City of Richmond

Report to Committee

To:	Public Works and Transportation Committee	**Date:**	October 20, 2022
From:	Suzanne Bycraft Director, Public Works Operations	**File:**	10-6000-00/Vol 01
Re:	**Update on 2022/2023 Snow and Ice Response Preparations**		

Staff Recommendation

That the staff report titled "Update on 2022/2023 Snow and Ice Response Preparations", dated October 20, 2022, from the Director, Public Works Operations, be received for information.

Suzanne Bycraft
Director, Public Works Operations
(604-233-3338)

Att. 2

REPORT CONCURRENCE		
ROUTED TO:	**CONCURRENCE**	**CONCURRENCE OF GENERAL MANAGER**
Communications	☑	
Parks Services	☑	
SENIOR STAFF REPORT REVIEW	**INITIALS:** CJ	**APPROVED BY CAO**

Origin

The coastal environment of Richmond makes the City's roads more susceptible to frost conditions and weather can vary greatly and change quickly from Steveston to Hamilton. During the winter season, staff continually monitor conditions of the entire area to ensure a speedy and appropriate response to snow and ice events and provide safe roadways to the travelling public.

This report presents the City's standard approach to operational readiness in accordance with the service level requirements outlined in Council Policy 7013 "Roadways – Ice and Snow Removal". A report in response to a specific referral for snow removal from priority pedestrian corridors arising from the November 16, 2021 Public Works and Transportation Committee meeting is presented separately entitled, "Options for Snow Removal from Priority Pedestrian Corridors – Referral Response".

This report supports Council's Strategic Plan 2018-2022 Strategy #1 A Safe and Resilient City:

Enhance and protect the safety and well-being of Richmond.

1.2 Future-proof and maintain city infrastructure to keep the community safe.

Analysis

Operational Preparations

Operational preparations for the upcoming winter began in mid-September including equipment overhauls, equipment training for staff and meetings to coordinate response efforts amongst departments during an event.

The City of Richmond's salt supplies have been secured for the upcoming winter season. There are currently 1,050 metric tonnes available under contract and an additional 2,200 metric tonnes on reserve.

The City has 39 pieces of equipment available for snow response (Attachment 1). Four tandem axle vehicles outfitted with brine tanks perform the majority of road pre-treatment which, when done prior to an event, prevents snow or ice bonding to the pavement surface requiring four to five times the brine or salt to break that bond. The use of brine for pre-treatment effectively stretches the same amount of salt used on one lane kilometre with traditional salters to 4.3 lane kilometres of roadway coverage with brine. Brine making and storage capacity increased in 2021 from 69,000 litres to 115,000 litres which aids in our efforts to reduce overall salt usage on the roadways. Six one-tonne dump trucks, which are outfitted with brine and insert salters, focus on the City Centre and entrances to subdivision collector roads, allowing the tandem salters and plows to remain focussed on first and second priority routes.

Road temperature sensors at ten specific locations are monitored 24-hours a day by the City's Public Works Dispatcher and provide early indications of potential road frost or freezing conditions. Each sensor is strategically located throughout the City to provide real time information concerning road conditions across the City. Sensor locations are illustrated in Attachment 2 and public viewing of these road temperature sensors is available through the

City's website at www.richmond.ca/services/rdws/weather/roadtemps.htm. More detailed weather and road information from each sensor location is available to responding staff via the SCADA system to assist in appropriate and timely event response.

During a snow event, staff in a centralized control centre closely monitor the information coming from the weather sensors, monitor and record equipment locations, salt and brine distribution and route start and completion times. GPS monitoring of vehicles allows staff to ensure adequate treatment is placed on the roadway, to respond accurately to enquiries and to better track expenditures that can be used to forecast costs for future events.

Public Outreach

Public involvement within the community is vital during the winter season. The City works jointly with the public on the following two programs:

- *Snow Angels Program*: This program was introduced in 2010 and connects volunteers with elderly citizens and residents with mobility/health challenges during a snowfall event. Assistance involves shovelling snow from sidewalks and/or walkways. Information on enrolling in the Snow Angel Program is available on the City's website and can also be obtained by calling Parks, Public Works Dispatch or City Hall. The program is activated in the event of a significant snowfall (defined as an accumulation of 3+ centimetres of snow) and is dependent on the severity of the storm and volunteer resources. The City Parks Department manages volunteer recruitment, promotion, activation and participation in the program. In the 2021/2022 winter, the Snow Angels program was activated four times and provided snow removal services to 52 homes across Richmond.

