

NO: R215

COUNCIL DATE: December 18, 2023

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **December 11, 2023**

FROM: **General Manager, Engineering**

FILE: **5400-45**

SUBJECT: **Snow and Ice Operations - Winter Maintenance Preparedness**

RECOMMENDATIONS

The Engineering Department recommends that Council:

1. Receive this report for information; and
2. Endorse the Engineering Department's Winter Maintenance Procedure, attached to this report as Appendix "I".

INTENT

The intent of this report is to provide information with respect to the City's annual preparedness for winter maintenance operations for the upcoming 2023/2024 winter season and to seek Council endorsement of the Engineering Department's Procedure in regard to winter maintenance.

BACKGROUND

The Engineering Department's Winter Maintenance Procedure, attached as Appendix "I", was developed to reflect the realities of the intermittent icy road conditions and relatively short duration snow events typical for the southwest region of British Columbia during winter months. In the interest of allocating the City's limited resources to areas where they provide the greatest impact, the City prioritizes the effective management of snow and ice accumulations on arterial and major collector roads, as well as on streets with steep hills, schools, and care centres.

DISCUSSION

Winter Season Outlook

The City annually consults with a meteorologist to look at the latest long-range forecast for the upcoming winter season, as illustrated in Appendix "II", and receives daily forecast updates during the winter season. The current forecast is predicting El Nino conditions that have higher average temperatures than previous years during December and could bring below-normal amounts of precipitation throughout the remainder of the winter season coupled with above average temperatures.

Engineering Winter Maintenance Budget

The Engineering Department's 2023 Winter Maintenance Budget is \$4.46 million. Expenditures to date are \$3.79 million since January 1, 2023. If seasonal temperatures remain favourable for the balance of December and Council approves of the level of service outlined in the Winter Maintenance Procedure, the Engineering Department will likely be within the allocated budget for 2023.

Winter Maintenance Equipment

The City operates a total of 75 pieces of snow clearing equipment available to respond to storm events during the 2023/24 winter season. A full list of equipment is attached as Appendix "III".

Levels of Service

In contrast to some municipalities in the region, the City has not experienced a shortage of road salt since increasing its storage capacity to 17,000 tonnes of road salt in 2010. The large storage capacity was specifically designed to safeguard the City against intermittent harsh winters.

The Engineering Department's Winter Maintenance Procedure (Appendix "I") provides services once snow and ice conditions exist, and results in a relatively high level of municipal snow and ice removal service in comparison to other Lower Mainland municipalities with respect to the types of roads that are included as priority roads (approximately 4,000 lane kilometres) during winter maintenance operations. As noted above, the Winter Maintenance Procedure is intended to allocate the City's limited resources to areas where they provide the greatest impact, prioritizing the effective management of snow and ice accumulations on arterial and major collector roads, as well as on streets with steep hills, schools, and care centres.

The City's snow and ice maintenance initiatives have proven beneficial in terms of the City providing timely clearing of Priority 1 and 2 routes, ensuring the safe movement of traffic throughout Surrey. In this regard, City crews consistently provide thorough coverage of these routes during snow events and have received well-deserved praise from the public in addition to favourable news coverage. Attached as Appendix "IV" is a map identifying Priority 1 and 2 routes.

Sidewalks, Multi Use Pathways and Parking Lots

As per Section 80 of the *Highway and Traffic By-law, 1997, No. 13007* (the "Bylaw"), snow and ice clearing of walkways, which includes off-street cycling facilities and multi-use paths, is the responsibility of the adjacent property owner. This is a long-standing Bylaw requirement in Surrey which mirrors similar requirements in municipalities within the region and many cities across Canada. This Bylaw is necessary as it would not be possible for the City to clear all such assets in a timely manner in view of its limited resources.

Ministry of Transportation and Infrastructure and TransLink Coordination

The Ministry of Transportation and Infrastructure ("MoTI") is responsible for winter maintenance of Provincial Highways throughout the City of Surrey, including: Highway 1, Highway 10, Highway 15 (176 Street), Highway 17 (South Fraser Perimeter Road), and the most recently resumed/acquired Bridgeview Drive and a segment of King George Boulevard between Bridgeview Drive and the Patullo Bridge. MoTI's jurisdiction extends to the interchange, bridge on-ramps, and road segments immediately connecting to municipal roads.

