* Count completed by WSP

Table B-3 Falkland Street Between Victoria Street and Lincoln Street <i>Lunenburg, NS</i> Starting Thursday, October 3, 2019 Ending Friday, October 4, 2019									
									
Volume Data									
Time		Vehicles			Bicycles			Crossing Dufferin Street	
		North-East	South-West	Total	North-East	South-West	Total	Bicycles	Pedestrians
07:00	07:15	33	25	58		1	1		
07:15	07:30	34	31	65			0		
07:30	07:45	39	48	87	1		1		
07:45	08:00	61	63	124		1	1		2
08:00	08:15	84	98	182		2	2		3
08:15	08:30	84	73	157			0		
08:30	08:45	63	59	122			0		
08:45	09:00	98	70	168	1		1		4
09:00	09:15	74	63	137		3	3		
09:15	09:30	79	63	142			0		3
09:30	09:45	87	77	164			0		1
09:45	10:00	86	60	146			0		3
10:00	10:15	97	63	160			0		1
10:15	10:30	92	61	153			0		2
10:30	10:45	81	63	144		1	1		4
10:45	11:00	88	60	148	2		2		1
11:00	11:15	92	68	160			0		2
11:15	11:30	90	69	159		1	1		
11:30	11:45	90	80	170		1	1		1
11:45	12:00	112	50	162	1		1		4
12:00	12:15	94	72	166		1	1		4
12:15	12:30	81	59	140			0		1
12:30	12:45	65	70	135			0		1
12:45	13:00	102	48	150		1	1		1
13:00	13:15	78	67	145			0		1
13:15	13:30	80	61	141			0		1
13:30	13:45	70	64	134			0		1
13:45	14:00	74	46	120			0		2
14:00	14:15	83	67	150			0		1
14:15	14:30	85	82	167			0		
14:30	14:45	90	83	173	1	1	2		1
14:45	15:00	95	67	162			0		2
15:00	15:15	73	91	164			0		
15:15	15:30	82	75	157			0		3
15:30	15:45	92	60	152			0		1
15:45	16:00	83	90	173			0		4
16:00	16:15	93	78	171			0		25
16:15	16:30	75	69	144			0		
16:30	16:45	75	95	170	2	1	3		1
16:45	17:00	80	81	161		1	1		1
17:00	17:15	85	73	158		2	2		10
17:15	17:30	67	63	130	2		2		2
17:30	17:45	52	52	104	1		1		3
17:45	18:00	59	43	102			0		4
18:00	18:15	51	47	98		1	1		3
18:15	18:30	49	39	88			0		5
18:30	18:45	55	51	106			0		6
18:45	19:00	56	41	97	1		1		8
19:00	19:15	46	33	79			0		7
19:15	19:30	34	34	68			0		1
19:30	19:45	30	41	71		1	1		1
19:45	20:00	27	28	55			0		
20:00	20:15	27	40	67			0		3
20:15	20:30	26	34	60			0		
20:30	20:45	20	20	40		1	1		
20:45	21:00	13	25	38	1		1		
21:00	21:15	24	17	41			0		
21:15	21:30	15	19	34			0		
21:30	21:45	6	9	15			0		
21:45	22:00	12	36	48			0		1
22:00	22:15	15	16	31			0		
22:15	22:30	9	4	13			0		1
22:30	22:45	3	7	10			0		
22:45	23:00	4	2	6			0		
23:00	23:15	2	1	3			0		
23:15	23:30	1	2	3			0		
23:30	23:45	5	8	13			0		
23:45	00:00	4	4	8			0		
00:00	00:15	5	1	6			0		
00:15	00:30	1	3	4			0		
00:30	00:45	0	1	1			0		
00:45	01:00	2	8	10			0		
01:00	01:15	0	1	1			0		
01:15	01:30	1	2	3			0		2
01:30	01:45	2	0	2			0		
01:45	02:00	0	0	0			0		
02:00	02:15	1	0	1			0		
02:15	02:30	1	3	4			0		
02:30	02:45	4	0	4			0		
02:45	03:00	0	1	1			0		
03:00	03:15	0	1	1			0		
03:15	03:30	2	1	3			0		
03:30	03:45	1	0	1			0		
03:45	04:00	1	0	1			0		
04:00	04:15	1	1	2			0		
04:15	04:30	2	3	5			0		
04:30	04:45	3	2	5			0		
04:45	05:00	4	4	8			0		
05:00	05:15	1	6	7			0		
05:15	05:30	5	4	9			0		
05:30	05:45	5	7	12			0		
05:45	06:00	11	12	23			0		
06:00	06:15	8	9	17			0		1
06:15	06:30	10	16	26			0		
06:30	06:45	19	17	36			0		
06:45	07:00	40	19	59			0		
24-Hour Summary		4141	3580	7721	13	20	33	0	140
		Vehicles			Bicycles			Crossing Dufferin Street	
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles	Pedestrians
AM Peak Hour		329	300	629	1	2	3	0	7
Midday Peak Hour		386	271	657	1	3	4	0	9
PM Peak Hour		326	332	658	2	1	3	0	30

