



C2014-0098
SNOW AND ICE
CONTROL FOR
EXTREME SNOW
EVENTS

VERBAL REPORT TO
COUNCIL

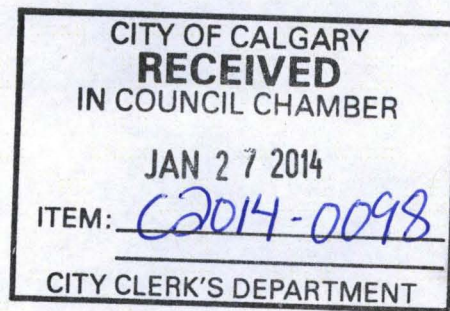
JANUARY 27, 2014

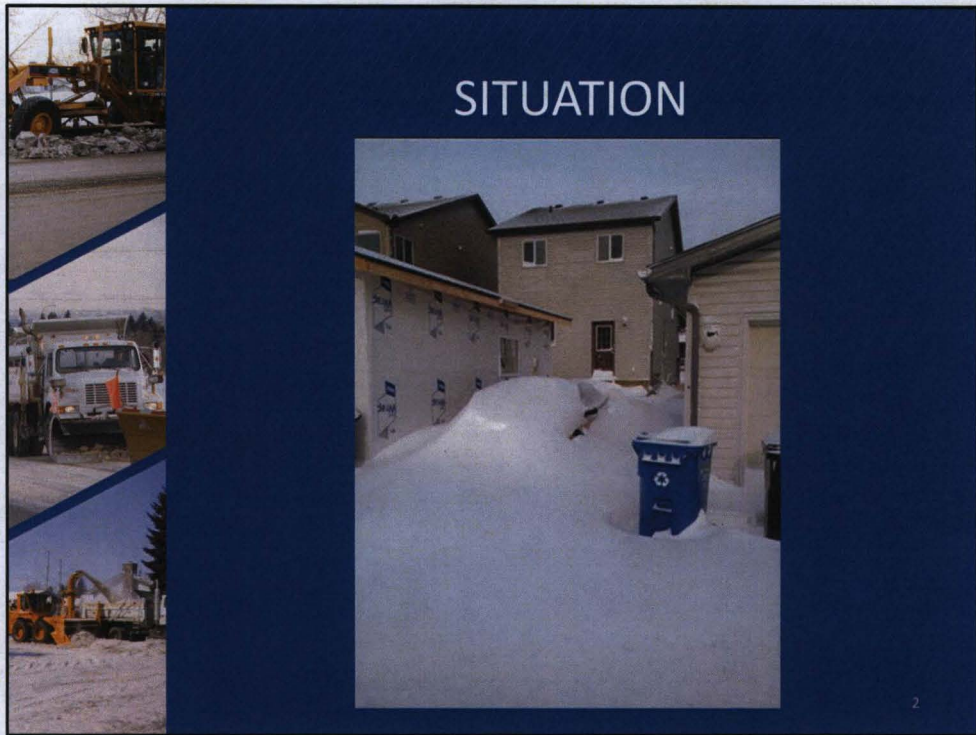
calgary.ca | call 311

Onward! Transportation provides services to help keep Calgarians on the move.

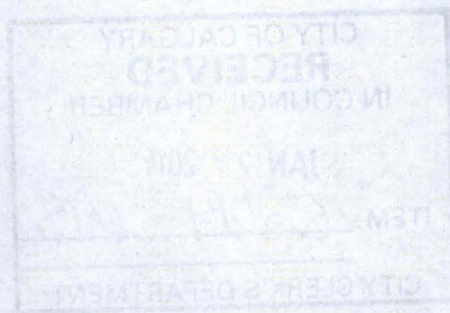


Good Morning / Afternoon Your Worship and Members of Council. My name is Bill Biensch, and I am the Manager of Roads Maintenance. I will present this Verbal Report to Council on the Extreme Snow Event that has impacted Calgarians. Copies will be provided at the conclusion of this presentation.



