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**Item No. 11.1.8**  
**Halifax Regional Council**  
**September 29, 2020**

**TO:** Mayor Savage and Members of Halifax Regional Council

**SUBMITTED BY:** Original Signed by   
\_\_\_\_\_  
Jacques Dubé, Chief Administrative Officer

**DATE:** September 2, 2020

**SUBJECT:** Winter Operations Service Standard Review

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**ORIGIN**

On February 22, 2018, the following motion of TSC regarding Item No. 13.1 was put and passed.

That the Transportation Standing Committee request a staff report with recommendations on changes to snow clearing standards and timelines of active transportation infrastructure, given that the Integrated Mobility Plan that was adopted in December 2017 explicitly prioritizes walking, cycling, and transit over private vehicles.

Action 72 in the Integrated Mobility Plan (IMP) outlines the need to deliver an all ages and abilities Regional Centre bicycle network by 2022.

Action 77 in the IMP provides direction to develop enhanced options for snow clearing and cleaning standards for bicycle routes. Recent funding from the Provincial and Federal government further reiterates the commitment to implement this connected bicycling network.

**LEGISLATIVE AUTHORITY**

**Halifax Regional Municipality Charter 2008, c. 39,**

s. 320 (1), s. 320 (2) and s. 320 (3) confers legislative authority for Council to make by-laws relating to snow and ice removal.

s. 322 (3) The Council may expend funds for the purpose of clearing snow and ice from the streets, sidewalks and public places in all, or part, of the Municipality.

**Motor Vehicle Act, c. 293, s. 202**

**RECOMMENDATIONS ON PAGE 2**

(1) The traffic authority is hereby empowered to make and enforce temporary regulations to cover emergencies or special conditions.

(2) Such regulations may prohibit or restrict the parking of vehicles between the fifteenth day of November and the fifteenth day of April.

### **RECOMMENDATION**

It is recommended that Halifax Regional Council:

1. Suspend the rules of procedure under Schedule 7, the Transportation Standing Committee Terms of Reference, of Administrative Order One, the Procedures of the Council Administrative Order;
2. Adopt the proposed Winter Operations service standards as detailed in attached Appendix C;
3. Direct the CAO to bring forward funding options to improve the service standard for transit stops, from 48 to 24 hours as part of the 2021/22 budget deliberation process;
4. Direct the CAO to provide a supplementary report that evaluates the business case for in-house towing operations to support the proposed winter operations service standards; and,
5. Direct the CAO to undertake another review of Winter Operations Service Standards within five years to ensure continued alignment with Council priorities, best practices, stakeholder expectations and funding levels.

### **BACKGROUND**

HRM has not updated its winter operation service standards since 2011. Winter operation service standards do not exist for active transportation (AT) infrastructure such as protected bicycle lanes, multi-use pathways, and walkways. Existing standards also do not incorporate new operational considerations such as the universal accessibility targets outlined in Provincial legislation and HRM's Integrated Mobility Plan (IMP). In response to the motion from Transportation Standing Committee, staff sought third party support to undertake an impartial and comprehensive review of HRM's winter operations and service standards, including a jurisdictional scan. RFP 19-071 was awarded to KPMG, the highest scoring proponent on September 19, 2019, and produced the report in Appendix A.

The report prepared by KPMG took a holistic view of Winter Operations, and was carried out in five phases:

- Project initiation and the development of the steering committee, project charter, schedule and engagement plans;
- Documentation review, along with the review of existing service standards, stakeholder consultations and the development of a strategy relating to the summary of findings;
- A jurisdictional review was conducted comparing existing and proposed standards to those of five other comparator cities with similar climates;
- New service standard recommendations were developed for all areas, along with a review of fleet inventory and associated fleet recommendations; and,
- Report delivery.

The content of this staff report has been aligned to directly address the motion from TSC. Broader recommendations of the KPMG report are being analyzed by staff and will be implemented as resources and/or future business plans allow. As a result of the beneficial information obtained through the third party review, and to address HRM's ever-growing AT network infrastructure and experience, staff is

recommending that another winter operations review be undertaken within five years.

**DISCUSSION**

Council approved winter operation service standards are critical to:

- a. Managing mobility expectations and safety for residents, business, and visitors;
- b. Establishing appropriate budgets and resource plans to meet the standard;
- c. Establishing effective and enforceable contracts for outsourced service delivery;
- d. Determining appropriate infrastructure designs; and,
- e. Ensuring appropriate insurance is in place to safeguard ratepayers.

HRM seeks to balance resident and stakeholder expectations within the financial capabilities of the region in the delivery of municipal services. TPW’s goal is to develop realistic and attainable winter operation service standards to minimize the tax burden while providing a balanced approach to service that addresses Council Priorities along with both internal and external stakeholder expectations.

The attached KPMG report organizes the winter operations service standards into five categories: Sidewalks, Walkways and Multi-Use Pathways (MUP), Protected Bike Lanes, Transit Infrastructure and Winter Parking Enforcement, each section containing at least one recommendation. The KPMG report did not consider the Local Street Bikeway facility-type, but staff proposes a standard for these as well.

Staff’s recommended winter operation service standards (WOSS) are summarized in Appendix C. New proposed standards have been recommended for all AT infrastructure. It is important to note that the COVID-19 pandemic commenced as the report from KPMG was concluding. Staff’s recommendations have given consideration to the significant financial pressure that the pandemic has brought to the municipality. The option analysis and rationale leading to staff’s proposed service standards follows below.

**A. Sidewalks**

Table 1 summarizes current WOSS for sidewalks in the HRM. Note that operations typically start earlier than snowfall amounts described in the table. Considerations relating to associated recommendations can be found below.

**Table 1 sidewalk clearing standards:**

| Sidewalk Classification                      | When clearing begins | Timeline to completion after end of event | Finish Surface Condition                                |
|--|----------------------|---|---|
| 1. Downtown Halifax & Dartmouth (Priority 1) | After 5cm            | 12 hours                                  | Bare (or as close to bare as possible given conditions) |
| 2. Main Arterials (Priority 1)               | After 15cm           | 12 hours                                  | Bare or with salt / sand for traction                   |
| 3. Halifax Transit Routes (Priority 2)       | After 15cm           | 18 hours                                  | Bare or with salt / sand for traction                   |
| 4. School drop off zones (Priority 2)        | After 15cm           | 18 hours                                  | Bare or with salt / sand for traction                   |

| <b>Sidewalk Classification</b>   | <b>When clearing begins</b> | <b>Timeline to completion after end of event</b> | <b>Finish Surface Condition</b>       |
|--|-----------------------------|--|---------------------------------------|
| 5. Residential Streets and Walkways not on Transit Routes (Priority 3) | After 15cm                  | 36 hours   | Bare or with salt / sand for traction |
| 6. Intersections/ bus stops  | After end of snowfall       | 48 Hours   | Bare or with salt / sand for traction |

**Current State Considerations:**

- Sidewalk conditions are an area of concern for many stakeholders, particularly for the Halifax peninsula and downtown core. Consultation participants cited contractor oversight and the historic focus on streets as reasons why sidewalk services were not delivered with the same quality as street services.
- Active Transportation stakeholders noted that sidewalks should at a minimum be cleared to the same standard as adjacent streets and in some high-volume pedestrian areas should be prioritized higher than adjacent streets.
- As identified in the April 2017 Sidewalk Snow Removal Options report presented to council<sup>1</sup>, it is challenging to mirror service levels from streets to sidewalks. This reflects the physical characteristics of sidewalks (limited width and lack of direct drainage) as well as effects of pedestrian traffic versus vehicle traffic. Heat from vehicular traffic helps accelerate melt and breakdown of snow and ice.
- Current WOSS do not consider the barrier free mobility needs of citizens e.g., the need to clear rumble strips, sidewalk intersections, crosswalk buttons, and accessible parking access to the sidewalks.
- Jurisdictional comparators such as Ottawa and Quebec City have set standards to initiate plowing earlier than HRM (2.5–5 cm) and have set shorter timeline standards to completion (less than 12 hours). Comparator jurisdictions are also increasing service in select areas such as school frontages and senior and advanced care homes.

**Sidewalk options and recommendations from the KPMG Report:**

**1. Do not alter WOSS for sidewalks:**

Improved WOSS for sidewalks were a recurring concern for multiple stakeholders. By not altering the WOSS for sidewalks, HRM will not be addressing these stakeholders' concerns.

**Estimated cost implications: \$0**

**2. Expand accessibility requirements (Staff recommended option):**

HRM currently completes activities to support winter accessibility, such as clearing crosswalk buttons and removing windrows next to accessible parking locations. Management, staff and sidewalk vendors receive annual training on accessibility awareness which is supported through HRM's Office of Diversity and Inclusion. Still, staff have received feedback that service is inconsistent and should be improved. Expanding

<sup>1</sup> <https://www.halifax.ca/sites/default/files/documents/city-hall/regional-council/170425rci4.pdf>

and formalizing sidewalk accessibility requirements outlined in the WOSS is the option with the greatest anticipated impact and the lowest anticipated effort. Defined standards for clearing pedestrian ramps including tactile warning indicators, crosswalk buttons, and accessible parking benefit not only those with increased mobility needs, but all sidewalk users. This option aligns with the intent of the draft Accessibility and Inclusion Strategy and would help to ensure that HRM provides a more consistent and equitable winter service within the municipality. As HRM already completes some of these activities, delivery of these standards may be achievable through enhanced staff training and adjustments to existing operational plans. Increases in operating costs are estimated to be low and it is anticipated they can be absorbed within staff's current funding allocation for 2020/21.

**Estimated cost implications:** Nominal

**3. Increase sidewalk service standards:**

Lowering the amount of snow to initiate plowing on sidewalks and decreasing the time to completion is in line with stakeholder desire for betterment of services. Improving service levels on sidewalks is also in line with IMP prioritization of the pedestrian.

Current sidewalk expenditures of approximately \$6.7 million per year would be expected to increase by \$7–12 million under this option. Assumed increases in costs are based on a potential threefold rise in the number of plowing operation deployments that result from 2.5 –5 cm as opposed to 5–15 cm initiation set points. Costs may also increase due to a shorter timeline to completion. Actual increases relating to this option will be dependent on market capacity and competitiveness.

This option may also render WOSS for sidewalks too challenging to realistically achieve; therefore, creating increased safety and liability concerns. Even with large increases in budget, achievement of these standards may further be limited due to current market capacity.

Staff is not recommending pursuit of this standard at this time due to current financial pressures.

**Estimated cost implications:** Additional \$7M to \$12M annually above base budget of \$6.7M

**4. Add winter maintenance of sidewalks along HRCE and CSAP school frontages and health centers to P1 classification definition (Staff recommended option):**

This option aligns with the sidewalk classifications of jurisdictional comparators. Increasing services for sidewalks along school frontages and health centers aligns with the IMP's prioritization of the pedestrian and is consistent with stakeholder feedback. HRM currently provides partial services to these locations. Expanding these services to all schools and health centers is anticipated to be able to be absorbed within staff's current funding allocation for 2020/21.

**Estimated cost implications:** Nominal

**B. Walkways & Multi-Use Pathways (MUP)**

HRM currently does not have established WOSS for Active Transportation (AT) walkways and MUPs in the municipality. Without clearly defined WOSS for walkways and MUPs, HRM increases its risk of providing inconsistent and unpredictable services across the network which do not align with Council priorities. Other considerations related to WOSS for walkways and trails are listed below.

Considerations:

- Stakeholders noted that AT walkways and MUPs should be cleared, at a minimum, to the same standards as adjacent streets. These respondents also noted that AT networks (MUPs, walkways, bike lanes and sidewalks) should be well-defined and communicated to the public.
- AT walkways and MUPs are maintained by Road Operations staff in most other comparator municipalities. While Winnipeg services all established trails in their AT network (including gravel trails), Ottawa, Quebec City and Hamilton only service select walkways and trails.
- Ottawa explicitly does not service gravel trails or paths leading to schools.
- Comparators with defined standards set finished surface conditions to be snow-packed with abrasives applied. While Winnipeg services its entire AT network, time to completion standards (36 hours to 5 days) are longer than those used in Ottawa and Quebec City (12 and 4 to 8 hours, respectively).

**MUP options and recommendations from KPMG report:**

**Note:** Where a MUP acts as the primary sidewalk or parallel to a street, then service standards for the MUP should reflect those of sidewalks, with the priority mirroring the opposite sidewalk where present.

**1. Do not apply winter service to walkways and MUPs:**

This option does not align with the desires of stakeholders for a connected AT network. It also does not align with the direction most other comparator municipalities have taken for walkways and trails.

As HRM currently services some walkways and MUPs in the absence of defined standard, this option would result in a reduction in service.

**Estimated cost implications:** \$0 or potential savings in future contracts

**2. Clear a portion of paved walkways and MUPs (Staff recommended option):**

Service paved walkways and MUPs on municipal property to a bare or with abrasives-applied surface condition, within 36 hours, based on the following criteria:

- i. Maintenance of corresponding walkway to school by HRCE;
- ii. Minimum width of 1.5 meters along entire section;
- iii. Connects serviced routes;
- iv. Estimated community usage; and,
- v. Provision of a substantial shortcut (e.g., 200m).

Winter servicing of paved walkways and MUPs based on the noted criteria most closely matches HRM's current operations. Developing formalized standards for walkways and MUPs will allow HRM to deliver these services in a more defined, consistent manner. This option partially aligns with stakeholder desires for a connected AT network.

The cost of this option was calculated using the average sidewalk cost per kilometer as a unit cost and the total length of paved trails 1.6 meters or greater in width. The estimated cost for this option current state is \$260,000 annually: however, this standard is already funded within the 20/21 budget envelope.

**Estimated cost implications:** Currently funded in the 20/21 base budget envelope

**3. Clear all paved walkways and trails:**

Winter servicing all AT walkways and MUPs most closely aligns with the desires of stakeholders for a connected AT network. However, this option would require HRM to clear all paved paths and to assume the liability of clearing paths leading to schools which are off of school property. As the HRCE does not clear many of the paths on school property, HRM could be potentially clearing walkways to dead ends. HRM staff have met with HRCE representatives and parties agreed that, due to public risk, this was not best practice.

The cost of this option was calculated using the average sidewalk cost per kilometer as a unit cost multiplied by the total length of all paved walkways, trails and MUPs. As this option includes an additional 10km of paths less than 1.6m in width, increased use of hand-crews means that this option will cost more per kilometer compared to Option 2.

**Estimated cost implications:** \$75,000 annually in addition to current budgeted envelop of \$260,000

**C. Protected Bike Lanes**

A connected bicycle network is an important part of the transportation network for commuters who choose to travel by bike as well as from an accessibility and equity perspective. The bicycle network is one of the lowest cost forms of travel in the transportation network, so limiting access throughout the year will impact how the Municipality services our various communities and how residents move around the municipality. HRM currently does not have established standards for protected bike lanes in the municipality. Without clearly defined WOSS for protected bike lanes, HRM increases its risk of providing inconsistent and unpredictable services across the network which do not align with Council priorities. Other considerations related to WOSS for protected bike lanes are listed below.

**Considerations:**

- AT stakeholders noted that AT protected bike lanes should be cleared, at a minimum, to the same standards as adjacent streets. These respondents also noted that AT networks of trails, walkways, bike lanes and sidewalks should be well-defined and communicated to the public.
- The nature of the protected bike lane snow clearing equipment and the speed at which it can be operated makes aligning street and protected bike lanes standards challenging to achieve effectively.
- Ottawa, Hamilton and Winnipeg currently maintain protected bicycle lanes within their municipality during winter months with varying conditions for service. Comparator municipalities generally service bike lanes to the same standard as adjacent streets.
- When retro-fitting bike lane in HRM, the ROW may not be wide enough for equipment to service the entire length of the lane when snowbanks begin to build up which causes challenges to maintaining the standard and variance to the cost/km.
- While Winnipeg will maintain the entire AT network during the winter for the first time this year, Ottawa maintains only a portion of the network. Ottawa specifically does not service protected lanes that are narrower than current equipment (less than 1.6 meters wide). Ottawa also noted that in previous years, some protected bike lane barriers were removed during winter months to allow for equipment and provide snow storage.

**Protected bike lane options and recommendations from KPMG report:**

**1. Do not winter service protected bike lanes:**

This option does not align with AT stakeholder desires or the Council direction to service protected bike lanes in the winter. It also does not align with approaches taken by comparator municipalities.

**Estimated cost implications: \$0 (potential savings)**

**2. Winter service protected bike lanes to the same standard as adjacent sidewalks. (Staff recommended option):**

Service protected bike lanes to the same standard as the adjacent sidewalk, considering the following:

- i. Design and facility type along the corridor, that allows winter operations using a single fleet asset type;
- ii. Minimum clear width of 1.75 meters; and,
- iii. A 1.5 meter buffer for snow storage where the sidewalk is open on the other side of the bike lane. Where the sidewalk is not open (e.g. against a building) a 2.0 meter buffer for snow storage is required.

Servicing protected bike lanes to the same standard as adjacent sidewalks based on minimum lane and snow storage widths would give HRM the best opportunity to meet service standards while also maintaining cleared protected bike lanes. This option is currently estimated at approximately \$7,000 per linear km, which is consistent with the cost of maintaining a sidewalk. If there is a protected facility on both sides (unidirectional bike lanes) the cost per kilometer is estimated at \$14,000/km, similar to having sidewalks on both sides of the roadway.

Snow removal may be required for lanes or portion of lanes that do not meet minimum buffer widths, increasing costs from \$7k to \$27k /linear km depending on the number of times snow is removed. If hand crews are required in addition to snow removal costs may be higher than \$27k/linear km.

This option generally aligns with the desires of AT stakeholders who seek standards for protected bike lanes that match adjacent street standards. Current planned/existing protected bike lanes in HRM are located adjacent to existing P1 streets and sidewalks which means the protected bike lanes will be completed to the same surface condition and within the same time frame of 12 hours. The primary difference is the start time which is 5 cm for sidewalks and 2 cm for streets. It should also be noted that local street bikeways (integrated with road and not separated) are already serviced to the same standard as the street.

Under this option, it may be challenging to design and build future protected bike lanes to meet the minimum design width requirements given the age and architecture of the municipality. As each design is unique and may change throughout functional and preliminary design phases, staff will be required to provide operational cost impacts per project, related to the standards required. There is a risk that the associated snow clearing costs for protected bike lanes will be higher.

As HRM gains experience and refines standards for both design and maintenance of these facilities, efficiencies are expected.

**Estimated cost implications:** \$7,000/linear km ranging to \$27,000/linear km when design widths are not achieved. It should be noted that funding for the current 6.4 km of protected bike lanes is in the base budget envelope for 20/21 winter season.

- 3. Winter service all protected bike lanes to the same standard as the adjacent street:**  
Winter servicing all protected bike lanes to the same standard as the adjacent street is in line with AT stakeholder expectations and Winnipeg's approach.

This option presents the risk that HRM will not be able to complete protected bike lanes to the same standard as streets given the speed of the equipment used, and the recognition that the weight and heat from vehicles helps with snow melt. Snow removal may be required for lanes that do not meet minimum buffer widths, increasing costs from \$7k to up to \$27k/linear km depending on the number of times snow is removed. If hand crews are required in addition to snow removal costs may be higher than \$27k/linear km. Due to the infrastructure challenges associated with clearing all types of lanes, there is a risk that increases in budget will not lead to the service levels expected by citizens.

As noted above, current planned/existing protected bike lanes in HRM are located adjacent to existing P1 streets and sidewalks which means the protected bike lanes will be completed to the same surface condition and within the same time frame of 12 hours. The primary difference is the start time which is 5 cm for sidewalks and 2 cm for streets. It should also be noted that local street bikeways (integrated with road and not separated) are already serviced to the same standard as the street.

**Estimated cost implications:** Up to \$27k/linear km annually; however, as noted above the funding for the current 6.4 km of protected bike lanes is in the base budget envelope for 20/21 winter season.

#### **D. Transit Infrastructure**

**HRM's current WOSS for transit infrastructure are as follows:**

- Maintenance of an area approximately 12 meters around the bus stops/shelter by plowing and/or snow removal dependent upon conditions; accessible parking locations are done at the same time; including in front of curb line.
- Application of winter de-icing and/or abrasive materials (treated sand or salt) to surfaces to improve traction for pedestrians or to de-ice the surface around the bus stop area.
- Improvement of visibility by pushing back snow (with mechanical equipment) to clear bus stop area where feasible and when required.
- Completion of all locations within 48 hours after snow accumulation has stopped.

**Current State Considerations:**

- Stakeholders noted that the standard for bus stop winter maintenance – within 48 hours after the snow accumulation has stopped – does not meet user needs and causes barriers to transit system use.
- While WOSS are established for bus stops they do not specify the surface condition required to operate the accessibility platforms. The built-in safety features of the platforms require a flat finish surface in order to enable someone to embark and disembark.
- Not all transit stops are hard-surfaced and not all stops have landing pads large enough to capture the rear door when passengers are disembarking.

- Business improvement stakeholders noted that snow removal at bus stops is often not wide enough for passengers to exit rear doors without climbing over snowbanks.
- All comparator municipalities noted that transit departments are responsible for clearing inside transit shelters, for clearing outside of shelters, and making cuts into windrows. Municipalities such as Winnipeg complete annual staff training on the clearing of transit stops. Ottawa services bus stops within 24 hours, as compared to HRM which services bus stops in 48 hours after snowfall.

**Transit Infrastructure Options and Recommendations from KPMG Report:**

**1. Do not change current WOSS for transit infrastructure**

This option does not align with stakeholder feedback on transit infrastructure mobility needs. Current standards on time to complete are double those of Ottawa.

**Estimated cost implications: \$0**

**2. Reduce time to complete bus stops to 24 hours after end of snowfall (Staff recommended option, subject to budget availability):**

Staff recommends reducing the time to complete bus stops to 24 hours after the end of snowfall aligned with stakeholder feedback and WOSS set in Ottawa. Reducing completion time and maintaining bare pavement surfaces at all paved bus stops increases mobility for all transit users and is aligned with the mobility goals of the IMP which prioritizes transit use and accessibility.

There is a risk that contractor capacity may limit the viability of this option; the crews that clear bus stops are typically also responsible for clearing streets and sidewalks.

Estimated increases in annual contract costs were calculated to range up to \$2 million, based on a doubling of costs per bus stop from approximately \$850 per unsheltered stop (\$1,075 per sheltered stop) to \$1,700 per unsheltered stop (\$2,150 per sheltered stop).

**Estimated cost implications: up to \$2,000,000**

**3. Reduce time to complete bus stops to 36 hours after end of snowfall:**

Reducing the time to complete bus stops to 36 hours after the end of snowfall partially aligns with stakeholder feedback.

Contractors may have capacity to complete this option, as they might be able to complete streets and sidewalks before needing to finish bus stops in most cases.

Estimated increases in annual contract costs were calculated to be approximately \$545,000, based on a 25% increase in contract costs. This increase is consistent with the experience of other municipalities.

**Estimated cost implications: \$545,000**

**4. Maintain bare pavement finish surface conditions at all full-length paved stops (Staff recommended option):**

Maintaining bare pavement surfaces at all full-length paved transit stops would help to ensure that landing pads are as flat as possible to enable accessible platform functionality. Note that not all stops are full-length and paved.

HRM currently maintains the majority of paved stops to as close to bare pavement as possible, as these stops are along P1 sidewalks. Costs to formalize this requirement in the WOSS would therefore be nominal.

**Estimated cost implications:** Nominal

#### **E. Winter Parking Enforcement**

In order to facilitate snow removal, the municipality, in conjunction with the Province, places an overnight parking ban from December 15 to March 31, which is only enforced during declared snow events.

##### **Key aspects of the ban include:**

- When enforced, the ban is in effect from 1:00 a.m. to 6:00 a.m. throughout the municipality.
- Residents are advised of winter parking bans via mobile apps and twitter notifications, email, the municipal website, and by 311 call-in. Residents are given notification 12 hours in advance of the commencement of the ban.
- Regardless of the status of the parking ban or snow and street conditions, vehicles can be ticketed (\$50 fee) or towed at any time if they are interfering with snow-clearing operations, as per Section 139 of the Nova Scotia Motor Vehicle Act.

##### **Current state considerations:**

- Ticket fees are set by the Province and may be too low to help enforce parking bans in the Halifax peninsula. With the exception of St. John's, comparator municipalities have higher winter parking ban ticket fees. Tickets for early payment in Ottawa, Quebec City and Winnipeg range from \$75–\$112.50, as compared to \$50 fees in HRM. The Province is currently reviewing a motion delivered by Council to increase fees in the Halifax peninsula to \$100.
- If a tow is required, operators must wait with the vehicle until the contracted tow truck arrives. This process is time consuming and can have a significant demand on resources.
- HRM has altered the towing process this year to speed up the towing of vehicles for obstructing snow removal. For example, Compliance Officers can now determine whether a vehicle is obstructing snow removal and ticket and tow without prior authorization of a supervisor.
- In anticipation of the findings in the KPMG report, and further to Council direction in the 2020/21 recast operating budget, staff has increased the number of contracted enforcement officers from 6 to 12 to improve service response.

##### **Winter Parking Enforcement Options and Recommendations from the KMPG report:**

#### **1. Maintain current approach to winter parking bans:**

Staff agree that maintaining the current approach to parking bans will continue to present challenges.

**Estimated cost implications:** \$0

#### **2. Expand the window for enforcement from 1:00 a.m.-6:00 a.m. to 12:00 a.m.-7:00 a.m.:**

Staff do not recommend adopting the change in hours to the winter parking ban. Prior to 2011, the winter parking ban extended to 7 a.m. Staff had received feedback that the ban was restrictive and

punitive to shift workers particularly at the hospital. While adding two hours of time to facilitate the removal of vehicles to accommodate snow clearing could result in more vehicles being towed, staff do not feel the nominal benefit to operations outweighs the impact to residents. The winter parking ban is currently governed by the municipal Traffic Authority for municipal roads and the Provincial Traffic Authority for Provincial roads. Staff would need to petition the Province to consider extending the parking ban window by two hours and this could potentially have impacts on other jurisdictions. This could result in municipal roads having a different time for winter ban enforcement than provincial, and leading to confusion and frustration for residents.

**Estimated cost implications:** approximately \$20,000 per year based on current contract conditions.

**3. Institute a snow-removal rolling parking ban (Staff recommended option):**

Subject to the approval of the HRM Traffic Authority, staff recommends instituting a 12-hour rolling parking ban for snow-removal operations in the downtown core in addition to the current approach to a blanket winter parking ban. Operations would target every second street within the zones. Residents would be notified through existing channels: Halifax Alert and PSAs as well as via the new Parking Technology solution including the HotSpot mobile app and notifications from the permit management website.

A rolling 12-hour snow-removal parking ban in the downtown core would allow HRM to complete snow-removal operations efficiently. This approach is used across comparator municipalities.

Downtown residents may be opposed to the implementation of this type of ban. Careful communications and targeting of every second street within a zone may help to mitigate opposition.

Instituting a 12-hour rolling snow-removal parking ban in the downtown core will allow HRM to complete winter service operations in a much more efficient manner. This option does present risks of resident opposition. Careful implementation and communication of the benefits could help to reduce resident opposition.

**Estimated cost implications:** Nominal

**4. Transition Towing Services in House:**

The analysis completed by KPMG requires further review of the service and cost implications. Staff recommends that Council provide direction to fully analyze the cost, pros and cons associated with developing an in-house towing program as part of the broader parking enforcement program for the municipality.

