

TO: CHAIR AND MEMBERS
FINANCIAL MANAGEMENT COMMITTEE

DATE: 2015 October 06

FROM: DEPUTY CITY MANAGER

SUBJECT: POST AUGUST 29, 2015 WIND STORM EVENT REPORT

PURPOSE: To provide the Committee and Council with a report on the City's assessment on the impact of the August 29 wind storm on City services and infrastructure and on proposed actions to improve future emergency response.

RECOMMENDATION:

1. **THAT** the Committee recommend Council receive this report and approve in principle the proposed improvements and studies as outlined in section 5.0 of this report.

REPORT

1.0 INTRODUCTION

At the Financial Management Committee meeting of September 15, 2015 the Committee requested a staff report on the impact of the August 29, 2015 wind storm event on City infrastructure and services and the adequacy of the City's current standards and preparedness for this type of events in the future.

One week after the August 29 storm event, a post-storm debrief meeting was held with staff from City departments and RCMP to review the storm impact on City infrastructures and services, the response and recovery practices and standards, and the associated costs. The purpose of this report is in response to the Committee's request, to apprise the Committee and Council of the post-storm assessment conducted and to outline the framework of a possible action plan for Council's consideration.

This report is a compilation of information, data and assessment gathered from the Parks, Fire, Emergency Management, Engineering, Finance, IT, Planning and Library departments and from the RCMP. The support and cooperation received from all City departments and the RCMP during the storm event helped the City to deliver the best possible emergency response services. The post-storm debrief and assessment allowed staff to identify steps that may be undertaken to improve emergency preparedness and response plan in the future.

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2.0 AUGUST 29, 2015 WIND STORM EVENT

A big wind storm hit southwest British Columbia on Saturday, August 29, 2015. At the peak of the storm, wind speed reached up to 115 km/hr on Saturna Island while Vancouver Airport measured a maximum of 80 km/hr. Many may remember the wind storm of December 11, 2006 with images of many fallen and damaged trees in Stanley Park. However, the August 2015 wind storm left more BC Hydro customers (700,000) without power, many for up to 3 days, and more tree damages in Burnaby than the 2006 storm.

3.0 IMPACT OF THE WIND STORM ON CITY INFRASTRUCTURE AND SERVICES

Due to the strong wind and the resultant problem of power outage and fallen trees some City services were down and several City facilities were closed. The following is a summary of the storm's impact on City services and infrastructure.

3.1 City Trees

During the wind storm and the following 2 week period, the City received approximately 1,000 calls for service in connection with fallen tree branches, and downed trees. Typically, the weekly call volume for routine tree maintenance enquiry and request is 75 to 100.

The current count of downed trees following the storm is at 144, and field crews are continuing with the cleanup work. It is anticipated that the cleanup work will continue till the end of 2015. During and immediately after the storm, all available Forestry field staff and additional contractors were called in to remove downed trees on roads and walkways/trails. After the first priority (public safety) was addressed, the crews moved to fallen City trees on boulevards, driveways and park sites.

3.2 City Computer Data Centre

At the height of the storm, the 12,400 volt overhead Hydro power line supply to the City Hall complex was shorted due to fallen tree branches. This subsequently led to the disconnection of the Hydro pole fuse. Although the City Hall emergency power generator started and supplied power to the entire building as intended, the circuit breakers for the data centre room air conditioning units were tripped and power to the data centre A/C units was not restored. As a result, temperature in the data centre rose and forced the shutdown of the majority of the computer servers. City staff and a service contractor were on-site in response to the system shutdown. The A/C unit's breakers were reconnected and the room began to cool down and the data centre equipment began to be reinstated after approximately 3 hours. The main City web site was re-established at approximately 10:30 pm Saturday, about 10 hours after the initial power outage was reported. The service stoppage in the data centre had affected all computer related services including business applications such as CLASS, Hansen, SAP and remote system services such as Wi-Fi and

telephones. As a result of this incident, staff are conducting a review of the existing system design, emergency secondary servers and response procedures. More on the post-storm evaluation work is included in sections 4.0 and 5.0 of this report.

Although the City's website was down for most of the day on Saturday, the City's Facebook and Twitter accounts were fully utilized to post information on the City's service disruption.

3.3 Engineering Infrastructure

At approximately noon on Saturday, August 29, staff attended a power outage alarm signal from the Capitol Hill water pump station. It was quickly determined that the pump station had lost power and the standby generator did not transfer over. A manual override was carried out by staff on-site, the water supply was reinstated and the system was re-pressurized after approximately 30 minutes. Thirty houses were affected by the loss of water supply. As a precautionary measure, watermains within the affected zone were flushed and disinfected. Water sample results indicated there was no negative impact on the water quality. A detailed review of the failure of power transfer was conducted and corrective actions will be carried out to prevent recurrence in the future. The rest of the City-wide water supply system and sanitary system were operational during the storm.

