

Committee of the Whole (Working Session) Report

DATE: Wednesday, May 31, 2023

WARD(S): ALL

TITLE: WINTER MAINTENANCE SERVICE LEVEL REVIEW

FROM:

Zoran Postic, Deputy City Manager, Public Works

ACTION: DECISION

Purpose

To provide a risk-based analysis of current winter maintenance service levels and recommendations for future service levels.

Report Highlights

- An audit of the Roads Winter Maintenance program was conducted in 2018 with recommendations to conduct a risk-based evaluation of the winter strategy.
- A jurisdictional review of peer municipalities was conducted which revealed the City of Vaughan has the highest service levels for road winter maintenance in the GTA.
- Industry experts conducted a study which confirmed the City of Vaughan's higher service levels reduce the risk of collisions during winter events.
- The 2022 Vaughan Citizen and Business Survey showed an increased satisfaction score of 5 points for road snow removal.
- To manage extreme weather events effectively and communicate realistic outcomes, Public Works has developed a Severe Weather Response Plan.

Recommendations

1. THAT winter maintenance services be maintained at the current level, given their positive impact on safety and citizen satisfaction;
2. THAT funding in the amount of \$250,000 be added to the snow removal budget to sustain current snow removal operations, without impacting the winter reserve;

3. THAT the Severe Weather Response Plan (SWRP) be adopted to help communicate to the public potential service level impacts during major storms using the City's established communications channels;
4. THAT as per the February 2022 Member's Resolution, that the City of Vaughan and the Regional Municipality of York collectively undertake a review of various service delivery options for sidewalks adjacent to regional roads and their impacts, while providing the most affordable service that ensures legislative compliance and an accessible and safe citizen experience; and
5. THAT the City Clerk forward a copy of this report to the Regional Municipality of York.

Background

The May 2018 Roads Winter Maintenance Audit recommended that the City conduct a risk-based evaluation of its winter maintenance strategy.

The City's roads winter maintenance program was evaluated against multiple risk factors including financial, operational, health and safety as well as environmental. The objective was to determine whether existing service levels were deriving any additional benefits considering the incremental costs and potentially adverse environmental impacts.

The Audit recommended a complete review of winter maintenance strategies and budgets to ensure alignment with Council directives and historical and anticipated spending.

A jurisdictional review was conducted to compare the City of Vaughan's Roads winter maintenance strategy to those of peer municipalities. The peer group included the cities of Markham, Richmond Hill, Brampton, Toronto, Mississauga, Oakville, and York Region. Comparisons included service levels, costs (where available) and road safety outcomes.

Since the 2018 audit, Public Works has worked with stakeholders to increase funding to enable the delivery of services in alignment with Council directives. The operating season has been extended where required to address the additional demands placed on services due to climate change and operational efficiency increased through innovative service initiatives to manage funds effectively and responsibly.

Extreme weather events have resulted in Public Works reviewing its service delivery model and exploring an enhanced operational response.

Extreme weather events can stress an organization's ability to deliver winter maintenance services while maintaining service level commitments. Though these events are not common, they are becoming more frequent as a result of climate

change. On January 17, 2022, the City experienced the greatest daily snowfall in 14 years and the second most snowfall in 23 years with a snow accumulation of 40 cm. Extensive analysis and review was conducted which confirmed that the City performed exceptionally well overall in its response to the January 17, 2022, extreme snow event and minimized risk to the community.

To ensure the City is managing such extreme events effectively, Public Works has performed a service level review, developed a Severe Weather Response Plan and is exploring several avenues including communication tools and provisional service options to maintain citizen satisfaction.

A recent survey shows that Vaughan's citizens are satisfied with the winter maintenance services provided by the City.

The 2022 Citizen and Business Survey revealed that citizen satisfaction scores for road snow removal increased from the previous survey in 2018. Road snow removal increased by 5 points and end-of-driveway snow removal (windrows) increased by 1 point. Road snow removal was identified as a primary area for maintenance. Primary areas are services that have relatively high impact on overall satisfaction and high individual satisfaction scores. The focus is on maintaining the current level of service and satisfaction.