* Count completed by WSP

Table B-4
Falkland Street
Between
Victoria Street and Lincoln Street

Lunenburg, NS
 Starting Saturday, October 5, 2019
 Ending Sunday, October 6, 2019



Volume Data								
Time		Vehicles			Bicycles			Crossing Dufferin Street
		North-East	South-West	Total	North-East	South-West	Total	Bicycles Pedestrians
07:00	07:15	15	12	27			0	2
07:15	07:30	19	15	34			0	
07:30	07:45	23	25	48			0	1
07:45	08:00	32	24	56			0	
08:00	08:15	29	21	50			0	3
08:15	08:30	29	44	73			0	
08:30	08:45	35	40	75			0	
08:45	09:00	45	31	76			0	
09:00	09:15	49	37	86			0	1
09:15	09:30	42	41	83			0	
09:30	09:45	73	57	130			0	
09:45	10:00	78	58	136			0	1
10:00	10:15	57	68	125			0	4
10:15	10:30	57	64	121			0	1
10:30	10:45	50	59	109			0	1
10:45	11:00	77	65	142		1	1	1
11:00	11:15	58	62	120			0	6
11:15	11:30	142	124	266	1	3	4	6
11:30	11:45	71	76	147	1	3	4	
11:45	12:00	71	63	134	2	1	3	3
12:00	12:15	78	62	140	2		2	2
12:15	12:30	58	54	112		1	1	
12:30	12:45	77	61	138			0	2
12:45	13:00	56	51	107			0	1
13:00	13:15	72	53	125		2	2	2
13:15	13:30	66	61	127	1	1	2	3
13:30	13:45	65	64	129			0	2
13:45	14:00	68	54	122			0	4
14:00	14:15	74	58	132			0	
14:15	14:30	72	60	132	1		1	
14:30	14:45	67	52	119			0	3
14:45	15:00	70	57	127		1	1	4
15:00	15:15	54	65	119			0	2
15:15	15:30	59	52	111	1		1	2
15:30	15:45	63	75	138			0	8
15:45	16:00	61	56	117			0	2
16:00	16:15	59	73	132			0	1
16:15	16:30	57	51	108			0	2
16:30	16:45	49	57	106			0	2
16:45	17:00	53	54	107			0	4
17:00	17:15	55	63	118			0	5
17:15	17:30	49	68	117			0	
17:30	17:45	55	29	84			0	4
17:45	18:00	59	35	94			0	3
18:00	18:15	51	43	94			0	1
18:15	18:30	43	42	85			0	2
18:30	18:45	55	48	103		1	1	4
18:45	19:00	42	36	78			0	1
19:00	19:15	42	29	71	1		1	1
19:15	19:30	42	34	76			0	1
19:30	19:45	27	38	65			0	1
19:45	20:00	20	25	45			0	3
20:00	20:15	23	21	44	1		1	1
20:15	20:30	16	29	45			0	
20:30	20:45	19	17	36			0	
20:45	21:00	13	12	25			0	1
21:00	21:15	14	17	31			0	
21:15	21:30	12	15	27			0	
21:30	21:45	15	15	30			0	1
21:45	22:00	8	16	24			0	
22:00	22:15	12	13	25			0	
22:15	22:30	1	5	6			0	
22:30	22:45	4	13	17			0	
22:45	23:00	3	15	18			0	
23:00	23:15	3	12	15			0	
23:15	23:30	7	4	11			0	
23:30	23:45	2	6	8			0	
23:45	00:00	3	6	9			0	
00:00	00:15	2	3	5			0	
00:15	00:30	2	6	8			0	
00:30	00:45	3	4	7			0	
00:45	01:00	1	3	4			0	
01:00	01:15	3	3	6			0	
01:15	01:30	1	1	2			0	
01:30	01:45	1	1	2			0	2
01:45	02:00	1	5	6			0	
02:00	02:15	0	1	1			0	
02:15	02:30	1	0	1			0	
02:30	02:45	0	1	1			0	
02:45	03:00	1	3	4			0	
03:00	03:15	2	1	3			0	
03:15	03:30	1	1	2			0	
03:30	03:45	0	0	0			0	
03:45	04:00	0	0	0			0	
04:00	04:15	0	0	0			0	
04:15	04:30	1	1	2			0	
04:30	04:45	0	0	0			0	
04:45	05:00	0	0	0			0	
05:00	05:15	0	0	0			0	
05:15	05:30	1	1	2			0	
05:30	05:45	3	8	11			0	
05:45	06:00	5	4	9			0	
06:00	06:15	5	4	9			0	
06:15	06:30	1	2	3			0	
06:30	06:45	3	5	8			0	1
06:45	07:00	6	3	9			0	
24-Hour Summary		3069	2923	5992	11	14	25	3 108
		Vehicles			Bicycles			Crossing Dufferin Street
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles Pedestrians
AM Peak Hour		171	149	320	0	0	0	0 1
Midday Peak Hour		362	325	687	6	7	13	0 11
PM Peak Hour		240	255	495	0	0	0	0 13

