CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF MAY 27, 2014

Item 4, Report No. 25, of the Committee of the Whole (Working Session), which was adopted without amendment by the Council of the City of Vaughan on May 27, 2014.

4 WINTER CONTROL PROGRAMS OPERATIONAL REVIEW

The Committee of the Whole (Working Session) recommends approval of the recommendation contained in the following report of the Commissioner of Engineering and Public Works, the Commissioner of Strategic and Corporate Services, the Director of Public Works, and the Director of Innovation and Continuous Improvement, dated May 21, 2014:

Recommendation

The Commissioner of Engineering and Public Works, the Commissioner of Strategic and Corporate Services, the Director of Public Works, and the Director of Innovation and Continuous Improvement recommend:

1. That the presentation on the Operational Review – Winter Control Programs be received;

2. That the Commissioner of Engineering & Public Works, or designate, be authorized to negotiate with the City's service providers to extend the contracts for Winter Road Maintenance for an additional one year (for winter 2015/2016) with a commensurate increase in allowable equipment age, maintaining any price increases and other terms and conditions within the limits defined in the current contract; and,

3. That staff be directed to develop a detailed scope for a comprehensive Request for Tender for Winter Maintenance Services using recommendations outlined in the attached Operational Review and present this scope for Council review in early 2015, prior to issuing a new multi-year tender for a comprehensive Winter Maintenance Services contract.

Contribution to Sustainability

A key pillar of sustainability is financial viability. This has been noted in many reports, most specifically the recent financial master plan for the City of Vaughan. The organization will face many financial challenges in the coming years, while balancing the continued delivery of excellence in its programs and services. In 2012, the City completed a program review which examined its 200 plus programs/services. Further, the City recognized the significance of long term sustainability given the growth and change within the municipality and the administration: this resulted in a reorganization of the City and the establishment of the Department of Innovation and Continuous Improvement (ICI). One of ICI's main business functions is to complete operational reviews for the City's 200 plus programs/services as a means of identifying program/services efficiencies, relevance and cost effectiveness while considering service levels/standards and delivery models.

Findings, and associated recommendations, from an Operational Review of the City's Winter Control Programs are contained in the attached report.

Economic Impact

For the winter 2013/2014, the budgeted contract cost for providing Winter Road Maintenance was $6,471,716. Extending the contract for an additional one year (i.e., for services through the winter 2015/2016) will require a similar budget amount, with an adjustment for changes in the Consumer Price Index (CPI).

It is anticipated that the more comprehensive performance based approach to Winter Control programs proposed in the Operational Review recommendations will provide significant savings for the City.

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Communications Plan

A residents' survey was conducted as part of the Operational Review of Winter Control Programs, a detailed analysis of the survey is contained in the attached report and this section will also be made available on the "Have Your Say" section of the City's website. Further communication with residents will be planned, as specifications for a new comprehensive approach to winter control programs are developed.

Purpose

To update Council on the findings from the Operational Review of the City's Winter Control Programs, and to review opportunities to improve aspects of efficiency, effectiveness and cost management.

Background - Analysis and Options

Vaughan residents receive some of the highest levels of winter maintenance services in the GTA

When compared to other municipalities, the City of Vaughan provides residents with some of the highest levels of service in Winter Control or Maintenance programs. Whether it's reducing ice formation on roads through sanding / salting, removing snow from roads, clearing snow from paths / sidewalks or enabling residents to exit their driveways by partially removing windrows – crews from the City's Public Works and Parks & Forestry Operations departments endeavour to ensure that residents, and others, can travel safely despite the weather.

The City aspires to provide a level of service for all its Winter Programs that will enable residents (and other stakeholders) to travel safely within a certain timeframe of a winter storm ending. At the same time, the City must balance levels of services with the costs of providing those services. A recent comparison of service levels between the City of Vaughan and other GTA municipalities, suggests that the City provides its residents with some of the highest levels of service for winter control programs.

Although the various winter maintenance services are provided by different departments using a variety of resources and / or service providers, they are interlinked

Currently, the City uses a blend of external and internal resources to deliver its winter control programs. The most significant operational and cost components relate to the salting and plowing of the extensive road network, and the majority of these services are delivered by external contractors, under a contract that expires in March 2015.

Winter control programs (i.e., Road Salting, Road Snow Plowing, Snow Removal, Windrow Snow Clearing, Snow Fencing and Path / Sidewalk Plowing) are highly interlinked (e.g., snow plowing roads and sidewalks, and snow plowing roads and removing windrows), so any proposed changes in service level (or service delivery model) in one program could have a ripple impact on another program.

To understand these impacts, to develop a holistic and truly integrated approach to winter control, and to prepare for issuing a new request for services, an operational review of all winter control programs was warranted (including windrow clearing). City staff recommended that an operational review of all Winter Control Programs be conducted in order to highlight potential service delivery models, levels of service, impacts on residents, program costs, risks and mitigation.

Surveys suggest that the overwhelming majority of Vaughan residents believe they are getting good value for their tax dollars when it comes to winter maintenance services

The most recent Ipsos Reid survey conducted for the City[1] demonstrates that residents "believe they receive good value for their tax dollars" with over 81% VERY SATISFIED or SOMEWHAT SATISFIED with the winter control services provided by the City. The survey suggests that residents are comfortable supporting the current service levels. The Ipsos Reid report also identified Road and Sidewalk Snow Removal programs as areas for maintenance, i.e., services of relatively high importance where satisfaction is good and where the focus is on maintaining current levels of service.

The residents' survey was a self-selected survey utilizing both on-line and hard copy response forms. Residents were made aware of the survey through a Corporate Communications e-mail "blast" to over 8,000 subscribers, information posted on the City's web-site together with information presented at the City's ten community centres. Over 670 responses were collected from respondents in all wards; though hard copy survey forms were available at the community centres, only one returned from these locations.

From this survey, it was apparent that:

- Residents largely feel positively about the winter control services provided by the City and the associate levels of service;
- Residents would not welcome a reduction in service or an increase in taxes to secure a higher level of service; and,
- The City should look at leveraging local radio and TV stations and other tools to provide up-to-date winter storm-related communications.

There are a number of factors impacting the City's ability to deliver "Service Excellence" to residents

Not only does the City aspire to deliver high levels of service to residents with its winter maintenance programs, it actually does so much of the time – though delivering services through the unusually cold 2013/2014 winter has highlighted some challenges. Some of the City's approaches to winter maintenance service delivery impose additional constraints and impact service delivery costs, e.g., road plows and windrow machines operating in tandem requires more routes and equipment, striving to clear sidewalks to bare pavement requires more passes and causes greater wear / tear on equipment, inconsistent by-law enforcement with respect to sidewalk maintenance and car parking requires service providers to perform additional passes.

The following items impact the ability of the City to deliver on its service levels, and should be addressed:

1. The City is currently providing service levels greater than those that have been formally approved by Council, i.e., plowing snow in laneways;
2. Operating practices can constrain the ability to meet all service level objectives cost effectively, e.g., road plow routes are planned to keep plows and windrow machines closely linked;
3. In certain areas snow removal operations have had to be implemented regularly, as there is nowhere for plows to push the snow;
4. The fleet of City-owned sidewalk plows struggles to cope with the wear and tear associated with meeting the requirement to clear snow to bare pavement;

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1 City of Vaughan – Citizen Survey – Ipsos Reid, March 2012

5. The City is constrained by Employment Standards legislation and must limit the number of hours that staff can work consecutively and in a seven day period. As Parks & Forestry Operations staff (sidewalks) and Parks Services staff (hand clearing) have responsibilities beyond winter control, even in winter, crews can sometimes be under-staffed particularly when overtime call-outs are required and staff decline the callout and/or overtime;
6. Roads supervisors are supported by foremen and resources seconded from the team of heavy equipment operators, who have each been working (on average) an additional day each week in overtime, impacting their ability to rest and recover, and, in the case of the seconded resources, focus on a key role of managing the City's salt inventory;
7. Barriers, such as parked cars and encroachments, impact the ability of contractors and staff to deliver winter control programs, leading to higher costs or reduced service quality; and,
8. The City collects a great deal of data associated with the delivery of its winter control programs, (e.g., CTS, road winter maintenance logs, equipment GPS, road patrol logs etc.) but in many cases it is difficult to collect this data and mine it for information in order to identify challenges / issues and potential route causes.

Additionally, the ability to manage residents' expectations with respect to winter maintenance service levels is critical to ensuring continued resident satisfaction with the City's service delivery. The City expanded on its tools for communicating information about winter control, which worked well at informing residents about what to expect during the winter, but more needs to be done to be able to tell / show a resident when s/he will have her/his local roads and sidewalks cleared and to clarify residents' responsibilities to ensure a safe and accessible City.

The attached report provides details of the following issues and associated recommendations for addressing them (presented in order of priority). In total, 10 recommendations are provided and the comprehensive justification for the recommendations (and an associated approach) is detailed in Section 8.0 of the report.

Next Steps

In order to address the challenges previously identified, a one year extension to the existing winter road maintenance contracts is required

The majority of the City's Winter Control programs (i.e., those associated with maintaining safe roads) are provided under a contract that was initially negotiated in 2008 and which has subsequently been extended twice under available extension terms. The current contract extension expires at the end of the 2014/2015 winter season, i.e., March 2015.

The City has the opportunity to consolidate all winter control programs into a comprehensive contract for winter control programs, i.e., incorporate winter maintenance of sidewalks and facilities / parking lots, and to implement a performance-based environment, so that service providers are held accountable for delivering the service levels approved by Council.

It is anticipated that such a comprehensive tender for winter control services and the performance management approach to contract management envisioned by the Operational Review, will take some time to design, draft and issue. Additionally, as the City wants to be able to attract a large number of respondents, a significant amount of time must be given for potential respondents to respond and then for the successful respondent(s) to be able to make any capital / equipment purchases that may be required in order to provide the necessary services.

The Public Works Division believes that the comprehensive requirements (and performance measurement framework) can be defined by the end of 2014 and then brought to Council for review in early 2015. A Request for Tender could then be issued with a successful respondent

selected by mid to late 2015. The successful respondent will likely require a year to acquire any additional specialized pieces of equipment (particularly if the respondent is not one of the City's current contractors), and so the earliest feasible start for a new contract would be the winter season 2016/2017.

This proposed timeline requires the City to seek a further extension to the existing contract for Winter Maintenance services for the winter 2015/2016.

Relationship to Vaughan Vision 2020/Strategic Plan

By examining service level needs, expectations, standards and costs for various City programs and services facilitate the achievement of all three Vaughan Vision 2020 goals:

- Service Excellence – demonstrating excellence in service delivery by ensuring we have the most efficient and effective service delivery model that addresses citizen needs
- Organizational Excellence – by examining financial viability, sustainability, relevance and cost effectiveness; as well as promoting a high performing organization by identify program/service efficiency and enhancement opportunities
- Staff Excellence – by ensuring the City has the right people with the right skills and the tools/processes in the right places.

Regional Implications

Not Applicable

Conclusion

As the City grows, the expectations and requirements of its residents and stakeholders continue to evolve and change. Program service levels define how the City strives to meet these expectations and provide insight into the effectiveness, efficiency and economy of the City's service delivery models.

The Operational Review of the City's Winter Control programs (a review that coincided with one of the most challenging winters in the past ten years) provides insight into how the City tries to meet (and exceed) the approved service levels. Some of the operational challenges faced by the City in meeting service levels (and associated cost structures) could be addressed by implementing a comprehensive performance management based contract for Winter Control Programs.

Attachments

1. Operational Review – Winter Control Programs – Final Report

Report prepared by:

Derek Patterson
Director, Innovation and Continuous Improvement

(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)

COMMITTEE OF THE WHOLE (WORKING SESSION) - MAY 21, 2014

WINTER CONTROL PROGRAMS OPERATIONAL REVIEW

Recommendation

The Commissioner of Engineering and Public Works, the Commissioner of Strategic and Corporate Services, the Director of Public Works, and the Director of Innovation and Continuous Improvement recommend:

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3. That staff be directed to develop a detailed scope for a comprehensive Request for Tender for Winter Maintenance Services using recommendations outlined in the attached Operational Review and present this scope for Council review in early 2015, prior to issuing a new multi-year tender for a comprehensive Winter Maintenance Services contract.

Contribution to Sustainability

A key pillar of sustainability is financial viability. This has been noted in many reports, most specifically the recent financial master plan for the City of Vaughan. The organization will face many financial challenges in the coming years, while balancing the continued delivery of excellence in its programs and services. In 2012, the City completed a program review which examined its 200 plus programs/services. Further, the City recognized the significance of long term sustainability given the growth and change within the municipality and the administration: this resulted in a reorganization of the City and the establishment of the Department of Innovation and Continuous Improvement (ICI). One of ICI's main business functions is to complete operational reviews for the City's 200 plus programs/services as a means of identifying program/services efficiencies, relevance and cost effectiveness while considering service levels/standards and delivery models.

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residents will be planned, as specifications for a new comprehensive approach to winter control programs are developed.

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This proposed timeline requires the City to seek a further extension to the existing contract for Winter Maintenance services for the winter 2015/2016.

Relationship to Vaughan Vision 2020/Strategic Plan

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- Staff Excellence – by ensuring the City has the right people with the right skills and the tools/processes in the right places.

Regional Implications

Not Applicable

Conclusion

As the City grows, the expectations and requirements of its residents and stakeholders continue to evolve and change. Program service levels define how the City strives to meet these expectations and provide insight into the effectiveness, efficiency and economy of the City's service delivery models.

The Operational Review of the City's Winter Control programs (a review that coincided with one of the most challenging winters in the past ten years) provides insight into how the City tries to meet (and exceed) the approved service levels. Some of the operational challenges faced by the City in meeting service levels (and associated cost structures) could be addressed by implementing a comprehensive performance management based contract for Winter Control Programs.

Attachments

1. Operational Review – Winter Control Programs – Final Report

Report prepared by:

Derek Patterson
Director, Innovation and Continuous Improvement

Respectfully submitted,

Paul Jankowski
Commissioner, Engineering and Public Works

Joseph Pittari,
Commissioner, Strategic and Corporate Services

Brian Anthony
Director, Public Works

Derek Patterson
Director, Innovation & Continuous Improvement

Operational Review

Winter Control Programs

Final Report

May 6th, 2014

Contents

Executive Summary

Project Overview

When compared to other municipalities, the City of Vaughan provides residents with some of the highest levels of service in Winter Control or Maintenance programs. Whether it's reducing ice formation on roads through sanding / salting, removing snow from roads, clearing snow from paths / sidewalks or enabling residents to exit their driveways by partially removing windrows – crews from the City's Public Works and Parks & Forestry Operations departments endeavour to ensure that residents, and others, can travel safely despite the weather.

The City aspires to provide a level of service for all its Winter Programs that will enable residents (and other stakeholders) to travel safely within a certain timeframe of a winter storm ending. At the same time, the City must balance levels of services with the costs of providing those services.

A recent comparison of service levels between the City of Vaughan and other GTA municipalities, suggests that the City provides its residents with some of the highest levels of service for winter control programs.

Currently, the City uses a blend of external and internal resources to deliver its winter control programs. The most significant operational and cost components relate to the salting and plowing of the extensive road network, and the majority of these services are delivered by external contractors, under a contract that expires in March 2015.

Project Purpose, Goals and Objectives

Winter control programs (i.e., Road Salting, Road Snow Plowing, Snow Removal, Windrow Snow Clearing, Snow Fencing and Path / Sidewalk Plowing) are highly interlinked (e.g., snow plowing roads and sidewalks, and snow plowing roads and removing windrows), so any proposed changes in service level (or service delivery model) in one program could have a ripple impact on another program.

To understand these impacts, to develop a holistic and truly integrated approach to winter control, and to prepare for issuing a new request for services, an operational review of all winter control programs was warranted (including windrow clearing). City staff recommended that an operational review of all Winter Control Programs be conducted in order to highlight potential service delivery models, levels of service, impacts on residents, program costs, risks and mitigation.

Project Approach and Methodology

The Innovation and Continuous Improvement (ICI) department followed a two-phase multiple step approach in conducting the operational review of the City's winter control programs. The first phase focused on understanding the current service delivery model, while the second phase focused on developing recommendations for the future state for delivering the City's winter control programs.

In order to gain greater perspective into the concerns, challenges and issues associated with the winter control programs residents, managers, supervisors, contractors, special interest groups and other municipalities provided insight through surveys, interviews and focus groups. Data was also collected

from a variety of sources, e.g., the City's Case Tracking System (CTS), contractors' reporting documents and road patrollers' log sheets, and analyzed in order to identify:

- Resident / constituent / stakeholder satisfaction with the current levels of service;
- Potential service delivery disconnects;
- Potential opportunities to improve service delivery efficiency;
- Potential opportunities to provide greater management information; and,
- Potential opportunities to reduce costs.

Key Findings and Recommendations

The most recent Ipsos Reid survey conducted for the City[1] demonstrates that residents "believe they receive good value for their tax dollars" with over 81% *VERY SATISFIED* or *SOMEWHAT SATISFIED* with the winter control services provided by the City. The survey suggests that residents are comfortable supporting the current service levels. The Ipsos Reid report also identified Road and Sidewalk Snow Removal programs as areas for maintenance, i.e., services of relatively high importance where satisfaction is good and where the focus is on maintaining current levels of service.

The residents' survey was a self-selected survey utilizing both on-line and hard copy response forms. Residents were made aware of the survey through a Corporate Communications e-mail "blast" to over 8,000 subscribers, information posted on the City's web-site together with information presented at the City's ten community centres. Over 670 responses were collected from respondents in all wards; though hard copy survey forms were available at the community centres, only one returned from these locations.

From this survey, it was apparent that:

- Residents largely feel positively about the winter control services provided by the City and the associate levels of service;
- Residents would not welcome a reduction in service or an increase in taxes to secure a higher level of service; and,
- The City should look at leveraging local radio and TV stations and other tools to provide up-to-date winter storm-related communications.

Not only does the City aspire to deliver high levels of service to residents with its winter maintenance programs, it actually does so much of the time – though delivering services through the unusually cold 2013/2014 winter has highlighted some challenges. Some of the City's approaches to winter maintenance service delivery impose additional constraints and impact service delivery costs, e.g., road plows and windrow machines operating in tandem requires more routes and equipment, striving to clear sidewalks to bare pavement requires more passes and causes greater wear / tear on equipment, while barriers such as parked cars and encroachments can also interfere with service delivery.

The following items impact the ability of the City to deliver on its service levels, and should be addressed:

[1] City of Vaughan – Citizen Survey – Ipsos Reid, March 2012

1. The City is currently providing service levels greater than those that have been formally approved by Council, i.e., plowing snow in laneways;
2. Operating practices can constrain the ability to meet all service level objectives cost effectively, e.g., road plow routes are planned to keep plows and windrow machines closely linked;
3. In certain areas snow removal operations have had to be implemented regularly, as there is nowhere for plows to push the snow;
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5. The City is constrained by Employment Standards and must limit the number of hours that staff can work consecutively and in a seven day period. As Parks & Forestry Operations staff (sidewalks) and Parks Services staff (hand clearing) have responsibilities beyond winter control, even in winter, crews can sometimes be under-staffed particularly when overtime call-outs are required and staff decline the callout and/or overtime;
6. Roads supervisors are supported by foremen and resources seconded from the team of heavy equipment operators, who have each been working (on average) an additional day each week in overtime, impacting their ability to rest and recover, and, in the case of the seconded resources, focus on a key role of managing the City's salt inventory;
7. Barriers, such as parked cars and encroachments, impact the ability of contractors and staff to deliver winter control programs, leading to higher costs or reduced service quality; and,
8. The City collects a great deal of data associated with the delivery of its winter control programs, (e.g., CTS, road winter maintenance logs, equipment GPS, road patrol logs etc.) but in many cases it is difficult to collect this data and mine it for information in order to identify challenges / issues and potential route causes.

Additionally, the ability to manage residents' expectations with respect to winter maintenance service levels is critical to ensuring continued resident satisfaction with the City's service delivery. The City expanded on its tools for communicating information about winter control, which worked well at informing residents about what to expect during the winter, but more needs to be done to be able to tell / show a resident when s/he will have her/his local roads and sidewalks cleared and to clarify residents' responsibilities to ensure a safe and accessible City.

Key Recommendations

This report provides details of the following issues and associated recommendations for addressing them (presented in order of priority). In total, 10 recommendations are provided and the comprehensive justification for the recommendations (and an associated approach) is detailed in Section 8.0 of this report.

