

The Regional Municipality of Niagara Value for Money Audit of Snowplowing, Roads Maintenance, and Landscaping Services

Final Report

May 24, 2016 - 15-2387

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Executive Summary

Background

At the February 23, 2015 Audit Committee meeting, Report RRIT 01-2015 External Value for Money Audits was discussed and members selected three value-for-money audits to be completed. One of the three program/service areas identified for a value for money audit was snowplowing, roads maintenance, and landscaping services.

The Regional Municipality of Niagara retained Dillon Consulting Limited, in collaboration with Performance Concepts Consulting Limited, to undertake the program review of its snowplowing, roads maintenance, and landscaping services which are delivered by its Transportation Operations division. This audit was completed using the best available data as provided by the Region.

Overview of Transportation Operations

Niagara Region provides winter maintenance, landscaping and road maintenance services across 1,697 lane kilometers of roads through areas of geographic diversity (urban versus rural areas). The Transportation Operations division of Public Works is a multidisciplinary service area that manages and performs all road and roadside maintenance activities, including forestry and signs maintenance. The Transportation Operations division operates within a "hybrid" business model whereby a mix of in-house staff and contracted service providers are utilized to meet operational objectives. The average direct-staffing operating budget for roads over the past few years has been \$16.4 million dollars (annually). Additionally, approximately \$4.2 million is allocated to private contractors or to local area municipal cost sharing contracts.

Program Review Scope and Team

The scope of this program review included:

- Document/map the current Region's business model including the level of outsourced vs. internally managed activity – current work processes, performance measures, service levels and operational standards;
- Determine if the Region uses an appropriate mix of internal and contracted services for all services;
- Detail and validate all costs and their components such as service costs, long term capital costs and maintenance costs, etc.;
- Identify, through a comparative analysis, business model and process improvements that should be considered, indicating the relevant benefits and risks to the various business enhancements including competitive service delivery, in-sourcing, or total outsourcing of services/activities (risks to include, but not be limited to service/operational risks, financial risks and market risks); and,



- Consider input from private sector contractors in transportation operations and any relevant industry associations; and,
- Provide comment on any other relevant information obtained during the program review which would be of importance for Council to know, act upon in the future or investigate further.

The program review was undertaken independently by Dillon Consulting Limited and Performance Concepts Consulting using information provided by Regional Staff.

Focus Group Findings: A Culture of Continuous Improvement

Semi-structured interviews and semi-structured focus group discussions were conducted at the outset of the program review to provide an initial sense of core issues that would help focus the program review's analysis on areas for improvement. These positive aspects about the organization were noteworthy from the interviews and focus group sessions:

- staff had clear opinions about how things are working;
- there are high levels of collaboration and team work; and,
- there is a clear culture of "continuous improvement".

Industry Research: Better Performance Measurement Is Needed Industry-Wide

Industry-wide quantitative peer benchmarking of transportation operations suffers from shortcomings in the input data and a lack of standardized documentation. This is indicative of the industry-wide need to strengthen performance measurement and reporting. Municipalities are still in a transition period to fully implementing an asset management IT platform that would assist with this challenge. From the perspective of the Ontario Auditor General in the Report on Winter Highway Maintenance, there are on-going problems with verifying/monitoring contractor performance.

The Ontario Good Roads Association indicates that many municipalities have contracted out transportation operations services but the degree of contracting out varies so there is no apparent ideal mix of contracted-out and in-sourced services. Steed & Evans, the Region's snow removal contractor, notes that contractors will accept performance-based contracts but are wary of penalty charges. Although the trend is for municipalities to make the contractor fully liable when outsourcing transportation operations, the municipality should retain supervisory capacity and some in-house capacity to maintain its own assets.

Peer Benchmarking Findings: Niagara Faces Many of the Same Challenges as its Peers

Municipal peer jurisdictions were investigated to determine what others are doing to improve efficiency and effectiveness. Peer municipalities were selected because they face similar operational challenges. The following peer municipalities were investigated: Durham (Region); Halton (Region); Ottawa (single tier City); Peel (Region); and, Waterloo (Region).



Niagara, with its structure including a Commissioner, Directors, Managers, Supervisors and frontline staff, is on par with the peer municipalities of Durham, Halton, Peel, and Waterloo that have similar organizational structures. Niagara also delivers a similar range of transportation operations services as its peers that deliver winter control, surface maintenance, roadside maintenance, and signs and signals maintenance. There is no apparent need for restructuring based on this evidence.

	Durham	Halton	Ottawa*	Peel	Waterloo	Niagara	
Asset mgmt. IT platform	No	Yes	In progress	Yes	In progress	Yes	
MMS reporting	No	No	No	No	No	No	
Service-based budget	No	No	In progress	Yes	In progress	No	
Flexible staffing	No	n/a	No	No	No	Yes	
Contracting- out	Mostly in- sourced	100% to local municipalities	Mostly in- sourced	~80%	~35%	~20%	
Comparable unit costs	No	n/a	No	No	No	No	
*winter control only							

Table ES-1: Peer Benchmarking Summary

Niagara faces many of the same challenges as peer municipalities. As shown in the above table, Niagara is on par with peers in terms of adopting new technologies and moving toward stronger asset management. Niagara is also on par with many peers regarding MMS reporting – there is room for improvement across all jurisdictions. Niagara should move towards more direct communications with Council on Level of Service/budgeting and should move toward selecting and reporting on clear, relevant KPIs. With regards to contracting-out, each municipality has a unique model. The variation of service delivery models across all of the municipalities suggests that there are no models that are inherently superior. Similar to the peer municipalities, Niagara does not have sufficient information to accurately compare the cost of in-sourced versus out-sourced services, and would require further due diligence before changing its blend.

Recognizing that there is interest in alternative service delivery to potentially achieve costsavings, the following provides an overview of the risks and benefits based on the industry research and feedback from the peer municipalities:



Table ES-2: Risk and Benefits of Contracting Out

Risks Benefits Cost-saving measures implemented by Under a contract, the municipality can the contractor assist with its control year-over-year cost by indexing profitability and do not get passed on the services provided, which is to the municipality, as compared to currently the case in the Region's Cost cost-saving measures implemented by contract with Steed & Evans. the municipality that allow it to reduce its operational budget (or deliver more Competition among contractors is an services for the same amount) in incentive to demonstrate costfollowing years. effectiveness when bidding. As experienced by MTO, a contract A contractor has greater flexibility than may be awarded to contractor that a municipality to make adjustments to Resources does not have sufficient personnel and its workforce level. equipment to do the work. If Council decides it wants to change the level of service, this would be difficult to implement until the contract As experienced in Ottawa, a comes up for renewal. municipality may be more likely to Levels of Service / over-deliver on level of service, as **MMS Response Times** As experienced by MTO, when the compared to a contractor that aims to meet the level of service while contractor does not meet MMS matching effort to budget. response times then the penalties may be so great that the contractor walks away from the contract. As experienced by MTO, contractors There are no apparent benefits when Supervision cannot be expected to reliability report supervision is contracted out. on their own performance. From a liability perspective, the municipality should maintain its own records, resulting in some duplication if If the vehicles are properly equipped, the contractor is also providing reports. the contractor can generate detailed Reporting reports from the AVL systems, although It is unusual for a contractor to the same applies if municipal vehicles integrate with a municipality's asset are similarly equipped. management and work order platform, whereas this is better integrated when the services are delivered by staff. The municipality remains liable

The contractor shares some liability.

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regardless of how much work is

contracted out.

Liability



Areas of Analysis

The following areas of Transportation Operations have been analyzed and full details appear in the body of this report:

- winter season maintenance activities;
- non-winter season maintenance activities;
- workforce demographics; and,
- CityWorks maintenance management system and key performance indicators.

Summary of Recommendations

The following is a compilation of all the thirteen recommendations arising from this program review, organized into three themes.

A. Better Manage the Winter Control Budget and Consider Alternative Service Delivery after Due Diligence

Reduce the winter control budget to the level required for a typical winter instead of a severe winter.

Niagara should transition to a risk-based budgeting model (weather defined risk) by adopting a reduced-but-sustainable winter control budget. This reduced budget should be calibrated to provide event response core capacity for a normal-tomoderately severe winter season. In order to ensure the reduced risk-based budget does not negatively impact levels of service, bare pavement achievement performance data should be used to determine the appropriate sustainable level of budget reduction for the next year. Based on the difference between the 2014 direct-delivered core winter control budget and actual of approximately \$400,000, the audit team recommends that the Region reallocate this amount from the direct delivery budget to the reserve for the 2016/2017 winter. This is a prudent approach that manages the risk of being under-resourced until the Region has performance data demonstrating the ability to consistently meet bare pavement achievement levels below 6 hours as per Regulation 293/02. When the Region is certain it is meeting the MMS, then it can consider further budget adjustments.

Conduct a competitive service delivery exercise at the end of the current winter contract encompassing all established routes.

To determine whether in-sourcing or out-sourcing is the most cost-effective, Niagara needs to conduct a competitive service delivery exercise that includes all the routes delivered by Region staff and delivered by the outside contractor. The



competitive service delivery bids submitted by Region management/staff and/or potential contractors should provide total service delivery costs, pass-kilometre based unit costs, and guaranteed bare pavement achievement response times. Scheduling/deployment should not be prescribed, allowing Region and/or contractor bids to adopt a wide range of potential scheduling/deployment models featuring best practices. Bid requirements could set out expected winter season severity (i.e., an events profile) to inform costing and bare pavement achievement responses.

In support of the above principal recommendation, the following supporting recommendations are made to facilitate due diligence:

- i) Document the end time of winter events so it is possible to measure the time it takes to reclaim bare pavement.
- ii) Restructure budgeting accounting to separate core winter services from supporting services and allow accurate comparison of the costs of direct delivery versus contracted delivery for winter control.
- iii) Collect and use pass kilometre data to better monitor and report on winter control activities.

B. Strengthen Key Performance Indicators and Reporting

Implement winter control achievement reports for winter storm events.

Reports should be prepared for the following categories of event responses by the Region and its contracted service providers:

- system-wide winter event responses > 24 hours in duration;
- system-wide winter event responses < 24 hours in duration; and,
- significant localized winter event responses > 24 hours in duration.

Provide annual reports to Council on the level of service achievement for the winter season.

For this (2015-2016) and all subsequent winter seasons, Council should receive a report demonstrating actual levels of winter control "bare pavement achievement" (versus the 4-6 hour service level timeframes in Regulation 239/02). The report should provide a breakdown of level of service achievement in the event categories identified in this audit. Each subsequent winter season will require this report.



Niagara should use the portfolio of KPIs set out in this program review to create annual service delivery targets and report on actual results achieved.

To ensure the appropriate data is available to populate these KPIs, it will be necessary to track time spent on productive activities (i.e. directly generating work outputs) separately from non-productive time/activities (example: travel time).

Niagara should implement a performance dashboard that reports on KPIs to support operational improvement and a results-based culture.

The dashboard tool should integrate enterprise financial data; CityWorks activity based operational data, and CityWorks asset management information.

C. Ensure Labour is Aligned to Niagara's Needs

Prepare in advance for forecasted winter storm events by rescheduling staff shifts within the two week pay-period.

Niagara should transition to a more flexible "fixed cost" staffing/deployment model. This would build on the existing approach used during the "shoulder seasons" when staff levels are ramped up or down depending on the weather conditions and forecasts. The current version of the Region's fixed cost model features a pool of staff resources scheduled uniformly across each two-week pay period – essentially deploying its available event response capacity independently of winter event timing. This static/uniform approach to staff deployment can evolve, since the Region has advanced weather forecasting capabilities. Restructuring the static/uniform scheduling process into a more dynamic process will achieve improved "matching" of a reduced winter staff pool with forecast winter events during each two-week staffing cycle.

- Shifts can be changed 24-hours' notice (as appropriate) to meet forecast winter events, thereby concentrating staff's straight-time man hours around predictable/forecast periods of event response.
- Shifts without a forecast winter event response (during the same two-week period) may end up featuring below-normal scheduled staffing.
- A dynamic staffing model of cancelled/rescheduled shifts is permitted within the collective agreement, provided that the total number of hours are correct over a 2-week period and provided that 24-hours' notice is given for shift changes.



The restructured model will function more like a standard mandatory callout for forecast winter events. Traditional callouts with overtime are still available when needed to deal with unanticipated winter events.

Conduct an "activity-based" review of budget allocations based on the labour hours required to properly maintain infrastructure and complete reactive maintenance.

Niagara should conduct an activity-based review of its 2016 annual budget allocations for surface, roadside, signs/markings, and signals maintenance activity categories. The activity-based budget review should be based on a process that first considers the required number of planned maintenance man-hours for each activity category. These planned maintenance man-hour calculations will permit the Region to prepare a planned maintenance "coverage rate" – where a consistent / targeted percentage of assets are inspected / maintained each year in each activity category. Once calculated man-hour requirements are in place, staff pay rates can then be applied to arrive at the new budget allocations for each activity category. Finally, a reactive maintenance hours allowance should be added to the planned man-hours requirement for each activity category.

Shortfalls in actual labour hours of maintenance completed should be offset with an increase in the following year so the Region does not fall behind in maintenance.

Once an activity-based budget is in place for non-winter maintenance activity categories, any major shortfall between actual service hours versus budgeted hours should be corrected in the following budget year. The correction should ensure actual maintenance hours catch up with the budgeted maintenance hours for the two years in question. This budget catch-up provision will ensure planned maintenance workload remains a priority – resulting in the preservation of asset values over time.

The Region of Niagara should closely monitor its changing workforce demographics.

The Region needs to:

- Manage predictable future budget impacts;
- Implement appropriate cost controls provisions when/if needed; and,
- Improve service delivery capacity by maximizing the number of annual productive hours available per employee.



Closure

After this report is submitted to Council and direction is received by Management, it is imperative that an implementation plan be prepared to help Transportation Operations implement this program review's recommendations. This will provide Transportation Operations with the logical roadmap that it needs to achieve change management, continuous improvement, and demonstrate value-for-money.



1.0 Introduction

1.1 Program Review Background

On February 5, 2015, Regional Council approved the 2014-2018 Council Strategic Priorities, which included direction to have external Value-For-Money or Performance Audits completed and reported directly to the Audit Committee.

At the February 23, 2015 Audit Committee meeting, Report RRIT 01-2015 External Value for Money Audits was discussed and members selected three value-for-money audits to be completed. One of the three program/service areas identified for a value for money audit was snowplowing, roads maintenance, and landscaping services.

The Regional Municipality of Niagara retained Dillon Consulting Limited, in collaboration with Performance Concepts Consulting Limited, to undertake the program review of its snowplowing, roads maintenance, and landscaping services which are delivered by its Transportation Operations division.

1.2 Overview of Transportation Operations

Niagara Region provides winter maintenance, landscaping and road maintenance services across 1,697 lane kilometers of roads through areas of geographic diversity (urban versus rural areas). The Transportation Operations division of Public Works is a multidisciplinary service area that manages and performs all road and roadside maintenance activities, including forestry and signs maintenance. The activity based approach used in this division allows management to assign the appropriate in-house or contracted resources required to meet the road maintenance standards as set by the Region.

The Transportation Operations division operates within a "hybrid" business model whereby a mix of in-house staff and contracted service providers are utilized to meet operational objectives. The average direct-staffing operating budget for roads over the past few years has been \$16.4 million dollars (annually). Additionally, approximately \$4.2 million is allocated to private contractors or to local area municipal cost sharing contracts.

