

APPENDIX 1

TRANSPORTATION SERVICES – REVIEW OF WINTER MAINTENANCE SERVICES

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Auditor General's Office

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EXECUTIVE SUMMARY

***Auditor General's
2010 Audit Work
Plan***

The Auditor General's 2010 Audit Work Plan included a review of the Transportation Services Division's management of winter maintenance operations.

***Audit objectives
and scope***

The objective of the audit was to assess the adequacy and effectiveness of controls and processes in the management of the City's winter maintenance program and compliance with policies and procedures. The focus of our review was on contracted services, representing approximately two-thirds of the City's winter maintenance costs.

Audit results

While Transportation Services Division has established controls and processes over contracted winter maintenance services, our review identified the following areas where improvements can be made to enhance the overall effectiveness of winter maintenance operations and minimize costs:

- Conduct detailed analysis of costs for incremental increases in services or where levels exceed legislated requirements;
- Reassess service standards to identify services that could potentially be discontinued or reduced;
- Develop performance measurements to determine whether services meet or exceed established criteria and to review and adopt best practices from among districts or other municipalities as appropriate; and
- Consider whether certain modifications to procurement practices are possible and advisable

In our view, implementation of the recommendations contained in this report will further improve the overall effectiveness of the winter maintenance program resulting in potential cost savings. In addition, potential service level reductions such as eliminating clearing of driveway windrows could result in cost savings of approximately \$3.7 million annually. While certain recommendations can only be implemented once current contracts expire in 2015, the compilation and analysis of data necessary to determine future requirements should be completed as soon as practicable.

BACKGROUND

*Mandate for
winter
maintenance
services*

Transportation Services Division's Infrastructure Operations Unit is responsible for the City's winter maintenance operations. The Unit's primary mandate is to keep the roads and sidewalks safe and passable for pedestrians, cyclists and motorists, while remaining sensitive to environmental impacts.

*Extent of
operations*

The City's winter maintenance operations cover approximately 5,600 kilometres of roadway and 8,000 kilometres of sidewalk, across four districts. Approximately two-thirds of the City's winter maintenance costs are for contracted services, with the balance of services being provided by in-house staff.

*Seven-year
contracts
commenced 2008*

Commencing with the 2008/2009 winter season, the City entered into seven-year winter maintenance contracts approved by Council for snow ploughing, de-icing and snow removal operations. Previous contracts were for five-year terms. The total value of winter maintenance contracts, including contingency items, is approximately \$87 million per season.

AUDIT OBJECTIVES, SCOPE AND METHODOLOGY

The Auditor General's 2010 Audit Work Plan included a review of the City's winter maintenance program. This review was selected based on the extent of expenditures and potential for liability.

Audit objective

The objective of this review was to assess the adequacy and effectiveness of controls and processes in the management of the winter maintenance program and compliance with policies and procedures, identifying opportunities for efficiencies and cost reductions.

Audit scope

The focus of the review was on the following areas:

- Extent of current service levels and their financial impact
- Contract development, tendering and awarding processes
- Contractor payment controls
- Performance monitoring controls
- Cost control initiatives

The review covered contracted winter maintenance activities for the 2008/2009 and 2009/2010 winter seasons.

Audit methodology

Our audit methodology included the following:

- Review of policies and procedures
- Review of Council and Committee minutes and reports
- Interviews with staff of Transportation Services and Purchasing & Materials Management divisions
- Review of documents and records
- Analysis of data
- Review of reports or presentations related to performance benchmarking and municipal service level comparisons and other winter-related data from other jurisdictions, including:
 - Ottawa
 - Peel Region
 - Oshawa
 - Edmonton
 - Minnesota
 - Iowa
 - Wisconsin

Compliance with generally accepted government auditing standards

We conducted this audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence that provides a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

AUDIT RESULTS

A. NEED TO REVIEW WINTER MAINTENANCE SERVICE STANDARDS

A.1 Need to Determine the Incremental Costs of Service Level Decisions

In 2009, Council confirmed the levels of service for winter maintenance. Currently, the City Manager is conducting various reviews of the City's core services, service efficiencies and user fees, which include Transportation Services. We anticipate that several issues raised in this report will be considered in the reviews being conducted by the City Manager.

