



Staff Report for Council Meeting

Date of Meeting: July 6, 2022

Report Number: SRCS.22.11

Department: Community Services

Division: Public Works Operation

Subject: 2021 to 2022 Season Winter Maintenance Review

Purpose: To present a full review of the City's snow removal operation and communication plan.

Recommendations:

- a) That Staff Report SRCS.22.11 regarding review of winter maintenance operations and communications be received for information.

Contact Person:

Jeff Stewart, Director, Public Works Operations

Report Approval:

Submitted by: Tracey Steele, Acting Commissioner of Community Services

Approved by: Darlene Joslin, City Manager

All reports are electronically reviewed and/or approved by the Division Director, Treasurer (as required), City Solicitor (as required), Commissioner, and City Manager. Details of the reports approval are attached.

Background:

This report has been prepared in response to the February 23, 2022 Council Member Motion which directed staff "to conduct a full review of the City's snow removal operation and communication plan and report back before summer recess."

Winter maintenance is a vital municipal service involving the management of ice and snow during the winter months across the public realm within the city. This report will focus on providing a full review of implementation of the City's winter maintenance program for the transportation network (including roads, sidewalks, park pathways, mid-block walkway connections and windrows) for the 2021 to 2022 winter season.

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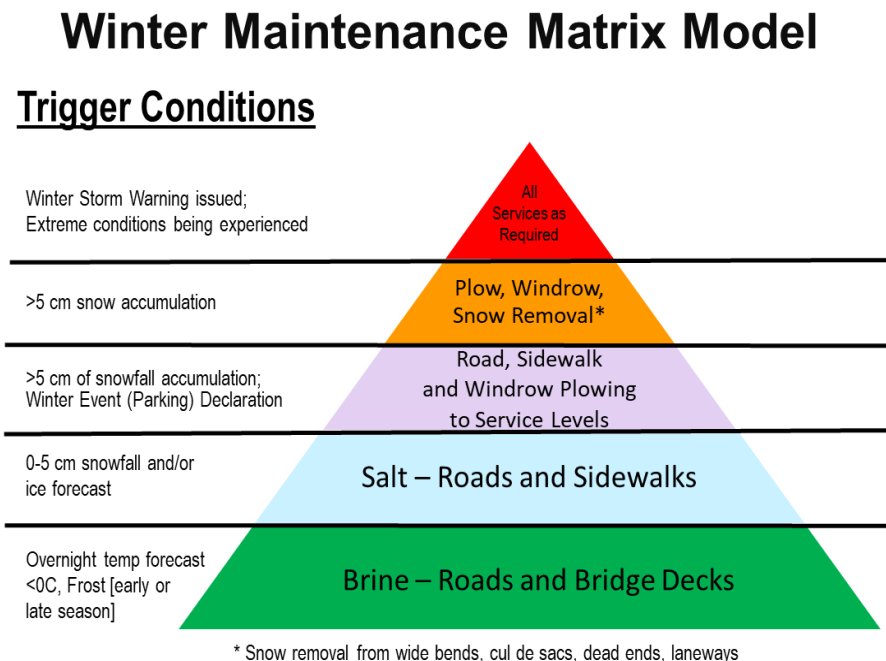
Winter Maintenance Program Overview

The winter maintenance activities implemented in the transportation network for any particular weather event are determined by the specific snow and icefall conditions anticipated and experienced as described in the Winter Maintenance Matrix Model (Figure 1) below.

Weather forecasts of overnight temperatures less than 0 degrees Celcius may trigger anti-icing or de-icing measures for roads and bridge decks. A snow or icefall forecast to be of less than 5 centimetres of accumulation triggers the initiation of salting activities on all roads and sidewalks. When greater than 5 centimetres of snow accumulation is forecast, the City prepares for the activation of plows by declaring a “Winter Event” pursuant to the Parking Regulation By-law (Municipal Code Chapter 1116).

Road and sidewalk plowing activities are initiated when 5 centimetres of snow has accumulated. The City’s road network is divided into zones and plow routes. Approximately 30% of the plow routes are maintained in-house with approximately 70% maintained by a contractor. All sidewalk maintenance (including park pathways and mid-block walkway connections) is conducted in house. Residential driveway windrow clearing begins at approximately the same time that local road plowing begins and is conducted entirely in-house.

Figure 1



Winter Maintenance Service Levels

Minimum service levels for winter maintenance on roads are established by Ontario Regulation 239/02 regarding Minimum Maintenance Standards (O. Reg. 239/02). Additionally, in December of 2014 Council approved Winter Maintenance Level of

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Service Guidelines for Roads and Sidewalks which were recommended through staff report SRCS.14.033. The approved winter maintenance target levels of service for roads and sidewalks are a harmonization of industry best practices and regulatory requirements set out in O. Reg. 239/02. Target service levels for the windrow clearing program were determined through Council approval of the in-house program recommended in staff report SRCS.19.07 on March 25, 2019. There is no Council-approved level of service for park pathways. Approved target service levels for transportation network asset types are summarized in Table 1.

