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**Subject:** Award of Tender 2020-T-6 Area Winter Maintenance

**Report to:** Public Works Committee

**Report date:** Tuesday, July 14, 2020

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## **Recommendations**

1. That Contract 2020-T-6 Area Winter Maintenance **BE AWARDED** to Steed and Evans Limited, based on year one pricing of \$3,605,378 (including 13% HST) for a ten (10) year term, and;
2. That the Regional Chair and Regional Clerk **BE AUTHORIZED** to execute the Contract and any required documents related thereto in a form satisfactory to the Director of Legal and Court Services.

## **Key Facts**

- The purpose of this report is to seek Council's approval to award Contract 2020-T-6, Area Winter Maintenance to Steed and Evans Limited for a ten (10) year term.
- The Procurement By-law 02-2016 as amended on February 28, 2019 requires Council approval for all tender awards in excess of \$5,000,000, which is the case with the cumulative value of this contract award.
- The procurement was undertaken in anticipation of the expiration of the current Area Winter Maintenance contract at the end of the current 2019 – 2020 winter season.
- A Request for Tender for Area Winter Maintenance Contract (Contract 2020-T-6) was issued to the following subset of prequalified bidders developed from Request for Prequalification (2019-RFPQ-301):
  - Steed and Evans Limited;
  - Integrated Maintenance & Operations Services Inc.
- As outlined in Appendix 1 appended to this report as Appendix 1 – 2010-T-6 Summary of Bids, one (1) bid submission from Steed and Evans Limited at a year one (1) bid price of \$3,190,600 (excluding taxes) was received and deemed compliant with the requirements of the Tender.

- The estimated cumulative value of this contract over the ten (10) year term is \$35,419,192 (excluding taxes).

## **Financial Considerations**

The estimated cumulative value of this contract over the ten (10) year term is \$35,419,192 (excluding taxes) with due consideration to annual adjustment for CPI and diesel fuel escalation.

In 2020 Council approved an operating budget for this contract in the amount of \$2,702,991. To date in 2020, \$1,830,382 has been spent on these services. With the award of this contract, it is anticipated that the actual costs for these services would exceed budget by approximately \$407,000 in 2020. The increase in the contract actuals compared to budget will be accommodated by the overall transportation services 2020 operating budget. As communicated in PWC-C 17-2020 Snowplow Costs (Appendix 6), to date winter maintenance savings of \$400,739 have been realized which will be used to offset this overage.

Through the annual budget approval process, staff will adjust future year operating budgets as needed, taking into consideration the new cost of this contract throughout the duration of the Contract term. Staff estimated there would be an increase of approximately fifteen percent (15%) in the 2021 budget forecast (See Appendix 4 - Multi Year Forecast) for this contract. Forecasted increases were based on additional legislated service level requirements and a review of other recent winter maintenance contract awards with MTO and other comparable Municipalities. The projected increase were based on the following:

- Increase in winter material costs;
- Increase in insurance costs;
- Increase in level of service to match legislation of mandated bike lane maintenance;
- Higher level of accountability in liquidated damage section;
- Increase costs of purchasing new winter vehicles;
- MBNC benchmarking indicated the following % increases from the 2017-18 winter seasons for other Municipalities.

ROAD309 Operating Cost for Winter Control of Roadways per Lane Km Maintained

Municipality	2018 Result	2017 Result	% Change
Durham	\$5,450.22	\$4,770.79	14.24 %
Halton	\$5,202.32	\$4,974.55	4.58 %
Hamilton	\$3,635.58	\$3,532.64	2.91 %
London	\$3,974.28	\$3,405.58	16.70 %
Niagara	\$4,413.43	\$4,060.28	8.70 %
Waterloo	\$4,729.31	\$4,088.91	15.66 %
York	\$6,622.97	\$5,621.76	17.81 %

Staff will recalibrate the operating budget each year based on best estimates of anticipated contract payments.

## Analysis

In April 23 2019, Council approved a second one year extension of the current Area Winter Maintenance Contract 2008-RFP-40 to provide staff with adequate time to complete a service delivery review. This extension is scheduled to expire prior to the start of the 2020 – 2021 Winter season (Appendix 2 – PW 18-2019 Winter Maintenance Extension). As part of this report the following amendment was accepted:

That an amending agreement with Steed and Evans Limited **BE PREPARED** by the Director of Legal and Court Services to exercise the *final* one year option and extend the contract end date to September 3, 2020, following Council approval.

### Operational Review:

In accordance with the recommendations outlined in the Value for Money Audit of Snowplowing, Road Maintenance and Landscaping Services – Final Report 15-2387, a competitive service delivery was completed in 2019.

Currently the Transportation Operations division operates within a “hybrid” business model during the winter season utilizing the Niagara Region, City of St. Catharines and an Area Maintenance Contractor forces.

As part of the analysis performed in 2019, Niagara Region Operation staff conducted a competitive service delivery exercise encompassing all established winter routes. As part of the routing analysis, Niagara Region evaluated all of the existing winter routes

and the total lane kilometers maintained and made strategic decisions on the overall routing strategy and areas of maintenance based on:

- current Niagara Region winter vehicle capacity and staff complement;
- geographical areas in proximity to the four (4) Regional Operation facilities;
- optimizing partnerships with Municipalities; and
- the award of an Area Maintenance Contract as part of a hybrid winter operations model.

Based on the analysis, in those areas that Niagara Region staff did not have the capacity to manage in-house, staff consulted with other local municipalities including Niagara-on-the-Lake, Wainfleet, Fort Erie, St Catharines, Lincoln and Port Colborne.

St Catharines indicated they could continue with present agreement but would not have capacity to manage any additional Niagara Region Roads. Port Colborne was the only other Municipality that indicated they had capacity to undertake any winter maintenance on Niagara Region Roads.

Staff have reviewed changes in pertinent legislation, Ontario Regulation 239/02 Minimum Maintenance Standards for Municipal Highways which includes Bike Lane standards for winter maintenance and have updated internal policies and procedures to reflect legislative changes and to incorporate the Transportation Master Plan objectives around Complete Streets.

Staff then developed a revised Hybrid business model based on the conclusions of the competitive service delivery exercise identified above and attached as, Appendix 3 - Winter Service Area Map. The findings of the operational review were considered/included in the 2020 RFPQ and tender processes to ensure Niagara Region's winter level of service met all current regulations and standards.

#### Request for Prequalification (RFPQ) Process:

Transportation and Procurement staff met on September 17, 2019 to identify the optimum procurement strategy and process which would be employed for this procurement. The team evaluated the merits of both a Request for Proposal and a Request for Prequalification followed by a Request for Tender process.

A prequalification process, followed by a competitive tender was selected as the preferred procurement strategy because it offered the best combination of procurement processes to provide the optimum balance of bidder capability, financial stability, staff resourcing to meet service levels and qualifications/experience in similar work coupled with providing Niagara Region with best value from a financial perspective.

Pursuant to consultation with Staff in Transportation Operations, procurement initiated a prequalification process, 2019-RFPQ-301, in November 2019 which included a minimum technical threshold of seventy-five percent (75%) of the evaluation criteria.

During this open Prequalification process, a total of three (3) addenda were issued to provide Proponents with responses to questions which they asked. Staff noted that none of the questions received suggested that further refinements outlined in the RFPQ document were necessary.

Pursuant to the prequalification process, a total of three (3) submissions were received, two (2) of which were deemed prequalified on February 20, 2020 as they had met the minimum technical threshold based on the stated evaluation criteria; Steed and Evans Limited and Integrated Maintenance & Operations Services Inc. In accordance with our stated process, on May 14, 2020, Niagara Region extended invitations to both prequalified bidders to bid on Contract 2020-T-06.

It should be noted that from the onset of the procurement, Staff did anticipate there could potentially be a limited number of Bidders who would be both qualified and capable of facilitating this contract in large part due to the significant requirements in terms of the scope and service level requirements. In this regard, Staff note that currently within the Niagara Region area there are only two (2) winter maintenance contracts of this magnitude (Niagara Region and MTO).

#### Request for Tender (RFT) Process:

To ensure Niagara Region's requirements were aligned with best practices and current market standards, the tender was developed with due consideration of Staff experience, a review of similar procurements conducted from other jurisdictions including the MTO's procurement documentation for winter maintenance and the outcomes from the competitive service delivery process which was initiated from the Value for Money Audit of Snowplowing, Road Maintenance and Landscaping Services.

In reviewing contracts of a similar nature from other Municipalities and the Ministry of Transportation (Region of Waterloo, Peel Halton East, Toronto-York and Niagara), a ten (10) year term was considered to be the best option:

- Ten (10) year term aligns the amortization of Contractor Fleet with the amortization of the Niagara Region Winter Fleet which allowed for an accurate comparisons of costs.
- The contractors' capitalization of a fleet in a competitive procurement process for a shorter term could potentially result in increased costs, making the value of this tender unaffordable within the Operating budget.
- Recommendations from the Office of the Auditor General of Ontario, Special Report on Winter Highway Maintenance, recommended that Contracts became longer in duration: Previous AMC contracts were for seven to nine years. The current performance-based MTO contracts are for nine (9) to 13 years.

The tender document Contract 2020-T-6 was posted on May 14 2020. While there was some delay in the targeted posting in large part due to COVID-19, staff considers the time afforded to Bidders to respond to the tender, and prepare for commencement of services following award sufficient. During this open tendering period, a total of one (1) addendum was issued on May 25, 2020 to provide Proponents with responses to questions which they asked. Staff noted that none of the questions received suggested that further refinements to the requirements and tendering timeline were necessary.

Pursuant to that public tendering process, a total of one (1) bid was received. Niagara Region's Procurement & Strategic Acquisitions division reviewed the bid received for compliance, and determined it to be compliant with the requirements of the tender document. In this second stage, the submission from Steed and Evans Limited is being recommended for award of this contract.

Of note, on the day before the closing date of Contract 2020-T-6, Niagara Region did receive a notice of no bid from one of the Prequalified Bidders.

Staff are confident that a fair, transparent and competitive procurement process was undertaken and as such are supportive of the recommendation being presented to Council.

Contract award requires resources from Corporate Services in order to finalize and approve the required contract documents for execution. Transportation Operations staff

will be providing resources throughout the length of the contract in order to manage the contract and conduct periodic audits of the Contractor's performance.

## **Alternatives Reviewed**

Three alternative solutions were reviewed:

1. Renew existing contract for an additional one (1) year term.
2. Tender existing winter maintenance service model in place for a ten year term.
3. Tender revised hybrid winter maintenance service model for a ten (10) year term based on routing analysis maximizing:
  - a) Capacity of Niagara Region Winter Fleet;
  - b) Capacity of Local Municipality Winter Fleets if available;
  - c) Adjusted Contract area to manage remainder of winter routes.

The preferred alternative was option three (3) to tender based on the results of the competitive service delivery exercise encompassing all established winter routes.

## **Relationship to Council Strategic Priorities**

Sustainable and Engaging Government, this winter maintenance tender shows a commitment to high quality, efficient, fiscally sustainable and coordinated core services activities.

Foster Partnerships, leveraging resources of other Municipalities with the Niagara Region resources maximizes capacity in an efficient cost effective manner.

## **Other Pertinent Reports**

Value for Money Audit of Snowplowing, Road Maintenance and Landscaping Services – Final Report 15-2387 (Appendix 5).

PW 18-2019 Winter Maintenance Extension (Appendix 2).

PWC-C 17-2020 Snowplow Costs (Appendix 6).

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**Prepared by:**

Shawn McCauley  
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Operations  
Public Works Department

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**Recommended by:**

Bruce Zvaniga, P.Eng.  
Commissioner of Public Works (Interim)  
Public Works Department

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**Submitted by:**

Ron Tripp, P.Eng.  
Acting Chief Administrative Officer

*This report was prepared in consultation with: Carolyn Ryall, Director Transportation Services, Brian McMahon, Program Financial Specialist, Donna Gibbs, Director Legal and Court Services and Bart Menage, Director Procurement and Strategic Acquisitions.*

**Appendices**

Appendix 1	2020-T-6 Summary of Bids
Appendix 2	PW 18-2019 Winter Maintenance Extension
Appendix 3	Winter Service Area Map
Appendix 4	Multi Year Forecast
Appendix 5	Value for Money Audit of Snowplowing, Road Maintenance and Landscaping Services – Final Report 15-2387
Appendix 6	PWC-C 17 -2020 Snowplow Costs



Appendix 1 2020-T-6 Area Winter  
Maintenance

	2020-2021	13%	Total
<b>Steed &amp; Evans Ltd</b>			
Year 1 Price	\$ 3,190,600	\$ 414,778.00	\$ 3,605,378
Total Estimated Contract Price ( excluding tax)	\$ -	\$ -	\$ 35,419,192

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**Subject:** Winter Maintenance Extension

**Report to:** Public Works Committee

**Report date:** Tuesday, April 16, 2019

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## Recommendations

1. That the amending agreement option to extend the term of the Area Winter Maintenance Services Contract under 2008-RFP-40 for an additional one year term ending September 3, 2020, as outlined in Appendix 1 of Report PW 18-2019, **BE APPROVED**;
2. That an amending agreement with Steed and Evans Limited **BE PREPARED** by the Director of Legal and Court Services to exercise the one year option and extend the contract end date to September 3, 2020, following Council approval; and
3. That the Chief Administrative Officer **BE AUTHORIZED** to execute the amending agreement with Steed and Evans Limited.

