



STAFF REPORT ACTION REQUIRED

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

Date:	October 29, 2008
To:	Public Works and Infrastructure Committee
From:	General Manager, Transportation Services
Wards:	All
Reference Number:	P:\2008\ClusterB\TRA\Scarborough\pw&i08079 (AGF#8825)

SUMMARY

The purpose of this report is to respond to standing committee motions received in recent months for reports from the General Manager, Transportation Services on various matters related to winter maintenance. 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.

RECOMMENDATIONS

Transportation Services Division recommends that:

1. City Council confirm the current levels of service for winter maintenance respecting roadway de-icing, roadway snow ploughing, driveway windrow opening, sidewalk snow clearing, and snow removal as outlined in Appendices 1, 3, 5 and 6 as continuing to be appropriate.
2. City Council direct the General Manager, Transportation Services to undertake a pilot project for the removal of windrows at entrances to public laneways at a cost of approximately \$50,000 subject to additional funding being allocated to the 2009 Transportation Services Operating Budget.
3. Recommendation 2 of this report be referred to Budget Committee for consideration as part of the 2009 Operating Budget Process.

FINANCIAL IMPACT

Funding for a pilot project for the removal of snow at laneway entrances will cost \$50,000 and will be referred for consideration during 2009 Operating Process.

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

BACKGROUND

The Public Works and Infrastructure Committee, at its meeting held on February 8, 2008, under Item PW13.7, referred letters from the Toronto Pedestrian Committee (January 23, 2008) and Councillor Joe Mihevc (February 4, 2008) respecting Accessible Pedestrian Routes after Heavy Snowfalls and Snow Clearing Enforcement to the General Manager, Transportation Services for report to the Public Works and Infrastructure Committee.

The Public Works and Infrastructure Committee, at its meeting held on April 9, 2008, under Item PW14.7 referred requests from the Toronto Cycling Advisory Committee to the General Manager, Transportation Services for consideration and report to the Public Works and Infrastructure Committee:

- (1) The Toronto Cycling Advisory Committee requests the Public Works and Infrastructure Committee to request the General Manager, Transportation Services Division, in consultation with appropriate City officials, to report on the feasibility of enforcing a temporary “No Parking” policy along designated snow routes, for key roads or key portions of major thoroughfares, preceding forecasted snow storms, in order to provide motorists ample notice to not park on the designated roads and to facilitate the clearing of snow right to the curb, thereby providing cyclists with sufficient space to ride safely on the designated road.

City Council, at its meeting held on April 28 and 29, 2008, under Item EX19.4, adopted the following motion in connection with the award of Transportation Services’ seven-year winter maintenance contracts:

- (1) The General Manager of Transportation Services report back to the Public Works and Infrastructure Committee after the seven-year winter control contracts have been awarded, on any savings or increased effectiveness that are expected to be realized in the future from these contracts.

The Public Works and Infrastructure Committee at its meeting held on May 7, 2008, under Item PW15.6, directed that the General Manager, Transportation Services be requested to:

- (1) Review and report on all bike lanes and trail paths under the jurisdiction of the

Transportation Services Division, in order to determine and advise which bike lanes can be identified as priority bike lanes in order to ensure the snow is removed from those bike lanes rather than the snow being cleared only; and

- (2) As part of the review and report, consider identifying the following bike lanes as priority bike lanes, as identified by the Toronto Cycling Advisory Committee:
 - a. Harbord Street;
 - b. St. George Street/Beverley Street;
 - c. Davenport Road/Dupont Street;
 - d. Sherbourne Street;
 - e. The entire Martin Goodman Trail;
 - f. Dundas Street East;
 - g. Danforth Avenue Viaduct; and
 - h. College Street;

and add other west end opportunities

The Public Works and Infrastructure Committee at its meeting held on May 7, 2008, under Item PW15.5, referred letters from Councillor Mihevc and Councillor Milczyn respecting snow ploughing in laneways to the General Manager, Transportation Services for consideration and report to the Public Works and Infrastructure Committee.

- (1) (April 8, 2008) letter from Councillor Joe Mihevc, Ward 21, St. Paul's West respecting Snow Ploughing in Laneways; and requesting that staff report on a service adjustment related to laneways, specifically about ploughing the entrances/exits to laneways, and that the protocol for snow clearing in laneways be so amended.
- (2) (May 7, 2008) letter from Councillor Peter Milczyn, Ward 5, Etobicoke-Lakeshore requesting that staff report back to the Public Works and Infrastructure Committee, specifically on Market Garden Mews, Etobicoke, and generally on public lanes in new developments, regarding the possible changes to the policy and practice of ploughing snow in public laneways.

