



P.O. Box 1749
Halifax, Nova Scotia
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Item No. 14.2.4
Halifax Regional Council
August 15, 2017

TO: Mayor Savage and Members of Halifax Regional Council

Original Signed

SUBMITTED BY: _____
Councillor Tim Outhit, Chair, Transportation Standing Committee

DATE: July 28, 2017

SUBJECT: Implementation of the Macdonald Bridge Bikeway Connectors Project

ORIGIN

July 27, 2017 meeting of the Transportation Standing Committee, Item No. 15.2.

LEGISLATIVE AUTHORITY

Transportation Standing Committee Terms of Reference, section 4 (a) which states: "The Transportation Standing Committee shall oversee and review the Municipality's Regional Transportation Plans and initiatives, as follows: overseeing HRM's Regional Transportation Objectives and Transportation outcome Areas".

RECOMMENDATION

The Transportation Standing Committee recommends that Halifax Regional Council:

1. Direct the CAO to proceed with the recommended approaches to implement the Macdonald Bridge Bikeway Connectors project as described in the Discussion section of the staff report dated May 17, 2017, subject to Regional Council approval of annual capital budgets and applicable tender award reports;
2. Direct the CAO to invite the Halifax Dartmouth Bridge Commission to develop an agreement that would clarify the roles and responsibilities of implementation of this project, particularly as it pertains to the proposed new structures that would be attached to existing Macdonald Bridge infrastructure;
3. Amend the Active Transportation Priorities Plan by designating the following as "candidate routes" Dickson Street, Faulkner Street and Wyse Road between Nantucket Avenue and Thistle Street; and,
4. Approve the installation of bike lanes on the following streets: Wyse Road between Nantucket Ave and Albro Lake Road; North Street between Gottingen Street and Agricola Street; Dickson Street, and Faulkner Street between Dickson Street and Wyse Road.

BACKGROUND

A staff report dated May 17, 2017 pertaining to the implementation of the Macdonald Bridge Bikeway Connectors project was before the Transportation Standing for consideration at its meeting held on July 27, 2017.

For further information, please refer to the attached staff report dated May 17, 2017.

DISCUSSION

Staff provided an overview of the May 17, 2017 staff report and responded to questions of clarification from members of the Standing Committee in relation to the proposed bike lane installations, and the scope of the project. The Transportation Standing Committee, having reviewed this matter at its meeting held on July 27, 2017, forwarded the recommendation to Halifax Regional Council as outlined in this report.

FINANCIAL IMPLICATIONS

As outlined in the attached staff report dated May 17, 2017.

RISK CONSIDERATION

As outlined in the attached staff report dated May 17, 2017.

COMMUNITY ENGAGEMENT

The Transportation Standing Committee meetings are open to public attendance, a live webcast is provided of the meeting, and members of the public are invited to address the Committee for up to five minutes at the end of each meeting during the Public Participation portion of the meeting. The agenda, reports, video, and minutes of the Transportation Standing Committee are posted on Halifax.ca.

ENVIRONMENTAL IMPLICATIONS

As outlined in the attached staff report dated May 17, 2017.

ALTERNATIVES

The Transportation Standing Committee did not discuss alternative recommendations.

ATTACHMENTS

1. Staff report dated May 17, 2017.

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Liam MacSween, Legislative Assistant, 902.490.6521.



P.O. Box 1749
Halifax, Nova Scotia
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Attachment 1
Transportation Standing Committee
July 27, 2017

TO: Chair and Members of the Transportation Standing Committee

Original Signed

SUBMITTED BY: _____
Bruce Zvaniga, P.Eng., Director, Transportation and Public Works

DATE: May 17, 2017

SUBJECT: Implementation of the Macdonald Bridge Bikeway Connectors Project

ORIGIN

- January 28, 2014 motion of Regional Council to “champion the development of a solution to the cycling connectivity challenges at the Halifax end of the Macdonald Bridge Bikeway”. This was further to a report on the “*Mayor’s Conversation on a Healthy Liveable Community*” submitted in fall 2013;
- Recommendation #19 of the Halifax Active Transportation Priorities Plan 2014 – 2019 that “The Municipality should continue to explore solutions to improving connections of the Macdonald Bridge Bikeway on both sides of the bridge, and aim to implement a solution on the Halifax side concurrent with the end of the re-decking project.”; and
- September 22, 2015 motion of Regional Council “THAT Halifax Regional Council direct staff to continue planning bridge bikeway access improvements on both sides of the bridge, pursue funding partnerships and determine requirements for any land use agreements. It is recommended that on the Dartmouth side of the bridge, that staff continue to develop two options:
 1. an access directly from the bikeway to Lyle and Dickson Streets which would connect with proposed bicycle routes into downtown Dartmouth and north end Dartmouth; and,
 2. enhancements at the Wyse Road and the Nantucket intersection to facilitate improved access from the bridge bikeway to the street network and to a planned bicycle route through the Dartmouth Common to communities east of the bridge.

On the Halifax side, it is recommended that staff continue to develop a “flyover ramp” option that would also incorporate enhancements to the intersection of Gottingen and North Streets to facilitate access to the street network and origins and destinations in the north (e.g. north end of the peninsula), west (e.g. western mainland and peninsula west end) and south (e.g. commons, hospitals and universities).”

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter, clause 79 (1) (aa): “The Council may expend money required by the

Municipality for (aa) streets, culverts, retaining walls, sidewalks, curbs and gutters;”

Halifax Regional Municipality Charter, subsection 61 (1): “The Municipality may acquire and own property granted or conveyed to the Municipality either absolutely or in trust for a public or charitable purpose.”

Halifax Regional Municipality Charter, clause 79 (1)(ah): “The Council may expend money required by the Municipality for: (ah) playgrounds, trails...bicycle paths, swimming pools, ice arenas and other recreational facilities;”

Motor Vehicle Act, subsection 90 (3) “The traffic authority may also mark lanes for traffic on street pavements at such places as he may deem advisable, consistent with this Act and may erect traffic signals consistent with this Act to control the use of lanes for traffic.”

Administrative Order One, the Procedures of Council Administrative Order, Schedule 7, Transportation Standing Committee Terms of Reference, clause 7(b) which states: “The Transportation Standing Committee shall...(b) promote and encourage the Municipality’s Active Transportation corridor initiatives which supports the overall Transportation Strategy as outlined in the Regional Plan”.