* Count completed by WSP

Table B-5									
Montague Street Between Cornwallis Street and King Street									
Lunenburg, NS Starting Thursday, October 3, 2019 Ending Friday, October 4, 2019									
Volume Data									
Time		Vehicles			Bicycles			Crossing Dufferin Street	
		Eastbound	Westbound	Total	Eastbound	Westbound	Total	Bicycles	Pedestrians
07:00	07:15	4		4			0		
07:15	07:30	11		11			0		1
07:30	07:45	10		10			0		1
07:45	08:00	27		27			0		
08:00	08:15	11		11			0		3
08:15	08:30	11		11			0		5
08:30	08:45	13		13			0		5
08:45	09:00	14		14	1		1		2
09:00	09:15	18		18			0		4
09:15	09:30	13		13			0		14
09:30	09:45	12		12			0		5
09:45	10:00	16		16			0		1
10:00	10:15	21		21			0		
10:15	10:30	18		18			0		4
10:30	10:45	22		22			0		1
10:45	11:00	33		33			0		9
11:00	11:15	19		19			0		14
11:15	11:30	20		20			0		17
11:30	11:45	22		22			0		10
11:45	12:00	19		19			0		14
12:00	12:15	18		18	1		1		12
12:15	12:30	20		20			0		20
12:30	12:45	22		22			0		22
12:45	13:00	21		21			0		32
13:00	13:15	28		28			0		39
13:15	13:30	22		22			0		19
13:30	13:45	22		22	1		1		21
13:45	14:00	26		26			0		48
14:00	14:15	35		35			0		27
14:15	14:30	20		20			0		12
14:30	14:45	28		28			0		16
14:45	15:00	18		18			0		12
15:00	15:15	11		11			0		29
15:15	15:30	19		19			0		11
15:30	15:45	22		22			0		19
15:45	16:00	24		24			0		25
16:00	16:15	26		26			0		14
16:15	16:30	24		24			0		20
16:30	16:45	25		25	1		1		16
16:45	17:00	20		20			0		15
17:00	17:15	23		23	1		1		13
17:15	17:30	18		18			0		14
17:30	17:45	20		20	1		1		8
17:45	18:00	20		20			0		2
18:00	18:15	19		19			0		7
18:15	18:30	14		14			0		10
18:30	18:45	17		17			0		10
18:45	19:00	11		11	1		1		14
19:00	19:15	12		12			0		8
19:15	19:30	12		12			0		7
19:30	19:45	9		9	1		1		3
19:45	20:00	10		10			0		4
20:00	20:15	13		13			0		20
20:15	20:30	12		12			0		5
20:30	20:45	4		4			0		8
20:45	21:00	7		7			0		1
21:00	21:15	1		1			0		3
21:15	21:30	3		3			0		3
21:30	21:45	2		2			0		2
21:45	22:00	3		3		1	1		5
22:00	22:15	1		1			0		1
22:15	22:30	0		0			0		1
22:30	22:45	2		2			0		1
22:45	23:00	1		1			0		
23:00	23:15	1		1			0		2
23:15	23:30	0		0			0		
23:30	23:45	3		3			0		1
23:45	00:00	1		1			0		0
00:00	00:15	1		1			0		3
00:15	00:30	0		0			0		
00:30	00:45	0		0			0		1
00:45	01:00	1		1			0		3
01:00	01:15	0		0			0		
01:15	01:30	0		0			0		4
01:30	01:45	0		0			0		
01:45	02:00	0		0			0		
02:00	02:15	1		1			0		
02:15	02:30	0		0			0		
02:30	02:45	0		0			0		
02:45	03:00	1		1			0		
03:00	03:15	0		0			0		
03:15	03:30	1		1			0		
03:30	03:45	0		0			0		
03:45	04:00	0		0			0		
04:00	04:15	0		0			0		
04:15	04:30	3		3			0		
04:30	04:45	1		1			0		
04:45	05:00	1		1			0		
05:00	05:15	0		0			0		
05:15	05:30	0		0			0		
05:30	05:45	1		1			0		
05:45	06:00	0		0			0		
06:00	06:15	0		0			0		
06:15	06:30	3		3			0		
06:30	06:45	2		2			0		
06:45	07:00	7		7			0		1
24-Hour Summary		1047	0	1047	8	1	9	0	887
		Vehicles			Bicycles			Crossing Dufferin Street	
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles	Pedestrians
AM Peak Hour		62	0	62	0	0	0	0	13
Midday Peak Hour		81	0	81	1	0	1	0	86
PM Peak Hour		99	0	99	1	0	1	0	75