The North York Community Council, under Item NY15.44, in a letter (May 13, 2008) to the Public Works and Infrastructure Committee (Item PW16.9) recommended:

- (1) That the General Manager, Transportation Services Division, be requested to:
 - a. improve the windrow clearing program so that windrows are opened in conjunction with street ploughing rather than at a later time;

- b. restore sidewalk clearing standards to the former City of North York standard and that sidewalk clearing include the deposit of sand or some other slip retardant or skid material; and
 - c. give consideration to clearing snow on sidewalks, especially where the TTC buses stop to pick-up and drop-off passengers.
- (2) That the General Manager, Transportation Services, be requested to report on:
- a. ways to better clear the snow from bus shelters and bus stops, in consultation with the Toronto Transit Commission;
 - b. ways to clear the snow from the Toronto Parking Authority Pay and Display machines, in consultation with the staff of the Toronto Parking Authority; and
 - c. the estimated costs associated with implementing the improvements identified in Recommendations 1a., 1b., and 2a. and 2b referred to above.

The Public Works and Infrastructure Committee, at its meeting held on June 27, 2008, under Item PW17.15, requested the General Manager, Transportation Services to include in all future reports related to snow removal a clear explanation of the service provided.

The Public Works and Infrastructure Committee, under Item PW17.18, in a letter (June 27, 2008) requested the General Manager, Transportation Services to report to the Public Works and Infrastructure Committee on the possibility of:

- (1) equipping all salt trucks, snow ploughs, and sidewalk snow ploughs with a Global Positioning System (GPS), in order to provide taxpayers with an opportunity to view on-line on the City's web site where the vehicles are located on their respective routes; and
- (2) broadcasting a snow storm status report on the City's web site and by telephone.

DECISION HISTORY

Winter maintenance levels of service were first approved shortly following amalgamation by Urban Environment and Development Committee through adoption of Item 1.F on March 16, 1999 and Item 3.26 on March 31, 1999.

The road classification system, on which the majority of winter maintenance levels of service are based, was approved by Works Committee through adoption of Item 3.25 at its meeting of July 14, 1999.

City Council further approved a policy for providing mechanical sidewalk snow clearing on City streets where feasible, through adoption of Item 7.64 at its meeting of July 24 to 26, 2001 and through adoption of Item 10.15 at its meeting of September 10, 2001. At

it's meeting on July 3, 2003, Works Committee, in Item 6.24 re-affirmed the criteria for provision of mechanical sidewalk clearing.

At it's meeting on May 3, 2006 Works Committee, in Item 3.9 approved the summer and winter levels of service for laneways.

COMMENTS

Glossary of Terms

This section has been included in this report to provide clarification with respect to terminology that is used by staff in relation to winter maintenance services.

De-icing. The elimination of snowy or icy conditions on the roadway or sidewalk through the application of a material which melts snow or ice (typically salt), or which provides traction (typically sand). Other materials used may include salt brine, sand/salt mixtures, or alternative chemicals.

Snow Ploughing. The pushing of snow to the curb on roadways typically performed with a blade attached to a motorized vehicle. This activity is not to be confused with snow removal.

Windrow. A linear pile of snow that is created by ploughing when the snow comes off the end of the blade. Windrows may be created across driveway entrances or across collector or local roads.

Driveway Windrow Opening. The clearing of a 3.0 metre wide opening at the foot of the driveway in the windrow created by the road plough so that a small car may pass safely. There will be some residual snow left in the driveway that a resident will have to clear by hand.

Snow Removal. The physical displacement of snow from a roadway or laneway by either loading it into trucks and hauling it to another location, or through rapid onsite melting. This activity is not to be confused with snow ploughing.

Bicycle Lane. A designated travelling lane for cyclists that is on the roadway. The bicycle lane may be adjacent to the curb where there is no on-street parking permitted, or it may be between an on-street parking area and the vehicular lanes.

Bicycle Path. A path located off the roadway which may have the appearance of a public sidewalk. It may be adjacent to the roadway or it may cut through recreational areas such as parks. Most bicycle paths are constructed of asphalt, not concrete like sidewalk, have poor drainage capability, and typically do not have an engineered pavement structure usually with no winter service provided.

Sidewalk Snow Clearing. All winter maintenance services for sidewalks, including sidewalk snow ploughing, sidewalk de-icing and sanding, and sidewalk snow removal. This generic term is used as these operations may be performed simultaneously using the same piece of equipment; for example, sidewalk machines are capable of ploughing and de-icing at the same time during some snow events.

Full Scale Snow Removal. The physical displacement of snow from a roadway, laneway, bicycle lane, or pedestrian area by hauling the snow away or through rapid

onsite melting. A full scale snow removal operation in Toronto would typically occur only once every 5 – 10 years.

Managed Snow Removal. The physical displacement of snow from a roadway, laneway, bicycle lane, or pedestrian area by hauling the snow away or through rapid onsite melting. Unlike, full scale snow removal managed snow removal is much more limited in scope, has limited financial implications, and occurs much more frequently.

