P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 15.4.1
Halifax Regional Council
April 30, 2019

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original Signed
Councillor Lorelei Nicoll, Chair, Transportation Standing Committee

DATE: April 23, 2019

SUBJECT: Implementation of IMP Downtown Bikeways (Regional Centre Bicycle Network Corridors on Hollis Street, Lower/Upper Water Street, George Street and Terminal Road)

ORIGIN

April 23, 2019 Transportation Standing Committee meeting, Item No. 12.1.2

LEGISLATIVE AUTHORITY

Administrative Order 1, Respecting the Procedures of the Council, Schedule 7, Transportation Standing Committee Terms of Reference, section 7 (b):

"The Transportation Standing Committee shall… promote and encourage the Municipality's Active Transportation corridor initiatives which supports the overall Transportation Strategy as outlined in the Regional Plan."

RECOMMENDATION

The Transportation Standing Committee recommends that Halifax Regional Council approve the installation of 2.8 km of bicycle facilities and related changes to the right-of-way on the following street segments as described in the Discussion section of the staff report dated February 8, 2019:
• Hollis Street from the Cogswell interchange lands to Barrington Street;
• Upper Water Street and Lower Water Street from the Cogswell interchange lands to Terminal Road;
• Terminal Road from Hollis Street to Lower Water Street; and
• George Street from Barrington Street to Lower Water Street.

BACKGROUND

A staff report dated February 8, 2018 pertaining to the implementation of Integrated Mobility Plan (IMP) Downtown Bikeways was before the Transportation Standing Committee for consideration at its April 23, 2019 meeting.

For further information, please refer to the attached staff report dated February 8, 2018.

DISCUSSION

The Transportation Standing Committee reviewed the February 8, 2018 staff report at its meeting held on April 23, 2019 and forwarded the recommendation to Halifax Regional Council as outlined in this report.

FINANCIAL IMPLICATIONS

As outlined in the attached staff report dated February 8, 2018.

RISK CONSIDERATION

As outlined in the attached staff report dated February 8, 2018.

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 February 8, 2018.

ALTERNATIVES

The Transportation Standing Committee did not discuss alterative recommendations.

ATTACHMENTS

1. Staff report dated February 8, 2018.

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: Phoebe Rai, Legislative Assistant, 902.490.6517.

Attachment 1

P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 12.1.2
Transportation Standing Committee
April 23, 2019

TO: Chair and Members of the Transportation Standing Committee

SUBMITTED BY: **ORIGINAL SIGNED**

Brad Anguish, P. Eng., Director, Transportation and Public Works

ORIGINAL SIGNED

Jacques Dubé, Chief Administrative Officer

DATE: February 8, 2019

SUBJECT: **Implementation of IMP Downtown Bikeways (Regional Centre Bicycle Network Corridors on Hollis Street, Lower/Upper Water Street, George Street and Terminal Road)**

ORIGIN

Action # 72 of Halifax's Integrated Mobility Plan (IMP): Deliver the Regional Centre all ages and abilities bicycle network by 2022.

Recommendation #20 of the Halifax Active Transportation Priorities Plan 2014-2019: To achieve the goal of doubling of AT mode share, the Municipality needs to focus AT plan implementation for cycling on the types of infrastructure preferred by new bicyclists.

Recommendation # 23 of the of the Halifax Active Transportation Priorities Plan 2014-2019 states that when making decisions about potential trade-offs needed to establish bicycle lanes in the Regional Centre, there should be:

1. More detailed review of each corridor under criteria listed in Appendix E of the plan;
2. Public engagement; and
3. Regional Council approval.

January 30, 2018, motion (Item 9.2.1) of Regional Council "THAT Halifax Regional Council direct staff to continue to plan the development of a permanent "all ages and abilities" on-road bicycle lane running north-south through downtown Halifax and return to Transportation Standing Committee and Regional Council in 2018 with a recommended option for implementation in 2019."

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter section 322(1) states that "Council may design, lay out, open, expand, construct, maintain, improve, alter, repair, light, water, clean and clear streets in the Municipality."

Motor Vehicle Act, subsection 90 (3) "The traffic authority may also mark lanes for traffic on street pavements at such places as they 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 outline in the Regional Plan."

RECOMMENDATION

It is recommended that the Transportation Standing Committee recommend that Halifax Regional Council approve the installation of 2.8 km of bicycle facilities and related changes to the right-of-way on the following street segments as described in the *Discussion* section of this report:

- Hollis Street from the Cogswell interchange lands to Barrington Street;
- Upper Water Street and Lower Water Street from the Cogswell interchange lands to Terminal Road;
- Terminal Road from Hollis Street to Lower Water Street;
- George Street from Barrington Street to Lower Water Street.

BACKGROUND

This section describes the policy rationale for the project and then provides baseline information on each of the corridors discussed in the report.

Policy Rationale

The proposed bicycling facilities support HRM's goal to implement modern bicycle facilities that are safer, connected and more comfortable for a wide range of residents and visitors. The project uses the most recent engineering design guidance to better separate vulnerable road users and manage interactions with other road users. The project aligns with the following HRM policy:

- Integrated Mobility Plan (IMP): all the corridors proposed for changes are identified as candidate bicycle routes designed to be suitable for riders of all ages and abilities (AAA). AAA bicycling facilities on streets with high motor vehicle volumes and/or speeds typically provide people riding bicycles with some form of physical separation from traffic. Proposed changes to the streets also support the complete street objectives of the IMP.
- Regional Municipal Planning Strategy: the proposed bikeways support the Regional Plan's transportation objectives and modal share targets.
- Active Transportation Priorities Plan: all the corridors proposed for changes, except George Street, are identified as candidate bicycle routes.
- HRM's Strategic Road Safety Plan: the proposed bicycling facilities align with two of the seven "emphasis areas" in the plan: *bicyclist collisions* and *intersection related*. Protected bicycle lanes are one of the identified countermeasures in the plan.

All the proposed bicycling facilities will support goals for provincial and national active transportation corridors, including designation as part of the provincial Blue Route bicycle route network.

Figure 1: Planning Context – Regional Centre AAA Bicycle Network, Integrated Mobility Plan

Project Context and Baseline

This section describes the context for the Downtown streets that are the subject of this report. For further detail on the Downtown context see Attachment A.

This project considers four Downtown streets: Hollis Street (Cogswell interchange to Barrington Street); Terminal Road (Hollis Street to Lower Water Street); Upper Water Street and Lower Water Street (Terminal Road to Cogswell interchange); and George Street (Lower Water Street to Barrington Street/Grand Parade).

Current and Future Bicycle Network Connections

The Downtown Bikeways project was prioritized for functional planning in large part due to the Cogswell District Redevelopment project. The Cogswell District concept plan includes several AAA active transportation facilities that will improve access to the Downtown for people walking and bicycling. The Downtown bikeway options were informed by the Cogswell District concept plan and will provide seamless connections to those facilities.

The proposed Downtown bikeways would connect to several planned AAA bicycle facilities:

- North to the Barrington Greenway and proposed Cogswell Street bidirectional bikeway via the planned

Figure 2: Downtown Bikeways Study Area

Cogswell District bidirectional bikeway (see Figure A-1 on page A-1 in Attachment A).
- Planned AAA bicycle facility on the University Avenue/Morris Street corridor (see Figure 1).