TransLink is responsible for winter maintenance along Golden Ears Way between 176 Street and the Surrey-Langley border.

City staff have met with TransLink and MoTI's winter maintenance contractor to emphasize the requirement to have their roads salted more regularly and cleared of snow on a timely fashion, particularly the interchange on-ramps and the steep portion of Highway 15 between 88 Avenue and 96 Avenue.

Communication and Community Engagement

The Engineering Department's communication and community engagement utilizes the Surrey website, social media, and handouts to provide important and helpful winter information to residents and businesses including topics such as:

- Real time messaging of snow/ice conditions;
- "Track My Plow" App – residents can access which roads in their area have been serviced;
- City's policies with respect to snow and ice control;
- Businesses' and residents' responsibilities for snow and ice control;
- A list of resources that residents should keep on-hand to deal with winter conditions; and
- Encouraging public reporting of trouble spots through "Report a Problem App".

CONCLUSION

The City is well-equipped with the necessary resources, including manpower, materials, and funding to effectively manage snow and ice events on Priority 1 and 2 routes in accordance with the Winter Maintenance Procedure.

Scott Neuman, P.Eng.
General Manager, Engineering

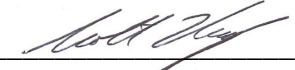
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Appendix "I" – Winter Maintenance Procedure
Appendix "II" – British Columbia Winter Outlook 2023/2024
Appendix "III" – List of Winter Maintenance Equipment
Appendix "IV" – Map of Priority 1 and 2 Routes

**Engineering Department
PROCEDURE**

No. O14-P

AUTHORITY:

APPROVED BY: 
General Manager, Engineering

REFERENCE:

SUPERSEDES:

DATE: December 11, 2023

TITLE: PRIORITIES FOR WINTER MAINTENANCE

1. Due to limited resources, winter maintenance operations will be limited to keeping the portions of roads intended for the movement of motor vehicles (i.e., cars, trucks, buses, emergency service vehicles) reasonably clear of ice and snow.
2. During regular business hours, winter maintenance operations may be initiated by the General Manager, Engineering or delegated manager.
3. Upon receiving a request for service outside of regular business hours the General Manager, Engineering or delegated manager will determine whether winter maintenance operations may or may not be initiated.
4. Due to limited resources, winter maintenance operations will be conducted as per the following priorities once initiated:

First Priority:	As identified in the Snow and Ice Route Map, as updated from time to time, consisting generally of arterial and collector roads.
Second Priority:	As identified in the Snow and Ice Route Map, as updated from time to time, consisting generally of connector roads.
Third Priority:	As identified in the Snow and Ice Route Map, as updated from time to time, consisting generally of residential roads.
5. Resources will not be redirected onto lower priority routes until it is determined by the General Manager, Engineering or delegated manager that those resources are no longer required to service higher priority routes.

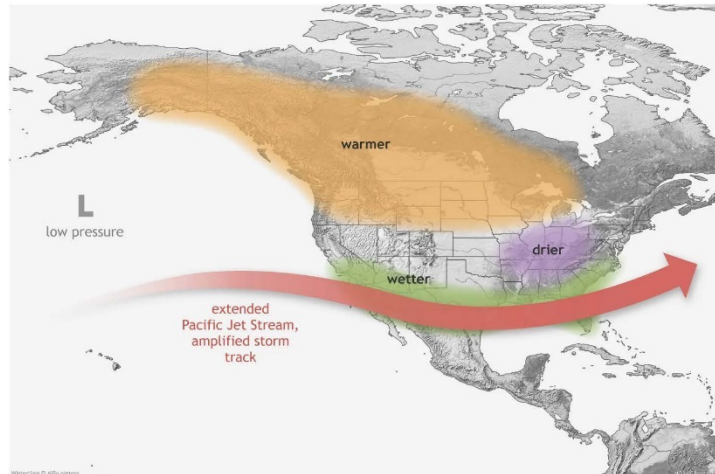
British Columbia Winter Outlook 2023-2024: A Winter with El Niño

Winter is quickly approaching so let's take a look at the latest long range outlook for the winter season ahead. Keep in mind this is an **extremely general** outlook regarding the overall trends in the weather patterns through the winter and doesn't reflect the sometimes drastic short term, isolated variations due to individual weather systems that we'll experience. It should be treated as an average through the winter season.

