



Ice Storm – December 2013

Presentation to General Committee January 8, 2014



Purpose of Presentation

- ☐ Overview of ice storm
- ☐ Report on activities of Emergency Operations Centre (EOC)
- ☐ Departmental Reports:
 - ☐ Fire Services, Operations, Waterworks, Waste Management
 - ☐ Warming Centres
 - ☐ Contact Centres
 - ☐ Communications
- ☐ Financial Implications
- ☐ Lessons learned
- ☐ Recommendations

Overview – The Damage

2013 Ice Storm	
Precipitation	Freezing Rain from Dec. 20-22
Ice Accumulation (Accretion)	20-25 mm* (approx. 1")
Power Outages In Markham	Approx 17,200 customers at 11am Dec 22
Trees damaged	Over 10,000
Financial Implications	
• Clean-up	\$2.6 to \$3.2M
• Recovery	\$7 to \$10M

***Environment Canada Weather Summary Dec. 23, 2013**

Environmental Implications

❑ 10,000+ trees damaged

- Reduction in natural infrastructure for storm water and air quality management (particulate and CO²)
- Reduction in habitat for various animal and insect species

❑ Energy

- Increased use of fossil fuels for heating, small generators and vehicle operation resulting in increased Greenhouse Gas (GHG) emissions

Overview Dec. 22- Dec.30 – The Work

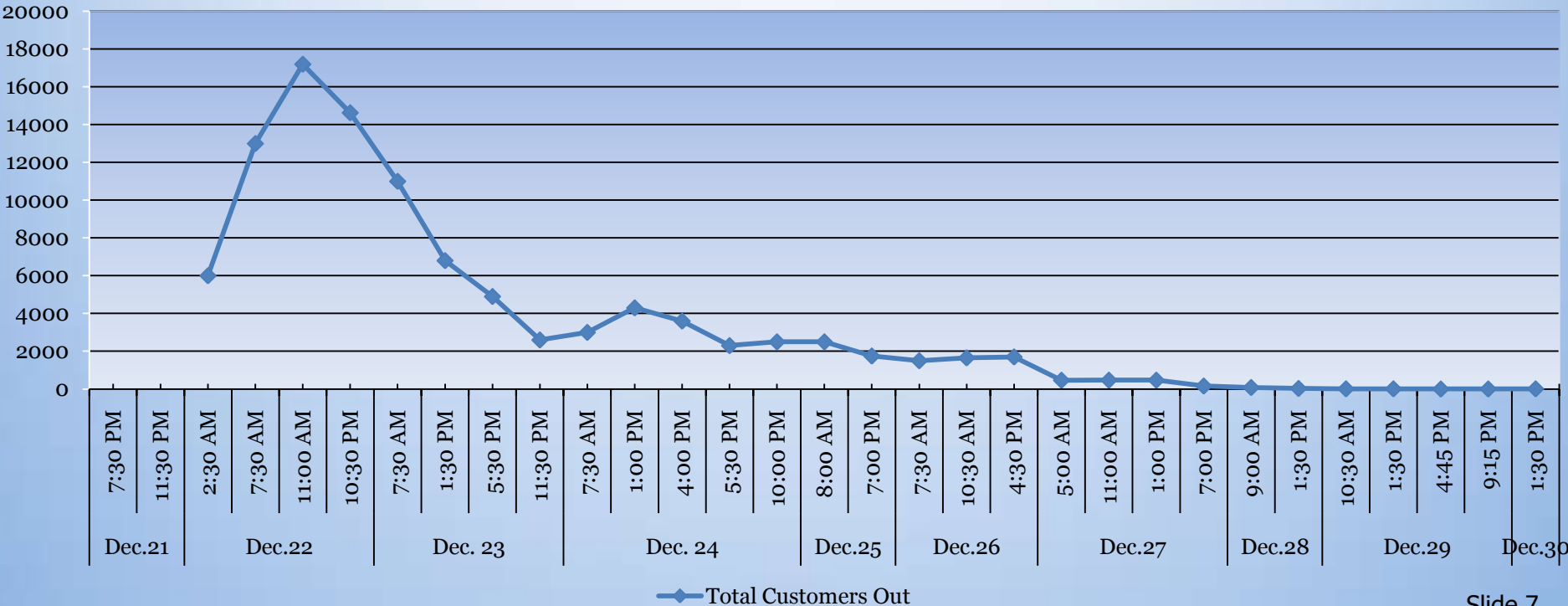
EOC	47 staff rotating shifts	Approx 650 hrs
Warming Centres	16 staff rotating shifts	250.5 hrs
Fire	184 Suppression 9 Alarm room staff	228 phone call inquiries 371 responses 42 CO calls
Communications	3 staff for web updates/social media	235 tweets 50 Facebook posts 14 web updates, 13 media updates 19 council updates
Contact Centre	3-10 staff alternating shifts	5200 calls 676 Voice Mails returned 410 Emails answered Total hours 530

