

NO: R231

COUNCIL DATE: November 18, 2024

REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **November 13, 2024**

FROM: **General Manager, Engineering**

FILE: **5400-45**

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

RECOMMENDATIONS

The Engineering Department recommends that Council receive this report for information.

INTENT

The intent of this report is to provide information regarding the City's annual preparedness for winter maintenance operations for the upcoming 2024/2025 winter season.

BACKGROUND

The City's current Snow and Ice Control Policy, attached as Appendix "I", was approved by Council on December 18, 2023, and was established to reflect the intermittent icy road conditions and relatively short-duration snow events typical in the southwest region of British Columbia during winter months. In the interest of public safety as a priority, the City's resources are primarily equipped to manage 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 review the latest long-range forecast for the upcoming winter season, as illustrated in the attached Appendix "II". The current forecast predicts La Nina conditions that could bring more precipitation with cooler temperatures throughout the winter season.

Engineering Winter Maintenance Budget

The Engineering Department's 2024 Winter Maintenance Budget is \$4.61 million. Expenditures to date are \$2.74 million since January 1, 2024. If seasonal temperatures remain favourable for the balance of the winter season, the Engineering Department will likely be within the allocated budget for 2024.

Winter Maintenance Equipment

The City operates a total of 77 pieces of snow-clearing equipment to respond to storm events during the 2024/25 winter season. A full list of equipment is detailed in the attached 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 in 2010. This large storage capacity safeguards the City against intermittent harsh winters.

The City’s Snow and Ice Control Policy ensures services are provided once snow and ice conditions exist. This results in a relatively high level of municipal snow and ice removal service in comparison to other Lower Mainland municipalities, covering approximately 4,000 lane kilometres of priority roads during winter maintenance operations.

The City’s snow and ice maintenance initiatives have proven beneficial, ensuring the timely clearing of Priority 1 and 2 routes and safe movement of traffic throughout Surrey. City crews consistently provide thorough coverage of these priority routes during snow events and have received praise from the public and favorable news coverage. A map identifying Priority 1 and 2 routes is attached as Appendix “IV”.

Sidewalks, Off-Street Cycling, 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 sidewalks (including off-street cycling and multi-use pathways) is the responsibility of the adjacent property owner. This long-standing requirement mirrors similar ones in other municipalities in the region and across Canada. The Bylaw is necessary as it would not be feasible for the City to clear all sidewalks in a timely manner.

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), the 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.

Miller Capilano, on behalf of TransLink, is responsible for winter maintenance along Golden Ears Way between 176 Street and the Surrey-Langley border.

City staff have met with MoTI’s winter maintenance and their contractor to emphasize the need for regular salting and timely snow clearance on their roads.

Communication and Community Engagement

The Engineering Department 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-positioned to respond to snow and ice events this coming winter, with the appropriate level of equipment, manpower, material, and funding to effectively manage snow and ice events on Priority 1 and 2 routes.

Scott Neuman, P.Eng.
General Manager, Engineering

YY/bn

Appendix “I” – Snow and Ice Control Policy

Appendix “II” – British Columbia Winter Outlook 2024/20245

Appendix “III” – List of Winter Maintenance Equipment

Appendix “IV” – Map of Priority 1 and 2 Routes

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 2024-2025: La Niña Returns

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 La Niña:

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 worldwide.

We are very likely in the process of transitioning back to a La Niña phase with ENSO neutral conditions currently. The Climate Prediction Center (CPC) based in the United States estimates a 71% chance of La Niña developing between September-November and probabilities rise into the 80-85% range as we move into the late autumn-early winter timeframe.