## Key Facts

- The purpose of this report is to seek approval to exercise the option agreed to as part of the first amending agreement to extend the terms of the Area Winter Maintenance Services Contract - 2008-RFP-40 (Contract) with Steed and Evans Limited for one additional winter season (2019-2020) for reasons outlined in this report.
- The Purchasing By-law 2016-02 requires that Council approve negotiation awards/extensions greater than \$1,000,000.
- The Contract negotiated in 2008 with Steed and Evans Limited was scheduled to expire on September 6, 2018.
- Staff proceeded with an amending agreement to extend the Contract for an additional winter season (2018-2019) and include an option for a further one year extension (2019-2020).
- The negotiation award extension (2018-2019) to Steed and Evans Limited was done in accordance with Purchasing By-law 2016-02 Section 19 (a) (vi) - the extension of an existing Contract being more effective than undertaking a formal procurement process – approved by the CAO under delegated authority in the fall of 2018 pursuant to Report GM 8-2018 for a total amount of \$2,599,822 before taxes and Consumer Price Index (CPI) increase.

## Financial Considerations

The amending agreement (Appendix 1) entered into with Steed and Evans Limited extended their contract to cover one additional winter season (2018-2019) and included an option for a further one year extension (2019-2020). Staff are now recommending to exercise the second one-year option on the 2019-2020 winter season. In year 11 (2018-2019), Steed and Evans Limited's contract increased by \$40,000 to cover increases to their insurance premiums plus the annual CPI increase of 2.5% (approximately \$63,995). In year 12 (2019-2020), only an annual CPI increase would be applied.

Funding for the Contract and anticipated Contract increases is provided for in the approved 2019 Transportation Services operating budget and will be provided for in the 2020 operating budget.

Transportation Operations winter maintenance budget totalling \$7,971,739 in 2016, \$8,482,487 in 2017 and \$8,301,562 in 2018 is divided into four (4) sections. A detailed budget breakdown is outlined in Appendix 2 comparing actuals to budget for calendar years 2016 - 2018. A summary of 2018 actual costs are noted below by section:

- 1) Niagara Region utilizes regional staff and equipment to provide winter maintenance to 990 lane kilometers of roadway with an actual cost of \$3,995,834 for the 2018 calendar year. It is important to note that this cost represents all vehicles and equipment, over a five-month period, within the Transportation Operations section. A more precise figure will be made available in the coming months once staff are further able to isolate work-specific tasks for each vehicle/equipment.
- 2) Area Winter Services Maintenance Contract utilizes Steed and Evans Limited staff and equipment to provide winter maintenance to 674 lane kilometers of roadway with an actual cost of \$2,821,368 for the 2018 calendar year.
- 3) City of St Catharines utilizes city staff and equipment to provide winter maintenance to 126 lane kilometers of roadway at a cost of \$348,617 for the 2018 calendar year.
- 4) Supporting winter services activities are delivered across the entire regional road network of 1790 lane kilometers with a budget of \$852,498 for the 2018 calendar year. Services such as snow fence erection and removal, winter sand cleanup and winter drainage are delivered through a combination of Niagara Region staff and outside contractors.

Niagara Region's actual costs in 2016 and 2017 are significantly lower than budgeted cost due to the milder winter conditions resulting in lower overtime costs and lower fuel usage. The 2018 calendar year costs are higher due to the increase in winter events

from January to April. The City of St. Catharines' actual costs are relatively constant from 2016 - 2018. The Contract, with Steeds and Evans Limited, (a fixed price plus contract) actual costs are relatively flat to budget costs with the slight variance attributed to adjustments for fuel and salt usage.

## Analysis

Niagara Region operates within a "hybrid" business model during the winter season utilizing the Niagara Region, City of St. Catharines and an Area Maintenance Contractor (currently Steed and Evans Limited) forces.

- Niagara Region Staff maintain 19 plow routes covering 990 lane kilometers of roadway.
- City of St. Catharines maintain 126 lane kilometers of Regional Roads through an amalgamation of Region Roads within in the City's own routing system.
- Steed and Evans Limited maintains 10 plow routes covering 674 lane kilometers.

As outlined in the Corporate Value for Money Audit of Snowplowing, Road Maintenance and Land Scaping Services eight (8) recommendations were provided concerning value-for-money, effective risk management and operational Improvement for winter control.

Several of these recommendations required staff to collect the necessary data, which will influence the terms of a new Area Winter Maintenance Services Contract.

- **R1: Document the end time of winter events so it is possible to measure the time it takes to reclaim bare pavement.**
  - Starting in 2016, Staff have collected this information and at the end of the 2018-2019 winter season will have three (3) complete winter seasons to analyse. This information measures timeframes for reclaiming bare pavement as per winter Maintenance Standards contained in Ontario Regulation 366/18. This data will be used to update our Level of Service documents to be included in the tendering of a new Area Maintenance Services contract.
- **R2: Restructuring budgeting/ accounting to separate core winter services from supporting services and allow accurate comparisons of the costs of direct delivery versus contracted delivery for winter control.**
  - The implementation of The Enhanced Financial Management Service has allowed Staff to streamline finance processes and provide comprehensive reporting capabilities. As shown in Appendix 1, Niagara Region winter control costs are in line with Steed and Evans Limited costs. At the end of the 2018-2019 winter season, Staff will have three (3) full years of data to analyse.
- **R3: Collect and use pass kilometer data to better monitor and report on winter control activities.**

- In 2016 staff began to collect this information and determined that comparing costs against actual lane kilometers was a more productive measure because it could be calculated utilizing our existing plow routes. This GIS data could be updated yearly to reflect any additions or subtractions of road segments throughout the year as indicated in Appendix 2.
- **R4: Implement winter control achievement reports for winter storm events.**
  - Niagara Region Staff have collected this information starting in the 2016–2017 winter season. In the 2017-2018 winter season Steed and Evans Limited also began collecting this data. This data measures the event responses by Niagara Region and its contracted service providers.
    - System wide winter event responses > 24 hours in duration;
    - System wide winter event responses < 24 hours in duration
    - Significant localized winter event responses > hours in duration.

This data will be used to update our Level of Service documents to be included in the tendering of a new Area Maintenance Services contract.

- **R5: Provide Annual reports to Council on the level of service achievement for the winter season.**
  - Staff have developed a process to collect the necessary data recommended over the last two winter seasons and will provide a report outlining these findings at the end of the 2018 - 2019 winter season.
- **R6: Reduce the Winter Control Budget to the level required for a typical winter instead of a severe winter.**
  - Through the annual budget approval process over the last three (3) years, staff have adjusted the budgets accordingly based on Council guidance.
- **R7: Prepare in advance for forecasted winter storm events by rescheduling staff shifts within the two-week pay period.**
  - Staff have adjusted winter shift schedules accordingly based on weather forecasts and the conditions outlined in the CUPE 1287 Collective Agreement.
- **R8: Conduct a competitive service delivery exercise at the end of the current winter contract encompassing all established routes.**
  - This analysis will be completed after the 2018 – 2019 winter season. Yard replacement/rehabilitation decisions at Niagara Region's Smithville and Pelham patrol yards will have to be taken into consideration as part of this analysis.

Staff have been in communication with the MTO on their new Contractor Directed Maintenance Contract model that commenced in August 2018. Staff will be reviewing

the effectiveness of this new contract throughout the 2018-2019 winter season with MTO staff in order to see if the principle concepts in this contract can be applied to Niagara Region's next Area Maintenance Services contract.

The Transportation Master Plan has put more emphasis on street scaping and active transportation. In the short term, by 2021, the Region will focus on implementing policies that will transform its approach to transportation, addressing existing constraints in the road system, filling in gaps in the active transportation network, and taking the next steps to plan for the major network needs for the future. Specifically, the early actions to be undertaken in the first five (5) years of the program include incorporating the Complete Streets approach in the Region's design process. Staff are gathering information on how these changes will impact winter maintenance costs.

The major objective for winter operations are to meet or exceed the Minimum Maintenance Standards for Municipal Highways (Ontario Provincial Regulation 239/02 – Municipal Act 2001). This regulation was amended May 3, 2018 to the Minimum Maintenance Standards for Municipal Highways O. Reg. 366/18 (Appendix 3). These amendments added maintenance sections on snow accumulation on bicycle lanes. Staff will be compiling data on additional maintenance costs associated with this change that will be incorporated into a new winter maintenance services contract to ensure compliance with the Act.

## **Alternatives Reviewed**

In 2017, staff considered issuing a two year contract to cover the 2018-2019 and 2019 – 2020 winter seasons. When reviewing this option, Staff felt it was an unreasonable expectation to ask a contractor to capitalize a fleet in a competitive procurement process for this short duration (2 years). It is Staff's recommendation to go forward with a procurement in the fall of 2019 for a new 10-year winter maintenance contract once the data collection analysis identified in the Value for Money Audit, as noted above, is completed, and staff can incorporate necessary changes in the new Area Maintenance Services Contract document. The new contract will commence in October 2020.

Steed and Evans Limited has indicated they have no concerns utilizing their existing fleet throughout the proposed extension.

## **Relationship to Council Strategic Priorities**

Moving people and goods: winter maintenance activities allow for the safe movement of vehicles and pedestrians throughout the Niagara Region.

## Other Pertinent Reports

- Value for Money Audit of Snowplowing, Roads Maintenance, and Landscaping Services – Final Report 15-2387

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### Prepared by:

Shawn McCauley, CRSS, C-Tech, B.B.E.  
Associate Director Transportation

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### Recommended by:

Catherine Habermehl  
Acting Commissioner  
Public Works Department

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### Submitted by:

Ron Tripp, P.Eng.  
Acting Chief Administrative Officer

*This report was prepared in consultation with Brian McMahon Program Financial Analyst, reviewed by Carolyn Ryall, Director Transportation Services and Curt Anderson, Manager Road and Bridge Operations.*