Issue	Recommendation
The service level objectives for the City's Winter Control Programs have not been reviewed and approved by Council, and are not consistent with those communicated to residents (and contractors).	1. Prior to developing a Request for Tender (RFT) for a new contract for the delivery of Winter Control Programs, review, clarify and formalize service level objectives for the City's Winter Control Programs.
For a variety of reasons, including resource constraints (e.g., equipment and operators), the City struggles with meeting its service level objectives for sidewalk maintenance in winter.	2. Evaluate the potential for outsourcing the winter maintenance of sidewalks.
The current contracts for roads winter maintenance, while aligned with service level objectives defined in 2008, are structured with fixed standby costs, variable (un-capped) operating costs and limited controls on service quality, making it difficult to align cost of delivery with quality.	3. Consider alternative contracting and costing frameworks for Winter Maintenance contracts, including incorporating performance-based work specifications.
Data is not easily accessible to facilitate performance management and to identify issues and make informed business decisions	4. Review the Case Tracking System (CTS) and develop requirements to facilitate capture and reporting of necessary data.
The current operating requirements of keeping the windrow equipment within close proximity of the road plows while ensuring alignment between road plowing and driveway access, it potentially has an impact on costs. As plows are slowed considerably to enable windrow equipment to "keep up", more routes and equipment are required in order to meet service level objectives.	5. While windrow clearing is a key service provided by the City, consider de-coupling windrow clearing from the plowing of roads.
Barriers, such as parked cars and encroachments, impact the ability of contractors and staff to deliver winter control programs, leading to higher costs or reduced service quality.	6. Institute a cross-departmental team to develop and communicate strategies for effective management of existing by-laws.
Contractors are required to report information using Winter Hired Equipment and Road Winter Maintenance log forms. While this information is very useful in validating services delivered, the reporting by contractors is paper-based,	7. Enable integrated reporting by contractors.

Issue	Recommendation
frequently not timely and difficult to analyze.	
While much information is available prior to the arrival of a winter event, residents believe they have limited insight into the impacts of an on-going winter storm, e.g., limited information about local roads is available.	8. Implement and resource a communications protocol for developing and delivering proactive communications about Winter Control Programs.
Supervisory resources are stretched to provide the appropriate level of support to operations through the winter season.	9. Assess the overall supervisory (and foremen) requirements for the Roads division for both Winter and Summer operations.
Accountability for servicing the City's facilities is split between two departments, Building & Facilities and Parks Services.	10. Move contract management for facilities and parking lots to Buildings & Facilities.

1.0 Structure and Organization of the Report

The report consists of eight sections:

- Section 2.0 provides details on the purpose, goals and objectives of the Operational Review;
- Section 3.0 includes review of project approach and methodology;
- Section 4.0 provides an overview of the various programs delivered as part of the City's Winter Control initiatives and includes an overview of service levels, operational expenses, current business processes, staffing levels, equipment, contracts, systems and tools used, as well as current and proposed Key Performance Indicators;
- Section 5.0 summarizes relevant findings from a jurisdictional review and their potential applicability to the City;
- Section 6.0 summarizes findings from a survey of residents conducted to gain their insight and perspective of the City's winter maintenance programs;
- Section 7.0 includes key findings related to evaluation and assessment of service efficiencies conducted by the ICI team; and,
- Section 8.0 summarizes a series of recommendations for addressing issues, gaps and challenges identified in the previous section of the report.

Appendices include information on the routes used to provide winter control programs, a.

2.0 Project Background, Purpose, Goals and Objectives

The City of Vaughan provides a variety of winter control (or winter maintenance / safety) programs to its residents. These programs are delivered by the Public Works Department and the Parks and Forestry Operations Department and include:

- Road Salting;
- Road Snow Plowing;
- Road Snow Removal;
- Sidewalk / Path Snow Plowing;
- Snow Windrow Clearing; and,
- Clearing Snow from City Facilities and Parking Lots.

The provision of higher levels of service is, all other things being equal, associated with higher costs. The most recent Ipsos Reid survey conducted for the City[2] demonstrates that residents "believe they receive good value for their tax dollars" with over 81% *VERY SATISFIED* or *SOMEWHAT SATISFIED* with the winter control services provided by the City. The survey suggests that residents are comfortable supporting the current service levels. The Ipsos Reid report also identified Road and Sidewalk Snow Removal programs as areas for maintenance, i.e., services of relatively high importance where satisfaction is good and where the focus is on maintaining current levels of service.

[2] City of Vaughan – Citizen Survey – Ipsos Reid, March 2012

Additionally, a recent comparison of service levels between the City of Vaughan and other GTA municipalities, suggests that the City provides its residents with some of the highest levels of service for winter control programs.

Currently, the City uses a blend of external and internal resources to deliver its winter control programs. The most significant operational and cost components relate to the salting and plowing of the extensive road network, and the majority of these services are delivered by external contractors, under a contract that expires in March 2015.

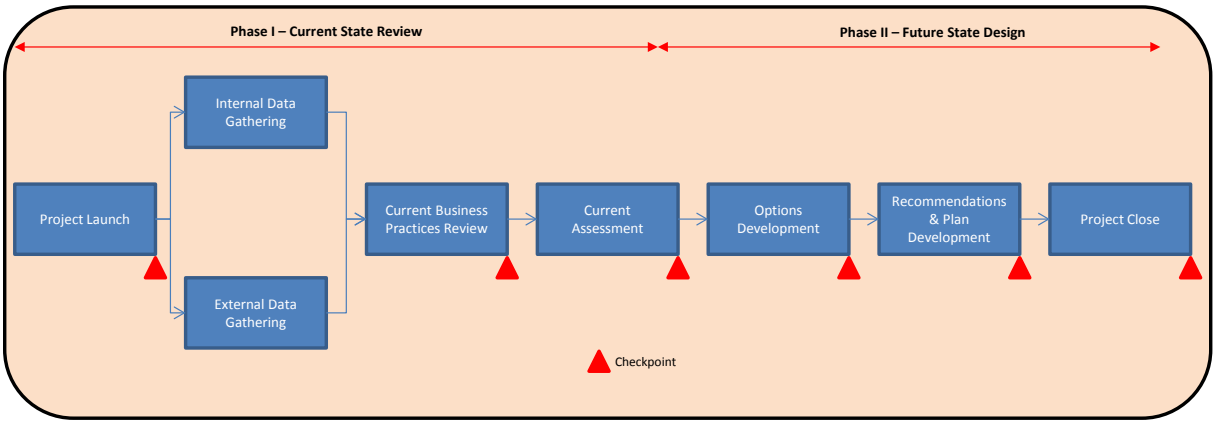
Winter control programs (i.e., Road Salting, Road Snow Plowing, Snow Removal, Windrow Snow Clearing, Snow Fencing and Path / Sidewalk Plowing) are highly interlinked (e.g., snow plowing roads and sidewalks, and snow plowing roads and removing windrows), so any proposed changes in service level (or service delivery model) in one program could have a ripple impact on another program.

To understand these impacts, to develop a holistic and truly integrated approach to winter control, and to prepare for issuing a new request for services, an operational review of all winter control programs was warranted (including windrow). City staff recommended that an operational review of all Winter Control Programs be conducted in order to highlight potential service delivery models, levels of service, impacts on residents, program costs, risks and mitigation.

3.0 Project Approach and Methodology

A two-phase multiple step approach was followed in conducting the operational review of the City's winter control programs. The first phase focused on understanding the current service delivery model, while the second phase focuses on developing recommendations for the future state for delivering the City's winter control programs.

Figure 1: Project Approach



To gain complete perspective on different expectations and experiences, it was important to engage key stakeholders throughout the review and so a variety of stakeholders were engaged in interviews (e.g., staff, management, contractors and residents' groups). Residents were also asked to provide input through an on-line survey. In addition, the following documents were reviewed:

- Ontario Regulation 239/02 – Minimum Maintenance Standards for Municipal Highways[3]; and,
- Minimum Maintenance Standards for Municipal Highways – 2013 – an overview of potential impacts of recent lawsuits provided by Ontario Good Roads Association[4].

The enabling structures and approaches of comparable municipalities (e.g., Brampton, Markham, Mississauga, and Richmond Hill) were identified (at a high level), and management from these jurisdictions were approached to provide insight into their respective challenges, issues and learnings.

The Current State Assessment assisted in identifying any gaps, concerns or issues that prevent the City from delivering on its current mandate. It also assisted in evaluating the relevance, success and effectiveness of the department with respect to its mandate, processes, data management, staffing, structure and cost/budgeting. Additionally, a review of the response to the winter storm event of Wednesday February 5th was incorporated into the initiative, in order to gain further insight into any disconnects or challenges in meeting service level objectives.

Recommendations for key processes, service delivery models, process ownership and accountability, organizational structure and potential enabling technologies, have been developed to address identified gaps. Details of these recommendations are provided in Section 8.0 of the Report.

Following input from departmental management and the Senior Management Team (SMT), a case for change will be developed that identifies the costs and benefits associated with implementing the preferred option(s) and recommendations, together with a detailed implementation approach that will also address risks (and mitigation) and monitoring performance.

[3] http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_020239_e.htm
[4] Minimum Maintenance Standards for Municipal Highways – 2013 – Brian Anderson – Ontario Good Roads Association

4.0 Winter Control Programs – Current State

The City of Vaughan provides its residents with a variety of winter control (or maintenance) programs that are focused on ensuring that residents (and visitors) can travel through the city safely (by vehicle or on foot). Currently, the provision of these services is managed by the Public Works Department through the Roads Maintenance Division (i.e., salting roads, plowing roads and clearing windrows), the Parks and Forestry Operations Division (i.e., path / sidewalks snow plowing) and the Parks Services Division (i.e., clearing snow from around City facilities and parking lots). This responsibility framework reflects the recent reallocation of resources from the Commission of Community Services.

Ontario Regulation 239/02 sets out the Minimum Maintenance Standards for Municipal Highways and defines, among other items, when a road can be deemed to be in a state of repair with respect to snow accumulation (section 4(2)) and ice formation (section 5(3)).

Clearing Snow from Paths and Sidewalks

The City has separated its network of sidewalks into primaries, i.e., "municipally owned sidewalk on a street serviced by York Region Transit within the City of Vaughan, as well as sidewalks adjacent to schools or places of worship", and secondaries, i.e., "all other municipally owned sidewalks and pathways leading to schools through municipal parks, where the school and the park are adjacent to each other"[5].

While the Province's Minimum Maintenance Standards for Municipal Highways does not contain any requirements for removing snow and ice from municipal sidewalks, the City, like many municipalities, takes a multi-pronged approach to making its sidewalks and pathways safe for pedestrians in winter. By-law 300-93 and amendment 56-96 require owners of vacant land and occupants of dwellings to remove snow and ice from sidewalks "in front of, alongside or at the rear of such vacant land or the land occupied by such building or dwellings within twenty-four hours after a fall of snow, rain or hail has ceased".

The City has the right to enforce this by-law and ensure "every person who contravenes any provision of this By-law is guilty of an offence, and upon conviction is liable to a fine as provided for in the Provincial Offences Act, RSO, 1990, as amended".

Beyond the responsibilities of residents and property owners, the City also takes a proactive approach to clearing snow and ice from sidewalks and pathways, by dedicating resources to these activities.

Snow Clearing Routes

There are 520 km of primary sidewalks and 499 km of secondary sidewalks / pathways within the City and these have been allocated to 39 routes (see Appendix A – Path / Sidewalk Snow Clearing Routes), the average length of sidewalk allocated to each route being approximately 26 km. For management of sidewalks, the City has been divided into three districts (i.e., East, North and West) and 12, 14 and 13 routes have been allocated to each district.

[5] Guidelines for Sidewalk & Facility Snow Clearing and Salting Operations – City of Vaughan – December 20, 2011

Service Levels

The following service level objectives have been defined for clearing snow from sidewalks and pathways:

- Plowing of primary sidewalks will commence when 5cm (2") of snow has accumulated;
- One complete pass of sidewalk plowing on primary sidewalks should be completed within 8 hours of starting, based on average conditions;
- Secondary sidewalks will be plowed only after primary sidewalks have been cleared;
- One complete pass of all secondary sidewalks should be completed within 16 hours of starting;
- In snow storms with accumulations of less than 5cm (2"), the specific course of action will be determined by the Supervisor, taking into account snow depths, type of snow, icy conditions etc. Such actions may include limited plowing, sanding / salting or no action.

Following a long lasting winter storm in early 2013, service level objectives for sidewalks were amended to ensure that in the event of a continuous snow fall, a first pass of secondary sidewalks would be initiated after two passes of primary sidewalks have been completed. This change was implemented to remove the chance for an endless loop of primary sidewalk clearing taking place with no secondary sidewalk clearing occurring, however, this change in service levels has not been approved by Council.

Staffing

Parks & Forestry Operations use a blend of 34 full-time park attendants and 14 part-time labourers to clear snow from sidewalks. Normal working hours are 07:00 – 15:30, with overtime required outside of these hours. Staff is restricted to working no more than 13 hours consecutively and no more than 60 hours in a seven day period, per the Collective Bargaining Agreement and Ministry of Labour Employment Standards.

Equipment

A total of 47 pieces of equipment are used to clear snow from pathways and sidewalks; these include 34 Kubota's, 7 Holders and 6 Benco's. 13 of the Kubota plows are owned by the City while the remaining 21 are currently being leased ($270,000 annually) with the final lease payment due to be made in mid-September 2015. The Holder and Benco pieces of equipment are currently owned by the City.

Three pieces of Holder equipment were taken out of service prior to the start of 2013/2014 winter (due to escalating repair costs) and these are scheduled to be replaced in 2014, together with another 3 Holders, and a capital budget approval for $535,000 reflects this replacement cost.

Budget

The 2013 budget for clearing snow from pathways and sidewalks was $660,000, which included $333,000 labour costs and $250,000 equipment costs; material costs, (i.e., salt) are not "covered" by Parks & Forestry Operations, but are included in the Public Works budget of $2,644,000 for salt purchases.

Processes

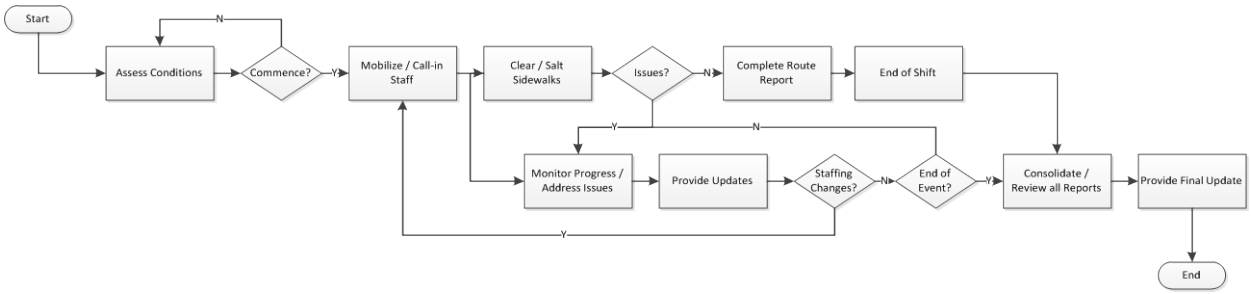
The "Guidelines for Sidewalk and Facility Snow Clearing and Salting Operations" set out the steps to be followed in managing tasks associated with clearing snow from sidewalks. The guidelines identify

activities related to pre-season preparation, commencing operation, calling-in staff, monitoring activities and reporting status to management.

The "Guidelines for Sidewalk Units" set out the responsibilities of snow clearing unit operators, including maximum speeds, avoiding rush hour traffic, plowing techniques (e.g., approaching corners, fueling at shift end and reporting concerns to supervisors.

The process for managing pathway and sidewalk snow clearing operations is outlined below:

Fig 2: Process for Pathway and Sidewalk Snow Clearing



Once a storm begins, supervisors monitor the amount of snow accumulation and will commence snow clearing operations when 5cm (2") of snow has accumulated, or is imminent, on sidewalks. In some cases, salting or snow clearing operations may commence if accumulation is less than 5cm, e.g., if drifting snow is likely to create hazardous conditions. Information about snow clearing activities is captured by operators filling-in a sidewalk plow log (see Appendix B – Sidewalk Plow Log) before starting and after completing snow clearing operations.

In order to enhance pedestrian safety and when weather conditions allow, primary pathways and sidewalks are salted as snow is cleared from them. Sidewalk snow plows generally carry enough salt to complete 4km of a route before they run out of salt; the operators then request more be delivered by the "salt replenishment team" assigned to their district.

If a storm begins outside of normal working hours, and conditions warrant snow be cleared from the sidewalks, calls are cascade to staff from the on call supervisor through resources designated as the area "primary on-call".

At any time residents can call in to Access Vaughan in order to raise an issue or concern with respect to the state of the City's sidewalks; these issues and concerns are entered into the Case Tracking System (CTS) and are manually assigned to the appropriate supervisor for investigation and appropriate action. Work orders are not generated during operations unless the residents have reported unsafe or hazardous conditions, as the reported issues (e.g., sidewalk not cleared) may be in the process of being addressed. Once the first complete pass of the City's sidewalks has been finished, work orders are then generated within CTS.

The area supervisors monitor snow clearing activities by keeping in regular contact with operators via cell phone, 2-way radio and site visits in the field, with operators providing estimates of how far they

have progressed with their routes. Regular updates on the status of snow clearing are provided by the on-call supervisor and manager to ensure that the Senior Management Team, Council and residents (through the City website) have the most up to date information.

Salting Roads, Road Snow Clearing and Windrow Removal

Ontario Regulation 239/02 sets out the Minimum Maintenance Standards for Municipal Highways and, among other items, defines when a road can be deemed to be in a state of repair with respect to snow accumulation (section 4(2)) and ice formation (section 5(3)). The Public Works Department of the Engineering and Public Works Commission is responsible for maintaining the City's roads in a state of repair and manages, or provides, the services necessary to meet the minimum maintenance standards.

For the winter control programs, Regulation 239/02 sets out the following minimum standards for each class of road, where each road class is a function of the posted or statutory speed limit and the average annual daily traffic volume. The City is responsible for roads of Class 2 through 6 as shown in the following table.

		Snow Accumulation (Minimum Standards)			Ice Formation (Minimum Standards)
Road Class	**Road Type**	**Depth of Snow**	**Time to clear to depth after Snowfall**		**Time to de-ice after Notification**
Class 1	Expressway	2.5cm	4 hours		3 hours
Class 2	Arterial	5.0cm	6 hours		4 hours
Class 3	Collector	8.0cm	12 hours		8 hours
Class 4	Local / Residential	8.0cm	16 hours		12 hours
Class 5	Local / Residential	10.0cm	24 hours		16 hours
Class 6	Laneway	N/A	N/A		N/A

The table above illustrates that for a Class 3 road to be deemed to be in a state of repair, the depth of snow should be no greater than 8.0 cm, 12 hours after the end of snowfall, and the same class road should be de-iced within 8 hours of determining that roads are susceptible to ice formation.

It must be stressed that these are minimum maintenance standards developed by the Ministry of Transportation and many municipalities have service levels that exceed the minimum requirement, for example, most municipalities clear a road to bare pavement.

Note: there are no maintenance standards for clearing windrows from the end of driveways.

By-law 1-96 section 3 paragraphs 7.l and 7.m prohibit the parking of a vehicle on a highway "so as to interfere with the clearing of snow" or "in such a manner as to interfere with the movement of traffic or the clearing of snow from the highway".

Snow Plowing Routes

There are 1,950 lane km of roads maintained by the City and these are allocated to 51 routes divided into two areas, i.e., East and West, with Weston Road being the dividing line. Each area has its own operating centres, the Joint Operations Center on Rutherford Road and the Dufferin Street yard in the East, and the Woodbridge yard in the West (see Appendix C – Road Plowing Area Map).

The City identifies roads as being primary (i.e., roads with heavy traffic volumes, steep hills, sharp curves or connecting roads that provide access to a majority of secondary roads), secondary (i.e., roads with low traffic volumes and all other residential streets) and rear laneways. The City's roads would be allocated to the following road classes in the Provinces Minimum Maintenance Standards for Municipal Highways, primary roads – class 2 and class 3, secondary roads – class 4 and class 5 and rear laneways – class 6.

Service Levels

The following service level objectives have been defined for salting roads:

- Salting of primary roads salting shall commence when snow or ice starts to accumulate on the traveled portion of the roadway, causing slippery driving conditions;
- Primary roads shall be salted to maintain a bare pavement condition, until such actions become ineffective due to temperature, severity of the storm or other conditions;
- A complete pass of salting of primary roads should be completed within 4 hours of starting operations;
- Salting of secondary roads shall commence only after all primary roads have been maintained and snow accumulations are less than 5cm (2");
- A complete pass of salting of secondary roads should be completed within 12 hours of starting salting operations;
- Salting shall be used to maintain secondary roads in a limited bare pavement condition after plowing operations; and,
- Rear lanes are maintained only after all other roads have been completed.