Overview Dec. 22- Dec.30 – The Work

Waterworks	7 Staff	77 hours
Operations – Roads Operations - Parks	28 staff on pre-set shift schedule 130 contractors - winter operations 24 – 30 staff available including one in-house forestry crew 3 – 12 forestry crews available on various dates and times	Provide 24/7 winter operations All available staff removing road, sidewalk and driveway obstructions Patrol roads to identify safety hazards Dec 25 th only day forestry crews not deployed – 3 crews on emergency standby
Bylaw	13 Officers	270 hours



PowerStream Outages





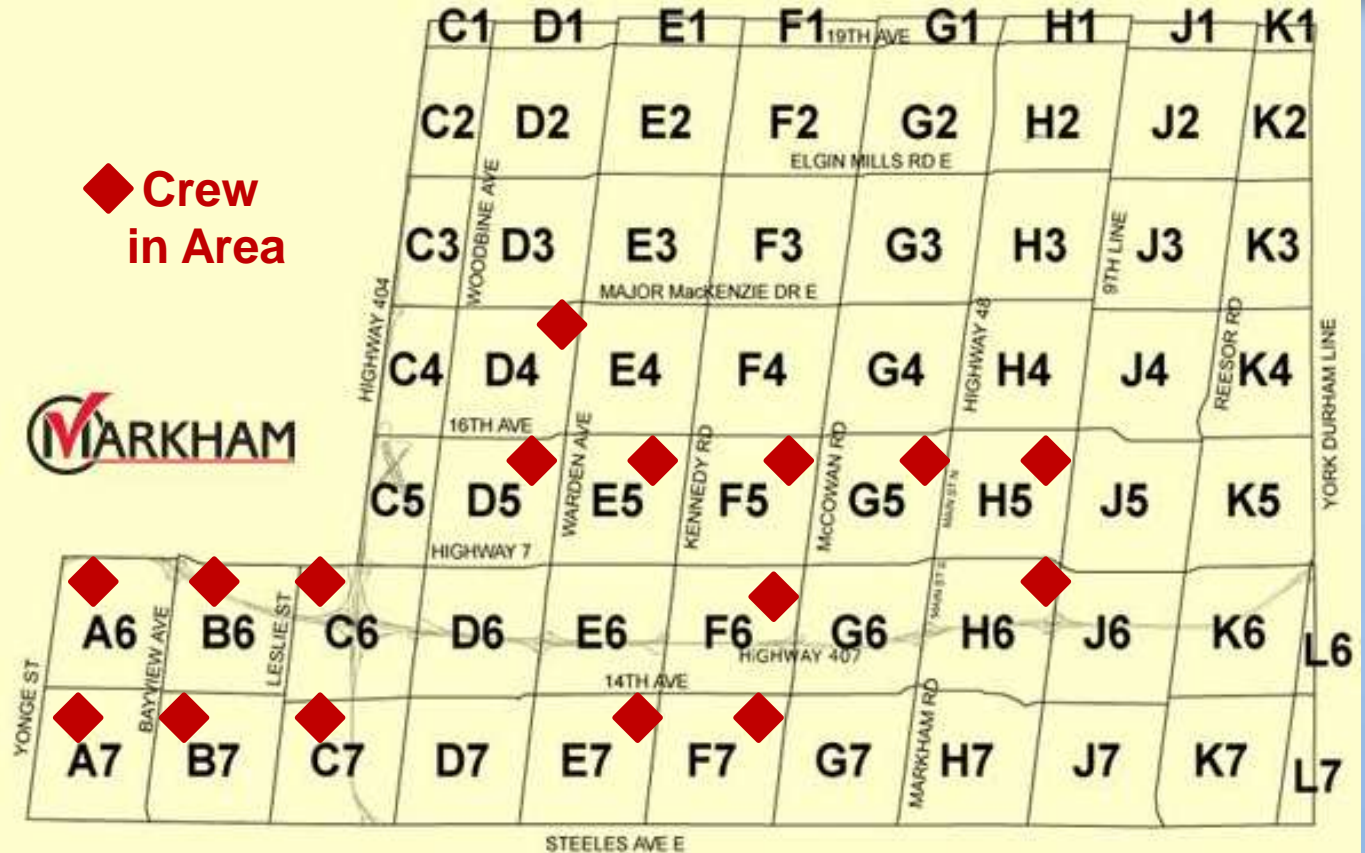
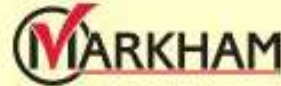
Ice Storm – December 2013