Table 1 – Winter Maintenance Service Level Summary by Asset Type

ROAD Classification	Service Type	Target Level of Service	Service Level Source
Primary and Local Roads	De-icing treatment (Less than 5cm of snow and ice formation)	8 hrs to complete	O. Reg. 239/02 SRCS.14.033
Primary Roads	Plowing/de-icing (5 cm snow accumulation)	12 hrs to complete once snow has stopped	O. Reg. 239/02 SRCS.14.033
Local Roads	Plowing/de-icing (5 cm snow accumulation)	16 hrs to complete once snow has stopped	O. Reg. 239/02 SRCS.14.033
SIDEWALK Classification	Service Type	Target Level of Service	Service Level Source
Primary and Local sidewalks	De-icing treatment (Less than 5cm of snow and ice formation)	12 hrs to initiate 14 hrs to complete after initiation	SRCS.14.033
Primary (includes Regional Road sidewalks)	Plowing/de-icing (5 cm snow accumulation)	9 hrs to complete once snow has stopped	SRCS.14.033
Local (includes mid-block connectors)	Plowing/de-icing (5 cm snow accumulation)	14 hrs to complete once snow has stopped	SRCS.14.033
WINDROW Classification	Service Type	Target Level of Service	Service Level Source
All	Clear at least one car width of all residential driveways	8-12 hours to complete following the completion of road plowing	SRCS.19.07

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Winter Maintenance Monitoring and Technology

PWO continually monitors the road network from October 1 to April 30, as required by O. Reg. 239/02, in order to make informed and timely decisions respecting winter maintenance. Monitoring involves reviewing weather data and reports as well as inspecting and documenting road conditions.

The following technology, materials and information are used to enhance and inform operational decisions and assist with the overall management of winter control:

- Weather Information – The City receives regular forecasts four times daily from a meteorological weather service and obtains weather information from two City-owned weather stations (located at 70 Old Colony Road and High Tech Road).
- GPS System – An Automatic Vehicle Location (AVL) system, which includes dash and plow cameras, and system tracking technology (e.g., obstruction recording, plow up/down and salt spinner controls) is installed on the majority of winter control vehicles and equipment. The AVL system presents real time data to our online portal and public-facing Track My Plow app.
- Salt Distribution Management – Optimal application of liquid anti-icing or solid de-icing material (i.e., salt and/or treated salt) is managed via a calibrated computerized unit installed on each road vehicle.

2021-2022 Winter Season

Table 2 provides a synopsis of transportation network winter maintenance during the 2021 to 2022 winter season. Overall, winter maintenance of the transportation network resulted in a total cost to the City of approximately \$7.86 million during the 2021 to 2022 winter season. The graphs in Appendix 1 provide supporting information comparing the weather and winter activities during the 2021 to 2022 season to that of previous seasons. Graph 5 shows that during the 2021 to 2022 winter season there were four weather events that required plowing and de-icing, and 42 weather events that required anti-icing or de-icing treatment.

Table 2 – Transportation Network and associated Winter Maintenance Costs

Asset Type	City Network Quantity	Regional Network Quantity	2021/2022 Season Total Operating Costs	2021/2022 Season Unit Operating Costs
Roads	1 100 lane km	None	\$4 668 000	\$4 200 per lane km
Sidewalks (including park pathways and mid-block connectors)	600 km (including 17 km of park pathway & 5 km of mid-block connector)	118 km	\$1 663 000	\$2 300 per km
Windrows	44 000 driveways	17 driveways	\$1 532 000	\$35 per driveway

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Public Works Operations (PWO) Staff work closely with other agencies to provide continuity of services during winter maintenance. The road asset quantity number in Table 2 includes Norman Bethune Avenue, which is maintained in collaboration with the City of Markham in accordance with an annual rotation agreement. Table 2 also includes 6.5 kilometres of sidewalk and 5 kilometres of road in un-assumed subdivisions, which is maintained by the City on a full cost-recovery basis upon request from qualifying developments. It should also be noted that maintenance of Regional Road sidewalks is currently undertaken by the City as set out in the Municipal Act, and involves ongoing coordination with the Region's snow clearing activities on Regional Roads. Windrows are currently being cleared for seniors who have requested the service on 17 Regional Road driveways.

