

TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON JULY 23, 2019
FROM:	KELLY SCHERR, P.ENG, MBA, FEC MANAGING DIRECTOR OF ENVIRONMENTAL AND ENGINEERING SERVICES AND CITY ENGINEER
SUBJECT:	WINTER MAINTENANCE PROGRAM SUPPORT

RECOMMENDATION

That on the recommendation of the Managing Director, Environmental & Engineering Services and City Engineer, the Winter Maintenance Program Support Options described herein **BE CONSIDERED** as part of the 2020-2023 Multi Year Budgeting process.

PREVIOUS REPORTS PERTINENT TO THIS MATTER
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- Environment and Transportation Committee – April 14, 2003 – Minimum Maintenance Standards for Municipal Highways
- Environment and Transportation Committee – June 7, 2004 – Walkway Winter Policy Review
- Environment and Transportation Committee – January 21, 2005 – Service Level - Winter Sidewalk Maintenance
- Environment and Transportation Committee – March 23, 2009 – Winter Maintenance Budget Monitoring
- Environment and Transportation Committee – November 16, 2009 – Service Level – Winter Sidewalk Maintenance
- Civic Works Committee – January 6, 2014 – Snow Packed Roads and Snow Dumping from Private Property
- Civic Works Committee – October 7, 2014 – Provincial Minimum Maintenance Standards 2013 Update
- Civic Works Committee – February 3, 2015 - CWC Roadway Winter Maintenance Program
- Civic Works Committee – November 3, 2015 - CWC Winter Maintenance Program Enhancements
- Civic Works Committee – August 13, 2018 - CWC Provincial Maintenance Standards for Municipal Highways – Amendments 2018

2019-23 STRATEGIC PLAN

The following report supports the Strategic Plan through the strategic focus area of Leading in Public Service by considering improvements to resident satisfaction with winter road and sidewalk maintenance.

BACKGROUND

Purpose

The purpose of this report is to provide Council with a response to the following communication to the January 8, 2019 Civic Works Committee meeting:

That Civic Administration BE DIRECTED to investigate and report back, before the next multi-year budget process, on the operational and budget impacts of the following items to snow clearing:

- a) lowering the snow clearing of residential streets from 10 cm to 8 cm and 7 cm options;
- b) the capital cost for new equipment and options for faster response times during heavy or consecutive snowfall events;
- c) lowering the threshold of sidewalk snow clearing from 8 cm to 5 cm;
- d) ensuring that school walking routes are cleared of snow as a priority; and,
- e) Reviewing of current plowing routes, and available technologies to implement smarter, more flexible and more responsive snow clearing.

This report provides considerations related to each of the items followed by the cost for the identified program support options.

Context

The City of London maintains roadways in accordance with the Provincial Minimum Maintenance Standards for Municipal Highways (MMS), Regulation 239/02. This Provincial regulation under the Municipal Act specifies minimum maintenance standards for roads, bridges, luminaires, road shoulders, signs, and as of May 13, 2018, includes the maintenance related to bike lanes and sidewalks. Winter standards include thresholds to deploy resources and time to complete the work after the snowfall ends.