Building Markham's Future Together
Journey to Excellence

Week of January
6-11, 2014

◆ Crew
in Area



Pre-storm Planning

Wednesday, Dec. 18

- ☐ Markham staff began monitoring weather reports

Thursday, Dec. 19

- ☐ Web update on winter storm preparations, social media postings on storm forecast and resident emergency preparations (*additional social media postings Friday, Dec. 20*)

Friday, Dec. 20

- ☐ Acting CAO met with key senior staff: EOC roles and responsibilities, and schedule and plan for activation of EOC were established

Saturday, Dec. 21

- ☐ Staff closely monitored the weather situation in Markham from the evening of Dec. 21 through early morning Dec. 22

Emergency Operation Centre Activation

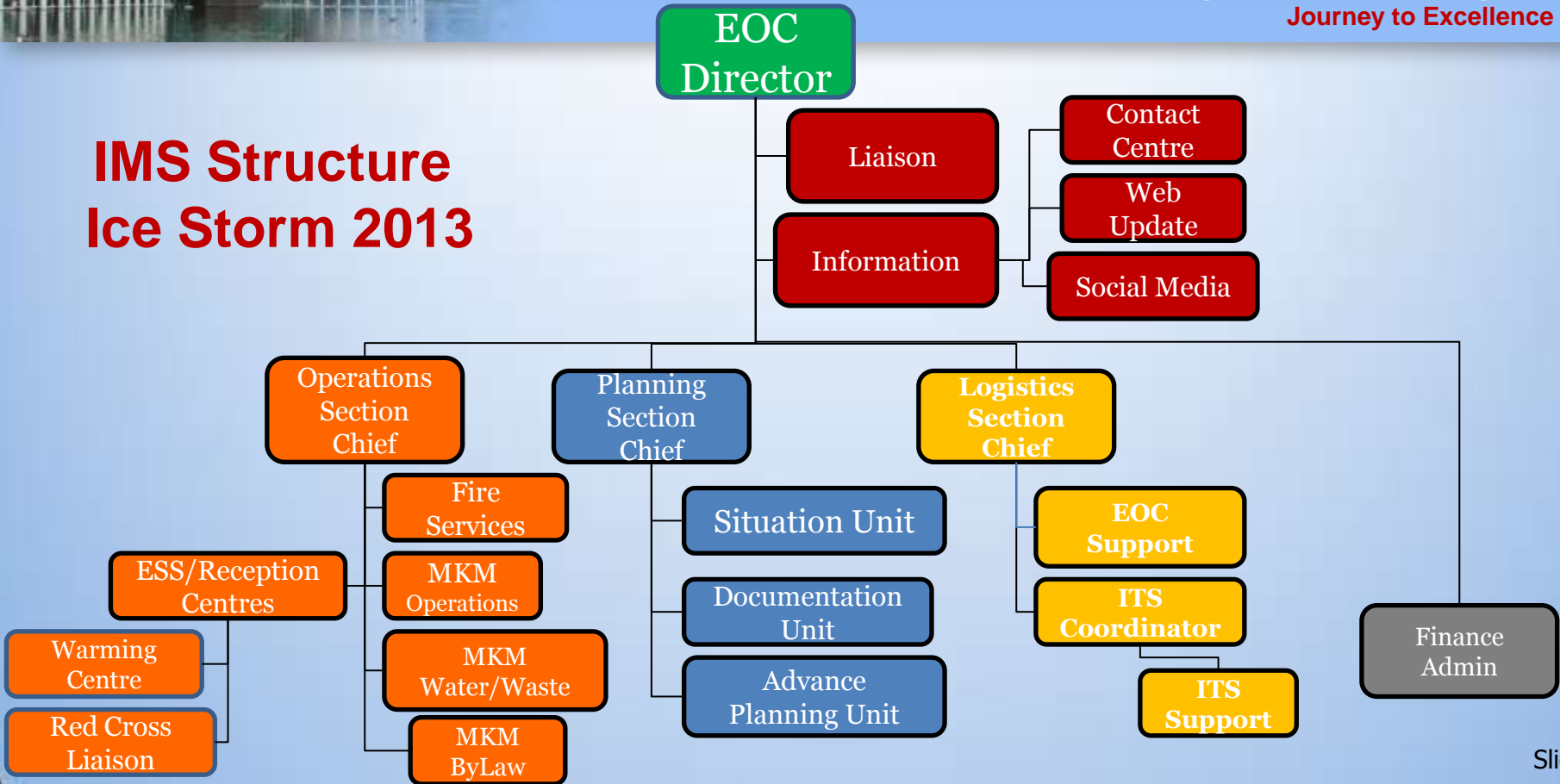
Sunday, Dec. 22

- ❑ 2:24am – Fire staff conveyed information from PowerStream identifying significant power outages in York Region
- ❑ 9:46am – Staff in place at the EOC; CAO Andy Taylor and Mayor Scarpitti were notified and arrived onsite later in the day
- ❑ 12:30pm – EOC activated – Level 1
- ❑ 1:23pm – First report to Mayor and Council issued

What is the Emergency Operations Centre?

- ☐ Central facility
- ☐ Centre of operations for City staff during an emergency
- ☐ Responsible for the direction, control, coordination, support and provision of additional resources required during an emergency
- ☐ Strategic in nature

IMS Structure Ice Storm 2013



Emergency Management Interface in Markham



Operations - Markham Fire

- ❑ Dec. 21 the Alarm Room experienced an increase number of storm related calls.
- ❑ While the Contact Centre was closed Dec. 21 & 22, Alarm Room received 228 phone inquiries (normal would be 15-20 calls)
- ❑ Dec. 21 – 30: Markham Fire & Emergency Services (MFES) responded to 371 incidents – Dec. 22 & 23, 144; Dec. 23-30, 227 (double the average)
- ❑ 371 incidents including electrical wires down/arcing, trees down/on wires & fire alarms activated due to frozen sprinkler pipes

Operations - Markham Fire cont'd

- ☐ 11 reported fires
- ☐ Responded to 42 Carbon Monoxide calls (double the 4-year average)
- ☐ No increase in motor vehicle collisions
- ☐ During the ice storm, travel time to emergency incidents increased due to road conditions and uncontrolled intersections
- ☐ Visited vulnerable areas, senior facilities, special needs housing and high rises

Operations Response – Forestry, Parks & Roads

Initial response – December 22

- ❑ 35 hired loaders immediately dispatched with most roads opened by 10pm
- ❑ In-house and contract forestry crews dispatched to deal with emergency tree safety issues – approximately 1500 work orders generated in first 24 hours
- ❑ Commenced procurement efforts to secure additional forestry crews

Prioritized work plan – December 23-present