RECOMMENDATIONS

It is recommended that the Transportation Standing Committee recommend that Halifax Regional Council:

1. Direct the CAO to proceed with the recommended approaches to implement the Macdonald Bridge Bikeway Connectors project as described in the Discussion section of this report, subject to Regional Council approval of annual capital budgets and applicable tender award reports;
2. Direct the CAO to invite the Halifax Dartmouth Bridge Commission to develop an agreement that would clarify the roles and responsibilities of implementation of this project, particularly as it pertains to the proposed new structures that would be attached to existing Macdonald Bridge infrastructure;
3. Amend the Active Transportation Priorities Plan by designating the following as “candidate routes” Dickson Street, Faulkner Street and Wyse Road between Nantucket Avenue and Thistle Street; and,
4. Approve the installation of bike lanes on the following streets: Wyse Road between Nantucket Ave and Albro Lake Road; North Street between Gottingen Street and Agricola Street; Dickson Street, and Faulkner Street between Dickson Street and Wyse Road.

BACKGROUND

The Angus L. Macdonald Bridge is a critical transportation link in the municipality for vehicles, transit, pedestrians and bicycles. It provides the only bicycling connection between the Halifax peninsula and Dartmouth and is therefore a critical link in Halifax’s developing bicycle route network. It is a link in Halifax’s vision for a greenway trail network and is a designated section of the national Trans Canada Trail. It is also expected to be a key segment in the provincial Blue Route bicycling network. There are approximately 500 bicycling trips per day across the bridge (with higher counts in the summer and lower counts in the winter).

Before 1999, people were required to walk their bicycles over the bridge on a single sidewalk shared with pedestrians. A separated bikeway and pedway were added to the bridge in 1999 as part of the addition of a third reversible lane and connection improvements for motor vehicles. The addition of a separated bikeway represented a significant improvement over the prior situation.

Despite this improvement, the access points to the Bridge Bikeway are a challenge and are not accessible to a wide range of the population. On the Halifax side, access to the Bikeway is under the bridgehead

which provides good connections to the CFB Dockyard and downtown Halifax, via the Barrington AT Greenway. Those going to, and arriving from all other parts of the peninsula and beyond, however, are required to contend with high traffic volumes, busy intersections and steep grades. On the Dartmouth side people on bicycles need to navigate the busy and complex Wyse Road - Nantucket Avenue - Macdonald Bridge intersection. These conditions were detailed in the September 2015 Regional Council report entitled "Improving Access to the Macdonald Bridge Bikeway". In summary, access off and on the bridge bikeway on both sides of the bridge is challenging and inconsistent with the Active Transportation Priorities Plan to develop a bikeway network that is suitable for "all ages and abilities" (AAA), including new bicyclists.

Studies to remedy the situation between 2001 and 2015 provided helpful analysis and information, but did not lead to implementation of a solution. One limitation of these studies was that they focussed only on the Halifax side and did not consider connections off the bridge, through adjacent intersections and onto the current and planned bikeway network. Improving this situation was the top project priority of the 2014 Active Transportation Priorities Plan. In September 2015, Regional Council directed staff to plan improvements on both sides of the bridge.

The Active Transportation Priorities Plan recommends considering how improved access to the bikeway could be achieved together with the Macdonald Bridge redecking project. Early in the planning process, it was determined in conjunction with Halifax Harbour Bridges that the scale and complexity of the redecking project was such that trying to implement this project concurrently was not feasible.

The policy rationale for this project comes from a number of initiatives approved by Regional Council. The 2014 Active Transportation Priorities Plan had a recommendation to improve access to the Bridge Bikeway and this project was ranked as the number two project priority in that plan. The number one priority was implementation of the Regional Centre Bikeway network which this project would help facilitate. The Active Transportation Priorities Plan also recommends installing the type of infrastructure that is preferred by new bicyclists (i.e. all ages and abilities or "AAA"). Improving access to the Bridge Bikeway was also a project identified in the *Mayor's Conversation on a Healthy Liveable Community* as approved by Council in 2013.

Furthermore, policy rationale for this project is reflected in the 2014 Halifax Regional Municipal Planning Strategy which calls for "...a choice of integrated and connected travel options emphasizing public and community based transit, active transportation, carpool and other viable alternatives to the single occupant vehicle;" and "Design complete streets for all ages, abilities and travel options." This project also aims to help facilitate implementation of aspects from Halifax Transit's Moving Forward Together Plan, particularly as it relates to the North-Gottingen Intersection. As improvements for bicyclists are realized, we would also integrate transit signal priority, upgrade passenger amenities at bus stops to accommodate new corridor route #1, and aim to improve accessibility.

Some of the recommended project elements, such as crossrides and bicycle traffic signals, are not yet enabled under the provincial Motor Vehicle Act. Currently there is a process underway between HRM and the Provincial government to request the use of such treatments in Nova Scotia.

This report also recommends that Regional Council approve installation of bicycling facilities on four streets. Recommendation 23 of the AT Priorities Plan states that:

Maps 2B & C identify streets that Council has confirmed as candidate routes for bicycle lanes in the Regional Centre. Prior to establishing these painted (or protected) bicycle lanes there should be:

- *More detailed review of each corridor under criteria listed in Appendix E;*
- *Public engagement; and*
- *Regional Council approval.*

The proposed configurations of these facilities are described in the discussion section.

Descriptions of the proposed facility types are as follows:

- Buffered Bike Lanes - These are typically 1.5 metre painted bike lanes with an additional hatched buffer of about 60 cm between the bike lane and the vehicle lane. For this project, the

recommendation is to consider if and how protective elements such as bollards or other devices could be added to the buffer area to provide additional protection.

- Parking Protected Bike Lane - This is a bike lane that is located next to the curb and separated from traffic by a painted buffer, parked vehicles and sometimes a curb or bollards.
- Local Street Bikeway - These are streets with low motorized traffic volumes and speeds, modified to optimize bicycle travel and which include features that are intended to create conditions on the streets where people of all ages and cycling abilities can comfortably share the street with motor vehicles without the addition of separate bicycle lanes or paths.
- Multi-Use Pathway – this is the technical term for shared three – four metre wide facilities for walking and bicycling that are separated from the road. They are also referred to as “Greenways” or “Trails”.
- Bi-Directional Bikeway - This is a two-way pair of bike lanes, exclusively for bicycles, that is on or off the road and is separated from vehicle traffic.
- Crossride - This is similar to a pedestrian crosswalk, but for bikes. They are usually installed with special bicycle traffic signals. HRM is currently working with the Province to enable their use in Nova Scotia.

DISCUSSION

Following the selection of a consultant, the Macdonald Bridge Bikeway Connectors planning project began in May 2016. The project aimed to identify “all ages and abilities” access routes to the bikeway on both sides of Halifax Harbour. The project conducted functional planning and design of two connecting structures, intersection modifications to facilitate dedicated bicycle crossings, and 3.5 km of on-street bike routes that connect to the existing and planned regional bicycle network.

