Roadways Emergency Response Plan for Extreme or Unusual Snow Events – December 2022

ISSUE

This report provides a summary of the first activation of the Roadways Emergency Response Plan for Extreme or Unusual Snow Events in December 2022. It includes details of the plan's execution, outcomes, and opportunities for refining its effectiveness during future emergency snow events.

BACKGROUND

City Council approved the Roadways Emergency Response Plan for Extreme or Unusual Snow Events (Plan) at its September 27, 2021 regular meeting. The Plan consists of an immediate and planned response to extreme or unusual snow events, including a phased approach for winter maintenance activities required to restore mobility and safety on Saskatoon's streets and sidewalks.

Highlights of the Plan are included in Appendix 1. A video describing the plan is available at https://youtu.be/-fDoEmlF0KQ.

The Plan, which was developed using the City of Saskatoon's (City's) experience from the response to the November 2020 extreme snowstorm, was activated for the first time on December 28, 2022. The Plan was activated after two back-to-back snow events between December 25 and 28. These events resulted in 34 centimetres of snow accumulation and severely impacted mobility on streets and sidewalks. Prior to this, Saskatoon had already encountered four snow events, an above-average number of snow events for that period of the winter season. These four snow events had resulted in a total snow accumulation of 40 to 50 centimetres. As a result, there was no snow storage capacity left in medians, parking lanes and boulevards along most priority streets to store new snow, without narrowing the driving lanes and impacting safety.

The Emergency Management Organization activated an Emergency Operations Center, and Roadways, Fleet and Support activated a Tactical Operations Center to coordinate and manage the City's response to the major snowfall.

On January 17, 2023, the Governance and Priorities Committee considered the report titled "Update on Roadways Emergency Response Plan Activated December 28, 2022" and resolved:

> "That Administration include information in the annual winter maintenance report about improvements to private contractor procurement for future emergency snow responses."

The requested information about improvements to private contractor procurement is included in this report, which is being presented in conjunction with the annual winter maintenance report.

Prior to December 28, 2022 there was no City Council approved funding for future activations of the Plan in response to extreme or unusual snow events.

At its regular meeting held on January 25, 2023, City Council considered the report titled "2022 Roadways Emergency Response Plan Funding Options [GPC 2023-101]", and resolved:

> "That borrowing be approved as the funding source for the 2022 Snow Response, with reporting to be provided to Council in advance of budget including options for borrowing to be repaid by reductions to the 2024-2035 Major Capital Plan as contained in Option 3 or building in a 0.75% dedicated property tax phase in for the 2024 to 2027 budgets to repay the borrowing and build in base funding for future snow responses as contained in Option 4."

CURRENT STATUS

The close-out of the December 2022 activation and subsequent execution of the Plan has been completed, including surveys of key stakeholders, financial analysis, and identification of new improvement opportunities.

DISCUSSION/ANALYSIS

Lessons Learned from Response to November 2020 Snowstorm

The experience from the response to the November 2020 extreme snowstorm resulted in several lessons learned which enabled the City to respond to the December 2022 major snowfall more efficiently. The following improvements contributed to the more efficient response:

- Having a detailed City Council-approved emergency response plan. The response team clearly understood the scope of work to be completed and potential challenges. The plan enabled the team to quickly mobilize crews, take steps to prevent problems faced during the November 2020 response, and work more efficiently.
- Early assignment of additional capacity to the core response team to manage and coordinate the work, including inspectors and engineers. This resulted in proper resourcing of the team.
- Increased number of inspectors, improved contract terms, and clear quality requirements. This resulted in more consistent quality of workmanship.
- Improved progress tracking and planning and scheduling processes. This resulted in less frustration and improved efficiency for both the project team and contractors.
- Sequencing of neighbourhoods for residential snow removal. This resulted in lower costs for crew mobilization and de-mobilization. The sequencing was shared with the public early in the response and provided better information to residents about when snow removal in their neighbourhood was planned.
- Early assignment of resources to "spot issues" such as snow piles in pedestrian crossings, and obstructed driveways and transit stops. This helped address these issues faster while allowing the larger equipment to maintain progress and continue clearing the streets.

