Appendix C

Winter Maintenance Policy Update

Date	September 30, 2020
To	Mayor Masters and City Councillors
From	Public Works & Infrastructure Committee
Service Area	Citizen Services
Item #	CR20-85

RECOMMENDATION

The Public Works and Infrastructure Committee recommends that City Council:

1. Consider the Winter Maintenance Policy Update during the 2021 Budget process; and
2. Direct Administration to bring a report with options to amend *The Clean Property Bylaw,* with respect to sidewalk clearing, in *Q2* of 2021.

HISTORY

At the September 23, 2020 meeting of the Public Works and Infrastructure Committee, the Committee considered the attached report PWI20-8 from the Citizen Services Division.

The Committee adopted a resolution to concur in the recommendation contained in the report after changing the date for Administration to bring a report with options to amend The Clean Property Bylaw, with respect to sidewalk clearing, from Q3 of 2021 to Q2 of 2021.

Recommendation #2 in report PWI20-8 (attached) does not need City Council approval.

Respectfully submitted,
PUBLIC WORKS AND INFRASTRUCTURE COMMITTEE

Elaine Gohlke, Secretary 9/25/2020

ATTACHMENTS
PWI20-8 - Winter Maintenance Policy Update.pdf
Appendix A - Environmental Conditions and Budgetary Impacts
Appendix B - Current Winter Maintenance Policy
Appendix C - Policy Review and Feedback
Appendix D - Road Network Reclassification
Appendix E - School Unloading Zones
Appendix F - Transit Stop Accessibility
Appendix G - Transit Route General Conditions
Appendix H - Residential Road General Conditions
Appendix I - Bike Lane General Conditions
Appendix J - Intersection Ice Control
Appendix K - Snow Removal on Category 1-3 Roads

Winter Maintenance Policy Update

Date	September 23, 2020
To	Public Works and Infrastructure Committee
From	Citizen Services
Service Area	Roadways & Transportation
Item No.	PWI20-8

RECOMMENDATION

The Public Works and Infrastructure Committee recommends that City Council:

1. Consider the Winter Maintenance Policy Update during the 2021 Budget process.

2. Approve this recommendation at its September 30, 2020 meeting.

ISSUE

The purpose of this report is to review the City of Regina's (City) Winter Maintenance Policy (Policy) for snow and ice management services and to provide recommendations to update the Policy in alignment with City's *Transportation Master Plan* (TMP) and the *Official Community Plan* (OCP) and community needs.

IMPACTS

Accessibility Impact:
One of the enhancements to the Policy could include enhanced snow clearing on sidewalks adjacent to transit stops, making them more accessible for all users.

Financial Impact:
Administration undertook an evaluation and analysis of the environmental conditions over the last ten years and it demonstrates that Regina is experiencing a reduced amount of snow accumulation and number of snow days in recent years, resulting in a cost savings of

$1.2 million annually. Further details can be found in appendix A.

Any approved enhancements to the Policy would result in additional expenditures on an annual basis.

The Winter Road Maintenance Reserve has a current balance of $1.8 million and is sufficient to cover expenditures during an above average winter season if conditions exceed historic averages.

Policy/ Strategy Impact:
The recommendations support the Transportation Master Plan (TMP) and the D*esign Regina: The Official Community Plan* (OCP), specifically:

Section D3, Transportation:

- *Goal 1 – Sustainable Transportation Choices; Offer a range of year-round sustainable transportation choices for all, including a complete street framework.*
- *Goal 2 – Public Transit; Elevate the role of public transit.*
- *Goal 3 – Integrated Transportation and Land Use Planning; Integrate transportation and land-use planning in order to better facilitate walking, cycling, and transit trips.*
- *Goal 4 – Road network Capacity; Optimize road network capacity.*
- *Goal 5 – Active Transportation; Promote active transportation for healthier communities*

The recommendations also support Council's resolution to continue providing winter maintenance that effectively supports the health, attractiveness, and economic viability of our community.

Environmental Impacts:
Any recommended Policy updates would enhance general ice control practices while still adhering to Environment Canada and Transportation Association of Canada (TAC) guidelines on responsible road salt usage. A better coordinated Ice Control Program will optimize the use of sand and salt while providing improved driving conditions.

Risk/Legal Impacts:
Administration will ensure the updated Policy document continues to serve as a legal document defining levels of service in the community, and roles and responsibilities of the Administration, City Council and residents.