Legislated Requirements

The City of Toronto Act stipulates the maintenance standards for roadways in the City of Toronto. For snow clearing operations, the Act provides guidelines relating to the following:

- Minimum level of accumulation when clearing should commence
- Minimum level to which accumulation should be cleared
- Timeframes for completing clearing operations.

*City standards
higher than
legislated
requirements*

Our comparison of the City's service levels with the minimum legislated requirements as shown below indicates that the City standards are higher than legislated requirements.

Table 1: SNOW CLEARING COMPLETION TIME AFTER END OF SNOWFALL			
Road Classification	Comparable Highway Class	City of Toronto Standard	Legislated Requirement
Expressway	1	1-2 hours	3-4 hours
Arterial	2 & 3	2-4 hours	4-8 hours
Collector	3 & 4	4-6 hours	8-12 hours
Local	4, 5 & 6	8-12 hours	12-16 hours

Staff indicated that there has not been a detailed analysis of the costs associated with providing a higher level of service than the levels required by legislation. This information would assist management and Council when confirming service levels.

Harmonized Services

Residential driveway windrow clearing rarely offered in other municipalities

Prior to municipal amalgamation, the former municipalities had different levels of service for winter maintenance. Over several years following amalgamation in 1998, these services were harmonized, generally resulting in an overall increase in service level standards. For example, the City currently provides residential windrow clearing where mechanically possible as a standard service. This service is rarely offered in other Canadian municipalities and was only offered in two of the former municipalities, one of which added the service immediately prior to amalgamation.

However, while residential windrow clearing is a standard service for the City, it cannot be provided in neighbourhoods with a narrow street configuration or in an area which permits on-street parking. Staff estimate that approximately 19 per cent of neighbourhoods, located mostly in the Toronto and East York districts, do not receive this service.

In identifying potential service cuts to achieve budget reductions, Transportation Services has reported in previous budgets that windrow clearing is a service that could be discontinued. This service reduction was highlighted since it is higher than offered by most municipalities and cannot be provided in all Toronto neighbourhoods.

Estimated annual cost of residential driveway windrow clearing service is \$3.7 million

The estimated cost of residential windrow clearing is approximately \$3.7 million per year, consisting of \$2.7 million for standby charges and \$1 million for operating costs. As standby charges are paid whether or not the equipment is used, discontinuing the service would generate \$1 million in annual savings under the current contract. Full savings from changes to this service could only be realized when the current contracts expire in 2015.

Additional or Enhanced Services

Need for detailed analysis of costs

A review of the Division's annual operating budget submissions and other Council reports indicate that winter maintenance services are continually added such as changes related to bike lanes and trail paths, transit lanes, and windrow clearing at entrances to public laneways. Although Transportation Services staff are generally consulted when other divisions initiate such changes, winter maintenance costs are not always reflected in the financial implications statement on reports when considering such service enhancements.

In addition, during the 2010 budget process, staff reported that service levels at local roads were at bare pavement condition, higher than Council approved standard of safe and passable condition. At that time, the Division informed Council that they would be adhering to Council approved service levels and that while doing so could lead to complaints, it would result in savings of approximately \$2 million per year.

In the past, complaints have driven service higher than the service levels adopted by Council

Staff explained that, in their experience, clearing to the “safe and passable condition” standard results in many residents complaining to their Councillors. This in turn results in complaints to the division leading them to clear streets again to the higher “bare pavement” standard. To avoid making a second pass, the division had taken to clearing to the higher standard on the first pass in many cases.