The following service level objectives have been defined for plowing snow from roads:

- Road plowing operations commence on primary roads when snow accumulations reach 5cm (2");
- One complete pass of road plowing of primary roads should be completed within 4 hours of starting with final completion being 4 hours after the cessation of the snowfall (based on an average snowfall);
- Re-plowing of primary roads may be necessary if accumulations exceed 5cm (2") during the storm;
- Road plowing of secondary roads commence when snow accumulations exceed 5cm (2") and after all primary roads have been completed;

- One complete pass of plowing of secondary roads should be completed within 12 hours of starting operations on secondary roads, with final completion being 12 hours after the cessation of the snowfall; and,
- Rear laneways are maintained primarily through the application of salt, if, after salting, accumulations reach 15cm (6") or severe rutting takes place, snow removal shall take place.

As clearing windrows happens at almost the same time as the clearing of snow from roads, (every residential route has one windrow clearing machine dedicated to it which follows behind the snow plow), the same timeframes are expected for clearing windrows as plowing roads. An exception to this occurs for residences on regional roads; these roads are plowed by the Region and the City only clears the windrows after the first round of plowing, or, if multiple rounds of plowing are required, the windrow is cleared just once.

Staffing and Contracts

The Road Maintenance Services unit of Public Works has 35 staff working year round on road maintenance operations. There are two road supervisors each with assigned responsibility for a particular City area (i.e., East and West) who are supported by two full-time foremen and two resources seconded from the team of heavy equipment operators. The full-time and seconded foremen are on-call from the start of October until the end of March, in order to ensure an appropriate level of supervisory coverage. For the winter of 2013/2014, in addition to the 4,060 standby hours worked by the full-time and seconded foremen, an additional 870 overtime hours were also worked.

Staff is responsible for patrolling roads on a daily basis in order to report on road and weather conditions, this is particularly important as the data collected is critical in determining when winter control operations should be launched. In the winter months, 4 to 6 seasonal staff assists with road patrolling activities in order to provide coverage for weekends and holiday periods. City employees are also responsible for salting and plowing operations in three industrial routes in the East area (V1, V2 and V3), as well as assisting in clearing snow (when required) from hundreds of cul-de-sacs and wide corners

The City primarily uses outside contractors to salt and plow roads and clear windrows. A Request for Tender (RFT) for Winter Road Maintenance services (T08-057) was issued in 2008, and contracts with two service providers (ArmKing – East area and Gazzola – West area) were selected. Through the contracts, services are defined as STANDBY (i.e., services associated with ensuring equipment and resources are available from October 1st to February 28th) and OPERATING (i.e., hourly services associated with salting, plowing and clearing windrows).

The initial term of the contract was three years (November 2008 – March 2011), with two optional two-year extensions, the first November 2011 – March 2013 and the second November 2013 – March 2015. To date both options have been exercised.

Equipment

Public Works has approximately 10 pieces of equipment dedicated to winter maintenance activities, including five 4x4 pick-ups with plows and several dump trucks.

The services contract also defines the minimum number of pieces of equipment that contractors must have for each service area. The required number of units may increase from year to year as growth occurs in the road network. Currently, the number of units has been defined as:

Equipment	Minimum number – East	Minimum number - West
Salters	17	15
Plows	25	23
Windrow plows	21	16
Anti-icing Tanker	1	1

Contractors are required to deliver salting equipment to the City's yards by November 10th, while plowing and windrow equipment must be delivered to the City's yards by December 1st. The City has installed GPS units to facilitate tracking unit position (e.g., to integrate with WhereisMyPlow.com) and to assist City staff in determining the location of units in both real time and for historical analysis (e.g., claims management).

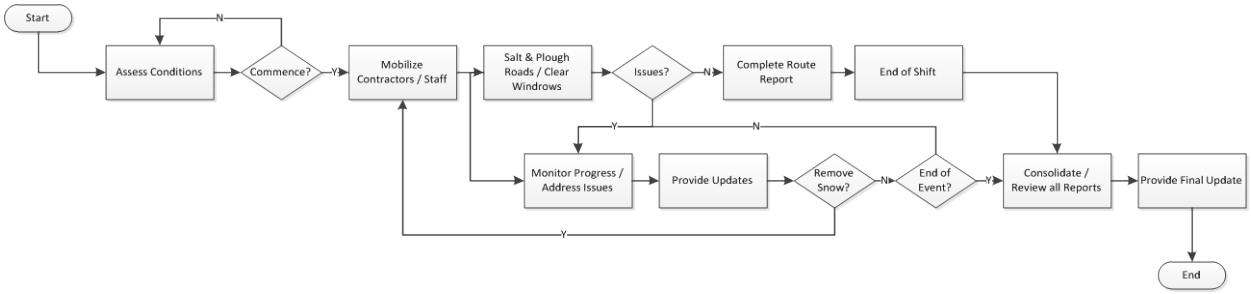
Budget

The 2013 budget for winter control programs provided by Public Works was $9,760,000, this figure included $2,790,000 for contracted road salting services, $2,250,000 for contracted plowing services, $1,230,000 for windrow clearing services and $270,000 for snow removal. The budgeted amount also included $2,640,000 for the purchase of salt.

Processes

The process for managing winter control operations for the City's roads is outlined below:

Fig 3: Process for Winter Control of roads



Road patrols are carried out daily, following pre-designated routes on both sides of the City. There are three patrol shifts on weekdays (07:00 – 15:30, 15:00 – 23:30 and 23:00 – 07:30), with overlaps at both ends of a shift to ensure appropriate communication between shifts (and sharing of map books / journals); on the weekend, there are two shifts (00:00 – 12:00 and 12:00 – 00:00).

Road patrol routes are based on road classification and on the Provinces Minimum Maintenance Standards, which define the frequency of inspection by road type, e.g., Class 2 roads should be patrolled 2 times every 7 days. Road patrols are expected to identify and report issues with roads including potholes, shoulder drop-offs, cracks, debris, luminaries, signs, surface discontinuities and traffic signals. Additionally, patrollers are required to monitor the impact of current and forecasted weather on road

conditions. Road patrollers report issues with roads using a manual log sheet (see Appendix C – Road Winter Maintenance Log). The information collected by the road patrollers is kept in "hard copy" form, and is entered into an Excel spreadsheet by the Roads Supervisor, and may be extracted when requested by interested parties, e.g., Risk Management. In the near future, road patrol data will be captured electronically utilizing a laptop computer and specialized software.

During winter, as weather conditions (and associated impacts on roads) change, the road patrollers will communicate with the Assistant Foremen and supervisors, who will then determine whether conditions warrant mobilizing contracted salting or plowing service providers. While the decision to treat roads with salt in order to address ice formation is relatively straightforward, i.e., if ice is forming then it must be addressed within a certain timeframe, the Public Works department must take the following into account, time of day, ambient air / road temperatures, current / forecasted snow accumulations. The City has three Road Weather Information Systems (RWIS) in place across the City, to provide detailed information to Roads personnel to assist in determining when salt should be applied. Salters may be mobilized prior to ice formation or snow accumulation as an approach to prepare the roads, particularly, if significant snowfall is anticipated within several hours. When salters are mobilized, the Public Works department defines the appropriate salt spread rate to be utilized.

When conditions allow, e.g., road surface temperature is within a certain range, anti-icing of selected roads occurs utilizing contracted services. Anti-icing involves the direct application of anti-icing chemicals (primarily salt brine) to the road surface, a process known as direct liquid application (or DLA).

In preparation for responding to winter storms, the City reviews precipitation forecasts provided by the Weather Network (on a six-hourly basis). The forecasts indicate projected air temperature, potential snowfall, wind chill and sky conditions for each hour in the next 24 hour period. With this information, roads supervisors start to plan the projected needs for mobilizing City and contracted resources, and, if necessary, may send home some staff in order to have them available to work if a storm is projected to last for a significant amount of time.

Once a decision has been made to mobilize salting or plowing operations, area supervisors will contact the contractors, who are required to respond and initiate operations within one hour. Contractors are required to track the time spent to complete each route (salting, plowing and windrow clearing) and to provide this information to City supervisory staff for verification and sign-off prior to submitting their invoices. For those routes that are salted or plowed by City resources, staff conduct operations as outlined Snow Plowing and Snow / Ice Removal Activity Methods.

The contractors' operators should complete their route as directed by the City; if streets cannot be maintained due to parked cars, the operator should inform the City's supervisors, who will then inform By-law and Compliance to take appropriate action. If an entire street cannot be plowed because of parked cars, the contractor will attempt to return to salt, plow and clear windrows once the cars are removed. If the contractor has not informed the City of the problem cars, any clean-up that is required will not be paid for by the City.

Foremen and supervisors make periodic checks during winter operations to ensure that contractors are carrying out their operations appropriately. Any service issues that are identified are then communicated to contractors for remedial actions. Service issues / concerns are also reported by residents by contacting Access Vaughan and / or Public Works dispatch. Residents' concerns are entered into the Case Tracking System (CTS) by the customer service representative, and then manually allocated to the appropriate foreman / supervisor to investigate and determine appropriate action.

The contractor completes the Winter Hired Equipment form which outlines the type of operation performed by piece of equipment. The area foreman validates this information by manually collecting information from equipment GPS's and comparing it to information contained on the hired equipment form. Should any discrepancies be discovered, they will be discussed with the contractor.

Beyond the "standard" salting, plowing and windrow clearing operations, in years of heavy snow accumulations, the City may need to remove snow from streets, laneways, cul-de-sacs and wide corners. When this operation is required, the City will mobilize both contract and City staff to remove snow and bring it to one of two specific dumping sites.

Regular updates on the status of winter road operations are provided by the manager and director to ensure that the Senior Management Team, Council and residents (through the City website) have the most up to date information. Residents also have access to the Where is My Plow website[6] to track the status of roads that have been cleared.

Clearing Snow from around City Facilities and Parking Lots

The Parks Services unit is responsible for ensuring that parking lots and entrance ways to the City's facilities are clear of snow and are safe for pedestrian traffic.

Facilities and Locations

There are 31 locations that have to be cleared of snow and ice; these locations include City Hall, fire stations (10), community centres (10) and libraries (7). The locations have been prioritized so that fire and emergency locations are cleared first, followed by City Hall and then the remaining facilities.

Entrances and stairways to the locations are cleared, together with parking lots – which can only be completed when facilities (e.g., community centres and libraries) have closed for the day.

Service Levels

There are no defined service levels for clearing snow from City facilities and parking lots.

Staffing and Contracts

There are 7 full-time park attendants who are utilized during the winter to mitigate the impacts of weather events by manually clearing steps and entrance-ways at some of the City's facilities (e.g., front

[6] http://communityaccessapps.com/mobile_web_road_condition/index/48/

steps at City Hall). The bulk of the snow clearing and salting operations at City facilities are performed under contract by Forest Contractors Limited. In previous contracts, the City provided the contractor with salt necessary for salting operations, however this practice was ended with the current contract (as the contractor's vehicles are not dedicated to the City and do not have equipment to measure salt spread rates or GPS there is no way to ensure the salt provided is only being used for City properties).

The initial term of the contract (beginning in 2012) was for two years, with an option to renew for three additional one year terms.

Budget

The 2013 budget approved for removing snow and ice from around City facilities was $1,410,000, a figure that includes $1,270,000 of contracted services and materials (i.e., salt).

Processes

Operations to clean snow and ice from around City facilities are started at the same time as roads are being cleared, i.e., the facilities contractor is mobilized at the same time as the road contractors.

The contractor provides inspection sheets for each facility that show the start and finish time of the clearing operations, together with the amount of salt used. Parks Services supervisors check that work has been performed as required, and ensure that remedial action is taken (if required), additionally, Buildings & Facilities staff in some locations may inspect conditions and highlight any concerns.

Parks Services purchases additional salt which is stored at City facilities and which can be spread (as required) on steps, fire exits and entranceways.

Regular updates on the status of snow clearing at City facilities are provided by the on-call supervisor and manager to ensure that the Senior Management Team, Council and residents (through the City website) have the most up to date information.

5.0 Jurisdictional Review

Sidewalks / Pathways

The table in Appendix E – Sidewalk Snow Clearing – Municipal Service Level Comparisons provides a comparison between the City of Vaughan's level of service for clearing snow from sidewalks and those of comparable GTA urban municipalities. As municipalities in the Region are responsible for maintaining sidewalks adjacent to Regional roads, the Region is not included in this comparison.

Several municipalities, including Vaughan, have a by-law that requires property owners or tenants to clear snow from sidewalks fronting their property (usually within 24 hours of the snowfall ending). Brampton enforces this by-law (based on residents' complaints) by investigating, giving property owners or tenants time to comply and then clearing the sidewalk and charging the property owner.

The comparison shows that the City provides some of the highest level of service for clearing snow from sidewalks within this group of municipalities, with the major difference being the target time for completing the activity. The City of Vaughan appears to be one of the only municipalities in this group where sidewalks are cleared solely by city staff, while several of the other municipalities have fully contracted out this service. (Richmond Hill is currently evaluating a pilot study which saw responsibility for sidewalk clearing brought in-house.)

Salting

The table in Appendix F – Salting – Municipal Service Level Comparisons provides a comparison between the City of Vaughan and other municipalities' service levels for salting (or ice formation prevention) on roadways for each road class. The information provided in the table has been collated from a variety of sources including each municipality's Roads' Department, 2011 Municipal Performance Measurement Program (MPMP) data and information publically available from each municipality.

The comparator municipalities have differing approaches to providing the program. The majority uses a blend of contracted and in-house resources for the delivery of the programs while Markham contracts out this work fully to a third party. The general approach taken by municipalities is to divide their roads into routes (based on geography and/or road class) and to ensure that the roads within a route can typically be treated within the required service level time.

From the data, it is apparent that many of the comparator municipalities have set the minimum standard as their desired service level, though the City has set service levels that are higher than the required minimum. The City is also the only municipality to publish a standard for providing salting for Class 6 roads.

The comparison demonstrates that the City provides its residents (and road users from other communities) with one of the highest levels of service with respect to salting its roads and ensuring that ice formation on roads is addressed as expeditiously as possible.

Plowing

The table in Appendix G – Road Snow Plowing – Municipal Service Level Comparisons provides a comparison between the City of Vaughan's and other municipalities' service levels for plowing snow from roadways for each road class. The information provided in the table has been collated from a variety of sources including each municipality's Roads' Department, MPMP data (2011) and information publically available from each municipality.

As with Salting, the general approach taken by municipalities is to divide their roads into routes (based on geography and/or road class) and to ensure that the roads within a route can typically be treated within the required service level time. The municipalities also utilize a blend of delivery options to plow snow from roadways, with third party providers being the dominant model.

For plowing snow from their roads, the municipalities generally adhere to service levels that are superior to the Minimum Maintenance Standards, as in most cases, the municipalities strive to return roads to bare pavement rather than just meeting the depth of snow required "to be deemed in a state of repair". Further, the City has some of the highest service levels and is the only municipality to set a service level for plowing snow in laneways.

All municipalities in the comparator group have enacted by-laws to address the problem of parked cars interfering with winter control operations, though approaches may vary, e.g., Vaughan has a blanket restriction, Markham requires cars to be parked on the odd numbered side of the street in winter months and Oakville just restricts parking overnight. Some of the comparator municipalities appear to actively enforce the by-law when parked cars are interfering with plowing operations, e.g., Brampton, Markham and Mississauga.

The comparison shows that the City provides its residents (and all road users) with one of the highest levels of service with respect to clearing snow from its roads as expeditiously as possible.

6.0 Residents' Survey

Objective

A necessary part of the operational / organizational review of the City's winter control programs was obtaining a picture of how a variety of stakeholders experience (and perceive) the services provided through the programs. This input is useful in identifying potential opportunities to ensure program effectiveness (i.e., the focus on doing the right things) with stakeholder expectations and efficiency (i.e., the focus on doing things right).

A survey of the winter control programs' stakeholder experience could specifically help identify:

- Residents' understanding of the current winter control programs delivered by the City;
- Residents' expectations for the winter control services provided by the City;
- Residents' experience (good or bad) of winter control services delivered by the City;
- Residents' suggestions for improving winter control services delivered by the City; and,
- Potential areas where education (of residents or staff) may be required.

Target Respondents / Size

The objective was to gain input from residents across the City in all wards by:

- Providing access to the survey through the City's website;
- Directing interested residents to the survey using standard City communications tools (e.g., City's Twitter feed, Access Vaughan – Public Works queries); and,
- Providing hard-copy surveys, envelopes, writing implements and collection boxes at City facilities (i.e., City Hall, community centres and libraries
- .

Timing of Survey

The survey was available on-line and in hard copy format from December 16th, 2013 until February 17th, 2014. (See Appendix H – Winter Maintenance Residents' Survey).

User Experience – Residents' Survey – Introduction

In order to gather residents' thoughts and perspectives on the services provided through the City's winter control programs, a web-based survey was developed and made available to residents and other interested parties. While robust surveying typically would use a methodology based on the principle of probability sampling, i.e., using random selection sampling to estimate feelings/beliefs etc. of a larger population, such surveys are often time consuming and expensive to conduct.

Self-selected surveys (such as this residents' survey) "suffer" from population biases, i.e., residents with a particular agenda may feel more compelled to participate, and under-coverage, i.e., residents with no access to the survey are not represented within the sample population. However, within a municipal service delivery context, these type of surveys can provide useful "directional" insight into how residents perceive the types and quality of delivered services and identify opportunities to improve the experience.

Given these concerns with a self-selected survey, it was important to generate as much awareness participation in the survey as possible, and to provide residents with more than one survey channel – though a recent review suggests that over 90% of Vaughan residents have access to the internet[7].

Residents were encouraged to participate in the survey, through the following channels:

- Corporate Communications sent an e-mail "blast" and twitter feed to over 8,000 subscribers in order to notify them that the City was seeking input from residents with respect to their experiences of the City's winter control programs;
- The City's website was updated to include a surveys section within the "Have Your Say" area;
- Hard copies of the survey were prominently displayed at the City's 10 Community Centres; and,
- The Citizen Service Representatives of Access Vaughan also informed residents about the survey.

Methodology

Residents were asked to respond to a variety of questions in order to provide demographic information (e.g., ward of residency, age), identify the type of residence and road on which the residence was located, provide a ranking by importance of the types of services provided under winter maintenance programs and identify respondents' perception of how the different winter control services are being delivered.

Respondents were asked about their perception about how the City delivered various winter control services (e.g., plowing snow from roads, salting roads, clearing snow from sidewalks, removing windrows etc.) and, for each service, were prompted to signify whether they *Strongly Agree, Agree, Neither Agree nor Disagree, Disagree or Strongly Disagree* with the following statements:

[7] The Way Forward – City of Vaughan Corporate Communications Strategy p. 23 - 2013

- I am satisfied with the City's service level objectives;
- I am satisfied with how the City meets its service level objectives for a "typical" storm;
- I would be comfortable with the City taking longer to provide this service;
- I would rather the City provided this service more quickly; and,
- I would be willing to pay more in taxes to have a higher level of service.

This approach can introduce certain respondent biases, e.g., a tendency to pick the *Neither Agree or Disagree* option (central tendency bias) or a tendency to agree with the statements presented (acquiescence bias), additionally, respondents may not value each interval between responses equally (e.g., for a particular respondent *Agree* may be closer to *Strongly Agree* than it is to *Neither Agree or Disagree*).

In analyzing the results of the survey, scoring each response has been avoided (removing concerns about interval values) and a summary net score has been calculated by subtracting the sum of *Disagree* and *Strongly Disagree* responses from the sum of *Agree* and *Strongly Agree* responses. To determine overall respondents' attitude to a particular service statement, the summary net score has been divided by the total number of responses and a result of greater than 20% is defined as being positive, i.e., more than 20% of total respondents *Strongly Agree* or *Agree* with a particular service statement than the number of respondents who *Disagree* or *Strongly Disagree*.

