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**Item No. 2**
**Committee of the Whole**
**August 4, 2015**

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

**SUBMITTED BY:** Original Signed by Director

Bruce Zvaniga, Director, Transportation & Public Works

**DATE:** July 21, 2015

**SUBJECT:** Winter Operations End of Season Report

## INFORMATION 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

## BACKGROUND

Travelling conditions in winter can deteriorate and vary dramatically due to snowfall and ice formation, causing significant reduction in pavement friction and increasing the risk of accident. Pavement surface condition is the single most important safety factor during a winter event — more important than visibility, precipitation intensity, air temperature, wind speed, or exposure.[2] Winter maintenance operations play an important role in assuring the safety, mobility and productivity of Halifax's multi-modal transportation network under winter weather conditions. Winter maintenance activities offer direct benefits to the public such as fewer accidents, improved mobility and reduced travel times and costs. They also offer indirect benefits such as sustained economic productivity, reduction in accident claims, continued emergency services, and improved traveler experience. The municipality is facing increasing demands and higher resident expectations during inclement weather, while confronting budget and staffing constraints and a growing awareness of environmental challenges inherent in the use of chemicals and abrasives for snow and ice control.

## DISCUSSION

**Winter 2014/2015 Snow Events:** The winter of 2014/2015 was a heavy winter with above average accumulations, colder than normal temperatures, punctuated by multiple blizzards. Flash-freezing, multiple-day-storm-events, freezing rain, and drifting snow further hampered snow and ice management. This past season was distinguished from previous years by the absence of intermittent thaws. Previous Winter Operations seasons were characterized by snow melting that either reduced or eliminated accumulation between successive snowfalls.

Winter Operations mobilized in-house and contracted crews to respond to 62 snow events during 2014/2015. These break down into the following snow event categories:

- 38 minor (0 cm – 5 cm);
- 11 moderate (5.1 cm – 10 cm);
- 11 heavy (10.1 cm – 20 cm); and
- 2 extreme (20.1+ cm).

On six occasions[3] (captured in the numbers reported above) heavy icing conditions were the result of winter weather events that combined snow, rain, high winds and flash freezing. These events required continuous Winter Operations mobilization, over an extended period of time, to achieve service standards.

Virtually no snow fell in November and December. During February and March of 2015, however, Halifax received 277.5 cm of snow, the largest amount of snow to fall in any two month period for the past decade. Over the course of two months, snowfalls occurred on 33 out of 59 days (see Table 1)

[2] See Quantifying Safety Benefit of Winter Road Maintenance: Accident Frequency Modeling - Department of Civil & Environmental Engineering, University of Waterloo, Waterloo | http://www.civil.uwaterloo.ca/itss/papers%5C2010-4%20(Safety%20benefits%20of%20winter%20road%20maintenance).pdf

[3] January 27, February 2, February 5, February 15, March 14 and March 18.

**Table 1: 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[4] |
|---|---|---|---|---|---|---|---|
| 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[5] | 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.[6] Total rain and total snow figures are in millimetres and centimetres respectively. Snow on ground figures are in centimetres.

On average, Halifax experiences 40 minor snow events, 6-7 moderate snow events, 4 heavy events and 1-2 extreme snow events each year (see Table 2). The 2014-2015 Winter Operations season was exceptional in terms of both the frequency of moderate snow events (+4 over average) and the frequency of heavy snow events (+7 over average). The 2014-2015 Winter Operations season was roughly on par with the average frequency of minor and extreme snow events.

**Table 2: Snow Events Over 10-Year Period (2006 – 2015)**

| Year | Minor (0-5 cm) | Moderate (5-10 cm) | Heavy (10-20 cm) | Extreme (20+ cm) | Total Rain | Total Snow | Snow on Ground |
|---|---|---|---|---|---|---|---|
| 2014-2015 | 37 | 11 | 11 | 2 | 710.0 | 366.9 | 93 |
| 2013-2014 | 51 | 5 | 4 | 5 | 735.3 | 381.2 | 38 |
| 2012-2013 | 29 | 4 | 0 | 1 | 344.8 | 93.8 | 40 |
| 2011-2012 | 36 | 4 | 3 | 1 | 595.6 | 164.9 | 34 |
| 2010-2011 | 47 | 6 | 4 | 0 | 694.0 | 200.1 | 40 |
| 2009-2010 | 37 | 6 | 4 | 1 | 387.6 | 157.7 | 30 |
| 2008-2009 | 38 | 13 | 6 | 2 | 659.5 | 264.7 | 30 |
| 2007-2008 | 44 | 12 | 7 | 1 | 602.1 | 280.8 | 26 |
| 2006-2007 | 45 | 3 | 2 | 2 | 456.9 | 149.7 | 30 |
| 2005-2006 | 40 | 5 | 3 | 1 | 542.4 | 149.6 | 40 |
| **Average** | **40.4** | **6.7** | **4.2** | **1.6** | **572.8** | **220.94** | **40.1** |

**Note:** Figures are as recorded by the Environment Canada reporting station located at Halifax International Airport. Total rain and total snow figures are in millimetres and centimetres respectively. Snow on ground figures are in centimetres. Figures in this table reflect seasonal totals by year. Snow on ground figures reflect the highest total reported in any given year.

[4] 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.
[5] The highest snow on ground figure ever recorded at the airport weather station (snow on ground figures have been kept since 1961).
[6] See http://www.climate.weather.gc.ca/

**Figure A: Precipitation by Year**

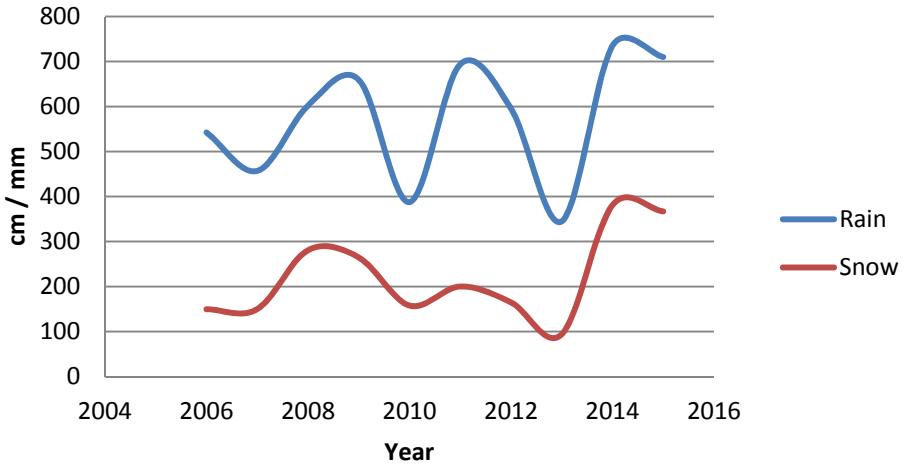
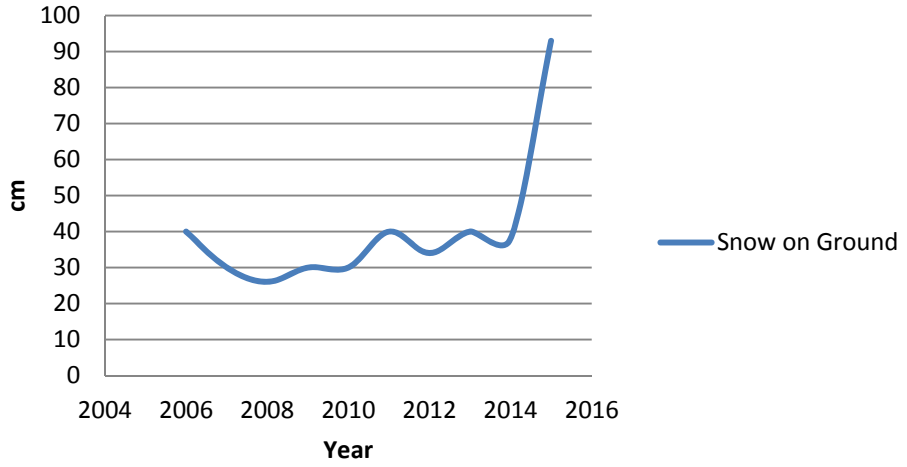



**Figure B: Snow on Ground by Year**




During the month of February 2015, snow on ground figures ranged from a low of 12 cm to a high of 80 cm (averaging 50.6 cm). During the month of March 2015, snow on ground figures ranged from a low of 29 cm to a high of 93 cm (averaging 58.2 cm). The previous 10-year high, for snow on ground, was 40 cm. To put this in perspective, the snow on ground figure after February of 2004's hurricane-strength nor'easter blizzard (White Juan) was 81 cm.

**Winter Operations Service Delivery Model:** Halifax's Winter Operations program used a blended approach to service delivery in 2014/2015 – a combination of in-house personnel, hourly based contractors, and longer-term performance based contractors.[7] In-house and hourly based contractor

[7] The use of contractors for ice and snow management is consistent with other jurisdictions in Canada. Contracting out winter work has traditionally been the most efficient method by which municipalities/cities can deliver the service and contain costs.

resources were largely focused on the urban core. Performance based contracts were largely focused on the delivery of snow and ice management in suburban and rural areas.

**Third Party Contracts:** No new contracts were signed with performance based contractors or with hourly based contractors on retainer. Contracts executed in 2011 and 2013 continued in force during this past Winter Operations season. As of the writing of this report, liquidated damages have been applied in relation to sidewalk contracts. No contracts have been terminated for failure to meet contractual terms and conditions, however, staff are currently reviewing the performance of two contractors that were engaged in 2014/2015.