- An improved communications plan. The plan included frequent updates at saskatoon.ca/snow that had over 50,000 visits from residents, radio advertisements, news releases and the map view of the neighbourhood snow removal sequencing.

December 2022 Response Overview

Once the activation criteria were met, the Plan, which includes snow grading and removal along all Saskatoon streets (priority and residential) and clearing of all City maintained sidewalks, was activated. This work was a major undertaking requiring allocation of significant additional capacity to the Roadways, Fleet and Support department. The extra capacity included City employees from other departments and private contractors. City crews, contractors and management personnel worked extensive overtime.

The approved Plan was used to prioritize and guide the response operations. The trigger event involved snowfalls over several days, which allowed crews to maintain mobility on priority streets with early and repeated snow grading. City and contractor crews completed priority street grading earlier than the targeted timelines in the Plan, which were based on one large snowfall. Saskatoon Transit did not experience any significant interruption to transit services.

Steady progress of Phase IV snow grading of local and industrial streets allowed for some Phase V snow removal to be advanced while meeting the targeted timelines for snow grading.

Upon completion of the response, the core response team debriefed on all the processes and activities and gathered feedback on the City's response and opportunities for improvements from key stakeholder groups including internal customer service and communications staff, City crews, contractors and the public. A statistically relevant survey of Saskatoon residents validated many of the targeted service levels in the Plan and identified some activities that could be improved. Some work processes will be improved due to the received feedback; however, there were no significant recommendations that require Plan modifications. A summary of the public survey results is found in Appendix 2.

One of the most common improvement suggestions from residents was to complete the snow removal phase faster. All snow removal work was completed within approximately nine weeks (64 days). The target completion timeline for this phase of the Plan is approximately eight weeks. This target timeline was based on the experience from the November 2020 snowstorm, which was the first snow event of the season and resulted in less snow that had to be removed from the streets, compared to the snow removal after the December 2022 event.

The timelines included in the Plan depend extensively on contracted resources. Contractors were invited to submit bids to assist with the response and practically every contractor that could provide winter maintenance services was hired. There is a finite

amount of equipment within the contracting industry around Saskatoon available for this type of work.

Completion Timelines and Key Accomplishments

A timeline of the work phases comparing actual to targeted completion times is included in Appendix 3.

The following summary provides an overview of key accomplishments:

- Snow grading along all streets in Saskatoon substantially completed within 8 days of the end of snowfall, sooner than the targeted timeline of 10 days.
- Snow removal along Priority 2 and 3 streets completed within five weeks. This is the fastest this work has ever been completed.
- 102,000 truck loads of snow removed from Saskatoon streets.
- 1.4 million cubic metres of snow stored at the three snow management facilities at the Civic Operations Centre, along Wanuskewin Drive and Central Avenue. This is approximately four times the amount of snow stored at the snow management facilities in years leading up to 2020.

Required Effort and Resources

The following summary provides an overview of the required effort and resources to execute all the phases of the Plan. Most of the work was undertaken in the snow removal phase (Phase V):

- Approximately 250 people were dedicated full-time during Phase V. This included contractor and City crew members, inspectors, and managers.
- A typical day during snow removal included 150 haul trucks, 32 graders, 18 loaders, 4 snow blowers, 12 skid steers, 10 pilot trucks, 7 dozers, 11 tow trucks and much more light equipment.
- 27 contracting companies provided additional resources including haul trucks, loaders, snow blowers, dozers and graders. Contractor capacity for towing vehicles and hauling snow to assist City snow removal crews was fully utilized.
- 94% of all contractors that submitted interest and pricing for local street snow removal were hired.
- 500 crew days of effort to remove snow piles on local streets.
- Parking restriction signage was posted along approximately 950 kilometres of streets.
- Nearly 500 maps were created for the sign management crews to put up parking restriction signs. About 20 additional employees were hired temporarily to undertake this work.
- 18 additional engineers and engineering technologists from other City departments joined the effort full time during the snow removal phase for inspections and contract management.
- Additional support was provided by many other City employees not typically involved with winter maintenance to assist with responding to resident inquiries, communications, finances, logistics and procurement.