Current Context of Downtown Streets
These streets are key vehicle, freight, transit and pedestrian corridors. They are at the heart of the Municipality's largest employment district with over 40,000 jobs located within the Downtown MPS plan area, a key destination for visitors, and, increasingly, a place where people live. The Downtown also features services, entertainment and other destinations within a walkable distance of each other and high-frequency transit service. Further details on these characteristics are outlined below.

There are currently several temporary changes on the candidate streets due to adjacent construction projects. These include an encroachment for a temporary sidewalk adjacent to the Ralston building property (north of Salter Street) on Hollis Street and an encroachment adjacent to the Queens Marque development that reduces Lower Water Street to one vehicle through lane between Prince and George Streets.

Hollis Street extends 1.4km from the Cogswell interchange south to Barrington Street and is classified as an arterial street, accommodating an average of 10,000 motor vehicles per day. Hollis Street is also a full-time truck route, serving as the primary route for trucks traveling to the Halifax Port at HalTerm. There are sixty-five on-street parking spaces, five accessible spaces and two taxi stands between Duke Street and Barrington Street. There are five bus stops on Hollis Street between George Street and Terminal Road serving local Halifax Transit routes 90 and 29. There is a painted, buffered bicycle lane on the east side (to the left of traffic) from the Cogswell interchange to Terminal Road.

Lower/Upper Water Street extends 1.1km from the Cogswell interchange south to Terminal Road (George Street is where Lower Water Street becomes Upper Water Street) and is classified as an arterial street, accommodating an average of 11,000 motor vehicles per day. Lower/Upper Water Street is also a full-time truck route, serving as the primary route for trucks traveling outbound from the Halifax Port at HalTerm. There are two accessible parking spaces, two taxi stands and approximately forty-one on-street parking spaces in sections of off-peak parking on the west side and a small number of spaces in two separate laybys on the east side. There are four bus stops on Lower Water Street and the Water Street Terminal on Upper Water Street that serve local and express transit service and provide transfers to the Halifax Ferry Terminal. The *Integrated Mobility Plan* designates Lower/Upper Water Street as a transit priority corridor and there is an existing transit priority measure for buses exiting the Water Street Terminal at Duke Street. The existing Lower Water Street bicycle facility is a one-way painted bicycle lane (no buffer) on the right-hand side of the street that begins at Terminal Road and ends at Sackville Street.

There are two locations on Lower/Upper Water Street where pedestrian infrastructure is constrained and/or lacking. On Lower Water Street, just south of Prince Street, sidewalk widths are substandard and pedestrian movements are further impeded by metal bollards embedded in the sidewalk on the east side and a light pole on the west side. Sidewalk width through these pinch points is at or below the absolute minimum width required by a person in a wheelchair. On Upper Water Street north of Duke Street the sidewalk on the west side ends at the edge of the Waterside Centre property and the width of the east-side sidewalk is substandard and similarly obstructed by metal bollards.

George Street is a one-way street (eastbound) extending 200m from Barrington Street (Grand Parade) to Upper Water Street and the Halifax Ferry Terminal. It is classified as a local street, accommodating an average of 2,500 motor vehicles per day, and is also a full-time truck route between Hollis and Upper Water Street. There are nine on-street parking spaces and one taxi stand on George Street. It has one eastbound bus stop at Hollis Street and is used by Halifax Transit for connections to the Water Street Terminal. There is currently no bicycling facility on George Street.

Terminal Road is a 110m two-way east-west street connecting Hollis Street to Lower Water Street and Marginal Road. It is classified as a local street and a full-time truck route, accommodating an average of 6,500 motor vehicles per day. There are 12 on-street parking spaces between Hollis Street and Lower Water Street. Halifax Transit buses do operate on Terminal Road though there are no bus stops on the street. There is currently no bicycling facility on Terminal Road.

Current Cycling Facilities
The Hollis Street and Lower Water Street bike lanes see consistent, though relatively low, usage despite the lack of physical separation and the motor vehicles that regularly stop in the lane. This, combined with the fact that car and truck traffic volumes are high on both corridors, means they have minimal appeal for people who are uncomfortable riding in mixed traffic. Neither facility connects to other bicycling facilities in the existing network.

The Halifax Harbourwalk connects Pier 21 north to Casino Nova Scotia along the waterfront. People are permitted to ride bicycles on the Harbourwalk, though they must dismount in several locations. High volumes of pedestrians on the Harbourwalk often make riding a bicycle impractical in the summer. For these reasons it is not considered a commuter bicycle route.

The downtown network would be adjacent to the Halifax Ferry terminal and provide connections for people with bikes commuting to and from Dartmouth on the ferry.

Loading
There is significant loading (people and goods) demands on all four streets, but particularly Hollis and Lower Water Street. Loading demands are for destinations such as restaurants and hotels, as well as several small businesses, office towers and multi-unit residential buildings.

There are seven stops within the study area that serve a combination of tour buses and hop-on/hop-off bus tours. There are existing laybys adjacent to Historic Properties (tour buses) and the Maritime Museum (tour buses, hop-on/hop-off tours) that allow buses to pull out of the traffic lanes to load/unload passengers.

Parking Supply and Utilization in the Study Area
There are approximately 350 on-street parking spaces in the study area, 17 accessible spaces, 15 spaces for taxis and 2,649 spaces available to the public for parking in off-street lots. Table A-3 in Attachment A summarizes the parking supply in the study area.

An April/May 2018 parking utilization study found utilization along Hollis Street was generally lower than on Lower Water Street or the overall average for the study area, which was typically between 70% and 85% with a significant reduction after 2:00 PM. See Figure A-2 in Attachment A for a visual summary of the study results and an inventory of off-street public parking lots.

DISCUSSION

This section describes the project scope, an overview of public engagement outcomes, the recommended option, implications of the recommended option, and the proposed implementation strategy. Further information about the functional planning process, an overview of the options considered and more detail on the implications of the project can be found in Attachment A.

This information is based on the functional planning processes and the 30% plans that have been produced. The options will be further refined as part of preliminary and detailed design, but the overall approach and implications will be relatively consistent with the proposed bicycle facilities and related changes to the streets described below.

The on-street bicycle facilities described in this report total approximately 2.8km and represent about 8% of the IMP Regional Centre AAA bikeway network targeted for completion by 2022.

Project Objectives and Scope
To support the Regional Council-approved policy directions as described above in the "Origin" section of this report, AT staff initiated a functional planning process to identify preferred bikeway design options for downtown Halifax. Objectives for the planning process include:

- Develop a bicycling route network in downtown Halifax designed for all ages and abilities (AAA).
- Connect future bikeways planned for the Cogswell District with the ferry terminal, Grand Parade and destinations to the south, including the Seaport Market and bus/train station as well as future proposed IMP routes.
- Understand and accommodate other street uses.

WSP Canada Inc. was retained to complete the functional planning and design of the Downtown AAA bikeways.

Public Engagement Overview
Two separate public open houses were held in March 2018 and a survey was available online at Shape Your City for four weeks in March/April 2018. Stakeholders were engaged via HRM's Active Transportation Advisory Committee and Accessibility Advisory Committee, a meeting with external active transportation stakeholders and a meeting with staff and members of the Downtown Halifax Business Commission. All property owners along the candidate streets were informed by mail about the planning project and were provided with staff contact information. See the *Community Engagement* section for more information about the engagement strategy and a summary of public and stakeholder feedback.

