

NO: R166

COUNCIL DATE: November 9, 2020

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## REGULAR COUNCIL

TO: **Mayor & Council**

DATE: **November 5, 2020**

FROM: **General Manager, Engineering**

FILE: **5400-45**

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

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## RECOMMENDATION

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

## 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 2020/2021 winter season.

## BACKGROUND

The City's current Snow and Ice Control Policy, attached as Appendix "I", was established 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 public safety as a priority, the City's resources are mainly equipped to levels required to ensure the effective management of snow and ice accumulations on arterial and major collector roads (Priority 1 and 2 routes).

The City's snow and ice control service continues to evolve towards improving effectiveness through the experience obtained from previous winter seasons, new technology and continuous improvement to ensure the City is providing a high level of service to its residents.

The City takes all the necessary precautions with preparation of all its fleet and resources, along with ongoing monitoring and immediate deployment of snow and ice control during snow and ice events.

## 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". In summary, the current forecast is predicting La Nina conditions that could bring above-normal amounts of precipitation throughout the winter season coupled with above average temperatures in November and December followed by below average temperatures January through March.

## **Engineering Winter Maintenance Budget**

The Engineering Department's 2020 Winter Maintenance Budget is \$3.7 million. Expenditures to date are \$2.9 million since January 1, 2020. If seasonal temperatures remain favourable for the balance of this winter season, in late 2020, the Engineering Department will likely fall within the allocated budget for 2020.

It should be noted that the City's budget includes Operations & Maintenance ("O&M") funding of \$1.9 million from TransLink, which is to be used for winter maintenance on MRN arterial roads throughout the City, which are considered Priority 1 routes. Earlier this year, TransLink withheld O&M funding to municipalities due to the financial impact they are experiencing as a result of the COVID-19 pandemic. The Engineering Department has adjusted operational budgets accordingly in an attempt to absorb this shortfall, which includes reallocating all winter maintenance budget for Priority 3 routes (i.e., local roads). Should the City experience extended periods of winter conditions in the 2020 calendar year, the City's winter maintenance levels of service on Priority 2 routes may need to be further re-evaluated.

TransLink has indicated funding to municipalities for O&M of MRN arterial roads will be re-established in 2021.

## **Winter Maintenance Equipment**

The City operates a total of 56 pieces of snow clearing equipment available to respond to storm events during the 2020/21 winter season. A full list of equipment is attached as Appendix "III".

## **Level 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.

In advance of a forecasted snow and ice event, City crews will apply a brine solution to the road. The brine applied to the road surface dries, with the residual salt taking effect immediately when snow begins to fall or when frost begins to form. 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. Brine is 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. This process has proven to be very effective; however, brine application is dependent on dry weather conditions preceding a snow/cold weather event.

The City's Snow and Ice Control Policy (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.

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.

As per Section 80 of the *Highway and Traffic By-law, 1997, No. 13007* (the "Bylaw"), snow and ice clearing of sidewalks 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 sidewalks in a timely manner

### **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 the "My Surrey App".

### **SUSTAINABILITY CONSIDERATIONS**

The City's winter snow and ice clearing services support the objectives of the City's Sustainability Charter 2.0. In particular, these services support the Sustainability Charter 2.0 theme of Public Safety. Specifically, these services support the following Desired Outcomes ("DO") and Strategic Direction ("SD"):

- Transportation Safety DO9: Transportation network supports and provides safe mobility for all ages and abilities;
- Transportation Safety DO10: Surrey is part of a coordinated effort to reduce the risk of harm for all road users, with attention to those who are most vulnerable, including pedestrians and cyclists; and
- Transportation Safety SD8: Ensure all public infrastructure is built and maintained to ensure community safety and well-being for all ages and abilities.

### **CONCLUSION**

The City is reasonably positioned to respond to snow and ice events this coming winter. The City has the appropriate level of equipment, manpower, material, and funding to effectively manage snow and ice events on Priority 1 and 2 routes. Levels of service on Priority 2 routes may need to be adjusted for the remainder of the 2020 calendar year, if multiple winter events occur, due to O&M funding being withheld by TransLink.

As in previous years, staff are ensuring that the public is notified through regular media releases and website information about the City's policies and procedures related to snow and ice control, resident responsibilities related to snow removal and ice control, and how residents can prepare for winter to minimize its impacts on their lives.