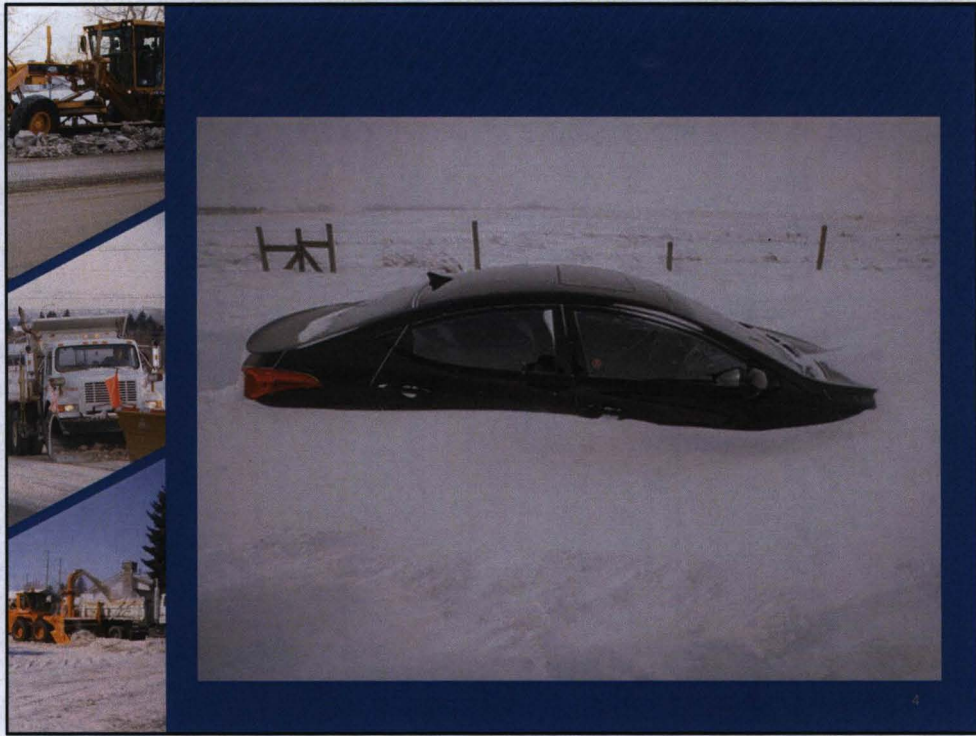


In this report, I will walk you through the events that brought us to this extreme weather event, the action taken and the plan going forward. To start off, I would like to show some pictures of the December 2 and 3 storm that impacted the communities along the northern edge of the City. Many of these communities are new and therefore do not have the trees, hedges and fences that will slow the drifting snow. This picture is a drift in SkyView Ranch NE





In this picture you can see the snow drifts that were deposited on the street. Again these are residential road in a NE community.



This final picture shows a car parked at the curb but buried in snow. The picture clearly demonstrates the openness of the area.

