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Item No. 3
Committee of the Whole
August 4, 2015

TO: Mayor Savage and Members of Halifax Regional Council

SUBMITTED BY: Original signed by

Richard Butts, Chief Administrative Officer

Original Signed by

Mike Labrecque, Deputy Chief Administrative Officer

DATE: July 22, 2015

SUBJECT: Winter Operations 2014/2015 – Strategic Direction Recommendations

RECOMMENDATION REPORT

ORIGIN

HALIFAX REGIONAL COUNCIL MINUTES

February 24, 2015 – **MOVED** by Councillor Mosher, seconded by Deputy Mayor Nicoll, that Halifax Regional Council requests that the Winter Operations End of Season staff report include:

1. An evaluation of the best practises for management of streets, sidewalks, intersections and bus stops during icing conditions when salt does not work.

2. Options for on street parking such as longer enforcement of the winter parking ban and/or alternate side of the street parking during winter.[1]

LEGISLATIVE AUTHORITY

The *Halifax Regional Municipality Charter* 2008, c. 39, s. 79 (1) (f) confers legislative authority to expend money required by the Municipality for snow and ice removal.

The *Halifax Regional Municipality Charter* 2008, c. 39, s. 320 (1), s. 320 (2) and s. 320 (3) confers legislative authority to make by-laws relating to snow and ice removal.

The *Halifax Regional Municipality Charter* 2008, c. 39, s. 322 (3) confers legislative authority to expend funds for the purpose of clearing snow and ice from the streets, sidewalks and public places in all, or part, of the Municipality.

The *Motor Vehicle Act* 1989 R.S.N.S. c.293, s.202 confers on the Local Traffic Authority the ability to declare an overnight parking ban during winter months.

[1] See Regional Council Minutes at http://www.halifax.ca/council/agendasc/documents/c150224.pdf

RECOMMENDATION

It is recommended that Halifax Regional Council:

1. Endorse the following strategic directions to improve the delivery of the Winter Operations services as described in the discussion section of the report by:

    a. Increasing 311 call centre capacity to respond to calls and e-mails during severe weather events;
    b. Increasing capacity to monitor and measure performance and quality of contracted and in-house service delivery;
    c. Take necessary actions to improve compliance with snow-related parking prohibitions;
    d. Improve operational readiness by securing additional equipment capability and strengthening winter operations planning; and
    e. Stabilizing winter operations expenditures.

2. Improve Sidewalk clearing by:

    a. Working within existing approved contracts and resources, direct staff to return to Regional Council in December 2015 with options to improve sidewalk service outcomes, including service coordination, street intersections, and accessibility; and

    b. Extending the remaining nine sidewalk service contract routes through the 16/17 winter season and direct staff to return to Regional Council in the November 2016, with recommendations on the sidewalk program, commencing the 17/18 winter season.

BACKGROUND

This report provides a series of strategic directions with accompanying actions in response to Council's Motions, feedback received from residents and Councillors, calls handled by 311, lessons learned by staff and contractors, and an independent third party winter operations review.

The municipality is facing higher resident expectations and increased demands during inclement weather while confronting growing awareness of environmental challenges inherent in the use of chemicals and abrasives for snow and ice control. As discussed in the 2014/15 Winter Operations End of Season Report, this past season was notable for weather patterns creating a greater snow on ground accumulation and flash freeze icing. This resulted in road and sidewalk conditions that severely impacted residents' mobility.

To assist in an evaluation of Winter Operations practices, staff sought proposals from qualified individuals/firms to provide an independent review of, and recommendations on, the municipality's Winter Operations program.[2] The review was intended to assist in the context of changing weather patterns and evolving multi-modal transportation demands. The analysis reviewed the Winter Operations division's current utilization of resources, the existing composition of the snow clearing fleet, current use of technology, the collaboration with local institutions, and the combination and level of services provided. The independent Winter Operations review was awarded to Grant Thornton Productivity Improvement (GTPI). GTPI's final report is included as Attachment 3. Staff have incorporated, where appropriate, the consultant's recommendations in the strategic directions.

In anticipation of a Committee of the Whole session to discuss this report and the End of Season report on Winter Operations, members of Council were invited by Mayor Savage to forward questions and comments to Transportation and Public Works staff for inclusion in an information staff report to be

[2] See 2015 Winter Operations Review – Request for Proposal (RFP) #P15-061 issued by the municipality on April 10, 2015.

provided to Halifax Regional Council. The responses to questions submitted by members of Regional Council were collected by staff and are responded to in Attachment 2 of this report. These issues have shaped the strategic directions.

DISCUSSION

With the goal of improving the delivery of the Winter Operations Service, staff have analyzed the factors which combined to prevent HRM from meeting the existing service standards during several circumstances during the past winter season. As noted in the 2014/15 Winter Operations End of Season report, there were six of 62 winter storm events where the existing performance standards were not achieved. Recovery from the heavy icing and snow on ground accumulation took many days.

As a result, the focus of the strategic directions that follow is to take actions which will improve delivering service to the standards, and providing increased capability to recover from the extreme events. As noted by GTPI in their review, Halifax's existing winter operations service standards are equal to, or higher than, the comparison cities (with the exception of St. John's NL standard for residential Priority 2 routes). Staff do not recommend changes to the service standards at this time, but do recommend that the sidewalk standards be reconsidered prior to the tendering of new contracts.

It is also important to note that the service standards, and thus service level delivery expectations, is independent of whether the service is provided in-house or by contractors.

Strategic Direction #1a: Increase 311 call centre capacity to respond to calls and emails during severe weather events by:

- **Modernizing Halifax's 311 Call Centre technology (telephony/CMS system);**
- **Implementing remote call-fielding by 311 agents;**
- **Supplementing dedicated 311 call centre agents with cross-trained staff; and,**
- **Better communicating appropriate resident use of 311 Call Centre capacity (in preparation for 2015/2016 winter season).**

311 Call Centre Overview: Halifax's 311 Call Centre (311 CC) is located at the Eric Spicer building, Mount Hope Ave, Dartmouth. Residents can call 311 toll-free from anywhere throughout HRM to access a wide variety of municipal information and services in over 150 languages using a telephone interpretation service. The 311 CC also accept emails and web-form submissions.[3]

The 311 CC currently employs 36 full time staff (agents and supervisors) – including 24 permanent full-time-equivalent (FTE) agents, 4 permanent part-time (PPT) agents and 4 part-time over-hire (PTOH) agents. At peak times, there are typically 16-18 agents answering telephone requests. The call centre has a 23-agent maximum capacity (due to availability of seats for agent use). The targeted grade of service (GoS) is that a citizen reaches an agent within 25 seconds, 80% of the time.

The 311 CC handles an approximate volume of over 450 thousand calls annually, and is primarily an in-bound call center. During the 2014/2015 Winter Operations season, 311 CC agents fielded over 23 thousand snow and ice management related calls.

Existing Call Centre Technology: The 311 CC currently uses a Centrex system that offers an array of features such as voice mail, call display and transfer, music on hold, conferencing, and Automatic Call Distribution (ACD) functionality (which answers incoming calls and distributes them to available agents).

[3] The system allows for priority queue-jumping from specific numbers such as Transportation and Public Works (TPW) employees and regional councillors.

The existing technology is, however, considered to be "end of life" and does not allow for modern call centre capabilities.

New Call Center Technology: The replacement of the Automatic Call Distribution System technology with a new, modern capable Call Center Management (CMS) system has been approved, by Council, for funding in the 2015-2016 fiscal. Quantifiable benefits associated with 311 call centre modernization include the following:

- reduced complaint resolution times;
- increased queue capacity;
- more accurate real-time analytics;
- enhanced work-force management capability (staff scheduling and tracking);
- skills based routing;
- more accurate historical reports;
- increased staff dispersion and specialty skills;
- expanded channels for communicating with citizens and
- emergent capability to work from remote locations.

Remote Call Fielding by 311 Agents: From a business continuity and disaster recovery perspective, capability to work remotely is particularly significant. Currently, 311 call center agents are only able to access the Call Management System from the main facility for which it is configured. Inability to travel to work or delayed travel to work (due to adverse weather conditions) compromised 311's capacity to field resident calls in the winter of 2014/2015. Implementing CMS will improve call centre resiliency in the face of extreme weather.

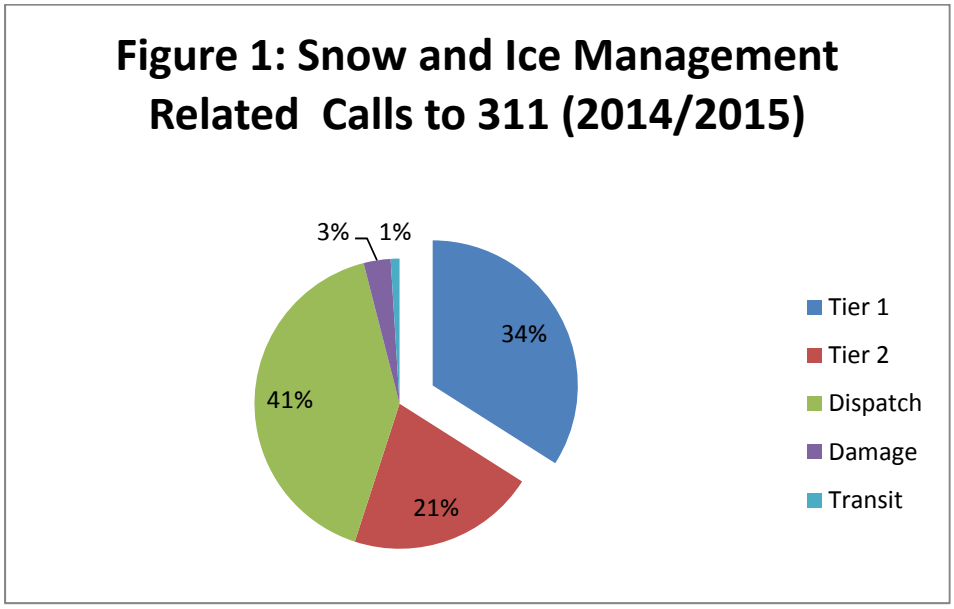
Cross-training Staff: The 311 CC staffs-up for annual peak periods when call volumes are known to spike (e.g. when tax bills are mailed out to residents). Staffing-up is possible in relation to predictable/ periodic up-swings in call volumes, but is problematic in the case of snow events (due to variability of weather). Moreover, high snow-related call volumes can (as demonstrated in 2014/2015) exceed staffing capacity – even with full mobilization of the entire pool of 311 call centre agents. Vacation black-outs for the entirety of the winter season are not feasible (contrary to peak periods that are limited in duration and can be predicted with a high level of confidence).

While adding staff to the 311 agent pool is an option, doing so could result in excess capacity/over-resourcing if winter weather conditions in the upcoming winter season are moderate to mild. As an alternative, staff will explore the feasibility of cross-training municipal staff to allow for additional capacity on an as-needed basis. Cross-trained staff can supplement baseline call centre agent capacity. This approach has the advantage of allowing for mobilization at periods of (unpredictable) peak demand during the winter season. Skills-based routing[4], together with staff dispersion (both available through modernization of 311 CC technology) can facilitate the use of cross-trained staff.

Communications with Residents: Efforts will be made to better educate residents on use of the 311 system in connection with winter weather events. Residents will be encouraged to restrict 311 snow-related calls to situations where public safety is at risk or the snow clearing service delivery period has expired. Figure 1 shows that during the 2014/15 winter season, 34% of snow and ice management related calls were Tier 1, i.e. received before the snow clearing service standard had expired. A reduction in Tier 1 calls would serve two purposes:

[4] Skills-based routing allows for assigning call centre work to employees with the appropriate skill set required by a task. In the case of cross-training, staff could conceivably be trained to respond to snow event related calls (as opposed to the full range of municipal service inquiries typically fielded by 311 CC agents).

- It frees the 311 line for all urgent requests including urgent snow clearing and other urgent issues (such as emergency vehicles needing assistance and potential public safety hazards). **If an issue is an emergency, those callers should always dial 911.**
- It frees the 311 line to allow residents who have other municipal inquires (such as tax billing, garbage collection, etc.) to speak to an agent.



Strategic Direction #1b: Increase capacity to monitor and measure quality of contracted and in-house service delivery by:

- **Increasing the capacity to monitor service delivery through periodic/short-term re-assignment of existing staff;**
- **Increasing the frequency of inspections of locations serviced by contractors;**
- **Revising contract language to better enable the municipality to hold contractors accountable; and,**
- **Installing Automatic Vehicle Location (AVL) technology on in-house Winter Operations equipment.**

Currently staff measure performance against the standard through field reporting by patrol supervisors. The patrol supervisors manually assess routes for completion. The supervisors will also calculate turnaround times and then revisit to confirm the trucks are meeting the turnaround times. This information is then used to determine if standards on being met.

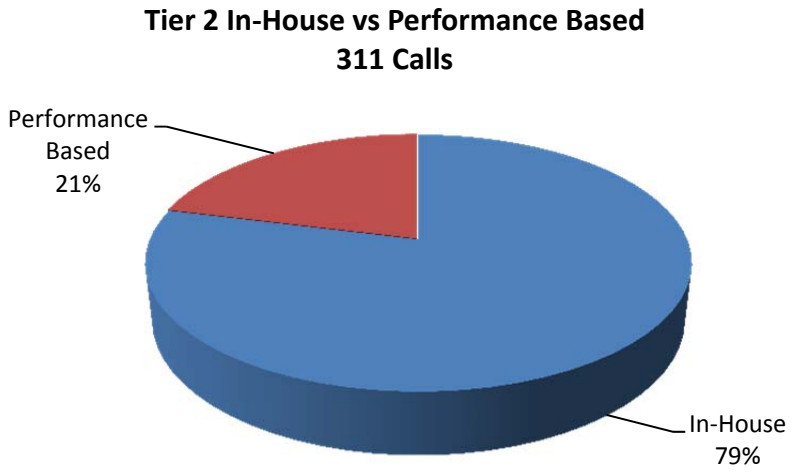
Monitoring and measuring is key to improving service delivery. Staff recognize the truth in the axiom that 'if you cannot measure it, you cannot manage it'. As a consequence, increased emphasis will be placed on monitoring and measurement in the upcoming Winter Operations season. To this end, steps will be taken to enhance the municipality's capacity to monitor and measure performance against standards, both in relation to in-house crews and in relation to contracted crews.

Inspection Capacity: Inspections of areas serviced by in-house and contractor crews are currently carried out by a team of 20 supervisors/inspectors. These supervisors/inspectors are each assigned to a region (east or west) and are scheduled to provide both day-time (8 am to 4 pm) and night-time coverage

(12 am to 8 am).[5] Individual supervisors/inspectors are assigned to individual contractors. This approach contributes to increased familiarity with individual contracts and familiarity with individual contractors. Familiarity better ensures that historical performance is known to the supervisor/inspector, as is historical responsiveness to direction to address service delivery deficiencies. This knowledge base facilitates managing contracts.

On a go-forward basis, the intention is to augment this inspection capability with additional eyes-on-the-ground. During responses to winter weather events, periodic/short-term re-assignment of existing Road Operations and Construction staff will be implemented. Dependent on weather event severity, the extent of re-assignment will be on a sliding scale. To best leverage this additional inspection capacity, contractor Automatic Vehicle Location (AVL) data[6] will be used to time route inspections to coincide with contractor street/sidewalk clearing (i.e. inspections will follow as immediately as possible on contractor vehicle passage).

Inspection Frequency: The geography serviced by performance based contractors is significant (1580 km of streets / 840 km of sidewalks). As such, comprehensive, street-by-street inspection is not practical. Consequently, inspection of streets and sidewalks must be done on a periodic, spot-inspection basis. Staff have relied on in the past, and will continue to rely on in future, 311 call data to identify problem areas for heightened scrutiny. Similarly, 311 call data can be mined for frequency of calls specific to areas serviced by a particular contractor.[7] Staff have also identified chronic problem sites (e.g. catch basins/storm drains) and maintain an inventory of these sites that is accessible via a mobile application developed for municipal use. Staff will, in upcoming winter seasons, increase the frequency of inspection of areas serviced by contractors. As noted above, additional eyes-on-the-street, will enable increased frequency of inspection.



Tier 2 = Service request is forwarded to the business unit for action

Tier 1 = Service request is closed at the call centre.

[5] During a winter weather event, both the day-time and night-time supervisory/inspection shifts are extended by 4 hours to provide continuous coverage.
[6] Performance based contractors are required to have Automatic Vehicle Location (AVL) technology on their vehicles and are contractually obligated to share AVL tracking data with the municipality.
[7] Future 311 call centre technology upgrades may provide improved analytics that will assist staff in this regard.

Table 1: Tier 2 311 Call Volume Breakdown (In-House vs Performance Based)
November 1, 2014 – May 1, 2015

Service Area	Total Calls	% of Calls	Serviced km	Calls Per km
Downtown Dartmouth, Burnside (E1)	1,815	10.7%	412	4.4
Caledonia, Portland Estates/Hills (E2)	1,716	10.2%	321	5.3
Lower Sackville, Bedford (E6)	2,757	16.3%	461	6.0
Peninsula (W1)	3,202	18.9%	460	7.0
Fairview, Clayton Park, Larry Uteck (W2)	1,954	11.6%	370	5.3
Spryfield, Herring Cove (W3)	1,891	11.2%	261	7.3
Total In-House	**13,335**	**78.9%**	**2,285**	**5.8**
Eastern Passage, Cole Harbour, Waverley (E3)	2,025	12.0%	542	3.7
Windsor Junction, Fall River (E4)	228	1.3%	221	1.0
Upper Sackville, Beaverbank (E5)	449	2.7%	222	2.0
Beechville, Lakeside, Timberlea (W4)	464	2.7%	104	4.4
Hammonds Plains (W5)	401	2.4%	452	0.9
Total Performance Based	**3,567**	**21.1%**	**1,541**	**2.3**
Total All	**16,902**	**100.0%**	**3,825**	**4.4**

Note: Tier 1 calls (received before service standard expired) are excluded. Calls which were unattributed to a service area (2,838 calls) have also been excluded from the calculations.

Contract Language Revisions: Based on experience during the past two winter seasons, staff have amended the terms and conditions for Winter Operations performance based streets contracts. Amended contract language would be applicable in the 2015/2016 season. A number of changes/ enhancements to the new contracts have been made, including a requirement for bidders to clearly demonstrate they have:

- an inventory of specific equipment (e.g. grader, loaders, backhoes, loader mounted blower);
- capacity to not just use a plow truck on smaller, narrow cul-de-sacs; they will be required to bucket when the lane widths are reduced by 10% or more.
- capacity to use brine (direct liquid application) when it's feasible to do so. This aligns with our salt management plan;
- capacity to provide regular and effective communications to Winter Operations (e.g. daily updates, plans for each weather event); and
- experience delivering similar snow and ice clearing performance.

Furthermore, fundamental changes to the structure and requirements under the contracts have been made, including an increase in the duration of the season (from 22 to 28 weeks) and an increase in the geographical limits of the contracts; shifting the boundaries into more urban areas of the city (Bedford,

Herring Cove and Cole Harbour).[8]

Specific requirements, which better align the resources, operational strategies and communications requirements of contractors to those of the municipality (including salt management and the mandatory use of direct liquid brine application and/or pre-salting before forecasted weather events) are included in the new contracts. These strategies contribute to the overall success of a winter operations plan and the consistency of messaging delivered by staff.

These tenders also include the requirement for the contractor to perform the spring sweeping of any traction sand left behind from winter operations and grading of all HRM owned and serviced gravel roads within the contract boundary. Typically this work would be done through separate tenders and including it in the snow and ice contract provides a more inclusive and structured approach to winter service delivery.

The link of the contractors to the HRM Corporate Call Center has also been enhanced in these contracts. The contractor is required to have 24/7 coverage on-site and available within the contract boundary through the use of one direct phone number and/or one email address.

In cases where contractors fail to meet contractual obligations, the municipality can apply liquidated damages. Updated contract language allows for penalties ranging from $2,000 to $5,000 (per incident). By contrast, prior contracts allowed for penalties ranging from $200 to $2,000 (per incident). Note that there is no maximum/cap. Failure to meet service delivery standards during a single winter weather event could result in the imposition of multiple penalties for any given contractor.

Automated Vehicle Location (AVL) Technology: Measuring performance against standards would be facilitated by on-board Automated Vehicle Location (AVL) technology to track performance against standard. AVL technology, incorporating global positioning systems (GPS), can be used to track and provide real time information on winter maintenance operations (type of applied material, application rate, position of plow blade, pavement temperature, etc.). AVL integrates vehicle location information with other information from the vehicle to provide time and space referenced information on a winter operations vehicle's activities. AVL technology has been adopted in other jurisdictions and has been recommended by the consultant in its Winter Operations review.

Strategic Direction #1c: Increase compliance with snow-related parking prohibitions by:

- **Increasing the number of dedicated parking enforcement officers employed to issue tickets (during overnight parking bans);**
- **Exploring the feasibility of increasing parking ticket fines;**
- **Securing additional access to tow trucks; and,**
- **Emphasizing the importance of resident compliance with parking prohibitions.**

The ability to conduct snow and ice management activities unimpeded by (illegally) parked vehicles is imperative. As noted by the consultant,

> "Despite a substantial volume of communications and the enactment of overnight parking bans, illegally parked vehicles caused delays in snow removal operations."