La Niña impacts and expectations:

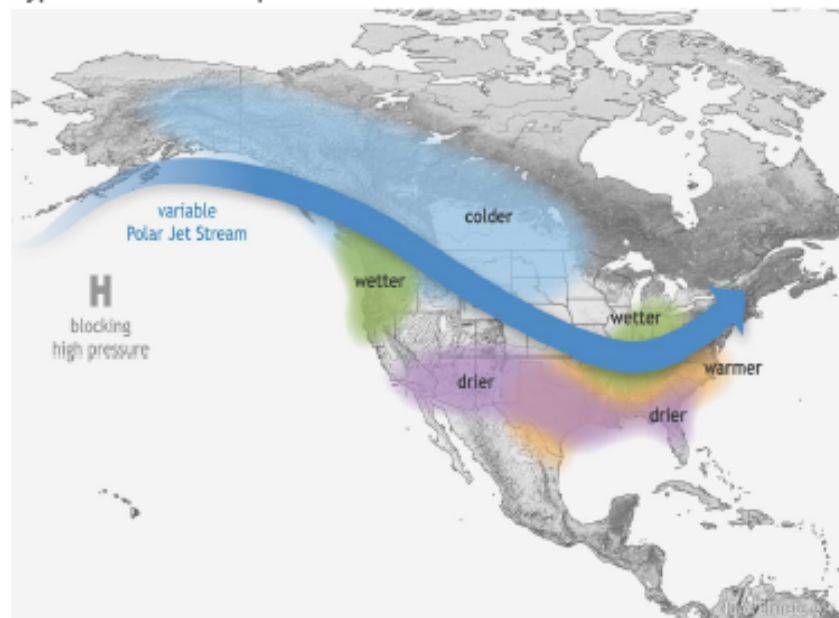
During La Niña conditions, the polar jet stream tends to shift south and as a result, the storm track will often direct disturbances from the Gulf of Alaska into the Pacific Northwest. The jet stream also tends to have more variability in its orientation compared to El Niño winters but will often have a northerly component. On average, this configuration leads to cooler temperatures (especially in interior and northern BC) across British Columbia and more precipitation, especially along the Coast Range. La Niña winter patterns increase the frequency of Pacific storms moving into the region which, in addition to more precipitation and cooler temperatures, increase the chances of wind storms and tidal flooding events.

With cooler average temperatures and higher average precipitation, chances for lowland snow in the Lower Mainland are higher, though still heavily dependent on how individual events evolve. We can have more confidence in the increased probability of more mountain snow compared to last winter and, in particular for the Lower Mainland, more frequent precipitation with snow levels under 500-700 meters.

Like the rest of the province, the Central and Southern Interior has an increased chance of higher average precipitation during La Niña winters along with cooler than average temperatures. During previous La Niña winters, there is a general trend of above average snowfall during the early winter in the Interior, followed by drier conditions in the mid-to-late winter.

As mentioned above, this is a very general outlook and there will always be exceptions related to microclimate variations, significant individual events, and the strength of the La Niña phase.

