

COUNCIL REPORT

M&C No.	2022-351
Report Date	November 21, 2022
Meeting Date	November 28, 2022
Service Area	Public Works & Transportation

Her Worship Mayor Donna Reardon and Members of Common Council

SUBJECT: Winter Management Overview

OPEN OR CLOSED SESSION

This matter is to be discussed in open session of Common Council.

AUTHORIZATION

Primary Author	Commissioner/Dept. Head	City Manager
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RECOMMENDATION

It is recommended that Common Council:

1. Endorse the definition and service objective of Priority 6 streets as defined in M&C 2022-351, and
2. Receive this report for information.

EXECUTIVE SUMMARY

The purpose of this report is to update Common Council on what City staff will be doing, and is what is asked of the community, in keeping Saint John streets and sidewalks clear of snow, to specific objectives, for the 2022-2023 winter season.

Resources are lean to achieve service the City's Winter Management Plan (WMP) objectives. There are no redundancies to account for storm severity nor factors within or outside the WMP team's control.

The 2021-2022 winter season was the first true test of the ability to achieve service objectives defined in the City's Winter Management Plan with resource and organizational adjustments. Further service efficiencies and planning efforts have been identified and are being implemented to better assure objectives are met in volatile and variable conditions, including those related to the current economic environment.

PREVIOUS RESOLUTION

City staff presented a similar Winter Management Overview prior to the last 2021-2022 winter season.

REPORT

Inventory of Streets and Sidewalks Maintained During Winter Season

The City maintains 1160 lane-kilometers of roadways and 225 kilometers of sidewalks throughout the winter, enough to travel to Moncton and back to Saint John 4 times and run 5 marathons, respectively.

The City’s inventory of sidewalks is 400 kilometers long. A portion (240 KM) is cleared in the winter given available resources and sought service objectives. The decision of which sidewalks are cleared is based on a risk-management approach, with a combination of expected sidewalk use and the speed and volume of vehicle traffic on the adjacent roadway. Future work to better estimate sidewalk use is planned.

Service Objectives and Timelines

Specific outcomes related to clearing streets and sidewalks during and following winter storms are defined and measured as part of the City’s Winter Management Plan.

Each street and sidewalk fits into one of four priorities referenced in service objectives, as described in the following table:

	Priority 1	Priority 2	Priority 3	Priority 4
Streets	Arterial streets, highway connections, emergency routes	Major bus routes, schools, community centres, business districts	Collector streets, minor bus routes, industrial parks	Local or subdivision streets
Sidewalks	Major retail areas and major Saint John Transit bus stops	Immediate school areas	Remaining arterial street	Remaining local or subdivision streets

Following is a summary of what and when objectives are pursued for each priority:

- During a winter storm, achieve a basic level of accessibility on the City's Priority 1 and 2 streets and sidewalks, including to serve emergency vehicles,
- Clear passable travel lanes on streets on Priority 1 and 2 streets 8 hours after end of a storm, 12 hours after end of storm for Priority 3 and 4 streets,
- Push back and apply appropriate anti-icing material on Priority 1 and 2 streets 48 hours after end of storm, 72 and 96 hours after end of storm on Priority 3 and 4 streets,
- Clear a basic pedestrian passage on Priority 1 sidewalks 12 hours after the end of a storm, 24 hours for Priority 2 and 3 sidewalks, 72 hours for Priority 4 sidewalks
- Establish a walking surface with sand or salt applied at least once on Priority 1 sidewalks within 48 hours after end of storm, within 72 hours for Priority 2 and 3 sidewalks, within 96 hours for priority 4 sidewalks.

The City is resourced to achieve these service objectives in an average winter. Storm severity (measured as an index out of 100 points) and successive storms, among other factors, can impact achieving these objectives. It is also important resources are not diverted from achieving objectives of higher priority streets.

New Recommended Priority 6 Service Objective and Timeline

The City can reasonably clear the vast majority of streets that fit into the four established priorities in a range of winter conditions. A very small number of streets, in fact just a portion of one identified so far, has often not been cleared to meet timelines of any of the four priorities. Therefore, City staff believe it is important to identify the service standard we have actually been able to achieve on this street(s) with a newly defined Priority 6 in the City's Winter Management Plan.

The recommended definition of a Priority 6 street in the Winter Management Plan is as follows:

“Rural streets, typically gravel and with poor drainage, that, under particular climatic conditions, become rutted and/or ice packed and extra-ordinarily difficult or not possible to plow.”