- ❑ All in-house and available contracted forestry crews clearing overhanging limbs and obstructions on City road network
- ❑ Priority given to City's primary road network (school zones, transit routes, etc.), which was completed on Dec. 27

Operations Response – Forestry, Parks & Roads

Roads Mapping – Dec. 27-29

- ❑ Cross-commission staff team (Bylaw Enforcement and ITS) engaged to gather inventory of damaged trees on all City roads and manage data conversion and GIS map production – completed Dec. 29
- ❑ Initially identified 6,000 damaged street trees (approximately 33% are ash trees)
- ❑ Grid-based mapping and damage assessments allowed staff to identify location and severity of tree damage; excellent tool utilized for priority work planning and resource deployment

Operations Response – Forestry, Parks & Roads

Parks Mapping – Jan. 9-24

- ☐ Handheld units to be deployed to record location and damage to park trees
- ☐ Park recovery plan (scope and financial impact) to be developed as soon as data collection and mapping completed

Response Plan – Anticipated completion 7- 9 weeks

- ☐ Significantly greater number of damaged trees than originally reported
- ☐ 16 aerial crews addressing overhanging limbs, obstructions and removals with anticipated completion by Jan. 18
- ☐ 8 ground crews chipping and disposing of large tree debris
- ☐ Once all overhanging limbs and removals completed, Operations will transition aerial crews to ground crews, maintaining 24 crews until cleanup completed
- ☐ 6 Miller Waste units secured to collect and dispose of smaller tree debris each Monday

Operations Recovery – Forestry, Parks & Roads

Recovery Plan – Communications Updates

☐ Phase 1

- Weekly updates will be provided to Councillors on work completed to-date and work plans (by grid zone) for the following week
- Weekly updates will be posted on portal for residents

Removals and Replanting Plan – 2014-2016

- ☐ Undertake assessment of total trees lost within road allowances and parks
- ☐ Prepare update report and work plan to present to General Committee in Q2 2014
- ☐ Complete removals and stumping throughout remainder of 2014
- ☐ Identify locations and develop tree replacement plan for 2014-2016

Operations Response – Technical Services

Private Property Tree Removals

Expedited Tree Permit Process for Emergency Tree Removals

- ❑ In the event a whole tree has failed as a result of the ice storm and its immediate clean up/removal is critical, then the resident should:
 - take multiple photographs of the downed tree in situation; and
 - submit an application along with the photographs (online application is easiest way); and
 - the resident may then proceed with the cleanup and the permit will be issued after the fact.