[8] More urban areas have a higher concentration of bus stops, cul-de-sacs, catch basins, crosswalks and locations with limited snow storage. This requires an increased capacity for snow hauling with specialized equipment such as loaders with snow blowers, graders, backhoes and dedicated/multiple crews for contiguous work activities.

Parked vehicles obstruct curb-to-curb plowing, lead to a narrowing of the traveled way and reduce the speed at which snow plows, graders, loaders and dump-trucks can operate in the course of delivering snow and ice management services. Modifying resident behavior (in regards to contravening winter parking prohibitions) is critically important to efficient and effective service delivery.

COUNCIL MOTION TO CONSIDER LONGER ENFORCEMENT OF OVERNIGHT WINTER PARKING BAN

February 24, 2015 – **MOVED** by Councillor Mosher, seconded by Deputy Mayor Nicoll, that Halifax Regional Council requests that the Winter Operations End of Season staff report include:

1 Options for on street parking such as longer enforcement of the winter parking ban and/or alternate side of the street parking during winter.

Halifax's Local Traffic Authority is created by Section 321 of the Halifax Regional Municipality Charter and by Section 86 of the Nova Scotia Motor Vehicle Act.[9] Pursuant to Provincially conferred authority, Halifax's Local Traffic Authority creates winter parking regulations for the municipality (see Attachment 1). Section 202 of the Motor Vehicle Act confers on Halifax's Local Traffic Authority the ability to declare a special condition day, triggering the application of the municipality's winter parking regulations.[10] Any number of days may be declared as special condition days. In other words, winter parking can be restricted/prohibited indefinitely, at the sole discretion of Halifax's Local Traffic Authority. Over the past four years, parking restrictions/prohibitions have been imposed between 14 and 47 days in a given Winter Operations season.

Section 202 of the Motor Vehicle Act, is silent concerning the number of hours that winter parking restrictions/prohibitions may be imposed. The Act is similarly silent concerning time of day that winter parking restrictions/prohibitions may be imposed. Halifax's Local Traffic Authority is free to adjust winter parking restriction/prohibition timing to safeguard public safety and facilitate ice/snow management.[11] Since 2011, winter parking regulations have stated that the winter parking ban (when declared) runs from 1 am to 6 am.[12] This time-frame was adopted, following public consultation, to offer increased flexibility to those most affected by the ban (e.g. shift workers, residents without a driveway, business owners) while not compromising the municipality's snow and ice clearing operations.[13]

Halifax's winter parking regulations (currently) stipulate that a special condition day must be declared and publicized at least 12 hours before a parking restriction/prohibition takes effect.[14] The prevalence of social media channels, widespread internet connectivity and virtually universal mobile device use has facilitated publicizing the winter parking ban. The high level of interactivity and ease of instantaneous notification has meant that season-long winter parking bans are no longer required.[15] Permitting on-street parking on

[9] Note that the Traffic Authority is a *persona designate*, meaning an officer who derives his/her authority by virtue of their office pursuant to legislation.
[10] Although the municipality's Traffic Authority declares the ban, the decision involves a collaboration of representatives from Police, Fire and Emergency Services, Transportation and Public Works (Road Operations and Construction), Planning and Development (Municipal Compliance), Parks and Recreation, Operations Support (311 Call Centre), Halifax Transit, and the CAO's Office (Corporate Communications).
[11] Prior to 2011, for instance, overnight winter parking was prohibited between 1 am and 7 am.
[12] Moncton's overnight winter parking ban is in place daily from 12 pm until 7 am (between December 1st and April 15th).
[13] See https://www.halifax.ca/boardscom/SCtransp/documents/7.2WinterParkingBan.pdf
[14] Exemptions are made for taxis operators, physicians/surgeons, persons loading or unloading merchandise and persons employed by the armed forces, police or fire services.
[15] Lack of adequate/timely means to put residents on notice previously made periodic parking restrictions/ prohibitions problematic.

days during the winter, when weather conditions allow, maximizes availability of on-street parking all winter without compromising the municipality's ability to manage ice and snow.

As staff members have become more experienced with imposing periodic parking bans the approach has changed. Staff will impose an overnight parking ban as a precautionary measure if weather conditions warrant. If extensive operations are required to deal with a storm's aftermath, staff impose an overnight parking ban on multiple, consecutive days. If an extended ban is going to be imposed, the public will be alerted. Announcing extended bans, as opposed to advising of overnight parking bans on a day-by-day basis, helps members of the public secure off-street parking and avoid being ticketed or towed.

Section 202 of the Motor Vehicle Act specifies that the municipality "may prohibit or restrict the parking of vehicles between the fifteenth day of November and the fifteenth day of April."[16] Without legislative amendment, Halifax lacks the authority to prohibit or restrict parking (on grounds of special conditions) before November 15th or after April 15th. In light of section 139 of the Motor Vehicle Act, amending section 202 is, however, deemed unnecessary.

Section 139 of the Motor Vehicle Act deals with winter parking restrictions. Members of the public are prohibited from parking a vehicle on a highway if doing so might interfere with snow removal or winter maintenance operations. Highway is defined, in the Motor Vehicle Act, as a public highway, street, lane, road, alley, park, beach or place (including the bridges thereon) and private property that is accessible (by vehicle) to the general public. Peace officers[17] can have obstructing vehicles moved or towed at the owner's expense. Section 139 of the Motor Vehicle Act, unlike section 202, can be used to remove vehicles (to facilitate ice and snow management) at any point during the year.

COUNCIL MOTION TO CONSIDER ALTERNATE SIDE OF STREET PARKING DURING WINTER

February 24, 2015 – **MOVED** by Councillor Mosher, seconded by Deputy Mayor Nicoll, that Halifax Regional Council requests that the Winter Operations End of Season staff report include:

2. Options for on street parking such as longer enforcement of the winter parking ban and/or alternate side of the street parking during winter.

Alternate side of street parking regulations are used in cities to facilitate mechanical street cleaning/ clearing. Some alternate side of street parking systems change side every two weeks – others permit parking on the odd-numbered side of the street on odd-numbered days and permit parking on the even-numbered side of the street on even-numbered days. Alternate side of street parking is only suitable on streets that are wide enough to safely accommodate temporary two-sided parking (necessary during change-over-day grace-periods) and that have roughly the same number of parking spaces on either side.

Winter parking control practices across the country correspond to jurisdiction-specific winter weather conditions – particularly rain and/or rapid melting (see Table 2).

[16] See http://nslegislature.ca/legc/statutes/motor%20vehicle.pdf (page 133).
[17] Peace officer includes a member of the Royal Canadian Mounted Police, a police officer appointed by a city, town or municipality, a police officer appointed by the Attorney General, or a motor vehicle inspector;

Table 2: Winter Parking Controls – Cross Jurisdictional Comparison

Winter Parking Controls Used	Prevailing Conditions Driving the Controls	Regions Where Approach is Used
All streets quickly cleared of snow to the curb line. Reliance on overnight parking ban to facilitate snow clearing.	Quick melting of snow or follow-up rainfall is usual. Flash freezing is a frequent occurrence.	Atlantic Canada
All streets eventually cleared of snow to the curb line. May use alternating side of the street parking ban.	Quick melting of snow or follow-up rainfall is unusual, but is a possibility.	Central Canada
Plowing of designated "snow routes". All other streets receive little or no winter maintenance. Parking restrictions applied only to snow routes.	Occurrences of rainfall or mid-winter melting are rare.	Western Canada

The frequency of rain and/or melting snow in Atlantic Canada requires that streets be entirely clear of parked vehicles to enable push-back to curbs and catch-basins to prevent flooding conditions. When rainfall occurs during near-freezing temperatures, it is essential that the rain be able to drain off the crown of the street into the gutters and catch-basins. Snow that is not cleared to the curb can prevent the proper drainage of this water resulting in the water being trapped on the street surface leading to the potential of black ice.

Bi-weekly alternate street side parking (turnover every two-weeks) would severely inhibit effective snow and ice operations as plows would be denied access to the alternate side of the street for two full weeks each month. Daily alternate street side parking is better suited to winter ice and snow management, but would still delay service delivery by 12 hours or more. Snow clearing of the alternate side of the street would have to be timed to coincide with the switch over of vehicles (to the opposite side of the street). Parking on both sides of the street (permitted during change-over grace-periods) would further complicate managing ice and snow on streets if alternate side of street parking was permitted. Build-ups of frozen snow and ice, due to (unavoidable) service delays, would likely require the use of specialized heavy equipment and/or extra salting (at increased cost to the municipality).

Alternate side of the street parking would necessitate a duplicate snow clearing shift, regardless of the severity of the snow event. With alternate side parking in place, crews would only be able to clear one side of the street at a time. Plowing equipment would have to be driven to and from previously plowed areas, on subsequent days, resulting in higher fuel consumption, maintenance and repair costs. Hourly, in-house and performance based crews would have to operate for longer to clear any given street, thereby increasing compensation costs.[18]

On-street parking (on alternate sides of the street) would also reduce the travelled way width, particularly during storms. Narrowed travelled ways would affect the delivery of municipal services and potentially put resident safety at risk. Movement of emergency vehicles (fire/police/ ambulance) during winter weather events would be impeded by narrow thoroughfares resulting from alternate side of the street parking. On-street parking, under storm conditions, would increase the likelihood of winter weather related vehicular collisions (with other vehicles and with pedestrians) and would increase the likelihood of private and

[18] Performance based contractors would very likely pass incremental costs along to the municipality (in the form of contract-based compensation increases) if alternate side of the street parking was to be permitted.

public property damage. Vehicles parked on-street would also slow the pace of snow and ice management – crews would need to reduce vehicle/equipment speeds when operating in close proximity to parked vehicles.

Dedicated Enforcement Officers: During a winter weather event, the number of traffic collisions increases and police officers are diverted from parking enforcement duties to assist residents involved in vehicular collisions (particularly collisions involving injuries). To address this enforcement deficit issue, Winter Operations contracted Independent Security Services Atlantic (ISSA) in 2014/2015 to issue overnight parking ban tickets.[19] A complement of six ISSA enforcement officers was contracted last season. On a go-forward basis, staff will establish a mechanism to adjust upward (on an as needed basis) the number of dedicated enforcement personnel.

Towing Illegally Parked Vehicles: Vehicle seizures were limited in 2014/2015 (87 seizures – less than two seizures per parking ban day). The ability to get to and remove vehicles left on the street (interfering with winter operations) deteriorated with the severity of the winter weather conditions. Towing an illegally parked vehicle, during a winter weather event, can be challenging if the vehicle is covered in snow, and/or has been plowed around. Given the importance of keeping streets free of parked vehicles, timely towing is important. To this end, staff will be looking to increase the municipality's ability to tow vehicles early, while prevailing weather conditions still permit ease of removal. Halifax's towing contract expires in 2015. This presents the city with an opportunity to negotiate additional towing capacity and to adjust the contract language to secure priority access to tow trucks during winter weather events.

Parking Ticket Fines: During the 2014/2015 winter season over 12,000 parking tickets were issued. The volume of tickets issued in Halifax, would suggest that ticketing is not having the desired effect of encouraging residents to secure off-street parking when winter parking prohibitions are in effect. Given that behavior modification (as opposed to revenue generation) is the intended consequence of ticketing, a modified approach seems to be required. Currently ticket fines are minimal ($50 if paid within 60 days). At this dollar value, many residents are willing to risk getting a parking ticket, rather than incurring whatever cost is associated with securing off-street parking. Given the importance of keeping streets clear of vehicles during winter weather events, this risk-reward-calculus must change. Staff, therefore, propose exploring increasing fines for snow-removal-related parking tickets. To create a disincentive for repetitive illegal parking, parking fines could be made incremental (i.e. progressively higher fines for second and subsequent offences). Incrementalism discourages continual illegal parking without unduly punishing first-time parking offenders.

Communicating Importance to Public: Throughout the 2014/2015 winter season, Corporate Communications worked closely with Road Operations and Halifax Regional Police to notify citizens when the overnight parking ban was in effect (and again when it was lifted) using multiple, integrated channels that will continue to be examined for effectiveness and opportunities for improvement. While this communication created high public awareness of when the ban was in place, it only had an impact on those residents who are naturally predisposed to comply with Municipal rules.

Based on the number of residents who are willing to risk getting a parking ticket, there is likely a need to increase public awareness and appreciation *why* it matters to the safety and well-being of families, neighbours and businesses that everyone help expedite snow clearing efforts by complying with on-street parking restrictions—that is, it's more about the impact on people than it's about obeying Municipal laws. An integrated campaign of paid and unpaid traditional/social media to influence attitudes and behaviours (similar to Heads Up Halifax) in advance of the overnight parking ban could be implemented to:

- persuade residents of the civic benefit of actively avoid parking on the streets when necessary;
- promote opportunities to avoid on-street parking by securing off-street parking at home and taking transit, carpooling or, if they need to use their vehicle, use parkades and parking lots where available; and

[19] The contract with ISSA has been in place since 2014/2015. Prior to this past Winter Operations season, tickets were issued by a combination of off-duty police officers and municipal compliance officers.

- enhance the Municipality's reputation for executing proactive, timely, integrated efforts to effectively address snow clearing challenges following significant weather events

The campaign approach could highlight citizen's "doing their part" to keep their neighbours' streets accessible to snow clearing operations. It could also engage regional partners (e.g. Waterfront Development, Canadian Forces, Province, Business Improvement Districts, Destination Halifax, Halifax Partnership) to underscore that "we're all in this together" and to spread the word amongst their audiences.

Strategic Direction #1d: Improve operational readiness by:

- **enhancing operator training;**
- **securing additional equipment capacity when conditions require;**
- **increasing meteorological forecasting; and,**
- **annually updating the winter control plan.**

Enhancing Operator Training: Mandatory pre-season training sessions with in-house Winter Operations staff currently cover policies, procedures, schedules, record keeping requirements, reporting procedures for callout and route maps. Any issues resulting from the training sessions are resolved either at the meeting or prior to the winter season. Winter patrollers (or staff whose duties also include patrolling) are familiarized with the representative roads to be patrolled and the de-icing chemicals to be applied for the forecast weather conditions.

Due to minimal in-house training capacity (one dedicated trainer), however, equipment training and safety precautions training is limited. As addressed in the consultant's report, the lack of grader operations training was particularly problematic in the winter of 2014/2015. Staff will explore how to enhance Winter Operations vehicle operator training, including adding to in-house trainer capacity. As an alternative to deepening in-house training capacity, staff will explore the feasibility of an operator training partnership with Nova Scotia Transportation and Infrastructure Renewal.[20] Staff will also explore the feasibility of an operator training partnership with a private sector training provider.

Securing Additional Equipment Capacity: Provisions built into the new/proposed performance based streets tenders have specific requirements around the availability of heavy equipment such as loaders, graders, large blowers and additional equipment to be used for clearing catch basins, including the requirement for staffing levels to be augmented when snow is shifting to rain or vice versa. This will allow street plowing and catch basin clearing to happen congruously. Having these requirements built into the tenders has effectively increased the availability of specialized equipment and qualified operators able to perform the work.

For the area of the municipality that will be serviced by in-house equipment, staff will increase the availability of graders on hourly retainer and heavy equipment available for clearing catch basins.

Increasing Meteorological Forecasting: Scotia Weather Services Inc. (SWS) is currently contracted by the municipality as a Value Added Meteorological Service (VAMS). Scotia Weather Services provides three forecasts per day between November 15th and April 15th. Forecasts use hourly segments showing temperature, precipitation, wind speed and direction, surface temperature, probability of black ice and

[20] Differences in types of infrastructure maintained and/or differences in types of vehicles operated may present challenges in merging training of municipal and provincial snow and ice management crews. Whereas the municipality is responsible for maintaining infrastructure in the urban core (including sidewalk clearing and snow hauling), the Province is primarily concerned with plowing on 100-series highways and rural streets/roads.

dew point. The Winter Operations management team is also able to consult with a Scotia Weather Services' duty forecaster on a 24/7 basis.

Depending on frost depth, weather forecasts, current conditions, temperature trends and time of year, each snow event is approached differently. Winter Operations staff evaluate the weather forecasts and choose the best method to prepare the streets for snow and ice, and to maintain clear, safe streets throughout a weather event. Staff are proposing that a second Value Added Meteorological Service be contracted in the upcoming winter season. Access to a second service provider will provide additional data upon which key Winter Operations resource mobilization decisions can be based.[21]

Updating Winter Control Plan: A winter control plan is intended to detail preparations leading up to the winter season, operational practices for implementation in the midst of the winter season and steps to be taken in decommissioning winter operations at the end of the winter season. As noted in the consultant report, a written Winter Control Plan is considered to be a best practice. Halifax does have a draft Winter Control Plan that is similar, to some degree, to the structure and content to the Ontario Good Roads Association's (OGRA) template recommended by the consultant. Staff will update the Winter Control Plan in preparation for the coming winter season taking into account the consultant's recommendations and the OGRA template. The plan will be reviewed and update annually to enhance preparedness and provide clearly communicated responsibilities and response expectations.

Strategic Direction #1e: Stabilize winter operations expenditures by:

- **Minimizing the use of hourly based contractors;**
- **Expanding the (geographic) scope of performance based contracts;**
- **Consolidating in-house resources (staff and equipment)**
- **Moving accountability for, and control of, expenses for fleet fuel, repairs and damage to Winter Operations; and,**
- **Standardizing trucks and equipment.**

Minimize Hourly Based Contracts: Under the hourly-based contract, equipment and services are provided when requested by the municipality. Hourly fees are pre-negotiated and specified in the contract. Variable retainer fees are paid depending on the number and type of specialized equipment and personnel that must be made available upon request. Number, duration and severity of winter weather events[22] directly impact Winter Operations' variable expenditures – in particular the use of hourly based contractors. High variable costs, due to severe winter weather conditions, drove up overall Winter Operations actual expenditures to over $36M in 2014-2015. Of the $20.4M in variable expenditures in 2014/2015, $9.7M in costs, were attributable to hourly based contracts (47.5% – the single highest variable cost line item).

By consolidating in-house resources in the urban core and expanding the scope of work handled by performance based contractors, the need to use hourly based contractors will be significantly reduced. The reduction in hourly based contracting will reduce variable budgetary expenditures and contribute to budgetary stability.

[21] Although staff have access to forecasts publically available through Environment Canada and the Weather Network, a Value Added Meteorological Service (VAMS) provides site specific forecasting tailored to the municipality's needs.

[22] Winter weather event means a weather condition affecting roads such as snowfall, wind-blown snow, sleet, freezing rain, frost, or ice, to which a winter event response is required.

Table 3: Advantages and Disadvantages of Hourly Based Contracts

Advantages	Disadvantages
Reduced costs in mild weather.	Unpredictable operational costs.
Resources on stand-by are available within 10-minute response time.	Discourages industry investment in snow and ice management equipment.
Flexibility in determining when required (no minimum call-outs).	High contracted crew turn-over resulting in less experienced staff.
Less municipal equipment to capitalize and maintain.	Consistent municipal supervision of contracted crews is required.
Increased liability exposure.	Wider range of costs between contractors.
Specialized equipment available.	Management of customer complaints required.
	Equipment used by contractor may be in poor repair.
	Additional equipment and crews may not be available for deployment due to prior commitments.
	Service delivery driven by contractual obligation/profit motive versus stewardship.

Expand Performance Based Contracts: Winter Operations program costs include both fixed and variable costs. Fixed costs, which occur regardless of the type of winter conditions experienced, include regular salaries and benefits (municipal employees), performance based street and sidewalk contract fees, retainers associated with hourly-based contracts, and senior assistance program-related costs. Variable costs, which increase dependent on winter weather conditions, include equipment costs, overtime salaries (municipal employees), salt/sand/brine materials costs, and hourly contractor costs (non-retainer).

Performance-based contracts, equipment and services are contracted for the duration of the Winter Operations season. Seasonal compensation is payable on per km unit price basis specified in the contract. Unit price remains the same regardless of the number, or the severity, of winter weather events. This provides budget stability, as performance based contract costs are flat. Geographic expansion of performance based contract coverage reduces the municipality's overall exposure to seasonal variability. In essence, the performance based contracts insulate the Winter Operations budget against expenditure spikes due to severe weather.

Consolidate In-House Resources (Staff and Equipment): By expanding the scope of performance based work, the municipality will be able to consolidate in-house staff and equipment. Consolidation of in-house resources will have a number of operational advantages including the following:

- increased in-house ownership of, and accountability for, areas serviced (i.e. less dilution of service delivery resulting from the use of hourly contractors in areas serviced by in-house crews);
- Better responsiveness due to proximity of serviced areas to operational depots (timeliness due to reduced travel time);
- Reduced wear-and-tear and fuel consumption for in-house equipment (due to reduced travel distances);
- Greater certainty of in-house cost-per-km calculations (as hourly based contractor work will obscure the calculations to a lesser degree);

- Ability to declare Bayers Lake salt dome surplus to needs in 2016/2017(reducing carrying costs).[23]

Move Fleet Expense Accountability and Control: Accountability for, and control of, Winter Operations fleet expenditures currently sits with Corporate Fleet and Equipment. This "budget-based relationship" (between fleet and the user groups) is a by-product of the municipality's consolidation of all fleet costs, from a budget and accounting standpoint, was done to facilitate meeting the objectives of the Fleet Focus project. Having all related costs, in one place, more readily identifies problems and allows management to take corrective action.