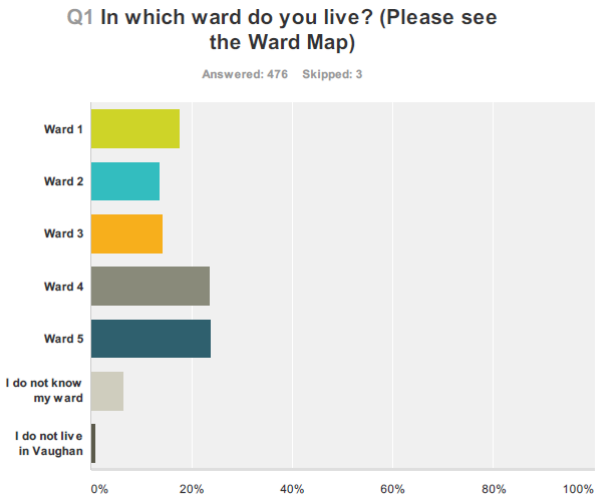
For example, if 500 responses were captured for a particular question, of which 350 showed that respondents *Agreed* or *Strongly Agreed* with the statement, and 100 showed respondents *Disagreed* or *Strongly Disagreed* with the statement, then a summary net score would be calculated as 250 (i.e., 350 – 100), and an attitudinal score of 50% would be calculated (i.e., 250 / 500). For this question, the overall attitude of respondents would be deemed as being positive (i.e., greater than 20%), as the difference between those who agreed and those who disagreed with the sentiments expressed in the statement, is more than 20% of the total respondents (i.e., greater than 100).

In the same way, a result of less than -10% has been defined as negative, and a result of between -10% and +20% has been defined as neutral. (See Appendix I – Survey Attitudinal Summary)

In this report, the summary net score and overall attitude will be provided, e.g., (250, +50%).

Residents' Responses – Demographic Data

Fig 4. – Respondents by Ward



There were 673 responses in total to the survey, of which 479 (71%) were completed in full – only completed responses were incorporated into the analysis of the survey. The responses reflected perspectives from across the City (and even outside the City) as each ward was represented and the average length of residency was 16 years.

While, respondents under 30 (40% of Vaughan's population) were not well represented in the survey – perhaps suggesting that winter control programs have little relevance to them or that alternative / broader mechanisms should be considered to collect their input – other age groups did participate in the survey. The average age of respondents was 50.

Fig 5. – Respondents by Age Group

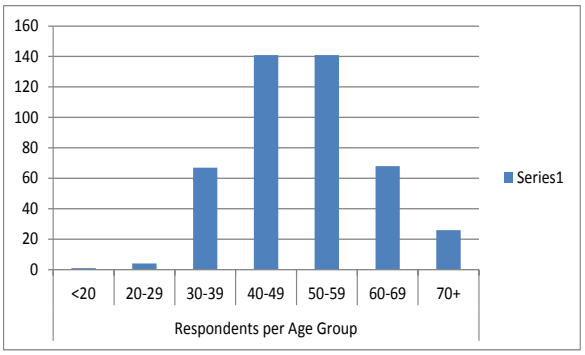
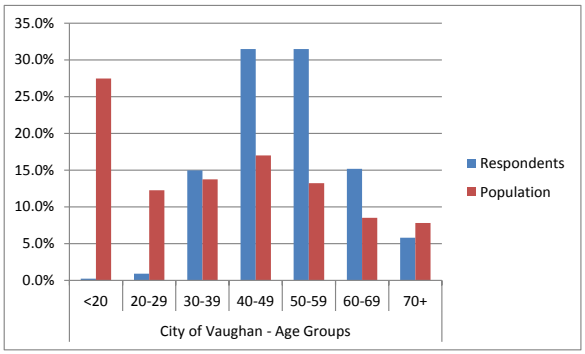


Fig 6. – Respondents and City Population Age Groups



The majority (>80%) of respondents live in detached homes, while 72% live on local roads (such as Johnswood Crescent), and the average number of vehicles owned by the respondent's household was two.

Winter Control Programs Overall

Before drilling down into individual winter control services, respondents were asked to provide perspective on the complete package of winter control programs provided by the City. Overall, respondents indicated:

- They understood all the winter control programs provided by the City (226, +49%);
- The City meets its objectives for winter control programs (251, +54%); and,
- They were satisfied with how the City delivers services under its winter control programs (222, +47%)

A variety of services are provided under the City's Winter Control programs, and survey participants were asked to rank these services in order of importance to them. Survey respondents ordered these services as follows:

1. Enabling travel throughout the municipality by plowing snow from roads (83%);
2. Salting roads to remove ice (80%);
3. Clearing windrows (or snow banks left by road snow plows) at the end of the driveway (68%);
4. Clearing snow and ice from paths and sidewalks (67%);
5. Salting key paths and sidewalks to remove ice (63%);
6. Removing excess snow (or snow banks) from the side of roads (53%)
7. Clearing snow and ice from parking lots at City-owned facilities (39%);
8. Updating residents as to when City's roads and sidewalks will be cleared (35%);
9. Providing information about the state of City roads and sidewalks (32%); and,
10. Informing residents of any impending storm systems (31%).

Residents were asked to provide perspective on five elements of the City's winter control programs, i.e., communications, salting roads, plowing roads, clearing windrows and clearing snow from paths / sidewalks, the summary of these perspectives is provided in the following sections.

Communications

Overall, respondents had a largely positive perspective to the approaches used by the City to provide useful communications prior to, and during, a winter storm event. While overall attitudes towards communications were over 19%, residents appeared to indicate that more could be done to communicate the state of roads and sidewalks after a storm.

The responses provided were:

- The City has clearly communicated the expected service levels associated with each of the Winter Control Programs (e.g., road snow removal and salting) (136, +30%);
- I am satisfied with how the City communicates the state of roads and sidewalks following a winter storm (86, +19%);

- I find the information about its winter control (i.e., snow removal and salting) programs provided on the City website easy to understand and useful (161, +39%); and,
- The Public Works Newsletter is helpful in getting ready for winter travel (181, 41%).

Respondents were also asked from where they received information about the state of roads and sidewalks during a winter storm, and local TV / radio stations were identified as the prime source (both utilized by over 60% of respondents). Other channels, e.g., the City's Winter Maintenance webpage, e-mail from Public Works and "Where is my Snowplow.com", were utilized by less than 15% of respondents. Respondents were asked to identify any other sources they would use and identified "Weather Network", "looking outside" and "councilor e-mails".

Salting Roads before a Winter Storm

Respondents were very positive about both the City's service levels for salting roads and how the City meets its service levels for a "typical" storm, as both had attitudinal scores of over +50%, and while respondents would like the City to salt roads more quickly, this sentiment was expressed less positively at +29%. However, respondents were very clear that they would not be comfortable with the City taking longer to salt the roads (-58%) nor would they be willing to pay more in taxes for a higher level of service (-52%).

The responses provided were:

- I am satisfied with the City's service level objectives for salting roads (250, +53%);
- I am satisfied with how the City meets its service level objectives for a "typical" storm (249, +53%);
- I would be comfortable with the City taking longer to salt roads (-273, -58%);
- I would rather the City salted the roads more quickly (136, +29%); and,
- I would be willing to pay more in taxes to have a higher level of service for salting roads (-243, -52%).

Residents were asked to provide insight into what the City could do to better meet their service expectations associated with salting roads, and in 142 suggestions provided included the following themes:

- Ticket or remove cars that are parked illegally preventing salting operations;
- Look for ways to use salt / brine / sand / other material that is more environmentally friendly; and,
- Begin salting operations earlier and before a storm.

Plowing snow from Roads

Respondents were very positive about both the City's service levels for plowing snow from roads and how the City meets its service levels for a "typical" storm, as both had attitudinal scores of over +50%, and while respondents would like the City to plow roads more quickly, this sentiment was expressed less

positively at +32%. However, respondents were very clear that they would not be comfortable with the City taking longer to plow the roads (-62%) nor would they be willing to pay more in taxes for a higher level of service (-55%).

The responses provided were:

- I am satisfied with the City's service level objectives for plowing snow from roads (241, +52%);
- I am satisfied with how the City meets its service level objectives for a "typical" storm (260, +55%);
- I would be comfortable with the City taking longer to plow snow from City roads (-285, -62%);
- I would rather the City plowed the roads more quickly (158, +34%); and,
- I would be willing to pay more in taxes to have a higher level of service for plowing roads (-256, -55%).

Residents were asked to provide insight into what the City could do to better meet their service expectations associated with plowing snow from roads, and the 108 suggestions provided included the following themes:

- Address issue of cars that are parked illegally preventing plowing operations;
- Address issue of private contractors dumping snow in road;
- Remove snow for smaller streets;
- Look for ways to plan routes so that clearing of primary and secondary roads are more aligned ; and,
- Plow the full width of streets (particularly at bends).

Clearing Windrows

Respondents were quite positive about both the City's service levels for clearing windrows at the end of driveways and how the City meets its service levels for a "typical" storm, as both had attitudinal scores of over +40%. Respondents were somewhat neutral to windrows being cleared more quickly or having windrows cleared at a different time to the roads being plowed. However, respondents were very clear that they did not want the City to stop the windrow clearing service (-72%), nor did they want to pay more for higher levels of service (-52%), nor did they want the City taking longer to clear windrows (-42%). Additionally, respondents would not be enthusiastic if the City cleared windrows for accessibility challenged residents only (-40%).

The responses provided were:

- I am satisfied with the City's service level objectives for clearing windrows (198, +43%);
- I am satisfied with how the City meets its service level objectives for a "typical" storm (235, +51%);
- I would be comfortable with the City taking longer to clear windrows after a storm (-195, -42%);
- I would be comfortable with the City no longer clearing windrows (-337, -72%);
- I would rather the City cleared windrows more quickly (83, +18%);

- I would be willing to pay more in taxes to have a higher level of service for clearing windrows (-239, -52%);
- I would be willing to have my windrows cleared at a different time to the roads being cleared, if it saved money (-44, -9%);and,
- I would be willing to have the City clear windrows for accessibility challenged residents only (-186, -40%).

Residents were asked to provide insight into what the City could do to better meet their service expectations associated with clearing windrows, and the 131 suggestions provided included the following themes:

- Address issue of cars that are parked illegally preventing windrow clearing operations;
- Address issue of where to put snow from windrows on smaller streets;
- Clear windrows on regional roads;
- Clear all of windrow, particularly in shared driveways; and,
- Ensure operators focus on quality not quantity.

Clearing snow from Paths and Sidewalks

Respondents were positive about both the City's service levels for clearing paths and sidewalks, and how the City meets its service levels for a "typical" storm, as both had attitudinal scores of over +45%, and while respondents would like the City to clear paths and sidewalks more quickly, this sentiment was expressed less positively at +17%. However, respondents were clear that they would not be comfortable with the City taking longer to clear paths and sidewalks (-38%) nor would they be willing to pay more in taxes for a higher level of service (-65%).

The responses provided were:

- I am satisfied with the City's service level objectives for clearing snow from paths and sidewalks (219, +46%);
- I am satisfied with how the City meets its service level objectives for a "typical" storm (239, +51%);
- I would be comfortable with the City taking longer to clear snow from paths and sidewalks (-177, -38%);
- I would rather the City cleared snow from paths and sidewalks more quickly (78, +17%); and,
- I would be willing to pay more in taxes to have a higher level of service for plowing roads (-302, -65%).

Residents were asked to provide insight into what the City could do to better meet their service expectations associated with clearing snow from paths and sidewalks, and the 92 suggestions provided included the following themes:

- Enforce by-law requiring residents to clear path / sidewalk in front of their residence;
- Focus on removing snow at cross-walks / intersections;

- Apply salt or sand to paths and sidewalks to reduce risk of slipping on ice; and,
- Focus on removing ice and snow from heavily used paths and sidewalks.

Additional services

Respondents were asked to provide insight into any additional services that should be considered as enhancements to the City's winter control programs. Approximately 80% of respondents (i.e., 326) indicated that no additional services should be offered. 84 respondents provided suggestions, which included the following:

- Snow removal services for seniors and mobility challenged (e.g., driveways, pathways to door) – provided for an additional fee;
- Snow removal from laneways;
- Clearing snow and salting around Canada Post mailboxes; and,
- Utilize environmentally friendly materials to melt ice.

Respondents were asked how much they would be willing to pay extra in taxes for additional winter control services and higher levels of service, and as only 61 respondents answered this question (even with an option of $0), the clear indication is that residents are unwilling to pay more for additional services or service levels.

Supplementary Perspectives

Sessions were held with two residents' groups who brought particular perspectives to the concerns faced by seniors and residents with mobility / accessibility challenges. The Seniors Association of Vaughan Initiative (SAVI) is an umbrella organization for 14 seniors' clubs from across the City and has a mandate of "giving a united voice and improving the quality of life to seniors in the City of Vaughan"[8].

While generally happy with the quality of services, the SAVI members did raise concerns about:

- Removing ice from around Canada Post mailboxes;
- How to inform the City of issues and / or concerns, (many of the seniors' group representatives did not realize that they could contact Access Vaughan to register a concern);
- Clearing ice from catch basin covers to ensure that there would not be the potential for flooding; and,
- Ensuring that senior club parking spaces were not lost when snow is plowed in the parking lots of the retail locations where many of the seniors' clubs are located.

"The Accessibility Advisory Committee assists in the preparation and implementation of an Accessibility Plan, provides guidance and identifies the needs of the community by the removal and prevention of barriers in the City of Vaughan's by-laws, policies, programs, practices and services."[9] The Committee recognized the level of services provided by the City, but raised the following issues and concerns:

- Clearing snow and ice from around Canada Post mailboxes;

[8] http://www.saviseniors.ca/about-2/
[9] Terms of Reference – City of Vaughan – Accessibility Advisory Committee – 2010 – 2014

- Curbs or asphalt that have risen due to frost and very cold temperatures often make it difficult for wheelchairs to navigate;
- Providing accessibility challenged residents with channels to report concerns and issues (Access Vaughan may not be utilized appropriately as some residents may not realize that it has TTY and Ubi-Duo functionality available);
- Providing winter control communications and information for those who may be visually or hearing impaired (e-mail blasts and website communications developed by Corporate Communications are all compliant with AODA requirements).

Summary

The residents' survey was a self-selected survey utilizing both on-line and hard copy response forms. Residents were made aware of the survey through a Corporate Communications e-mail "blast" to over 8,000 subscribers, information posted on the City's web-site together with information presented at the City's ten community centres. Over 670 responses were collected from respondents in all wards; though hard copy survey forms were available at the community centres, only one returned from these locations.

While self-selected and web-based surveys do reflect inherent biases (e.g., excluding a proportion of a population), they still can provide some useful insight into respondents perceptions and help organizations identify areas on which they may want to focus.

From this survey, it is apparent that:

- Residents largely feel positively about the winter control services provided by the City and the associated levels of service;
- Residents would not welcome a reduction in service or an increase in taxes to secure a higher level of service; and,
- The City should look at leveraging local radio and TV stations to provide winter storm-related communications.

Throughout the survey, suggestions provided by respondents demonstrated a realization that the City could enforce by-laws (e.g., car parking and sidewalk clearing) that could facilitate the delivery of services. Additionally, some of the respondents' comments demonstrated that the City needs to do better at communicating the objectives of the winter control programs and the City's performance, as there appeared to be confusion at times at what the City's objectives included (e.g., regional road windrows, sidewalk priorities etc.)

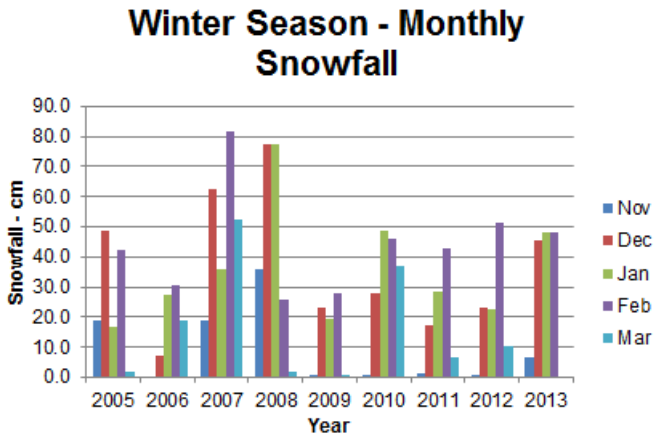
7.0 Current State Assessment

Local Weather Trends

While the winter of 2013/2014 seems to many to have been one of the hardest for many years, in reality, from the perspective of managing municipal winter programs, it has been very similar to several recent winters, with one important distinction – the length of consistent cold spells.

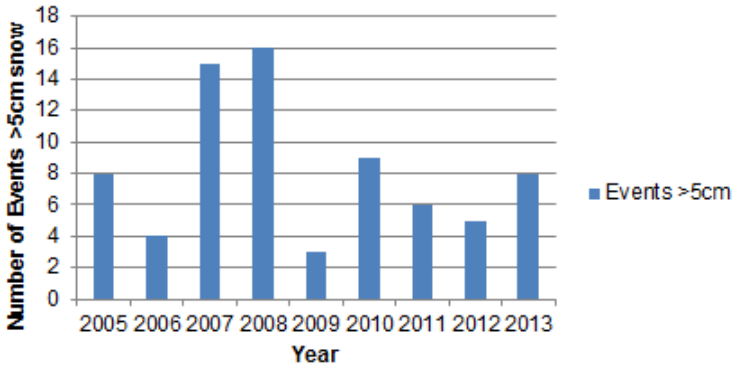
As the following figure shows, the monthly snowfall in the 2013/2014 (for local data up to and including the end of February 2014), is actually lower than that of two more recent winters, i.e., 2007 and 2008.

Fig 8 – Winter Season – Monthly Snowfall



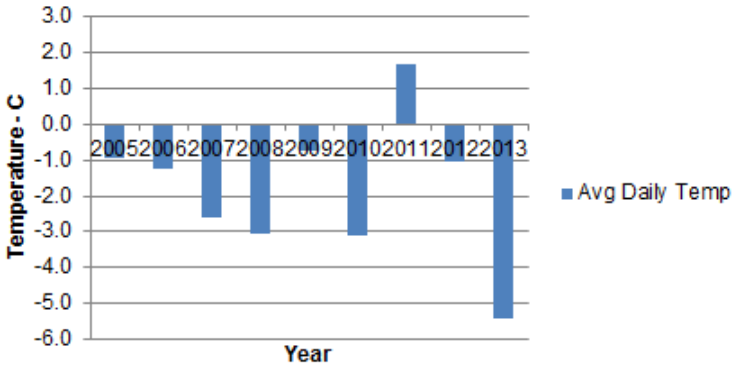
Similarly, the number of storm events in which there were more than 5cm of snow, the accumulation level at which plows are usually mobilized, was greater in those years.

Fig 9 – Snow Events >5cm per winter season



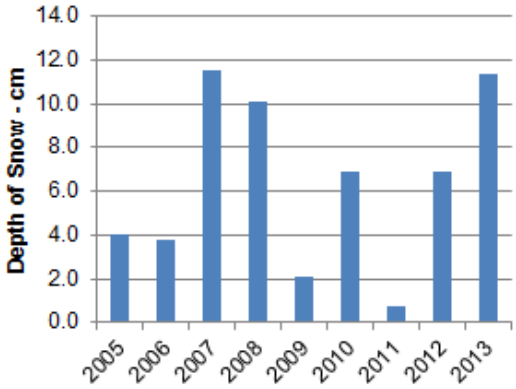
As the following figure shows, the winter of 2013/2014 had average daily temperatures that were significantly colder than any winter in the preceding 10 years.

Fig 10 – Average Winter Season Daily Temperature



The net result of the colder temperatures is that snow has remained on the ground for much longer than in previous years and that each successive fall of snow adds to the total accumulation on roads, boulevards, lawns and other places where snow is typically piled during plowing operations.

Fig 11 – Average Daily Depth of Snow on Ground



In providing winter control services and managing the impacts of a "winter event", the following three stages are applicable.

In the 2013 / 2014 winter (up to March 1st 2014), there have been 8 storm events in which the total snowfall exceeded 5cm. The details of these events are contained in the tables below.

Sidewalks

Date	Snowfall (cm)	Snowfall Ended	Sidewalks Started	Sidewalks Completed	Comments
14/12/2013	10.0	04:00 15/12/13	03:00	15:30 16/12/13	Service level met
17/12/2013	7.4	06:00 18/12/13	07:00	15:30 18/12/13	Service level met
26/12/2013	7.8	11:00	04:00		Continuous cycle due to ice storm
05/01/2014	13.2	10:00 06/01/14	03:00 06/01/14		Staff hours maxed
26/01/2014	5.8	07:00 27/01/14	06:00		Continuous cycle due to cold temperatures / freezing conditions
01/02/2014	16.5	02:00 02/02/14	03:00		Continuous cycle due to drifting snow and snow storage issues
05/02/2014	18.8	16:00	07:00	16:30 07/02/14	Service level met
18/02/2014	6.4	14:00	04:00	16:30 19/02/14	Service level met

There have been challenges meeting the sidewalk snow clearing service levels for a variety of reasons this year as service levels were met only 50% of the time. The amount of snow that has fallen and that has remained on the ground (and its depth) has meant that the City's sidewalk plows have been unable at times to move snow from the sidewalks – this situation generally occurs when the depth of the snow on boulevards, lawns or other greenspace is greater than the height of the plow blade. In these cases, snow often runs up over the plow blade, falls back into the sidewalk and is run over by the tractor, leaving the sidewalk looking as if it has not been fully plowed.