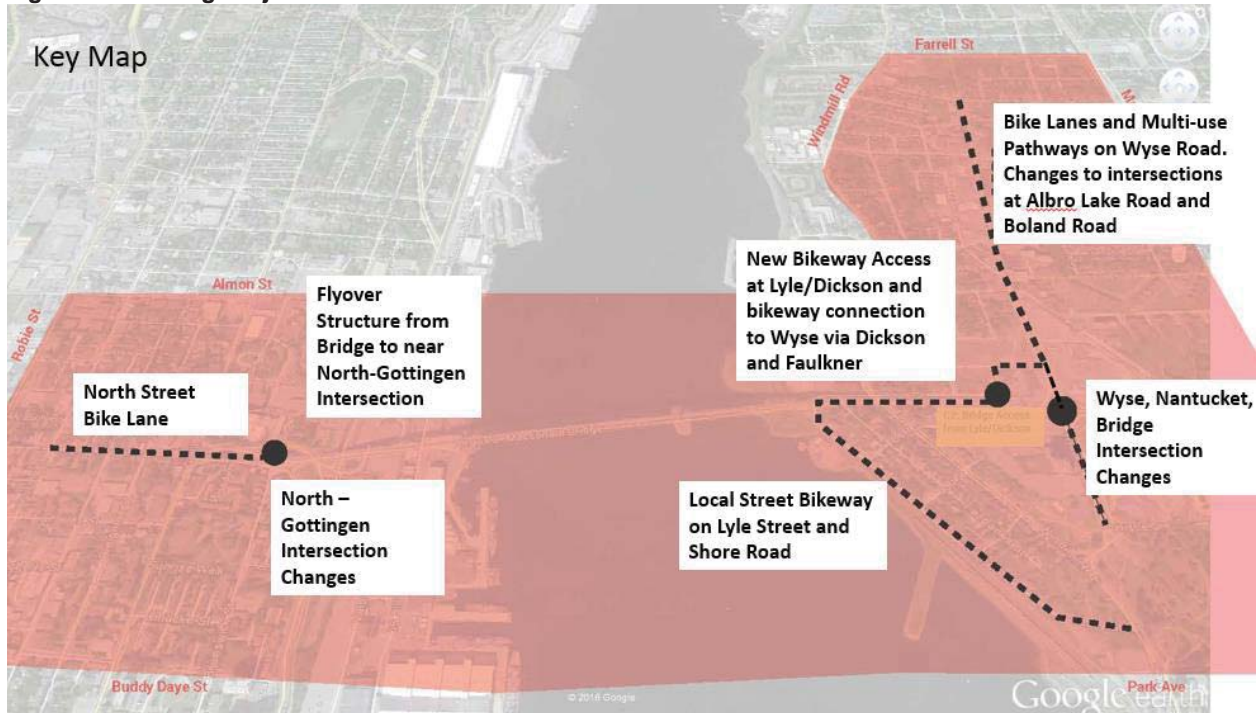
The overall purpose of functional planning and design was to analyze and develop the preferred options to improve bikeway access. Options needed to be practical or “implementable” given the many factors that need to be considered in these areas. A key consideration in developing the recommended options was to plan for safer facilities that would be more comfortable to a wide range of residents and visitors, including people who do not currently bicycle regularly now. Finally, the options consider both the direct connections at the bridgeheads, as well as adjacent streets connecting to the bridgeheads.

Key elements of planning for the Macdonald Bridge Bikeway Connectors project included:

- Retention of a planning and engineering consultant. Parsons Engineering from Ottawa was selected and began work in May 2016 and submitted their final report a year later;
- The formation of the project Steering Committee with representation from Halifax Harbour Bridges, and Halifax Regional Municipality groups of Halifax Transit, Traffic Management, Project Planning and Design, and Planning and Development;
- Collection of baseline information on the study area. This included physical dimensions, topographical survey, intersection counts, intersection analysis, property ownership, related planning projects, and more;
- The development of conceptual options to meet project goals;
- Refinement and “optimization” of these options based on the background research and analysis and the advice of the Steering Committee;
- The presentation of the options to stakeholders and the public for feedback;
- The development of complete preliminary design drawings, preliminary design for structures, intersection analysis and proposals for new signals;
- The development of “class “C” cost estimates to help inform decision-making, budgeting and partnership development; and,
- Identification of property requirements and potential funding partnerships.

The recommended options, including cost, property requirements and other factors are described below.

Figure 1: Planning Project Elements



Dartmouth Bikeway Connector Options and Recommendations

On the Dartmouth side, the goal is to improve safety and comfort at the bridgehead, and to consider bike routes to connect communities in the north (via Wyse Road and parallel local streets), south (via Wyse Road and Lyle Street/Shore Road) and east (via Wyse Road and connecting into the Dartmouth Common).

On the Dartmouth side of the bridge the project considered: 1) addition of bicycle facilities within the Wyse Road, Nantucket Avenue, Macdonald Bridge intersection; 2) A new access directly to the Bridge Bikeway at the intersection of Lyle and Dickson Streets; and, 3) bikeways or multi-use pathways on Wyse Road, Dickson Street, Faulkner Street, Lyle Street and Shore Road.

1) Addition of Bicycle Facilities within the Wyse Road, Nantucket Avenue, Macdonald Bridge Intersection.

The goal for this project element was to determine if dedicated space for bicycles could be integrated within the intersection. This would provide bicyclists with comfortable access to and from the south or east between the bridgehead and the Dartmouth Common in front of the Sportsplex. Conceptual options for bicycle crossrides next to the pedestrian crosswalks and a protected intersection were explored. To implement these changes would require relocation of at least some curbs, traffic lights and potentially overhead sign structures. There may be property implications as well.

The existing intersection is not a comfortable place to bicycle and the access to the Macdonald Bridge Bikeway is via a sidewalk. The preliminary review of this intersection noted that it is operating at capacity for vehicles at peak hours, is critical for Halifax Transit routes, and that pedestrian improvements should also be considered, as well as overall design and aesthetics.

A critical factor in making decisions on this option was the potential removal of toll booths from the Macdonald Bridge and move to full electronic fare collection. This remains a proposal that Halifax Harbour Bridges will be considering for implementation in the three-five year timeframe. Given that such a project would likely result in a need/opportunity for a reconstruction of this intersection, the Steering Committee advised against an immediate reconfiguration until a decision is made on the future of the toll booths.

