



STAFF REPORT ACTION REQUIRED

Confirmation of Levels of Service for Roadway and Roadside Winter Maintenance Services

Date:	October 28, 2013
To:	Public Works and Infrastructure Committee
From:	General Manager, Transportation Services
Wards:	All Wards
Reference Number:	P:\2013\Cluster B\TRA\Scarborough District\pw1382.doc AFS17496

SUMMARY

The purpose of this report is to confirm the levels of service for roadway and roadside winter maintenance provided by Transportation Services, and in particular to enable the Division to tender contracts for the upcoming 2015–2022 term.

This report describes existing levels of service for the City’s winter operations and seeks to confirm, or adjust as directed, these levels of service for roadway de-icing, roadway ploughing, driveway windrow opening, sidewalk snow clearing and snow removal.

The report does not propose any adjustment to the existing levels of service for roadway de-icing and roadway ploughing, but does seek to enhance the level of service for sidewalk clearing. The levels of service for all winter activities are illustrated in the attached appendices.

RECOMMENDATIONS

Transportation Services Division recommends that:

1. City Council reconfirm the existing levels of service for roadway de-icing, as outlined in Appendix 1.
2. City Council reconfirm the existing levels of service roadway snow ploughing and driveway windrow opening, as outlined in Appendix 2.

3. City Council confirm the amended levels of service beginning in the 2015/16 winter season for sidewalk and bus stop snow clearing, including the introduction of a higher level of service for high pedestrian volume sidewalks, at a cost of approximately \$2,900,000 as outlined in Appendix 3.
4. City Council reconfirm the existing levels of service for snow removal as outlined in Appendix 4.

Financial Impact

There is no immediate financial impact associated with this report. The staff recommendation that does have financial impact would not come into effect until the 2015/16 winter which is the commencement of the next round of winter contracts.

This report recommends an increase in the level of service for high pedestrian volume sidewalks at a cost of approximately \$2,900,000.

The Deputy City Manager and Chief Financial Officer has reviewed this report and concurs with the financial impact information.

DECISION HISTORY

City Council last confirmed the levels of service for winter maintenance through adoption of Public Works and Infrastructure Committee Item PW20.10 at its meeting of January 27 and 28, 2009. Those are the existing levels of service.

By adopting Audit Committee Item AU2.2 at its meeting of June 14 and 15, 2011, City Council also requested that the General Manager, Transportation Services re-confirm with City Council the City's winter maintenance service levels that would serve as the basis for the next winter contracts (for 2015 and on), before initiating the Request for Quotation process. This was contained in the April 26, 2011 report from the Auditor General entitled *Transportation Services – Review of Winter Maintenance Services, Recommendation No.2*.

ISSUE BACKGROUND

Transportation Services provides a full suite of winter maintenance services including roadway de-icing, roadway ploughing, driveway windrow opening, sidewalk clearing, bus stop clearing, seniors sidewalks clearing, and snow removal. Where mechanically possible, these services are delivered consistently and equitably to all areas of the city. In general, the levels of service are on par with or higher than any comparable North American municipality. A sampling of the levels of service and approved budget for the service is shown below.

Activity	Contracted Costs	Contracted Equipment	Inhouse Costs	Inhouse Equipment
Roadway De-Icing	\$18,000,000	155	\$7,500,000	48
Roadway Ploughing	\$22,000,000	380	-	
Driveway Windrow Opening	\$4,000,000	130	-	
Mechanical Sidewalk Clearing	\$11,500,000	210	\$500,000	8
Mechanical Bus Stop Clearing	\$5,500,000	106		
Seniors Sidewalk Clearing			\$500,000	
De-icers (Salt)			\$10,500,000	
Inter-div'l Charges (Fleet maint./fuel)			\$3,500,000	
Contrib. to Capital (Fleet reserve)			\$2,000,000	
Total	\$61,000,000		\$24,500,000	

The majority of the winter services provided by the Division are delivered using contractors. This has traditionally been the most efficient method by which to deliver the service and contain costs; however, to ensure that the City remains a knowledgeable owner in the field of winter maintenance it is important to have a balance of in-house and contracted equipment. In-house staff are focussed on salting of local roads, manual clearing of steps and priority locations, and Service Request response.

Transportation Services has recently undertaken a public consultation process to determine how residents of the City view how well the division provides winter services. A telephone survey was conducted within each of the four Community Council areas.