**FINANCIAL IMPLICATIONS**

The total financial impact carried by all staff recommendations in this report, excluding fleet acquisition, is \$2,000,000 in operational funds relative to the current 20/21 funding envelope. Should Regional Council approve the recommendation in this report, funding options will be presented through the budget process. Approved recommendations will be implemented through the tender process as HRM's existing 17 contracts expire. Details on HRM's existing contracts can be found in Appendix B. Should Council wish to implement changes prior to the expiry of the contracts, Legal would have to be engaged to explore the legal and financial ramifications of doing so.

| Option   | Est. Cost |
|--|-----------|
| <b>A2. Expand accessibility requirements for sidewalks</b>   | Nominal   |
| <b>A4. Add sidewalks along school frontages and health centers to P1 classification definition</b> | Nominal   |
| <b>B2. Clear a portion of existing paved walkways and MUPs</b>                                     | Nominal   |

|   |                    |
|---|--------------------|
| <b>C2 Winter service protected bike lanes to match adjacent sidewalks.</b>                              | Nominal*           |
| <b>D2. Reduce time to complete bus stops to 24 hours after end of snowfall.</b>                         | \$2,000,000        |
| <b>D4. Maintain bare pavement finish surface conditions at all paved stops</b>                          | Nominal            |
| <b>E3. Institute a Snow-removal Rolling Parking Ban in addition to the current sweeping parking ban</b> | Nominal            |
| <b>Total</b>  | <b>\$2,000,000</b> |

\*For the 5.15km length of network constructed as of fall 2020. As the protected bike lane network grows the cost of the network will be increased and the cost will be included in the project costs for each project as identified during Functional and Preliminary design.

No additional fleet is required at this time to meet recommended standards for the 20/21 winter season. In future, as part of Capital Budget process and in partnership with Fleet Services, TPW may bring to council request for fleet replacement and modernization that will both assist with the current standards and aid in implementing the revised and new standards moving forward. New equipment, when required, takes time to spec, Tender, and award, with delivery times often a full season out, so careful future planning is required as the network is expanded.

**RISK CONSIDERATION**

There is an overall risk that where service standards have not previously existed for AT infrastructure, there could be an increase in liability claims. Based upon past claims history, this risk is considered low.

Specific risks associated with staff’s recommendations follow:

- Add sidewalks along school frontages and health centres to P1 classification definition:  
 Risk that HRM may face higher public scrutiny if standards are not met or are perceived to not be met. An example would be over multi-day storms or storms presenting a variety of precipitation challenges.
- Winter service protected bike lanes to the same standard as adjacent sidewalks:  
 HRM is developing new designs for protected bike lanes. There is risk that some future protected bike lanes may not meet new service standards and require specific approval from the Municipal Engineer. Protected bike lanes that are unable to meet the standard will be more costly to maintain. If necessary, these design exceptions and costs will be identified during the functional and preliminary design.
- Reduce time to complete bus stops to 24 hours after end of snowfall:  
 There is a risk that the local vendors would be unable to provide this level of service. In this instance, staff would return to council to seek a modification to increase service standard from 24hrs to 36hrs.
- Institute a snow-removal rolling parking ban:  
 Downtown residents and businesses may be opposed to the implementation of this type of ban. Careful communications and targeting of every second street within a zone may help to mitigate opposition.

**COMMUNITY ENGAGEMENT**

As part of the winter operations service standard review, employees and elected officials across the organization were interviewed. Additionally, focus group sessions were held with key external accessibility, active transportation, and business stakeholders to understand their unique winter mobility needs and priorities. The engagements served to better understand HRM’s WOSS and operations and to identify current challenges and opportunities for future improvement.

In total, 14 internal HRM interviews, two focus groups and two interviews with the HRM Mayor and Councillors, and three external stakeholder focus groups were conducted, as outlined in the below table:

| Internal HRM Stakeholders   | Mayor & Councillors  | Key External Stakeholders  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• Social Policy</li> <li>• Diversity and Inclusion</li> <li>• Parks and Recreation</li> <li>• Halifax Transit Operations</li> <li>• Halifax Transit Planning</li> <li>• By Law Enforcement</li> <li>• Traffic Management</li> <li>• Corporate Fleet</li> <li>• Parking Management</li> <li>• Development</li> <li>• Road Operations and Construction Operators and Supervisors</li> <li>• Active Transportation</li> <li>• Director, Transportation and Public Works</li> <li>• EMO</li> </ul> | <ul style="list-style-type: none"> <li>• Mike Savage</li> <li>• David Hendsbee</li> <li>• Lindell Smith</li> <li>• Russel Walker</li> <li>• Steve Adams</li> <li>• Paul Russell</li> <li>• Lisa Blackburn</li> <li>• Sam Austin</li> <li>• Lorelei Nicoll</li> <li>• Tony Mancini</li> <li>• Shawn Cleary</li> <li>• Tim Outhit</li> </ul> | <ul style="list-style-type: none"> <li>• Halifax Cycling Coalition</li> <li>• Ecology Action Centre</li> <li>• Bicycle Nova Scotia</li> <li>• Walk ‘n’ Roll</li> <li>• Province of Nova-Scotia Accessibility Directorate</li> <li>• Canadian National Institute for the Blind</li> <li>• Canadian Paraplegic Association of Nova-Scotia</li> <li>• Downtown Dartmouth Business Commission</li> <li>• Spring Garden Area Business Association</li> <li>• Halifax Chamber of Commerce</li> </ul> |

In addition to the above, KPMG engaged five other comparable cities including St. John’s, Quebec City, Ottawa, Hamilton and Winnipeg.

Results of the engagement are available in Appendix A.

**ENVIRONMENTAL IMPLICATIONS**

Increase in fossil fuel usage and salt are anticipated to meet recommended changes to service standards. No environmental considerations or assessment was undertaken as a part of this report; however, staff will be reviewing the environmental footprint of the service in future as part of HalifACT 2050.

**ALTERNATIVES**

1. Regional Council may direct staff to amend some of the proposed service standards. Depending upon the degree of the change, this may require a supplementary report to Council to analyze feasibility and cost.
2. Regional Council may decline all recommendations and direct staff to continue with the existing standards and service approach.

**ATTACHMENTS**

Appendix A: KPMG Winter Operations Service Standard Review

Appendix B: Winter Contract Details

Appendix C: Proposed Winter Service Standards

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A copy of this report can be obtained online at [halifax.ca](http://halifax.ca) or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Steven York, Road Operations, Superintendent, 902.880.0948

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# HRM – Review Winter Operations Service Standards

Final Report

April 6th, 2020

# Disclaimer

This report is subject to the terms and conditions in our engagement letter October 7<sup>th</sup>, 2019. This report is intended solely to assist The Halifax Regional Municipality ("HRM") with a review of winter operations service standards. The comments and observations in our report are not intended, nor should they be interpreted, to be legal advice or legal opinion. This report is based on information and documentation that was made available to KPMG at the date of this report. KPMG has not audited nor otherwise attempted to independently verify the information provided unless otherwise indicated.

We had access to information up to April 3<sup>rd</sup>, 2020 in order to arrive at our observations but, should additional documentation or other information become available which impacts upon the observations reached in our report, we will reserve the right, if we consider it necessary, to amend our report accordingly. This report and the observations expressed herein are valid only in the context of the whole report. Selected observations should not be examined outside of the context of the report in its entirety.

Our observations and full report are confidential and are intended for the use of the HRM. Our review was limited to the procedures conducted. The scope of our engagement was, by design, limited and therefore the observations should be considered in the context of the procedures performed. In this capacity, we are not acting as external auditors nor value for money auditors and, accordingly, our work does not constitute an audit, examination, value for money, attestation, or specified procedures engagement in the nature of that conducted by external auditors on financial statements or other information and does not result in the expression of an opinion.

Pursuant to the terms of our engagement, it is understood and agreed that all decisions in connection with the implementation of advice and recommendations as provided by KPMG during the course of this engagement shall be the responsibility of, and made by, the HRM. KPMG has not and will not perform management functions or make management decisions for the HRM.

KPMG has no present or contemplated interest in the HRM, nor are we an insider or associate of the Municipality. Accordingly, we believe we are independent of the HRM and are acting objectively.

This report is not intended for general use, circulation or publication and any use of KPMG's report for any purpose other than circulation within the HRM without KPMG's prior written permission in each specific instance is prohibited. KPMG assumes no responsibility or liability for any costs, damages, losses, liability or expenses incurred by anyone as a result of the circulation, reproduction or use of or reliance upon KPMG's reports, contrary to this paragraph.

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# Executive Summary

**HRM – Review Winter Operations Service Standards  
Final Report**

# Introduction and Context

## Introduction

KPMG was engaged by Halifax Regional Municipality (“HRM”) to undertake a comprehensive review of HRM’s current Winter Works service standards (WWSS) and report any recommended changes. The overall goal of this report is to provide recommendations and next steps for defining WWSS, including active transportation infrastructure (AT), asset classifications, design standards, and resource requirements.

## Setting the Stage

With over 400,000 residents, the HRM is Nova Scotia’s largest county and serves as Atlantic Canada’s economic center. HRM often experiences severe, and varying winter weather. The county’s winter maintenance operations are performed by HRM’s Department of Transportation and Public Works (TPW) in collaboration with other HRM departments such as: Social Policy, Diversity and Inclusion, Parks and Recreation, Halifax Fire, Police and EMO, HRM Communications, Halifax Transit, Traffic Management, Parking Management, By-Law enforcement, Corporate Fleet, and Strategic Transportation Planning.

HRM undertook this review of its winter service standards for the following reasons:

- As with all municipalities, the HRM seeks to balance stakeholder expectations with the financial constraints of the region in the delivery of municipal services. The Department’s goal is to develop realistic and attainable winter service standards to keep the tax burden on residents and businesses to a minimum while maximizing its services.
- HRM has not updated its winter service standards since 2011, and they do not incorporate new operational considerations such as the universal accessibility targets outlined in HRM’s Integrated Mobility Plan and active transportation infrastructure such as protected bicycle lanes.
- The municipality has been involved in comparisons to other jurisdictions in the past, and wanted an objective and formalized review of its service standards to determine whether service levels align with those in other jurisdictions.
- While winter expenditures face great public scrutiny, winter operation costs are not always well known within the Department, making the development of operating and capital budgets difficult.

## Project Objectives

Specific project objectives included the following:

- Perform a comprehensive review of the existing municipal winter service standards for Streets, Sidewalks, Walkways and Trails;
- Compare existing standards and service to Ottawa and four (4) other comparable cities to gain insights into leading practices (including practices to activate and enforce Winter Parking bans and the use of technologies);
- Recommend costed service standard options for protected bike lanes;
- Develop and recommend criteria options to be used for establishing which walkways and trails (Multi-Use Pathways) receive winter maintenance;
- Review existing sidewalk classification criteria and provide costed options for revised criteria for establishing sidewalk clearing priorities;
- Review existing service standards for servicing Transit infrastructure, and develop and recommend (with cost implications) criteria to establish what infrastructure receives winter maintenance;
- Review HRM current Winter Equipment inventory and provide recommendations to meet service standard options; and,
- Perform stakeholder engagement with key groups to obtain information on their mobility needs and priorities and their views for future winter maintenance standards, and to provide them with information on HRM's current approach and priorities.

## Project Principles

- All recommendations made consider HRM's Integrated Mobility Plan, current operating environment and future state service goals and objectives.
- The knowledge and expertise of HRM employees and Members of Council and the Public were fully engaged, building upon their knowledge and expertise to arrive at recommended actions through transparent, participative and inclusive processes facilitated by the consultant.
- Wherever possible, KPMG transferred knowledge and necessary "tools" to HRM staff to enable them to better develop their own solutions to operational and process issues and challenges over time.
- The framework and approach was based on leading practice from municipal and other levels of government experience and/or private sector experience.
- Lastly, this was not an audit; the review built on successes and identified opportunities to improve the efficiency and effectiveness of how HRM delivers winter operation services.

# Introduction and Context

## Project Scope

### Phase One: Project Initiation

- Kick Off Meeting with Project Sponsor and Steering Committee
- Project Charter and Project Schedule
- Developed Engagement Plans for Stakeholders

### Phase Two: Current Service Delivery Model Review

- Documentation review to provide insight into the HRM's existing municipal winter service standards
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### Phase Five: Final Report and Presentation

- Develop first draft of final report
- Working session with HRM to present draft final report
- Incorporate feedback and finalize report



The project commenced October 24, 2019, and all engagement activities and deliverables will be completed and submitted to HRM on or before April 6<sup>th</sup>, 2020.

# Recommended WWSS

HRM's Integrated Mobility Plan is a strategy to transition mobility from automobiles to public transit and pedestrians. It is not an approved WWSS. The Integrated Mobility Plan clearly prioritizes people who walk followed by people who bicycle, and people who take transit ahead of people who use vehicles, as shown in the diagram to the right.

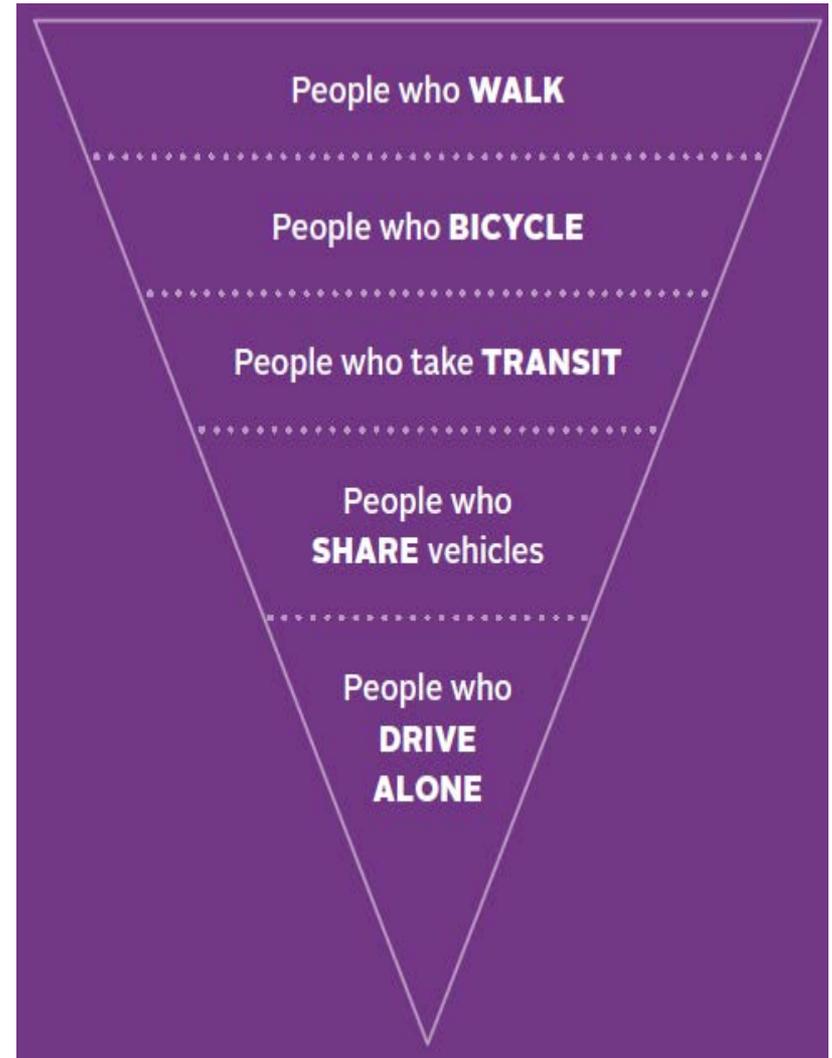
All changes to the WWSS should consider this Integrated Mobility Plan prioritization. Recommended options noted in the following slide move HRM closer to the Plan targets, and also take into consideration other pertinent legislation such as the Nova Scotia Accessibility Act.

WWSS options have been developed by examining jurisdictional analysis findings and emerging themes from the current state analysis. For each section of the WWSS examined, this report provides:

1. **A summary of current WWSS as well as issues and considerations relating to the current standard and processes;**
2. **Service level options, including associated option costs, risks, and estimated level of impact and required effort; and**
3. **Recommended WWSS option(s) to pursue with justification.**

NOTE: Cost estimations included in this report are high-level estimates, and should be treated as such. Actual option costs will be dependent on a number of factors such as contractor market capacity and competitiveness, actual weather severity, and changing HRM resourcing requirements.

**Further, while some comparators may have higher standards, in practice, delivery of these standards may not always be achieved.**



Source: Integrated Mobility Plan

# Recommended WWSS

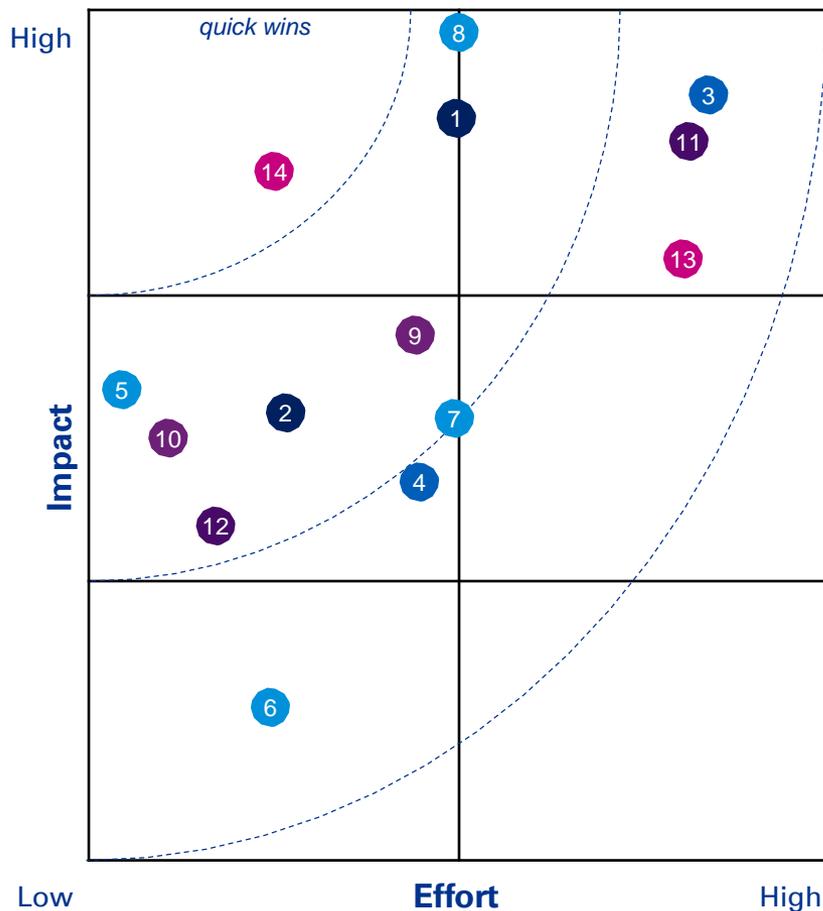
In response to jurisdictional scan findings and current state observations, the following WWSS options are recommended to enhance service:

| Type                                   | Recommended WWSS Option   | Est. Cost                                    | Impact | Effort |
|--|---|--|--------|--------|
| <b>Sidewalks</b>                       | Expand accessibility requirements   | <b>Nominal</b> –training and oversight costs | H      | L      |
| <b>Sidewalks</b>                       | Add sidewalks along school frontages and health centers to P1 classification definition   | <b>Nominal</b> –oversight costs              | M      | M      |
| <b>Walkways and Multi-Use Pathways</b> | <p>Winter-service paved municipal walkways and Multi-Use Pathways on municipal property to a bare or with abrasives applied surface condition, within 36 hours, based on the following factors:</p> <ul style="list-style-type: none"> <li>▪ Maintenance of corresponding walkway to school by HRCE;</li> <li>▪ Width greater than 1.6 meters along entire section;</li> <li>▪ Connects serviced routes;</li> <li>▪ Estimated community usage; and,</li> <li>▪ Provision of a substantial shortcut (e.g., 200m)</li> </ul> <p><b>Note:</b> Where a MUP acts as the primary sidewalk or parallel to a street, then service standards for the MUP should reflect those of sidewalks, with the priority mirroring the opposite sidewalk where present.</p> | <b>\$260K</b>                                | M      | L      |
| <b>Protected Bike Lanes</b>            | <p>Service a portion of protected bike lanes to the same standard as the adjacent sidewalk, based on the following factors:</p> <ul style="list-style-type: none"> <li>▪ Uniform design and layout along entire section of the lane, i.e. a consistent and homogenous physical layout that allows winter service requirements to be completed using a single fleet asset type;</li> <li>▪ Width greater than 1.75 meters along entire section of the lane; and,</li> <li>▪ 1.5 meters of available snow storage where the adjacent sidewalk is unencumbered on the side opposite to the bike lane. Where the adjacent sidewalk is otherwise encumbered (e.g. against a building) 2.0 meters of snow storage is required.</li> </ul>                     | <b>\$7k / km</b>                             | M      | L      |
| <b>Transit Infrastructure</b>          | Reduce time to complete bus stops to 24 hours after end of snowfall   | <b>\$2 Million</b>                           | H      | H      |
| <b>Transit Infrastructure</b>          | Maintain bare pavement finish surface conditions at all full-length paved stops   | <b>Nominal</b>                               | M      | L      |
| <b>Winter Parking Bans</b>             | Expand the window of enforcement from 1:00a.m. - 6:00a.m. to 12:00 a.m. - 07:00 a.m.  | <b>Nominal</b>                               | M      | L      |
| <b>Winter Parking Bans</b>             | Institute a 12-hour rolling snow-removal parking ban for the downtown core  | <b>Nominal</b>                               | M      | M      |

A full WWSS option analysis, including summaries of current state issues and considerations, option assessments and potential option risks is presented in the Recommended WWSS section beginning on page 46.

# Prioritization of Suggested Actions

In conjunction with the changes to the WWSS, the following actions are recommended to be undertaken. Suggested actions have been mapped for **impact versus effort** to help prioritize activities.



## Suggested Actions

- 1 Align Planning and Design with Road Operations and Construction so that winter service delivery is a key consideration of municipal infrastructure creation
- 2 Develop a set of five to 10 specific and measurable KPIs to monitor municipal performance against established winter service level goals
- 3 Update WWSS for sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans
- 4 Expand WWSS for snow removal
- 5 Increase collaboration with Transit Infrastructure
- 6 Remove traffic-calming infrastructure before the beginning of the winter season and complete training with operations on locations of infrastructure that cannot be removed
- 7 Alter towing practices such that towing activities are completed before operators begin to clear streets
- 8 Implement a unified capital budget planning and lifecycle costing model with Fleet and coordinate maintenance timing
- 9 GPS-enable the entire HRM fleet, as well as contractor equipment
- 10 Investigate the cost / benefit of using a RWIS to assist with planning and decision-making during the snow clearing season
- 11 Consider investment in new street and sidewalk fleet and equipment
- 12 Consider leasing purpose-build winter work equipment
- 13 Cross-train operators on winter work equipment and methods
- 14 Have all staff complete accessibility training annually to help ensure stakeholders' barrier-free mobility needs are better met, and hand-crew efforts are better allocated

|   |   |  |
|---|---|--|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #002060; border: 1px solid black;"></span> Governance        | <span style="display: inline-block; width: 15px; height: 15px; background-color: #0070C0; border: 1px solid black;"></span> Service Standard  | <span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; border: 1px solid black;"></span> Process & Delivery Model |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #6A329F; border: 1px solid black;"></span> Data & Technology | <span style="display: inline-block; width: 15px; height: 15px; background-color: #3A006A; border: 1px solid black;"></span> Fleet & Equipment | <span style="display: inline-block; width: 15px; height: 15px; background-color: #E91E63; border: 1px solid black;"></span> People                   |



# Project Overview

**HRM – Review Winter Operations Service Standards  
Final Report**

# Introduction and Context

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# Jurisdictional Review

**HRM – Review Winter Operations Service Standards  
Final Report**

# Comparative Analysis – Why Compare to Other Jurisdictions

For the purposes of this project, five comparator municipalities were selected as municipal comparators based on population and weather severity, as outlined in the table below.

The primary purpose of comparative analysis is to understand the performance of comparator municipalities in relation to HRM and to identify opportunities for change in HRM’s winter works service delivery. Points of comparison include the following:

- Budgets and expenditures;
- Service standards and service delivery for streets, sidewalks, walkways and trails, and protected bike lanes;
- Approaches to snow storage, de-icing and anti-icing, and operations staffing;
- Composition of fleet and equipment and use of technology; and,
- Winter parking ban enforcement



| Jurisdiction                     | Population <sup>1</sup> | Households <sup>1</sup> | Annual Snowfall (cm) <sup>2</sup> | Nov - April Rainfall (mm) <sup>2</sup> |
|----------------------------------|-------------------------|-------------------------|-----------------------------------|--|
| 1. Halifax Regional Municipality | 403,390                 | 173,460                 | 154                               | 644                                    |
| 2. St. John's, NL                | 205,955                 | 85,015                  | 335                               | 536                                    |
| 3. Quebec City, QC               | 705,103                 | 324,430                 | 303                               | 236                                    |
| 4. Ottawa, ON                    | 934,243                 | 373,755                 | 176                               | 232                                    |
| 5. Hamilton, ON                  | 536,917                 | 211,595                 | 157                               | 290                                    |
| 6. Winnipeg, MB                  | 705,244                 | 281,050                 | 114                               | 40                                     |

<sup>1</sup>Statistics Canada census profile, 2016 census data

<sup>2</sup>Environment Canada 30-Year Normal data

# Context – HRM Winter Control Past, Present & Future

While comparative analysis has many benefits, comparison alone also comes with risks. Comparisons can potentially lead to incorrect conclusions, as they often assume that many underlying variables are held constant between municipalities. In reality, a number of underlying variables are not constant between municipalities, including differences such as taxation bases and rates, budgetary allocations, climate and geographic differences, cultural expectations relating to level of service, existing infrastructure, and relationships with provincial governments.

Understanding HRM's past, present, and future winter control context is important, therefore, before making comparisons to other jurisdictions. Pertinent contextual information relating to HRM's winter operations includes:

- **Age** – Established in the 18<sup>th</sup> century, Halifax was incorporated as a city in 1842. As a result, many of the Municipality's streets and sidewalks are narrow, especially in Dartmouth and on the Halifax Peninsula. This architecture limits on-site snow storage and increases snow-removal needs. New infrastructure such as protected bike lanes and widened sidewalks compound these space-related winter operation issues.
- **Municipal Amalgamation** – In 1996, the former municipalities of Halifax, Dartmouth, Bedford and Halifax County were amalgamated into HRM. Although amalgamation occurred 24 years ago, there is a perception that winter works service level standards remain inconsistent across the former municipalities.
- **Geographic Scale** – HRM encompasses a region of 5,490 square km that includes coastal and inland areas. Weather within a municipality this large can vary greatly across its territory, with higher altitude inland regions receiving significantly greater snowfall amounts than low-lying coastal regions and maritime weather varying along the coastline. Additionally, due to geographic scale, the Municipality contains a number of provincially owned and maintained roads. Rural residents who live in areas on or near provincial roads have noted potential differences in winter works service delivery. The varied nature of the weather in the municipality makes setting and achieving 'consistent' standards across the HRM territory more difficult.
- **Sidewalk Clearing** – In 2013, HRM Council made the decision to move the responsibility of sidewalk clearing from residents to the Municipality. This increased level of service is not offered in many Canadian cities and some residents have questioned whether the change was the correct decision.
- **New Council Policy and Professional Practices for Active Transportation** – Public expectations for year-round access to AT networks is increasing in HRM. HRM now faces new pressure to offer bare pavement **Path Forward** - The IMP clearly prioritizes transit and AT for all ages and abilities. This policy direction will continue to pose new winter operation challenges for HRM, as the Municipality must balance increased service demands for sidewalks, walkways, transit stops, and bike lanes with continued services for streets. New infrastructure resulting from the IMP such as protected bike lanes and widened sidewalks will also continue to pose challenges for future winter operations.
- **Climate Change** – As the climate changes, HRM can expect more frequent, severe weather events and a greater amount of rain, freezing rain, and freeze-thaw ice build-up<sup>1</sup>.

