

Winter Maintenance Salt Routes Review 2023

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Report Summary

This report provides information regarding all City roads that will be converted from salt routes to sand routes within existing approved service levels.

Relationship to the Strategic Plan, Health Impact Assessment and Community Energy & Emissions Plan (CEEP)

A pillar of the Strategic Plan 2019–2027 is the Asset Management and Service Excellence strategic initiative. One of the key principles of this initiative is to continually look for innovative and cost-effective approaches for the operational services staff deliver each day. Utilizing this continuous improvement approach ensures Linear Infrastructure Services provides efficient, high quality operational activities that meet the needs of residents and supports how they work, live, and play in Greater Sudbury.

This report is also consistent with Council’s Strategic Plan with respect to the goal of conducting research, benchmarking, and experimentation to ensure road maintenance practices reflect appropriate best practices.

Financial Implications

There are no financial implications associated with this report.

Background

City’s Winter Road Maintenance Standards

The City maintains approximately 3,620 lane-kilometers of roadways each winter in accordance with Council approved policies. The last major change to the City’s winter road maintenance policy was made in 2007 followed by minor changes in subsequent years. The City’s winter road maintenance policies are largely derived from O. Reg. 239/02, commonly referred to as the Minimum Maintenance Standards (MMS). The MMS prescribes a minimum level of maintenance for roads based on a maintenance classification system that is contingent on a combination of posted speed (km/h) and average daily traffic (ADT). This road maintenance classification system categorizes roads from Class 1 to Class 6 and is commonly utilized province wide by municipalities. Class 1 Roads typically constitute high volume/speed arterial roads (i.e.

portions of MR 55 and MR 80) that receive the highest standard of maintenance while Class 6 Roads typically constitute low volume/speed residential roads (i.e. Albert Street, Capreol and Ash Street, Levack) that receive the least amount of maintenance. The MMS does not obligate municipalities to provide any level of maintenance to Class 6 Roads. Table 1 outlines the MMS road maintenance classification system utilized by the City.

Table 1 - Classification of Highways

Average Daily Traffic (number of motor vehicles)	91 - 100 km/h speed limit	81 - 90 km/h speed limit	71 - 80 km/h speed limit	61 - 70 km/h speed limit	51 - 60 km/h speed limit	41 - 50 km/h speed limit	1 - 40 km/h speed limit
53,000 or more	1	1	1	1	1	1	1
23,000 - 52,999	1	1	1	2	2	2	2
15,000 - 22,999	1	1	2	2	2	3	3
12,000 - 14,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
6,000 - 7,999	1	2	2	3	3	4	4
5,000 - 5,999	1	2	2	3	3	4	4
4,000 - 4,999	1	2	3	3	3	4	4
3,000 - 3,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6

Source: <https://www.canlii.org/en/on/laws/regu/o-reg-239-02/latest/o-reg-239-02.html>

City policy dictates that Class 1 – 3 Roads be plowed and salted once a snow accumulation of 5 cm has been realized. The goal of applying salt to the Class 1 – 3 Roads is to expedite snow melt and achieve a bare pavement state. However, the effectiveness of salt to melt snow decreases drastically when temperatures are very cold (i.e. colder than -12 C). During these periods of cold temperature, roads are maintained to a snow packed state and treated with sand to provide adequate friction for safe motor vehicle passage. Once the weather warms up (i.e. warmer than -12 C), salt is applied to achieve a bare pavement state.

On Class 4 – 6 Roads City policy dictates plowing and sanding shall commence once a snow accumulation of 8 cm has been realized. These roads are typically maintained to a snow packed state throughout the winter months. Table 2 summarizes the City's current overall winter road maintenance standard.