The findings show that residents are generally satisfied with the services provided. Residents of Scarborough and North York rated highly the overall job the City is doing providing winter maintenance services, with 70% and 67% respectively, saying that the City is doing either an excellent or good job. Residents of Etobicoke-York and Toronto & East York rated the City slightly lower, with 55% and 54% respectively, saying the City is doing an excellent or good job. Overall, 27% considered there to be a significant or moderate improvement over how the City delivered winter services three years ago.

Nearly 60% of respondents agreed or strongly agreed that the City is doing a good job communicating to the public about its winter maintenance activities, and most of the people surveyed felt the City provided snow clearing activities within a reasonable amount of time. Just over half of all respondents felt the City is spending the right

amount on winter maintenance activities, while 12% felt the City is spending too much and 15% felt the City is spending too little.

The survey asked residents to suggest improvement areas for the winter maintenance program. The top three rated suggestions are; better clearing of pedestrian facilities, better clearing of roadways, and faster snow removal. The complete survey results are attached as Appendix 6.

COMMENTS

The maintenance of a safe and reliable municipal transportation system is based on three main elements: **de-icing**, **snow ploughing** and **snow removal**. The selection of the most appropriate method of dealing with a particular winter storm is principally based on the amount of accumulated snowfall and prevailing temperatures. Based on these, the selected method offers a balance between the clearing and/or removal of the accumulated snow and ice at an appropriately determined pace in a responsive manner. In addition to these major winter service operations, work crews ensure that catch-basins, drains, and culverts work properly and that crosswalks, transit stops and many sidewalks are also cleared of snow and ice. In areas where mechanical snow clearing is not feasible, snow clearing services are provided to seniors and people with disabilities. The effective deployment of these winter service operations makes it possible for emergency vehicles and the public to travel safely, for the transit system to provide the public with timely service and for commerce to continue functioning.

During the winter season (November to April), Transportation Services staff patrol the expressways, arterial roads, and potential “trouble spots” like hills on collector or local roads, 24 hours per day, 7 days per week. Staff also monitors detailed weather forecasts supplied by various service providers. In this way, the appropriate response to any given condition can be activated in a timely manner.

De-icing of Streets and On-street Bike Lanes

The application of de-icing agents is the first level of snow response on pavements. De-icing products, such as salt, are spread on roads for light snowfalls and during the initial stages of significant storms. When temperatures are not extremely cold, de-icing is the most inexpensive method of dealing with snow accumulation. The melting of the snow is achieved when vehicle tires mix the snow with the salt on the roadway. Where necessary, due to ice conditions, traction-providing agents, such as sand, are spread on the pavement to achieve safe and passable conditions. The amount of salt applied will depend upon the prevailing temperature, intensity and duration of the snowfall. Generally road salt is applied during the initial stages of a snowfall. Depending upon snow intensity and accumulation, two rounds of salt may be applied prior to commencing a ploughing operation.

When snow accumulations exceed 5 cm, ploughing operations may commence and salting operations modified. Salt trucks will then be re-deployed as required to salt steep

hills, main intersections, curves and bridges while ploughing operations continue until the storm has ended and all streets are cleared.

On-street bike lanes are de-iced to the same level of service as the road on which they are located. The majority of bike lanes are located on arterial roads and are de-iced within 2 to 4 hours of the onset of a winter event.

Sidewalk Snow Clearing Levels of Service

There are currently no legally mandated minimum maintenance standards for sidewalk snow clearing that are legislated in Ontario. Under the City of Toronto Act, Ontario Regulation 612/06, a municipality is not liable for a personal injury caused by snow or ice on a sidewalk, except in cases of gross negligence. This identical provision is stated in the Municipal Act, Ontario Regulation 239/02 for the rest of the province as well. Nevertheless, Toronto has a high level of service in providing mechanical sidewalk snow clearing on most city streets, save for the inner areas where it is not feasible.

In general, mechanical clearing is precluded in areas with streets less than 8 metres wide, with sidewalks less than 1.5 metres wide, with sidewalks adjacent to the street, with long-term parking adjacent to the sidewalk or with boulevards having obstructions like utility poles, planters or retaining walls adjacent to or within the sidewalk. There are approximately 1,100 km of sidewalk in Toronto that cannot be cleared mechanically. Staff estimates that it would cost \$9,900,000 to manually clear these locations to the same service level as mechanical clearing elsewhere in the City due to the labour intensive nature of the work. There would be additional logistical challenges associated with such a program as approximately three hundred and sixty manual crews would be required, likely composed primarily of day labourers.

