



memorandum

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COMMUNICATION
FAA - June 6/2018
ITEM - 4.5

DATE: May 31, 2018

TO: Finance, Administration and Audit Committee

FROM: Stephen Collins, Deputy City Manager, Public Works

COPY: Daniel Kostopoulos, City Manager
Tim Simmonds, Chief of Corporate Initiatives and Intergovernmental Relations
Laura Mirabella, Chief Financial Officer and City Treasurer

RE: **FAA Meeting - June 6, 2018, Item #2018-204**
Review of City of Vaughan Response to April 14-15, 2018 Ice Storm

Purpose

To provide Council a review of the City's response to the ice storm event that took place April 14-15, 2018, and to identify opportunities to improve our extreme weather preparedness and response protocols.

Recommendations

1. That Council receive this report for information.

Report Highlights

- The April 14-15 Ice Storm occurred beyond the typical winter season, and consisted of an unpredictable combination of ice pellets, freezing rain and snow received over a period of more than two days.
- The City's response was in accordance with existing protocols and aligned with peer municipalities.
- Communications efforts reflected action undertaken by Public Works employees, who continuously monitored weather forecasts and made the necessary decisions and adjustments to storm response operations.
- The estimated cost of the City's Ice Storm response was \$1.14 million.
- Staff are currently assessing opportunities to improve extreme weather preparedness and response protocols. Additional resources needed for these initiatives will be identified in the 2019 budget process.

Background

Southern Ontario endured an ice storm on the weekend of April 14-15, 2018, beyond the typical winter season, traditionally assumed to end on or before March 31 each year.

A mix of freezing rain, ice pellets and snow fell across the City and neighbouring municipalities throughout the weekend of April 14-15. With significant rain and warming temperatures in the forecast, several municipalities, including the City of Vaughan, chose not to plow, in order to avoid flooding, which could result from blocked catch basins.

The actual conditions between April 14 and 16 were different from forecast. As shown in Table 1, temperatures hovered around freezing throughout the weekend, resulting in freezing rain, ice pellets and snow falling on City roads and sidewalks. Although temperatures warmed slightly on Monday, it was not sufficient to melt the accumulation of ice and snow. Staff continued to assess the conditions and monitor road and sidewalk conditions during and following the ice storm, and then made the decision to begin plowing on April 17.

Table 1: Actual weather data for April 13-17, 2018

Date 2018	Day	Temp (°C)			Rain (mm)	Snowfall (cm)
		Max	Min	Mean		
April 13	Friday	5.9	1.6	3.8	7.4	0.0
April 14	Saturday	3.8	-4.4	-0.3	5.6	4.2
April 15	Sunday	0.8	-4.0	-1.6	15.2	3.8
April 16	Monday	2.9	0.8	1.9	18.6	Trace
April 17	Tuesday	1.1	-2.0	-0.5	0.0	0.2

Source: Environment Canada (<http://climate.weather.gc.ca>) for Toronto Pearson weather station.

Communications efforts were undertaken to inform the public about the City's ongoing response efforts throughout the storm. Please see Table 6 for a complete listing of communications response support.

Previous Reports/Authority

Council, at their meeting on May 23, 2018, adopted a Member's Resolution directing staff to provide Council with a review of the City's planning, decision-making, execution and communications processes in response to the ice storm event that took place April 14-15, 2018.

Analysis and Options

The City of Vaughan protects its citizens, services and infrastructure from the impacts of extreme weather by continuously monitoring weather conditions and forecasts, and ensuring that departments work closely together to provide a coordinated response.

City staff receive weather reports from specialized weather services four (4) times a day through the winter, and three (3) times a day through the summer. Based on those forecasts, staff take proactive measures to ensure the safety of citizens along City-owned streets and sidewalks, and at City-owned facilities. Before and throughout extreme weather events, the City keeps citizens informed about weather risks, actions being taken by the City, and facility closures through multiple communication channels, including social media, City websites, constituent correspondence, mainstream media, and digital signage.

During the week preceding the April ice storm, forecasts were calling for freezing rain into the weekend, followed by heavy rain beginning Sunday and into Monday. Based on that forecast, staff were focused on flood mitigation.