Recommended Approach for Wyse Road, Nantucket Avenue, Macdonald Bridge Intersection:

Given the potential changes to bridge fare collection systems and the opportunity for a number of changes at this intersection, a two-phase approach is recommended to improve bicycle access:

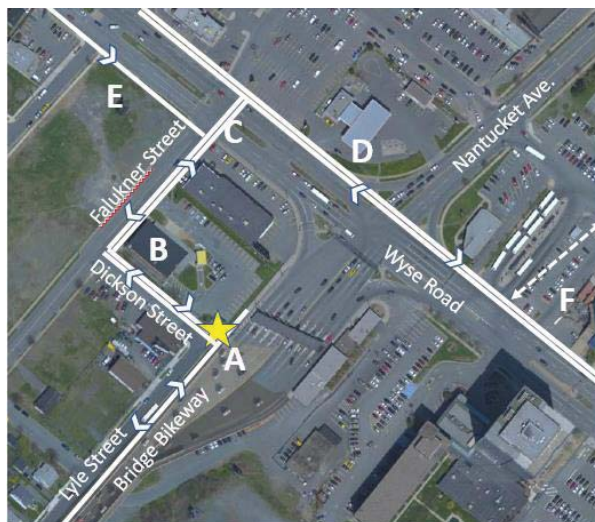
- a) provide a direct connection to the south or east (from the direction of the Sportsplex) via the proposed new Bridge bikeway access point at Lyle and Dickson Streets, as described below; and,
- b) Conduct a multi-modal planning process for the intersection in conjunction with potential changes to the toll collection system. Use this as the opportunity to incorporate bicycling infrastructure, transit priority and enhanced pedestrian crossings into the intersection.

2) A new access directly to and from the Bridge Bikeway at the intersection of Lyle and Dickson Streets.

The goal for this aspect of the project was to determine the viability of a new access point for the Macdonald Bridge Bikeway where it abuts the intersection of Lyle and Dickson Streets. This structure would provide direct access to the street network and the proposed local street bikeway route between the bridge and downtown Dartmouth on Lyle Street and Shore Road. As noted above, it also serves as the access to Wyse Road bike facilities which provide connections to the north, south and east.

Considerations here include the need to use Bridge Commission property to make the connection. The proposed changes for this area are represented in Figure 2.

Figure 2: New Access at Lyle/Dickson and Proposed Connecting Bikeways



- A. Proposed new direct connection to bridge bikeway at Lyle/Dickson;
- B. New protected bikeway on Dickson and multi-use pathway on Faulkner;
- C. Upgraded crossing of Wyse Road and Faulkner;
- D. Multi-use pathway on east side of Wyse Road. Includes crossride at Nantucket;
- E. Protected bike lane, west side of Wyse Road;
- F. Potential direct connection to Sportsplex entrance and Halifax Transit Bridge Terminal.

The estimated “Class C” cost for this structure is just under \$93,000 (including 30% contingency, engineering design and engineering services during construction).

Recommended approach for new Bridge Bikeway access point at the corner of Lyle/Dickson:

Proceed to detailed design and implementation of this option before 2020 in conjunction with Halifax Harbour Bridges.

3) Dartmouth bikeways and multi-use pathways on Wyse Road, Dickson Street, Faulkner Street, Lyle Street and Shore Road.

To connect the new access structure at Lyle/Dickson to origins and destinations in Dartmouth, a network of on-street bikeways and multi-use pathways is proposed (Figure 3). Most of these are candidate routes in the AT Priorities Plan (Dickson Street and Faulkner Street are not, but this report recommends their addition). This planning process considered and recommended the following on-road bikeways in Dartmouth to connect with the Macdonald Bridge Bikeway:

- A. a buffered bike lane on Wyse Road between Boland Road and Albro Lake Road. There would be consideration of how to add in protective devices (e.g. bollards) in the detailed design. This would connect to the pathway continuing north between Albro Lake Road and Farrell Street and continue on as a route through north end Dartmouth to Burnside. There may also be potential for bus stop enhancements.
There would be intersection changes at three locations (Albro Lake Road - Wyse Road, Boland Road - Wyse Road, and a new crossside at Faulkner Street – Wyse Road) to more safely accommodate bicycles;
- B. a protected bike lane on the west side of Wyse Road between Boland Road and Faulkner Street.
- C. a multi-use pathway on the east side of Wyse Road between Boland Road and Thistle Street.
This would connect with the Dartmouth Common pathways.
- D. a bi-directional bikeway on the east side of Dickson Street between the new connecting structure and Faulkner;
- E. a multi-use pathway on Faulkner between Dickson and Wyse Road. A bi-directional bikeway would also be considered as an option in detailed design;
- F. a local street bikeway for Lyle Street and Shore Road. This planning process found that both streets were strong candidates for local street bikeways. There are, however, issues such as a pinch point on Shore Road and the crossing of Windmill Road to be addressed in more detailed planning;
- G. a local street bikeway route to serve as a more “all ages and abilities” route into the north end of Dartmouth (north-south alternative to Wyse Road);
- H. bicycle facilities as part of potential changes to the existing pedestrian connection between Thistle Street and (approximately) the intersection of Geary Street and Alderney Drive that could connect directly to the Dartmouth Harbourfront Greenway. Because this area is within the Dartmouth Common, it may be subject to limits set out in the Halifax Charter; and,
- I. bicycle and pedestrian connections to the new Dartmouth Sportsplex entrance and the Halifax Transit Bridge Terminal. These have not been designed as part of this process, however, it is proposed that some type of facility be developed through the Sportsplex parking lot. There is a desire to have a quality connection to the Sportsplex, but this is complicated by the fact that there will be no public entrance on Wyse Road.

Figure 3: Dartmouth Bikeways Proposed for Implementation and Further Planning



- A. Wyse Rd. Buffered Bike Lane (Albro Lake to Boland)
- B. Wyse Rd. Parking Protected Bike Lane (Boland to Dawson, west side)
- C. Wyse Rd. Multi-use Pathway (Boland to Thistle, east side)
- D. Dickson Street Bi-directional Bikeway
- E. Faulkner Street Multi-use Pathway (Dickson to Wyse)
- F. Lyle Street and Shore Road Local Street Bikeway for implementation before 2020
- G. Cairn Street Local Street Bikeway
- H. Thistle to Geary AT upgrades
- I. Direct connections to Sportsplex and Bridge Terminal

All of the above bikeways proposed for implementation would be subject to detailed design. In places where multi-use pathways are recommended, there would be consideration of an alternative cross section that would separate pedestrians and bicyclists.

There may be minor property implications on Wyse Road between Faulkner and Thistle to be considered.

There are some limited impacts to other road users with the proposed Dartmouth bikeway options. A small amount of on-street parking (approximately 10 spaces) on Dickson Street would be eliminated. Intersection changes at Wyse Road - Boland Road and Wyse Road - Albro Lake Road could result in a small increase in motor vehicle delay, but these would be well within what is considered "acceptable" for intersection performance. Attachment A of this report contains the criteria assessment for the recommended on-street routes as per Recommendation #23 of the Active Transportation Priorities Plan.

The longer-term configuration of bicycle facilities on Wyse Road between Boland Road and Thistle Street would be impacted by potential changes to the bridgehead intersection that could result from changes to Macdonald Bridge fare collection (as described above). This may permit new cross-sections on this entire segment that could include on-road bikeways as part of potential multi-modal/complete street changes.

The total preliminary, class "C" cost estimate for Dartmouth bikeways is \$761,000 (including 30% contingency, engineering design and engineering services during construction).