Transportation Operations' business model requires that it efficiently deploys available resources to meet its mandated performance objectives. The business model is defined by the use of "split-job" staffing. The division consolidates its summer workforce from seasonal service groups (e.g. signs, lane marking and forestry) to create a 24/7 core winter complement from November to April. The core winter complement provides direct supervision and winter maintenance services across 19 pass-routes. These pass-routes cover 939 lane kilometers of



roadway (717 rural lane kilometers and 211 urban lane kilometers. Coverage is delivered out of four separate depots (yards): the Pelham Patrol Yard, the Smithville Patrol Yard, the Thorold Patrol Yard, and the Welland Patrol Yard. The Region's winter area maintenance contractor maintains 10 routes, consisting of 637 lane kilometers (378 rural lane kilometers and 259 urban lane kilometers). Finally, the City of St. Catharines maintains 122 urban lane kilometers and 2 rural lane kilometers within its borders on behalf of the Region.

Summer maintenance activities include road surface maintenance, shoulder maintenance, drainage maintenance, mowing, tree trimming and removal and repairs to safety devices. Typically, Transportation Operations staff monitor road surface and other asset (e.g. bridges) conditions, conduct minor repairs and manage contractors brought on for larger scale activities. For larger scale projects, the division develops a scope of work, and puts out a request for quotation or tender, using a competitive process to award the work to third party contractors.

The Transportation Operations division is staffed as follows:

- 1 Director, 1 Associate Director, 3 Managers;
- 10 non-union supervisors;
- 4 clerks;
- 6 winter patroller / lead heads;
- forestry: 5 arborists year round, 2 seasonal;
- general Transportation Operations front line: 60 full-time unionized field staff;
- signals: 13 year round installers / technicians / electricians, including 2 lead hands; and,
- signs and markings: 6 year round, 15 seasonal including 1 extra seasonal lead hand.

1.3 Program Review Scope and Team

The scope of this program review included:

- Document/map the current Region's business model including the level of outsourced vs. internally managed activity current work processes, performance measures, service levels and operational standards;
- Determine if the Region uses an appropriate mix of internal and contracted services for all services;
- Detail and validate all costs and their components such as service costs, long term capital costs and maintenance costs, etc.;
- Identify, through a comparative analysis, business model and process improvements that should be considered, indicating the relevant benefits and risks to the various business enhancements including competitive service delivery, in-sourcing, or total



outsourcing of services/activities (risks to include, but not be limited to service/operational risks, financial risks and market risks); and,

- Consider input from private sector contractors in transportation operations and any relevant industry associations; and,
- Provide comment on any other relevant information obtained during the program review which would be of importance for Council to know, act upon in the future or investigate further.

The program review was undertaken independently by Dillon Consulting Limited and Performance Concepts Consulting using information provided by Regional Staff, as well as the consultant's own research and analysis.

1.4 **Program Review Objectives**

The objectives of this program review were:

- Benchmark peer municipalities to investigate what they are doing to optimize efficiency and effectiveness, and identify any "better practices" in terms of organizational design, service bundles, core delivery processes, business planning/measurement frameworks, IT tools, asset management, risk management, performance measurement, and/or budgeting suitable for Niagara to adopt;
- Assess the Region's current transportation operations costs and program delivery functions through an engagement strategy (interviews, group working sessions, etc.) and a performance profile of service levels, actual results, unit cost trends, and available effectiveness data;
- Review the Region's other linked programs to identify potential cross-department linkages meriting investigation and develop a potential restructuring critical path if any organizational scenarios seem viable for implementation; and,
- Consider and identify alternative service delivery approaches, including differing blends of direct versus purchased services.

Methodology

1.5

A key component of a value-for-money audit through a program review is to maintain objectivity that provides a reliable, evidence-based analysis. This Program Review has been structured with an overriding commitment to an impartial third party evidence-based assessment applying four main analytical approaches:

- metric and data-based historic and current performance assessment (i.e., using quantifiable / measurable information);
- risk-based assessment of go-forward cost savings and process improvements;
- SWOT (strengths, weaknesses, opportunities and threats) analysis leading to identification of improvement opportunities; and,



• a blend of quantitative and qualitative assessment tools.

This audit was completed using the best available data. Previous reports were also referenced particularly for the winter and non-winter analysis. Two key reports were the "Transportation Services Operations Delivery Review" (2014) and the "Niagara Patrol Yards Study Retrofit Smithville & Pelham Patrol Yards" (2013).

Approximately 65% of the Region's operational budget is for winter control, so the audit team expected a high likelihood of finding cost-saving opportunities in winter control.

1.6 How this Report is Organized

The report is organized by the major areas of analysis that were conducted for this program review, as follows:

- Section 2.0: Focus Groups What We Heard provides an overview of the findings from individual and group interviews conducted at the outset of the program review;
- Section 3.0: Peer Benchmarking and "Better Practices" Analysis provides an overview of the findings from studying peer municipalities, industry expertise/research, and OMBI data;
- Section 4.0: Winter Analysis and Findings provides the analysis of the winter season maintenance activities;
- Section 5.0 Non-Winter Analysis and Findings provides the analysis of the non-winter season maintenance activities;
- Section 6.0 Workforce Demographics Analysis and Findings contains the analysis of the division's staffing;
- Section 7.0: Key Performance Indicators and CityWorks contains the analysis of the maintenance management system tools; and,
- Section 8.0: Closure provides closure to the review.

In addition, **Appendix A: Results from Focus Group Sessions** provides details of the interviews noted in Section 2.0 and **Appendix B: Summary of Strengths, Weaknesses, Opportunities, and Threats** provide a matrix overview of the study findings and their linkages to the recommendations.

1.7 Acknowledgements

The consulting team would like to acknowledge the contributions and cooperation of Transportation Operations staff, Human Resources staff, and Organizational Performance staff for this program review.



2.0 What We Heard

2.1 Focus Groups with the Region of Niagara

Semi-structured interviews and semi-structured focus group discussions were conducted at the outset of the program review to provide an initial sense of core issues that would help focus the program review's analysis on areas for improvement. These interviews occurred in September 2015 and were conducted with:

- the Director of Transportation Services, the Associate Director of Transportation Operations, and the Associate Director of Systems and Planning;
- Managers in sections of Transportation Operations (e.g., roads/bridges, technology, signals/signs, pavement marking);
- Project managers responsible for deployment of CityWorks;
- maintenance yard supervisors; and,
- lead hands /winter patrollers.

Generally the tone of the interviews demonstrated the characteristics of a culture supportive of continuous improvement and/or internal communication. The tone of the interviews was:

- authentic (i.e., staff spoke freely and openly);
- respectful; and,
- largely positive.

These positive aspects about the organization were noteworthy from the interviews and focus group sessions:

- staff had clear opinions about how things are working;
- there are high levels of collaboration and team work; and,
- there is a clear culture of "continuous improvement".

It should be noted that observations emanating from the interviews and focus groups do not lead to any specific recommendations since these sessions were intended to assist the program review team in focusing their analysis efforts. The results from the interviews and focus group sessions are provided in **Appendix A**.

2.2 Interview with Steed & Evans (Snow Removal Contractor)

A semi-structured interview was conducted with the Niagara area manager for Steed & Evans. Steed & Evans holds a 10-year winter control contract for several of the Region's snow removal routes. The contract term is from 2008-2018. Overall, the contractor believes that the Region has a suitable blend of direct and contracted service delivery and emphasizes that they have a good relationship with the Region. Steed & Evans noted that it would have capacity to take on



more work as long as they had sufficient time to prepare¹. The following bullets summarize the key insights from the interview:

- Winter Maintenance Activities:
 - The contractor's vehicles are all equipped with AVL and satellite equipment to track the vehicle's movements:
 - The AVL data is paid for by the Region and both the Region and the contractor have access to the data;
 - Currently the AVL and the material spreader communicate and it is possible that in the next generation of equipment the standard will be for the AVL to communicate with the plow as well (this is available now but not standard);
 - Reporting is done through winter patrol diaries which are provided to the Region:
 - Patrol deployment is through two 10-hour shifts and increases dependent on the weather;
 - It is difficult to determine when "bare pavement" is achieved since this can depend on temperature and/or traffic volume to activate the salt;
 - A clear protocol would be needed to mark the storm event end times and the definition of "bare-pavement" achievement;
 - The contractor completes its own internal "daily costing" tracking/reporting to monitor spending for its own purpose;
 - The contractor pays an hourly rate rather than an on-call rate for their senior drivers as a way to keep good staff;
 - In this respect, the contractor believes that the municipality has an advantage since it could assign drivers to other tasks whereas for the contractor this is idle time;
 - It is appreciated that there is a relationship with the Region of Niagara and the sense that they can work together to solve problems;
 - Capacity and the existing contract:
 - The contractor could increase capacity to complete more work but would need to be an adequate time-frame to implement an increase;
 - The existing contract is for 10 years and a shorter contract would have the impact of heavily favouring the existing contractor since a 5-year



¹ It is presumed that six months' notice would be needed since this timeframe was noted in Section 1.9 of the 2008 Request for Proposals: "No later than six (6) months prior to the end of the first five (5) years of the contract term, the Region and the Proponent will then have an opportunity to decide whether or not to continue the contract under the same terms and conditions as the original contract for the remaining five (5) years based on the Region's assessment of the Proponent's performance",

minimum is required to make it feasible to purchase or lease equipment; and,

- The overall impression by the contractor is that the Region is doing a good job of balancing a blend of direct and contracted service delivery.
- Non -Winter Maintenance Activities:
 - Re-iterated that it is important for a municipality to have some capacity to take care of its assets rather than contracting 100% of service delivery.



3.0 Industry Research and Peer Benchmarking Analysis

This section of the report provides observations and findings regarding the industry and peer municipalities, and helps inform the discussion in Sections 4 through 7 of the report where the ultimate recommendations are made.

3.1 Industry Research

The following subsections summarize the audit team's research of the industry. This research was conducted to determine the current state of transportation operations service delivery and to gather any industry knowledge (e.g., trends) that might be relevant for improving Niagara's service delivery.

3.1.1 OMBI Reporting

The audit team reviewed the 2014 Road reporting from the Ontario Centre for Municipal Best Practices for the same municipalities for winter and non-winter activities. As well, the audit team reviewed twelve winter control "best practice" cases prepared by the Ontario Centre for Municipal Best Practices across 2000-2006.

The 2014 OMBI data for winter control appears below.



Source: ROAD309T (Efficiency)

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OMBI does not publicly report winter event frequency/severity along with its cost per lane kilometre data. Therefore it is difficult to make value-for-money inferences about relative unit costs across the peers. The audit team holds the professional opinion that comparisons of Niagara's system performance against itself over time will provide greater insights than potentially misleading OMBI comparisons that lack weather based context and do not address differences in bare pavement achievement times.

OMBI reports regional municipalities' spending on non-winter road maintenance (see below). It is clear that there is an inherent problem with the OMBI data because Durham, Halton, and Waterloo's spending totals are 100% higher than Niagara's reported data; this is more likely a result of what data is provided by the municipalities and less likely to be a true benchmark of cost-effectiveness. OMBI has long suffered from inconsistent definitions of operating versus capital cost definitions used by participants, as well as wide variations in the approach to amortized asset values/replacement value calculations for road networks of different ages.



Source: ROAD3077 (Efficiency)

OMBI also reports on pavement quality ratings. Participants use widely varying approaches to measuring pavement quality – all that is standardized are the "Good to Very Good" rating categories. Niagara pavement quality data matches the sample median. No maintenance program performance inferences are possible using this non-comparable data.



PW 24-2020 Appendix 5 3.0 Industry Research and Peer Benchmarking Analysis 10



Source: ADAD405M (Customer Service)

It is noted that the Transportation Services Operations Delivery Review conducted by AMEC in 2014 used OMBI results to compare Niagara to peer municipalities. While it drew some conclusions, these were qualified by statements such as "for a better comparison, the annual snowfall... should be taken into account". This underscores the gap that currently exists in the industry: there is no truly comparable benchmarking (i.e., reporting on a standardized set of key performance indicators) available to fairly assess the transportation operations services of municipalities.

3.1.2 Ontario Auditor General Report on Winter Highway Maintenance

A recent winter control audit of the Ontario highway system executed by the Provincial Auditor found that the MTO was not accurately reporting bare pavement achievement times.

Figure 12: Fines Assessed, Winter 2013/14

Source of data: Ministry of Transportation

Reason	Amount (\$)	# of Instances ¹
Inaccurate reporting of winter operations and activities	360,500	283
Untimely deployment	1,558,050	115
Circuit times not met	7,173,000	300
Continuous plowing service not maintained	250,500	67
Multi-lane highways not plowed using a staggered approach	343,500	41
Incorrect salt and sand application rates	358,000	68
Equipment breakdowns & equipment not fully utilized	1,739,875	156
Bare Pavement not achieved within the maximum time allowed	525,000	13
Frost and slippery conditions not addressed	196,000	11
Other winter maintenance outcome target categories ²	843,875	65
Total	13,348,300	1,119

1. Total number of instances where contractors were notified that either one or multiple outcome targets were not met.

2. Includes untimely clearing of shoulders, passing lanes, commuter parking lots and truck inspection stations.



The above table from the Auditor's 2015 report documents the incidence of inaccurate reporting in one winter season – 283 incidents of detected reporting inaccuracies and a total of 1,119 compliance failures with contractors.

The following quote from the Provincial Auditor's report is instructive on the need for accurate/dependable reporting of bare pavement achievement times by service providers.

"We were also concerned about the accuracy of the information the Ministry receives from contractors on their performance against the bare-pavement target. In the winter 2013/14, Coordinator audits identified over 200 instances of contractors submitting inaccurate information to the Ministry. In our audit, we noted instances where some contractors either failed to input bare-pavement data for an entire winter season or reported inaccurate information to the Ministry. We also noted instances where the Ministry, after identifying bare pavement data errors, did not correct the information in the system used for public reporting."

The findings of the Provincial Auditor's report demonstrate that problems with level of service reporting and problems with verifying/monitoring contractor performance are widespread and impact various jurisdictions. It also inherently suggests that a risk of outsourcing transportation operations services is verifying/monitoring contractor performance.

3.1.3 Trends Reported by the Ontario Good Roads Association

The Ontario Good Roads Association (OGRA) was asked to comment on emerging industry best practices, challenges and trends in service delivery. The following summarizes the information gathered through a semi-structured interview with the Manager of Policy and Research at OGRA.

- Winter and Non-Winter Maintenance Activities:
 - Good recordkeeping is the foundation of the MMS:
 - OGRA has been encouraging members to standardize reporting, including by using weather station data and combining it with maintenance schedules;
 - OGRA has launched a winter maintenance "app" which allows municipalities to prepare an annual winter maintenance plan using a standardized template;
 - Technologies for winter control vehicles (such as AVL) have been getting more sophisticated and OGRA has been looking for ways to bring down the costs of some technologies so they are accessible for all municipalities;



- Case law is as much a driver of winter maintenance as are changing regulations: there is a recent case in Ontario where farmers were awarded a claim based on decreased land values caused by over-salting the road;
- Active transportation (e.g., public transit, cycling) is becoming more important and new maintenance obligations are emerging;
- OGRA is lobbying the province to change MMS to "Maintenance Standard" since the word "Minimum" leaves the impression that more should be done;
- Service delivery models:
 - OGRA does not take a position on what is the most appropriate service delivery model or blend of models between direct and contracted models;
 - OGRA believes that every municipality is a unique context and all models have benefits and drawbacks;
 - OGRA notes that many municipalities have contracted out services hoping it would be more efficient or cost effective but the results have not been clear;
- Climate change:
 - Assumption that warmer weather will lead to cheaper winter maintenance/road maintenance may not be correct:
 - For example, salt may need to be applied each time a temperature threshold is crossed; and,
 - Concern that some capital investments (equipment and infrastructure) may become obsolete as conditions change.