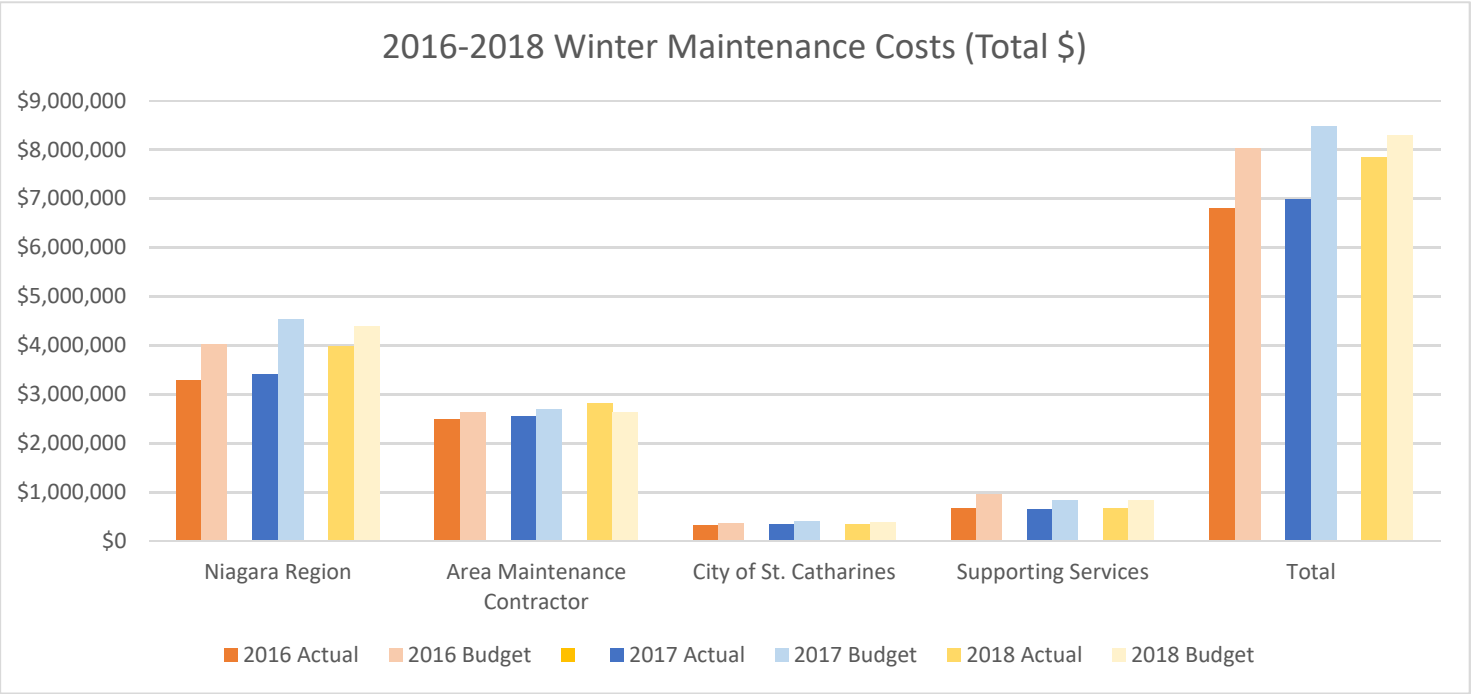
## Appendices

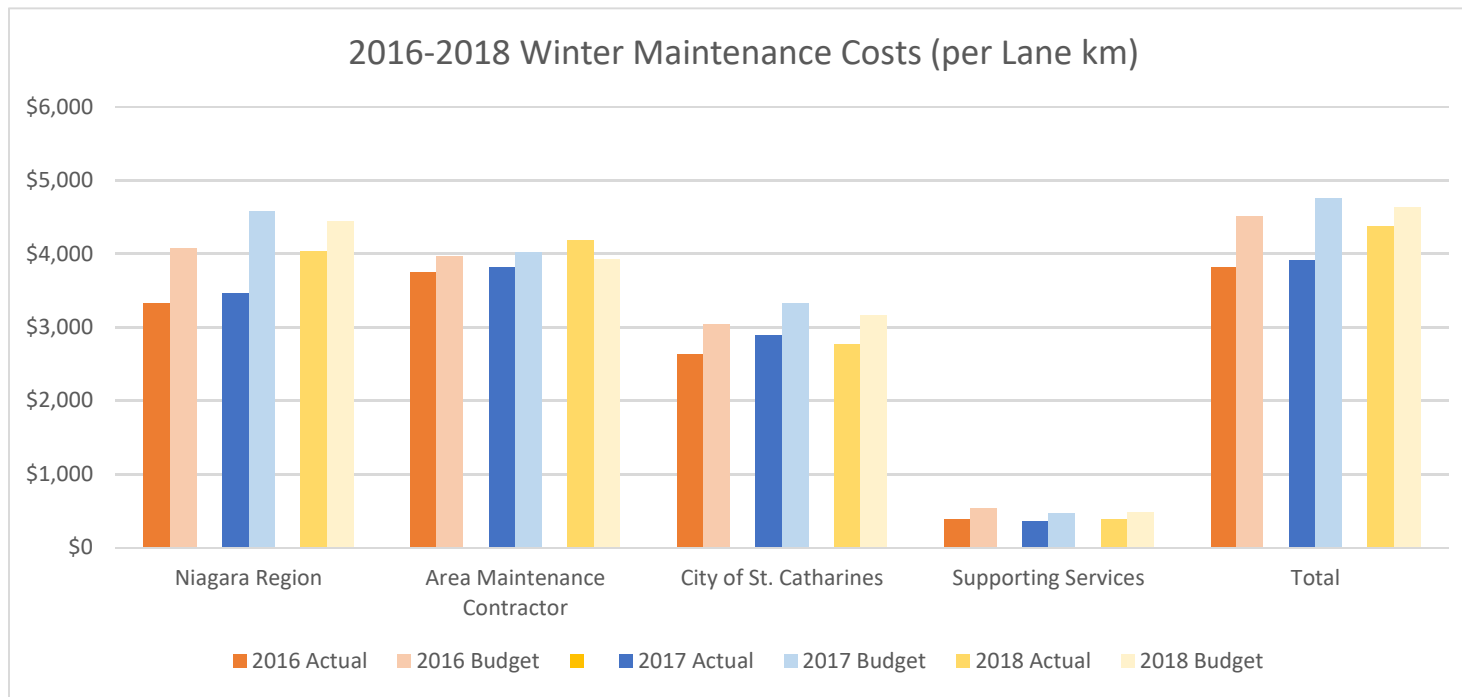
Appendix 1	Winter Maintenance Costs
Appendix 2	Amending Agreement 2008-RFP-40
Appendix 3	Minimum Maintenance Standards for Municipal Highways O. Reg. 366/18

2016-2018 Winter Maintenance Costs  
Budget vs Actuals

Budget vs Actual \$	Niagara Region			Area Maintenance Contractor			City of St. Catharines			Supporting Services			Total		
	989	989	990	668	670	674	125	122	126	1782	1781	1790	1782	1781	1790
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Total Lane Km's Maintained															
Year															
Winter Budget	4,037,881	4,533,599	4,399,064	2,650,000	2,700,000	2,650,000	381,000	406,000	400,000	968,289	842,888	852,498	8,037,170	8,482,487	8,301,562
Winter Actual	3,287,709	3,425,507	3,995,834	2,504,624	2,559,293	2,821,368	329,728	353,490	348,617	687,276	648,681	686,215	6,809,336	6,986,972	7,852,034
Budgeted Cost per lane Km	4,083	4,584	4,443	3,967	4,030	3,932	3,048	3,328	3,175	543	473	476	4,510	4,763	4,638
Actual Cost per Lane Km	3,324	3,464	4,036	3,749	3,820	4,186	2,638	2,897	2,767	386	364	383	3,821	3,923	4,387







PW 18-2019 Appendix 2

## AMENDING AGREEMENT

**THIS AGREEMENT** made as of the 4<sup>th</sup> day of September, 2018.

**BETWEEN:**

**THE REGIONAL MUNICIPALITY OF NIAGARA**

(Hereinafter called the "**Region**")

- and -

**STEED AND EVANS LIMITED**

(Hereinafter called the "**Contractor**")

**WHEREAS** by an Agreement dated the 6<sup>th</sup> day of October, 2008 (hereinafter called the "Original Agreement"), the Region and the Contractor agreed that the Contractor shall provide Area Winter Maintenance Services under 2008-RFP-40 (hereinafter called the "Project");

**AND WHEREAS** the parties hereto desire to amend the Original Agreement to extend the term of the Original Agreement;

**NOW THEREFORE** this in consideration of the sum of TWO DOLLARS (\$2.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. The Original Agreement shall be amended as of the date set out above for one additional year ending on September 3, 2019 with the option in favour of Niagara Region and at Niagara Region's sole and absolute discretion to extend the term for one additional one year term ending on September 3, 2020.
2. Payment to the Contractor shall be in accordance with the terms and conditions outlined in the Original Agreement, save an except for a one-time increase to the annual payment of \$40,000.00 to cover increased insurance premiums. The parties agree the applicable aggregate fee, inclusive of the \$40,000.00 increase, for the period September 4, 2018 to September 3<sup>rd</sup>, 2019, is \$2,599,822.11.
3. Section 2.5 Contract Security in 2008-RFP-40 forming part of the Original Agreement shall be amended by requiring the substitution of a Performance Bond in the amount of \$2,000,000.00 in place of the Original Agreement requirement of a combination Performance Bond and Letter of Credit, which replacement Performance Bond shall will remain in effect for the duration of the contract.
4. The terms, covenants, provisos, and stipulations in the Original Agreement are hereby confirmed in full force save and except such modifications only as are necessary to make them applicable to this Amending Agreement.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement.

**THE REGIONAL MUNICIPALITY OF NIAGARA**

Per:



Name: Carmelo D'Angelo, BSC, MPA

Title: Chief Administrative Officer

I have the authority to bind the Corporation.

**STEED AND EVANS LIMITED**

Per:

BOB HUNTER 

Name:

CONSTRUCTION MGR

Title:

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Name:

Title:

We have the authority to bind the Corporation.

PW 18-2019 Appendix 3

# O. Reg. 366/18: MINIMUM MAINTENANCE STANDARDS FOR MUNICIPAL HIGHWAYS

filed May 3, 2018 under [Municipal Act, 2001, S.O. 2001, c. 25](#)

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ontario regulation 366/18

made under the

Municipal Act, 2001

Made: May 2, 2018

Filed: May 3, 2018

Published on e-Laws: May 3, 2018

Printed in *The Ontario Gazette*: May 19, 2018

Amending O. Reg. 239/02

(MINIMUM MAINTENANCE STANDARDS FOR MUNICIPAL HIGHWAYS)

1. (1) The definition of “surface” in subsection 1 (1) of Ontario Regulation 239/02 is amended by striking out “roadway or shoulder” and substituting “sidewalk, roadway or shoulder”.

**(2) Subsection 1 (1) of the Regulation is amended by adding the following definitions:**

“bicycle facility” means the on-road and in-boulevard cycling facilities listed in Book 18 of the Ontario Traffic Manual;

“bicycle lane” means,

(a) a portion of a roadway that has been designated by pavement markings or signage for the preferential or exclusive use of cyclists, or

(b) a portion of a roadway that has been designated for the exclusive use of cyclists by signage and a physical or marked buffer;

“encroachment” means anything that is placed, installed, constructed or planted within the highway that was not placed, installed, constructed or planted by the municipality;

“pothole” means a hole in the surface of a roadway caused by any means, including wear or subsidence of the road surface or subsurface;

“sidewalk” means the part of the highway specifically set aside or commonly understood to be for pedestrian use, typically consisting of a paved surface but does not include crosswalks, medians, boulevards, shoulders or any part of the sidewalk where cleared snow has been deposited;

“significant weather event” means an approaching or occurring weather hazard with the potential to pose a significant danger to users of the highways within a municipality;\_

“utility” includes any air, gas, water, electricity, cable, fiber-optic, telecommunication or traffic control system or subsystem, fire hydrants, sanitary sewers, storm sewers, property bars and survey monuments;

“utility appurtenance” includes maintenance holes and hole covers, water shut-off covers and boxes, valves, fittings, vaults, braces, pipes, pedestals, and any other structures or items that form part of or are an accessory part of any utility;

“weather hazard” means the weather hazards determined by Environment Canada as meeting the criteria for the issuance of an alert under its Public Weather Alerting Program.

**(3) Subsections 1 (2) and (3) of the Regulation are amended by striking out “annual” wherever it appears.**

**(4) Subsection 1 (4) of the Regulation is revoked and the following substituted:**

(4) For the purposes of this Regulation, unless otherwise indicated in a provision of this Regulation, a municipality is deemed to be aware of a fact if, in the absence of actual knowledge of the fact, circumstances are such that the municipality ought reasonably to be aware of the fact.

**(5) The Table to section 1 of the Regulation is revoked and the following substituted:**

TABLE  
CLASSIFICATION OF HIGHWAYS

Column 1 Average Daily Traffic (number of motor vehicles)	Column 2 91 - 100 km/h speed limit	Column 3 81 - 90 km/h speed limit	Column 4 71 - 80 km/h speed limit	Column 5 61 - 70 km/h speed limit	Column 6 51 - 60 km/h speed limit	Column 7 41 - 50 km/h speed limit	Column 8 1 - 40 km/h speed limit
53,000 or more	1	1	1	1	1	1	1
23,000 - 52,999	1	1	1	2	2	2	2
15,000 - 22,999	1	1	2	2	2	3	3
12,000 - 14,999	1	1	2	2	2	3	3
10,000 - 11,999	1	1	2	2	3	3	3
8,000 - 9,999	1	1	2	3	3	3	3
6,000 - 7,999	1	2	2	3	3	4	4
5,000 - 5,999	1	2	2	3	3	4	4
4,000 - 4,999	1	2	3	3	3	4	4
3,000 - 3,999	1	2	3	3	3	4	4
2,000 - 2,999	1	2	3	3	4	5	5
1,000 - 1,999	1	3	3	3	4	5	5
500 - 999	1	3	4	4	4	5	5
200 - 499	1	3	4	4	5	5	6
50 - 199	1	3	4	5	5	6	6
0 - 49	1	3	6	6	6	6	6



**2. The Regulation is amended by adding the following section:**

Purpose

**2.1** The purpose of this Regulation is to clarify the scope of the statutory defence available to a municipality under clause 44 (3) (c) of the Act by establishing maintenance standards which are non-prescriptive as to the methods or materials to be used in complying with the standards but instead describe a desired outcome.

**3. (1) The heading before section 3 of the Regulation is amended by striking out “MINIMUM” and substituting “MAINTENANCE”**

**(2) Subsections 3 (1) and (2) of the Regulation are amended by striking out “minimum” wherever it appears.**

**(3) Subsection 3 (4) of the Regulation is amended by striking out “section 16.1” and substituting “section 16.1, 16.2, 16.3 or 16.4”.**

**4. Subsections 3.1 (1) and (2) of the Regulation are amended by striking out “minimum” wherever it appears.**

**5. (1) Subsection 4 (1) of the Regulation is amended by striking out the portion before clause (a) and substituting the following:**

Snow accumulation, roadways

(1) Subject to section 4.1, the standard for addressing snow accumulation on roadways is,

.....