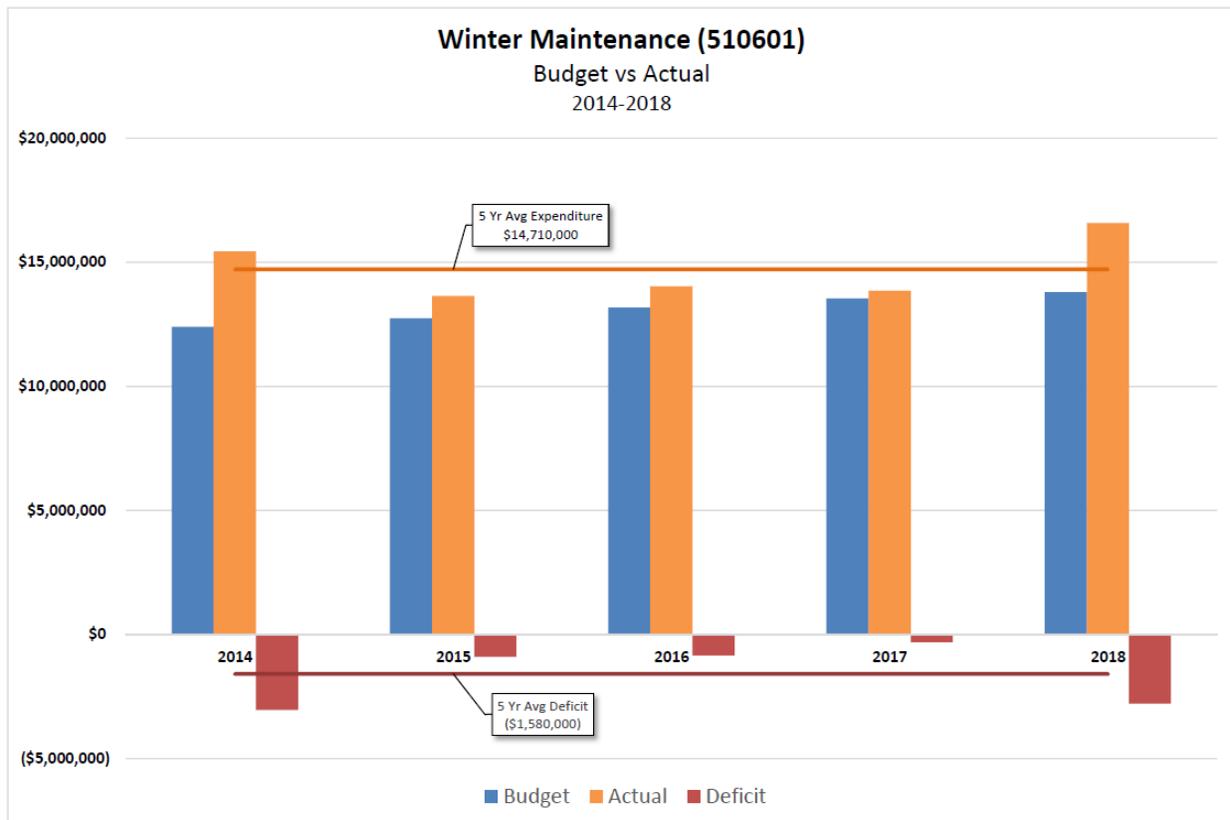
The timing of winter weather events influences the impact on the sidewalk, bike lane or road user. If the snowfall ends by the late evening, City forces have time to clear most routes before the beginning of the school or work day. Early morning snow events are more impactful.

It is also important to recognize that conditions across the city can be variable. For example, during the January 10, 2019 snow event, snow accumulation in the east end of the city was 5.3 cm, while the west end reported 16.9 cm of snow.

The City executes winter maintenance via a combination of in-house resources and staff and outsourced contractors. The City has a 24/7 response team equipped with 70 pieces of road plowing equipment, 27 road salt/sanders and 41 sidewalk plows. The response team maintains 3,655 kms of roadway, 1,500 kms of sidewalk and 720 cul-de-sacs. Over 2,000 bus stops are also maintained on behalf of the LTC on a cost-recovery basis. In an average winter season, crews are deployed approximately 70 to 90 days on major roads and bus routes and 10 to 14 times on residential routes.

Winter Maintenance Budget

The 2019 budget for the Winter Maintenance Program is \$14,579,311. The winter maintenance budget has been experiencing pressures over the last five years as shown in the graph below. This issue is under review in the current Multi-Year Budget creation.



The cost to maintain the City's roadways during the winter depends on the frequency, severity and timing of weather events. The type and duration of winter storms impacts operations and maintenance costs. London benchmarks cost with other municipalities that follow the Provincial Minimum Maintenance Standards for Municipal Highways (MMS), Regulation 239/02. The operating costs in London are average in comparison.

The following analysis and program support options consider average multiyear expenditures and deployments for snowfall frequency.

DISCUSSION

Winter maintenance is a function of the frequency and severity of snowfall events which vary from year to year. Deploying plows at lower snow accumulations would require more frequent deployments plus additional passes through the road or sidewalk network when accumulations reach the threshold a second time during a large and sustained winter snowfall event. The number of snowfall events at various snowfall depths over the past ten years is illustrated below in Table 1.