Recommended approach for Dartmouth bikeways and multi-use pathways

- 1) Proceed to detailed design and implementation of bicycle facilities on:
 - a. Wyse Road between Albro Lake Road and Thistle Street;
 - b. Dickson Street; and,
 - c. Faulkner Street between Dickson Street and Wyse Road.The proposed timeframe for implementation is before 2020.
- 2) Plan direct bikeway connections to the Bridge Terminal and front entrance of the Dartmouth Sportsplex from Wyse Road;
- 3) Plan improved pedestrian and bicycle access between Thistle Street and Geary Street to connect to Downtown Dartmouth Harbourfront Greenway;
- 4) Initiate a planning process to implement Local Street Bikeways on Lyle Street and Shore Road before 2020, (as per Administrative Order 2016-002-OP, Respecting the Implementation of Local Street Bikeways);

- 5) Incorporate multi-modal/complete street changes to Wyse Road between Boland Road and Thistle Street as part of the potential intersection modifications at the Macdonald Bridgehead; and,
- 6) Consider development of local street bikeway parallel to Wyse Road from Boland Road to Albro Lake Road as an “AAA” alternative to Wyse Road.

Halifax Bikeway Connector Options and Recommendations

On the Halifax side of the Macdonald Bridge the goal is to create safer and more comfortable access between the Bridge Bikeway and destinations in the north (e.g. north end of the peninsula), west (e.g. western mainland and peninsula west end) and south (e.g. Halifax Commons, hospitals and universities). The existing access to the Bridge bikeway from Barrington Street (under the bridge) would remain and continue to serve as the connection into downtown Halifax via the Barrington Greenway and potential future Cogswell Redevelopment bicycle facilities.

Planning on the Halifax side of the bridge considered: 1) two flyover options; 2) an at-grade bicycle crossing within the North Street-Gottingen Street intersection; and, 3) bike lanes on North Street.

1) Flyover Ramp Options

The two flyover options based on previous design studies were “optimized” and then compared to each other based on criteria that included factors such as cost, safety and comfort for bicyclists, land acquisition, impacts to other road users, and bridge interaction.

Option 1: Flyover Ramp to Lorne Terrace and Bikeway to Gottingen:

This option would see a 50 metre flyover ramp extend from the Macdonald Bridge Bikeway over the area where the existing stone wall is located between North Street and the Admiral’s House on CFB Stadacona (Figure 4). The ramp would extend to the Lorne Terrace entrance to CFB Stadacona and then transition to either a bidirectional bikeway or multi-use pathway with a grade of 10% in the greenspace between North Street and the CFB Stadacona wall to the North - Gottingen Intersection.

Figure 4: Option 1, Flyover Ramp to Lorne Terrace and Bikeway to Gottingen



The preliminary cost estimate (Class “C”) for this flyover ramp, including the changes to the North Street-Gottingen Street intersection and North Street bike lanes, is estimated to be \$5 million. This includes 30% contingency, and costs for engineering design and engineering services during construction as well as land acquisition.

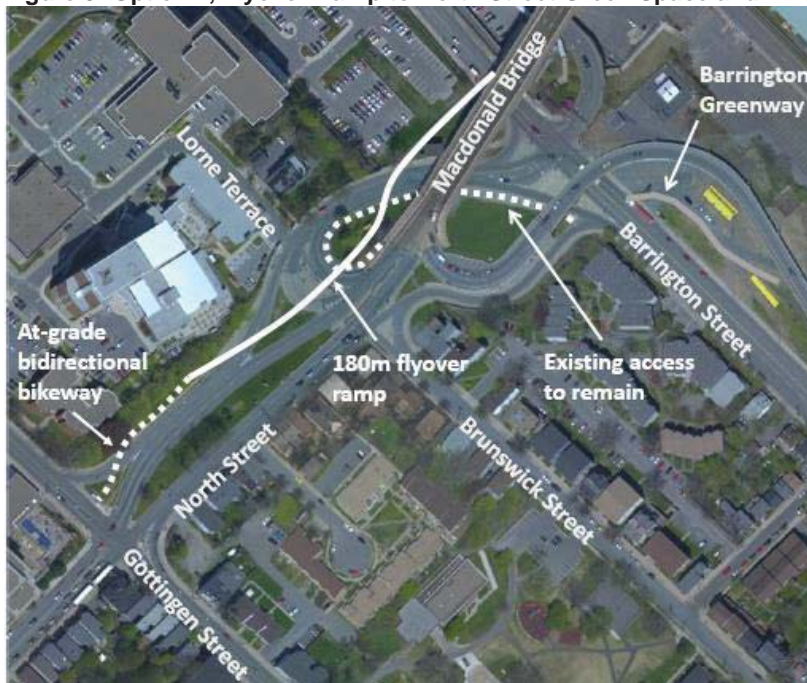
Some considerations with this option include:

- the need to acquire property from the Department of National Defense, relocate the stone wall and cut down mature trees;
- This option provides more direct access to Brunswick Street via the existing pedestrian crossing;
- the addition of a further “conflict” in the area of Lorne Terrace. There is already significant interaction of vehicles, buses and pedestrians through this area; with many entering and exiting CFB Stadacona at the Lorne Terrace gate. Adding in a further interaction with bicyclists would increase the complexity;
- there would still be a 10% grade that bicyclists would have to climb; and,
- the addition of a bikeway intersection at Lorne Terrace would require moving the gate back which would likely impede the operations of the new gatehouse, and potentially require it to be relocated.

Option 2: Flyover Ramp to North Street Green Space and Bikeway to Gottingen

This option is based on the initial concept of a longer flyover that would land in the median between the eastbound and westbound lanes of North Street between the bridgehead and Gottingen. This option was “optimized” by having it land in the greenspace on the north side of North Street in the area near the temporary Bridge Shuttle bus stop. It was further optimized by moving the connection to the Bridge Bikeway eastward which increased the overall length of the structure, but decreased the slopes.

Figure 5: Option 2, Flyover Ramp to North Street Green Space and Bikeway to Gottingen



The optimized version would see the construction of a 180 metre flyover ramp connecting to the existing Bridge Bikeway in the vicinity of Barrington Street and landing in the green space near the location of the temporary Bridge Shuttle bus stop. This flyover would extend over travel lanes and would have no Department of National Defense land acquisition requirements.

The preliminary cost estimate (Class “C”) for this flyover ramp structure, including the changes to the North Street-Gottingen Street intersection and North Street bike lanes is estimated to be \$6.2 million. This includes 30% contingency, and costs for engineering design and engineering services during construction.

Some considerations with this option include:

- higher cost than Option 1;
- less direct connection to Brunswick Street than Option 1;
- higher operational costs due to a longer structure;
- property acquisition from the Department of National Defense (DND) is not required. However, there would still have to be co-ordination with DND to ensure that their security standards are met relative to the location of their property and the proposed flyover;
- the need to consider aesthetics of the structure;
- offers greater comfort and fewer conflicts for bicyclists. This option offers a 5.5% grade (compared to a 10% grade climb up from the Lorne Terrace in Option 1) and bicyclists avoid the Lorne Terrace Gate and the need to stop and interact with vehicles and pedestrians there.