Operations Response – Technical Services

Private Property Tree Removals cont'd

Tree Permit Process for Trees Injured by the Ice Storm

- ❑ Trees under 20cm in diameter do not require a permit to remove
- ❑ The resident should retain an ISA (International Society of Arboriculture) certified Arborist to remove any broken, cracked or hanging branches still in the tree.
- ❑ If after the storm injury to the tree has been cleaned up, the resident believes the tree on their property now poses an unacceptable risk of whole tree failure, or is not biologically or aesthetically retainable, they should submit an application and it will be inspected/addressed as soon as possible.

Operations Response – Technical Services

Private Tree Debris and Removal - Tree Debris Pick-up

- ☐ Residents should put all their tree debris – twigs, branches and limbs only – out on the curb as soon as possible so that the City can assess the amount of debris to be collected and continue the collection process
- ☐ It is the responsibility of the homeowner, or their contractor, to dispose of all debris from full private tree removals – the City will **not** pick up full private trees
- ☐ Residents may also take tree debris to York Region's
Bloomington Yard Waste Depot
1351 Bloomington Road
Richmond Hill, ON

Operations - Water

☐ Reservoir water levels

- Noticeably low water levels at the Markham reservoir Monday morning Dec. 23 (pump interruptions from Toronto)
- Region corrected levels by afternoon of Dec. 23

☐ Sewer pumping stations

- All sewer pumping stations were physically inspected by City staff to ensure normal operation

☐ Emergency calls / follow up calls

- Staff responded to 27 emergency calls; 17 were storm related

☐ Staff response

- Anticipate follow up calls as residents return from extended vacations

Operations - Waste

- ❑ Material collection by Miller Waste commenced Tuesday, Dec. 24, as scheduled, in Thornhill - Collection Areas A & B (between Yonge St. & Warden Ave. – east/west and Steeles Ave. & 19th Ave. – north/south)
- ❑ Low wires and blocked roads restricted access to a small percentage of streets
- ❑ Impacted residents were advised to bring material in until next scheduled collection day
- ❑ Miller provided special collection services on Monday, Dec. 30 for waste left out on inaccessible streets

Operations – Warming Centres

- ❑ Two “pet friendly” 24/7 Warming Centres, supervised by Recreation Staff, were mobilized quickly and well used
 - Milliken Mills CC: Sunday December 22 – Friday December 27
 - Thornhill CC: Monday December 23 – Sunday December 28
- ❑ City provided mats, food and refreshments.
- ❑ Red Cross provided cots and blankets
- ❑ All Community Centres were well used for technical connection, showers and warming
- ❑ Warming Centres answered calls from Tuesday, Dec. 24 at 7:00pm to Friday, Dec. 27 at 8:00am to ensure residents could speak directly with a staff person if they had a storm-related issue

Warming Centre Usage

Date	Attendance Day Residents		Attendance Overnight Residents	
	Thornhill CC	Milliken Mills CC	Thornhill CC	Milliken Mills CC
Sunday, Dec. 22	0	7	n/a	10
Monday, Dec. 23	52	35	12	30
Tuesday, Dec. 24	90	20	14	19
Wednesday, Dec. 25	30	10	7	8
Thursday, Dec. 26	27	8	4	1
Friday, Dec. 27	5	n/a	0	n/a
Saturday, Dec. 28	n/a	n/a	0	n/a

Information (Contact Centre)

- ❑ Contact Centre was opened Sun., Dec. 22 at 9:30 am and remained open 24 hours a day until Tues., Dec. 24
- ❑ Contact Centre staff continued to check messages once an hour, 24 hours a day, until reopening Fri., Dec. 27
- ❑ Following close of business on Dec. 27, as well as on Saturday, Dec. 28 and Sun., Dec. 29, staff continued to check voicemails once an hour, 24 hours a day.
- ❑ Contact Centre staff worked a total 530 hours Dec. 22-Dec.30