In order to remedy this situation, sidewalk crews have been sent out repeatedly to re-plow and salt the sidewalks, often with limited success, and this is part of the reason (together with the ice storm) for the costs of labour associated with clearing the sidewalks is running at 64% above budget (i.e., at $545,000 vs. the budgeted $333,000).

At one point, sidewalk crews had been dispatched 54 days out of a 60 day period, and this then created issues with ensuring staff availability as staff cannot work more than 13 hours straight, or more than 60 hours in a 7 day period. Additionally, while there is a call-out protocol for requesting staff to come in to work overtime if there has been an event in off-hours or a major event (e.g., the ice storm), staff are not obliged to respond and so the City may not have the necessary resources (45) to meet its service level obligations (e.g., storm of January 26th, 2014).

With the amount of sidewalk snow clearing and salting activity required this year, an additional challenge has been presented by the wear and tear on the Parks and Forestry Operations' plows. In 2012, 17 sidewalk plows were out of commission for more than a day 33 times, while in 2013, 20 plows were out of commission for more than a day 67 times. When equipment fails, it further impacts the ability of the City to meet its service levels.

A further challenge to clearing sidewalks is presented by sidewalk hazards and encroachments. A route dry-run is conducted in each area in late November, in order to identify where there are issues that will interfere with clearing sidewalks; these issues include poor sidewalk surfaces, encroachments onto the sidewalks and trees / shrubbery requiring pruning. The route dry run in November 2013 identified the following issues:

Area	Issues Identified	Encroachments
East	219	176
North	100	61
West	146	13

While encroachments recorded in the dry run may be permitted by the City, they still require monitoring and to be taken into consideration when removing snow from the sidewalks. Unauthorized encroachments are reported to By-law & Compliance for investigation and auctioning, though Parks & Forestry Operations are not updated with respect to the results of any action that may be taken.

Supervisors are responsible for providing updates on status to management, drawing on estimates provided by operators through their Driver Sheets (logs). An analysis done by Parks & Forestry Operations in 2013 showed some discrepancies when driver sheets were audited after a major storm, particularly as it related to secondary sidewalks. As sidewalk clearing operations may cross shifts, i.e., be started in one shift and completed in another, it is sometimes difficult to get an accurate picture of status and, more importantly, understand whether service level objectives were met.

Roads

Date	Snowfall (cm)	Snowfall Ended	Salting Started	Salting Suspended	Plowing Started	Plowing Completed	Salting Started	Salting Completed
14/12/2013	10.0	04:00 15/12/13	00:30 14/12/13	21:00 14/12/13	02:00 15/12/13	17:30 15/12/13	14:30 15/12/13	08:00 16/12/13
17/12/2013	7.4	06:00 18/12/13	04:00 16/12/13	15:30 16/12/13	14:00 17/12/13	03:00 18/12/13	01:30 18/12/13	07:00 18/12/13
26/12/2013	7.8	11:00						
05/01/2014	13.2	10:00 06/01/14	18:45 05/01/14	22:00 05/01/14	01:00 06/01/14	14:00 06/01/14	13:00 06/01/14	20:30 06/01/14
26/01/2014	5.8	07:00 27/01/14	00:50 27/01/14	07:00 27/01/14	10:00 27/01/14	23:00 27/01/14	19:00 27/01/14	01:00 28/01/14
01/02/2014	16.5	02:00 02/02/14	10:30 01/02/14	18:30 01/02/14	19:40 01/02/14	00:20 02/02/14	08:30 02/02/14	15:00 02/02/14
05/02/2014	18.8	16:00 05/02/14	02:00 05/02/14	11:30 05/02/14	11:30 05/02/14	05:00 06/02/14	12:30 06/02/14	06:30 07/02/14
18/02/2014	6.4	14:00 18/02/14	01:40 18/02/14	08:30 18/02/14	06:15 18/02/14	18:30 18/02/14	18:45 18/02/14	00:00 19/02/14

The Public Works department has to balance a variety of constraints when salting or plowing the City's roads. The highest priority is given to ensuring public safety while meeting service level objectives and keeping a lid on costs. These constraints are often competing. For example, if an overnight storm is

projected to last into the morning rush hour, the City may opt to complete a pass of plowing before 7:00 AM, then pull the plows and complete a second pass in the mid-morning. Alternatively, in a late evening storm, the City may opt to send salters out and only send the plows out when the storm has finished (even if the snow accumulation has passed the 5cm target depth), in order to remove the need to plow the roads twice. The number of times salters and plows are mobilized in a storm is important, as the City pays an hourly operating rate for their use.

The current two-step process to mobilizing salting and plowing activities,(i.e., road patrol call supervisors who will then review conditions and then call the contractors), can add up to two hours to the start of winter maintenance operations. These delays are being minimized by having foremen / supervisors monitoring roads in advance of a storm's arrival. The data above shows that the City has been challenged in meeting its service level objectives in major storm events, while the service level for first round salting was met 6 out of 7 times, the plowing service level was met only 5 times while the salting completion service level was met only three times (though achieving the service level was made more difficult given that multiple rounds of salting were required on 9 occasions to ensure roads stayed at bare pavement).

There is a disconnect between the service levels relating to laneways communicated on the City's Winter Maintenance website (which are aligned with the service levels attached to the service providers' contracts) and the service levels currently desired by the City. The published service level states that rear laneways will be treated with salt (unless the snow depth is greater than 15cm) and will only be maintained once all other roads have been addressed. However, the current service in force strives to maintain rear laneways to the same level as secondary roads – this is a difficult service level to meet, as rear laneways do not have similar boulevard area on which to push the snow.

The amount of snow that has fallen and the significant number of days with temperatures well below freezing, has meant that the City has not benefited from the usual thaws and has, in some areas, run into problems finding room for plows to push the snow. This situation has been exacerbated by trends in design where boulevards are becoming smaller, streets are becoming narrower, joint driveways are becoming more prevalent as are rear laneways. To address this issue, the City initiates snow removal operations in certain areas (e.g., cul-de-sacs, laneways), when plowing operations have been completed. For the 2013/2014 season, $270,000 was budgeted for snow removal, however, to the end of March 2014 close to $3,000,000 has been spent on this service, which is provided under the existing third-party contracts.

While clearing windrows continues to be an integral part of the winter maintenance programs offered to Vaughan residents, the impact of the way in which the service is currently provided (i.e., requiring windrows to be cleared at the same time as residential roads) was highlighted in December 2013 (following the ice storm), when windrows were cleared after the roads had been maintained. An assessment conducted by the Roads Maintenance unit, comparing the time it took to plow routes following other storms when windrows were cleared in the usual fashion, suggested that clearing windrows in this way added an additional 3 hours to the route clearing time.

Winter operations on the roads are impacted by parked cars, particularly plowing and windrow clearing operations. Issues with parked cars interfering with winter control operations tend to move based on the time of day and the day of the week, i.e., residential areas have a problem when snow plowing is occurring on the weekend or holidays, while business areas have a problem during the workday. The contractors are incented to report parked cars that are interfering with their routes, for if they do not do so and must return to a street to re-plow it, then the City does not pay them for the clean-up operation. There were not many formal reports made this year, so data is difficult to verify, however several routes were identified anecdotally as having parking issues, i.e., 10E, 17E, 39W and 53W.

Operators are expected to report challenges with parked cars to the area supervisor, who will then contact the By-law & Compliance department so that a By-law & Enforcement Officer (BLEO) can be dispatched to investigate. Operators have been informed that they are meant to wait for the BLEO to investigate (which impacts the operator's ability to complete the route) and so will often leave reporting the incident as a comment on the hired equipment reporting form.

Facilities

Although there are no clearly defined service levels for removing snow and ice from around City facilities and parking lots, there are obviously important safety and risk management considerations. Challenges, particularly in winters of heavy – and long lasting – snowfall, include finding space to push snow, having parking lots that are empty of cars (i.e., plowing at night) and having resources available to ensure that hand shoveling of snow is possible.

While most of the snow removal is completed under contract, the Forestry Services staff is utilized as part of the hand shoveling brigade and is subject to the same working condition constraints as outlined for Parks & Forestry Operations. In a winter of frequent (and long) storms, it is possible to reach a point where the appropriate level of resources are not available to hand clear entrances and steps as quickly as possible.

Date	Snowfall (cm)	Snowfall Ended	East – No. of Facilities	East – Tonnes of Salt Used	West – No. of Facilities	West – Tonnes of Salt Used
14/12/2013	10.0	04:00 15/12/13	22	76.5	16	57
17/12/2013	7.4	06:00 18/12/13	22 22	76.5 71	16 16	57 51.5
26/12/2013	7.8	11:00	22 9	76.5 36.5	16 4	57 6.5
05/01/2014	13.2	10:00 06/01/14	22	76	16	57
26/01/2014	5.8	07:00 27/01/14	21	69.5	16	51.5
01/02/2014	16.5	02:00 02/02/14	7 7	16.5 16.5	5 5	11 11
05/02/2014	18.8	16:00	9	27	4	5.5
18/02/2014	6.4	14:00	21	75	16	57

Parks Services monitors the amount of salt used (and invoiced) by the contractor on a per facility basis, in order to ensure that the contractor is meeting its obligations. For some of the major storms of 2013/2014, some facilities had to be visited more than once (e.g., fire halls and City Hall) to ensure that residents and staff could access priority facilities. While the salt spread at many facilities was relatively consistent from one treatment to another, where above average amounts of salt are used, Parks Services requires the contractor to validate the usage and may reject payment.

Review of storm February 5th – 8th 2014

In order gain further insight into the City's response to a winter storm event, a review of a major storm event (February 5th 2014) was conducted, with a particular focus on sidewalk snow clearing, road plowing and salting.

In conducting the review, the winter event was considered as consisting of the following three phases and associated activities.

Fig. 8: Winter Event Lifecycle

As discussed previously, in planning for the winter event, Parks & Forestry Operations and Public Works, are striving to deliver, the following service levels:

Fig. 9: Winter Maintenance – Service Levels

Service Levels

- Salting Roads
  Primary – start with snow / ice - 4hrs
  Secondary – after Primary 12hrs
- Plowing Roads
  Primary – start @ 5cm – 4hrs
  Secondary – start @ 5cm – 12hrs
  Laneways – only salted after secondary
  (Actually done with secondaries)
- Windrows
  Same as plowing
- Sidewalks
  Primary – start @ 5cm – 8hrs
- Secondary – after Primary – 16hrs

Service Levels

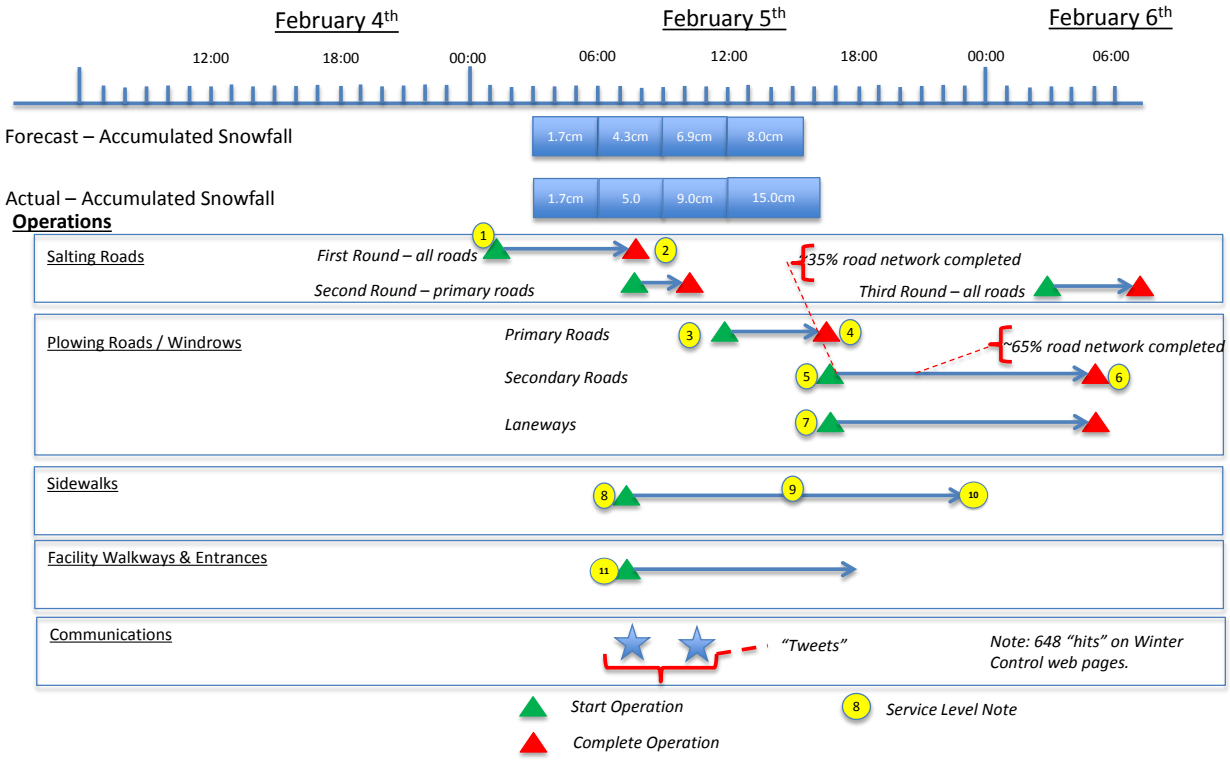
- Plowing Roads
  Primary – completion – 4hrs
  Secondary – completion – 12hrs
  Laneways – only salted after secondary
  (Actually done with secondaries)
- Windrows
  Snow removal **MAY** occur if >15cm

The storm was originally forecasted (by the Weather Network subscription service) to lead to an accumulation of snow in Vaughan South of 8.0cm by 15:00; a similar forecast was provided for Vaughan Northwest.

On the afternoon of February 4th, realizing that snow would need to be cleared from sidewalks and roads by city staff well into the evening of February 5th (as snow was projected to continue falling into the middle of the afternoon), some staff were sent home in order to be available to work the necessary consecutive hours on February 5th.

The timeline associated with the storm is provided below.

Fig 10: Timeline of Winter Storm February 5th, 2014



Snow started to fall around midnight on February 4th, and by 01:00, road salting operations had begun on all routes. Salt spread on the roads not only retarded the formation of ice at the -7.0C temperature, but also helped melt the snow and this approach was considered to be appropriate to comply with meeting the service level standards and to avoid having plows sitting in traffic.

At 07:00, snow plowing and salting of primary sidewalks commenced as did operations to clear entranceways and walkways at City facilities. During the morning rush, the snow fall continued and a second round of salting of primary routes began at 08:00, when the accumulation of snow measured at the JOC was below 5cm.

At 11:30, plows and windrow clearing equipment were mobilized on primary roads, and snow plowing operations commenced on secondary routes and laneways at 16:00.

The following table contains notes associated with operational service levels highlighted above.

Note	Area	Service Level	Comment
1 & 2	Roads – Salting	o Commence salting of primary routes when ice starts to form	✓ Completed on time
		o Complete primary roads in 4 hours and secondary roads in 12 hours	✓ Completed on time
		o Maintain primary roads at bare pavement	× Bare pavement goal overwhelmed by snow
3, 4, 5, 6 & 7	Plowing Roads and Clearing Windrows	o Plowing starts on primary roads when 5cm accumulates	× Plows mobilized at 9cm
		o Plowing starts on secondary roads after primary roads completed	✓ Secondary roads started after primary roads
		o Primary roads should be plowed within 4 hours	× Primary roads took 5 hours
		o Secondary roads should be plowed within 12 hours	✓ Secondary roads plowed within 12 hours
		o Primary roads should be at bare pavement within 4 hours of snowfall ending	✓ Primary roads bare within 2 hours of snowfall ending
		o Secondary roads should be at bare pavement within 12 hours of snowfall ending	✓ Secondary roads bare within 12 hours of snowfall ending
		o No plowing service level for laneways (salted after secondary roads)	✓ Laneways treated as secondary road
8, 9 & 10	Sidewalks	o Plowing starts on primary sidewalks when 5cm accumulation	✓ Plows mobilized at 5cm
		o Plowing starts on secondary sidewalks after primary sidewalks completed	✓ Secondary sidewalks started after primary sidewalks completed
		o First pass of primary sidewalks should be completed within 8 hours	× First pass took over 8 hours
		o First pass of secondary sidewalks should be completed within 16 hours	× First pass of secondary sidewalks took over 16 hours
11	Facility Walkways and Entranceways	o No defined service levels	✓ Crews mobilized at 5cm

Despite the heavy fall of snow, the City appeared to have met many of its service level objectives, however, there were several areas where the City fell short of its stated goals. While planning for the approaching storm, Public Works department believed that salting of the roads would not only address the formation of ice, but would also help keep the pavement clear (particularly with the traffic during morning rush hour) until the road plows could be mobilized.

Given the early forecasts and the salting strategy, and that snow accumulation on roads is often less than at the measuring points (in the yard) due to traffic compressing the snow, the department felt that the road plows could be held off the roads until after the morning rush. This also had the added benefit

of requiring only a single pass of plows thus avoiding having plows sit in rush hour traffic, additionally, as traffic also crushes (and melts) snow on the road, the amount of accumulated snow on roads can be less than at an "undisturbed" measuring station. However, the amount of snow that fell during the morning was higher than contemplated and the bare pavement standard was overwhelmed.

As road traffic fell off after the morning rush, the department continued with its plan to mobilize plows in late morning, though if they had been mobilized by 09:00 (requiring a decision to have been communicated to the contractors by 08:00), the service level objective of commencing operations at 5cm accumulation of snow (at the yards) would have been met. However in this scenario, the plows would have been on the roads before the typical rush hour ends at 09:30 – and in winter weather rush hour tends to last longer.

As the snow kept falling into the afternoon, it took contractors nearly five hours to clear what started at 9cm of snow (and approached 15cm by the time routes were being completed). The amount of snow that fell (as well as the amount of snow that already lay on the ground) caused problems for the plows (and associated windrow clearing equipment), particularly as it related to where to put the snow, and generally slowing down operations.

It should be noted that secondary roads and laneways were cleared within the defined service level in fact laneways were maintained above standard.

There were significant issues with meeting the service standards associated with clearing snow from sidewalks. While snow clearing operations commenced when snow had accumulated to 5cm, it took significantly longer than normal to complete the first pass of both primary and secondary sidewalks. The reasons for this included equipment challenges (i.e., 10 pieces of equipment or 30% were out of service requiring repairs), staff and equipment were operating for almost 50 days straight and the problem for plows to push snow up and over existing snow banks.

Throughout the storm, status updates were sent by staff to management, SMT and Council, additionally, updates were provided to residents (and others) through tweets to City followers and on the City's webpage. The updates were also provided to Access Vaughan Citizen Service Representatives so that they could provide the latest data to any callers.

Managing Residents' Concerns, Issues and Complaints

An analysis of calls made to the City following the February 5th storm, shows that 354 concerns, issues and complaints were received between February 5th and February 8th, reflecting concerns from approximately 0.4% of all City households. These calls were received by Access Vaughan and/or Public Works dispatch, and were recorded in the City's Case Tracking System (CTS) – see Appendix J – Winter Control Case Management Process.

Access Vaughan took 251 calls about roads, were able to address / answer 43 of them and transferred 208 to Public Works; Public Works dispatch also took an additional 42 calls directly from residents. Access Vaughan took 61 calls about sidewalks, were able to address / answer 26 of them and

transferred 35 to Parks and Forestry Operations. As Access Vaughan was able to address / answer a total of 69, this suggests that the number of resident issues reported was 285.

Of the 250 calls captured by Public Works within CTS as work orders, further analysis showed that 115 were related to windrows, 26 were related to snow banks / snow removal and 21 were related to roads requiring plowing. An additional 77 work orders had no details, making further analysis impossible. It should also be noted that few work orders had details about the root cause of an issue and the action taken to resolve it.

Of the reported issues, 132 were associated with the East area, 114 were associated with the West side and 4 were associated with windrow clearing on regional roads. Some of the routes (e.g., 3W, 6W, and 7W on the West and 4E and 23E on the East) had significantly more issues than other routes and, for example, these routes represented 43% of all windrow complaints. Further data was not available to allow analysis of potential root causes, e.g., parked cars, operator care etc., but these routes could (and should) be monitored in future winter storms. A pictorial representation of residents' complaints is contained in Appendix K – Winter Storm February 5th – 8th 2014 – Resident Windrow Complaints / Issues.