However, as noted in the consultant's report,

> "[B]ecause there are no line items in user budgets for fleet expenses, users have no incentive to work for economy or rationalize the number of vehicles and equipment they really need."

The alternative to "budget-based relationship" approach is a "transaction price-based relationship". All costs for fleet operations, including fuel, repair labour, parts and fleet management are budgeted in the end-user's cost centre. To better facilitate accountability, budget transparency and fiscal responsibility (vis-à-vis fleet-related expenditures) staff will move to a transaction price-based relationship for Winter Operations in future budget years.

Standardize Trucks/Equipment: Fleet, in partnership with Procurement and Road Operations, will explore how Winter Operations fleet standardization can be achieved. Future equipment acquisitions will evaluate a range of available options, with due consideration of fleet standardization. As noted in the consultant report, cost savings can be realized through mechanic familiarity with standardized vehicles and a reduced need to maintain a diverse stock of vehicle parts. By introducing standardization, variable costs can be better controlled, contributing to improved expenditure stability.

Taken together, these operational advantages will serve to drive down variable costs attributable to in-house operations, and thereby help to stabilize the Winter Operations budget.

Strategic Direction #2a and 2b: Improve Sidewalk clearing by:

- **make all contracted sidewalk routes have identical contract end dates;**
- **re-aligning sidewalk service delivery areas;**
- **tightening sidewalk contract language; and,**
- **considering changes to the sidewalk service level standards including accessibility under severe winter conditions.**

Sidewalk Contracts: Currently there are six separate sidewalk contracts, with nine individual contractors. Of the 34 total sidewalk routes covered under contract, nine will expire in 2015/16. The remaining 25 routes will expire in 2016/17. Differing contract end dates undermine staff's ability to adjust contract language to ensure uniformity of service across all sidewalk routes. Making all sidewalk contracts identical contract end dates will address this issue. The earliest opportunity to make all sidewalk contracts with identical contract end dates is after the 2016/2017 winter season.[24] This would require a one year sidewalk contract extension for those contracts that expire in 2015/2016.

Re-Alignment of Sidewalk Routes: As currently structured, some neighbourhoods are serviced by multiple sidewalk contractors. The Peninsula and Herring Cove are, for example, covered by two

[23] Declaration of the salt dome as surplus to municipal needs would need to be delayed until 2016/2017 due to contractual obligations in existing performance based/hourly contracts and agreements with agencies, boards and commissions.
[24] This assumes no mid-contract renegotiation of sidewalk contracts.

separate sets of contracts, employing multiple contractors. This overlap creates inefficiencies that could be corrected by contract area reconfiguration. By enlarging service areas, route servicing can be better coordinated to achieve route optimization. Multiple plow operators traveling over and through each other's routes, leads to:

- perceived/actual inconsistency of service (e.g. routes being plowed at different times, with different equipment and/or equipment travelling (with their plow blade up) over a route serviced by another contractor);
- snow being deposited by one operator on a route serviced by another operator;
- fragmented service delivery (leading to convoluted route design); and
- lack of accountability (in connection with asset damage where routes meet/overlap).

This situation undermines the municipality's capacity to manage sidewalk contractors and ultimately compromises service delivery. When sidewalk contracts become coterminous, staff can re-align sidewalk routes to rationalize service delivery and improve efficiency.

Contract Language Revisions: Based on the past two Winter Service End of Season reviews, changes to contract language to improve service delivery were identified and incorporated in the current streets tenders. After the current contract ends, sidewalk contractors, like their street contractor counterparts, will be required to clearly demonstrate their operational capacity (during the bid process). Furthermore, to ensure alignment with streets, the duration of the winter season will be extended from 22 to 28 weeks. Specific requirements, that better align the resources, operational strategies and communications requirements of contractors to those of the municipality, will be included in the new sidewalk contracts. The link of the sidewalk contractors to the Corporate Call Center will also be enhanced in future sidewalk contracts.

Consider changes to the sidewalk service level standards: Citizens, Councillors and staff have each identified problems with the current clearing of sidewalks after heavy storms. The fragmented contracts, alignment of routes, and coordination with street clearing is not optimal.

Nine contract routes expire after the 2015/16 season, and the remaining 25 contract routes expire the following year. Therefore, there is an opportunity to make fundamental changes to the program for future years.

In the short term however, additional discussion with stakeholders including the Accessibility Advisory Committee is needed by staff to provide Council with options for improvement, for the 2015/16 season.

Staff believe there are improvements that can be made within the current contracts and resources. Staff will return to Regional Council in December 2015, with some options to improve the sidewalk service outcomes.

FINANCIAL IMPLICATIONS

The Winter Operations program costs include both fixed and variable costs.

Fixed costs, which occur regardless of the type of winter conditions experienced, include regular salaries and benefits (municipal employees), performance based street and sidewalk contract fees, retainers associated with hourly-based contracts, and senior assistance program-related costs.

Variable costs, which increase dependent on winter weather conditions, include equipment costs, overtime salaries (municipal employees),[25] salt/sand/brine materials costs, and hourly contractor costs (non-retainer).

Fixed costs represented 44% of Winter Operations' 2014/2015 season actual expenditures. Variable costs, directly associated with ice and snow management, represented 56% of Winter Operations' actual expenditures (see Table 4).

Number, duration and severity of winter weather events[26] directly impact Winter Operations' variable expenditures. A severe winter weather season, requires higher salt usage, increases the use of hourly based contractors and incurs greater staff overtime costs for 24/7 mobilization – particularly where winter weather events happen during weekends or Holiday periods. Severe winter weather conditions resulted in high variable costs (including fleet, maintenance and fuel costs) which drove up overall Winter Operations actual expenditures to over $36M in 2014/2015.

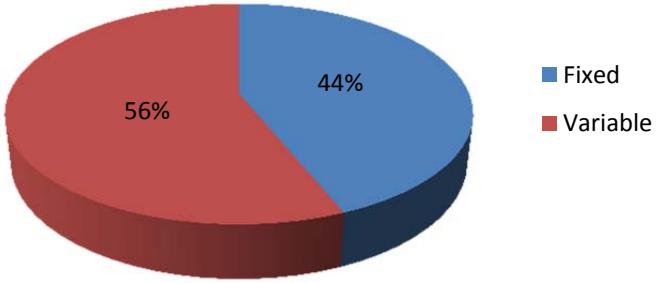
Table 4: Winter Operations Budget for 2014-2015 Season

Item	Planned Expenditure	Actual Expenditure	Variance (Dollars)	Variance (Percent)
Fixed Costs				
Compensation (Salary)	$4,909,100	$4,659,500	-$249,600	-5%
Performance Based Sidewalk Contracts	$4,110,900	$3,910,259	-$200,641	-5%
Performance Based Street Contracts	$6,247,900	$6,507,006	$259,106	4%
Seniors Assistance Program	$400,000	$400,000	$0	0%
Hourly Based Contracts (Retainers)	$595,000	$478,506	-$116,494	-20%
Total Fixed Costs	**$16,262,900**	**$15,955,271**	**-$307,629**	**-2%**
Variable Costs				
Compensation (Overtime)	$659,200	$3,004,506	$2,345,306	356%
Hourly Based Street Contracts (Fees)	$1,427,400	$9,703,201	$8,275,801	580%
Repairs to Infrastructure	$0	$164,527	$164,527	N/A
Salt and Sand[27]	$1,749,800	$4,120,642	$2,370,842	135%
In-House Traffic Control	$0	$183,499	$183,499	N/A
Miscellaneous[28]	$383,800	$427,727	$88,927	23%
Fleet (Repairs and Fuel)	$2,000,000	$2,785,111	$785,111	**39%**
Total Variable Costs	**$6,220,200**	**$20,434,213**	**$14,214,013**	**229%**
Total All Costs	**$22,483,100**	**$36,389,484**	**$13,906,384**	**62%**

[25] Overtime costs are higher in cases where winter weather events occur on weekends and during holidays.
[26] Winter weather event means a weather condition affecting roads such as snowfall, wind-blown snow, sleet, freezing rain, frost, or ice, to which a winter event response is required.
[27] Reflects salt and salt/sand mix expenses attributable to in-house and hourly based contractors only.
[28] This figure includes expenditures relating to training, local travel and advertising.

Note that the total variable costs reflected in Table 4, now include fleet costs. Prior representations, made to the media and to Council, did not account for fleet costs. This change in approach is consistent with the consultant recommendation regarding fleet cost accounting.[29]
The 2014/2015 budget figure includes Winter Operations salaries and benefits calculated at a value of $4.8M, which are captured in non- Winter Operations Cost Centres in SAP.
The 2014/15 budget figure also includes the $1,907,300, which was omitted from the performance-based contracts during the 2014/15 budget process. These additions total $8,707,300 and have been added to the $13,775,800 budget figure for Winter Operations in SAP.

Figure D: Fixed versus Variable Costs – Winter Operations Budget 2014/2015



The municipality's yearly spending on the Winter Operations program varies significantly from year to year (see Table 5). Over the past seven years, budgets have increased by $8.8M. Over the same period, Winter Operations program actual expenditures have ranged from a low of $18.1M in 2010/2011 to a high of $36.3M in 2015. The budgetary variance has ranged from a high of $13.9M over budget in 2014/2015 to a low of $2.5M over budget in 2012/2013. These over-expenditures were, however, not based on a $22M operating budget. Prior year budgets ranged from $12M to $22M. Actual expenditures for the past seven years establish that a $22M operating budget would meet or exceed expenditures in five out of seven years.

Table 5: Winter Operations Budget (2008 – 2015)

	2014/15	2013/14	2012/13	2011/12	2010/11	2009/10	2008/09
Budget	22,483,100	21,995,000	19,123,000	12,419,000	12,247,000	12,445,000	13,621,000
Actual	36,389,484	25,756,642	21,636,795	18,365,000	18,963,000	18,188,000	21,782,000
Variance	-13,906,384	-3,761,642	-2,513,795	-5,946,000	-6,716,000	-5,743,000	-8,161,000

Note: The 2014/2015 budget figure reflects Winter Operations salaries and benefits calculated at a value of $4.8M, fleet costs of $2M and an additional $1,907,300 for performance based contracts. Budget and actual expenditures in 2012/2013 and 2013/2014 differ from prior reported figures due to inclusion of fleet costs – $1,539,795 in 2012/2013 and $1,550,642 in 2013/2014.

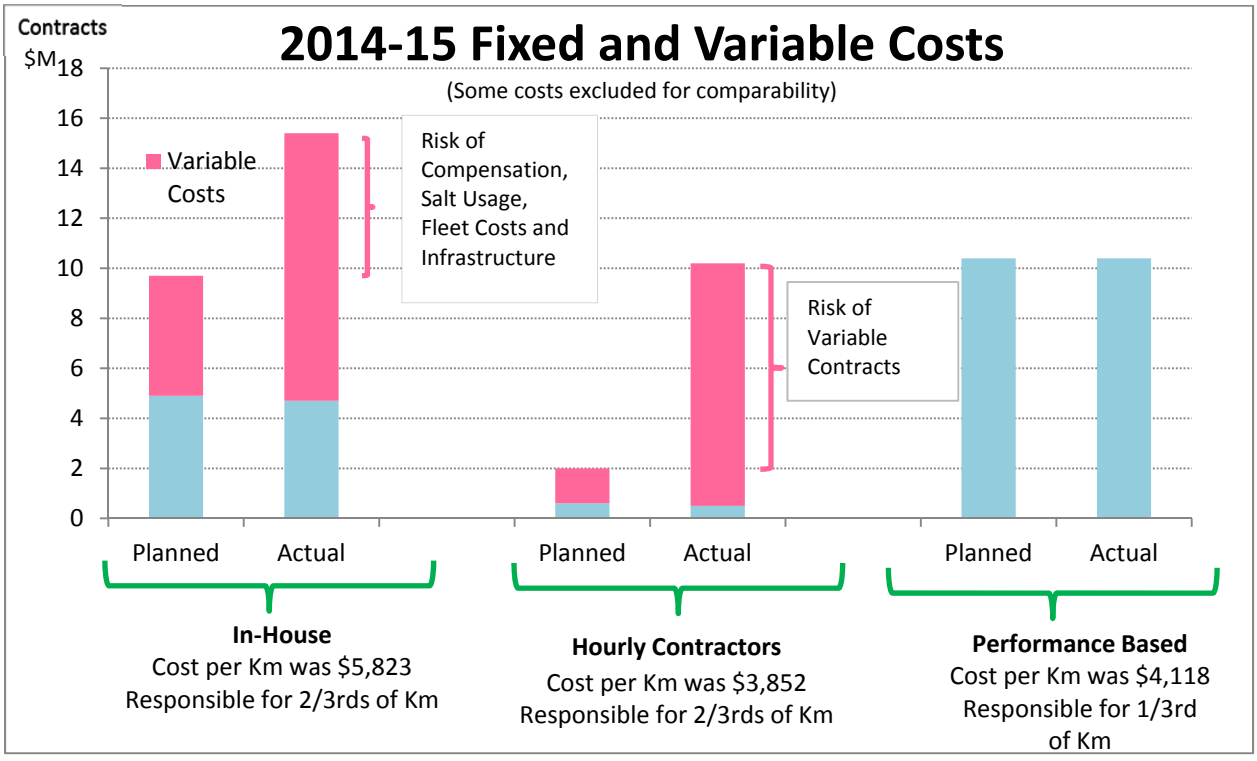
[29] The consultant has recommended that the municipality align budgets with responsibilities by moving accountability and control of expenses for fleet fuel, repairs and damage from Corporate Fleet and Equipment to line items in user operating budgets.

Year-over-year increases in Winter Operations actual expenditures are attributable, in part, to growth in municipal infrastructure (newly constructed streets and sidewalks within the municipality). Incremental cost increases relating to equipment maintenance and repair, materials (salt and sand) and employee salaries and benefits have likewise contributed to the upward trend in expenditures. Council decisions taken to enhance service delivery standards and to expand the scope of Winter Operations have also increased Winter Operations program actual expenditures in recent years.

Budget versus actual expenditure variances are largely a result of adverse winter weather conditions. The 2012/2013 season, which has the least variance from budget is, for example, characterized by minimal seasonal snowfall (93.8cm), few snow events (4 moderate; 0 heavy; and 1 extreme) and average snow on ground maximum accumulations (40 cm).

The operational advantages described in this report will serve to drive down variable costs attributable to in-house operations, and thereby help to stabilize the Winter Operations budget.

The increased cost of expanding the performance based contracts is approximately $6 million per year and should be partially offset by estimated annual savings of $2,000,000 in 2015/16, as well as future years. While this increases the fixed costs of the Winter Operations budget, the variable costs will decrease during heavy winter seasons, thereby stabilizing the overall budget, as demonstrated in the below graph.



Increased costs	$6,000,000
Estimated Operational Savings (see below)	$2,000,000
Remaining budget shortfall	$4,000,000

Estimated Annual Savings

Category	Current Budget	Estimated Savings
Salt	$1,625,200	$800,000
Sand	$124,600	$100,000
Retainers for hourly-based contractors	$614,400	$300,000
Usage for hourly-based contractors	$1,400,000	$700,000
Infrastructure Repair	$150,000	$100,000
Total Estimated Savings		$2,000,000

In addition, the following recommendations are mentioned in this report, which are estimated to result in an increase of between $136,500 and $201,500 to the Winter Operations budget annually:

- The availability of graders on hourly retainer and heavy equipment for clearing catch basins will be increased for the area of the municipality that will be serviced by in-house equipment ($72,500);
- The usage of AVL on approximately 40 trucks and 10 plows (estimated to cost between $10,000 and $24,000).
- Increasing tow truck availability and the number of dedicated parking officers employed to issue tickets, the cost of which could be offset by increasing parking ticket fines during winter weather events.
- Obtaining additional forecasts (estimated to cost between $4,000 and $5,000)
- Increasing training, the cost of which will be determined based on the actual requirements, but is expected to be in the range of $50,000 to $100,000.

The net increase to the performance-based contracts of approximately $4 million, as well as the increased costs mentioned above will be managed within the approved 2015/2016 HRM operating budget, and specifically through the quarterly projection reports. Should there be significant overages at the end of 2015/16, there are several Reserves available (Q308 Operations Stabilization, Q309 Snow & Ice Control and Q328 Operating Surplus) that could help cover any shortfalls.

In 2016/17, the increased costs will be included in the Winter Operations budget, which will be addressed during the regular budget approval process.

ALTERNATIVES

Council could choose to leave the winter works program as it is currently delivered. This is not recommended as there are options available to Council to make improvements to the program.

ATTACHMENTS

1. Winter Parking Regulations
2. Councillor's Winter Operations Questions/Issues
3. Grant Thornton – HRM Winter Operations Review Report

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

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Financial Approval by: Original Signed

Bruce Fisher, Manager, Financial Policy and Planning, 902.490.4493

Report Approved by: Bruce Zvaniga P.Eng.,- Director, Transportation & Public Works, 902.490.4855

ATTACHMENT 1

WINTER PARKING REGULATIONS
WINTER 2014/2015

WHEREAS due to the congestion on the streets of the Halifax Regional Municipality caused by vehicular and pedestrian traffic and the limitation of the free use of the streets liable to be caused by the presence of snow and ice thereon, I am of the opinion that special conditions exist and I do so declare.

THEREFORE under the authority of Section 202 of the Motor Vehicle Act, 1989 R.S.N.S c.293 as amended, as Traffic Authority for the Halifax Regional Municipality, I make the following regulations:

1. In this Regulation:

    a) "publicized" means a communication to public in any form determined by the Traffic Authority for the Halifax Regional Municipality on a case by case basis and includes posting a communication on the website for the Halifax Regional Municipality; and

    b) "Special condition day" means any number of days, determined by the Traffic Authority for the Halifax Regional Municipality, to be required for snow or ice operations, or any other weather event.

2. At its sole discretion, the Traffic Authority for the Halifax Regional Municipality may declare a special condition day.

3. A special condition day shall be declared and publicized at least 12 hours before parking prohibition takes effect.

4. Notwithstanding that certain traffic signs or parking meters have been erected in the Halifax Regional Municipality prohibiting the parking of vehicles upon sections of the highway during the hours stated thereon:

    a) a. No person shall park an unattended vehicle upon any highway in the core service area of the Halifax Regional Municipality between the hours of 1:00 a.m. and 6:00 a.m. of a special condition day.

5. The provisions of section 4 shall not apply to:

    a) A motor vehicle parked by a physician or surgeon reasonably near his or her office or residence and immediately available for professional calls; or parked reasonably near where he or she is actually engaged in professional duties;

    b) A motor vehicle parked by an operator actually engaged in discharging duties as a police officer, a member of the police of the Canadian Forces, or as a member of the Halifax Regional Fire Service;

    c) A commercial vehicle parked by an operator for the purpose of loading or unloading merchandise;

    d) A taxi parked at a taxi stand; and

    e) A motor vehicle belonging to a public utility company or corporation parked reasonably near the residence of an operator and immediately available for emergency calls.

6. It shall be an offence for any person to fail to comply with these Regulations and such person shall be liable to a penalty as provided by Section 293 of the Motor Vehicle Act.

7. These Regulations shall be in force and in effect from the 1st day of April 2015 until the 15th day of April 2015, both dates inclusive.

Approved this 24th day of March 2015, with respect to all highways in the Halifax Regional Municipality under the direct responsibility of the HRM Traffic Authority. Traffic Authority Halifax Regional Municipality

EFFECTIVE Wednesday April 1, 2015

ATTACHMENT 2

Regional COUNCIL WINTER OPERATIONS QUESTIONS/ISSUES

SERVICE DELIVERY STANDARDS

Q/C #1: *Sidewalks in downtown cores and major commercial/industrial (not just downtown Halifax, but key parts of Burnside, Sackville Drive, shipyard, etc.) with high pedestrian counts to 4 or 6 hours standard to concrete like other major cities (Ottawa).*

Halifax's service delivery standards for sidewalks are on par with, or exceed most other major cities in Canada. Halifax, unlike many jurisdictions clears all sidewalks. A window of opportunity to consider changes will occur in 2017 when existing contracts expire. Many cities across Canada only mechanically clear a subset of sidewalks, typically those in high volume corridors or those that abut municipal property. Several Canadian cities require that residents clear their own sidewalks. Halifax's bare pavement standard is likewise exceptional when compared to other jurisdictions – numerous cities have either a safe-and-passable standard or a snow-covered standard (for sidewalk clearing). Halifax's completion times likewise meet or exceed the completion time standards used by most cities in Canada. Completion times in other jurisdictions range everywhere from 4 hours to 168 hours (7 days), with the majority of cities having completion times of 12+ hours. Completion times vary depending on the type of sidewalk infrastructure (arterial/business district/transit route/residential etc.). See Table 1 for a cross jurisdictional survey.