The ENSO cycle and El Niño:

The El Niño-Southern Oscillation (ENSO) is a pattern based on sea surface temperatures in the tropical Pacific Ocean that changes between warmer (El Niño) and colder (La Niña) temperatures every two to seven years. These changes disrupt the large-scale air movements in the tropics, triggering seasonal changes to weather patterns world wide.

For the 2023 to 2024 winter season we're expecting to see an El Niño oscillation. El Niño conditions are already observed and are anticipated to continue with an estimated greater than 95% chance December-February. There is slightly more confidence in seeing a “strong” El Niño event as well from November-January. This will be the first El Niño event since the 2018-2019 season.



El Niño impacts and expectations:

During El Niño conditions the storm track generally shifts southwards into Central and Southern California along with the Southwestern United States. As a result, the Pacific Northwest and British Columbia as a whole typically sees drier than average conditions throughout the winter season overall. Bear in mind this does not mean that the season is expected to be completely dry as we will still have individual storms and weather patterns that impact the region, but those events are expected to be less frequent with larger dry periods in between compared to La Niña conditions, which is what we have experienced over the past 3 years.

Additionally, temperatures with El Niño conditions tend to be a bit milder compared to average. During this scenario, southerly flow tends to dominate which results in milder temperatures as warmer air is forced into the region. In turn, when precipitation does arrive the snow levels tend to be higher on average so Lower Mainland and Southwest BC as a whole should see fewer snow events compared to La Niña seasons but to reiterate, this does not preclude snow and ice events from occurring at points through the season as individual weather patterns can still be cold enough to sustain this, but they should be relatively isolated events.

For the interior, although temperatures will likely be warmer than average we will still be cold enough through much of the season to sustain snowfall when precip does arrive, it is still winter after all. However, this may result in a higher frequency of storms transitioning between snow and rain, especially across the Cariboo and southern interior province, but overall we should plan on seasonal snowfall totals being lower than what we've seen over the past few years.

Even with El Niño generally meaning drier and milder conditions, warm atmospheric rivers are still possible which could then bring in higher rainfall totals for a wetter season overall. The 2015-2016 winter season was an El Niño, but we saw above average rainfall throughout the season. These wetter weather systems have a tendency to be focused in the Fall and early Winter (October-December), especially for Southwest BC and the Coast Range, before conditions trend drier in the latter half of the season.

**2023/2024 LIST OF WINTER
MAINTENANCE EQUIPMENT**

<u>FLEET</u>	<u>NO.</u>	<u>PLOW</u>	<u>SANDER</u>	<u>BRINE</u>
Tandem Dump Trucks	24	Yes	Yes	10*
Grader – City	2	Yes	No	
Backhoe	12	No	No	
 <u>AREA CREWS</u>				
One Ton Trucks (small)	35	Yes	Yes	6
Multi-Purpose Tractor	2	Yes	Yes	
TOTAL	75	63	61	16