Situation – Typical vs Non Typical

Actual versus Average Snowfall

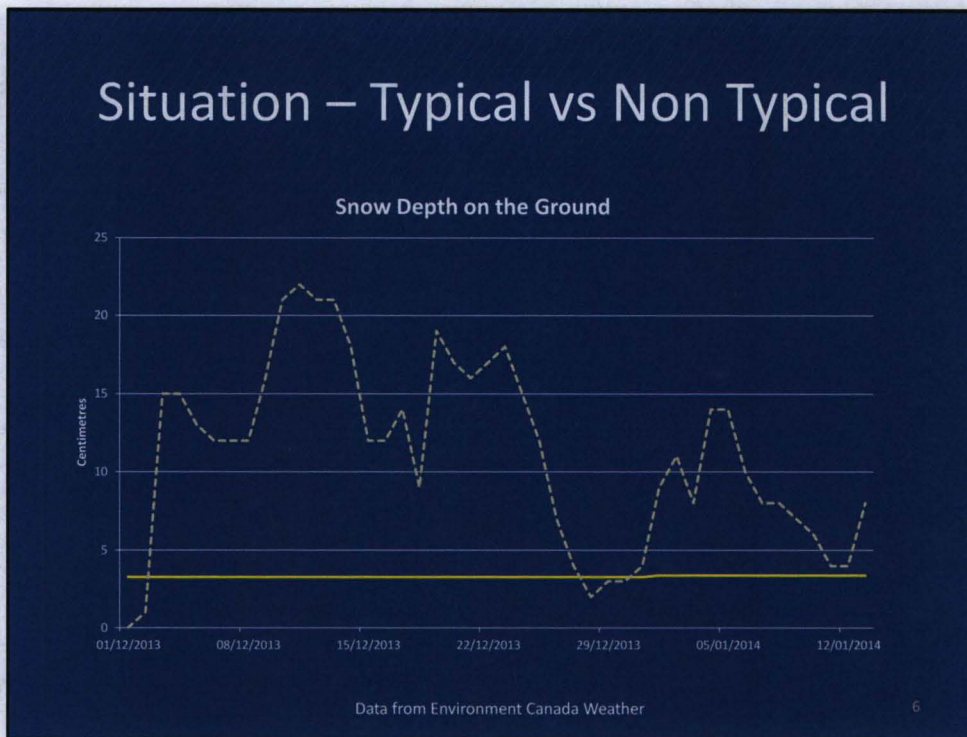


Data from Environment Canada Weather

5

Calgarians have had to deal with a significantly greater amount of snow over the last 8 weeks, starting with the blizzard on December 2nd and 3rd. The 30 year average snowfall in December is 15 centimetres and we saw this amount in the first snowfall, combined with 74 Km/H wind gusts which created the blizzard conditions experienced in communities along the extreme northern edge of the city. In total, we saw 52.4 centimetres of snow fall in the city in December, which is 3.5 times the normal value. In January, the average snowfall is 15.3 centimetres and we experienced 15.5 centimetres in the first 13 days. This graph shows the Actual snowfall from December 1 to January 25.

Situation – Typical vs Non Typical



This snowfall resulted in the significant accumulation on residential streets. This graph shows measured snow depth at the Calgary Airport, taking into consideration any accumulation and melting. The median snow depth of 12 centimetres is also 3.5 times the 30 year average of 3.3 centimetres. This accumulation of snow created a condition where snow removal was required on a significant number of residential roads to make them passable.

7-DAY PLAN:
This plan is
very effective
when there
are at least 7
days between
storms

The City's Snow Plan

We know how important it is for Calgarians to get to where they want to go safely and without driving on ice. We know that snow and ice conditions can be challenging because of snow and icy conditions. The City keeps you moving safely by following a snow and ice removal (SINIC) plan.

Preparing the roads for snow and ice
Even before it snows The City's Roads crews are busy anti-icing roadways to reduce the accumulation of ice and snow on the roads when it comes.

Once the last snowflake falls the seven day plan begins

DAY 1 Priority 1 - All Priority 1 routes are completed by the end of the first 24 hours after the snow has stopped. Priority 1 routes are major roadways with traffic of over 20,000 vehicles per day, like Crowchild Trail and Alameda Trail.

DAY 2 Priority 2 - Within 48 hours after the snow has stopped, all Priority 2 routes will have been plowed, sanded and salted. Priority 2 routes include all on-street, marked bike routes and access roads which carry 6,000 to 19,999 vehicles per day.

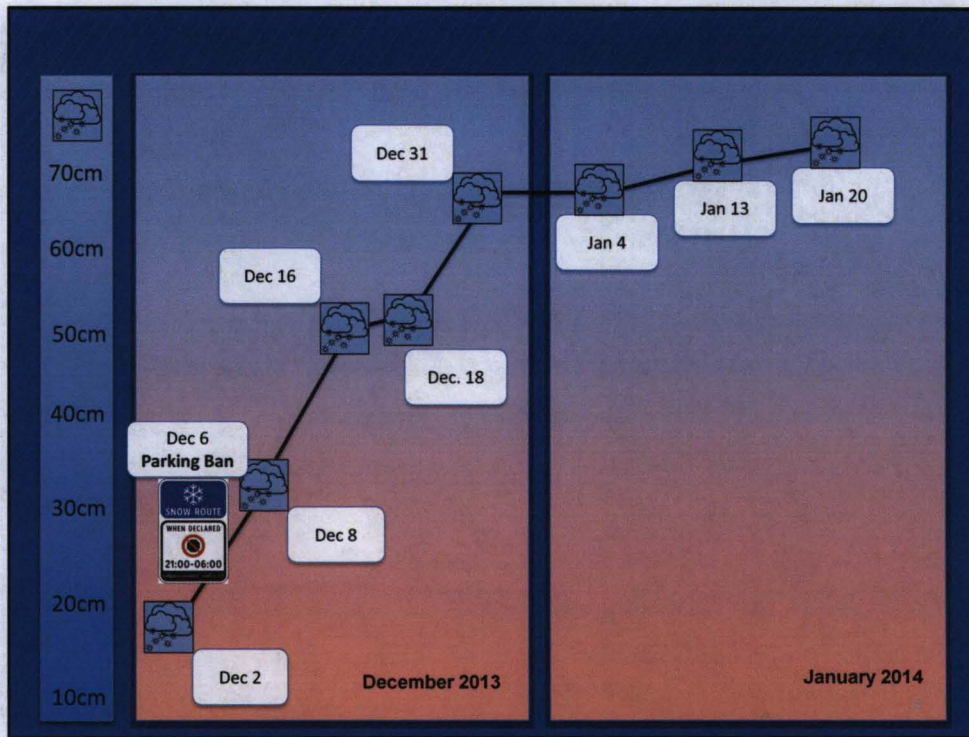
DAY 3 Priority 3 & 4 - Once Priority 1 & 2 routes have been completed, work begins on Priority 3 & 4 routes like school and playground zones, hills and residential roadways.