Table 1 : Sidewalk Service Standards – Cross Jurisdictional Survey

City	Pavement Condition and Scope of Clearing	Threshold for Initial Plowing	Completion Time for Plowing	Comments
Calgary	Safe and passable. Only major roads, collectors and bus routes cleared.	Not specified.	96 hrs – all	Residents responsible for clearing snow.
Edmonton	Not specified. Only sidewalks adjacent to city owned land cleared.	Not specified.	24 hrs – transit facilities 48 hrs – city owned land	Residents responsible for clearing snow.
Halifax	Bare pavement All sidewalks cleared.	5 cm – arterial 10 cm – school zone and transit route	12 hrs – arterial 18 hrs – school zone and transit route 36 hrs – residential 48 hrs – bus stops	Residents responsible for windrow opening.
London	Snow packed. Not specified.	8 cm – all sidewalks	24 hrs – all	

Moncton	Not specified. Select sidewalks cleared.	Not specified.	24 hrs – central business district and arterial 120 hrs – remainder	Residential and collector sidewalks plowed on one side of the street.
Montréal	Safe and passable. All sidewalks cleared.	2.5 cm - all sidewalks	14 hrs – all Manual sidewalk clearing in downtown core	
Ottawa	Bare pavement (arterial). Safe and passable (remainder). All sidewalks cleared.	2.5 cm – downtown 5 cm – remaining sidewalks	4 hrs – high concentrations 12 hrs – primary 16 hrs – residential	
Saint John	Safe and passable Designated sidewalks cleared (61%).	Not specified	12 hrs – major retail and transit routes 24 hrs – remaining arterials and school areas 72 hrs – residential	Operations plan states that storm severity or successive storms may preclude meeting service standard.
Saint John's	Not specified. Designated sidewalks cleared (crosswalks, sidewalks adjacent to municipal facilities, bus stops and steps)	Sidewalk snow plowing starts after pushback of streets is completed.	96 – 168 hrs	Residents responsible for clearing snow (select sidewalks). Residential and collector sidewalks plowed on one side of the street.
Toronto	Safe and passable. Designated sidewalks cleared.	2 cm – high pedestrian volume 8 cm – low pedestrian volume	4 hrs – high pedestrian volume 9 hrs – low pedestrian volume	Residents responsible for clearing snow (select sidewalks).
Winnipeg	Bare pavement (downtown core). Snow packed (remainder). All sidewalks cleared.	5 cm – P1 & P2 8 cm – residential	36 hrs – arterial and collector 120 hrs – residential	

Source: Calgary , Edmonton, London, Montreal, Ottawa, Toronto and Winnipeg data as reported in City of Toronto staff report – see http://www.toronto.ca/legdocs/mmis/2014/pw/bgrd/backgroundfile-69023.pdf

Q/C #2: *Reworking of standards to say "this much time for 10 cm, this much for 20, this much for 30" like Montreal.*

This approach is recommended by the Ontario Good Roads Association. Timeframe to achieve road conditions after the storm ends vary according to snow accumulation. Current timeframes for Halifax are variable at present, although the standard does not reflect this variability. Where snowfall is light, streets

are cleared before the time frame specified in the performance standard. Measuring performance against standards (to this level of specificity) would, however, require investment in on-board AVL technology to track performance against standard. The cost, legal liability, equipment/staff resourcing and contractual implications of changing the sidewalk and/or street clearing service delivery standards are currently unknown and would require further analysis.

Q/C #3: *Rewording of standards to clearly state "cleared to snow covered passable" or "to pavement" in public facing standard.*

Current service standards do specify road condition maintained during a winter weather event. The service delivery standards matrix includes street and sidewalk priority classifications, service levels, initial response times, clearing frequencies, and completion times. See http://www.halifax.ca/municipalops/Winter/SnowServiceStandards.php#Priority1

Q/C #4: *Halifax Transit to 24 hour standard (I asked [staff] to look around and 24 hours is pretty much standard in Canada, based on that informal survey).*

Council approved the current 48 hour service delivery standard in April of 2013.[30] Halifax Transit routes service 2,295 transit stops. Limited snow storage capacity at 938 transit stops necessitates physical removal of snow (when accumulated snow on ground reaches 25 cm or more). Snow clearing and snow removal is carried out by a combination of in-house resources and hourly based hired equipment consisting of backhoes and trucks usually carried out at night or during low traffic volume.

Q/C #5: *Secondary roads often become a sheet of ice as crews are working on priority routes, there is a flash freeze and crews cannot get ahead of this which results in significant public safety concerns. Due to the severity of the storms P2 standards were not met. After the flash freezes many of these streets were a block of ice. Plows got stuck. Can we review the P2 standard and at least have the same standard as a P1 for one cut through?*

Cut through standards are already integrated into Halifax's service delivery standards. Cut-throughs, on P2 streets, are commenced when snow accumulation meets or exceeds 10cm. The cost, legal liability and contractual implications of changing the cut-through service delivery standard are currently unknown and would require further analysis.

Q/C #6: *Do we need a Priority 3 designation [for cul-de-sacs]? We have received many calls where someone lives on a small cul-de-sac or a dead end street and they see a plow going by continuously on adjacent street and they have not even received a cut through. The entire area receives snow removal with the exception of one or two streets. It does not make sense.*

Cul-de-sacs have a Priority 2 classification which is identical to the classification of other local residential streets. The goal is to service all local residential streets within the Priority 2 standard.

Q/C #7: At the very minimum, P2 streets that have very steep grades should be changed to a P1. Can a list not be determined based on previous complaints and issues?

Streets with steep grades (10% or more) are currently classified as Priority1 and are managed accordingly.

[30] The service delivery standard specified bus stop clearing completion time was changed from 72 hours to 48 hours. See http://www.halifax.ca/council/agendasc/documents/130430ca1016.pdf

PRIORITIZATION

Q/C #8: *Can consideration be given to prioritizing clearing of streets/sidewalks in areas where there are schools, nursing homes, places of work that have high use of accessible transit (Prescott Industries, for example) – P1 and P2 designations do not respond to these on ground realities.*

Street and sidewalk clearing routes are designed to maximize efficiency. School, day care, senior home, and nursing home locations are broadly distributed throughout the municipality. Without clustering of these facility types, plowing prioritization is problematic. Route design requires that contiguous streets be plowed in succession – otherwise inefficiencies would occur and travelled ways would be potentially unsafe (i.e. stretches of street plowed and other stretches not plowed).

Staff acknowledge that there are other Canadian jurisdictions that have school route zones. Saint John's Newfoundland, for example, clears at least one side of the majority of arterial and collector street sidewalks within a 1.6km radius of every school.[31] Staff can, at Council's direction, provide an analysis of the cost, legal liability, equipment/staff resourcing and contractual implications of prioritizing residential sidewalk clearing based on proximity to schools.

Q/C #9: *Establish priorities inside of standards - P-12 schools, day cares, seniors' homes as starting points and initial priorities for snow routes.*

See response to Q/C #8.

Q/C #10: *Can removal of snow be a priority for business districts and can communication be established to let BIDS know the plan and how and when this will be implemented?*

The majority of streets in business improvement districts are classified as Priority 1 streets, many of which are arterials that are currently prioritized for snow clearing and snow removal. BIDs are invited, annually, to attend pre-season and mid-season Winter Operations meetings. Also, the executive team representing the BIDs receive regular e-mail communications from Winter Operations staff advising as to the status of operations, parking ban, etc.

Q/C #11: *HRM needs to recognize that on the peninsula a major transportation mode is walking on sidewalks. When they are not clear due to ice for days on end this seriously prohibits pedestrians from getting to work and doing other basic functions.*

Halifax's service delivery standard for sidewalks on main arterials and sidewalks in the urban core (former capital district) is currently 12 hours. This timeframe reflects prioritization of the sidewalk infrastructure in the urban core. Current standards for the balance of the peninsula vary between 18 and 36 hours, depending on whether or not the sidewalk is on a transit route. Applying a 12 hour service delivery standard to the peninsula, as a whole, would require additional investment in in-house and contracted sidewalk clearing capacity. The cost, legal liability, equipment/staff resourcing and contractual implications of changing the sidewalk service delivery standard for the entire peninsula are currently unknown and would require further analysis.

RESPONSE TIMES

Q/C #12: *With a significant ice storm, there needs to be a more immediate response to clearing ice from streets and sidewalks and not assume a melt will take care of the ice – what have we learned from the ice storm of this past year and what would we do differently in the future?*

Ice and snow management under persistent sub-zero conditions with multiple weather events requires significant resources. Current resourcing is adequate for typical precipitation and frequency of events.

[31] See http://www.stjohns.ca/living-st-johns/city-services/snow-clearing/sidewalks

Ramping up capacity would require in-house and contractor investment in equipment (e.g. graders and specialized blades), materials (de-icers) and crews. Doing so, however, may result in idle capacity and over-resourcing, depending on prevailing weather conditions in future seasons.

Q/C #13: *Climate change is making our winter conditions change for the worse. Two years ago we were told it was an unusual winter, and the same goes for last winter. We had heavy rains, snow, freezing rain and then flash freezes, making our roads, sidewalks, intersections and bus stops very icy and unsafe. Recently the temperatures have dropped considerably during winter events. My concern is these 'atypical winters' may become the new normal. We need to review best practises and our process and provide service improvements for next year or we will have the same issues.*

See response to Q/C #12.

SNOW REMOVAL

Q/C #14: *Focus on removing snow, rather than plowing it in the days following a storm to minimize massive snowbanks on the side of roads.*

Snow removal occurs when storage capacity (on the adjacent boulevard – area between sidewalk and curb) is exceeded. Snow removal is both inefficient and expensive. Removal is prioritized for arterials. In situations where it has been determined that snow removal is warranted, our current practice is to remove snow when snow plowing of all streets and sidewalks has been completed. Where, however, successive snowfalls occur, snow removal can be delayed by higher priority tasks. Ramping up snow removal capacity would require in-house and contractor investment in equipment (e.g. trucks, loaders, blowers) and crews. Doing so, however, may result in idle capacity and over-resourcing, depending on prevailing weather conditions in future seasons.

Q/C #15: *Can't they dump snow in the harbour or alternative location? There is a lack of snow storage areas.*

Snow storage at municipal snow dumps was not exceeded this past winter season. Given the severity of the winter, and given the extent of snow removal (hauling) that occurred, the city's snow dump capacity is adequate to its needs. In addition, the federal Fisheries Act, Section 36, prohibits the disposal of unauthorized "deleterious substances" into waters frequented by fish. Deleterious substances are not defined in any schedule, but likely include road salts and other materials collected from roadways through standard road clearing operations (metals, petroleum products, and particulate matter etc.). Also, materials that can be typically found within the right-of-way (e.g. pylons, garbage, hydrants, parking meter posts, real estate signs) are scooped up as part of the snow removal process. As such, dumping snow into the harbour cannot be recommended.

Q/C #16: *Snow is not removed from banks, just shifted back & forth. Why can't the bank heights be lowered at intersections making visibility better? This is a public safety issue as cars have to creep out and vehicles travelling on the road cannot see them or pedestrians.*

Once snow accumulates to a certain level (usually at 40 cm), sidewalk boulevard and parking lane snow storage capacity begins to be exceeded and snow removal commences. Snow removal requires the use of loaders and removal trucks to haul the snow to the municipality's snow dump sites. For safety purposes, blocker trucks are required. The removal of snow, although a public benefit, is an extremely costly and resource intensive task. Typically snow removal in the downtown and/or arterial streets occurs from 9 pm to 6 am, whereas some removal does take place during the daytime on certain streets, including residential streets.

In cases of back-to-back storms Winter Operations equipment priorities are the street, hauling operations happen afterwards. The very same equipment hired to haul snow is used by hourly based contractors for

snow clearing. Consequently, snow hauling is challenging under winter weather conditions experienced last season.

Q/C #17: *Loss of lanes in some streets, banks actually extending into the streets, these streets need to be shut down and snow removed completely*.

See response to Q/C #16.

PROPERTY DAMAGE

Q/C #18: *How can property damage be reduced on sidewalks which are narrow and buildings are built to property line? There are chronic locations where this happens.*

Tactics to reduce property damage include right-sizing of equipment, operator training and use of hand-work in select locations. Each of these tactics is, however, limited in application and/or effectiveness. Hand work is extremely time consuming and expensive and is generally restricted to locations with steps and street furniture (parking meters, planters, benches, etc.).[32] Select transit stops are also cleared by hand. Requirements to right-size equipment are incorporated into sidewalk clearing performance based contracts. Right-sizing of equipment, however, has its drawbacks – in particular, smaller units have less horsepower and are, therefore, less able to clear heavy snow. Operator training does reduce damage, but operator error does occur. Operator familiarity with routes reduces the likelihood of property damage.[33] Performance based contractors are contractually obligated to identify and repair property damage that happens within their service area. Also, repair costs are the responsibility of the contractor. The municipality is similarly obligated to identify and repair property damage that happens within areas serviced by the municipality.

Extensive work is performed during pre-season preparations to identify problem areas and mark obstacles, as well as the “Bring it On” advertisements encouraging residents to prepare their property for the winter to help reduce instances of damage.

WINTER OPERATIONS BUDGET

Q/C #19: *Increase base budget – do we need 4 million more as the Herald stats seem to indicate, i.e. a persistent 4 million dollar shortfall for 5 years. Increase budget to accommodate shift in service standards.*

Prior year Winter Operations budgetary deficits ranged between $2.5M and $13.9M, these deficits were, however, not based on a $22M operating budget. Prior year budgets ranged from $12M to $22M. Actual expenditures for the past seven years establish that a $22M operating budget would meet or exceed expenditures in five out of seven years.

Table 2: Winter Operations Budget (2008 – 2015)

	2014/15	2013/14	2012/13	2011/12	2010/11	2009/10	2008/09
Budget	22,483,100	21,995,000	19,123,000	12,419,000	12,247,000	12,445,000	13,621,000
Actual	36,389,484	25,756,642	21,636,795	18,365,000	18,963,000	18,188,000	21,782,000
Variance	-13,906,384	-3,761,642	-2,513,795	-5,946,000	-6,716,000	-5,743,000	-8,161,000

Note: The 2014/2015 budget figure reflects Winter Operations salaries and benefits calculated at a value of

[32] Some jurisdictions will only clear sidewalks where mechanically possible.
[33] Property damage in areas serviced by performance based contractors has historically decreased in second and subsequent years of operation.

$4.8M. Budget and actual expenditures in 2012/2013 and 2013/2014 differ from prior reported figures due to inclusion of fleet costs – $1,550,642 in 2013/2014 and $1,539,795 in 2012/2013.

EXTERNAL COMMUNICATIONS

Q/C #20: *Biggest issue is communications. Between "we cannot meet the standard" and "state of emergency" is a space. We sucked at owning up to it. Our messaging was poor. We need to be able to say "we are not going to be able to meet the standard here is why and what we are doing". We should have said "these are the roads we hope to clear today" when we were in snow disaster. We are timid in our communications and it hurts us.*

Key messages and talking points were adjusted throughout the 2014/2015 Winter Operations season in response to significant snow events and emerging service delivery developments. Communications staff and municipal spokespersons highlighted the exceptional nature of the weather conditions being faced and emphasized that mobility, visibility and accessibility were winter operations priorities. As part of the communications strategy, staff proactively acknowledged the significant challenges to snow and ice clearing efforts and identified the current efforts underway, the planned work for coming days, as well as the anticipated timing of completion. To manage expectations, the public was also regularly advised that, per the service delivery standards, severe winter weather conditions preclude clearing efforts from achieving targeted timelines.

Q/C #21: *Website does not say "passable snow covered" on P2s. It should.*

Snow and ice service standards are currently on the municipal web site. The service delivery standards matrix includes street and sidewalk priority classifications, service levels, initial response times, clearing frequencies, and completion times.
http://www.halifax.ca/municipalops/Winter/SnowServiceStandards.php#Priority1

Q/C #22: *Rewording of website to clearly state "cleared to snow covered passable" or "to pavement" in public facing standard.*

See response to Q/C #21.

Q/C #23: *Can the routes be communicated; can we show the process and priorities online?*

Posting specific priorities or route maps online is problematic because routes change based on the prevailing weather conditions/patterns of the day. In general, our priorities are communicated (e.g. P1 and P2 standards). However, residents can use the on-line priority finder tool at http://www.halifax.ca/snow/streetpriorityfinder.php to find the service standard for a particular street.

See response to Q/C #3 (regarding service delivery priorities).

Q/C #24: *Establish thresholds in standards and beyond standards that automatically trigger change on communications strategy (i.e. if for any reason we cannot meet the standards (ice storm! 70 cms!) that we say that from the first moment, and talk about what we can do as we can do it). Too much snow or ice below emergency but above standards results in clear and immediate change in tone and content ("that's it folks, are we ever in trouble now!")*

The service standard states that, "(I)n snowfalls greater than 30 centimetres, or in blizzard conditions, the service standards may not be achieved".

Q/C #25: *Can the service standards be reviewed and clearly explained on website – what is meant by passable? If we are no longer clearing to pavement what is the expectation that pedestrians can expect for sidewalk snow clearing?*

Safe and passable treatment of sidewalks means:

- plow or blow accumulated snow off public sidewalks;
- apply winter de-icing and/or abrasive materials (treated sand or salt) to sidewalk surfaces to improve traction for pedestrians, or to de-ice the sidewalk surface; and
- push back snow (with heavy equipment) to clear sidewalk and associated right-of-way

As stated in Saint John NB's winter operation plan, sidewalk service levels cannot mirror (in practical terms of time consistency and quality) what is possible on street. This reflects the physical characteristics of sidewalks (limited width and lack of direct drainage), effects of pedestrian traffic versus vehicles and limitations of sidewalk equipment. Severity of weather is much more a determinant of sidewalk conditions.[34]

Q/C #26: *We need more information on Halifax.ca Residents call their councillors, requesting specific information. How can we improve public notification?*

During the 2014-2015 winter season, Corporate Communications began sharing with the public the same information given to Regional Council by posting it on http://www.halifax.ca/municipalops/Winter/WinterFAQ.php. Timely and reliable information related to when specific streets and sidewalks will be plowed is not available, and given the unpredictability of snow clearing operations at any given time, sharing such information would likely only serve to create unmanageable expectations when the expected timing is not realized.

Q/C #27: *Residents should be notified of an alternate date for pick up. In many cases residents had to keep six weeks' worth of solid waste due to inability of trucks getting on their street*

Corporate Communications issued a press release https://apps.halifax.ca/hfxnews/2804 and engaged social media to advise residents that cancelled collection days would not be rescheduled, and that all waste would be collected on the next regular collection date for each community.

WINTER PARKING PROHIBITIONS

Q/C #28: *Many businesses suggested that there should be additional off-street parking made available by the city to compensate for the loss of parking due to temporary no-parking signs – can there be a policy in place that supports this on HRM property?*

Surface municipal parking lots require snow clearing to enable continued day-time use. Permitting parking in surface lots overnight would impede/prevent overnight snow removal (when the lots are typically not in use). The challenge with allowing parking for this purpose on municipal property in the daytime is the space is either allocated for paid parking or for community use such as recreation centres.

Q/C #29: *Can we provide more public parking areas for resident when the ban is on?*

See response to Q/C #28.

Q/C #30: *Consider sector bans with the parking bans to reflect which streets will be worked on especially during times of snow removal as opposed to clearing after a storm?*

The overnight parking prohibition is currently a blanket (city wide) ban. This approach is taken for a number of reasons, including messaging clarity for residents. Sector specific overnight parking bans would be problematic from an operational perspective. Ice and snow management requires responding to winter weather conditions as they occur. While certain sectors may be a focus at any given time, the blanket ban allows supervisors to assign resources as needed in response to changing priorities.

[34] See http://www.saintjohn.ca/site/media/SaintJohn/2014-15-WMP.pdf).

Restricting the overnight parking ban (on a sector-specific basis) would have the effect of curtailing how and where resources could be applied to best advantage.
Sector specific parking restrictions are, however, an option at any point in time. Section 139 of the Motor Vehicle Act grants authority to ticket and/or towing vehicles that interfere with ice and snow management. This legislative authority facilitates snow removal on an as-needed basis.

Q/C #31: "Why is winter parking [ban] on for days and days and no one is clearing my street at night" so a system of identifying large areas so you could say "No parking area A tonight". Staff was talking about redoing the leaf clearing signs so maybe do both at once.

See response to Q/C #30.

Q/C #32: *Modify parking restrictions to be alternate side of the street parking in the city core, not just over night to assist with snow clearing/removal.*

See response to formal Council motion regarding alternate side of street parking.

Q/C #33: *Why can't we have alternate street parking so residents know when and where to park or not park and our streets can be appropriately cleared?*

See response to formal Council motion regarding alternate side of street parking.

Q/C #34: *Review Montreal's operations, alternate side of the street parking to enable operators to clear snow, no tolerance for illegally parked vehicles – whistle blows and fleet of tow trucks go to community and clear cars. Check out You Tube on their operations.*

See response to formal Council motion regarding alternate side of street parking.

Q/C #35: *Can temporary parking bans for snow removal be used more often as opposed to signing streets for no parking on one side for weeks on end?*

Temporary no parking signs are installed (on a sustained basis) in response to narrowing of the traveled way. Signage typically remains in place until the traveled way is widened (either through snow melt or through snow hauling). Signage put in place under these circumstances is intended to address public safety concerns, including access by emergency vehicles. Signing an area on a more limited basis is possible to facilitate snow removal. Doing so, however, requires that the signage be in place a minimum of 24 hours prior to ticketing/towing of vehicles (per the Motor Vehicle Act).