Comprehensive evaluation of winter maintenance services after each season has yet to be completed

In January 2009, on adopting winter maintenance service levels, Council directed that:

“at the end of each snow clearing season, the City Manager be requested to engage all Members of Council in a standardized comprehensive evaluation of the roadway and roadside winter maintenance service for that season, and the results become the basis for improving and building a roadway and roadside winter maintenance plan for the following season”.

Although this evaluation has not been formally undertaken, staff indicate that ongoing consultations are held with Councillors with respect to winter maintenance services.

Given that service reviews of City divisions are being conducted by the City Manager, it is anticipated that the issues raised in this report will be considered in the review of Transportation Services.

Recommendations:

- 1. The City Manager, in consultation with the General Manager, Transportation Services, ensure that the service review of Transportation Services include winter maintenance service levels, with a view to:**
 - a. Determining the incremental cost of providing higher standard of service than legislated and providing additional winter maintenance services, such as clearing residential windrows, bike lanes, trail paths and transit lanes;**
 - b. Determining the implications arising from any service level increases or decreases, including any potential liability exposure; and**
 - c. Prioritizing services that could be reduced or discontinued to effect cost savings.**
- 2. The General Manager, Transportation Services, re-confirm with City Council, the City's winter maintenance service levels that would serve as basis for the next winter maintenance contracts (for 2015 and on), before initiating the Request for Quotation process.**
- 3. The City Manager, in consultation with the General Manager, Transportation Services, ensure that winter maintenance costs are included in the financial impact statements for changes such as road developments, bike lanes, trail paths and transit lanes.**

A.2 Need to Update Long-term Strategy for Snow Disposal Operations

Snow removal operations need to be carefully planned

In cases where there is significant build-up of snow or insufficient space to pile the snow, Transportation Services initiates snow removal operations. Snow removal involves the transporting of snow to a portable or stationary snow melter or to a snow dump site. Snow removal is costly and has environmental implications and must be carefully planned.

The number of permanent and emergency dump sites have been reduced from 15 to 5

Over the years, the number of snow dump sites, and consequently space available, has been decreasing due to competing demands for land space and reluctance from residents to have such sites in their neighbourhoods. Since 2005, the City went from having nine primary and six emergency dump sites to five sites in 2009. Securing adequate snow disposal sites will require coordination between Transportation Services and Facilities and Real Estate Divisions.

Snow removal plan needs to be updated

Given the temporary nature of the actual use of snow dump sites and the environmental preparations required to develop such sites, it is important that management has adequate plans, both in the short and the long term, for securing permanent and emergency snow dump sites. Transportation Services reported to Council in 2005 on the status of the City's snow disposal capacity and challenges to replace lost capacity. Given that six years have passed since the last complete update to Council, it is recommended that an updated snow disposal plan be provided to Council.

The following is an example of the importance of securing adequate snow disposal sites. The 2008/2009 winter season presented significant snow disposal needs for the City. Since there was not sufficient time to secure a permanent replacement site, the City spent \$930,000 to develop a temporary snow dump site. The cost included \$590,000 for rental and operation of snow melters. This site was subsequently developed as a permanent snow dump site for additional cost of \$1.7 million. Had there been adequate time to develop the site as a permanent snow dump site from the outset, the City may not have needed the snow melters.

Recommendation:

- 4. The General Manager, Transportation Services, in conjunction with the Chief Corporate Officer, give priority to updating the long-term strategy for snow disposal operations, including:**
 - a. Determining the optimal number and location of snow dump and snow melting sites;**
 - b. Developing timelines for the acquisition and development of snow dump sites; and**
 - c. Reporting on the updated snow disposal plan to the Public Works and Infrastructure Committee by September 2012.**

B. CONTRACT MANAGEMENT PRACTICES COULD BE FURTHER ENHANCED

B.1 Standby Charges are Incurred to Ensure Streets are Cleared According to Standards

Winter Maintenance Costs

Total winter maintenance contracts valued at approximately \$87 million annually

Commencing with the 2008/2009 winter season, the City entered into seven-year winter maintenance contracts for services such as snow ploughing, de-icing and snow removal. There are over 50 contracts with more than 30 vendors, including contracts for the supply of trucks and salt. The total annual contract value is approximately \$87 million, comprising of \$73 million for winter maintenance services and \$14 million for the supply of salt.