**Scope of Work:** In 2014-2015, Winter Operations crews (contracted and in-house) were responsible for clearing 3,824 lane kilometres[8] of streets, 1,009 kilometres of sidewalks and walkways, and 2,295 bus stops across the municipality. Stretched end to end, Halifax's street network would reach from Halifax to Winnipeg.

**Table 3: Municipal Infrastructure Requiring Ice and Snow Management**

| Infrastructure Type | Lane Kilometres Serviced |
|---|---|
| **Streets** | |
| Priority 1 Streets | 2,246 km |
| Priority 2 Streets | 1,578 km |
| **Total Streets** | **3,824 km** |
| | |
| **Sidewalks** | |
| Priority 1 Sidewalks | 423 km |
| Priority 2 Sidewalks | 294 km |
| Priority 3 Sidewalks | 264 km |
| Other | 28 km |
| **Total Sidewalks** | **1,009 km** |

**Service Delivery Standards:** The municipality's service delivery standards specify street and sidewalk priority classifications, initial response times, clearing frequencies, and completion times (see Attachment 1). In 2014/2015 the clearing of streets and sidewalks was prioritized (consistent with the service delivery standard) based on a number of criteria, including how often they are used by commuters, access to important infrastructure like hospitals and schools, and whether they are on major bus and traffic routes.

**Street Clearing:** Winter Operations crews were responsible for 3,824 lane km of streets in 2014/2015. Street clearing was performed by a combination of in-house crews, hourly contract crews and performance based crews. Performance based contractors were responsible for clearing 1,580 kilometres of streets (41% of all streets).

Street plowing crews this past season were challenged by frequent back-to-back storms throughout February and March, making snow storage an ongoing issue, particularly in the urban core. Amounts of ice and snow (volume and type) made pushing back snow difficult and led to street narrowing. Although

[8] Lane kilometres are defined as a minimum 3.5 metre wide lane measured through its length. A stretch of street 1 km in length with 2 lanes in either direction (4 lanes total) would have a lane kilometre length of 4 km.

the main arterial roads were kept open, many residential streets were reduced to one lane or, at times, extremely difficult to navigate due to heavy snow accumulations.

Multiple mixed precipitation (rain and snow) events caused ice packs on most side streets. Ice packs reached thicknesses of up to 12-14 inches – roughly 5 times historical ice thicknesses (2-3 inches). Salt applications became ineffectual due to ice thickness and prevailing temperatures. Removal of 12-14 inch thick ice required the use of graders (equipped with ice blades) paired with hauling crews to truck out ice chunks. Ice removal took 8 to 12 hours for an average residential street. Ice ruts formed within the ice pack itself (due to uneven melting of the ice surface). This created an uneven driving surface on ice covered streets.

Each grader crew cost approximately $7280 per 12hr shift.

The breakdown is as follows:

| | | |
|---|---|---|
| Grader | ± $210/hr for 12hrs | = $2520 |
| Backhoe | ± $85/hr for 12hrs | = $1020 |
| Mini-Loader | ± $85/hr for 12hrs | = $1020 |
| 2 Dump Trucks | ± $80/hr per for 12hrs | = $1920 |
| Traffic Control | - | = $800 |

The graders were effective in removing the packed ice; however, the operation is complex, disruptive and noisy to execute and each crew only clears one residential street per 12 hour shift. Thereforethe use of graders is only appropriate under extreme conditions.

More frequent snow hauling was required this past year due to both volume of snow and the lack of thaw/melt periods (see snow on ground Figure B). Lack of space to store snow necessitated widespread hauling in 2014/2015. During February and March, 12 crews worked around the clock to haul snow. Each snow hauling crew consisted of a large loader or blower, several hauling trucks (dump trucks), a couple of backhoes, a traffic control crew and, in some cases, a police officer to do traffic control. During the week following the March 18th blizzard, crews hauled away approximately 21,000 dump truck loads of snow — that's enough snow to fill the Scotiabank Centre in Halifax more than 1.5 times.

Winter Operations equipment was mobilized virtually every day during February and March. Crews were operational around the clock (24-hour mobilization in 2 back-to-back 12 hour shifts) for 21 days at the height of the Winter Operations for 2014/2015. On two occasions, damage to fleet vehicles was so extensive that clearing operations had to be suspended to allow for repairs.

During the height of Winter Operations mobilization, hourly contractors were used extensively. By way of example, on March 23, 2015, the following hourly equipment was operating:

- 28 loaders
- 5 large excavators
- 3 graders
- 15-20 backhoes
- 45-55 haul trucks
- 2 large rental blowers

While the number of pieces of equipment varied from day-to-day (due to availability), this list of equipment reflects the extent of mobilization. At peak periods, staff called on all available contractor capacity (i.e. any other contractor equipment not otherwise being used for private sector snow clearance).

Note that the equipment listed above was in addition to, and operating alongside of, the following:

- in-house crews (operating 40+ pieces of municipal equipment);

- hourly-based contractors (operating 110+ pieces of contracted equipment – on retainer); and
- performance based contractors (operating their own equipment).

**Table 4: Cost Per Kilometre Calculations – Streets (Contractor vs. In-House Comparison)**

| Category | 2008/09 | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|---|---|---|
| In-House (without P2) | $4,619 | $3,689 | $3,785 | $3,331 | $4,039 | $5,783 | $9,655 |
| Performance Based | N/A | N/A | N/A | $4,030 | $4,109 | $3,871 | $4,118 |

**Sidewalk Clearing:** Winter Operations crews were responsible for 1,009 km of sidewalks in 2014/2015. Sidewalk clearing was performed by a combination of in-house crews, hourly contract crews and performance based crews in 2014/2015. Performance based contractors were responsible for clearing 840 kilometres of sidewalks (83% of all sidewalks).

Sidewalk plowing crews this past season were challenged by frequent back-to-back storms throughout February and March, making snow storage an ongoing issue, particularly in the urban core. Extreme snow accumulation (see snow on ground Figure B) significantly impaired sidewalk plow operator visibility (snow banks were higher than sidewalk snow removal equipment), slowing the pace of sidewalk snow removal.

Ice build-up on sidewalks presented similar challenges to those faced in dealing with streets. Thick ice layers made traction an issue and inhibited sidewalk snow removal. To help combat ice build-up, some performance based sidewalk contractors purchased ice blades for their sidewalk equipment to chop/carve ice on the sidewalks. Due to difficulties in removing ice from sidewalks, operators needed to continuously apply sand to sidewalks. Consequently, end of season sand build-up on sidewalks was significantly higher than in prior years.

**Table 5: Cost Per Kilometre Calculations – Sidewalks (Contractor vs. In-House Comparison)**

| Category | 2008/09 | 2009/10 | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
|---|---|---|---|---|---|---|---|
| In-House (without P2) | $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 |

**Bus Stop Clearing:** Halifax Transit routes service 2,295 bus stops that require snow clearing.[9] Bus stop clearing in 2014/2015 was performed by a combination of in-house crews, hourly contract crews and performance based crews.[10] Performance based contractors were responsible for clearing 72% of bus stops. Bus stop clearing was done either by a sidewalk crew (80%) or by a street crew (20%).

Snow accumulation in 2014/2015 negatively impacted crews' capacity to remove snow from bus stops. Clearing was, at times, pre-empted by (higher priority) street clearing, and at other times prevented by the

[9] In 2013/14 the service delivery standard specified bus stop clearing completion time was changed from 72 hours to 48 hours.
[10] In the case of performance based contractors, responsibility for bus stop clearing was written into service delivery contracts that also included street or sidewalk clearing.

volume of snow on abutting streets. Limited storage capacity along most bus routes, necessitated physical removal of snow from bus stops during times when traffic volumes were lower and crews are able to operate safely (often from 1 am – 6 am, during the overnight winter parking ban). Due to the severity of the season, snow removal at many bus stops was repeatedly offset by subsequent snowfalls. Build-up of ice and snow on transit bus lay-bys impeded 'kneeling' of transit buses.

**Bike Lanes:** The majority of Halifax's bike lanes are located on arterial roads. The level of service for winter maintenance on an arterial road is bare pavement following salting and plowing. However, it is difficult to get to bare pavement on a bike lane solely through salting and plowing. Car/truck/bus traffic breaks up snow and ice treated with de-icers, whereas bike traffic does not. Maintaining Halifax's bike network during the winter period requires aggressive ice and snow management. Due to the severity and frequency of winter weather events, bike lanes were not passable during February and March of the 2014/2015 Winter Operations season.

**Contract Extensions:** Multiple snow/ice events and late-March major snowfall amounts resulted in significant snow accumulation delaying the end-of-season melt conditions. Extensive snow cover, into April, and cool overnight temperatures late in the year created higher than normal occurrences of black ice conditions requiring overnight salting programs almost every evening or morning (when not in snow plowing operations).

To ensure continued ice and snow management in areas serviced by contractors, contract extensions were approved for all performance based contracts (streets and sidewalks) for a one-week period (April16th to April 22nd).[11] Contractors were reimbursed at a rate equal to 5% of the total annual contract value (based upon a normal 22 week season, one week represented approximately a 5% increase to the period). The total cost of all performance based contractor contract extensions in 2014/2015 was $0.5M. Staff will be extending contract terms on a go-forward basis (i.e. terms commencing earlier in November and/or terminating later in May). Performance based contracts, which were originally signed in 2011 and 2013, expire in 2015 and in 2017 respectively.