* Count completed by WSP

Table B-6
Montague Street
Between
Cornwallis Street and King Street

Lunenburg, NS
 Starting Saturday, October 5, 2019
 Ending Sunday, October 6, 2019



Volume Data								
Time		Vehicles			Bicycles			Crossing Dufferin Street
		Eastbound	Westbound	Total	Eastbound	Westbound	Total	Bicycles Pedestrians
07:00 07:15		2		2			0	
07:15 07:30		8		8			0	3
07:30 07:45		6		6			0	2
07:45 08:00		10		10			0	3
08:00 08:15		13		13			0	6
08:15 08:30		6		6			0	2
08:30 08:45		10		10			0	5
08:45 09:00		6		6			0	5
09:00 09:15		10		10			0	4
09:15 09:30		11		11			0	10
09:30 09:45		13		13			0	7
09:45 10:00		22		22			0	8
10:00 10:15		11		11	2		2	3
10:15 10:30		7		7			0	6
10:30 10:45		14		14			0	11
10:45 11:00		14		14			0	4
11:00 11:15		10		10			0	7
11:15 11:30		20		20	1		1	8
11:30 11:45		27		27			0	10
11:45 12:00		14		14			0	16
12:00 12:15		21		21			0	15
12:15 12:30		18		18			0	22
12:30 12:45		16		16			0	19
12:45 13:00		14		14			0	22
13:00 13:15		19		19			0	25
13:15 13:30		30		30			0	14
13:30 13:45		20		20			0	31
13:45 14:00		22		22			0	29
14:00 14:15		30		30		1	1	27
14:15 14:30		32		32			0	24
14:30 14:45		27		27			0	10
14:45 15:00		28		28			0	20
15:00 15:15		8		8			0	14
15:15 15:30		22		22			0	35
15:30 15:45		15		15			0	13
15:45 16:00		11		11			0	16
16:00 16:15		15		15			0	29
16:15 16:30		18		18	1		1	18
16:30 16:45		14		14			0	20
16:45 17:00		21		21			0	7
17:00 17:15		25		25			0	27
17:15 17:30		13		13			0	29
17:30 17:45		18		18			0	23
17:45 18:00		23		23			0	10
18:00 18:15		23		23			0	12
18:15 18:30		16	1	17			0	13
18:30 18:45		17		17			0	12
18:45 19:00		14		14			0	9
19:00 19:15		15		15			0	10
19:15 19:30		13		13			0	10
19:30 19:45		12		12			0	7
19:45 20:00		7		7			0	5
20:00 20:15		9		9	1		1	1
20:15 20:30		9		9			0	1
20:30 20:45		2		2			0	3
20:45 21:00		5		5			0	3
21:00 21:15		4		4	1		1	
21:15 21:30		3		3			0	5
21:30 21:45		2		2			0	5
21:45 22:00		2		2			0	1
22:00 22:15		6		6			0	2
22:15 22:30		3		3			0	2
22:30 22:45		0		0			0	
22:45 23:00		3		3			0	1
23:00 23:15		3		3			0	
23:15 23:30		3		3			0	1
23:30 23:45		3		3			0	
23:45 00:00		0		0			0	
00:00 00:15		0		0			0	
00:15 00:30		1		1			0	1
00:30 00:45		0		0			0	
00:45 01:00		1		1			0	1
01:00 01:15		0		0			0	
01:15 01:30		1		1			0	
01:30 01:45		0		0			0	
01:45 02:00		1		1			0	
02:00 02:15		0		0			0	
02:15 02:30		0		0			0	
02:30 02:45		0		0			0	
02:45 03:00		0		0			0	
03:00 03:15		0		0			0	
03:15 03:30		0		0			0	
03:30 03:45		0		0			0	
03:45 04:00		0		0			0	
04:00 04:15		0		0			0	
04:15 04:30		0		0			0	
04:30 04:45		0		0			0	
04:45 05:00		0		0			0	
05:00 05:15		0		0			0	
05:15 05:30		0		0			0	
05:30 05:45		0		0			0	
05:45 06:00		0		0			0	
06:00 06:15		1		1			0	
06:15 06:30		0		0			0	
06:30 06:45		0		0			0	
06:45 07:00		4		4			0	
24-Hour Summary		897	1	898	6	1	7	1 723
		Vehicles			Bicycles			Crossing Dufferin Street
		Northbound	Southbound	Total	Northbound	Southbound	Total	Bicycles Pedestrians
AM Peak Hour		39	0	39	0	0	0	0 16
Midday Peak Hour		82	0	82	1	0	1	0 49
PM Peak Hour		78	0	78	1	0	1	0 72