In February 2022, Regional Councillor Linda Jackson, now Deputy Mayor, presented a Member's Resolution requesting the Regional Municipality of York (the Region) perform a review of the effectiveness and efficiency of winter maintenance activities on sidewalks adjacent to regional roads.

The Member's Resolution was supported by Committee and subsequently provided to the Region and local municipal partners. In response, on June 16, 2022, the Region's Committee of the Whole endorsed a report from the Commissioner of Public Works entitled "Winter Maintenance on Sidewalks Adjacent to Regional Roads". The report requested local municipal partners to determine their position on sidewalk winter maintenance adjacent to regional roads.

Previous Reports/Authority

The following report(s) provide additional information on various topics discussed in this report:

[Staff Communication – January 17, 2022, Winter Storm Event \(SC1, June 21, 2022, Committee of the Whole \(2\)\)](#)

[Review of Regional Winter Maintenance Roles and Responsibilities Extract from Council Meeting Minutes of February 15, 2022 \(Report No. 6, Item 14 of the Committee of the Whole \(2\) February 8, 2022\)](#)

[Internal Audit – Winter Maintenance Audit Extract from Council Meeting Minutes of June 19, 2018 \(Report No. 6, Item 4 - Finance, Administration and Audit Committee Report, June 6, 2018\)](#)

[Winter Control Programs Operational Review Extract from Council Meeting Minutes of May 27, 2014 \(Report No. 25, Item 4 – Committee of the Whole \(Working Session\), May 21, 2014\)](#)

Analysis and Options

Vaughan’s implementation of provincially and internationally award-winning artificial intelligence (AI) technology has enabled Public Works to improve operations efficiency and optimize salt usage, which has improved environmental and financial sustainability and increased citizen satisfaction.

Public Works has undertaken initiatives to improve both citizen satisfaction and operational performance. One of these initiatives is the implementation of an artificial intelligence-based system that provides recommendations on winter maintenance treatments. The Maintenance Decision Support System (MDSS) uses weather forecasts, road pavement conditions and the City’s operational rules to recommend road treatments and optimal salt usage. The effective reduction in salt usage has made for a more financially sustainable operation and has reduced the amount of salt introduced into the watershed, contributing to environment sustainability.

The City was awarded the following awards for innovation:

- 2022 Technology Project of the Year from the Ontario Public Works Association (OPWA)
- 2022 Willis Award for Innovation from the Canadian Association of Municipal Administrators (CAMA)
- EA Danby Certificate of Merit from the Association of Municipal Managers, Clerks and Treasurers of Ontario (AMCTO)
- Smart 50 Award from the Smart Cities Connect Foundation, which honours the 50 most innovative and transformative municipal-scale smart city projects globally.

The implementation of MDSS was also recognized recently at a United Nations Industrial Development Organization Bridge for Cities conference as an example of building resilience through urban innovation.

A roads winter maintenance survey was conducted among peer municipalities and demonstrates that Vaughan has the highest service levels in the GTA for Roads Winter Maintenance.

The City's winter maintenance service levels were benchmarked against the service levels of a group of peer municipalities. The comparator group included the cities of Markham, Richmond Hill, Brampton, Toronto, Mississauga, Oakville, and York Region. The items benchmarked included service levels, costs (where available), and resources. The Minimum Maintenance Standards legislation (O.Reg. 366/18) defines the minimum standards for winter maintenance for roads (highways). The highest service levels apply to major highways and arterial roads with decreasing requirements for residential roads. All municipalities surveyed maintain their main roads to the higher levels of the standard, which is a target state of bare pavement. However, only Vaughan maintains its residential roads to the same standard as the main roads. (See Attachment 2: Jurisdictional Review).

Vaughan also maintains its laneways to the standard of bare pavement (which is unique among the peers). Additionally, Vaughan is one of the few municipalities to offer a windrow clearing service for all residential driveways and has the most comprehensive of all offerings among the peer municipalities.