Asset Management:

- OGRA lobbied the province to make Asset Management a requirement for getting provincial funding. This has led to more strategic planning for new assets and a greater confidence in the condition of existing assets;
- Most municipalities are moving towards using asset management software to track maintenance activities against specific assets;
- Municipalities fall on a wide spectrum in terms of how much progress they have made toward asset management;
- It is common for regular maintenance budgets to be deferred in favour of reactive maintenance or new capital investments:
 - More holistic asset management helps with keeping maintenance as a priority; and,
 - Municipalities are sometimes finding that assets do not age exactly as expected; sometimes infrastructure will look older or newer than expected. When an asset is lasting well, it can be reasonable to defer maintenance.



3.1.4 Trends Reported by Steed & Evans

The Region's snow removal contractor Steed & Evans provided the following information about the industry based on the contractor's experience:

- Winter Maintenance Activities:
 - Overall, contracts work better when they are not adversarial;
 - MTO previously issued contracts with specific requirements around equipment and man power (i.e., number of vehicles) whereas the current contracts are based on performance standards and penalizing underperformance – these contracts have not been working well since contractors may not be appropriately resourced to complete the work and the penalties are so punitive that the contractor sometimes walks away rather than paying;
 - Despite the efforts to download liability to a contractor, a municipality needs to have some capacity to maintain (or supervise the maintenance of) its assets;
- Non-Winter Maintenance Activities:
 - Many MTO contracts are for year-round road maintenance this is a way to balance resources between winter and non-winter operations; and,
 - Re-iterated that it is important for a municipality to have some capacity to take care of its assets rather than contracting 100% of service delivery.

3.1.5 Observations from the Industry Research

The following paragraphs describe the findings of the industry research. As noted earlier, this subsection of the report provides findings that help inform the discussion in Sections 4 through 7 of the report where the ultimate recommendations are made.

- OMBI Winter and Non-Winter: Industry-wide quantitative peer benchmarking of winter control achievements and costs is not technically viable at this point in time due to the shortcomings in OMBI public reporting (i.e., no winter event frequency/severity) and the absence of bare pavement achievement timeframes across peer regions. Meaningful non-winter industry-wide peer benchmarking is also not technically viable at this point in time due to the shortcomings in OMBI public reporting (e.g., lack of standardized life cycle asset costing across participants) and the absence of consistent pavement quality measurement tools across peer regions. There are no performance inferences emerging from the OMBI data which is indicative of the industry-wide need to strengthen performance measurement and reporting.
- **Province of Ontario Auditor General:** There are on-going problems with verifying/monitoring contractor performance which is inherently a risk of outsourcing transportation operations services.
- **ORGA:** Good standardized documentation is a challenge industry-wide although the collective move towards asset management IT platforms is expected to help in the near future. Many municipalities have contracted out transportation operations



services but the degree of contracting out varies so there is no apparent ideal mix of contracted-out and in-sourced services.

• Steed & Evans: Contractors will accept performance-based contracts but are wary of penalty charges. Although the trend is for municipalities to make the contractor fully liable when outsourcing transportation operations, the municipality should retain supervisory capacity and some in-house capacity to maintain its own assets.

3.2 Peer Municipalities

The following matrix (**Table PM-1**) summarizes existing knowledge, research, data gathering, and interviews with peer municipalities. It should be noted that the matrix was developed using available data and in some cases complete information was not available or information was out of date. Municipalities with incomplete data were still retained as comparators because the available information provided insight on other topics. For example, the City of Ottawa was included because it completed an audit of winter maintenance in 2015, however other information on Ottawa is not known.

Peer municipalities were selected because they face similar operational challenges to the Region of Niagara and/or they have recently completed audits of winter or non-winter transportation operations.

The following peer municipalities were investigated:

- Durham (Region);
- Halton (Region);
- Ottawa (single tier City);
- Peel (Region); and,
- Waterloo (Region).



Table PM-1: Peer Municipality Comparisons

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Organizational Structure	 DEPARTMENTS – Works – Roads and Transportation – Transportation Operations and Maintenance STAFFING MODEL Commissioner, Works Director, Transportation & Field Services Manager, Transportation Infrastructure Supervisors of Maintenance Operations Maintenance Operators DEPLOYMENT Five regional depots and a traffic operations centre 	 DEPARTMENTS – Public Works Transportation – Transportation Operations and Maintenance Contract management for winter and non-winter control, pavement markings, signals, signs STAFFING MODEL Commissioner, Public Works Manager, Transportation Supervisor (1 only), Transportation Operations and Maintenance (non-union) DEPLOYMENT No works yards Non-winter control patrollers deploy from main Regional building – looking to contract this out Winter control is patrolled by Local municipalities (since winter control is contracted out to the Local municipalities) 	 DEPARTMENTS – Operations Portfolio - Public Works Department – Roads Services Branch. STAFFING MODEL Deputy City Manager (Operations) General Manager Public Works Manager, Roads Service Branch Approximately 590 employees are engaged in winter operations. DEPLOYMENT 17 yards across five zones 	 DEPARTMENTS – Public Works Transportation – Transportation Operations and Maintenance STAFFING MODEL Commissioner, Public Works Director, Transportation Planning Manager, Transportation Operations and Maintenance Supervisors, patrollers and frontline staff DEPLOYMENT Two work yards, one in the north and one in the south. Bulk of deployment from two yards in the south (urban areas), the northern area roads are generally rural. 	 DEPARTMENTS – Transportation and Environmental Services Department – Transportation Division – Transportation Operations STAFFING MODEL Commissioner, Transportation and Environmental Services Director, Transportation Manager, Transportation Manager, Transportation Manager, Transportation Operations 7 non-union supervisors, 6 technologists and administrative support, 60 full time unionized frontline staff, Additional seasonal (winter) staff, 2 supervisors and 13 frontline staff DEPLOYMENT Several work yards. 	Niagara, with its structure including a Commissioner, Directors, Managers, Supervisors and frontline staff is on par with the peer municipalities of Durham, Halton, Peel, and Waterloo in terms of Organizational Structure.

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Winter Maintenance Activities Service Delivery Model Direct delivery augmented by contracted resources- no pre-determined routes assigned to contractors. Contractors deployed flexibly as required. All services are contracted resources- text assigned to contractors. Contractors deployed flexibly as required. All services are contracted wear agreement cycle. Municipalities on a three wear agreement cycle. Most of winter operations are delivered direcity, one roce winter services. Direct delivery focused on proactive/first response. Non-core (road patrol, the limits of the direct delivery by the Region patrollers and storm response. Non-core froad patrol, the limits of direct delivery/outsourcing should be changed. Non-core (road patrol, the limits, of the storm response. No second shu direct delivery deploy and an evening/night events. No second shu direct delivery deploy and an evening/night events. No second shu dotted the delivery/outsourcing No second shu direct delivery deploy and an evening/night events. No second shu direct delivery No second shu direct delivery No second shu deliver ad the seco	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region
area is contracted dating from before the City was amalgamated. • City is currently assessing whether the composition of direct delivery/outsourcing should be changed. • Direct delivery focused on proactive/first response. • Don-core (road patrol, supervisor, activities are direct delivery by the Region patrollers and storm response. • No second shi direct delivery deploy and ar funded for an evening/night events.	Durham (Region) Winter Maintenance Activities Service Delivery Model Direct delivery augment by contracted resource no pre-determined rou assigned to contractor Contractors deployed flexibly as required. 	 Halton (Region) All services are contracted out to the Local Municipalities on a three year agreement cycle. 	 Ottawa (Single Tier City)* Municipality owns 73% of the fleet of plows/salters/combination units (236 municipally owned, 88 contracted). Most of winter operations are delivered directly, one 	 Peel (Region) Hybrid model of direct delivery and contracted services. Approximate split is 20% direct delivery, 80% contracted services for core winter services. 	 Region directly most roads ou limits of the tr (Cambridge, K Waterloo). Several roads tri-cities (form
			 area is contracted dating from before the City was amalgamated. City is currently assessing whether the composition of direct delivery/outsourcing should be changed. 	 Direct delivery focused on proactive/first response. Non-core (road patrol, supervision) activities are direct delivery by the Region. Region patrollers and supervisors call in contractors and manage storm response. 	 maintained by through AMC s contract. Cities are cont maintain the r the limits of th cities with the continuing to p some activities No second shift direct delivery deploy and are funded for any evening/night events.

How does Niagara Compare?

gion directly maintains st roads outside of the its of the tri-cities mbridge, Kitchener, terloo).

eral roads outside the cities (former MTO) are intained by contractors ough AMC style ntract.

es are contracted to intain the roads within limits of the three es with the Region itinuing to provide ne activities.

second shift for Region ect delivery – crews oloy and are overtime ded for any ening/night winter ents.

There are a range of service delivery models that combine direct delivery and contracted services in different ways and different proportions.

Halton and Peel contract a higher proportion of work (to lower tier municipalities in Halton and to private contractors in Peel). Like Durham, Ottawa, and Waterloo, Niagara directly delivers a higher portion of the services. Some municipalities, like Durham and Peel integrate the contracts into the Regional Operations and supervise and deploy them directly. Other municipalities like Ottawa and Niagara use an AMC style contract where contractors are responsible for specific geographies and are directly responsible for supervision and deployment.

Each of the service delivery models is unique in some respect. The variation of service delivery models across all of the municipalities suggests that there are no models that are inherently superior.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Level of Service	 Level of service per the MMS. No current ability to demonstrate/measure direct delivery/contractor achievement of winter MMS service levels for bare pavement achievement. 	 Level of service per the MMS. No current ability to demonstrate/measure local municipal achievement of winter MMS service levels for bare pavement achievement. 	 Level of service was higher than MMS by between 1 and 6 hours depending on the road classification. LOS was adopted by Council in 2003 and had not been reviewed since. 2015 audit found that the levels of service were often being exceeded and this year they have been monitoring crews more closely to ensure they do not exceed the standards. 2015 audit found that there is no documented assurance that the level of service is being met. The audit further recommended reducing level of service to provincial standards to reduce costs. 	 Level of service exceeds MMS. Level of service report is approved by council every 4 years (each term of council). Council gives Public Works the direct mandate to deliver the higher than required LOS. Reporting on success of delivering on Level of Service not known. 	 Level of service per the MMS. No current ability to demonstrate/measure tri- city or contractor or direct staff achievement of winter MMS service levels for bare pavement achievement. Risk based deployment plans differ across each city, so service level achievement is uneven as is value-for-money. Different cost profiles among tri-city providers for the same season and different overtime frequency. Financial exposure significant in a severe winter. Legal liability clearly transferred to each tri-city provider. 	Niagara's level of service is the MMS but it cannot demonstrate that it is meeting the MMS. That places Niagara on par with the peers for ability to report on achievement of MMS (there is room for improvement among all the peers). Niagara should work towards more direct communication with Council in setting Levels of Service (such as in Ottawa or Peel).



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)
Budgeting	 No sophisticated system of budgeting/tracking winter events, unit costs or bare pavement achievement using AVL data. No existing activity based budgeting linking service levels to deployed resources. 	 No system coverage price set within local municipality contracts. Region is invoiced by amount of work / activity (open-ended). Contracts allow Halton to utilize different levels of staffing from municipalities at different times (more flexibility). 2009 audit called for better monitoring of budget to actual costs. 	 2013 Winter Operations budget was \$55.3 million and actual expenditures were \$79.2 million. Monthly reporting on budget variances includes comparisons of budget to actual by detailed cost category. 2015 audit recommended linking this reporting to weather information and staff allocations of time. Reconciliation of winter materials is only performed once per year. 	 Core Budget based on "Winter Storm Equivalent" units: the cost for 8 hours of full deployment of resources - includes, overhead, labour, equipment, contractors, and materials for anti- icing, de-icing, plowing and snow removal. Budget based on a ten- year trend line of actual spending/winter events; current budget is for 29 "Winter Storm Equivalents". Costs that are more static such as patrols and installing snow fences are budgeted separately. This system allows Region to isolate budget shortfalls/surpluses that are caused by seasonal weather variation. Maintains a snow reserve at a level that would cover overspending caused by extreme weather for two back to back extreme years. In lighter years surpluses are reallocated to the reserve fund so it is kept at the ideal level. 	 Tri-city budgets do not separate region road funding from local road funding. It is unclear what data supports tri-city cost recovery claims so there is a current wide variation in unit costs.
Cost comparison	• Not available.	 Not available. With better reporting would be possible to compare costs directly across the different municipalities. 	 Not available. The City is currently completing a review to compare the cost of direct delivery with outsourcing. 	 Information not available. Acknowledge that it might be possible to reduce costs by reducing LOS but that it is difficult to quantify. 	 Information not available.

How does Niagara Compare?

Niagara should work toward linking Winter Budgeting to climatic conditions. Only Peel takes this best practice approach, whereas Niagara is on par with the other peer municipalities that also budget year-to-year.

No municipality is able to accurately compare the cost of direct delivery and contracted winter services.