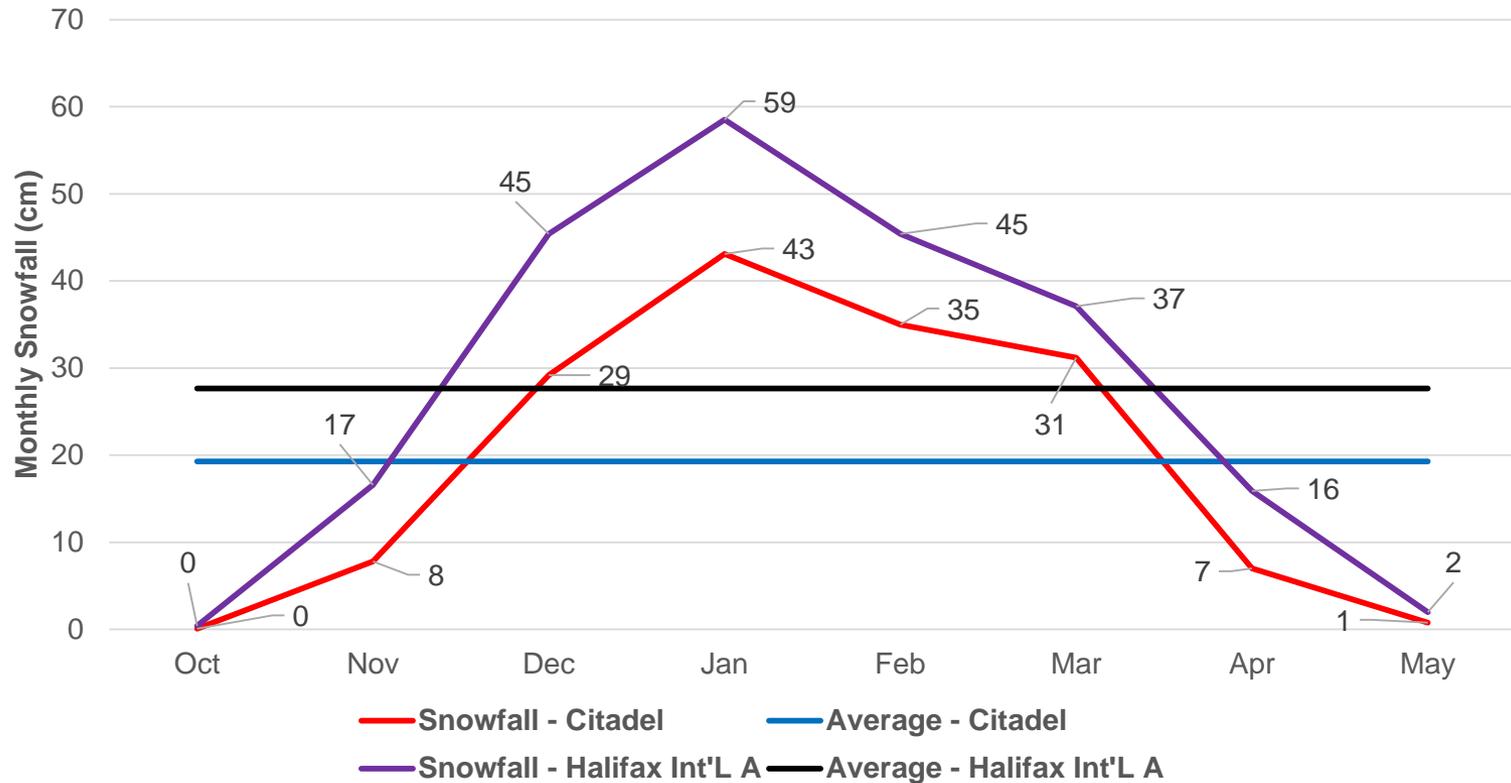
<https://www.halifax.ca/sites/default/files/documents/about-the-city/energy-environment/HRM%20Climate%20SMART%20Community%20Action%20Guide%20to%20Climate%20Change%20and%20Emergency%20Preparedness%20Nov%202010.pdf>

# Context - Weather

The Halifax Peninsula averages approximately 19.3 cm of snowfall per month between October and May, and 43.1 cm of snowfall in the month of January as shown in the graph below. In more inland regions, such as the Halifax International Airport, an average of 27.7 cm of snow falls between October and May and an average of 58.5 cm falls during the month of January.

As previously indicated, weather patterns vary across the HRM territory but also from year to year. There are years, such as 2015, where the Municipality received significantly more snow than average years.

### Halifax October to May Monthly Snowfall Averages



Source: Environment Canada 30-Year Normal data

# Context - Weather

Using Environment Canada 30-Year Normal data, we have compared winter weather severity in peer municipalities to weather severity in HRM in the table below. This is to reduce the effect of climate differences when comparing municipal operations. The following table includes a weather severity index for each comparator municipality.

Cities were compared based on total annual snowfall, number of days with temperatures below the freezing point, number of days with snowfall greater than 5 cm, and total rainfall during November to April to account for ice build-up. Assigning **HRM-Citadel** a baseline severity index of 1.00, we see that Hamilton, Winnipeg, and Ottawa have less severe winters than HRM, and St. John's and Quebec City have more severe winters than it.

With severity indexes of 0.92, 0.83, and 0.7, Ottawa, Hamilton and Winnipeg respectively appear to be the closest comparators to HRM. However, it's important to note that Winnipeg winters are much colder and do not typically experience wet snow and freeze-thaw cycles. While St. John's and Quebec City do experience wet snow and freeze-thaw cycles, weather severity in these municipalities is much higher.

**Based upon our analysis, it appears that Ottawa and Hamilton are more closely aligned with HRM-Citadel and serve as the most accurate comparators.**

| City        | Annual Snowfall Total (cm) | Index - Snowfall | # Days with min. temp. ≤0C | Index - Temperature | # Days with snowfall ≥5cm | Index - Snow Depth | Nov - April Rainfall (mm) | Winter Rainfall Index | Average Winter Weather Index |
|-------------|----------------------------|------------------|----------------------------|---------------------|---------------------------|--------------------|---------------------------|-----------------------|------------------------------|
| HRM-Citadel | 154                        | 1.00             | 131                        | 1.00                | 11                        | 1.00               | 644                       | 1.00                  | 1.00                         |
| HRM-INTL A  | 221                        | 1.43             | 153                        | 1.17                | 14                        | 1.23               | 575                       | 0.89                  | 1.18                         |
| St. John's  | 335                        | 2.17             | 167                        | 1.27                | 22                        | 1.93               | 536                       | 0.83                  | 1.55                         |
| Quebec City | 303                        | 1.97             | 171                        | 1.30                | 21                        | 1.86               | 236                       | 0.37                  | 1.37                         |
| Ottawa      | 176                        | 1.14             | 150                        | 1.14                | 12                        | 1.04               | 232                       | 0.36                  | 0.92                         |
| Hamilton    | 157                        | 1.01             | 138                        | 1.06                | 9                         | 0.81               | 290                       | 0.45                  | 0.83                         |
| Winnipeg    | 114                        | 0.74             | 193                        | 1.47                | 6                         | 0.54               | 40                        | 0.06                  | 0.70                         |



# Budget & Expenditures

**HRM – Review of Winter Operations Service Standards**

**Summary of Initial Findings**

# Budget & Expenditures

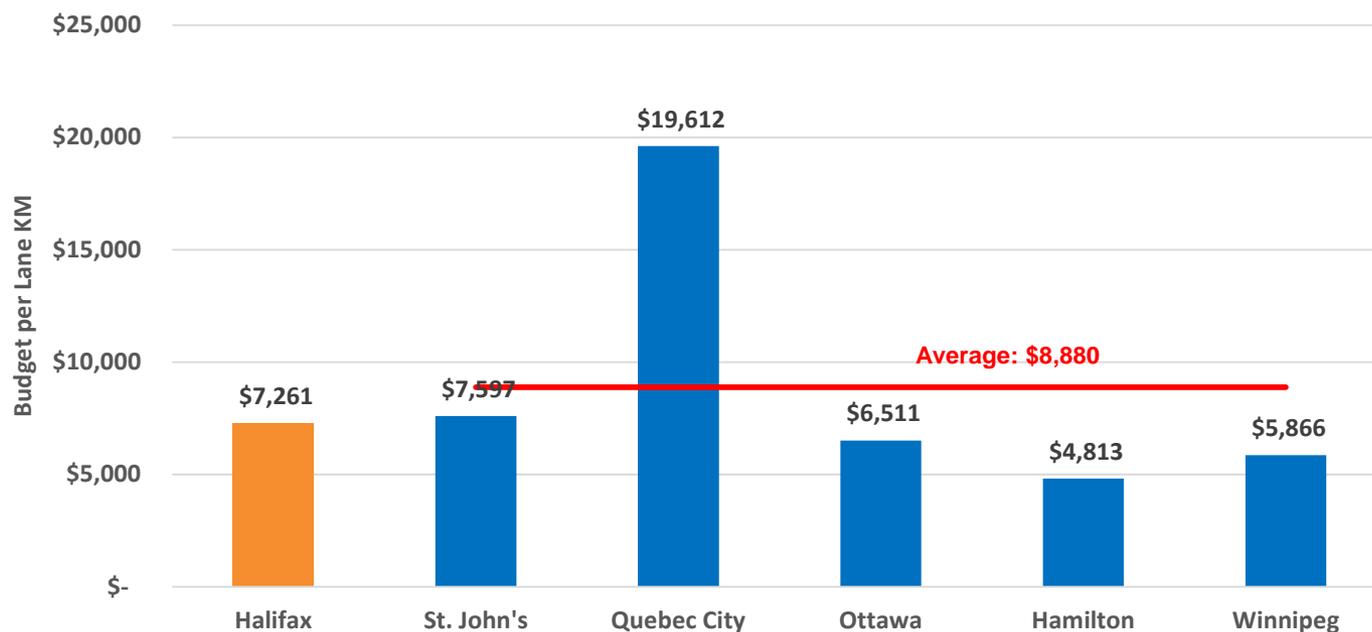
**Note** – No comparator jurisdictions were able to provide budgets broken down by infrastructure type, rendering correlations between budgetary increases and level of service difficult to make.

Of the comparator group, Quebec City budgets the most per street lane KM, even when factoring in weather severity. Representatives indicated that their standard requires multiple equipment passes which impacts transport costs, as well as a province-wide issue of contractor fee increases of 40-50%. Quebec City advised KPMG that they may move more operations in-house.

HRM budgets \$7,261 per lane KM, which is on par with the comparator average of \$8,880, but above the adjusted budget for Ottawa, Hamilton and Quebec City.

| Based on Budgeted Total Expenditures |                       |              | Adjusted for Weather Severity |        |
|--------------------------------------|-----------------------|--------------|-------------------------------|--------|
| City                                 | WW Exp Rounded (000s) | WW / Lane KM | WW / Lane KM                  |        |
| Halifax                              | \$ 28,677             | \$ 7,261     | \$                            | 7,261  |
| St. John's                           | \$ 16,500             | \$ 11,786    | \$                            | 7,597  |
| Quebec City                          | \$ 64,000             | \$ 26,947    | \$                            | 19,612 |
| Ottawa                               | \$ 76,000             | \$ 5,984     | \$                            | 6,511  |
| Hamilton                             | \$ 26,000             | \$ 4,014     | \$                            | 4,813  |
| Winnipeg                             | \$ 29,000             | \$ 4,128     | \$                            | 5,866  |

**Budget per Lane km Adjusted for Weather Severity**



# Budget & Expenditures

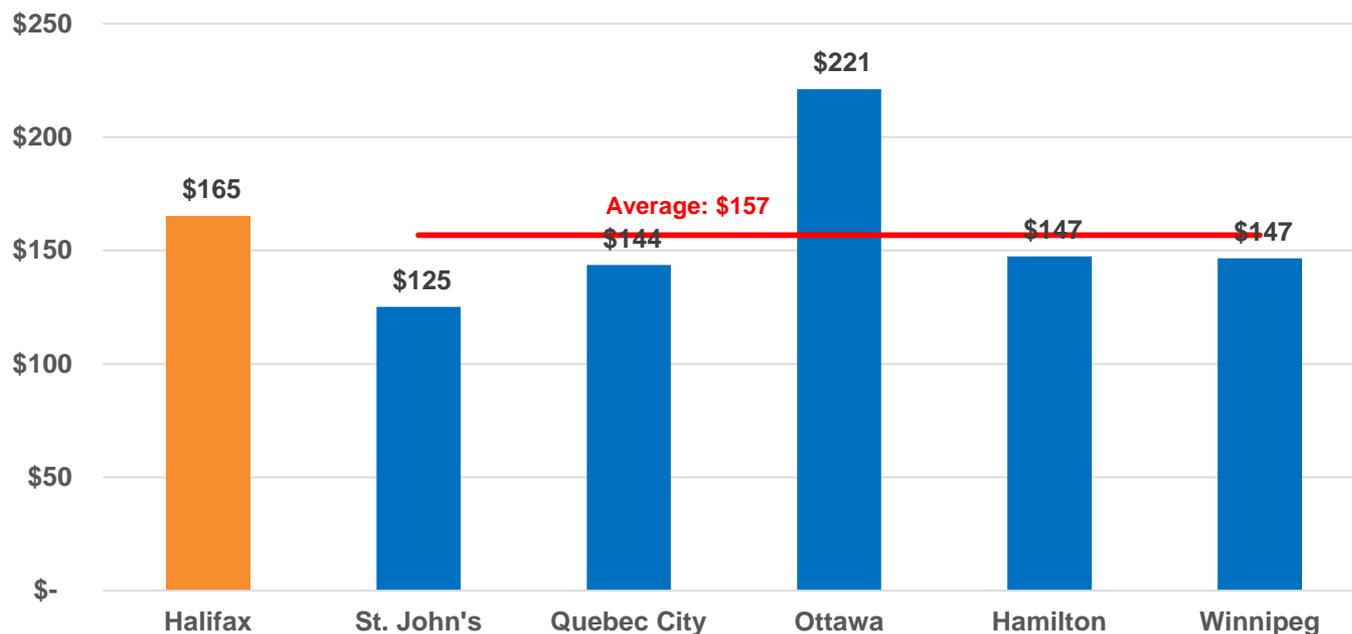
Before adjusting for weather severity, HRM budgets the fourth most per household for winter works, ahead of Hamilton and Winnipeg, but below St. John's, Quebec City and Ottawa.

Adjusting for weather severity, however, HRM budgets the second most per household for winter works at \$165 per household. This is slightly above the adjusted comparator average of \$157 per household.

The \$165 per household value calculated for the HRM may be attributed in part to household density across its territory. With a surface area of 5,490 km<sup>2</sup>, HRM has the largest area to service across comparators (twice Ottawa's), but has a number of households at the lower end of the group.

| Based on Budgeted Total Expenditures |                       |                | Adjusted for Weather Severity |                |
|--------------------------------------|-----------------------|----------------|-------------------------------|----------------|
| City                                 | WW Exp Rounded (000s) | WW / Household | WW / Household                | WW / Household |
| Halifax                              | \$ 28,677             | \$ 165         | \$ 165                        | \$ 165         |
| St. John's                           | \$ 16,500             | \$ 194         | \$ 125                        | \$ 125         |
| Quebec City                          | \$ 64,000             | \$ 197         | \$ 144                        | \$ 144         |
| Ottawa                               | \$ 76,000             | \$ 203         | \$ 221                        | \$ 221         |
| Hamilton                             | \$ 26,000             | \$ 123         | \$ 147                        | \$ 147         |
| Winnipeg                             | \$ 29,000             | \$ 103         | \$ 147                        | \$ 147         |

Budget per Household Adjusted for Weather Severity





# Service Standards and Delivery

**HRM – Review of Winter Operations Service Standards**

**Summary of Initial Findings**



A summary of key findings from the jurisdictional analysis for street service standards is presented below. See slide 25 for detailed service standards for each comparator municipality.

**Note that while some comparators may have higher standards, in practice, delivery of these standards may not always be achieved.**

|                                   |   |
|-----------------------------------|---|
| <b>Street Classifications</b>     | <p>Similar to HRM, comparator municipalities have 4 – 6 street classifications, which prioritize arterial and collector streets, transit routes, and streets with steep gradients. Residential and rural streets are given lower priority.</p> <p>Comparator municipalities prioritized winter operations for schools (St. John’s), hospitals and emergency services (Quebec City), business improvement districts, and enhanced services for streets with connected defined AT pathways (Winnipeg).</p>  |
| <b>Amount to Initiate Plowing</b> | <p>Comparator municipalities begin snow-clearing operations at snow accumulation amounts similar to HRM; operations on higher priority streets are generally set to start between 2 – 5 cm and lower priority streets start between 5 – 10 cm of accumulation. Quebec City’s standard requires plowing to start higher classification streets at the onset of precipitation.</p>  |
| <b>Multiple Passes</b>            | <p>In general, snow plowing is carried out throughout a snowfall event. Quebec City’s standard specifies that equipment must do additional passes to prevent the accumulation of 5 cm of snow on class 1 and 2 streets and 10 cm on class 3 streets.</p>  |
| <b>Timeline to Completion</b>     | <p>With a time to completion of 12 hours for P1 streets and 24 hours for P2 streets, HRM appears to have a moderate level service standard for completion time of streets in comparison to other jurisdictions.</p> <p>Ottawa, Hamilton and Quebec City have a more aggressive 2 – 8 hour time-to-completion standard for higher priority streets. St. John’s and Winnipeg have set less stringent standards; however, St. John’s commits to complete all streets in 24 hours and Winnipeg commits to completing higher priority streets within 36 hours and lower priority streets within five days.</p> |
| <b>Finish Surface Condition</b>   | <p>Comparator municipalities have slightly higher finish surface condition standards for streets in comparison to HRM.</p> <p>HRM has set 10-foot bare centerline and bare centerline standards for transit routes and residential streets with &gt;10% slopes, respectively. Other municipalities have set bare pavement as the standard finish surface condition for all higher priority streets.</p>   |

NOTE: All comparators recognized that standards may not be achieved following significant snow accumulation weather events. Ontario municipalities' standards may be influenced by the Minimum Maintenance Standards required by the Province.

| Municipality       | Street Classifications |   | Amount to Initiate Plowing                 | Timeline to Completion  | Finish Surface Condition                     |
|--------------------|------------------------|---|--|---|--|
| <b>HRM</b>         | P1                     | Main Arterials  | 2 cm                                       | 12 hours  | Bare pavement                                |
|                    |                        | Transit Routes  | 2 cm                                       | 12 hours  | 10 foot bare centerline                      |
|                    |                        | Residential with >10% slope   | 4 cm                                       | 12 hours  | Bare centerline                              |
|                    | P2                     | Residential   | 10 cm                                      | 24 hours  | Snow covered & passable                      |
|                    |                        | Gravel  | 10 cm                                      | 24 hours  | Snow covered & passable                      |
| <b>St. John's</b>  | P1                     | Arterials & Steep Hills   | 3 – 5 cm                                   | 24 hours  | Bare pavement                                |
|                    | P2                     | Collectors, Transit and School Routes   | 3 – 5 cm                                   | 24 hours  | Bare pavement                                |
|                    | P3                     | Residential Streets and Cul-de-sacs   | 3 – 5 cm                                   | 24 hours  | Bare pavement                                |
|                    | P4                     | Private Lanes   | 3 – 5 cm                                   | 24 hours  | Bare pavement                                |
| <b>Quebec City</b> | 1                      | Arterials, Primary Collectors, Gradients > 8%, School Zones*, Secondary Collectors or Transit Routes with Gradient > 5% | 0 cm (Initiated at start of precipitation) | - 4 hours after snowfall, if total ranges between 5 and 14.9 cm<br>- 6 hours after snowfall, if total ranges between 15 and 21.9 cm<br>- 8 hours after snowfall, if total ranges between 22 cm and more | Bare pavement                                |
|                    | 2                      | Secondary Collectors or Transit Routes with Gradient < 5%   | 0 cm (Initiated at start of precipitation) |   | Bare pavement                                |
|                    | 3                      | All other streets   | 5 cm                                       |   | Bare pavement at intersections and in curbs. |
| <b>Ottawa</b>      | 1                      | High priority Roads   | 2.5 – 8 cm                                 | 2 hours   | Bare pavement                                |
|                    | 2                      | Most Arterials  | 2.5 – 8 cm                                 | 3 hours   | Bare pavement                                |
|                    | 3                      | Major Collectors  | 2.5 – 8 cm                                 | 4 hours   | Bare pavement                                |
|                    | 4                      | Minor Collectors  | 5 cm                                       | 6 hours   | Varies                                       |
|                    | 5                      | Residential Roads and Lanes   | 7 – 10 cm                                  | 10 –16 hours  | Snow-packed                                  |
| <b>Hamilton</b>    | 1                      | Arterial roads & escarpment accesses  | 2.5 cm                                     | 4 hours   | Bare Pavement                                |
|                    | 2A                     | Primary collector roads   | 8 cm                                       | 8 hours   | Bare Pavement                                |
|                    | 2B                     | Secondary collector & steep residential   | 8 cm                                       | 8 hours   | Bare centerline                              |
|                    | 3                      | Rural roads   | 8 cm                                       | 24 hours  | Bare centerline / Snow-packed                |
|                    | 3R                     | Residential roads   | 8 cm                                       | 24 hours  | Bare Pavement                                |
| <b>Winnipeg</b>    | P1                     | High Priority - Arterials   | 3 cm                                       | 36 hours  | Bare Pavement                                |
|                    | P2AT                   | Enhanced service for AT   | 3 cm                                       | 36 hours  | Bare Pavement                                |
|                    | P3AT                   | Enhanced service for AT   | 3 cm                                       | 36 hours  | Bare Pavement                                |
|                    | P2                     | Collectors  | 5 cm                                       | 36 hours  | Bare Pavement                                |
|                    | P3S                    | Residential – School Route  | 5 cm                                       | 36 hours  | Bare Pavement                                |
|                    | P3                     | Residential   | 10 cm                                      | 120 hours   | Snow-packed                                  |

Source: Comparable Municipalities

## Streets

The following table describes four key insights from comparator municipalities on the delivery of winter works for streets.

### Starting Early

01

Comparators noted that street plowing begins as soon as snow begins to fall, and not necessarily as outlined in their respective standards in order to control ice build-up. This approach is consistent with HRM's current operations.

### Traffic-calming Infrastructure

02

Comparators noted increased challenges in working around traffic-calming infrastructure; e.g., speed bumps. Annual operator training on infrastructure location and increased signage has been effective in making operations more efficient and reducing damage incidents. Ottawa also noted that lower gradient speed hump designs (termed 'speed tables') were effective in limiting damage to equipment. Ottawa & Quebec City also noted that they remove some traffic-calming infrastructure in the winter.

### Geographic Elevation

03

Comparators such as St. John's have begun to factor elevation into the deployment of equipment. They anticipate 10 cm of additional snowfall per 10 m of elevation gain. Elevation could factor into HRM operations; the International Airport (elevation 145 m) receives annual average snowfall of 221 cm versus Halifax Citadel's (elevation 70 m) average snowfall of 154 cm.

### Working with Municipal Transit

04

Comparators noted that regular communication with Transit Services has led to better route planning and service delivery for both parties during winter events. St. John's is trialing a direction connection between transit and operations bypassing 311. Quebec City uses a SharePoint site to communicate timelines of operations and includes Transit in the coordination center.

A summary of key jurisdictional scan findings for sidewalk service standards is presented below. See the following slide for detailed service standards for each comparator municipality. Note that while some comparators may have higher standards, in practice, delivery of these standards may not always be achieved.

Note that while St. John's, Quebec City, Hamilton, and Ottawa conduct winter works on select city sidewalks, only Halifax and Winnipeg conduct winter works on all municipal sidewalks.

|  |   |
|--|---|
| <p><b>Sidewalk Classifications</b></p>   | <p>HRM has identified five categories of sidewalks while comparator municipalities have identified four or less categories. Similar to HRM, comparators classify sidewalks based upon the adjacent street classification. There are several notable exceptions to this:</p> <ul style="list-style-type: none"> <li>▪ <b>St. John's</b> – Top-priority are sidewalks within school zones; remaining operations follow street prioritization.</li> <li>▪ <b>Quebec City</b> – The snow-clearing policy uses a decision tree to determine sidewalk service levels. The details are included in the pages that follow.</li> <li>▪ <b>Ottawa</b> – Historically, the City has had separate sidewalk and road classifications. BIA sidewalks, employment centers, and tourist areas are given the highest priority, followed by transit routes and commercial frontages and finally residential areas.</li> <li>▪ <b>Winnipeg</b> – Identified sidewalks along school frontages and senior living facilities are given higher priority and level of service.</li> </ul> |
| <p><b>Amount to Initiate Plowing</b></p> | <p>Comparator municipalities; e.g., Ottawa, St. John's and Quebec City commence sidewalk operations slightly earlier than HRM, with the standards of 2.5 – 5 cm as compared to HRM starting between 5 – 15 cm. Starting sidewalks winter works later may exacerbate difficulties in clearing sidewalks.</p> <p>Winnipeg standards to initiate sidewalk snowplowing are similar to those of HRM. Hamilton begins sidewalk operations after the end of the snowfall.</p>  |
| <p><b>Timeline to Completion</b></p>     | <p>Ottawa and Quebec City have set slightly tighter timelines for the completion of top priority sidewalks, with time to bare pavement set at four hours for Ottawa and two to eight hours for Quebec City (depending on weather conditions). Alternatively, St. John's, Hamilton, and Winnipeg have much less aggressive times for completion with standards set at one to seven days.</p>   |
| <p><b>Finish Surface Condition</b></p>   | <p>HRM's finish surface condition standards are consistent with those of the comparator municipalities. Ottawa and Winnipeg, however, have bare pavement standards for sidewalks along main arterials whereas HRM standards call for bare or snow covered with abrasives applied.</p> <p>While St. John's has bare pavement standards for all sidewalks, this is achieved over a much longer time period of four to seven days.</p>   |

| Municipality  | Sidewalk Classifications |   | Amount to Initiate Plowing | Timeline to Completion   | Finish Surface Condition                                   |
|---|--------------------------|---|----------------------------|--|--|
| <b>HRM</b><br>Service primarily completed by contractors outside of downtown core                 | 1                        | Capital Districts   | 5 cm                       | 12 hours   | Bare (or as close to bare as possible given conditions)    |
|   | 2                        | Main Arterials  | 15 cm                      | 12 hours   | Bare or with salt / sand for traction                      |
|   | 3                        | Transit routes  | 15 cm                      | 18 hours   | Bare or with salt / sand for traction                      |
|   | 4                        | School Routes   | 15 cm                      | 18 hours   | Bare or with salt / sand for traction                      |
|   | 5                        | Residential Streets and Walkways not on Transit Routes  | After end of snowfall      | 36 hours   | Bare or with salt / sand for traction                      |
| <b>St. John's</b><br>Service provided primarily by the municipality, as well as some contractors. | SZ                       | School Zone   | 3 cm                       | 4-7 days   | Bare   |
|   | 1                        | P1 Streets - Arterials & Steep Hills  | 3 cm                       | 4-7 days   | Bare   |
|   | 2                        | P2 Streets - Collectors and Transit Routes  | 3 cm                       | 4-7 days   | Bare   |
|   | 3                        | P3 Streets - Residential Streets and Cul-de-sacs  | 3 cm                       | 4-7 days   | Bare   |
| <b>Quebec City</b>  | 1                        | High traffic and Gradients > 8%   | 5 cm                       | Total snowfall dependent as per street timelines on page 34. Class 1 and 2 sidewalks however must be done on a priority basis. | Bare   |
|   | 2                        | School zones, Gradients > 5%, or presence of either old age home, blind individual, or person with reduced mobility   | 5 cm                       |  | Bare or with salt / sand for traction                      |
|   | 3                        | Other   | 5 cm                       |  | Abrasives for traction and salt on iced surfaces as needed |
| <b>Ottawa</b><br>Service provided primarily by the municipality, as well as some contractors.     | 1                        | Business district, employment centers, tourist areas  | 2.5 cm                     | 4 hours  | Bare   |
|   | 2                        | Transit routes, commercial frontages, urban residential   | 5 cm                       | 12 hours   | Bare (arterials roads) / Snow-packed (other)               |
|   | 3                        | Rural and suburban along collector and residential roads  | 5 cm                       | 16 hours   | Snow-packed  |
| <b>Hamilton</b><br>Service provided primarily by the municipality, as well as some contractors.   | 1                        | City-owned sidewalks adjacent to City property, reverse frontage lots, schoolboard frontages (charge-back system) and former town of Ancaster ( urban special levy) | After end of snowfall      | 24 hours   | Bare   |
|   | 2                        | All other sidewalks within the municipality are the responsibility of the property owner  | No service offered         | No service offered   | No service offered   |
| <b>Winnipeg</b><br>Service provided primarily by the municipality, as well as some contractors.   | 1                        | Along High Priority - Arterials   | 5 cm                       | 36 hours   | Bare   |
|   | 2                        | Along Collectors  | 5 cm                       | 36 hours   | Snow-packed  |
|   | 3                        | Along Residential Streets   | 8 cm                       | 5 days   | Snow-packed  |

The following table describes four key insights from comparator municipalities on the delivery of winter works for sidewalks.

