

**Date:** 2019-10-23

**Subject:** **Winter Maintenance Service Review**

**Contact:** Susan Evans, Manager, Contracts, Operations Planning & Projects,  
905-874-2592 Road Maintenance, Operations and Fleet, Public  
Works and Engineering Department

Frank Massacci, Manager, Roads Operations, 905-458-4888 x63107

**Recommendations:**

1. That the report from Frank Massacci and Susan Evans dated October 23, 2019, to the Committee of Council Meeting of November 13, 2019, **re: Winter Maintenance Service Review** be received;
2. That the review from Ernst and Young **re: Service Delivery Review, Category 2 – Public Works & Engineering, Winter Maintenance Report** be received;
3. That Winter Maintenance service levels on local roads be increased to 5.0 cm from 7.5 cm accumulation and staff report back to Council on the effectiveness of this service level improvement following the 2019/2020 winter season;
4. That the Communication, Education and Awareness Plan be implemented as outlined in this report.

**Overview:**

- This report is in response to Council's referred matter RM 90/2019 requesting staff to explore various possible Winter Maintenance program and service delivery improvements.
- The consultant, KPMG, provided a Service Review report to Council on May 29, 2019. The report identified opportunities to improve efficiencies to the City's current approach for service delivery, including winter maintenance.
- Members of Council attended a Winter Maintenance workshop on June 10, 2019 hosted by Public Works and Engineering Services staff. During the workshop,

## 9.2.3-2

members of Council provided suggestions for consideration by staff regarding possible Winter Maintenance service delivery improvements.

- Ernst & Young LLP is currently conducting an in-depth review of KPMG's recommendations including Winter Maintenance. In advance of Ernst and Young's final report, a preliminary analysis has been conducted and the following is considered in this report:
  - Review of other service delivery models for completing winter operations such as, but not limited to, in-house staff versus contracted staff delivery and its impact to winter/ summer operations.
  - Increasing the service level minimum threshold for plowing on local roads from 7.5 cm to 5.0 cm accumulation and utilizing alternative removal and mitigation methods (other than salt) for service delivery for the 2019/2020 winter season and report back to Council.
  - Improving public communication, education and awareness programs related to winter operations to assist in managing residents' expectations and cooperation.

### **Background:**

The consultant, KPMG provided a Service Review report to Council on May 29, 2019. The report identified opportunities to improve efficiencies to the City's current approach for service delivery, including its winter maintenance program.

Members of Council attended a Winter Maintenance workshop on June 10, 2019, hosted by Public Works and Engineering Services staff. During the workshop, members of Council provided suggestions for consideration by staff regarding possible Winter Maintenance improvements, including but not limited to service delivery, service levels and public communications and awareness.

As a result of the deliberations at this Workshop, the following motion was approved at the Committee of Council meeting on June 12th, 2019:

"CW305-2019 Whereas Members of Council attended a Winter Maintenance workshop on June 10, 2019, hosted by Public Works and Engineering Services staff, and

Whereas during part of this workshop, Members of Council provided suggestions for consideration by staff regarding possible Winter Maintenance program and service delivery improvements, including but not limited to service delivery, service levels and public communications and awareness;

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Therefore Be It Resolved That Public Works and Engineering Staff be requested to report to Committee of Council by October 2, 2019, on various possible Winter Maintenance program and service delivery improvements including:

- a. Consideration of other service delivery methods for completing winter operations such as, but not limited to, in-house staff versus contracted staff delivery and its impact to winter/summer operations;
- b. Increasing the service level minimum threshold for plowing on local roads from 7.5 cm to 5.0 cm and utilizing alternative removal and mitigation methods (other than salt) for service delivery; and
- c. Improved public communication, education and awareness programs related to winter operations to assist in managing residents' expectations and cooperation;
- d. Review the sidewalk clearance 24-hour requirement with a view to potentially reducing the timeframe; and
- e. That costs related to item (a) above be prepared as expeditiously as possible, but potentially available later than the October 2, 2019 date noted above."

### **Current Situation:**

Based on the items identified through the KPMG Review, the feedback from the Winter Workshop held earlier this year, the attached Appendix 1 is the result of Ernst and Young's analysis. This analysis will be expanded in their final report to Council.

### Current Service Delivery Model

To ensure enhanced customer service delivery is available during the winter season, City Staff are scheduled on three shifts during the week. Their responsibilities include continuously servicing roads and sidewalks during non-winter events including bridges and curves, monitoring and filling salt boxes located around the City and managing winter material. Staff respond to urgent and non-urgent winter related service requests including water main breaks, pothole repairs due to fluctuation in temperature and complete clean up after a winter event.

During a winter event, City Staff are the first responders to service roads and are responsible to maintain approximately half of the arterial routes, four sidewalk routes and all crossing guard locations.

The City will be commencing the third term of a seven term contract for Winter Maintenance with options to extend for an additional three years. During a winter event, Contractors working for Road Operations, Maintenance & Fleet are responsible to complete the following services:

- Roadway plowing & material (salt, brine pre-wet salt) application

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- Sidewalk plowing & material application
- Transit Stop plowing & material application

## Local Roads Service Level

Currently, local roads, including courts, are plowed when snow accumulation reaches 7.5 cm (3”) during a single snow event. For winter events with less than 7.5 cm of snow accumulation, salt is applied to the road surface. Plows are sometimes deployed into local roads and courts when the snow accumulation is less than 7.5 cm during a single event because of anticipated temperature drops and the previous snow fall begins to melt and there is a risk of ice and/or rutting, or there is anticipated snow fall forthcoming. If two snowfalls are anticipated to accumulate more than 7.5cm of snow, then plowing does occur.

As depicted in the table below (Table 1.1), local roads, including courts, are serviced by utilizing salt and brine during accumulation and are plowed once snow accumulation reaches 7.5 cm. The typical service level target is for the local roads to be safe and passable within 24 hours after the storm event has ended and general condition of the road is track bare or snow covered.

Please note that the arterial roads are serviced and plowed continuously and the service level within 24 hours is base dry or wet. Collector roads are serviced and plowed during accumulation and the service level condition of the road within 24 hours (unless otherwise noted) could range from base dry to track bare.

		Winter Road Conditions – General Condition Guidelines Reference	
<p><b>Safe and passable within 24 hours after the winter event has ended</b></p> <p><b>Collectors</b> serviced &amp; plowed during accumulation</p> <p><b>Locals &amp; Courts</b> serviced during accumulation &amp; plowed after snow accumulation reaches 7.5 cm</p>	<p><b>Arterials</b> serviced &amp; plowed continuously</p>	<p><b>Bare Dry</b> Road surface completely clear of ice and snow and dry from edge of driving surface to edge of driving surface.</p>	
		<p><b>Bare Wet</b> Road surface completely clear of ice and snow but wet from edge of driving surface to edge of driving surface.</p>	
		<p><b>Centre Bare</b> Road surface generally clear of ice and snow along the centre line of the roadway, approximately 1 metre either side of centreline with localized snow or ice.</p>	
		<p><b>Partially snow covered</b> Road surface has snow covered or snow pooled sections. For example, there may be drifted sections of snow covering lanes or the road centre is bare.</p>	
		<p><b>Track Bare</b> Road surface is mainly snow-covered with the exception of the wheel track area of vehicles, which is generally clear of ice or snow.</p>	
		<p><b>Snow-Covered</b> Road surface is completely covered with a layer of snow from edge of driving surface to edge of driving surface with localized ice.</p>	

Table 1.1 - Current Council approved service levels



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The table below (Table 1.2) is a summary of service requests received over the last four winter seasons for arterial, collector and local roads. The majority of service requests received from the public and members of Council relate to the level of service on local roads. It should also be noted that an increase in snowfall has occurred over the same time period.



Table 1.2

\*2017-2018 experienced snow fall until April 29, 2018

\*\*2018-2019 experienced snow fall from Nov 9, 2018 to April 28, 2019

Although service levels are currently being met on local roads, there is a perception that it is not. In an effort to help improve this situation, staff recommends an increase to the service level for local roads for the 2019/2020 winter season. It is important to note that even with this increase, local roads will still not receive the same service level (e.g., bare pavement) as what occurs on collector and arterial roadways.

### Communication, Education and Awareness

Another area that can assist in dealing with this perception is improvements in communication with the public and members of Council. To do this, Roads Operations staff has worked closely with Strategic Communications to develop a comprehensive communication and media strategy.

A wide variety of tactics will be used to reach as many residents as possible throughout the winter season, with a combination of general education and event-specific updates. Tactics will include, but are not limited to:

- Snow webpage ([www.brampton.ca/snow](http://www.brampton.ca/snow)) with winter event status updates
- New interactive tracking map going live this winter season

## 9.2.3-6

- Videos with the Mayor, Councillors and staff
- Updated Council toolkits
- Advertising and interviews on ethnic TV and radio
- Comprehensive social media outreach, including geotargeted advertising
- Media roundtable and yard tour
- Newspaper and specialty advertising
- Various print materials, with widespread distribution/availability
- Information in existing corporate publications (e.g. City Matters newsletter, Councillor newsletters, seniors' recreation guide)

### Parking on Local Roads

Vehicles parked on the roadways have severely impacted Winter Maintenance. Operators either have to manoeuvre around parked vehicles leaving areas not serviced or the operator is not able to continue along their route and the remaining roadway is therefore not serviced. These vehicles parked on the road result in repeat deployment of winter equipment to complete the operation and corresponding service requests related to incomplete service provisions.