During the 2021 to 2022 winter season, target service levels were met or exceeded for all snowfall events with the exception of the January 17, 2022 storm. The exceptional snowfall event of January 17, 2022 triggered a Winter Storm Warning by Environment Canada and was declared a Significant Weather Event pursuant to O. Reg. 239/02 due to its magnitude and rate of snowfall. During Significant Weather Events there is a recognized likelihood that services levels applicable to more frequent 5 to 15 centimetre events will not be met and therefore provincially legislated service levels do not apply.

The 2021 to 2022 winter season was the third season of implementation of the windrow program. Since inception of the program, Staff have been working to continually reduce the time required to clear windrows following plowing of the same road. Currently, ongoing improvements are a matter of piloting different approaches to plow routes, start times and staff scheduling rather than a need for additional staff or financial resources. The ability for property owners to opt-out of the windrow program was approved by Council in 2021, but there have been no requests to opt-out to date.

Parking Enforcement

Ice or snowfall accumulations that are likely to exceed 5 centimetres of accumulation are declared "Winter Events" pursuant to the City's Parking Regulation By-law (Municipal Code Chapter 1116). During a Winter Event vehicles are not permitted to be parked on City streets.

During the 2021 to 2022 winter season, Parking Enforcement issued the following for winter control-related violations:

- 183 Winter Event Warnings
- 706 Penalty Notices for Park on a Highway During a Winter Event
- 15 Penalty Notices for Park on a Highway so as to Interfere with Winter Operations
- 172 Penalty Notices for Park Obstructing a Sidewalk

Winter Operations Inquiries and Service Requests

Access Richmond Hill (ARH) works closely with PWO during winter operations to ensure residents, business customers and visitors have up-to-date information on snow clearing activities and service levels. ARH handles all inquiries and complaints related to

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clearing activities and is able to resolve most calls directly. Calls that require site attendance are submitted to PWO to address once winter maintenance service levels have been achieved for the specific event.

Table 3 shows an analysis and comparison of ARH calls and PWO Service Requests generated for all snowfall events occurring between November 2020 and April 2022 for which snow plowing services were implemented. Note that we have included two seasons of data here in order to provide a more comprehensive data set since the 2021 to 2022 winter season only experienced four winter events requiring plowing activities.

Table 3 – Resident inquiry and complaint summary: 2020 to 2022 plowing events

Event Date	Snowfall at Pearson Airport (cm)	# Calls Received by ARH	#ARH Calls per cm snowfall	# PWO Service Requests	#PWO Service Requests per cm snowfall
Nov. 22-26/20	19.4	196	10.1	71	3.7
Dec. 1-4/20	9.8	60	6.1	33	3.4
Dec. 9-12/20	4.2	104	24.8	36	8.6
Dec. 25-30/20	10.2	76	7.5	40	3.9
Jan 1 - 8/21	5.4	125	23.1	81	15.0
Jan. 27-30/21	9.2	143	15.5	109	11.8
Feb. 5-9/21	4.6	80	17.4	37	8.0
Feb. 16-19/21	8.8	280	31.8	87	9.9
Jan. 17-28/22	36.8	1558	42.3	304	8.3
Jan. 28 - Feb 4/22	15.6	237	15.2	75	4.8
Feb. 11-18/22	8.1	112	13.8	101	12.5
Feb. 25 - Mar. 4/22	8.1	68	8.4	29	3.6

The data in Table 3 shows that the number of calls received by ARH during snowfall events requiring plow activity ranged from 6.1 to 42.3 calls per centimetre of snowfall, with the highest number of calls per centimetre of snowfall having been received during the significant weather event of January 17th, 2022. The number of calls that generated POW service requests ranged from 3.4 to 15.0 calls per centimetre of snowfall, with the January 17th significant weather event being comparable to other events.

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Communications and Public Education

The City has an extensive winter maintenance communications program that aims to educate residents about the winter maintenance services the City provides, the role residents play in supporting these services (for example, no parking on the street, waste set-out placement) and updates on winter maintenance activities during winter events. Strategic communications and public education tactics are targeted to reach the widest possible Richmond Hill audience.

Seasonal Communications

Seasonal tactics run regularly from mid-October through the end of winter, and include, but are not limited to:

