

Alternative Approaches to Snow and Ice Control

Recommendation

That the July 6, 2020, City Operations report CR_7694, be received for information.

Previous Council/Committee Action

At the October 8, 2019, City Council meeting, the following motion was passed:

That Administration prepare amendments to the Snow and Ice Control Policy and provide a report in June 2020 detailing enhancements or additional measures that can be made to achieve a safe winter road surface, which could include bare pavement without the use of salt, calcium chloride, and sand.

At the February 3, 2020, City Council Meeting, the following motion was passed:

That Administration include in the Alternative Approaches to Snow and Ice Control report options for windrow snow removal with a range from 30cm to 0cm.

At the March 9/11, 2020, City Council Meeting, the following motion was passed:

That Administration include, as part of the Alternative Approaches to Snow and Ice Control report, the feasibility and high-level costs/benefits of residential snow and ice clearing pilot project in one or several neighbourhood(s) which may include full snow services eg. Sidewalks, crosswalks, windrow removal, parking bans, multi-use paths, and residential roads and alleyways.

Executive Summary

Snow and ice control is one of the many high-visibility, high-impact services provided by the City of Edmonton. The public often views the effectiveness of the program as an indicator of value for their tax dollars. Edmontonians have indicated that they want clear roads, as fast as possible. To achieve a safe mobility network as quickly as possible, Administration and residents must work together. Edmontonians play a key role in supporting City staff and contractors as they deliver high-quality service more efficiently.

This report details a series of short and long term actions to enhance the Snow and Ice Control program, with the goal of improving the experience and safety of the mobility

network in the winter. These actions include enhancements to residential snow clearing as well as refreshing and refocusing the Snow and Ice Control Policy to enable Administration to be more agile and provide a more resident-focused service.

A residential parking ban is key to providing higher quality service and improving the experience of residents during the winter. With vehicles removed from the road, operators are better able to clear curb-to-curb and can do so more efficiently. Coupled with modifications to the residential service level, Administration will be better positioned to meet the expectations of residents and Council.

The COVID-19 pandemic has changed the way Edmontonians move around the city. There have been significant changes in overall traffic volume, transit ridership and sharing of streets and active pathways. Administration anticipates that COVID-19 will continue to impact residents' behaviours and experiences with the City and its operations. COVID-19 also presents an increased challenge for the City to deliver a high level of service with increased financial pressures. This report and subsequent conversations with Council present an opportunity to ensure service delivery is anchored in a satisfying experience for residents balanced with responsible fiscal management.

Report

Edmonton has implemented a number of best practices for Snow and Ice Control, many of which were developed through learnings from other jurisdictions with similar, though not identical, conditions. As the most northerly major city in Canada, the historical climate and weather patterns are distinctive and vary from common comparator cities in North America, including Calgary, Regina, Winnipeg and Minneapolis.

The current Snow and Ice Control program has been heavily influenced by past weather events and resident experiences. This report presents options and actions to modify and enhance the program to provide a more agile response for residents in the future.

Refocusing the Policy: Resident Experience and Communications

To support the re-alignment of the current policy with resident and Council expectations, Administration has undertaken a comprehensive review using a customer experience focused process and is developing a modernized, outcome-based policy that will focus on safety, environmental stewardship, service responsiveness and livability. Comprehensive administrative procedures will support the policy and enable Administration to be agile and responsive to conditions and resident needs.

Outcomes and performance measures are key components of the refreshed Snow and Ice Control Policy (C409). A Strategic Framework has been developed and is presented in Attachment 1. This Framework builds on the *Safe Mobility Strategy* (currently under development), as effective snow and ice control is a key component to a safe and livable mobility network.

Work is underway to develop enhanced customer insights and better understand the resident experience, including the unique communication requirements of stakeholder groups. This work will provide Administration with a more inclusive understanding of stakeholders' needs, leading to improved communications and enhanced program delivery.

Larger cross-corporate initiatives are underway that will help provide more specific information to stakeholder and operational groups, including:

- Installing active GPS in City vehicles;
- Exploring ongoing improvements to digital communication tools and technologies for Snow and Ice Control notifications, including the potential to provide push notifications and/or alerts to residents who subscribe; and
- Customer journey mapping to provide insight to the resident experience.

Parking Ban

For the Snow and Ice Control program to deliver on the outcome of a *Safe and Livable Winter Mobility Network*, and for the proposed service level to be effective, a city-wide, all road parking ban is required while crews are clearing. A city-wide ban will allow Administration to integrate existing parking bans - including the Seasonal Parking Ban routes - with the residential road network to create a new comprehensive program. Residents will benefit from a faster, higher quality service that results in safer and more usable roads. Administration will see benefits from being able to deliver services more efficiently and effectively.