To assist Winter Maintenance in meeting our service levels and streamline our operation, By-Law Enforcement will be proactively ticketing known parking areas of concern. During the Winter Maintenance events, staff will be in continuous communication with By-Law Enforcement to assist with achieving our service levels. Note that often towing is not feasible as By-Law Enforcement finds it difficult to get access to towing equipment as they are focused on attending to accidents and other emergency related issues during a storm event.

### **Corporate Implications:**

#### Financial Implications:

Staff will explore options to fund the one time pilot project as part of the 2020 budget submission. If Council determines that the revised service levels are to remain in place after the pilot project, it will be included in the 2021 budget submission, pending council approval.

### **Term of Council Priorities:**

This report achieves the “Good Government” Priority of the Strategic Plan by practicing proactive, effective and responsible management of municipal assets and services.

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### Council Priority – Service Excellence

This report is to continue to transform corporate culture to be more resident-focused in its approach to service delivery.

#### **Conclusion:**

In an effort to help address the concerns raised by residents, that the service is not comparable between local and collector roadways, it is proposed that Council authorize an increase in service level for local roads from 7.5 cm to 5.0cm of accumulation for the upcoming winter season. It is important to note that even with this increase, local roads will not receive the same service level (e.g. bare pavement) as what occurs on collector and arterial roadways.

Implementation of a Communication, Education and Awareness strategy for Winter Maintenance has commenced for this season.

The preliminary findings of the service review undertaken by Ernst & Young reveal that winter maintenance costs per lane kilometre in the City of Brampton are above the average of peer municipalities reviewed in the Greater Toronto and Hamilton Area (GTHA), but to a lesser extent than in the previous KPMG analyses.

Ernst and Young will provide their final Winter Maintenance service review with further analysis on the following:

- Validation of KPMG's cost per kilometre.
- Other service delivery models for completing winter operations such as, but not limited to, in-house staff versus contracted staff delivery and its impact to winter/summer operations.
- Review of additional Service Levels for driveway snow windrow clearing.
- Review the impact of increasing the time to clear sidewalks.
- Review the impact on increasing sidewalk clearing to include the entire City sidewalk network.

In addition to Ernst and Young's final report, staff will report back on the effectiveness of the local road service level increase and the overall winter maintenance service delivery in the third quarter 2020.

Approved by:

Approved by:

## 9.2.3-8

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Michael Parks, C.E.T.  
Director,  
Road Maintenance,  
Operations and Fleet  
Public Works and  
Engineering

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Michael Won, P.Eng.  
Acting Commissioner,  
Public Works &  
Engineering

### **Attachments:**

Appendix 1: Service Delivery Review – Winter Maintenance Report by Ernst and Young

Report co-authored by: Susan Evans  
Report co-authored by: Frank Massacci

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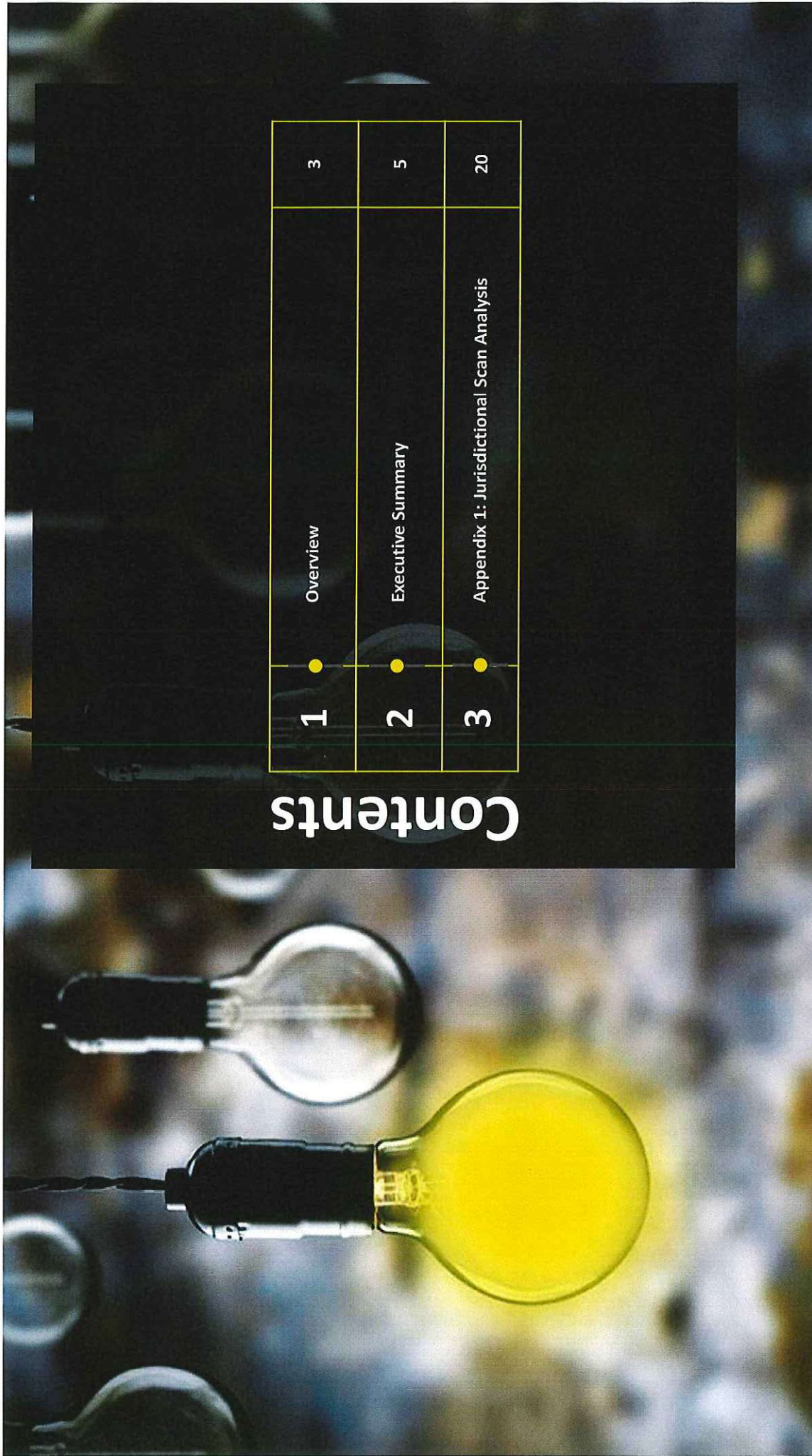
# City of Brampton Service Delivery Review

Category 2 – Public Works & Engineering

Winter Maintenance Report Presentation  
October 22, 2019







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## Purpose

### Project Context

The City of Brampton undertook an external service review which concluded in May 2019. The service review identified a number of different opportunities to be further investigated during subsequent service reviews, including evaluating the level at which Winter Maintenance services are delivered. The City subsequently initiated further reviews across the organization, including this review of Public Works and Engineering.

### Purpose of this Report:

This report is intended to provide the findings and analysis from the following components of the Public Works – Winter Maintenance Review scope:

- Alternative service delivery for winter maintenance services, including the impacts of increasing service levels and / or expanding the scope of services
- Initial jurisdictional analysis of alternative removal and mitigation methods
- Analysis of comparable jurisdictions including service delivery models, service levels, removal and mitigation methods, and communications considerations

### Not included in this Report:

- Additional alternative service delivery analysis for sidewalks and other winter maintenance operations as required
- Broader communications considerations for engaging the public in a more effective manner
- Full jurisdictional analysis of alternative removal and mitigation methods

This information will be included in the final report of the project, expected to be delivered on December 20, 2019.





### Data and Modelling Assumptions

- Winter 2018/19 city and contractor costs have been used as current cost (base case).
- Calculations for scenario analysis have been performed using input assumptions and data provided by the City of Brampton Winter Maintenance Management team (“the management team”). Inputs to the analysis are the sole responsibility of the management team.
- The methodology was developed through discussion with the management team and outputs have been reviewed by the management team.
- The analysis herein is in summary form. Selecting portions of this analysis without considering all of the factors and analyses considered, may create a misleading view of the output and results.
- Calculations have been based on specific assumptions noted in the appendix to this report, not every potential influence or factor has been considered including but not limited to negotiated changes with contractors and unions, inflation, the impact of overhead costs, storage costs for new equipment and changes in contractor rates resulting from changes in requirements.





## Executive Summary



## Context for Winter Maintenance Review



### Service Description

- Winter Maintenance services include snow removal and salting for more than 3,900 lane kilometres of roads, over 900 km of sidewalks, over 2,400 transit stops and 81 City Parking Lots, in addition to school crossings, recreation trails, bus terminals and courts.
- Services are delivered using a mix of in-house and contracted resources, with contractors being responsible for maintaining approximately 90% of routes.
- Winter Maintenance staff also conduct significant winter planning exercises during the April – November period, as well as performing a number of summer maintenance activities.
- Winter Maintenance had a 2018/19 operating budget of \$21M and approximately 66 FTE.