Table 1

Yearly Summary of Snowfall Events @ London Airport							
	>=0 cm	>=2.5 cm	>=5 cm	>=7 cm	>=8 cm	>=10 cm	>=15 cm
2007	89	32	10	7	5	4	2
2008	96	41	26	15	14	11	7
2009	66	16	9	3	2	1	0
2010	62	18	12	9	8	7	5
2011	74	31	14	9	8	7	2
2012	56	18	8	4	2	2	1
2013	93	31	12	8	7	5	2
2014	75	29	13	8	7	4	2
2015	58	20	10	6	5	3	1
2016	65	30	17	14	11	7	1
Average	73	27	13	8	7	5	2

The following are considerations related to the items in the Council resolution that inform the subsequent winter maintenance support options.

Item A: Lowering the snow clearing of residential streets from 10 cm to 8 cm and 7 cm options

The current practice prescribed by the MMS is to deploy plows on residential streets once snow accumulation reaches 10 cm. This snow clearing is to occur within 24 hours after the snowfall ends.

Based on Table 1 there would be an annual average of 2 and 3 more deployments required for the 8 and 7 cm thresholds respectively plus additional secondary deployments for large sustained events.

Item B: the capital cost for new equipment and options for faster response times during heavy or consecutive snowfall events

Winter road maintenance is executed with a combination of in-house owned equipment and outsourced services.

A key consideration in this balance is the sustained need for the equipment year round. For example, owned road plow units are also used assisting summer road building projects. The development of program support options considered current year-round operations needs and identified a negligible need for additional owned equipment for road maintenance.

The option costs presented later in the report represent operating dollars based on a combination of outsourcing and additional usage of existing equipment.

Item C: Lowering the threshold of sidewalk snow clearing from 8 cm to 5 cm

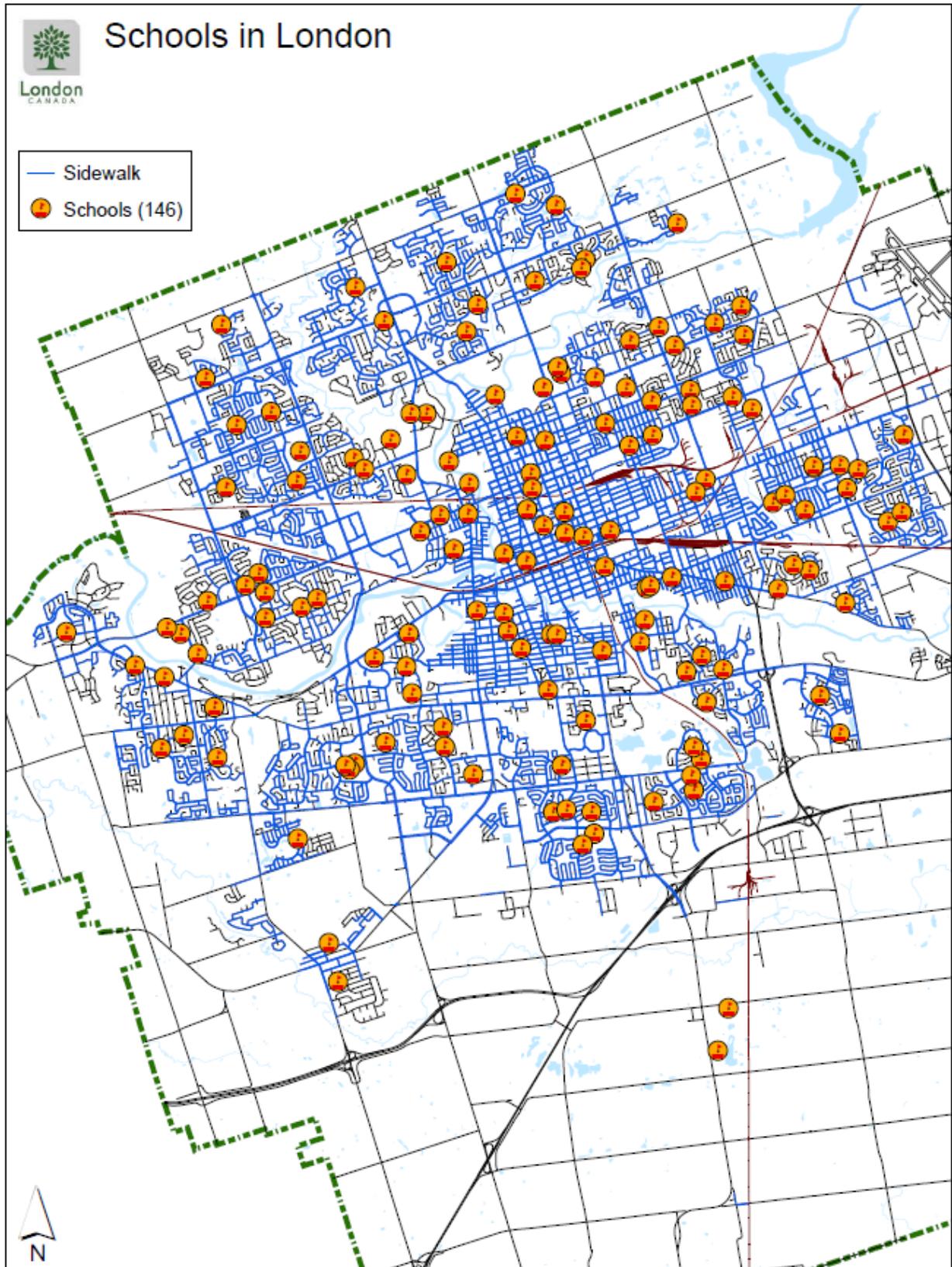
Currently the MMS threshold is 8 cm of snow accumulation before equipment is deployed and it allows 48 hours after the snowfall ends to clear the sidewalk. Based on Table 1, a 5 cm threshold would require an average of 6 additional deployments for a total of 13 annually. Lowering the threshold for sidewalk clearing to 5 cm could also require multiple passes through the beat system during a single sustained winter storm event if 10, 15 or 20 cm of accumulation occurs.