Recommended Approach for Flyover Structure on the Halifax Side

The recommended approach for the flyover structure is Option 2, the 180 metre structure that extends over the Halifax bridgehead and lands in the greenspace between North Street and the CFB Stadacona Wall near the temporary Bridge Shuttle stop (figures 5 and 6). This would extend up to the North-Gottingen intersection via a separate bi-directional bikeway.

This recommendation was based on criteria related to cost, impacts to all modes, timing and co-ordination, lifecycle cost, and interaction with the existing bridge. The key criteria that influenced this recommendation include:

- a) “cycling safety, comfort and convenience”. The longer flyover ramp option results in reduced slopes for bicyclists and they avoid mixing with traffic at the bridgehead;
- b) “land ownership/property acquisition/private property impacts”. The longer flyover ramp option does not require any land acquisition. There would still need to be co-ordination with the DND on security factors as the ramp would be close to the CFB Stadacona wall; and,
- c) “intersection safety/comfort”. The longer flyover ramp option removes bicyclists from the complex traffic movements near the bridgehead in the area of Lorne Terrace.

If approved, an initial next step would be to engage with Halifax Harbour Bridges to agree on roles and responsibilities in the planning, construction and ongoing maintenance and operations of the structure. A detailed design for the structure would have to be commissioned.

In addition to the above recommendations, the existing access point under the bridgehead would be enhanced under the regular Active Transportation capital program so that the bikeway continues to the street and does not begin and end on a sidewalk.

Figure 6: Concept rendering of Flyover Ramp to North Street Green Space



2) Upgrade to the North-Gottingen Intersection

As on the Dartmouth side, this project considered how to make a safer and more comfortable transition from the Bridge Bikeway to the on-road bicycling network. This requires consideration of how bikes would navigate the busy and complex North Street – Gottingen Street intersection. In the planning process, considerations also included the movement of all modes between the bridgehead and the intersection of North Street with Northwood Terrace/Creighton Street.

Regardless of which flyover option was recommended, the changes to the North-Gottingen intersection would be the same as both would have access points at the northeast corner of this intersection. The proposed recommendation incorporates the following changes:

- Remove the right-turn slip lane from North Street (westbound) on to Gottingen Street (northbound) and replace it with a standard right turn lane;
- Use the space where the right turn slip lane used to be as the entry to the Bridge Bikeway and as an improved bus stop for Halifax Transit on Gottingen Street;
- Add a priority left-turn signal for Halifax Transit's Route #1 to turn from North Street to southbound on Gottingen Street. This is the planned routing as part of the Moving Forward Together Plan.
- Changes to North Street between Gottingen Street and Northwood Terrace/Creighton Street to continue the bi-directional bikeway a bit further west to connect with proposed bike lanes on North Street and the potential local street bikeway on Maynard Street/Fuller Terrace and/or Creighton Street/Northwood Terrace.

The preliminary design shows the bi-directional bikeway next to the curb and the sidewalk between Northwood Manor and the proposed bikeway. This has implications for the transit stop at this location. As currently shown in the preliminary design, the buses load and unload from the bikeway and the bus shelter would be located next to the sidewalk. Under such a scenario, bikes would yield to pedestrians when the bus is loading and unloading. While this does not currently happen in Halifax, it does happen in Toronto and Ottawa. The design consultant for this project has indicated that this could also be switched to have the sidewalk next to the curb. Further analysis

be effects to some trees alongside the CFB Stadacona Wall near the current Bridge Shuttle Bus Stop. The detailed design would manage and mitigate any impacts.

The preliminary cost estimate to upgrade the North-Gottingen Intersection is about \$550,000 including contingency, detailed design and construction oversight costs. (Note that this cost is included the estimates for Flyover Options 1 and 2 above.)

Recommended approach for changes to the North-Gottingen Intersection

Initiate detailed design of the multi-modal upgrades to the North Street corridor between the bridgehead and Northwood Terrace/Creighton Street. This design process would be based on the existing preliminary design and would include consideration of:

- general pedestrian improvements in the area (e.g. crossing of North Street, routes between bus stops);
- adding a new bridgehead bus stop to provide a stop for the corridor route #1 down Gottingen Street;
- development of a new bus stop at the northeast corner of the intersection;
- further review of the recommended bikeway design and how it integrates with the North Street bike lanes and bus stop (between Northwood Terrace and Gottingen Street); and,
- any other elements that project stakeholders identify.

3) Adding Bike Lanes to North Street between Northwood Terrace/Creighton Street and Agricola Street

The preliminary design shows painted or buffered bike lanes from Northwood/Creighton to Agricola Street. These could be implemented with no impact to on-street parking. There is limited space in the right-of-way to provide a barrier between the bikeway and travelway, but, there would be consideration of protective devices (e.g. bollards) in the detailed design.

Recommended approach for addition of bike lanes to North Street between Northwood Terrace/Creighton Street and Agricola Street

Initiate detailed design and implement bike lanes on this section.

Partnership Funding and Property Requirements

The September 2015 direction from Regional Council requested that funding partnerships be considered and that land use or property acquisition requirements be identified.

Given that this project is relevant to policy objectives at the municipal, provincial and national levels, it should be eligible for funding from such sources as the provincial Connect2 sustainable transportation funding program, from national TransCanada Trail funding, Federation of Canadian Municipalities Green Municipal Fund, and potentially from federal infrastructure funding programs.

The potential need for property acquisition was identified in the description of options above. Overall, there will be minimal need to acquire property. The exact needs will be determined as part of detailed design.

FINANCIAL IMPLICATIONS

The preliminary cost estimate to implement the entire project as described in the preliminary design is approximately between \$5.8M and \$7.4M, as per the following Table. This includes 30% contingency, design costs and engineering oversight costs during construction. More precise cost estimates will be available after the detailed design is completed. OCC associated with the various stages of the project will be determined during the annual budget processes.

Initiative	Cost	Incl. net HST
Dartmouth Bikeways, multi-use pathways and intersection changes	\$761,000	\$793,616
Addition of new access to Bridge Bikeway at Lyle - Dickson	\$93,000	\$96,986
Halifax Bikeway Connector – Option 1 Flyover Ramp to Lorne Terrace and Bikeway to Gottingen plus North- Gottingen Intersection Changes.	\$5,000,000	\$5,214,300
Halifax Bikeway Connector – Option 2 Flyover Ramp to North Street Green Space and Bikeway to Gottingen plus North-Gottingen Intersection Changes.	\$6,200,000	\$6,465,732
Total Estimated Cost	\$5,854,000 - \$7,054,000	\$6,104,902 - \$7,356,334

The 2017/18 HRM Capital budget included the creation of account CT000010, Macdonald Bridge Bikeway Connection to support the detailed design and future implementation costs. The current total proposed project budget is \$7,000,000 over four years, distributed as follows:

17/18 - \$ 400,000 – approved
 18/19 - \$1,000,000 – approved in principle
 19/20 - \$4,600,000
 20/21 - \$1,000,000
 Total - \$7,000,000

Budget Summary, CT000010, Macdonald Bridge Bikeway

Cumulative Unspent Availability \$400,000

RISK CONSIDERATION

There are no significant risks associated with the recommendations in this Report. The risks considered rate Low.