**Overnight Winter Parking Ban:** In 2014/2015, the overnight winter parking ban was in effect from December 15, 2014 to April 15, 2015.[12] The parking ban was only enforced from 1 am to 6 am during declared snow and ice events. Prevailing weather conditions and clearing operations determined how often an overnight ban was in effect. This past season, the ban was enforced 47 times – slightly more than double the average number of overnight parking ban days enforced in the previous three years (see Table 6). Within an eight week period (February 1st to March 31st), the municipality's parking ban was enforced on 42 out of 59 days (see Table 7).

[11] Performance based contracts (streets and sidewalks) at that point in time ran from November 15th, 2014 to April 15th, 2015. There was no obligation of service following the April 15th termination date.
[12] Since amalgamation this was the first time the ban was extended to April 15th. Normally the ban ends on March 31st. Prior to 2011/2012 when a permanent overnight ban was in effect (i.e. enforced continuously throughout the duration of the ban), it would be lifted earlier if weather conditions allowed.

**Table 6: Overnight Parking Ban Enforcement in 2014/2015**

| | January 2015 | February 2015 | March 2015 | April 2015 |
|---|---|---|---|---|
| Days Enforced | 5,14,28 | 1,3,4,6,7,13,15,16, 17,1819,20,23,24, 25,26,27,28 | 1,2,3,4,5,6,7,8,12,15, 16,17,18,19,20,21,22, 23,24,25,26,27,30,31 | 7,8 |
| Monthly Total | 3 days | 18 days | 24 days | 2 days |

**Table 7: Overnight Parking Ban Enforcement**

| Year | Days Parking Ban Enforced | Total Number of Tickets Issued | Tickets Issued Per Parking Ban Day* | Total Number of Vehicles Seized | Vehicles Seized Per Parking Ban Day* |
|---|---|---|---|---|---|
| 2009/10 | 84[13] | 10,752 | 128 | 38 | 0.5 |
| 2010/11 | 97[14] | 7,788 | 80 | 23 | 0.2 |
| 2011/12 | 18[15] | 6,325 | 351 | 106 | 5.9 |
| 2012/13 | 32 | 6,046 | 188 | 35 | 1.1 |
| 2013/14 | 14 | 3,346 | 239 | 33 | 2.4 |
| 2014/15 | 47 | 12,307 | 261 | 87 | 1.9 |

* Calculated as an average based on the number of overnight parking ban days (for the year in question) relative to the number of tickets issued or vehicles seized.

In absolute terms, the municipality issued the most overnight parking ban tickets in 2014/2015. The 2014/2015 figure (12,307 tickets) is nearly triple the 2013/2014 figure (3,346 tickets). However, in relative terms (calculated per overnight parking ban day), the number of tickets, issued in 2014/2015, is comparable to number of tickets issued in 2013/2014 – average of 239/day versus 261/day.

Similarly, in absolute terms, the seized vehicles figure for 2014/2015 (87 seizures) is over double the figure for 2013/2014 (33 seizures). However, in relative terms (calculated per overnight parking ban day), the number of seizures in 2014/2015 actually drops comparative to the number of seizures in 2013/2014 – average of 2.4/day versus 1.9/day.

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.[16] This dedicated enforcement approach may have contributed to the relative increase in tickets issued per parking ban day this past season.

Vehicle seizures were limited in 2014/2015 (less than two seizures per parking ban day). The ability to get to and remove vehicles left on the street (interfering with winter operations) deteriorates with the severity of the winter weather event. Towing an illegally parked vehicle, during a winter weather event, can be

[13] The overnight parking ban was enforced continuously from December 15th 2009 to March 8th 2010.
[14] The overnight parking ban was enforced continuously from December 15th 2010 to March 21st 2011.
[15] From this year forward, the overnight parking ban was only enforced during declared snow and ice operations between 1 a.m. and 6 a.m.
[16] 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.

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). The limited inventory of secure storage for seized vehicles and the reduced availability of tow trucks negatively impacted the municipality's capacity to remove illegally parked vehicles during a winter weather event. Tow trucks were, at times, diverted from towing illegally parked vehicles to respond to collisions and to respond to stranded/broken-down motorists.

**Winter Operations Communications:** In 2014/2015, Corporate Communications enhanced its marketing and public affairs efforts to communicate with the public prior to, and throughout, the winter season. This included increased print and radio advertising, as well as proactive media relations as part of a new pre-season campaign ('Bring it On!') focused primarily on winter preparation and winter safety.[17] Residents and business owners were encouraged to prepare their properties before the snow started to ensure that clearing efforts were as safe and smooth as possible, and to help reduce incidences of property damage caused by snow clearing equipment. Motorists were encouraged to adjust their driving according to the prevailing winter weather conditions.

Throughout the 2014/2015 Winter Operations season, Corporate Communications proactively engaged the media and the public on a range of issues including (but not limited to) overnight parking ban restrictions, storm preparation and cleanup, and impact on municipal services (including transit, recreation, municipal offices and solid waste). This past year, the Marketing department placed 18 newspaper ads and Public Affairs distributed 130 public service announcements (PSAs) to media and over 400[18] Tweets to more than nineteen thousand followers using the city's main Twitter handle, @hfxgov. (See Table 8)

**Table 8: Winter Operations Public Communications Channels**

| Channel | Comments |
|---|---|
| Phone, email and/or text messages | Overnight parking ban status updates sent by phone, email, and/or text message to subscribed residents. |
| 311 Call Centre | Incoming calls from the public fielded by 311 Call Centre staff. |
| Internet | Online snow page (www.halifax.ca/snow) updated on a timely basis. Street finder utility available at http://www.halifax.ca/snow/StreetPriorityFinder.php.[19] |
| Twitter | Twitter feed (@hfxgov) updated on a timely basis. |

Continued growth in City Watch program registration by residents allowed Winter Operations and Public Affairs staff to better communicate when the Overnight Parking Ban was enforced and when it was lifted. Registrations last year numbered 7,418, up from 5,700 in 2013/2014 and 2,800 in 2012/2013. Residents that previously signed up for notification did not need to re-register.

Media interactions were up significantly last year comparative to the previous Winter Operations season (see Table 9). Public Affairs facilitated 10 proactive media availabilities (before and after major storms)

[17] In 2013/2014 ads focused on ways to prepare and how to stay informed about the status of the the overnight parking ban by registering for CityWatch notifications.
[18] This Tweet figure does not include additional engagement tweets triggered by Public Affairs' initial posts.
[19] The online street finder utility allows residents to look up any street to find winter street maintenance responsibility particulars (municipality or Province) and frequency of clearing/standard of clearing particulars.

and responded to 329 media inquiries and interview requests. A combination of Public Affairs team members, elected officials, the CAO and municipal staff interacted with the media.[20]

**Table 9: Winter Operations Communications Metrics**

| Media Interaction | Winter 2013-2014 | Winter 2014-2015 |
|---|---|---|
| PSAs | 59 | 130 |
| Proactive Media Availabilities | 5 | 10 |
| Media Inquiries and Interviews | 92 | 329 |
| Tweets | N/A* | 404 |
| Newspaper Adverts | 15 | 18 |
| 311 Calls | 11,619 | 23,084 |
| Toolkits/Updates (Mayor and Council) | 8 | 28 |

* Tweets not tracked in 2013/2014.

To ensure consistent Winter Operations messaging, Public Affairs provided the Mayor and Council with an information tool kit prior to the start of the winter season and 27 updates throughout the winter, typically following major winter weather events or cleanup operations. 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 (see Attachment 3). Municipal spokespersons highlighted the exceptional nature of the weather conditions being faced and emphasized that mobility, visibility and accessibility were winter operations priorities. Staff proactively acknowledged the significant challenges to snow and ice clearing efforts, identified both the current efforts underway and planned work for coming days, as well as the anticipated timing of completion. To manage expectations, the public was also regularly advised that, per service delivery standards, severe winter weather conditions precluded clearing efforts from achieving targeted timelines.

**Service Request Information:** This past Winter Operations season, 23,084 snow and ice management related calls were handled by 311 (see Table 10).[21] Significantly, 7,936 (34.38%) were calls for service before the applicable sidewalk/street service standard completion period had lapsed. These calls were logged and closed at the first point of contact. A substantial proportion, 9,476 (41.4%) of 311 snow and ice management calls were dispatched to Winter Operations for service.

[20] Interviewees included the Superintendent of Winter Operations, the Superintendent of Streets and Roads, the Manager of Road Operations and Construction, the Deputy Police Chief and the Director of Halifax Transit.

[21] Call volumes are for the period between November 1, 2014 and April 30, 2015. Note that these call volumes do not include calls that were fielded by agents that originated due to snow accumulation (e.g. delayed transit / inability to provide waste collection service / illegally parked vehicles).