OTHER OPTIONS

Administration is recommending that the winter maintenance policy update and any recommended enhancements or subsequent possible reductions to the budget be considered through the 2021 Budget process. An alternative to that option is:

Option 2: Status Quo Policy
The resident survey showed that general satisfaction is high, except for the residential roads level of service. Administration could continue to operate the winter maintenance program on a status quo basis.

COMMUNICATIONS

Administration will develop a comprehensive communications strategy once budget approval has been received from City Council on any of the recommended enhancements. This will be used prior to and during the implementation of the updated Policy in 2021. The estimated cost is expected to be approximately $35,000 annually and is included in the recommended Policy enhancements.

Administration will collaborate with community partners such as Regina Police Service, Canadian Automobile Associate (CAA), school boards, Community Associations, Regina Accessibility Committee, Regina Downtown Business Improvement District (RDBID), Saskatchewan Health Authority (SHA), and SGI in order to educate key stakeholders on the Policy enhancements.

DISCUSSION

The Winter Maintenance Policy (Appendix B) was approved by City Council in 2007 with the purpose of providing winter maintenance activities that support the health, attractiveness, and economic viability of our community. Since then, the community has experienced growth, environmental conditions have changed, and the wants and needs of residents has evolved. The City also adopted long-term strategies such as the *OCP* and *TMP* to achieve the City's vision and help guide our community into the future.

As part of the Policy review, Administration conducted a resident survey, engaged with internal and external stakeholders, evaluated previous feedback and Service Request data, researched policies in other cities, studied winter maintenance cost comparison for various cities under the MBN Canada Performance Measurement Report and evaluated gaps in the current Policy. More details can be shown in Appendix C. Although feedback from the survey showed that general satisfaction is high, the overall review identified several themes for consideration, some of which require City Council approval and others that can be implemented through operational changes.

Several options were reviewed and considered regarding possible enhancements to winter maintenance levels of service. Options were chosen based on survey and stakeholder feedback, financial viability and operational capacity. Administration is proposing the following Policy enhancements and would undertake to bring a Policy Level of Service document back to City Council in Q3 2021 for final approval. It should also be noted that activities contained in the current Policy and not identified in this enhancement report would be included in the new Policy and continue to be carried out as status quo.

Policy Enhancement 1 – Communication Plan
Implement an enhanced communication plan annually.

In previous years, the Roadways Seasonal Operations branch worked with the Citizen Services department to inform residents of the activities and expectations during winter months, opportunities for engagement with stakeholders, and level of service outlined in the Policy. More recently, the Administration has used specific tools and tactics to notify residents when there are parking bans in place for efficient snow plowing activities.

Feedback from the survey suggests that general awareness about the Policy is lacking and not sufficient, and that many of the Service Requests could be avoided if the City improved communication efforts and simplified the Policy document. This is like the findings in researching other municipalities; policy documents are simple to understand, and outline expected level of service that residents can expect. Administration will undertake to create a communication plan for residents leading into every winter season as well as throughout.

The cost for this enhancement is $35,000.

Policy Enhancement 2 – Road Classification and Priority
Adopt road classification system as shown in Table 1.

Table 1-Proposed Road Classification

Proposed/ New Road-Classification	Length Km	Snowfall trigger
Category 1	157	5 cm
Category 2	204	5 cm
Category 3	156	5 cm
Category 4	47	5 cm
Category 5	532	15 cm
Total	1096 Km	

The current Policy classifies roads in six categories based on road classification, traffic volumes, and usage for the purposes of prioritizing systematic plowing operations and service levels.

Administration is recommending that the road prioritization system be updated and simplified to enhance residents' understanding of the level of service for the road network. This will also and ensure that snow clearing efforts are in alignment with community priorities, such as the *OCP*. The classification and priority system will consist of five categories as shown in the table above.

The costs and implications of the enhanced classification system are reflected in the upgrades to the categories of school unloading zones, transit routes and residential roads with traffic volumes greater than 1500 vehicles per day (VPD). Additional details can be found in Appendix D.

Policy Enhancement 3 – School Unloading Zones
Upgrade the road plowing classification of all school unloading zones to Category 3 or higher and remove the snow ridges on both sides of the road adjacent to a school after a systematic plowing event.

Currently the Policy for snow clearing in front of schools specifies that snow ridges are removed when they exceed 30 centimetres in the School Bus Unloading Zone and exceed 75 centimetres on the remainder of the road adjacent to the school. However, there are no provisions for snow removal on the side of the road opposite of the school and this creates overall pick-up and drop-off challenges for parents and students.