Additional or New Services

There have been several requests made for the City to consider providing additional snow and ice removal services for residents who may have difficulty clearing snow / ice from around their homes, e.g., residents with mobility challenges or some seniors. Several municipalities, including Toronto, Ottawa and Peel, broker services through community groups to eligible residents, for which services the residents pay in whole or in part (depending on income level).

The not-for-profit organization Community and Home Assistance to Seniors (CHATS) is a York region-based charity enhancing the independence of seniors living at home. One of the programs offered by CHATS is called Home Adaptation and Maintenance Program (HAMP) which includes providing seniors 65+ with home maintenance services such as yard clean-up, snow removal and lawn care. These services are provided following a needs assessment and eligibility determination process, with subsidies being available (based on financial need) of 0%, 20%, 50% or 100%.

CHATS arranges contracts with a variety of sub-contractors to provide snow clearing services, which would be triggered once 5cm of snow had accumulated on the ground. Currently, this program is only available to residents East Gwillimbury, Georgina, Bradford West Gwillimbury, and The Town of New Tecumseth and is funded by the Central Local Health Integration Network (under its Aging at Home program).

CHATS is willing to conduct a small pilot project within Vaughan in a particular geographic area of high economic need for 20-25 clients, in order to assess the need and impact of such a service. CHATS would coordinate and administer the program (including conducting home assessments and eligibility) while the City would be expected to cover the costs of the program, (which could be in the region of $ 15,000 - $20,000, depending on contractor costs and the amount of subsidy provided).

Assessment Summary

The City provides its residents with some of the highest levels of service associated with winter control programs, and the 2012 Citizen Survey conducted by Ipsos Reid shows how important these services are to residents (i.e., 98% of respondents define these services as Very Important or Somewhat Important to them) and how satisfied residents are with the services provided (i.e., 90% of respondents are Very Satisfied or Somewhat Satisfied).

The survey conducted for this review some two years after the last Ipsos Reid survey, shows that the overall satisfaction with the level of winter control services remains. The residents' survey also clearly demonstrated that residents are not open to any changes in services associated with winter control programs, nor are they willing to contemplate higher taxes to pay for the cost of delivering current levels of service.

Not only does the City aspire to deliver high levels of service to residents with its winter maintenance programs, it actually does so much of the time – though delivering services through the unusually cold 2013/2014 winter has highlighted some challenges. The City also attempts to provide services over and beyond the service levels currently approved by Council (please see Appendix L – Winter Control Programs – Service Levels – "As Approved" and "As Delivered").

Some of the City's approaches to winter maintenance service delivery impose additional constraints and impact service delivery costs, e.g., road plows and windrow machines operating in tandem requires more routes and equipment, striving to clear sidewalks to bare pavement requires more passes and causes greater wear / tear on equipment, while barriers such as parked cars and encroachments can also interfere with service delivery.

The following items impact the ability of the City to deliver on its service levels, and should be addressed:

1. The City is currently providing service levels greater than those that have been formally approved by Council, i.e., plowing snow in laneways;
2. Operating practices can constrain the ability to meet all service level objectives cost effectively, e.g., road plow routes are planned to keep plows and windrow machines closely linked;
3. In certain areas snow removal operations have had to be implemented regularly, as there is nowhere for plows to push the snow;
4. The fleet of City-owned sidewalk plows struggles to cope with the wear and tear associated with meeting the requirement to clear snow to bare pavement;
5. The City is constrained by Employment Standards and must limit the number of hours that staff can work consecutively and in a seven day period. As Parks & Forestry Operations staff (sidewalks) and Parks Services staff (hand clearing) have responsibilities beyond winter control, even in winter, crews can sometimes be under-staffed particularly when overtime call-outs are required and staff decline the callout and/or overtime;

6. Roads supervisors are supported by foremen and resources seconded from the team of heavy equipment operators, who have each been working (on average) an additional day each week in overtime, impacting their ability to rest and recover, and, in the case of the seconded resources, focus on a key role of managing the City's salt inventory;
7. Barriers, such as parked cars and encroachments, impact the ability of contractors and staff to deliver winter control programs, leading to higher costs or reduced service quality; and,
8. The City collects a great deal of data associated with the delivery of its winter control programs, (e.g., CTS, road winter maintenance logs, equipment GPS, road patrol logs etc.) but in many cases it is difficult to collect this data and mine it for information in order to identify challenges / issues and potential route causes.

Additionally, the ability to manage residents' expectations with respect to winter maintenance service levels is critical to ensuring continued resident satisfaction with the City's service delivery. The City expanded on its tools for communicating information about winter control, which worked well at informing residents about what to expect during the winter, but more needs to be done to be able to tell / show a resident when s/he will have her/his local roads and sidewalks cleared and to clarify residents' responsibilities to ensure a safe and accessible City.

8.0 Recommendations

In this section, Innovation and Continuous Improvement has developed ten initial recommendations for addressing issues, gaps and challenges identified in the assessment of the City's Winter Control programs. Each recommendation has been identified as either a high, medium or low priority, based on such factors as organizational risk and ease / cost of implementation.

Recommendation	Priority	Description
1	*High*	Prior to developing a Request for Tender (RFT) for a new contract for the delivery of Winter Control Programs, review, clarify and formalize service level objectives for the City's Winter Control Programs.
2	*High*	Evaluate the potential for outsourcing the winter maintenance of sidewalks.
3	*High*	Consider alternative contracting and costing frameworks for Winter Maintenance contracts, including performance based work specifications.
4	*High*	Review the Case Tracking System (CTS) and develop requirements to facilitate capture and reporting of necessary data.
5	*High*	While windrow clearing is a key service provided by the City, consider de-coupling windrow clearing from the plowing of roads.
6	*Medium*	Institute a cross-departmental team to develop and communicate strategies for effective management of existing by-laws.
7	*Medium*	Enable integrated reporting by contractors.
8	*Medium*	Implement and resource a communications protocol for developing and delivering proactive communications about Winter Control Programs.
9	*Medium*	Assess the overall supervisory (and foreman) requirements for the Roads division for both Winter and Summer operations.
10	*Low*	Move contract management for facilities and parking lots to Buildings & Facilities.

Recommendation 1

Issue	The service level objectives for the City's Winter Control Programs have not been reviewed and approved by Council, and are not consistent with those communicated to residents (and contractors).
Recommendation	Prior to developing a Request for Tender (RFT) for a new contract for the delivery of Winter Control Programs, review, clarify and formalize service level objectives for the City's Winter Control Programs.

Approach	• Confirm disconnects between currently publicized service levels and current practices:
	  o Clearing snow from rear laneways (instead of salting)
	  o Clearing snow from secondary sidewalks
	• Review rationale for changes (improvements) to service levels:
	  o Increasing number of rear laneways
	  o In major / continuous snow fall, secondary sidewalks may not get cleared with focus only being on primary sidewalks
	• Clarify operating constraints imposed by current practices and service levels:
	  o Existing routes – East and West
	  o Tethering windrow clearing equipment to road snow plows
	• Identify any potential cost impacts of changes to service levels
	  o More time spent by contractors clearing laneways
	• Develop recommendation for Council for changes (improvements) to service levels
	• Update service level objectives on Winter Maintenance websites
	• Develop formal communication for contractors (roads) for 2014/2015 winter season
	• Develop communications for residents for 2014/2015 winter season
	• Provide information for Access Vaughan and Public Works Dispatch for 2014/2015 winter season

Potential Impacts / Costs	• Public Works time to collate data and develop report for Council • Public Works and Corporate Communications time to update website and communications to residents
Potential Benefits	• Alignment between Council direction and operating objectives • Clear guidelines for the development of future Winter Control Program requests for tenders (RFT's) and contracts
Priority	• High – as road contracts expire at the end of the 2014/2015 winter season, new RFT's should be developed and issued by mid-2014

Recommendation 2

Issue	For a variety of reasons, including resource constraints (e.g., equipment and operators), the City struggles with meeting its service level objectives for sidewalk maintenance in winter.
Recommendation	Evaluate the potential for outsourcing the winter maintenance of sidewalks.

Approach	• Confirm service level objectives for sidewalk winter maintenance (see Recommendation 1)
	• Develop specifications for Request for Information (RFI) and/or Request for Tender (RFT)
	  o Routes
	  o Service Levels – Primary & Secondary sidewalks
	  o Equipment requirements
	  o Provision of materials – salt and fuel
	  o Call-out / mobilization process
	  o Response times
	  o Reporting requirements
	  o Quality assurance
	  o Incentives / penalties
	  o Term
	• Issue RFT and evaluate proposals
	• Develop business case comparison
	  o Develop cost projections for providing service in-house
	  o Develop cost projections for contracted services
	• Develop recommendation for Council

Potential Impacts / Costs	• Public Works time to collate data, develop RFT and develop report for Council • Finance time to develop cost comparisons • Purchasing time to manage Request for Proposal process
Potential Benefits	• Opportunity to reduce costs associated with leasing and maintaining fleet of 47 sidewalk plows ($270,000 and at least $100,000 respectively for 2013) • Opportunity to reduce overtime associated with providing winter maintenance of sidewalks (31% additional to fulltime labour cost $96,000 for 2013 • Opportunity to reduce requirement for 14 part-time labourers (budget 2013 $151,000) • Opportunity to meet service level objectives more effectively • Opportunity to enable full-time Parks & Forestry Operations staff to focus on spring / summer preparation work (e.g., maintenance)
Priority	• High – as road contracts expire at the end of the 2014/2015 winter season, new RFT's should be developed and issued by mid-2014, with sidewalk maintenance as a part of the contract

Recommendation 3

Issue	The current contracts for roads winter maintenance, while aligned with service level objectives defined in 2008, are structured with fixed standby costs, variable (un-capped) operating costs and limited controls on service quality, making it difficult to align cost of delivery with quality.
Recommendation	Consider alternative contracting and costing frameworks for Winter Maintenance contracts, including performance based work specifications.

Approach	• Clarify service level objectives (see Recommendation 1)
	• Obtain support to develop framework for service contracts:
	  o Cost effective service delivery
	  o Holding contractor accountable
	  o Leverage contractor experience and tools
	  o Term
	• Develop Request for Tenders (RFT's) with following items included:
	  o Contractor must meet service level objectives for infrastructure class (i.e., roads, sidewalks, facilities and parking lots)
	  o The City will be responsible for mobilizing contractor services (i.e., salting, plowing and snow removal)
	  o Contractor must define optimum and cost efficient routes to meet service levels (current routes to be provided)
	  o Contractor must meet salt spreading specifications defined by the City
	  o Contractor's equipment must have GPS technology installed and the data must be available to the City at all times
	  o Contractor must have an issue response capability so that calls can be routed from Access Vaughan / Public Works dispatch for investigation and action
	  o Contractor must provide real-time updates to calls through the City's Case Tracking System
	  o The City will impose a quality assurance framework to ensure that Contractor is delivering required levels of service
	  o Elements of the payment to contractor will be performance based (e.g., equipment utilization, application rates, response times, service completion times, resident issues etc.)
	• Issue RFT and evaluate proposals
	• Develop implementation plan

Recommendation 3

Issue	The current contracts for roads winter maintenance, while aligned with service level objectives defined in 2008, are structured with fixed standby costs, variable (un-capped) operating costs and limited controls on service quality, making it difficult to align cost of delivery with quality.
Recommendation	Consider alternative contracting and costing frameworks for Winter Maintenance contracts, including performance based work specifications.
	○ Operating changes ○ Contract management ○ Technology changes ○ Training • Develop recommendation for Council
Potential Impacts / Costs	• Public Works time to collate data, develop RFT and develop report for Council • Finance time to develop cost comparisons • Information & Technology Management to assess ability to provide contractor with access to CTS • Purchasing time to manage Request for Proposal process
Potential Benefits	• Alignment between Council direction and operating objectives • Greater opportunity to manage costs and quality of services provided under Winter Maintenance
Priority	• High – as contracts expire at the end of the 2014/2015 winter season, new RFT's should be developed and issued by mid-2014

Recommendation 4

Issue	Data is not easily accessible to facilitate performance management and to identify issues and make informed business decisions
Recommendation	Review the Case Tracking System (CTS) and develop requirements to facilitate capture and reporting of necessary data.

Approach	• Develop requirements for CTS data capture, at the very least to include:
	  o Reason code for call
	  o Ward associated with call
	  o Block associated with call
	  o Route associated with call
	  o Investigation result
	  o Follow-up action required
	  o Case close reason code
	• Develop guidelines and training for capturing CTS winter maintenance data:
	  o Access Vaughan
	  o Public Works dispatch
	  o Public Works supervisors / foremen
	  o Contractors
	• Review opportunity automate work order reporting from field and with contractors (see Recommendation 3)
	• Develop issue report and analysis framework

Potential Impacts / Costs	• Public Works and Innovation & Continuous Improvement time to refine CTS requirements • Information & Technology Management time to assess (and implement) changes required to CTS • Innovation & Continuous Improvement and Information & Technology Management time to develop and deliver training
Potential Benefits	• Better information available to assess issues / concerns / complaints raised by residents • Opportunity to identify potential areas requiring focused response (e.g., By-law & Compliance support, operator training etc.)
Priority	• High – currently information within CTS provides little insight into challenges in service delivery

Recommendation 5

Issue	The current operating requirements of keeping the windrow equipment within close proximity of the road plows while ensuring alignment between road plowing and driveway access, it potentially has an impact on costs. As plows are slowed considerably to enable windrow equipment to "keep up", more routes and equipment are required in order to meet service level objectives.
Recommendation	While windrow clearing is a key service provided by the City, consider de-coupling windrow clearing from the plowing of roads.

Approach	• Develop options in Request for Proposal (see Recommendation 4) to include:
	  o Requirement for existing operating framework (i.e., plows and windrow equipment operating together on routes)
	  o Requirement for roads only to be plowed before windrows are cleared
	• Evaluate costing implications:
	  o Number of routes
	  o Pieces of equipment and number of operators
	  o Standby costs
	  o Operating costs
	• Prepare recommendation for Council

Potential Impacts / Costs	• Public Works time to collate data and develop report for Council • Public Works and Corporate Communications time to update website and communications to residents
Potential Benefits	• Opportunity to reduce number of routes and associated costs • Opportunity to increase road snow clearing response
Priority	• High – as contracts expire at the end of the 2014/2015 winter season, new RFT's should be developed and issued by mid-2014

Recommendation 6

Issue	Barriers, such as parked cars and encroachments, impact the ability of contractors and staff to deliver winter control programs, leading to higher costs or reduced service quality.
Recommendation	Institute a cross-departmental team to develop and communicate strategies for effective management of existing by-laws.

Approach	• Collate information with respect to recent by-law impacts:
	  o Cars parked on routes 10E, 17E, 39W and 53W
	  o 250 sidewalk encroachments reported in North, East and West
	  o Slippery sidewalk issues reported through Case Tracking System (CTS)
	• Identify potential areas for targeted communications for 2014/2015 winter
	• Align on strategy for achieving compliance:
	  o Communication
	  o Potential penalties
	  o Warning
	  o Enforcement
	• Review approach with Council
	• Collate data for on-going issue review and management (see Recommendation 2)
	• Develop communications for residents, Council and staff

Potential Impacts / Costs	• By-law & Compliance time to develop strategies, communication and training • Risk Management & Insurance time to provide input to strategies • Public Works time to collate data, develop strategies and develop report for Council • Public Works and Corporate Communications time to update website and communications to residents
Potential Benefits	• Clearer communication with respect to citizen responsibilities within the context of Winter Maintenance • Reduced impact (quality and cost) on providing Winter Control programs
Priority	• Medium

Recommendation 7

Issue	Contractors are required to report information using Winter Hired Equipment and Road Winter Maintenance log forms. While this information is very useful in validating services delivered, the reporting by contractors is paper-based, frequently not timely and difficult to analyze.
Recommendation	Enable integrated reporting by contractors (see also Recommendation 4)

Approach	• Develop requirements for on-line reporting for Road Winter Maintenance log
	  o Incorporate ability to report issues immediately (e.g., parked cars
	• Explore opportunity to integrate information from the following:
	  o Winter Hired Equipment Form
	  o Road Winter Maintenance log
	  o Equipment GPS
	• Identify potential technical / hardware requirements
	• Develop requirements for summary reporting for City foremen / supervisors
	• Developed detailed design and cost estimates for budget approval

Potential Impacts / Costs	• Innovation & Continuous Improvement and Information & Technology Management time to develop requirements and cost estimates
Potential Benefits	• More reliable data available more easily for analysis
Priority	• Medium – as new contracts will become effective in November 2015, integrated reporting

Recommendation 8

Issue	While much information is available prior to the arrival of a winter event, residents believe they have limited insight into the impacts of an on-going winter storm, e.g., limited information about local roads is available.
Recommendation	Implement and resource a communications protocol for developing and delivering proactive communications about Winter Control Programs.

Approach	• Explore opportunity to expand relationship with local and GTA media:
	  o Radio
	  o Television
	• Develop detailed design for changes to Where is My Plow website, to include:
	  o Incorporating estimates to completion based on plow position and speed
	  o Incorporating re-fueling or re-stocking or waiting mode indicators
	  o Incorporating warning that information provided reflects estimates only and is subject to change
	  o Incorporating process to add / change routes (e.g., road assumptions)
	• Develop communication tools to provide updates with respect to current road / weather conditions:
	  o Leveraging existing corporate communication channels
	  o Providing link to Where is My Plow website
	  o Providing link to weather related route planning site (e.g., www.weather.com/travel/trip-planner)
	• Develop estimate to incorporate changes to Where is My Plow website by external vendor (Webtech Wireless)
	• Review and approve proposed costs
	• Code and test changes to Where is My Plow website
	• Communicate changes to residents

Potential Impacts / Costs	• Innovation & Continuous Improvement and Information & Technology Management time to develop detailed requirements • Webtech wireless costs to develop and implement detailed design
Potential Benefits	• Real time access to estimated service completion for multiple stakeholders (e.g., residents, Access Vaughan etc.)
Priority	• Medium

Recommendation 9

Issue	Supervisory resources are stretched to provide the appropriate level of support to operations through the winter season.
Recommendation	Assess the overall supervisory (and foreman) requirements for the Roads division for both Winter and Summer operations.

Approach	• Review role of foremen in Roads Division:
	  o Job description
	  o Competencies and required skill sets
	  o Work load
	• Interview full-time and seconded resources:
	  o Processes
	  o Tools
	  o Reporting / communication
	  o Winter / Summer differences
	  o Concerns / challenges
	• Identify resourcing requirements
	• Identify impacts of resource disconnects
	  o Costs
	• Develop ARR for additional resources (if required)

Potential Impacts / Costs	• Building & Facilities time to review impacts of contract management • Budgeting & Financial Planning time to review impacts of change, set-up accounts and transfer budget
Potential Benefits	• More consistent supervisory focus and support to all winter control operations • Reduced impact on heavy equipment operator team
Priority	• Medium

Recommendation 10

Issue	Accountability for servicing the City's facilities is split between two departments, Building & Facilities and Parks Services.
Recommendation	Move contract management for facilities and parking lots to Buildings & Facilities.