**Table 10: Ice and Snow Management Related Calls to 311 (2010 to 2015)**

| 311 Coded Category | Calls 2009/10 | Calls 2010/11 | Calls 2011/12 | Calls 2012/13 | Calls 2013/14 | Calls 2014/15 |
|---|---|---|---|---|---|---|
| Streets – Dispatched | 663 | 1,267 | 953 | 1,330 | 2,381 | 7,406 |
| Streets – Tier 1 | 1,101 | 1,299 | 1,594 | 1,432 | 2,512 | 6,484 |
| Streets – Tier 2 | 635 | 930 | 776 | 1,174 | 1,759 | 3,541 |
| Hard Assets – Damage | 431 | 446 | 687 | 483 | 815 | 504 |
| Soft Assets – Damage | - | - | - | - | 983 | 216 |
| Transit Stops | 36 | 29 | 11 | 82 | 152 | 238 |
| Sidewalks – Dispatched | 168 | 255 | 142 | 397 | 1,146 | 2,070 |
| Sidewalks – Tier 1 | 187 | 309 | 171 | 251 | 947 | 1,452 |
| Sidewalks – Tier 2 | 169 | 257 | 161 | 296 | 924 | 1,173 |
| **Total Call Volume** | **3,390** | **4,792** | **4,495** | **5,445** | **11,619** | **23,084** |

Call volumes reflect calls handled. Offered call volumes exceed these figures.

Calls to 311 relating to damage to soft and hard assets are the exception – likely due to significant snow accumulation between February and April. Hard and soft assets were hidden/snow covered (reducing the likelihood of reporting).

**Figure C: Ice and Snow Management Related Calls to 311 (2014/2015)**

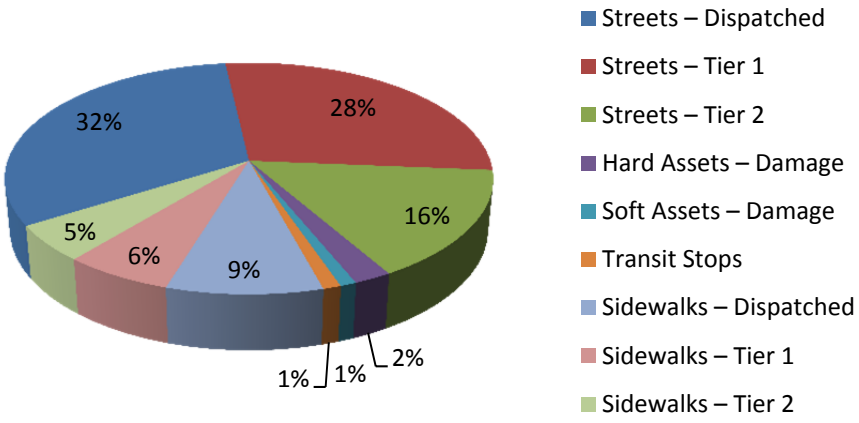


**Table 11: Calls to 311 in 2015 Compared to Six Year Average**

| 311 Coded Category | Calls 2015 | Calls Average | Percent of Average |
|---|---|---|---|
| Streets – Dispatched | 7,406 | 2,333 | 317,40% |
| Streets – Tier 1 | 6,484 | 2,404 | 269.75% |
| Streets – Tier 2 | 3,541 | 1,469 | 241.02% |
| Hard Assets – Damage | 504 | 561 | 89.84% |
| Soft Assets – Damage | 216 | 600 | 36.03% |
| Transit Stops | 238 | 91 | 260.58% |
| Sidewalks – Dispatched | 2,070 | 696 | 297.27% |
| Sidewalks – Tier 1 | 1,452 | 553 | 262.65% |
| Sidewalks – Tier 2 | 1,173 | 497 | 236.17% |
| **Total Call Volume** | **23,084** | **9,203** | **250.80%** |

Call volumes reflect calls handled. Offered call volumes exceed these figures.

Halifax's 311 call centre system can hold 50 calls in queue. This queuing capacity was exceeded three times during the 2014/2015 Winter Operations season. On-hold-queues of 30-40 people were consistent for multiple weeks. The 311 staff complement includes 24 full-time agents, 4 permanent part-time agents and a variable number of casuals. Overtime staffing at 311 was a challenge during the 2014/2015 season due to staff burn-out (owing to high call volumes), illness and vacations.

**Assistance Program for Seniors and Persons with Disabilities:** For the 2014/2015 Winter Operations season, the Assistance Program for Seniors and Persons with Disabilities was restructured to maximize funding and maintain a fair snow removal contractor compensation structure (see Table 12).[22] Baseline payout to snow removal contractors was increased to $650/client. An additional $50/client/season was payable to snow removal contractors if the cumulative snowfall for the season exceeded 212 cm.[23]

Restructuring has allowed YMCA to increase the program cap to 452 clients (i.e. total number of participants eligible for the program). Due to a $40,743.50 surplus from 2013/2014, a total of 508 clients were assisted in 2014/2015 (see Attachment 4 for a breakdown of clients by Council District).

Program clients concerns during the 2014/2015 season related primarily to narrow walkways, back steps not being shoveled, no salt being put down and delays in snow being cleared. During the two flash freeze storms in February and the major snow fall on March 18th, there were high call volumes related to timing and quality of work. Most client concerns were resolved by a phone call and/or a site visit by the YMCA's Program Coordinator. In two cases, snow removal contractors were replaced.

[22] In 2013/2014, snow removal contractors were paid $625/client and were eligible for bonus payments of $25/client for every snowfall event over 30 cm. With this structure, the number of the Assistance Program for Seniors and Persons with Disabilities clients had to be limited to 425 clients. That client number cap was necessary to ensure the program stayed within budget (contingency reserve funds were required for snowfalls over 30 cm).
[23] The 212 cm figure was based on the average annual snowfall figure recorded between 2010 and 2014.

**Table 12: Assistance Program for Seniors and Persons with Disabilities – Program Structure**

| | 2013-2014 | 2014-2015 |
|---|---|---|
| Clients Assisted* | 438 | 508 |
| Program Cap (400k budget) | 425 | 452 |
| Baseline Contractor Compensation Model | $625/client | $650/client |
| Severe Weather Compensation Model | $25/client/event (30+ cm snowfall event) | $50/client/season (212+ cm cumulative seasonal snowfall) |

* Client cap exceeded in 2014-2015 and 2014-2015 due to prior year surpluses.

**Winter Operations Sand and Salt Usage:** Multiple winter weather events during the 2014-2015 Winter Operations required frequent treatment and retreatment of streets. Salt and salt/sand mix usage under these circumstances is higher than average and is reflected in seasonal usage for this past year.

Winter Operations' total salt usage in 2014-2015 was 71,056 tonnes. Of this total, 52,387 tonnes of salt was issued to in-house crews and 18,007 tonnes of salt was issued to performance based contractor crews. Winter Operations' total salt/sand mix usage in 2014-2015 was 14,048 tonnes. Of this total, 6,757 tonnes of salt/sand mix was issued to in-house crews and 7,291 tonnes of salt/sand mix was issued to performance based contractor crews.

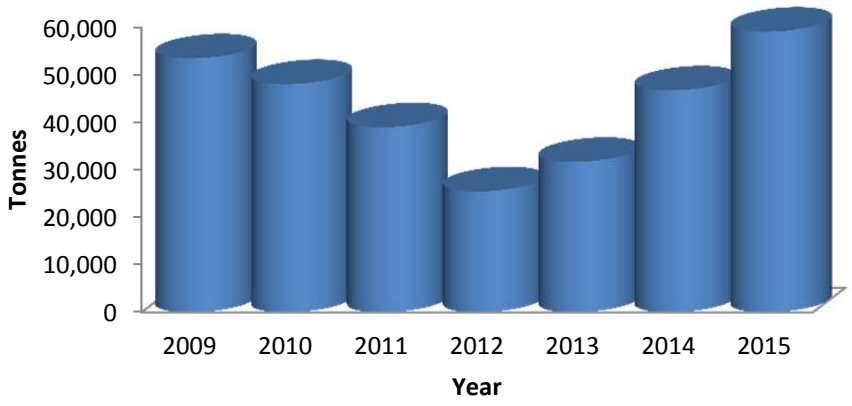
**Table 13: Sand and Salt Usage by Winter Operations (In-House)**

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Salt and Sand Usage (tonnes) | 53,517 | 48,100 | 39,000 | 25,500 | 31,699 | 46,759 | 59,144* |

* The 2014-2015 usage total includes 52,387 tonnes of salt and 6,757 tonnes of salt/sand mix issued to in-house crews and hourly based contractor vehicles.

Manual surveying, compilation and inputting of data resulted in a salt inventory reconciliation discrepancy (surplus) of 1,277 tonnes at total calculated value of $97,052 ($76/Tonne) and a salt/sand mix inventory reconciliation discrepancy (surplus) of 1,604 tonnes at total calculated value of $41,704 ($26/Tonne).

**Figure D: Sand and Salt Usage by Winter Operations (In-House)**



**Winter Operations Fleet:** Continuous operation in severe weather over extended periods of time contributed significantly to fleet costs last season. Vehicle maintenance and repair costs, relating to the 2014/2015 Winter Operations season, total $2,785,111.[24].

Constant exposure to salt and moisture, necessitated repairs to, and maintenance of, vehicles' electronics, exhaust, brakes, steering components and, drivelines. Extremely rough streets (ice build-up and pot holes) played havoc on vehicle suspension systems. Many trip springs[25] on front mounted plows were broken and many pivot and push pins were sheared. Wing assemblies on most of the tandems had to be removed due to bent components.[26] Sometimes these equipment failures lead to further damage. Damage detection was impeded by ice and snow build-up on vehicles' chassis (crews had to beat ice off of vehicles to inspect them).

## FINANCIAL IMPLICATIONS

**Winter Operations Budget:** 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),[27] 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 14).