**(2) Subsection 4 (3) of the Regulation is amended by adding “and, if applicable, lane width under clause (1) (b),” after “roadway” in the portion before paragraph 1.**

**(3) Subsection 4 (4) of the Regulation is amended by adding “and lane width” after “roadway” in the portion before clause (a).**

**(4) Subsections 4 (5) and (6) of the Regulation are revoked and the following substituted:**

(5) For the purposes of this section, addressing snow accumulation on a roadway includes,

(a) plowing the roadway;

(b) salting the roadway;

(c) applying abrasive materials to the roadway;

(d) applying other chemical or organic agents to the roadway;

(e) any combination of the methods described in clauses (a) to (d);

(6) This section does not apply to that portion of the roadway,

- (a) designated for parking;
- (b) consisting of a bicycle lane or other bicycle facility; or
- (d) used by a municipality for snow storage;

**(5) The heading of the Table to section 4 of the Regulation is revoked and the following substituted:**

#### SNOW ACCUMULATION - ROADWAYS

#### **7. The Regulation is amended by adding the following sections:**

##### Snow accumulation on roadways, significant weather event

**4.1** (1) If a municipality declares a significant weather event relating to snow accumulation, the standard for addressing snow accumulation on roadways until the declaration of the end of the significant weather event is,

- (a) to monitor the weather in accordance with section 3.1; and
  - (b) if deemed practicable by the municipality, to deploy resources to address snow accumulation on roadways, starting from the time that the municipality deems appropriate to do so.
- (2) If the municipality complies with subsection (1), all roadways within the municipality are deemed to be in a state of repair with respect to snow accumulation until the applicable time in the Table to section 4 expires following the declaration of the end of the significant weather event by the municipality.
- (3) Following the end of the weather hazard in respect of which a significant weather event was declared by a municipality under subsection (1), the municipality shall,
- (a) declare the end of the significant weather event when the municipality determines it is appropriate to do so; and
  - (b) address snow accumulation on roadways in accordance with section 4.

##### Snow accumulation, bicycle lanes

**4.2** (1) Subject to section 4.3, the standard for addressing snow accumulation on bicycle lanes is,

- (a) after becoming aware of the fact that the snow accumulation on a bicycle lane is greater than the depth set out in the Table to this section, to deploy resources as soon as practicable to address the snow accumulation; and
  - (b) after the snow accumulation has ended, to address the snow accumulation so as to reduce the snow to a depth less than or equal to the depth set out in the Table to this section to provide a minimum bicycle lane width of the lesser of 1 metre or the actual bicycle lane width.
- (2) If the depth of snow accumulation on a bicycle lane is less than or equal to the depth set out in the Table to this section, the bicycle lane is deemed to be in a state of repair in respect of snow accumulation.

(3) For the purposes of this section, the depth of snow accumulation on a bicycle lane and, if applicable, lane width under clause (1) (b), may be determined in the same manner as set out in subsection 4 (4) and by the persons mentioned in subsection 4 (3), with necessary modifications.

(4) For the purposes of this section, addressing snow accumulation on a bicycle lane includes,

- (a) plowing the bicycle lane;
- (b) salting the bicycle lane;
- (c) applying abrasive materials to the bicycle lane;
- (d) applying other chemical or organic agents to the bicycle lane;
- (e) sweeping the bicycle lane; or
- (f) any combination of the methods described in clauses (a) to (e).

#### TABLE

##### Snow Accumulation – Bicycle Lanes

Column 1	Column 2	Column 3
Class of Highway or Adjacent Highway	Depth	Time
1	2.5 cm	8 hours
2	5 cm	12 hours
3	8 cm	24 hours
4	8 cm	24 hours
5	10 cm	24 hours

##### Snow accumulation on bicycle lanes, significant weather event

**4.3** (1) If a municipality declares a significant weather event relating to snow accumulation, the standard for addressing snow accumulation on bicycle lanes until the declaration of the end of the significant weather event is,

- (a) to monitor the weather in accordance with section 3.1; and
- (b) if deemed practicable by the municipality, to deploy resources to address snow accumulation on bicycle lanes, starting from the time that the municipality deems appropriate to do so.

(2) If the municipality complies with subsection (1), all bicycle lanes within the municipality are deemed to be in a state of repair with respect to snow accumulation until the applicable time in the Table to section 4.2 expires following the declaration of the end of the significant weather event by the municipality.

(3) Following the end of the weather hazard in respect of which a significant weather event was declared by a municipality under subsection (1), the municipality shall,

(a) declare the end of the significant weather event when the municipality determines it is appropriate to do so; and

(b) address snow accumulation on bicycle lanes in accordance with section 4.2.

**8. Section 5 of the Regulation is revoked and the following substituted:**

Ice formation on roadways and icy roadways

**5.** (1) The standard for the prevention of ice formation on roadways is doing the following in the 24-hour period preceding an alleged formation of ice on a roadway:

1. Monitor the weather in accordance with section 3.1.

2. Patrol in accordance with section 3.

3. If the municipality determines, as a result of its activities under paragraph 1 or 2, that there is a substantial probability of ice forming on a roadway, treat the roadway, if practicable, to prevent ice formation within the time set out in Table 1 to this section, starting from the time that the municipality determines is the appropriate time to deploy resources for that purpose.

(2) If the municipality meets the standard set out in subsection (1) and, despite such compliance, ice forms on a roadway, the roadway is deemed to be in a state of repair until the applicable time set out in Table 2 to this section expires after the municipality becomes aware of the fact that the roadway is icy.

(3) Subject to section 5.1, the standard for treating icy roadways is to treat the icy roadway within the time set out in Table 2 to this section, and an icy roadway is deemed to be in a state of repair until the applicable time set out in Table 2 to this section expires after the municipality becomes aware of the fact that a roadway is icy.

(4) For the purposes of this section, treating a roadway means applying material to the roadway, including but not limited to, salt, sand or any combination of salt and sand.

(5) For greater certainty, this section applies in respect of ice formation on bicycle lanes on a roadway, but does not apply to other types of bicycle facilities.

TABLE 1  
ice formation prevention

Class of Highway	Time
1	6 hours
2	8 hours
3	16 hours
4	24 hours
5	24 hours

TABLE 2  
Treatment of ICY ROADWAYS

Class of Highway	Time
1	3 hours
2	4 hours
3	8 hours
4	12 hours
5	16 hours

Icy roadways, significant weather event

**5.1** (1) If a municipality declares a significant weather event relating to ice, the standard for treating icy roadways until the declaration of the end of the significant weather event is,

(a) to monitor the weather in accordance with section 3.1; and

(b) if deemed practicable by the municipality, to deploy resources to treat icy roadways, starting from the time that the municipality deems appropriate to do so.

(2) If the municipality complies with subsection (1), all roadways within the municipality are deemed to be in a state of repair with respect to any ice which forms or may be present until the applicable time in Table 2 to section 5 expires after the declaration of the end of the significant weather event by the municipality.

(3) Following the end of the weather hazard in respect of which a significant weather event was declared by a municipality under subsection (1), the municipality shall,

(a) declare the end of the significant weather event when the municipality determines it is appropriate to do so; and

(b) treat icy roadways in accordance with section 5.

**8. (1) Subsection 6 (1) of the Regulation is amended by striking out “minimum”.**

**(2) Section 6 of the Regulation is amended by adding the following subsections:**

(1.1) For the purposes of this section, the surface area and depth of a pothole may be determined in accordance with subsections (1.2) and (1.3), as applicable, by a municipal employee, agent or contractor whose duties or responsibilities include one or more of the following:

1. Patrolling highways.

2. Performing highway maintenance activities.

3. Supervising staff who perform activities described in paragraph 1 or 2.

(1.2) The depth and surface area of a pothole may be determined by,

(a) performing an actual measurement; or

(b) performing a visual estimate.

(1.3) For the purposes of this section, the surface area of a pothole does not include any area that is merely depressed and not yet broken fully through the surface of the roadway.

**9. (1) Subsections 7 (1) and (2) of the Regulation are revoked and the following substituted:**

**Shoulder drop-offs**

(1) If a shoulder drop-off is deeper than 8 cm, for a continuous distance of 20 metres or more, the standard is to repair the shoulder drop-off within the time set out in the Table to this section after becoming aware of the fact.

(2) A shoulder drop-off is deemed to be in a state of repair if its depth is less than 8 cm.

**(2) The Table to section 7 of the Regulation is revoked and the following substituted:**

TABLE  
SHOULDER DROP-OFFS

Class of Highway	Time
1	4 days
2	4 days
3	7 days
4	14 days
5	30 days

**10. (1) Subsections 8 (1) and (2) of the Regulation are revoked and the following substituted:**

**Cracks**

(1) If a crack on the paved surface of a roadway is greater than 5 cm wide and 5 cm deep for a continuous distance of three metres or more, the standard is to repair the crack within the time set out in the Table to this section after becoming aware of the fact.

(2) A crack is deemed to be in a state of repair if its width or depth is less than or equal to 5 cm.

**(2) The Table to section 8 of the Regulation is revoked and the following substituted:**

TABLE  
CRACKS

Column 1	Column 2
Class of Highway	Time
1	30 days
2	30 days
3	60 days

4	180 days
5	180 days

**11. Subsection 9 (1) of the Regulation is amended by striking out “minimum”.**

**12. Subsections 10 (0.1), (1), (2), (3), (4), (5) and (6) of the Regulation are revoked and the following substituted:**

#### Luminaires

(1) The standard for the frequency of inspecting all luminaires to check to see that they are functioning is once per calendar year, with each inspection taking place not more than 16 months from the previous inspection.

(2) For conventional illumination, if three or more consecutive luminaires on the same side of a highway are not functioning, the standard is to repair the luminaires within the time set out in the Table to this section after becoming aware of the fact.

(3) For conventional illumination and high mast illumination, if 30 per cent or more of the luminaires on any kilometre of highway are not functioning, the standard is to repair the luminaires within the time set out in the Table to this section after becoming aware of the fact.

(4) Despite subsection (2), for high mast illumination, if all of the luminaires on consecutive poles on the same side of a highway are not functioning, the standard is to deploy resources as soon as practicable after becoming aware of the fact to repair the luminaires.

(5) Despite subsections (1), (2) and (3), for conventional illumination and high mast illumination, if more than 50 per cent of the luminaires on any kilometre of a Class 1 highway with a speed limit of 90 kilometres per hour or more are not functioning, the standard is to deploy resources as soon as practicable after becoming aware of the fact to repair the luminaires.

(6) Luminaires are deemed to be in a state of repair,

(a) for the purpose of subsection (2), if the number of non-functioning consecutive luminaires on the same side of a highway does not exceed two;

(b) for the purpose of subsection (3), if more than 70 per cent of luminaires on any kilometre of highway are functioning;

(c) for the purpose of subsection (4), if one or more of the luminaires on consecutive poles on the same side of a highway are functioning;

(d) for the purpose of subsection (5), if more than 50 per cent of luminaires on any kilometre of highway are functioning.

**13. The Regulation is amended by striking out “minimum” wherever it appears in the following provisions:**

**1. Sections 11 to 16.**

**2. Subsection 16.1 (1).****14. Subsections 16.1 (2), (2.1), (3) and (4) of the Regulation are revoked and the following substituted:**

(2) If a surface discontinuity on or within a sidewalk exceeds two centimetres, the standard is to treat the surface discontinuity within 14 days after acquiring actual knowledge of the fact.

(3) A surface discontinuity on or within a sidewalk is deemed to be in a state of repair if it is less than or equal to two centimetres.

(4) For the purpose of subsection (2), treating a surface discontinuity on or within a sidewalk means taking reasonable measures to protect users of the sidewalk from the discontinuity, including making permanent or temporary repairs, alerting users' attention to the discontinuity or preventing access to the area of discontinuity.

(5) In this section,

“surface discontinuity” means a vertical discontinuity creating a step formation at any joint or crack in the surface of the sidewalk or any vertical height difference between a utility appurtenance found on or within the sidewalk and the surface of the sidewalk.

**15. The Regulation is amended by adding the following sections.****Encroachments, area adjacent to sidewalk**

**16.2** (1) The standard for the frequency of inspecting an area adjacent to a sidewalk to check for encroachments is once per calendar year, with each inspection taking place not more than 16 months from the previous inspection.

(2) The area adjacent to a sidewalk that has been inspected in accordance with subsection (1) is deemed to be in a state of repair in respect of any encroachment present.

(3) For greater certainty, the area adjacent to a sidewalk begins at the outer edges of a sidewalk and ends at the lesser of the limit of the highway, the back edge of a curb if there is a curb and a maximum of 45 cm.

(4) The area adjacent to a sidewalk is deemed to be in a state of repair in respect of any encroachment present unless the encroachment is determined by a municipality to be highly unusual given its character and location or to constitute a significant hazard to pedestrians.

(5) If a municipality determines that an encroachment is highly unusual given its character and location or constitutes a significant hazard to pedestrians, the standard is to treat the encroachment within 28 days after making such a determination, and the encroachment is deemed in a state of repair for 28 days from the time of the determination by the municipality.

(6) For the purpose of subsection (4), treating an encroachment means taking reasonable measures to protect users, including making permanent or temporary repairs, alerting users' attention to the encroachment or preventing access to the area of the encroachment.

**Snow accumulation on sidewalks**



**16.3** (1) Subject to section 16.4, the standard for addressing snow accumulation on a sidewalk after the snow accumulation has ended is,

a) to reduce the snow to a depth less than or equal to 8 centimetres within 48 hours; and

b) to provide a minimum sidewalk width of 1 metre.

(2) If the depth of snow accumulation on a sidewalk is less than or equal to 8 centimetres, the sidewalk is deemed to be in a state of repair in respect of snow accumulation.

(3) If the depth of snow accumulation on a sidewalk exceeds 8 centimetres while the snow continues to accumulate, the sidewalk is deemed to be in a state of repair with respect to snow accumulation, until 48 hours after the snow accumulation ends.