Information insufficient to assess how Niagara compares to peer municipalities in this respect.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier Citv)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Risk Management	 Sufficient direct resources are available to cover all routes. Contractors are used to augment resources when storms are long or heavy precipitation. Contractors are deployed directly by Region's supervisors. Region patrols all routes. Winter reserve is in place for heavy winter seasons. 	 No ceiling limit as to amount billed. Unclear how Local Municipalities determine Region's portion of an activity. 	 2015 audit found that current resourcing levels create "idle capacity" and recommending reducing resources. 2015 audit also recommended developing procedures and policies to specify/prioritize work activities when there is no snow clearing occurring. 	 Contracts for core winter services allow flexibility based on weather variations while retaining control of level of service and storm management. Draws connection between risk and levels of service – 2010 audit was prompted by an Ontario Supreme Court Case where a municipality was held liable because it could not demonstrate that it had met the MMS. Possible that providing a higher level of service improves safety and convenient movement of goods and services and therefore reduces liability. 	 Region staffs to a minimum level meaning that in cases of illness or vacation, some equipment and crews cannot be deployed. Reactive and planned maintenance are often in conflict. 	Niagara maintains flexible staffing during the shoulder seasons to minimize idle time. Niagara is ahead of peer municipalities in terms of flexibility of deploying its in- house resources while attempting to minimize "idle time" (though there is still room for improvement by better managing how staffed are scheduled during winter).
Non-Winter Mainte	 Blend of direct and contracted work. Most surface maintenance is completed by contractors. 	 All services are contracted out to the Local Municipalities on a three year agreement cycle. Some private contracts tendered together with Local Municipalities, such as pavement markings and crack sealing. 	Information not available.	 Direct delivery of most maintenance services. Maintains roads for some other jurisdictions including MTO. Transportations Operations is not involved in construction or major rehabilitations or resurfacing. Pavement markings and signals maintenance are contracted out. Signals maintenance is delivered by local municipalities in two of three local municipalities. 	• Direct delivery of most maintenance services outside of the three city limits.	 Niagara delivers service through a blend of direct and contracted work, so it has a similar service delivery model to the peer municipalities of Durham, Peel, and Waterloo. Halton contracts all maintenance work, and information about Ottawa is not available. The variation of service delivery models across all the municipalities suggests that there are no models that are inherently superior.
Level of Service	• See winter.	• See winter.	Information not available.	• See winter.	• Level of service per the MMS.	See winter.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Budgeting	 No existing activity based budgeting linking service levels to deployed resources. 	• See winter.	• Information not available.	Information not available.	 2014 audit recommended transitioning to an activity based budget. Activity based budgeting would require enhanced time tracking and asset management regimes. 	Like Niagara, some peers are moving toward activity based budgeting and stronger asset management regimes. Information insufficient to assess how Niagara compares to peer municipalities in this respect.
Cost Comparisons	• Information not available.	• See winter.	• Information not available.	• Information not available.	• Information not available.	No municipality is able to accurately compare the cost of direct delivery and contracted services. Information insufficient to assess how Niagara compares to peer municipalities in this respect.
Risk Management	Information not available.	• See winter.	Information not available.	 2010 audit recommended changes to reduce risk around signals liability. Recommended that records of maintenance to signals were retained by the municipality independently of the contractor and that the Region hire an electrician to review the work of the contractor. 	• See winter.	Information insufficient to assess how Niagara compares to peer municipalities in this respect.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Workforce Demogra	aphics					
Workforce Demographics (This is included since it can provide an early warning regarding potential productivity improvement or erosion associated with workforce trends and resultant changes in available work hours.)	Information not available.	 Not applicable since Region does not deliver services directly. 	 Information not available. Succession planning is part of the annual planning activities completed by the City of Ottawa. Potential successors are identified for all positions that are considered "critical" and succession planning including career development and training is provided to help employees prepare for more senior positions. 	Information not available.	 Aging workforce presents a need for succession planning and is a significant risk/opportunity for the Region. 	Ottawa's approach to succession planning is more pro-active than Niagara's; however, information is insufficient to assess how Niagara compares to peer municipalities in this respect.
Time Tracking	Not clear that labour hours are linked to activities.	 1 staff for contract monitoring. Time tracking by activity not applicable as all activities are contracted. 	 Time is tracked by activity and can be linked to service requests. Audit found that 25% of winter time is allocated to "Yard", "Litter", "On-call" and "other" even in a relatively heavy winter. Activity sheets and service requests seem to be completed on paper and provided to yard clerks. 	Information not available.	 Time for productive, travel time, non-productive time, is mixed together for maintenance activities. Different individuals track productive/non-productive time differently. Manual paperwork and data entry are a burden on frontline and supervisory staff. 	Although Niagara tracks time by activity, the time for productive, travel, and non- productive time is recorded as one, putting it on par with peer municipalities that all need to refine their activity based time tracking. This would improve Niagara's ability for budget analysis.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Asset Management	 Maintenance activities are not directly linked to specific assets. 	 Proprietary asset management system tracks Region's signals (maintained by others), signs, pavement management System triggers work orders which are fed to Local Municipalities, can be directly from 311 Work orders issued and entered at dispatch Looking to transition to Hansen Work order generation and entry will be done in- field 	Information not available.	 Hansen platform links service requests to asset management. Information entered in the field using tablet computers. Updates to record keeping for winter patrol (to minimize duplication in forms) were recommended in 2010 Audit. 	 Asset management software has been acquired and is being implemented over time. Existing asset/information management is not sufficient to support staff in performing maintenance activities. Currently, reactive and proactive maintenance is not tracked against individual assets. Asset inventories are inconsistent and not kept current. 	Niagara's use of the CityWorks platform is on par with Halton and Peel that also use an IT system for asset management and properly tracking maintenance to assets.

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	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Level of Service/Performance Targets, Tracking, and Reporting	 No established KPIs reported. No established measurement regime for bare pavement achievement timeframes following the end of a winter storm event. 	 Level of service is set, but does not prescribe methodology or performance targets GPS and "Road Patrol Manager" software implemented in 2012 to improve documentation. 	 Levels of service were established and approved by Council in 2003; Reporting through OMBI but not directly to Council "Service Excellence Scorecard" is used to report performance indicators. This scorecard is not ideal, it tracks time as "productive" or "sick/vacation" rather than based on activity, and it does not report on clean- up time after a storm, and it does not report time to complete a service request. Vehicles are equipped with GPS "where's my plow app" available to citizens and supervisors, but there has been no follow up analysis to determine if the intended benefits of investing in the technology has been realized. Concern that the "real costs" of depreciation and overhead are not known. Reports on time allocations for employees are available and can be customized by time period, person, or activity code. 	 2010 audit recommended "random monitoring" and "spot checks" of work performed by contractors to ensure contracted work is being adequately performed. 	 Plows and vehicles are equipped with GPS/AVL. In field supervision is limited and widely viewed as insufficient by staff. Performance standards for services are not known or worked towards and certainly not measured consistently. Performance measurement is not possible with existing data tools; they do not allow for review, analysis or reporting on KPIs. Performance measurements are not shared or compared across the Yards or Supervisors. 	 How does Magara Compare? Ottawa has the clearest performance measures (although not KPIs) and regularly reports on them. Niagara needs KPIs and should move towards this with regular reporting.



	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterlo
Monitoring Service Providers	• Information not available.	 Contract agreements with Local Municipalities include provisions for performance targets and reporting but it is not clear if the reporting has been implemented. Municipalities want Region to provide reporting staff. Salt management reporting. Only other form of reporting is invoicing of time and system km. 2009 audit suggested updating agreements with municipalities to include consequences for non- adherence. 	 Supervisors review snow clearing activity on an ad- hoc basis, if a standard or contractual requirement is not met deficiency reports are provided to the procurement group. Concern that salt deliveries were being accepted containing up to 15% less salt than documented. Recommended random weight checks of salt trucks. 	 In winter, contractors are directly supervised by Peel. 	 Perfu and/ not p cont mun citie Perfu not p priva Ther finar pena non- neith mun cont

oo (Region)

ormance reporting /or measurement is provided through the tracts with the local nicipalities in the three ts.

formance reporting is required from the ate contractors. re are no enforceable ncial incentives or alties associated with -performance for ther the local nicipalities nor the tractors.

How does Niagara Compare?

Monitoring service providers is a common challenge among peer municipalities, including Niagara since its patrollers can verify that work has been completed but cannot always verify that the contractor has met MMS response times.


3.2.1 Observations from the Peer Benchmarking and "Better Practices" Analysis

The following is a summary of the key observations from the preceding peer benchmarking matrix. This summary helps inform the discussion in Sections 4 through 7 of the report where the ultimate recommendations are made.

3.2.1.1 Organization Design

Niagara, with its structure including a Commissioner, Directors, Managers, Supervisors and frontline staff, is on par with the peer municipalities of Durham, Halton, Peel, and Waterloo that have similar organizational structures. Niagara also delivers a similar range of transportation operations services as its peers that deliver winter control, surface maintenance, roadside maintenance, and signs and signals maintenance. There is no apparent need for restructuring based on this evidence.

3.2.1.2 Winter Maintenance Activities

- There are a range of models blending direct and contracted service delivery. For
 instance Halton Region relies on local municipal direct delivery (costs reimbursed),
 while the City of Ottawa provides most services directly. Waterloo Region features
 urban service delivery by the cities of Cambridge/Kitchener/Waterloo within their
 respective boundaries, while Waterloo Region's staff deliver services across the
 remaining local municipalities. Niagara uses more contracted services than some
 municipalities and less than others. Niagara uses an area maintenance contract where
 the contractor is responsible for specific geographies as compared to some
 municipalities that incorporate contracted resources into their general deployment.
 The variation of service delivery models across all of the municipalities suggests that
 there are no models that are inherently superior, including Niagara's.
- None of the peer municipalities could definitively compare the cost of direct delivery of activities by their own staff versus contracted providers versus local municipal staff because the data to report on specific performance measures is lacking, and basic analysis (e.g., cost per lane kilometre) is too coarse to provide actual insights given the complexity of the services delivered and the variable environment in which they are delivered. Ottawa is currently attempting to complete this type of exacting activity based costing analysis for winter control. The information available is insufficient to assess how Niagara compares to peer municipalities in this respect.
- The Region of Peel is driving service planning innovation by linking winter control staffing, budgets and service levels to winter weather "risk scenarios". Peel's core winter budget is based on units of "Winter Storm Equivalent" where service levels can be custom designed based on the system-wide deployment of a fully-costed fleet of heavy machinery for an eight hour period. Peel obtains Council approval for its winter service level (i.e., the number of Winter Storm Equivalents) from Council at the



beginning of a term. Niagara is on par with the peers – no municipality can verify that it is meeting the MMS. Niagara should move towards linking budget to weather scenarios and should work towards more direct communication /approval with Council regarding desired levels of service.

 Niagara maintains flexible staffing during the shoulder seasons to minimize stand by or winter prep time. Niagara is ahead of peer municipalities in terms of ensuring its inhouse resources can be easily deployed while attempting to minimize stand by or winter prep time (though there is still room for improvement by better managing how staff are scheduled during winter).

3.2.1.3 Non-Winter Maintenance Activities

- Peer municipalities employ a range of service delivery models (i.e. direct and contracted blends). Niagara delivers service through a blend of direct and contracted work, so it has a similar service delivery model to the peer municipalities of Durham, Peel, and Waterloo. Halton contracts all maintenance work, and information about Ottawa is not available. The variation of service delivery models across all of the municipalities suggests that there are no models that are inherently superior.
- As discussed above for winter, unit cost comparisons for different service delivery models are not available/reliable. The information available is insufficient to assess how Niagara compares to peer municipalities in this respect.
- Niagara should work towards more clear communication with Council in terms of budgeting and Level of Service targets, using the systems such as CityWorks that it has in place.
- Municipalities are starting to move towards activity based budgeting that is directly linked to asset management. In general, time tracking and asset management regimes are not yet in place to allow for activity based budgeting. Niagara is on par with peer municipalities in moving toward activity based budgeting.

3.2.1.4 Workforce Demographics

 Municipalities such as Ottawa have integrated succession planning into their annual planning activities. Municipalities that are not proactivity planning for succession should consider this a risk. Waterloo's recent operational review also considered workforce demographics as a future risk/opportunity requiring careful monitoring. Niagara appears to be adequately managing changes to workforce demographics.

3.2.1.5 Key Performance Measures and Asset Management

• Most of the peer municipalities track labour time by mixing together productive and non-productive labour hours (including travel time). Where activities are tracked separately (as in Ottawa which represents the best practice) then it becomes easier to identify and measure productivity, gauge any surplus capacity, and build accurate



activity based budgets. Niagara is on par with most peer municipalities in terms of tracking productive and non-productive time.

- Peer municipalities have adopted GPS/AVL technology for winter machinery and smaller vehicles, but have not properly integrated the technology/data to results based planning and reporting processes (i.e., the location of the vehicle and distance travelled can be determined, but it is not always clear if the vehicle was plowing the road, or simply travelling). Niagara is on par with peer municipalities in adopting GPS/AVL technology.
- Peer municipalities are attempting to transition to more robust asset management systems that link planned maintenance activities/hours to specific asset classes.
 Ideally applying proper levels of planned maintenance hours in a rational/targeted fashion optimizes asset life cycles. By using CityWorks for asset management and properly tracking maintenance to assets, Niagara is on par with Halton and Peel that use similar systems for asset management.
- Lack of evidence based reporting on service level achievement is a common problem. Gathering performance data reports from alternate service providers, including local municipalities and private contractors is a persistent problem among peers. Niagara, which cannot always verify that its contractor is meeting the MMS, is on par with peer municipalities in this regard.
- The Region of Peel has suggested a connection between providing a higher LOS and reduced liability. The reduced liability only exists where the achievement of the maintenance standards is appropriately tracked and documented. If the municipality cannot demonstrate the achievement of LOS, then actual performance (unproven) does not matter from a liability perspective. With respect to having levels of service but not comprehensively tracking/documenting them, Niagara is on par with peer municipalities this regard.
- Few peer municipalities have key performance indicators in place with regular results reporting back to Council, management or frontline staff. Even where indicators have been selected and reporting is in place as in Ottawa, it can still be a challenge to ensure the KPIs are relevant from a value-for-money perspective. Niagara should move towards selecting and reporting on clear, relevant KPIs (e.g., dollars per pass kilometres as discussed in Section 4.6 and those KPIs suggested in Table KPI-1 in Section 7).
- Monitoring service providers is a common challenge among peer municipalities. Niagara is on par with peer municipalities in this respect.

Risks and Benefits of Contracting Out

Recognizing that there is interest in alternative service delivery to potentially achieve costsavings, the following provides an overview of the risks and benefits based on the industry research and feedback from the peer municipalities:



3.3

	Risks	Benefits
Cost	Cost-saving measures implemented by the contractor assist with its profitability and do not get passed on to the municipality, as compared to cost-saving measures implemented by the municipality that allow it to reduce its operational budget (or deliver more services for the same amount) in following years.	Under a contract, the municipality can control year-over-year cost by indexing the services provided, which is currently the case in the Region's contract with Steed & Evans. Competition among contractors is an incentive to demonstrate cost- effectiveness when bidding.
Resources	As experienced by MTO, a contract may be awarded to contractor that does not have sufficient personnel and equipment to do the work.	A contractor has greater flexibility than a municipality to make adjustments to its workforce level.
Levels of Service / MMS Response Times	If Council decides it wants to change the level of service, this would be difficult to implement until the contract comes up for renewal. As experienced by MTO, when the contractor does not meet MMS response times then the penalties may be so great that the contractor walks away from the contract.	As experienced in Ottawa, a municipality may be more likely to over-deliver on level of service, as compared to a contractor that aims to meet the level of service while matching effort to budget.
Supervision	As experienced by MTO, contractors cannot be expected to reliability report on their own performance.	There are no apparent benefits when supervision is contracted out.
Reporting	From a liability perspective, the municipality should maintain its own records, resulting in some duplication if the contractor is also providing reports. It is unusual for a contractor to integrate with a municipality's asset management and work order platform, whereas this is better integrated when the services are delivered by staff.	If the vehicles are properly equipped, the contractor can generate detailed reports from the AVL systems, although the same applies if municipal vehicles are similarly equipped.
Liability	The municipality remains liable regardless of how much work is	The contractor shares some liability.



4.0 Winter Analysis and Findings

Niagara Region funds/delivers/oversees winter control services across an arterial road network consisting of 1,808 lane kilometres. The Region's winter control model includes the following service delivery components:

- Direct delivery of winter event core services by Region staff across 19 routes totalling 1,005 lane kilometres;
- Direct delivery of a portfolio of supporting winter control activities by Region staff across the entire Regional network of 1,808 lane kilometres;
- Contracted delivery of winter event response services by a contractor across 10 routes totalling 672 lane kilometres; and,
- Direct delivery of winter event response services by the City of St. Catharines across 127 lane kilometres of Regional roads integrated into routes primarily consisting of City roads.

The following analysis of winter control system performance/value-for-money is based on financial and operational data for three calendar years (2012-2014). The winter seasons of 2012-2014 provided the audit team with three diverse scenarios in terms of winter weather (i.e., storm event frequency and severity) – this was an ideal circumstance for the value-formoney analysis.

