



City of Richmond

Report to Committee

To: Public Works and Transportation Committee **Date:** November 6, 2023
From: Suzanne Bycraft **File:** 10-6000-01/2023-Vol
 Director, Public Works Operations 01
Re: **Update on 2023/2024 Snow and Ice Response Preparations**

Staff Recommendation

1. That the staff report titled “Update on 2023/2024 Snow and Ice Response Preparations”, dated November 6, 2023, from the Director, Public Works Operations, be received for information; and
2. That Policy 7013, updated to reflect servicing of bus stops, wheelchair letdowns and services at civic facilities, be adopted.

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

Att. 4

| REPORT CONCURRENCE | | |
|-----------------------------------|-------------------------------------|--------------------------------|
| ROUTED TO: | CONCURRENCE | CONCURRENCE OF GENERAL MANAGER |
| Communications | <input checked="" type="checkbox"/> | |
| Parks Services | <input checked="" type="checkbox"/> | |
| Law | <input checked="" type="checkbox"/> | |
| SENIOR STAFF REPORT REVIEW | INITIALS: | APPROVED BY CAO |

Staff Report

Origin

The City of Richmond's coastal environment makes the City's roads more susceptible to the formation of frost conditions as the weather can vary greatly and change quickly from Steveston to Hamilton. During the winter season, staff continuously monitor the weather conditions and forecasted precipitations for the entire area to respond effectively to snow and ice events, and provide safe road conditions to the travelling public.

This report outlines the City's standard for winter maintenance operations and response plan to snow and ice events in accordance with the service level requirements outlined in the Council Policy 7013 "Roadways – Ice and Snow Removal". An updated version of Policy 7013 is presented with this report. The updated Policy re-establishes the priorities of ice and snow clearing from the City's public roads, highways, overpasses, lanes and bus stops and to set out when the City will initiate and continue such ice and snow clearing operations. The Policy also incorporates operational response practices relating to bus stops, wheelchair let downs and services at City facilities as approved by Council at the November 28, 2022 meeting.

This report supports Council's Strategic Plan 2022-2026 Focus Area #3 A Safe and Prepared Community:

Community safety and preparedness through effective planning, strategic partnerships and proactive programs.

3.4 Ensure civic infrastructure, assets and resources are effectively maintained and continue to meet the needs of the community as it grows.

Analysis

Operational Preparations

Operational preparations for the upcoming winter begin generally by mid-September. The snow and ice treatment response plan is reviewed, revised and updated annually with all key stakeholders. Roads and Construction Services will direct key frontline staff from Roads and Construction Services and coordinate additional snow and ice treatment response resources with other City operations and service sections.

Key stakeholders provide snow and ice treatment operations training to designated staff authorized to operate the snow and ice treatment equipment. Training is provided annually to qualified operator staff prior to the start of the winter season.

By October of each year, the City's salt supplies are secured and guaranteed for the upcoming winter season. Under contract, 1,050 metric tonnes are available with an additional 2,200 metric tonnes on reserve. However, should a snow and ice event occur earlier, the City has 450 metric tonnes currently stored in the Works Yard and are expanding the on-site storage for this winter. The City owns 39 pieces of equipment available for major snow response (Attachment 1).

Equipment Services performs critical equipment maintenance functions to ensure the snow fleet is also readied prior to the start of the winter season. The City maximizes the use of its internal equipment fleet units throughout regular operations with specialized snow and ice treatment attachments. The snow and ice treatment equipment fleet is deployed to mechanically treat priority locations and response routes.

For preventative treatment intended to limit and/or delay snow or ice from bonding to pavement surfaces, the City's preferred anti-icing treatment is salt brine. The application of salt brine is effective, is operative in temperatures as low as -15°C, is inexpensive in comparison to salt, and has lower environmental impacts. The use of salt brine as pre-treatment effectively stretches usage longer than regular road salt; for the same quantity of salt used on one lane kilometre with traditional salters, brine will cover over 4.3 lane kilometres of roadway. Furthermore, the capacity for mixing and storing salt brine was increased in 2023 from 115,000 litres to 145,700 litres to support the City's efforts to reduce the overall use of salt on roadways.

Currently, four tandem axle vehicles outfitted with brine tanks perform the majority of preventative treatment while a one-tonne dump truck outfitted with a brine insert focuses on the City Centre's preventative treatment. In a snow event, six one-tonnes fitted with plows and brine inserts focus on the City Centre, responding to citizen complaints and entrances to subdivision collector roads which allows nine tandem axle vehicles with brine/salt and plows and three single axle trucks with plows and spreaders to remain focussed on first and second priority routes.