Information (Contact Centre)

Phone Statistics	Time Frame	Ice Storm 2013
Sun., Dec. 22	9:30am -12:00am	777
Mon., Dec. 23	12:01am-12:00am	874
Tues., Dec. 24	12:00am -7:00pm	1,538
Fri., Dec. 27	8:00am- 5:00pm	948
Mon., Dec. 30	8:00am- 5:00pm	1,063
Total:		5,200

Information (Contact Centre)

ACR Type – work orders	Ice Storm 2013
Parks fallen trees and broken branches	1,837
Operations road/streets not properly plowed/icy road conditions	345
Waste Management missed garbage collection	81
Streetlight safety concerns	32
By-law parking complaints	29
Waterworks sewer backup/water infrastructure check/locate	24
Utilities contractor/utility safety related	19
Partnerships/Forestry/Roads/Traffic	6
Parks icy sidewalk	5
Total:	2,387

Communications Environment

- Pre-storm communications important as early warning to residents
- Emergency communications needs to be timely, accurate and consistent
- Local media outlets limited and major media a challenge (Toronto centric)
- Tactics need to be flexible & responsive based on changing nature and severity of emergency (i.e. length/complication of the outages)
- Every emergency is different - tactics need to respond accordingly
- New technologies present new communications opportunities
- Each emergency provides new learnings

Storm Response Metrics **Communications**

Date	Tweets	Face book Posts	Council Updates	Media Updates	Media Interviews with Mayor	Web Updates	Printed Public Notice	Robo Call from Mayor	On-hold / After-hours Messaging	eNews
Dec. 19-21	5	2				2				
Dec. 22	50	8	1	2						
Dec. 23	18	3	2	2	News Talk 1010 105.9 FM CP24	2			Warming Centres Open	
Dec. 24	26	2	4	2	640 News 680 News CP24 105.9FM	2	Hand delivered to homes by Bylaws, Fire & Waterworks staff		Waste Collection Service Operationa l	
Dec. 25	5	1	2	1	640 News 680 News CP24	1				

Communications

Storm Response Metrics cont'd

Date	Tweets	Face book Posts	Council Updates	Media Updates	Media Interviews with Mayor	Web Updates	Printed Public Notice	Robo Call from Mayor	On-hold / After-hours Messaging	eNews
Dec. 26	23	6	2	1		2				
Dec. 27	26	10	2	1		1		75,000		1
Dec. 28	27	10	2	1		1				
Dec. 29	30	7	2	1		1			Standard Storm Service Level	
Dec. 30	8	0	1	1	640 News 680 News	1				1
Dec. 31	17	2	1	1		1				
TOTAL	235	51	19	13	12	14	1	1		2

Communications

Storm Response Results

Twitter

- ❑ 392 new followers since Dec. 19; Total followers = 3347
- ❑ City ice storm tweets/re-tweets potentially reached 883,800 people

Facebook

- ❑ 46 new likes since Dec. 19: Total likes = 946
- ❑ City ice storm Facebook posts potentially reached 20,100 people
- ❑ Markham Facebook page received 63,500 impressions from 11,400 Facebook users

Financial Implications

The preliminary estimated costs associated with the ice storm are categorized into two phases:

- A. Response
- B. Recovery

Financial Implications

A. Response

1. Emergency Forestry Crews

- ☐ 2 Existing Markham Crews

- ☐ Contracted Crews – 24 crews in total for 7 to 9 weeks

- a. Weeks 1 to 3: 16 Aerial Crews to remove hazardous trees/tree limbs and 8 ground crews to remove tree debris on the roads/sidewalks

- b. Weeks 4 to 6 (may be extended to 9 weeks if required): 24 Ground Crews to continue removing tree debris on the roads/sidewalks

Financial Implications

A. Response

2. Personnel Costs

- ☐ 1 Additional Supervisor to manage contracted crews for 7 to 9 weeks
- ☐ Overtime by existing union Staff and other personnel costs (Parks, Recreation, Fire, Contact Centre, Legislative Services)

3. Special Debris Collection Service – Miller Waste

- ☐ Separate collection service to pick up tree branches, twigs and limbs on Mondays starting January 6th for at least 6 weeks