To assist the Parks crews in fallen tree debris cleanup, four road crews were called out on the weekend to clear 25 road blockages caused by fallen trees. For safety reasons, approximately 60 tree stumps that were rotated and lifted above ground due to fallen trees were removed from City property. Repair to damaged sidewalks is currently underway. Recognizing the significant volume of green waste including spoiled foods as a result of the storm, the City's Eco Centre waived the tipping fee to allow Burnaby residents to dispose all green waste free of charge for a two-week period. In addition, the City also offered to collect tree debris piles from residents who were unable to deliver the materials to the Eco Centre.

The City has 240 traffic signals and of these 240 signals, 57 are equipped with back-up battery power. Dependent on the number of signal heads at the intersection, the back-up battery will provide full power for up to 4 hours and after that will reduce to flash operation for up to 20 hours. During the power outage, staff received 27 reported signal outages. All signals were back in full operation mode by late Monday morning. The traffic signals at the intersection of Canada Way/Kensington and the ramps to the freeway were out of service for a longer period than expected. These signals are owned by the Ministry of Transportation and Infrastructure, and City staff will engage the Ministry staff in working towards creating a better power back-up plan for this major intersection. In addition, staff are evaluating the feasibility of increasing the battery power capacity for major intersections and adding more back-up power packs to key intersection signals. More on this discussion is included in section 5.0 of this report.

3.4 City Facilities

This section highlights the impact of the storm on City facilities including libraries, recreation and community centres, and public safety buildings.

In the early afternoon of August 29, 2015, the Hydro power outage situation extended to include the Bob Prittie Metrotown and McGill libraries. Although full emergency back-up power is not available in City library facilities, emergency lighting was available through battery power for 30 minutes to allow a safe evacuation of patrons and staff. Both libraries were closed until Hydro power was restored on Monday morning. Tommy Douglas and Cameron libraries were not affected and continued to operate as usual. It should be noted that the library's website is remotely hosted by an external party which was not affected by the power outage. Library staff were able to post information on the website to inform the public of the temporary branch closures.

For community/recreation centres, the following facilities were closed following the power outage that occurred around noon on Saturday. Hydro power was not reinstated to some facilities until Monday morning.

- Burnaby Village Museum (till Monday)
- Shadbolt Centre for the Arts (till Saturday 9 pm)
- Burnaby Art Gallery (till Monday)
- Kensington Ice Rink (till Sunday 4 am)
- CG Brown Pool (outage lasted for 2 hours on Saturday only from noon to 2 pm)
- Burnaby Mountain Club House (outage lasted 4 days but portable generators were brought in to carry on 2 pre-scheduled events)
- Riverway and Burnaby Mountain golf courses (closed on Saturday due to high wind condition).

All other major recreation/community centres including Edmonds, Cameron, Eileen Dailly, Bill Copeland, Burnaby Lake and Confederation remained open and largely unaffected operationally. Bonsor Recreation Centre continued to operate with back-up emergency power.

During the storm event, all seven Fire Stations and the RCMP Detachment building lost power (36 to 48 hours) but the transition to the emergency back-up power was seamless and no operational impacts to service delivery occurred. However, the wind storm and the subsequent Hydro power outage had caused a spike in calls for service. For the RCMP, total calls for service from August 29 to 31 was 625, and the average calls for service for a similar period is 500. Due to the traffic signal outage problem, police resources were reprioritized to address traffic flow issues and to maintain public safety. For the Fire Department, the loss of Hydro power caused a significant increase in false fire alarm activation that required attendance of Fire personnel. The power outage also generated a

much higher number of residential fire calls due to the use of alternate indoor lighting and cooking equipment. During the first 12-hour period of the storm, the Fire Department responded to 136 calls for service, 7 times the average call volume for a similar period. For the 48-hour period of August 29 and 30, the Department responded to a total of 248 calls, 3.5 times the average fire-related call volume for a similar period.

4.0 POST-STORM EVENT ASSESSMENT

A debrief meeting attended by staff from City departments, Fire and Police was held on 2015 September 9 to assess the City's preparedness and response actions as a result of the storm event and to identify opportunities for improvements.

A summary of the assessment findings and conclusions is provided below.