Overall, there was strong public support for the objective of safer, more comfortable bicycle facilities through the Downtown. The recommended option for a unidirectional couplet of protected bicycle lanes on Hollis Street and Lower/Upper Water Street was the option most preferred by online survey respondents. Top concerns of the public include: too few people riding bicycles to justify the infrastructure, Halifax streets are too narrow for bikeways, potential loss of on-street parking and impacts to loading.

See page A-4 in Attachment A for a summary of the functional planning process and overview of the bikeway options considered.

Recommended Option
The facilities proposed for the downtown network (referred to as "Option D" during public engagement) are:

- Hollis Street from the Cogswell interchange to Terminal Road: unidirectional protected bicycle lane on the west side of the street.
- Hollis Street from Terminal Road to Barrington Street: either a unidirectional bicycle lane on each side, OR a bidirectional bikeway on the west side of the street.
- Lower/Upper Water Street: unidirectional protected bicycle lane on the east side of the street.
- Terminal Road: unidirectional protected bicycle lane on each side of the street.
- George Street: bidirectional bikeway on the south side of the street.

Appendix A contains further information on the options that were considered. The project team considered multiple criteria drawn from Appendix E (*Evaluation Criteria for New Bicycle Facilities*) of the AT Priorities Plan (see Attachment B) in their comparative analysis of the four options.

Several factors led to the decision to recommend option D:

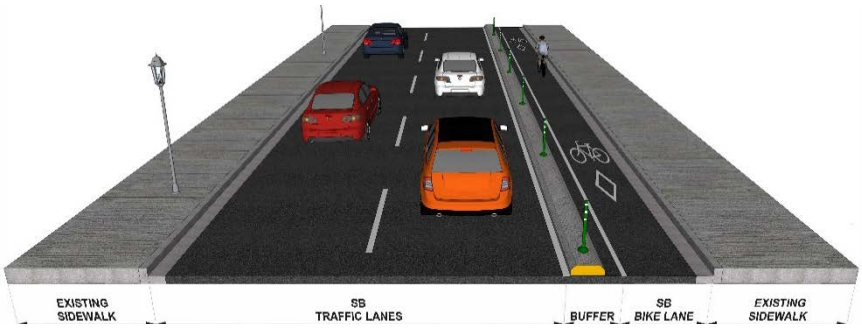
- Significant benefits for pedestrians, including curb extensions to shorten crossing distances, new sections of sidewalk and/or widened sidewalk to close gaps in the pedestrian network, and right-turn-on-red restrictions at several intersections. Sidewalk widths would remain the same or be widened.
- Complexity at the intersections is minimized with one direction of travel for people on bicycles on the right-hand side of the street where they are typically expected by pedestrians and drivers.
- The proposed Lower Water Street protected bicycle lane does not preclude the introduction of transit priority on Lower Water Street, identified in the IMP as a Transit Priority Corridor.

- Minimal impact to other street functions, including on-street parking where the supply would remain relatively constant.
- Option D is the least expensive, least complex option to construct, and lends itself well to phased implementation, important considerations given the 2022 target to complete the IMP AAA Bicycle Network.
- Option D was the public's most preferred option as identified through an online survey posted to Shape Your City.

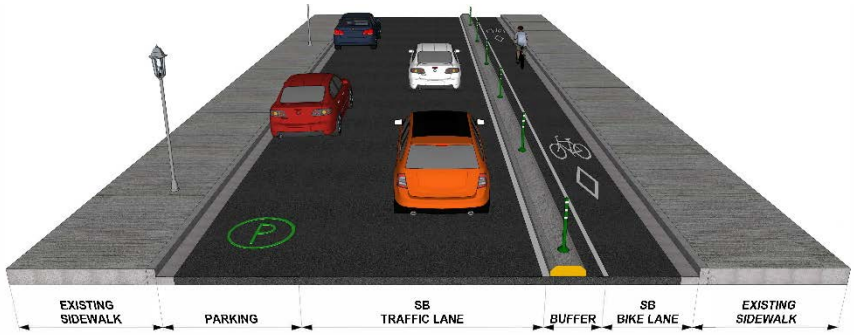
Description of Recommended Option
The proposed Downtown facilities consist primarily of protected bicycle lanes with a combination of pre-cast curb, bollards and/or planter boxes to physically separate people on bicycles from motor vehicle traffic. There are some sections proposed where the bikeway would be raised to the height of the sidewalk to better accommodate accessible parking, bus stops and loading. See Figures 4, 5 and 6 for illustrations of the recommended facilities. Table A-4 in Attachment A provides more information on the proposed facility for each candidate street.

Two possible configurations are being considered for Hollis Street between Terminal Road and Barrington Street: unidirectional protected bicycle lanes on each side of the street or a bidirectional protected bikeway on the west side of Hollis Street. A preferred option would be identified during the design phase of the project. Anticipated impacts to on-street parking on Hollis Street described in this report are based on the unidirectional option.

Figure 4: Illustrations of Proposed Hollis Street Bikeway (Typical Segments)

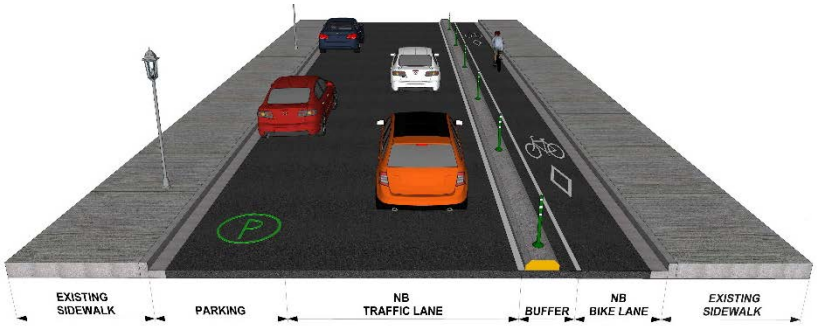


HOLLIS STREET, INTERCHANGE TO SACKVILLE STREET (7 - 9AM AND 4 - 6PM)
LOOKING SOUTH



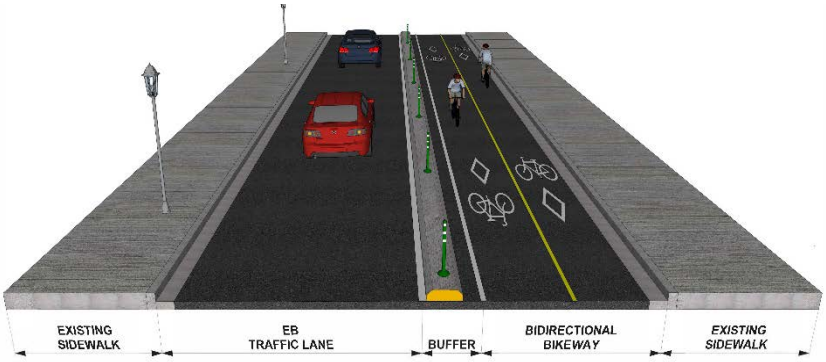
HOLLIS STREET, INTERCHANGE TO SACKVILLE STREET (OFF- PEAK)
AND SACKVILLE STREET TO TERMINAL ROAD
LOOKING SOUTH

Figure 5: Illustration of Proposed Lower Water Street Bikeway (Typical Segment)