### Service Criteria

01

Comparators have begun to prioritize sidewalks based on factors other than road classification. Service criteria increasingly include urban profile and community need. Comparators noted they need more information on pedestrian volumes to inform prioritization.

### Transit Stops

02

Some comparators noted that Transit is responsible for clearing inside transit shelters, and Operations is responsible for clearing outside of shelters and making cuts into windrows. Winnipeg annually trains staff on the clearing of transit stops. Ottawa services bus stops within 24 hours, as compared to HRM which services bus stops within 48 hours. Quebec City has specified in its snow-clearing policy that sidewalks must be cleared from the street to the property line across 8m of bus stop frontage.

### Street Infrastructure Removal

03

To assist in efficient sidewalk snow-removal operations, municipalities such as Ottawa and Quebec City remove a significant amount of street infrastructure in the right of way. For example, on pedestrian streets similar to Argyle Street in Halifax, infrastructure such as bicycle stands are removed.

### Accessibility

04

Two comparators have incorporated accessibility into sidewalk operations. Quebec City's policy that old age homes and presence of an individual with accessibility needs are eligible criteria for a level 2 sidewalk classification. Winnipeg enhances services near old age homes and annually trains Operators on sidewalk accessibility. The other comparators noted they were in the early stages of incorporating accessibility considerations into sidewalk operations, and planned to update standards in the coming years.

Comparator municipalities generally service bike lanes to the same standard as adjacent streets.

Of the comparator municipalities, Ottawa, Hamilton and Winnipeg maintain protected bicycle lanes during winter months.

These municipalities maintain protected bike lanes to the same standard as adjacent roads.

Winnipeg will maintain the entire AT network during the winter for the first time this year, \*Ottawa maintains only a portion of the network. This approach is discussed further on the following slide. Ottawa also noted that in previous years, some protected bike lane barriers were removed during winter months.

| Municipality       | Bike Lanes Winter Maintained?                                      | Municipality Contains Protected Bike Lanes which are Winter Maintained? | Level of Service   |
|--------------------|--|---|--|
| <b>HRM</b>         | <b>Yes</b>   | <b>Yes</b>  | TBD  |
| <b>St. John's</b>  | <b>Yes</b><br>Service is provided by municipality and contractors  | <b>No</b>   | Same as adjacent street  |
| <b>Quebec City</b> | Piloting service on one bike lane this year                        | <b>No</b>   | TBD  |
| <b>Ottawa</b>      | <b>Yes*</b><br>Service is provided by municipality and contractors | <b>Yes*</b>   | Same as adjacent street or sidewalk on Winter AT network only  |
| <b>Hamilton</b>    | <b>Yes</b><br>Service is provided by municipality and contractors  | <b>Yes</b>  | TBD – standards not currently defined, but current operations follow the same standards as the adjacent street |
| <b>Winnipeg</b>    | <b>Yes</b><br>Service is provided by municipality and contractors  | <b>Yes</b>  | Same as adjacent street  |

The following table describes four key insights from comparator municipalities on the delivery of winter works for bike lanes.

### Maintenance Cycle Times

01

Comparator municipalities with protected bike lanes noted that quick maintenance cycle times were key to maintaining bike lanes during the winter in order to prevent snow and ice build-up, which can narrow lanes. Additionally, comparators noted Operators have been trained to avoid plowing snow into protected bike lanes.

### Winter / Summer AT Networks

02

Ottawa maintains separate winter and summer AT networks; only 44 km of 737 km of the network is maintained in the winter. Ottawa developed a Cycling Plan to identify the winter network that focused on the downtown core. Ottawa's website emphasizes that bike paths not on arterial roads will be maintained to a snow-packed surface. This approach is opposite of Winnipeg where the entire AT network is maintained year-round, which is the preference of HRM AT stakeholders.

### Protected Lane Width and Equipment

03

Ottawa, Hamilton and Winnipeg have protected winter bike lanes that are all 1.6 to 3m wide; equipment geometry has not posed an issue. Ottawa noted that lanes less than 1.6m wide are specifically not maintained as they are too narrow for equipment.

### Collaboration with Planning and Design

04

Comparator municipalities emphasized the importance of fostering a high level of collaboration between Road Operations and Planning and Design for all new infrastructure within the right of way, especially for infrastructure such as protected bike lanes. Collaboration is required to ensure that development design is aligned with Road Operation's available fleet and capacity.

# Walkways and Trails

AT walkways and trails are maintained by Road Operations in Quebec City, Ottawa, Hamilton, and Winnipeg. While Winnipeg services all established trails in their AT network (including gravel trails), Ottawa, Quebec City and Hamilton only service select walkways and trails. Ottawa noted they explicitly do not service trails to schools.

Comparators with defined standards set finished surface conditions to be snow-packed with abrasives applied. While Winnipeg services its entire AT network, time to completion standards are longer than those used in Ottawa and Quebec City.

| Municipality       | AT Walkways and Trails Maintained by Road Operations?   | If Yes, which AT Walkways and Trails?   | Level of Service  |
|--------------------|---|---|---|
| <b>HRM</b>         | TBD   | TBD   | TBD   |
| <b>St. John's</b>  | <b>No</b> – Walkways, staircases, trails, and links between streets in downtown core maintained by the Parks and Open Spaces Division | N/A   | N/A   |
| <b>Quebec City</b> | <b>Yes</b><br>Service is provided by municipality and contractors   | Short cuts (200m+) to community buildings and high-traffic trails. On-site storage and width necessary for equipment access required in order to be serviced. | Short cuts: as per sidewalks completed within four to eight hours depending on snowfall. Snow-packed with sand/salt applied finish surface condition. Trails: done in maintenance phase of snow-clearing operations. Snow-packed. |
| <b>Ottawa</b>      | <b>Yes</b><br>Service is provided by municipality and contractors   | Paved paths which reduce walking distance by 400m and on municipal property only. Paths to schools are not winter maintained.                                 | Same standards as P2 sidewalks: plow after 5 cm and complete within 12 hours. Snow-packed with sand/salt applied finish surface condition.  |
| <b>Hamilton</b>    | <b>Yes</b><br>Service is provided by municipality and contractors   | Most walkways and trails on municipal property that connect roadways/sidewalks.   | TBD – standards not currently defined. Standard review occurring this year.   |
| <b>Winnipeg</b>    | <b>Yes</b><br>Service is provided by municipality and contractors   | All walkways and trails on defined AT network, including gravel trails.   | Plow after 5 – 8 cm (generally after each event) and complete within 36 hours to five days. Snow-packed with sand applied finish surface condition.   |

### Equipment Used

- Comparators noted that sidewalk equipment is used to clear AT walkways and trails.

# Jurisdictional Analysis

## Snow Storage Facilities

Key insights from a scan of snow facilities include:

- All are engineered plots of land in which runoff is managed
- Facilities require ongoing maintenance throughout the winter, spring, and – at times – summer, which is a significant cost driver.
- Crews are required to handle the snow multiple times over the winter months to optimize the use of the space and ensure site safety by managing slope gradients and height. Staging of snow piles is actively planned and managed.
- Summer operations are sometimes required to break off the dark layer of debris to better enable snow melt.

| Municipality       | Approach  |
|--------------------|---|
| <b>HRM</b>         | Snow storage within the HRM occurs at municipal depots and other municipally owned sites. These are not engineered facilities with controlled drainage. Winter operations contractors use their own sites for snow storage. HRM does not have visibility on the nature and location of the privately owned sites used by the contractors, but requires environmental compliance within service agreements. Emergency storage is facilitated by HRM.   |
| <b>St. John's</b>  | St. John's owns one snow storage facility and it is not shared with others. Settling ponds are used to collect debris, but no other treatment is used. The facility is not centralized.   |
| <b>Quebec City</b> | Quebec City owns nine storage facilities located and has agreements with private land operators, such as quarries, for emergency storage. The municipally-owned sites have engineered drainage systems that meet environmental standards. They are costly to operate due to the continuous handling of snow required to maintain site safety. Maintenance is also required in the summer to help enable snow melt. A new snow-removal tax was implemented for high density areas where more than 80% of the population agrees to embark on the program offer. Full cost recovery has not been verified. |
| <b>Ottawa</b>      | There are eight municipally-owned snow storage facilities that offer little to no treatment of runoff. Oil grit separators are installed at the outlets; however, these sites require improved treatment. The only solution identified in the water strategy that could resolve runoff salt levels is dilution.   |
| <b>Hamilton</b>    | Hamilton owns two main centralized snow storage facilities, as well as several smaller facilities, which are dispersed throughout the municipality. These facilities are not shared. Runoff is managed to either a storm or sanitary sewer service level, but is not treated.   |
| <b>Winnipeg</b>    | Winnipeg currently owns and operates four snow disposal sites that are dispersed throughout the municipality. These sites are open to the public and industry. To manage runoff, the sites use a surface land drainage system.  |

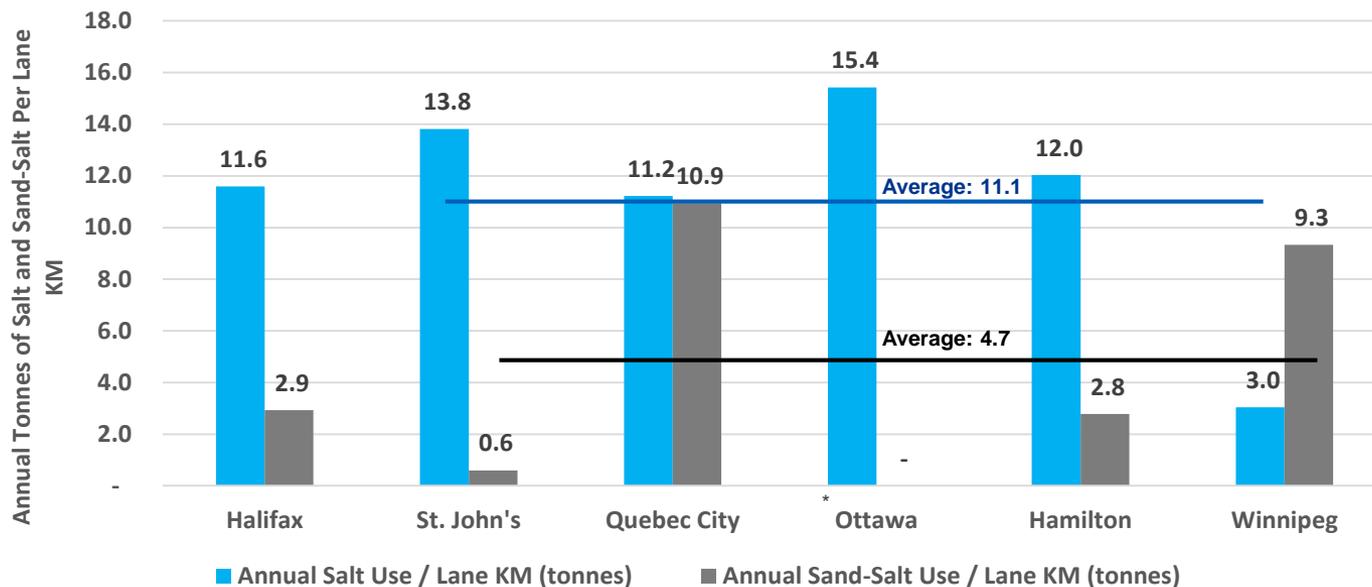
# De-Icing and Anti-Icing Materials and Operations

When comparing salt use to other jurisdictions with similar freeze-thaw cycles (St. John's Ottawa and Hamilton), HRM appears to use an average quantity per lane KM.

Note that salt use in Winnipeg is limited as colder temperatures (< -10 Celsius) render salt much less effective.

| City        | Based on Actual Reported Usage     |   | Adjusted for Weather Severity      |   |
|-------------|------------------------------------|---|------------------------------------|---|
|             | Annual Salt Use / Lane KM (tonnes) | Annual Sand-Salt Use / Lane KM (tonnes) | Annual Salt Use / Lane KM (tonnes) | Annual Sand-Salt Use / Lane KM (tonnes) |
| Halifax     | 11.6                               | 2.9                                     | 11.6                               | 2.9                                     |
| St. John's  | 21.4                               | 0.9                                     | 13.8                               | 0.6                                     |
| Quebec City | 15.4                               | 15.0                                    | 11.2                               | 10.9                                    |
| Ottawa      | 14.2                               | -                                       | 15.4                               | -                                       |
| Hamilton    | 10.0                               | 2.3                                     | 12.0                               | 2.8                                     |
| Winnipeg    | 2.1                                | 6.6                                     | 3.0                                | 9.3                                     |

Annual Use of Salt & Sand-Salt per Lane km Adjusted for Weather Severity



\*Sand-salt data for Ottawa was not provided



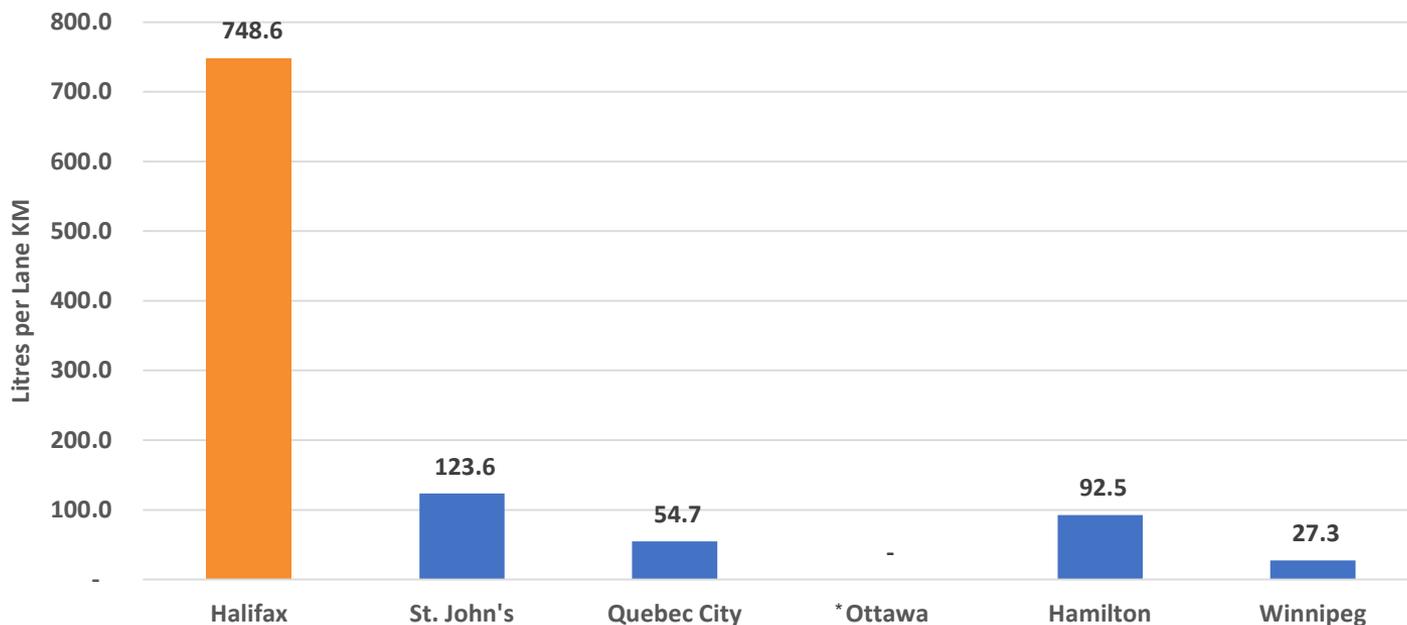
# De-Icing and Anti-Icing Materials and Operations (cont'd)

HRM uses significantly more liquid brine per lane km when compared to other jurisdictions.

This increased use is related to the high winter rainfall amounts experienced in HRM. Liquid brine is beneficial with combating black ice and helps to prevent bonding of snow and ice to the road surface at the start of an event.

| Based on Actual Reported Usage |  | Adjusted for Weather Severity              |
|--------------------------------|--|--|
| City                           | Annual Liquid Brine Use / Lane km (Litres) | Annual Liquid Brine Use / Lane km (Litres) |
| Halifax                        | 748.6                                      | 748.6                                      |
| St. John's                     | 191.7                                      | 123.6                                      |
| Quebec City                    | 75.2                                       | 54.7                                       |
| Ottawa                         | -  | -  |
| Hamilton                       | 77.2                                       | 92.5                                       |
| Winnipeg                       | 19.2                                       | 27.3                                       |

Annual Liquid Brine Use / Lane km Adjusted for Weather Severity



\*Data for Ottawa was not provided

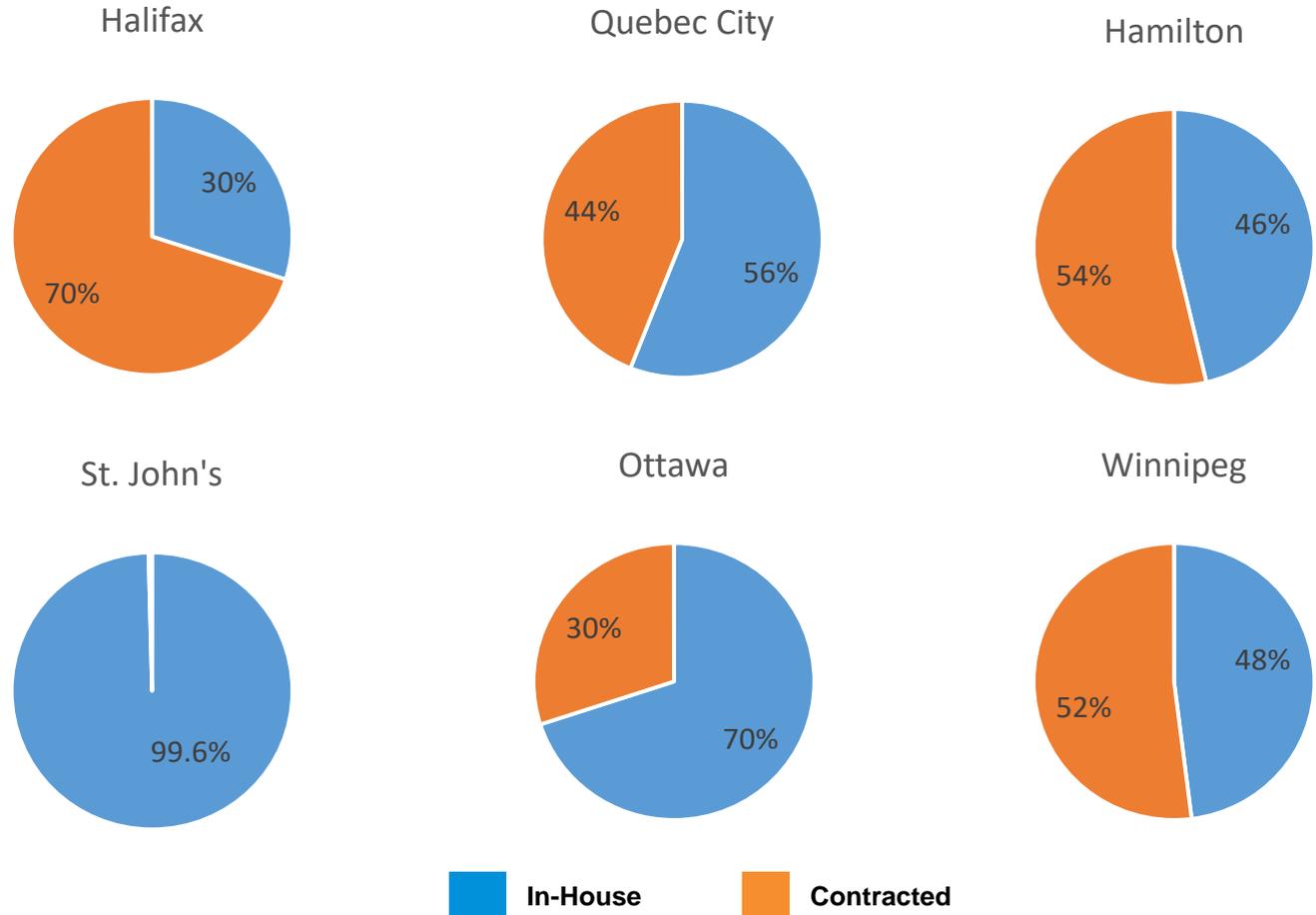
# Jurisdictional Analysis

## Staffing Considerations

By outsourcing 70% of street operations, Halifax uses the greatest proportion of contracted services for streets. While Quebec City, Hamilton and Winnipeg use contractors for approximately half of their winter road operations, St. John's and Ottawa use a much lower proportion of contractors.

Ottawa noted that it uses contracted staff for surge capacity, and St. John's indicated that contracted staff use expands and contracts based on snow transport needs (but was unable to determine the exact number of contracted staff).

**Percentage of Streets Completed In-House & by Contractors**



# Staffing Considerations

Other winter operation staffing approaches used by comparator municipalities are described in the table to the right.

Comparators were asked to provide insights into their approach to ramping up and down staffing levels during the winter season, as well as their approach to sharing staff with the Parks department.

| Municipality       | Approach to Staffing Up / Down  | Approach for Sharing Staff with Parks   |
|--------------------|---|---|
| <b>HRM</b>         | <ul style="list-style-type: none"> <li>Approximately 80% of Parks department staff are moved to Transportation and Public Works from November 15<sup>th</sup> to April 15<sup>th</sup>.</li> <li>Ten Term Staff are used for hand-work and are shared with Parks when not required for snow and ice removal.</li> </ul>   | <ul style="list-style-type: none"> <li>Sharing of staff generally works well, but Supervision of Parks staff during the winter can be problematic.</li> <li>Due to Collective Agreement terms, HRM is challenged by less experienced, but more senior Parks staff operating the largest pieces of equipment.</li> </ul>   |
| <b>St. John's</b>  | <p>Roads staffing for the winter season is as follows:</p> <ul style="list-style-type: none"> <li>November: 60 operators to staff the routes for salting and light plowing (30 on day shift and 30 on night shift)</li> <li>December to mid-March: 180 operators assigned to various shifts for roads and sidewalks</li> <li>April: 60 operators to staff the routes for salting and light plowing (30 on day shift and 30 on night shift)</li> </ul> | <ul style="list-style-type: none"> <li>Staff are not shared between divisions during the winter.</li> <li>Staff are required to pass an assessment on each piece of equipment prior to sign-off.</li> </ul>   |
| <b>Quebec City</b> | <ul style="list-style-type: none"> <li>Additional employees are added for the winter period.</li> <li>Road operations staffing is budgeted based on an average winter season. If a more severe winter occurs, peripheral activities such as water systems repair, paving, etc. are abandoned in favor of snow clearing.</li> </ul>  | <ul style="list-style-type: none"> <li>Parks staff are not shared for winter operations. Only Public Works and contractors complete snow operations on streets and sidewalks.</li> </ul>  |
| <b>Ottawa</b>      | No information provided.  | No information provided.  |
| <b>Hamilton</b>    | <ul style="list-style-type: none"> <li>There are internal and external postings for winter operations staff</li> <li>External recruitment for winter operations (term and task positions) begins in September</li> <li>Staff start in the middle of November and their term typically ends in the second week of week of April (weather pending)</li> <li>There are approximately 140 part-time/seasonal winter operations</li> </ul>                 | <ul style="list-style-type: none"> <li>There are designated dual positions that spend 60% in Parks and 40% in Road Operations</li> <li>There are no issues with the operating of equipment. Shifts are balanced so there is a mix of experienced and inexperienced staff. Seniority is determined by the CBA.</li> <li>Many experienced supervisors have left resulting in issues with less experienced staff that are not as familiar with winter operations.</li> </ul> |
| <b>Winnipeg</b>    | <ul style="list-style-type: none"> <li>Approximately 100 Road Operations staff are laid off in the fall for the winter.</li> </ul>  | <ul style="list-style-type: none"> <li>The Parks Division participates in snow-clearing of some AT and all parks pathways. They have an assigned inventory to complete.</li> <li>As they operate relatively small types of equipment and are typically less busy in the winter, Supervisory issues have not been a concern.</li> </ul>  |



# Fleet and Technology

**HRM – Review Winter Operations Service Standards**

**Summary of Initial Findings**

# Jurisdictional Analysis

## Fleet and Equipment

Comparator figures include leased and owned equipment.

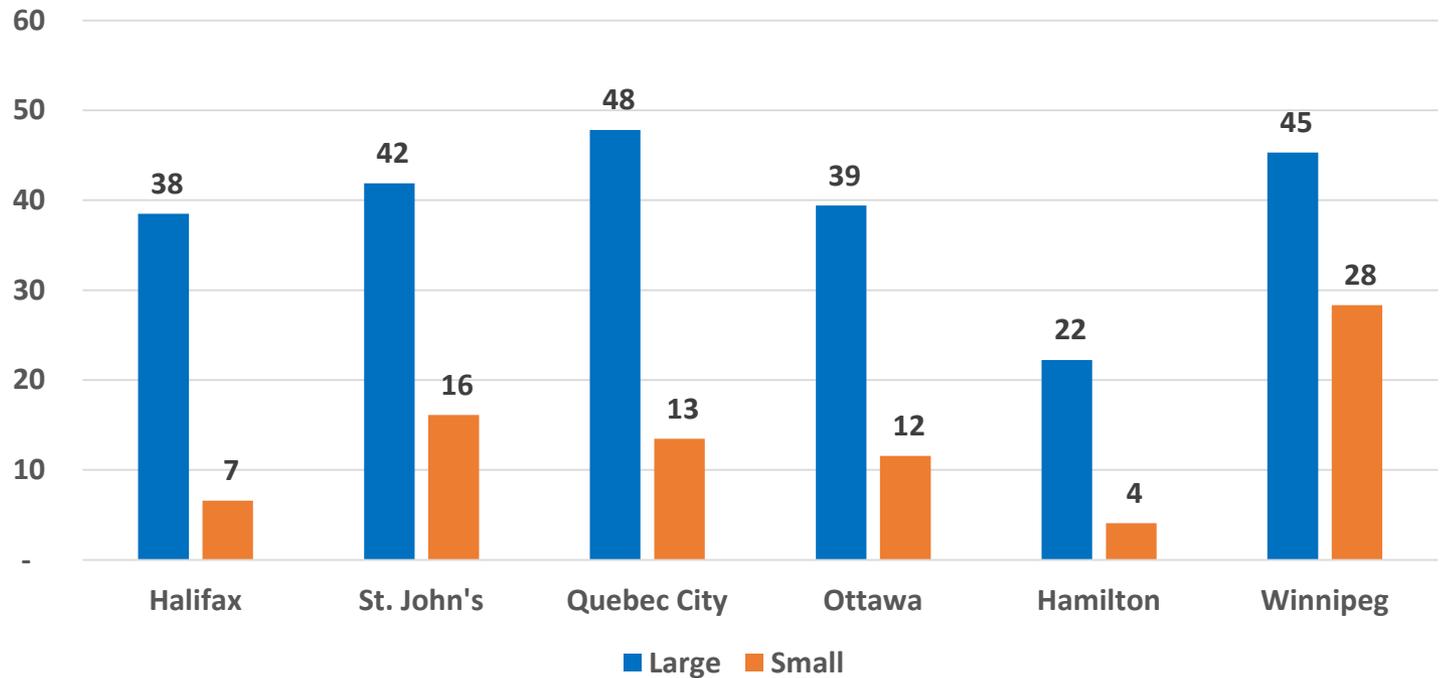
Large equipment includes fleet assets such as heavy roadway plows, loaders, backhoes and spreaders. Small equipment includes light vehicles and sidewalk equipment.