Winter road maintenance is executed with a combination of in-house owned equipment and outsourced services. A key consideration in this balance is the sustained need for the equipment year round. For example, owned sidewalk units are used for roadside mowing. The development of program support options considered current year-round operations needs and identified a negligible need for additional owned equipment for sidewalk snow clearing.

Item D: Ensuring that school walking routes are cleared of snow as a priority

Staff reviewed sidewalks within school busing thresholds, which are 1.6 km from elementary schools and 3.2 km from secondary schools. Mapping these radii around schools revealed overlapping circles covering most of the city indicating that the vast majority of the City's sidewalk network are within the school board expected walking areas of schools. Mapping smaller radii around schools did not identify logical walking routes. Therefore, an individual school approach is required in conjunction with plowing operations.

Current sidewalk snow clearing operations prioritizes major roads and bus routes which tend to have higher volumes of pedestrians. This aligns with road plowing operations that clear the windrows at the major road intersections that have been created by the earlier road plowing. While some schools are on major roads and benefit from the prioritization of these streets, there are many schools on lower priority streets that do not. An approach to provide priority plowing to schools would be to assess individual school areas and add logical local street routes to schools to the main route plow beats. The identification of routing would consider school property, main access points and school bus operations. Ongoing discussions with the school boards have resulted in the plowing of some joint park/school pathways which could also influence the identification of priority routes.



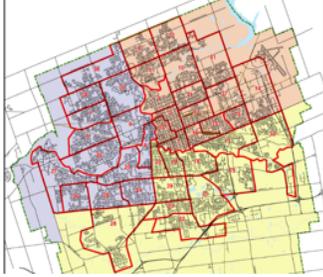
Item E: Reviewing of current plowing routes, and available technologies to implement smarter, more flexible and more responsive snow clearing.

Operations staff monitors new technologies to improve winter operations as they become available. London has kept pace with many available technologies, they include:

- Road Weather Information System (RWIS) that provides a road air temperature forecast and pavement temperatures. London has five locations and these supplement the Environment Canada weather station at the airport to help provide a local forecast three times per day.
- Electronic spreader controllers which provide measured amounts of sand, salt or winter liquids through the spreader fleet. These units and the contracted units are calibrated to ensure the prescribed dosage of winter materials is applied to the road.
- Anti-icing brine is used to help break the bond of snow and ice to the road. The recent replacement of road flushers included an upgrade to allow anti-icing of more than 700 lane-km in advance of a storm.
- Pre-wetting technology that enhances the rock salt capabilities and placement.
- Social media has improved communication with users. Winter maintenance social media statistics reveal the following.
 - Snow Removal Updates on Twitter alone resulted in 275,084 impressions (number of times our post appears in feed) and 4,539 engagements (retweets, likes, replies) from Nov 1, 2018 to March 31, 2019. This demonstrates the widespread organic (unpaid) reach winter maintenance-related social posts receive.
 - Six videos posted on Twitter, Facebook and Instagram (combined) resulted in 82,373 impressions, 28,321 views and 6,036 engagements (likes, shares, comments). These numbers demonstrate the power of use of video when possible.
 - The City of London received more than 250 inquiries about snow removal / winter maintenance on social media from Nov 1, 2018 to March 31, 2019. The City's winter maintenance web page received 5,146 page views from Nov 1, 2018 to March 31, 2019.
 - Corporate Communications has reported a noticeable improvement in tone and complimentary visitor replies / comments on winter maintenance-related content.
- Roads and sidewalks are cleared using a sequence of deployments that rely on equipment assigned to specific routes, geographical areas known as 'beats'. Priorities follow the prescribed MMS standards starting with main roads, LTC bus routes and then residential streets. Some areas have limited snow storage due to bike lanes or reduced boulevard width and those areas need additional service. This process is reviewed and modified as new subdivisions are assumed or road classes change.

A beat sheet example is illustrated below:

SIDEWALK PLOWING
Winter 2018/2019



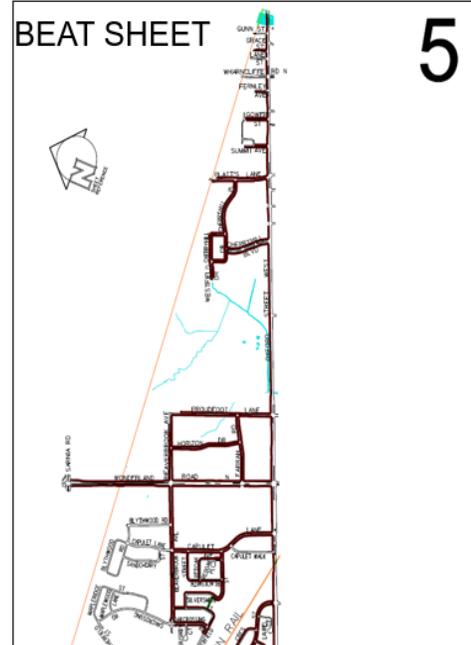
Sidewalk Plowing & Sanding 5

London Winter 2018/2019

Start _____ Time _____ Plowing _____
 Date _____ Time _____ Sanding _____
 Employee # _____
 Contractor _____
 Vehicle # _____
 Issued Nov 24, 2018
 Operation Tables
 Allowance

Only Mainline Sidewalks Listed! List to be read in conjunction with beat map on reverse side.

Priority		
Sidewalks	Limits	
Beaverbrook Ave	Prosser Lane to Capulet Lane	
Capulet Lane	Oxford St W to Beaverbrook Ave	
Cherryhill Blvd		
Cherryhill Cr		
Cherryhill Pt		
Furnish Rd		
Hyde Park Rd		
Oxford St W	North Side	
Platt's Lane	Oxford St W to CP Rail Subway	
Prosser Lane		
Westfield Dr		
Wonderland Rd N	Oxford St W to Sarnia Rd	
Secondary		
Beaverbrook Ave - Capulet Lane to Oakescrossing Rd	Oakescrossing Rd - S of Beaverbrook Ave	
Blacksmith St	Prince Philip Dr	
Cedarwood Cres	Endlich Ave	
Cedarwood Rd	Richmeadow Cres	
Chatham Rd	Richmeadow Rd	
Colonial Cres	Royal Fork Rd	
Ferriday Ave	Sarnia Rd - E&W of Beaverbrook Ave	
Flaxman Blvd	Silverton St	
Gower St	St Crisp Ave	
Grave St	Staffordshire Rd - S of Manchester Rd	
Gullwood Blvd	Summit Ave	
Gullwood Gate	Tyneside Ave	
Horizon Dr	Whitworth St	
Laurel Cres	Beaverbrook Ave to S of W of Oakescrossing Rd	
Laurel St		
Manchester Rd		
Madison Cres		
Madisonville Rd		
Northumberland Rd		
Walkways		
Edon	76	Remarks
1188 Gullwood Blvd	High Park Rd	
166 Northumberland Rd	860 Manchester Rd	
1152 Inverhill Rd	83 Queen Mary Cres	
30 Rosalinda Cres	Oxford St W	
1028 St Crisp Ave	1028 Wensley Rd	
943 Gullwood Blvd	St Crisp Ave	Flow to steps
829 Whitherfield Ave	827 Silverton St	



- “Track my Plow” applications provide residents the ability to monitor recent plow progress. The implementation of these are being monitored and considered for the future. However, this service requires additional staff to monitor and review data that are not currently available.