LOWER WATER STREET, SACKVILLE STREET TO TERMINAL ROAD, LOOKING NORTH

Figure 6: Illustrations of Proposed George Street and Terminal Road Bikeways (Typical Segments)



GEORGE STREET, HOLLIS STREET TO UPPER WATER STREET, LOOKING EAST

TERMINAL ROAD, LOOKING EAST

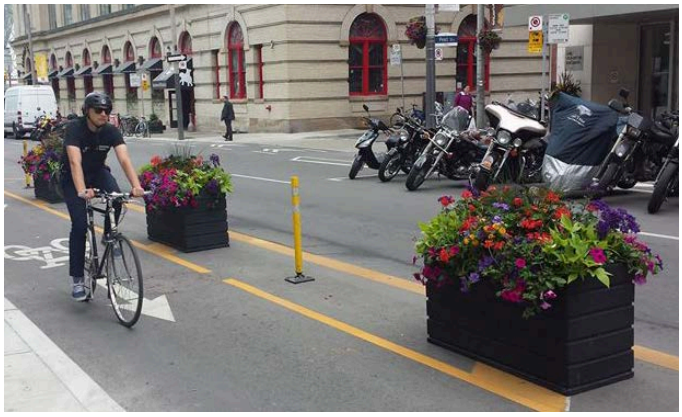
Physical Separation for Bikeways

The proposed physical separation for the Downtown bikeways would include a continuous row of pre-cast concrete curb placed end-to-end with planter boxes and/or flexible delineators placed on top of the curb at strategic locations, such as the start and end of a parking lane (this is the same configuration as the Council-approved South Park Street bicycle lanes). The concrete curb will provide a durable, horizontal barrier that will prevent vehicles entering the bicycle lane and will provide a guide for snow clearing equipment (see Figure 7 below). The planter boxes and flexible bollards (see Figure 8 below) add a vertical element that improves visibility of the barrier, especially in the winter when the concrete curb may be covered by snow. The planter boxes also add visual appeal to the facility (see Figure 9 below). There would be gaps in the barriers at driveways.

Figure 7: Pre-cast Concrete Curb Prototype Developed for South Park Street Bicycle Lanes

Figure 8: Example of Durable, Flexible Bollards in Ottawa, ON

Figure 9: Example of Planter Boxes as Physical Separation for Bicycle Lane in Toronto, ON



Intersection Treatments

The safety of interactions between vehicles, pedestrians and bicycles at intersections is an important component of this project. The measures proposed aim to improve visibility of pedestrians and people on bicycles, encourage eye contact between users, and provide clarity regarding the intended path and right-of-way for all modes, thus helping to reduce conflicts.

In addition to continuing the bicycle lanes to the intersections, markings in the intersections to indicate the intended path of people on bicycles and highlight conflict zones are proposed (see Figure 10 below).
To facilitate safe left turns for people on bicycles, especially at intersections with existing or planned bikeways, green turn box pavement markings and right-turn-on-red restrictions at several intersections would be used to accommodate two-stage left turns.

Figure 10: Example of Bikeway Intersection Markings, Seattle, WA

Summary of Implications of Recommended Downtown Bikeways
This section describes how the Downtown streets would change with implementation of the proposed bicycling facilities and what the implications of those changes would be for all users.

Pedestrian Infrastructure

- Curb extensions at intersections improve comfort and safety for pedestrians by slowing traffic, shortening pedestrian crossing distances, improving sightlines, and providing more space at intersections for pedestrians. Curb extensions would be incorporated at several Hollis Street and Lower Water Street intersections.
- Improvements to conditions for pedestrians are proposed at the two pinch points on Lower Water and Upper Water Streets where pedestrian infrastructure is substandard and/or lacking (see Figure 11 and the description of existing pedestrian conditions on page 4).

Figure 11: Pedestrian Pinch Point, West Side of Lower Water Street at Prince Street (75cm at Narrowest Point)

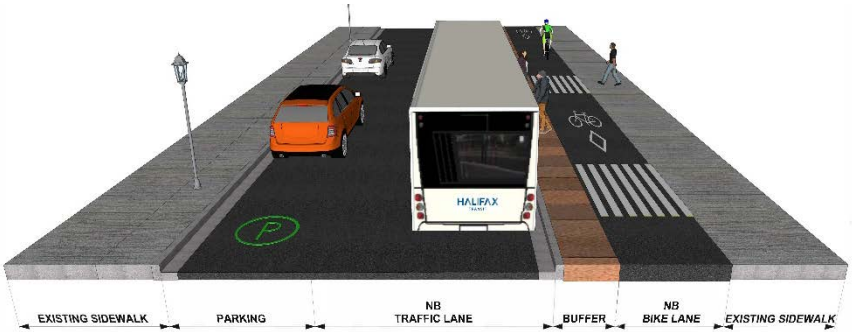
Bicycle Level of Service

- Conditions for people on bicycles would improve significantly along the corridors as a result of a physical barrier separating the bikeways from vehicle traffic and treatments to manage conflicts at the intersections.

Transit Service and Future Plans

- A shared bicycle lane-bus stop treatment at bus stops is proposed to manage interactions between people on bicycles and buses. This is the same treatment approved by Council for construction on South Park Street (see Figure 12).
- The proposed lane configurations will improve conditions for transit by reducing the number of times a bus would need to leave its primary travel lane to board/alight passengers.
- The proposed Lower Water Street protected bicycle lane does not preclude the introduction of transit priority on Lower Water Street, identified in the IMP as a Transit Priority Corridor.

Figure 12: Illustration of a Shared Bicycle Lane-Bus Stop



HOLLIS STREET (LOOKING SOUTH) AND LOWER WATER STREET (LOOKING NORTH), TYPICAL TRANSIT STOP

Automobiles

- Right-turn-on-red restrictions would be considered at several signalized intersections to facilitate two-stage left turns for people on bicycles.
- The dedicated left turn lane on Lower Water Street at Prince Street would be removed to provide room for the bikeway and sidewalk improvements.
- Upper Water Street would be reduced to a single traffic lane at Historic Properties to provide room for the bikeway and sidewalk improvements. This is not expected to have a significant impact, as lane utilization data indicate that the two narrow vehicle lanes are currently functioning mostly as a single lane.
- Conditions for automobiles would worsen slightly, but remain within acceptable limits, at two intersections (Hollis at George Street and Lower Water at Prince Street) and one segment during the afternoon peak period (Sackville Street to the interchange) due to the changes described above.

Goods Movement

- The proposed changes would reduce the need for trucks to change lanes to continue straight on Hollis Street and Lower/Upper Water Street.
- Conditions for trucks would worsen slightly in some locations due to narrowed curb lanes and intersection impacts; however, overall impacts to truck operation are expected to be minimal.

Relocation/Reconfiguration of Accessible Parking

- The proposed Downtown bikeways would require the relocation and/or reconfiguration of the existing five accessible parking spaces on Hollis Street as most of the on-street parking would shift from the west side to the east side of the street. Where possible the relocated accessible spaces will be retained within the same block and as close to the current location as is feasible. There are no impacts to accessible parking on Lower Water Street.
- There would be potential for accessible spaces on the right-hand side on some blocks of Hollis Street.
- Consideration will be given to designating additional right-hand side accessible parking spaces on parallel streets with appropriate grades such as Granville Street and Bedford Row.