Table 2 – City’s Winter Road Maintenance Policy

Road Winter Maintenance - Snow Events			Service Timelines		Service Timelines when SWE is Declared
Road Classification	Protocol / Action	Snow Accumulation	Complete Round #1 / Initial Deployment	Clear / Material Application	
Class 1 - 3	Apply Brine / Salt	N/A	Within 2 - 4 Hours of Significant Snowfall	-	None
	Plow Roads	5 cm	Within 3 - 8 Hours of reaching 5 cm Threshold	3 - 8 Hours after Storm Ends ^{if Required}	None
	Salt / Brine / Sand Roads	N/A	Within 3 - 8 Hours of reaching 5 cm Threshold	3 - 8 Hours after Storm Ends ^{if Required}	None
Class 4 - 6	Plow Roads	8 cm	Within 24 Hours after reaching 8 cm Threshold	24 Hours after Storm Ends ^{if Required}	None
	Spot Sand Roads	N/A	Within 24 Hours after reaching 8 cm Threshold	24 Hours after Storm Ends ^{if Required}	None

Road Winter Maintenance - Ice Events			Service Timelines		Service Timelines when SWE is Declared
Road Classification	Protocol / Action	Ice Detection	Complete Round #1 / Initial Deployment	Clear / Material Application	
Class 1 - 3	Salt / Brine/ Sand Roads	Detected	Within 2 - 4 Hours of Ice Detection	2 - 4 Hours after Storm Ends ^{if Required}	None
Class 4 - 6	Sand Roads	Detected	Within 24 Hours of Ice Detection	24 Hours after Initial Application, ^{if Required}	None

SWE – Significant Weather Event

Amendments to O.Reg. 239/02, Minimum Maintenance Standards for Municipal Highways

The Province of Ontario introduced several updates to the MMS on May 3, 2018, one of which modified the road classification system discussed above. This report analyzes how that change impacts the City’s winter road maintenance operations.

Although completion of such an analysis was previously considered, it did not allow for a fulsome review until recently. Given that road maintenance class is contingent on traffic volume (discussed above), accurate traffic counts were necessary prior to initiating changes to winter maintenance routes. The accurate collection of traffic counts was largely impeded by traffic irregularities that resulted from the covid pandemic.

Analysis

Changes to MMS Road Classification System

The **highlighted** cells in Table 1 indicate the specific road maintenance class changes that were introduced through the 2018 MMS update. Generally, the change affected low speed roadways (less than 51 km/h) and high-volume roadways (ADT greater than 15,000 vehicles). For example, prior to 2018, a roadway with a posted speed of 80 km/h and ADT of 12,000 vehicles would be classified as a Class 1 Road (receiving the highest level of maintenance). After the 2018 update, the same road (with a posted speed of 80 km/h and

ADT of 12,000 vehicles) would be classified as a Class 2 Road. A summary of all roads that changed classification are outlined in Table 3.

Table 3 – CGS Road Maintenance Class Changes

Road Class (Lane Km) - Prior to 2018 MMS Update	Road Class (Lane Km) - After 2018 MMS Update					
	Class 1 Roads (38)	Class 2 Roads (424)	Class 3 Roads (332)	Class 4 Roads (382)	Class 5 Roads (1632)	Class 6 Roads (814)
Class 1 Roads (119)	38	80				
Class 2 Roads (400)		328	67	5		
Class 3 Roads (360)		13	257	89	2	
Class 4 Roads (862)			8	286	568	
Class 5 Roads (1753)		3		2	1062	687
Class 6 Roads (127)						127

As described earlier, the City maintains its Class 1 – 3 Road network as salt routes. Therefore, a change in road class from 1 to 2 does not change the level of service that road would receive. Similarly, since the City maintains its Class 4 – 6 Road network as sand routes, a change in road class from 4 to 6 does not change the level of service that road would receive. However, when a road class changes from 3 to 4 (highlighted in **turquoise** in Table 1) a service level change is realized. Based on the 2018 MMS update, there were approximately 86 Lane Km that changed from a (Class 1 – 3 Roads) salt route to a sand route (Class 4 – 6 Roads).