4.1 Direct Delivery of Core Winter Services by Region Staff

Table W-1 below provides a summary of the winter core services response model delivered by Region staff across 2012-2014. The Region's operating budget for directly delivered core services (i.e., snowplowing/de-icing) falls within a fairly narrow range of \$5.31M to \$5.78M. However actual spending varied significantly from \$3.4M to \$5.26M. Major system-wide winter storm events requiring a response across all 19 routes ranged from 7 storms in 2012 to 28 storms in 2014. Local events (i.e., not system-wide) requiring a significant event response ranged from 37 in 2012 to 54 in 2014. Heavy equipment machine hours for snowplowing/deicing vary across 2012-2014 in proportion with winter storm events. Machine hours in 2014 are 23,369 – an increase of 14,148 over 2012 levels. Budgeted unit costs of service delivery are reasonably stable - whether tracked on a "lane kilometre" basis or a "machine hour" basis. However, actual unit costs vary significantly based on storm frequency and machine hour trends. The actual cost per lane km in 2014 was \$5,266 – approximately 54% higher than the 2012 actual cost per lane km of \$3,410.



	2012 Season	2013 Season	2014 Season
# Lane Kilometres Receiving Coverage	1,009	1,009	1,009
Heavy Equipment Machine Hours	9,221	15,622	23,369
Utility Vehicle Machine Hours	14,698	15,778	15,254
Total Machine Hours	23,919	31,400	38,623
Winter Budget \$	\$5,318,953	\$5,784,659	\$5,721,998
Winter Actual \$	\$3,440,801	\$4,192,392	\$5,313,241
Budgeted Cost per Lane Km	\$5,272	\$5,733	\$5,760
Actual Cost per Lane Km	\$3,410	\$4,155	\$5,266
Budgeted Cost per Total Machine Hour Delivered	\$222	\$184	\$148
Actual Cost per Total Machine Hour Delivered	\$144	\$135	\$138
* Major Storm Events -System Wide > 24 Hours	3	5	7
* Major Storm Events -System Wide < 24 Hours	4	17	21
* Significant Local Events < 24 hours with OT	15	12	22
* Significant Local Events < 24 Hours No OT	22	34	32

Table W-1: Direct Staff Delivery of Core Winter Services (2012-2014)

The Region's current direct delivery winter control budget which was not overspent even during the severe winter of 2014 that consumed over 23,000 heavy equipment machine hours indicates an exceptional amount of event response capacity. As illustrated below in **Figure W-1**, the actual cost for direct delivery winter control was approximately \$400,000 less than the budgeted amount.



Figure W-1: Budget and Actual Dollars of Core Winter Services (2012-2014)



4.2 Direct Staff Delivery of Supporting Winter Control and Other Activities

Table W-2 below provides a summary of the supporting winter control activities delivered by Region staff across 2012-2014. Supporting winter control activities include snow fencing, snow removal, winter drainage, winter sand clean-up, brine station maintenance and an "other" category. These supporting winter control activities are delivered across the entire Regional road network consisting of 1,808 lane kilometres. Spending patterns were fairly stable across the 2012-2014 winter seasons, ranging from \$879k in 2012 to \$773k in 2013. Utility vehicle machine hours varied from 5,800 to 6,933. Unit costs were also reasonably stable on both a "per lane kilometre" basis and a "machine hour" basis. However, costs did not track particularly closely to variations in storm event frequency – it appears that winter support activities represent a fixed level of effort/cost that is independent of weather trends. One notable exception to the fixed effort pattern was the spike of machine hours during the mild 2012 winter. In 2012, the number of heavy equipment machine hours (linked to the delivery of core services as shown in Table W-1) is much lower than in other seasons. These man hours seem to have migrated (approximately 1,000 hours) into the supporting activities (see Table **W-2**). The resulting spike of 6,933 utility vehicle hours is much higher than the levels documented in 2013 and 2014.

	2012 Season	2013 Season	2014 Season
# Lane Kilometres Receiving Coverage	1,808	1,808	1,808
Heavy Equipment Machine Hours	198	163	130
Utility Vehicle Machine Hours	6,933	5,800	5,982
Total Machine Hours	7,131	5,963	6,112
Winter Budget \$	\$879,924	\$773,790	\$872,315
Winter Actual \$	\$879,924	\$773,790	\$872,315
Budgeted Cost per Lane Km	\$487	\$428	\$482
Actual Cost per Lane Km	\$487	\$428	\$482
Budgeted Cost per Total Machine Hour Delivered	\$123	\$130	\$143
Actual Cost per Total Machine Hour Delivered	\$123	\$130	\$143
Major Storm Events -System Wide > 24 Hours	3	5	7
Major Storm Events -System Wide < 24 Hours	4	17	21
Significant Local Events < 24 hours with OT	15	12	22
* Significant Local Events < 24 Hours No OT	22	34	32

Table W-2: Direct Staff Delivery of Supporting Winter Control and Other Activities (2012-2014)

Man-Hour and Machine Hour Trends

4.3

Machine-hour trends across 2012-2014 display two operational realities (see **Table W-3**). Heavy equipment usage is highly variable depending on winter event frequency/severity. However, utility vehicle usage is stable across seasons; reflecting the fixed effort/costs



associated with the core activities of winter patrol and supervision, plus the bundle of supporting winter activities.

	2012	2013	2014
Region Maintained Roads: Heavy Equipment	9,221	15,662	23,369
Region Maintained Roads: Utility Vehicles	14,698	15,778	15,254
All Roads Maintenance: Heavy Equipment	198	163	130
All Roads Maintenance: Utility Vehicles	6,933	5,800	5,982
TOTAL	31,050	37,402	44,735

Table W-3: Winter Control Machine Hours

Despite the wide variation in winter severity/storm events across the 2012-2014 seasons, manhours deployed/expended are very stable (see **Table W-4**). The 2014 winter was one of the most severe winters in decades however the expended man-hours of 56,574 were only 6% higher than expended man-hours during the mild winter of 2012. The man-hour data demonstrates the fact that the Region has designed a fixed-cost direct staffing model; this is an issue since there is very limited variation in deployed manpower over diverse winter seasons.

Table W-4: Winter Control Man Hours	
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	2012	2013	2014
Region Maintained Routes	38,198	41,842	43,177
Maintenance Across All Roads	14,897	12,855	13,397
TOTAL	53,095	54,697	56,574

4.4 Winter Control and Public Safety – Direct Delivery Model

Despite the spike in system-wide storm events during the 2013 and 2014 winter seasons, the number of reported winter collisions on Region maintained roads remained relatively flat. Assuming driver "adaptive behavior" regarding collision avoidance was largely constant across 2012-2014 winter seasons, it is reasonable to conclude the Region's "peak winter" deployment model was a significant factor in limiting collisions/protecting public safety during the severe winters of 2013 and 2014. The Region's "peak" deployment model features the capacity to



meet the demands of an exceptionally severe winter like 2014 without compromising public safety – note the 23,369 hours of deployed heavy equipment (to deliver core winter event responses) compared to the appreciably lower levels of heavy equipment deployment in 2012 and 2013.

	2012	2013	2014
# Reported Winter Collisions on All Region Roads	1,011	1,112	1,058
Region Maintained Roads: Heavy Equipment Hours	9,221	15,662	23,369
Region Maintained Roads: Utility Vehicle Hours	14,698	15,778	15,254
Major Storm Events -System Wide > 24 Hours	3	5	7
Major Storm Events -System Wide < 24 Hours	4	17	21

Table W-5: Collision Frequency on Region Maintained Roads

4.5

Winter Control Overtime Trends – Direct Delivery Model

The winter control overtime hours/costs for the 2012-2014 seasons track closely with the frequency and severity of winter events. The time of day that a given winter event occurs also impacts overtime trends, since lower levels of scheduled staffing occur after 3pm each weekday and on weekends. Overtime hours of 4,383 were deployed during the severe 2014 winter – a 61% increase over the relatively mild 2012 winter. Overtime costs followed a similar pattern as overtime hours – featuring 2014 totals that were 66% higher than 2012.

Table W-6: Winter Control Overtime Trends

1	2012 Season	2013 Season	2014 Season
Overtime Hours	2,721	2,859	4,383
Overtime Spending	\$84,351	\$91,974	\$140,256
Major Storm Events -System Wide > 24 Hours	3	5	7
Major Storm Events -System Wide < 24 Hours	4	17	21
Significant Local Events < 24 hours with OT	15	12	22
Significant Local Events < 24 Hours No OT	22	34	32
Overtime Hours per Event (including Major Storm Events and Significant Local Events with Overtime)	124	84	88



Private Contractor Delivery of Core Winter Services

4.6

Core services (i.e., snowplowing/di-icing) are delivered by a private contractor across 10 routes totalling 672 lane kilometres. Actual spending in 2012 and 2013 closely matches budgeted spending in 2012 and 2013 (see **Table W-7** below). In 2014 the actual spending of \$2,873,333 exceeded the budget by \$373,333. The cost overrun in 2014 was due to winter event frequency levels, which required the use of more gas and salt, and provisions in the contract allow for variations in these material costs to be passed on to the Region. Machine hours/man hours expended by the contractor were not available to the audit team for review. The profile of local winter events that the contractor responded to was not available to the audit team for review (to the extent it differed from the Region's profile of direct delivery events). System-wide event response frequency mirrors the staff direct delivery workload for 2012-2014.

	2012 Season	2013 Season	2014 Season
# Lane Kilometres Receiving Coverage	672	672	672
# Machine Hours of Service Delivered	NA	NA	NA
Winter Budget \$	\$2,325,000	\$2,325,000	\$2,500,000
Winter Actual \$	\$2,287,637	\$2,341,359	\$2,873,333
Budgeted Cost per Lane Km	\$3,460	\$3,460	\$3,720
Actual Cost per Lane Km	\$3,404	\$3,484	\$4,276
Budgeted Cost per Machine Hour Delivered	NA	NA	NA
Actual Cost per Machine Hour Delivered	NA	NA	NA
# Major Storm Events - System-wide >24 hours	3	5	7
# Major Storm Events – System-wide < 24 hours	4	17	21
# Significant Local Events	NA	NA	NA

Table W-7: Private Contractor Delivery of Core Winter Services

A comparison of the Region direct delivery model versus the private contractor model has been prepared by the audit team (see **Table W-8** below). The Region's direct delivery actual costs do not track closely against the budget because of variations in winter event frequency/severity. The Region also attempts to achieve bare pavement (following the end of each winter event) that meets the Province's minimum maintenance standard of 6 hours. In contrast the private contractor employs a level of effort model under a lump sum contract (while also required to meet the bare pavement achievement service level target as the contract's primary objective). This allows the contractor to match deployed effort/cost against the contract budget providing it can also meet the bare pavement achievement target. Region unit costs per lane kilometre are higher than the contractor in 2013 and 2014.



REGION			
	2012 Season	2013 Season	2014 Season
Budgeted Cost per Lane Km	\$5,272	\$5,733	\$5,760
Actual Cost per Lane Km	\$3,410	\$4,155	\$5,266
Major Storm Events -System Wide > 24 Hours	3	5	7
Major Storm Events -System Wide < 24 Hours	4	17	21
CONTRACT			
	2012 Season	2013 Season	2014 Season
Budgeted Cost per Lane Km	\$3,460	\$3,460	\$3,720
Actual Cost per Lane Km	\$3,404	\$3,484	\$4,276
Major Storm Events -System Wide > 24 Hours	3	5	7
Major Storm Events -System Wide < 24 Hours	4	17	71

Table W b. companyon of onit costs between bireet beivery and contractor models	Table W-8: Comparison of	Jnit Costs between	Direct Delivery and	d Contractor Models
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Note: The Region's objective is to meet MMS, whereas the contractor's objective is to meet MMS and match effort to its bid price.

Caution should be exercised in the interpretation of this per kilometre unit cost data (i.e. the cost of winter control divided by the number of lane kilometres maintained). A preferred unit cost comparison would be based on the actual number of pass kilometres executed across the routes (i.e., the cost of winter control divided by the number of pass kilometres completed).

The "pass kilometre" measurement records the total number of times that the roads receive treatment (i.e., material spreading or snow clearing). For example, the contractor in Niagara maintains 672 lane kilometres in the winter, so if the contractor cleared snow over the 672 lane kilometres a total of ten times in a season then it would have completed 6,720 pass kilometres. Measuring costs per pass kilometres would make it possible to fairly compare the cost of service delivery between the Region and the contractor. In addition to better comparison between the Region and the Contractor, unit cost per pass kilometre would be a better comparison for peer benchmarking. Using this measure would help to equalize differences between municipalities such as climatic conditions or different proportions of road surfaces. A 2007 report from Iowa State University recognized pass kilometres/plow down kilometres as one of the few reliable and stable measures that can be used to track outputs for winter control. At that time, only four of the forty-three jurisdictions studied could measure pass kilometres (one of the four was Edmonton, Alberta), however it was recognized that reporting pass kilometres would become easier as technology evolved.²

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² Maze, T.H., C. Albrecht, D. Kroeger, and, J. Wiegand (2007). NCHRP Web-Only Document 136: Performance Measures for Snow and Ice Control Operations. *Centre for Transportation Research and Education, Iowa State University*.

This pass kilometre data is contained in the Region's AVL database for each piece of heavy equipment, but is neither reported nor regularly accessed. Unit cost comparisons should not be used to support decision-making about competing service delivery models in the absence of pass kilometre unit data. The current contract does not require the contractor to supply system performance data such as pass kilometres or bare pavement achievement times.

4.7 City of St. Catharines Delivery of Core Winter Services

The City of St. Catharines integrates 127 lane kilometres of regional road sections into its various snowplowing routes across the City (see **Table W-9** below). The City budgets approximately \$300k annually for region winter control services, and then recovers its costs according to actual activity levels – which in turn are tied to winter event frequency/severity. The City overspent the budget during the severe 2014 winter season, and was very close to budget during the 2013 season. The mild winter of 2012 featured significant under-spending versus budget. Winter event frequency data is not reported, nor are bare pavement achievement times for the various routes including regional road sections. In any event, regional road standards for achieving bare pavement (i.e., 6 hours for Class 1-2 arterial road sections) would not apply to routes composed of local City roads. The Region enjoys a significant operational benefit from the current arrangement with the City, since no direct delivery equipment needs to be diverted from its own routes to service road sections within the City that do not form continuous/serviceable routes.

	2012 Season	2013 Season	2014 Season
Lane Km Receiving Coverage	127km	127km	127km
# Machine Hours of Service Delivered	NA	NA	NA
Winter Budget \$	\$297,513	\$299,187	\$299,187
Winter Actual \$	\$151,053	\$317,299	\$446,633
Budgeted Cost per Lane Km	\$2,343	\$2,356	\$2,356
Actual Cost per Lane Km	\$1,189	\$2,498	\$3,517
Budgeted Cost per Machine Hour Delivered	NA	NA	NA
Actual Cost per Machine Hour Delivered	NA	NA	NA

Table W-9: St. Catharines Delivery of Core Winter Services

Because St. Catharines has incorporated the Region's Roads into the local snow removal routes, a direct comparison of the unit costs for the Region versus St. Catharines would not be possible.

Actual Winter Control Performance Against the Region's Bare Pavement Service Level Standard

The Province sets out municipal winter control service levels (by regulation) for five categories of roads (see **Table W-10** below). The Region's network of arterial roads is primarily Class 2,



with a few roads (running up and down the escarpment) maintained as Class 1. The Provincial Minimum Maintenance Standards (MMS) include snow accumulation depth that should trigger a snowplowing response by the Region. The MMS also include target timeframes to return the road to a desired navigable condition following the end of a winter event. The Region's winter control service level derived from the MMS is bare pavement achieved within 6 hours of the end of a winter event³.