Administration has conducted pilots of parking bans in residential areas in the past:

- One-sided parking ban - 2014/2015 season
- Odd/even side parking ban - 2019/2020 season

Both pilots had limited benefits to residents and operators, as challenges to deliver a high-quality service included: low compliance to the bans (roads are most effectively cleared if they have no parked vehicles), uncertainty around where and when to park and increased heights of windrows on the unplowed side of the street.

Despite the limited success of the pilots, residents have expressed strong support for mandatory parking bans in residential areas: 82 per cent of respondents indicated they

were likely to comply when asked in the May 2020 Insight survey, while 62 per cent indicated support when asked during the 2019 Residential Snow and Ice Control public engagement.

The proposed parking ban would build on the successes and lessons learned from the existing Seasonal Parking Ban and would be the same style - declared when conditions in residential areas warrant and ended when the work is complete. Administration would design the program to minimize impacts to residents, including enhancing scheduling and communication, and allowing parking once the plow has been through the area.

Administration will design the proposed parking ban based on the following principles:

- Following existing priority levels, beginning with Priority 1, including Business Improvement Areas;
- Effective only when and where crews are clearing, with parking allowed once crews have completed a section of road;
- Designed using a GBA+ lens to determine which residents could be inordinately adversely impacted by the ban and how to minimize the duration that residents are required to be off the street; and
- Integrated, timely and effective communication.

A full-season, full parking ban (mid-October to mid-April) is presented as a key component of the Full Removal Service level option. This style of parking ban is required to allow Administration to provide snow-free conditions throughout the winter season. This ban would require that there is no parking on all roads for the entire duration of the season (mid-October to mid-April).

Parking ban details are presented in Attachment 2.

Service Delivery and Service Level

The core of an effective Snow and Ice Control program is clear and concise service levels. Service levels are the primary way Administration prioritizes services while balancing limited resources - people, equipment and materials. Residents and Council have indicated that current service levels are not being met and leave room for interpretation.

In response, Administration has undertaken a comprehensive service level review with a specific focus on residential roads. This review has resulted in the development of a modified residential service level, which builds on the existing services provided to residential roads and proposes modifications that will balance cost with an improved level of services to residents. Should Council choose to increase service levels,

Administration will prepare this enhanced service level for the coming Winter season (2020/2021) for consideration at the Fall Supplementary Operating Budget Adjustment.

In response to the motion at the March 9/11, 2020, City Council meeting, Administration has prepared a second option - Full Removal. At this service level, all snow and ice control services are provided by the City, with the intent of maintaining snow-free conditions throughout the season for all residents. This option increases the service level for all priorities of roads and Active Pathways, not just residential roads.

The service levels are presented in detail in Attachment 3.

Balancing Considerations: Quality, Timeliness and Speed of Service

Any discussion of service levels for snow and ice control necessitates a discussion of tradeoffs. Financial and non-financial tradeoffs are by their nature intertwined but are presented separately here for simplified consideration. The primary tradeoffs are the residential snowpack, a parking ban and culs-de-sac and are discussed in detail in Attachment 4.

Administration understands that each of these tradeoffs impacts all stakeholders, particularly residents, businesses and industry partners. To mitigate the impacts of these changes, Administration is proposing the following:

- **Residential Snowpack:** Conducting enhanced residential routine winter roadway maintenance to minimize the depth of snow and reduce icing, ruts or a collapse of the snowpack.
- **Parking Ban:** develop a comprehensive and transparent program, designed to work for Edmonton, but informed by best practices from other municipalities.
- **Culs-de-sac:** develop a detailed service plan that balances speed of service with the cost of service provision. This service plan would seek the optimal balance of City services (including equipment and staffing) with contracted services.

These mitigations will result in additional future budget impacts. Administration will return to Council to present these impacts as applicable.

Windrow Heights and Culs-de-sac

Windrows are a key component of a service level and are one of the primary ways residents experience and assess the effectiveness of snow and ice control. Operators do their best to minimize heights where possible; otherwise, they aim to keep windrows to the 30 cm height or less when blocking a driveway as defined in the current policy. Operationally, heights below 15 cm are too difficult to maintain and

instead require full removal. Details of the height options and their associated service level are presented in Attachment 5.

The frequency of culs-de-sac winter maintenance is also a primary driver of the resident experience for snow and ice control. Edmonton currently has more than 3,300 residential culs-de-sacs. Clearing a cul-de-sac requires specialized equipment: skid-steers or front end loaders to remove snow from the pavement and stack it in the centre. Crews then return to move the snow stack into trucks and haul to specialized snow dump sites. Truck-mounted plows and graders cannot be used. Administration currently uses hired equipment to perform this service, as it can take four to six weeks of continuous effort to clear all 3,300+ culs-de-sacs if completed by one contractor.