- *Good Neighbour Program*: This program encourages everyone to clear the walkways around their property and help others who may face challenges. This neighbour-helping-neighbour campaign simply encourages residents to watch for people in their neighbourhood that could use help removing snow from their sidewalks and driveways and offer them a helping hand.

Communications Strategy

A comprehensive communication strategy has proven to be valuable in delivering accurate, timely and relevant information to the public. The City's various departments, with the guidance of Corporate Communications and Marketing, have established communications protocols and key messaging which reinforce the snow response communications program. Participating departments include Public Works, Parks, Corporate Communications and Marketing, Customer Service, Community Bylaws, Emergency Programs and Richmond Fire-Rescue.

This cross-functional approach ensures each division's important messages are delivered in a coordinated fashion over a variety of the City's communication channels. Pre-determined and circumstantial messaging is delivered before, during and after events, particularly when extreme weather occurs. The communications strategy includes, but is not limited to, using the following channels:

- Social media (the City's Twitter, Facebook and Instagram accounts: posting the City's own messaging as well as sharing information from credible sources, i.e., weather warnings and safety tips)
- Media relations (news releases, media interviews)
- City's website (dedicated web pages, news pages)
- City's intranet for employees

2022/2023 Weather Forecast

Long ranges forecasts grow more uncertain the farther into the future you look. Staff continuously monitor weather forecasts to ensure operational readiness. Meteorologists can predict the weather three and five days out with an accuracy, however forecasting any further increases the chances of the weather being affected by unpredictable variables. The speed, power, and placement of fronts, low-pressure centres, and even smaller features like individual thunderstorms can have a huge ripple effect that significantly changes the weather downstream in the days to come. With those variable factors in mind, one of the primary climate factors of winter patterns will be repeated for the third year in a row. The International Research Institute for Climate and Society forecasts the climatological phenomenon known as La Niña will be present. Three consecutive La Nina winters have occurred only twice since 1950. It will play a vital role in the overall weather pattern this coming winter. For British Columbia, a La Niña cycle typically correlates to above average amounts of precipitation in the winter, slightly below average to near average temperatures and an amplified polar jet stream. While La Nina is the primary driver of the winter pattern, a shift in the jet stream influenced by the polar vortex could enhance or counter its impacts.

2021/2022 Winter Season Summary

During the 2021/2022 winter season, Richmond experienced 37 frost/ice events and three snow events with a total accumulation of 54.1 centimetres of snow at YVR. This was one of the worst winters since 1999 with 49.6 of the 54.1 centimetres of snow falling between December 24, 2021 and January 6, 2022. Total accumulations exceeded every winter since 2000 other than 2016-2017 and 2008-2009. We also experienced an overnight temperature of -15.3 C which was the coldest recorded temperature in 54 years. The City pre-treated and/or de-iced 48,961 lane kilometres and salted/plowed 6,420 lane kilometres of first, second and third priority roads.

Financial Impact

None. Should there be a severe winter and additional funds required beyond established budgeted amounts, staff will report back to Council accordingly.

Conclusion

Preparations for the 2022/2023 snow and ice season by all required departments are well underway and will be completed in time for the upcoming winter.

