Staff Memorandum

To	Mayor A. Nuttall and Members of Council
Subject	Salt Management Update
Date	May 14, 2025
Ward	All
From	D. Friary, Director of Operations
	S. Mack, P.Eng., Director of Waste Management and Environmental Sustainability
Executive Member Approval	B. Araniyasundaran, P. Eng., General Manager of Infrastructure and Growth Management
CAO Approval	M. Prowse, Chief Administrative Officer

The purpose of this memorandum is to provide members of Council with an update on continuous improvement strategies related to road salt management.

The City continues to invest in optimizing the use of road salt to protect public safety while minimizing the environmental impacts related to its storage, handling, and application. The current approach to managing road salt usage is committed to exploring new technologies and practices in winter maintenance activities to reduce the amount of road salt entering the environment, while ensuring safety is not compromised and is done so in a fiscally-sound manner.

Road salt optimization is a tenet of the City's Source Water Protection program and part of on-going collaboration between various Departments within the City including Operations, Corporate Facilities, and Waste Management and Environmental Sustainability.

Environmental Impacts from Road Salts

In 2001, Environment Canada released an assessment report stating that road salts are entering the environment in large amounts and are posing a risk to plants, animals, birds, fish, groundwater, and lakes and stream ecosystems. Once road salt is applied, due to its highly soluble state, there is nothing that can be done to remove it from the water and it continues to be washed through the natural environment

Due to the adverse effects that salt has on the environment, the City continues to use best practices and explore new methods and technologies to minimize the amount of salt entering the environment while continuing to deliver a safe and effective winter maintenance program.

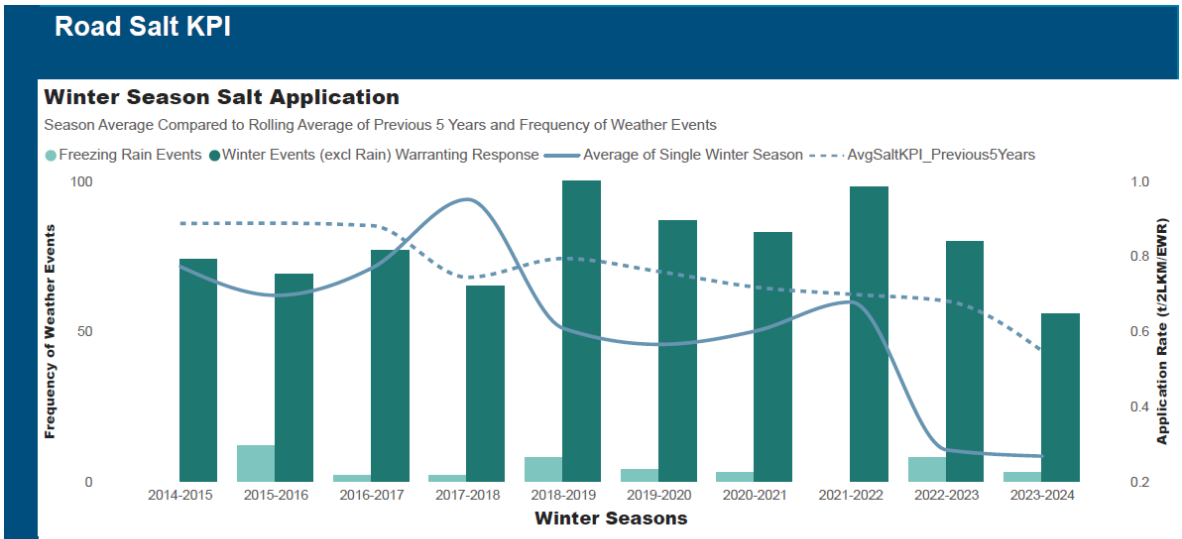
City Roads and Sidewalks

The City operates in accordance with the Provincial Minimum Maintenance Standards (O. Reg. 239/02, as amended) and the Federally-mandated Code of Practice for the Environmental Management of Road Salts.