### Why Review Winter Maintenance?

- The KPMG Service Efficiency report (May 2019) identified that Winter Maintenance and Winter Control services were delivered at an above standard level, and identified them as opportunity areas to examine alternate service delivery models.
- Council has also asked for a report back on Winter Maintenance including examining alternate service delivery models, the impacts of changing service levels for snow removal and sidewalk clearing, and the impact of expanding sidewalk clearing.





## Scope of Winter Maintenance Review

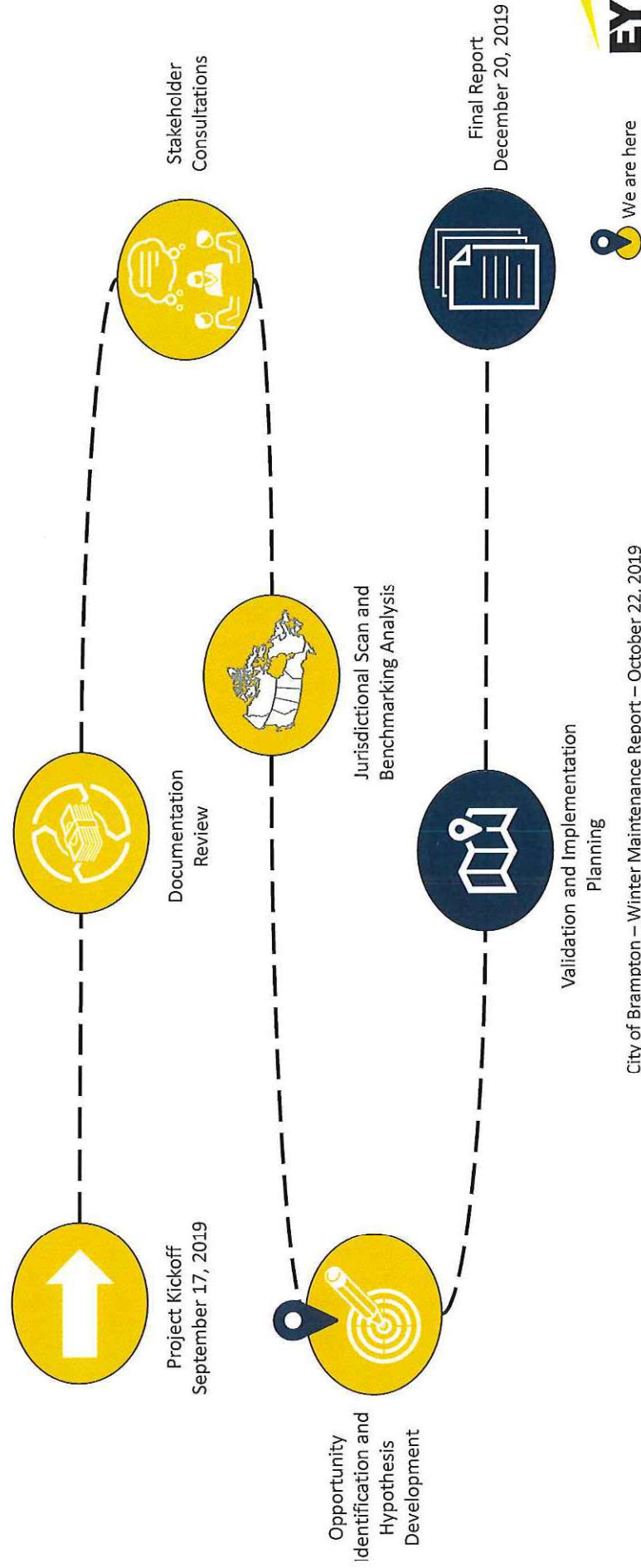
The scope of the Winter Maintenance review encompasses the following key activities:

Alternative Service Delivery	Impact Analysis	Jurisdictional Analysis	Public Communications Considerations
<ul style="list-style-type: none"> <li>▶ Examine alternative service delivery models, including the existing split between City-run and Contractor-run operations</li> <li>▶ Examine alternative removal and mitigation methods to salt</li> </ul>	<ul style="list-style-type: none"> <li>▶ Analyze the implications of increasing service level minimum thresholds (plowing and sidewalk clearance)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Review comparable jurisdictions to identify alternative service delivery models, service levels, and potential opportunities to deliver services more effectively and / or efficiently</li> <li>▶ Review comparable jurisdictions to identify public communications considerations (as applicable) that the City could adopt</li> </ul>	<ul style="list-style-type: none"> <li>▶ Identify opportunities to communicate Winter Maintenance service standards more effectively with the public</li> </ul>



## Timeline for Review

The overall Public Works Review launched on September 17, and is expected to wrap up on December 20 with the completion of the final report. We have accelerated the delivery of components of the Winter Maintenance scope in order to align to the report being produced for Council.





## Winter Maintenance Scenario Analysis Approach

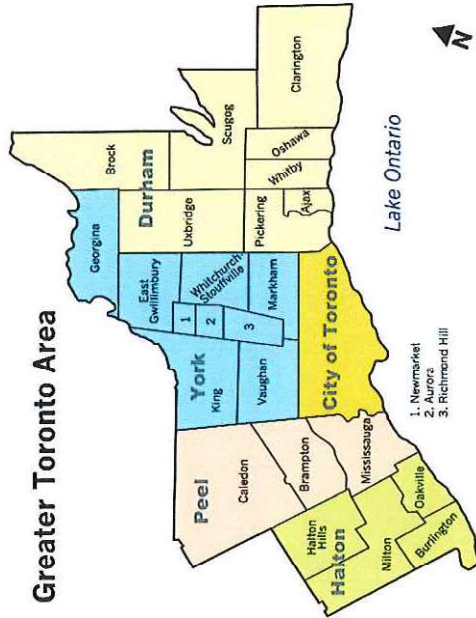
Four different scenarios aligned to the overall scope of the Winter Maintenance Review were analyzed as part of this report:

1. **Scenario 1: Evaluate alternate service delivery models**
  - a. Considered bringing additional maintenance routes in-house rather than continuing with the contracted out model
2. **Scenario 2: Evaluate the impact of increasing service levels for local roads clearing from 7.5cm to 5cm**
3. **Scenario 3: Evaluate the impact of increasing the time taken to clear sidewalks**
  - a. This scenario requires further data inputs and analysis, and will be included in the December 20<sup>th</sup> report
4. **Scenario 4: Evaluate the impact of increasing the percentage of sidewalks cleared**
  - a. Currently approximately 45% of kilometres of City sidewalks are cleared. The analysis contemplates increasing this to 100% of sidewalks.

This analysis was conducted because these scenarios are the ones Winter Maintenance staff are required to report back on to Council at the end of October 2019.



## Jurisdictional Scan Approach



### Jurisdictions reviewed by EY

- City of Vaughan
- City of Mississauga
- City of Markham
- City of Hamilton
- City of Burlington



### The Approach

Conduct a jurisdictional analysis of comparable local jurisdictions to identify service delivery models, service levels, leading practices, and other key findings by:



### Primary & Secondary Source Review

Evaluate the performance of Brampton's current service offerings, its service levels and winter maintenance delivery model relative identified jurisdictions. This includes identifying where service gaps exist, innovative practices/service delivery models and Brampton's performance.



### Local Jurisdictions

Jurisdictions identified for consideration are situated within the Greater Toronto Area based on previous jurisdictional analyses, weather conditions, comparable size, service delivery models or those in the process of evaluating service levels investments

- Top priority issues (local vs main road service levels, sidewalk/windrow cleaning) will be taken into consideration and evaluation of comparable services
- Conversations with the aforementioned jurisdictions can help inform the key observations within this section.



## Jurisdictional Scan Priority Areas

The Jurisdictional Analysis focused on specific research parameters and focus areas aligned to the scope of the Winter Maintenance service review

- Parameters include: size (population); demographics (diversity and age); economic growth rates; unionization rates; in addition to category specific parameters we identify such as # of dwellings.
- Three central focus areas will guide the jurisdictional scan that will be applied to each jurisdiction (Service Delivery Models; Organization Structure/Staffing; Service Levels), in addition to two Winter Maintenance specific categories

**Service Delivery Models**

- Evaluating Service Delivery Structure (In-house vs contracting)
- Winter Maintenance Contract
- Facility Considerations/Impacts
- Governance

**Service Levels**

- Council approved service levels
- Priority Areas vs Non Priority Areas
- Cost and impact considerations
- Salting Methodology

**Organization Structure and Staffing**

- FTE
- Full time vs part time
- Unionization Considerations
- Spans and layers

**Winter Maintenance Coverage**

- Sidewalks
- Evaluation of salting and salting alternatives
- Windrows
- Recent initiatives under review

**Public Engagement, Reporting and Education**

- Managing service requests and expectations
- Citizen complaints and reporting
- Public education opportunities
- Innovative technologies







## Jurisdictional Scan Key Findings

*A review of 5 comparable local jurisdictions, selected in collaboration with the City based on size, governance, and service delivery model. Key findings from the jurisdictional analysis include:*



### Service Delivery Model Findings

1. All jurisdictions analyzed employ a mix of in-house and contracted service delivery.
  - a. In all cases, the majority of service delivery is contracted out, and in many cases the distribution is consistent with Brampton's current delivery model mix of 90:10 contracted out to delivered in-house.
  - b. In Vaughan's case they have recently implemented performance-based contracts for external service providers which appears to have resulted in improvements in service delivery through a combination of quality control frameworks and incentive/disincentive structures.
2. Many jurisdictions which have sought to implement increased service levels during the life of a contract have found contractors struggle to economically procure additional equipment if there are two or fewer years remaining in the contract.
3. Mississauga employs a Lean Program to drive continuous improvement and empowers staff to maximize customer value and minimize waste while allowing staff to problem solve customer problems on a daily basis.
  - a. They have employed 114 small improvements and 7 projects which resulted in an estimated \$898,000 in savings since 2014.