Curbside Access for Loading

Hollis Street

- On the east side, from the Cogswell interchange to Sackville Street, stopping/loading would be prohibited during the AM and PM peak periods (7-9am; 4-6pm) to provide a second through lane for vehicles (as it is now on the east side).

- On the east side, between Sackville Street and Barrington Street, some space would be allocated to parking and/or loading throughout the day on each block.
- On the west side at Salter Street a section of raised bicycle lane is proposed to allow for some right-hand side accessible parking and loading in front of the Four Points Sheraton Hotel.
- Where space permits (i.e., where a second through/turn lane would remain north of Sackville Street) short-term stopping for loading could happen on the right-hand side (next to the proposed protected bicycle lane).
- Where space is constrained stopping would likely be prohibited on the right-hand side of the street.
- Strategies to accommodate loading will be further refined during the project's design phase.

Lower/Upper Water Street

- On the west side, between Terminal Road and Prince Street, parking and/or loading would be maintained on each block. Between Prince Street and the interchange, it is not yet clear the degree to which (and when) loading could be accommodated on the west side.
- On the east side, the tour bus lay-bys adjacent to the Maritime Museum and Historic properties would be retained. Removal of the parking lay-bys adjacent to 1601 Lower Water Street and Bishop's Landing to minimize conflicts with the bikeway would be considered during the design phase.

Taxis and Tour Buses

- Potential need to move some of the existing hop-on/hop-off tour bus stops that would be impacted by the proposed bikeways. The double-decker hop-on/hop-off buses can load from both sides so moving the stops to the left-hand side of the street is an option in some locations.
- The five taxi stands on the candidate streets can remain in their existing location or will move to the left-hand side of the street.

Maintenance and Operations

- Protected bicycle lanes are a new facility type in HRM and there is very limited experience with snow clearing, sweeping and other maintenance related operations. Staff anticipate the proposed unidirectional street-level bikeways will require the removal of snow from the street to enable all street functions to continue to operate. This will add to the cost of winter maintenance. These costs are identified in the *Financial Implications* section of this report.
- There is no existing standard for winter maintenance for bicycle lanes, though staff anticipate developing a standard in the next two years (as per IMP Action #73 and an outstanding request from Council to consider updated standards). Until a standard is developed, staff propose that protected bicycle lanes conform to the "Priority 3" standard for sidewalks. Experience maintaining these facilities will help build an understanding of costs, the best techniques and equipment requirements, which will inform a permanent standard for winter maintenance.
- Addressing the substandard sidewalk conditions at the Lower/Upper Water Street pinch points would make winter maintenance easier through these sections.
- Curb extensions and the shared cycle track-bus stops, both at sidewalk height, provide sufficient width for snow clearing with standard equipment.
- Pavement markings will require regular maintenance to maintain the integrity of the proposed bicycling facilities. Staff are investigating the use of permanent pavement markings, such as thermoplastic products, as an alternative to conventional painted markings.

On-Street Parking Changes and Mitigation

- On-street parking changes could range from a loss of approximately 16 spaces to a gain of approximately 8 spaces depending on decisions related to space for loading and traffic capacity that will be made during the design phase of the project (see Table A-5 in Attachment A for a detailed summary of the proposed on-street parking changes).
- The proposed on-street parking changes represent a -4% to +2% change in the on-street supply and a -0.5% to +0.3% change in the total public parking supply in the study area (including public surface and indoor parking lots).
- See Figure A-2 in Attachment A for a full picture of the public parking supply in the Downtown.

- During the detailed design phase of the project staff will work to maximize space for on-street parking while achieving an appropriate balance of curbside access for other uses such as loading, tour bus stops, and taxi stands.

Emergency Access

- No changes to the ROW are proposed that would restrict the passage of emergency vehicles.
- Changes to turning radii for vehicles due to curb extensions would be modelled by HRM engineers during the design phase and emergency services staff would be consulted if there are any concerns.

Streetscape Enhancements

- Opportunities for adding planters as part of the separation treatment or to delineate the beginning and/or end of parking/loading lanes will be explored in the detailed design phase.
- Other tactical urbanism enhancements will be considered.
- Opportunities to collaborate with the sidewalk reinstatement of adjacent developments in progress are also being co-ordinated and could result in permanent streetscape enhancements.

Implementation

Phased Implementation

The exact timeframe for implementation can only be determined following completion of preliminary and detailed design. Pending Council approval and capital budgets, the following phasing for design and construction of the Downtown bikeways is anticipated:

- Hollis Street: detailed design and target for construction in 2019 from the Cogswell interchange to Terminal Road (potential construction of Terminal Road to Barrington Street in 2020).
- Lower/Upper Water Street: detailed design in 2020, pending completion of the Upper/Lower Water Street functional planning study (see discussion below), and target for construction between 2020 and 2022. Potential integration on Lower Water Street with reinstatement of sidewalk adjacent to Queens Marque in 2019.
- George Street and Terminal Road: detailed design in 2019 and target for construction between 2020 and 2022.

Given ongoing development in the Downtown, it is important to note that implementation of the proposed facilities will need to consider, and potentially integrate with, various developments on the candidate streets.

Integration with Future Street Recapitalization

The facility types recommended in this report would be implemented independent of larger-scale street re-capitalization projects. As such, the need for civil works would be limited to curb extensions at bus stops and loading areas. It is anticipated that all the streets in the Downtown bikeways network would be subject to larger-scale street rehabilitation projects in the next three to seven years. When those projects happen, there would be opportunities to refine and enhance the bicycle facilities through measures such as raising them to sidewalk level and incorporating other complete streets improvements.

Given the many priorities on Lower/Upper Water Street and limited available right-of-way along much of the corridor, HRM staff plan to complete a functional planning study in 2019 or 2020 that will consider design options at a corridor level for all modes. This study could result in recommendations for changes to the ROW that would allow for the integration of transit priority measures, pedestrian environment improvements and the proposed bikeway. These changes could include extensive civil works such as moving the location of the curb on one or both sides of the street. The findings of the functional planning study would inform detailed design of the proposed Upper/Lower Water Street bikeway.

Monitoring

To support IMP and AT Priorities Plan monitoring and evaluation objectives, staff are developing a comprehensive strategy to monitor the utilization of both individual bicycling facilities and the bicycling

network. Central to this strategy will be counts of riders from a mix of permanent and temporary counters. Staff will consider installing permanent counters on the proposed Downtown bikeways.

Education and Promotion
Staff are developing education and marketing strategies to launch in coordination with the opening of new types of AT facilities as per IMP Action #78.

FINANCIAL IMPLICATIONS

The class D cost estimates for construction of the recommended bikeways and associated changes to the right-of-way are as follows:

Hollis Street: $739,045 (excluding HST).

The above amount for Hollis Street is reflected in the proposed 2019-2020 Active Transportation Capital Budget.

More refined cost estimates for the Upper/Lower Water Street, George Street and Terminal Road segments will be developed as they are programmed into the capital plan and as project integration factors are fully considered.

The estimated annual cost for year-round maintenance of the 2.9 lane km of recommended bicycling facilities is approximately $81,800 (net HST included). Most of this cost is for snow clearing, including snow removal where required due to limited space for snow storage after implementation of the bikeways.

The estimated annual cost for repainting pavement markings associated with the 2.9 lane km of recommended bicycling facilities is approximately $14,200 (net HST included). This assumes only conventional painted markings are used with no permanent markings.