- Provision of winter maintenance information in the City-wide print newsletter (delivered to more than 66,000 homes and available in five languages). The fall and winter 2020 edition of the newsletter was dedicated almost entirely to winter maintenance and the 2021 edition included infographics outlining what we plow and when we plow it, service levels, windrow clearing and more (Appendix 2 provides a sample of winter maintenance communication material included in the newsletter).
- A dedicated section on the City's website at RichmondHill.ca/WinterMaintenance experiences an average of 33,000 page views during winter and includes:
 - an infographic demonstrating service levels,
 - a windrow clearing page (an average of 7,000 page views in winter),
 - the 'Track my Plow' app (more than 19,600 visits this winter).
- 'We're Ready for Winter' and 'Top 5 Access Richmond Hill Winter Questions' Public Service Announcements are posted at RichmondHill.ca/News (1,220 subscribers) and distributed to local and multilingual media and local community groups serving multilingual populations.
- Animated and live-action videos explaining windrow clearing service (10,400 views)
- Inclusion of a variety of winter maintenance topics in the monthly myRichmond Hill eNewsletter (more than 900 subscribers and available in the language of the readers' choice using automated translation).
- Continual social media posts on a variety of winter maintenance topics driving to our broader web content (22,600 followers).
- Print advertising in local and multilingual publications (reaching approximately 97,000 readers in Richmond Hill).
- Information on where to place your waste for collection so as not to impede snow clearing operations in the Waste Management Calendar (delivered to more than 56,000 homes) and Recycle Coach app push notifications (15,540 users).
- Mobile billboard signs reminding drivers not to park on the street during snowfalls.
- Geo-targeted and weather-triggered advertisements implemented on The Weather Network app (80,000 impressions were recorded in the 2021 to 2022 season).

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Communications During Winter Events

When a Winter Event declaration is expected, the City will proactively Tweet weather updates and encourage citizens to subscribe to [RichmondHill.ca/WinterUpdates](https://richmondhill.ca/WinterUpdates). Additionally, Parking Enforcement Officers will proactively issue Warning Notices (no penalty) to encourage removal of parked vehicles from the road.

When the winter event declaration is issued, the City will notify residents by sending an advisory to select local and multilingual print, digital and radio media, issuing an email to on-street parking permit holders, posting a banner on the [RichmondHill.ca](https://richmondhill.ca) homepage, posting the declaration on [RichmondHill.ca/WinterUpdates](https://richmondhill.ca/WinterUpdates) (more than 280 page subscribers), and posting and pinning the declaration to the City's Twitter account.

While winter maintenance operations are ongoing, high level progress updates are posted to [RichmondHill.ca/WinterUpdates](https://richmondhill.ca/WinterUpdates), as well as the City's Twitter account, to advise of anticipated service levels and delays, road priorities, windrow service start times and how to track plows online. Communications related to service levels note that times are subject to change due to snowfall amounts, length of storm, time of day (for example, rush hour) and lately, staffing due to COVID-19. The City also shares reminders via Twitter on a variety of topics including on-street parking, where to place your waste bins in winter, the importance of clearing hydrants, no shoveling snow back onto the road and more.

End of winter event declarations are posted to the website and Twitter.

Financial/Staffing/Other Implications:

This report has no financial or staffing implications as resources associated with winter maintenance are addressed through the annual budget process.

Relationship to Council's Strategic Priorities 2020-2022:

This report is directly related to the Council Strategic Priority of "Getting around the City" as winter maintenance ensures that our roads, sidewalks and trails are clear of snow and safe for use during the winter months.

Climate Change Considerations:

Efficient management approaches and technology are used to mitigate the climate change impacts associated with winter maintenance. For example, optimization of plow routes provides for reduced vehicle emissions, and computer-aided spread controllers on road plows assisting with the management of anti-icing and de-icing materials.

Conclusion:

Overall, winter maintenance of the transportation network during the 2021 to 2022 winter season addressed four weather events that required plowing and de-icing, and 42 additional events that required anti-icing or de-icing treatment. The total cost to the City for the 2021 to 2022 season winter maintenance was approximately \$7.86 million

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and target service levels were met or exceeded for all snowfall events with the exception of the January 17, 2022 storm.

Winter maintenance activities are supported by a comprehensive communications program that includes seasonal tactics intended to increase public awareness regarding winter maintenance services in general, and event-specific communications that provide updates about ongoing maintenance activities during weather events.

Attachments:

The following attached documents may include scanned images of appendixes, maps and photographs. All attachments have been reviewed and made accessible. If you require an alternative format please call the contact person listed in this document.

- Appendix 1 – Annual Weather and Winter Maintenance Activity Data Graphs 2018-19 through 2021-22
- Appendix 2 – Sample Winter Maintenance Communication Material

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Report Approval Details

Document Title:	SRCS.22.11 - 2021 to 2022 Season Winter Maintenance Review.docx
Attachments:	- Appendix 2 Sample Communication Materials.docx - Appendix 1 2021-2022 Season Weather and Maintenance Activity Data Graphs.docx
Final Approval Date:	Jun 28, 2022

This report and all of its attachments were approved and signed as outlined below:

Diogo Oliveira - Jun 27, 2022 - 5:28 PM

Tracey Steele - Jun 28, 2022 - 6:44 AM

Darlene Joslin - Jun 28, 2022 - 8:45 AM