Staff has explored the option of deleting the local road sidewalk clearing program in the Etobicoke-York, North York, and Scarborough Districts in order to deliver a harmonized level of service throughout the city. Implementing this option would require the introduction of a senior's and persons with disabilities sidewalk clearing program, as is currently in place in the Toronto and East York District. It is estimated that such a program would cost approximately \$4,500,000 and would cancel out the potential savings of approximately \$3,750,000 that could be realized through deletion of local road sidewalk clearing in the suburban districts.

Staff are recommending that the level of service for high volume pedestrian areas, such as sidewalks on arterial roads, school zones, transit corridors, and accessibility locations, be increased to clear snow at 2 cm of snow fall throughout the winter season within 15 hours. Low volume pedestrian routes, such as sidewalks on local roads, would not be cleared until at least 8 cm of snow has fallen and would take up to 48 hours to complete. In addition, Road Operations Managers in each district would be given greater latitude to activate sidewalk clearing or de-icing in response to icy conditions that may be caused by freezing rain or freeze / thaw cycles. When clearing low volume sidewalks under such activations, staff will instruct operators to lift the blade of the sidewalk plough so as to

minimize any potential impact on residents who have already cleared their sidewalk. Developing distinct levels of service for high vs. low volume pedestrian streets will also allow staff to potentially dedicate more appropriately sized equipment to the task, thereby reducing the amount of damage to sod, adjacent retaining walls and fences caused by sidewalk ploughs. Appendix 3 summarizes the proposed sidewalk snow clearing level of service.

Transit Stop and Crosswalk Snow Clearing Levels of Service

Transportation Services clears snow at transit stops and crosswalks at the completion of arterial and collector road ploughing operations or when icy conditions exist. It is essential that ploughing operations are complete prior to the commencement of this activity so that windrows can also be cleared to provide safe egress for passengers exiting transit vehicles. A de-icer is also applied to the passenger waiting pads as part of this procedure. This service has been improved significantly over the years. The service is now delivered within 48 hours and often less depending on the amount of snow received. Appendix 3 summarizes the proposed transit stop and crosswalk snow clearing level of service.

Wheel Trans locations are not routinely cleared as part of snow removal operations. There are approximately 33,000 registered Wheel Trans users throughout the city. It is estimated that the cost to deliver a snow clearing program throughout the City would be approximately \$5,323,000 per season assuming a unit cost of \$20 per residence and a level of service linked to the current mechanical sidewalk clearing program. Due to the nature of the work, it would not be possible to clear the locations mechanically, and all of the work would have to be performed manually so as not to cause damage to adjacent curbs, retaining walls or fences.

Driveway Windrow Opening Levels of Service

It is very rare that municipalities in Canada provide driveway windrow opening for residents. As far as staff is aware, Toronto is only one of two cities to provide this service. Further, it is not a legislated activity, and is not covered by any mandated minimum maintenance standard.

Driveway windrow opening is not a stand-alone activity. It is a component of the roadway ploughing operation, and so it is not mobilized without roadway ploughing first having been activated.

Transportation Services currently opens driveway windrows, where mechanically possible, on all classifications of roads in the City of Toronto for residential single-family properties. It is not meant for commercial, industrial or multi-family residential developments where property managers typically contract with private service providers to clear parking areas and driveway entrances, including the windrow. This program is currently delivered according to road classification, as the road ploughing service is. Although based on roadway ploughing routes, driveway opening takes a little longer due

to the extra care required to avoid damaging parked cars, curbs, and encroachments adjacent to driveways. On collector or local roads, windrows are typically opened within one hour of roadway ploughing, although there may be a slightly longer delay towards the end of ploughing routes. On arterial roads, which are often ploughed multiple times during one storm, windrows are typically opened within one hour of the final round of roadway ploughing.

The goal of the service is to open the windrow to the extent that a car may pass safely (i.e., to a width of about 3 metres). The program does not clear snow down to the pavement surface or across the entire driveway width. This is intended to minimize damage to driveways and adjacent boulevards. Accordingly, there is some residual snow left in the driveway that residents have to clear themselves.

The current level of service for the driveway windrow program is to open residential driveways only whenever roadway ploughing operations are mobilized. Typically, this would occur at 5 cm of snow accumulation on arterial and collector roads and at 8 cm of snow accumulation on local roads. Approximately 262,000 driveways are opened as part of each operation. It is expected to occur about 4 to 6 times per year, but this number may fluctuate dramatically depending on the severity of the winter. Due to the limitations of the program as a result of parked vehicles, driveway windrows are not opened in those areas of the City with long-term on-street parking. These conditions exist primarily in the Toronto and East York District. Narrow streets (less than 8.5 metres wide) and boulevards with limited snow storage space also prevent the service from being provided to residents in those locations.