COMMUNITY ENGAGEMENT

Stakeholders and the general public were invited to learn more about the project and provide their feedback on the preliminary design options.

Active transportation stakeholders were engaged via the Active Transportation Advisory Committee (ATAC). Members of this committee were invited to participate in a meeting with the project consultants and conducted site visits in the early stages of the project. The committee also received a special presentation with the preliminary design options in November 2016. Finally, the committee received a presentation from staff at the April 2017 meeting. ATAC members have expressed support for the project. They have been particularly interested in safety and comfort for bicyclists with a wide range of abilities and experience, to ensure that the options provide the most access to the street network as possible (e.g. access to Brunswick Street on the Halifax side) and that design/aesthetics are a key consideration in the detailed design.

Halifax Harbour Bridges has been both a stakeholder and a project partner. They have had membership on the planning steering committee and there has been a meeting between senior officials from both HRM and HHB to lay the foundation for implementation.

A final key stakeholder has been the Department of National Defense due to the proximity of the Lorne Terrace gate, the base wall and the potential need to acquire property should the shorter flyover ramp option be identified as the preferred option. Several meetings were held with DND officials on this project to understand the potential impacts, security requirements and other issues.

Three public engagement sessions were held in November 2016, one on the Halifax side and two in Dartmouth. The full consulting team was at these sessions, as were many members of the steering committee. Over 150 people attended these sessions, which featured a staff presentation and information panels.

A survey was posted on the Shape Your City website as were the information panels and the presentation from the public engagement sessions. A total of 139 surveys were submitted. The responses provided were generally supportive of the options proposed in this report.

All property owners on the proposed bike routes were informed of the planning project and were provided with staff contact information.

ENVIRONMENTAL IMPLICATIONS

This project is supportive of the sustainability objectives of the municipality as it aims to make it safer and more comfortable for residents to choose sustainable transportation options for everyday transportation purposes. This is reflected in the enhancements for bicycling, but also the improvements for transit and potentially pedestrians.

ALTERNATIVES

The Transportation Standing Committee may recommend to Regional Council that this project not proceed.

The Transportation Standing Committee may recommend implementation of only some elements of the project to Regional Council.

ATTACHMENTS

Attachment "A": Evaluation of Dickson Street for a Bi-directional Bicycle Lane as per Appendix E of the Active Transportation Priorities Plan

Attachment "B": Evaluation of Faulkner Street for Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

Attachment "C": Evaluation of Wyse Road for Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

Attachment "D": Evaluation of North Street for Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.php> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

Report Prepared by: David Maclsaac, Active Transportation Supervisor, 902.490.1665

Attachment “A”: Evaluation of Dickson Street for a Bi-directional Bicycle Lane as per Appendix E of the Active Transportation Priorities Plan

Appendix E of the Active Transportation Priorities Plan establishes evaluation criteria that staff should use when planning new bicycle facilities. The criteria and staff evaluation for bicycling facilities on Dickson Street between Lyle Street and Faulkner Street.

Evaluation Criteria	Staff Comments
<i>Potential for Use/ Connectivity - High density of existing/ planned origins and destinations</i>	
Residences	n/a
Workplaces	There is a range of retail and office workplaces near this location.
Shops	Retail on Wyse Road. There is one enterprise near this street on Lyle Street.
Community Facilities	n/a
Schools	n/a
Other destinations	n/a
Other AT infrastructure (bicycle lanes, local street bikeways, AT greenways)	Macdonald Bridge bikeway and future local street bikeway on Maynard/Fuller and/or Creighton/Northwood.

Street Characteristics	
Favourable grades (preferably 6% or less)	Very favourable
Low volume of motor vehicle traffic	yes
Low volume of large vehicles	yes
High volume of existing cyclists	This is already a route from the bridge down to Shore Road
Speed of traffic	n/a
Few complex intersections	no
Safety issues	The project is not addressing any specific safety issue. Rather it is creating dedicated space for bicycling.
Impact on traffic (i.e. of reducing vehicle travel or turn lanes to add a bike facility).	No significant impact.
Impact on green space	n/a
Impact on commercial or residential parking	Ten spaces would need to be removed.
The ability to mitigate losses to on-street parking	There is significant availability of on-street parking on Lyle Street and Faulkner Street.
Alternative Route Analysis: There is no alternative.	
Public Feedback	Generally, there was support for this project as part of the new access point to the Bridge Bikeway.
Stakeholder feedback	Active transportation stakeholders were consulted as part of a presentation at the Active Transportation Advisory Committee in November 2016 and April 2017. There was general support for the project,
Internal (HRM) review of the facility	No issues.

Attachment “B”: Evaluation of Faulkner Street for a Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

Appendix E of the Active Transportation Priorities Plan establishes evaluation criteria that staff should use when planning new bicycle facilities. This table shows the criteria and staff evaluation for bicycling facilities on Faulkner Street between Dickson Street and Wyse Road. Please note that an off-street multi-use pathway may also be built. The final decision will be made during detailed design.

Evaluation Criteria	Staff Comments
<i>Potential for Use/ Connectivity - High density of existing/ planned origins and destinations</i>	
Residences	n/a
Workplaces	There is a range of retail and office workplaces near this location.
Shops	Retail on Wyse Road. There is a commercial plaza on Wyse Road at the corner with Faulkner Street.
Community Facilities	n/a
Schools	n/a
Other destinations	This is a short connection between Wyse Road and the proposed new Bridge Bikeway access at Lyle/Dickson.
Other AT infrastructure (bicycle lanes, local street bikeways, AT greenways)	Macdonald Bridge bikeway and future bikeway on Wyse Road.

Street Characteristics	
Favourable grades (preferably 6% or less)	Very favourable
Low volume of motor vehicle traffic	yes
Low volume of large vehicles	yes
High volume of existing cyclists	This is already a route from the bridge down to Shore Road
Speed of traffic	n/a
Few complex intersections	The preliminary design proposes an enhanced signalized crossing at Wyse Road, but there is already an RA-5 pedestrian crossing.
Safety issues	The project is not addressing any specific safety issue. Rather it is creating dedicated space for bicycling.
Impact on traffic (i.e. of reducing vehicle travel or turn lanes to add a bike facility).	No significant impact.
Impact on green space	n/a
Impact on commercial or residential parking	No impact.
The ability to mitigate losses to on-street parking	n/a
Alternative Route Analysis: There is no alternative.	
Public Feedback	Generally, there was support for this project as part of the new access point to the Bridge Bikeway.
Stakeholder feedback	Active transportation stakeholders were consulted as part of a presentation at the Active Transportation Advisory Committee in November 2016 and April 2017. There was general support for the project,
Internal (HRM) review of the facility	No issues.