Winter Maintenance of LTC Bus Stops

The winter maintenance of bus stops is the responsibility of the LTC. LTC contracts the City to maintain bus stops based on a Council approved standard. The cleaning of LTC bus stops is currently done after all roads and sidewalks are completed. The current standard to clear bus stops is 48 hours after the sidewalks have been cleared; therefore, up to 96 hours after the snowfall ends. The City uses contracted sidewalk plows to clear bus stops. The timing is cost effective because it occurs after equipment has completed sidewalk clearing. The costs for this service are currently billed back to the LTC and are approximately \$165,000 per year. The charge includes equipment operating time only and does not include supervision or contractor standby. The City would require additional equipment on standby to plow the bus stops as soon as the road plows are finished on the main roadways and bus routes. Equipment numbers would be based on service level requirements.

Bus stop clearing is coordinated with sidewalk plowing and road plowing to address windrows. Therefore, more frequent sidewalk plowing would require additional bus stop clearing. The additional bus stop clearing associated with the lower threshold of 5 cm would increase the expenditure for LTC by approximately \$140,000 and \$23,000 if threshold for roads is changed to 7 cm.

PROGRAM SUPPORT OPTIONS

Winter Maintenance Support Options

Options to ensure standards are met and to provide a better customer experience when using the transportation network during winter events are listed below. The associated additional annual operating budget estimates are based on the additional deployments estimated by historical weather data and current operating costs. The identified costs are entirely operating because the development of program support options envisions a combination of outsourcing and additional usage of existing equipment.

Option	Description	Estimated Additional Annual Operating Budget
1	<p>Lowering the threshold of road plow deployments from 10 cm to 8 cm of snow on residential streets</p> <p>Two additional deployments per year based on Table 1 weather data.</p>	\$500,000
2	<p>Lowering the threshold of road plow deployments from 10 cm to 7 cm of snow on residential streets</p> <p>Three additional deployments based on Table 1 weather data.</p> <p>The LTC will see increased costs due to additional bus stop clearing to match the more frequent road threshold and address windrows. This cost is estimated at \$23,000.</p>	\$760,000
3	<p>Lowering the threshold of sidewalk snow clearing from 8 cm to 5 cm</p> <p>Six additional deployments based on Table 1. This option does not include prioritization of school areas in Option 4.</p> <p>The LTC will see increased costs due to additional bus stop clearing to match the more frequent sidewalk threshold and address windrows. This cost is estimated at \$140,000.</p>	\$600,000
4	<p>Prioritize school area sidewalks (more timely 8 cm response)</p> <p>This option will provide earlier sidewalk clearing to all school main entrances including those on local streets. School route plowing would be done at the same time as main roads and transit routes.</p> <p>The cost assumes additional sidewalk plowing equipment for one access route to the schools main entrance without significantly affecting main route sidewalk plowing completion time. There would be no change to sidewalk clearing leading to rear or side entrances.</p>	\$280,000
5	<p>Prioritize school area sidewalks (more timely 5 cm response)</p> <p>Same comments as Option 4, but with six additional deployments based on Table 1.</p>	\$520,000

Due to contractual commitments with service providers, the optimal time to make changes to the contracted fleet is when the current contracts expire which are as follows:

- Road plow contract expires in April 2020
- Sidewalk plow contract expires in April 2021

These timings should be considered if any of the support options are implemented.

SUMMARY

The program support options described herein are identified for budget consideration to improve mobility for all users of roads and sidewalks within the City road allowance. Civic Administration does not recommending repealing the MMS because it is the provincial standard and provides a legal defense under the Municipal Act. The options are meant to compliment the service that is already provided to meet the Provincial Standards.

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