DAY 4, 5, 6 Priority 3 & 4 - Work on Priority 3 & 4 routes continues including snow, water and clearing of bus pads.

DAY 7 - We continue to maintain all priority 1 and 2 routes and all bus pads are complete. We're monitoring the weather forecasts. We're getting ready to do it all again.

464
120
24/7

The City's Snow Plan, as approved in policy, outlines the steps that Maintenance would take to deal with a typical winter storm but when the city is faced with these higher quantities of snow and the wind conditions that were experienced on December 2nd and 3rd, additional steps must be taken.



Maintenance responded to the snow storm of December 2nd and 3rd (which involved 15 cm of snow) by placing our equipment on the Priority 1 and 2 routes. Examples of a Priority 1 route would include Crowchild Trail, Metis Trail, Glenmore Trail or Anderson Road and Priority 2 would include roads like Cranston Drive, 45 St SW, 39 Av NE or 8 Street SE. Day 1 of the snow plan began on December 4, once the snow had stopped falling. Four days later on December 8, we were back into snow for three days. An additional 10.8 cm of snow fell. At this point, we had seen the impact of the storm on the northern communities. Despite crews being assigned back to our Priority 1 routes we assigned some crews to work on residential roads in these hardest hit communities, like Skyview Ranch and began discussion to bringing in hired equipment.

9 centimetres of snow fell on December 15 and 16. Snowfall had been much heavier in the northern half of the city and some crews were reassigned from the south to the north. We also began to bring in hired graders, loaders, bobcats and trucks to deal with the impassable residential roads. On December 18, we have an additional 10.6 centimetres of snow.



Definitions – TP004 Snow and Ice Control

Passable road:

a road with a total accumulation of less than 12 centimetres, or ruts that do not exceed 12 centimetres in depth.

Extreme winter conditions:

Where the immediate demand for snow and ice control services will exceed the available resources. Normally this will trigger Council to declare a snow emergency and provide the Roads Maintenance Division with additional funds to increase the response using contracted services.

Snow emergency:

In a general sense it refers to a winter storm that overwhelms the base compliment of snow fighting equipment and personnel. Actions can include banning all traffic except emergency personnel, restrictions or prohibitions to on-street parking and closure of public buildings. Normally issued before the storm begins as drivers may not be able to reach their destinations after it has begun.

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The existing Snow and Ice Control Policy TP004 defines a Passable Road, Extreme Weather Conditions and a Snow Emergency. We used these definitions and the policy to guide operations in this current snow response. In the instance of passable roads, it is defined as 12 cm but because of freeze thaw cycles at the beginning of January we lowered the value to 7 cm to accommodate these conditions.

ACTION



This is a photo that sent to us on Twitter to show us what Calgarians were seeing.