On-street parking changes related to the proposed Downtown bikeways could range from a loss of approximately 16 spaces to a gain of approximately 8 spaces (see discussion on page 12). Based on current rates, a loss of 16 metered spaces could result in a net loss of parking revenue up to approximately $26,000 per year, while a gain of eight spaces could result in a net gain of parking revenue up to approximately $13,000 per year.

RISK CONSIDERATION

Risk, as it relates to safety for all road users, and, in particular, vulnerable road users is one of the main factors in evaluating options for introducing bike facilities and the related changes to the road. The types of bicycle facilities being proposed conform to the most recent professional design guidelines for street design. There are no significant risks associated with the recommendations in this Report. The risks considered rate Low. To reach this conclusion, consideration was given to operational and financial risks.

COMMUNITY ENGAGEMENT

Stakeholders and the public were invited to learn more about the project and provide their feedback on the functional design options. Information about the Downtown Bikeways projects is available on the Halifax.ca website at:
www.halifax.ca/transportation/cycling-walking/expanding-network/fall-2018-regional-centre-bikeway-update

Additional information, including a summary of public input in the *What We Heard Report* for, is available on the *Shape Your City* site: www.shapeyourcityhalifax.ca/downtownbikeways

Summary of Community Engagement for Downtown Bikeways
Public engagement activities for the Downtown Bikeways project included:

- Two separate public open houses were held in the Art Bar + Projects space on Granville Street on Wednesday March 21, 2018.
- Staff presented to HRM's Active Transportation Advisory Committee and Accessibility Advisory Committee in October 2018.
- Staff hosted a meeting with external active transportation stakeholders held on December 8, 2017, and a meeting with staff and members of the Downtown Halifax Business Commission held on January 18, 2018.
- All property owners along the candidate streets were informed by mail in February 2018 about the planning project and were provided with staff contact information.
- A survey was available online at Shape Your City between March 17 and April 15, 2018. A few public comments were also received by email. Overall, input was submitted by approximately 400 participants and representatives of organizations, including 341 people who responded to the online survey.
- The open house sessions and online survey were promoted through Facebook, Twitter, print ads in The Coast and The Star Halifax, posters, HRM's Employee HUB, HRM's digital screens, a PSA and a memo to the Mayor and members of Regional Council.

Although most participants who attended the open house sessions preferred Option B, (raised bidirectional bicycle lanes on the east side of Hollis Street), the preferred option from the online survey was Option D (unidirectional bicycle lanes on Hollis Street and Lower Water Street).

According to the online survey results, 80% of respondents support the Downtown bikeway project, 13% do not support it, and 7% indicated they are unsure. Positive comments related to the project include:

- The presented designs significantly improve the safety for cyclists riding in the downtown core.
- This is a good project. It improves the street and the city.
- This project makes HRM more bike/pedestrian/transit friendly.
- This project makes for a healthier population.

Top concerns of those not in support of the project include:

- There are not enough cyclists in the city to justify paying for this infrastructure.
- Cyclists should be required to pay for licenses/ registration fees/ tolls to help pay for this project.
- Halifax's streets are too narrow for bikeways.
- This infrastructure should not be built at the sake of losing on-street parking and making loading/deliveries more difficult.

Common themes from the stakeholder meetings include:

- In the design, HRM needs to ensure conflicts between road users (cyclists, pedestrians, traffic, transit, deliveries) are minimized and that the street remains safe for everyone.
- The bikeway must be designed to protect cyclists, and to not allow cars/delivery trucks to block the bikeway.
- Improvements to the pedestrian realm must be made. Implementing these facilities should not be done to the detriment of the pedestrian.
- Proper education and signage will be needed for all road users (cyclists, pedestrians, drivers, transit drivers, delivery drivers), so that all user groups understand the function of the street's components.

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.

ALTERNATIVES

The Committee may recommend to Regional Council to modify or not proceed with some or all the proposed bikeways. This alternative is not recommended as the proposed bicycle facilities are key to achieving Integrated Mobility Plan and Active Transportation Priorities Plan objectives.

ATTACHMENTS

Attachment A: Downtown Bikeways Additional Information
Attachment B: Appendix E from the Active Transportation Priorities Plan

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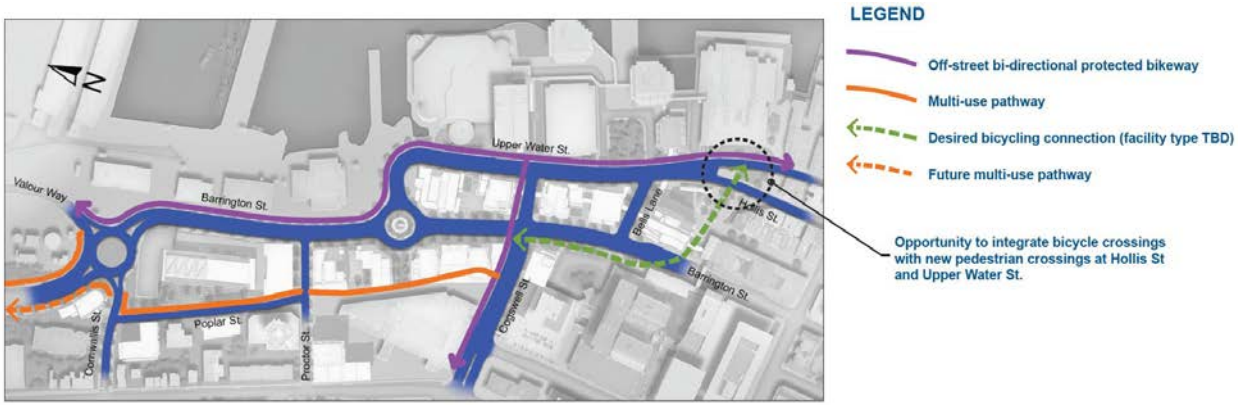
A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Mark Nener, Active Transportation Planner, Project Planning and Design, 902.490.8474

ATTACHMENT A: Downtown Bikeways Additional Information

Current Context of Downtown Streets

Figure A-1: Cogswell District 60% Concept Plan, AT Connections



Note: The street configuration has changed in the approved 90% Cogswell Construction Design Plan (southern roundabout has been changed to a three-leg intersection)

Table A-1: Summary of Downtown Candidate Street Characteristics

Candidate Street	Transit	Truck Route	Traffic Volume (Average Daily Traffic)	Pedestrian Volume (Average Weekday Traffic)
Hollis Street	29,90 + express routes	Yes	9,400 (2018)	No data
Lower/Upper Water Street	29, 90 + express routes	Yes	8,200 (2017)	930 @ Bishop Street 2,380 @ Duke Street
George Street	Access to Water Street Terminal for multiple routes	Hollis to Upper Water	1,300 (2017)	1,920 @ Upper Water
Terminal Road	29	Yes	6,300 (2016)	No data

Bicycle Counts

Monitoring of the Hollis Street bike lane in 2016 included bike counts at George, Sackville and Morris Streets and observations on loading (results are summarized in Table A-2 below). The number of people on bicycles on Hollis Street is lower than other streets with bicycle lanes on the peninsula such as South Park Street and Windsor Street. Vehicles stopped in the Hollis Street bike lane were regularly observed.