There are 10 road surface temperature sensors located at key locations throughout the City. These sensors are monitored 24-hours a day, 7 days a week by the City's Public Works Dispatcher. These infrared laser sensors are used to ensure accurate, real-time road surface temperature information critical to proper deployment of anti-icing and de-icing materials; the pavement temperature sensors create an alert when road conditions are deteriorating which will allow staff to respond before conditions become hazardous for driver safety. Additional weather details and road information from each sensor location is available to responding staff via the Supervisory Control and Data Acquisition (SCADA) system (Attachment 2). The road temperature sensors data is also available to the public through the City's website at <https://www.richmond.ca/services/weather-response/snow/roadtemps.htm>

Staff are further supported by an external weather forecasting agency (Weathernet) to provide localized (Richmond-specific) weather forecasts; a meteorologist is available 24 hours a day to provide clarification prior to and during snow events.

During snow events, staff located in a centralized control centre closely monitor the information available from the sensors, monitor and record equipment locations, salt and brine distribution, and route start and completion times. All vehicles are equipped with GPS allowing staff to monitor road treatments, respond accurately to enquiries, and track and report on expenditures which is later used to forecast costs for future events.

Policy Changes

Policy 7013 – Roadways – Ice and Snow Removal: To support adequate operation of public transit during a snow event, snow removal from priority bus stop locations across the City is

undertaken along with wheelchair letdowns on first priority routes to the degree possible based on available resources. Similarly, the City will remove snow from the entrances, wheelchair ramps, stairs, parking lots, walkways and perimeter sidewalks of civic facilities as resources permit. This operational practice was endorsed by Council at their November 28, 2022 meeting and is proposed to be included as an amendment to Policy 7013 to integrate service priorities for completeness. Additional housekeeping amendments are included to add clarity on the purpose of the policy, with no changes proposed to first, second and third priority routes. Attachment 3 presents the revised Policy, which is recommended for adoption as part of this report.

Traffic Bylaw 5870 – Requirement to Clear Snow from Sidewalks: Section 6.1 requires that developed commercial, industrial and residential properties are required to remove all snow and ice from adjacent sidewalks. Staff are reviewing these requirements to further clarify the responsibilities of adjacent businesses and residents when it comes to clearing sidewalks and will bring forward any proposed amendments to Traffic Bylaw 5870.

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 community volunteers with residents with mobility, health and economic challenges, including seniors, during a snowfall event. Staff review applications to confirm that the service recipients meet the criteria for assistance. Assistance involves shovelling snow from sidewalks and/or walkways leading to the main residential access points but excludes driveways. Starting on November 1, 2023 the Snow Angel Program enrollment information was made available on the City's website. Enrollment forms (Attachment 4) can also be obtained by calling Parks, Public Works Dispatch, City Hall or emailing parksprograms@richmond.ca. 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 available volunteer resources. Staff from Parks Services oversee volunteer recruitment and training, program promotion, activation and participation in the program. During the past 2022/2023 winter season, Snow Angel program volunteers were activated four times and provided snow removal services to 81 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.
- *Snow Plow Information through MyRichmond:* Staff have fitted snow response equipment with equipment sensors and the Council-approved GPS systems that will link the snow response equipment to road asset information. Staff are continuing to create the necessary road asset information linking the data to show active snow equipment location and current route completion on a map through MyRichmond. This should be ready to trial internally at

some point during this winter season with the intention of having the public facing portal open for the 2024/2025 snow season.

Communications Strategy

A comprehensive communication strategy has proven to be valuable in delivering accurate, timely and relevant information to the public before, during and after winter weather events. The City's various departments, with the guidance of Corporate Communications and Marketing, have established communication 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 and timely fashion over a variety of the City's communication channels. Messaging includes a combination of pre-determined and circumstantial messaging particularly when extreme weather occurs. The communications strategy includes, but is not limited to, using the following channels:

- Social media (the City's Instagram, X and Facebook accounts: posting the City's own messaging as well as sharing/amplifying 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

2023/2024 Weather Forecast

Weather forecasting is still an inexact science. Meteorologists use computer programs called weather models to make forecasts. These models have to rely on estimates and assumptions to predict future weather. The atmosphere is changing all the time, so those estimates are less reliable the further into the future. Meteorologists can predict with some accuracy short term ranges (3-5 days), however, forecasting much further in the future increases the chances of the weather being affected by unpredictable variables which can significantly change the weather pattern.