Staff has examined every street in the City to assess the locations where this service could be provided. Due to the dense urban form, narrow streets and prevalent on-street parking, the vast majority of streets in Toronto and East York District cannot be feasibly accommodated for driveway windrow opening.

Transportation Services' winter program was recently reviewed by the Auditor General's Office and the driveway windrow opening program was identified by the Auditor General as an area of potential service level reduction. Recommendation No.1 of the April 26, 2011 report entitled *Transportation Services – Review of Winter Maintenance Services*, approved by City Council through adoption of Audit Committee Item AU2.2 at its meeting of June 14 & 15, 2011 speaks to this issue. At the time, the Division was in the middle of seven-year contracts and the true savings of approximately \$4,000,000 per season could not be realized until the expiration of the contracts.

Bicycle Lane Levels of Service

Designated on-street bike lanes receive a priority level of winter service. During a storm, ploughing of main roads, where most of the bike lanes are located, is commenced at accumulations of 5 cm and continues until the snowfall stops. In accordance with the Council policy, ploughing of these routes is completed within 8 to 10 hours of the end of a storm.

For a period of 48 to 72 hours after a storm, ploughs are again sent out to “clean up” curb lanes, where the majority of bike lanes are located, with instructions to the Operators to move the snow as close as possible to the curb without blocking the public sidewalk. Our goal upon completion of this activity is to have at least 1 m of the bike lane open for use. It is not possible to completely eliminate snow from the curb lanes, however, the “clean up” is done more frequently on streets with bike lanes in order to keep them open.

The majority of Toronto and East York District bike lanes are located on streets where the curb is against the sidewalk and on-street parking is adjacent to one side of the bike lane. Staff continues to communicate the message of removing parked cars from the road during snow events to the public through media messaging and public education.

With large snowfalls, the windrows are significant, easily approaching or exceeding 2 m in width. Compounding the problem is on-street parking and service vehicles. After a road and sidewalk has been ploughed, parking vehicles, service/delivery trucks and even general traffic driving in the already narrowed curb lanes tend to drive on the ploughed windrows and push the snow onto the sidewalk and/or the curb/bike lane. Additionally, as drivers clear their cars after a storm and residents or abutting business owners shovel out, large piles of snow end up being deposited on the street within the bike lanes. These large piles harden after freeze/thaw events and ice is formed. In locations where on street parking occurs, the presence of these hardened windrows commonly results in vehicles parking several feet from the curb often obstructing the bike lane.

Where segregated bike lanes are present within the road allowance, dedicated equipment is used to maintain the lanes to the same levels of service for salting and ploughing as the arterial roads on which they reside.

Response to Climate Change

Transportation Services has incorporated measures into the winter program to counter the climate changes that have become more prevalent in recent years. The period during which the division receives its winter weather forecasts four times daily has been extended to October 1st to April 30th to better anticipate unpredictable shoulder season events.

Staff reviewed climatology data with the weather provider to better understand the changing climatic conditions within the City of Toronto. This is for the purpose of determining an appropriate level of preparedness to respond to winter events. This information also determined that microclimates exist within the city boundaries and will be used to establish new Road Weather Information System locations. It was also noted that changing weather patterns are long term and that for the immediate future it is necessary to be prepared for major winter storms of the magnitude that has been expected in the previous 30 year period.

Enhanced contract language will be introduced within the next winter contracts to broaden our ability to call upon contractors earlier and retain them later during a winter season. Actual contract commencement dates may be advanced into the fall season for the Winter Maintenance Depots which are typically the primary and major lines of defence against a winter storm.

Further, the division has steadily been increasing its anti-icing capability and use of liquids as part of its response to early and late season frost events, providing an enhanced level of safety for bridge deck and steep hill locations.

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SIGNATURE

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DG/PN/ef

ATTACHMENTS

Appendix 1 – Roadway De-icing Level of Service Table
Appendix 2 – Roadway Ploughing Level of Service Table
Appendix 3 – Sidewalk and Bus Stop Snow Clearing Level of Service Table
Appendix 4 – Snow Removal Level of Service Table
Appendix 5 – Glossary of Winter Maintenance Terms
Appendix 6 – Toronto Winter Maintenance Survey Findings