Snow Removal

Snow removal on priority streets was completed using different crews and equipment than snow removal on local streets due to different street characteristics. Appendix 4 includes pictures of the different types of equipment used.

Snow blowers were used to remove snow piles along priority streets while keeping the street open for traffic. This work was completed at nighttime to minimize impacts on traffic and pedestrian movement and mobility.

Snow piles on local streets were removed with loaders. This work was completed during the daytime and the streets were closed to traffic. There are typically fewer parked vehicles along local streets during the day. In addition, working in the daytime provides better visibility to the operators, reduces the risk of safety-related incidents and equipment noise during the night hours.

Local street and priority street snow removal operations occurred concurrently. On a city-wide basis, priority street snow removal was completed before the local street snow removal. However, within each neighbourhood, there were instances where the local street snow removal was completed before the priority street snow removal. It is estimated that eight snow blower crews would be required to complete the snow removal on the priority streets before the local streets in each neighbourhood. Last winter, four snow blower crews were removing snow from priority streets. A snow blower crew includes 3-4 graders, 10-15 snow hauling trucks, a grader, and a pilot vehicle. This operational change would be challenging due to limitations on snow blowing equipment and personnel availability and would result in significant incremental costs.

Approximately 70% of surveyed residents indicated they were satisfied with the approach used to determine the order of neighbourhoods for local street snow removal, 17% of residents were not satisfied, and 14% were not sure.

Lessons Identified

The December 2022 activation and execution of the Plan resulted in several lessons identified that are expected to improve response when the Plan is activated next time.

- Lesson 1 - Procurement

The procurement process for hiring snow removal contractors will be modified to reduce the timeframe for procurement and activation of services once the Plan is initiated. Procurement at the City is conducted in accordance with the City of Saskatoon Purchasing Policy C02-045. The process changes will be accomplished by pre-qualifying bidders (private contractors interested in this work) and having all contract documents developed and in place before the start of the winter season. With these steps undertaken, the City will be then able to proceed and obtain pricing from the prequalified companies when the Plan is initiated. Given that it is not reasonable to secure pricing every season for such a large quantity of work without certainty that the work will take place, this approach strikes a good balance of being prepared while not

doing unnecessary work or making commitments to contractors when work is not guaranteed. Other procurement options under the approved policy that are applicable to emergency situations may be considered, as needed.

Another lesson identified and opportunity for improvement that will be pursued is looking for ways to secure sufficient vehicle towing capacity. Vehicles that did not follow parking restrictions were towed to a nearby street to provide sufficient room for the large equipment to do the work. Delays were experienced due to a lack of available private towing trucks. Options to enhance the capacity for towing vehicles will be explored further.

- Lesson 2 - Parking Restrictions

The "No Parking" signs were found to be a very effective method of informing residents about snow removal and were the most recalled source of communication in the public survey. However, these signs will be modified to make it clearer whether the parking restrictions are applicable for the day or night only, and which days of the week. This will help reduce some residents' confusion and frustration with parking restrictions.

- Lesson 3 - Snow Grading Capacity

The Plan states that an additional 10 graders beyond the 32 used for a typical snow event are required to meet the timelines when the snow falls at one time. Despite identifying these additional contracted resources in advance, not all were readily available when the Plan was activated.

City crews will pilot clearing snow from select streets with snowplow trucks, rather than the graders typically used. Snowplow trucks travel faster than graders so there is the potential to complete the clearing work quicker, although there may be some challenges with snow ridges left behind. Upgrading some City tandem sander trucks to include plows has the potential to improve capacity and resilience to major snowstorms, without relying on contractor assistance that may not be readily available.