Staff actions in response to this forecast were as follows:

1. On April 12 and 13 (Thursday and Friday), the City's Corporate and Strategic Communications (CSC) Department posted social media messages warning of the ice storm expected over the weekend, and digital signs were programmed to display the message "Heavy Rain Expected. Clear catchbasins. Point downspouts away from homes" from April 13-16.
2. In anticipation of flooding, on Friday, April 13, the Environmental Services (ES) Department invoked their Heavy Rain Protocol, which involves cleaning catchbasins in flood-prone areas, and inspecting receiving ponds to ensure the inlet and outlet are clear. This work was supported by the Transportation Services, Parks and Forestry Operations (TSPFO) Department. ES also developed a secondary standby list of staff to maintain stormwater infrastructure should the storm occur off-hours.
3. In consultation with ES, TSPFO decided not to plow through the weekend, to ensure that catchbasins would remain clear for anticipated rain run-off.

The winter road maintenance contract had been extended from March 31 to April 15, then just prior to the storm was further extended to April 18.

The City had already extended the end date of its winter road maintenance contract from March 31 to April 15. Due to the timing of the ice storm, staff decided on April 12 to arrange an additional extension to April 18.

Beginning on Friday morning, April 13, Public Works staff established Ice Storm Coordination conference calls to be held three times each day until the weather risk subsided.

Directors, Supervisors and Managers from TSPFO and ES held coordination telephone meetings each day at 9am, 3pm and 9pm each day from Friday morning, April 13,

through Wednesday morning, April 18. During each call, weather conditions and forecasts were reviewed, operational adjustments discussed. Any changes to the response were then communicated to the CSC Department.

Freezing rain fell throughout the weekend; however, forecasts continued to call for warming temperatures and heavy rain on Monday.

ES staff continued to execute the Heavy Rain Protocol, attempting to clear catchbasins throughout the weekend. At the direction of TSPFO, the City's winter maintenance contractors completed four rounds of salting through Saturday and Sunday.

Through the weekend, the CSC Department posted ongoing messages on social media informing the public that staff were continuing to monitor potential power outages and fallen trees and branches. A fourth message on Sunday evening informed the public that staff continued to monitor for expected heavy rainfall.

By Monday morning, slush and ice pellets had accumulated, and many calls were received from citizens struggling with that day's commute.

Warmer temperatures and rain still signaled a risk of flooding, so staff continued to clear catchbasins. One more round of salt was applied on Monday to melt the ice and slush.

The CSC Department posted two (2) public service announcements on the storm response, along with social media messages, explaining that the City was continuing to focus on preventing catchbasin blockages, and that plowing would increase the risk of flooding due to such blockages.

By Tuesday, April 17, precipitation had tapered off; however, temperatures remained around freezing, preventing the accumulated ice and snow from melting.

With the risk of heavy rain and flooding past, the City began a plowing operation (with salting) to remove the accumulated ice and snow from City-owned streets, and to clear residents' windrows. The plowing was required to meet the provincial Minimum Maintenance Standards for roads, and to alleviate mobility issues being experienced by residents and businesses. Citizens were informed about this plowing operation through social media, the City's website, digital signage, and a public service announcement.

Forecasts showed more snow expected later in the week, so the winter road maintenance contract was extended a third time, to April 22.

Although the worst of the storm appeared to have past, forecasts on Wednesday, April 18, were calling for snow later in the week. As such, staff further extended the winter road maintenance contract to April 22 to ensure that salting and plowing services would be available, if needed.

Staff surveyed neighbouring municipalities on their responses to the ice storm, and found that all who were surveyed has salted their roads throughout the storm; however, plowing activities varied from municipality to municipality.

Like Vaughan, the cities of Markham, Brampton, Mississauga and Toronto did not plow through the weekend storm, or plowed only their primary roads. Similar to Vaughan, their decisions were driven by a concern about potential flooding caused by blocked catch-basins. Some also cited a desire to avoid creating windrows at the end of residential driveways, as well as difficulty and high cost of calling in plowing equipment after the contracted season had ended. In contrast, Richmond Hill, Aurora and Newmarket plowed their roads Sunday and Monday.

Table 2: Dates that Neighbouring Municipalities Plowed their Roads during the Ice Storm

Municipality*	April 14, 2018 Saturday	April 15, 2018 Sunday	April 16, 2018 Monday	April 17, 2018 Tuesday
Vaughan	No**	No***	No	Yes
Markham	No	No	Primary roads only	unknown
Brampton	No	No	No	No
Mississauga	Primary roads only	Primary roads only	Primary roads only	Unknown
Toronto	No	Primary roads only	Primary roads only	No
Richmond Hill	No	Yes	Yes	unknown
Aurora	No	Yes	Yes	Yes
Newmarket	No	Yes	Yes	Yes

* York Region is not included in this comparison, because their road network is composed mostly of arterials, whereas the City of Vaughan's roads are mostly secondary roads.