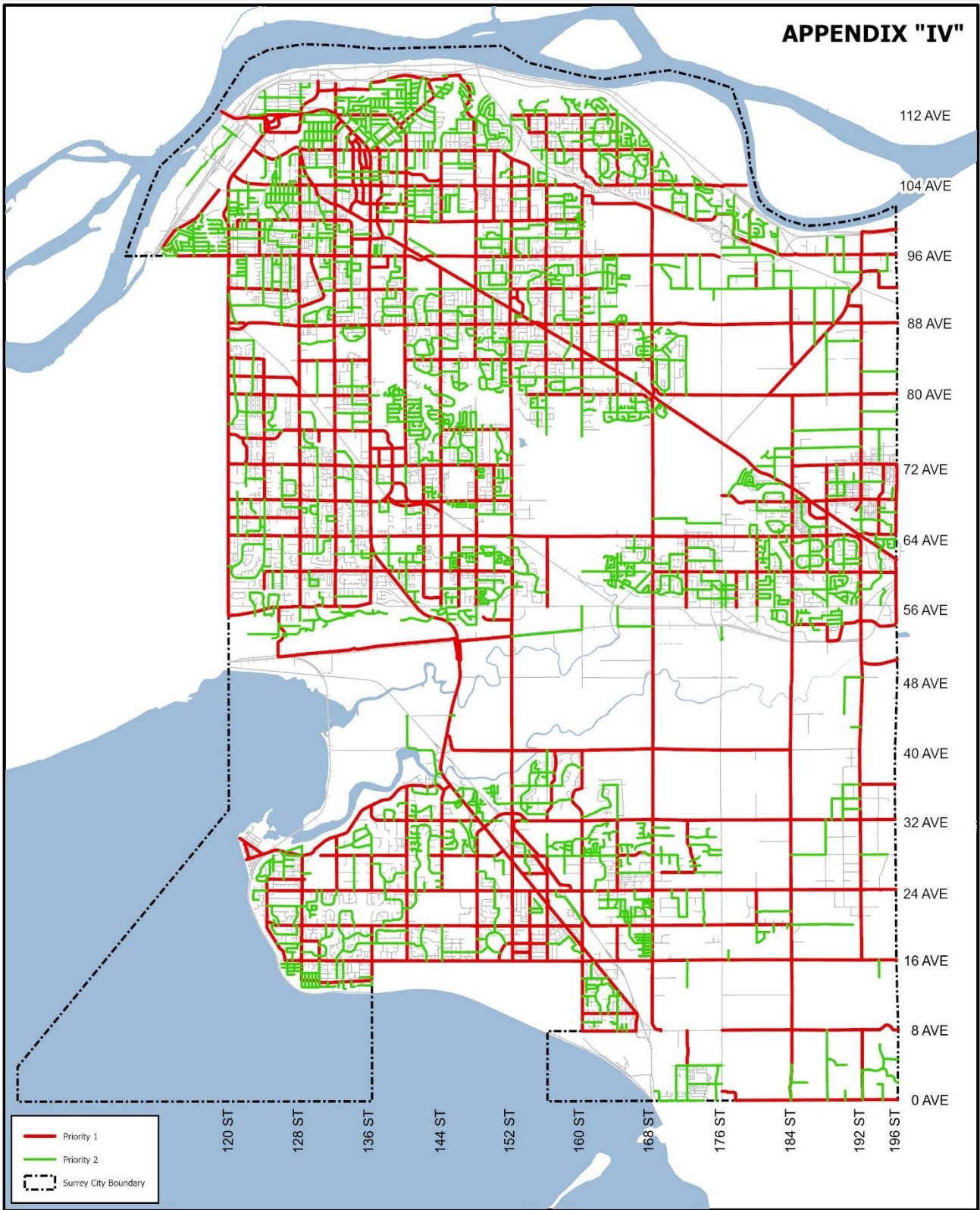
* The brine system is mounted on existing trucks which reduces the number of sanders available at the beginning of a snowstorm.

The City operates a total of 16 brine units, which allows the application of brine solution to the surfaces of all of the major arterial roads in advance of forecasted snow/ice conditions subject to dry pavement conditions in advance of storm events.

Brine applied to the road surface dries on the road with the residual salt taking effect immediately when snow begins to fall or when frost begins to form (i.e., the salt on the road is activated by the moisture). This approach effectively reduces the accumulation of snow and ice on treated pavement surfaces. By using brine, crews have an increased window of time to effectively mobilize regular snow and ice services and provide enhanced coverage when heavier snow events occur. This process has proven to be very effective; however, brine application is dependent on dry weather conditions preceding a snow/cold weather event. Brine is also a more efficient way to apply salt, requiring only about 25% of the volume that would need to be applied if it was being applied by traditional salt spreaders.

** The number of hired graders depends on the availability of hired equipment at the time of the snow event. Each year we request commitments from owner/operators and contractors to commit to callout and compensate them with a retainer fee.

APPENDIX "IV"



Priority 1 and Priority 2 Snow Removal Routes

0 0.5 1 2 km
Scale: 1:110,000
Engineering Operations
CITY OF SURREY
Last Saved Date: 2023-10-04 9:58 AM

The data provided is compiled from various sources and IS NOT warranted as to its accuracy or sufficiency by the City of Surrey.
This information is provided for information and convenience purpose only. Lot sizes, legal descriptions and encumbrances must be confirmed at the Land Title Office.

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