- Lesson 4 - Initiation of Plan Phases

The Plan provides for flexibility to only execute certain phases based on the time of year. With the December 28 activation, the work was fully completed by March 2, only weeks before the typical spring melt. The later winter start and completion meant that the benefits of the snow removal phase were experienced for a shorter time. An option could be considered to revise the Plan to indicate that the snow removal phase (Phase V) will not be completed if the activation of the Plan occurs after January 1 or later in the winter. It is noted however, that 81% of surveyed residents stated that removing snow piles from residential streets was important.

- Lesson 5 - Sidewalk Clearing

The Plan identified that sidewalk mobility may be reduced until the snow removal phase (Phase V) due to piled snow spilling onto sidewalks. Almost half of residents that responded to the public survey indicated that the snow piles impacted their ability to use the sidewalks. This was due to a combination of snow piles spilling onto the sidewalk as

well as the snow piles creating a barrier between the street and the sidewalk. The barrier meant pedestrians could not cross the street mid-block or quickly access the sidewalk from their parked vehicle.

Snow piles that spilled on sidewalks were addressed during the snow removal phase. Crews removed snow piles from the streets plus any snow spilled on the sidewalks. There are nearly 1,700 kilometres of sidewalks in Saskatoon and currently only about 200 kilometres of those are cleared by the City, with the remainder cleared by the adjacent occupant or landowner.

An option could be considered to have crews clear sidewalks separately from the snow removal phase. This could address situations where the snow piles spill over onto the sidewalk but may not eliminate all concerns from residents about accessibility of the sidewalks because the snow piles will still be in the curb lane. This work would take several weeks and result in incremental costs.

FINANCIAL IMPLICATIONS

The total cost of the response to the December 2022 major snowfall was approximately $18 million.

The table below breaks down the total cost by Phase. The numbers are rounded for simplicity. Phase V, city-wide snow removal, represents 89% of the total cost, with snow removal along local streets accounting for 54% of the total cost.

Phase of Emergency Response Plan	Cost	% of Total Cost
Phase 1 to 3: Priority Street Snow Grading & Sidewalk Clearing	$600,000	3%
Phase 4: Local Street and Industrial Street Snow Grading	$700,000	4%
Phase 5: Snow Removal in BIDs	$500,000	3%
Phase 5: Snow Removal in School Zones	$400,000	2%
Phase 5: Snow Removal on Priority 1 Streets	$1,500,000	8%
Phase 5: Snow Removal on Priority 2 and 3 Streets	$4,000,000	22%
Phase 5: Snow Removal on Local Streets	$9,700,000	54%
Sanding and Salting	$600,000	3%
TOTAL	$18,000,000	

The cost of responding to this snowstorm was higher than the cost of responding to the 2020 snowstorm of approximately $14 million. This was primarily due to inflationary pressures for materials, fuel, and contractor services as well as more snow removed from the streets.

Winter material costs and contractor costs have increased 15 to 20% since 2020. Contractor costs represented about 70% of the overall costs, so inflationary pressure on contractor costs was very impactful to the overall cost of the work. A contributing factor

to the rise in contractor costs has been the changes in fuel prices since 2020. There was also more snow to grade and remove due to the snowfalls that occurred prior to the activation of the Plan.

OTHER IMPLICATIONS

There are no privacy, legal, social or environmental implications identified.

NEXT STEPS

Unless otherwise directed, the Administration will undertake the following steps:

- Introduce a new procedure for prequalifying contractors and prepare all contract documents required to expedite procurement of contractor services for future Plan activations.
- Explore options to enhance the capacity for towing vehicles.
- Modify “No Parking” signs to make it clearer whether the parking restrictions are applicable for the day or night only, and which days of the week.
- Pilot clearing snow from select streets with snowplow trucks rather than graders.

APPENDICES

1. Highlights of the Roadways Emergency Response Plan for Extreme or Unusual Snow Events
2. Public Survey Results
3. Timeline of ERP Phases
4. Pictures of Snow Removal Equipment

Report Approval

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