Feedback from the survey and Service Requests suggests that snow ridges should be removed from both sides of the road after a snowfall and systematic plowing operations. This will allow for adequate parking and pick-up and drop-off locations, as well as enhance road conditions and safety for those accessing the schools.

The cost for this enhancement is $100,000 annually and details can be found in Appendix E.

Policy Enhancement 4 – Sidewalks Adjacent to Transit Stops
Plow all sidewalks adjacent to transit stops.

Currently the Policy for snow plowing on sidewalks includes maintaining sidewalks adjacent to City-owned parks and facilities, bridge decks and subways, and locations that do not have a property owner fronting the sidewalk. However, this only represents a small percentage of sidewalks in the community, with most of the responsibility assigned to the property owners adjacent to the sidewalk. There is a requirement for commercial properties to clear their sidewalk as outlined in *The Clean Property Bylaw*, however residential properties are not included, and the City encourages residents to be a good neighbor and clear their sidewalks. Unfortunately, this does not always happen, and it creates accessibility challenges for users of the transit system when the pick-up and drop-off locations are not consistently cleared by property owners.

Feedback from the survey and Service Requests suggests that the City improve snow clearing efforts around transit stops. This is also in alignment with *OCP* goals of offering a range of year-round sustainable transportation choices for all, as well promoting active transportation.

It should be noted that a negative impact is that sidewalks not adjacent to the transit stops will not be cleared and there may be a negative perception that the City is clearing some

residents' sidewalks and not all. In addition, this does not address accessibility on the remaining sidewalk network.

If City Council preferred to adopt a Bylaw requiring all property owners to keep the sidewalks adjacent to their property free and clear of snow, this policy enhancement would not be required (see Bylaw Amendment – Sidewalk Clearing option below).

The cost for this enhancement is $339,000 annually and details can be found in Appendix F.

Policy Enhancement 5 – Transit Routes

Upgrade the road plowing classification of all transit routes to Category 2 or higher.

Currently the Policy states that all transit routes are to be classified as a Category 3 priority or better. This means that during systematic plowing operations, many of the transit routes in the community can take up to 48 hours to complete after a snow event.

Feedback from Service Requests and internal stakeholders such as Regina Transit and Winter Maintenance staff, suggests that transit routes should be classified as a higher priority and cleared faster as this may be the primary mode of transportation for many residents after a snowfall. This may be especially true during a major snow event when major roads are cleared relatively quickly but residential roads take more time. Ensuring that Regina Transit has clear and safe roads to carry out consistent service level commitments and schedules is integral in elevating the role of public transit and optimizing the road network capacity.

There are no costs associated with this level of service enhancement and Administration will utilize existing tools and resources to implement this enhancement for the 2021/2022 season. Additional details can be found in Appendix G.

Policy Enhancement 6 – Residential Roads

Upgrade the road plowing classification of residential roads greater than 1500 vehicles per day (VPD) to Category 3 and plow all residential roads after every snow event greater than 15 centimetres.

Currently the Policy specifies that residential roads are plowed after a snow event greater than 25 centimetres, or when rutting exceeds ten centimetres. The residential road network represents approximately 541 kilometres of the entire road network and are typically plowed once or twice per season.

Feedback from the survey and Service Requests suggest that general satisfaction is low regarding snow clearing on residential roads. Administration is recommending that residential roads that are acting more as collector roads serving over 1500 VPD be classified as a higher priority and included in systematic plowing operations. In addition,

Administration recommends all residential roads are systematically plowed after a snow event greater than 15 centimetres.

Based on recent data, it is expected that this will result in one additional plow every season. It should be noted that the City will continue utilizing the Ice Shaving Program to maintain ruts and have discretion to plow all residential roads if there are unusual or extenuating circumstances during the winter.

The cost for this enhancement is $304,000 annually and details can be found in Appendix H.

Policy Enhancement 7 – Bike Lanes
Upgrade the road plowing classification of bike lanes to Category 2 or higher.

The current Policy does not include any reference to bike lanes. However, most the City's existing bike lanes are located on Category 1 or 2 roads, therefore they are plowed within 36 hours of a snowfall event. There are some bike lanes located on Category 3 roads, such as Lorne Street and Smith Street, and they would be included in the upgrade.

In an effort to offer a range of year-round transportation choices and promote active transportation, the enhanced level of service will include plowing and ice control activities after a snowfall, as well as routine inspections to ensure ice, snow, and slush is cleared from the bike lane.

As most of the bike lanes are already located on higher priority roads, there are no costs associated with this enhancement. Routine inspections will be included in the current inspection program. Additional details can be found in Appendix I.