4. Other Costs (Loaders, Wood Chip Disposal and Equipment)

Financial Implications

A. Response

Item #	Item	Details	\$ in millions		
1a.	Contracted Aerial Crews	16 crews at 60 hours/week/crew for 3 weeks at average rate of \$236/hour/crew	0.7		
1a.	Contracted Ground Crews	8 crews at 60 hours/week/crew for 3 weeks at average rate of \$231/hour/crew	0.3		
1b.	Contracted Ground Crews	24 crews at 60 hours/week/crew for 4-6 weeks at average rate of \$219/hour/crew	1.3	to	1.9
2.	Personnel	Additional supervisors 7-9 weeks, overtime & other personnel costs	0.1		
3.	Special Debris Collection	6 trucks at 10 hours per week for 7-9 weeks at \$210/hour/truck	0.1		
4.	Other	Loaders, Wood Chip Disposal & Equipment	0.1		
Preliminary Estimated Costs			2.6	to	3.2

Preliminary Estimated Clean Up Costs Ranges From \$2.6M to \$3.2M

Financial Implications

B. Recovery

Stumping & Replanting of Damaged Trees and Removal & Replanting of Parks Trees

- ☐ Initial assessment estimates 10,000 trees are damaged
- ☐ Cost is \$700/tree to \$1,000/tree
- ☐ Costs are approximately \$7.0M to \$10.0M

Preliminary Estimated Recovery Costs is \$7.0M to \$10.0M

Financial Implications

C. Cost Summary

Response	\$2.6M to \$3.2M
Recovery	<u>\$7.0M to \$10.0M</u>
Total	\$9.6M to \$13.2M

Preliminary Estimated Costs Ranges From \$9.6M to \$13.2M

Financial Implications

D. Funding

Preliminary estimated costs of \$9.6M to \$13.2M

Ash trees represent 33% of the damaged trees; hence 33% of the total costs (\$3.2M to \$4.4M) will be funded from the EAB program

Funding from the Trees for Tomorrow program for the next 7 years at \$0.12M/year totalling \$0.8M will be committed as a funding source

Remaining preliminary funding requirement of \$5.6M to \$8M

Financial Implications

D. Funding

	<u>\$ in millions</u>		
Estimated preliminary costs	9.6	-	13.2
Less: 33% EAB funding	(3.2)	-	(4.4)
Subtotal	6.4	-	8.8
Less: Trees for Tomorrow funding	(0.8)	-	(0.8)
Remaining preliminary funding requirement	5.6	-	8.0

Financial Implications

D. Funding

Remaining preliminary funding requirement of \$8M

Funding Source: Corporate Rate Stabilization Reserve

The purpose of the reserve is to maintain the City's cash flow, minimize need for short-term borrowing, fund urgent expenditure requirements, minimize changes in the property tax rate and to smooth out fluctuations due to one-time expenditures.

Based on Government Finance Officer Association's (GFOA) recommended best practices, the reserve balance should be maintained at a level equivalent to 15% of the local tax revenues, \$18.7M based on 2013 local tax revenues

Current reserve balance is \$18.0M

Financial Implications

D. Funding

Impact to the Corporate Rate Stabilization Reserve

	<u>\$ in millions</u>
Reserve balance as of Nov. 2013	18.0
Projected 2013 Y/E deficit	<u>(2.0)</u>
Subtotal	16.0
Remaining ice storm costs	<u>(8.0)</u>
Projected reserve balance	<u><u>8.0</u></u>

To achieve 15% of local tax revenues (\$18.7M), the reserve requires \$10.7M.
Based on a 0.5% tax rate increase/year, it will take 5 years to replenish the reserve.

Ontario Disaster Relief Assistance Program

The Ontario Disaster Relief Assistance Program (ODRAP) is intended to assist those whose essential property has been extensively damaged as a result of a sudden, unexpected natural disaster.

ODRAP contains:

- ☐ Public component: Financial assistance may be provided by the province to affected municipalities for disaster response and recovery

The program provides financial assistance within the declared disaster area to restore damage public infrastructure to pre-disaster condition, when the cost of the restoration exceeds the financial capacity of the affected municipality and community at large.

ODRAP is not a substitute for adequate insurance coverage and does not provide full cost recovery

Request for a Disaster Declaration

Some examples of “Disaster Areas” not declared by the Province

Markham flood in 2005

Vaughan tornado in 2009

Some examples of “Disaster Areas” declared by the Province

Ottawa/Quebec ice storm in 1998

Peterborough flood in 2004

Goderich tornado in 2011

Request for a Disaster Declaration

Municipal Council must adopt a resolution requesting a disaster declaration for the public assistance of ODRAP and forward it to the Minister of Municipal Affairs and Housing within 14 working days of the onset of the disaster (by January 14, 2014).

As well, a municipal disaster information report, containing an estimate of damage losses, must be submitted.