Typical winter La Niña pattern



**2024/2025 LIST OF WINTER
MAINTENANCE EQUIPMENT**

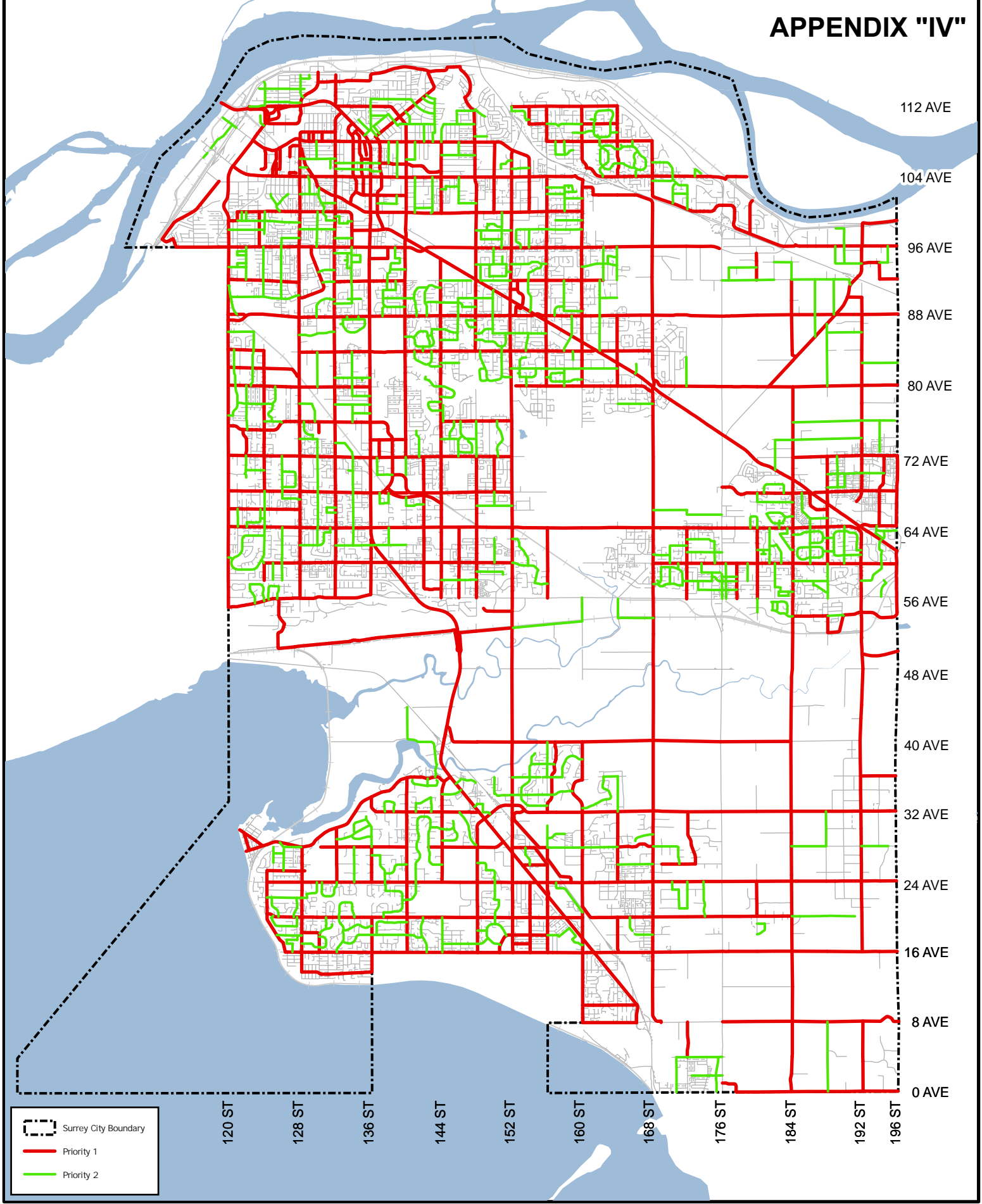
<u>FLEET</u>	<u>NO.</u>	<u>PLOW</u>	<u>SANDER</u>	<u>BRINE</u>
Tandem Dump Trucks	23	Yes	Yes	10*
Grader – City	2	Yes	No	
Backhoe	12	No	No	
 <u>AREA CREWS</u>				
One Ton Trucks (small)	38	Yes	Yes	6
Multi-Purpose Tractor	2	Yes	Yes	
TOTAL	77	65	63	16




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

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.

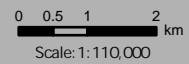
Brine applied to the road surface dries on the road with the residual salt taking effect immediately when snow begins to fall or when frost begins to form (i.e., the salt on the road is activated by the moisture). This approach effectively reduces the accumulation of snow and ice on treated pavement 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.



 Surrey City Boundary
 Priority 1
 Priority 2

Priority 1 and Priority 2 Snow Removal Routes



1 Engineering Operations 
 Last Saved Date: 2024-11-08 10:46 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. Path: C:\Users\P210031\City of Surrey\Eng Ops Business Enhancement - Business Operations\OpsGIS\ArcGIS Pro Projects\Snow and Ice\SnowOverview.aprx