Winter Services Introduction

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 fiscally responsible manner. In addition to these major winter service operations, work crews ensure that catch-basins, drains, and culverts work properly and that crosswalks, bus stops and sidewalks for senior citizens and people with physical disabilities are also cleared of snow and ice. 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 from November to April, Transportation Services staff patrol the expressways, arterial roads, and potential “trouble spots” like hills on 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 timely manner.

De-icing of Streets

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.

In addition, when rush-hour snowfall or icing is predicted, salt trucks can be placed in “loaded standby” positions across the City in order to effectively apply salt to the road network. This practice minimizes the time it takes salt trucks to get to their designated salt beats and commence de-icing operations in the rush hour direction.

Studies have shown that accident rates are drastically reduced upon the application of de-icers. Nowhere is this more apparent than on expressways and main roads with daily traffic volumes that range from 150,000 per day for expressways and 20,000 to 50,000 vehicles per day for main roads. Delayed or ineffective de-icing not only impacts on the road network’s ability to carry emergency, vehicular, transit and commercial traffic but also results in higher levels of ground ozone from vehicular emissions.

At the same time, the Transportation Services Division is committed to the principles of reducing salt use while maintaining safe road conditions. In fact, Transportation Services has emerged as a recognized international leader in salt management. In 2001, the City of Toronto became the first major municipality to develop a Salt Management Plan and has been working with Environment Canada as part of a multi-stakeholder working group. Since there are no cost effective alternatives to road salt at this time, new technology has been introduced to allow vehicle operators to apply just the right amount of salt to the roadway surface in order to achieve effective de-icing. This new technology involves requiring all salt trucks to be equipped with electronic salt spreader controllers which monitor, control and verify salt application rates on their specified routes. In addition, pre-wetting technology is being phased in over the next few years which allows salt truck operators to apply a brine solution to the coarse rock salt immediately prior to spreading on the road network. This application of salt brine causes faster de-icing, thereby potentially reducing the volume of rock salt required to achieve safe conditions by as much as 15%.

Another method of de-icing involves the application of a salt brine solution directly to the pavement surface in advance of a storm. After drying, the salt brine turns into a fine powdery residue that immediately reverts to salt brine during any precipitation and prevents the formation of an ice/roadway bond. This technique is called direct liquid application (or anti-icing). This activity was initiated by Transportation Services in 2003-2004 and our experience over the last few winter seasons has confirmed that this is an effective de-icing practice. Appendix 1 outlines the levels of service for roadway de-icing.

Sidewalk Snow Clearing Levels of Service

In 2007, Transportation Services initiated a survey of municipalities administered through the Ontario Good Roads Association to determine which towns, cities and regions delivered a separate mechanical sidewalk clearing program. Of approximately 30 responses, 29 indicated that they had a sidewalk snow clearing program. Twelve municipalities said they clear sidewalks only if it is mechanically possible. Most

responding municipalities don't distinguish between sidewalks on arterial, collector and local roads, with 23 saying they clear sidewalks on all roads, and the ones who don't clear local roads still place an emphasis on special conditions (e.g., transit routes, parks or school frontage). It should be noted that none of the municipalities are comparable to Toronto's total sidewalk length of 7,945 kilometres. Appendix 2 indicates the names of the municipalities which responded to the survey.

There are currently no legally mandated minimum maintenance standards for sidewalk snow clearing that are legislated on municipalities. Nevertheless, Toronto still has a high level of service in providing mechanical sidewalk 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. At its meeting of July 3, 2003, Works Committee re-affirmed the provision of mechanical sidewalk snow clearing only to those streets meeting the feasibility criteria (i.e. 6000 km of a total 7,945 km sidewalk network).

Looking to the future, staff recognizes the increasing importance to focus services on pedestrian-oriented infrastructure. Direction is apparent from the City's Official Plan that not only transit-supportive services are being called for from City Divisions, but also through the Pedestrian Charter and Walking Strategy, that pedestrian-supportive services also be recognized and given equitable consideration. To be more pro-active on arterial roads and high volume pedestrian corridors (e.g. more focused on road classification), Transportation Services will be implementing the sidewalk snow clearing program in order to respond to changing climate conditions in Toronto (e.g., more icy surfaces rather than deep snowfalls) and higher expectations of its citizens.

The Toronto Parking Authority currently operates approximately 2000 Pay and Display parking machines at on-street parking spaces on Toronto streets. Staff estimates that it would cost approximately \$1,500,000 per season to clear snow around Pay and Display machines. Due to the presence of various items of street furniture adjacent to the machines, mechanical clearing of snow is not possible and manual clearing would be required. However, snow around Pay and Display machines would continue to be removed as part of snow removal operations.