Resolution

“That the City of Markham recently experienced an ice storm from December 21/22, 2013 and has experienced substantial damage to municipal property and infrastructure and has reported losses of public damage, the Council of the City of Markham hereby requests the Minister of Municipal Affairs and Housing to declare the City of Markham a disaster area for the purposes of the ODRAP.”

Eligible Public Losses and Costs

Examples of eligible public losses and costs under ODRAP:

- ☐ Clearing and removal of debris and wreckage, including removal of trees and limbs if public safety is endangered;
- ☐ Overtime for employees and those hired for disaster response/relief effort, or to backfill for regular employees deployed for disaster response/relief efforts;
- ☐ Incremental administrative costs related to disaster relief committee;
- ☐ Activation of the municipal emergency operations centre;
- ☐ Municipal owned equipment costs or equipment rental costs;
- ☐ Emergency communication;
- ☐ Repair and restoration to pre-disaster condition of uninsured facilities (e.g. parks infrastructure); and
- ☐ Evacuation and shelter of people and animals, including incremental expenses.

Ineligible Public Losses and Costs

Examples of ineligible public losses and costs under ODRAP:

- ☐ Regular salary;
- ☐ Insurance deductibles;
- ☐ Municipal equipment costs (other than as described on the previous slide);
- ☐ Additional costs to repair or improve structures of infrastructure beyond pre-disaster condition; and
- ☐ Lost revenues.

Lessons Learned

1. The City's Emergency Operations Centre & Incident Management System worked well.
2. Making “pet friendly” Warming Centres available quickly during a winter weather event worked well.
3. Strong liaison relationships with external agencies are critical in emergencies.
4. Miller works yard requires uninterrupted power source.
5. Early deployment of loaders was most effective and timely use of resource to open road network.
6. Review EOC Council liaison for future extreme weather events/emergencies (to disseminate & receive information)

Lessons Learned

7. Timely & accurate communication of information to the public is critical.
8. Impact of traffic signals being out was minimized due to lower holiday traffic volumes.
9. Traditional forms of communication are insufficient during an extended and wide-spread power outage.
10. Public education needed to teach residents how they can make their private property more resilient.
11. Locating vulnerable residents is difficult.
12. Improve linkages with community and faith groups.
13. Accurate Data/Analytics is critical to informing the City's emergency response efforts (precise location(s) of power outages/number of homes impacted, etc).

Recommendations

Emergency Operations Centre (EOC)

1. Discuss with PowerStream possibility of having City staff person located at PowerStream EOC during major & prolonged outages
2. Formalize liaison function with partner agencies (e.g. York Region, York Regional Police & utilities)
3. Train additional City staff in EOC operations & create expanded roster of staff available over extended periods

Recommendations

Environmental:

Review opportunities to improve community resiliency:

- Continue working with neighbouring municipalities on extreme weather and climate change adaptation
- Review how Markham District Energy's Combined Heat and Power (CHP) could supply power to their service areas and City assets
- Evaluate permanent, full back-up power for strategic City assets
- Understand how PowerStream's smart-grid initiatives could increase energy resiliency in extreme weather

Recommendations

Communications:

1. Deliver further public education on emergency preparedness
2. Acquire Contact Centre software to allow for remote call answer
3. Investigate feasibility of public notification software for use in future weather events/emergencies
4. Use mobile roadside signs, City vehicles & signage at major retail outlets (bulletin boards) to deliver key information to residents

Recommendations

Communications cont'd:

5. Utilize electronic information boards at City facilities across the community and investigate centralized control of programming
6. Evaluate installation of electronic information boards at City Fire Stations

Community Outreach:

Reach vulnerable residents by establishing a formal network of community groups and organizations to share/extend reach of information generated by the City (e.g. ratepayers' associations, faith groups, Mayor's youth task force, youth councils)

Recommendations

Operations: Restoring the Tree Canopy

Staff report back in April 2014 with an update on Ice Storm Recovery efforts, including an overall urban forestry plan to address storm impacts on the City's tree canopy, and further analysis and recommendations to reduce future tree loss due to extreme weather

Proactive Strategies for Protecting Continuity of Hydro Service

Staff explore with PowerStream the feasibility, costs and funding sources associated with burying major feeder power lines in Markham

Recommendations

Resources

Expand the scope of City's current reciprocal aid agreements or protocols and enter into additional agreements for assistance during extreme weather events or other times of need

Technology

Implement the planned relocation of the Data Centre from Civic Centre to 8100 Warden Ave for uninterrupted power

Discussion