Number, duration and severity of winter weather events[28] 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.

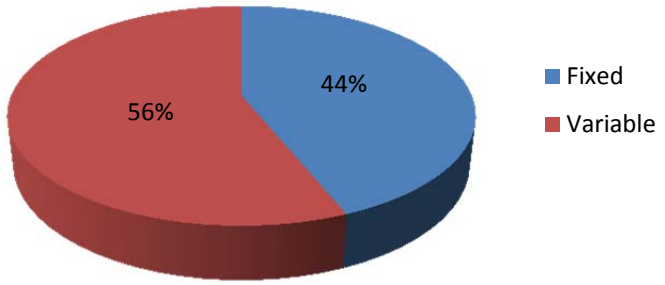
[24] This figure reflects costs incurred in fiscal year 2014/2015. Repairs to the Winter Operations fleet are ongoing.
[25] Trip springs are used to allow a plow blade to fold over an immoveable object.
[26] Wing assembly damage is usually caused by striking immoveable objects, such as frozen ice, under circumstances where the safety mechanisms of the plow are unable to react in time or the immoveable object is not seen.
[27] Overtime costs are higher in cases where winter weather events occur on weekends.
[28] 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 14: 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[29] | $1,749,800 | $4,120,642 | $2,370,842 | 135% |
| In-House Traffic Control | $0 | $183,499 | $183,499 | N/A |
| Miscellaneous[30] | $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%** |

Note that the total variable costs reflected in Table 14, 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.

**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 15). Over the past seven years, budgets have increased by $8.8M. Over the same

[29] Reflects salt and salt/sand mix expenses attributable to in-house and hourly based contractors only.
[30] This figure includes expenditures relating to training, local travel and advertising.

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 15: 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. 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.

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).

## COMMUNITY ENGAGEMENT

While no community engagement has been sought in the drafting of this report, it was continuous throughout the winter season and continues today while progressing through the completion of all winter damage cases.

## ATTACHMENTS

1. Service Delivery Standards for Streets and Sidewalks
2. Cross Jurisdictional Survey Comparative Service Delivery Standards for Streets and Sidewalks
3. Winter Operations Communications Key Messages and Talking Points Winter 2014/2015
4. Assistance Program Breakdown by Council District Winter 2014/2015
5. Winter Operations Program Overview

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

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**ATTACHMENT 1**

**SERVICE DELIVERY STANDARDS FOR STREETS AND SIDEWALKS**

**TABLE 1: SERVICE STANDARDS FOR STREETS**

| Road Type | Priority | Service Level (post operations) | Initial Response | Clearing Frequency | Completion Time (after snowfall ends) |
|---|---|---|---|---|---|
| Main Arterials[31] | Priority 1 | Bare pavement driving lanes | After 2 cm of snow | 3 hour turnaround | 12 hours to full driving lanes |
| Transit Routes/ Collector Roads[32] | Priority 1 | 3m centreline bare | After 2 cm of snow | 3 hour turnaround | 12 hours |
| Residential Street with greater than 10% slope that serve as snow routes[33] | Priority 1 | Centreline bare | After 4 cm of snow | 3 hour turnaround | 12 hours to 2 lane width |
| Residential Streets[34] | Priority 2 | Snow covered, passable | After 10 cm of snow | N/A | 24 hours to 2 lane widths |
| Gravel Roads[35] | 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.

[31] Examples of main arterials include Robie Street, Sackville Street and Portland Street.
[32] Examples of transit routes/collector roads include Parkland, Caledonia Road and Metropolitan Avenue
[33] Examples of snow routes include Vestry Street, Joffre Street and Lindsay Hill.
[34] Examples of residential streets include Cork Street, Anderson Street and Chandler Drive.
[35] Examples of gravel roads include Confederation Drive and Raines Mill Road.

**TABLE 2: SERVICE STANDARDS FOR SIDEWALKS**

| Sidewalk/ Shelter Type | Priority | Materials Used | Initial Response | Clearing Frequency | 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 |

**Note:** In the case of multiple snowfalls, where there is not enough time to clear all sidewalks, intersections and bus stops, Winter Operations staff will return to the highest priorities and start over.

**ATTACHMENT 2**

**CROSS JURISDICTIONAL SURVEY COMPARATIVE SERVICE DELIVERY STANDARDS FOR STREETS AND SIDEWALKS**

**Table 1: Winter Operations Cross-Jurisdictional Survey**

| | Halifax | St. John's | Moncton | Saint John | Boston |
|---|---|---|---|---|---|
| Streets Serviced | 3,824 km | 1,400 km | 850 km | 672 km | 320 km (arterials) |
| Main thorough-fares and arterials | Bare pavement 12 hrs | Bare pavement 12 hrs | Two lanes 8 hrs | Two lanes 8 hrs<br><br>Curb to curb 48 hrs | |
| Residential and Side Streets | Snow covered/ passable 24 hrs | Bare pavement 24 hrs | Two lanes[36] | Centre lane 8-96 hrs<br><br>Two lanes 48-72 hrs | |
| Sidewalks Serviced | 1,009 km | 134 km | 430 km | 240 km | 0 km |
| Sidewalks | 12-48 hrs | 18-24 hrs | 24-20 hrs[37] | 12-96 hrs | Residents responsible |
| In-house Staff | 165 | 201 | 77 | 72 | |

[36] Moncton does not clear residential streets with traffic volumes less than 500 cars/day (unless grandfathered).
[37] To minimize costs and maintain service, many Moncton streets only have sidewalks on one side of the street plowed.

**ATTACHMENT 3**

**WINTER OPERATIONS COMMUNICATIONS KEY MESSAGES AND TALKING POINTS WINTER 2014/2015**

**Topline Messages:** The message below were delivered consistently following significant snowfall, or extreme conditions, which, as acknowledged in the service standards, preclude clearing efforts from achieving targeted timelines.

- The Halifax region saw an extraordinary amount of snow in just a few days — more than 80 centimetres in some areas.
- While frustration amongst residents is understandable, the conditions we're facing are unprecedented. Crews are doing everything in their power to improve mobility and visibility on the roads and sidewalks so that it is safer for the travelling public.
- In the aftermath of atypical weather conditions, our typical expectations cannot be met.
- Priority is placed on clearing streets that are a particular issue for emergency vehicles and buses. Crews are working to widen those streets first, and then focus on other areas where visibility is poor.
- To be very frank, it is going to take several weeks before the streets return to what might be considered normal conditions.

**Mobility, Visibility & Accessibility:** Following the rain and rapid deep freeze cycles in February, the city received hundreds of calls about the condition of many ice-packed sidewalks and streets. The following key messages were developed and used over several weeks as crews worked to address the situation.

**Key Messages**

- Staff members in Winter Operations have been working with representatives from Halifax Transit, Halifax Regional Fire & Emergency, Halifax Regional Police, Halifax District RCMP and EHS to identify streets that are a particular issue for emergency vehicles and buses.

- Crews are working to widen those streets first, and then focus on other areas where visibility is poor.

- We appreciate residents' frustrations with the impact the sidewalk conditions are having on their day-to-day activities.

- The recent and sustained extreme weather conditions have certainly posed challenges for everyone, including crews. We must recognize that in the aftermath of atypical weather conditions, our typical expectations cannot be met.

- In an effort to improve road and sidewalk conditions, Winter Operations has been working day and night since the beginning of the month, focusing on two key priorities: improving access and mobility for pedestrians and motorists, and increasing visibility in areas where snow levels make walking or driving unsafe.

**Talking Points**

- In order to further optimize mobility, visibility and ultimately safety, temporary No Parking signage is being used on select streets in the Halifax region where it is particularly difficult for local traffic, buses and emergency service providers to navigate around parked vehicles.

- This step is often taken during the winter months and is permitted under Section 151 of the Motor Vehicle Act. Motorists are advised to obey these parking restrictions or risk being ticketed or towed.

**Extraordinary Winter Conditions:** This past winter brought the most challenging weather conditions in decades, which was substantiated both anecdotally and in the municipality's snow budget. Key messages around the atypical conditions were developed and used from February through to the end of April.

**Key Messages**

- The resources dedicated to snow and ice removal are aligned with our municipal service standards.

- The city develops its plan for winter operations based on a typical winter season; this past month has been far from typical, with twice the snow, significantly more rain and much colder temperatures.

- While frustration amongst residents is understandable, the conditions we're facing are unprecedented. Crews are doing everything in their power to improve mobility and visibility on the roads and sidewalks so that it is safer for the travelling public.

- To be very frank, it is going to take several weeks before the streets return to what might be considered normal conditions.

**Service Standards:** There was a great deal of public discussion around the municipality's service standards for snow and ice removal. Communications had key messages from the beginning of the season on what the standards are, including the circumstances under which the targeted timelines may not be met. These were used and adapted as needed throughout the season.

**Key Messages**

- Regional Council approved service standards for snow removal after the end of a snowfall, which municipal and contracted crews make every effort to achieve:
-

  Roads: 12 hours for main roads and bus routes, 24 hours for residential and rural streets.

  Sidewalks: 12 hours on main routes, 18 hours for school and bus routes, 36 hours for residential and rural streets.

- In snowfalls greater than 30 centimetres, or in blizzard conditions, the targeted timelines in the service levels may not be achieved.