During the 2023/2024 period, a strong El Niño's is expected to play a role in influencing the winter temperatures. This usually means warmer-than-average condition for Richmond, resulting in more mild winter temperatures expected. The extra burst of global warmth that has appeared in 2023 will result in an upward offset to temperatures, meaning warm periods will be even warmer than usual and cold periods will be less cold than usual.

Summary - Winter Season 2022/2023

During the 2022/2023 winter season, Richmond experienced 40 frost/ice events and 4 snow events with a total accumulation of 62.5 centimetres of snow at YVR including 41.8 centimetres

of snow falling from December 18-23. The City crews brined, salted and plowed over 96,619 lane kilometres of first, second and third priority roads, which is the equivalent of driving back and forth to Halifax, Nova Scotia over eight times. The most kilometres treated in previous winters was in the 2016-2017 winter with over 55,000 lane kilometres. The winter of 2022/2023 was one of the worst winters since 1999, setting new record cold temperatures on eight separate days and the third highest snow accumulations in the past 25 years.

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 2023/2024 snow and ice season are currently underway and will be completed in time for the upcoming winter. To clarify services relating to public transit and civic facilities, an updated version of Policy 7013 is presented with this report for recommended adoption.



Larry Ford
Manager, Roads and Construction Services
(604-244-1209)

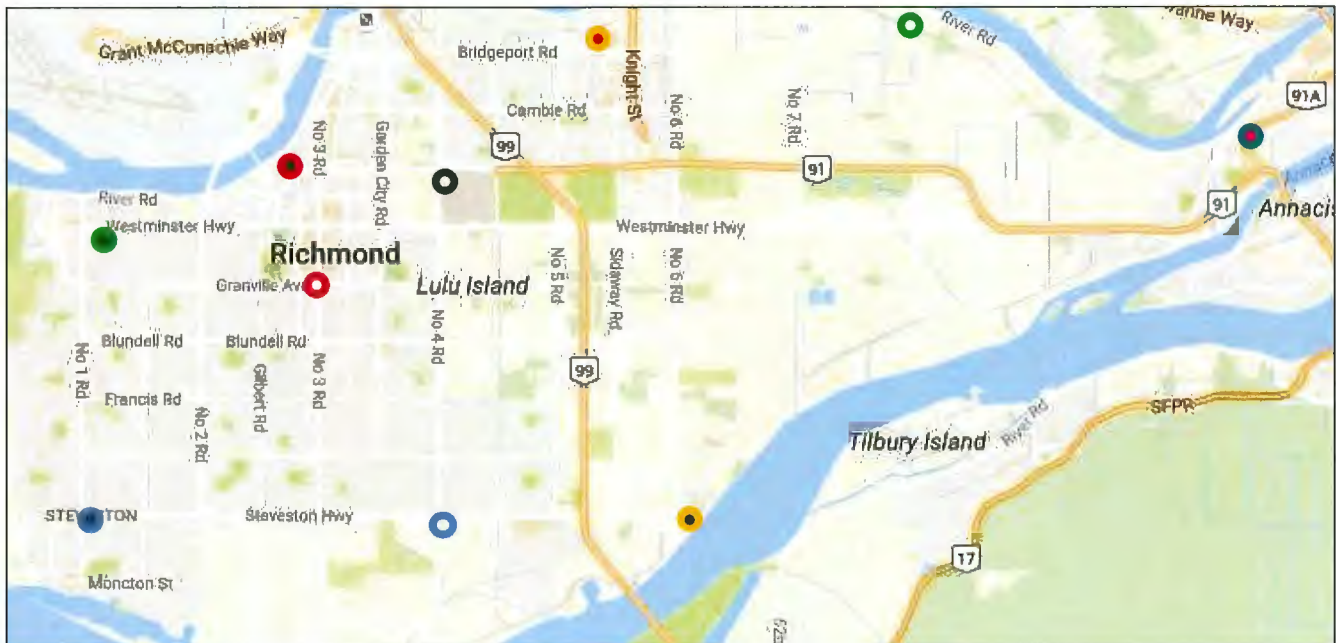
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- Att. 1: City of Richmond – Snow Response Equipment
- 2: City of Richmond – Road Temperature Sensor Locations
- 3: Roadways Ice & Snow Removal Policy 7013 - Updated Version for Adoption
- 4: Snow Angels Enrollment Form