Scott Neuman, P.Eng.  
General Manager, Engineering

RK/cc

Appendix "I" - City of Surrey Snow and Ice Control Policy

Appendix "II" - British Columbia Winter Outlook 2020-2021: La Nina Returns

Appendix "III" - 2020/21 Winter Maintenance Equipment

Appendix "IV" - Priority 1 and 2 Snow Removal Routes Map

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# 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.

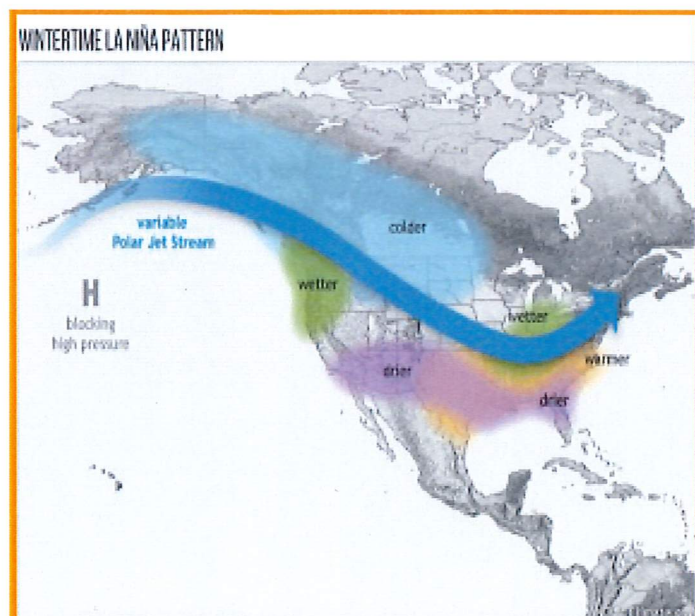
## British Columbia Winter Outlook 2020-2021: La Nina Returns

As winter approaches let's take a look at the latest long range outlook for the season ahead. Keep in mind this is a **very general** outlook regarding the overall trends in the weather patterns through the winter and doesn't reflect the short term variations due to individual weather systems that we'll see. It should be treated as an average through the winter season.

### The ENSO cycle and La Nina, what does it mean?

The El Niño-Southern Oscillation(ENSO) is a climatological pattern in the tropical Pacific that shifts irregularly 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, including British Columbia.

For the 2020 to 2021 winter season we're expecting to see a La Niña temperature cycle this year, an estimated 75% chance according to the Climate Prediction Center. With a La Niña expected, the Pacific Jet Stream and storm track will be biased farther north than usual, placing itself around southern BC near the US border. This doesn't necessarily mean the storm track won't still fluctuate north and south at times through the season but on average that's where it will be focused. The Polar Jet Stream will be focused farther north over the Rockies over Yukon and BC.



### La Niña's impacts:

For British Columbia a La Niña cycle typically correlates to above average amounts of precipitation in the winter, especially for the SW portion of the Province, and slightly below average to near average temperatures. With that said we'll likely end up with above average temperatures in the early winter months (Oct-Dec) followed by slightly below average temperatures through the rest of the winter (Jan-Mar).

As a result expect an active season for the southern portion of the Province with respect to winter precipitation (e.g. mountain snow) but Lower Mainland and the SE parts of Vancouver Island will still primarily see rain despite the cooler temperatures. However it is likely we'll still see at least 1 or 2 snow events for Lower Mainland with the cooler weather but that will be most likely to occur in the second half of the winter (Jan-Mar). It's still possible that a cold weather system could cause snow earlier than that though.

The southern interior sections of the Province and the Rockies are likely to see more frequent large snow events through the season due to the above average precipitation and below average temperatures and it's very possible we'll see some late season snow events there (Apr-May) so this has the potential to be a long season ahead for those sections. Meanwhile due to the Polar Jet Stream we're expecting the Cariboo and Peace Country to see prolonged periods of cold, dry Arctic air through the season and at times that may stretch into parts of the southern interior during the late winter months, particularly around Jan-Feb.