** On Saturday, Vaughan plowed and salted rural roads, because these roads do not have catch basins that would be blocked by ice.

*** On Sunday, Vaughan plowed junctions to Regional roads, in order to remove the windrows left by the Region's plows.

Several improvement opportunities were identified, for which resources may be requested through the 2019 budget process.

Following the storm, staff held a debrief session to review the City's response to the ice storm, and identified improvement opportunities listed in Table 3.

Table 3: Improvement Opportunities

Topic	Improvement Opportunity	Action Plan
Winter Road Maintenance Contract	Consider costs and benefits of extending winter maintenance contract to cover a longer winter season	<p>Alternatives are currently under review, and being assessed against historical weather patterns and public risk.</p> <p>Recommendations will be considered in the 2019 budget process.</p>
Communications	<p>When anticipating extreme weather, arrange a meeting with Mayor and Council staff to discuss communications support and overall response efforts being taken by other departments. Explore possibility of conference call updates for Mayor and Council staff outside of work hours. Further solicit feedback from Council staff about constituent inquiries and respond accordingly.</p> <p>Develop “<i>what was said</i>” updates to staff on public feedback, during severe weather conditions, received through social media, by email and through Access Vaughan and public correspondence to Mayor and Council.</p>	<p>Create a standing agenda for Mayor and Council staff meetings that provides Mayor and Council staff with additional context and support about efforts and communications support during severe weather conditions.</p> <p>Develop a process that provides ongoing updates to departments about public commentary, concerns and overall feedback.</p>
Stand-by Procedures	Review standard operating procedures and for stand-by staff, and ensure that responsibilities match authorities	TSPFO has prioritized this effort for 2018, recognizing it as an urgent need.
Heavy Rain Protocol	Update Heavy Rain Protocol to consider freezing rain impact on stormwater system	ES may request additional resources through the 2019 budget processes to support this initiative.
Extreme Weather Operations	<p>Establish Extreme Weather Operations (EWO) protocols, which may leverage resources (staff and equipment) from across the Corporation.</p> <p>Authority to trigger EWO must be defined, as well as execution and communication processes, roles and responsibilities.</p>	TSPFO will begin developing protocols for wind and flood responses in preparation for the upcoming summer season. However, additional resources may be requested through the 2019 budget processes to establish a more comprehensive set of EWO protocols.

Financial Impact

It is estimated that the April Ice Storm response cost the City \$1.14 million.

A breakdown of the costs related to the April Ice Storm are shown in Table 4. The Ice Storm occurred beyond the City’s planned winter contract period, requiring the City incur additional standby costs for the contracted road maintenance fleet. Moreover, with precipitation changing between freezing rain and ice pellets over a period of three days, the response required more salting and plowing than an average winter event.

Table 4: Cost of April 2018 Ice Storm, in thousands of \$

Storm Response Cost Element		Cost	Sub-Total
Roads			\$ 847.7
	Standby – April 14-18	\$ 273.4	
	Salt – 3,911 tonnes	\$ 363.5	
	Salting – 6 rounds	\$ 128.1	
	Plowing & Windrows – 1 round	\$ 82.7	
Sidewalks			\$ 170.4
	Salt – 588 tonnes	\$ 54.6	
	Salting & plowing	\$ 115.8	
City-owned Buildings (walkways & parking lots)			\$ 95.0
	Salt – 228 tonnes	\$ 21.1	
	Salting & plowing	\$ 73.9	
Heavy Rain Protocol (clearing catchbasins)			\$ 20.0
	Labour to clean catchbasins and inspect stormwater ponds	\$ 20.0	
Forestry			\$ 4.0
	Addressing tree damage	\$ 4.0	
TOTAL			\$ 1,137.1

The total winter operations budget for 2018 is \$11.1 million. Including the response costs from the April ice storm, approximately 80% of the 2018 budget has been spent to date. The April Ice Storm was an extraordinary weather event and the additional costs incurred as a result of this event has put pressure on the winter operations budget for the remainder of the year. It is difficult to forecast what the year-end financial position will be as it will depend on weather events that occur in Q4. However, if Q4 weather adheres to average historical weather patterns for that period, it is likely that total costs for the year will exceed budget. Staff will work with Finance and seek to mitigate this risk within the City’s overall approved budget.