Impacts of Road Maintenance Class Change

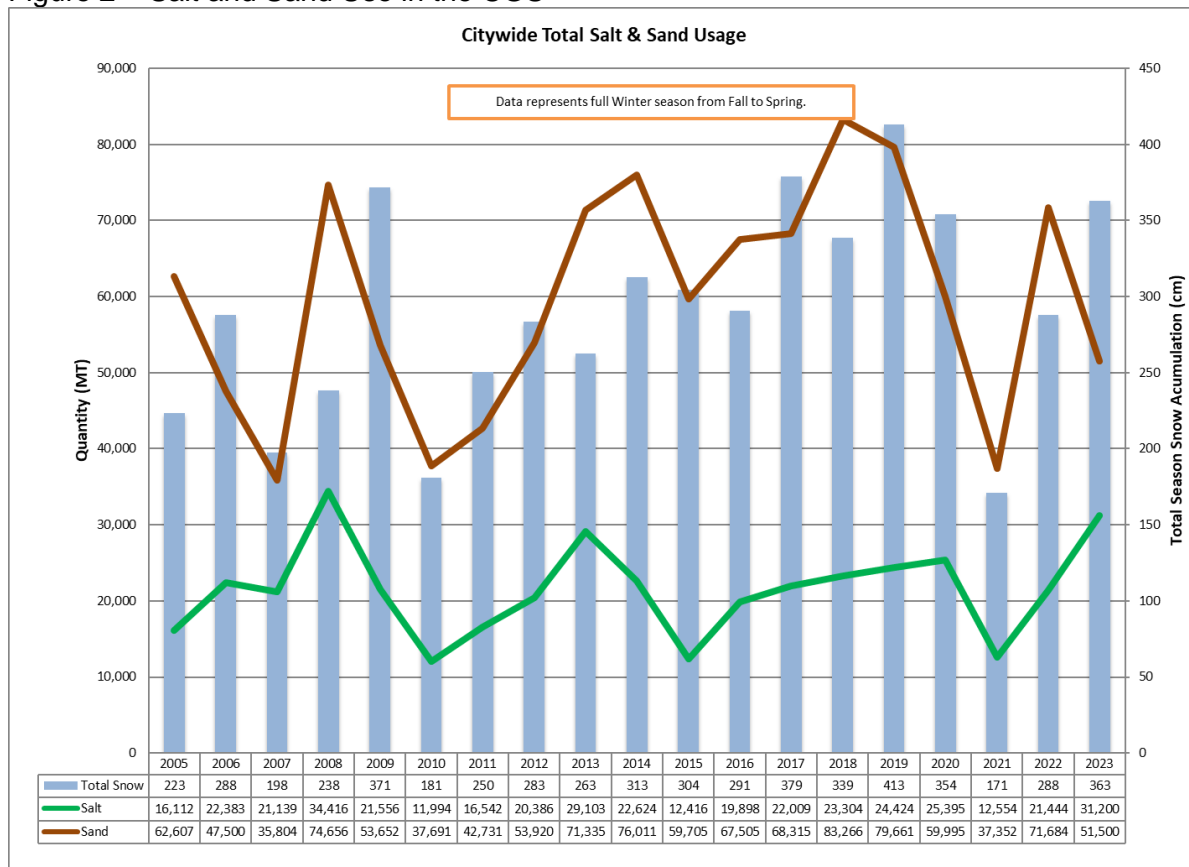
There are certain Class 4 – 6 Roads within the City that have historically been maintained as salt routes despite them being outside the MMS requirements for salting. This was mainly done to address operational restrictions and safety concerns. For instance, roads such as Corsi Hill and Sunrise Ridge (Class 4 – 6 Roads) have been maintained as salt routes to allow maintenance equipment to navigate its steep hills. Traditional 'Main Street' downtown areas, like those identified in the City's Strategic Core Areas Community Improvement Plan (i.e. Chelmsford, Capreol, Sudbury, Copper Cliff), are typically made up of two-storey buildings with "zero lot lines", meaning the buildings directly front onto the road-right-of-way. This type of urban form makes winter maintenance a significant challenge and is therefore maintained as salt routes. Although winter control equipment is routinely upgraded and best practices are adhered to, operational restrictions limit the ability of a fulsome service level change from salt to sand treatment on some Class 4 – 6 Roads.

However, several road segments can be converted from salt to sand routes. For instance, Loachs Road, between Regent Street and Latimer Crescent, that was previously treated with salt (was a Class 3 Road prior to the MMS update) can now be treated with sand (is a Class 4 Road following the MMS update). Similarly, Latimer Crescent, between Loachs Road and Oriole Drive, that was previously treated with salt (despite it being a Class 4 – 6 Road) to facilitate buses to navigate a steep hill in the area, can now be treated with sand due to a change in the Transit route (buses do not travel on Latimer Crescent currently). The estimated total quantity of Class 4 – 6 Roads that have been determined to remain on salt routes is approximately 134 Lane Km and those that will be converted to sand routes is approximately 73 Lane Km. A list of all Class 4 – 6 Roads that will be converted from salt to sand routes is provided in the appendices.