(4) For the purposes of this section, the depth of snow accumulation on a sidewalk may be determined in the same manner as set out in subsection 4 (4) and by the persons mentioned in subsection 4 (3) with necessary modifications.

(5) For the purposes of this section, addressing snow accumulation on a sidewalk includes,

(a) plowing the sidewalk;

(b) salting the sidewalk;

(c) applying abrasive materials to the sidewalk;

(d) applying other chemical or organic agents to the sidewalk; or

(e) any combination of the methods described in clauses (a) to (d).

Snow accumulation on sidewalks, significant weather event

**16.4** (1) If a municipality declares a significant weather event relating to snow accumulation, the standard for addressing snow accumulation on sidewalks until the declaration of the end of the significant weather event is,

(a) to monitor the weather in accordance with section 3.1; and

(b) if deemed practicable by the municipality, to deploy resources to address snow accumulation on sidewalks starting from the time that the municipality deems appropriate to do so.

(2) If the municipality complies with subsection (1), all sidewalks within the municipality are deemed to be in a state of repair with respect to any snow present until 48 hours following the declaration of the end of the significant weather event by the municipality.

(3) Following the end of the weather hazard in respect of which a significant weather event was declared by a municipality under subsection (1), the municipality shall,

(a) declare the end of the significant weather event when the municipality determines it is appropriate to do so; and

(b) address snow accumulation on sidewalks in accordance with section 16.3.

### Ice formation on sidewalks and icy sidewalks

**16.5** (1) Subject to section 16.6, the standard for the prevention of ice formation on sidewalks is to,

(a) monitor the weather in accordance with section 3.1 in the 24-hour period preceding an alleged formation of ice on a sidewalk; and

(b) treat the sidewalk if practicable to prevent ice formation or improve traction within 48 hours if the municipality determines that there is a substantial probability of ice forming on a sidewalk, starting from the time that the municipality determines is the appropriate time to deploy resources for that purpose.

(2) If ice forms on a sidewalk even though the municipality meets the standard set out in subsection (1), the sidewalk is deemed to be in a state of repair in respect of ice until 48 hours after the municipality first becomes aware of the fact that the sidewalk is icy.

(3) The standard for treating icy sidewalks after the municipality becomes aware of the fact that a sidewalk is icy is to treat the icy sidewalk within 48 hours, and an icy sidewalk is deemed to be in a state of repair for 48 hours after it has been treated.

(4) For the purposes of this section, treating a sidewalk means applying materials including salt, sand or any combination of salt and sand to the sidewalk.

### Icy sidewalks, significant weather event

**16.6** (1) If a municipality declares a significant weather event relating to ice, the standard for addressing ice formation or ice on sidewalks until the declaration of the end of the significant weather event is,

(a) to monitor the weather in accordance with section 3.1; and

(b) if deemed practicable by the municipality, to deploy resources to treat the sidewalks to prevent ice formation or improve traction, or treat the icy sidewalks, starting from the time that the municipality deems appropriate to do so.

(2) If the municipality complies with subsection (1), all sidewalks within the municipality are deemed to be in a state of repair with respect to any ice which forms or is present until 48 hours after the declaration of the end of the significant weather event by the municipality.

(3) Following the end of the weather hazard in respect of which a significant weather event was declared by a municipality under subsection (1), the municipality shall,

(a) declare the end of the significant weather event when the municipality determines it is appropriate to do so; and

(b) address the prevention of ice formation on sidewalks or treat icy sidewalks in accordance with section 16.5.

### Winter sidewalk patrol

**16.7** (1) If it is determined by the municipality that the weather monitoring referred to in section 3.1 indicates that there is a substantial probability of snow accumulation on sidewalks in excess of 8 cm, ice

formation on sidewalks or icy sidewalks, the standard for patrolling sidewalks is to patrol sidewalks that the municipality selects as representative of its sidewalks at intervals deemed necessary by the municipality.

(2) Patrolling a sidewalk consists of visually observing the sidewalk, either by driving by the sidewalk on the adjacent roadway or by driving or walking on the sidewalk or by electronically monitoring the sidewalk, and may be performed by persons responsible for patrolling roadways or sidewalks or by persons responsible for or performing roadway or sidewalk maintenance activities.

### **Closure of a highway**

**16.8** (1) When a municipality closes a highway or part of a highway pursuant to its powers under the Act, the highway is deemed to be in a state of repair in respect of all conditions described in this Regulation from the time of the closure until the highway is re-opened by the municipality.

(2) For the purposes of subsection (1), a highway or part of a highway is closed on the earlier of,

(a) when a municipality passes a by-law to close the highway or part of the highway; and

(b) when a municipality has taken such steps as it determines necessary to temporarily close the highway or part of a highway.

### **Declaration of significant weather event**

**16.9.** A municipality declaring the beginning of a significant weather event or declaring the end of a significant weather event under this Regulation shall do so in one or more of the following ways:

1. By posting a notice on the municipality's website.

2. By making an announcement on a social media platform, such as Facebook or Twitter.

3. By sending a press release or similar communication to internet, newspaper, radio or television media.

4. By notification through the municipality's police service.

5. By any other notification method required in a by-law of the municipality.

### **Commencement**

16. This Regulation comes into force on the day it is filed.

Made by:

Kathryn McGarry

Minister of Transportation

Date made: May 2, 2018

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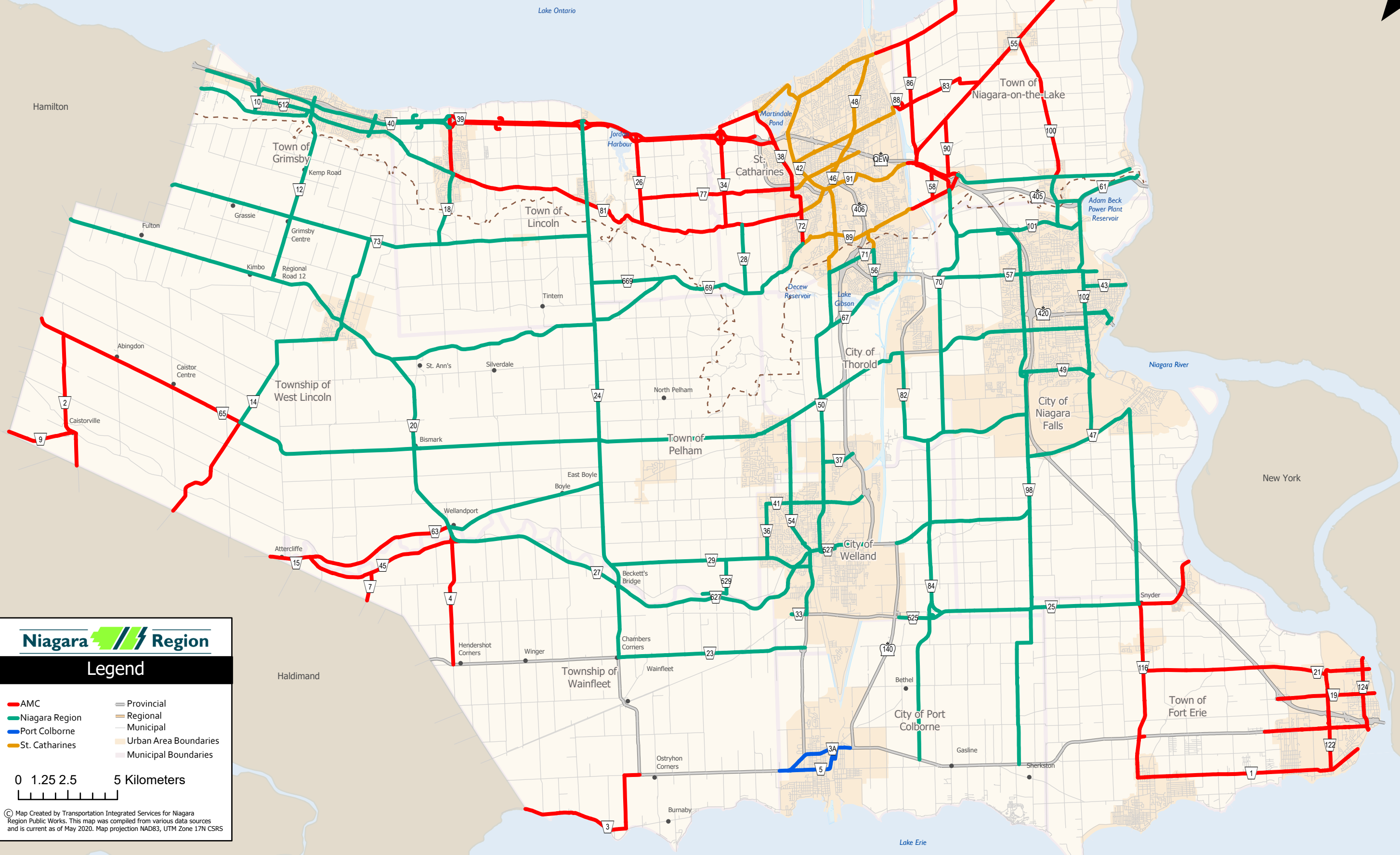
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# Appendix 3 Winter Service Area Map



**Niagara Region**

**Legend**

AMC

Niagara Region

Port Colborne

St. Catharines

Provincial

Regional

Municipal

Urban Area Boundaries

Municipal Boundaries

0 1.25 2.5 5 Kilometers

© Map Created by Transportation Integrated Services for Niagara Region Public Works. This map was compiled from various data sources and is current as of May 2020. Map projection NAD83, UTM Zone 17N CSRS



Prior Year Schedule of Revenue and Expenditures by Account (including Multi Year)  
DeptID: D\_60108 Winter Maintenance Contract  
Fiscal Year: 2020

	2019				2020				2021				2022			
	Budget 2020				Budget 2020				Budget 2020				Budget 2020			
	Total				Total	Variance	Variance %		Total	Variance	Variance %		Total	Variance	Variance %	
A_44482 Hired Equipment - Roadways	2,700,000	2,700,000	0	-	3,105,000	405,000	15.0%		3,167,100	62,100	2.0%					
A_44000AB Operational & Supply	2,700,000	2,700,000	0	-	3,105,000	405,000	15.0%		3,167,100	62,100	2.0%					
A_60014 ABD Radio & Comm Equip (60114)	3,142	2,991	(151)	(4.8%)	3,051	60	2.0%		3,112	61	2.0%					
A_60000AA Intercompany Charges	3,142	2,991	(151)	(4.8%)	3,051	60	2.0%		3,112	61	2.0%					
Gross Expenditure Subtotal	2,703,142	2,702,991	(151)	0.0%	3,108,051	405,060	15.0%		3,170,212	62,161	2.0%					
Gross Revenue Subtotal	-	-	-	-	-	-	-		-	-	-		-	-	-	-
Net Expenditure (revenue) before indirect allocations	2,703,142	2,702,991	(151)	0.0%	3,108,051	405,060	15.0%		3,170,212	62,161	2.0%					
A_70002 Ind Alloc FMP Trans (70102)	99	94	(5)	(4.8%)	95	1	0.7%		97	2	2.1%					
A_70003 Ind Alloc FMP Budget (70103)	14,902	13,992	(910)	(6.1%)	14,587	596	4.3%		14,982	394	2.7%					
A_70023 Ind Alloc Procure Admin(70123)	1,241	2,842	1,601	129.0%	2,899	57	2.0%		2,961	62	2.1%					
A_70224 Cap Levy-Prog Support (70324)	-	5	5	-	5	0	0.6%		5	0	0.4%					
Allocation Subtotal	16,242	16,933	690	4.3%	17,587	654	3.9%		18,045	458	2.6%					
Net Expenditure (revenue) after indirect allocations	2,719,385	2,719,924	539	0.0%	3,125,637	405,714	14.9%		3,188,256	62,619	2.0%					
FTE - Reg	-	-	-	-	-	-	-		-	-	-		-	-	-	-
FTE - Temp	-	-	-	-	-	-	-		-	-	-		-	-	-	-
FTE - Student	-	-	-	-	-	-	-		-	-	-		-	-	-	-



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

**Final Report**



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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.

**Table ES-1: Peer Benchmarking Summary**

	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

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 cost-savings, 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**

	<b>Risks</b>	<b>Benefits</b>
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 contracted out.	The contractor shares some 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-to-moderately 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.

#### 1.5 Methodology

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 prepare<sup>1</sup>. 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

<sup>1</sup> 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

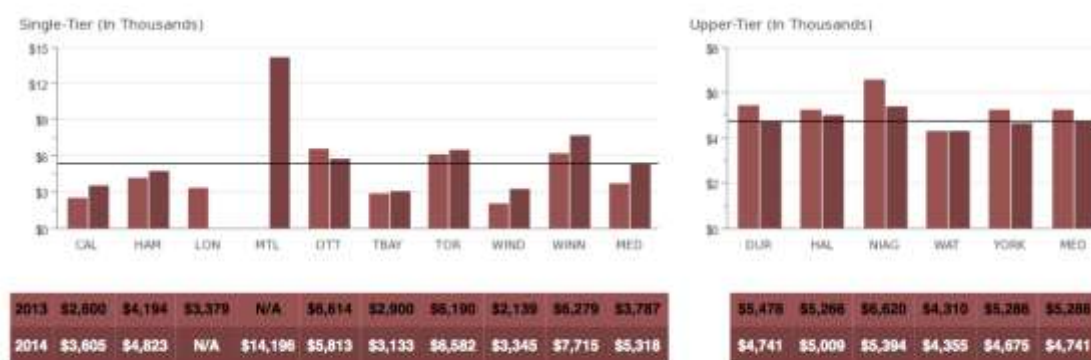
#### OMBI Reporting

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.