McKnight Blvd after SNIC



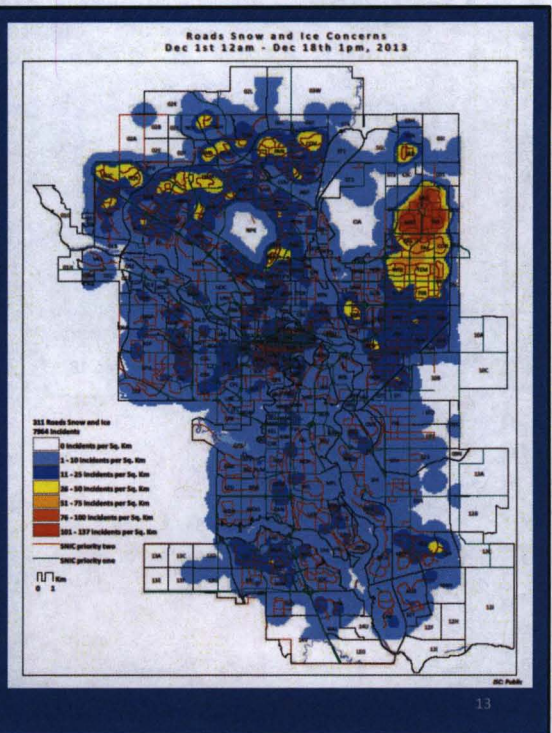
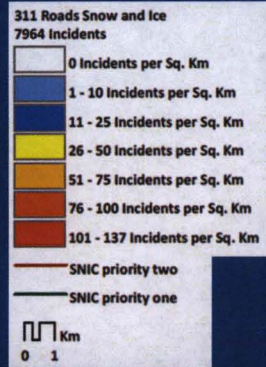
This is McKnight Boulevard after the drifts were ploughed.

SNIC in Skyview Ranch

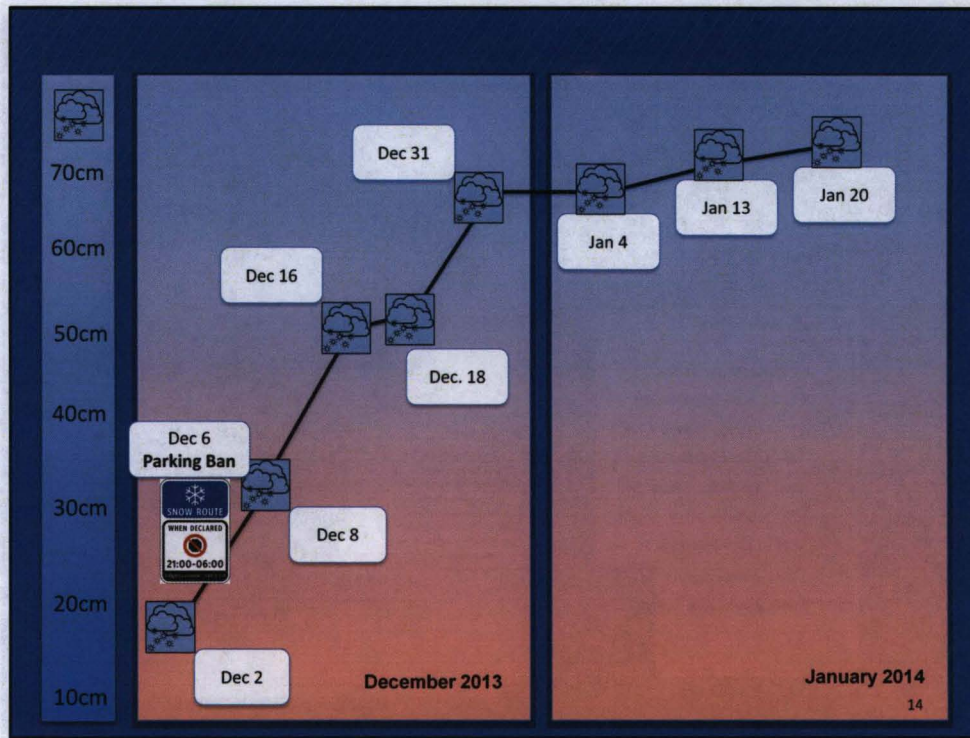


Skyview Ranch was one of the first area crews were assigned to make road passable. In an effort to quantify the road condition, Maintenance brought staff from other Roads Divisions and sent these staff to drive all the roads in the northern communities to document what roads were passable (no action needed), which needed to be flat bladed, which needed to be plowed with a wind row at the curb and which required snow removal. This evaluation was undertaken in a matter of 6 hours. Using this information, city and contracted crews were assigned to specific communities and streets as they became available. Roads shut down their asphalt and aggregate crushing operations and brought all the loaders and personnel to assist in this work. Fleet Services assisted by increasing the existing lists of rental trucks, loaders, graders, and bobcats. Every available snow blower was brought in to assist.