Due to the time it takes to complete one cycle, culs-de-sac clearing is undertaken separately from other snow and ice control services. This can result in a disconnection between the clearing of a cul-de-sac and the road segment that leads into it. Administration is committed to improving this service experience and is preparing a plan to undertake cul-de-sac maintenance on a scheduled basis, up to three times per year as required. This will not impede or replace Administration's ability to conduct this service in response to major snow events.

Enhancements to Achieve a Safe Winter Road Service

Administration has conducted a comprehensive investigation into the various chemical tools that exist for snow and ice control. All materials come with tradeoffs. Administration is confident that the current mix of tools in use strikes an appropriate balance of cost, effectiveness and environmental impact. Details of the tools available for snow and ice control are presented in Attachment 6.

Previous jurisdictional scans found that no municipality or provincial/state transportation department used mechanical means only for snow and ice control. It is not cost effective to achieve a safe and livable winter mobility network without the use of abrasives or chemical ice control. The cost of this option cannot be accurately estimated, as the total cost depends on many uncontrollable factors, which can include the duration of the winter storm event, the type of precipitation and the temperature of both the air and the pavement and the cost and availability of contracted equipment. To focus on mobility network safety, a variety of tools are deployed, focusing on using the right tool for the right condition.

Full Removal Service Level

Administration has reviewed the motion from the March 9/11, 2020, City Council Meeting and has determined that a full removal service level is not financially feasible at this time. Total costs of this option for city-wide service are estimated at \$265 million to \$271 million for an average winter season.

Changes that would be required are as follows:

- *Priority 4 Roads (Residential):*
 - Pavement - bare pavement after each snowfall with pick up of all snow including all windrows and windrow-free zones, after each snowfall; +\$135 million
- *Active Pathways (Existing network):*
 - Daily Service during/after weather events; +\$3 million
- *City sidewalks abutting private property:*
 - Daily Service during/after weather events - includes all crosswalks and curb ramps; +\$60 million
- *Cul-de-Sac:*
 - Scheduled removal up to 3 times per season as required, additional removal(s) possible based on weather events: +\$6 million to +\$12 million
- *Bus Stops (Existing Network):*
 - Daily Service during/after weather events; +\$1 million

The benefits of this model include:

- Consistent service level provided to all property owners;
- Minimized mobility network downtime due to winter weather events;
- Faster recovery of the full mobility network from winter weather events; and
- Reduction of the overall environmental impact of abrasives and chemicals (city-wide), as continual service would reduce snow and ice buildup.

The drawbacks of this model include:

- Substantial (approximately 350 percent) increase in overall costs for the Snow and Ice Control program, including City staff, equipment (owned and leased), materials and contractors;
- Substantial increase in contracted services This capacity likely does not currently exist in the marketplace; additional market capacity would require the City to be the primary funder;
- Increased climate and environmental impacts as a result of increased usage of snow removal and hauling equipment;
- Perceptions of inequality due to standardized routing; and
- Reduction of resident responsibility in maintaining a safe and livable mobility network.

Considerations of a pilot program include:

- Transparent and equitable identification and selection of pilot neighbourhood(s);
- Increased funding to support dedicated staff and contractors for the duration of the program; and

- Comprehensive communications and engagement activities to support both selected neighbourhood(s) and those not selected.

Program Enhancements: Underway and Planned

Administration has multiple projects and activities that are either underway or planned to support and enhance the Snow and Ice Control program. They include:

Enhancements Currently Underway

- *Monitoring Program*: integration of existing monitoring activities into a comprehensive, ongoing program. Monitored items are presented in Attachment 7. Administration will provide Council the results of the 2019/2020 program in late summer/early fall of 2020.
- *Weather Stations*: Upgrades to existing stations, including moving some to optimal locations. The Government of Alberta's Transportation Ministry has provided access to data from their weather stations that monitor the condition of Anthony Henday Drive.
- *Weather Forecasting*: Additional services have been secured to support enhanced reporting and provide forecasting. The city has been segmented into three zones (micro-climates) for optimized forecasting purposes.
- *Maintenance Decision Support System*: The combination of upgraded weather station hardware and enhanced forecasting feeds into a new operational decision support system. This system will assist in choosing the right mix of services and materials to deploy, including customizing sand/salt mixes for the best outcome in smaller zones.
- *Active GPS in City-owned vehicles*: Work is underway to upgrade existing or add new GPS functionality to a greater number of City vehicles, including trucks used for plowing and sanding. Once installed, a future project could be undertaken to support the development of a public facing live map.
- *Hired Equipment Strategy enhancements*: a request for proposal has been released that modernizes how the City manages hired equipment and contractors, moving to a primary contractor model. This change is expected to result in approximately 30 contracts, down from approximately 180.
- *Snow Dumps*: planning and design are underway to enhance the capacity and reduce the environmental impact of the City's snow dump sites. Work includes enhanced water management, refined site design and providing a solid surface to reduce leaching and overall environmental impacts.