With the recent focus on cost containment, Transportation Services will be reviewing the conditions of each winter storm individually to critically determine which services are required at which times. Staff will, more than ever, be looking ahead at weather forecasts to take advantage of warming trends, or different precipitation levels across the City, in order to rationalize effective use of resources. That is, if sidewalk clearing is required in one part of the City because the 8 centimetre snowfall guideline has been met, it doesn't mean that all parts of the City will receive the same service if those areas experience less snowfall. Similarly, if milder temperatures are forecast, then significant expenditures for

additional clearing or removal of snow will be carefully scrutinized. Safety for motorists or pedestrians will in no way be compromised by the suggested cost containment measures. Safety is still a top priority for the division.

It typically takes about 15 hours to complete one round of de-icing and/or ploughing on sidewalks using mechanical means. For storms where snow accumulations exceed 8 centimetres, or wherever road ploughing operations result in the clearing of windrows at bus stops, a minimum of two rounds of de-icing/clearing is required to return the sidewalk to normal winter conditions.

Currently, when sidewalk clearing is mobilized, a mixture of approximately 90% salt and 10% sand is spread on the sidewalks to melt any accumulated ice or snow and to provide traction for pedestrians. In order to provide an increased level of traction, higher amounts of sand will be applied in the future. Transportation Services will also be more aggressive in mobilizing equipment to respond to slippery conditions where ploughing operations are not required. Appendix 3 summarizes the bus stop and crosswalk snow clearing level of service.

Transportation Services does not presently deliver winter maintenance services to sidewalks based on road classification as all sidewalks receive the same level of service wherever mechanical clearing is feasible. Transportation Services will explore structuring sidewalk snow clearing routes so as to give priority to those sidewalks on arterial and collector roads where transit routes prevail and pedestrian loadings are heaviest. Local road sidewalks would be cleared after arterial and collector sidewalks had been completed. During Type 2 or greater storms, whenever road ploughs are mobilized, there is sometimes a delay in the opening of corner radii. This is particularly true on arterial roads where sidewalk clearing must be coordinated with roadway ploughing as sidewalks cannot be cleared until roads have been ploughed. Appendix 2 summarizes the sidewalk snow clearing level of service currently provided.

In those areas of the City where mechanical sidewalk clearing is not feasible, Transportation Services provides sidewalk snow clearing services to residents and/or tenants of one or two family dwellings where:

1. Residents/tenants are 65 years of age or older and where there are no members of the same household under 65 years of age; or
2. Residents/tenants are 65 years of age or older and where a member of the same household under 65 years of age is determined by a physician to be disabled; or
3. Residents/tenants are under 65 years of age and are determined by a physician to be incapable of removing snow from the sidewalks adjacent to their home without endangering their health, without an able-bodied member of the same household under 65 years of age residing on the premises.

For this free service, an application form must be completed annually and signed by the requesting person. In the case of applicants with temporary or permanent physical disabilities, a doctor's certificate confirming their inability to clear snow is required.

Sidewalk Snow Clearing By-laws and Enforcement

The clearing of snow and ice from City sidewalks where the City does not provide sidewalk snow clearing service is regulated by and enforced through Municipal Code Chapter 719, Snow and Ice Removal. This Chapter indicates that it is the responsibility of every owner or occupant to clear his/her sidewalk abutting his/her property within twelve(12) hours after any snowfall and to maintain them in a clear state thereafter. The Chapter further prohibits the clearing of snow from private property and depositing onto the public roadway/sidewalk/lane. If there is no compliance with the provisions of the Municipal Code, the City has the authority to clear the sidewalks and to add the resulting costs of this work to the Realty Tax bill of the property. The charges to clear snow/ice for 2008/09 winter season will be \$6.00 per square metre for shovelling and \$3.00 per square metre for salting.

In addition, owners/occupants who fail to clear snow/ice from sidewalks abutting their properties may be subject to a fine of \$100.00 plus \$25.00 victim surcharge and for moving snow/ice from private property to public property may be subject to a fine of \$295.00 plus \$65.00 victim surcharge.

Staff will be striving to make residents aware of the Municipal Code requirements through communications materials at the beginning of winter and throughout the season using media channels when available. Staff believe that a more aggressive public awareness campaign such as what was previously referred to as "Be nice, clear your ice" would be beneficial in gaining compliance with by-laws.

By-law enforcement is largely complaint driven, except in areas where repeated offenders have been identified from previous years. The longstanding enforcement procedure employed to deal with the identified parties who have not cleared their sidewalks is to first provide a notice for the purpose of seeking their compliance, then upon reinspection if the walk is still not cleared, moving on to progressive levels of enforcement. This is done by delivering a "Notice of Inspection" which is left either with the owner/occupant of the property or in the mail box at the property. The delivery of the notice is not a requirement of the Municipal Code, but rather a courtesy reminder to the owners of their obligation to make the sidewalks safe.

A follow up inspection is made twenty-four (24) hours after the "Notice of Inspection" is issued. If the sidewalk remains snow covered the Bylaw Officer will issue a "Notice of By-law Infraction" and request City Road Operations crew to undertake the necessary clearing of snow and ice. At locations considered dangerous, for public safety Road Operations staff gives high priority. Locations of repeated complaints/offenders staff will

automatically issue a fine as well as request that the sidewalk be cleared by Road Operations staff.