HRM has the second lowest amount of large and small equipment per 1000 lane kilometers adjusted for weather severity, ahead of only Hamilton.

Comparators noted that leasing instead of buying winter-specific machinery was an effective mechanism to reduce capital and repair costs.

| City        | Number of Fleet Assets per 1000 Lane KM |       | Adjusted for Weather Severity |       |
|-------------|---|-------|-------------------------------|-------|
|             | Large                                   | Small | Large                         | Small |
| Halifax     | 152                                     | 26    | 38                            | 7     |
| St. John's  | 91                                      | 35    | 65                            | 25    |
| Quebec City | 156                                     | 44    | 66                            | 19    |
| Ottawa      | 460                                     | 135   | 36                            | 11    |
| Hamilton    | 120                                     | 22    | 19                            | 3     |
| Winnipeg    | 224                                     | 44    | 32                            | 20    |

Number of Fleet Assets per 1000 Lane km Adjusted for Weather Severity



Comparator municipalities are using communications and forecasting technology to make winter operations more effective and efficient.

### Communications Technology

- Cities such as St. John's and Hamilton leverage GPS technology on their fleet and equipment to show residents where winter operations are occurring or have already occurred. St. John's shows residents the current location and direction of travel of leased and owned equipment, whereas Hamilton shows residents the coverage of all owned, leased and contractor equipment over the past 24 hours.
- Similar to HRM, Winnipeg reports winter operations completion to residents. Unlike HRM, however, the Winnipeg website allows residents to search if specific streets have been serviced.
- Additionally, for the 2019/2020 season, Winnipeg is directing residents to utilize the *Waze Traffic App* that will allow residents to receive real-time updates on what routes have been plowed and which are still waiting to be cleared.
- See [Appendix A](#) for screenshots of the above mentioned communications tools.

### Forecasting Technology

Note: HRM currently subscribes to two weather forecasting services (RWDI and BTN Group) to meet current forecasting needs.

- St. John's uses a Road Weather Information System (RWIS) to forecast upcoming weather events. The RWIS assists with planning and decision-making during the snow-clearing season by providing event start and stop times and guidance for the application of de-icing materials.
- Winnipeg is in the process of testing a MRWIS to better understand live surface conditions.
- Similar to HRM, Quebec City uses a third-party meteorological service provider. It sends weather reports four times per day to guide operational planning. It also calculates the depth of snowfalls, which is used in contractor payment schemes and in the case of legal disputes.



# Parking Ban Enforcement

**HRM – Review of Winter Operations Service Standards**

**Summary of Initial Findings**

# Parking Ban Enforcement

Details of comparator municipality parking ban types, administration, and enforcement are detailed on the following slides. Note that Hamilton does not administer winter parking bans. Three key themes from the jurisdictional comparison on parking ban standards and enforcement are presented in the table below:

## Enforcement Standards

|                              |  |
|------------------------------|--|
| <b>Window of Enforcement</b> | Comparator municipalities have longer windows of parking ban enforcement. Comparators generally have a six- to seven-hour window to complete plowing operations as compared to HRM’s five hours. Additionally, comparators enforce a seven- to twelve-hour parking ban window to complete snow-removal operations. |
| <b>Ticket Fees</b>           | With the exception of St. John’s, comparator municipalities have higher winter parking ban ticket fees. Tickets for early payment in Ottawa, Quebec City and Winnipeg range from \$75 – \$112.50, as compared to \$50 fees in HRM.   |

## Parking Ban and Enforcement Delivery

**Pre-emptive Towing**

- Ottawa and Winnipeg noted that before winter operations begin, parking enforcement and towing activities are already completed. This saves operators time and effort.

**Snow Removal in Downtown Residential Areas**

- St. John’s, Quebec City and Ottawa noted that when completing snow-removal operations in downtown residential areas, operations focus on every second street within a zone. This allows residents in the downtown areas to find alternative parking near their homes.

**In-house Towing Capacity**

- Comparators noted that private towing contracts can be difficult to procure as there are fewer contractors and bids are increasing. In response, Winnipeg completes all towing in-house.

# Parking Ban Enforcement

| Municipality             | Types of Winter Parking Bans Used  | Approach and Enforcement   |
|--------------------------|--|--|
| <p><b>HRM</b></p>        | <p><b>1. Municipal Overnight Winter Parking Ban:</b> This rolling parking ban is in effect every year from December 15 to March 31, but is only enforced during declared weather events and ongoing clearing operations. When enforced, the ban is in effect from 1:00 a.m. to 6:00 a.m. throughout the Regional Center of the municipality.</p>   | <p>Residents are advised of winter parking bans via mobile apps and Twitter notifications, email, the municipal website, and by 311 call-in. Residents are given notification 12 hours in advance of the commencement of the ban.</p> <p>Regardless of the status of the parking ban or snow and street conditions, vehicles can be ticketed (\$50 fee) or towed at any time if they are interfering with snow-clearing operations, as per Section 139 of the Nova Scotia Motor Vehicle Act.</p>   |
| <p><b>St. John's</b></p> | <p><b>1. Outside the Downtown and Business District Parking Ban:</b> No on-street parking is permitted from 12:30 a.m. and 7:30 a.m. regardless of snow or street conditions. The ban is generally in effect from January to April with timing depending on winter conditions.</p> <p><b>2. No Parking Snow Routes:</b> From December 1 to March 31 parking is prohibited 24 hours a day on streets designated as snow routes.</p> <p><b>3. Business District Winter Parking Ban:</b> No on-street parking in the downtown business district is permitted from 4:00 a.m. to 6:00 a.m. regardless of snow or street conditions. The ban is generally in effect from January to April within timing depending on winter conditions.</p> <p><b>4. Downtown Parking Restriction:</b> Parking is restricted on downtown streets between 12:30 a.m. and 7:30 a.m. on streets where snow-removal operations are taking place.</p> | <p>The timing of when the Outside the Downtown and Business District Parking Ban and the Business District Winter Parking Ban comes into effect varies depending on weather conditions. Delayed implementation of these bans can be challenging to operations staff when there are multiple, consecutive significant accumulation snowfalls.</p> <p>Any vehicle that impedes snow-removal operations at any time can receive a \$50 ticket or be towed. Towing operations are most relevant to the Downtown Parking Restriction during snow-removal operations.</p> <p>Streets impacted by the Downtown Parking Restriction are communicated to residents by email lists, the municipal website, and via physical signage the day of operations by 3:00 p.m. To allow downtown residents to find alternative parking near their homes, the City will complete snow-removal operations on every second street within an area.</p> |

# Parking Ban Enforcement

| Municipality              | Types of Winter Parking Bans Used  | Approach and Enforcement   |
|---------------------------|--|--|
| <p><b>Quebec City</b></p> | <p><b>1. Municipal Overnight Winter Parking Ban:</b> The rolling parking ban is in effect every year from November 1 to April 15, but is only enforced during snow-removal operations. The sectors across the municipality are divided into three parking ban categories.</p> <ul style="list-style-type: none"> <li>- Commercial areas 12:00 a.m. to 7:00 a.m.</li> <li>- Problematic areas 10:00 p.m. to 7:00 a.m.</li> <li>- Residential neighborhood areas 9:00 p.m. to 7:00 a.m.</li> </ul> <p>The problematic areas are categorized by narrow streets where removal operations will be impeded and other factors. When enforced, the ban in effect is sector-dependent and announced by pole-mounted flashing orange signs. The municipality must announce the decision to enforce the ban by 4:00 p.m. the night of planned snow-removal operations.</p> <p><b>2. No Parking Snow Routes:</b> From December 1 to March 31 parking is prohibited from 9:00 p.m. to 7:00 a.m.</p> | <p>Towing only takes place during snow-removal operations. The exception to this rule occurs during severe freezing rain events that require crews to treat the road surface and neighboring sidewalks.</p> <p>Case dependent the vehicle will get ticketed (\$75) or towed as well as ticketed. The municipality has vehicle holding areas but typically vehicles are towed to a neighboring priority street that was just cleared and that is therefore used for local staging. The vehicle owner can call a dedicated phone number to find out the location of his or her vehicle.</p> <p>The private-sector tow truck operator is accompanied by a by-law officer (parking by-law enforcement is contracted out year round). The by-law officer electronically logs the ticket and the approximate new location of the vehicle. The municipality may emit up to 400 tickets during one evening of snow-removal operations. Because the municipality is short-staffed, towing in commercial and problematic areas is prioritized.</p> |
| <p><b>Ottawa</b></p>      | <p><b>1. Overnight Parking Ban:</b> Between November 15 to April 1, there is no on-street parking between 1:00 a.m. and 7:00 a.m. when Environment Canada forecasts 7 cm or more of snow in the Ottawa area. This includes any forecast for a range of snow more than 7 cm, such as 5 to 10 cm. When an overnight winter parking ban is made, the municipality issues a special advisory to the local media and posts it on ottawa.ca. The parking ban ends when snow clearing is completed and the municipality issues an advisory indicating that it has been lifted.</p>  | <p>Vehicles without a residential parking permit that are parked on the street during an overnight parking ban are ticketed or towed. Vehicles with residential parking permits are exempt from overnight parking bans.</p> <p>During plowing operations, ticketing (\$75 fee) only is used as ban enforcement. During snow-removal operations, however, contracted tow trucks are kept on standby, and begin towing illegally parked vehicles before operations start. Snow removal takes places from 7:00 p.m. to 7:00 a.m., and residents are alerted of operations by email, the municipal website and with physical signage the day of operations. Similar to St. John's, Ottawa completes snow removals on every second street to allow residents to find alternative parking.</p>   |

# Parking Ban Enforcement

| Municipality | Types of Winter Parking Bans Used  | Approach and Enforcement   |
|--------------|--|--|
| Hamilton     | <p><b>No winter parking bans utilized.</b></p>   | <p>Hamilton has identified the lack of winter parking bans a major operational challenge.</p> <p>Snow-removal operations only take place in the BIA on one side of the street at a time. Areas where operations will take place are cordoned off with traffic cones the day of snow removal, and operations take place from 2:00 a.m. to 7:00 a.m. Towing is almost never utilized, except for in the case of emergencies.</p>   |
| Winnipeg     | <ol style="list-style-type: none"> <li>1. <b>Annual Snow Route Parking Ban:</b> Vehicles may not park on designated snow routes between 2:00 a.m. to 7:00 a.m. on designated snow routes.</li> <li>2. <b>Extended Snow Route Parking Ban:</b> Following snow events or significant snow accumulation, vehicles may not park on designated snow routes between 12:00 a.m. to 7:00 a.m. on designated snow routes.</li> <li>3. <b>Residential Parking Ban:</b> This ban is a rolling parking ban in residential areas. Areas are cleared by zone in 12- hour, 7 – 7, day and night shifts.</li> <li>4. <b>Temporary No Parking:</b> Restricts parking during snow-removal operations.</li> <li>5. <b>Snow Emergency Parking Bans:</b> The Mayor may declare a snow emergency at any time. This prompts a snow emergency parking ban that prohibits parking on snow routes at all times.</li> </ol> | <p>Residents are alerted of parking bans in effect through mobile app notifications, email, 311, and the municipal website. For snow-removal operations, residents are given 24-hours' notice, and physical signage is placed in snowbanks.</p> <p>To enforce parking bans, tickets range from \$75 to \$112.50. The municipality may also courtesy-tow vehicles to adjacent streets when they are impeding snow operations at the cost of the municipality.</p> <p>Ticketing and towing occurring before snow operations begin. Winnipeg owns all of its own towing capacity.</p> |



# Recommended WWSS

**HRM – Review Winter Operations Service Standards  
Final Report**

# Recommended WWSS Introduction

HRM's Integrated Mobility Plan is a strategy to transition mobility from automobiles to public transit and pedestrians. It is not an approved WWSS. The IMP clearly prioritizes people who walk followed by people who bicycle, and people who take transit ahead of people who use vehicles, as shown in the diagram to the right.

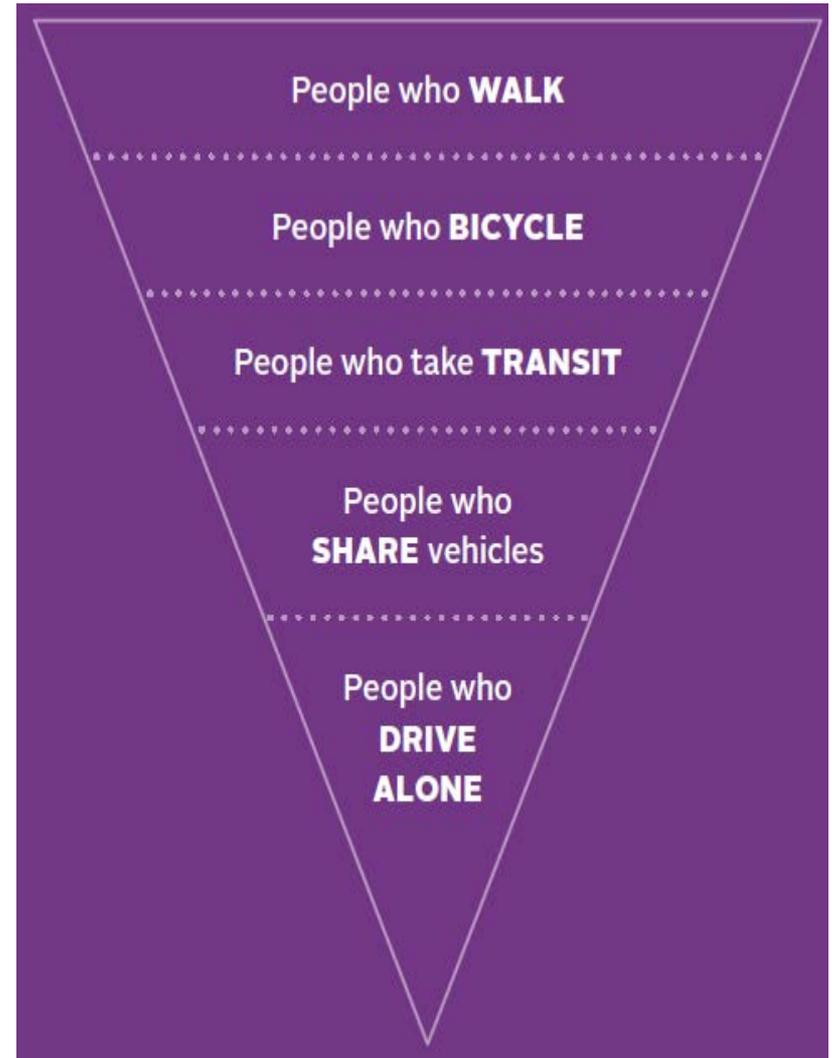
All changes to the WWSS should consider this Integrated Mobility Plan prioritization. Recommended options in this section move HRM closer to the Plan targets, and also take into consideration other pertinent legislation such as the Nova Scotia Accessibility Act.

WWSS options have been developed by examining jurisdictional analysis findings and emerging themes from the current state analysis. For each section of the WWSS examined, this report provides:

1. **A summary of current WWSS as well as issues and considerations relating to the current standard and processes;**
2. **Service level options, including associated option costs, risks, and estimated level of impact and required effort; and**
3. **Recommended WWSS option(s) to pursue with justification.**

NOTE: Cost estimations included in this report are high-level estimates, and should be treated as such. Actual option costs will be dependent on a number of factors such as contractor market capacity and competitiveness, actual weather severity, and changing HRM resourcing requirements.

**Further, while some comparators may have higher standards, in practice, delivery of these standards may not always be achieved.**



Source: Integrated Mobility Plan



# Sidewalks

**HRM – Review Winter Operations Service Standards**

**WWSS Options Development**

# Sidewalks

The below tables summarizes current WWSS for sidewalks in the HRM. Note that operations typically start earlier than snowfall amounts described in the table. Considerations relating to modifications to these standards are discussed below.

| Sidewalk Classifications |  | Amount to Initiate Plowing | Timeline to Completion | Finish Surface Condition                                |
|--------------------------|--|----------------------------|------------------------|---|
| 1                        | Capital Districts                                      | 5 cm                       | 12 hours               | Bare (or as close to bare as possible given conditions) |
| 2                        | Main Arterials   | 15 cm                      | 12 hours               | Bare or with salt / sand for traction                   |
| 3                        | Transit routes   | 15 cm                      | 18 hours               | Bare or with salt / sand for traction                   |
| 4                        | School Routes  | 15 cm                      | 18 hours               | Bare or with salt / sand for traction                   |
| 5                        | Residential Streets and Walkways not on Transit Routes | After end of snowfall      | 36 hours               | Bare or with salt / sand for traction                   |

### Current State Considerations:

- Sidewalk conditions are an area of concern for many stakeholders, particularly for the Halifax peninsula and downtown core. Consultation participants cited contractor oversight and the historic focus on streets as reasons why sidewalk services were not delivered with the same quality as street services.
- Active Transportation stakeholders noted that sidewalks should at a minimum be cleared to the same standard as adjacent streets and in some high-volume pedestrian areas should be prioritized higher than adjacent streets.
- However, as identified in the April 2017 Sidewalk Snow Removal Options report presented to council, sidewalk service levels cannot mirror what is possible on streets. This reflects the physical characteristics of sidewalks (limited width and lack of direct drainage) and effects of pedestrian traffic versus vehicle traffic. Heat from vehicular traffic helps accelerate melt and breakdown of snow and ice.
- Current WWSS do not consider the barrier free mobility needs of citizens e.g., the need to clear rumble strips, sidewalk intersections, crosswalk buttons, and accessible parking access to the sidewalks.
- Jurisdictional comparators such as Ottawa and Quebec City have set standards to initiate plowing earlier than the HRM (2.5 – 5 cm), and have set shorter timeline standards to completion (less than 12 hours). Comparator jurisdictions are also increasing service in select areas such as school frontages and old-age homes.

# WWSS Options Development

## Sidewalks

Options for sidewalk WWSS modifications are presented below.

| Option  | Est. Cost  | Impact          | Effort          | Option Assessment & Risks to Implementation  |
|---|--|-----------------|-----------------|--|
| <p><b>1. Do not alter WWSS for sidewalks</b></p>  | <p><b>\$0</b></p>                                    | <p>N/A</p>      | <p>N/A</p>      | <p>Improved WWSS for sidewalks were a recurring concern for multiple stakeholders. By not altering the WWSS for sidewalks, HRM will not be addressing these stakeholders' concerns.</p>  |
| <p><b>2. Expand accessibility requirements</b></p> <p>This would include defined standards for clearing rumble strips, sidewalk intersections, crosswalk buttons, and accessible parking access to sidewalks.</p> | <p><b>Nominal – training and oversight costs</b></p> | <p><b>H</b></p> | <p><b>L</b></p> | <p>HRM already completes activities to support winter accessibility, such as clearing crosswalk buttons and removing windows next to accessible parking locations, but have received some feedback that service is inconsistent and could be improved.</p> <p>Implementing this option would result in formalized accessibility requirements that help HRM deliver winter services on sidewalks more consistently. Increases in operating costs are estimated to be low. These costs will namely relate to WWSS supervision and supervisor and operator training as HRM is completing some of this activity already.</p> <p>This low-cost option could have a large, positive impact on stakeholders with increased accessibility needs.</p> |

Options for sidewalk WWSS changes are presented below.

| Option  | Est. Cost   | Impact   | Effort   | Option Assessment & Risks to Implementation   |
|---|---|----------|----------|---|
| <p><b>3. Increase sidewalk service standards</b></p> <p>Lower threshold to initiate plowing to 2.5 – 5 cm and the timeline to completion to four to 16 hours.</p>   | <p><b>\$7 – 12 Million</b><br/>– based on number of increased deployments</p> | <p>H</p> | <p>H</p> | <p>Lowering the amount to initiate plowing on sidewalks and decreasing the time to completion is in line with stakeholder desire for betterment of services. Improving service levels on sidewalks is also in line with IMP prioritization of the pedestrian.</p> <p>Current sidewalk expenditures of approximately \$6.7 million per year are expected to increase by \$7 – 12 million under this option. Assumed increases in costs are based on a potential threefold rise in the number of plowing operation deployments that result from 2.5 – 5 cm as opposed to 5 – 15 cm initiation set points. Costs may also increase due to a shorter timeline to completion. Actual increases relating to this option will be dependent on market capacity and competitiveness.</p> <p>This option may render WWSS for sidewalks too challenging to realistically achieve. Even with large increases in budget, achievement of these standards may be limited due to current market capacity.</p> |
| <p><b>4. Add sidewalks along school frontages and health centers to P1 classification definition</b></p> <p>Formalize the range of sidewalk frontages serviced to P1 standards along school frontages and health centers where feasible from a routing perspective.</p> | <p><b>Nominal</b><br/>– oversight</p>   | <p>M</p> | <p>M</p> | <p>This option aligns with the sidewalk classifications of jurisdictional comparators. Increasing services along school frontages and health centers is also in line with the desires of stakeholders to increase services where they are needed most.</p> <p>There is a risk, however, that HRM may face much higher public scrutiny if standards are not met, or are perceived to not be met, in these areas.</p> <p>The cost is based on the assumption that schools and health centers are largely located along existing P1 routes.</p>  |

|                              |   |
|------------------------------|---|
| <p><b>Recommendation</b></p> | <p><b>Options 2 &amp; 4: Expand accessibility requirements outlined in WWSS and add sidewalks along school frontages and health centers to P1 classification definition</b></p>   |
| <p><b>Justification</b></p>  | <p>Expanding and formalizing sidewalk accessibility requirements outlined in the WWSS is the option with the greatest anticipated impact and the lowest anticipated effort. Defined standards for clearing rumble strips, sidewalk intersections, crosswalk buttons, and accessible parking benefit not only those with increased mobility needs, but all sidewalk users. This option aligns with the intent of the Accessibility and Inclusion Strategy, and would help to ensure that HRM provides a more consistent service within the municipality. As HRM already completes some of these activities, delivery of these standards may be achievable through increased staff training and adjustments to existing operational plans.</p> <p>Increasing services for sidewalks along school frontages and health centers aligns with the IMP’s prioritization of the pedestrian and with stakeholder desires. It is already being partially completed by HRM. Expanding these services to all schools and health centers is expected to be a lower cost option.</p> <p>While matching Ottawa’s standards for all sidewalk classifications could improve services to all HRM residents, this option is expected to be exceedingly costly. There is also a risk that these WWSS are challenging to achieve due to the total capacity of contractors within the HRM. For these reasons, this option is not recommended.</p> |



# Walkways & Multi-Use Pathways (MUP)

**HRM – Review Winter Operations Service Standards**

**WWSS Options Development**

# WWSS Options Development

## Walkways & MUPs

HRM currently does not have established standards for Active Transportation (AT) walkways and MUPs in the municipality. Without clearly defined WWSS for walkways and MUPs, HRM increases its risk of reputational damage and legal liabilities. Other considerations related to WWSS for walkways and trails are listed below.

### Current State Considerations:

- AT stakeholders noted that AT walkways and MUPs should be cleared, at a minimum, to the same standards as adjacent streets. These respondents also noted that AT networks MUPs, walkways, bike lanes and sidewalks should be well-defined and communicated to the public.
- AT walkways and MUPs are maintained by Road Operations in most other comparator municipalities. While Winnipeg services all established trails in their AT network (including gravel trails), Ottawa, Quebec City and Hamilton only service select walkways and trails.
- Ottawa explicitly does not service gravel trails or paths leading to schools.
- Comparators with defined standards set finished surface conditions to be snow-packed with abrasives applied. While Winnipeg services its entire AT network, time to completion standards (36 hours to 5 days) are longer than those used in Ottawa and Quebec City (12 and 4 to 8 hours respectively).

Options for walkway and trails WWSS development are presented below.

| Option   | Est. Cost | Impact | Effort | Option Assessment & Risks  |
|--|-----------|--------|--------|--|
| <b>1. Do not apply winter service to walkways and MUPs</b> | \$0       | N/A    | N/A    | <p>This option does not align with the desires of stakeholders for a connected AT network. It also does not align with the direction most other comparator municipalities have taken for walkways and trails.</p> <p>As HRM currently services some walkways and MUPs without a defined standard, this option would ultimately result in a reduction in service.</p> |

# WWSS Options Development

## Walkways & MUPs

Options for walkway and trails WWSS development are presented below.

| Option  | Est. Cost                      | Impact          | Effort          | Option Assessment & Risks  |
|---|--------------------------------|-----------------|-----------------|--|
| <p><b>2. Clear a portion of paved walkways and MUPs</b></p> <p>Service a portion of paved walkways and MUPs on municipal property to a bare or with abrasives applied surface condition, within 36 hours, based on the following factors:</p> <ul style="list-style-type: none"> <li>▪ Maintenance of corresponding walkway to school by HRCE;</li> <li>▪ Width greater than 1.6 meters along entire section;</li> <li>▪ Connects serviced routes;</li> <li>▪ Estimated community usage; and,</li> <li>▪ Provision of a substantial shortcut (e.g., 200m).</li> </ul> | <p><b>\$160 –<br/>260k</b></p> | <p><b>M</b></p> | <p><b>L</b></p> | <p>Winter servicing a portion of paved walkways and MUPs most closely matches HRM's current operations. Developing formalized standards for walkways and MUPs will allow HRM to deliver these services in a more defined, consistent manner. This option partially aligns with stakeholder desires for a connected AT network.</p> <p>The cost of this option was calculated using the average sidewalk cost per kilometer as a unit cost and the total length of paved trails 1.6 meters or greater in width.</p>   |
| <p><b>3. Clear all paved walkways and trails</b></p> <p>Service the entire network of paved walkways and MUPs to a bare or with abrasives applied surface condition. Complete within five days.</p>   | <p><b>\$210 –<br/>335k</b></p> | <p><b>M</b></p> | <p><b>M</b></p> | <p>Winter servicing all AT walkways and MUPs most closely aligns with the desires of stakeholders for a connected AT network. However, this option would require HRM to clear all paved paths and to assume the liability of clearing paths leading to schools which are off of school property. As the HRCE does not clear many of the paths on school property, HRM could be potentially clearing walkways to dead ends.</p> <p>The cost of this option was calculated using the average sidewalk cost per kilometer as a unit cost multiplied by the total length of all paved walkways, trails and MUPs. As this option includes an additional 10km of paths less than 1.6m in length, increased use of hand-crews means that this option will cost more per kilometer compared to Option 2.</p> |

|                              |   |
|------------------------------|---|
| <p><b>Recommendation</b></p> | <p><b>Option 2: Winter service paved municipal walkways and MUPs on municipal property to a bare or with abrasives applied surface condition, within 36 hours, based on the following factors:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Maintenance of corresponding walkway to school by HRCE;</b></li> <li>▪ <b>Width greater than 1.6 meters along entire section;</b></li> <li>▪ <b>Connects serviced routes;</b></li> <li>▪ <b>Estimated community usage; and,</b></li> <li>▪ <b>Provision of a substantial shortcut (e.g., 200m)</b></li> </ul> <p><b>Note: Where a MUP acts as the primary sidewalk or parallel to a street, then service standards for the MUP should reflect those of sidewalks, with the priority mirroring the opposite sidewalk where present.</b></p> |
| <p><b>Justification</b></p>  | <p>This option most closely matches HRM's current operations, and defining formalized standards for walkways and MUPs will allow HRM to deliver these services in a more defined, consistent manner.</p> <p>While serving all paved AT walkways and trails most closely aligns with stakeholder desires, it also requires greater hand-work and cost as well as carrying higher levels of risk. The five-day timeline to achieve this standard in a realistic, cost-effective way would likely not be acceptable for stakeholders.</p>  |



# Protected Bike Lanes

**HRM – Review Winter Operations Service Standards**

**WWSS Options Development**

# Protected Bike Lanes

HRM currently does not have established standards for protected bike lanes in the municipality. Without clearly defined WWSS for protected bike lanes, the HRM increases its risk of reputational damage and legal liabilities. Other considerations related to WWSS for protected bike lanes are listed below.