Actual winter maintenance costs, excluding supply of salt, were \$63 million and \$43 million for the 2009 and 2010 winter season

The following table shows a breakdown of contracted winter maintenance costs for each winter season, which generally runs from November to March. The table also illustrates that while operating costs would vary depending on winter severity, standby charges remain relatively constant.

TABLE 1: CONTRACTED WINTER MAINTENANCE COSTS (Excluding the cost of salt)			
Category	Total Contract Estimate Year 1	Year 1 2008/2009 Actual	Year 2 2009/2010 Actual
	(in thousands)		
Standby	\$33,121	\$33,515	\$34,135
Snow Removal	14,827	11,673	1,463
Snow Ploughing	8,181	9,938	2,878
De-icing	2,571	2,763	1,421
Depot Maintenance	3,123	3,114	2,730
Contingency	10,596	2,189	922
Other	1,023	277	28
Total	\$73,442	\$63,469	\$43,577

Note: Total contract estimate for Year 2 is approximately \$73.6 million, reflecting an inflationary factor and adjustments in snow removal and contingency amounts.

City has highest winter maintenance cost per lane kilometre

The City Manager's 2008 Performance Measurement and Benchmarking Report, and a supplementary background report, indicate that the City has the highest winter maintenance cost per lane kilometre for all cities participating in the benchmarking. The report cited the following factors affecting the higher costs:

- Residential driveway windrow clearing, which is rarely provided by other municipalities
- Higher service standards
- Differences in standby charges
- Weather variations
- Narrow streets and on-street parking
- Traffic density
- Enhanced road safety

We recognize that Transportation Services has undertaken various cost-saving measures and efficiency improvements such as using combination units, (such as a plow and a salter), to minimize the number of equipment and thereby reduce standby charges, using weather forecasting services to plan and mobilize resources, and improving salt handling practices.

As winter maintenance contracts expire in 2015, opportunities exist to further strengthen the contracting practices in order to minimize costs by reviewing the pricing structure with respect to standby charges and the contract awarding process, as discussed below.

Standby Charges

Annual standby charges amount to \$34 million

In order to ensure City streets can be cleared of snow and ice on a timely basis, all equipment must be ready and available on short notice. Standby charges compensate contractors for reserving this equipment for the City 24 hours a day 7 days a week during the snow clearing season and contractors are paid whether or not the equipment is used. This is a practice followed by many municipalities across Canada.

As shown on Table 1 above, standby charges of approximately \$34 million represent the largest component of contracted winter maintenance costs. Since they are fixed by contract, the standby charges are constant regardless of winter conditions.

Service levels determine standby charges

Standby charges are dependent on the number and type of equipment required. The equipment required is determined by the level of service provided. Therefore, any change in the level of service results in a corresponding change in equipment requirements and related standby charges.

Competitive pricing resulted in significant variances in standby rates for similar equipment

Standby charges are also dependent on the rates charged by vendors. Standby rates for similar equipment varied significantly among contracts. However, this is not particularly significant given that the winter maintenance contracts were awarded to the lowest bid meeting specifications.

We understand that the City has set standard standby rates in the past. For the current contracts the standby rates were open to competitive pricing by the bidders. Staff indicate that they believe allowing competitive bidding of standby charges allows for the most competitive and transparent process and therefore the best price for the City. Regardless, staff indicate that they are constantly evaluating their approach to acquiring winter maintenance services and will consider all available options at the next contract renewal.