Approximately 3,900 “Notices of Inspection” were issued during the 2007/08 winter season, followed by 450 charges being laid (approximately 80% were laid in the Toronto and East York District). The results indicate that the majority of owners/occupants comply with the first “Notice of Inspection”. For further details on compliance with the sidewalk snow clearing by-law, refer to Appendix 4.

Some concern has been expressed with the approach of first providing a “warning” to property owners in these circumstances. While the above-noted statistics suggest that the level of success with the notice approach is good, staff, at the request of some Councillors, have taken the approach of carrying out enforcement in the first instance in chronic areas. It is suggested that this more aggressive application of the Code Chapter requirements be carried out on an as-needed basis, in consultation with the affected Ward Councillor.

Bus Stop and Crosswalk Snow Clearing Levels of Service

Transportation Services clears snow at bus 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 bus stop clearing so that windrows at bus stops can also be cleared to provide safe egress for passengers exiting buses. A de-icer will also be applied to the bus pads as part of this procedure. This service has been improved significantly over the years. Where as it previously took 72 – 96 hours to complete all transit stops, the service is now down to 48 hours and often better. Appendix 3 summarizes the bus stop and crosswalk snow clearing level of service.

Driveway Windrow Opening Levels of Service

It is very rare that municipalities in Canada provide driveway windrow snow opening for residents. Toronto is one of the only cities to provide this service. Staff is of the opinion that this is a high level of service that was expanded across the entire City from the former North York roughly at the time of amalgamation.

Driveway windrow opening is not a stand-alone activity. It is a component of the roadway ploughing operation, and therefore 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, driveways, etc. 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. Local road ploughs that have the ability to clear roads and open driveways at the same time have been introduced through the recently awarded winter contracts. If successful, this limited pilot project will enhance the effectiveness of the driveway windrow clearing program by eliminating the delay between the clearing of the road and the opening of the driveway windrow. Appendix 5 summarizes the driveway windrow opening level of service in the context 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 by hand.

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 centimetres of snow accumulation on arterial and collector roads and at 8 centimetres 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 & East York District cannot be feasibly accommodated for driveway windrow clearing. Often, a pattern emerged where one street or block could be considered under the criteria, but several adjacent streets or blocks could not.

While all efforts are made to provide the highest quality of service, invariably, a driveway may be missed or not opened properly. City staff does respond in a timely manner to address resident calls concerning the opening of driveway windrows on a follow-up basis. However, in years with excessive amounts of snow this service is difficult to provide.

Although as it stands, the existing driveway windrow opening service has been optimized by staff to be as efficient as possible given each district's area and equipment constraints, it is generally delivered with the use of a second piece of specialized equipment subsequent or attached to the road plough clearing the street. Appendix 5 summarizes the roadway ploughing and driveway windrow opening level of service.

Snow Clearing at the Entrances to Laneways

As indicated, Transportation Services clears residential driveway windrows, where mechanically possible, on all classifications of road. The simplest means of clearing the entrances to laneways would be to utilize the driveway windrow opening equipment. This is the approach taken in the Scarborough, North York, and Etobicoke-York Districts on an extraordinary complaint basis only, since the service is not officially provided. However, in the Toronto and East York District, where the majority of the laneways exist, it is not feasible to deliver a driveway windrow opening service on most local roadways, primarily due to the presence of on-street parking and the lack of snow storage on narrow streets. The recommended approach is to initiate a limited pilot project in Toronto and East York District utilizing various pieces of equipment to determine the most suitable, if any, for removing snow at laneway entrances. Staff estimates that such a pilot project would require approximately \$50,000 above and beyond the approved Transportation Services Operating budget for winter services. Should Council wish to implement a complete program at all laneway entrances, the cost would be approximately \$3,000,000 to \$4,000,000.

Public Laneway Levels of Service

After a major winter storm, public lanes are typically one of the most problematic areas to deal with. The City's winter resources focus on the priorities of clearing the main streets, street car routes, main street sidewalks and bus stops to ensure access for emergency services, the transit system and the high volume traffic routes.

Ploughing of laneways has never been carried out by the City, even prior to amalgamation. The Transportation Services Division winter budget allocation accommodates resources to undertake salting of the laneways. Interestingly, until about the mid-1980s, no winter service at all was provided for lanes. This will certainly not result in snow being eliminated, but does assist in keeping them at least passable.

Unfortunately, if there were a desire to increase this longstanding level of winter service for laneways, the next feasible increment that could be contemplated would be physically removing the snow from the lanes (i.e. ploughing it out, loading it onto trucks and hauling to dumping sites). Simply ploughing lanes has been tested on numerous occasions, but has proven not to be feasible due to lack of storage space for windrows, blocking access to garages, property damage, lack of manoeuvring space for equipment, etc. A regular program of snow removal from the approximately 325 kilometres of

public lanes in Toronto would be prohibitively costly, as new specialized equipment and a great many additional personnel would be required, not to mention the environmental impacts associated with the hauling and dumping of the snow (similar to the narrow local roads).