## **Current State Considerations:**

- AT stakeholders noted that AT protected bike lanes should be cleared, at a minimum, to the same standards as adjacent streets. These respondents also noted that AT networks of trails, walkways, bike lanes and sidewalks should be well-defined and communicated to the public.
- However, as identified by HRM, the nature of the protected bike lane equipment and the speed at which it can be operated would make aligning street and protected bike lanes standards very challenging to achieve effectively.
- Ottawa, Hamilton and Winnipeg currently maintain protected bicycle lanes within their municipality during winter months. Comparator municipalities generally service bike lanes to the same standard as adjacent streets.
- HRM's only current protected bike lane may not be wide enough for equipment to service the entire length of the lane when snowbanks begin to build up.
- While Winnipeg will maintain the entire AT network during the winter for the first time this year, Ottawa maintains only a portion of the network. Ottawa specifically does not service protected lanes that are narrower than current equipment (less than 1.6 meters wide). Ottawa also noted that in previous years, some protected bike lane barriers were removed during winter months.

# Protected Bike Lanes

Options for protected bike lane WWSS development are presented below. Note that non-protected (painted) bike lanes in HRM are cleared along with streets.

| Option  | Est. Cost                   | Impact   | Effort   | Option Assessment & Risks  |
|---|-----------------------------|----------|----------|--|
| <p><b>1. Do not winter service protected bike lanes</b></p>   | <b>\$0</b>                  | N/A      | N/A      | <p>Stakeholders mentioned this option does not align with AT stakeholder desires or the directive from Council to winter service protected bike lanes. It also does not align with approaches taken by comparator municipalities.</p>  |
| <p><b>2. Winter service a select portion of protected bike lanes</b></p> <p>Service a portion of protected bike lanes to the same standard as the adjacent sidewalk, based on the following factors:</p> <ul style="list-style-type: none"> <li>▪ Uniform design and layout along entire section of the lane, i.e., a consistent and homogenous physical layout that allows winter service requirements to be completed using a single fleet asset type;</li> <li>▪ Width greater than 1.75 meters along entire section of the lane; and,</li> <li>▪ 1.5 meters of available snow storage where the adjacent sidewalk is unencumbered on the side opposite to the bike lane. Where the adjacent sidewalk is encumbered (e.g. against a building) 2.0 meters of snow storage is required.</li> </ul> | <b>\$7k /<br/>Linear km</b> | <b>M</b> | <b>L</b> | <p>Servicing protected bike lanes to the same standard as adjacent sidewalks if lane design and snow storage are adequate would give the HRM the best opportunity to meet service standards while also maintaining cleared protected bike lanes. This option is partially aligned with Ottawa's standards. Based on estimates provided by HRM, this option would cost approximately \$7,000 per linear km.</p> <p>This option does not align with the desires of AT stakeholders who seek standards for protected bike lanes that match adjacent street standards for all types of bike lanes. As discussed on the previous page, matching standards for streets would be very challenging given the speed differentials of the equipment used.</p> <p>Under this option, HRM's existing service for protected bike lanes may be reduced depending on protected bike lane's width and snow capacity. Additionally, HRM may be challenged to design and build future protected bike lanes to meet these requirements given the age and architecture of the municipality. There is a risk that few protected bike lanes will be winter maintained under this option.</p> |

# Protected Bike Lanes

| Option  | Est. Cost                              | Impact          | Effort          | Option Assessment & Risks   |
|---|--|-----------------|-----------------|---|
| <p><b>3. Winter service all protected bike lanes to the same standard as the adjacent street.</b></p> | <p><b>\$7k - \$27k / Linear km</b></p> | <p><b>M</b></p> | <p><b>H</b></p> | <p>Winter servicing all protected bike lanes to the same standard as the adjacent street is in line with AT stakeholder expectations and Winnipeg’s approach.</p> <p>This option presents the risk that HRM will not be able to complete protected bike lanes to the same standard as streets given the speed of the equipment used. Snow removal may be required for lanes that do not have adequate snow storage, increasing costs from \$7k /linear km to \$27k /linear km depending on the number of snow removals required. Additionally, hand-crews may be required to clear sections of protected bike lanes if width is not adequate, which could increase costs beyond \$7k - \$27k /linear km. Due to the infrastructure challenges associated with clearing all types of lanes, there is a risk that increases in budget will not lead to the service levels expected by citizens.</p> |

|                              |  |
|------------------------------|--|
| <p><b>Recommendation</b></p> | <p><b>Option 2: Winter service protected bike lanes to the same standard as adjacent sidewalks if lane uniformity, width and snow storage are adequate</b></p>   |
| <p><b>Justification</b></p>  | <p>Servicing protected bike lanes to the same standard as adjacent sidewalks if lane uniformity, width and snow storage are adequate would give the HRM the best opportunity to meet service standards while also maintaining cleared protected bike lanes.</p> <p>While Option 3 better aligns with AT stakeholder desires, clearing protected lanes that are irregular, too narrow for equipment, and lacking in snow storage will result in unmet standards, high costs, and inconsistent service delivery. For these reasons, this option is not recommended.</p> <p>HRM should make every effort to design and build protected bike lanes that meet Option 2 winter service requirements. If municipal architecture dictates that sections of the planned future AT network cannot be built to the option requirements, HRM should leverage its exception committee process to determine if service should be provided on an exception basis to sections that connect the network. HRM should also determine if further development of MUPs (which combine bike lanes and sidewalks) could reduce costs and improve winter service in the future.</p> |



# Transit Infrastructure

**HRM – Review Winter Operations Service Standards**

**WWSS Options Development**

# Transit Infrastructure

HRM's current WWSS for transit infrastructure are as follows:

- Maintenance of an area approximately 40 feet around the bus stops/shelter by plowing and/or snow removal dependent upon conditions; accessible parking locations are done at the same time; including in front of curb line.
- Application of winter de-icing and/or abrasive materials (treated sand or salt) to surfaces to improve traction for pedestrians or to de-ice the surface around the bus stop area.
- Improvement of visibility by pushing back snow (with mechanical equipment) to clear bus stop area where feasible and when required.
- Completion of all locations within 48 hours after snow accumulation has stopped.

## **Current State Considerations:**

- Stakeholders noted that the standard for bus stop winter maintenance – within 48 hours after the snow accumulation has stopped – does not meet user needs and causes barriers to transit system use.
- While WWSS are established for bus stops they do not specify the surface condition required to operate the buses' accessibility platforms. The platforms' built-in safety features require a flat finish surface in order to enable someone to embark and disembark.
- Not all transit stops are hard-surfaced and not all stops have landing pads large enough to capture the rear door when passengers are disembarking.
- Business improvement stakeholders noted that snow removal at bus stops is often not long enough for passengers to exit rear doors without climbing over snow banks.
- All comparator municipalities noted that transit departments are responsible for clearing inside transit shelters, for clearing outside of shelters, and making cuts into windrows. Municipalities such as Winnipeg complete annual staff training on the clearing of transit stops. Ottawa services bus stops within 24 hours, as compared to HRM which services bus stops in 48 hours after snowfall.

# WWSS Options Development

## Transit Infrastructure

Options for transit infrastructure WWSS development are presented below.

| Option   | Est. Cost  | Impact | Effort | Option Assessment & Risks   |
|--|--|--------|--------|---|
| <b>1. Do not change current WWSS for transit infrastructure.</b>               | <b>\$0</b>   | N/A    | N/A    | This option does not align with stakeholder feedback on transit infrastructure mobility needs. Current standards on time to complete are double those of Ottawa.  |
| <b>2. Reduce time to complete bus stops to 24 hours after end of snowfall.</b> | <b>\$2 Million</b><br><br>Based on a doubling of bus stop contract costs | H      | H      | <p>Reducing the time to complete bus stops to 24 hours after the end of snowfall aligned with stakeholder feedback and WWSS set in Ottawa.</p> <p>There is a risk that contractor capacity may limit the viability of this option; the crews that clear bus stops are typically also responsible for clearing streets and sidewalks.</p> <p>Estimated increases in annual contract costs were calculated to be approximately \$2 million, based on a doubling of costs per bus stop from approximately \$850 per unsheltered stop (\$1,075 per sheltered stop) to \$1,700 (\$2,150 per sheltered stop).</p> |
| <b>3. Reduce time to complete bus stops to 36 hours after end of snowfall.</b> | <b>\$545k</b><br><br>Based on a 25% increase in bus stop contract costs  | M      | M      | <p>Reducing the time to complete bus stops to 36 hours after the end of snowfall partially aligns with stakeholder feedback.</p> <p>Contractors may have capacity to complete this option, as they might be able to complete streets and sidewalks before needing to finish bus stops in most cases.</p> <p>Estimated increases in annual contract costs were calculated to be approximately \$545,000, based on a 25% increase in contract costs. This increase is consistent with the experience of other municipalities.</p>   |

# WWSS Options Development

## Transit Infrastructure

Options for transit infrastructure WWSS development are presented below. The HRM could choose to peruse any combination of these, including selecting all or none of the presented options.

| Option  | Est. Cost | Impact | Effort | Option Assessment & Risks  |
|---|-----------|--------|--------|--|
| <b>4. Maintain bare pavement finish surface conditions at all full-length paved stops</b> | Nominal   | M      | L      | <p>Maintaining bare pavement surfaces at all full-length paved transit stops would help to ensure that landing pads are as flat as possible to enable accessible platform functionality. <b>Note that not all stops are full-length and paved.</b></p> <p>HRM currently maintains the majority of paved stops to as close to bare pavement as possible, as these stops are along P1 sidewalks. Costs to formalize this requirement in the WWSS therefore would be nominal.</p> |

|                       |   |
|-----------------------|---|
| <b>Recommendation</b> | <b>Options 2 &amp; 4: Reduce time to complete bus stops to 24 hours after the end of snowfall and set an as-close-to-bare-pavement-as-possible service standard for all paved transit stops</b>   |
| <b>Justification</b>  | <p>Reducing the time to complete bus stops and maintaining bare pavement surfaces at all paved bus stops increases mobility for all transit users, and is aligned with the mobility goals of the IMP which prioritizes transit use.</p> <p>If contractors are unable to meet this service time to completion, HRM should consider negotiating a 36 hour-time-to-completion for bus stops.</p> |



# Winter Parking Bans

**HRM – Review Winter Operations Service Standards**

**WWSS Options Development**

# Winter Parking Bans

In order to have access to clear streets, HRM places an overnight parking ban from December 15 to March 31, which is only enforced during declared snow events. Key aspects of the ban include:

- When enforced, the ban is in effect from 1:00 a.m. to 6:00 a.m. throughout the Regional Center of the municipality.
- Residents are advised of winter parking bans via mobile apps and twitter notifications, email, the municipal website, and by 311 call-in. Residents are given notification 12 hours in advance of the commencement of the ban.
- Regardless of the status of the parking ban or snow and street conditions, vehicles can be ticketed (\$50 fee) or towed at any time if they are interfering with snow-clearing operations, as per Section 139 of the Nova Scotia Motor Vehicle Act.

## Current State Considerations:

- Ticket fees are set by the Province, and may be too low to help enforce parking bans in the Halifax peninsula. With the exception of St. John's, comparator municipalities have higher winter parking ban ticket fees. Tickets for early payment in Ottawa, Quebec City and Winnipeg range from \$75 – \$112.50, as compared to \$50 fees in HRM. The Province is currently reviewing a motion delivered by the Mayor to increase fees in the Halifax peninsula to \$100.
- We understand there is a perception that there are too few towing companies available to service the requirements of winter operations. In actuality, KPMG was advised that tow trucks are almost always available. Difficulty in completing towing may be caused by the lack of contracted Compliance Officers that are authorized to issue towing tickets.
- If a tow is required, operators must wait with the vehicle until the contracted tow truck arrives. This process may take over an hour and can be a significant demand on resources.
- HRM is currently experiencing issues with operators plowing vehicles in, causing tow drivers to refuse removal of these vehicles. HRM plans to change tender requirements for towing services such that towing companies themselves will be responsible for the removal of the window around illegally parked vehicles to enable towing activities to occur.
- HRM has altered the towing process this year to speed up of the towing of vehicles for obstructing snow removal. For example, Compliance Officers can now determine obstructing snow removal and ticket and tow without prior authorization of a supervisor.
- The winter parking ban contract is concludes this season. In the upcoming request for standing offers, requirements such as coming in prior to winter ban, working non winter ban nights, working during HRM shut-downs and holidays, and extending the number of staff can be added into the offer requirements.
- HRM plans to move from six contracted Compliance Officers to 12 Compliance Officers next season. With one officer per enforcement zone, issues relating to towing services may be reduced.

**Current State Considerations (Continued):**

- Comparators noted that private towing contracts can be difficult to procure as there are less contractors and bids are increasing. In response, Winnipeg completes all towing in-house and Quebec City is currently transitioning this service in-house.
- Comparator municipalities have longer windows of parking ban enforcement. Comparators generally have a six- to seven-hour window to complete plowing operations as compared to HRM's five hours. Additionally, comparators enforce a seven- to 12-hour parking ban window to complete snow-removal operations.
- Comparators enforce multiple types of parking bans, and generally have separate bans for snow-removal options.

Options for winter parking bans in the HRM are presented below.

| Option   | Est. Cost | Impact | Effort | Option Assessment & Risks   |
|--|-----------|--------|--------|---|
| <b>1. Maintain current approach to winter parking bans.</b>  | \$0       | N/A    | N/A    | Without changes to the current winter parking ban approach, HRM will continue to be challenged at times to complete required winter road and sidewalk operations.   |
| <b>2. Expand the window for enforcement</b><br><br>Extend the window of the overnight parking ban from 1:00 a.m. to 6:00 a.m. to 12:00 a.m. to 7:00 a.m. | Nominal   | M      | L      | This option would give operators an additional two hours a night to complete work on empty streets, and would may improve operator morale and help to improve overall services.<br><br>There is a risk that community and business stakeholders may be opposed to lengthening the ban. This is particularly true for streets near hospitals that shift workers rely on for parking. |

# WWSS Options Development

## Winter Parking Bans

Options for winter parking bans in the HRM are presented below.

| Option  | Est. Cost      | Impact | Effort | Option Assessment & Risks  |
|---|----------------|--------|--------|--|
| <p><b>3. Institute a Snow-removal Rolling Parking Ban</b></p> <p>Institute a 12-hour rolling parking ban for snow-removal operations in the downtown core. Operations would target every second street within city zones.</p> | Nominal        | M      | M      | <p>A rolling 12-hour snow-removal parking ban in the downtown core would allow HRM to complete snow-removal operations efficiently. This approach is used across comparator municipalities.</p> <p>Downtown residents may be opposed to the implementation of this type of ban. Careful communications and targeting of every second street within a zone may help to mitigate opposition.</p>   |
| <p><b>4. Transition Towing Services In-House</b></p> <p>Purchase 12 tow trucks and add 12 FT deputized truck drivers that can issue towing tickets*.</p>  | \$1.2 Million* | M      | H      | <p>Transitioning towing services in-house may lead to more coordinated operations as fewer parties would be required to be involved (e.g., a deputized tow truck driver could be contacted directly by an operator to complete a tow, as opposed to a contracted Compliance Officer being required to issue a ticket and contact a third-party towing company). These in-house services would be able to complete tasks year-round in a number of compliance functions for the entire Department.</p> <p>In 2018, the Manger, Buildings and Compliance prepared an estimate of costs to add an additional 11 Compliance Officers in-house, and determined it would cost an additional \$843,500 per year. Using this amount as a proxy for deputized tow truck drivers, labour costs would total approximately \$920,182 per year for 12 drivers (in place of the 12 contracted Compliance Officers). <b>Note: Determining actual staffing required and position type/mix would require further analysis in relation to Department needs.</b></p> <p>Adding the cost of tow trucks (approximately \$150,000 financed over five years at 3% interest) and subtracting the contracted compliance costs for 12 officers (\$100,000 for 25 events) the total option cost has been calculated to cost \$1.2 million per year.</p> |

\*Actual position type and staffing compliment would need to be determined through further analysis.

# Winter Parking Bans

|                              |   |
|------------------------------|---|
| <p><b>Recommendation</b></p> | <p><b>Options 2 &amp; 3: Expand the window for regular winter parking ban enforcement and institute a 12-hour rolling snow-removal parking ban for the downtown core</b></p>  |
| <p><b>Justification</b></p>  | <p>Expanding the window of enforcement from 1:00 a.m. to 6:00 a.m. to 12:00 a.m. to 7:00 a.m. and instituting a 12-hour rolling snow-removal parking ban in the downtown core will allow HRM to complete winter service operations in a much more efficient manner. Both of these options do present risks of resident opposition. Careful implementation and communication of the benefits of extended parking bans could help to reduce resident opposition.</p> <p>While transitioning towing services in-house could lead to more coordinated towing services and efficient winter operations, the cost of doing so is high. Further, the already planned/budgeted addition of six more contracted Compliance Officers next season may greatly reduce the difficulty experienced by operators in receiving towing services.</p> |

# Summary of Recommended Options

The annual estimated increase in costs resulting from updating WWSS is presented below:

| Option   | Est. Cost          |
|--|--------------------|
| <b>Expand accessibility requirements for sidewalks</b>   | Nominal            |
| <b>Add sidewalks along school frontages and health centers to P1 classification definition</b> | Nominal            |
| <b>Clear a portion of paved walkways and MUPs</b>  | \$260,000          |
| <b>Winter service a select portion of protected bike lanes</b>                                 | \$0*               |
| <b>Reduce time to complete bus stops to 24 hours after end of snowfall.</b>                    | \$2,000,000        |
| <b>Maintain bare pavement finish surface conditions at all paved stops</b>                     | Nominal            |
| <b>Expand the window for parking ban enforcement</b>   | Nominal            |
| <b>Institute a Snow-removal Rolling Parking Ban</b>  | Nominal            |
| <b>Total</b>   | <b>\$2,260,000</b> |

\*Based on current protected bike lane infrastructure

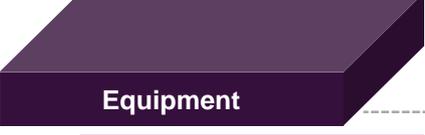


# Observations & Recommendations

**HRM – Review Winter Operations Service Standards  
Final Report**

# Observation Mapping

In conjunction with the changes to the WWSS, the actions in the following section are recommended to be undertaken. Observations and recommendations have been organized based on the following domains:

| Domains / Design Layers   | Description of what it means  |
|---|---|
|  <p><b>Governance</b></p>                     | <p>The manner in which oversight is provided to the service delivery model for winter service maintenance operations and how partnerships between the Department of Public Works, HRM, Council, and key external stakeholders are established and maintained</p>      |
|  <p><b>Service Standard</b></p>               | <p>The Winter Works service standards which dictate how winter service maintenance operations are performed in HRM; this includes service categorizations and prioritization, accessibility standards, expected finish surface conditions, time to complete, etc.</p> |
|  <p><b>Processes &amp; Delivery Model</b></p> | <p>The core operations and supporting winter maintenance processes for HRM including delivery model decisions (e.g., in-house versus outsourced services)</p>   |
|  <p><b>Data &amp; Technology</b></p>          | <p>The information technology required to manage information / data and support delivery</p>  |
|  <p><b>Equipment</b></p>                     | <p>The physical fleet and equipment that enable winter service maintenance operations and processes</p>   |
|  <p><b>People</b></p>                       | <p>The structure, reporting and accountability hierarchy, composition, capabilities, and skills for the Department and contractors to meet service standards</p>  |

| Ref No. | KPMG Observations  | Recommendation  | Impact | Effort |
|---------|--|---|--------|--------|
| 1       | <p>From our consultations, it was noted that partnerships within TPW may not always support efficient winter operations since interdependencies for winter service delivery are not proactively managed. For example, Road Operations and Construction is consulted during the planning and development of new infrastructure and neighborhoods. However, final detailed design of new infrastructure and community frontages does not always incorporate the feedback given by staff.</p> <p>This has resulted in preventable cost increases to snow-removal or trade-offs leading to reductions in service delivery.</p>   | <p>Align Planning and Design with Road Operations and Construction so that winter service delivery is a key consideration of municipal infrastructure creation. A philosophy of collaboration within the Transportation and Public Works Department will reduce preventable cost increases and service delivery trade-offs.</p> | H      | M      |
| 2       | <p>HRM has identified 18 WWSS performance measures. However, Key Performance Indicators (KPIs) are not reviewed regularly to monitor winter operations nor are they reported. The performance measures are primarily used to address a public issue (e.g., an under-performing contractor).</p> <p>Further, several existing performance measures are difficult to measure due to their ambiguity. For example, measures such as meeting reasonable reporting deadlines, achievement of service standards and guidelines, and stakeholder feedback, are difficult to quantify, measure and report.</p> <p>Respondents noted this as a challenge, because the lack of indicators makes monitoring progress in the delivery of services difficult.</p> | <p>Advance the adoption of a set of specific, measureable KPIs (no more than five to ten) to monitor municipal performance against established service level goals. A set of possible KPIs is included in <b>Appendix D</b>.</p>  | M      | L      |

# Observations & Recommendations

## Service Standards

| Ref No. | KPMG Observations   | Recommendation   | Impact | Effort |
|---------|---|--|--------|--------|
| 3       | As described in the previous section of this report, sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans were areas of concern for a number of internal and external HRM stakeholders.  | <p>Update WWSS for sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans.</p> <p>As described on slide 70, recommended updates to the service standard are anticipated to cost an additional \$2.26 million per year.</p>                | H      | H      |
| 4       | <p>Current WWSS for snow removal do not describe the amount of snowfall required to initiate removal operations or prioritization categories.</p> <p>Further, as WWSS are not established for conventional parking spaces located in business improvement districts, this often results in reduced parking space availability since snow is not fully cleared and removed during the winter months.</p> | <p>Expand WWSS for snow removal to include more detail on when, where and how snow-removal operations should occur. This includes creating standards for parking spaces in the BIA.</p> <p><b>Note: Updating WWSS for snow-removal operations was not in the scope of this review.</b></p> | M      | M      |

# Observations & Recommendations

## Processes & Delivery Model

| Ref No. | KPMG Observations  | Recommendation  | Impact | Effort |
|---------|--|---|--------|--------|
| 5       | The potential for greater collaboration on route prioritization, especially for servicing Access-A-Bus clients, was identified by stakeholders. Transit's ability to monitor and communicate to TPW current road conditions and the status of operations on critical roads could be leveraged further according to stakeholders. | Meet with Transit Operations in October each year to discuss route prioritization and communications during the upcoming season. Additionally, hold monthly touchpoint meetings with Transit to discuss ongoing challenges and areas of concern.  | M      | L      |
| 6       | Traffic-calming infrastructure is posing new challenges to HRM to deliver winter services effectively.   | <p>Remove as much traffic-calming infrastructure as possible before the beginning of the winter season.</p> <p>For infrastructure that cannot be removed, have operators review the locations of infrastructure and ensure the infrastructure is signed well to minimize damage from winter operations.</p> | L      | L      |

# Observations & Recommendations Processes & Delivery Model

| Ref No. | KPMG Observations   | Recommendation   | Impact | Effort |
|---------|---|--|--------|--------|
| 7       | <p>Historically, the process to leverage towing services during winter parking bans has been lengthy and difficult to complete. HRM as added six contracted Compliance Officers for the 2020/21 season to shorten the time needed to issue tow tickets, improving the overall process.</p>  | <p>Additional Compliance Officers should be leveraged to issue towing tickets as soon as the parking bans are in effect. HRM should alter current practices to allow towing to occur before operators even begin to clear streets.</p>   | M      | M      |
| 8       | <p>According to HRM respondents, most of the equipment in use has reached its estimated useful life. They indicated that the use of equipment past its service life has resulted in increased repair requirements, increased lifecycle costs, and equipment downtime when it is needed for service delivery.</p> <p>Additionally, it was noted that Operations purchases vehicles using its own budget, and that Fleet may not be aware of these purchases. This results in greater repair and maintenance requirements for Fleet without a related increase in budget, as Fleet's budget is based upon the number of vehicles it owns.</p> | <ol style="list-style-type: none"> <li>a. Implement a unified capital budget planning and lifecycle costing model with Fleet.</li> <li>b. Coordinate maintenance timing with Fleet such that preventative equipment maintenance is completed directly after the end of equipment use. This will help to reduce the number of equipment breakdowns that occur during weather events.</li> </ol> | H      | M      |

# Observations & Recommendations

## Data & Technology

| Ref No. | KPMG Observations  | Recommendation  | Impact | Effort |
|---------|--|---|--------|--------|
| 9       | <p>Technologies such as apps, automated email alerts, social media, and HRM's website have been successfully used to inform residents of parking bans and changes to transit routes.</p> <p>However, respondents also expressed interest in the capability of the collection of real time data on street, bicycle lane, and sidewalk conditions to enable route planning by users.</p> | <p>GPS-enable the entire HRM fleet, as well as contractor equipment. Allow residents to view the recent movements of winter equipment to allow for better route planning, similar to the systems used in Winnipeg, Hamilton and St. John's.</p> | M      | M      |
| 10      | <p>Similar to some comparator municipalities, HRM has not yet incorporated Road Weather Information Systems (RWIS) to forecast upcoming weather events. RWIS can be used to provide event start and stop times and guidance for the application of de-icing materials.</p>   | <p>Investigate the cost / benefit of using of a RWIS to assist with planning and decision making during the snow-clearing season.</p>   | M      | L      |

# Observations & Recommendations

## Fleet & Equipment

| Ref No. | KPMG Observations  | Recommendation  | Impact | Effort |
|---------|--|---|--------|--------|
| 11      | Per the jurisdictional scan, HRM has the second lowest number of small and large equipment per 1000 lane kilometers, when adjusted for weather severity. Updated WWSS will require an investment in fleet and equipment to ensure new standards are met. | To support the delivery of the updated WWSS for sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans, it is recommended that HRM consider investment in the following pieces of equipment: | H      | H      |

| Equipment  | Cost                                      | Width   | Rationale   |
|--|---|---|---|
|  <p><b>Prinoth SW50</b></p>         | <b>\$108k (with blade) + HST and fees</b> | <b>1,285 mm (vehicle)</b><br><b>1,371 mm (snow blower attachment)</b><br><b>1,520 mm (straight blade)</b> | This versatile, fit-for-purpose, and appropriately sized vehicle would be an asset for improving general plowing on core sidewalks. Numerous attachments are available such as a straight blade, V-blade, snow blower and sand/salt spreader. |
|  <p><b>Weidemann – 1160</b></p>    | <b>\$76.5k + HST and fees</b>             | <b>1,044 mm</b>   | This agile and narrow unit is well suited to tighter areas such as residential areas in the downtown core and protected bicycle lanes.  |
|  <p><b>Trackless Series 7</b></p> | <b>Approximately \$150k</b>               | <b>1,283 mm</b>   | This multi-season unit is able to service many of HRM's winter and summer season needs with various attachments.  |