Q/C #36: *Why can't the ban remain in effect longer when it is called to ensure that the streets are pushed back to ensure proper width?*

See above for response to formal Council motion regarding extension of parking ban.

Q/C #37: *Operators often could not move snow from streets and/or sidewalks due to illegally parked cars. Why can't we have a more robust towing program?*

Towing an illegally parked vehicle, during a winter weather event, can be challenging if the vehicle is covered in snow, and/or has been plowed around. In severe weather, extremely slippery conditions and limited visibility (due to wind and blowing snow) may present safety risks for tow truck operators and increase the time needed to tow a vehicle (hook-up / drop off at impound / return trip). Availability of tow trucks for removal of illegally parked vehicles is also a factor. Tow trucks are, at times, diverted from towing illegally parked vehicles to respond to collisions and to respond to stranded/broken-down motorists. Staff will explore options for implementing a more robust towing program in upcoming seasons.

Q/C #38: *Can the cars be towed early in the season prior to becoming encased in ice and then either HRM or the operator does not want the liability of towing it due to possibility of damaging vehicles?*

Towing prior to a winter weather event is not permitted unless a vehicle is illegally parked. Towing in connection with a weather event is only possible under section 139 or section 202 of the NS Motor Vehicle Act. In both cases, authority to tow is predicated on the necessity of removing the vehicle to facilitate ice and snow management. Without snow and ice, the municipality cannot tow. Towing when snow accumulation is minimal is, however, an option and may lead to increased awareness. Staff will undertake to evaluate what steps can be taken to increase resident compliance with the overnight parking prohibition.

See also response to Q/C #37.

Q/C #39: *Need to ticket and tow early to discourage this activity [illegal parking]. If we do not take action then residents do not find alternate parking. It is worth the odd ticket to park on the street all winter.*

See response to Q/C #38.

Q/C #40: *Due to continued illegal street parking on Cavendish and Bromley Roads in Cowie Hill, Armdale, residents contacted me as the snow plows could not properly clear their streets. I had to contact Halifax Regional Police and the Supervisor, Winter Works. The police had to contact a towing company, who started to tow the vehicle but HRM crews had to clear it from the block of ice first. The police had to be present to ensure the owner did not drive way after clearance. It was a coordinated and elaborate use of resources to remove one car which caused public safety issues.*

See response to Q/C #37.

PERFORMANCE BASED AND HOURLY CONTRACTORS

Q/C #41: *I need to understand the way we contract out and how they are held to a standard and what happens in extraordinary circumstances (what are their off ramps?)*

Performance based contracts are awarded following a municipal procurement process whereby contractors bid on contracts to service a specified service area over a specified period of time. Once awarded, contractors are held to contractual obligations that match up with municipal service delivery standards (for sidewalk and street ice and snow management). Contracts can be terminated for failure to meet contractual terms and conditions. Alternatively, the municipality can assess liquidated damages for failure to meet contractual terms and conditions. There are no contractual allowances for extraordinary circumstances. Where a contractor is demonstrating good faith efforts to meet contractual obligations, however, the municipality typically will not exercise its contractual rights to terminate or assess damages.

Q/C #42: *There must be requirements for better service standards from contractors particularly the sidewalk snow removal. Many residents were upset that there seemed to be no accountability on the part of the contractors to clear the sidewalks within the time frame or to salt/sand the sidewalks for several days after an event. The sidewalks were unwalkable for weeks.*

See response to Q/C #41.

Q/C #43: *Lack of snow removal is affecting other services such as solid waste removal. How can we ensure our contracted service providers can meet our tender requirements?*

See response to Q/C #41.

Q/C #44: *One contractor should be assigned to "everything" in one area- streets, sidewalks, and catch basins.*

Responsibility for sidewalks and streets under performance based contracts is currently separated. Under the current tender process, however, a contractor is free to bid on both a sidewalk contract and a street contract for any given area. Performance based contracts could be restructured to fold both sidewalks and streets into a single contract. The option of folding sidewalk and street responsibility together has been explored by staff and rejected based on feedback from contractors. Contractors advised staff that differing equipment requirements, staffing specializations and service delivery timeframes (12 and 24 hours for streets; 12, 18 and 36 hours for sidewalks) make bidding on tenders for both sidewalks and streets problematic. Contract language in the new street tenders requires coordination between the street and sidewalk contractors. This change is intended to reduce the incidence of street plowing depositing snow on sidewalks that have been recently plowed.

Q/C #45: *Can the following option be considered: continue with the sidewalk snow tax for contracted sidewalk snow removal service on the peninsula but have contractors responsible for the curb cuts and enhanced bus shelter service.*

Performance based contractors are currently responsible for 'curb cuts'[35] (pedestrian ramps) within their respective service areas. Likewise performance based contractors are currently responsible for snow clearing and snow removal from transit stop pads. Transit stop shelters are, however, serviced under a contract with OUTFRONT Media (managed by Halifax Transit). Neither the municipal in-house crews nor performance based crews clear transit stop interiors.

IN-HOUSE CAPACITY (EQUIPMENT)

Q/C #46: *Contingent contracts, more in house staff and equipment.*

Hourly based retainers for graders will be increased (assuming industry uptake) in the upcoming Winter Operations season. Ramping up in-house capacity would require in-house investment in equipment and hiring of additional staff. Doing so, however, may result in idle capacity and over-resourcing, depending on prevailing weather conditions in future seasons.

Q/C #47: *4 x 4's used for secondary roads get stuck on P2's. Do we have the right trucks for P2's?*

Winter Operations uses four-wheel-drive vehicles (4x4s) for locations that require tight maneuvering and for areas with limited clearance. In-house two-wheel-drive 3-ton trucks are supplemented (where necessary) by four-wheel-drive 3-ton trucks sourced through hourly based contracting.

Q/C #48: *Equipment needs – can the following be considered: (1) The city needs to use more snow blowers: Industrial tractors using snow blowers attachments instead of plows and use alongside dump trucks; (2) Bring in "Brush" technology to help clear snow closer to sidewalks; (3) Examine "heated" sidewalks: Iceland has them, Saskatoon was considering them; (4) Look at Ventrac snow removal equipment; (5) HRM should purchase more graders.*

The municipality currently has one large front-end-loader-mounted-blower, as well as two mid-sized blowers that mount on Trackless units. All three of these pieces of equipment are used in tandem with dump trucks for snow removal (hauling). Snow blowers are expensive units that are prone to break down. Depending on weather conditions and accumulation, blowers may not be required in any given season. Blowers are less effective in removing heavy/icy snow. Icy conditions lead to blower breakage and down-time. Some performance based contractors have experimented with brushes mounted on sidewalk plow equipment – performance varies depending on degree and nature of precipitation.

[35] The term curb cut, as used by Road Operations, differs from its use in this context. Curb cut means cutting/removing snow cleanly to the curb line.

Fleet, in partnership with Procurement and Road Operations, evaluates Winter Operations' equipment needs on an ongoing basis. The municipality clears sidewalks using a combination of Trackless and Bobcats (skid steer loaders). Future equipment acquisitions will evaluate a range of available options (including Ventrac) with due consideration of fleet standardization.[36] Performance based contractors currently use a range of equipment including Bobcats, Trackless, Kubota, and John Deere. The feasibility of sidewalk treatments (like heating) is currently unknown and would require further analysis.

Q/C #49: *On many routes there is a sidewalk snow removal plow to remove snow, and then a second plow has to come by to salt. Why can there not be combination machines?*

Some sidewalk clearing machines have the ability to do both snow plowing and salting simultaneously (e.g. trackless tractors). Other sidewalk equipment – a "bobcat" or skid steer loader, for example – cannot plow and salt the sidewalk at the same time. There is no single perfect tool for sidewalk clearing.[37] The municipality, therefore, maintains a mixed fleet of vehicles for sidewalk clearing.

See also response to Q/C #48.

Q/C #50: *In Ontario and other areas there are sidewalk snow plows with a blower and a bucket, why can't we have these machines?*

The municipality has the following equipment:

- Ten Trackless (including a plow and bucket for each one),
- Two Trackless mounted blowers (used for street snow removal)
- Eleven Skid Steers (ten Bobcats and one John Deere)
- Two Skid Steer mounted blowers

Hourly based contractors and performance based contractors also make use of blowers to manage snow on sidewalks (particularly on the peninsula and in downtown Dartmouth). Newly developed subdivisions have more snow storage (wider boulevards) thus they do not require blowers, other than in extreme conditions. Blowers work great on light fluffy snow. They are not good in heavy snow and ice.

Q/C #51: *Can't we have large blowers on the main sidewalks?*

See response to Q/C #50.

Q/C #52: *Implement system similar to the province, showing tracking of where the snow plows and sidewalk plows have been.*

This approach would require the use of Automated Vehicle Location (AVL) systems. AVL technology incorporating global positioning systems (GPS) can be used to track and provide real time information on winter maintenance operations (type of applied material, application rate, position of plow blade, pavement temperature, etc.). AVL integrates vehicle location information with other information from the vehicle to provide time and space referenced information on a winter operations vehicle's activities. AVL technology has been adopted in other jurisdictions and has been recommended by the consultant in its Winter Operations review. Staff support the use of AVL on Winter Operations vehicles.

Q/C #53: *Can we get more front end loaders to remove the snow?*

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[36] As articulated in the GTPI consultant report, fleet standardization can have operational benefits.

[37] Some pieces of sidewalk equipment, for instance, are well-suited suited to plowing narrow, street-furnishing-rich routes. Other pieces of equipment are well-suited for plowing wider thoroughfares where snow accumulation is significant, and/or snow is heavy due to saturation by subsequent rainfalls.

The municipality's Winter Operations fleet includes enough front end loaders for snow removal operations. Snow hauling, however, is a slow and resource intensive.

See response to Q/C #14 for discussion of snow removal (hauling).

Q/C #54: *Why did we sell equipment and now rent the same equipment out? Do we need more in house equipment?*

No, the municipal fleet does not need additional equipment. Surplus gear is sold at auction.[38] Independent contractors buy surplus municipal equipment. This same equipment may be contracted on an as-needed basis when severe weather conditions require supplementing in-house capacity with external contracted capacity.

FIRE HYDRANTS AND CATCH BASINS

Q/C #55: *Poles to mark all fire hydrants, plan to clear them immediately after any significant accumulation.*

Clearing of fire hydrants is not a Road Operations responsibility. Halifax Water is responsible for marking and/or clearing fire hydrants.

Q/C #56: *Can the fire hydrants be cleared regularly starting at the beginning of the winter prior to it becoming a major issue?*

See response to Q/C #55.

Q/C #57: *Develop a more proactive approach to clearing storm drains and fire hydrants – what systems can be put in place to assist residents in maintaining drains and hydrants?*

The municipality is responsible for clearing storm drains. A list of drains that are prone to flooding is maintained. These storm drains are given priority and are cleared when rain is forecasted. The balance of storm drains is cleared as resources allow.

Experience in the 2014/2015 winter season with multiple extreme weather events and prolonged sub-zero temperatures suggests that dedicated resources for keeping catch-basins clear of ice and snow may be warranted. Where rapid temperature shifts take place, devoting resources to catch-basins can become a challenge. The same resources (staff and equipment) that are currently responsible for both plowing are also responsible for clearing catch basins.

See response to Q/C #55 regarding fire hydrants.

Q/C #58: *We need a dedicated person to clear the catch basins, or have a volunteer organization or resident participation to have them cleared. The basins get plugged and when it rains nowhere for water to go then it freezes and becomes a safety issue.*

See response to Q/C #57

HALIFAX TRANSIT

Q/C #59: *Halifax Transit should have alternate winter route plans. These could be available to users on the specific routes, via Halifax website, etc. So residents know where to go during winter events.*

[38] Decisions to declare equipment surplus to needs are, in part, driven by vehicle age – older vehicles require more frequent servicing and cost more to maintain.

Halifax Transit has alternate winter routes, snow plan routes, and these routes are published online.

Q/C #60: *Bus stops need to be cleared on a priority basis to ensure safety and accessibility for users. Can these be included in the sidewalk tenders with the same standard timeframes to clear? Operators there anyway and they would clear them versus filling them when clearing sidewalks.*

Bus stop plowing is included in sidewalk contracts. The streets crews are responsible for hauling the large piles away as required.

Q/C #61: *Buses cannot get through parked cars. On several occasions they had to call a supervisor, get assistance in backing bus up, often an articulated vehicle. This affects ability to pick up residents, schedule times, etc.*

Halifax Regional Police and Parking Enforcement are responsible to ticket and towing vehicles. Halifax Transit Operations staff works closely with enforcement personnel to advise them of problem areas.

Q/C #62: *Halifax Transit needs to ensure the bus terminals are cleared and coordinated with roads and sidewalks.*

Facilities Management is responsible for snow removal at terminals. Halifax Transit Operations advises Facilities of problems by sending pictures of areas needing attention.

Q/C #63: *Buses are lining up and dropping passengers off at terminals and stops and have to climb over huge snow and ice banks. Wheel chair users and persons with mobility problems cannot use regular Halifax Transit when faced with these obstacles.*

Winter Operations is responsible to clear bus stops and Facilities Management is responsible to clear bus terminals. Halifax Transit Operations staff advises of problems by submitting pictures of areas that need attention.

EMERGENCY VEHICLE ACCESS

Q/C #64: *On at least two occasions an ambulance could not get on a street due to illegally parked cars. Residents had to frantically run around and ask people to move their cars. How can this be addressed?*

Leaving space for emergency vehicles is a requirement under provincial legislation, regardless of the time of year. In cases where parked vehicles block passage of emergency vehicles, residents are encouraged to call 911. In cases where snow build-up is contributing to blockage of the right-of-way, residents are encouraged to advise the 911 dispatch of the situation. Under that scenario, a Winter Operation crew will be dispatched to facilitate emergency vehicle access.

311 CALL CENTRE

Q/C #65: *311 has to have more capacity, the new system has to allow people to see if a ticket is closed online.*

The new telephony system may not be in place by the upcoming winter season. The public can currently see the status or resolution of any requests that are put through the on-line service request system. However, there will not be a connection between the telephony and the on-line tools at this time.

Q/C #66: *HRM should set up a dedicated hotline for street and sidewalk clearing problems, and free up 311 for all other issues.*

The dedicated line for snow clearing operations is 311. Halifax's 311 agents are very clear on their role and very knowledgeable of all processes around snow clearing operations and service standards. Better up front communications from winter operations staff, 311 and Councillors on the fact that those only urgent requests are dispatched during winter events and while within the service standards, may decrease non-urgent winter works calls which will then free up the 311 line for all other issues.

Q/C #67: *There is a problem when sidewalks are not cleared and there are recurring storms. Some sidewalks were literally not cleared for well over a week. How can the 311 system respond in a way that allows for complete miss of service?*

Winter Operations and 311 already have a process in place to track complete miss of service, or any ongoing service issues. This is tracked in Hansen via SNST2 (for streets) and SNWT2 (for sidewalks). 311 operators take the call, records the issue and forwards the Hansen Service Request to Road Operations for investigation and follow up.

For many instances in the 2014/2015 winter season, and many other seasons, snowfall occurred and then occurred again within the 12-36 hour service standards. This appeared as a 'missed' sidewalk, however in actuality the sidewalk was not missed as it was still within the service standards for clearing and then another event occurred. Once a 'new' snowfall or weather event begins, service standards are 'reset' as per Road Operations processes and direction so it appears to the public to be missed.

Q/C #68: *Residents call police non-emergency line about illegally parked cars, they tell resident to call 311, 311 says there is nothing that can be done about illegally parked cars until 1 am – 6 am. However, under the Motor Vehicle Act there is a ban regardless if HRM calls one or not. How can this be addressed?*

During January 2015, there was confusion surrounding on how to dispatch calls received from the public outside of Winter Parking Ban hours. The process was clarified and agreed upon between 311, Road Operations, Parking Enforcement and HRP by the end of January 2015. The following is the process that was used for the rest of the 2015 winter season:

311 answered calls between the hours of 6:00am and 9:00pm:

- ALL calls reporting vehicles impeding snow removal were called over to Parking Enforcement staff (this includes calls from the public and from Winter Operations staff).
- During snow clean-up, Parking Enforcement staff prioritized the illegally parked vehicle reports and responded accordingly; calls from Winter Operations staff took precedent.
- Parking Enforcement staff determined if the car was impeding snow removal. (It is not required that an authorized Winter Operations crew be on-site).
- Callers were advised that 311 dispatched the issue to a Parking Enforcement unit and that response to vehicle reports were prioritized.

311 answered calls between the hours of 9:00pm and 6:00am:

- ALL calls reporting vehicles impeding snow removal were referred to police non-emergency.
- Police non-emergency staff (i.e. calls to 902 490 5020) accepted these calls for dispatch to Patrol Constables.
- Priority for all winter operations calls for service were given to the Winter Operations Supervisor for both the detail and patrol/traffic resources.
- Members of the public who called for ticketing or towing, were advised that priority was given to Winter Operations, but their call would be entered in the queue and dispatched when an enforcement officer was available.

311 answered calls During the Winter Parking Ban:

- When the winter parking ban was enforced (between the hours of 1:00am to 6:00am), calls from the public continued to go to Police non-emergency staff (i.e. calls to 902 490 5020) and were prioritized and dispatched.
- Winter Operations staff had direct contact with contracted parking enforcement staff (ISSA) who were responsible for ticketing and towing during the winter ban.

Q/C #69: *Ill prepared to deal with the volume of calls, and HRM discouraging residents to make calls unless it is an emergency. Also what constitutes an emergency? If cars are blocking the passage of an emergency vehicle on a street is this not an emergency?*

311, in conjunction with Road Operations and Corporate Communications ask that only urgent requests for snow removal be called into 311 during storm events, and while still within snow clearing service standards and winter operations staff are out in full force. This serves two purposes:

- It frees the 311 line for all urgent requests including urgent snow clearing and other urgent issues (such as emergency vehicles needing assistance and potential public safety hazards). If an issue is an emergency, those callers should always dial 911.
- It frees the 311 line to allow residents who have other municipal inquires (such as tax billing, garbage collection, etc.) to speak to an agent.

Q/C #70: *Residents are being asked to call 311 and becoming increasingly frustrated with long wait times. They then call their Councillors who contact the Supervisors who tell us to contact 311. We get so many calls we can't wait for 15 minutes each time! Can we not get supplemental, seasonal staff as we know there will be winter events?*

The 311 management team does everything within their power to ensure adequate staffing during high volume snow events. The extremely challenging and unforeseen winter of 2014/2015 saw unprecedented call volumes that could not have been handled even if staffing had been increased substantially. It should be recognized that 311 Halifax staff made every attempt to come to work even when offices were closed for all other staff. However, there were times that staff arrived late for shifts (2-3 hours), or not at all, due to the weather conditions. This left the Centre with insufficient call takers. Management is currently looking for solutions that will be considered in the purchase of a new telephony system that will allow for more efficient call processing, as well as opportunities to provide increased call taking ability for any weather or other events that spike call volumes.

SENIORS AND PERSONS WITH DISABILITES ASSISTANCE PROGRAM

Q/C #71: *Can the following option be considered: increase funding for the current municipal snow removal program for Seniors and disabled persons.*

Halifax's snow removal assistance program for seniors and persons with disabilities is currently funded to the level of $400,000. This municipal funding is managed, under a multi-year agreement, by the YMCA.[39] Additional funding could be provided at Council's direction. The YMCA has, however, advised that there is no program wait list.

Q/C #72: *Can an evaluation of the Seniors and Disabled Snow Removal Program be done – is there a wait list? How can program be improved? With continued push backs of snow clearing seniors in the program may need service several times to have entrance ways cleared – how can this be accommodated in program?*

[39] Further details regarding the program structure are provided in the Winter Operations end of season

See response to Q/C #71.

REVERSION TO RESIDENT RESPONSIBILITY FOR SNOW REMOVAL (SIDEWALKS)

Q/C #73: *What would be the process and implications of returning responsibility of sidewalk snow clearing on the peninsula to the property owner?*

Council may, by way of motion, return responsibility for sidewalk snow clearing to residents. Existing performance based contracts would, however, remain in force and effect until their contract end dates. Existing sidewalk snow clearing contracts end in 2016 and 2017.

Q/C #74: *Can the following option be considered: to have residential sidewalks returned to the responsibility of the property owner?*

See response to Q/C #73.

MATERIALS

Q/C #75: *What is the salt/sand mixture used for sidewalks. Are we using a 50/50 mix of salt and sand, or all salt and no sand?*

Winter Operations use a variety of ratios, depending on the weather. A "hot" mix of 50/50 is mostly used when crews are trying to de-ice and provide traction at the same time. Otherwise, crews use a mix that is typically around 5-10% salt and 85-90% sand.