Policy Enhancement 8 –Intersection Ice Control
Implement ice control routing and enhance coordination between snow plowing and ice control activities.

The current Policy for ice control outlines minimum cycling times based on category during snow events and when slippery conditions are present. Sand and salt is placed on the road in advance of intersections, crosswalks, ramps and merge lanes, curves and adjacent to school properties. After a snowfall, ice control material is placed on the road up to 24 hours after systematic plowing operations have been completed.

Feedback from the survey showed general satisfaction of ice control operations, however comments suggested there could be better coordination between snow plowing and ice control activities. Implementing routes based on priority and classification for both ice control and plowing operations will bring greater consistency to these activities and reduce the time delay between the coordinated activities.

There are no costs associated with this level of service enhancement and Administration will utilize existing tools and resources to implement this enhancement for the 2021/2022 season. Additional details can be found in Appendix J.

Policy Enhancement 9 – Snow Removal on Category 1, 2, 3 Roads
Remove snow on all Category 1, 2 and 3 roads when sightlines and lane widths are impacted.

The current Policy specifies that snow removal on Category 1 and 2 roads and Category 3 transit routes will be completed when sightlines and lane widths are impacted.

Feedback from the survey indicates that the snow removal activities need to be further enhanced on major roads after each systematic plow. Removing snow from Category 1, 2, 3 roads will ensure that snow removal takes place on all arterial and collector roads that are regularly plowed, providing safer winter driving conditions by improving road capacity and visibility around intersections.

There are no additional costs associated with this level of service enhancement as Administration has gained efficiencies in this activity and typically performed much of this activity on Category 3 roads out of necessity. Additional details can be found in Appendix K.

Bylaw Amendment – Sidewalk Clearing
Implement a sidewalk snow clearing Bylaw for all property owners.

In conjunction with the City's sidewalk clearing activities outlined in the Policy, the City requires owners of commercial properties, parking lots and apartment buildings to clear sidewalks within 24-48 hours of a snowfall as per *The Clean Property Bylaw*. These programs combined represent eighteen per cent of sidewalks in our community.

Feedback from the survey and Service Requests suggest that residents want to see increased and consistent sidewalk clearing efforts in our community and favour an approach that includes enforcement options.

This would assist in achieving *OCP* goals to offer a range of year-round transportation choices and promote active transportation and would ultimately benefit Regina residents by ensuring all sidewalks are consistently cleared of snow and maintained throughout the winter season.

If this option was chosen, Administration would bring a report in Q3 2021 with options to amend *The Clean Property Bylaw.*

DECISION HISTORY

At the September 8, 2018 Public Works and Infrastructure Committee meeting, the Winter Maintenance Summary Report *PWI18-16* was considered, and Administration committed to review to update and align the policy with community priorities and operational requirements.

The recommendations in this report require City Council Approval.

Respectfully Submitted,

Chris Warren, Director, Roadways & Transportation 9/4/2020

Respectfully Submitted,

Kim Ohra, Executive Director, Citizen Services 9/18/2020

Prepared by: Neeraj Saroj, Senior Engineer, Roadways & Transportation

ATTACHMENTS

Appendix A - Environmental Conditions and Budgetary Impacts
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Appendix A
Environmental Conditions Analysis

Although it is very difficult to predict the winter conditions in advance, the weather data for the past ten years indicates that the snowfall amounts in Regina have been decreasing. Figures 1 and 2 below indicate this trend. The linear trendline in Figure 2 highlights the possibility of snowfall amounts dropping in the coming years if this trend continued. The data also shows that the average monthly temperatures have been rising through the years. The number of snow days have dropped to 35 days in the last five years when compared to an average of 44 days during 2009/2010 to 2013/2014 seasons.

The above factors directly impact City of Regina's (City) Winter Maintenance Program in terms of operational and financial planning. Over the past few years, the need to systematically plow the major roads in Regina has reduced from five times a season to only four times. Similarly, major blizzards that dump 25 centimetres or more during a single event are less frequent requiring winter maintenance crews to perform only one residential plow and one alley plow in a season instead of two plows performed for each activity in earlier seasons.