## Jurisdictional Scan Key Findings

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### Service Level Findings

1. Other jurisdictions consistently found that increases in service levels which required the acquisition of additional capital equipment required multiple years to implement, and in some cases required additional investment in facilities space in order to house additional equipment (whether owned by the City or Contractor).
  - a. Mississauga's analysis found that it is not economically efficient for the City to purchase winter maintenance-specific equipment as the demands on their winter maintenance program grow.
2. Service level increases do not necessarily result in reductions in resident complaints.
  - a. Complaints in Vaughan more than doubled following the implementation of city-wide windrow clearing.
3. Local road snow clearance service levels start at the end of snowfall for all municipalities included in the jurisdictional scan.
4. A number of other jurisdictions have raised concerns about the sustainability of implementing substantial service level increases, particularly related to windrow clearing.



## Jurisdictional Scan Key Findings

*A review of 5 comparable local jurisdictions, selected in collaboration with the City based on size, governance, and service delivery model. Key findings from the jurisdictional analysis include:*



### Winter Maintenance Coverage Findings

1. Jurisdictions which have evaluated non-salt alternatives have found that there is no broadly accepted application practice that yields meaningful improvements. Municipalities which have used salting alternatives use significantly larger volumes of alternative products which may reduce or eliminate both financial and environmental benefits associated with alternatives.
  - a. Vaughan used 45,000 tons of non-salt alternative to clear 2084 lane km of roads (22 tons per lane km). For comparison, Toronto used 88,140 tons of salt for 14,800 lane km of roads (6 tons per lane km).



### Public Engagement , Reporting and Education Findings

1. All jurisdictions struggle with effectively communicating winter maintenance service levels to the public, and complaints are often related to misaligned expectations
  - a. In Vaughan, contractors are also responsible for Customer Service Representatives, providing incentives to deliver quality customer service.
  - b. Markham and Mississauga uses an app to provide updates on the progress of snow clearance operations.

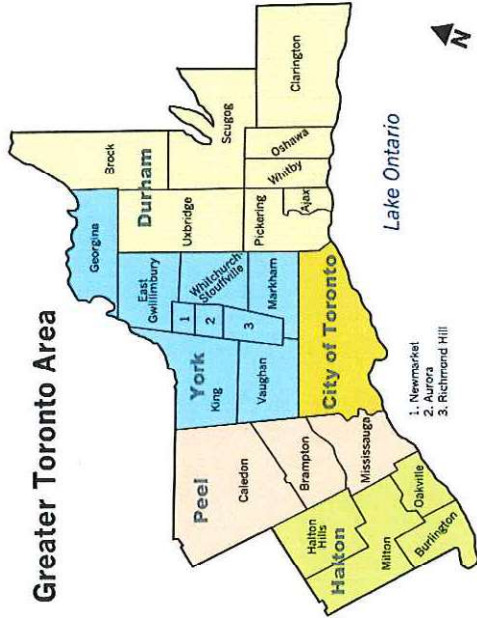




## Appendix 1: Jurisdictional Scan Analysis



## Jurisdictional Scan Approach



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## Summary Findings

	City of Brampton	City of Vaughan	City of Mississauga	City of Markham	City of Hamilton	City of Burlington
Population	642,800	329,000	775,000	348,718	572,575	176,802
Dwelling Units	173,428	71,265	248,468	106,131	222,918	72,535
Road network	3967 km of roads 2115 km of sidewalks 2462 transit stops	2222 km of roads 1000 km of sidewalks	5757 km of roads 2400km sidewalks	81,000 Driveways 2224 km of roads 1112km sidewalks	6,582 kms of roads 1,10 cul-de-sacs 2445 km of sidewalks 2300 bus stops	1,635 km of roads 850 km of sidewalks
Expense per lane Kilometer	\$5,306	\$5,648	\$4,048	\$5,054	\$4,115	\$2,913
Arterial (Primary)	Prior to Accumulation, bare surface (24 Hours)	5 cm (4 hours)	8 cm (12 hours) 15 cm (24 hours)	Bare surface condition (24/7)	2.5cm, Bare Surface (4 hours for Major Arterial, 8 for primary collector)	5 cm, bare pavement (24 hours)
Collector (Secondary)	At start of accumulation, bare surface (24 hours)	5 cm (12 hours)	8 cm (12 hours) 15 cm (24 hours)	Centre bare surface (7am-6pm)	8 cm, centre bare (8 hours)	5 cm, bare pavement (24 hours)
Local	7.5 cm (24 hours)	5 cm (16 hours)	8 cm (24 hours) 15 cm (36 hours)	7.5 cm: > 15 cm, (16 hours) < 15cm, 16 hrs	8-10 cm (24 hours)	7.5 cm, not salted (24 hours)
Service Model	In-house/contracted	Winter maintenance service contracted except: sidewalks, industrial roads	In-house/contracted 10% of fleet city owned	In-house (10%)/contracted (90%)	In-house/contracted	In-house (37%)/contracted (63%)
Sidewalk Coverage	Within 24 hours, 48 for prolonged events, 45% (942km) of city network maintained (2018)	5 cm, within 24 hours, all city sidewalk routes maintained	City clears 55% of total sidewalks (1400km, 24 hours of snowfall) - Contracted service	Regional and City Roads (5 cm within 24 hours)	Within 24 hours, 16% (397 km) of city network maintained	5 cm, within 48 hours. Potential for 72 hours
Windrow Coverage	Senior Assistance Rebate Program (2400 residents)	City-wide windrow clearing service for all residential driveways (78,500 windrows)	Driveway Windrow Clearing Pilot (65+)	Senior Household Program (4683 Households)	Seniors and disability assistance volunteer program, 3cm (24 hours), 209 clients served	Program for those with physical limitations
Bike Lane and Pathways	Bare surface (12- 24 hours)	N/A	N/A	No pathway maintenance provided	N/A	Selected designated pathways (30km) and hydro corridors cleared at the same time as primary sidewalks
Salting Methodology	Salt	Thawrox	Salt	Salt	Salt/Sand & Sand Mix	Salt and Sand





## Fiscal Effectiveness – Overview

Brampton has the second highest expense per lane kilometre according to 2018 FIR data at a cost of \$5,306 compared to the average cost of \$4,515. The major drivers of expenditures on Winter Maintenance and Winter Control Services are:

- Brampton’s expense per lane km are driven by relatively higher expenditures on ‘Salaries, Wages and Employee Benefits’
- As a percentage of total expenditures, and on an expense per lane km basis, Brampton’s expenditures on ‘Contracted Services’ are around the average, and it has one of the lowest ‘Materials’ expenditures
- It is important to note that expenditures are for all Winter Maintenance services including sidewalks, transit stops, bike paths and trails as applicable to each municipality.

	City of Brampton	City of Vaughan	City of Mississauga	City of Markham	City of Hamilton	City of Burlington
Total lane KM maintained	3967 km	2222 km	5757 km	2224 km	6582 km	1635 km
Salaries, Wages and Employee Benefits	\$5,932,077	\$1,591,643	\$1,487,493	\$344,646	\$8,264,498	\$913,455
Materials	\$3,266,131	\$3,312,594	\$6,564,200	\$2,840,224	\$9,710,770	\$763,835
Contracted Services	\$12,198,387	\$7,525,003	\$14,143,583	\$7,431,122	\$8,024,939	\$2,350,651
Total Operating Expenditures**	\$21,051,949	\$12,551,070	\$23,307,106	\$11,241,818	\$27,089,352	\$4,764,261
Expense per lane KM	\$5,306	\$5,648	\$4,048	\$5,054	\$4,115	\$2,913

27 \*analysis based on 2018 FIR data  
 \*\*may include additional categories of expenditure



## Fiscal Effectiveness – Additional Considerations

The comparison of fiscal effectiveness indicates the following opportunities which will be further evaluated and included in the Final Report on December 20, 2019:

- **Salaries, Wages and Employee Benefits:** Brampton's current cost / lane km is \$1,495, indicating that there may be additional opportunities for alternative service delivery.
  - Opportunities could include optimizing route planning, increasing the number of winter maintenance facilities to reduce the amount of time equipment spends in transit getting to routes, and opportunities to increase the services delivered by contractors.
  - Note that Brampton's current Winter Maintenance resources, in addition to maintaining some dedicated routes and sidewalks, are also responsible for pre-salting, clearing debris, maintaining hotspots including bridges, filling salt boxes, post-winter cleanup, transit stops, repairing potholes and winter-related damage and planning for winter operations which other Municipalities may not do, or may not do to the same extent.
- **Contracted Services:** Brampton's current cost / lane km is in the average of the jurisdictions reviewed. However, it appears that contractors have different rates for common pieces of equipment; this suggests that the City could negotiate to bring down those differential costs to lower the overall cost / lane km.
- **Note:** Municipalities use different methodologies to report for FIR purposes. This may account for some of the differences in expenditures per lane km. For example, Brampton includes a proportionate allocation of time from the Public Works Commissioner, other Roads administration and support resources, and Fleet services to their 'Salaries, Wages and Employee Benefits' which other municipalities may not do or may do to a different extent.