Q/C #76: *Some improvements have been made such as applying brine as a precaution prior to storms. This preventative measure does not work in very cold temperatures. What research is being done to determine what compounds can be used to augment the effectiveness of traditional rock salt? Many cities have augmented the traditional rock salt application with products such as beet juice, cheese brine, pickle brine and sugar cane molasses. Toronto and New Brunswick (for the Gateway Highway Project) use sugar beet juice. Other cities utilize the by-products of the brewery and distillery industries such as Ayers Mass. These organics are combined with rock salt to form a syrupy, gooey type substance to which the salt adheres, it also minimizes run off into ditches and watercourses. Also, when the organics are applied they stay on the road surface longer when the pavement dries up and the next time it snows the road is already pretreated, so it takes longer to accumulate. *This gives the plows time to get out and clear before it has a chance to freeze.*

Data indicates that the use of rock salt can be reduced by as much as 50% (as temperatures drop salt becomes less effective so more is used). Some of these products are effective in temperatures as low as minus 40 degrees. Many of the products are better for the environment and for pets, i.e, one of the products using distillery waste could also be used for cattle feed.
It would be great if we could engage the local expertise, including scientists, to determine if organics could be utilized and which product would be the best from a supply, cost and environmental perspective. Important questions we need to be answered are: what standard can we live with and how much do we wish to pay? We need to balance public safety expectations with fiscal responsibility.

Consistent with the direction of Grant Thornton in their review, staff will continue to evaluate the appropriate circumstances for using salt additives.

MISCELLANEOUS

Q/C #77: *Sidewalk crews should be properly trained with direction to follow a "lift blade" policy when approaching an already maintained sidewalk.*

Plows push the snow forward for the most part. It is very difficult in many cases to lift the bucket and not leave a pile behind. Implementing a lift-blade policy would likely slow the pace of sidewalk clearing service delivery.

Staff will explore the feasibility of including a lift-blade policy in future performance based contracts. In the interim, staff will table the introduction of a lift-blade policy at pre-season meetings with existing performance based contractors.

Q/C #78: *Residents clean the sidewalks to bare concrete. Sidewalk plows come in to widen them to 50 then the banks cave in behind them, leaving the sidewalks impassable (also falls under communication as many residents ask why this happens, they need to know the width requirement under our contracts). They want to know why the sidewalk plows don't just lift their buckets if already cleared.*

See response to Q/C #77.

Q/C #79: *HRM used to place sandboxes on some P2 streets that had safety issues such as steep grade, underground streams, etc. They were removed; staff stated that it is HRM's job to ensure the streets were sanded. They are not meeting the standards, residents would like them back. Plows are now getting stuck on these streets, when sand boxes were in place less likely to occur.*

Due to misuse, sand is no longer provided for resident application. Sand provided, in prior winter seasons, was frequently used for sanding of private driveways, walkways and decks, as opposed to its intended use on the right-of-way (i.e. streets and sidewalks).

Q/C #80: *Why is our HRM staff not empowered to have chains, etc.to assist in getting stuck vehicles out?*

Winter Operations equipment is not configured for towing. Empowering staff to assist with extracting stuck vehicles potentially puts vehicle operators at risk of personal injury. Devoting equipment to extracting stuck vehicles also diverts those vehicles from snow and ice management activities. When Winter Operations vehicles get stuck, a tow truck operator is contacted to arrange an extraction.

Q/C #81: *Can there be coordination? Sidewalks get cleared then filled in again by street plows.*

This scenario occurs for a number of reasons which are difficult, if not impossible to remedy. Sidewalk and street service delivery standards do not align. Streets are cleared either within 12 hours (P1) or 24 hours (P2). Sidewalks, by contrast, are cleared within 12 hours (P1), 18 hours (P2) or 36 hours (P3). In-house and contracted crews are, therefore, working to meet differing standards and must plow accordingly. Secondly, street plows and sidewalk plows have very different paces of operation. Whereas a street plow travels at 30-50km/hr, sidewalk gear travels at under 10km an hour. Sidewalk plows simply cannot keep pace with street plows. Backfilling also occurs because of the streets turnaround times. For P1 streets, crews are plowing every three hours. This means that plowing of a street can happen multiple times (i.e. before, during and/or after a sidewalk plow clears an adjacent sidewalk).

In the new proposed streets tenders we have included language around the requirement for coordination with sidewalk plow contractors in areas with limited or no snow storage between the curb and sidewalk.

Q/C #82: *Snow complaints are logged into Hansen and two days later another snow event happens, the previous complaint is sent back to us indicating that it won't be logged as it is now a snow event. The old service request is wiped out, no Hansen # is assigned and if the resident asks for a call back no call is made. The previously unaddressed issue is compounded.*

See response to Q/C #67.

Q/C #83: *Why are we blocking streets off for one or two days and using valuable police resources – having a police vehicle block street?*

Street closures to allow snow removal (hauling) took place over a number of hours, not days. Police were employed to ensure adequate traffic control was in place. In certain cases traffic control is best handled by police who have the requisite training to direct traffic appropriately. Provincial legislation requires that operations of this nature must be adequately controlled to ensure public safety. Given that Winter Operations resources were stretched to their limit, staff reached out to police to provide assistance with controlling traffic in conjunction with snow removal operations in select cases.

Q/C #84: *Due to our varied weather conditions it often rains prior to a snow event, then rapid freezes. Need a way to pre-treat.*

Winter Operations is continually growing its direct liquid application program. New performance based streets contracts require the application of brine ahead of storms. Not every storm, however, warrants pre-treatment of streets.

ATTACHMENT 3

CONSULTANT REPORT

Grant Thornton

An instinct for growth™

Halifax Regional Municipality – Winter Operations Review

Final Report

July 22, 2015

Contents

1. Introduction

Grant Thornton Productivity Improvement has been retained by the Halifax Regional Municipality (HRM) to make recommendations concerning its winter season maintenance of roads and sidewalks. HRM Transportation and Public Works Department maintains 2,185 kilometres of roads with city crews and vehicles, and manages the maintenance of an additional 1,580 kilometres of roads with contractors who provide their own labour and equipment. Snow and ice clearing are also done on 1,010 kilometres of sidewalks.

Snow clearing expense is an important part of the Transportation and Public Works budget. Each snow storm requires a major logistical operation to clear the snow, involving hundreds of people, including HRM employees and contractors working in shifts 24 hours a day. The winter weather from the end of January 2015 to the end of March 2015 was unusual due to the absence of any thaws, which were common in previous years. This was the major difference between this past winter and the one before it, which had about the same amount of snowfall. Heavy snowfall turning into brief periods of rain followed by a rapid freeze on several occasions created road conditions that made it more difficult for HRM to meet its' publicly advertised service level for winter road maintenance.

This report and the observations and recommendations made below are the result of interviews with a number of HRM staff, and information publicly available in other municipalities. In the limited time given to GTPI to gather information and prepare this report, it was not possible to verify all of the information and data given to us. GTPI therefore accepts in good faith the information given as factual, but is not able to confirm that this information is valid or complete. GTPI worked under the direction of HRM staff who arranged interviews and reviewed our weekly progress reports. No requests for interviews were declined by either GTPI or HRM staff.

2. Executive Summary

This report is a review of the state of the HRM's winter operations with a focus on determining if the standard of service for clearing snow from municipal roads and sidewalks is at par with other sea-level cities in northeastern North America. Our conclusion based on observations, interviews and research is that the standard in the Halifax Regional Municipality for Priority 1 roads (arterials and bus routes) is higher than in some comparable cities and slightly lower than in Moncton and Quebec City where the standard is 8 hours to bare pavement, but not explicitly all driving lanes. Only St. John's NL has a higher standard for Priority 2 roads (residential and side roads).

The review process included interviews with twenty municipal functions, a citizen advisory committee and the province of Nova Scotia, as well as direct interviews with several other municipalities.

The report presents a number of recommendations, all of which are based on best practices in Canada and the United States. These include:

- Create a Winter Control Plan and update it each year in time to order and receive new equipment if needed. For tandem-axle trucks with plows and salter/sander bodies this can be six months or longer. The Ontario Good Roads Association (www.ograapps.com) is a good source for winter planning documents.
- Align budgets with responsibilities. Move accountability and control of expenses for fleet fuel, repairs and damage from Corporate Fleet and Equipment to line items in user operating budgets. Realign Fleet priorities from controlling budget to building a high performance service operation. Consider a full fleet review to assess capability and opportunities for improvement.
- Create "snow routes" along P1 roads with permanent signs indicating that parking is prohibited during snow emergencies. Increase resources to enforce the rules.
- Develop an "Operator Training Program" to be completed before each snow season by operators. Consider a partnership with NSTIR to share their snow school resource.
- Standardize trucks and equipment. Monitor the market for alternatives to ownership of trucks and equipment. Consider alternatives to articulated municipal tractors for sidewalk clearing.
- Schedule a pre-season planning meeting with participation by all MCC members to review the Winter Control Plan, identify vulnerabilities and plan for contingencies.
- Continue to research de-icing technologies and materials to find more effective solutions.
- Automated vehicle location systems are available from a large number of vendors and should be considered for HRM vehicles and equipment used in Winter Operations.
- The use of snow melters does not appear to offer any advantages to HRM.

3. The Review

a) The Review Process

The review process began on June 2, 2015 and included meetings with as wide a variety of HRM staff as could be accommodated within a short time period, listed in Table 3-1. It was agreed that there were a number of municipal functions that were required to extend and adjust their operations well beyond the normal effect of a typical winter storm. A public advisory committee representing people with mobility challenges was also consulted.

Table 3-1 Interviews and Consultations	
Operation	**Function**
Transit Operations	Bus service and Access-A-Bus service
Halifax Regional School Board	Primary and secondary education
Emergency Measures Office	Public safety and security coordination
Fire & Emergency	Public safety, fire prevention, emergency response
Police	Public safety, law enforcement, emergency response
Nova Scotia Transportation and Infrastructure Renewal	Streets and roads in HRM outside City service area
Accessibility Advisory Committee	Public advisory body
Parking and Contracts	Parking control and enforcement
311 – Call Centre	Receive telephone and email communications from the public
Risk Management	Damage claims and insurance
Public Affairs	Communications and information
Labour Relations	Administration of the collective agreement
Finance	Budget and expense reporting
Corporate Fleet and Equipment	Acquisition, repair and maintenance of vehicles and equipment
Traffic Management	Traffic engineering, controls and wayfinding
Roads Operations Superintendents	Streets and Sidewalks
Roads Operations Supervisors	Streets and Sidewalks
CUPE Local 108 Snow and Ice Committee	Collective agreement and front-line operations
Winter Works, Training and Compliance	Driver and operator training and safety
Contractors – Sidewalks	Sidewalks in designated areas awarded by tender
Performance-Based Contractors – Roads	Streets in designated areas awarded by tender
Chief Administrative Officer	Executive

Consultations were carried out between June 3 and June 17, 2015. In addition, interviews with other municipalities were conducted and information available on-line was obtained.

b) High Level Findings

The winter of 2014-15 was unusual as there was a lower than normal snowfall with no major events until January 27. From that date on, there were a number of heavy snowfalls (greater than 10 cm) and substantial snow cover remained in place until the end of March due to an absence of warm weather thaws. This created a situation where streets had high snowbanks and reduced width for traffic. Table 3-2 details month-by-month rainfall and snowfall.

Table 3-2: Snow Events in 2014-2015 Winter Operations Season (November 2014 – April 2015)

Month	Minor (0-5 cm)	Moderate (5-10 cm)	Heavy (10-20 cm)	Extreme (20+ cm)	Total Rain	Total Snow	Snow on Ground[1]
November	6	0	0	0	207.1	4.0	2
December	3	0	0	0	275.0	3.0	1
January	11	2	2	0	82.2	59.2	17
February	10	3	4	1	32.8	130.8[2]	80
March	7	2	5	1	32.8	146.7	93
April	1	3	0	0	80.1	23.2	50
Season	**38**	**11**	**11**	**2**	**710.0**	**366.9**	**N/A**

Note: Figures are as recorded by the Environment Canada reporting station located at Halifax International Airport.[3] Total rain and total snow figures are in millimetres and centimetres respectively. Snow on ground figures are in centimetres. Source: HRM

Table 3-3 Comparison between HRM (2014-15) and St. John's NL (2013-14) – presented to compare financial resources for similar annual snowfall amounts.

	Halifax	St. John's
Total Expenditures (actual)	$36.3-million	$15.2-million
Total Snowfall	367 cm	413 cm
Roadway – kilometres	3,825	1,400
Sidewalk – kilometres	1,010	134
Supervisors	16 for City crews 4 for Performance Contracts	15
Labour force	160 operators and labourers 110 hourly-based contract	201 operators and labourers

Sources: HRM, City of St. John's

[1] Snow on Ground represents the depth of snow in centimetres (cm) on the ground. The total depth of snow on the ground at the time of the observation is determined in whole centimetres by making a series of measurements and taking the average. The figure in the table reflects the highest snow on ground figure recorded for the month.
[2] The highest snow on ground figure ever recorded at the airport weather station (snow on ground figures have been kept since 1961).
[3] See http://www.climate.weather.gc.ca/

Table 3-4 shows that the actual expense for snow clearing in 2014-15 exceeded the budget by a wide margin. The main factors were additional labour and materials.

Table 3-4 – Preliminary Budget and Actual Expenses for Winter Operations, 2014-15. Source: HRM Finance, Budgets & Financial Analysis

Item		Planned Expense	Actual Expense	Variance (Dollars)	Variance (Percent)
Fixed Costs -$					
1)	Compensation (Salary)	4,909,100	4,659,500	-249,600	-5%
2)	Performance Based Sidewalk Contracts	4,110,900	3,910,259	-200,641	-5%
	Performance Based Street Contracts	6,247,900	6,507,006	259,106	4%
	Seniors Assistance Program	400,000	400,000		0%
	Retainers for Hourly Based Street Contracts	595,000	478,506	-116,494	-20%
Total Fixed Costs		**16,262,900**	**15,955,271**	**-307,629**	**-2%**
Variable Costs -$					
	Compensation (Overtime)	659,200	3,004,506	2,345,306	356%
	Hourly Based Street Contracts (Fees)	1,427,400	9,703,201	8,275,801	580%
	Repairs to Infrastructure		164,527	164,527	0%
	Salt and Sand	1,749,800	4,120,642	2,370,842	135%
	In-house Traffic Control		183,499		
	Total Miscellaneous	383,800	472,727	88,927	23%
3)	Fleet Costs	2,000,000	2,785,111	785,111	39%
Total Variable Costs		**6,220,200**	**20,434,213**	**14,214,013**	**229%**
Total All Costs		**22,483,100**	**36,389,484**	**13,906,384**	**62%**

The budgetary impact of this past winter, and the one before it, can be seen in Table 3-5 below. The cost of winter maintenance of roadways per lane kilometer doubled compared to the five-year average from 2008/09 to 2012/13. For comparison, the cost for a number of other single-tier municipalities is shown in Table 3-6.

Table 3-5 HRM Costs ($) per KM for snow clearing - Streets. Source: HRM Finance

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
In-House excluding Priority 2 work	4,619	3,689	3,785	3,331	4,039	5,783	9,655
Performance Based				4,030	4,109	3,871	4,118

Table 3-6 Comparison of Costs ($) per KM for snow clearing in other cities. Source: 2012 Ontario Municipal Benchmark Initiative Report, Measure ROAD309 (Efficiency)

	2010	2011	2012
Barrie	3,352	4,082	3,320
Calgary	2,508	2,819	2,517
Hamilton	2,510	3,569	2,586
London	3,411	3,221	2,318
Ottawa	5,260	4,724	5,510
Sudbury	2,783	2,931	3,505
Thunder Bay	2,227	2,592	2,225
Toronto	4,720	5,770	4,815
Windsor	1,660	2,240	1,784
Winnipeg	3,520	5,399	4,298
Median	3,068	3,395	2,953

Certain factors included in Table 3-5 are not known for certain to be included in Table 3-6, such as the use of contracted equipment, fleet costs, and fuel. Data for Moncton and Saint John NB not available. Prevailing weather conditions are not the same as seaboard cities and make direct comparison difficult, but the information is presented for illustrative purposes.

4. Service Levels (Standards)

This review was primarily focused on evaluating the level of service for maintaining roads in winter conditions such as snow and ice accumulation.

TABLE 4-1 SERVICE STANDARDS FOR STREETS

Road Type	Priority	Service Level (post operations)	Initial Response	Clearing Frequency	Completion Time (after snowfall ends)
Main Arterials[4]	Priority 1	Bare pavement driving lanes	After 2 cm of snow	3 hour turnaround	12 hours to full driving lanes
Transit Routes/ Collector Roads[5]	Priority 1	3m centerline bare	After 2 cm of snow	3 hour turnaround	12 hours
Residential Street with greater than 10% slope that serve as snow routes[6]	Priority 1	Centerline bare	After 4 cm of snow	3 hour turnaround	12 hours to 2 lane width
Residential Streets[7]	Priority 2	Snow covered, passable	After 10 cm of snow	N/A	24 hours to 2 lane widths
Gravel Roads[8]	Priority 2	Snow covered, passable	After 10 cm of snow	N/A	24 hours
Private Lanes	Priority 2	Snow covered, passable	N/A	N/A	24 hours

Note: In the case of multiple snowfalls, where there is not enough time to clear all streets and roads, Winter Operations staff will return to the highest priorities and start over. Source: HRM

[4] Examples of main arterials include Robie Street, Sackville Street and Portland Street.
[5] Examples of transit routes/collector roads include Parkland, Caledonia Road and Metropolitan Avenue
[6] Examples of snow routes include Vestry Street, Joffre Street and Lindsay Hill.
[7] Examples of residential streets include Cork Street, Anderson Street and Chandler Drive.
[8] Examples of gravel roads include Confederation Drive and Flandrum Hills.

Table 4-2	SERVICE STANDARDS FOR SIDEWALKS			
Sidewalk/ Shelter Type	**Priority**	**Materials Used**	**Initial Response**	**Completion Time (after snowfall ends)**
Main Arterials/ Urban Core	Priority 1	Salt or salt/ sand mixture	After 5 cm of snow	12 hours
School Drop Off Zones and Transit Routes	Priority 2	Salt or salt/ sand mixture	After 10 cm of snow	18 hours
Residential Streets/ Walkways	Priority 3	Salt or salt/ sand mixture	After priority 1 and 2 sidewalks are cleared	36 hours
Intersections / Bus Stops	Priority 4	Salt or salt/ sand mixture	After priority 1, 2 and 3 sidewalks are cleared	48 hours

Table 4-3 shows the service levels of Halifax and five other sea-level cities in northeastern North America that received higher than normal snowfall in 2015 to date.

Table 4-3: Comparison of Halifax Standards to Other Cities

	Priority 1 Roads Main Thoroughfares And Arterial Roads	**Priority 2 Roads Residential and Other Side streets**	**Sidewalks**	**Resources**
Halifax NS	Ensure Priority 1 streets safe and clear of snow and ice within 12 hours of the end of a snowfall.	Start cut-throughs at intersections to allow access onto the local streets after 10 centimetres of accumulation and to ensure Priority 2 streets are snow-covered and passable within 24 hours of the end of a snowfall.	Priority 1 after 5 cm. Priority 2 after 10 cm. Bus stops within 48 hrs.	2185 km streets done by staff 40 City trucks. 10 sidewalk plows, 4 loaders 110 Hourly contracted vehicles Plus Performance-based vehicles. 2 teams of City operators. 24/7 coverage as needed.

	Priority 1 Roads Main Thoroughfares And Arterial Roads	Priority 2 Roads Residential and Other Side streets	Sidewalks	Resources
Moncton NB	All cleared to two lanes within 8 hours after storm ends.	DOES NOT clear residential streets <500 cars per day unless grandfathered	City plows around hospitals and schools, then residential sidewalks.	850 km streets 430 km sidewalks 10 city operators. 70% done by contractors. City has 10 plows, 5 loaders, 2 graders. Snow dumps, no melters.
Saint John NB	Priority 1 cleared to two lanes within 8 hours or storm ends; 2 days curb to curb;	Priority 2 cleared to centre lane 8 hrs, 2 days both lanes; Priority 3 cleared to centre lane 12 hrs; both lanes 3 days; Priority 4 accessible, snow pack 12 hrs; bare centre lane 4 days	Schools and hospitals done first, then others as time permits. City has 15 sidewalk plows.	672 km streets 240 km sidewalks 72 staff year round 95% handled by city crews. 4 snow dumps, no melters.
Quebec City QC	Start plowing at the beginning of each event, salt as needed at intersections, hills, school zones. Bare after 4 hours if snow less than 15 cm, 6 hours if less than 22 cm, 8 hours if more than 22 cm.	Plow after 10 cm accumulation and maintain in snow-covered condition.	P1 salt before and after, plow at 5 cm P2 sand for freezing rain, after storm, plow after 5 cm P3 sand during freezing rain, and icy areas after snow - plow after 10 cm Complete 4 hours after snow if <15 cm, 6 hours after snow <22 cm, 8 hours after snow >22 cm	
St. John's NL	Bare pavement within 12 hours.	Bare pavement within 24 hours.	Start second shift 18 to 24 hours after snow stops	1400 km streets 134 km sidewalks 201 staff

	Priority 1 Roads Main Thoroughfares And Arterial Roads	Priority 2 Roads Residential and Other Side streets	Sidewalks	Resources
Boston MA	0-7.5 cm of snow: City Equipment dispatched -spreaders and salters. 7.5 to 15 cm of snow: Contracted equipment dispatched No standard comparable to Canadian cities in survey.	0-3 inches: done by request to city web site. 3-6 inches: Plowing equipment dispatched - City and Contracted	Owners and tenants responsible for clearing within 3 hours after snowfall ends.	320 km major arterials 85 pieces of equipment. Rely on contractors for up to 600 pieces of equipment
Province of Nova Scotia	100 series highways: bare within 8 hours. Trunks and roads: cleared to centre line within 12 hours.	Side roads: Passable within 24 hours.	n/a	

Sources: HRM, City of St. John's, City of Moncton, City of Saint John, City of Boston, Nova Scotia Transportation and Infrastructure Renewal

The tables above shows that the Halifax Regional Municipality for Priority 1 roads (arterials and bus routes) is higher than in some comparable cities and slightly lower than in Moncton and Quebec City where the standard is 8 hours to bare pavement, but not explicitly all driving lanes. The HRM standard is higher or equal for Priority 2 routes with the exception of clearing residential streets to bare pavement in St. John's, the highest standard for that class of service.

