

DISCUSSION

Record Snow Event

The most recent snow event was a record event. It commenced on the afternoon of December 12, 2008 and continued until the morning of January 5, 2009 (24 consecutive days of near freezing or sub-zero temperatures). It required some form of snow and ice control on a continuous basis for this full period of time. During this 24-day period, there were 17 days during which snow fell with a total accumulation of 1039 mm (42"), based on Environment Canada data for Vancouver Airport. Experience tells us that for most snow events in the region, Surrey experiences, on average, more snow accumulation than Richmond, where the airport is located.

This event was the most significant challenge in relation to snow and ice control experienced by the City in the last few decades. Due to the amount of snow and the duration of freezing temperatures, snow accumulations were significant. The snow accumulating on the local streets in the City, which the City does not typically clear, made it difficult for residents to move in and out of their neighbourhoods.

Deployment of Staff and Equipment

To mitigate as much as possible the impacts of the snow event on the City's residents, all vacations for equipment operators and roads crews were cancelled and all appropriate Operations staff were available such that a 24 hour a day operation with all available equipment could be maintained on a continuous basis (i.e., 24 hours a day, 7 days a week) throughout the event.

Staff's dedication to serving the City's residents during the event was outstanding as many sacrificed spending time with their family and friends during the holiday season to assist with the snow clearing and related activities. Shifts were generally running at 12 hours on and 12 hours off for approximately 20 days. In spite of these long work hours everyone was present for duty on an on-going basis. This commitment to the needs of the community allowed for a much more effective response than would otherwise have been possible.

While daily equipment usage varied slightly, in general thirty-two (32) pieces of equipment were used to clear snow continuously during this period. This included 21 tandem trucks with plows and sanders, 9 one-tonne trucks with plows and sanders and 3 graders. For this storm alone Engineering Operations applied in excess of 14,100 tonnes of salt, which was more than the total allotment of road salt that was budgeted for the entire 2008/2009 winter season. This amount exceeded the previous annual record for road salt usage of 10,300 tonnes, which occurred during the winter of 2006/2007. The following table lists the equipment available for snow and ice control since 2005. Appendix III documents the amount of salt used by the City in each of the last 5 years.

Equipment Available for Snow & Ice Control

Winter	Equipment Available	Percentage Increase from 2005
2005	20	
2006	22	10%
2007	23	15%
2008	32	60%
2009 *	38	90%

* Level of Equipment that will be available by 2009 – 2010 winter season.

Resident Complaints

There were a relatively high number of complaints from residents received by the City during the storm event related to snow clearing and accessibility issues particularly during the third week of the storm. The majority of the complaints received related to the lack of snow clearing on residential streets and snow removal from sidewalks as well as delayed solid waste collection.

The City also received a high number of letters of appreciation from residents that were very satisfied with the City's performance during this record snowfall.

The short duration snow events that have been typical for the Region over the last 10 years have not generated the number of complaints that this event generated, as the public has not been inconvenienced to the same extent in those events and was better able to deal with the smaller accumulations of snow. During this event, as the duration of the event became more extended and access problems lingered, residents became less tolerant. City crews concentrated snow removal efforts on the major road network. Most residents cleared snow from their driveways and walkways onto the adjacent local roadway, which compounded the access problems along their local streets. In most cases local streets were reduced to one travel lane as a result of the heavy snow. The City's by-laws require the owner of each property in the City to clear the snow from the sidewalk that abuts the frontage of their property.

In accordance with City policy, Operations staff removed snow from residential (local) roads where it was determined that a resident had an immediate need for medical care, where a request was received from emergency services for assistance and where there are steeply sloped sections.

Surrey Fire Services has advised that while snow in some areas impeded their response time, it did not compromise their objective of supplying emergency services to the residents of Surrey.