## Jurisdiction 1: City of Vaughan






### About this Jurisdiction

Over the past 30 years, Vaughan has experienced rapid population and infrastructure growth, with the city expected to grow by up to 105,400 between 2013 and 2031. Increase in dwellings and population density has resulted in significant pressures on its road networks. The municipality has become a leading practitioner in winter maintenance, recognized by its peers and accredited associations with one of the highest levels of service. They are the only municipality in the GTA that provides windrow clearing for all residents and maintain an 84% citizen satisfaction rate for its snow removal services.

The City's winter maintenance services employ a mixed in-house/contracted services model. Its in-house services are provided by different City departments. Similar to Brampton, the City is providing service levels greater than those formally approved by Council (ex. bare pavement).

Vaughan has been able to successfully tie strategic outcomes of its contract to service delivery with a new performance-based contract and a robust quality performance management framework.

### Lessons Learned

-  Unique performance-based contract that incentivizes delivery of contractual requirements
-  Longer term contracts (up to 10 years) similar to Brampton's current structure minimize bidder risk as capital amortized closer to equipment life cycles
-  Employment standards restrictions and staff commitments beyond winter maintenance limit in-house capabilities
-  City-wide windrow clearing can increase citizen satisfaction but also increase complaint burdens
-  Leveraging more environmental friendly salting products such as Thawrox could result in a large increase in costs due to Brampton's bare pavement standards that may offset potential environmental benefit

How does Brampton perform relative to Vaughan?		
	City of Vaughan	
Population	642,800 City of Vaughan 329,000	
Dwelling Units	173,428 71,265	
Road network	155 km of Arterial Roads 3812 km of Local Roads 2115 km of sidewalks 2462 transit stops 2222 km of road 1000 km of sidewalk	
Expense per lane kilometer	\$5,306 \$5,648	
Priority System	Arterial (Primary)	Prior to Accumulation, bare surface (24 Hours) 5 cm (4 hours)
	Collector (Secondary)	At start of accumulation, bare surface (24 hours) 5 cm (12 hours)
	Local	7.5 cm (24 hours) 5 cm (16 hours)
Service Model	In-house/contracted Winter maintenance service contracted except: sidewalks, industrial roads	
Sidewalk Coverage	Within 24 hours, 48 for prolonged events, 45% (942km) of city network maintained (2018) 5 cm. within 24 hours, all city sidewalk routes maintained	
Windrow Coverage	Senior Assistance Rebate Program (2400 residents) City-wide windrow clearing service for all residential driveways (78,500 windrows)	
Bike Lane and Pathways	Bare surface (12- 24 hours) N/A	
Salting Methodology	Salt Thawrox	







## Jurisdiction 1: City of Vaughan

Areas of Inquiry		Relevant Outcomes Achieved/Insights Gathered
Service Delivery Model	<ul style="list-style-type: none"> <li>Winter Maintenance Cost (2017/18): \$13.1M, \$1.5M for windrows</li> <li>Internal City Division oversees quality assurance of winter operations</li> <li>Majority of salting and ploughing are done by external contractors</li> <li>Sidewalk operations completed in-house</li> </ul>	<ul style="list-style-type: none"> <li>Internal staff play a largely oversight role, ensuring mandated contractor service levels are met and meet the service delivery expectations of citizens (35 FTEs in 2014)</li> <li>Only two vendors for service delivery (divided into east and west quadrants)</li> <li>Point-system based evaluation following each snow event awards incentives or disincentives for performance. Payment tied to achievement of service levels</li> <li>Contractors are responsible for resolving resident complaints and providing the CSRs, naturally incentivising them to meet their quality service levels</li> <li>City sets a maximum allowable standby rate to control costs. Standby rates are constant throughout contract term</li> <li>Contract provides a defined list of equipment and age limits, requiring contractors to purchase new equipment in fulfillment of the contract</li> <li>Longer term (up to 10 years) increases the amortization period in capital allowing bidders to reduce their risk profile and generate more competition and value for money (Brampton's is 7 years with 3 one year extension options)</li> </ul>
	<p><b>Winter Maintenance Contract (2016-Present)</b></p> <ul style="list-style-type: none"> <li>First of its kind performance based contract supported by quality assurance measures (\$7M annual contract, 6 year term with two additional 2 year options)</li> <li>18 dedicated customer service representatives (CSRs)</li> <li>Contractors responsible for a quality control plan to achieve service obligations that is used as a tool to evaluate their contractual requirements</li> <li>Previous contract had fixed standby costs, but uncapped variable costs and limited controls created misalignment in quality and delivery</li> </ul>	
Service Levels	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>Primary Roads: Ploughing commence at 5 cm, completion within 4 hours</li> <li>Secondary Roads: Ploughing commence at 5 cm, completion within 12 hours</li> <li>Local Roads: Cleared within 16 hours</li> </ul>	<ul style="list-style-type: none"> <li>Mandate of clearing all roads within 16 hours of snowfall</li> <li>Windrow machines clear 80% of windrows</li> <li>City-owned equipment was found to struggle with meeting the requirements to clear snow to bare pavement standards (particularly for sidewalks)</li> </ul>
	<p><b>Windrows</b></p> <ul style="list-style-type: none"> <li>Cleared within 4 hours after snowplows have passed</li> </ul>	
	<p><b>Salt/sanding</b></p> <ul style="list-style-type: none"> <li>Primary/Secondary Roads: Commence on accumulation, bare pavement conditions, completion within 4 hours</li> <li>Local/Residential Roads: Salted within 12 hours</li> </ul>	
	<p><b>Sidewalks</b></p> <ul style="list-style-type: none"> <li>Ploughing commence at 5 cm, with all sidewalks cleared within 24 hours</li> </ul>	



## Jurisdiction 1: City of Vaughan

Areas of Inquiry		Relevant Outcomes Achieved/Insights Gathered
Staffing Compliment	<ul style="list-style-type: none"> <li>Sidewalks done by internal staff (34 FTEs, 14 PT) (2014 data)</li> </ul>	<ul style="list-style-type: none"> <li>City is constrained by employment standards, limited the number of hours staff can work consecutively. As operation staff had responsibilities beyond winter maintenance, instances of understaffing can occur</li> </ul>
Service Offerings & Coverage	<ul style="list-style-type: none"> <li>Internal Audit report found Vaughan has higher levels of service compared to other municipalities</li> </ul>	<ul style="list-style-type: none"> <li>Only municipality to offer city-wide windrow clearing services</li> <li>Following the implementation of city-wide windrows, complaints to the city during winter storms more than doubled</li> </ul>
	<p><b>Salting Methodology</b></p> <ul style="list-style-type: none"> <li>Moved to Thawrox, an environmentally friendly salting product in 2012</li> </ul>	<ul style="list-style-type: none"> <li>Vaughan's salt spread rates (45,000 tons in 2016, 22 tons/lane km) are higher than other comparable municipalities, especially compared to non-salt products, which is attributed to their bare pavement standard. (Markham in comparison uses 29,000 tons of Salt, 13 tons/lane km)</li> <li>City has expressed concern whether they are generating significant benefits from Thawrox given the incremental costs and possible adverse environmental impacts</li> </ul>
Public Engagement, Reporting and Education	<ul style="list-style-type: none"> <li>Residents' survey was conducted in 2014 as part of an operational review of Winter Maintenance Programs</li> </ul>	<ul style="list-style-type: none"> <li>Vaughan residents would not welcome a reduction in service, but did not want an increase in taxes to secure a higher level of service</li> <li>Winter Maintenance Service Delivery Review currently included as part of new 2018-2022 council directives.</li> </ul>
	<ul style="list-style-type: none"> <li>Implemented cross-departmental teams to develop communication strategies to better manage by-laws that mitigate barriers to delivering winter maintenance services</li> </ul>	<ul style="list-style-type: none"> <li>Roads divisions sends updates to council for winter events that require plowing and extreme weather events</li> </ul>







## Jurisdiction 2: City of Mississauga






### About this Jurisdiction

Mississauga is Canada's 6th largest and growing major city with a population of 729,000 residents representing cultures from around the world. Adjacent to Brampton and denser in population (Brampton's 1967.1 compared to Mississauga 2439.9 persons per square km), Mississauga faces similar winter weather experiences and a sizable road network.

Brampton's relative service level performance is above Mississauga's council approved metrics. Comparatively, on an expense per lane kilometer basis, Brampton is greatly outperforming Mississauga to deliver the higher level of service.