* Count completed by WSP



APPENDIX C

SPEED AND VOLUME DATA

Location: Location 2 - Broad Street, Lunenburg, NS
Dates: Wednesday, October 2, 2019
to Monday, October 7, 2019



Start Time	Wednesday, October 2, 2019		Thursday, October 3, 2019		Friday, October 4, 2019		Saturday, October 5, 2019		Sunday, October 6, 2019		Monday, October 7, 2019		Average (5 days)		
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Total
12:00 AM			0	0	0	0	1	0	0	1	0	0	0	0	0
01:00			0	0	0	0	0	0	0	0	0	0	0	0	0
02:00			0	0	0	0	0	1	0	0	0	0	0	0	0
03:00			0	0	0	0	0	0	0	1	0	0	0	0	0
04:00			0	0	0	0	0	0	0	0	0	0	0	0	0
05:00			0	0	0	0	0	0	0	0	1	0	0	0	0
06:00			1	1	0	2	1	2	1	0	2	0	1	1	2
07:00			2	5	3	8	0	4	0	3	7	7	2	5	7
08:00			7	16	11	9	1	5	0	3	8	14	5	9	14
09:00			5	10	1	12	2	7	5	4	3	10	3	9	12
10:00			9	12	5	9	5	5	5	11	7	14	6	10	16
11:00			6	17	2	9	0	11	4	4	4	4	3	9	12
12:00 PM			7	12	9	13	8	2	10	3	11	9	9	8	17
01:00			7	12	4	6	2	10	4	9	6	8	5	9	14
02:00			6	8	10	7	5	7	8	5			7	7	14
03:00	6	10	5	11	6	14	3	5	6	8			5	10	15
04:00	10	20	12	13	13	10	7	11	1	3			9	11	20
05:00	11	7	8	3	7	9	6	2	5	3			7	5	12
06:00	8	8	6	10	6	7	6	2	4	5			6	6	12
07:00	5	3	2	5	3	7	3	3	2	3			3	4	7
08:00	3	2	5	0	4	5	1	2	3	2			3	2	5
09:00	2	1	3	2	5	1	1	3	2	1			3	2	5
10:00	0	0	0	0	1	2	1	2	1	0			1	1	2
11:00	1	1	0	1	0	1	0	1	0	0			0	1	1
Daily Total	46	52	91	138	90	131	53	85	61	69	49	66	78	109	187
	98		229		221		138		130		115		187		