Figure 1: Regina Weather Trend

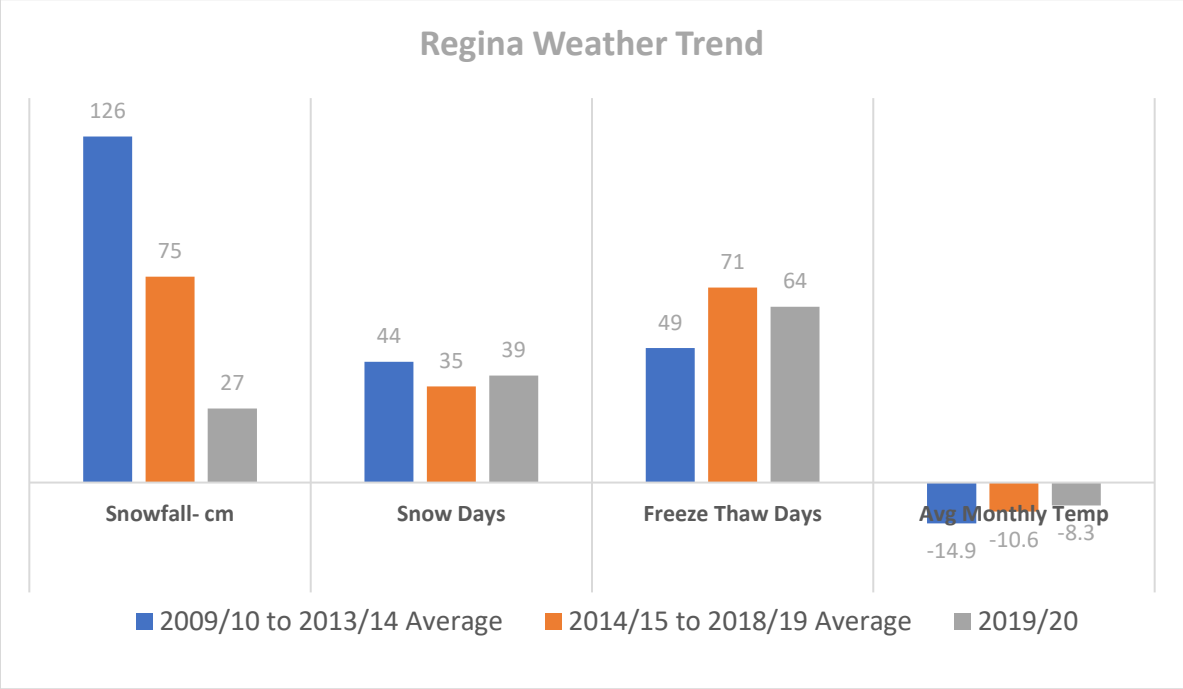
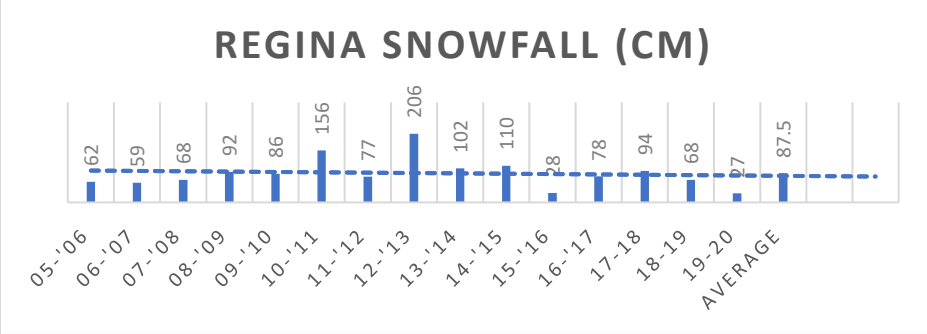


Figure 2:Regina Snowfall 2005/06 to 2019/20 & Average



The Roadways Seasonal Operations branch would always be ready to tackle harsher winters and provide emergency response if required. The Winter Maintenance Reserve has a current balance of $1.8 million and this source of funding would be used in an above average season. Assuming the milder weather trend could continue in the coming years, Administration studied the possible financial impact and it is expected that a total cost saving of $1.223 million is possible due to reduced maintenance activities.

Expected Savings:
As indicated in the Table 1 below, there is a total saving potential of $1.223 million due to reduced winter maintenance requirements under various programs listed in the table.