Attachment “C”: Evaluation of Wyse Road for Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

Appendix E of the Active Transportation Priorities Plan establishes evaluation criteria that staff should use when planning new bicycle facilities. The criteria and staff evaluation for bicycling facilities on Wyse Road between Albro Lake Road and Nantucket Avenue.

Evaluation Criteria	Staff Comments
<i>Potential for Use/ Connectivity - High density of existing/ planned origins and destinations</i>	
Residences	The North End of Dartmouth is a higher density part of the municipality and would be part of the CentrePlan’s recommendations for development.
Workplaces	Wyse Road has a variety of businesses and public buildings that employ residents.
Shops	Neighbourhood retail/ services from Nantucket Avenue to Albro Lake Road.
Community Facilities	Sportsplex and Halifax Transit Bridget Terminal
Schools	Connects to Dartmouth High School and Bi-centennial Junior High via Dartmouth Common
Other destinations	
Other AT infrastructure (bicycle lanes, local street bikeways, AT greenways)	Macdonald Bridge bikeway and Dartmouth Common pathways.

Street Characteristics	
Favourable grades (preferably 6% or less)	Almost flat.
Low volume of motor vehicle traffic	There are an average of 15,300 vehicles per week day on Wyse Road between Nantucket and Boland. Between Bollland and Albro Lake there are less specific traffic counts, but the number of cars appears to decrease.
Low volume of large vehicles	Between Bollland and Nantucket, on week days, there are 300 buses, 212 smaller trucks (e.g. more than six tires), and 23 are larger trucks with trailers. Between Bollland and Albro Lake there are less specific traffic counts, but the number of larger vehicles appears to be similar to the number between Bollland and Nantucket.
High volume of existing cyclists	Bicycle counts have not been done but they are assumed to be low
Speed of traffic	A formal speed study was not commissioned.
Few complex intersections	The main intersections to manage are with Albro Lake Road, Bollland Road, Nantucket and Thistle Street. The preliminary design provides proposed treatments for this.
Safety issues	The project is not addressing any specific safety issue. Rather it is creating dedicated space for bicycling.
Impact on traffic (i.e. of reducing vehicle travel or turn lanes to add a bike facility).	No significant impact. Changes to the intersections with Albro Lake Road and Bollland Road may require changes to the turning lanes. The traffic modeling for the proposed changes indicate that the intersections should still perform well within municipal recommended limits.
Impact on green space	There may be a small impact to the small park at the corner of Wyse Road and Bollland Road. The exact impact would be determined during detailed design and there would be an effort to integrate the park and perhaps improve it as part of this project.
Impact on commercial or residential parking	No impact. Most of Wyse Road has no on-street parking currently. There is one small section of on-street parking south of Bollland Road on the west side of the street that would be retained.
The ability to mitigate losses to on-street parking	There is no need.
<p>Alternative Route Analysis: There is a potential alternative route from Bollland Road to Albro Lake road using a combination of local streets and a park. While this alternative might be beneficial to new cyclists or youth, it lacks the directness and access to services that Wyse Road provides. It may be developed in future years in addition to Wyse Road.</p>	
Public Feedback	Generally, there was strong support for this project among the public and the abutting residents who provided feedback to staff.

Stakeholder feedback	Active transportation stakeholders were consulted as part of a presentation at the Active Transportation Advisory Committee in November 2016 and April 2017. There was general support for the project and an interest in protected bike lanes.
Internal (HRM) review of the facility	There are bus routes on Wyse Road that would continue to operate as they do now.

Attachment “D”: Evaluation of North Street for a Bicycle Lanes as per Appendix E of the Active Transportation Priorities Plan

Appendix E of the Active Transportation Priorities Plan establishes evaluation criteria that staff should use when planning new bicycle facilities. The criteria and staff evaluation for bicycling facilities on North Street between Gottingen Street and Agricola Street.

Evaluation Criteria	Staff Comments
<i>Potential for Use/ Connectivity - High density of existing/ planned origins and destinations</i>	
Residences	The north end of the peninsula is one of the densest areas of the municipality and is part of the CentrePlan’s recommendations for development.
Workplaces	North Street has a variety of businesses and public buildings that employ residents.
Shops	Some retail. Helps to access retail on Agricola Street
Community Facilities	n/a
Schools	Joseph Howe Elementary is close by.
Other destinations	n/a
Other AT infrastructure (bicycle lanes, local street bikeways, AT greenways)	Macdonald Bridge bikeway and future local street bikeway on Maynard/Fuller and/or Creighton/Northwood.

Street Characteristics	
Favourable grades (preferably 6% or less)	Very favourable
Low volume of motor vehicle traffic	The Average Weekday Daily Traffic Volume is 9,800 vehicles per day.
Low volume of large vehicles	Information on the types of vehicles were not available at this time. There are several bus routes on North Street, including the 52, 2 and 4.
High volume of existing cyclists	n/a
Speed of traffic	No speed study was commissioned, but due to traffic volumes and the number of signalized intersections the typical speed is estimated to be well within the speed limit.
Few complex intersections	The main intersection to manage is the Gottingen Street intersection and this is proposed for upgrading to better accommodate bicycles.
Safety issues	The project is not addressing any specific safety issue. Rather it is creating dedicated space for bicycling.
Impact on traffic (i.e. of reducing vehicle travel or turn lanes to add a bike facility).	No significant impact. Changes to the block between Northwood Terrace and Gottingen Street may narrow and the street and make it more difficult for westbound cars to pass busses stopped at this location. However, this is exactly how vehicles and bus stops operate all along North Street.
Impact on green space	n/a
Impact on commercial or residential parking	No impact. All of North Street is currently no parking.
The ability to mitigate losses to on-street parking	There is no need.
Alternative Route Analysis: There is a potential alternative route using Charles Street as a local street bikeway. This may be beneficial to new cyclists or youth. It may be developed in future years in addition to North Street.	
Public Feedback	Generally, there was support for this project among the public and the abutting residents who provided feedback to staff. There is an interest in the addition of protective elements.
Stakeholder feedback	Active transportation stakeholders were consulted as part of a presentation at the Active Transportation Advisory Committee in November 2016 and April 2017. There was general support for the project and an interest in protected bike lanes.
Internal (HRM) review of the facility	There are bus routes on North Street that would continue to operate as they do now, with the exception of the stop beside Northwood Manner. Here, additional

	planning is required to ensure accessibility and comfort for bus passengers and the safest design for shared space.
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