Broader Regional Impacts/Considerations

City staff consulted neighbouring municipalities throughout the Ice Storm to compare approaches and share ideas. Staff will continue to cooperate and collaborate with peer municipalities to leverage best practices in extreme weather operations, as well as to identify opportunities to coordinate extreme weather responses.

Conclusion

The April 13-19 extreme weather event occurred beyond the typical winter season, and consisted of an unpredictable combination of ice pellets and freezing rain received over a period of more than four days. The City's response was in accordance with existing protocols.

The estimated cost of the City's Ice Storm response was \$1.14 million.

Staff have identified several opportunities to improve future responses to extreme weather, and will modify operations accordingly. Any budget impact to the modifications will be submitted for Council's consideration in the 2019 budget.

For more information on winter salting and plowing operations, please contact:
Zoran Postic, Director of Transportation Services, Parks and Forestry Operations, ext. 6137

For more information on the Heavy Rain Event Protocol, please contact:
Jennifer Rose, Director of Environmental Services, ext. 6116

For more information on the corporate communications protocols, please contact:
Michael Genova, Director of Corporate and Strategic Communications, ext. 8027

Attachments

1. Corporate & Strategic Communications Support During Ice Storm of April 2018

Prepared by

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In consultation with:

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Corporate and Strategic Communications Support During Ice Storm of April 2018


The CSC Department collaborated with Public Works staff, along with other departments, to provide communications support for Mayor and Members of Council in response to the ice storm. Ten separate Communications Briefings were provided to Mayor and Members of Council between Friday, April 13 to Wednesday, April 18. Briefings included social media content, public correspondence, visuals, public service announcements and a question and answer document. Much of the content was incorporated by Mayor and Members of Council directly into their own communications with residents. Moreover, communication content was provided to Access Vaughan staff and Council Offices to address the higher-than-normal number of calls and questions from frustrated residents.

Public communications reflected action undertaken by Public Works employees, who continuously monitored weather forecasts and made the necessary decisions and adjustments to response storm operations. Also, throughout the weather event, the corporate Twitter account shared social media messages from partner organizations, such as Alectra, Toronto Region and Conservation Authority and York Region, to help keep citizens informed.


The @City_of_Vaughan corporate account gained 132 followers between April 14-18. On average, the City gains 100 followers in one month. The City of Vaughan Facebook account gained 61 page likes between April 14-18. On average, the City gains 40 page likes in one month.


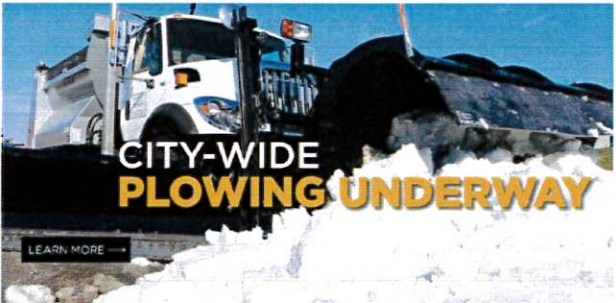
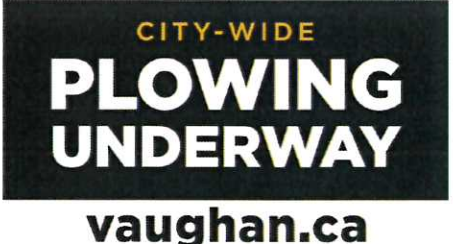
Table 6: Day-to-Day Communications Support

Date	Main Public Communication	Communications Support
Thursday, April 12 (Morning)	Special weather statement for Vaughan. Potential for ice storm over the weekend.	Social media

Date	Main Public Communication	Communications Support
<p>Friday, April 13 (Afternoon)</p> <p>Digital Sign scheduled for April 13 to April 16.</p>	<p>An ice storm is expected this weekend. Make sure your emergency kit is up to date. Learn more about what should be in your kit: http://bit.ly/2pW8bC2.</p> <p>Please note that the Ministry of Transportation has advised that the full closure of Highway 400 between Teston Road and King Road, for the demolition of the King-Vaughan bridge, that was scheduled for this Sunday has been cancelled due to inclement weather. It has been rescheduled for the following weekend (April 21-22).</p> 	<p>Communications Briefing 1</p> <p>Social media</p> <p>Digital Sign</p>
<p>Saturday, April 14 (Morning)</p>	<p>Staff continue to monitor potential power outages and fallen trees and branches.</p>	<p>Communications Briefing 2</p> <p>Social media</p>
<p>Saturday, April 14 (Evening)</p>	<p>Staff continue to monitor potential power outages and fallen trees and branches. We have also provided information from York Region about emergency overnight conditions.</p>	<p>Communications Briefing 3</p> <p>Social media</p>
<p>Sunday, April 15 (Morning)</p>	<p>Staff will continue to monitor potential power outages and fallen trees and branches throughout the day.</p> <p>We have been informed that the sinkhole (and surrounding area) at 10472 Islington Road has been made safe. The hole has been temporarily backfilled and the Water Department will further address the issue this week.</p> <p>Update to Recreation Services webpage:</p> <p>Inclement Weather Update to Recreation Services</p>	<p>Communications Briefing 4</p> <p>Social media</p> <p>Website</p>