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 with 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 plow |
| 4 | One-tonne dump truck with plow and 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) |
| 1 | One-tonne dump truck with plow and salt insert |
| 1 | One-tonne flat deck truck with 1,875 L brine tank insert |
| 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 MT | Salt + 450 MT currently in the Works Yard |

City of Richmond – Road Temperature Sensor Locations



Road Temperature Sensors:

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



Adopted by Council: December 22, 1980

Amended by Council: February 28, 2005, October 25, 2010, November [REDACTED], 2023

POLICY 7013:

1. This Policy establishes the priorities of City salting operations and ice and snow removal from City of Richmond (the “City”) public roads, highways, overpasses, lanes and bus stops (collectively, “City Streets”) and to set out when the City will initiate and continue such salting and ice and snow removal operations;
2. The intent of this Policy is to maintain City Streets in such a manner so as to:
 - a) facilitate the operation of public transit vehicles as well as emergency vehicles; and
 - b) provide others with a travel surface which is enhanced from the condition it would otherwise be in during periods of snow and ice accumulation;
3. A brine and/or salt mixture (the “Mixture”) will be applied on specified roadways (a “Salting Operation”) to enhance travelling surfaces for winter driving conditions during adverse weather. Snow removal will only be done when, in the opinion of the City’s on-duty representative or designated alternate (the “City’s Representative”), the Mixture proves ineffective;
4. This Policy is not to be interpreted as a bare pavement policy. The City does not guarantee that any City Street will be free from snow or ice, prior to, during, or after adverse weather. All City decisions, practises and actions taken or not taken under this Policy are subject to numerous factors, including without limitation, City budgetary constraints and availability of City personnel, availability of equipment and traffic volume;

Commencement of Salting Operations

5. The City will commence Salting Operations at the earliest of:
 - a) verification by the City’s Representative of the accumulation of ice and snow on City Streets which results in poor City Street conditions;
 - b) upon request by the RCMP; or
 - c) at a pre-scheduled time in response to weather forecasts;
6. It is anticipated that from the commencement of Salting Operations, it will take the City approximately 90 minutes to prepare City personnel and equipment for Salting Operations with a completion time of up to five hours, depending on conditions;



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|---|--|--------------------|
| Page 2 of 3 | Roadways – Ice and Snow Removal | Policy 7013 |
| Adopted by Council: December 22, 1980 Amended by Council: February 28, 2005, October 25, 2010, November [REDACTED], 2023 | | |