B.2 Contract Tendering and Awarding

Current contract tendering and awarding process allows random bid opening and withdrawal

Winter maintenance contracts were awarded through a Request for Quotation process in accordance with corporate procurement policies. Given the scope of the City's snow maintenance operations, the total requirements were split into approximately 50 different portions of work.

Vendors are allowed to submit bids on more than one contract, even if winning all contracts would exceed their capacity. The bids are opened on a random basis. As bids are opened and awarded, a vendor that has the lowest bid on one contract may withdraw their bid on other contracts not yet awarded that are no longer within their capacity. As a result, there is no guarantee that the remaining bids in other contracts are the lowest unless all the bids were opened.

Giving the City more control over award and withdrawal of bids

Amending the process to give the City more control over award and withdrawal of bids would provide added assurance that the City obtains the best price, while maintaining an open, fair and competitive process. For example, while still allowing vendors to submit bids on more than one contract, even if they exceed their capacity, the City could reserve the right to open all bids on all contracts and award contracts in a manner that ensures the lowest possible price for the City.

Recommendation:

- 5. The General Manager, Transportation Services, in consultation with the Director, Purchasing and Materials Management Division and the City Solicitor, explore the possibility of modifying the current winter maintenance contract award process by:**
 - a. Allowing the opening of all submitted bids; and**
 - b. Reserving the City's right to award contracts in a manner that gives the City the lowest possible price while respecting the principles of a fair and open procurement process.**

C. NEED TO ENHANCE PERFORMANCE MEASURES

C.1 Performance Data Available but not Fully Analyzed

Lack of detailed analysis of available data to monitor overall performance

Performance measures are necessary to determine whether established service levels are achieved. Transportation Services has several tools to help them measure performance relating to winter maintenance. For example, all contractor vehicles are required to be equipped with technology such as a Global Positioning System and salt application sensors that provide data, which can facilitate such measurements.

However, there is no detailed analysis performed on available data. Such analysis would help in assessing whether standard service levels are met and provide a basis for comparison of performance both internally between districts and externally with other municipalities.

The cost of installing specific equipment is passed on to the City by the contractors through their individual bids on contracts. While we cannot estimate the contract cost attributable to the requirement for such equipment, the data collected has not been fully utilized and therefore the City has not received value for the funds expended on the required equipment.

Global Positioning System

All winter maintenance vehicles are equipped with GPS

The current seven-year winter maintenance contracts require all contractor vehicles to be equipped with a Global Positioning System (GPS), which allows tracking of vehicles and monitoring of equipment activity. Currently, the GPS information is used mainly to track equipment location during snow clearing operations or for specific targeted requests for information.

GPS data not fully utilized

Since GPS data provides evidence that a service has been provided at a particular time and location, this could be valuable in proving the City acted reasonably and diligently in clearing ice and snow. This information could be useful in the City's defense against individuals claiming they slipped and fell on icy sidewalks as a result of negligence on the part of the City. We understand the information has not yet been utilized for this purpose.

GPS data can also be used to measure operational efficiency. For example, the actual amount of time to complete a snow clearing route can be compared to target hours. In addition, GPS data can also be used to analyze equipment usage, determine trends, and simplify the verification of actual hours billed.

Salt Management

***All salt trucks
are equipped
with sensors***

In 2005, Transportation Services developed a Salt Management Plan, a comprehensive report outlining de-icing activities with emphasis on environmental issues. The current seven-year contracts require that all salt trucks be equipped with sensors for salt application rates and usage.

***Need for
standard salt
usage
monitoring
procedures***

The Salt Management Plan requires that estimated salt usage be established for each route and this should be compared to actual usage. However, there are no standard procedures in place to compare the actual salt usage with the estimated usage for each route. Currently, conducting this type of analysis is a tedious and manual process. It is possible to ease the work load of doing these comparisons by automating the process. That is, data collected by sensors could be automatically transferred to a simple spreadsheet package for ease of use.