Class of Highway	Depth	Time
1	2.5 cm	4 hours
2	3 cm	6 hours
3	8 cm	12 hours
4	8 cm	16 hours
- 5	10 cm	24 hours

Table W-10: MMS Standards for Bare Pavement Achievement (Hours)

The audit team has not been provided with any quantifiable data concerning bare pavement achievement times for the Region's direct service delivery or contractor routes. Like many other Ontario municipalities, as discussed in the "Better Practices" analysis, Niagara does not track end-times for winter events. Therefore there is no defined point in time where the "stopwatch is turned on" to calculate timeframes for a post-event clean-up effort that achieves bare pavement. In the absence of any measurement based service level achievement data, the audit team has only anecdotal observations/assurances from staff that they meet Class 1-2 MMS standards for the direct delivery routes. There is also no evidence that the contractor meets MMS standards on the 10 contracted routes.

It is difficult to truly ascertain the value-for-money of the Region's winter control service in the absence of data regarding bare pavement achievement by region staff and the contractor. Given the timing of the program review and importance of having this data for managing risk, the audit team provided an interim recommendation to Management in late 2015 prior to the completion of the audit. This interim recommendation appears as Recommendation #1 in this report. The interim recommendation provided the Region with clear direction to take immediate technical preparations to measure bare pavement achievement for system-wide winter event responses beginning January 1, 2016.

³ While the reasonableness of this service level for Niagara could be debated, it is a regulated standard so the municipality has no choice but to meet it.

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Winter Control Findings

4.9

The following paragraphs describe the findings of the winter control analysis and the ultimate recommendations are provided in the following subsection of this report.

- The Region's current direct delivery winter control budget which was not overspent even during the severe winter of 2014 that consumed over 23,000 heavy equipment machine hours indicates an exceptional amount of event response <u>capacity</u>.
- The relatively "flat" trend displayed by Regional road winter collision data (2012-2014) suggests the Region's current winter control model was a significant public safety contributor during the severe 2013 and 2014 "outlier" winters.
- The direct delivery winter control budget creates surplus event response capacity during mild/normal winter seasons (e.g. 2012). For instance, the 2012 winter consumed 14,148 fewer heavy machinery hours than the 2014 winter. The Region is able to redeploy surplus event response capacity towards a range of other winter maintenance and non-maintenance activities during mild/typical winters. It is not possible to assess whether the value-for-money associated with these discretionary activities (during a mild/normal winter) is equivalent to the value-for-money associated with the core activities of winter event response (in a heavy winter).
- Across the 2012-2014 seasons, spending on secondary winter control activities (i.e., not event response or patrol) was maintained in the \$872k \$879k range despite the variations in winter severity. Man-hours spent on these activities increased during the mild 2012 winter season (by approximately 1,000 added man hours) again demonstrating that there is some surplus capacity that is re-deployed to non-core activities during mild winters.
- The Region's current winter control model is best understood as a "fixed cost" deployment model relying heavily on direct delivery by Regional staff, and a supporting contractor. The annual operating budget for this fixed cost model (approximately \$6.5M) currently generates capacity levels that are matched to severe "outlier" winters, while creating surplus capacity during mild/normal winters. In this sense the current model/budget eliminates severe winter financial risk but maximizes mild winter financial risk. This risk management profile is not typical of most municipal winter control budgets, where a winter reserve fund is used to manage the risk of "outlier" winters (outside the annual operating budget).
- Measurement gaps currently prevent the Region from documenting the direct delivery model's "bare pavement achievement times" following the end of a winter event. The Region's contractor does not currently report "bare pavement achievement times" following the end of a winter event. Therefore the Region cannot verify compliance with its Minimum Maintenance Standard (MMS) derived service standard for post-event snow plowing or icy road treatment. Given these measurement gaps it is therefore difficult to definitively determine the value-for-money of the current winter control model.



Pass kilometre data – one of the few reliable performance measures for winter control

 is central to proper winter system planning, budgeting and results reporting. The
 Region currently collects/owns AVL data on the movement of its heavy winter
 machinery across the road system. With refinements AVL data can generate valuable
 pass kilometre data. In order to properly track pass kilometres of core winter control
 work outputs (not just heavy machine movement) the Region would need to install
 AVL sensors for spreaders and plow blades on all units (including the contractor). The
 Region could then define/track pass kilometres of winter control output using AVL data
 with the spreader active and/or the plow blade "down".

4.10 Recommendations: Winter Control

The following recommendations are provided concerning value-for-money, effective risk management, and operational improvement for winter control.

Note that recommendations "R1", "R4" and, "R5" were provided in formal correspondence to Management on November 25, 2015, concerning the need to measure bare pavement achievement times during the current winter season. Region Staff has indicated that a plan had been developed and implemented to address the initial recommendations. To this end, staff developed a new winter event log and conducted a trial of the event logging so that it could be rolled out to the contractor and the City of St. Catharines for the 2016-2017 winter. The preliminary results of the trial on the Region's direct delivered winter control routes during the 2015-2016 winter suggest that it can meet the MMS.

R1. Document the end time of winter events so it is possible to measure the time it takes to reclaim bare-pavement.

Commencing in January 2016, Niagara and its contracted service providers should establish a common methodology for documenting the end of a winter event in order to subsequently measure timeframes for re-claiming bare pavement as per winter minimum maintenance standards contained in Ontario Regulation 293/02. This methodology will require the Region to create geographic "event zones" in order to reflect the reality that a system-wide winter event does not end at the same time across the entire region. The methodology should include a combination of real time weather station data and Supervisor/Patrol staff qualitative assessments in order to determine event "end times".



PW 24-2020 Appendix 5

R2. Restructure budgeting accounting to separate core winter services from supporting services and allow accurate comparison of the costs of direct delivery versus contracted delivery for winter control.

Niagara should restructure its 2016-2017 winter accounting structure to ensure distinct cost centres exist for the following service delivery components:⁴

- Direct staff delivery of *core* winter service activities (i.e. snowplowing/deicing/patrol) currently delivered across the current 19 standardized routes;
- Direct staff delivery of <u>supporting</u> winter service activities currently delivered across the entire regional road system of 1,808 lane kilometres (i.e. snowfencing/snow removal);
- Contractor delivery of <u>core</u> winter service activities (i.e. snowplowing/de-icing) currently delivered across the current 10 standardized routes; and,
- Direct delivery of <u>core</u> winter service activities by the City of St. Catharines (i.e. snowplowing/de-icing) for 127 lane kilometres of regional road sections currently integrated within City-defined routes.

R3. Collect and use pass kilometre data to better monitor and report on winter control activities.

Pass kilometre data is central to proper winter system planning, budgeting and results reporting. Niagara should ensure that *pass kilometre* data (i.e. the true "countable unit" of core winter service delivery) is properly integrated into its budgeting, business planning and results reporting processes for 2017 (see section 4.6 for more information on "pass kilometres"). The Region currently collects/owns AVL data on the movement of its heavy winter machinery across the road system. In order to properly track pass kilometres of *work* (not just machine movement) the Region should install AVL sensors for both spreaders and plow blades on all units (including the contractor). The Region should track pass kilometres of work defined by AVL data featuring the spreader functioning and/or the plow blade "down". Pass kilometre data should also inform future decisions around contractor selection and the recommended competitive service delivery initiative. Finally, pass kilometre data should support future targeted peer benchmarking efforts that provide meaningful insights beyond the overly simplistic OMBI model now in place.

⁴ Note that certain activities are tracked year-round, so for example, drainage or road surface maintenance completed in the winter would be coded separately from the winter control budget.

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R4. Implement winter control achievement reports for winter storm events.

Reports should be prepared for the following categories of event responses by the Region and its contracted service providers:

- system-wide winter event responses > 24 hours in duration;
- system-wide winter event responses < 24 hours in duration; and,
- significant localized winter event responses > 24 hours in duration.

R5. Provide annual reports to Council on the level of service achievement for the winter season.

For this (2015-2016) and all subsequent winter seasons, Council should receive a report demonstrating actual levels of winter control "bare pavement achievement" (versus the 4-6 hour service level timeframes in Regulation 239/02). The report should provide a breakdown of level of service achievement in the event categories identified in R4. Each subsequent winter season will require this report.

R6. Reduce the winter control budget to the level required for a typical winter instead of a severe winter.

Niagara should transition to a risk-based budgeting model (weather defined risk) by adopting a reduced-but-sustainable winter control budget. This reduced budget should be calibrated to provide event response core capacity for a normal-tomoderately severe winter season. In order to ensure the reduced risk-based budget does not negatively impact levels of service, bare pavement achievement performance data (R1-R5) should be used to determine the appropriate sustainable level of budget reduction for the next year. Based on the difference between the 2014 direct-delivered core winter control budget and actual of approximately \$400,000, the audit team recommends that the Region reallocate this amount from the direct delivery budget to the reserve for the 2016/2017 winter. This is a prudent approach that manages the risk of being under-resourced until the Region has performance data demonstrating the ability to consistently meet bare pavement achievement levels below 6 hours as per Regulation 293/02. When the Region is certain it is meeting the MMS, then it can consider further budget adjustments.



R7. Prepare in advance for forecasted winter storm events by rescheduling staff shifts within the two week pay-period.

Niagara should transition to a more flexible "fixed cost" staffing/deployment model. This would build on the existing approach used during the "shoulder seasons" when staff levels are ramped up or down depending on the weather conditions and forecasts. The current version of the Region's fixed cost model features a pool of staff resources scheduled uniformly across each two-week pay period – essentially deploying its available event response capacity independently of winter event timing. This static/uniform approach to staff deployment can evolve, since the Region has advanced weather forecasting capabilities. Restructuring the static/uniform scheduling process into a more dynamic process will achieve improved "matching" of a reduced winter staff pool with forecast winter events during each two-week staffing cycle.

- Shifts can be changed at 24-hours' notice (as appropriate) to meet forecast winter events, thereby concentrating staff's straight-time man hours around predictable/forecast periods of event response.⁵
- Shifts without a forecast winter event response (during the same two-week period) may end up featuring below-normal scheduled staffing.
- A dynamic staffing model of cancelled/rescheduled shifts is permitted within the collective agreement, provided that the total number of hours are correct over a 2-week period and provided that 24-hours' notice is given for shift changes.

The restructured model will function more like a standard mandatory callout for forecast winter events. Traditional callouts with overtime are still available when needed to deal with unanticipated winter events.

R8. Conduct a competitive service delivery exercise at the end of the current winter contract encompassing all established routes.

To determine whether in-sourcing or out-sourcing is most cost-effective, Niagara needs to conduct a competitive service delivery exercise that includes all the routes delivered by Region staff and delivered by the outside contractor. The competitive

⁵ Article 20.04 of the collective agreement states: "Twenty-four (24) hours notice shall be given before change of shifts. Failure to provide at least sixteen (16) hours rest between shifts which are being changed shall result in payment of overtime at established rates for any hours worked during such normal rest period."



service delivery bids submitted by Region management/staff and/or potential contractors should provide total service delivery costs; pass-kilometre based unit costs, and guaranteed bare pavement achievement response times. Scheduling/deployment should not be prescribed, allowing Region and/or contractor bids to adopt a wide range of potential scheduling/deployment models featuring best practices. Bid requirements could set out expected winter season severity (i.e., an events profile) to inform costing and bare pavement achievement responses.



5.0 Non-Winter Analysis and Findings

The Region delivers non-winter maintenance activities using a blend of staff direct delivery and contractors. These maintenance activities can be grouped into paved surface, roadside, signs and markings, and traffic signals. The same core group of Transportation Operations staff that deliver winter control services also deliver non-winter maintenance activities.

The table below sets out direct service delivery "budget versus actuals" spending trends for non-winter maintenance. The surface maintenance budget is divided into direct delivery and contract components. Across 2012-2014 the "Surface Direct" actual spending level is significantly less than budget. The under-spending in "Surface Direct" is driven by lower-thanbudgeted man-hours of work. The budget offset for lower-than-budgeted man-hours of "Direct Surface" activity can be found in the over-expenditure Signals and Signs/Markings activities. Across 2012-2014 man-hours of Region staff labour are being consistently redeployed to priority Signals maintenance activities – activities that produce extra revenue via maintenance services sold to Niagara's local municipalities.

Roadside activities also fluctuate over/under budget across the 2012-2014 periods. The scheduling of specialized equipment (impacted by weather) plays a significant role in the labour hours deployed in any given season for roadside maintenance.

Improved internal purchasing processes implemented in 2014 have reduced the Surface Contractor program's inability to get planned work done in 2013. The \$497k deficit in 2013 has been reduced to \$50k in 2014.



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	2012 Budget \$	2012 Actuals \$	Variance \$	2013 Budget \$	2013 Actuals \$	Variance \$	2014 Budget \$	2014 Actuals \$	Variance \$
Surface Direct	1,390,274	821,750	568,524	1,117,133	633,330	483,803	1,121,739	913,530	208,209
Surface Contracts	170,000	212,383	(42,383)	650,000	152,692	497,308	652,990	602,634	50,356
Surface Total	1,560,274	1,034,133		1,767,133	786,022	-	1,774,729	1,516,164	-
Roadside	1,687,078	1,667,957	19,121	1,664,654	1,895,035	(230,381)	1,869,144	1,482,653	386,491
Signs & Markings	1,217,205	1,349,673	(132,468)	1,230,167	1,413,022	(182,855)	1,230,216	1,148,464	81,752
Signals	1,158,564	1,154,967	3,597	1,174,650	1,291,246	(116,596)	1,174,650	1,154,057	20,593
Total Variance			416,391	-		451,279	-		747,401

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	2012	2013	2014
\$ Value Uncompleted Surface Work	568,524	483,803	208,209
Surface Man Hours Expended	6,169	7,814	9,265

NW-2: Direct Surface Maintenance Imbalance of Budget versus Actual Spending: In Detail

There is a sizeable gap between budgeted and actual spending on surface maintenance. The Region has been reducing this gap over the past several years.

5.1 Productivity and Cost Trends in Non-Winter Maintenance

From a productivity perspective it is instructive to examine trends in the service delivery output (measured in expended dollars) per 100 man-hours of inputs. If you consider 100 man hours to be a fixed input, the amount of dollars spent per 100 man-hours of output can be considered a proxy of productivity. In 2014 the dollars of output per 100 man-hours of input were lower than 2012 levels across Surface, Roadside and Signs/Markings activity groupings. In contrast, the 2014 dollars of output per 100 man-hours of input for Signals was appreciably higher than 2012 levels.

	2012	2013	2014	
	Actuals	Actuals	Actuals	
Surface Maintenance (Direct)	\$13,320 per 100 Man Hours	\$8,105 per 100 Man Hours	\$9,860 per 100 Man Hours	
Roadside	\$7,446 per 100 Man	\$8,621 per 100 Man	\$6,183 per 100 Man	
Maintenance	Hours	Hours	Hours	
Signs &	\$5,926 per 100 Man	\$7,118 per 100 Man	\$5,379 per 100 Man	
Markings	Hours	Hours	Hours	
Signals	\$6,242 per 100 Man	\$6,644 per 100 Man	\$7,378 per 100 Man	
Maintenance	Hours	Hours	Hours	

NW-3: Non-winter Spending Outputs (\$) per 100 Man-hours of Inputs



The unit cost trend (**Table NW-4**) tracks actual costs (across activity groupings) against system lane kilometres. In 2014 unit costs are higher than 2012 levels for Surface Direct, and Surface Contract. Unit costs are stable for Signals, and declined for Roadside and Signs/Markings. The total costs per lane km remain relatively stable across the three years, fluctuating less than 5%.