5. Opportunities for Improvement

Road Operations' objective is to maintain a high performance service operation and deliver their services at peak efficiency, including the Winter Operations section.

The top priorities for Winter Operations are shown in Table 5-1.

Table 5-1 What Needs To Be Addressed

1. Hiring more road graders was identified as a partial solution but this took time and achieving the service standard was delayed on some routes.

Implications if not addressed	Opportunities if addressed
Lack of basic information to support quick decisions may lead to higher expense. Any delay to start work and continue work to resolve the problem leaves the City vulnerable to ice buildup, blocked sidewalks and complaints. No trained City grader operators available (the only trained City grader operator was on sick leave).	Additional equipment, such as graders, and extended shifts can be authorized in a timely way to maintain control over road and sidewalk conditions and keep cost down. Plan can be updated every year with new tactics based on most recent experience.

2. Budget responsibilities for fleet and equipment are interfering with making winter operations equipment ready for service in time.

Implications if not addressed	Opportunities if addressed
Diminished or conflicted control issues between Fleet Services and Roads. Ineffective budget control. Users are not conditioned to work for economy. Fleet has little incentive to improve service quality.	Fleet Services will focus on providing good service, not controlling the budget for services they don't provide. Users will rationalize their fleet unit count, fuel use, care and control of gear and optimize replacement decisions. Users will be accountable for fleet costs under their control.

3. Despite a substantial volume of communications and the enactment of overnight parking bans, illegally parked vehicles caused delays in snow removal operations.

Implications if not addressed	Opportunities if addressed
Snow removal will be impeded because of vehicles parked along P1 routes.	Pushback of snow and snow removal will make P1 streets safe and passable sooner.

Recommendation 5.1 (Resources/Budget)

Create a Winter Control Plan and update it each year in time to order and receive new equipment if needed. For tandem-axle trucks with plows and salter/sander bodies this can be six months or longer. The Ontario Good Roads Association www.ogra.org is a good source for winter planning documents.

The Winter Operations group was making progress clearing roads until thick ice began to form rapidly on road surfaces. The salter/sander combination plow trucks in the Winter Operations fleet, with blades mounted on the front of the trucks, are not able to remove heavy ice effectively. Graders with blades mounted undercarriage are more efficient, but the HRM owns only one. Hiring more road graders was identified as a partial solution but this took time and achieving the service standard was delayed on some routes.

In preparation for the 2015-2016 winter season, Winter Operations has created new route maps that concentrate HRM crews in the built-up areas of Halifax and Dartmouth, and transfer more routes to contractors. This expansion is a staff initiative that pre-dated this consultation but is consistent with the principle of consolidating work for efficiency. A tender for "Performance-Based contracts" was issued in June 2015, which is considered to be a best practice. See Appendix C for comments.

A written Winter Control Plan is considered to be a best practice. By paying special attention to vulnerabilities and identifying solutions, such as needing graders to tackle ice buildup, a level of confidence can be established that unplanned expenses have been addressed before they are incurred. A draft plan was created for Winter Operations and should be finalized and presented for approval.

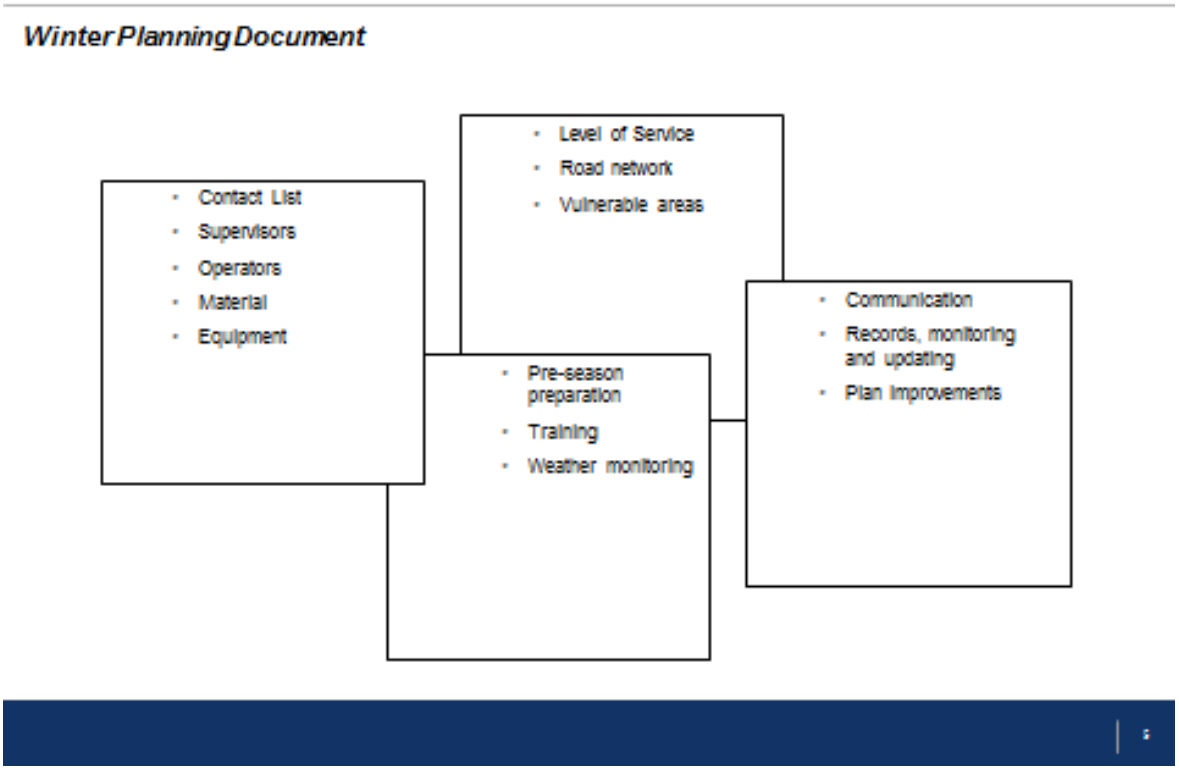
As almost every winter provides something new or different to manage, the Winter Control Plan should be updated every year, approved by the CAO and referred to at the Municipal Coordination Centre (activated during a major event). This also provides an opportunity to address changing social trends. The use of mainstream media such as newspapers and television to communicate with the public is undergoing a shift towards social media such as Twitter. More streets feature bicycle lanes with public demand that they be maintained to the same standard as vehicle lanes in winter.

OGRA recommends several sections as shown in Figure 5-1. One section covers resources, another covers road and sidewalk coverage and service standards, another looks at training and preparation, and the last section covers communications and records. All of this is based on Minimum Maintenance Standards.

For example, a section on Pre-Season Preparations should include procedures to follow in a sequence such as Prior to the Winter Season, One Month Prior to the Winter Season, Two Weeks Prior to the Winter Season, and Start of the Winter Season.

The document may have a number of appendices, such as detailed plow routes, a list of equipment, a list of vulnerable areas, records of operator training, and sample public service announcements. A video demonstrating how such a document can be created using an on-line application is available at www.ograapps.com.

Figure 5-1 Winter Planning Document



Recommendation 5.2 (Resources/Budget)

Align budgets with responsibilities. Move accountability and control of expenses for fleet fuel, repairs and damage from the Corporate Fleet and Equipment section to line items in user operating budgets. Realign Fleet priorities from controlling budget to building a high performance service operation to ensure availability of critical equipment, in good working order when required. Consider a full fleet review to assess capability and opportunities for improvement.

There were several observations made about the state of equipment readiness as the winter weather became more severe in late January. For example, a number of snow blowers were not ready for service.

All costs for fleet operations, including fuel, repair labour, parts and fleet management are budgeted in the Corporate Fleet and Equipment cost centre. Including employee and office expenses, this amounted to $11-million in 2014-2015[9]. These costs are not recovered from the users. By default, the Fleet Manager is assumed to have control over fleet expenses, as they are recorded in the fleet budget.

In reality, the users of fleet equipment, such as Road Operations & Construction, have control over the main drivers of fleet expense. These drivers are:

- The number of equipment units in the fleet;
- The number of kilometres driven or hours of use;
- The type of equipment in the fleet.

The users determine how many individual items of equipment they need to perform their tasks, and the Fleet Manager generally complies with their decision. The user's employees also determine how much use is made of each vehicle or equipment unit, with no direct constraints imposed by the Fleet Manager. The type of equipment chosen for a job (snow clearing, for example), may be influenced by the Fleet Manager, but is ultimately a user decision. The Fleet Manager's effective control is limited to his own employees and organization of their work schedules.

The current HRM situation is known as a "budget-based relationship" (between fleet and the user groups), which is common in government and utility fleets. It is most often established for the convenience of the accounting function, on the principle that having all related costs in one place makes it easier for management to identify problems and take corrective action. As stated above, the Fleet Manager really has very little control over the main cost drivers of fleet expense.

There are risks to this arrangement. First, while fleet management does as much as it can to improve efficiency in its own operations, such as offering 24-hour service in winter, there is not much incentive to do so. Users do not know the cost of the in-house services and cannot make comparisons to other sources. So long as everyone remains within budget, there is no need to make changes.

This can lead to Fleet Services having priorities in conflict with the users. For example, Corporate Fleet and Equipment maintains light-duty vehicles such as passenger cars in-house. This may mean that all service bays are occupied when a Roads truck needs attention during a winter operation, forcing the operator to wait until a bay and a mechanic are available. Best practice in municipal fleet management is to contract-out light-duty vehicle service to commercial garages and focus on medium and heavy-duty equipment.

Second, because there are no line items in user budgets for fleet expenses, users have no incentive to work for economy or rationalize the number of vehicles and equipment they really need. "Affordability" is not something they must think about. They become cost generators for Corporate Fleet and Equipment.

[9] HRM 2014-15 Budget and Business Plan (Approved), p. O10

The alternative to this approach is called a "transaction price-based relationship". It has been developed as the result of dozens of municipal and utility fleet reviews done in the United States. Simply put, fleet users receive a bill from the Fleet Manager for every transaction.

HRM should move from the existing budget-based system to transaction pricing. This is a major undertaking. However, this was the system in place until just a few years ago, and users expressed willingness to "go back" to paying their own way. Creating bills for users to pay requires changes to the data collection and reporting functions in the enterprise information management system. The enterprise system may be capable of handling transaction prices but a closer look at this is needed.

The transfer of budget responsibility to users would lead to fleet reduction and significant cost saving. In the City of Winnipeg and Toronto Hydro assigning the budget to the users in both cases resulted in an approximately 25% decrease in fleet vehicles.

Consideration should be given to a full fleet services review to see if such a change is within the capabilities of the Corporate Fleet and Equipment section. Such a review would focus in part on developing performance measurements that matter to users. The "Key Service Area Metrics" now in place for Fleet are focused on the price of diesel fuel and gasoline[10], a matter that is totally out of the Fleet Manager's control, both with respect to market pricing and actual consumption by user departments.

Recommendation 5.3 (Practices/Methods)

Create "snow routes" along P1 roads with permanent signs indicating that parking is prohibited during snow emergencies. Increase resources to enforce the rules.

The provincial Motor Vehicle Act, sections 139 and 202 gives the HRM the authority to prohibit parking where it will interfere with snow removal. Pushing snow back over the curb and removing snow could have been carried out faster in the absence of parked vehicles on many roads. Before 2011, HRM had a permanent winter parking ban in effect during the winter season from 1:00 AM to 7:00 AM. This generated a high volume of complaints. In 2011, this was replaced with a flexible parking ban, effective from 1:00 AM to 6:00 AM and only enforced during declared events. Temporary signs are used to supplement parking restrictions.

The parking ban is difficult to enforce with the number of enforcement personnel and tow trucks available. There was a constant stream of information through HRM Public Affairs to the media, including social media such as Twitter, about the urgent need for residents to avoid on-street parking. Road Operations staff gave over 300 media interviews. Yet there were observations made during this review that enough residents ignored all this to create a significant problem, and there were not enough tow trucks available to remove the illegally parked vehicles.

There were also views expressed that a 5-hour window is too short to get much work done, whereas 24 hours would be sufficient time to clear the downtown Halifax area.

Toronto has made use of snow routes for many years and it is illegal to park or even stop on a snow route when a snow emergency is in effect. The Mayor and the General Manager of Transportation Services have the authority to declare a major snow storm condition. When a major snow storm condition is declared, parking on those roads designated as snow routes is prohibited for a period of 72 hours. This is to permit the prompt and efficient clearing of snow along these routes. The declaration

[10] HRM, 2014/15 Budget and Business Plan (Approved), p O11

may be terminated sooner than 72 hours or it may be extended for a further period of time at the discretion of the General Manager of Transportation Services.

Designated snow routes are primarily located in the downtown core and include all streetcar routes. They are all clearly signed. Parking on a designated snow route during a major snow event is subject to ticketing and towing and a fine of up to $200. (Toronto by-law 1996-005, section 400-44 Snow emergencies; section 400-10 Removal and impoundment of vehicles. Passed under the authority of sections 207 and 210 of the Municipal Act, R.S.O. 1990).

Figure 5-2 Sign Designating Snow Route. Source: City of Toronto Transportation**.**

Sidewalk clearing on routes used by children walking to school was raised as an issue at the Accessibility Advisory Committee's meeting in June. A presentation was submitted by a citizen with photographs of local sidewalks. Many municipalities have designated "School Routes" with permanent signage for wayfinding. These "School Route" sidewalks could be designated as Priority 1 for winter maintenance.

Recommendation 5.4 (Practices/Methods)

Develop an "Operator Training Program" to be completed before each snow season by operators. Consider a partnership with NSTIR to share their snow school resource.

Inadequate resources for training City operators of snow plow/salter/sander combination trucks and graders were an issue that was raised consistently throughout this review. There is a consensus that some operators were not skilled enough to carry out some maintenance procedures. A deficiency in using the pre-wetting function for spreading salt was noted. This is a critical process for managing snow. There was no qualified grader operator on staff available to use the sole grader in the HRM fleet. This needs to be addressed when preparing for next winter.

Nova Scotia Transportation and Infrastructure Renewal has limited resources for training but their "snow school" may have capacity to train HRM operators. The training includes 20 hours of daytime operations training and 20 hours of nighttime operations training. Further investigation would confirm that this is available to municipal operators.

The Ontario Good Roads Association is holding its annual Snow School in Alliston, ON September 28-30, 2015. A variety of courses for managers, supervisors and operators is available. The OGRA

training catalogue on their website (www.ogra.org) includes on-site training for operators, which would reduce travel expense.

Recommendation 5.5 (Fleet Composition)

Standardize trucks and equipment. Monitor the market for alternatives to ownership of trucks and equipment. Consider alternatives to articulated municipal tractors for sidewalk clearing.

Observations were made that the many different makes and models of plow trucks make it difficult for operators to learn how to plow snow effectively. The harness for a plow on one model of truck may be different on another, for example, making the attachment process more difficult, especially in bad weather.

HRM fleet acquisitions have been made using specifications designed to attract bids from multiple vendors, and then awarding the order to the lowest bidder meeting specifications. This is usually a result of the purchasing policy focus on treating vehicles and equipment as commodities with no financial impact to the HRM other than the initial purchase price.

Mechanical and motorized vehicles and equipment do not fit in a consumable commodity category, like furniture, diesel fuel or office supplies. The lifetime repair and maintenance cost of vehicles can sometimes exceed their initial purchase price, which is ignored in the current purchase process.

The result is that the HRM fleet has considerable diversity in the makes and models of vehicles and equipment. This forces the HRM to maintain a large stock of parts and materials to keep these vehicles on the road. Mechanics must learn about all of the different manufacturers' products. Operators may be assigned to equipment with which they are not familiar and take longer to complete their work.

Purchasing policies that focus solely on initial purchase cost make poor gatekeepers and will sometimes admit inferior quality equipment into the fleet, resulting in more repair work and downtime. Any fleet system will have a hard time coping with this.

"Vehicle standardization" is a best practice that results in variations between makes and models being kept to a minimum.

Recommendations for standardization are often justified based on the results of lifecycle cost analysis. This includes initial purchase price, plus repair and fuel costs over the life of the vehicle, and resale value. Corporate Fleet and Equipment has data for review and has done lifecycle cost analysis on many of the Roads trucks. This should be supplemented by using Requests for Proposals on future acquisitions, instead of Requests for Quotation. The RFP should require proven examples of lifetime maintenance and repair expense for the product being offered. Demonstrations using the actual equipment should be done so operators can comment on the suitability and efficiency of products. The outcome would be a fleet that operators are familiar with and equipment that is used properly.

When a clearly established benefit for a particular product is found, staff should seek approval to make the product "standard equipment" for a period of several years. A defined time limit should also include a premature exit should the product be discontinued or found to have a material defect.

Sidewalk plowing using articulated municipal tractors is transitioning to smaller gear in some cities. One sidewalk contractor in HRM observed that a smaller skid-steer vehicle was easier to operate and caused less damage to property. The City of Boston has a number of older streets too narrow for heavy gear and has found compact skid-steer and wheeled vehicles to be more effective. The average maintenance cost for each of HRM's ten articulated municipal tractors is nearly as high as the cost for a 3-ton dump truck. HRM should consider alternatives to articulated tractors. Table 5-2 shows the cost for sidewalk maintenance, which is substantially higher than the cost for roadway maintenance. While lower travel speeds are the main factor (labour costs per kilometre cleared on sidewalks are higher than on roadways), equipment maintenance expense is also a significant factor[11].

The use of wing plows in built-up areas has caused issues with damage to utility poles and traffic signs and some private property. A wing plow is most effective at pushing back high snowbanks to prevent drifting and whiteouts, more common on rural roads than city streets. A wing plow is more difficult to use by a solo operator than a single straight plow. Consideration should be given to converting wing plows to straight plows.

Municipalities including HRM have traditionally chosen cash purchase of trucks and equipment over alternatives such as short-term rental or long-term leasing. This is least expensive as there is no interest paid, but seasonal equipment that is parked and idle for months at a time may be viewed by some as an uneconomical practice. Leasing is offered by some intermediary companies such as Penske, Hertz and Battlefield Equipment, and heavy equipment can be leased from banks. Leasing eliminates the need for capital but adds an expense to the operating budget.

Table 5-2 HRM Costs ($) per KM for Snow Clearing – Sidewalks. Source: HRM Finance

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
In-House excluding Priority 2 work	13,676	10,475	7,960	9,478	8,029	10,573	17,249
Performance Based	5,503	5,436	5,555	5,606	5,727	4,550	4,655

[11] In-house routes are focused on downtown areas which have more "furniture", i.e. benches, posts and steps compared to contractor routes that are have fewer intersections and obstacles and can be cleared faster.

Figure 5-3 Sidewalk Clearing with Articulated Tractor in Downtown Halifax

Recommendation 5.6 (Social Demands/Political/Economical)

Schedule a pre-season planning meeting with participation by all MCC members to review the Winter Control Plan, identify vulnerabilities and plan for contingencies.

Participants in the meetings of the Municipal Coordination Committee (MCC) in 2015 were satisfied that the process worked well and outcomes were ultimately successful. A pre-winter season planning meeting of the MCC should be considered.

At the pre-season meeting, the Winter Control Plan should be an agenda item. Roads and Construction should consider suggestions and comments in updating the plan, especially regarding vulnerable areas.

Another important agenda item is the communications plan. Internet social media services such as Twitter (@hfxgov) have become a primary news source for many people and must be part of the communications plan. There are other Internet applications that HRM may find effective in communicating news like parking ban announcements.

The 311 call centre was a critical link for many residents, with more than double the volume of calls this past winter compared to the previous winter. The duration of calls (length of time between call answered and call ended) also increased. The MCC may be able to help the call centre develop more ways to respond to residents. Similarly, the Public Relations office created a substantial volume of messages for the public. The Integrated Communications Plan was developed by Public Affairs for Winter Operations. There is also an online web page for snow information www.halifax.ca/snow.

All modes of transportation are affected by severe winter weather, including transit, walking, cycling and private vehicles. The MCC meeting may want to address this in the pre-season meeting. Bike lane maintenance, last addressed in a report to Committee of the Whole in March 2014, may be reviewed and updated.