# Observations & Recommendations

## Fleet & Equipment

Additionally, for streets HRM should consider the following:

| Equipment   | Cost   | Rationale   |
|---|--|---|
| <b>Underbody Scraper Technology</b><br>  | <b>Approximately 15k per blade</b>                 | Removing the front plough from trucks would increase the maneuverability of trucks in the downtown core and in other tight areas. Comparators such as St. John's have begun to employ underbody scraper blades.   |
| <b>Retirement of 5-tonne fleet and replacement with 10-tonne tandem trucks</b><br> | <b>Approximately 100k extra per replaced track</b> | Tandem trucks carry larger salt loads, and therefore require fewer trips to the depot. Tandem tracks are also more maneuverable than the current 5-tonne fleet. Additionally, replacement would allow HRM to simplify training programs to allow staff to type on a single platform type. |

| Ref No. | KPMG Observations   | Recommendation  | Impact | Effort |
|---------|---|---|--------|--------|
| 12      | HRM has emphasized procurement of multi-season equipment. The type and effectiveness of equipment in the fleet is not fully aligned with the WWSS, service expectations, and winter operational conditions e.g., salt exposure. | Consider leasing purpose-build winter work equipment such as tracked sidewalk machines. | M      | L      |

| Ref No. | KPMG Observations  | Recommendation   | Impact | Effort |
|---------|--|--|--------|--------|
| 13      | <p>Respondents noted that current levels of HRM operator equipment training does not allow sufficient level of flexibility in resource allocation.</p> <p>Snow-clearing and de-icing approaches used by operators, which can be ineffective or inconsistent between operators, indicate a training need on proper snow-clearing and de-icing methods.</p>  | <p>Cross-train operators on winter work equipment and methods.</p>   | H      | H      |
| 14      | <p>Winter work supervisors completed accessibility training in November 2019. The current two-hour accessibility training enables individuals to experience the transport networks from the users standpoint. It has been effective according to recent TPW trainees.</p> <p>Supervisors noted that hand crews have capacity to deliver accessibility work, but require a practical understanding of the needs and related tasks to transition to customer-centric service delivery.</p> | <p>Have all staff complete accessibility training annually to ensure stakeholders' barrier free mobility needs are better met, and hand-crew efforts are better allocated.</p> | H      | L      |

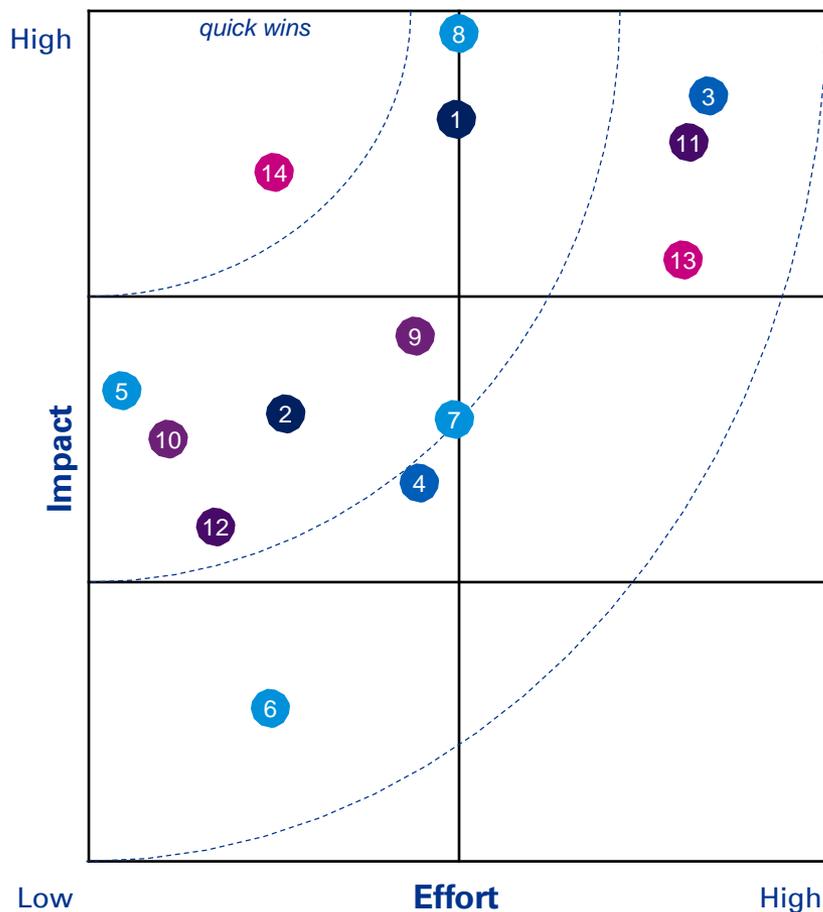


# High-level Implementation Plan

HRM – Review Winter Operations Service Standards  
Final Report

# Prioritization of Suggested Actions

In conjunction with the changes to the WWSS, the following actions are recommended to be undertaken. Suggested actions have been mapped for **impact versus effort** to help prioritize activities.



## Suggested Actions

- 1 Align Planning and Design with Road Operations and Construction so that winter service delivery is a key consideration of municipal infrastructure creation
- 2 Develop a set of five to 10 specific and measurable KPIs to monitor municipal performance against established winter service level goals
- 3 Update WWSS for sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans
- 4 Expand WWSS for snow removal
- 5 Increase collaboration with Transit Infrastructure
- 6 Remove traffic-calming infrastructure before the beginning of the winter season and complete training with operations on locations of infrastructure that cannot be removed
- 7 Alter towing practices such that towing activities are completed before operators begin to clear streets
- 8 Implement a unified capital budget planning and lifecycle costing model with Fleet and coordinate maintenance timing
- 9 GPS-enable the entire HRM fleet, as well as contractor equipment
- 10 Investigate the cost / benefit of using a RWIS to assist with planning and decision-making during the snow clearing season
- 11 Consider investment in new street and sidewalk fleet and equipment
- 12 Consider leasing purpose-build winter work equipment
- 13 Cross-train operators on winter work equipment and methods
- 14 Have all staff complete accessibility training annually to help ensure stakeholders' barrier-free mobility needs are better met, and hand-crew efforts are better allocated

|   |   |  |
|---|---|--|
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #002060; border: 1px solid black;"></span> Governance        | <span style="display: inline-block; width: 15px; height: 15px; background-color: #0070C0; border: 1px solid black;"></span> Service Standard  | <span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; border: 1px solid black;"></span> Process & Delivery Model |
| <span style="display: inline-block; width: 15px; height: 15px; background-color: #6A329F; border: 1px solid black;"></span> Data & Technology | <span style="display: inline-block; width: 15px; height: 15px; background-color: #330033; border: 1px solid black;"></span> Fleet & Equipment | <span style="display: inline-block; width: 15px; height: 15px; background-color: #E91E63; border: 1px solid black;"></span> People                   |

# Key Initiatives & Draft Roadmap

| No.              | Domain             | Initiative  | Spring 2020 |     |     | Summer 2020 2020 |     |      | Fall 2020 2020 |     |     | Winter 2021 2020 |     |  | Owner |
|------------------|--------------------|---|-------------|-----|-----|------------------|-----|------|----------------|-----|-----|------------------|-----|--|-------|
|                  |                    |   | Apr         | May | Jun | Jul              | Aug | Sept | Oct            | Nov | Dec | Jan              | Feb | Mar  |       |
| I<br>II<br>III   | WWSS Finalization  | Review and finalize WWSS recommendations with Transportation Committee  | ■           |     |     |                  |     |      |                |     |     |                  |     | Director of TPW & Transportation Committee |       |
|                  | WWSS Finalization  | Council Approval of WWSS  |             | ■   |     |                  |     |      |                |     |     |                  |     | Council                                    |       |
|                  | WWSS Finalization  | Develop Detailed WWSS   |             |     | ■   |                  |     |      |                |     |     |                  |     | WWSS Project Team                          |       |
| 1<br>2           | Governance         | Align Planning and Design with Road Operations and Construction so that winter service delivery is a key consideration of municipal infrastructure creation                 |             |     |     | ■                | ■   | ■    | ■              | ■   | ■   | ■                | ■   | ROC Manager & Planning and Design Manager  |       |
|                  |                    | Develop a set of specific, measureable KPIs   |             |     |     | ■                | ■   | ■    | ■              | ■   | ■   | ■                | ■   | WWSS Project Team                          |       |
| 3                | Service Standard   | Update WWSS for sidewalks, walkways and trails, protected bicycle lanes, transit infrastructure and winter parking bans   |             |     | ■   |                  |     |      |                |     |     |                  |     | WWSS Project Team                          |       |
| 4                | Service Standard   | Expand WWSS for snow removal  |             |     | ■   |                  |     |      |                |     |     |                  |     | WWSS Project Team                          |       |
| 5<br>6<br>7<br>8 | Process & Delivery | Increase collaboration with Transit Infrastructure  |             |     |     | ■                | ■   | ■    | ■              | ■   | ■   | ■                | ■   | Director of TPW & Transit Director         |       |
|                  |                    | Remove traffic-calming infrastructure before the beginning of the winter season and complete training with operations on locations of infrastructure that cannot be removed |             |     |     | ■                | ■   | ■    | ■              | ■   | ■   | ■                | ■   | ROC Superintendent                         |       |
|                  |                    | Alter towing practices such that towing activities are completed before operators begin to clear streets  |             |     |     |                  |     | ■    | ■              | ■   | ■   | ■                | ■   | ROC Superintendent & Parking Manager       |       |
|                  |                    | Implement a unified capital budget planning and lifecycle costing model with Fleet and coordinate maintenance timing  |             |     |     | ■                | ■   | ■    | ■              | ■   | ■   | ■                | ■   | ROC Superintendent & Fleet                 |       |

# Key Initiatives & Draft Roadmap (Cont'd)

| No. | Domain            | Initiative   | Spring 2020 |     |     | Summer 2020 2020 |     |      | Fall 2020 2020 |     |     | Winter 2021 2020 |     |     | Owner   |
|-----|-------------------|--|-------------|-----|-----|------------------|-----|------|----------------|-----|-----|------------------|-----|-----|---|
|     |                   |  | Apr         | May | Jun | Jul              | Aug | Sept | Oct            | Nov | Dec | Jan              | Feb | Mar |   |
| 9   | Data & Technology | GPS-enable the entire HRM fleet, as well as contractor equipment |             |     |     |                  |     |      |                |     |     |                  |     |     | GIS Team  |
| 10  | Data & Technology | Investigate the cost / benefit of using of a RWIS                |             |     |     |                  |     |      |                |     |     |                  |     |     | GIS Team  |
| 11  | Equipment         | Consider investment in new street and sidewalk infrastructure.   |             |     |     |                  |     |      |                |     |     |                  |     |     | Director of TPW                                 |
| 12  | Equipment         | Consider leasing purpose-build winter work equipment.            |             |     |     |                  |     |      |                |     |     |                  |     |     | Director of TPW                                 |
| 13  | People            | Cross-train operators on winter work equipment and methods.      |             |     |     |                  |     |      |                |     |     |                  |     |     | ROC Superintendent                              |
| 14  | People            | Complete accessibility training                                  |             |     |     |                  |     |      |                |     |     |                  |     |     | ROC Superintendent & Accessibility Stakeholders |



# Appendix A: Summary of Initial Findings

**HRM – Review Winter Operations Service Standards  
Summary of Initial Findings**

# The Engagement Process

As part of the HRM winter operations service standard review, employees and elected officials across the organization were interviewed. Additionally, focus group sessions were held with key external accessibility, active transportation, and business stakeholders to understand their unique winter mobility needs and priorities. The engagements held served to better understand HRM's WWSS and operations and to identify current challenges and opportunities for future improvement.

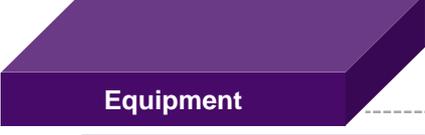
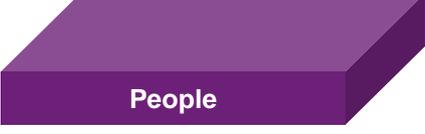
In total, 14 internal HRM interviews, two focus groups and two interview with the HRM Mayor and Councillors, and three external stakeholder focus groups were conducted, as outlined in the below table:

| Interviews  |  |  |
|---|--|--|
| Internal HRM Stakeholders   | Mayor & Councillors  | Key External Stakeholders  |
| <ul style="list-style-type: none"> <li>• Social Policy</li> <li>• Diversity and Inclusion</li> <li>• Parks and Recreation</li> <li>• Halifax Transit Operations</li> <li>• Halifax Transit Planning</li> <li>• By Law Enforcement</li> <li>• Traffic Management</li> <li>• Corporate Fleet</li> <li>• Parking Management</li> <li>• Development</li> <li>• Road Operations and Construction Operators and Supervisors</li> <li>• Active Transportation</li> <li>• Director, Transportation and Public Works</li> <li>• EMO</li> </ul> | <ul style="list-style-type: none"> <li>• Mike Savage</li> <li>• David Hendsbee</li> <li>• Lindell Smith</li> <li>• Russel Walker</li> <li>• Steve Adams</li> <li>• Paul Russell</li> <li>• Lisa Blackburn</li> <li>• Sam Austin</li> <li>• Lorelei Nicoll</li> <li>• Tony Mancini</li> <li>• Shawn Cleary</li> <li>• Tim Outhit</li> </ul> | <ul style="list-style-type: none"> <li>• Halifax Cycling Coalition</li> <li>• Ecology Action Centre</li> <li>• Bicycle Nova Scotia</li> <li>• Walk 'n' Roll</li> <li>• Province of Nova-Scotia Accessibility Directorate</li> <li>• Canadian National Institute for the Blind</li> <li>• Canadian Paraplegic Association of Nova-Scotia</li> <li>• Downtown Dartmouth Business Commission</li> <li>• Spring Garden Area Business Association</li> <li>• Halifax Chamber of Commerce</li> </ul> |

# Summary of Findings

## Emerging Themes

Findings from the engagement process and document review are organized based on the following domains.

| Domains / Design Layers  | Description of what it means   |
|--|--|
|  <b>Governance</b>                     | The manner in which oversight is provided to the service delivery model for winter service maintenance operations and how partnerships between the Department of Transportation and Public Works, HRM, Council, and key external stakeholders are established and maintained |
|  <b>Service Standard</b>               | The Winter Works service standards which dictate how winter service maintenance operations are performed in HRM; this includes service categorizations and prioritization, accessibility standards, expected finish surface conditions, time to complete, etc.               |
|  <b>Processes &amp; Delivery Model</b> | The core operations and supporting winter maintenance processes for HRM including delivery model decisions (e.g., in-house versus outsourced services)   |
|  <b>Data &amp; Technology</b>          | The information technology required to manage information / data and support delivery  |
|  <b>Equipment</b>                     | The physical fleet and equipment that enable winter service maintenance operations and processes   |
|  <b>People</b>                       | The structure, reporting and accountability hierarchy, composition, capabilities, and skills for the Department and contractors to meet service standards  |

# Summary of Findings

## Emerging Themes

Key themes have emerged from the interviews and review of current WWSS which are summarized below. The information in this document is preliminary and should be treated accordingly. It may be refined in subsequent deliverables to reflect additional feedback and further analysis.

| Governance  |  |   |
|---|--|---|
| Emerging Theme  | Details  | Summary & Impact  |
| <p><b>Accountabilities within and across departments may not always support efficient and effective winter service delivery</b></p> | <ul style="list-style-type: none"> <li>▪ From our consultations, it was noted that partnerships within TPW may not always support efficient winter operations since interdependencies for winter service delivery are not proactively managed.</li> <li>▪ For example, Road Operations and Construction is consulted during the planning and development of new infrastructure and neighborhoods. However, final detailed design of new infrastructure and community frontages does not always incorporate the feedback given by staff.</li> <li>▪ This has resulted in preventable cost increases to snow removal or trade-offs leading to reductions in service delivery.</li> </ul>   | <p><i>A lack of clarity in roles, accountabilities, and authorities may lead to lower quality, more expensive, and less timely winter operations.</i></p> |
| <p><b>Resource allocation for winter operations does not match strategic direction endorsed by Council</b></p>                      | <ul style="list-style-type: none"> <li>▪ Consultation participants noted that Council is approving mandates related to transportation for All Ages and Abilities (AAA) without the ensuing operating budget adjustments. As the Municipality adds new infrastructure to reduce reliance on driving, larger budgets are needed to fund winter operations that maintain year round service.</li> <li>▪ Stakeholders noted that as HRM improves access to alternative modes of transportation, it will have to balance service expansion and year round service delivery with key factors:               <ul style="list-style-type: none"> <li>➢ Necessary improvements to accessibility.</li> <li>➢ Willingness and ability to pay for service increases year round.</li> <li>➢ Local recognition that cars will remain a major mode of transportation for the foreseeable future for reasons such as limited ferry service, lack of commuter rail service, and the geographic dispersity of the Municipality.</li> </ul> </li> </ul> | <p><i>Inadequate resource allocation directly impacts service delivered to HRM residents.</i></p>   |

# Summary of Findings

## Emerging Themes

| Governance  |   |   |
|---|---|---|
| Emerging Theme  | Details   | Summary & Impact  |
| <b>Oversight of contracted winter services appears insufficient</b>   | <ul style="list-style-type: none"> <li>HRM has made improvements to its use of contracted services by bundling winter operations (i.e., developing contracts that bundle street and sidewalk clearing or sidewalks and bus stops).</li> <li>Bundling allows HRM to concentrate its oversight efforts on fewer contracts by reducing the scale of contract administration and allows contractors to improve road, sidewalk, and bus stop conditions through efficient work sequencing.</li> <li>Participants expressed concern that contractor performance is not monitored sufficiently and that it requires more thorough monitoring of material use and activities.</li> <li>The lag between the established contract periods, historical contract specifications, and changes brought to the WWSS in response to evolving service expectations may influence the perception of contractor's work by the public.</li> </ul> | <i>Inconsistencies in the quality of contracted winter services has a negative impact on HRM.</i> |
| <b>Key Performance Indicators (KPIs) are not consistently tracked</b> | <ul style="list-style-type: none"> <li>Within the most recent Winter Works Management Plan, HRM has identified qualitative and quantitative performance measures for winter operations. These relate for instance to salt management, as well as sidewalk, street, bus stop and accessible parking clearing.</li> <li>The performance measures are not reviewed regularly to monitor winter operations nor are they reported. The performance measures are primarily used to address a public issue (e.g., an under-performing contractor).</li> </ul>  | <i>There is limited use of KPIs to address performance issues.</i>                                |

# Summary of Findings

## Emerging Themes

| Service Standard  |  |   |
|---|--|---|
| Emerging Theme  | Details  | Summary & Impact  |
| <b>Street winter maintenance standards are satisfactory</b>                     | <ul style="list-style-type: none"> <li>▪ Stakeholders noted that TPW and its contractors generally do a good job of street plowing and snow removal.</li> <li>▪ Stakeholders noted that while citizens complain and expect a higher service level for their own street, the standard and its underlying service prioritization, as well as snow-clearing routes, are not sufficiently understood by the public.</li> </ul>   | <i>Citizens are not fully informed and their expectations are not managed.</i>  |
| <b>Current WWSS do not consider the barrier-free mobility needs of citizens</b> | <ul style="list-style-type: none"> <li>▪ It was noted by stakeholders that accessibility requirements are not sufficiently considered in current winter work operations. Examples of this are reflected in the current WWSS.               <ul style="list-style-type: none"> <li>➢ While WWSS exist for accessible parking locations, it does not specify the need to ensure sidewalk access and consideration of the side and rear door access design of vehicles.</li> <li>➢ While WWSS are established for bus stops, they do not specify the surface condition required to operate the buses' accessibility platforms. The platforms' built-in safety features require a flat finish surface in order to enable someone to disembark.</li> <li>➢ The need to clear rumble strips, sidewalk intersections, crosswalk buttons, and meters is not identified in the WWSS.</li> </ul> </li> </ul> | <i>The safety of citizens with mobility challenges is not fully addressed and their transportation options are limited.</i> |
| <b>Standards are not defined for parking in business improvement districts</b>  | <ul style="list-style-type: none"> <li>▪ WWSS are not established for conventional parking spaces located in business improvement districts.</li> <li>▪ This often results in reduced parking space availability since snow is not fully cleared and removed during the winter months.</li> </ul>  | <i>Local business traffic is reduced.</i>   |

# Emerging Themes

| Service Standard   |   |   |
|--|---|---|
| Emerging Theme   | Details   | Summary & Impact  |
| <p><b>The WWSS does not reflect the mobility needs and priorities of stakeholders, many of which were documented in the IMP’s mode-share targets by sub-region, and the complete streets hierarchy</b></p> | <ul style="list-style-type: none"> <li>▪ It was noted by stakeholders that the mobility objectives established in the IMP are not reflected in current winter work operations and WWSS.                             <ul style="list-style-type: none"> <li>➢ Respondents observed that since the mobility needs and expectations of citizens varied across HRM's territory, from the regional centre to the outer suburban area, the winter service expectations could also vary.</li> <li>➢ Respondents found that snow operations and the WWSS generally prioritized streets over sidewalks and bicycle lanes.</li> <li>➢ Many noted that the service standard observed did not keep with the IMP hierarchy by which “People who WALK”, followed by “People who BICYCLE” and “People who TAKE TRANSIT” are prioritized over vehicle drivers.</li> <li>➢ The need for winter street-to-street walkways, bicycle lanes, and multi-use pathway access is not reflected in the WWSS and is inadequately addressed in current operations.</li> <li>➢ Stakeholders indicated that not every walkway, bicycle lane, and multi-use pathway must be serviced, but the segments that are should be selected according to decision inputs such as usage, mobility equity, and network connectivity.</li> <li>➢ Stakeholders noted that the standard for bus stop winter maintenance (within 48 hours after the snow accumulation has stopped) does not meet user needs and causes barriers to transit system use.</li> </ul> </li> <li>▪ HRM provides an annual contribution of \$400,000 in support of the YMCA in the administration of its Snow Removal Program for Seniors and Persons with Disabilities. This funding allows the YMCA to serve about 450 households.</li> </ul> | <p><i>Public expectations established in the IMP are not being met in the winter months.</i></p> <p><i>Without clearly defined winter service standards for street to street walkways, bicycles lanes, and multi-use pathways, HRM increases its operational risks.</i></p> |

# Summary of Findings

## Emerging Themes

| Service Standard   |   |  |
|--|---|--|
| Emerging Theme   | Details   | Summary & Impact   |
| <p><b>Sidewalk conditions are an area of concern for many stakeholders</b></p> | <ul style="list-style-type: none"> <li>Multiple stakeholders identified sidewalks as an area for improvement for HRM's winter operations; particularly for the Halifax peninsula and downtown core.</li> <li>Participants cited difficulties with recent contractors and the historical focus on streets as reasons why sidewalk services were not delivered with the same quality as street services.</li> <li>Some consultation participants noted that classifications for streets and sidewalks should differ in certain areas. For example, in lower car volume streets within the Halifax peninsula that have high pedestrian volumes, sidewalks are a greater priority for residents.</li> </ul> | <p><i>The needs of pedestrians in high pedestrian traffic areas, such as the Halifax peninsula and downtown core, are not met.</i></p> |

# Summary of Findings

## Emerging Themes

| Processes and Delivery Model  |  |  |
|---|--|--|
| Emerging Theme  | Details  | Summary & Impact   |
| <b>HRM is challenged with respect to enforcing winter parking bans</b>            | <ul style="list-style-type: none"> <li>▪ Per the WWSS, the ability to plow and remove snow in HRM depends on the street geometry and presence of vehicles. Operations are impeded by the narrow width of some streets and on-street parked vehicles. Parking bans alleviate this, however, enforcement of overnight parking bans has been challenged for the following reasons:               <ul style="list-style-type: none"> <li>➢ There is narrow window of time to conduct enforcement, as parking bans are in effect from 1:00 a.m. to 6:00 a.m.</li> <li>➢ Ticket fees are set by the Province, and may be too low to help enforce parking bans in the Halifax peninsula. The Province is currently reviewing a request sent by the Mayor to double fines in the Halifax peninsula.</li> <li>➢ If a tow is required, operators must wait with the vehicle until the contracted tow truck arrives. This process may take over an hour and can be a significant drain on resources. The HRM has made improvements to this process concurrently to the project.</li> <li>➢ Consultation participants indicated that they would support increased enforcement of bylaw fines and towing provided that the public's awareness of parking ban increases and that road conditions improve.</li> </ul> </li> </ul> | <i>Non-compliance with winter parking bans increases the cost of and time to complete winter street operations and reduces work quality.</i> |
| <b>Stakeholders believe the service delivery model for sidewalks could change</b> | <ul style="list-style-type: none"> <li>▪ After 2013, HRM took the responsibility for maintaining sidewalks during the winter months. Prior to this, it was the responsibility of property owners except in one community of the Municipality.</li> <li>▪ There is no consensus whether property owners would assume back responsibility for sidewalk winter maintenance.</li> </ul>  | <i>Sidewalk conditions are not meeting the mobility needs of HRM residents</i>   |

# Summary of Findings

## Emerging Themes

| Processes and Delivery Model  |  |  |
|---|--|--|
| Emerging Theme  | Details  | Summary & Impact   |
| <b>Damage claims are increasing and processes for resolving claims are cumbersome</b>   | <ul style="list-style-type: none"> <li>▪ HRM has noted recent increases in damage claims by residents. Some of these claims take over a year to resolve.</li> <li>▪ Where properties are damaged during winter operations by HRM contractors, residents are instructed by 311 to directly reach out to contractors to file complaints and initiate the insurance process. Residents have found this process difficult and cumbersome, and feel that this should be the responsibility of HRM.</li> </ul>   | <i>Inefficient damage claim processes increase the administrative burden of winter operations and lower resident satisfaction.</i> |
| <b>Sharing staff with Parks has worked well, but resourcing Parks and TPW operations is problematic during shoulder periods</b> | <ul style="list-style-type: none"> <li>▪ It was noted that the sharing of operations staff with Parks generally works well, but resourcing issues are felt by both Parks and TPW:               <ul style="list-style-type: none"> <li>➢ There is increasing winter demand for park access.</li> <li>➢ Staff are transferred from Parks to TPW between November 15 and April 15, a time period that overlaps with fall and spring park maintenance tasks that helps mitigate lifecycle cost increases.</li> <li>➢ Parks staff are transferred back to their department if they are not needed on certain day shifts and at the end of service agreement. This can be problematic if an unexpected weather event suddenly occurs in the fall or spring.</li> <li>➢ Parks staff working winter night shifts cannot be transferred back to Parks even if they are idle.</li> <li>➢ Changing accountabilities between Parks and TPW makes staff performance management difficult.</li> </ul> </li> </ul> | <i>Services provided by both Parks and TPW are less effective.</i>   |
| <b>Regular touchpoints between transit and winter operations could improve service</b>  | <ul style="list-style-type: none"> <li>▪ The potential for greater collaboration on route prioritization, especially for servicing Access-A-Bus clients, was identified by stakeholders.</li> <li>▪ Transit's ability to monitor and communicate to TPW on current road conditions and the status of operations on critical roads could be leveraged further according to stakeholders.</li> </ul>   | <i>Transit network needs are not being effectively communicated.</i>   |