The recommended service objective of a Priority 6 street in the Winter Management Plan is as follows:

“192 hours (8 days) after end of storm – travel lanes passable. However, when particular climatic conditions that create rutted and/or ice packed conditions occur, road will not be passable indefinitely. No push back operations considered.”

The Priority 6 definition and service objective definition above form one of City's staff's recommendations to Common Council a part of this report.

The street that gave rise to the recommended Priority 6 street definition and service objective is an unpaved portion of Old Black River Road. An overhead view and pictures of this section of street are shown in the accompanying City staff presentation. From the start of the gravel portion to the City limits is just under 5.5 km in length. Another 1.6 km length beyond that point is currently serviced during the winter through the City's Kilometrage agreement with the Province. This road was never built to any kind of standard and has many challenges including lack of drainage and lack of proper base and subbase materials. Two fishing lodges and an additional cabin have been occupied along this unpaved section of Old Black River Road, at times seasonally, at times year-round.

Currently, an inordinate amount of resources go to provide winter service to a handful of mostly seasonal dwellings. With finite resources available, the City must prioritize roads based on their function in the transportation network as well maximizing the benefit to citizens. Practically this has meant *starting* winter maintenance on Old Black River Road when other streets have been properly cleared which can take up to four days after the end of a storm. Because of the condition of the road it can sometimes take days to clear this street alone. As with service level standards on other streets, successive storms may preclude achievement of these objectives.

There are times, such as during much of the 2021-2022 winter season, when the ground is not frozen or repeated freeze-thaw cycles result in heavily rutted sections in low-lying areas of the roadway. During these times, equipment passage is not always possible, let alone any effective snow clearing. The combination of the 2021-2022 conditions and a recent change from seasonal to year-round occupancy of one of the fishing lodges for property security purposes with heightened demand for winter clearing, the gap between what is possible and stakeholder expectations for winter clearing became acute.

The proposed change in service level more accurately reflects what is achievable with current resource levels. Anyone living on this roadway should be aware of these service level standards and be prepared to be snowed in for extended periods at a time - or to have alternate transportation means available to them (i.e. snowmobile or ATV).

Upon approval of Council of this change in priority, any residents or fishing lodges on this section of road will be notified of the coming changes.

The above-noted Priority 6 category of streets may be considered a stop-gap measure as further work takes place to appropriately balance service expectations and risks to the organization.

Resources to Achieve Winter Management Plan Service Objectives

There are 44 plow routes, 33 street plow routes and 11 sidewalk plow routes. There is a maximum of one resource available at certain times for each street and sidewalk plow route - i.e. there is zero redundancy. Resources are lean to maximize cost efficiency.

Being a service with lean resource levels means the ability to respond to uncertainty is very challenging, whether that be variable winter conditions or availability of resources. With both known and potential resource challenges, there is a heightened risk of not meeting service objectives more often. Simply put, when a single resource is unavailable to plow one of the 44 plow routes, there is more often times when service objectives within that route will not be met. There will be more times during late evenings and very early morning hours when there will be gaps in service; impacts on service objectives being dependent on timing of storms and storm severity.

There are two specific changes this year that will impact resource availability. The first is nighttime recycling collection. This will require the reallocation of resources even during winter storms that could impact ability to meet service level standards on some streets. The second is the continuing challenge of supply chain disruption. The City of Saint John is not alone in this challenge, which is faced by other municipalities and businesses around the globe. Snow plowing is very hard on equipment and mechanical breakdowns are frequent. Staff have been seeing delays in timelines for delivery of replacement parts well in excess of what we have experienced historically. This also has the potential of increasing equipment downtime which can also impact deliverables.

For the 2022-2023 season, it is expected there will be more times during late evenings and very early morning hours when there will be gaps in service; impacts on service objectives being dependent on timing of storms and storm severity.

City staff highlight further in this report how your Winter Management team are responding to various risks including those related to resources with contingencies and Continuous Improvement.

2021-2022 Measurement of Service Objectives

In the 2021-2022 winter season there were seven recordable winter storms. The average Storm Severity of the seven storms, measured out of 100, was 44. It is also important to note that five of the seven storms last season occurred within one month, with these four storms having an average Storm Severity of 55.

For context, during the previous 2020-2021 season, there were four recordable winter storms over the entire season with an average Storm Severity of 42 (fewer storms with less severity than a one-month period in the 2021-2022 season).