Northbound	
23 km/h	15 th Percentile Speed
34 km/h	50 th Percentile Speed
33 km/h	Mean Speed
43 km/h	85 th Percentile Speed
48 km/h	95 th Percentile Speed

Southbound	
26 km/h	15 th Percentile Speed
39 km/h	50 th Percentile Speed
37 km/h	Mean Speed
47 km/h	85 th Percentile Speed
51 km/h	95 th Percentile Speed

Total	
26 km/h	15 th Percentile Speed
35 km/h	50 th Percentile Speed
35 km/h	Mean Speed
45 km/h	85 th Percentile Speed
50 km/h	95 th Percentile Speed

Location: Location 3 - Lorne Street, Lunenburg, NS
Dates: Wednesday, October 2, 2019
to Monday, October 7, 2019



Start Time	Wednesday, October 2, 2019		Thursday, October 3, 2019		Friday, October 4, 2019		Saturday, October 5, 2019		Sunday, October 6, 2019		Monday, October 7, 2019		Average (5 days)		
	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Total
12:00 AM			0	0	0	0	0	0	0	1	0	0	0	0	0
01:00			0	0	0	0	0	1	0	0	0	0	0	0	0
02:00			0	0	0	0	0	0	0	0	0	0	0	0	0
03:00			0	0	0	0	0	0	0	0	0	0	0	0	0
04:00			0	0	0	0	0	0	0	0	0	0	0	0	0
05:00			0	0	0	0	0	0	0	0	0	0	0	0	0
06:00			0	0	0	0	0	0	0	0	0	0	0	0	0
07:00			0	0	0	1	0	0	1	0	0	0	0	0	0
08:00			3	4	2	1	4	4	3	0	0	2	2	2	4
09:00			9	2	3	1	1	3	0	2	1	2	3	2	5
10:00			4	3	3	4	0	1	2	2	0	6	2	3	5
11:00			3	6	3	1	3	1	3	3	0	1	2	2	4
12:00 PM			2	4	3	5	4	4	2	3	5	1	3	3	6
01:00			2	6	3	5	1	2	5	6	1	6	2	5	7
02:00			5	3	8	9	3	6	3	5			5	6	11
03:00	1	3	3	5	4	5	3	7	6	5			3	5	8
04:00	3	5	1	4	2	7	1	2	3	2			2	4	6
05:00	2	5	4	5	1	4	5	4	1	3			3	4	7
06:00	3	4	2	6	2	3	1	3	2	2			2	4	6
07:00	1	3	2	5	2	2	1	4	0	3			1	3	4
08:00	0	2	0	1	0	1	0	1	1	0			0	1	1
09:00	1	2	0	0	2	0	1	2	0	1			1	1	2
10:00	0	2	0	2	0	0	0	0	1	0			0	1	1
11:00	0	0	0	0	0	0	1	1	0	0			0	0	0
Daily Total	11	26	40	56	38	49	29	46	33	38	7	18	31	46	77
	37		96		87		75		71		25		77		

Eastbound	
14 km/h	15 th Percentile Speed
26 km/h	50 th Percentile Speed
25 km/h	Mean Speed
34 km/h	85 th Percentile Speed
39 km/h	95 th Percentile Speed

Westbound	
16 km/h	15 th Percentile Speed
26 km/h	50 th Percentile Speed
25 km/h	Mean Speed
31 km/h	85 th Percentile Speed
34 km/h	95 th Percentile Speed

Total	
16 km/h	15 th Percentile Speed
26 km/h	50 th Percentile Speed
25 km/h	Mean Speed
31 km/h	85 th Percentile Speed
35 km/h	95 th Percentile Speed

Location: Location 4 - Montague Street, Lunenburg, NS
Dates: Wednesday, October 2, 2019
to Monday, October 7, 2019