Snow Clearing on Local Streets

Snow plowing residential streets is a low priority for the City coming only after arterial and collector roads, medical emergencies are tended to and secondary streets are cleared. Due to the relatively continuous snowfall during the first 2 weeks of the recent event, City crews were fully occupied clearing the arterial and collector roads. Once the snowfall abated, most residents had cleared their driveways (many had pushed snow on to the adjacent road) and the temperatures increased (the last couple of days of December) so that the snow became wet and heavy. If clearing of local roads had occurred under those conditions, the clearing equipment would have simply pushed the heavy wet snow back across the adjacent driveways where it would have frozen and blocked access to the driveways and would have blocked the gutters draining melt water to catch basins along the streets, which would create localized flooding and related problems. In any case, by this point based on staff observations, it was determined that most of the local roads were passable to one lane traffic. Furthermore, rain was forecasted for January 3 and 4, 2009, which would accelerate snow melt. The weather forecast was incorrect and additional snow fell between January 1 and January 5, 2009, which compounded the access problems being faced by residents.

Flooding

At the beginning of January the City continued to experience snowfall and during a warming trend, which resulted in snowmelt runoff, the City also received a significant amount of rainfall. Between January 5 and 11 a total of 170 mm of rainfall was recorded at City Hall. The combination of snowmelt and rainfall resulted in significant flooding throughout the lower mainland and Fraser Valley including the City of Surrey. Within Surrey, the snow melt and rainfall resulted in high water levels and flooding mainly within the Serpentine and Nicomekl River floodplains.

Waste Collection Services

The severe weather conditions throughout the City also created problems for waste collection services. IPI kept trucks running throughout this period; however, pick-up was much slower than usual and some streets were temporary inaccessible, and consequently, IPI missed waste collection in a number of areas. In cases where collections were missed, residents were permitted to place their previous week's waste materials (up to 2 cans) at curbside along with the current week's waste materials (up to 2 cans), for collection. IPI also allocated 4 trucks during this period to cover missed areas. Waste collection services were back to normal in all areas of the City during the week of January 12.

Expenditures

The 2008 Snow and Ice Removal budget was \$1,120,000. It is estimated that during the period from December 12, 2008 to January 6, 2009, the City spent approximately \$3,000,000 on snow clearing and ice control. The total amount expended for snow removal and ice control in 2008 (including the amounts spent between January and March 2008) was \$4,000,500.

It is noted that the City's snow clearing and ice removal efforts through the recent storm event were **not** constrained by funding since the City has an Emergency Fund that has been drawn upon to supplement the regular budgeted amount. However, any adjustment to the current level of service or any near term recurrence of this type of winter snowfall event will require additional funding in the Snow and Ice Control budget.

Review of Snow and Ice Control Policies and Procedures

During the severe weather of December and early January, City staff mobilized the City's full snow and ice control capabilities to minimize the impacts of the weather on the City's residents in accordance with the City's Policies. Staff's dedication to serving the City's residents was outstanding. However, based on the experiences of this event, staff intend to review the current policies and procedures with a view to providing a further report to Council complete with recommendations, discussing options and costs for improving snow removal and ice control service.

The matters that will be reviewed include:

- **General Communications:** Staff will review and develop an improved communications protocol (including public safety advisories, news releases, etc.) so that City's residents, business owners, the media and other interested parties are provided with information more proactively prior to and during storm events. This will ensure that the City's efforts and activities in responding to any storm event are well understood by the general public and other parties. It will also assist in ensuring that the responsibilities of others in relation to responding to a storm event are communicated clearly (e.g., the responsibility of property owners to clear the sidewalks along the frontage of their property, etc.).
- **Responding to Inquiries and Requests for Service:** The protocols and capacity of the City to respond to inquiries and requests during extreme events will be reviewed with a view to adding call-taking capacity where appropriate so that turnaround time in responding to those making inquiries or requests of the City is reasonable. This will include a review of the number of phone lines serving the City's call centres to ensure that there is sufficient capacity to avoid dropped calls.
- **Increasing the City's capacity for snow clearing and ice control:** Staff will review options including costs for enhancing the City's snow clearing capabilities. The review will include adding equipment to the City's fleet and mobilizing more operators during storm events through such means as training more staff to operate snow clearing equipment on an "as needed" basis. Staff will review the current practice of deploying equipment firstly by area, then by varying regional conditions to determine if further efficiencies are possible. Staff will also review the network of priority roads to ensure that all critical links are included. The map attached as Appendix I illustrates the roads that are given priority for snow clearing currently.