Notwithstanding the above, there are a handful of lanes which have residential frontage and the city must remove snow from these lanes to provide for emergency access.

Laneways are facilities that are meant to provide vehicular access to properties, usually at the rear of lots. They serve both residential and commercial uses, and can be found in all districts of the City, although the vast majority are located in the central parts of the City, in former Toronto. Many were constructed during a time when automobiles were not prevalent; therefore, widths are usually in the 5 to 6 metre range, but can be as low as 3 metres. Accordingly, laneways are usually narrow in width, typically allowing passage for a single vehicle in one direction, and garage doors and doorways often lead directly into the lanes with little or no setback. Many laneways are also constructed with tight corners and dead ends which create additional bottlenecks for users and service providers.

The current policy for winter maintenance on laneways was adopted by Council through approval of the March 24, 1999 report to the Urban Environment and Development Committee entitled “Winter Operations – Road De-Icing and Ploughing” (UDEC3.26). The established level of service for winter maintenance in laneways is to de-ice as necessary to maintain passable conditions. As part of the City’s snow removal plan, snow removal in laneways can begin when accumulations have exceeded 30 centimetres.

There have been several newly constructed residential developments throughout the City where the inclusion of public rear laneways has been adopted by builders as an alternative development standard. These laneways are typically wider than traditional laneways but still present the same challenges from both a snow storage and snow removal perspective. Unfortunately, the inability to plough laneways in these new developments, although in keeping with the level of service afforded traditional laneways, has not been clearly explained to residents by developers. This has resulted in significant confusion and numerous inquiries from both residents and Councillors with respect to the winter level of service provided in laneways.

For example, Market Garden Mews in the Etobicoke-York District, is a local road that provides access to a new townhouse development located south of The Queensway and east of Islington Avenue. There is a rear laneway in which the residents’ garages are located. Transportation Services’ level of service for such laneways has been to de-ice as necessary as the characteristics of the laneway do not permit snow ploughing operations. Market Garden Mews will be ploughed as a local road, but the rear laneway will not.

In summary, while each laneway is unique in its construction and location, they all have similar challenges from a winter maintenance perspective. These challenges are:

Width – Laneways are usually narrow in width, typically only allowing passage for a single vehicle in one direction. Garage doors and doorways usually lead directly into the laneways (i.e. garages do not have designated driveways within the laneways). Many laneways are also constructed with tight corner radii and dead ends which create difficulties for our equipment operators.

Storage Space – The majority of laneways are constructed immediately adjacent to rear property lines. In some cases, buildings are abutting the edge of the laneways. There is very limited space for snow storage.

Equipment – In the majority of the City’s laneways, especially those in Toronto and East York District, only small sidewalk type equipment can operate safely without causing damage to adjoining properties.

As a result, ploughing is not feasible due to the above constraints and routine removal is cost prohibitive. In addition, it may expose the city to higher liability due to damage to private property.

Private Roadways

Transportation Services does not currently provide any winter maintenance services to private roadways in the City of Toronto. Private roadways generally have the same physical characteristics as laneways and pose the same challenges from a winter maintenance perspective. They tend to be narrow and lack snow storage space. In many instances private roadways are constructed to specifications substandard for public roadways. Further, Transportation Services’ staff would incur significant liability when performing work in private laneways and would require the authorization of private property owners. It is not recommended that the City of Toronto provide winter maintenance services of any kind to private roadways.

Snow Removal

After a heavy snowfall or series of significant storms, it may be necessary to remove snow from City streets to maintain safe, passable roadways. Appendix 6 summarizes the level of service for snow removal.

The Transportation Services Division has developed a comprehensive snow removal plan that coordinates snow removal operations across the City. The type of operation activated will depend upon snowfall accumulation. For example a major snowfall exceeding 30+cm may result in activating a full-blown snow removal operation across the City. It is generally at this level when ploughed windrows become a safety concern as transit & emergency vehicle access is very constrained and the local streets approach impassable conditions. Under these circumstances, the only solution is the removal or onsite melting of the snow (i.e. loading the massive piles and hauling to dump sites).

The City has over 14,000 kilometres of curbside, of which about 9,000 kilometres has been targeted as problematic for snow storage. It is these locations where snow, in the form of the ploughed windrow, would be removed in the following priority sequence:

- emergency snow routes
- streetcar and other transit routes
- bike lanes
- commercial areas on main streets

Concurrently, snow removal operations on collector and local roads will be initiated. This activity will be carried out in the following priority sequence:

- collectors
- dead ends
- school loading areas (during non-school hours)
- local streets with on street parking and no boulevards
- local streets with no parking and no boulevards

In order to enable efficient snow removal operations, a “Snow Emergency” By-law was enacted by Council which deals with arterial and commercial streets with street car routes, little boulevard snow storage space and on-street parking. In the event a snow emergency is declared, parking would be prohibited to enable the removal operation. To assist in enforcing the parking prohibitions and ensuring streetcars are not blocked, City and TTC staff completed training with the Police Service to enable them to enforce the by-laws. A Snow Emergency was last declared in 1999.