From a quantitative perspective, the proposed change of 73 Lane Km of Class 4 – 6 Roads from salt routes to sand routes is relatively small (~2%) as compared to the entire road network (3,620 Lane Km). However, the estimated annual average reduction in salt use on these roads is noteworthy at approximately 1,600 MT. Reduction in salt use is expected to reduce its impacts on the environment and sources of drinking water.

This observation is supported by the 2023 Salt Optimization Plan (SOP) Update and included in the appendices. Although there will be increased costs associated with sand application and street sweeping, the overall operational cost impact is expected to be neutral given that salt is a more expensive commodity than sand. Figure 2 illustrates historical salt and sand usage within the City.

Figure 2 – Salt and Sand Use in the CGS



Since the roads impacted by the proposed change are distributed in small quantities throughout the City, the change can be integrated into the City’s current winter control operations without disruption of other maintenance services.

Winter Road Maintenance in Levack, Onaping, Dowling and Lively

Citizens of Levack, Onaping, Dowling and Lively have voiced their opinions and concerns regarding winter road maintenance through local Town Hall meetings. Staff carefully reviewed salt route and sand route maintenance service levels in these communities. In all cases except in Levack and Onaping, the winter road maintenance service level provided closely meets City standards for the same. It was determined that the salt routes in Levack and Onaping were being serviced at a notably higher level than the City standard. Changes will be implemented to better align service levels in Levack and Onaping to the City standard during the upcoming winter season.

Conclusion

Making the change from salt routes to sand routes when and where possible allows the City to better align its winter control operations to its own policies and those of the Minimum Maintenance Standards. This will also facilitate a more uniform level of winter road maintenance services delivered to the public in a safe and effective manner. To be consistent with road maintenance class changes of its time, Council adopted a similar change from salt to sand for several roads as outlined in the June 18th, 2007, report to the Eleventh

(Special) Meeting of the Priorities Committee, titled “Winter Control Implementation Plan”.

The Audit Committee Report dated June 21, 2022, titled “Performance Audit of Salt Management Processes” recommended a closer adherence to the City’s Salt Management Plan and Salt Optimization Plan. These documents generally support the responsible use of salt to maintain public safety and recommends various methods of achieving that objective, including a change from salt to sand route where permissible. The reduction in salt use expected to result from changing some salt routes to sand routes will mitigate salt impacts to the environment and be implemented with no impacts to operational costs or other winter maintenance services.

Next Steps

To ensure the public is made aware of the changes to the winter road maintenance service level, staff will work with Communications and Community Engagement to ensure all relevant information, including lists of changed road maintenance routes be posted on the City’s website and communicated by Public Service Announcement. As well, letters communicating these changes will be sent to all adjacent property owners. Staff will closely monitor how the changes are functioning and will make minor alterations where necessary to ensure operational efficiency and that public safety is maintained.

Appendices

- Graphical Illustration of the Proposed Changes from Salt to Sand Route
- Salt Optimization Plan (2018) and its Update (2023)
- Salt Management Plan (2019)
- Report presented to the Eleventh (Special) Meeting of the Priorities Committee on June 18th, 2007, titled “Winter Control Implementation Plan”.

Resources Cited

Audit Committee Report dated June 21, 2022, titled “Performance Audit of Salt Management Processes”:
<https://pub-greatersudbury.escribemeetings.com/filestream.ashx?DocumentId=46640>

City of Greater Sudbury’s Winter Maintenance Practices and Policies:
<https://www.greatersudbury.ca/live/transportation-parking-and-roads/road-maintenance/>

Strategic Core Areas Community Improvement Plan:
<https://www.greatersudbury.ca/do-business/planning-and-development/community-improvement-plans-and-incentive-programs/financial-incentive-programs/strategic-core-areas-community-improvement-plan/>

O.Reg. 239/02 Provincial Minimum Maintenance Standards:
<https://www.canlii.org/en/on/laws/regu/o-reg-239-02/latest/o-reg-239-02.html#document>