#### How much does it cost to maintain our roads in winter?

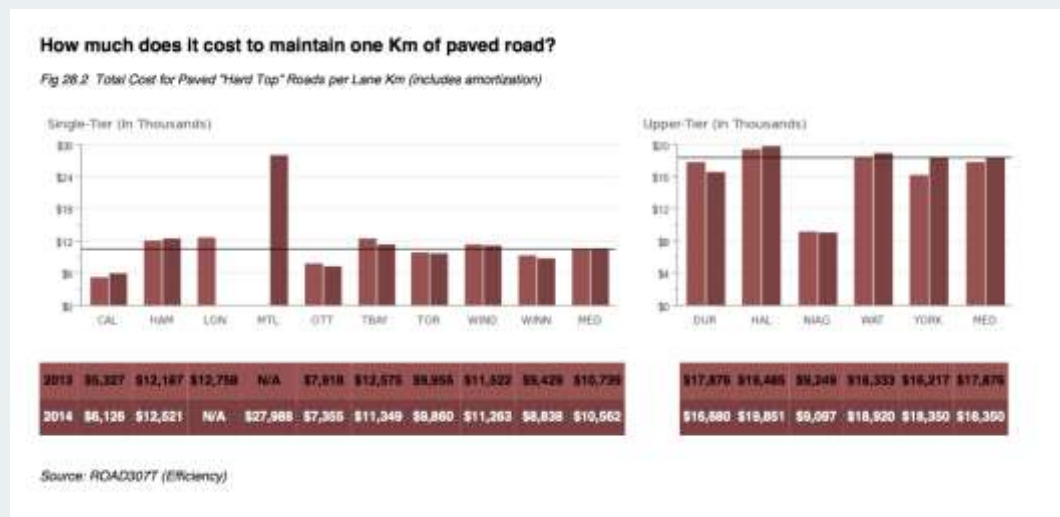
Fig 28.4 Total Cost for Winter Maintenance of Roadways per Lane Km Maintained (includes amortization)



Source: ROAD309T (Efficiency)

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.



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.

### What percent of paved roads are rated good to very good?

Fig 28.5: Percent of Paved Lane Km where the Condition is Rated as Good to Very Good



Source: ROAD405M (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 <sup>1</sup>
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 <sup>2</sup>	843,875	65
<b>Total</b>	<b>13,348,300</b>	<b>1,119</b>

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	<p><b>DEPARTMENTS</b> – Works – Roads and Transportation – Transportation Operations and Maintenance</p> <p><b>STAFFING MODEL</b></p> <ul style="list-style-type: none"><li>• Commissioner, Works</li><li>• Director, Transportation &amp; Field Services</li><li>• Manager, Transportation Infrastructure</li><li>• Supervisors of Maintenance Operations</li><li>• Maintenance Operators</li></ul> <p><b>DEPLOYMENT</b></p> <ul style="list-style-type: none"><li>• Five regional depots and a traffic operations centre</li></ul>	<p><b>DEPARTMENTS</b> – Public Works – Transportation – Transportation Operations and Maintenance</p> <ul style="list-style-type: none"><li>• Contract management for winter and non-winter control, pavement markings, signals, signs</li></ul> <p><b>STAFFING MODEL</b></p> <ul style="list-style-type: none"><li>• Commissioner, Public Works</li><li>• Manager, Transportation</li><li>• Supervisor (1 only), Transportation Operations and Maintenance (non-union)</li></ul> <p><b>DEPLOYMENT</b></p> <ul style="list-style-type: none"><li>• No works yards</li><li>• Non-winter control patrollers deploy from main Regional building – looking to contract this out</li><li>• Winter control is patrolled by Local municipalities (since winter control is contracted out to the Local municipalities)</li></ul>	<p><b>DEPARTMENTS</b> – Operations Portfolio - Public Works Department – Roads Services Branch.</p> <p><b>STAFFING MODEL</b></p> <ul style="list-style-type: none"><li>• Deputy City Manager (Operations)</li><li>• General Manager Public Works</li><li>• Manager, Roads Service Branch</li><li>• Approximately 590 employees are engaged in winter operations.</li></ul> <p><b>DEPLOYMENT</b></p> <ul style="list-style-type: none"><li>• 17 yards across five zones</li></ul>	<p><b>DEPARTMENTS</b> – Public Works – Transportation – Transportation Operations and Maintenance</p> <p><b>STAFFING MODEL</b></p> <ul style="list-style-type: none"><li>• Commissioner, Public Works</li><li>• Director, Transportation Planning</li><li>• Manager, Transportation Operations and Maintenance</li><li>• Supervisors, patrollers and frontline staff</li></ul> <p><b>DEPLOYMENT</b></p> <ul style="list-style-type: none"><li>• Two work yards, one in the north and one in the south.</li><li>• Bulk of deployment from two yards in the south (urban areas), the northern area roads are generally rural.</li></ul>	<p><b>DEPARTMENTS</b> – Transportation and Environmental Services Department – Transportation Operations</p> <p><b>STAFFING MODEL</b></p> <ul style="list-style-type: none"><li>• Commissioner, Transportation and Environmental Services</li><li>• Director, Transportation</li><li>• Manager, Transportation Operations</li><li>• 7 non-union supervisors, 6 technologists and administrative support, 60 full time unionized frontline staff,</li><li>• Additional seasonal (winter) staff, 2 supervisors and 13 frontline staff</li></ul> <p><b>DEPLOYMENT</b></p> <ul style="list-style-type: none"><li>• Several work yards.</li></ul>	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.

Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?	
Winter Maintenance Activities						
<b>Service Delivery Model</b>	<ul style="list-style-type: none"><li>• Direct delivery augmented by contracted resources – no pre-determined routes assigned to contractors. Contractors deployed flexibly as required.</li></ul>	<ul style="list-style-type: none"><li>• All services are contracted out to the Local Municipalities on a three year agreement cycle.</li></ul>	<ul style="list-style-type: none"><li>• Municipality owns 73% of the fleet of plows/salters/combination units (236 municipally owned, 88 contracted).</li><li>• Most of winter operations are delivered directly, one area is contracted dating from before the City was amalgamated.</li><li>• City is currently assessing whether the composition of direct delivery/outsourcing should be changed.</li></ul>	<ul style="list-style-type: none"><li>• Hybrid model of direct delivery and contracted services.</li><li>• Approximate split is 20% direct delivery, 80% contracted services for core winter services.</li><li>• Direct delivery focused on proactive/first response.</li><li>• Non-core (road patrol, supervision) activities are direct delivery by the Region.</li><li>• Region patrollers and supervisors call in contractors and manage storm response.</li></ul>	<ul style="list-style-type: none"><li>• Region directly maintains most roads outside of the limits of the tri-cities (Cambridge, Kitchener, Waterloo).</li><li>• Several roads outside the tri-cities (former MTO) are maintained by contractors through AMC style contract.</li><li>• Cities are contracted to maintain the roads within the limits of the three cities with the Region continuing to provide some activities.</li><li>• No second shift for Region direct delivery – crews deploy and are overtime funded for any evening/night winter events.</li></ul>	<p>There are a range of service delivery models that combine direct delivery and contracted services in different ways and different proportions.</p> <p>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.</p> <p>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.</p>

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Level of Service	<ul style="list-style-type: none"><li>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.</li></ul>	<ul style="list-style-type: none"><li>Level of service per the MMS. No current ability to demonstrate/measure local municipal achievement of winter MMS service levels for bare pavement achievement.</li></ul>	<ul style="list-style-type: none"><li>Level of service was higher than MMS by between 1 and 6 hours depending on the road classification.</li><li>LOS was adopted by Council in 2003 and had not been reviewed since.</li><li>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.</li><li>2015 audit found that there is no documented assurance that the level of service is being met.</li><li>The audit further recommended reducing level of service to provincial standards to reduce costs.</li></ul>	<ul style="list-style-type: none"><li>Level of service exceeds MMS.</li><li>Level of service report is approved by council every 4 years (each term of council).</li><li>Council gives Public Works the direct mandate to deliver the higher than required LOS.</li><li>Reporting on success of delivering on Level of Service not known.</li></ul>	<ul style="list-style-type: none"><li>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.</li><li>Risk based deployment plans differ across each city, so service level achievement is uneven as is value-for-money.</li><li>Different cost profiles among tri-city providers for the same season and different overtime frequency. Financial exposure significant in a severe winter.</li><li>Legal liability clearly transferred to each tri-city provider.</li></ul>	<p>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).</p> <p>Niagara should work towards more direct communication with Council in setting Levels of Service (such as in Ottawa or Peel).</p>

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
<b>Budgeting</b>	<ul style="list-style-type: none"> <li>No sophisticated system of budgeting/tracking winter events, unit costs or bare pavement achievement using AVL data.</li> <li>No existing activity based budgeting linking service levels to deployed resources.</li> </ul>	<ul style="list-style-type: none"> <li>No system coverage price set within local municipality contracts.</li> <li>Region is invoiced by amount of work / activity (open-ended).</li> <li>Contracts allow Halton to utilize different levels of staffing from municipalities at different times (more flexibility).</li> <li>2009 audit called for better monitoring of budget to actual costs.</li> </ul>	<ul style="list-style-type: none"> <li>2013 Winter Operations budget was \$55.3 million and actual expenditures were \$79.2 million.</li> <li>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.</li> <li>Reconciliation of winter materials is only performed once per year.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> <li>Budget based on a ten-year trend line of actual spending/winter events; current budget is for 29 “Winter Storm Equivalents”.</li> <li>Costs that are more static such as patrols and installing snow fences are budgeted separately.</li> <li>This system allows Region to isolate budget shortfalls/surpluses that are caused by seasonal weather variation.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>
<b>Cost comparison</b>	<ul style="list-style-type: none"> <li>Not available.</li> </ul>	<ul style="list-style-type: none"> <li>Not available. With better reporting would be possible to compare costs directly across the different municipalities.</li> </ul>	<ul style="list-style-type: none"> <li>Not available.</li> <li>The City is currently completing a review to compare the cost of direct delivery with outsourcing.</li> </ul>	<ul style="list-style-type: none"> <li>Information not available.</li> <li>Acknowledge that it might be possible to reduce costs by reducing LOS but that it is difficult to quantify.</li> </ul>	<ul style="list-style-type: none"> <li>Information not available.</li> </ul>	<p>No municipality is able to accurately compare the cost of direct delivery and contracted winter services.</p> <p>Information insufficient to assess how Niagara compares to peer municipalities in this respect.</p>

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
<b>Risk Management</b>	<ul style="list-style-type: none"> <li>Sufficient direct resources are available to cover all routes. Contractors are used to augment resources when storms are long or heavy precipitation.</li> <li>Contractors are deployed directly by Region's supervisors.</li> <li>Region patrols all routes.</li> <li>Winter reserve is in place for heavy winter seasons.</li> </ul>	<ul style="list-style-type: none"> <li>No ceiling limit as to amount billed.</li> <li>Unclear how Local Municipalities determine Region's portion of an activity.</li> </ul>	<ul style="list-style-type: none"> <li>2015 audit found that current resourcing levels create "idle capacity" and recommending reducing resources.</li> <li>2015 audit also recommended developing procedures and policies to specify/prioritize work activities when there is no snow clearing occurring.</li> </ul>	<ul style="list-style-type: none"> <li>Contracts for core winter services allow flexibility based on weather variations while retaining control of level of service and storm management.</li> <li>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.</li> <li>Possible that providing a higher level of service improves safety and convenient movement of goods and services and therefore reduces liability.</li> </ul>	<ul style="list-style-type: none"> <li>Region staffs to a minimum level meaning that in cases of illness or vacation, some equipment and crews cannot be deployed.</li> <li>Reactive and planned maintenance are often in conflict.</li> </ul>	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).
<b>Non-Winter Maintenance Activities</b>						
<b>Service Delivery Model</b>	<ul style="list-style-type: none"> <li>Blend of direct and contracted work.</li> <li>Most surface maintenance is completed by contractors.</li> </ul>	<ul style="list-style-type: none"> <li>All services are contracted out to the Local Municipalities on a three year agreement cycle.</li> <li>Some private contracts tendered together with Local Municipalities, such as pavement markings and crack sealing.</li> </ul>	<ul style="list-style-type: none"> <li>Information not available.</li> </ul>	<ul style="list-style-type: none"> <li>Direct delivery of most maintenance services.</li> <li>Maintains roads for some other jurisdictions including MTO.</li> <li>Transportations Operations is not involved in construction or major rehabilitations or resurfacing.</li> <li>Pavement markings and signals maintenance are contracted out.</li> <li>Signals maintenance is delivered by local municipalities in two of three local municipalities.</li> </ul>	<ul style="list-style-type: none"> <li>Direct delivery of most maintenance services outside of the three city limits.</li> </ul>	<p>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.</p> <p>Halton contracts all maintenance work, and information about Ottawa is not available.</p> <p>The variation of service delivery models across all the municipalities suggests that there are no models that are inherently superior.</p>
<b>Level of Service</b>	<ul style="list-style-type: none"> <li>See winter.</li> </ul>	<ul style="list-style-type: none"> <li>See winter.</li> </ul>	<ul style="list-style-type: none"> <li>Information not available.</li> </ul>	<ul style="list-style-type: none"> <li>See winter.</li> </ul>	<ul style="list-style-type: none"> <li>Level of service per the MMS.</li> </ul>	See winter.