311 Snow and Ice Concerns 2013 Dec 1 – 18



The focus in December was the north half of the city because of the blizzard and snow fall accumulations in the north areas. The Roads Snow and Ice Control service requests, shown on this Density Report from December 1 to 18, clearly reflect the difficulty experienced in the north part of the city while in comparison, there were very few calls from the south.



A limited amount of snow fell on December 21, 22 and 28. But on December 31, January 1, January 3 and January 4, we saw a total of 13.8 centimetres of snow fall. This time more snow fell on the south part of the city and this snowfall, in combination with the 50 centimetres from December, cascaded the issue of snow on residential roads to the south. Therefore the snow clearing efforts which were started in the north were extended city wide.

Residential Snow removal



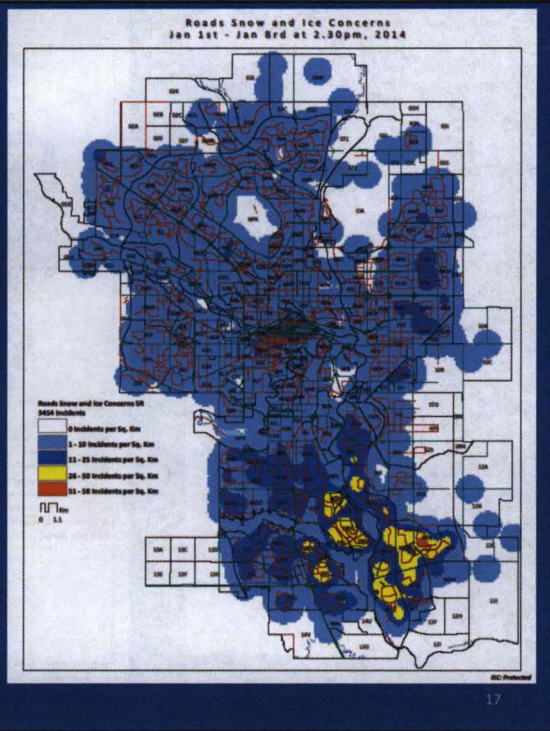
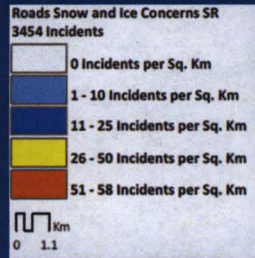
Snow clearing happened 24 hours per day.

Residential Snow Removal



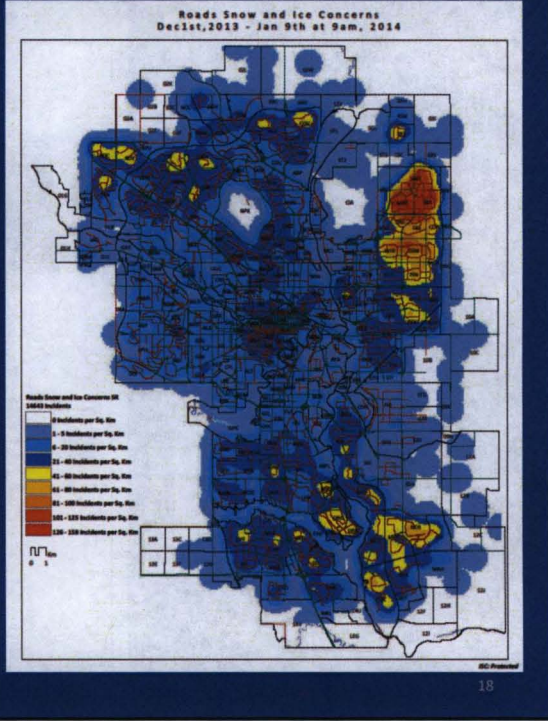
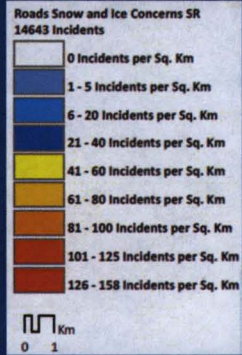
And this was a crew working at night.