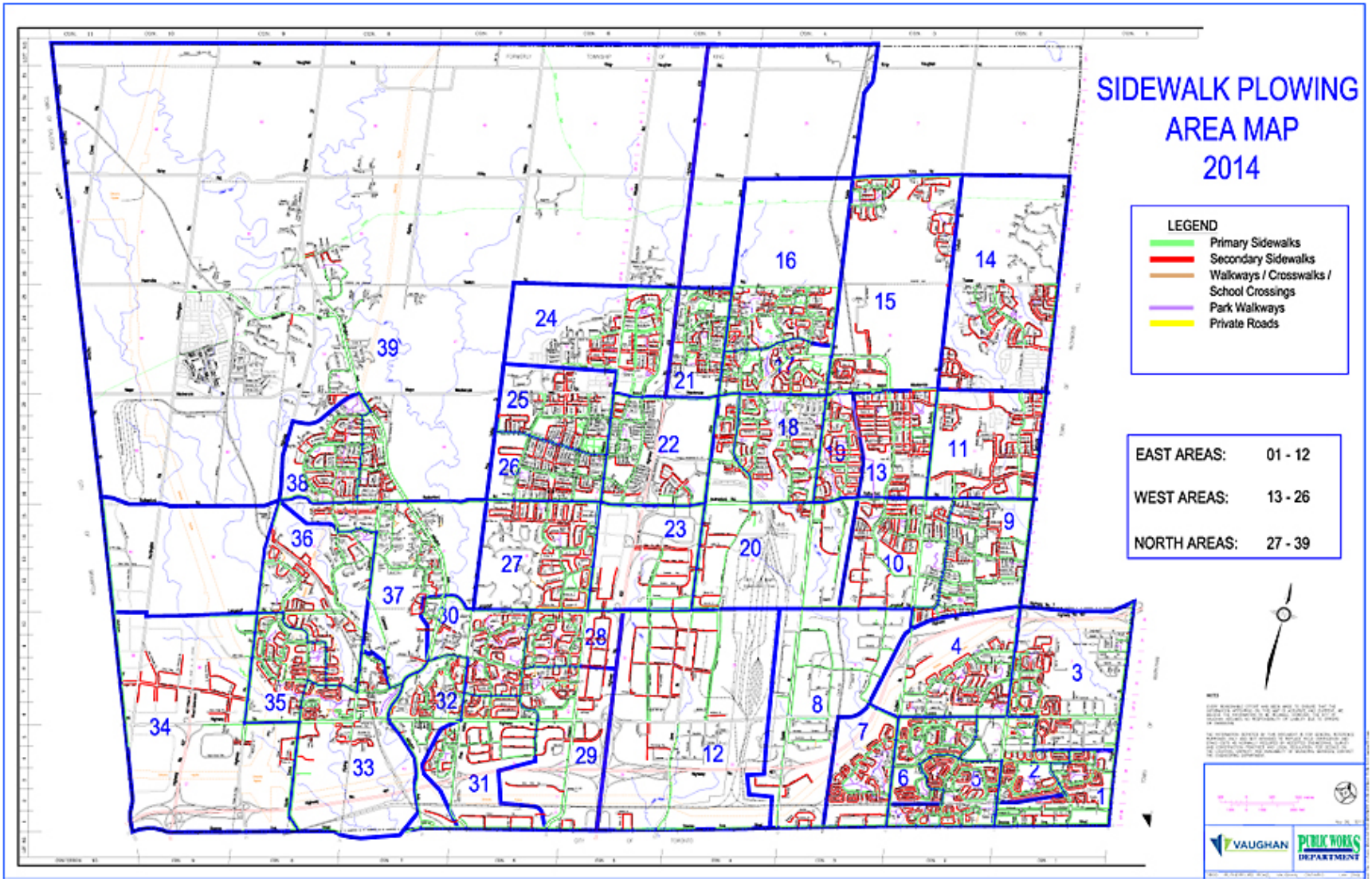
Approach	• Review contracts with Building & Facilities:
	  o Service Levels
	  o Resource mobilization
	  o Quality Assurance
	  o Issues Management
	  o Invoicing
	  o Reporting
	• Identify appropriate contract manager within Building & Facilities
	• Identify budgeting and financial impacts of transfer
	  o Accounts
	  o Budgets
	• Inform contractor of proposed change and provide contact information
	• Transfer contract management responsibility to Building & Facilities
	  o Account set-up
	  o Budget transfer

Potential Impacts / Costs	• Building & Facilities time to review impacts of contract management • Budgeting & Financial Planning time to review impacts of change, set-up accounts and transfer budget
Potential Benefits	• Single point of control for managing services and contracts associated with City facilities • Parks Services can focus on core mandate of forestry activities
Priority	• Low

Appendices

Appendix A – Path / Sidewalk Snow Clearing Routes

2012/2013 SIDEWALK TOTALS					
ROUTE	PRIMARY 2012/2013 (km)	SECONDARY2012/2013 (km)	WALKWAYS 2012/2013 (km)	PARK WALKWAYS 2012/2013 (km)	TOTALS
1	15.6	10.9	0.1	1.3	27.9
2	15.2	9.3	0.84	1.1	26.44
3	14.22	13.69	0.6	1.4	29.91
4	14.31	11.5	0.35	2.53	28.69
5	16	15.9	0.7	2.79	35.39
6	17.1	11.2	0.6	1.6	30.5
7	7.9	13.79	0.3	3.15	25.14
8	14.56	2.06	0.14	0.17	16.93
9	18.28	7.879	0	1.643	27.802
10	15.781	13.026	0.091	1.764	30.662
11	5	19.256	0	0	24.256
12	7.896	17.342	0	0.987	26.225
13	6.959	10.948	0.75	1.96	20.617
14	6.253	14.592	0	0	20.845
15	10.04	13.702	0.066	0.706	24.514
16	16.17	11.398	0.099	1.295	28.962
17	14.571	9.344	0.687	1.154	25.756
18	16.42	10.293	0.515	2.354	29.582
19	19.73	10.483	0	0	30.213
20	12.29	5.727	0	0.198	18.215
21	10.62	16.233	0	1.012	27.865
22	16.82	4.481	0	1.702	23.003
23	11.53	8.726	0	0.431	20.687
24	11.19	8.537	0	1.1345	20.8615
25	8.261	7.383	0	0	15.644
26	13.661	18.906	0.434	0.77	33.771
27	14.084	12.278	0	0	26.362
28	9.4	12.4	0.108	1.3	23.208
29	13.07	12.378	0.848	0.866	27.162
30	15.135	13.853	0.753	3.476	33.217
31	15.834	14.36	0.173	0.382	30.749
32	14.44	7.139	0.619	0	22.198
33	13.793	10.725	1.339	2.629	28.486
34	8.01	11.119	0	0	19.129
35	14.976	11.752	0.366	2.443	29.537
36	16.339	14.039	0.799	0.977	32.154
37	19.6	6.26	0.911	0.243	27.014
38	12.1	8.304	0	3.502	23.906
39	16.573	7.443	0.084	0.812	24.912
TOTALS:	519.716	438.646	12.272	47.7805	1018.4145


SIDEWALK PLOWING
AREA MAP
2014
LEGEND
Primary Sidewalks
Secondary Sidewalks
Walkways / Crosswalks / School Crossings
Park Walkways
Private Roads
EAST AREAS: 01 - 12
WEST AREAS: 13 - 26
NORTH AREAS: 27 - 39
VAUGHAN
PUBLIC WORKS DEPARTMENT

Appendix B – Sidewalk Plow Log

VAUGHAN
Parks and Forestry Operations

Sidewalk Plow Routes Area 1 **East District**

Operator:_____ Date:_____

Unit #:_____ Circle Check Completed:_____

Weather Conditions: Snow Accumulation:_____
Drifting Snow:_____
Icy Conditions:_____
Freezing Rain:_____

Operation Type: Plowing Only_____ Plowing/ Salting _____
Salting Only _____

Primary Start Time:_____ Primary Finish Time:_____
Location:_____ Location:_____

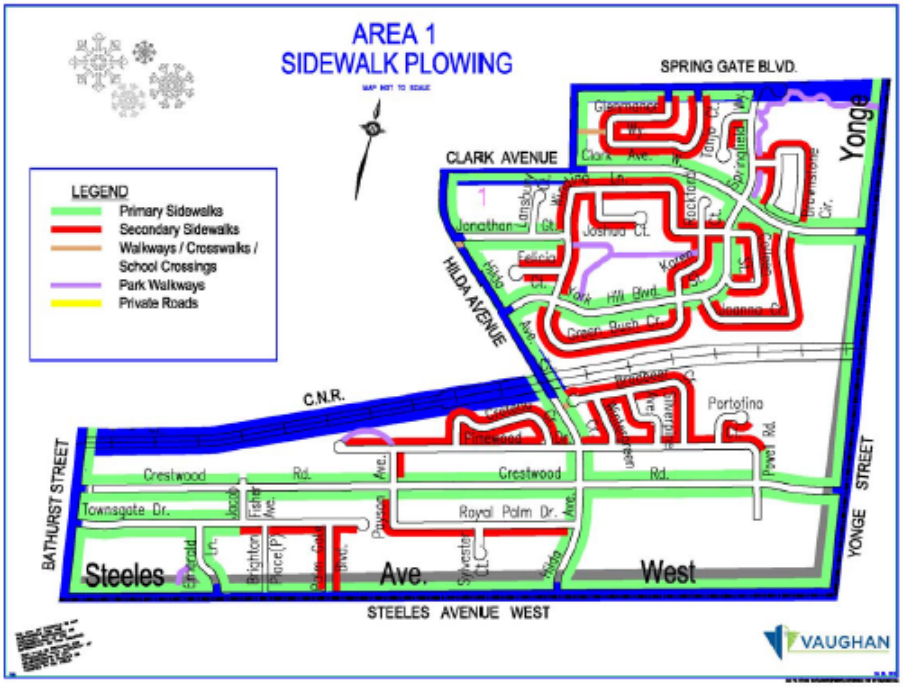
Secondary Start Time:_____ Secondary Finish Time:_____
Location:_____ Location:_____

Sidewalk Route Summary:

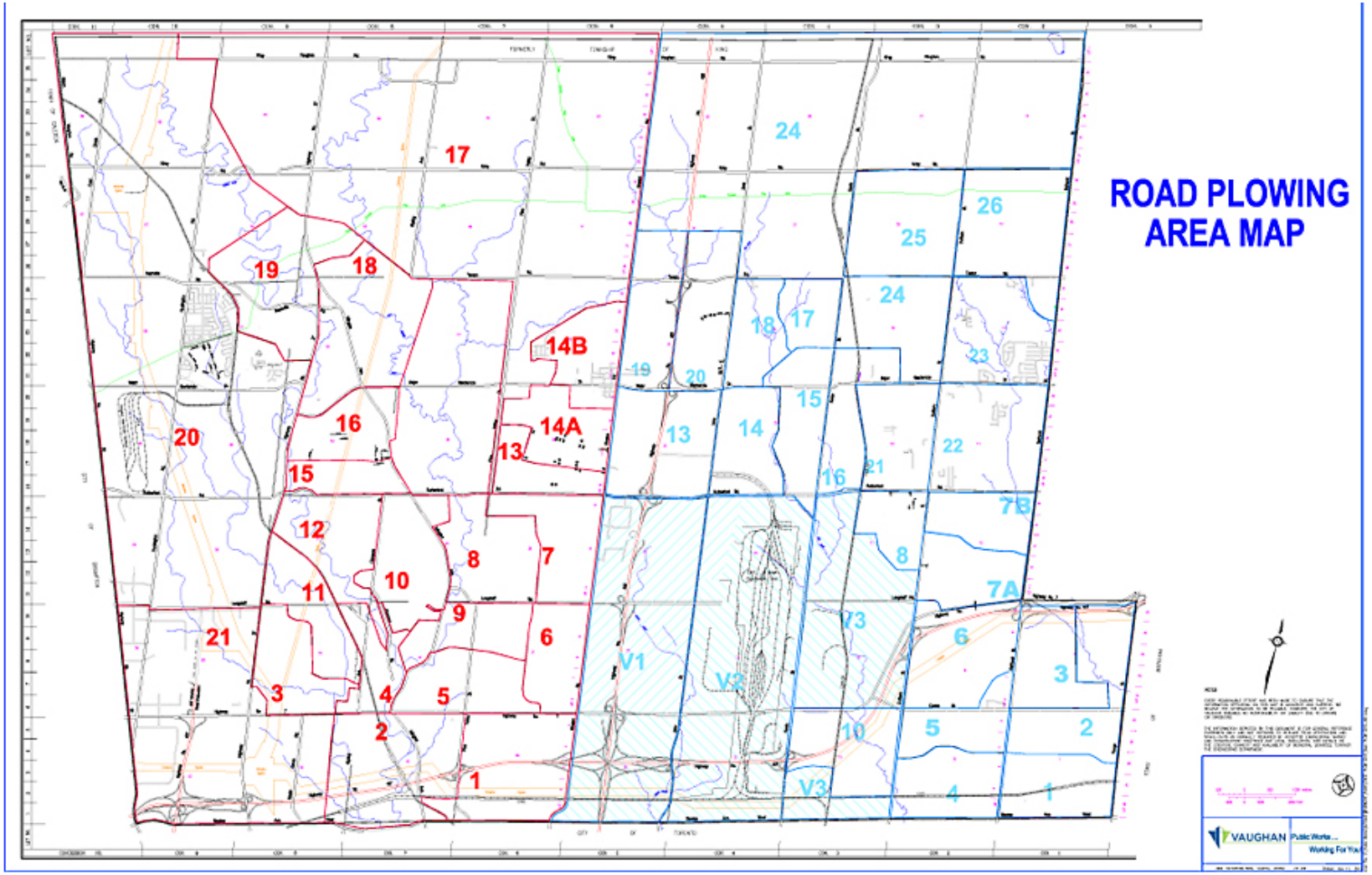
Primary Completed_____ Secondary Completed_____

Comments:_____
_____

Operator Signature:_____



Appendix C – Road Plowing Area Map



Appendix D – Road Winter Maintenance Log

City of Vaughan
The City Above Toronto

ROAD WINTER MAINTENANCE № 027810

(Please Print)

✓ ACTIVITY ❑ SANDING/ SALTING ❑ PLOWING ROADS ❑ CUL-D-SAC PLOWING ❑ WINDROW PLOWING ❑ ANTI-ICING ❑ SNOW REMOVAL

ROUTE NO. _____ ❑ 1ST PASS ❑ 2ND PASS ❑ 3RD PASS

DATE _____ OPERATOR _____

UNIT# _____ CONTRACTOR: EAST ❑ / WEST ❑

ODOMETER START _____ ODOMETER END _____

PRIMARY ROADS: TIME - STARTED _____ FINISHED _____

LOCATION - STARTED _____ FINISHED _____

SECONDARY ROADS: TIME - STARTED _____ FINISHED _____

LOCATION - STARTED _____ FINISHED _____

OPERATIONAL PROBLEMS / COMMENTS: _____

_____

_____

_____

_____
CONTRACTOR'S SUPERVISOR

WAS ROUTE COMPLETED?
❑ YES ❑ NO (See Comments)

Appendix E – Sidewalk Snow Clearing – Municipal Service Level Comparisons

Metric	Vaughan	Brampton	Burlington	Markham	Mississauga	Oakville	Richmond Hill	Aurora	Newmarket
Sidewalk KM Maintained (2011)	1,000	760			1,300		550		210
Service Levels - Accumulation / Time:									
Primary Sidewalks	5cm / 8 hours	24 hours	<12.5cm / 24 hours, >12.5cm / 18 hours	5cm /24 hours	<15cm / 24 hours, >15cm / 36 hours	5cm / 48 hours	6 hours	5cm/24 hours	5cm/24 hours
Secondary Sidewalks	5 cm / 16 hours (after primary)	N/A	<12.5cm / 24 hours, >12.5cm / 36 hours	5cm / after primary	N/A	5cm / 48 hours (after primary)	10 hours	5cm/24 hours	5cm/24 hours
Residential Sidewalks			<12.5cm / 24 hours, >12.5cm / 72 hours			5cm / 48 hours (after secondary)			
Material Cost per KM (2011)	$1,662			N/A	$1,605			N/A	In process of calculating figure
Routes	42	38	14	24 hired 9 in-house	64		15		8
By-Law for Property Owner Responsibility	Yes	Yes	No	No	No (gentle encouragement)	No	No	No	Yes
Service Delivery	Vaughan	In-house / Contractor	In-house/ Contractor	In-house/ Contractor	Contractor	In-house / Contractor	In-house by Roads staff (pilot project)		Newmarket (65% of sidewalks, in future may contract out)
Events 2011	41	26	42	37	29	26	53	46	42
Service Levels met	85%	100%	100%	100%	100%	100%	?	N/R	100%

Appendix F – Salting – Municipal Service Level Comparisons

Metric	Vaughan	Brampton	Burlington	Markham	Mississauga	Oakville	Richmond Hill
Lane KM Maintained (2011)	1,950	3,480	1,584	2,022	5,500	1,908	1,300
Service Levels - Time to Treat:							
Class 1 - Expressway	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Class 2 - Arterial	3 hours	*4 hours*	*4 hours*	*4 hours*	*4 hours*	*4 hours*	N/A
Class 3 - Collector	4 hours	*8 hours*	*8 hours*	*8 hours*	*8 hours*	*8 hours*	N/A
Class 4/5 – Local / Residential	6 hours	N/A	N/A	Only treated at hills, intersections and sharp curves as required	Blanket sanded as conditions warrant	Only treated at hills, intersections and sharp curves as required	12 hours
Class 6 - Laneway	8 hours	N/A	N/A	N/A	N/A	N/A	N/A
Material Cost / Lane km (2011)	$1,672	$695	$541	$1,145	$942	$-	$501
Salaries & Services per lane KM (2011)	$3,070	$3,935	$1,348	$2,322	$2,619	$1,883	$1,478
Service Delivery Model	City / Contractor	Brampton / Contractor	Burlington / Contractor	Contractor	Mississauga / Contractor	Oakville / Contractor	Richmond Hill Contractor
Events 2011	41	26	42	37	29	26	53
Service Levels met	100%	100%	100%	100%	100%	100%	100%

Appendix G – Winter Control / Road Snow Plowing – Municipal Service Level Comparisons

Metric	Vaughan	Brampton	Burlington	Markham	Mississauga	Oakville	Richmond Hill
Lane KM Maintained (2011)	1,950	3,480	1,584	2,022	5,500	1,908	1,300
Service Levels: - Depth Trigger / Time to Bare Pavement							
Class 1 - Expressway	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Class 2 - Arterial	5cm / 4 hours	5 cm / 6 hours	5 cm / 6 hours	5 cm / 6 hours	8 cm / 12 hours	5 cm / 6 hours	N/A
Class 3 - Collector	5 cm / 4 hours	5 cm / 12 hours	5 cm / 6 hours (after primary)	5 cm / 6 hours (after primary)	8 cm / 12 hours	5 cm / 6 hours (after primary)	N/A
Class 4/5 - Local	5 cm / 12 hours	7.5 cm / 24 hours	7.5 cm packed snow / 24 hours	7.5 cm / 24 hours	8 cm made safe / 24 hours	10 cm / 24 hours	5cm / 16 hours
Class 6 - Laneway	15 cm / 24 hours - removal	N/A	N/A	N/A	N/A	N/A	N/A
Salaries & Services per lane KM (2011)	$3,070	$ 3,935	$1,348	$2,322	$2,619	$1,883	$1,478
Service Delivery Model	City / Contractor	Brampton / Contractor	Burlington / Contractor	Contractor	Mississauga / Contractor	Oakville / Contractor	Richmond Hill Contractor
Winter Car Parking By-law	Yes	Yes	Yes	Yes (odd numbered side)	Yes	Yes (overnight)	Yes
Events 2011	41	26	42	37	29	26	53
Service Levels met	100%	100%	100%	100%	100%	100%	100%

Appendix H – Winter Maintenance Residents' Survey – 2013

Introduction

When compared to other GTA municipalities, the City of Vaughan provides its residents with some of the highest levels of service in Winter Maintenance programs. Whether it's salting roads to reduce ice formation, clearing snow from roads, paths and sidewalks or removing windrows from residents' driveways – the City's Public Works and Parks & Forestry Operations crews work to ensure residents can travel safely despite the weather.

The City aspires to provide a level of service for all its winter snow removal and salting programs that will enable residents (and other stakeholders) to travel safely within a certain timeframe of a winter storm ending. At the same time, the City must balance levels of services with the costs of providing those services.

The survey will be open until the mid-January 2014 and participation is purely voluntary; respondents will remain anonymous unless they want to connect directly with staff conducting the survey.

Demographic Information

1. In which ward do you live?
    a. Ward 1 ☐
    b. Ward 2 ☐
    c. Ward 3 ☐
    d. Ward 4 ☐
    e. Ward 5 ☐
    f. Unsure ☐
    g. I do not live in the City of Vaughan ☐

2. If you do live in the City of Vaughan, for how many years have you been a resident?
    a. _____years

3. In what type of home do you live?
    a. Detached Home ☐
    b. Townhome – with front driveway ☐
    c. Townhome – with rear driveway or laneway ☐
    d. Condominium ☐
    e. Apartment Building ☐

4. On which road do you live:
    a. _____

5. How many cars are owned by members of your household?
    a. _____
6. In what year were you born?
    a. _____

Winter Control or Maintenance Questions

7. With respect to the complete package of winter control programs (i.e., providing information, salting roads, clearing roads of snow, clearing sidewalks of snow and clearing windrows from driveways) provided by the City, please indicate whether you agree or disagree with the following statements.