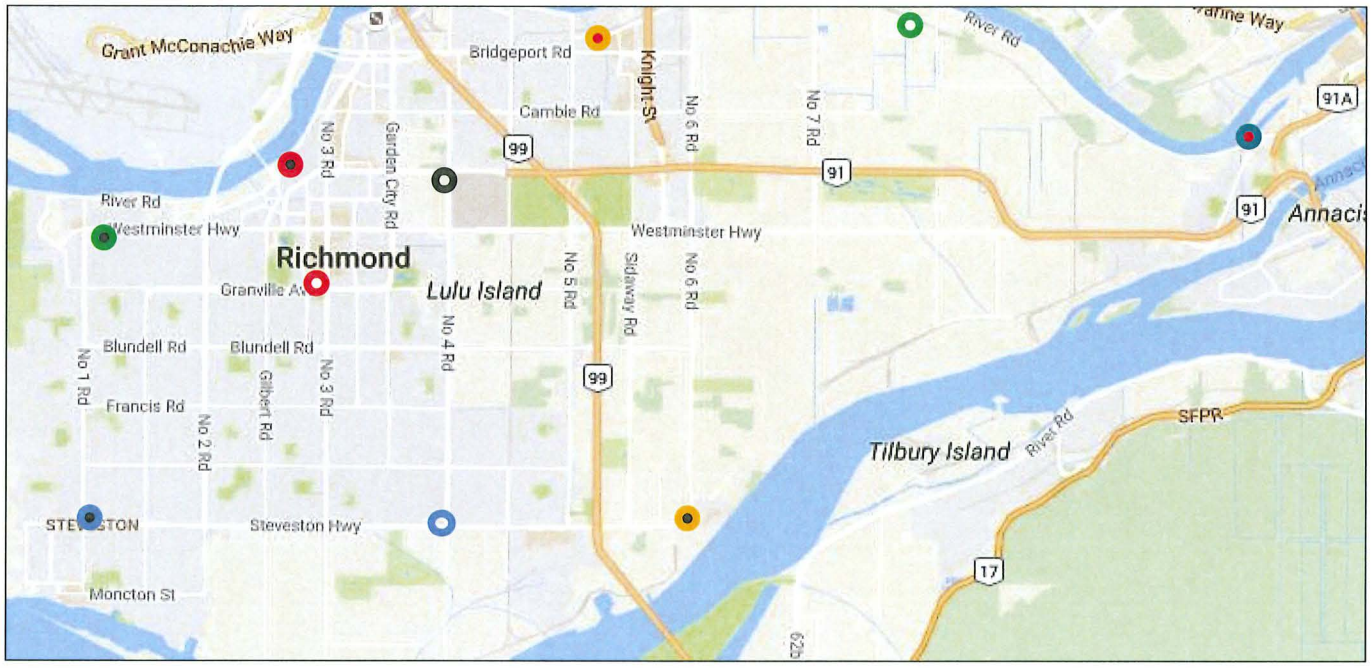
Larry Ford
Manager, Roads and Construction Services

Att. 1: City of Richmond – Snow Response Equipment
Att. 2: City of Richmond – Road Temperature Sensor Locations

City of Richmond – Snow Response Equipment

Number of Units	Description
5	Tandem axle dump trucks with front plow attachments and salt spreader inserts
2	Tandem axle dump trucks with front plow attachments and 12,000 L brine tank inserts
1	Tandem axle dump truck with front and belly plows and option of 12,000 L brine tank or salt insert
1	Flusher truck (14,000 L brine capacity) with belly plow
3	Single-axle dump trucks with salt flinks and belly plows
4	One-tonne dump truck with plow and 1,875 L brine tank insert
1	One-tonne dump truck with plow and salt insert
1	One-tonne flat deck truck with 1,875 L brine tank insert
2	One-tonne dump truck with plow and 1,875 L brine tank insert (designated for city facility parking lots)
4	Backhoes
1	Road Grader with belly plow and front bucket
2	Front-end wheel loader
2	Bobcat skid steers with plow
4	John Deere Ride-on mowers with plows
2	Kabota ATVs with plow
4	Mobile snow blowers
1,050 tonnes	Salt

City of Richmond – Road Temperature Sensor Locations



Road Temperature Sensors:

- No. 4 Rd Armoury (Road temperature, rain gauge and road friction)
- Queens North (Road temperature, ambient air temperature, humidity, wind speed/direction and rain gauge)
- No.1 Rd & Steveston (Road temperature, ambient air temperature, humidity, wind speed/direction and rain gauge)
- No.1 Rd & Westminster (Road temperature, ambient air temperature, humidity, wind speed/direction, rain gauge and road friction)
- No. 8 Rd & River Rd ((Road temperature, road friction)
- No. 6 Road & Steveston (Road temperature, ambient air temperature, humidity, rain gauge)
- Oval (Road temperature)
- No. 3 Rd and Granville (Road temperature, road friction)
- Bridgeport and Olafson (Road temperature)
- Steveston Hwy and No 4 Rd (Road temperature)