- Other factors play a part too. Rapidly changing weather conditions, like sudden freezes after rain, wet snow packed to ice and freezing rain can produce a heavy ice build-up on streets and sidewalks that is difficult to remove. Sand will be applied to provide a degree of traction, especially when temperatures drop and salt becomes less effective.

- Municipal and contracted crews will continue working until all streets and sidewalks are clear and safe from snow and ice.

- During significant snow events, "cut-throughs" (one-lane plowing) may commence on residential streets to allow single-lane access prior to full street-width clearing.

- In the case of multiple snowfalls, where there has been insufficient time to complete all sidewalks, operations will return to the highest priorities and start over.

- Plowing, from either street or sidewalk operations, will result in snow at the end of residents' driveways. It is the responsibility of the property owner to remove this snow.

**State of Emergency:** In the days following the March 18 blizzard, some people were calling for the city or the province to declare a state of emergency. The following key messages were developed and used in the week or so after the storm.

**Key Messages**

- The municipality has the ability to declare a state of emergency at any time. It is not a decision to be made lightly though.

- This approach was discussed following the March 18 blizzard; however, the municipality did not feel taking this step would be warranted given the status of conditions and clearing efforts.

- The municipality kept a close eye on the weather in the following days and continued to assess our ability to deal with the cleanup to see if the decision around declaring a state of emergency needed to be revisited.

- Declaring a state of emergency provides the municipality with certain extraordinary powers, such as prohibiting travel and allowing operations to commandeer equipment from the private sector if they are having trouble accessing it voluntarily.

- We were fortunate that residents cooperated and heeded advice to stay off the roads and refrain from on-street parking during the initial cleanup. That helped tremendously.

- As well, Winter Operations brought in more than 50 additional pieces of equipment to help with snow removal in the days following the storm.

**Coordinated Response to March 18th Blizzard:** In the days following the March 18 blizzard, many residents were asking about how the municipality was working with other agencies to address the cleanup. These messages were developed together with those agencies working out of the municipal coordination centre and used by all.

**Key Messages**

- The cleanup from the March 18 blizzard and earlier snowfalls was a massive effort that required a clear, coordinated response from the municipality, residents and other agencies, including Halifax Regional Police.

- Even before the storm hit, staff in Winter Operations were meeting with others in traffic, police, transit and 311 to develop a plan for during the storm and the days after.

- On the evening of March 18, a municipal coordination centre was activated in Dartmouth and regular meetings were held with the various agencies involved in the storm response.

- Officers with Halifax Regional Police and Halifax District RCMP were extremely helpful with enforcement of Section 139 of the Motor Vehicle Act, which governs on-street parking during snow removal.

- Police also helped to close down main arterial routes, as required, while heavy equipment was brought in to remove the snow and widen the street.

- In these instances, officers worked in pairs to ensure both ends of the operation zone were covered to ensure the safety of everyone involved. This assistance also increased efficiency for the crews and made it easier to restrict parking and tow any vehicles impeding snow removal.

**Talking Points**

- The Halifax region saw an extraordinary amount of snow in just a few days — more than 80 centimetres in some areas.

- The volume of snow posed serious challenges for clearing crews, emergency vehicles and larger vehicles like buses. Additional equipment was brought in and crews worked around the clock to remove tens of thousands of truckloads of snow.

- The municipality appreciates the cooperation and support of residents and agencies like Halifax Regional Police in the days after the storm. This made a significant difference for crews working to clear the streets and sidewalks so all users can get around more safely.

**ATTACHMENT 4**

**ASSISTANCE PROGRAM BREAKDOWN BY COUNCIL DISTRICT
WINTER 2014/2015**

**Table 1: Assistance Program for Seniors and Persons with Disabilities – Client Breakdown by District**

| Council District | Number of Clients | District Councillor | Catchment Area |
|---|---|---|---|
| District 1 | 19 | Barry Dalrymple | Waverley - Fall River - Musquodoboit |
| District 2 | 122 | David Hendsbee | Preston - Chezzetcook - Eastern Shore |
| District 3 | 25 | Bill Karsten | Dartmouth South - Eastern Passage |
| District 4 | 17 | Lorelei Nicoll | Cole Harbour – Westphal |
| District 5 | 32 | Gloria McCluskey | Dartmouth Centre |
| District 6 | 27 | Darren Fisher | Harbourview - Burnside - Dartmouth East |
| District 7 | 9 | Waye Mason | Peninsula South – Downtown |
| District 8 | 47 | Jennifer Watts | Peninsula North |
| District 9 | 50 | Linda Mosher | Armdale - Peninsula West |
| District 10 | 25 | Russell Walker | Halifax - Bedford Basin West |
| District 11 | 17 | Stephen Adams | Spryfield - Sambro Loop - Prospect Road |
| District 12 | 13 | Reg Rankin | Timberlea - Beechville - Clayton Park West |
| District 13 | 29 | Matt Whitman | Hammonds Plains - St. Margaret's |
| District 14 | 35 | Brad Johns | Middle/Upper Sackville - Beaver Bank - Lucasville |
| District 15 | 27 | Steve Craig | Lower Sackville |
| District 16 | 14 | Tim Outhit | Bedford – Wentworth |
| **Total** | 508 | N/A | N/A |

**ATTACHMENT 5**

**WINTER OPERATIONS PROGRAM OVERVIEW**

**OVERVIEW**

This document was created to provide an overview of the municipality's Winter Operations program. Snow and ice management is a significant aspect of the municipality's overall street network management program, both financially and in terms of actual and publically perceived importance. Transportation and Public Works has implemented a number of initiatives to enhance efficiencies and manage costs while meeting established service delivery standards.

**PART A: WINTER OPERATIONS**

**Winter Operations Support:** While Transportation and Public Works (Road Operations) coordinate and manage the Winter Operations program, they are supported by multiple business units.

- Operations Support (Fleet) provide and maintain all in-house snow and ice management equipment.
- Finance, Information, Communication and Technology (Procurement) procure snow and ice management materials including salt and sand.
- Finance, Information, Communication and Technology (Service Management) provide card reader and general technology support at the depots.
- Human Resources (Total Compensation) provide payroll administration and job costing.
- Operations Support (Call Centre) provide 311 call taking and dispatch services.
- Operations Support (Corporate Real Estate) maintain warehouse operations for supplies and fuel management.
- Regional Police and Planning and Development (Municipal Compliance) carry out on-street parking enforcement.
- CAO's Office (Corporate Communications) coordinates external communications with the media and with the general public.

**Winter Operations Program Goals:** The Winter Operations program goals include the following:

- Providing a safe and reliable municipal transportation system;
- Minimizing economic losses to communities and industry;
- Facilitating emergency response operations (Police, Fire, EMS);
- Facilitating public transit operations; and
- Providing winter maintenance at an affordable cost.

**Winter Operations Season:** The Winter Operations season runs from November to April.[38] This scope of operations does not include post-season detailed analysis of snow and ice clean-up activities, and does not include the removal and disposal of street sand, or the clean-up of snow dump sites. Nor does this Winter Operations season include time required for post-season equipment maintenance and repairs.

[38] The CUPE local 108 Collective Agreement makes specific provision for Winter Works. Under the agreement, winter-programing-specific allowances are made in connection with staffing and scheduling of unionized municipal employees between the 3rd Monday in November and the 1st Friday in April (22 weeks).

**Monitoring:** Depending on frost depth, weather forecasts, current conditions, temperature trends and time of year, each snow event is approached a little differently. Winter Operations Superintendents, Supervisors and crews, therefore, have to monitor street conditions and forecasted weather. During the winter season, municipal staff continuously patrol arterial roads, and potential "trouble spots" like hills on collector or residential streets. Winter Operations crews also monitor catch-basins, drains, and culverts to ensure that they are cleared of snow and ice and that they work properly.

Staff make use of detailed weather forecasts supplied by various service providers including Scotia Weather Services Inc., Environment Canada and the Weather Network. Scotia Weather Services Inc. is currently contracted, by the municipality, to provide three forecasts per day between November 15th and April 15th. Forecasts are provided using 3-hour segments showing temperature, precipitation, wind speed and direction, surface temperature, probability of black ice and dew point. The Winter Operations management team is also able to consult with a Scotia Weather Services' duty forecaster on a 24/7 basis.

Winter Operations staff evaluate the weather forecast and choose the best method to prepare the streets for snow and ice, and to maintain clear, safe streets throughout a weather event. Crews prioritize which streets and sidewalks to salt, sand or plow based on service standards approved by Regional Council. (See Attachment 1 for Council-approved Winter Operations service standards).

**De-Icing Streets:** To help prevent the buildup of snow and ice during a weather event, Winter Operations staff prepare the streets with rock salt, brine or a mixture of the two.[39] De-icing products are applied during light snowfalls and during the initial stages of significant storms. Using brine on the streets is better for the environment because it means crews use less rock salt, a substance that often washes into nearby ditches and waterways.

When temperatures are not extremely cold, de-icing is the most inexpensive method of dealing with snow accumulation. However, de-icing methods only work under certain conditions. Rock salt will not melt ice if the temperature is below -10 degrees Celsius and sprayed brine will wash away in heavy rain. The amount of salt/brine applied will depend upon the prevailing temperature, and upon the intensity and duration of the snowfall. Depending upon snow intensity and accumulation, more than one round of de-icing may happen prior to plowing.

Where necessary, due to ice conditions, traction-providing agents, such as sand, may be spread on the pavement to achieve safe and passable conditions.