The City has implemented several strategies for the management of road salt applications that are governed by the legislative requirements including: the Salt Management Plan, Salt Optimization Strategy and the Winter Operations Plan. These support the Source Water Protection Plan to reduce risk to water resources from road salt applications by municipal operations. Detailed within these documents are best management practices, technologies and control techniques, as well as material tracking protocols. Notable practices include:

- implementation of a four-tier road priority system for winter maintenance comprising arterial, primary, secondary, and residential routes;
- increased frequency of plowing with a shift toward mechanical snow removal over salting; and
- use of Road Weather Information Systems (RWIS) to monitor weather and pavement conditions, enabling more accurate forecasting and prioritized event response.

As noted on Figure 1 below, the City's best management practices are having a positive impact on reducing road salt usage within City roadways over the past decade. The overall tonnage applied per event per two-lane kilometre has steadily declined over the past decade from 0.77 tonnes to 0.27 tonnes per two-lane km.



Winter Seasons	Season Salt Usage (t)	Road Network in Salt Routes (2-Lane KM)	Freezing Rain Events	Winter Events Warranting Response (Event Response)	Salt KPI by Season (tonnes/2LKM/Event Response)	Salt KPI - Average of Previous 5-Seasons (tonnes/2LKM/Event Response)
2023-2024	11,964	798	3	56	0.27	0.55
2022-2023	17,699	778	8	80	0.28	0.68
2021-2022	29,046	437	0	98	0.68	0.70
2020-2021	21,545	432	3	83	0.60	0.72
2019-2020	21,254	432	4	87	0.57	0.76
2018-2019	26,273	432	8	100	0.61	0.79
2017-2018	26,722	432	2	65	0.95	0.74
2016-2017	20,188	341	2	77	0.77	0.88
2015-2016	16,380	341	12	69	0.70	0.89
2014-2015	19,500	341	0	74	0.77	0.89

Figure 1: Road Salt KPI

Figure 1 depicts that the tonnage of road salt applied per event per two-lane kilometer has steadily declined over the past decade from 0.77 tonnes to 0.27 tonnes per two-lane km. To ensure an accurate comparison across variable winter conditions and the growing road network maintained by the City, salt usage is measured as the average application rate (tonnes) per two-lane kilometre per winter event.

During the 2023/2024 season, Road Operations reduced salt usage by 51% compared to the previous five-year average. This reduction amounts to approximately 6,100 tonnes of salt, resulting in cost savings of $400,000, adjusted for current salt pricing per tonne.

Corporate Facilities

The City has a number of industrial, commercial and institutional properties managed by the Corporate Facilities Department. The City demonstrates leading by example through implementation of the Salt Optimization Strategy and site-specific Risk Management Plans for facilities that meet the Source Protection Plan criteria.

Recently, the City has moved to managing winter control internally for all City facility properties. It is still very early into the in-housing pilot to measure if we are reducing the use of salt on these City-owned sites. The outcome of the pilot project will provide insights into future possibilities to reduce salt usage aside from City roads.

New Development

The City's Official Plan contains policies requiring all new developments to be designed to minimize road salt pollution in public and private facilities. The policy objectives include encouraging covered parking structures and underground parking where appropriate, implementing smart design principles for grade changes and snow pile storage locations, and downspout placement to avoid creating icy conditions.

Work with Private Sector

The Source Water Protection Plan requires the City to negotiate Risk Management Plans with local businesses with large parking lots for winter maintenance activities when located in a Wellhead Protection Area when the criteria is met. The plans require local businesses and contractors to continuously improve winter maintenance practices and to protect local water resources.

On-going Education, Outreach and Collaboration

Staff participate in a number of working groups at the Provincial and watershed level that are focused on addressing the competing needs of protecting our drinking water resources and environment, while maintaining safe roads and parking lots in the winter. These working groups focus on the science of understanding the scope of the problem, developing strategic policies, and approaches to implement industry best practices. Staff routinely take knowledge from these collaborations and implement as appropriate to improve City operations.

Appendix:

Appendix A – Winter Operations Plan

Appendix B – Salt Management Plan

Appendix C- Salt Optimization Strategy

Memo Authors:

K. Thompson, P.Geo., Manager Environmental Risk Management & Compliance, Waste Management & Environmental Sustainability

C. Morton, Senior Manager Operations Roads & Fleet, Operations

File #:

C05

Pending # (if applicable):

Not Applicable