As Peel Region continues to grow, Mississauga faces the same issues of managing its growing road network and the burden of an expanding winter maintenance infrastructure need. It has identified the balance between existing and future service level demands with its existing fleet/staffing compliment will require potentially significant investments in facilities and resourcing combined with a significant time period for adoption.

### Lessons Learned

- 
Ongoing growth of road network has made it economically unviable for the City to purchase single-purpose winter vehicles
- 
Staff trained on Lean Principles reviewing winter maintenance routes and processes to optimize customer service and identifying savings internally
- 
2019 service level increase has bus stops and priority sidewalks being cleared in concert with priority roads at a \$2.2M annual cost
- 
Potential inability for contractors to source equipment within the existing contract in a financially viable manner
- 
Significant time required for City to lease or purchase property to accommodate expansion of service (12-24 months)

How does Brampton perform relative to Mississauga?		
	City of Brampton	
Population	642,800	
Dwelling Units	173,428	
Road network	155 km of Arterial Roads 3812 km of Local Roads 2115 km of sidewalks 2462 transit stops	
Expense per lane kilometer	\$5,306	
Priority System	Arterial (Primary)	Prior to Accumulation, bare surface (24 Hours)
	Collector (Secondary)	At start of accumulation, bare surface (24 hours)
	Local	7.5 cm (24 hours)
Service Model	In-house/contracted	
Sidewalk Coverage	Within 24 hours, 48 for prolonged events, 45% (942km) of city network maintained (2018)	
Windrow Coverage	Senior Assistance Rebate Program (2400 residents)	
Bike Lane and Pathways	Bare surface (12- 24 hours)	
Salting Methodology	Salt	
		City of Mississauga
		775,000
		248,468
		5757 km of roads 2400km Sidewalks
		\$4,048
		8 cm (12 hours) 15 cm (24 hours)
		8 cm (12 hours) 15 cm (24 hours)
		8 cm (24 hours) 15 cm (36 hours)
		In-house/contracted 10% of fleet city owned
		City clears 55% of total sidewalks (1400km, 24 hours of snowfall) - Contracted service
		Driveway Windrow Clearing Pilot (65+)
		N/A
		Salt





## Jurisdiction 2: City of Mississauga

	Areas of Inquiry	Relevant Outcomes Achieved/Insights Gathered
Service Delivery Model	<ul style="list-style-type: none"> <li>2018 Winter Maintenance Budget: \$23.01M, with in-house and contracted services</li> <li>Current Winter Maintenance Contract: 7 year duration, expires 2021                             <ul style="list-style-type: none"> <li>2018 Contract Cost: \$15.6M</li> </ul> </li> <li>10% of winter maintenance equipment is City owned. Contractors provide 340 pieces of equipment through their contract</li> <li>Surpluses from program annually are placed into Winter Maintenance Reserve</li> </ul>	<ul style="list-style-type: none"> <li>The City has found it is no longer economically efficient to purchase single-purpose winter equipment as it manages the growth of the City's road network with increased service levels</li> <li>There is significant time required for City to lease or purchase property to accommodate expansion of service (12-24 months)</li> </ul>
Service Levels	<ul style="list-style-type: none"> <li>Current service level: clear all major arterial roads and collector roads within 12 hours, residential roads within 24 hours, priority sidewalks</li> <li>Bus stops: within 24 hours of an average storm</li> <li>Sidewalks: cleared within 24 hours</li> </ul> <p><b>Recent Service Level Changes</b></p> <ul style="list-style-type: none"> <li>Increased winter maintenance service levels for all bus stop and priority sidewalks (beginning in 2019/2020 season)</li> </ul>	<ul style="list-style-type: none"> <li>Aims for a reserve target of 33% of last five year average of winter maintenance expenditures</li> <li>Uneven surfaces of sidewalks have caused damage to equipment and city infrastructure</li> <li>Bus stops and priority sidewalks will now be cleared in concert with priority roads at a cost of \$2.2M annually or 0.4% increase in proportion to the entire city annual budget</li> <li>No additional equipment purchases required beyond additional contractor resources and salt usage</li> </ul>







## Jurisdiction 2: City of Mississauga

Areas of Inquiry		Relevant Outcomes Achieved/ Insights Gathered
Staffing Compliment	<ul style="list-style-type: none"> <li>138.1 FTE in 2018 across the Maintenance Control program which includes Winter Maintenance. No further public data available.</li> <li>Lean Program focuses on strengthening organization culture of continuous improvement and Lean concepts/principles within each service area. Program focused on maximizing customer value and minimizing waste while empowering staff to solve complex issues daily</li> </ul>	<ul style="list-style-type: none"> <li>No breakdown of FTE's by Winter Maintenance was available through public reporting.</li> <li>Since its permanent inception in 2016, 390+ road maintenance staff have been trained, with 9 staff receiving intermediate/advanced level certifications</li> <li>Within the Roads division, there has been 114 small improvements and 7 projects enabled by Lean principles, generating \$898,660 in cost savings/avoidance since 2014</li> <li>Lean principles currently being applied in reviewing winter maintenance routes and processes to optimize customer service</li> </ul>
	<p><b>Sidewalks</b></p> <ul style="list-style-type: none"> <li>1,700km of priority sidewalks serviced as part of Winter Maintenance Program</li> <li>700 km of secondary sidewalks are not serviced; Expanding service to secondary sidewalks examined in 2019 (not advanced by council)</li> </ul> <p><b>Windrows</b></p> <ul style="list-style-type: none"> <li>City does not clear windrows caused by winter maintenance activities</li> <li>Windrow Clearing Program for eligible homeowners over 65 years + or those with disabilities (174 homes enrolled), cleared within 36 hour target</li> </ul> <p><b>Ongoing Initiatives Examined</b></p> <ul style="list-style-type: none"> <li>Winter Maintenance of Bike Lanes in Roadways</li> <li>Clearing secondary roads to bare pavement (estimated \$7M annually)</li> </ul>	
Service Offerings & Coverage		<ul style="list-style-type: none"> <li>Enhanced snow removal from bike lanes was not pursued due to high annual costs (\$5.2M) and a requirement for additional snow storage space beyond current capacity</li> </ul>
Public Engagement, Reporting and Education	<ul style="list-style-type: none"> <li>Mississauga provides service level information, routes, and other information on their website, has a Mississauga Roads app as well as a snow plow tracker online, and provides information through 311</li> </ul>	<ul style="list-style-type: none"> <li>Mississauga appears to provide a number of options for residents to find information on progress of plowing during snow events</li> </ul>







## Jurisdiction 3: City of Markham

### About this Jurisdiction

The City of Markham is a high growth municipality with a strong track record of economic development growth in the high-tech sector. Similar to Brampton, it is in the midst of an infrastructure and economic boom with ongoing road upgrades on major arteries and new transit construction.

Current Council approved service levels by the City either meet or exceed regulated MMS standards. The City has an extensive history of ongoing winter maintenance service improvements and evaluation, with a mandated service level review every two years.

The municipality face similar challenges currently facing Brampton including resident interest in increased service levels, ongoing evaluation of city-wide windrow clearing and a significant demand for additional facility space to manage winter maintenance infrastructure. In response to these demands, the City is also in the midst of evaluating how to best mitigate citizen requests with the need to offer sustainable value for money services.

### Lessons Learned

- 
High reliance on contracted services could result in potential gaps to address shoulder events when contractors are not available
- 
City-wide windrow clearing services will greatly impact the tax base through an increase in residential property tax
- 
Lack of defined guidelines and parameters for alternative salting products make it difficult to gauge its financial, environmental and infrastructure impact
- 
Sufficient facility capacity to manage added equipment requirements must be a key consideration when evaluating service level increases

How does Brampton perform relative to Markham?		
	City of Brampton	
Population	642,800	
Dwelling Units	173,428	
Road network	155 km of Arterial Roads 3812 km of Local Roads 2115 km of sidewalks 2462 transit stops	
Expense per lane kilometer	\$5,306	
Priority System	Arterial (Primary)	Prior to Accumulation , bare surface (24 Hours)
	Collector (Secondary)	At start of accumulation , bare surface (24 hours)
	Local	7.5 cm (24 hours)
Service Model	In-house/contracted	
Sidewalk Coverage	Within 24 hours, 48 for prolonged events; 45% (942km) of city network maintained (2018)	
Windrow Coverage	Senior Assistance Rebate Program (2400 residents)	
Bike Lane and Pathways	Bare surface (12- 24 hours)	
Salting Methodology	Salt	
	City of Markham	
	348,718	
	106,131	
	81,000 Driveways 2224 km of road 1112km Sidewalks	
	\$5,054	
	Bare surface condition (24/7)	
	Centre bare surface (7am-6pm)	
	7.5 cm: > 15 cm, (16 hours) < 15cm, 16 hrs	
	In-house (10%)/contracted (90%)	
	Regional and City Roads (5 cm within 24 hours)	
	Senior Household Program (4683 Households)	
	No pathway maintenance provided	
	Salt	