4.1 Strengths of City Infrastructure and Response Plan

- Dispatch staff (Engineering, Fire and RCMP) worked well with additional back-up staff to handle the extraordinary call volume
- Internal communication was good and effective with respect to work coordination, resource allocation and situation reporting
- Emergency call out procedures worked well
- Speedy response by Engineering and Parks crews, supplemented by hired contractors, to clear road blockages and fallen trees
- Emergency power for all key infrastructures and facilities worked as designed except the Capitol Hill and Burnaby Mountain (back-up) water pump stations where the power transfer process failed

4.2 Weaknesses of City Infrastructure and Response Plan

- Limited back-up power available for traffic signals
- Need better communication and coordination between City staff and RCMP members on road closure, signal outage and barricade deployment
- Lack of a backup system for the City's computer data centre, and its emergency response procedures need improvements
- Need more timely communication and notification to the public on impacted City services and infrastructure
- Lack of emergency power for extended power outage periods in library facilities
- Need improved inspection procedures for pump station emergency power transfer

Based on the post-storm assessment, a list of improvements was developed and included in Section 5.0 for Council consideration.

4.3 Cost

The cost incurred by the City (to the end of September) related to the clean-up work is approximately \$460,000. The final cost will be reviewed when the work is complete. The Province has indicated that eligible costs incurred by local governments to repair damages and clean-up debris as a result of the storm may be reimbursed under the Disaster Recovery Fund. The City will review the reimbursement guidelines and submit its cost recovery request to the Province when the clean-up is complete.

5.0 RECOMMENDED IMPROVEMENTS

To rectify the response deficiencies encountered during the August 29, 2015 event, operational enhancements and capital improvements were identified and are shown in Table 1. Staff are moving forward to incorporate the recommended operational improvements in the City's operating plan and budget. Other more significant project implementation will be investigated by staff, with further reports back to Council for consideration and funding approval.

Recommended Improvements/Studies	Comments
1. Investigate the feasibility and costs of expanding the back-up power capacity for key traffic signals in the City.	Report back to Council on findings, options, and costs
2. Develop internal procedures to improve coordination between City staff and RCMP members on road closure, signal outage and traffic control.	Incorporate into operating and emergency response procedures
3. Review the current location of the City data centre and system redundancy with respect to risks, security and suitability. Investigate the feasibility of establishing a back-up data centre (City-owned or otherwise).	Report back to Council on findings, options and costs
4. Investigate the advisability and feasibility of expanding the provision of emergency power to selected key City facilities, such as libraries and major community centres, to maintain business continuity and public access.	Report back to Council on findings, options and costs
5. Create a more robust inspection and testing of pump station back-up power transfer.	Incorporate into operating procedures
6. Investigate the feasibility of undergrounding the overhead Hydro power line serving the City Hall Complex. Initiate interim tree trimming if warranted.	Report back to Council
7. Refine current communication plan for residents impacted by temporary loss of City services.	Incorporate into the City's Emergency Management Plan
8. Continue with the investigation of a Notification System for residents impacted by major emergencies.	Report back to Council
9. Review with Hydro with respect to critical facilities, power reinstatement priority and power grid interconnection.	Incorporate into operating procedures

Table 1 – Recommended Improvements and Studies

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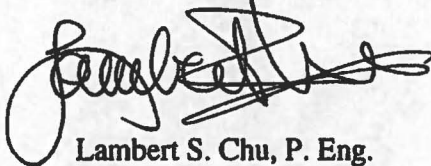
In addition to the recommendations above, other minor equipment changeovers, procedural changes and emergency communication improvements were identified and will be included in the City's operation programs. This storm event has proven to be a good learning opportunity for all and will help the City be better prepared for future emergencies.

6.0 CONCLUSIONS

The August 29, 2015 wind storm that hit the Metro Vancouver area produced significant impact to many communities due to the large number of fallen trees/branches and an extended period of power outage.

City departments (Parks, Fire and Engineering) and RCMP received a high volume of calls for service on the weekend of August 29 and 30 but they were able to re-assign work priority and called in additional resources when needed to meet the service demand. The loss of the air cooling system in the City's data centre and the failed emergency power transfer at the Capitol Hill and Burnaby Mountain back-up water pump stations are being addressed by staff to ensure that system reliability and redundancy can be maintained in the future. Additional extended back-up battery power for traffic signals will also be investigated and procedures to improve coordination between the City and RCMP on road closure and traffic control will be developed.

Overall, the City and RCMP had responded well and provided the community with the best possible service under an extreme weather condition. Lessons have been learned on what needs to be improved to better prepare the City for future emergencies. It is recommended that the Committee and Council receive this report and approve in principle the recommended improvements and studies outlined in section 5.0.



Lambert S. Chu, P. Eng.
Deputy City Manager

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