Over 7 recordable storms in the 2021-2022 season, the City achieved an average of 91% (passable/pushback) for Priority 1 streets, 88% (passable/pushback) for priority 3 and 4 streets, 88% (passable/pushback) for Priority 1 sidewalks, and 72% (passable/pushback) for priority 2, 3, and 4 sidewalks. Three tables in Appendix A of this report show the Storm Severity (measured on a scale of 100), and the percentage where deliverables were met on streets and sidewalks for all seven storms. The Storm Severity is shown on a negative scale to reflect the fact that more severe storms can result in lower service objectives.

The graphs demonstrate better results earlier and later in the season with a more significant reduction in met objectives in January through early February. These results can be explained as follows:

- 1) Only two minor storms with average precipitation in December, negating the need for round-the-clock snow servicing.
- 2) Pre-season equipment inspections/maintenance for the start of the season ensured our readiness.
- 3) Four severe winter snowstorms occurred within one month, which aligns with the drop in performance.

Performance during winter storms will be tracked again this winter season, and adjustments to service level standards considered in advance of the next update to Council in 2023. In particular, difficulties in meeting objectives for sidewalks may warrant adjustments to the service level standards, or resource levels in future years.

Continuous Improvements and Contingencies Identified During and Following 2021-2022 Season

With the last 2021-2022 season being a challenging one, and with known and possible resource availability risks, several additional contingencies and Continuous Improvement initiatives have been identified and pursued:

Enhanced Storm Response Planning and After-Action Reviews – During the 2021-2022 season, storms were handled as “mini-projects”. Cross-department pre-storm meetings and after-action reviews were completed. This enhanced level of planning is seen as a “keeper” for the upcoming season.

EMO-Inspired Cross-Department Coordination – During the approximate one-month period of four successive storms between early January and early February 2022, City staff commenced daily cross-department coordination meetings. Although the situation did not quite meet the warrant for activation of the City’s

Emergency Management Organization, City-staff never-the-less employed many of the same values and processes. This enhanced level of coordination is another “keeper” if severe conditions in 2022-2023 or beyond warrant.

Improved Highway Salt Availability – The challenging nature of the 2021-2022 season put pressures on highway salt usage to keep streets clear of ice and slippery conditions. Prior to last season, City staff placed heightened priority on managing impact on the 2021 General Fund Operating Budget by attempting to straddle initial season stocking of the City’s two salt sheds between the 2021 and 2022 fiscal years. A few early storms last season put early pressure on salt usage, combined with the City’s supplier of salt having a difficult time fulfilling demand from its various clients, including the City. Although the City maintained enough highway salt and abrasive sand during the 2021-2022 season to meet service objectives, the risk of running out of highway salt became greater than City staff was comfortable repeating, with uncertainty whether supply challenges will be improved for this next 2022-2023 season. For the 2022-2023 season, City staff have chosen to stock both salt sheds to capacity ahead of the season, which is now complete. City staff are continuing to pursue salt preservation techniques, including direct liquid application of brine City streets in advance of winter precipitation to further mitigate a repeat of high demand and low supply conditions and for environmental and financial purposes.

Improved Cutting Edge Availability – Cutting edges are the wearable components on the bottom of plows that need to be changed throughout the season. Similar to the 2020-2021 season, suppliers are not able to hold prices for the upcoming season in a consistent supply contract given the fluctuating price of metals in our current economic conditions. City staff are predicting extended ordering and supply timelines as a result, again which would be exacerbated if another challenging winter season occurs. In the previous season, the City remained with enough stock to not impact pursuit of service objectives, but the risk of running out of cutting edges became greater than City staff was comfortable repeating. For the 2022-2023 season, City staff have chosen to pre-order a much greater quantity of cutting edges to mitigate a risk of high demand and supply delay conditions.

Mitigating Increased Plow Fleet Age – Delays in delivery of replacement vehicles have required us to extend the service life of some of our equipment. As a result this older equipment is more susceptible to breakdown. In addition, supply chain issues with replacement parts is likely to extend down-time in the upcoming season. Several steps are being taken to mitigate the risk of extended down time of plow trucks, including

- Efforts to seek purchase of a plow truck that may be available in the market for this upcoming season,
- A heightened focus on equipment preparedness (detailed further in this report),
- Continuous efforts to stock spare parts, and

- Temporary rental agreement for one additional piece of heavy equipment

Increasing Use of Available Tracking Data – The City has the technology to track locations of where plow trucks have travelled. For 2022-2023, this data will be used more to identify streets that are either under serviced or serviced too much during and following winter storms.

Increasing Sidewalks Plowed with Street Plow Wings – Plowing sidewalks with wings of street plow trucks can complete the clearing faster and provides an opportunity to reduce or eliminate snow built up along the curb-line. However, this process is not possible in some circumstances and requires heightened coordination and training. Therefore, for 2022-2023 year, a minor increase in sidewalks plowed with a street plow wing will be planned.