- **Review Snow and Ice Control Policies with other Regional Municipalities:**
The matter of snow and ice control will be raised for discussion at the Regional Engineers Advisory Committee with a view to determining best practices in the Region and to determine whether current policies need to be adjusted based on trends in the weather (i.e., trends toward higher intensity and longer duration snow events).
- **Other similar issues and opportunities.**

CONCLUSION:

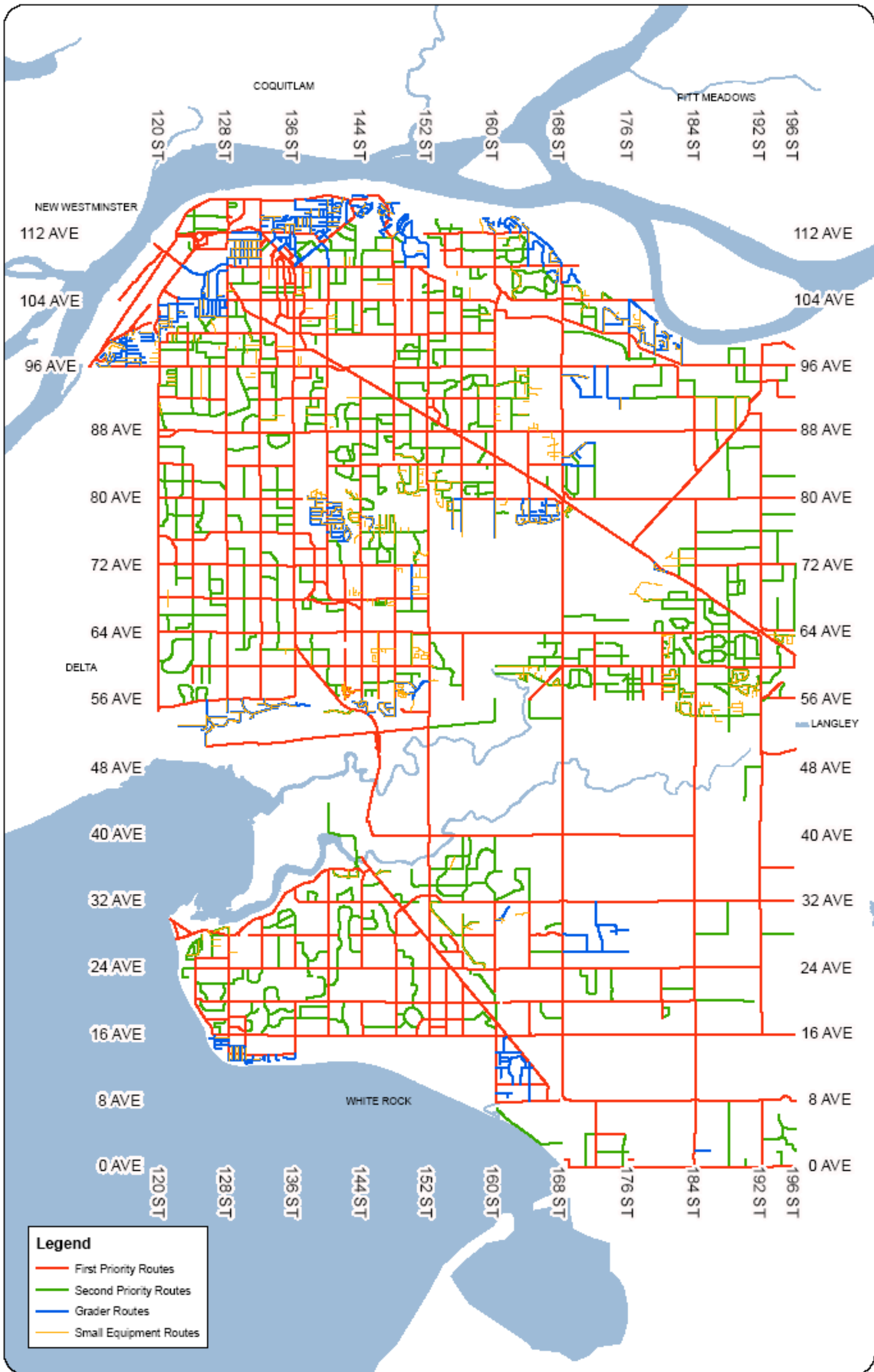
During December 2008 and early January 2009, the City of Surrey experienced the most significant winter storm on record based on snowfall accumulations and duration of sub-zero temperatures. The City's capabilities to keep the City mobile were stretched to the maximum. Based on this recent experience, staff will be reviewing current City policies and procedures with a view to providing a further report complete with recommendations to Council on any necessary adjustments.