Date	Main Public Communication	Communications Support
	<ul style="list-style-type: none"> • All community centres remain open and programs are running, as scheduled. • Swim programs at Woodbridge Pool and Memorial Arena are cancelled. 	
Sunday, April 15 (Afternoon)	<p>Vaughan public libraries are closed.</p> <p>Recreation staff have contacted participants that may have been affected by program service disruptions today.</p>	<p>Communications Briefing 5</p> <p>Social media</p>
Sunday, April 15 (Evening)	<p>Staff continue to monitor expected heavy rainfall.</p>	<p>Communications Briefing 6</p> <p>Social media</p> <p>Heavy rainfall digital sign visual</p>
Sunday, April 15 (7pm)	<p>Corporate and Strategic Communications staff arranged for Mayor Bevilacqua to do a live interview at approximately 7 p.m. with CP24 updating the public about Vaughan's ongoing storm response efforts.</p>	<p>CP24</p>

Date	Main Public Communication	Communications Support
Monday, April 16 (Afternoon)	<p>There remains a focus to prevent black ice from accumulating on roads throughout neighbourhoods, and to prevent blocked catch basins, which would result in flooding.</p> <p>PSA on storm response issued.</p>	<p>Communications Briefing 7</p> <p>Social media content</p>
	<p>“Weather Update” website homepage scrolling banner live pointing to the PSA on the Newsroom site.</p>  <p>The image shows a website banner for 'WEATHER UPDATE'. The text 'WEATHER UPDATE' is in large, bold, blue letters inside a dark blue rectangular box. Below the box, there is a 'LEARN MORE' button with a right-pointing arrow. The background of the banner is a photograph of a snowy and icy road with a plow in the distance.</p>	<p>Heavy rain visual</p> <p>Constituent correspondence</p> <p>Website</p> <p>Local and GTA Media</p>
Monday, April 16 (Evening)	<p>As staff monitor the ongoing weather, it has been determined that during this storm plowing could potentially increase the risk of flooding and result in new problems. This is because catch basins could be blocked with the buildup of ice and snow.</p> <p>Staff will continue to monitor weather forecasts and make the necessary decisions and adjustments to operations, including considering plowing.</p>	<p>Communications Briefing 8</p> <p>Social media content</p> <p>Constituent correspondence</p> <p>Public Service Announcement (PSA)</p>

Date	Main Public Communication	Communications Support
Tuesday, April 17 (Afternoon)	<p>After seven salting operations of all City of Vaughan streets, followed by unexpected low temperatures, Public Works staff have begun city-wide snow plowing. Windrow services will follow. Residents and businesses are reminded to be cautious around snow plows and ensure cars are not parked on the road.</p> <p>Updated website scrolling homepage banner with the "Storm Response" slide pointing to the PSA.</p> 	<p>Communications Briefing 9</p> <p>Social media content</p> <p>Public Service Announcement (PSA)</p> <p>Question and Answer Document</p> <p>Snow Plowing Visual Website</p>
	<p>Updated website scrolling homepage banner with "Plowing Underway"</p> 	<p>Website</p>
	<p>Updated digital sign with "Plowing Underway"</p> 	<p>Digital Sign</p>
Wednesday, April 18 (Afternoon)	<p>Since the onset of our operations, weather conditions continuously shift between ice pellets, snow, sleet, freezing rain and rain. Forecasts are now calling for a possible 3-4 cm of snow later this week instead of the original and previously forecasted warmer/sunnier conditions. Public Works staff are extending plowing,</p>	<p>Communications Briefing 10</p> <p>Social media content</p>

Date	Main Public Communication	Communications Support
	salting and windrow contract equipment for the third time this season (until April 22 at midnight) to better serve residents and prepare for the ongoing unpredictable weather.	