Changes to Timing of Called Overnight Parking Bans – In the 2021-2022 season, City staff attempted to be very proactive in calling overnight parking bans. Typically a North-East-West (NEW) ban was called the night of a storm and the South Central Peninsula (SCP) ban was called the night following a storm. Calling the NEW bans during a storm was problematic as it was difficult to reach all streets during the storm, a legitimate expectation of residents who experienced the inconvenience of finding alternate parking arrangements and created transportation challenges for enforcement personnel. For 2022-2022, calling bans during the night of a storm will generally be avoided and a switch in the sequence of bans changed (i.e. SCP bans occurring first, typically the night after a storm, followed by a NEW ban if needed the next night). There will also be the need for more localized parking bans for which signage needs to be put out a minimum of 24 hrs in advance. Staff believe this change in particular should be highlighted in pre-season public communications.

Earlier Focus on Winter Preparedness – In the end, fighting snow storms is a largely responsive service where the challenges are varied and often compounded. The best way to be even better at a responsive service is through adequate preparations and focus. As such, in advance of the 2022-2023 season, a switch from a focus in Public Works summer operations to winter preparedness commenced November 13, a full two weeks earlier than the previous season.

Future Continuous Improvement Initiatives

Additional Continuous Improvement projects related to winter storm management will be pursued in the future including:

- Road temperature measuring technology,
- Forecasts more specific to Saint John's climate,
- Data and technology to better understand sidewalk use in winter conditions.

How Can the Community Help?

The community can continue to play a significant role in maintaining our livable and safe city throughout the winter. Remaining informed about our Winter Management Plan through visiting the Snow Removal section of the City's website at www.saintjohn.ca is important. Planning for additional travel time or re-evaluating the need to travel at all during or immediately following forecasted storms will help. Use of winter tires and proper footwear will provide added traction as streets and sidewalks are going to be slippery at times, particularly while service objectives are being pursued. Keeping catch basins or fire hydrants around a citizen's property clear of snow and other debris will help ensure these are available to protect neighbourhoods if or when the need arises. Property owners are reminded snow from their property is not permitted to be placed onto City streets and sidewalks; this delays our ability to serve you and your neighbours and is a violation of one of our by-laws.

The City appreciates some in our community have no or limited off-street parking, or use of off-street parking that is available can be inconvenient. The City has developed over the years, and continue to refine, a comprehensive system of ensuring on-street parking is available when and where needed as much as possible while supporting effective snow clearing efforts that we all also expect. If on-street parking occurs when snow clearing equipment is on a street, in efficiencies are introduced as equipment needs to return at a different time, or service objectives do not get met for that street. The community can help by following on-street parking regulations for a particular street, parking off-street when overnight parking bans are called is important, and parking off-street whenever possible.

City staff, through our Integrated Customer Service Centre, are available to interact with the public at any time. Remaining informed about the City's winter management plan on our website, however, will assist in understanding expectations of service during and following storms. Patience during more severe storms is requested. Although we are available to interact with the public 24/7, citizens remaining informed will help prevent surges in calls to us during and following storms that may delay or prevent others with a need from reaching us.

City staff do not have the ability to divert resources, such as to plow lower priority neighbourhood streets sooner or to provide enhanced clearing in front of driveways.

STRATEGIC ALIGNMENT

This report best aligns with Common Council's priority of:

- **Move** – by contributing to the re-establishment of safe transportation options following a winter storm event, and
- **Perform** – by measuring results and continuous improvement of the street and sidewalk snow clearing service.

SERVICE AND FINANCIAL OUTCOMES

Staff is optimistic the service improvements and contingencies introduced for the 2022-2023 winter season, in conjunction with past initiatives, such as live edge plow technology and brine usage, will allow your Public Works team to maintain a consistent, balanced approach in providing citizens with quality service during the winter months with the resources and equipment available. We will continue to monitor success this coming season.

INPUT FROM OTHER SERVICE AREAS AND STAKEHOLDERS

Input was sought from additional City Departments including:

- *Communications*
- *Customer Service*
- *Fleet Services*

ATTACHMENTS

Appendix A: Storm Severity, Street Service Level Objectives, Sidewalk Service Level Objectives Experienced in 2021-2022 Season

City Staff Presentation

Appendix: A

Storm Severity, Street Service Level Objectives, Sidewalk Service Level Objectives Experienced in 2021-2022 Season