Vincent Lalonde, P.Eng.
General Manager, Engineering

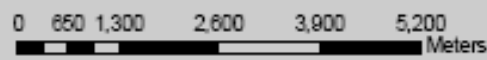
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Appendix I - Map Showing Snow & Ice Control Routes
Appendix II - Snow and Ice Control Policy
Appendix III - Available Equipment and Salt Usage in Last 5 Years

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SNOW & ICE CONTROL ROUTES



City of Surrey
Eng Ops
DEC 2009
By: H5J



CITY POLICY

No. H-22

REFERENCE:

REGULAR COUNCIL MINUTES
28 JANUARY 1991
PAGE 5

APPROVED BY:

CITY COUNCIL

DATE: 10 MARCH 1997 (RES.R97-622)**HISTORY:**

28 JANUARY 1991
14 JANUARY 1991
9 JANUARY 1978

TITLE: SNOW & ICE CONTROL

1. Sanding/Salting and Snow plowing operations shall be conducted according to the following priorities:
 - a) First Priority: Arterial roads, major collector roads, bus routes and hilly areas (regardless of road classification) are given first priority. Sanding and plowing are carried-out, around the clock, as long as poor conditions exist.
 - b) Second Priority: Secondary through roads in residential areas. These local roads exist between the arterial or major collector road grid. They are typically over 200 meters in length and connect local traffic with either an arterial or major collector roadway. All secondary priority work is performed during normal work hours only.
 - c) Third Priority: All remaining residential roads. Third priority routes will be only done as directed by the General Manger of Engineering or his delegate. The General Manager of Engineering shall inform Council of the decision to address third priority routes. These areas will be dealt with in a systematic manner starting with the more significant roads, hill areas, specific problem locations (as identified by the public and Area Managers). All third priority work is performed during normal work hours.
2. First priority routes are maintained until the conditions are under control; only then are resources redirected onto second priority routes. Surfaces shall be maintained as bare as possible through continued use of assigned personnel and equipment.

3. Once conditions are under control on secondary routes resources can be directed to third priority routes.
4. Third priority routes are only addressed under the direction of the General Manager of Engineering or his delegate.
5. As soon as conditions deteriorate on any of the previous priority routes, resources are moved back to those routes.
6. All sanding/salting and plowing operations with the exception of first priority routes are to be completed within normal working hours unless directed by the General Manager (or designate) of Engineering. First priority routes are addressed around the clock.
7. Snow removal and snow plowing occurs when the snow depth exceeds 10 centimeters (4 inches).
8. Snow removal from sidewalks is the responsibility of the adjacent property owners.

**Appendix III
AVERAGE SALT USAGE COMPARISON
2004/05 TO 2008/09 SEASON**