In Ottawa, the segregated bike lanes along Laurier Avenue (a downtown artery) are maintained throughout the year. During the winter, the pre-cast curbs, plastic poles and planter boxes remain in place. The bike lanes are plowed to the same bare pavement standard as roadways. Equipment using a mechanical sweeping broom, plow and snow blower will clear the snow. Then, a liquid anti-icing spray will be applied to the bike lanes and the use of roadway rock salt and grit will be minimized. Only

under dangerous conditions such as after a major winter storm or if black ice is apparent will the bike lanes be officially closed.[12] HRM has over 100 kilometers of bike lanes which are treated the same as the adjacent roadways. However, this past winter's high snowfall caused some bike lanes to be used for snow storage. The proposed segregated bike lane on University Avenue will be maintained by Dalhousie University.

[12]http://ottawa.ca/en/residents/transportation-and-parking/road-and-sidewalk-maintenance/segregated-bike-lanes

Figure 5-4 Segregated Bike Lane in Ottawa (same condition as roadway and sidewalk)

Recommendation 5.7 (New Technologies)

Automated vehicle location (AVL) systems are available from a large number of vendors and should be considered for HRM vehicles and equipment used in Winter Operations.

Using the Global Positioning System (GPS) vehicles can be located accurately by satellite and their location shown on a map via a computer screen. A number of other measurements can be made and recorded, although each additional measurement adds cost and complexity to the system.

AVL, also called "telematics" is considered to be a best practice, and many municipalities consider it to be an essential tool to measure the efficiency of winter operations. The City of Moncton uses an AVL application that has been added on to Asset Works, the software it uses for Fleet management. HRM also uses Asset Works for Fleet management, and may be able to save time and effort by observing

Moncton's operations. Moncton monitors contractor vehicles as well as its own fleet, and finds savings by reducing the amount of direct supervision needed.

Vendors of AVL systems claim that with proper use, their product offers numerous benefits.

- By monitoring vehicles for excessive speed, drivers can be alerted to slow down and the number of accidents due to high speed may be reduced, possibly reducing insurance costs.
- Excessive engine idling is common in municipal operations. Whether a truck's engine is left on due to forgetfulness, or the driver wants the heat on while waiting for a load of salt, idling consumes significant amounts of fuel. An AVL system can accurately record engine idling and procedures to reduce it can be introduced (such as having drivers wait indoors at salt domes instead of in the trucks).
- Engine idling reduces engine life because oil pressure is lower than needed at idle speeds. The life of a truck may be extended by several thousand kilometres by eliminating engine idling.
- Fuel used off-road is eligible for a rebate of the provincial fuel tax in most provinces. By locating and recording off-road use, municipalities can receive refunds of provincial gas taxes.
- Snow routes can be optimized to reduce total kilometres driven and fuel required.
- Hours worked per day can be tracked for each vehicle.
- HRM Winter Operations are decentralized, with two depots and three salt domes in the service area. Knowing where other equipment is located that may be able to provide a part or tool to another operator in need may reduce trips back to the depot in the middle of an operation.
- For operators working alone, AVL can enhance employee safety and provide assistance in the event of radio communications failure.
- Claims for damage blaming the municipality for inadequate winter maintenance may be resolved properly with accurate information about truck routes and salt/sand application.

One issue to be aware of is manipulation of the system by operators who do not like being monitored, so that transmission of data is defeated.

HRM does not have an AVL system in City vehicles or in hourly-rented gear, but the performance-based contractors are required to have it and their performance (location, speed and time) is monitored by Winter Operations supervisors. An observation was made that it makes managing much easier and provides valuable information when it comes to resolving third-party claims. An entry-level system that reports location and speed is the basic system required for Winter Operations.

Winter Operations management has investigated AVL applications for HRM snow gear for many of the reasons listed above. The prime reason for using AVL is to optimize the ratio of supervisors to operators.

Recommendation 5.8 (New Technologies)

Continue to research de-icing technologies and materials to find more effective materials.

The most common materials used for winter control are sodium chloride (rock salt) for melting snow and ice, crusher dust and sand for traction and brine. Rock salt works well at warmer temperatures (ordinary salt water freezes at -18C). It is corrosive to ferrous metals including vehicle bodies and rebar used in bridge and overpass structures. HRM uses a brine solution to treat roadways to prevent snow from sticking to the pavement and ice build-up. This is a best practice followed by most other jurisdictions.

HRM has tried alternative inorganic salts such as calcium chloride, which works better than rock salt at very cold temperatures. Other inorganic salts include magnesium chloride, which can be used for anti-icing, pre-wetting and pre-treating of rock salt to improve cold temperature effectiveness. Potassium chloride does not work at cold temperatures but causes less damage to plants and concrete. As with any chloride compound, the potential contamination of groundwater in areas that rely on wells needs to be examined.

Organic materials such as beet juice, urea (often used by airports), potassium formulate, potassium acetate and calcium magnesium acetate have also received attention in the industry. While some of these products are many times more expensive than rock salt, they are much less corrosive, which mitigates damage to vehicles and road surfaces. This factor, and the reduction in the amount of salt used, is the main reason municipalities are using organic materials.

> "The Niagara Region [in Ontario] is using a sugar beet juice compound to reduce the amount of salt on the roads by as much as 30 per cent. The sugar beet juice compound, also known as "organic liquid deicing", is made of equal parts salt brine and the by-product of sugar beet juice refining. The liquid is applied to dry roads as an anti-icing agent, or as pre-wetting agent to help salt stick to the ground.
>
> "By applying the beet juice to the road first before the road salt, the amount of "bounce and scatter" is reduced. This means less road salt has to be applied to the roads. The use of sugar beet juice will trim down the amount of road salt from 85 kg per lane kilometre to 78 kg per lane kilometre, while still achieving the same results. The Region will see a cost savings of almost $2 per lane kilometre by using the Sugar Beet Juice. This is a significant savings for the Region's 1,600 lane kilometres of roadway."[13]

An article in the Toronto Star dated January 21, 2012 stated that a mixture of beet juice and brine costs the City of Toronto 29 cents per litre compared to 5 cents per litre for brine alone, offset by the reduction in salt.

Aside from cutting back on salt in favor of less harmful compounds, another way municipalities can reduce the environmental impact of their street-clearing efforts is to use de-icers more efficiently. One way to do that is to use road-weather information systems (RWIS, currently used by the NSTIR), which use roadside sensors to collect data on air and surface temperatures, precipitation levels, and the amount of de-icing chemicals already on the road. These data are combined with weather forecasts to

[13] http://www.niagararegion.ca/living/roads/roadsaltreduction.aspx

predict pavement temperatures, letting road agencies anticipate the exact area and time range to cover, as well as the amount of de-icing chemicals to use.

Read more: http://www.mnn.com/earth-matters/translating-uncle-sam/stories/de-icing-dilemma-do-streets-need-salt#ixzz3fmH2b8Ug

The use of rubber plow blades as a replacement for steel plow blades has improved the scraping performance of front-mounted plows. Polyurethane is another replacement for steel that may be considered. Sectional blades, which have up to six separate plates which may rise over road surface objects independent of each other, may reduce the need to replace solid plow components. A comparison of purchase price and length of service life between replacements would complete the analysis of these alternatives.

Figure 5-5 Inorganic and Organic De-Icer Blending System

Recommendation 5.9 (New Technologies)

The use of snow melters does not appear to offer any advantages to HRM.

Snow melters are a type of equipment resembling a very large container heated by diesel fuel burners, or natural gas. Snow melters are used by the City of Toronto primarily due to a lack of affordable space to build snow dumps. The City of Ottawa and Ville de Montréal do not use snow melters. According to Trecan Combustion, a manufacturer of snow melters located in Halifax, snow melters are effective where trucking snow to snow dumps is a challenge because of geography. HRM has several convenient snow dumps, two in Halifax, two in Dartmouth and one operated by a contractor.

Trials on three occasions in HRM by the Roads and Construction section found that the high proportion of ice to snow significantly increased the melting time and diesel fuel consumption, compared to melting dry snow without ice. Trecan Combustion specifies a fuel flow rate of 644 litres per hour for its model 135-PD portable snow melter, which they state has a nominal capacity to process 135 tons of snow per hour (see Figure 5-3). A used Trecan 135-PD for sale was recently advertised by Thomas M. Keller Construction Specialists Inc. at a price of $275,000 (US dollars).

Trucking snow requires a front-end loader, five to eight dump trucks, and a smaller machine for clearing around hydrants, parking meters and poles. Snow melters are most often parked at a stationary location, such as a parking lot, but can be towed to other locations if needed. A melter adds the need

for another front-end loader, a plow truck to push the snow to the loader, and a smaller machine, so the equipment requirements are higher with a snow melter. With a suitable snow dump site located in the north end of the Halifax peninsula only a few kilometres from the downtown section, the cost advantage of hauling and dumping snow indicates that the melting option is too expensive.

Figure 5-6 Trecan Combustion Portable Snow Melter model 135-PD

6. Review of Recommendations

Resources/Budget

- Create a Winter Control Plan and update it each year in time to order and receive new equipment if needed. For tandem-axle trucks with plows and salter/sander bodies this can be six months or longer. The Ontario Good Roads Association (www.ograapps.com) is a good source for winter planning documents.
- Align budgets with responsibilities. Move accountability and control of expenses for fleet fuel, repairs and damage from Corporate Fleet and Equipment to line items in user operating budgets. Realign Fleet priorities from controlling budget to building a high performance service operation. Consider a full fleet review to assess capability and opportunities for improvement.

Practices/Methods

- Create "snow routes" along P1 roads with permanent signs indicating that parking is prohibited during snow emergencies. Increase resources to enforce the rules.
- Develop an "Operator Training Program" to be completed before each snow season by operators. Consider a partnership with NSTIR to share their snow school resource.

Fleet Composition

- Standardize trucks and equipment. Monitor the market for alternatives to ownership of trucks and equipment. Consider alternatives to articulated municipal tractors for sidewalk clearing.

Social Demands/Political/Economical

- Schedule a pre-season planning meeting with participation by all MCC members to review the Winter Control Plan, identify vulnerabilities and plan for contingencies.

New Technologies

- Continue to research de-icing technologies and materials to find more effective solutions.
- Automated vehicle location systems are available from a large number of vendors and should be considered for HRM vehicles and equipment used in Winter Operations.
- The use of snow melters does not appear to offer any advantages for HRM.

Appendix A– Situation Analysis

Table A-1 presents the critical issues identified in each of the main management functions: Finance, Human Resources and Operations, which are all paramount to effective winter operations in the HRM. For each function we have identified critical issues (derived from interviews and on-site visits), the context and cause(s) for the issue, and the implications if these are not addressed.

Table A-1 Situation Analysis

MANAGEMENT FUNCTION	CRITICAL ISSUES Problems/Weaknesses	How is the issue manifested?	Why is it happening? Underlying causes	Why is it important to deal with? Implications if not addressed
Finance/ **Accounting**	F1 Fleet Services is accountable for vehicle costs incurred for winter operations. Service provided by Fleet sometimes does not meet user expectations.	Users like Roads used to pay Fleet for fuel, repairs and damage. For the past two years, Fleet has not recovered any expenses for this.	Budget for fleet expenses is now centralized in Fleet Manager's cost centre.	Fleet cannot control major cost drivers, but must defend its budget. Outcomes include service delays, under and over-servicing, and lack of trust.
	F2 No standard vehicles	Many makes and models in Roads fleet.	Purchasing practice results in lowest bid awards.	Adds complexity and cost.

MANAGEMENT FUNCTION	CRITICAL ISSUES Problems/Weaknesses	How is the issue manifested?	Why is it happening? Underlying causes	Why is it important to deal with? Implications if not addressed
Human Resources/ **Organization**	HR1 Inadequate operator training on heavy trucks and equipment	Damage to vehicles, slow service on some snow clearing routes.	Only one individual on staff that provides training.	Inexperienced operators do not deliver service as quickly as experienced operators.
	HR2 Work force fatigue due to extreme number of days/nights on 12-hour shifts.	Slower service, roads and sidewalks not cleared quickly.	No reserve complement of seasonal workers in place.	Employee burnout and absenteeism may increase.
Operations	OP1 Unable to meet the service standard for clearing roads and sidewalks.	Road lanes covered with snow and ice more than 12 hours after snowfalls instead of bare. Many sidewalks were inaccessible	Weather was more severe than normal. Frequent thaws normal in past winters did not occur this year. Thick ice cover was difficult to remove. Parked cars on arterial roads delayed snow removal.	Public confidence diminished. Calls to 311 doubled.
	OP2 Hesitation for approval to obtain more graders and loaders.	Equipment needed to deal with ice was not available.	Threat of ice buildup was not immediately understood.	Roads unable to keep up with service standard.

Our assessment of the Critical Issues concludes that Winter Operations Management at the HRM had partial success in meeting service levels, but due to weather and heavy snow conditions it required continuous Winter Operations mobilization, over an extended period of time, to achieve service standards (six days out of 62 events in 2014-15).

Appendix B– Review of By-Laws Concerning Dumping of Snow into Public Roadways

The following by-law from HRM appears to be consistent with by-laws in several other Canadian municipalities. See the Mississauga website information (p. 31) for a good information example.

HALIFAX REGIONAL MUNICIPALITY
BY-LAW NUMBER S - 300
BY-LAW RESPECTING STREETS

Removal of Snow and Ice 4. (2) No person shall deposit snow or ice on the travelled way of any street.

Figure B-1 Information on the HRM website:

311

More than a telephone number, 311 is your direct connection to important municipal services and information. Our 311 Citizen Contact Centres include a call centre, five customer service centres, and a new resource for submitting online service requests. Whether you prefer to phone-in, walk-in, or connect with us on-line, we can help!

Some of the services we can help you with

- Animal services & licenses
- **By-law complaints**
- Civic Event information
- Construction information
- Customer service information
- Facility information
- Garbage collection schedules and services
- Illegally parked vehicle complaints and inquiries
- Halifax Transit schedules and services
- Parking ticket payments
- Property tax information
- Requests concerning parks, playgrounds and sports fields
- Requests for street and sidewalk maintenance
- Traffic and street lights; concerns and suggestions
- HRM Vending information
- Waste water services
- Taxi and Limousine Information

Mississauga ON

THE CORPORATION OF THE CITY OF MISSISSAUGA
HIGHWAY OBSTRUCTION
BY-LAW 357-10
(Amended by 209-14)

GENERAL PROVISIONS
2. (1) No Person shall Obstruct any Highway by any means whatsoever.
(2) Without limiting the generality of subsection (1), the Obstruction of a Highway includes any one or more of the following:
(a) the depositing of snow or ice on the Highway;
(b) the relocation of snow from a Highway or private property to the portions of a Highway normally used for pedestrian or vehicular traffic;

Mississauga is the only municipality found in this survey to have information about dumping snow into roadways on its website.

Figure B-2 Information on the City of Mississauga website. (Residents>Bylaws>Seasonal Bylaw Issues)

Seasonal By-Law Issues
FEATURED ARTICLE back
Snow Clearing

- When clearing snow from your driveway, sidewalk, vehicle or parking lots, please ensure that snow is tossed onto your lawn and not on the roadway. Tossing snow on the roadway is a violation of the Obstructing Highways By-law 23-79, as amended, and could result in a City fine.
- Tossing snow on the street affects road safety and the City's snow clearing operations.
- Call 905-615-SNOW (7669) anytime for the most up-to-date information about the City's snow clearing operations. TTY: (905) 896-5151.

Related Links:
- Snow Clearing Operations

Moncton NB

BY-LAW # T-410
A BY-LAW RELATING TO THE USE OF STREETS
IN THE CITY OF MONCTON
(Consolidated to include amendments T-410.1, T-410.2, T-410.3, T-410.4, T-410.5, T-410.6 T-410.7 and T-410.8)

Part I
General
2. No person shall:
(a) put, place, throw or sweep upon any street, or cause to be put, placed, thrown or swept upon any street any snow, dirt, rubbish, refuse, garbage or waste of any kind;

Charlottetown PE

SNOW REMOVAL BYLAW
Effective December 13, 1989 AMENDED DECEMBER 11, 1995

AMENDED MAY 12, 2003

BEING A BYLAW OF THE CITY OF CHARLOTTETOWN TO COMPEL THE REMOVAL OF SNOW AND ICE FROM OFF THE SIDEWALKS PURSUANT TO THE PROVISIONS OF THE CHARLOTTETOWN AREA MUNICIPALITIES ACT, R.S.P.E.I., 1988, CAP. C-4.1, SECTION 64.

BE IT ENACTED BY THE CITY COUNCIL OF THE CITY OF CHARLOTTETOWN AS FOLLOWS:

PART III - GENERAL PROVISIONS

SNOW REMOVAL BYLAW

3.2 Any owner who:

(a) deposits snow or ice from any source upon any street or sidewalk, lot, yard, playground, or any other type of property or premise owned by the City; or

(b) removes snow from any yard, street, sidewalk, lot, playground, or any other type of property or premise in any manner which obstructs traffic or creates a safety hazard;

is guilty of an offence.

Amended December 11, 1995

Amended May 12, 2003

Figure B-3 Information on the City of Charlottetown website (Home>City Hall>Bylaws):

The City of Charlottetown has the authority to enact bylaws under the Charlottetown Area Municipalities Act (CAMA) [PDF]. Below you will find, in alphabetical order, electronic versions of the City of Charlottetown bylaws for your convenience and personal use. Staff has strived to ensure these versions of the bylaws are as accurate as possible; however, where accuracy is critical, please consult official sources. The bylaws are copyrighted by the City of Charlottetown.

For information about Bylaw Enforcement or to make a complaint about a bylaw violation, please call (902) 566-5548 or e-mail your concern to city@charlottetown.ca.

St. John's NL

BY-LAW NO. 1098

AMENDMENT NO. 1358 , 1508, 1519 & 1543

SNOW REMOVAL REGULATIONS

PASSED BY COUNCIL ON March 22, 89

Pursuant to the powers vested in it under Section 170 of The City of St. John's Act and all other powers it enabling, the St. John's Municipal Council in regular session convened on this 22nd day of March, 1989, hereby passes and enacts the following Snow Removal Regulations governing the removal of snow and ice from sidewalks, gutters, houses, yards and parking lots in the City of St. John's.

BY-LAW

7. (1) No person shall deposit snow or ice upon any street or sidewalk which street or sidewalk is cleared of snow or ice by the City.

(2) Any cost to the City of removing snow or ice deposited in violation of subsection (1) shall, in addition to any penalty prescribed hereunder, be recoverable from the violator or abutter. (Amended 2011/03/28; #1543)

8. (1) No person engaged in removing snow or ice from any property or other premises shall do so in any manner that obstructs vehicular traffic on a street or pedestrian traffic on a sidewalk.

(2) Any cost to the City of removing snow or ice deposited in violation of subsection (1) shall, in addition to any penalty prescribed hereunder, be recoverable from the violator or abutter. (Amended 2011/03/28; #1543)

Appendix C– Review of Requirements for Performance-Based Contractors

A copy of Tender # 15-071 Winter Streets & Roads Snow and Ice Control-Waverley / Cole Harbour / Eastern Passage was reviewed and compared to best practices for terms and conditions. Our assessment is that overall the performance standard is very good and the contract should be attractive to competent vendors. The following opportunities for improvement are suggested.

General. Escalation of pricing makes reference to the Nova Scotia Consumer Price Index as the only allowable guideline to increase the price of the contract. Two of the largest cost components for this type of work are diesel fuel and salt. These are commodities that experience significant price fluctuations from year to year. The tender should specify how the bidder will be compensated for price increases above the CPI for these two commodities (a clause for unknown and uncontrollable costs).

General. The maximum amount of work that can be sub-contracted should be specified, to avoid a situation where a bidder relies on sub-contractors for 100% of the work, unless this situation is acceptable to HRM.

Section 1.2. Best practice is to issue an addendum following any bidders meetings so that questions raised at the meeting and answers given are available in writing.

Section 3.2. Suggest that the monthly invoice from the contractor be accompanied by a Letter of Good Standing from the WCB, also available monthly, instead of the language used here.

Section 3.4. Environmental Impairment insurance in the amount of $2,000,000 is a reasonable requirement.

Sections 3.7 and 3.8. It is very difficult to obtain bonds for multiple year contracts so this will be a post-award negotiation issue unless changed in the tender.

Section 6.6. Correcting arithmetic should be at the sole discretion of HRM.

Section TF-1 p. 11 Item B7. Tandem dump trucks should be specified with salter/sander combination dump body, spreader controls, pre-wetting tanks and spreader, plow blade configuration. Item B10 should specify minimum bucket size and engine horsepower of backhoe.

Section 10.6. The bidder should specify the name of the weather forecaster to be used.

Section 10-24. There is reference to "immediate termination". The reality of having alternate forces available immediately in the middle of winter is unlikely. This leads to consideration of adding a clause that the contractor cannot withhold his services should for example a dispute arise, failure to receive payment, or notice of future termination of contract be given.

Section 11.5. Specify the time limit for reporting accidents.

Section 15.4. The tender should specify that the AVL data will remain available for at least five years in the event of claims against the HRM or the contractor.

Appendix D. Suggest an equipment list be submitted showing age, make, model of equipment to be used.

Appendix E. Add columns showing historical use of salt and sand in the area covered in this tender. Qualify that this data is not to be relied upon and is illustrative only. A new bidder would need this information to calculate costs for the contract.

Appendix F. To simplify administration, use either a $2,000 figure or a $3,000 figure for all liquidated damages except response time (leave at $5,000 with an escalation for repeated incidents).

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