Start Time	Wednesday, October 2, 2019	Thursday, October 3, 2019	Friday, October 4, 2019	Saturday, October 5, 2019	Sunday, October 6, 2019	Monday, October 7, 2019	Average (5 days)
	Eastbound	Eastbound	Eastbound	Eastbound	Eastbound	Eastbound	Eastbound
12:00 AM		2	1	1	1	0	1
01:00		0	0	0	0	0	0
02:00		1	0	0	0	0	0
03:00		0	1	0	0	0	0
04:00		0	3	0	0	0	1
05:00		2	0	1	0	3	1
06:00		5	4	2	2	5	4
07:00		26	19	10	5	17	15
08:00		12	28	13	3	23	16
09:00		22	29	20	15	22	22
10:00		21	27	13	14	21	19
11:00		21	28	25	19	33	25
12:00 PM		30	17	15	9	33	21
01:00		15	17	26	16	26	20
02:00		21	32	34	24		28
03:00		30	21	21	29		25
04:00	16	38	19	17	26		23
05:00	20	35	32	18	20		25
06:00	16	15	24	10	18		17
07:00	8	21	18	16	15		16
08:00	3	20	8	10	6		9
09:00	3	3	4	2	6		4
10:00	4	0	2	2	4		2
11:00	4	3	0	5	0		2
Daily Total	74	343	334	261	232	183	438

Total	
18 km/h	15 th Percentile Speed
23 km/h	50 th Percentile Speed
23 km/h	Mean Speed
29 km/h	85 th Percentile Speed
32 km/h	95 th Percentile Speed

Location: Location 5 - Montague Street, Lunenburg, NS
Dates: Wednesday, October 2, 2019
to Monday, October 7, 2019



Start Time	Wednesday, October 2, 2019		Thursday, October 3, 2019		Friday, October 4, 2019		Saturday, October 5, 2019		Sunday, October 6, 2019		Monday, October 7, 2019		Average (5 days)		
	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Total
12:00 AM			1	1	2	1	2	0	1	1	1	1	1	1	2
01:00			0	0	0	0	1	0	0	0	0	0	0	0	0
02:00			0	0	1	0	0	1	0	0	0	0	0	0	0
03:00			3	0	1	2	1	0	0	0	2	2	1	1	2
04:00			0	1	3	1	1	0	0	0	0	0	1	0	1
05:00			3	0	2	0	1	0	1	0	3	0	2	0	2
06:00			10	3	11	7	1	1	0	0	9	6	6	3	9
07:00			24	11	30	9	4	3	3	1	28	19	18	9	27
08:00			45	20	57	32	9	6	5	3	40	23	31	17	48
09:00			37	26	44	17	21	8	13	8	47	33	32	18	50
10:00			57	27	52	34	25	11	20	15	51	38	41	25	66
11:00			46	45	56	33	25	23	20	18	57	37	41	31	72
12:00 PM			59	41	61	32	24	40	21	17	68	55	47	37	84
01:00			62	26	70	35	30	34	24	26	58	43	49	33	82
02:00			57	34	64	36	33	38	29	34			46	36	82
03:00			55	27	77	31	25	28	25	29			46	29	75
04:00			49	40	43	59	27	24	26	22			36	36	72
05:00	37	25	46	25	40	28	29	16	23	16			35	22	57
06:00	27	20	28	20	40	23	25	21	18	15			28	20	48
07:00	15	12	26	14	33	8	19	4	10	7			21	9	30
08:00	15	3	22	12	10	3	6	7	7	0			12	5	17
09:00	11	4	10	2	2	3	8	2	5	1			7	2	9
10:00	5	4	6	4	2	1	5	2	2	1			4	2	6
11:00	4	1	2	1	2	1	4	0	2	1			3	1	4
Daily Total	114	69	648	380	703	396	326	269	255	215	364	257	508	337	845
	183		1028		1099		595		470		621		845		

Eastbound	
18 km/h	15 th Percentile Speed
27 km/h	50 th Percentile Speed
28 km/h	Mean Speed
37 km/h	85 th Percentile Speed
43 km/h	95 th Percentile Speed

Westbound	
16 km/h	15 th Percentile Speed
24 km/h	50 th Percentile Speed
25 km/h	Mean Speed
35 km/h	85 th Percentile Speed
40 km/h	95 th Percentile Speed

Total	
18 km/h	15 th Percentile Speed
26 km/h	50 th Percentile Speed
27 km/h	Mean Speed
35 km/h	85 th Percentile Speed
43 km/h	95 th Percentile Speed