**2020/2021 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            |              |
| Grader – Hired         | 2**        | Yes         | No            |              |
| <u>AREA CREWS</u>      |            |             |               |              |
| One Ton Trucks (small) | 29         | Yes         | Yes           | 6            |
| <b>TOTAL</b>           | <b>56</b>  | <b>56</b>   | <b>52</b>     | <b>16</b>    |

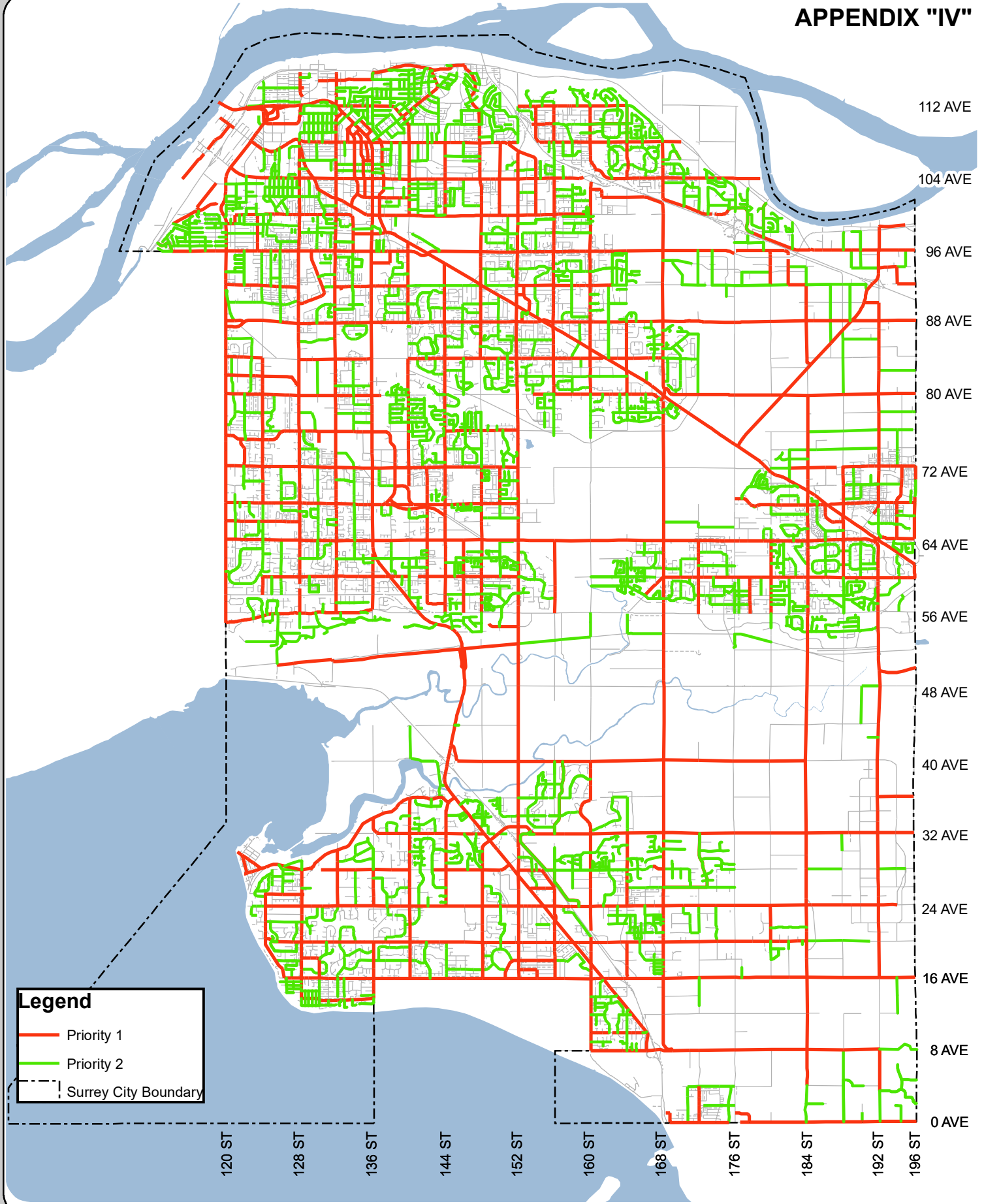
\* The brine system is mounted on existing trucks which reduces the number of sanders available at the beginning of a snow storm.

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.





**Legend**

- Priority 1
- Priority 2
- Surrey City Boundary

**Priority 1 and Priority 2 Snow Removal Routes**

0 0.5 1 2 Kilometers  
SCALE: 1:110,000



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 purposes only. Lot sizes, legal descriptions and encumbrances must be confirmed at the Land Title Office.