Table A-2: Bicycle Volumes in the Downtown Study Area (May and September 2017)

Intersection	AM Bicycle Volume 7-9am	Midday Bicycle Volume 11:30am – 1:30pm	PM Bicycle Volume 4pm – 6pm
Hollis/Morris	14	10	11
Hollis/Sackville	24	19	29
Hollis/George	24	15	22

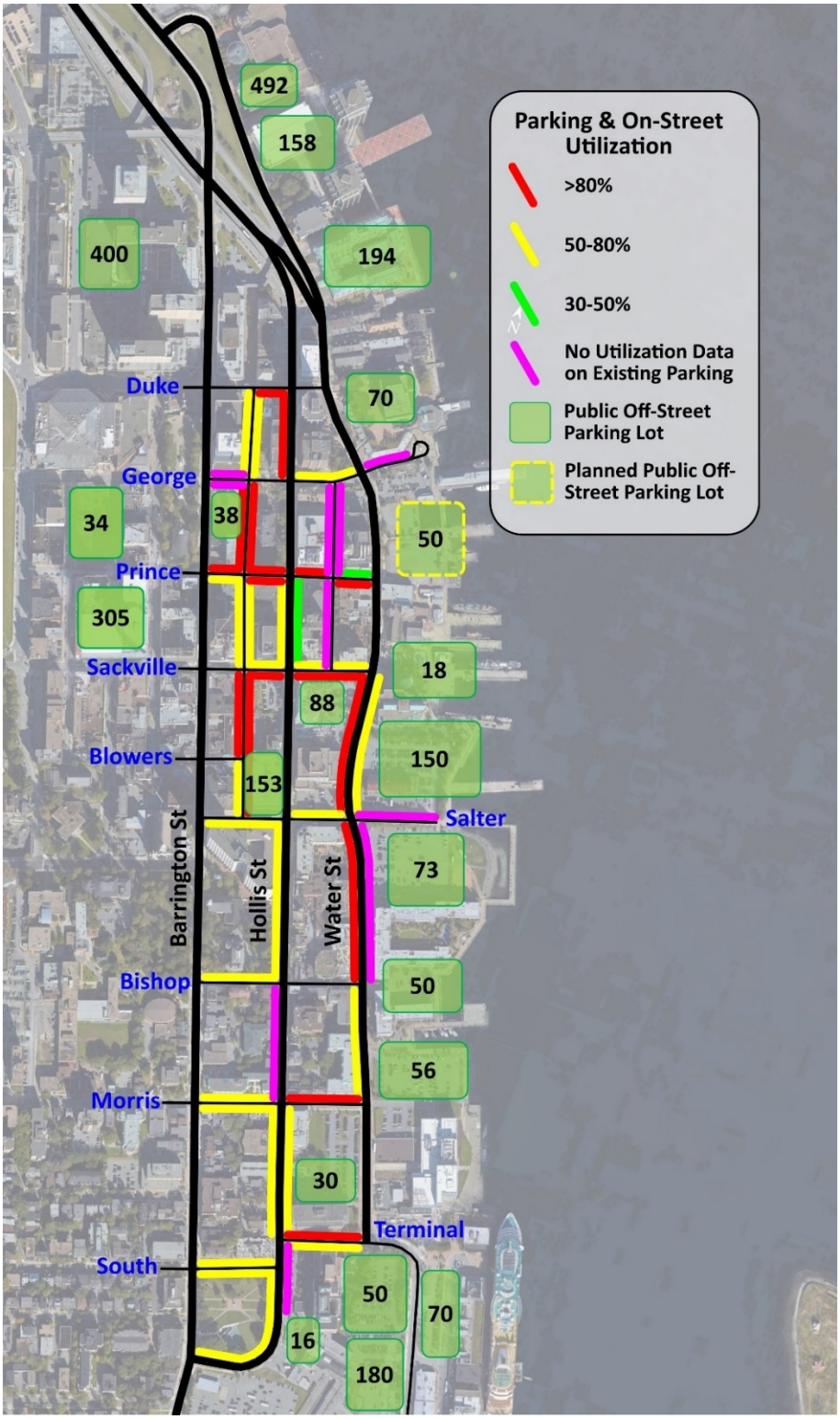
Parking Supply and Utilization in the Downtown Study Area

Table A-3 below summarizes the current parking supply in the study area (parking spaces currently displaced by construction encroachments are not included in the on-street parking numbers). See Figure A-2 on page A-3 for a visual summary of the parking supply and utilization in the study area.

Table A-3: Parking Supply in the Downtown Bikeways Study Area

Segment	Current On-Street Parking	Accessible Parking	Taxi Stands
Hollis Street Interchange to Sackville	13	2 west side (South of Prince)	2 west side (South of Prince)
Hollis Street Sackville to Terminal	31	2 west side (Bishop to Morris)	0
Hollis Street Terminal to Barrington	21	1 east side	4 west side
Upper/Lower Water Street Interchange to Sackville	5	0	3 west side (south of Duke)
Lower Water Street Sackville to Terminal	36	2 west side (Morris to Bishop)	3 west side (@ the Brewery Market, 6pm to 6am)
George Street Barrington to Lower Water	9	0	3 north side (Granville to Hollis)
Terminal Road Hollis to Lower Water	12	0	0
Adjacent Streets (Lower Water to Barrington)	223	10	0
Total On-Street	**350**	**17**	**15**
Off-Street Public Parking	2,649		
Total Public Parking	**2,999**		

Figure A-2: Parking Supply and Utilization in the Downtown Bikeways Study Area



Functional Planning Process
WSP Canada Inc. was engaged by city staff in 2017 to design and evaluate the Downtown bikeway options. An internal technical committee with representatives from multiple HRM business units, including Transportation & Public Works, Halifax Transit and Planning & Development, provided input at multiple stages throughout the project. The project team and technical committee have considered potential impacts to all users of the right-of-way in the analysis of bikeway options and have looked for opportunities to improve conditions for pedestrians and transit users in particular.

Overview of Options Considered
WSP and AT staff presented the following options to stakeholders and the public for feedback:

Hollis Street

- *Option A*: Raised bidirectional bike lanes on the west side of Hollis Street.
- *Option B*: Raised bidirectional bike lanes on the east side of Hollis Street.
- *Option C*: Southbound protected bike lane (west side) with raised contra-flow northbound bike lane (east side) on Hollis Street.
- *Option* D: Unidirectional protected bike lanes on Hollis and Lower Water Streets.

Each of the four options described above also included the following options for George Street and Terminal Road:

George Street

- Bidirectional protected bike lane on the south side of George Street.

Terminal Road

- Unidirectional protected bike lanes on both sides of Terminal Road.

See Figure A-4 on the following page for WSP's comparative analysis of the four options that considered multiple criteria drawn from Appendix E (*Evaluation Criteria for New Bicycle Facilities*) of the AT Priorities Plan (see Attachment B).

Figure A-4: Downtown Bikeways Evaluation Matrix

		Downtown Bicycle Facility Options						
		Existing Conditions	Option A	Option B	Option C	Option D	Option C - Enhanced	Option D - Enhanced
User Experience	Cyclist Facility Type (Protection)							
	Cyclist Visibility & User Expectations							
	Walking							
	Transit							
	Number of Private Driveway Crossings or Stop-controlled Intersections							
	Road Safety							
	Connectivity							
Impacts	Streetscaping							
	Traffic Impacts							
	Loading/Parking Impacts on Hollis Street							
	Loading/Parking Impacts on Lower Water Street							
	Implementation Cost							
Public Support	Public Feedback Response							

Most Desirable / Least Difficult

Least Desirable / Most Difficult

Note:
Grey indicates not applicable or not available

Recommended Option

Table A-4 below provides more information on the proposed bicycle facility for each candidate street.