Vaughan winter service level options have been reviewed and current service levels continue to ensure the safety of the road network in a fiscally and environmentally sustainable manner.

Several winter maintenance service level options were reviewed for Roads. The winter maintenance industry defines three typical outcomes of a maintenance operation:

- The first is a target state of "bare pavement".
- The second is a state of "safe and passable", which is a road surface that has residual snow and/or ice but may be travelled safely.
- The third is "snowpack", which is a permanent state of hard-packed snow on a roadway (typically implemented in jurisdictions with colder temperatures or lower traffic volumes).

As Vaughan implements a bare pavement strategy across its entire network, several options were examined for lower levels of service. Implementing a combined "bare pavement/safe and passable" approach would result in an increased risk to the City and reduce citizen satisfaction at marginal cost savings.

An independent study conducted by industry experts confirmed that Vaughan's winter maintenance service levels have a positive impact on road safety.

Industry experts were retained to examine the impact of the City's level of service on road safety. Vaughan's historical collision data was compared to those of several peer municipalities. The descriptive analysis showed that the number of collisions during winter events increased in all municipalities compared to collisions that occurred during corresponding non-event periods. However, the City of Vaughan experienced the smallest increase in collisions during the event periods compared to the comparison municipalities. Thus, the study demonstrates that the higher winter maintenance service levels have a positive impact on public safety.

Vaughan is a leader in providing the most extensive, time efficient and cost-effective windrow clearing program across the Greater Toronto Area

Vaughan is one of three municipalities in the GTA that offer city-wide windrow clearing. In comparison to other municipalities, Vaughan's windrow program services all residential driveways and has the most efficient service level timelines. Vaughan currently services approximately 90,000 residential driveways at an annual cost of \$2.1M, which equates to \$23 per residential driveway per winter season.

Several options were examined for windrow clearing services. The option of plow-windrow coupling involves the plow and windrow clearing unit working in tandem. This is an approach that was implemented in the City in the past. A 2014 study commissioned by the City found that this delayed the completion of maintenance on routes by an average of 3 hours. As a result, the coupling approach was abandoned and the current operational practice of plows and windrow clearing units to proceed independently was adopted. This finding was supported by a study using data from recent plowing events, which showed an average route completion delay of almost 4 hours for the coupling approach. To effectively pair plows and windrow units and maintain current maintenance timelines, a significant increase in the number of units deployed would be required, which would result in a significant increase in costs. Given the current contract status, the earliest this option could be implemented would be in 2026.

To ensure public safety, the City typically conducts snow removal operations three to four times per season within its Business Improvement Areas (BIAs) and once per season in laneways and narrow corridors when snow storage capacity has been exceeded.

The removal of accumulated snow and is only performed within our Business Improvement Areas (BIAs) or when snow accumulations pose a risk to public safety. The service is typically performed in the City's BIAs when snow accumulation in parking areas reaches a height exceeding 0.5m or in laneways when snow accumulation

impedes the passage of vehicles and snow storage capacity has been exceeded. From the jurisdictional review, most municipalities in the GTA that conduct snow removal in laneways take a similar approach to the City of Vaughan which is to perform snow removal operations as required when the passage of vehicles through the corridors is impeded.

As part of the service level review, several options were reviewed including making snow removal a standard service after every plow event for BIAs, laneways, narrow roads, and cul-de-sacs. Given an average of seven (7) plowing events per season, the cost of snow removal would be significant at a cost of over \$2M annually and would require additional contracted services. It is recommended to continue providing snow removal for major storm events when there is a risk to public safety. In recent years, snow removal operations within laneways and narrow corridors have been conducted once annually following severe winter storm events and when snow storage capacity has been exceeded.

A Severe Weather Response Plan has been developed to effectively communicate anticipated service level impacts to the public during severe weather events and to identify thresholds that trigger snow removal operations.

Extreme winter weather events can present challenges in meeting service level commitments. A Severe Weather Response Plan has been developed to identify realistic maintenance timelines when snow accumulation from an event exceeds 20 cm and when snow removal operations are required. The Plan classifies “Storm Types” and the corresponding service levels based on accumulation. This can be an effective way to explain the anticipated service level impacts to the public using the City’s various communications channels. The City of Toronto uses a similar tool to communicate service levels to their citizens. There is also potential for broader adoption across peer municipalities.