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Budgeting	<ul style="list-style-type: none"><li>No existing activity based budgeting linking service levels to deployed resources.</li></ul>	<ul style="list-style-type: none"><li>See winter.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>2014 audit recommended transitioning to an activity based budget. Activity based budgeting would require enhanced time tracking and asset management regimes.</li></ul>	<p>Like Niagara, some peers are moving toward activity based budgeting and stronger asset management regimes.</p> <p>Information insufficient to assess how Niagara compares to peer municipalities in this respect.</p>
Cost Comparisons	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>See winter.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<p>No municipality is able to accurately compare the cost of direct delivery and contracted services.</p> <p>Information insufficient to assess how Niagara compares to peer municipalities in this respect.</p>
Risk Management	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>See winter.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>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.</li></ul>	<ul style="list-style-type: none"><li>See winter.</li></ul>	<p>Information insufficient to assess how Niagara compares to peer municipalities in this respect.</p>



Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
<b>Workforce Demographics</b>					
<b>Workforce Demographics</b> (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.)	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>Not applicable since Region does not deliver services directly.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li><li>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.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li><li>Aging workforce presents a need for succession planning and is a significant risk/opportunity for the Region.</li></ul>	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.
<b>Key Performance Measures and Asset Management</b>					
<b>Time Tracking</b>	<ul style="list-style-type: none"><li>Not clear that labour hours are linked to activities.</li></ul>	<ul style="list-style-type: none"><li>1 staff for contract monitoring.</li><li>Time tracking by activity not applicable as all activities are contracted.</li></ul>	<ul style="list-style-type: none"><li>Time is tracked by activity and can be linked to service requests.</li><li>Audit found that 25% of winter time is allocated to “Yard”, “Litter”, “On-call” and “other” even in a relatively heavy winter.</li><li>Activity sheets and service requests seem to be completed on paper and provided to yard clerks.</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li><li>Time for productive, travel time, non-productive time, is mixed together for maintenance activities.</li><li>Different individuals track productive/non-productive time differently.</li><li>Manual paperwork and data entry are a burden on frontline and supervisory staff.</li></ul>	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	<ul style="list-style-type: none"><li>Maintenance activities are not directly linked to specific assets.</li></ul>	<ul style="list-style-type: none"><li>Proprietary asset management system tracks Region’s signals (maintained by others), signs, pavement management</li><li>System triggers work orders which are fed to Local Municipalities, can be directly from 311</li><li>Work orders issued and entered at dispatch</li><li>Looking to transition to Hansen</li><li>Work order generation and entry will be done in-field</li></ul>	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>Hansen platform links service requests to asset management.</li><li>Information entered in the field using tablet computers.</li><li>Updates to record keeping for winter patrol (to minimize duplication in forms) were recommended in 2010 Audit.</li></ul>	<ul style="list-style-type: none"><li>Asset management software has been acquired and is being implemented over time.</li><li>Existing asset/information management is not sufficient to support staff in performing maintenance activities.</li><li>Currently, reactive and proactive maintenance is not tracked against individual assets.</li><li>Asset inventories are inconsistent and not kept current.</li></ul>	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.

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Level of Service/Performance Targets, Tracking, and Reporting	<ul style="list-style-type: none"><li>No established KPIs reported.</li><li>No established measurement regime for bare pavement achievement timeframes following the end of a winter storm event.</li></ul>	<ul style="list-style-type: none"><li>Level of service is set, but does not prescribe methodology or performance targets</li><li>GPS and “Road Patrol Manager” software implemented in 2012 to improve documentation.</li></ul>	<ul style="list-style-type: none"><li>Levels of service were established and approved by Council in 2003;</li><li>Reporting through OMBI but not directly to Council</li><li>“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.</li><li>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.</li><li>Concern that the “real costs” of depreciation and overhead are not known.</li><li>Reports on time allocations for employees are available and can be customized by time period, person, or activity code.</li></ul>	<ul style="list-style-type: none"><li>2010 audit recommended “random monitoring” and “spot checks” of work performed by contractors to ensure contracted work is being adequately performed.</li></ul>	<ul style="list-style-type: none"><li>Plows and vehicles are equipped with GPS/AVL.</li><li>In field supervision is limited and widely viewed as insufficient by staff.</li><li>Performance standards for services are not known or worked towards and certainly not measured consistently.</li><li>Performance measurement is not possible with existing data tools; they do not allow for review, analysis or reporting on KPIs.</li><li>Performance measurements are not shared or compared across the Yards or Supervisors.</li></ul>	<p>Ottawa has the clearest performance measures (although not KPIs) and regularly reports on them.</p> <p>Niagara needs KPIs and should move towards this with regular reporting.</p>

	Durham (Region)	Halton (Region)	Ottawa (Single Tier City)*	Peel (Region)	Waterloo (Region)	How does Niagara Compare?
Monitoring Service Providers	<ul style="list-style-type: none"><li>Information not available.</li></ul>	<ul style="list-style-type: none"><li>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.</li><li>Salt management reporting.</li><li>Only other form of reporting is invoicing of time and system km.</li><li>2009 audit suggested updating agreements with municipalities to include consequences for non-adherence.</li></ul>	<ul style="list-style-type: none"><li>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.</li><li>Concern that salt deliveries were being accepted containing up to 15% less salt than documented. Recommended random weight checks of salt trucks.</li></ul>	<ul style="list-style-type: none"><li>In winter, contractors are directly supervised by Peel.</li></ul>	<ul style="list-style-type: none"><li>Performance reporting and/or measurement is not provided through the contracts with the local municipalities in the three cities.</li><li>Performance reporting is not required from the private contractors.</li><li>There are no enforceable financial incentives or penalties associated with non-performance for neither the local municipalities nor the contractors.</li></ul>	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 in-house 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.

### 3.3

### Risks and Benefits of Contracting Out

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

**Table ES-1: Risk and Benefits of Contracting Out**

	<b>Risks</b>	<b>Benefits</b>
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 contracted out.	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-for-money 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/de-icing 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.

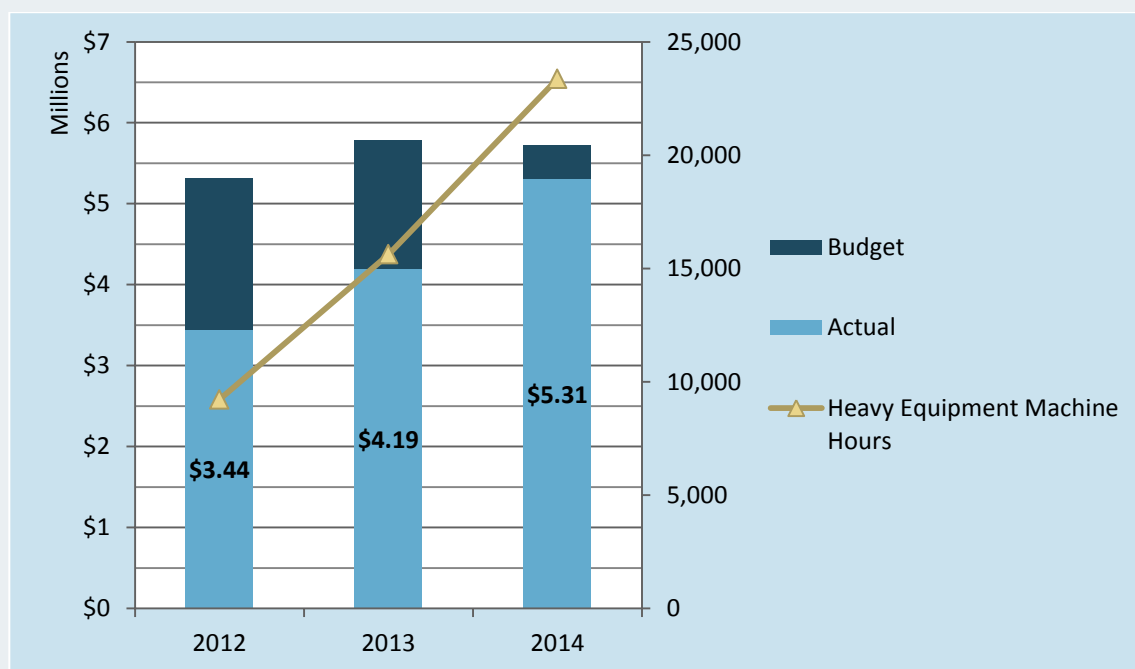


**Table W-1: Direct Staff Delivery of Core Winter Services (2012-2014)**

	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

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.

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

	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

## 4.3

**Man-Hour and Machine Hour Trends**

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.

**Table W-3: Winter Control Machine Hours**

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

Despite the wide variation in winter severity/storm events across the 2012-2014 seasons, man-hours 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**

	2012	2013	2014
<i>Region Maintained Routes</i>	38,198	41,842	43,177
<i>Maintenance Across All Roads</i>	14,897	12,855	13,397
<b>TOTAL</b>	<b>53,095</b>	<b>54,697</b>	<b>56,574</b>

#### 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.

**Table W-5: Collision Frequency on Region Maintained Roads**

	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

#### 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**

	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

4.6

## Private Contractor Delivery of Core Winter Services

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.

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

	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

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.



**Table W-8: Comparison of Unit Costs between Direct Delivery and Contractor Models**

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	21

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.<sup>2</sup>

<sup>2</sup> 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.

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

	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

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.

#### 4.8 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 event<sup>3</sup>.

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

<i>Class of Highway</i>	<i>Depth</i>	<i>Time</i>
1	2.5 cm	4 hours
2	5 cm	6 hours
3	8 cm	12 hours
4	8 cm	16 hours
5	10 cm	24 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.

<sup>3</sup> 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.



## 4.9

### Winter Control Findings

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 capacity.
- 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”.

**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:<sup>4</sup>

- Direct staff delivery of core winter service activities (i.e. snowplowing/de-icing/patrol) currently delivered across the current 19 standardized routes;
- Direct staff delivery of supporting winter service activities currently delivered across the entire regional road system of 1,808 lane kilometres (i.e. snowfencing/snow removal);
- Contractor delivery of core winter service activities (i.e. snowplowing/de-icing) currently delivered across the current 10 standardized routes; and,
- Direct delivery of core 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.

<sup>4</sup> 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.

**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-to-moderately 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.<sup>5</sup>
- 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

<sup>5</sup> 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-than-budgeted 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 re-deployed 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.



NW-1: Non-Winter Maintenance Budget versus Actual Expenditures (2012-2014)

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



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

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

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.

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

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

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%.

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

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

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 Avg Rate	2013 OT Hours	2013 OT Avg 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 standards

## 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.

## 6.0

## Workforce Demographics Analysis and Findings

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.

### WD – 1: Workforce Demographics Current and Projected to 2020

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.		

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 long-term 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.

#### WD – 2: 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
<b>Total unscheduled time away</b>	<b>26,696.83 hours</b>

## 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**

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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.**

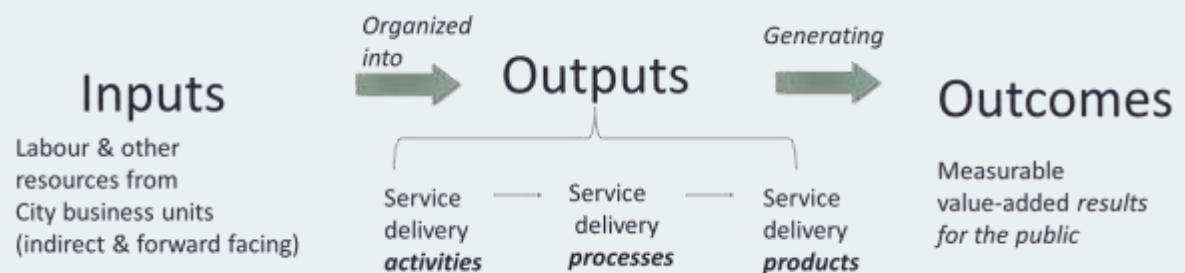
The Region needs to:

- 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
<b>Units of Service Delivered</b>	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
<b>Unit Cost Delivered</b>	Gross Operating Cost per Machine Hour or Pass Kilometre versus target	Gross Operating Cost per Maintenance Hour versus Target	Gross Operating Cost per Maintenance Hour versus Target	Gross Operating Cost per Maintenance Hour versus Target	Gross Operating Cost per Maintenance Hour versus Target
<b>Quality/ Effectiveness Level Achieved</b>	Prompt/adequate event response initiated; post-event clean up times meeting MMS.	Planned maintenance annual "coverage rate" of assets	Planned maintenance annual "coverage rate" of assets	Planned maintenance annual "coverage rate" of assets	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.