	2012	2013	2014
	Actuals	Actuals	Actuals
Surface Maintenance –	\$454 of output per lane	\$350 of output per lane	\$505 of output per lane
Direct Staff	km	km	km
Surface Maintenance -	\$117 of output per lane	\$84 of output per	\$333 of output per lane
Contract	km	lane km	km
Roadside	\$923 of output per lane	\$1,048 of output per lane	\$820 of output per lane
Maintenance	km	km	km
Signs &	\$717 of output per lane	\$761 of output per lane	\$616 of output per lane
Markings	km	km	km
Signals Maintenance	\$639 of output per lane	\$714 of output per lane	\$638 of output per lane
	km	km	km
Total	\$2850 of output per lane	\$2957 of output per lane	\$2912 of output per lane
	km	km	km

NW-4: Non-winter Unit Cost per Lane KM (2012-2014)

The non-winter overtime profile (**Table NW-5**) demonstrates a significant increase in OT hours across Surface, Roadside, Markings/Signs, and Signals activity categories. As the number of Markings, Signs and Signals being maintained have increased, the need for unanticipated "after hours" reactive maintenance also increases. A significant portion of the 2012-2014 OT hours for Signals is being recovered from local municipalities.



NW-5: Non-winter overtime profile

OVERTIME PROFILE

Service Category	2012 OT Hours	2012 OT 2012 OT Rate		kvg 2013 OT Hours		013 OT vg Rate	2014 OT Hours	2014 OT Avg Rate		Rationale
Winter Control	2,721	\$	31.00	2,859	\$	32.17	4,383	\$	32.00	additional staff to get to meet MMS
Pavement Surface Maintenance	930	\$	32.92	1,138	\$	32.54	1,393	\$	33.40	pothole maintenance to meet MMS
Roadside Maintenance	858	\$	32.52	891	\$	30.07	1,360	\$	29.48	Emergency tree call ins
Markings & Signs Maintenance	1,391	\$	26.89	1,400	\$	26.41	2,594	\$	28.54	Emergency sign/detour call ins
Signals Maintenance	5,021	\$	31.00	5,327	\$	31.08	6,350	\$	32.17	After hour call ins to meet stanadrds

5.2 Non-Winter Maintenance Findings

The following paragraphs describe the findings of the non-winter maintenance analysis and the ultimate recommendations are provided in the following subsection of this report:

- The Region's activity based budgeting approach to Surface, Roadside, Signs/Markings, and Signals features wide variations in "budget versus actuals" financial performance. Of particular note is the Region's accomplishment in re-engineering its purchasing process for Surface Contracting thereby eliminating a 2013 under-spending deficit of \$500k for small capital projects. An on-going trend of under-spending for Direct Surface work has been reduced by 63% between 2012 and 2014. Overall trends indicate on-going significant variation in "budget versus actual" financial performance driven by shifting operational priorities, weather impacts and difficult-to-predict vacation patterns where staff pay is not allocated to any activity.
- Productivity trends are uneven, as measured by spending outputs per 100 hours of staff labour inputs. Surface, Roadside and Signs/Markings spending per 100 hours of labour inputs are significantly lower in 2014 than they were in 2012. The productivity trend for Signals is positive: output spending per 100 hours of labour inputs is significantly higher in 2014 compared to 2012.
- Unit costs per lane kilometre are being managed well by the Region. Unit costs are down significantly for Roadside and Signs/Markings. Unit costs are constant for Signals. Only the Surface category demonstrates higher unit costs – this is a good sign since it signifies pavement improvement projects are being initiated and are spending a greater proportion of the annual budget compared to 2013 before improvements were made to purchasing processes.
- Increases in staff overtime hours can be explained in terms of growing numbers of signals, signs and other assets requiring immediate "after hours" reactive maintenance; however, as a percentage of overall expenditures, overtime continues to track as a relatively minor cost factor because some of these costs are recovered from the local municipalities.



5.3

Recommendations: Non-Winter Maintenance

The following recommendations address a number of the non-winter findings:

R9. Conduct an "activity-based" review of budget allocations based on the labour hours required to properly maintain infrastructure and complete reactive maintenance.

Niagara should conduct an activity-based review of its 2016 annual budget allocations for surface, roadside, signs/markings, and signals maintenance activity categories. The activity-based budget review should be based on a process that first considers the required number of planned maintenance man-hours for each activity category. These planned maintenance man-hour calculations will permit the Region to prepare a planned maintenance "coverage rate" – where a consistent / targeted percentage of assets are inspected / maintained each year in each activity category. Once calculated man-hour requirements are in place, staff pay rates can then be applied to arrive at the new budget allocations for each activity category. Finally, a reactive maintenance hours allowance should be added to the planned man-hours requirement for each activity category.

R10. Shortfalls in actual labour hours of maintenance completed should be offset with an increase in the following year so the Region does not fall behind in maintenance.

Once an activity-based budget is in place for non-winter maintenance activity categories (see R9), any major shortfall between actual service hours versus budgeted hours should be corrected in the following budget year. The correction should ensure actual maintenance hours catch up with the budgeted maintenance hours for the two years in question. This budget catch-up provision will ensure planned maintenance workload remains a priority – resulting in the preservation of asset values over time.



Workforce Demographics Analysis and Findings

6.0

An analysis of workforce demographics was conducted for this program review since it can provide an early warning regarding potential productivity improvement or erosion associated with workforce trends and resultant changes in available work hours. The analysis considers potential increases / reductions in staff salary costs associated with their progression through position wage ranges; the result can be an upcoming productivity dividend or deficit, paired with salary cost budget implications.

Numerous staff were hired when the Region was formed in the mid-1970s and most of these staff have retired. Another cluster of hires occurred in the mid-1980s so it is likely that another large group of staff will be retiring soon. There have been new staff hired for the frontlines in recent years that are both young and capable – highly skilled, well-trained, engaged – so there is not a concern among this group of staff.

Frontline Employees	Current (2015)	Five Years Out Status (2020)		
Average age	46 years	51 years		
% at top of pay grid (CUPE)	89%	84%		
% at top of pay grid (Non U)	25%	-		
% entitled to 5 weeks holiday (maximum allotment)	16%	25%		
% eligible for retirement within 5 years	4%	8.5%*		
*Assuming half of eligible employees do retire.				

WD - 1: Workforce Demographics Current and Projected to 2020

The 5-year workforce trend in the chart indicates limited downward pressure on the operating budget as some unionized frontline staff at the top of the wage scale retire. The 5-year workforce trend indicates relatively constant available work hours per frontline employee resulting from vacation time. Note that the percentage of non-unionized staff at the top of the pay grid cannot be projected since wage increases are performance based.

The 5-year workforce trend also demonstrates a doubling of the retirement eligibility – from 4% to 8.5% of frontline staff eligible to retire; however, it is expected that new staff can deliver more work hours per FTE at the low end of the wage grid, resulting in some efficiency gains.



The analysis of workforce demographics also includes a review of annual unscheduled time away. The nearly 27,000 hours of unscheduled time away is equivalent to 15 FTE. It was explained that the unscheduled time away includes employees who are on long-term disability. Long-term disability benefits are not financed by the Region and employees who are on longterm disability are replaced, meaning this is not a cost or a productivity risk for the Region. Discounting long-term disability the unscheduled time away amounts to approximately 15,000 hours of unscheduled time away, equivalent to 7.5 FTE. It is understood that some other types of leave are also financed other than through the Region and that some positions are replaced for the duration of an employee's absence. To the extent possible, it would be helpful for Niagara to reduce the amount of unscheduled time away as a means of gaining productivity from its staff resource. It is understood that the Transportation Operations Department and the Human Resources Department have been working to decrease unscheduled time away.

Type of Leave	Total Hours Away (in 2014)		
LTD Leave	11,526.0		
STD Leave	8,850.5		
WSIB	1,751.0		
Compassion Leave	618.0		
Medical Leave unpaid	144.0		
Appointment	579.0		
Authorized Leave unpaid	3077.33		
Authorized Leave paid	6.5		
Unauthorized Leave unpaid	120.0		
Unsupported Medical-Unauth Leave	24.0		
Total unscheduled time away	26,696.83 hours		

WD - 2: Unscheduled Time Away

6.1 Workplace Demographics Findings

The following paragraphs describe the findings of the workplace demographics analysis:

- The 5-year workforce trend in the chart indicates relatively constant operating budget and available work hours per front line employee.
- The 5-year workforce trend demonstrates a doubling of the retirement eligibility from 4% to 8.5% of frontline staff eligible to retire. It is expected that new staff can deliver more work hours per FTE at the low end of the wage grid, resulting in some productivity gains to balance out the impact of senior staff's reduction in available work hours.



6.2 Recommendations: Workforce Demographics

The following are the recommendations for the workforce demographics component of the program review:

R11. The Region of Niagara should closely monitor its changing workforce demographics.

The Region needs to:

- Manage predictable future budget impacts;
- Implement appropriate cost controls provisions when/if needed; and,
- Improve service delivery capacity by maximizing the number of annual productive hours available per employee.



7.0

Key Performance Indicators and CityWorks

Regional governments, and their various organization business units, are best understood as service delivery systems. In the case of the Transportation Operations division, the staff, the equipment, the contractor, and materials are the inputs leading to outputs of winter control, surface, roadside, signs/markings, and signals maintenance (consisting of detailed activities/processes). This horizontal systems view of Transportation Operations as shown in **Figure KPI-1** demonstrates the "program logic model" which is the basis for building a portfolio of Key Performance Indicators (KPIs).



Figure KPI-1 – Program Logic Model

The program review team found that existing accomplishment units must be modernized to reflect new operational technologies (e.g., grass cutting is measured by "blade cuts" instead of hectares mowed, despite changes in the breadth of a blade cut). This means moving away from accomplishment units and towards KPIs for core service activities. By using KPIs, transportation operations is able to link its budget and outcomes – meaning that it commits to deliver "x" units of service, at unit cost "y", while achieving quality/effectiveness result "z".

Table KPI-1 outlines a portfolio of KPIs that is consistent with the systems based view of Transportation Operations. It has been developed by the audit team since there are no industry-wide standard KPIs. This is not an exhaustive portfolio and may be modified or expanded.



KPI-1: Recommended Key Performance Indicators

	Winter Control	Pavement	Roadside	Signs & Markings	Signals
Units of Service Delivered	Machine Hours or Pass Kilometres versus Target	Planned Maintenance Hours versus Target	Planned Maintenance Hours versus Target	Planned Maintenance Hours versus Target	Planned Maintenance Hours versus Target
Unit Cost Delivered	Gross Operating Cost per Machine Hour or Pass Kilometre versus target	Gross Operating Cost per Maintenance Hour versus Target			
Quality/ Effectiveness Level Achieved	Prompt/adequate event response initiated; post-event clean up times meeting MMS.	Planned maintenance annual "coverage rate" of assets			

7.1 Towards a Performance Reporting Dashboard

Niagara has and uses corporate KPIs and can build upon this results-based culture for Transportation Operations. It is necessary that Transportation Operations move towards a performance-based reporting "dashboard" that automatically populates KPIs from CityWorks and other established data sources. Upon initial implementation, a simple yet powerful graphic dashboard can provide periodic feedback to Management on how the Region is doing in terms of actual service delivery results versus targets; eventually, once fully operationalized, the dashboard can provide continuous feedback on system performance.

The information in the dashboard can be a powerful tool for educating the public on service delivery and demonstrating accountability to Council. It is also beneficial since it can inform static reports, such as the division's input to OMBI and other benchmarking efforts. Furthermore, it reinforces frontline staff commitment to data collection – staff see their inputs to the system are being analyzed, and the information is cycling back and leading to something useful.

7.2 Assessment of CityWorks Roll-Out

The Region's CityWorks data management application is critical to the successful implementation of KPIs and a dashboard. The following observations are instructive concerning the ongoing refinement of the Region's CityWorks rollout.

Transportation Operations continues to roll out the CityWorks asset management and maintenance management system. The asset management focus creates linkages between the traditional maintenance management tracking of activity based labour hours to specific assets or road sections (i.e., by geography). Therefore the consumption of maintenance inputs (i.e.,



labour, materials, and other costs) by assets can inform capital budget investment decisions/priorities.

There is a current window of opportunity to decide what performance data is gathered for input to CityWorks and how it is best organized in terms of periodic reporting because the CityWorks platform has the ability to automate and continuously report on performance – with the proviso that the data is correctly coded and inputted.

The implementation of CityWorks is well underway. It is headed in a positive direction that will help management better understand the results being delivered by staff; however, it is not sufficiently refined to achieve best practices in KPI design/reporting. It should be noted that IT staff have an excellent understanding of what the technology is capable of to create a "best practice" Transportation Operations business model. The overall data framework and the data collection processes are still under development and flexible.

KPIs and CityWorks Findings 7.3

The following paragraphs describe the findings of the KPI and CityWorks analysis and the ultimate recommendations are provided in the following subsection of this report.

- Some existing "accomplishment units" are out of date with respect to modern • operational technologies and core service activities.
- CityWorks asset management software is being implemented. The asset management focus creates linkages between the traditional maintenance management tracking of activities to specific assets or road sections (i.e., by geography).
- CityWorks is currently being implemented, since the deployment of the program is still evolving, it is an opportune time to ensure that CityWorks is implemented and organized to properly support budget setting and the monitoring of performance indicators.

Recommendations: KPIs and CityWorks

The following are the recommendations for the KPIs and CityWorks component of the program review:

Niagara should use the portfolio of KPIs set out in this program review to create R12. annual service delivery targets and report on actual results achieved.

To ensure the appropriate data is available to populate these KPIs, it will be necessary to track time spent on productive activities (i.e. directly generating work outputs) separately from non-productive time/activities (example: travel time).



7.4

R13. Niagara should implement a performance dashboard that reports on KPIs to support operational improvement and a results-based culture.

The dashboard tool should integrate enterprise financial data; CityWorks activity based operational data, and CityWorks asset management information.



Closure

8.0

The Region is a growth municipality that seeks to provide exceptional customer service to its residents. As Niagara continues to grow, there will be greater pressure to do more with fewer resources to accommodate this growth. The Region has a number of internal review methods and initiatives to continue to advance its culture of improvement, and the program reviews play an important role. Niagara must continue to implement improvement activities, measure performance and build the systems needed to ensure efficient and effective service delivery.