311 Snow and Ice Concerns 2014 Jan 1 – 8



Again this shift to the south was also reflected on a Snow and Ice Control service requests call density report from January 1 to January 8, which shows the higher call volumes came from the south.

311 Snow and Ice Concerns 2013 Dec 1 – 2014 Jan 9



This Snow and Ice Control service request call density report from December 1 to January 9, clearly shows where the storms had the largest impact in the north, northeast and south sections of the city.



Snow and Ice Expenditures

2013 Dec = \$9.4M

Twice a typical Dec expenditure = \$4.7M

Resulted in over expenditure of 2013 SNIC budget by \$2.6M

Projected expenditure for 2014 Jan ~ \$12M

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Total Snow and Ice Control expenditures for December 2013 was \$9.4 Million dollars, which is 2 times larger than our typical expenditure of \$4.7 Million dollars. In November, Maintenance was projecting a \$2.1 Million dollar Snow and Ice Control surplus that would have rolled into the Snow and Ice Control Reserve Fund. We, in fact closed 2013, over-expenditure in Snow and Ice Control by \$2.6 Million dollars.

Our projected expenditures for January 2014 is \$12 Million dollars or 35% of our 2014 budget.

SNOW STORAGE SITES



To date, we have stored 2.7 million cubic meters of snow in four snow storage facilities. This is greater than the equivalent volume of stone in the Great Pyramid of Giza in Egypt. These numbers do not include snow that has been piled in residential areas.

NE:	1,000,000 m ³
SE:	1,000,000 m ³
City Centre:	350,000 m ³
SW:	350,000 m ³

approximate equivalent volume as the volume of stone for the Great Pyramid of Giza in Egypt (2.66M)

****This does not include snow removed and piled in residential areas (such as on boulevards or in parks for example)**



Snow Action Plan Equipment

City Truck and Equipment Totals –
Daily Average 80

Hired Truck and Equipment Totals –
Daily Average 195

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A significant numbers of trucks and equipment have been used during this operations. On average there has been 80 pieces of City owned trucks/equipment used per day and 195 pieces of Hired trucks/equipment used per day working to improve the residential roads.

PASSABLE ROAD EXAMPLES

I would now like to show you four roads that Maintenance has defined as a passable residential roads.



An ice covered road with minimal rutting in the northeast.



A snow covered road that was flat bladed down the centre in the southeast.



A packed snow and ice road with minimal ruts in the southwest.



A road with ruts to pavement, with the rutting less than 7 centimetres and ice on both sides.

Until we have to activate the 7 day plan, Roads crews will continue to address residential areas. As we speak, Maintenance has crews in Auburn Bay, Signal Hill, Braeside, Bay View, Willow Park, Mackenzie Town, Mackenzie Lake and Cranston. Work is still required in Oakridge, Palliser, Strathcona Park, Canyon Meadows, Mountain Park and Mahogany.



Go Forward 2013-2014 SNIC

For the remainder of the snow season, Maintenance will use contracted services if:

- a. The 7-day plan is reset due to successive snow events, preventing snow and ice control in residential areas
- b. An exceptional storm requires residential roads to be plowed immediately

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For the remainder of this Snow and Ice Control season, Maintenance will continue to use hired crews in the event that significant amounts of snow again restrict our ability to address residential streets within the 7 day plan, or if we have another exceptional storm that makes roads impassable.



Go Forward

The annual 2014 Snow and Ice Control Policy report will:

- a. Provide benchmarking on SNIC response and budgets compared to other winter cities (Canada and US)
- b. Research mandatory snow tires
- c. Explore having more equipment, operators and contractors on standby
- d. Research an increased SNIC response for mobility challenged, pedestrians and cyclists
- e. Research an increased SNIC response in residential areas (including snow removal)
- f. 4-year Action Plan budget requests for associated recommendations to enhance SNIC response
- g. Review the current Snow and Ice Control Policy TP004 and recommend amendments as required
- h. Non-typical event strategy

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We are requesting that council approve the recommendation to include these items in the 2014 annual Snow and Ice Control Policy Report which will be returned no later than July 2014.

Thank You