In one district, an arrangement has been made with the contractor to provide salt usage variance reports. Staff provided the contractor with estimated salt usage information. The contractor enters this information into their system, generating a report showing the estimated and actual usage, as well as variances. The reports are then reviewed by staff and significant variances investigated.

Road and Equipment Inspections

***Daily inspection
of roads and
equipment
conducted***

We recognize that Transportation Services has established procedures to monitor performance. For example, road inspections are conducted daily and reports manually written. Reports indicate winter road conditions observed and response taken, such as when salting or ploughing is requested and completed.

In addition, Transportation Services staff conduct daily inspections of vendor equipment at all depots. Where equipment is not in working order, no standby charges are paid.

***Need for
centralized
tracking of
exceptions noted***

However, there is no centralized tracking of exceptions noted. As a result, it is difficult to determine the extent of equipment breakdown, service deficiencies or when additional services are required. Such monitoring would facilitate the evaluation of vendor performance.

We understand that, with the significant amount of data collected and available, a thorough analysis of all data may not be practical or cost effective. However, given the potential benefits, it would be worthwhile to pilot such analysis on a small scale on selective data to gain a better understanding of the benefits of such analyses.

Recommendation:

- 6. The General Manager, Transportation Services, on a pilot program basis, implement performance measures using available information such as GPS and salt usage data to assess whether approved service standards are met or exceeded, efficient employment of resources or other useful information for management.**

C.2 Monitoring of Claims Investigations and Outcomes Needs Improvement

***Timeliness and
adequacy of
claims
information are
a concern***

In our February 2010 report on Insurance and Risk Management, we noted that the Insurance and Risk Management Unit had expressed concerns with respect to the timeliness of claim information requested from divisions. At the same time, the Unit had also not always been providing the divisions with Loss Control Notices containing details of certain claim settlements. Such information is helpful in preventing similar events in the future. However, Loss Control Notices are issued for claims over \$50,000 and many claims related to winter maintenance fall below this threshold. As such, it would be beneficial that divisions be provided appropriate claims information to assist them in identifying trends. This information could then be used to assess the adequacy of preventive measures to minimize occurrence of accidents and resulting claims.

The City has paid \$12 million for icy sidewalk slip and fall claims

Transportation Services is responsible for claims made against the City by individuals who have injured themselves in a fall on a City sidewalk. As at December 31, 2010, the City has paid \$14 million for icy sidewalk slip and fall claims for the period 2005 to 2010, with a further \$33 million in outstanding claims. These costs include legal and adjusting fees.

As noted previously, available GPS data providing evidence that a service has been provided at a particular time and location has not been utilized for defending claims. Insurance and Risk Management staff have indicated that such information has not been specifically requested or provided.

Need to establish formal communication protocols

There is a need to strengthen the communication protocols to ensure that adequate information is provided between divisions and the Insurance and Risk Management Unit to facilitate the analysis and monitoring of claims.

Recommendation:

- 7. The Manager, Insurance and Risk Management, and divisional staff review their respective roles in investigating claims and ensuring adequate preventive measures are in place to minimize occurrence and related costs, including**
 - a. Establishing monitoring procedures at the division level to identify risk areas and analyze trends;**
 - b. Determining the appropriate level of detail that should be provided by Insurance and Risk Management to divisions to facilitate such analysis; and**
 - c. Utilizing GPS information as required for claims investigation to establish that the appropriate level of service has been provided.**

CONCLUSION

This report presents the results of our review of contracted winter maintenance services managed by Transportation Services Division. We have identified areas that need improvement pertaining to winter maintenance standards, contract management practices and performance measures.

The report contains seven recommendations. Addressing the recommendations in this report will improve overall effectiveness of the City's winter maintenance operations. While savings are possible, significant savings will only be found through changes to service levels. Recommended changes to procurement practices could result in cost savings, but the amount, if any, is not determinable at this time.