Upon reflection of the thirteen recommendations presented in this report, it is apparent that there are three overarching themes that should guide Council in directing the continuous improvement of Transportation Operations. To aid Council, the following is a compilation of all the thirteen recommendations arising from this program review, organized into these three themes:

A. Better Manage the Winter Control Budget and Consider Alternative Service Delivery after Due Diligence

- Reduce the winter control budget to the level required for a typical winter instead of a severe winter. [R6]
- Conduct a competitive service delivery exercise at the end of the current winter contract encompassing all established routes. [R8]

In support of the above principal recommendation, the following supporting recommendations are made to facilitate due diligence:

- i) Document the end time of winter events so it is possible to measure the time it takes to reclaim bare pavement. [R1]
- Restructure budgeting/accounting to separate core winter services from supporting services and allow accurate comparison of the costs of direct delivery versus contracted delivery for winter control. [R2]
- iii) Collect and use pass kilometre data to better monitor and report on winter control activities. [R3]



B. Strengthen Key Performance Indicators and Reporting

- Implement winter control achievement reports for winter storm events. [R4]
- Provide annual reports to Council on the level of service achievement for the winter season. [R5]
- Niagara should use the portfolio of KPIs set out in this program review to create annual service delivery targets and report on actual results achieved. [R12]
- Niagara should implement a performance dashboard that reports on KPIs to support operational improvement and a results-based culture. [R13]

C. Ensure Labour is Aligned to Niagara's Needs

- Prepare in advance for forecasted winter storm events by rescheduling staff shifts within the two week pay-period. [R7]
- Conduct an "activity-based" review of budget allocations based on the labour hours required to properly maintain infrastructure and complete reactive maintenance. [R9]
- Shortfalls in actual labour hours of maintenance completed should be offset with an increase in the following year so the Region does not fall behind in maintenance. [R10]
- The Region of Niagara should closely monitor its changing workforce demographics. [R11]

After this report is submitted to Council and direction is received by Management, it is imperative that an implementation plan be prepared to help Transportation Operations implement this program review's recommendations. This will provide Transportation Operations with the logical roadmap that it needs to achieve change management, continuous improvement, and demonstrate value-for-money.



References

AMEC Environment & Infrastructure (2014). Transportation Services Operations Delivery Review: Niagara Region.

AMEC Environment & Infrastructure (2013). Niagara Patrol Yards Study Retrofit, Smithville & Pelham Patrol Yards: Design Brief.

City of Ottawa, Office of the Auditor General (2015). Audit of Winter Operations: Capacity Planning and Performance Measurement.

Dillon Consulting and Performance Concepts for the Region of Waterloo (2014). Program Review for Transportation Operations.

Region of Halton, Corporate Services Department, Internal Audit (2012). Roads Maintenance Agreements Administration – Phase I Winter Maintenance and Patrol Follow Up Audit Report.

Region of Halton, Corporate Administration Office, Internal Audit (2015). Roads Maintenance Agreements Administration – Phase II Audit Report.

Region of Peel, Commissioner of Public Works (2015). Roads Operations and Maintenance Level of Service. Report to Council.

Region of Peel, Internal Audit (2010). Roads Maintenance Audit. Report to Audit Committee.

Region of Peel, Internal Audit (2010). Transportation – Contract Management Audit. Report to Audit Committee.



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Appendix A *Results from Focus Group Sessions*

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The results of the interviews have been summarized to provide a perspective on the organization, rather than any individual person's perspective.

The findings from the interviews and focus group sessions are organized into six areas: staff/resources; equipment (winter/summer); deployment of resources; business process and performance data; winter control levels of service; and, budget and business planning.

Staff/Resources

Staff report that they are able to achieve desired service levels for both winter and non-winter maintenance activities. They further noted that there is an emphasis on promoting a culture of "continuous improvement." Feedback indicated that there is on-going service delivery improvement dialogue between frontline staff and managers – and a resulting consensus from the interviews that it has resulted in positive changes to procedures and influenced good decisions (e.g., LEAN process, input into equipment purchases).

With respect to the winter control shift design, feedback indicated that the shifts seem reasonable to both management and frontline staff. As a result, the Region is generally able to keep the roads clean without calling in additional staff (except in severe storm events) and without too much down time. It is recognized by staff in Transportation Operations that 12 hour shifts are not desirable from an employee quality of life perspective; however, there is recognition that it "makes sense" and is necessary for the winter season.

Feedback indicated that overtime may warrant adjustments to shifts in some departments (i.e., signals); however, it was also noted that overtime might be largely on a project-specific basis and the overtime incurred for activities conducted through evenings may be the most effective way to minimize daytime traffic interruptions.

Feedback also indicated that there is a suitable match between the planned level of staffing and the actual number of staff. There are enough staff to keep the equipment on the roads, and no major concerns were raised with attendance issues or vacation scheduling (partly because a new policy requires staff to choose vacation times early in the year).

The Region's flexible model ensures adequate staffing and equipment deployment. Staff indicated that Transportation Operations shares resources between yards / units when needed, and this is both a common practice and effective.

Feedback also indicated that the seasonal transition of work force is well-matched to the needs of the Region. A reasonable level of staff utilization is maintained in both winter and summer seasons. This is achieved by various tactics:



- Some of the core winter staff are assigned to forestry and pavement markings and signs in the summer as well as road maintenance;
- There are "provisional weeks" for 12 hour snowplow shifts in shoulder seasons to allow flexibility, reduce unnecessary expense, and get more core work done; and,
- There are only two drivers per shift after hours until mid-December, and then there are three.

Equipment (Winter/Summer)

Staff expressed satisfaction with the Region's Transportations Operations equipment, which is fairly new and viewed as high quality.

They noted that the combination units used during winter (versus the split sand / snow units) has added efficiency to winter control activities. Although the equipment is new, staff acknowledged a long-term challenge as equipment ages simultaneously across its lifecycle – so staff expect increased maintenance costs and reduced reliability over time, and this may reduce the ability of the Region to adopt new technologies across the fleet's life-cycle.

Other new specialized equipment used for stone shouldering and grass cutting is also helping to improve productivity. Staff noted that there are still some additional pieces of equipment that are desired; for example, a "hot box" would allow asphalting with less dead time by eliminating travel back to yards for more material.

Furthermore, staff note that sharing more specialized equipment across the east and west yards is working well, and that utilization is high without undue wait times for equipment. Some large equipment is rented by Transportation Operations and staff acknowledge that this requires advance planning and equipment is not always available at optimal times.

Deployment of Resources

Staff indicated that two of the patrol yards are old and are very close to being obsolete. In 2004, the Region completed a study that determined that the existing patrol yards were deficient for the needs of the department. A follow up study completed in 2013, concluded that the Smithville and Pelham Yards, should be closed and replaced with one new yard. It is not clear that the current/proposed yard locations are optimal in terms of minimizing travel time to job sites prior to the commencement of core maintenance activities. Consideration should be given to the location of infrastructure and other assets (where work is executed) relative to the yard locations, since there is the potential to reduce travel time to job sites and convert this into core activity hours. It is outside the scope of this audit to determine yard locations or the viability of shared-use facilities with local municipality yards.



Staff expressed satisfaction with the effective sharing of staff and equipment across yards and business units. The east-west sharing of equipment is widely supported and supervisors do not hesitate to ask for an extra person when needed – which results in good collaboration, keeps everyone busy, and keeps projects moving forward. It was noted that the work order system, CityWorks helps to facilitate this by making it easier to move resources around (i.e., charge another yard staff person's time to your maintenance program).

Business Process and Performance Data

Staff indicated that there is room for improvement in some of Transportation Operations business processes and performance measurement. Existing Key Performance Indicators (KPIs) that measure the accomplishment of maintenance activities need refinement (e.g., the measurement units for ditching work is out of date). Staff also noted the need for some new KPIs to be developed.

There is a key measurement challenge for winter control. The Ontario Minimum Maintenance Standard (MMS) requires that the municipality achieve clean-up of roads within specified time frames and this is a key performance requirement for the Region's winter control activities. While staff believe they are meeting the MMS, a procedure is required so that the start and end times of winter storms can be tracked, which would then allow Transportation Operations to accurately measure its bare pavement times. The current method for tracking weather seems effective: the Region has seven weather stations and divides itself into four weather quadrants and this seems to work well. This system recognizes that the weather is not uniform across the Region at a given time; for example, a storm event may have ceased in Wainfleet whereas it may still be on-going in Niagara on the Lake.

The Region's maintenance platform, CityWorks, is still fairly new and only some staff are fully trained on the software. Transportation Operations staff indicated that they are continually adapting the software so that it works best for the Region's needs. There is the potential to adopt mobile applications for CityWorks that would allow for management of work orders, logging of work, etc., in the field which has potential efficiency benefits. It was noted, however, that efficiency gains may be lost if data connections are not reliable through the Region so the cost/benefit of investing in mobile applications needs to be carefully considered.



Winter Control⁶ Levels of Service

Regional staff expressed pride in the level of service they maintain for winter control. Staff believe that the service they provide is better than the service that is delivered by the contractor. However, there is no data to substantiate this and better reporting using standardized data and KPIs would provide an opportunity for a fair comparison between direct delivery and contracted-out delivery.

With respect to routing, there were various perspectives among staff. It is not clear among staff how the routes are established and whether they are the most efficient routes possible. Additionally, it is not clear if there is a better way to manage winter control on some of the Region's major urban roads, especially when maintenance activities coincide with peak traffic hours. If the Region proceeds with replacing the Smithville and Pelham patrol yards as proposed in 2013, it will have an impact on winter routing. The 2013 study indicated that the Region's routing times and travel distances to the routes from the patrol yard would increase, but that the Region would still be able to meet MMS requirements.

Budget and Business Planning

Staff indicated that there are different approaches/commitment to seasonal planning across the yards and that this could be coordinated better. One obstacle to long-term planning is that any digging must be preceded by a "locate" for buried utilities; however, the long and inconsistent time that it takes to obtain a locate creates a challenge for seasonal planning and specialized equipment scheduling.

Staff indicate that a stronger linkage could be made between budgeting and the CityWorks maintenance management system, resulting in an activity-based approached to budgeting based on labour hours to deliver maintenance at specific service levels. Geographically, the Region continues to grow and add new assets every year, and there is a need to recognize that this leads to increased maintenance requirements. Without regular maintenance, existing infrastructure can depreciate faster and may need to be replaced on a shorter lifecycle. Maintaining existing assets protects the infrastructure investments that the Region has already made.

⁶ There is no standalone theme for non-winter maintenance since no significant issues were raised during the interviews. Feedback on non-winter maintenance is incorporated into the other themes.

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Observations from the Focus Groups

As noted earlier, observations emanating from the interviews and focus groups do not lead to any specific recommendations since these sessions were intended to assist the program review team in focusing their analysis efforts. However, the following observations are offered by the consulting team to give context to the feedback received in each theme **and are based on the consultant's knowledge and experience with similar audits in other municipalities**,.

Staff/Resources

Niagara is doing well in terms of its staffing and resources: whereas other municipalities are trying to promote a culture of continuous improvement, this is already established at the Region. The scheduling flexibility of staff and high level of equipment deployment for maintenance is also places Niagara in a pool of municipalities that excel at managing their resources.

Equipment (Winter/Summer)

Niagara is ahead of many municipalities due to its inventory of new equipment; however, will face lifecycle challenges as the equipment ages simultaneously. The use of specialized equipment and the need for some other pieces of specialized equipment is not uncommon, and places Niagara on par with other municipalities.

Deployment of Resources

The concern about the location of yards emerges from time-to-time as all municipalities grow so this is to be expected for Niagara. If the Region proceeds with replacing the two existing patrol yards with one yard, the Region should consider and prepare for the impact this will have on travel time and routing. The sharing of equipment between yards is common and on par with other municipalities as a best practice.

Business Process and Performance Data

Stronger performance measurement is a common challenge for many municipal transportation operations divisions, primarily because many of them are still in a transition implementing asset management plans and making their maintenance management system fully operational across the business unit. With respect to KPIs, measuring clean-up times for winter control under Ontario's Minimum Maintenance Standard, and the integration of the CityWorks maintenance management system, Niagara is on par with other municipalities.

Winter Control Levels of Service

Many municipalities in Ontario do not have sufficient data to measure the winter control levels of service, although they have the mechanisms in place to do so (e.g., GPS on



maintenance vehicles, road patrollers, weather stations). Additionally, municipalities do not receive full reporting on their contracted-out services that would allow for a fair comparison against directly delivered services. In this regard, Niagara is also on par with other transportation operations.

Budget and Business Planning

There are a handful of municipalities in Ontario that are moving towards an activity-based budgeting approach (e.g., City of Kitchener, Regional Municipality of Waterloo); other municipalities are still using typical budgeting approaches (e.g., fixed percentage increase) that do not accurately reflect the costs involved to properly maintain assets year-over-year. With respect to services impacted by seasonal fluctuations – such as winter control – Niagara is considering a three-year blended average to help inform the budgeting process. Niagara is slightly ahead of other municipalities in regards to its budgeting and business planning by using a three-year blended average instead of a year-over-year approach.



Appendix B *Summary of Strengths, Weaknesses, Opportunities and Threats*

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The following table summarizes the analyses of this report in terms of "Strengths, Weaknesses, Opportunities, and Threats" (SWOT). The table also indicates the recommended strategic direction to respond to the SWOT item and identifies which recommendations are linked to each strategic direction.

Strengths	Strategic Direction	Recommendations
Collaboration, teamwork, and culture of "continuous improvement"	 Maintain culture of collaboration, teamwork, and "continuous improvement" 	R12, R13
Good communication between management and frontline staff	 Maintain open communication between management and frontline staff 	R13
Flexible resourcing (e.g. staff and equipment are shared across patrol yards, staffing during shoulder season linked to seasonal forecasts)	 Maintain/increase flexibility in resourcing 	R7
Workforce demographics are stable and management is conducting succession planning	 Continue to monitor demographics and conduct succession planning 	R11
Winter control model contributes to public safety in severe winters	5. Maintain high levels of winter control	R6
Weaknesses	Strategic Direction	Recommendations
Business processes and performance measurements are out of date	 Update business processes and performance measurement data 	R3, R12, R13
Need additional tracking/reporting on MMS (winter) by the contractor and the Region	 Improve tracking and reporting of MMS achievement for winter control 	R3, R4, R5

Table SWOT-1: Summary of Strengths, Weaknesses, Opportunities and Threats, and Strategic Directions



Direct comparison of costs and outcomes between the contractor and the Region not possible	 Improve accounting R1, R3, R4, R5 and reporting to enable better comparisons
Need more direct communication with Niagara Council regarding LOS/achievement and budget variance within the overall department budget	9. Improve R1, R2, R5 communication with Regional Council on LOS/achievements and budgeting
AVL data (tracking) for vehicles captures the movements of the vehicles but does not differentiate between time spent working (i.e. plowing or spreading materials) and travel time	10. Use AVL data to track R3 different vehicle activities for better winter system planning and results reporting
Region falls behind on surface/roadside maintenance (direct delivery) because resources are redeployed to other activities	11. Ensure surface and R9, R10 roadside maintenance is not neglected
Opportunities	Strategic Direction Recommendations
New asset management software – CityWorks is being implemented	12. Fully leverage R9, R12, R13 CityWorks to track activities to assets and to monitor and report on performance
Region is growing & adding new infrastructure/assets each year; unit costs have remained stable	13. Align business planning R9, R12, R13 with asset growth
Region's winter control budget capacity is sufficient for even the most severe winters (e.g. 2013-2014)	 14. Reduce winter control R6, R7, R8 budget to reflect a typical winter rather than a severe winter



Threats	Strategic Direction	Recommendations
Smithville and Pelham Patrol Yards are close to being obsolete	15. Have travel time data available to inform future decisions about patrol yard locations	R1, R3, R4, R9, R12, R13
Reliance on provincial "locates" can impact scheduling of personnel and equipment	16. Continue to request locates in sync with scheduling to the extent possible	N/A
Climate change is impacting weather patterns and increasing instances of severe weather	 17. Increase flexibility in winter control model; improve monitoring and reporting 	R1, R2, R3, R4, R7, R9, R12