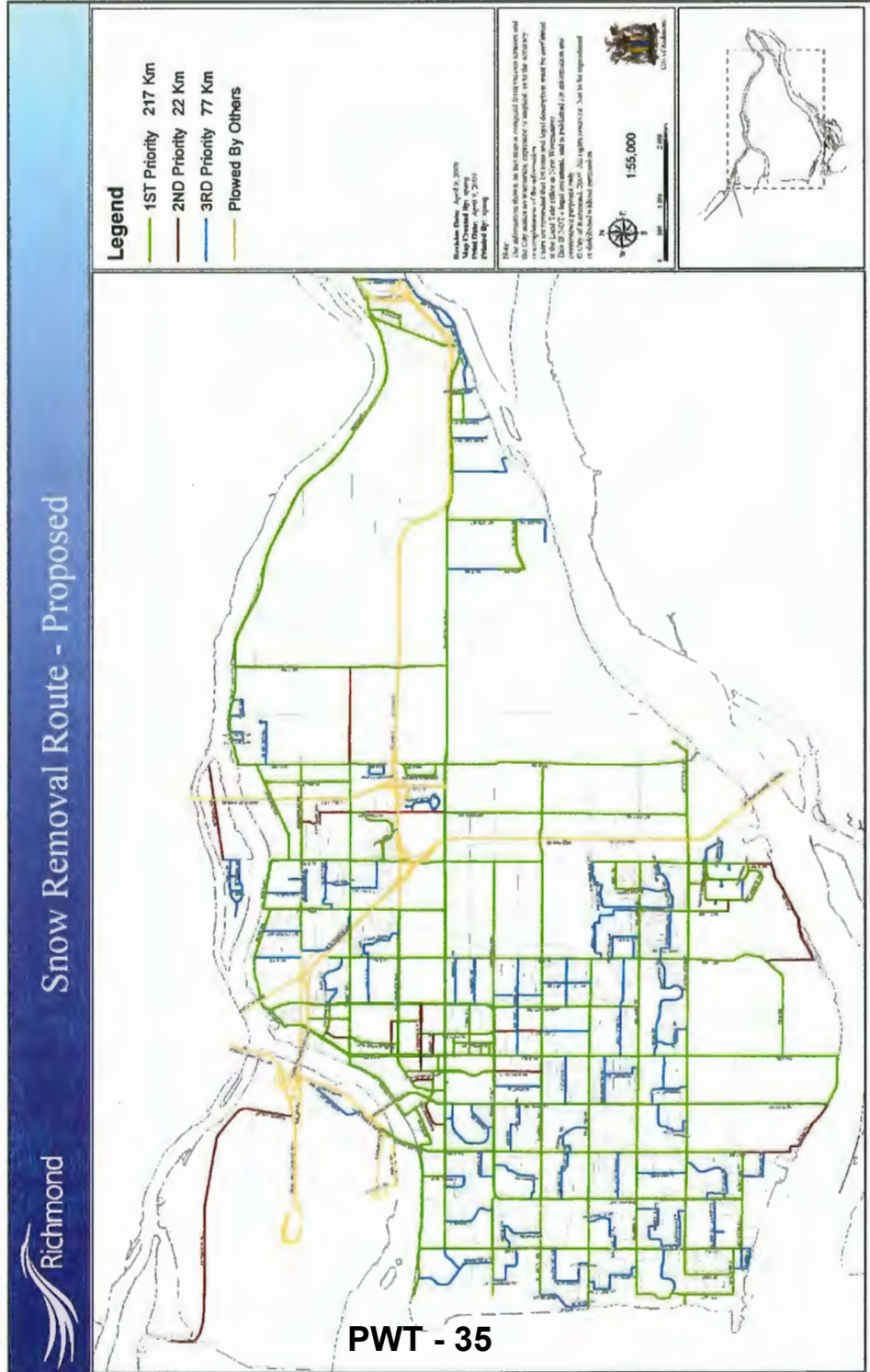
Priority Salting Operations

7. The City will give first priority for Salting Operations and snow removal to:
 - a) those major arterial streets, section line roads and bus routes identified as “1st Priority” and coloured green on the map attached to and forming part of this Policy; and
 - b) bus stops to ensure adequate operation of public transit and wheelchair letdowns, provided that the City is not responsible for snow removal from the sidewalks leading to these areas which is the responsibility of property owners under the applicable City bylaw;
8. The City will give second priority for Salting Operations and snow removal to:
 - a) those major collector roads identified as “2nd Priority” and coloured in red on the map attached to and forming part of this Policy
 - b) civic facilities, including entrances, wheelchair ramps, stairs, parking lots, and walkways. This includes community centers, fire halls, and other municipal facilities. The City will also remove snow from the perimeter sidewalks surrounding these facilities as part of the City’s comprehensive snow removal response;
9. The City will give third priority for Salting Operations and snow removal to those roads identified as 3rd Priority” and coloured blue on the map attached to and forming part of this Policy;
10. In extraordinary circumstances in the sole opinion of the General Manager of Engineering and Public Works, the General Manager of Engineering and Public Works is authorized to order Salting Operations and/or snow removal of City roads that are not set out and identified as being “1st”, “2nd” or “3rd” Priority roads on the map attached to and forming part of this Policy. Otherwise, no salting or snow removal will be conducted by the City on roads not set out and identified as being “1st”, “2nd” or “3rd” Priority roads on the map attached to and forming part of this Policy; and
11. The City Representative may investigate and assess localized road conditions. The City’s Representative may initiate the Salting Operations by Patroller staff or other qualified available individuals.



Adopted by Council: December 22, 1980

Amended by Council: February 28, 2005, October 25, 2010, November 2023





**City of
Richmond**

**Snow Angel
Registration Request Form**

Community Services Division
Parks Programs

Thank you for interest in the Snow Angel Program. Please enter the following information to apply for Snow Angel services.

Last Name: _____ First Name: _____

Home Address: _____

Phone: _____ Email: _____

Age: _____

Do you have family in Richmond who can provide snow removal assistance? _____

Do you have financial capacity to hire snow removal services? _____

Reason(s) for Snow Angel Assistance:

Once you have completed this application form, please e-mail a copy to:
parksprograms@richmond.ca

Please Note: This application is subject to review by City of Richmond staff. Once your application has been reviewed you will be contacted with information regarding your placement in the program.

If you have any questions regarding this form, or other questions about the Richmond Snow Angel Program, please contact the Snow Angel Coordinator at parksprograms@richmond.ca or 604-247-4453