**Snow Plowing:** There are currently no legally mandated minimum maintenance standards for street or sidewalk snow clearing that are legislated in Nova Scotia. Nevertheless, Halifax has a high level of service in providing mechanical sidewalk and street snow clearing. (See Attachment 1 for Council-approved Winter Operations service standards.)

**Snow Removal:** 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 site. For safety purposes, blocker trucks are required. The removal of snow, although a public benefit, is an extremely costly and resource intensive task that can only be completed at night during the six hour period of the overnight parking ban.

[39] Direct liquid application (DLA) is a newer technique in the municipality's overall salt management strategy that involves spraying the streets with saltwater, also known as brine. This minimizes the bond that forms between the surface of the road and snow or ice, similar to using Pam spray to prevent food from sticking to the pan.

**PART B: SERVICE STANDARDS**

**Service Delivery Standards:** Snow and ice management service delivery standards were initially adopted in response to the findings and recommendations in the Covenco Ltd. Snow and Ice Control Program Diagnostic Analysis (1998). The service delivery standards specify street and sidewalk priority classifications, initial response times, clearing frequencies, and completion times – see Attachment 1. In the case of more than 30 cm of snow, or in blizzard conditions, meeting service standards is challenging. Traffic congestion during either the morning or afternoon peak travel times can likewise make it very difficult for in-house and contracted crews to meet service delivery standards, as crews risk becoming stuck in traffic.

**Ice and Snow Removal Prioritization:** Streets and sidewalks are currently prioritized based on a number of criteria, including how often they are used by commuters, access to important infrastructure like hospitals and schools, and whether they are on major bus and traffic routes. The municipality has classified all streets and sidewalks and services them (salts, sands and plows) as outlined in Attachment 1.

**Sidewalk Clearing:** Sidewalk clearing normally occurs within 12 to 36 hours after the end of a snowfall. The service standards specify that Priority 1 sidewalks, abutting main arterial roads, should be cleared within 12 hours after the end of a snowfall. Priority 2 sidewalks, abutting transit routes and in front of schools, are cleared within 18 hours after the end of a snowfall. Priority 3 sidewalks, abutting local roads, are cleared within 36 hours after the end of the snowfall. Crews do not stop until all sidewalks are cleared.

While the objective is to maintain sidewalks to a bare condition, many factors play a part in achieving that goal. Rapidly changing weather conditions, like sudden freezes after rain, wet snow packed to ice and freezing rain can produce a heavy ice build-up on sidewalks that is difficult, or in some cases impossible, to remove. Sand or gravel is applied, to provide a degree of traction on sidewalks, when temperatures drop and salt becomes ineffective.

**Street Clearing:** Street clearing normally occurs within 12 to 24 hours after the end of a snowfall. The service standards specify that Priority 1 streets be completed within 12 hours after the end of a snowfall. Priority 1 streets include main arteries, bus routes, hilly areas and streets leading to schools and public buildings. Once those are complete, then crews will clear residential streets, gravel roads and private lanes, known as Priority 2 routes. The service standards specify that Priority 2 streets be completed within 24 hours after the end of a snowfall. Crews do not stop until all streets are cleared. Cut-throughs (to allow access to Priority 2 streets) occur once accumulations reach 10 cm.

**Intersection & Bus Stop Clearing:** Intersection and bus stop clearing normally occurs within 48 hours, after the end of a snowfall.[40] Bus stops vary in complexity. Some bus stops have full concrete pads with shelters, some have small pads attached to sidewalks, some are behind the curb with no pad (just grass or gravel) and some are simply drop off areas on the street shoulder. Bus stop clearing starts with the highest volume stops. Most bus stops and intersections are not fully cleared until all the streets are complete, as the snow needs to be removed with larger equipment and trucks. Much of this work is done after hours, when lighter traffic conditions enable the work to be carried out more safely.

**Cut-Throughs:** During significant snow events cut-throughs (one-lane plowing) may commence on residential streets to allow single lane access prior to full street width clearing.

**Driveway Windrow Opening:** Plowing, from either street or sidewalk operations, will result in snow at the end of residents' driveways. The municipality is not responsible for removing this snow (referred to in other jurisdictions as driveway windrow opening).

[40] In 2013/14 the service delivery standard specified bus stop clearing completion time was changed from 72 hours to 48 hours.

**PART C: WINTER WEATHER CONDITIONS**

**Winter Weather Events:** Snow events represent an accumulation of snow received over one or more days. Variations in the amount of precipitation (falling over several days) directly affect how Winter Operations crews must respond to allow for safe passage for vehicular and pedestrian traffic.

**Winter Weather Patterns:** Halifax's winter weather patterns are highly varied and extremely unpredictable, partly due to freeze-thaw cycles and the coastal effect. Winter weather events can transition through snow to rain to freezing rain and back to snow. Over the past decade, Halifax has received an average of 220.94 cm of snow fall between the beginning of November and the end of April. Total snow figures vary from a high of 381.2 cm to a low of 93.8 cm per season (2013-2014 and 2012-2013 respectively). On average, Halifax can expect to experience 40 minor "events" (0 cm – 5 cm), 6-7 moderate "events" (5.1 cm – 10 cm), 4 heavy "events" (10.1 cm – 20 cm) and 1-2 extreme "events" (20.1 cm+) per year.

**Micro-Climates:** The municipality's geographic footprint is large, spanning from coastal areas to inland areas. As a result of this diversity, there are a number of micro-climates that present challenges when determining the best possible response to a winter weather event. It is common to have rain along the coast, snow further inland and oscillating conditions in the areas in between.

**Topography:** Certain hills, bridges and street configurations require specialized and/or intensified approaches to ice and snow management. The municipality has multiple steeply graded hills that are the only way in or out of whole communities – these streets require heightened service to prevent communities from becoming isolated during severe winter weather events. Likewise, hills with s-shaped streets require frequent plowing and salting to keep them safe for travel. Intersections that are confusing when snow-covered must also receive higher degrees of attention. Heavily travelled arterials also demand heightened servicing to prevent standstill traffic conditions during peak commuter traffic periods.

Several external service partners provide snow and ice management services within the municipality – the Government of Canada (Department of National Defence), the Province of Nova Scotia and the Halifax and Dartmouth Bridge Commissions. Differing service delivery standards, that are adhered to by these partners, and the lack of public awareness of shared responsibility for ice and snow management, can lead to frustration over inconsistent driving/walking conditions throughout the municipality.

**PART D: SERVICE DELIVERY MODEL**

**Winter Operations Service Delivery Model:** Halifax's Winter Operations program uses a blended approach to service delivery – a combination of in-house personnel, hourly based contractors, and longer-term performance based contractors. In-house and hourly based contractor resources are largely focused on the urban core.[41] Performance based contracts are largely focused on the delivery of snow and ice management in suburban and rural areas.

**Municipal Personnel:** The Winter Operations program employs 165 CUPE Local 108 unionized employees operating out of three depots. Municipal employees report for scheduled night shifts and day shifts and provide 24-hour operational coverage during snow and ice events.[42] This approach maximizes

[41] Servicing the urban core involves more detailed work around municipal assets including streetscape furniture, intersections, transit stops and parking meters. The urban core also experiences higher volumes of pedestrian and vehicular traffic, increasing the difficulty of delivering timely, safe and effective snow and ice management. A significant number of the municipality's high priority streets and sidewalks are also located within the urban core.

[42] Day shift runs from Monday to Friday, 8 am to 4 pm. Night shift runs from Monday to Friday, 12 pm to 8 am. During a winter weather event, the night shift and the day shift will each be extended by 4 hours to provide 24-hour coverage (i.e. to cover the 8-hour period between 4 pm and 12 pm). Overtime applies to hours worked outside the employees' regularly scheduled shifts.

flexibility for winter weather event response and minimizes employee overtime. During periods when Winter Operations crews are not engaged in ice and snow management (plowing, de-icing, grading, catch basin clearing, hand shovelling), they are reassigned to road operations activities (leaf and litter collection, pothole repairs, sidewalk and street grading, guardrail and street shoulder inspection and repair).[43]

During the season, Winter Operations program staff spend a portion of their time on snow and ice management and the balance of their time on road operations activities. Seasonal variations impact the relative mix of activities, with more extreme weather years being more heavily weighted toward ice and snow management activities. During mild winters, municipal staff are freed up to conduct road operations activities that would otherwise occur during Halifax's compressed construction season (April – November).

**Performance Based Contractors:** Performance based contracts augment in-house capacity by providing specialized ice and snow management equipment and services. Performance based contracts are used in both Winter Operations Regions (East and West) to varying degrees. Under the performance-based contract, equipment and services are contracted for the duration of the Winter Operations season. Performance based contracts have contractual language that imposes service delivery standards (aligned with the municipality's Council-approved service delivery standards for snow and ice management). 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. Liquidated damages apply, for failure to provide service consistent with the contract-defined standards, and the municipality has the right to terminate the contract.

**Hourly Based Contractors on Retainer:** Hourly based contracts augment in-house capacity by providing specialized ice and snow management equipment and services on an as needed basis. Hourly based contracts are used in both Winter Operations Regions (East and West) to varying degrees. Under the hourly-based contract, equipment and services are provided only when requested by the municipality. Hourly based contracts include a stand-by clause that enables the municipality to give contractors advanced notice of a planned winter weather event response. Once put on notice, contractors must mobilize equipment and personnel within 10 minutes of receiving a follow-up mobilization call. 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.