Enhancements Currently Planned

- *Sand and Salt Management*: planning is underway to enhance the salt management program, including meeting environmental regulations for covering storage piles.

- *Workforce scheduling enhancements*: planning work is underway for a project that will support improved scheduling of the workforce and equipment across the Parks and Roads Services Branch. This project is tied to the Enterprise Systems Transformation Program.
- *Routing enhancements*: planning is underway for a project that will support the creation of dynamic, mathematically-optimized routes for Snow and Ice Control.

Holistic Approach

Administration will validate the proposed service levels through public engagement activities that are possible with COVID-19 restrictions. This engagement will focus on validating and enhancing the new approach to residential snow clearing as well as informing the development of the new policy and design of a parking ban.

A parking ban will be developed in collaboration with internal stakeholders - including Bylaw Enforcement and Edmonton Police Services - to develop a holistic enforcement strategy. The approach will consider community involvement, appropriate signage, automated enforcement, and Edmonton Police Services enforcement to support the successful implementation of the parking ban.

Building on the *Safe Mobility Strategy*, all future service and policy changes will consider the mobility needs of all network users and will be informed by GBA+ analysis. Administration will also monitor changes in travel patterns and network use as a result of the COVID-19 pandemic and adjust recommendations accordingly.

Next Steps

Throughout 2020 and into early 2021, Administration will work collaboratively with residents and community, business and industry partners to develop a modernized policy, design and implement a proof of concept parking ban and refine operational programs, including the development of outcomes and metrics.

Administration has identified a phased approach for the next steps to work within the operational realities of COVID-19. This approach includes conducting modified public engagement and implementing higher impact/lower cost enhancements sooner. The results of the Snow and Ice Control Audit will further inform an updated policy.

Details of activities to be completed for the 2020/2021 season are presented in Attachment 8: Next Steps and Timelines.

Administration will return to Council in spring 2021 with the following items for information and approval:

For Information

- Public engagement results

- Snow and Ice Control program enhancements, including results and lessons learned from refined service levels.

For Approval

- Refreshed Snow and Ice Control Policy C409
- Parking Ban program detailed design, informed by the Proof of Concept undertaken during the 2020/2021 season
- Service packages to support further program enhancements and/or parking ban (if required)

Financial/Budget Implications

Most enhancements for the 2020/2021 season outlined in Attachment 8, including amending the Snow and Ice Control Policy and developing associated procedures is not anticipated to have a significant financial impact, as these program changes can be made within the existing budget. Increases to residential service levels and regular cul-de-sac clearing will require an adjustment to the program budget. An unfunded service package will be advanced during the Fall 2020 Supplementary Operating Budget Adjustment.

The estimated financial implications for potential service levels are outlined in Attachment 3, and cost impacts to potential changes in window service levels are outlined in Attachment 5.

Public Engagement

Due to restrictions from COVID-19, the public engagement plan was scaled back but was able to provide observations and insights on citizen expectations specific to existing service levels as well as potential public acceptance of some form of parking restriction. This feedback, combined with previous engagement efforts, is the basis for the development of a city-wide parking restriction for snow and ice control.

Administration will use the feedback collected to develop an implementation plan for a city-wide parking ban approach as part of the 2020-2021 winter season. This implementation plan will also be informed by subsequent public engagement and then ultimately supported by an extensive public education program.

Administration also reached out to all Business Improvement Areas as well as the Urban Development Institute as representatives of the City's business and industry partners. One-on-one interviews have been conducted with those that indicated interest. Feedback provided outside of the interviews (verbal and email) has been integrated as applicable.

Corporate Outcomes and Performance Management

Corporate Outcome(s): Goods and services move efficiently			
Outcome(s)	Measure(s)	Result(s)	Target(s)
A safe and livable winter mobility network	% of service level achieved	N/A	TBD

Attachments

1. Snow and Ice Control Program Strategic Framework
2. Parking Ban Details
3. Service Level Details
4. Balancing Considerations for Snow and Ice Control
5. Residential Windrow Height Details
6. Tools Available for Snow and Ice Control
7. Monitoring Program Summary
8. Next Steps and Timelines

Others Reviewing this Report

- M. Persson, Deputy City Manager, Financial and Corporate Services
- C. Owen, Deputy City Manager, Communications and Engagement
- J. Meliefste, Acting Deputy City Manager, Integrated Infrastructure Services
- K. Armstrong, Deputy City Manager, Employee Services
- R. Smyth, Deputy City Manager, Citizen Services
- S. McCabe, Deputy City Manager, Urban Form and Corporate Strategic Development
- B. Andriachuk, City Solicitor