Table A-4: Proposed Downtown Bicycle Facilities

Candidate Street	Facility Type	Bike Lane Dimension	Buffer Dimension	Physical Barrier	Shared Cycle Track - Bus Stop Treatment	Traffic Control Changes
Hollis Street North of Terminal Rd.	• One-way southbound protected bike lane on west side	1.5m – 2.0m	0.6m – 1.0m	• Pre-cast curb with flexible bollards and/or planter boxes • Some sections of raised bike lane for loading/bus stops	5 Halifax Transit stops	• Prohibit right turn on red for motor vehicles at all signalized intersections • Bicycle signal phase at Hollis/George intersection
Hollis Street South of Terminal Rd.	• Either one-way protected bike lane on each side ***OR*** • Two-way protected bikeway on west side (TBD during detailed design phase)	1.5m – 2.0m (one-way bike lanes)	1.0m	• Pre-cast curb with flexible bollards and/or planter boxes • Some sections of raised bike lane for loading/bus stops	1 Halifax Transit stop	
Lower Water Street	• One-way northbound protected bike lane on east side	1.5m – 2.0m	0.6m – 1.0m	• Pre-cast curb with flexible bollards and/or planter boxes • Some sections of raised bike lane for loading/bus stops	4 Halifax Transit stops	• Prohibit right turn on red for motor vehicles at Lower Water/George intersection
George Street	• Two-way protected bikeway on south side	3.0m	1.0m	• Pre-cast curb with flexible bollards and/or planter boxes • Some sections of raised bike lane for loading/bus stops	1 Halifax Transit stop	• Bicycle signal phase at Hollis/George intersection • Consider bicycle signal phase at Lower Water/George intersection
Terminal Road	• one-way protected bike lane on each side	1.5m	0.8m	• Pre-cast curb with flexible bollards and/or planter boxes	No Halifax Transit stops	n/a

Implications of Proposed Downtown Bikeways
This section provides additional information on how the Downtown candidate streets would change with implementation of the proposed bicycling facilities.

Automobiles/Goods Movement
While the number of vehicle lanes will remain the same on Hollis Street, parts of Upper/Lower Water Street will become a single lane at pinch points (i.e., near Historic Properties and Prince Street). Lane utilization data for the segment of Upper Water Street at Historic Properties indicates over 90% of drivers are not currently driving side-by-side through this pinch point, meaning that the two narrow vehicle lanes are mostly functioning as a single lane.

Relocation/Reconfiguration of Accessible Parking
Making changes to accessible parking as part of implementing the bikeways project presents an opportunity to review where the spaces are provided as the demand for accessible spaces shifts over time, as with the demand for loading. For example, two of the current locations for accessible parking on Hollis Street were requested in 1990 and 2012 by two organizations that have since moved from Hollis Street.

To ensure there is sufficient accessible parking for vehicles that deploy a ramp to the right-hand side, there are potential spaces on the right-hand side on some blocks. Furthermore, there is the ability to designate additional right-hand side accessible parking spaces on parallel streets with appropriate grades such as Granville Street and Bedford Row. Such changes would be communicated to the pubic as part of the project launch and would be monitored for impact and the potential need to adjust.

This approach to managing changes to accessible parking was reviewed and endorsed by HRM's Diversity and Inclusion staff as well as the Accessibility Advisory Committee.

On-Street Parking Changes and Mitigation
It is important to note that the Downtown parking supply is continually fluctuating as surface parking lots are redeveloped, construction projects encroach on the ROW and displace on-street parking, and changes to lane configurations at intersections impact the space available for on-street parking. The baseline used below in Table A-5 to estimate impacts to the parking supply considers conditions as of August 2017.

Parking Management staff anticipate initiating the replacement of all parking meters with pay stations in 2019. Depending on the timing of this work in the Downtown, there may be a gap between the removal of parking meters for construction of the Hollis Street bikeway and installation of pay stations. If this is the case, signed parking restrictions will be implemented on a temporary basis in place of paid on-street parking, which could impact parking revenue.

During the detailed design stage staff will finalize the strategy for accommodating loading demands on each block. On average, staff are assuming the equivalent of two parking spaces dedicated to loading on each block. The final strategy may impact the number of on-street parking spaces remaining after implementation.

Parking is currently prohibited on Hollis Street between the interchange and Duke Street, but off-peak loading is permitted. Changes to curb usage for this section of Hollis Street could be considered in conjunction with the next phase of design for the Cogswell District project, which could result in a gain of approximately 8 off-peak on-street parking spaces (Table A-5 below assumes two of the eight spaces would be dedicated to loading).

Some of the anticipated gain in parking (18 of 25 spaces) on Lower Water Street south of Sackville Street assumes the removal of the left-turn lane at Morris Street, which was implemented on a temporary basis in an effort to relieve traffic congestion due to the Queens Marque construction encroachment.

Table A-5: Implications of Proposed Bicycle Facilities for Parking Supply in the Downtown Study Area

Segment	Current On-Street Parking	Proposed On-Street Parking	Change
Hollis Street Interchange to Sackville	15	24 to 30	+ 9 to +15
Hollis Street Sackville to Terminal	33	35	+2
Hollis Street Terminal to Barrington	22	6	-16
Lower Water Street Interchange to Sackville	5	4	-1
Lower Water Street Sackville to Terminal	38	45 to 63	+ 7 to +25
George Street Barrington to Lower Water	9	4	-5
Terminal Road Hollis to Lower Water	12	0	-12
Adjacent Streets (Lower Water to Barrington St)	233	233	no change
On-Street Total	**367**	**351 to 375**	**- 16 to +8**
Off-Street Public Parking	2,649	2,649	n/a
Total	**3,016**	**3,000 to 3,024**	**- 16 to +8**
On-Street Parking Change ≈ - 4% to +2%		**Total Public Parking Change ≈ - 0.5% to +0.3%**	

ATTACHMENT B:
Active Transportation Priorities Plan Appendix E: Evaluation Criteria for New Bicycle Facilities

Potential for Use/ Connectivity

- High density of existing/ planned origins and destinations
- Residences
- Workplaces
- Shops
- Community Facilities
- Schools
- Other destinations
- Other AT infrastructure (bike lanes, local street bikeways, AT greenways)

Street Characteristics

- Favourable grades (preferably 6% or less)
- Low volume of motor vehicle traffic
- Low volume of large vehicles
- High volume of existing cyclists
- Speed of traffic
- Few complex intersections
- Safety issues
- Impact on traffic (i.e. of reducing vehicle travel or turn lanes to add a bike facility).
- Impact on green space
- Impact on commercial or residential parking
- The ability to mitigate losses to on-street parking

Alternative Route Analysis

- Consideration of the suitability of adjacent corridors (if applicable) which could be alternatives to the proposed route. Alternatives would be subject to the same criteria.

Public and Stakeholder Feedback

- Public support for the facility
- Stakeholder support for the facility
- Internal (HRM) review of the facility