## Jurisdiction 3: City of Markham

	Areas of Inquiry	Relevant Outcomes Achieved/Insights Gathered
Service Delivery Model	<ul style="list-style-type: none"> <li>2018 Winter Maintenance Budget: \$9.7M</li> <li>Markham currently contracts out 90% of its winter service delivery</li> </ul>	<ul style="list-style-type: none"> <li>Potential gaps in addressing snow events that occur between existing contracts commencement and termination dates (cost to extend standby rates to shoulder events estimated at \$1.5M per season)</li> </ul>
	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>Arterial/Primary Roads: 24/7 bare surface conditions</li> <li>Secondary Roads: centre bare conditions between 7AM-6PM</li> <li>Local Roads: begin upon 7.5cm accumulation, within 16 hours</li> </ul>	<ul style="list-style-type: none"> <li>Local roads are acceptable in snow packed conditions</li> <li>Normal plowing operations for local roads will take approximately 16 hours</li> </ul>
	<p><b>Windrow Clearing (For those qualified in assistance program)</b></p> <ul style="list-style-type: none"> <li>Clear one car width at driveway base after 7.5cm snowfall within 8 hours of ploughing. Does not include sidewalk windrow</li> </ul>	<ul style="list-style-type: none"> <li>A pilot program to offer windrow subsidies for outside contracted services within two wards was proposed but not approved by council in 2016</li> </ul>
Service Levels	<p><b>Sidewalks</b></p> <ul style="list-style-type: none"> <li>Markham maintains all sidewalks within City</li> <li>Plowed/salted once accumulation reaches 5cm, priority given to those near school/bus stops. Priority areas completed within 12 hours</li> <li>Bus shelters are maintained by York Region Transit</li> </ul> <p><b>Pathways</b></p> <ul style="list-style-type: none"> <li>Concrete surface pathways that connect street to streets are plowed</li> <li>All other pathways are no maintained by the city and posted with “no winter maintenance” signs</li> </ul>	<ul style="list-style-type: none"> <li>Secondary sidewalks completed the next day if accumulation is significant</li> </ul>
		<ul style="list-style-type: none"> <li>No provincially legislated service levels for pathways</li> </ul>





## Jurisdiction 3: City of Markham

	Areas of Inquiry	Relevant Outcomes Achieved/Insights Gathered
Staffing Compliment	<ul style="list-style-type: none"> <li>No publicly available information on staffing compliment for Winter Maintenance program</li> </ul>	<ul style="list-style-type: none"> <li>No publicly available information on staffing compliment for Winter Maintenance program</li> </ul>
Service Offerings & Coverage	<p><b>Salt Management</b></p> <ul style="list-style-type: none"> <li>City has a salt management plan in compliance with Environment Canada</li> <li>City has evaluated alternatives to chloride salts but no alternatives considered due to lack of storage capacity at City facilities</li> </ul>	<ul style="list-style-type: none"> <li>Since 2005, the plan also establishes a set standard for GPS tracking, salt application/storage and snow disposal</li> <li>City trucks have internal trackers that measure salt application to ensure compliance with standard</li> <li>City has identified a lack of systematic study or guidelines for organic/semi-organic products in a context relevant to Canadian municipalities, which affect intended usage of such materials</li> </ul>
	<p><b>Windrow Clearing</b></p> <ul style="list-style-type: none"> <li>Assistance provided to seniors (60+) and residents that are unable to clear windrow for medical reasons</li> <li>City utilizes approximately 12 contracted units to clear windrows under the program for 4800 properties. Current contract ends in 2022</li> <li>City-wide windrow clearing has been evaluated over multiple council terms, but not approved due to high service cost (\$4.4M annual cost for a 7.5 cm service level excluding land acquisition, infrastructure)</li> </ul>	<ul style="list-style-type: none"> <li>Challenges under existing windrow assistance program due to the additional staff effort, cost and deployment to address resident complaints</li> <li>Differing customer expectations with program goals strain ability to meet resident satisfaction (i.e. extent of driveway and windrow clearing, as well as whether windrow clearing follows road plowing immediately)</li> <li>1% of windrows missed per storm in 2018/19</li> <li>Markham does not have the yard capacity to store all hired equipment if windrow service expanded (no increase in facility infrastructure in 30 years)</li> </ul>
Public Engagement, Reporting and Education	<p><b>Ongoing Initiatives Examined</b></p> <ul style="list-style-type: none"> <li>New public works facility to manage overcrowding</li> <li>Increasing local road service levels to 5 cm (\$3.2M annually) or 6 cm (\$1.6M annually) or all streets as primary (\$9.1M annually)</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing facility deficiency restricts Operations Department's ability to manage or increase service levels until new facility is constructed</li> <li>To increase service levels to 5 cm, Markham would have to increase from 44 to 110 hired road plow units</li> <li>Winter material storage requirements has far surpassed operational needs. (i.e. salt shortage in certain areas could lead to potential service level non-compliance and citizen claims</li> </ul>
	<ul style="list-style-type: none"> <li>Winter Maintenance Mobile app shows progress of road and sidewalk plows</li> </ul>	<ul style="list-style-type: none"> <li>All in house and hired equipment are equipped with automatic vehicle locators</li> <li>Road and sidewalk progress mapping is refreshed every hour during winter events</li> </ul>







## Jurisdiction 4: City of Hamilton

### About this Jurisdiction

The City of Hamilton presents a jurisdiction that presents fairly comparable population size and road network. Brampton's relative performance is above Hamilton in most focus areas although at a higher expense per lane kilometer.

Hamilton has an extensive sidewalk network, most of which is not maintained by the City. Recent initiatives by the City have centred around the possibility of extending to full city-wide sidewalk coverage.

### Lessons Learned

Leveraging community partnerships to manage windrow coverage to priority populations, minimizing direct city costs

Expanding to full sidewalk coverage would require lengthy procurement times, even if employing contracted services

How does Brampton perform relative to Hamilton?		
	City of Hamilton	
Population	642,800	
Dwelling Units	173,428	
Road network	6,582 kms of roads 1,10 cul-de-sacs 2445 km of sidewalks 2300 bus stops	
Expense per lane kilometer	\$5,306	
Priority System	Arterial (Primary)	Prior to Accumulation , bare surface (24 Hours)
	Collector (Secondary)	At start of accumulation , bare surface (24 hours)
	Local	7.5 cm (24 hours)
Service Model	In-house/contracted	
Sidewalk Coverage	Within 24 hours, 48 for prolonged events, 45% (942km) of city network maintained (2018)	
Windrow Coverage	Senior Assistance Rebate Program (2400 residents)	
Bike Lane and Pathways	Bare surface (12- 24 hours)	
Salting Methodology	Salt	
		City of Hamilton
		572,575
		222,918
		6,582 kms of roads 1,10 cul-de-sacs 2445 km of sidewalks 2300 bus stops
		\$4,115
		2.5cm, Bare Surface (4 hours for Major Arterial, 8 for primary collector)
		8 cm, centre bare (8 hours)
		8-10 cm (24 hours)
		In-house/contracted
		Within 24 hours, 16% (397 km) of city network maintained
		Seniors and disability assistance volunteer program , 3cm (24 hours), 209 clients served
		N/A
		Salt/Sand & Sand Mix





## Jurisdiction 4: City of Hamilton

	Areas of Inquiry	Relevant Outcomes Achieved/Insights Gathered
Service Delivery Model	<ul style="list-style-type: none"> <li>Inhouse/contracted model (161 plows, 22 sidewalk plows, 500 total pieces of equipment as of 2019)</li> <li>Sidewalk clearing services utilize city staff and contracted services for each equipment with 24 hour response</li> </ul>	<ul style="list-style-type: none"> <li>Annual budget estimates developed using a five year rolling average of actual cost</li> <li>Ongoing weather fluctuations have generated historic fluctuations in winter seasons and therefore significant budget variances</li> </ul>
Service Levels	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>Arterial/Primary Roads: 2-10 cm within 4 hours, bare surface</li> <li>Secondary Roads: 8 cm within 8 hours, centre bare</li> <li>Local Roads: 8-10 cm of snow within 24 hours, centre bare</li> <li>Transit stops:</li> </ul> <p><b>Sidewalks</b></p> <ul style="list-style-type: none"> <li>Only coverage for municipally-owned property, reverse frontage lots, one former ward and those adjacent to school property</li> </ul>	<ul style="list-style-type: none"> <li>Service levels last modified in 2012/2013 period</li> <li>School board sidewalks are completed on a charge-back basis</li> </ul>