It must be recognized that a snow removal operation is an extremely costly and unbudgeted undertaking that is not done routinely. The decision to initiate a large-scale snow removal operation from local residential streets has significant operational and environmental impacts, and thus, is a last resort in the hierarchy of winter maintenance operations.

Transportation Services is presently in the process of reviewing its snow removal plans. There is currently no funding for snow removal in the Transportation Services’ Operating Budget as all full scale snow removal operations have been traditionally funded through the Winter Control Stabilization Reserve fund. Due to the extensive snow removal operation undertaken in February of this year, most of this fund will likely be used in 2008 subject to Council’s discretion.

In May 2002, MacViro Consultants Inc. completed a Snow Disposal Feasibility Study that was later approved by Council in February 2003, without amendment. This report recommended that snow disposal be recognized as an essential activity, and that the City should pursue the acquisition of portable snow melters. A 350 tonne per hour portable melter was purchased in 2005 and is positioned at Ontario Place during the winter months to primarily service the downtown core area. However, several additional smaller

melting are required at a cost of approximately \$700,000 per unit to service suburban areas as a result of a reduction in the number of available snow disposal sites.

As a result of the significant amount of snow experienced during the winter of 2007/2008 and the extensive snow removal efforts required in February, staff concluded that an incremental, or managed, snow removal strategy would have been beneficial. Such a plan would have addressed constrained areas earlier and on a more regular basis during heavy snowfalls, rather than waiting until a city-wide snow removal operation was initiated. Additional funding would be required in order to provide for such a managed snow removal strategy; however, it would be of particular benefit to emergency snow routes, key transit corridors, high collision intersections, high pedestrian areas, bridges, bicycle lanes, some local roads with on-street permit parking that may become impassable, and expressways. In the past, costs for snow removal have typically been funded through winter reserves since these services have not been allocated in the Operating budget. Staff are suggesting that a Managed Snow Removal Plan be further reviewed and developed for consideration by Committee and Council at an upcoming meeting. Appendix 6 summarizes the current level of service for snow removal.

Bicycle Lanes and Paths 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.

In the case of the majority of Toronto & 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. Therefore, there is often no alternative but to leave the ploughed windrow partially on the sidewalk.

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.

Transportation Services does not have the authority to implement a temporary No Parking By-Law to proactively prepare for forecast snow storms that would require ploughing operations on arterial roads. The existing parking restrictions are typically such that they prevent cars from parking during rush hours but don't facilitate snow ploughing and/or snow removal during non-rush hour periods unless a Snow Emergency has been declared. 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.

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.

Those bicycle lanes that exist on the roadway between vehicular lanes and on-street parking areas require the use of specialized equipment that Transportation Services does not currently have. Staff is not aware of any equipment that has previously been designed for this purpose; however, Transportation Services is committed to a further and ongoing review of this issue and will continue to pursue the acquisition of equipment intended for the removal of snow in bicycle lanes.

Once a snow removal operation is initiated, as discussed in the following section, bike lanes receive priority removal, generally being completed in the first week of the operation. We find, nonetheless, that despite snow removal operations, the bike lanes continue to be plagued by intermittent blockages.

It is noted that Transportation Services is not presently, nor has it historically been resourced or budgeted to provide winter services on off-street bike facilities (ex. Don Valley or Martin Goodman Trails) which are under the purview of the Parks, Forestry & Recreation Division.

Further, Transportation Services is only able to clear snow from bike lanes or paths with a solid surface such as concrete or asphalt, as plough blades will damage any loose granular material.

Regarding the specific matter of providing winter maintenance on the Martin Goodman Trail (MGT), it is not recommended that Transportation Services clear snow on the entire length of the trail. Of the 20 kilometre length of the MGT, 3 kilometres are completely inaccessible to mechanical equipment due to bridges, steps, etc. On the remaining 17 kilometres, there are fifty one sets of fixed bollards situated along the trail that are designed to prevent motorized vehicles from gaining access. If the trail were to be cleared, these bollards would need to be replaced with collapsible style bollards. Further, mechanical clearing utilizing sidewalk ploughs will create windrows on either side of the trail. As the trail traverses across uneven terrain, there are many locations where ponding

will occur as water will be unable to escape due to the windrows. The resulting ice patches created by freeze/thaw cycles will pose a hazard for pedestrians and bicyclists. Many portions of the trail would have to be signed as No Winter Maintenance and require users to proceed at their own risk. Further, given that portions of the trail are located adjacent to the lake and cut through wetlands, there would also be an environmental impact resulting from the use of salt in those areas. An alternative and more environmentally friendly de-icing agent would be required.