# Summary of Findings

## Emerging Themes

| Processes and Delivery Model  |   |  |
|---|---|--|
| Emerging Theme  | Details   | Summary & Impact   |
| <b>Communications with the public on winter operations are good, but should expand</b>      | <ul style="list-style-type: none"> <li>Current communication processes on parking bans and transit route detours are working well according to stakeholders.</li> <li>Respondents suggested that HRM should expand the scope of communications to explain how the standard is established and how operations are prioritized. HRM has developed, concurrently to this engagement, public education videos in line with this theme.</li> <li>External stakeholders indicated that providing the public with interactive maps showing real-time winter operations, plow location, conditions, and routes completed, would help them make informed transportation decisions.</li> </ul>  | <i>Internal and external communication processes have the potential to improve and better support winter operations.</i> |
| <b>311 service is generally good except overnight and in response to urgent road issues</b> | <ul style="list-style-type: none"> <li>Participants expressed that the current use of 311 is generally effective and efficient in disseminating information between stakeholders, both internal and external, and TPW.</li> <li>According to stakeholders, a formalized 311 by-pass is required since it is not effective in generating the rapid response required for traffic safety issues. Examples mentioned include vehicles sliding or buses getting stuck on streets with high gradients.</li> <li>The 311 overnight shift is completed by contracted shift workers, except during weather events when HRM 311 staff are on duty. The contracted resources have been found to be less effective in relaying operational needs from callers to TPW.</li> </ul> | <i>311's work with winter operations is seen as effective and efficient except for traffic safety issues.</i>            |
| <b>Winter operations support services are not readily available</b>                         | <ul style="list-style-type: none"> <li>Parking, By-Law Enforcement, and Fleet personnel are not readily available after hours. This can cause problems during weather events when operators require these support services (e.g., de-icing) to efficiently complete their operations.</li> </ul>  | <i>Time to complete winter operations is extended.</i>   |

# Summary of Findings

## Emerging Themes

| Processes and Delivery Model   |  |   |
|--|--|---|
| Emerging Theme   | Details  | Summary & Impact  |
| <p><b>Capital asset planning is not aligned between Fleet, Operations and Infrastructure Development</b></p> | <ul style="list-style-type: none"> <li>Stakeholders noted that capital asset planning is not aligned with new infrastructure developments such as protected bike lanes, sidewalk additions and widening, and street remodelling. For example, the planned replacement of a loader was extended this year as Fleet was required to use this budget to purchase new narrow vehicles for clearing protected bike lanes.</li> <li>It was noted that Operations purchases vehicles using its own budget, and that Fleet may not be aware of these purchases. This results in greater repair and maintenance requirements for Fleet without a related increase in budget, as Fleet's budget is based upon the number of vehicles it owns.</li> </ul>                 | <p><i>Without unified capital budget planning, winter operation fleet and equipment needs are addressed on a reactive basis, causing service delivery issues and swings in budget requirements.</i></p> |
| <p><b>Maintenance of winter operations fleet and equipment can be delayed by other departments</b></p>       | <ul style="list-style-type: none"> <li>Stakeholders noted that the capacity of Fleet staff is low, and that these staff face competing needs from other departments such as Fire and Transit. This issue is compounded by the high repair requirements of winter operations fleet and equipment due to the harsh operating conditions they are exposed to.</li> <li>Participants stated that better communication is required between Fleet and Roads Operations so that the limited capacity that is available is better utilized. For example, participants noted that Fleet should be busy maintaining and repairing equipment between weather events, so that Operations does not experience service delays related to equipment during events.</li> </ul> | <p><i>Sub-optimal use of limited Fleet capacity results in a greater number of service delays related to equipment breakdown.</i></p>   |

# Summary of Findings

## Emerging Themes

| Data and Technology   |  |   |
|---|--|---|
| Emerging Theme  | Details  | Summary & Impact  |
| <b>HRM is challenged to collect and share winter operations data in an effective manner to support winter operations and communications</b> | <ul style="list-style-type: none"> <li>▪ Respondents expressed interest in the capability of crowdsourcing for the collection of real-time data on street, bicycle lane, and sidewalk conditions to coordinate operations but especially to enable route planning by users.</li> <li>▪ A portion of HRM's winter operations fleet is GPS-enabled and contractors are not currently required to be equipped with GPS and share equipment location.</li> <li>▪ HRM has also encountered issues with the abrasives spreading that is not calibrated at sufficient intervals to help ensure accuracy.</li> </ul> | <i>HRM is not able to effectively communicate road conditions to residents</i>                        |
| <b>Technologies supporting external communications about winter work have been successfully used</b>  | <ul style="list-style-type: none"> <li>▪ Technologies such as apps, automated email alerts, social media, and HRM's website have been successfully used to inform residents of parking bans and changes to transit routes.</li> <li>▪ Some residents may have less access to, or less ability to utilize, technology. HRM should strive to reach all of its residents.</li> </ul>  | <i>HRM can build on its successful use of technology for additional communication with residents.</i> |

# Summary of Findings

## Emerging Themes

| Equipment   |   |   |
|---|---|---|
| Emerging Theme  | Details   | Summary & Impact  |
| <b>The capability of HRM's equipment and the geometry of existing active transportation network components do not match</b> | <ul style="list-style-type: none"> <li>Respondents noted that the width of current equipment is not adequately sized for network-wide mechanized sidewalk clearing. The equipment width is typically too large which can cause sod damage and/or improperly cleared sidewalk intersections.</li> <li>Large equipment dimensions also results in damages to new protected bicycle lane infrastructure. To correct this, HRM recently delayed replacement of snow-removal equipment to purchase four new narrow pieces of equipment to service protected bike lanes.</li> </ul> | <i>Without infrastructure and equipment alignment, HRM will be challenged to meet current standards for sidewalks, as well as any standard put forth for protected bike lanes and trails.</i> |
| <b>The winter work equipment is not all fit for purpose</b>   | <ul style="list-style-type: none"> <li>HRM has emphasized procurement of multi-season equipment.</li> <li>The type and effectiveness of equipment in the fleet is not fully aligned with the WWSS, service expectations, and winter operational conditions e.g., salt exposure.</li> </ul>  | <i>The efficiency of winter operations is hindered by the equipment available to do the work</i>  |
| <b>The winter work equipment is in poor condition</b>   | <ul style="list-style-type: none"> <li>Respondents across HRM noted that the winter work equipment is in poor condition and that investment is needed.</li> <li>According to HRM respondents, most of the equipment in use has reached its estimated useful life. They indicated that the use of equipment past its service life has resulted in increased repair requirements, increased lifecycle costs, and equipment downtime when it is needed for service delivery.</li> </ul>  | <i>The efficiency of winter operations is hindered by the volume of equipment repair work and consequent equipment downtime.</i>  |

# Summary of Findings

## Emerging Themes

| People  |  |   |
|---|--|---|
| Emerging Theme  | Details  | Summary & Impact  |
| <b>Service could improve by training all operators on accessibility</b>   | <ul style="list-style-type: none"> <li>Winter work supervisors completed accessibility training in November 2019. The current two-hour accessibility training enables individuals to experience the transport networks from the users standpoint. It has been effective according to recent TPW trainees.</li> <li>Supervisors noted that hand crews have capacity to deliver accessibility work, but require a practical understanding of the needs and related tasks to transition to customer-centric service delivery.</li> </ul>  | <i>Operators' misunderstanding of residents' barrier-free mobility needs leads to misallocated efforts.</i>   |
| <b>Operators should be cross-trained on winter work equipment and methods</b>                                   | <ul style="list-style-type: none"> <li>Respondents noted that current levels of HRM operator equipment training does not allow sufficient level of flexibility in resource allocation.</li> <li>Snow-clearing and de-icing approaches used by operators, which can be ineffective or inconsistent between operators, indicate a training need on proper snow-clearing and de-icing methods.</li> <li>The institutional memory and knowledge inherent to winter operations is not fully documented in guidance material or passed on through training.</li> <li>The current terms of the Collective Agreement can lead to less experienced, but more senior, operators conducting snow operations with the largest and more complex pieces of equipment.</li> </ul> | <i>A lack of operator training on winter work equipment and methods impedes service delivery.</i>             |
| <b>Service could improve by training Council and operators on service implications relating to the standard</b> | <ul style="list-style-type: none"> <li>Council must understand the scale and scope of the service that is agreed to in the WWSS to effectively communicate with the public and help manage expectations, as well as conduct oversight.</li> <li>Operators need to understand when exceptional circumstances require an intervention on their part.</li> </ul>  | <i>Greater understanding of service implications relating to WWSS would improve operations and oversight.</i> |



# Appendix B: What we heard - External Stakeholders

HRM – Review Winter Operations Service Standards  
Final Report

# Input by External Stakeholders

## Accessibility

- Plowing at intersections needs to improve to allow better and safer access to crosswalks and the sidewalk
- Adequate space to access crosswalk buttons need to be cleared
- Transit stops occasionally are not cleared
- Accessible parking stalls need to be cleared to meet user needs with sufficient space provided at the rear and sides, as well as snow removal to nearby sidewalk
- A system is needed to provide “real time” conditions as to sidewalk network condition
- Previous winter accessibility training has been effective, and should be refreshed each year for HRM Winter Operations staff and contractors

## Active Transportation

- In line with the IMP, sidewalks, bike lanes and walkways should, at a minimum, be cleared to the same standard as adjacent streets.
- Currently, standards for sidewalks and bike lanes are noticeably worse than those for streets
- The preference would be to have bare pavement on bike lanes and sidewalks all year round
- Consistency of services should be improved so that AT commuters can expect a typical level of service
- AT networks and service standards for sidewalks, bike lanes and walkways should be well-defined and communicated to the public
- Service-standard assessments and performance indicators should be publicly reported on

## Business Improvement

- Snow should not be piled where paid parking is in place or near transit stops
- There does not appear to be a clear standard of practice as to what height snow banks are allowed to reach before being removed; they pose a safety concern
- Snow should be removed from the downtown core as soon as possible
- Snow removal at bus stops is often not long enough for passengers to exit rear doors without climbing over snow banks
- Sidewalks, bike lanes and roads should be cleared to the same standard
- As HRM community engagement partners, the BIA should continue to receive “Winter Operations Update” emails directly from HRM as in previous years instead of being directed to a website

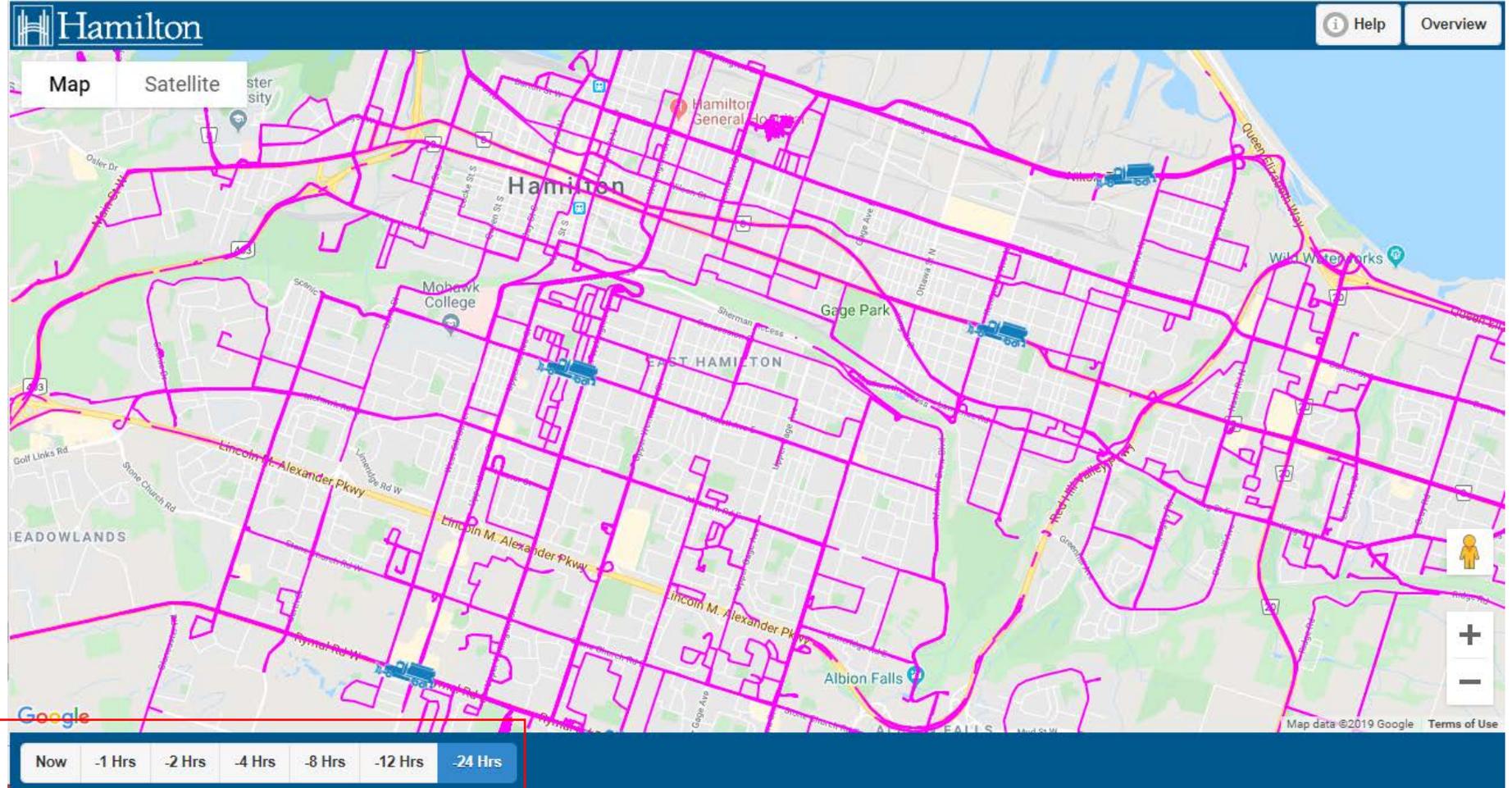


# Appendix C: Snow Operation Communications Technology

HRM – Review of Winter Operations Service Standards  
Summary of Initial Findings

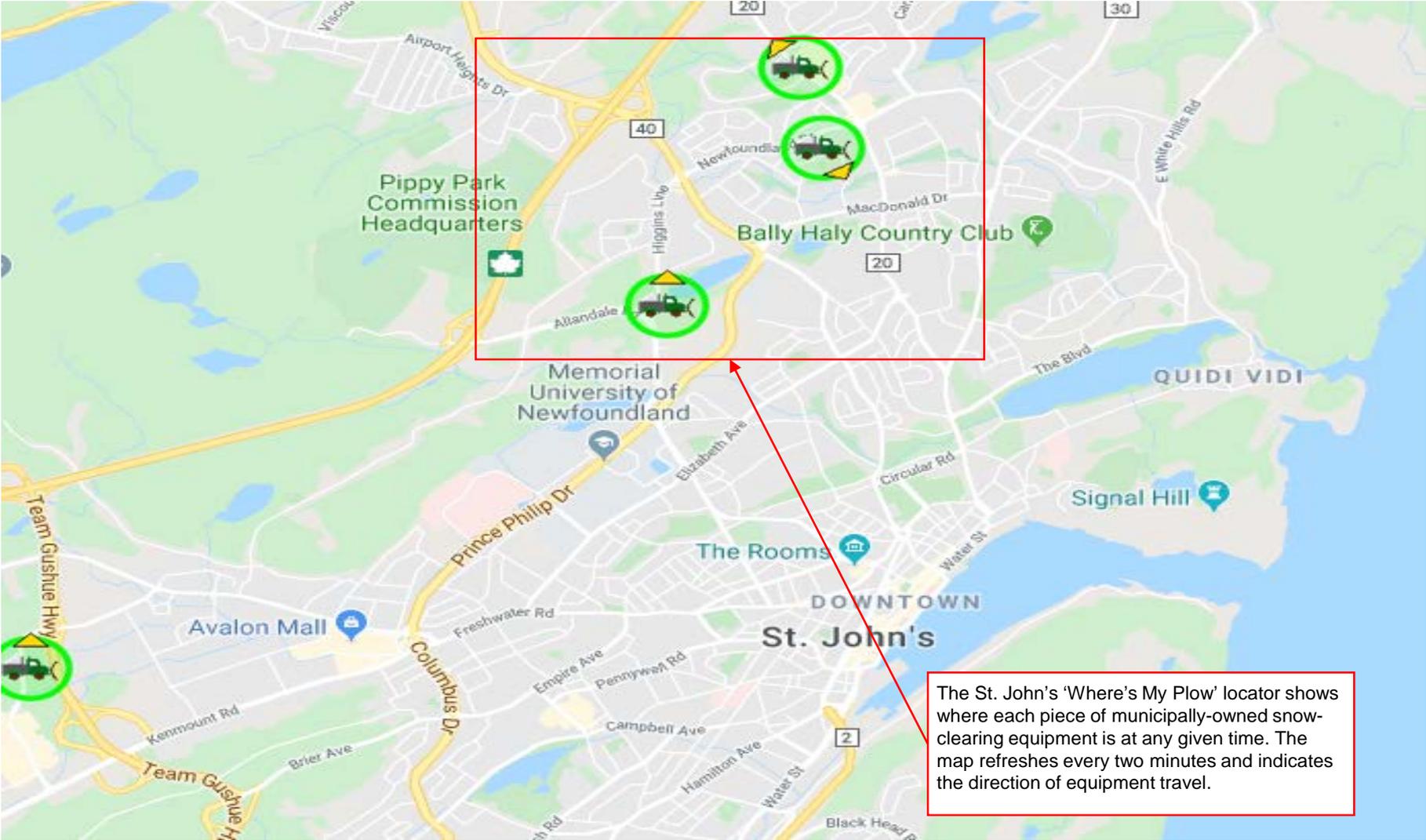
# Appendix C: Snow Operations Communications Technology

## Hamilton - Plow Tracker



The Hamilton Plow Tracker shows residents the movements of plows in the municipality over the past 24 hours.

# St. John's - Where's my Plow?



The St. John's 'Where's My Plow' locator shows where each piece of municipally-owned snow-clearing equipment is at any given time. The map refreshes every two minutes and indicates the direction of equipment travel.

# Winnipeg - Snow-clearing Status

**Streets, sidewalks & pathways**

The Winnipeg Snow-clearing Status Map allows residents to see what specific streets have been cleared. Updates are made at 6:30 a.m., 3:30 p.m. and 7:30 p.m.

|   |  |   |
|---|--|---|
| <b>North (complete)</b><br>No major plowing operation in progress | <b>East (complete)</b><br>No major plowing operation in progress | <b>South (complete)</b><br>No major plowing operation in progress |
|---|--|---|

# Winnipeg - Waze Traffic App



The Waze App will now update Winnipeg residents in real-time as to current road conditions.

Waze originally developed the 'Unplowed Road' feature in partnership with the Virginia Department of Transportation, and is planned to be made available in 185 countries worldwide<sup>1</sup>.

<sup>1</sup><https://winnipeg.ctvnews.ca/waze-app-debuts-real-time-plowing-updates-for-winnipeg-1.4723539>



# Appendix D: Sample Key Performance Indicators

HRM – Review of Winter Operations Service Standards  
Summary of Initial Findings

# Sample Key Performance Indicators

The following table describes eight key performance indicators for TPW's consideration. Baselines and targets would need to be established for each of these performance indicators.

| No. | Objective                                    | KPI  | Frequency of Measurement & Reporting | Description   |
|-----|--|--|--------------------------------------|---|
| 1   | Financially sustainable Winter Works service | Total winter control expenditure per household                             | Annual                               | Annually, after the end of each season, calculate total winter works expenditures divided by the census number of municipal households                      |
| 2   | Experienced, High-Morale Workforce           | Employee turnover rate   | Annual                               | Annually, after the end of each season, calculate total winter works employee separations divided by the average number of winter work staff for the period |
| 3   | Reliable Fleet and Equipment                 | Percentage of useful service life remaining                                | Annual                               | Annually, calculate the average percentage of remaining useful life of winter works fleet and equipment assets  |
| 4   | Quality of Service – Streets                 | Percentage of events where street service standard was met                 | Monthly                              | Monthly, divide the number of events where street service standards were met by the total number of events during the month                                 |
| 5   | Quality of Service – Sidewalks               | Percentage of events where sidewalk service standard was met               | Monthly                              | Monthly, divide the number of events where sidewalk service standards were met by the total number of events during the month                               |
| 6   | Quality of Service – Walkways & Trails       | Percentage of events where walkway and trail service standard was met      | Monthly                              | Monthly, divide the number of events where walkway and trail service standards were met by the total number of events during the month                      |
| 7   | Quality of Service – Protected Bike Lanes    | Percentage of events where protected bike lane service standard was met    | Monthly                              | Monthly, divide the number of events where protected bike lane service standards were met by the total number of events during the month                    |
| 8   | Quality of Service – Transit Infrastructure  | Percentage of events where transit infrastructure service standard was met | Monthly                              | Monthly, divide the number of events where transit infrastructure service standards were met by the total number of events during the month                 |



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### Winter Contract Details

| Contract Number | Contract Title  | Expiration (inc. opt. years) | Expiry (Not inc. opt. years) |
|-----------------|---|------------------------------|------------------------------|
| 2090008747      | Snow & Ice Control -<br>Additional Work -<br>PB4, Herring Cove /<br>Bayer's Lake /<br>Timberlea                             | 2023                         | 2020                         |
| 2090010183      | Snow & Ice Control -<br>PB, Zone 3, Bedford<br>/ Hammonds Plains<br>/ Additional Work                                       | 2027                         | 2023                         |
| 2090010191      | Snow & Ice Control<br>Services -<br>Additional Work for<br>Zone SWZ5 Halifax<br>Peninsula South                             | 2027                         | 2023                         |
| 2090010194      | Snow & Ice Control<br>Services -<br>Additional Work for<br>Zone SWZ7 Clayton<br>Park/ Fairview Area                         | 2027                         | 2023                         |
| 2090010195      | Snow & Ice Control<br>Services -<br>Additional Work for<br>SWZ8 Lake Banook/<br>Woodside Area                               | 2027                         | 2023                         |
| 2100001179      | Snow and Ice<br>Control Services -<br>Winter Sidewalks,<br>Walkways and<br>Trails for zone:<br>SWZ10- Sheet<br>Harbour Area | 2022                         | 2020                         |
| 2100001078      | Snow & Ice Control -<br>PB1, Waverley/Cole<br>Harbour/Eastern<br>Passage  | 2023                         | 2020                         |

|            |   |      |      |
|------------|---|------|------|
| 2100001080 | Snow & Ice Control -<br>PB4 Herring Cove /<br>Bayer's Lake /<br>Timberlea   | 2023 | 2020 |
| 2100001160 | Snow and Ice<br>Control Services -<br>Winter Sidewalks,<br>Walkways and<br>Trails Snow and Ice<br>Control - Zone<br>SWZ1- Cole<br>Harbour, Eastern<br>Passage, Waverley | 2022 | 2020 |
| 2100001162 | Snow and Ice<br>Control Services -<br>Winter Sidewalks,<br>Walkways and<br>Trails Snow and Ice<br>Control - Zone<br>SWZ4 -<br>Herring Cove,<br>Timberlea, Cowie<br>Hill | 2022 | 2020 |
| 2100001288 | Winter Sidewalks,<br>Walkways & Trails-<br>Snow & Ice Control-<br>Zone SWZ5- Halifax<br>Peninsula South   | 2027 | 2023 |
| 2100001289 | Winter Sidewalks,<br>Walkways & Trails-<br>Snow & Ice Control-<br>Zone SWZ6A-<br>Halifax Peninsula<br>West  | 2027 | 2023 |

|            |  |      |      |
|------------|--|------|------|
| 2100001290 | Winter Sidewalks,<br>Walkways & Trails-<br>Snow & Ice Control-<br>Zone SWZ6B-<br>Halifax Peninsula<br>North                | 2027 | 2023 |
| 2100001291 | Winter Sidewalks,<br>Walkways & Trails-<br>Snow & Ice Control-<br>Zone SWZ7- Halifax<br>Clayton Park,<br>Fairview Area     | 2027 | 2023 |
| 2100001292 | Winter Sidewalks,<br>Walkways & Trails-<br>Snow & Ice Control-<br>Zone SWZ8-<br>Dartmouth,<br>Woodside/Lake<br>Banook Area | 2027 | 2023 |
| 2100001147 | Snow and Ice<br>Control - Zone 2   | 2025 | 2021 |
| 2100001287 | Snow & Ice Control-<br>PB, Zone 3, Bedford<br>/ Hammonds Plains  | 2027 | 2023 |

## Proposed Winter Service Standards

| Infrastructure Type   | Priority   | Definition  | Existing Standard (Normal Circumstances)   | Proposed Standard  |
|---|------------|---|--|--|
| Streets   | Priority 1 | Main arterials;<br>Major bus routes;<br>Roads with steep inclines;<br>Emergency routes to hospitals and streets leading to schools and public buildings | <b>Start time:</b> After 2CM<br><b>Finish Condition:</b> Bare pavement<br><b>Time to completion from end of event:</b> 12 Hours  | No change  |
|   | Priority 2 | Residential and rural routes<br>Gravel roads<br>Private lanes that fall under Municipal Responsibility  | <b>Start time:</b> After 10CM cut throughs will begin<br><b>Finish Condition:</b> Snow-covered passable<br><b>Time to completion from end of event:</b> 24 hours                 | No change  |
| Sidewalks, Walkways & Multi Use Pathways including Pedestrian call buttons, tactile warning strips, pedestrian ramps and accessible parking spaces.   | Priority 1 | Main arterials / Capital District   | <b>Start time:</b> After 5CM (2cm for Capital District)<br><b>Finish Condition:</b> Bare<br><b>Time to completion from end of event:</b> 12 Hours                                | No change to standard, proposing officially adding school and health centre frontages to official P1 classification.   |
|   | Priority 2 | Transit Routes<br>School and Health Centre Frontages  | <b>Start time:</b> After 15CM<br><b>Finish Condition:</b> Majority of surface bare, with salt/sand for traction<br><b>Time to completion from end of event:</b> 18 Hours         | No change to standard, proposing officially adding school and health centre frontages to official P1 classification.   |
|   | Priority 3 | Residential sidewalks and pathways  | <b>Start time:</b> After end of event<br><b>Finish Condition:</b> Majority of surface bare, with salt/sand for traction<br><b>Time to completion from end of event:</b> 36 Hours | No proposed changes  |
| Local street bikeways<br><br>A local street with low motorized traffic volumes and speeds, modified to optimize bicycle travel, and designated by the Municipality as such. Bicycles and motor vehicles use the same space in the right-of-way. | Priority 1 | To match adjoining street   | No current standards   | <b>Start time:</b> After 2CM<br><b>Finish Condition:</b> Bare pavement<br><b>Time to completion from end of event:</b> 12 Hours                                  |
|   | Priority 2 | To match adjoining street   | No current standards   | <b>Start time:</b> After 10CM cut throughs will begin<br><b>Finish Condition:</b> Snow-covered passable<br><b>Time to completion from end of event:</b> 24 hours |

|  |            |  |   |  |
|--|------------|--|---|--|
| <p>Protected Bike Lanes</p> <p>An on-road bicycle lane made distinct from both the sidewalk and motor vehicle lanes by vertical barriers and/or elevation differences or other treatments.</p> | Priority 1 | To match adjacent sidewalk                         | No current standards  | <p><b>Mirror sidewalk priority</b></p> <p><b>Start time:</b> After 5CM</p> <p><b>Finish Condition:</b> Bare</p> <p><b>Time to completion from end of event:</b> 12 Hours</p>   |
|  | Priority 2 | To match adjacent sidewalk                         | No current standards  | <p><b>Mirror sidewalk priority</b></p> <p><b>Start time:</b> After 15CM</p> <p><b>Finish Condition:</b> Majority of surface bare, with salt/sand for traction</p> <p><b>Time to completion from end of event:</b> 18 Hours</p>         |
|  | Priority 3 | To match adjacent sidewalk                         | No current standards  | <p><b>Mirror sidewalk priority</b></p> <p><b>Start time:</b> After end of event</p> <p><b>Finish Condition:</b> Majority of surface bare, with salt/sand for traction</p> <p><b>Time to completion from end of event:</b> 36 Hours</p> |
| Bus Stops  | N/A        | This includes both sheltered and unsheltered stops | <p><b>Start time:</b> After 15cm</p> <p><b>Finish Condition:</b> Majority of surface bare, with salt/sand for traction</p> <p><b>Time to completion from end of event:</b> 48 hours</p> | <p>No change to standard for 2020/21 Winter Season</p> <p>Proposing to reduce time to completion from end of event to 24 hours, subject to budget availability</p>   |