### 7.3 KPIs and CityWorks Findings

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.

### 7.4 Recommendations: KPIs and CityWorks

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

- R12. 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).

- 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.

## 8.0

## Closure

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]
- 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. [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.

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## Appendix A

### *Results from Focus Group Sessions*

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**

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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)

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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 asphaltting 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

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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**

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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 Control<sup>6</sup> Levels of Service

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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

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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 approach 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.

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<sup>6</sup> 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.

### Observations from the Focus Groups

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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

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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)

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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

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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

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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

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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**

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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*

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.

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

<b>Strengths</b>	<b>Strategic Direction</b>	<b>Recommendations</b>
<b>Collaboration, teamwork, and culture of “continuous improvement”</b>	1. Maintain culture of collaboration, teamwork, and “continuous improvement”	R12, R13
<b>Good communication between management and frontline staff</b>	2. Maintain open communication between management and frontline staff	R13
<b>Flexible resourcing (e.g. staff and equipment are shared across patrol yards, staffing during shoulder season linked to seasonal forecasts)</b>	3. Maintain/increase flexibility in resourcing	R7
<b>Workforce demographics are stable and management is conducting succession planning</b>	4. Continue to monitor demographics and conduct succession planning	R11
<b>Winter control model contributes to public safety in severe winters</b>	5. Maintain high levels of winter control	R6
<b>Weaknesses</b>	<b>Strategic Direction</b>	<b>Recommendations</b>
<b>Business processes and performance measurements are out of date</b>	6. Update business processes and performance measurement data	R3, R12, R13
<b>Need additional tracking/reporting on MMS (winter) by the contractor and the Region</b>	7. Improve tracking and reporting of MMS achievement for winter control	R3, R4, R5

Direct comparison of costs and outcomes between the contractor and the Region not possible	8. Improve accounting and reporting to enable better comparisons	R1, R3, R4, R5
Need more direct communication with Niagara Council regarding LOS/achievement and budget variance within the overall department budget	9. Improve communication with Regional Council on LOS/achievements and budgeting	R1, R2, R5
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 different vehicle activities for better winter system planning and results reporting	R3
Region falls behind on surface/roadside maintenance (direct delivery) because resources are redeployed to other activities	11. Ensure surface and roadside maintenance is not neglected	R9, R10
Opportunities	Strategic Direction	Recommendations
New asset management software – CityWorks is being implemented	12. Fully leverage CityWorks to track activities to assets and to monitor and report on performance	R9, R12, R13
Region is growing & adding new infrastructure/assets each year; unit costs have remained stable	13. Align business planning with asset growth	R9, R12, R13
Region's winter control budget capacity is sufficient for even the most severe winters (e.g. 2013-2014)	14. Reduce winter control budget to reflect a typical winter rather than a severe winter	R6, R7, R8



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

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## MEMORANDUM

**PWC-C 17-2020**

**Subject:** Councillor Information Request - Snowplow Costs

**Date:** June 16, 2020

**To:** Public Works Committee

**From:** Shawn McCauley, Associate Director Transportation Operations

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The purpose of this memorandum is to provide a response to the following information request made at the Public Works Committee meeting held on January 14, 2020:

*Councillor Gale requested information respecting any potential cost savings from snow clearing operations due to the mild winter we have had so far. He also inquired about the duties of plow operators when there is no snow clearing being done.*

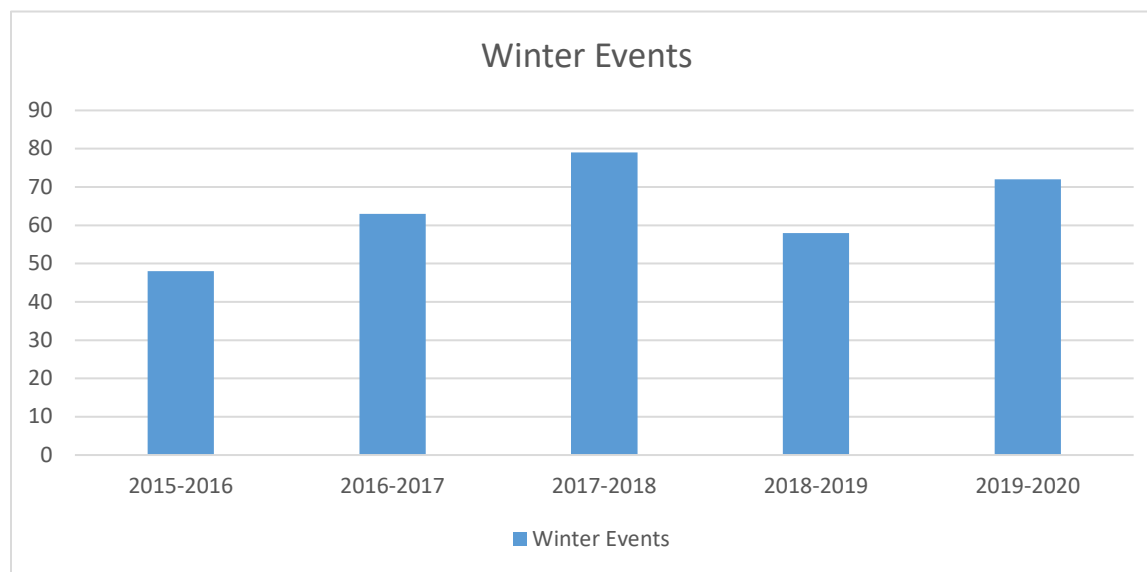
### ***Winter Operations***

The Transportation Operations division operates a “hybrid” business model during the winter season utilizing Niagara Region staff, City of St. Catharines staff and an Area Maintenance Contractor (currently Steed and Evans Limited).

- Niagara Region staff maintain 19 plow routes covering 996 lane kilometres.
- City of St. Catharines manages 126 lane kilometres of Regional Roads through amalgamation of Region Roads within in the City’s own routing system.
- Steed and Evans Limited maintains 10 plow routes covering 673 lane kilometres.

Although the 2019 – 2020 winter season was relatively mild, a significant number of smaller winter events were experienced that required a response from our winter operations staff, including several early storms in October and November 2019. The table below shows a summary of winter events over the last five (5) winter seasons. Even though the number of winter events falls within the historical range experienced over the last four (4) winter seasons, the total of 72 winter events is higher than the four (4) year average of 62 winter events.

**Table 1: Summary of winter events over the last five (5) winter seasons**

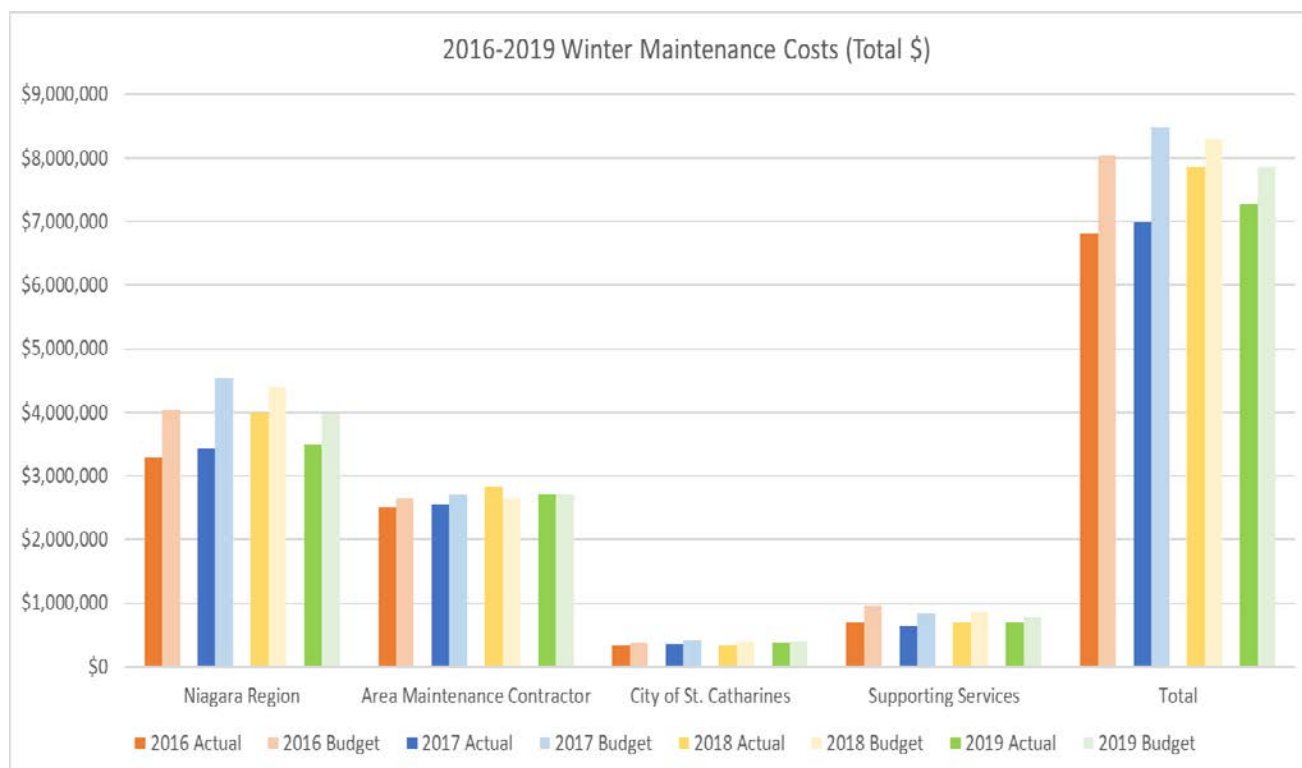


The 2020 operating budget for winter maintenance is \$7,999,226, to date (April 2020) the Niagara Region has incurred costs of \$3,990,863, including savings of \$269,706 on winter materials, \$31,022 on equipment including fuel savings, and \$99,651 on overtime.

The annual winter maintenance budget is broken into four sections, Niagara Region, Area Maintenance Contract, City of St. Catharines and Supporting Winter Services. Costs for supporting winter services include services such as snow fence erection and removal, winter sand cleanup and winter drainage. These services are delivered through a combination of Niagara Region staff and outside contractors. Table 2 summarizes these costs over the last four years.

Appendix 1 - Winter Maintenance Costs - gives a detailed breakdown of actuals versus budget for 2016 to 2019.

**Table 2: Winter Cost Summary**



Budget savings are reflected in the overall Transportation Services department operating results for the year. In addition, the new area winter maintenance contract has incorporated provisions in it to assist with providing more cost-effective delivery of winter maintenance activities. Report PW 24-2020, recommending the award of the new contract, is to be considered at the June 16, 2020 Public Works Committee.

Winter Maintenance staff have a variety of activities they perform when there is no winter activity forecasted.

### Day Shifts/Weekends

During extended periods of warmer weather during the winter months there is a corresponding increase in the need for other road maintenance repair activities to ensure compliance with Ontario Regulation 239/02 (Minimum Maintenance Standards).

1. An increase in freeze thaw cycles which leads to an increase in the need for pothole repair.

2. Shoulder maintenance - milder weather conditions lead to rutting and shoulder drop offs.
3. Drainage maintenance - ensuring culverts and catch basins are functioning.

### **Night Shifts**

1. Washing/cleaning and minor maintenance of all vehicles in the yards. This ensures our fleet is ready to respond, avoids calling in fleet staff on overtime to perform routine maintenance.
2. Yard Maintenance, done in house, reduces costs by not having to utilize a contract cleaning contractor.
3. Receive deliveries of some winter materials after hours. Avoids overtime charges to receive order.
4. Perform brine station preventative maintenance to avoid breakdowns during winter storm events.
5. Snow fence material loaded for the next day. Increases the number of daylight hours spent in the field actually installing fence.
6. Reduce overtime calls to respond to request for service, instead of calling staff in. Night shift staff responds to potholes, debris, drainage problems, signs and trees.
7. The required annual illumination inspection can be completed utilizing night staff without incurring overtime costs.
8. Job training, mandatory health and safety and human resource training is completed during shifts on line.

The shift schedule allows flexibility to add or subtract staff based on weather forecasts, during the start of the schedule if milder conditions are forecasted. The schedule also provides the capability to save on unnecessary overtime costs if weather conditions permit, by not replacing staff who are absent (vacation, sick, etc.) from a scheduled shift.

Other Maintenance items were started due to an early spring:

1. Debris Pickup.
2. Tree Maintenance.
3. Roadside Maintenance.

4. Bridge/ Culvert inspections.
5. Winter Sand Cleanup.
6. Annual Inspections of assets (Bridges, culverts, guide rail).

Respectfully submitted and signed by

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Shawn T McCauley, B.B.E., C Tech  
Associate Director Transportation Operations

## **Appendices**

Appendix 1 Winter Maintenance Costs