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Areas of Inquiry		Relevant Outcomes Achieved/Insights Gathered
Staffing Compliment	<ul style="list-style-type: none"> <li>325 in-house staff plus contracted staff (2017)</li> </ul>	<ul style="list-style-type: none"> <li>Limited insights from publicly available reporting</li> </ul>
Service Offerings & Coverage	<b>Salting materials</b> <ul style="list-style-type: none"> <li>Hamilton Salt Management plan first approved in 2003</li> <li>Rock Salt, Sand/Salt “Pickle mix”, salt brine, fusion</li> </ul>	<ul style="list-style-type: none"> <li>The Salt Management Plan acknowledges the use of road salt is not optimal from an environmental standpoint, could damage concrete sidewalks and contribute to the deterioration of other assets.</li> </ul>
	<b>Windrows</b> <ul style="list-style-type: none"> <li>Snow Angel Program matches seniors and disabled applicants with volunteers that provide snow removal service</li> <li>Minimum requirement of 3cm for service</li> <li>209 average clients served each winter (Program cost of \$99,000)</li> <li>Cost per volunteer \$798</li> </ul>	<ul style="list-style-type: none"> <li>Individual snow removal services are not offered for seniors and individuals with disabilities directly by the City, but rather coordinated through this program</li> <li>Leverage community partnerships and volunteers to address windrows serving for priority residents at minimal costs</li> <li>Average number of volunteers per year: 124 (2008-15)</li> </ul>
Public Engagement, Reporting and Education	<b>Ongoing Initiatives Examined</b> <ul style="list-style-type: none"> <li>Expansion of service for a sidewalk clearing program</li> </ul>	<ul style="list-style-type: none"> <li>Staff identified in 2019 the cost of providing city-wide sidewalk clearing at \$5.06M (\$4.57M + \$486K standby costs) per season.</li> <li>Expectation that current in-house staffing levels are insufficient and private sector contracting is necessary (requirement of 81 additional pieces of equipment to cover 2048km)</li> <li>Due to large requirement for additional snow clearing equipment, it would require 1 year in advance for successful vendor to secure required equipment</li> </ul>
	<ul style="list-style-type: none"> <li>The City provides information through their website, and provides a map showing plowing priorities as well as information for snowstorms and emergencies</li> </ul>	<ul style="list-style-type: none"> <li>Plowing priority map allows residents to see the priority of their street in terms of service level and setting expectations</li> </ul>





## Jurisdiction 5: City of Burlington

### About this Jurisdiction

The City of Burlington within Halton Region is a historically manufacturing-driven area located between the major arteries of Hamilton and Toronto. Like Brampton, it's location within the GTA making commuting and quality road infrastructure a high priority amongst residents.

Within its winter maintenance division, the City faces issues that are consistent with the concerns Brampton staff and residents have identified. This includes internal staffing and facility pressures amidst a backdrop of evaluating the increase of service levels.

As Brampton evaluates the future of its service delivery model mix and how to improve public awareness of the winter maintenance program, Burlington's initial findings into such priorities presents a peer case study of interest for evaluation.

### Lessons Learned



While city operators work up to 12 hour shifts, contractors are responsible for 24/7 response to staffing



An internal audit report found a combination of in-house and contracted services will provide greater management flexibility in handling winter events



Season end reviews is conducted with each member of Council



Alternative ice melter alternatives were found to be 4 to 6 times the cost of salt and financially not viable

How does Brampton perform relative to Burlington?		
	City of Burlington	
Population	176,802	
Dwelling Units	72,535	
Road network	1,635 km of road 850 km of sidewalk	
Expense per lane kilometer	\$2,913	
Priority System	Arterial (Primary)	Prior to Accumulation , bare surface (24 Hours)
	Collector (Secondary)	At start of accumulation , bare surface (24 hours)
	Local	7.5 cm (24 hours)
Service Model	In-house/contracted	
Sidewalk Coverage	Within 24 hours, 48 for prolonged events, 45% (942km) of city network maintained (2018)	
Windrow Coverage	Senior Assistance Rebate Program (2400 residents)	
Bike Lane and Pathways	Bare surface (12- 24 hours)	
Salting Methodology	Salt	







## Jurisdiction 5: City of Burlington

Areas of Inquiry		Relevant Outcomes Achieved/Insights Gathered
Service Delivery Model	<ul style="list-style-type: none"> <li>2018 Operating Budget: \$4.86M</li> <li>Excess funds are allocated to a severe weather reserve fund</li> <li>In-house/contractor split (3 contracted vendors)</li> <li>14 city owned combo plows, 13 contracted combo plows, 11 contracted regular plows. Sidewalk resource 50/50 in-house/contract</li> <li>2016 realignment of sidewalk routes to enhance service levels and better internal/contractor service delivery</li> <li>Windrow subsidy program subsidized at 73% city cost (\$53.58 per season per driveway)</li> <li>Road patrol monitors and reports road/sidewalk conditions 24/7</li> <li>Guaranteed Service Delivery Model (GSD) – program ensures qualified operators are available 24/7</li> </ul>	<ul style="list-style-type: none"> <li>Operating budget is based on a 5 year average</li> <li>Reserve fund is utilized in years when expenses exceed operating budget</li> <li>Road operations contracts range from 8 years, 3 years). Sidewalk contract (3 years)</li> <li>City operators work up to 12 hour shifts while contractor responsible to provide staffing for a 24/7 response</li> <li>City only provides oversight of windrow program, operations are done by contracted resources</li> <li>Road patrol provides immediate responses to isolated accidents and assist in dispatch service</li> <li>2017 internal audit report found in-house and contracted services combinations allows the best flexibility in managing weather events</li> <li>Voluntary program for staff members: operating in two shifts, staff selected receives a premium to be on call 24/7 during the winter season</li> </ul>
	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>Arterial/Primary Roads: 5 cm</li> <li>Secondary Roads: 5 cm</li> <li>Local Roads: 7.5 cm of snow and when primary/secondary roads completed (24 hour)</li> <li>Transit stops: 5cm within 48 hours</li> </ul> <p><b>Sidewalks (850 km)</b></p> <ul style="list-style-type: none"> <li>Plowed upon accumulation of 5 cm, within 24 hours</li> <li>In-house sidewalk coverage includes salting, contracted resources do not</li> </ul> <p><b>Previous additions to program include:</b></p> <ul style="list-style-type: none"> <li>Windrow Program (capped at 150 eligible driveways)</li> <li>Anti-icing</li> <li>Multi-use pathway clearing</li> <li>Priority clearing of bikeway and hydro corridor</li> </ul>	<ul style="list-style-type: none"> <li>Transit stops snow removal and salting currently done in house are done manually by City resources while contractors resources do so mechanically</li> <li>Actual average level of service was 16 hours, below the council approved threshold of 24 hours</li> <li>Salting/sanding service levels only extend to primary routes if extremely slippery, resident concerns of slippery secondary routes</li> <li>Opportunity for council to request adjustments and highlight areas of concern in advance of budget submissions</li> <li>Season end review is conducted with each member of Council</li> </ul>





## Jurisdiction 5: City of Burlington

	Areas of Inquiry	Relevant Outcomes Achieved/Insights Gathered
Staffing Compliment	<ul style="list-style-type: none"> <li>2 Managers have primary oversight, 10 supervisors split into teams of two provide on-call availability everyday during winter season</li> <li>28 in-house operators covering 24/7 for road operations</li> <li>8 staff assigned for sidewalk and pathway operations</li> <li>10 staff assigned for complete snow removal by hand at 700 transit stops</li> <li>Key internal partnerships with Fleer for vehicle maintenance/training</li> <li>Snow Fighting Training (through the Ontario Good Roads Association) for operators and supervisors to build awareness and knowledge of important winter operations procedures</li> </ul>	<ul style="list-style-type: none"> <li>City staff have no ability to cover 24/7 pathway coverage</li> <li>Lack of in-house resources to cover in-house sidewalk operations (14 staff required, 8 available), current issues exist in balancing workforce between road and sidewalk plowing</li> <li>Supervisor teams responsible to prepare operation plans, and update websites for citizens</li> <li>2 member supervisor teams supervise up to 100 staff (inhouse/contracting) and 80 pieces of equipment</li> <li>Operators assigned to specific vehicles and routes to maximize route/vehicle knowledge</li> </ul>
Service Offerings & Coverage	<p><b>Windrow Program</b></p> <ul style="list-style-type: none"> <li>Program expectation is windrows will be cleared within 40 hours after the snow stops and within 16 hours of all snow plowing</li> <li>City provides oversight of contract, manage intake of applications</li> <li>Call out contractors when plowing is complete</li> </ul> <p><b>Salting</b></p> <ul style="list-style-type: none"> <li>Average salt usage per year is 65,000 tons (2017)</li> <li>Sand pickle mix (95% sand, 5% road salt)</li> <li>Promelt (Salt solution with magnesium chloride)</li> <li>Brine station installed in 2016</li> </ul>	<ul style="list-style-type: none"> <li>Could take 16 hours after road plowing to clear windrows</li> <li>Program participants are required to pay an annual fee</li> <li>Sand may be used as an alternative to salt for secondary and primary roads</li> <li>Upon council direction to review alternatives to salt in 2013, it found ice melter alternatives are 4 to 6 times the cost of salt and financially not viable</li> <li>Amount of salt reduction tied to management practices, vehicle technology improvements and the use of a brine/sand combo</li> </ul>
Public Engagement, Reporting and Education	<ul style="list-style-type: none"> <li>Customer engagement tools include city website, scheduled daily operational updates during plowing events, YouTube, newspaper acts</li> <li>Automated vehicle locating (AVL) tracks the location of all city/contractor vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Acknowledgement by city that residents do not understand level of service and do not like it</li> <li>Website updates for winter control sent 3 times a day during plowing events</li> <li>Ongoing interest in developing a dashboard for ongoing monitoring and issue identification in winter operations</li> </ul>