Staff is proposing the initiation of a pilot project which would create two temporary bicycle routes into the downtown core. From the east, this route would encompass approximately 5.6 kilometres and would follow the multi-use trail on the north side of Lakeshore Boulevard from Northern Dancer Boulevard west to Lower Sherbourne St. From the west, this route would encompass approximately 5.4 kilometres and would follow The Queensway east to Bathurst Street via King Street. Each of these two routes would receive winter maintenance services as required on a priority basis. Staff will determine the most suitable approach for the ploughing and/or removal of snow along these routes and the most appropriate equipment to be used.

2008 – 2015 Winter Maintenance Contracts

Transportation Services has recently tendered and awarded seven year winter maintenance contracts for the period 2008 – 2015. A number of efficiencies have been realized through the new contracts.

Combination salter and plough units have been introduced to the arterial road contracts. Combination units are equipped with both salting and ploughing apparatus and are capable of performing both operations at the same time, or one after the other, and as a result standby costs are reduced. There are approximately 93 combination units through the city resulting in a savings of \$2,745,000 in standby costs. Appendix 1 summarizes level of service for roadway salting.

Through the new contracts, Transportation Services continues to engage in pilot projects to evaluate new technology. Local road ploughs that have the ability to clear roads and open driveways at the same time are being introduced. The success of this pilot project will enhance the effectiveness of the driveway windrow clearing program in those areas as there will be no delay between the clearing of the road and the opening of the driveway windrow.

In response to the unusually severe winter of 2007/2008, approximately fourteen self contained snow removal crews have been included in all the local road ploughing contracts as a contingency item. The existence of these crews will allow us to put more crews into the field and have a quicker response time in the event of a snow removal emergency.

Responsibility for bus stop clearing has been returned to the sidewalk contracts. As part of this, the level of service for bus stop clearing has been improved and bus stops, crosswalks, and pedestrian ramps at intersections will now be cleared within 48 hours of equipment being mobilized.

Global Positioning Systems and Public Snow Advisory

Transportation Services' recently awarded seven year winter maintenance contracts require contractors to maintain GPS devices in all salt trucks, sidewalk machines, and bus stop machines covered under the contracts. All local road ploughs and at least one plough in each arterial or collector road plough team will also be equipped with GPS. In order to contain costs, GPS has not been installed on driveway windrow clearing equipment except where the driveway plough also performs the road ploughing function.

Installation of GPS on such a broad range of equipment will ensure a level of contract management and quality assurance that has not previously been available to us. Not only will GPS allow for the tracking of vehicles, but additional sensors installed on the equipment will provide information on such things as salt application rate and whether the plough blade is up or down. It is a real-time GPS system that allows staff to monitor the status of snow clearing operations without the delay associated with having to wait on equipment to return to a maintenance yard to download the data.

The GPS devices installed through the new contracts are the property of the contractor. Further, in order to keep costs in check, the contractors were permitted to work with GPS vendors of their choosing on the requirement that the data is provided to the city's specification. At this time, there is no ability to permit public access to the GPS data as the contracts were not set up to allow for more than a limited number of users involved in the management of the contracts. Allowing public access to the website would increase the amount of web traffic beyond what was originally envisioned, likely increase costs, and slow the service for contract administrators. Also, as there may be more than one GPS vendor providing services to our contractors, there is presently no common web portal for users to access to view the equipment.

Each of the Transportation Services districts presently operates a Winter Communication Centre during all snow events that require the mobilization of road or sidewalk ploughs. The purpose of the communication centre is two fold; to have one central number through which Councillors and their staff can get access to a member of the district management team, and to prepare and distribute the Snow Advisory. The Snow Advisory is distributed every three to four hours during a snow event and provides up to date information on the status of all activities in the district. This information is invaluable to Councillors and their staff when responding to constituent inquiries.

Snow Advisory information is also available to residents by calling 416-338-SNOW. Callers can opt to hear a recorded message that will update them on the status of snow operations in their community. Staff updating the recorded message read the Snow

Advisory verbatim. If callers prefer to speak with a customer service representative they can also access Snow Advisory information as all Snow Advisories are e-mailed directly to the customer service staff. Snow Advisories will also be e-mailed directly to staff in the new 311 call centre when that service is introduced.

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SIGNATURE

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ATTACHMENTS

Appendix 1 – Road Classification – De-icing Chart
Appendix 2 – Responding Municipalities to Survey of Sidewalk Snow Clearing
Appendix 3 – Sidewalk and Bus Stop Snow Clearing Level of Service
Appendix 4 – 2007/2008 Sidewalk Clearing Complaints & Enforcement
Appendix 5 – Ploughing and Driveway Windrow Opening Level of Service
Appendix 6 – Guidelines for Initiation & Completion of Snow Removal