This will serve to further enhance the Corporate and Strategic Communications department’s already award-winning winter maintenance communications approach which employs various communications methods to increase public awareness of service levels, educate residents and business owners about their responsibilities during the winter season, and provide weather-related updates that may affect residents during winter. From November 2022 to April 2023, winter communications tactics included more than 125 Public Service Announcements and Council Communications Packages, educational videos on City services, proactive media outreach, eNewsletters, brochures, social media (both organic and paid) to the City’s 70,000 followers, website content, mailers, signage and much more. Going forward, the City of Vaughan will consider partially opening the Emergency Operations Centre in severe storm circumstances as required.

As per the Province of Ontario's *Municipal Act, 2001* sidewalk winter maintenance adjacent to regional roads is the responsibility of local governments. The time and equipment required to ensure sidewalks adjacent to regional roads are maintained to the appropriate levels of service impacts Vaughan's ability to deliver timely local sidewalk winter maintenance service.

Vaughan currently provides winter maintenance along 216 kilometres of sidewalks adjacent to the Region's roads. This makes up 18% of the 1,200 sidewalk kilometres maintained by the City. The City often expends 60 to 65% of its resources per winter event maintaining sidewalks and intersections adjacent to regional roads.

This is due to the high volume of snow cleared from the road that requires storage within the boulevard and sidewalk areas. With the compressing urban form and widening of roads, sidewalks have become the only option for road plowing operations snow storage. Stored snow is often a solid mass and can at times be up to three (3) feet deep. Clearing and removing this type of snow is tough on the City's equipment and requires a more robust, coordinated approach with the Region.

Financial Impact

The cost to fully fund the snow removal operations once per year within the City's laneways and narrow corridors will result in an increased cost of approximately \$250,000 to the existing snow removal budget.

Operational Impact

Public Works is responsible for delivering winter maintenance services. Corporate and Strategic Communications would be involved in the communication of the proposed Severe Weather Response plan.

Broader Regional Impacts/Considerations

There are no broader regional implications of the winter maintenance service level review. There is an opportunity to implement a Severe Weather Response plan as a common approach to communicating service level impacts across a number of peer municipalities.

Conclusion

Vaughan has among the highest levels of service for winter maintenance in the GTA. As a result, it is recommended that the City maintains its current winter maintenance service levels. In order to sustain current snow removal operations without impacting the winter reserve, it is recommended that funding in the amount of \$250,000 be added to the snow removal budget.

It is further recommended that the City proceeds with the proposed Severe Weather Response plan to enhance the approach to explaining potential service level impacts during major storms to the public.

As the City often expends 60 to 65% of its resources per winter event maintaining 18% of sidewalk kilometres adjacent to regional roads, Public Works recommends the City and the Region collectively examine various service delivery options for sidewalk snow clearing, and their impacts while providing the most affordable service that ensures legislative compliance and an accessible and safe Citizen experience.

For more information, please contact:

Peter Pilateris, Director, Transportation and Fleet Management Services, Ext.6141.
Shanon Kalra-Ramjoo, Acting Director, Parks, Forestry and Horticulture Operations / Business Excellence and Operational Performance, Ext.6308.

Attachments

1. Jurisdictional Review.
2. Severe Weather Response Plan.
3. Winter Maintenance Service Level Review Presentation.

Prepared by

Alan Pacheco, Manager, Road Operations, Ext. 6204

In consultation with:

Carmine Mainella, Manager, Parks and Horticulture Operations, Ext. 6500
Maurice Battistuzzi, Project Manager, Operational Performance, Analytics and Innovation, Ext. 6149
Bianca D'Mello, Project Manager, Business Transformation, Ext. 8886

Approved by



Zoran Postic, Deputy City Manager,
Public Works

Reviewed by



Zoran Postic
on behalf of Nick Spensieri,
City Manager