7a	I understand all the winter control programs provided by the City				
	1 – Strongly Agree ☐	2 – Agree ☐	3 – Neither agree nor disagree ☐	4 – Disagree ☐	5 – Strongly Disagree ☐
7b	The City meets its objectives for winter control programs				
	1 – Strongly Agree ☐	2 – Agree ☐	3 – Neither agree nor disagree ☐	4 – Disagree ☐	5 – Strongly Disagree ☐
7c	I am satisfied with how the City delivers services under its winter control programs				
	1 – Strongly Agree ☐	2 – Agree ☐	3 – Neither agree nor disagree ☐	4 – Disagree ☐	5 – Strongly Disagree ☐

8. Please rank the following 10 aspects of the City's Winter Control Programs in order of importance to you, from 1 – Least Important to 10 – Most Important:
   a. Clearing snow and ice from key paths and sidewalks _____ ☐
   b. Clearing snow and ice from car parks at City-owned facilities _____ ☐
   c. Clearing windrows (or snowbanks left by plows) at the end of the driveway _____ ☐
   d. Enabling travel throughout the municipality by plowing snow from roads _____ ☐
   e. Informing residents of any impending storm systems _____ ☐
   f. Providing information about the state of the City's roads and sidewalks _____ ☐
   g. Removing excess snow (or snowbanks) from the side of roads _____ ☐
   h. Salting key paths and sidewalks to remove ice _____ ☐
   i. Salting roads to remove ice _____ ☐
   j. Updating residents as to when the City's roads and sidewalks will be cleared _____ ☐

9. Where do you get your information about the state of roads and sidewalks during a winter storm (please check all that apply).
   a. By calling Access Vaughan at City Hall _____ ☐
   b. Local TV stations _____ ☐
   c. The City's Winter Maintenance webpage _____ ☐
   d. York Region's website (www.york.ca) _____ ☐
   e. Local radio stations _____ ☐
   f. The "Where is my Snowplow.com" application _____ ☐
   g. Other _____ ☐
      (Please Specify) _____

10. What could the City do to meet your service expectations for Winter Control Programs more effectively?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

11. What additional services should the City consider incorporating into its Winter Control Programs?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

12. How much would you be willing to pay extra in taxes each year for the City to provide additional Winter Control services and higher levels of service?
    a. $0 ☐
    b. $10 ☐
    c. $25 ☐
    d. $50 ☐
    e. $75 ☐
    f. $100 ☐
    g. Other ☐
    (Please Specify) _____

13. In order to provide additional Winter Program services or higher levels of service, please provide details of any services provided by the City that you would be willing to consider eliminating, and why.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Thank You

Thank you for participating in this survey for Winter Control Programs delivered by the Public Works and Parks & Forestry Operations Departments at the City of Vaughan, with your input we can ensure that we identify opportunities to address residents' concerns. Please leave your completed survey at the front desk.

If you have any questions about this survey, please do not hesitate to contact us at ICI_Survey@vaughan.ca.

If you would like to participate in further City surveys, please visit the website regularly to see a complete list of current surveys.

Thank you again.

Public Works and Parks & Forestry Operations,
City of Vaughan.

Appendix I – Winter Maintenance Residents' Survey – Summary Responses & Analysis

Attitudinal Responses – Summary

Winter Control Programs Overall	7	1	2	3	4	5	N/A	Total	N/2	Average	Median	Mode		Net Top Box	Net Top Two Box	%
I understand all the winter control programs provided by the City	7.1	90	207	97	61	10	8	473	233	2.34	2	4		80	226	49%
The City meets its objectives for winter control programs	7.2	85	222	101	38	18	8	472	232	2.31	2	3		67	251	54%
I am satisfied with how the City delivers services under its winter control programs	7.3	93	223	64	64	30	0	474	237	2.40	2	2		63	222	47%

Communications	9	1	2	3	4	5	N/A	Total		Average	Median	Mode		Net Top Box	Net Top Two Box	%
The City has clearly communicated the expected service levels associated with each of the Winter Control Programs (e.g., road snow removal and salting)	9.1	60	164	144	73	15	18	474	228	2.60	3	2		45	136	30%
I am satisfied with how the City communicates the state of roads and sidewalks following a winter storm	9.2	38	140	181	72	20	21	472	226	2.77	3	2		18	86	19%
I find the information about its winter control (i.e., snow removal and salting) programs provided on the City website easy to understand and useful	9.3	47	154	174	32	8	55	470	208	2.52	3	2		39	161	39%
The Public Works Winter Newsletter is helpful in getting ready for winter travel	9.4	47	186	157	40	12	32	474	221	2.51	2	2		35	181	41%

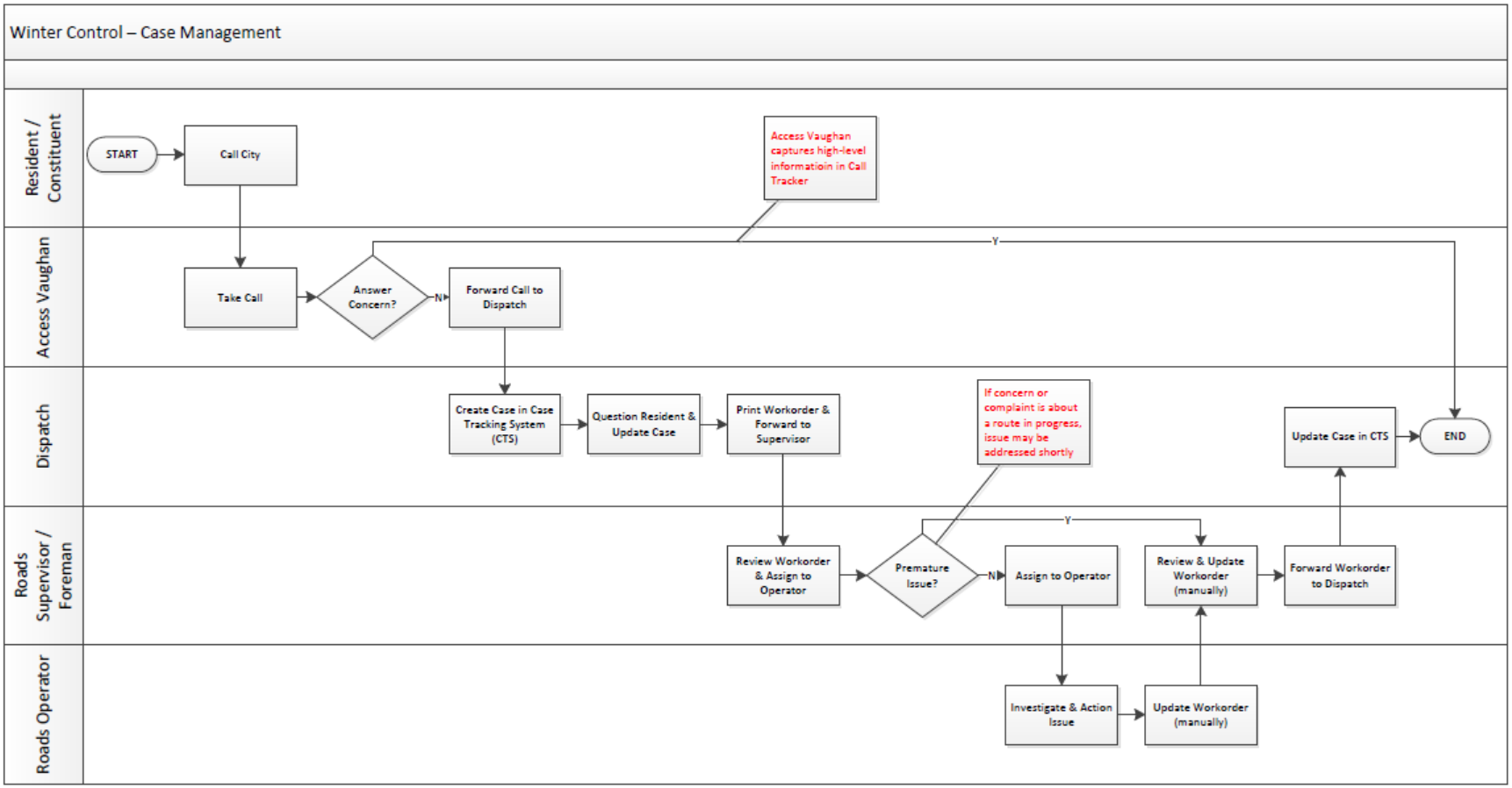
Salting Roads	11	1	2	3	4	5	N/A	Total		Average	Median	Mode		Net Top Box	Net Top Two Box	%
I am satisfied with the City's service level objectives for salting roads	11.1	64	247	96	43	18	4	472	234	2.37	2	2		46	250	53%
I am satisfied with how the City meets its service level objectives for a "typical" storm	11.2	67	248	86	49	17	3	470	234	2.36	2	1		50	249	53%
I would be comfortable with the City taking longer to salt roads	11.3	14	40	86	190	137	1	468	234	3.85	4	1		-123	-273	-58%
I would rather the City salted the roads more quickly	11.4	83	139	164	65	21	1	473	236	2.58	3	3		62	136	29%
I would be willing to pay more in taxes to have a higher level of service for salting roads	11.5	15	51	90	141	168	5	470	233	3.85	4	3		-153	-243	-52%

Plowing Roads	12	1	2	3	4	5	N/A	Total		Average	Median	Mode		Net Top Box	Net Top Two Box	%
I am satisfied with the City's service level objectives for plowing snow from roads	12.1	62	245	94	48	18	2	469	234	2.39	2	2		44	241	52%
I am satisfied with how the City meets its service level objectives for a "typical" storm	12.2	59	265	82	46	18	2	472	235	2.36	2	1		41	260	55%
I would be comfortable with the City taking longer to plow snow from City roads	12.3	8	41	80	206	128	2	465	232	3.87	4	1		-120	-285	-62%
I would rather the City plowed the roads more quickly	12.4	81	152	162	62	13	0	470	235	2.52	3	3		68	158	34%
I would be willing to pay more in taxes to have a higher level of service for plowing roads	12.5	18	47	80	141	180	4	470	233	3.90	4	3		-162	-256	-55%

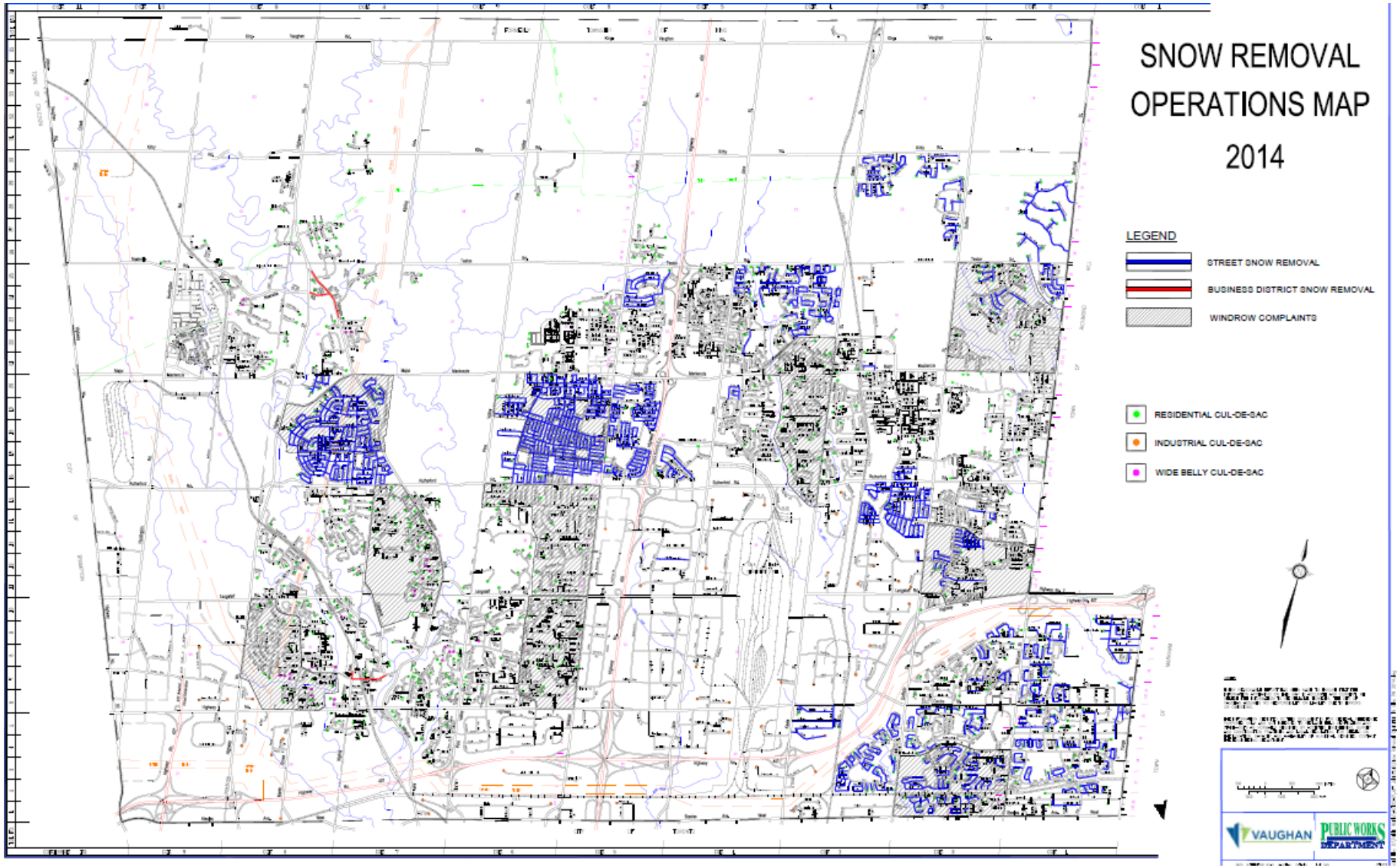
Clearing Windrows	13	1	2	3	4	5	N/A	Total		Average	Median	Mode		Net Top Box	Net Top Two Box	%
I am satisfied with the City's service level objectives for cleaning windrows	13.1	65	222	89	57	32	8	473	233	2.50	2	2		33	198	43%
I am satisfied with how the City meets its service level objectives for a "typical" storm	13.2	67	232	98	41	23	5	466	231	2.39	2	1		44	235	51%
I would be comfortable with the City taking longer to clear windrows after a storm	13.3	15	66	106	157	119	6	469	232	3.65	4	1		-104	-195	-42%
I would be comfortable with the City no longer clearing windrows	13.4	16	31	34	126	258	7	472	233	4.25	5	1		-242	-337	-72%
I would rather the City cleared windrows more quickly	13.5	48	132	186	74	23	6	469	232	2.77	3	3		25	83	18%
I would be willing to pay more in taxes to have a higher level of service for clearing windrows	13.6	21	54	74	137	177	7	470	232	3.85	4	3		-156	-239	-52%
I would be willing to have my windrows cleared at a different time to the roads being cleared, if it saved money	13.7	37	132	87	121	92	5	474	235	3.21	3	3		-55	-44	-9%
I would be willing to have the City clear windrows for accessibility challenged residents only	13.8	28	73	77	158	129	7	472	233	3.62	4	3		-101	-186	-40%

Paths and Sidewalks - Snow Clearing	14	1	2	3	4	5	N/A	Total		Average	Median	Mode		Net Top Box	Net Top Two Box	%
I am satisfied with the City's service level objectives for clearing snow from paths and sidewalks	14.1	62	230	106	49	24	5	476	236	2.45	2	2		38	219	46%
I am satisfied with how the City meets its service level objectives for a "typical" storm	14.2	55	248	102	42	22	6	475	235	2.42	2	1		33	239	51%
I would be comfortable with the City taking longer to clear snow from paths and sidewalks	14.3	15	74	116	177	89	3	474	236	3.53	4	1		-74	-177	-38%
I would rather the City cleared snow from paths and sidewalks more quickly	14.4	44	135	190	75	26	3	473	235	2.80	3	3		18	78	17%
I would be willing to pay more in taxes to have a higher level of service for clearing snow from paths and sidewalks	14.5	17	32	67	157	194	5	472	234	4.03	4	3		-177	-302	-65%

Appendix J – Winter Control Case Management Process



Appendix K – Winter Storm – February 5th – 8th 2014 – Resident Windrow Complaints / Issues



Appendix L – Winter Control Programs – Service Levels – "As Approved" and "As Delivered"

Area	"As Approved" Service Level	"As Delivered" Service Level
Sidewalks	➢ Plowing of primary sidewalks will commence when 5cm (2") of snow has accumulated ➢ One complete pass of sidewalk plowing on primary sidewalks should be completed within 8 hours of starting, based on average conditions ➢ Secondary sidewalks will be plowed only after primary sidewalks have been cleared ➢ One complete pass of all secondary sidewalks should be completed within 16 hours of starting ➢ In snow storms with accumulations of less than 5cm (2"), the specific course of action will be determined by the Supervisor	➢ Plowing of primary sidewalks will commence when 5cm (2") of snow has accumulated ➢ One complete pass of sidewalk plowing on primary sidewalks should be completed within 8 hours of starting, based on average conditions ➢ Secondary sidewalks will be plowed only after primary sidewalks have been cleared, **unless snowfall has been continuous and two passes of primary sidewalks have been completed** ➢ One complete pass of all secondary sidewalks should be completed within 16 hours of starting ➢ In snow storms with accumulations of less than 5cm (2"), the specific course of action will be determined by the Supervisor
Roads – Salting	➢ Salting of primary roads shall commence when snow or ice starts to accumulate on the travelled portion of the roadway, causing slippery driving conditions ➢ Primary roads shall be salted to maintain a bare pavement condition, until such actions become ineffective due to temperature, severity of the storm or other conditions ➢ A complete pass of salting of primary roads should be completed within 4 hours of starting operations ➢ Salting of secondary roads shall commence only after all primary roads have been maintained and snow accumulations are less than 5cm (2") ➢ A complete pass of salting of secondary roads should be completed within 12 hours of starting salting operations ➢ Salting shall be used to maintain secondary roads in a limited bare pavement condition after plowing operations ➢ Rear lanes are maintained only after all other roads have been completed	➢ Salting of primary roads shall commence when snow or ice starts to accumulate on the travelled portion of the roadway, causing slippery driving conditions ➢ Primary roads shall be salted to maintain a bare pavement condition, until such actions become ineffective due to temperature, severity of the storm or other conditions ➢ A complete pass of salting of primary roads should be completed within 4 hours of starting operations ➢ Salting of secondary roads **and laneways** shall commence only after all primary roads have been maintained and snow accumulations are less than 5cm (2") ➢ A complete pass of salting of secondary roads **and laneways** should be completed within 12 hours of starting salting operations ➢ Salting shall be used to maintain secondary roads **and laneways** in a limited bare pavement condition after plowing operations

Area	"As Approved" Service Level	"As Delivered" Service Level
Roads - Plowing	➢ Road plowing operations commence on primary roads when snow accumulations reach 5cm (2") ➢ One complete pass of road plowing of primary roads should be completed within 4 hours of starting with final completion being 4 hours after the cessation of the snowfall (based on an average snowfall) ➢ Re-plowing of primary roads may be necessary if accumulations exceed 5cm (2") during the storm ➢ Road plowing of secondary roads commences when snow accumulations exceed 5cm (2") and after all primary roads have been completed ➢ One complete pass of plowing of secondary roads should be completed within 12 hours of starting operations on secondary roads, with final completion being 12 hours after the cessation of the snowfall ➢ Rear laneways are maintained primarily through the application of salt, if, after salting, accumulations reach 15cm (6") or severe rutting takes place, snow removal shall take place	➢ Road plowing operations commence on primary roads when snow accumulations reach 5cm (2") ➢ One complete pass of road plowing of primary roads should be completed within 4 hours of starting with final completion being 4 hours after the cessation of the snowfall (based on an average snowfall) ➢ Re-plowing of primary roads may be necessary if accumulations exceed 5cm (2") during the storm ➢ Road plowing of secondary roads **and laneways** commences when snow accumulations exceed 5cm (2") and after all primary roads have been completed ➢ One complete pass of plowing of secondary roads **and laneways** should be completed within 12 hours of starting operations on secondary roads **and laneways**, with final completion being 12 hours after the cessation of the snowfall
Windrow Clearing	➢ A ratio of one windrow clearing machine to each road plow will be maintained during plowing operations ➢ A driveway windrow is considered cleared when approximately 80% of the driveway width is cleared of snow	➢ A ratio of one windrow clearing machine to each road plow will be maintained during plowing operations ➢ A driveway windrow is considered cleared when approximately 80% of the driveway width is cleared of snow

Note:

Although there is no defined service level with respect to the removal (i.e., collection, haulage and dumping) of snow from roads, snow may be removed from some primary roads, secondary roads, laneways and cul-de-sacs when the situation warrants it (e.g., limited space for plows to push the snow), only after plowing operations have been completed.