**Winter Operations Oversight and Coordination:** Centralized decision-making, combined with front line flexibility to respond according to conditions, is a structured strength of the Winter Operations program. Overall Winter Operations program delivery decision-making is coordinated through the Superintendent of Winter Operations. Implementation is decentralized and provided in two Service Regions that are further broken into Service Areas and Service Routes. This approach allows for the greatest flexibility to respond to local micro-climates and conditions unique to the area being serviced. Winter Operations Supervisors are assigned in pairs (night shift and day shift) to each Service Area to oversee the provision of Winter Operations related activities, including snow and ice management, provided by municipal staff, hourly contractors and performance based contractors. Winter Operations Supervisors report to Winter Operations Superintendents assigned to each Region.

When weather conditions warrant, Operations Support (Fleet) assigns a mobile mechanic to be on site at each depot. Being on site, the mechanic can keep the Winter Operations Supervisors and Superintendents updated on any equipment issues that may affect the planned level of response to a winter weather event. Once deployed, the mobile mechanics support operations in the field for the duration of the winter weather event.

[43] Road operations activities performed by municipal employees do not form part of the Winter Operations budget.

**Scaled Response to Winter Weather Events:** Winter Operations in-house crews and contracted crews are deployed on as needed basis. Escalation and de-escalation is based on prevailing weather conditions. The first level of response begins with the mobilization of all in-house staff and equipment and the mobilization of all performance based contractors. Under the terms of the current collective agreement with CUPE Local 108, hourly contracted equipment cannot be deployed until all equivalent in-house equipment has been deployed. The majority of salting only events are handled by in-house crews and performance based contractors. Likewise, minor snow events are typically handled with minimal engagement of hourly based contractors.

Hourly based contractors are mobilized during moderate, heavy or extreme snow events, to meet service delivery standards. Hourly based contractors deploy between 120 and 150 pieces of equipment (salt trucks, plows, loaders, etc.), depending on winter weather severity. Initial call-outs of hourly based contractors mobilize smaller/lighter equipment. Heavier equipment, operated by hourly based contractors, is called out when volume or weight of snow necessitates its deployment (either in place of smaller/lighter equipment, or to supplement smaller/lighter equipment provided by hourly contractors). Scaling back happens in reverse order of deployment and happens at a faster rate. Once service standards have been met, or are about to be met, hourly based contractors will be notified that they can discontinue their operations. Hourly based contacted heavy equipment is withdrawn first, followed by hourly based contracted smaller/lighter equipment. Clean-up work is handled primarily by in-house crew and performance based contract crews.

**Service Regions and Service Areas**: For the purposes of Winter Operations, the municipality is divided into two Service Regions – East and West (see Table 1 for communities serviced).
The East Service Region operates from the Turner Drive Depot. The West Service Region operates from the MacIntosh Depot (streets) and the Sackville Street Depot (sidewalks). Each Service Region (including surrounding areas), is further broken down into three Winter Operations Service Areas.

**Table 1: Winter Operations Service Regions**

| Service Region | Communities Serviced | Depot |
|---|---|---|
| East | Sackville, Beaverbank, Waverly and Fall River, Bedford, Dartmouth, Eastern Passage, East Preston, North Preston and Cole Harbour | Turner Drive Depot |
| West | Bedford, Halifax, Beechville, Lakeside, Timberlea, Tantallon, Hammonds Plains, Herring Cove, Purcell's Cove | MacIntosh Depot and Sackville Street Depot |

**Service Routes:** Within each Service Region, Service Areas are divided into Winter Operations Service Routes. Separate Service Routes are in place for streets and for sidewalks. The routes are devised for efficient coverage and reasonable response times. Individual Service Routes are serviced in priority order according to Council approved service delivery standards. Service Routes are reviewed annually (post season) to determine if changes are required to optimize service delivery.

Each individual Service Route is assigned to either an in-house crew or a performance based contractor crew – never both. Service Routes are separate to ensure a clear delineation of responsibility and to allow the municipality to hold performance based contractors accountable for meeting contractual service delivery standards. Depending on weather conditions, Service Routes serviced by in-house crews can also be serviced by hourly based contractors (see above for hourly based contractor deployment protocol).

**PART E: SENIORS AND PERSONS WITH DISABILITIES**

**Snow Removal Services to Seniors and Persons with Disabilities:** Halifax's snow removal program is available to seniors (65 years of age or older) and persons with disabilities. The program applies to residential properties only – commercial properties are ineligible. The program is not available to landlords. To be eligible a resident must reside in a single dwelling home that they own or rent and the gross household income of all people living on the premises must not exceed $30,000. The program offers assistance to clear snow from steps and walkways, including front and back steps, walkways and fuel tank access.

**PART F: BUDGET**

**Winter Operations Budget:** The Winter Operations budget and actual expenditures reflect the total cost of snow and ice management. Winter Operations program costs include both fixed and variable costs.

- **Fixed 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:** Variable costs, which increase dependent on winter weather conditions, include equipment costs, overtime salaries (municipal employees),[44] salt/sand/brine materials costs, and hourly contractor costs (non-retainer).

The municipality's yearly spending on the Winter Operations program varies significantly from year to year, depending primarily on winter severity.

**PART G: WINTER PARKING BAN**

**Winter Parking Ban**: The Overnight Winter Parking Ban is intended to reduce significant problems experienced by plow and salt truck operators in providing effective and efficient snow and ice operations on municipal streets. The parking ban provides a short window of opportunity for an operational shift to be completed in the early hours of the morning unimpeded by parked vehicles. It permits snow to be pushed back to the curb, resulting in a wider travel way, better street drainage, and snow plowing costs reduced by 20-30% per storm. A temporary parking ban also facilitates the movement of emergency vehicles during storms; reduces property damage; and allows for increased plowing efficiencies, thereby reducing the length of time it takes to clear all streets.

Although the HRM Traffic Authority declares the ban, the decision involves a collaboration of representatives from Police, Fire and Emergency Services, Road Operations and Construction, Parking Enforcement, Community Development, Corporate Communications, Call Centre, Regional Transportation, and Deputy CAO's office. The overnight parking ban is only enforced during declared snow and ice operations. When the parking ban is in effect, it runs from 1 a.m. to 6 a.m. Prevailing weather conditions and clearing operations determine how often an overnight ban will be in effect.

**PART H: COMMUNICATIONS**

**Communications:** Throughout a Winter Operations season, Public Affairs actively engage the media and the public on a range of issues including (but not limited to) overnight parking ban restrictions, storm preparation and cleanup, and impact on municipal services (including transit, recreation, municipal offices and solid waste). The municipality places newspaper ads puts out PSAs and pushed Tweets followers via @hfxgov. CityWatch subscribers receive timely messages by phone, email, and/or text message about the status of the overnight winter parking ban.

[44] Overtime costs are higher in cases where winter weather events occur on weekends.

In addition to CityWatch notifications, the municipality issues public service announcements to alert residents and business owners when the overnight parking ban will be in effect and when it has been lifted. Timely information is also posted online at www.halifax.ca/snow and via municipality's Twitter account, @hfxgov. Residents are also able to call 311 at any time for up-to-date information.

**Table 2: Winter Operations Public Communications Channels**

| Channel | Comments |
|---|---|
| Phone, email and/or text messages | Overnight parking ban status updates sent by phone, email, and/or text message to subscribed residents. |
| 311 Call Centre | Incoming calls from the public fielded by 311 Call Centre staff. |
| Internet | Online snow page (www.halifax.ca/snow) updated on a timely basis. Street finder utility available at http://www.halifax.ca/snow/StreetPriorityFinder.php.[45] |
| Twitter | Twitter feed (@hfxgov) updated on a timely basis. |

**PART I: INVENTORY MANAGEMENT**

**Salt Storage:** The municipality has three salt domes, each with a capacity of up to 7,000 tonnes. At any given time, municipal and contracted crews have access to between 18,000 and 20,000 tonnes of salt. Salt domes are located at MacKintosh Depot, Turner Drive Depot and Bayers Lake Salt Dome. The municipality's current salt contract is with Canada Salt Inc. The Procurement division of Finance Information, Communications and Technology is responsible for ordering and stocking salt at the salt domes. Winter Operations staff are responsible for monitoring usage and ensuring that an adequate store of salt is maintained.

**Salt Inventory Management:** Prior to 2011, salt inventory management was a cumbersome and inaccurate manual process. Computerized salt scales were installed at all depots in 2011 to improve tracking of salt inventory usage, facilitate salt inventory reconciliation, enhance control of salt usage and minimize the loss of inventory. The salt scales eliminate manual surveying of the salt inventory. Manual surveying, compilation and inputting of salt/sand usage data has an approximated 10% error rate.

The computerized scale system is currently integrated into the municipality's technology network as a stand-alone inventory management system. In 2012 swipe card technology was introduced. Security cameras were also installed at each salt dome to further strengthen salt inventory monitoring and reduce risk of theft. Contingency plans are in place for manual inventory tracking when scale system technology is inoperable.

Salt inventory is provided to Winter Operations vehicles and to hourly based contract vehicles. Performance based contractors have historically been permitted to purchase salt at the municipal depots. The practice of selling salt to performance based contractors is, however, under review and may be discontinued to better manage the municipality's salt inventory.

[45] The online street finder utility allows residents to look up any street to find winter street maintenance responsibility particulars (municipality or Province) and frequency of clearing/standard of clearing particulars.