Table 1: ***Expected Savings due to milder weather trends:***

Major Winter Maintenance Program	**Expected Costs (Average 5-storms)** Previous average winter season based on historic data	**Expected Costs (Average 4 storms)** New average	**Expected Savings**	**Comments**
Plowing of Roads	$2.172 million	$1.575 million	$0.596 million	• Based on cost of 4 systematic plows instead of 5 plows • Based on only one residential plow instead of two plows • Cost saving in storm, systematic and routine maintenance modes due to reduced cost of resources (manpower, City owned and hired equipment)
Plowing of Alleys	$0.131 million	$0.066 million	$0.066 million (reflected in Alley Tax Levy)	• Based on one alley plow instead of two.
Ice Control on Roads	$1.932 million	$1.665 million	$0.267 million	• Based on cost of 4 systematic plows instead of 5 plows
Snow removal	$2.519 million	$2.159 million	$0.360 million	• Lower snow accumulations require less snow removal
		Total Expected Saving	**$1.223 million**	

Winter Maintenance Policy

Purpose

The purpose of the Winter Maintenance Program is to provide winter maintenance that effectively supports the health, attractiveness, and economic viability of this community. The purpose of this Policy is to provide winter maintenance guidelines for the Winter Maintenance Program. Both the policy and program are intended to be complimentary with the City of Regina Salt Management Plan. All activities in the program, in particular the Ice Control activity, will follow the intent, guidelines, and practices laid out in the Plan.

Scope

The scope of the Winter Maintenance Program and Policy addresses those public right of way assets involving:

a) streets;
b) sidewalks;
c) alleys; and
d) easements.

Not included in the scope of this Policy or the Program are public and private property or right of way assets that are located within City limits:

a) in City parks and open spaces;
b) on City facilities and properties or on properties that are controlled by the City;
c) in the F.W. Hill Mall;
d) on properties controlled by the Wascana Centre Authority;
e) are the responsibility of Saskatchewan Highways; or
f) on private roads, sidewalks, facilities, or properties.

The Winter Road Maintenance Program is comprised of the following general activities:

a) snow plowing of roads, alleys and sidewalks;
b) ice control of roads, alleys and sidewalks;
c) snow removal;
d) snow dump sites; (To Be Inserted at Later Date)
e) spring runoff - catch basins and ditches; (To Be Inserted at Later Date);
f) snow fencing; and (To Be Inserted at Later Date)
g) success indicators, monitoring, documentation and reporting (To Be Inserted at Later Date)

Authority

This Policy is established by City Council.

Contact

For further information, please contact:

Public Works Division
Roadways Operations Department
P.O. Box 1790
2425 4th Avenue
Regina, Saskatchewan S4P 3C8
Telephone: 306.777.7000
Fax: 306.777.7057

Definitions

Bare Pavement – refers to a road surface condition where the wheel paths in driving lanes are generally visible. Ice, frost, or snow may remain in wheel paths which results in slippery conditions. Loose snow between or outside of the wheel paths is normally plowed. Generally 3 cm of compacted snow between or outside of the wheel paths is not plowed.

Ice Control – the application of aggregate abrasives and/or chemicals to a driving or walking surface to improve traction.

Normal Winter Driving Conditions – refers to the road conditions which result from adhering to a set of end condition statements as described in this Policy document.

Passability - refers to maintaining a driving lane in such a condition that police, fire, and ambulance vehicles can use the street in an emergency response.

Peak Traffic Hours – the hours between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m. Monday to Friday, excluding holidays.

Plow Snow (Alleys) – the pushing of accumulated snow from the centreline of the alley surface, leaving snow ridges on each side, such that one vehicle width is provided.

Plow Snow (Roads) - the pushing of accumulated snow from driving or parking lanes. The resulting snow ridges may be stored in centre medians or in parking lanes adjacent to the curb.

Plow Snow (Sidewalks) – the pushing of accumulated snow from the sidewalk surface, resulting in a minimum one metre wide compacted snow walking surface, leaving snow ridges on both sides of the sidewalk.

Plowed Around – during plowing operations a plow may travel around a parked vehicle leaving a snow ridge.

Road Categories for Systematic Plowing and Ice Control – every road segment within the entire road network is classified into one of five categories which are defined as follows:

Category 1	Freeways/expressways including ramps and loops, major arterial roads, and any road on a designated hospital emergency route.
Category 2	Minor arterial roads, major collector roads with traffic volumes > 5,000 vehicles per day and all roads in the area referred to as Regina downtown.
Category 3	Major collector roads (with traffic volumes < 5,000 vehicles per day), industrial/commercial roads, and any minor collector or major residential local roads on a designated transit or truck route.
Category 4	Minor collector roads and major residential local roads which lead into school bus unloading zones.
Category 5	Residential local roads.
Category 6	Gravel roads.

Road Segment – the distance between two intersections.

Rutting – refers to the wheel path troughs in compacted snow surfaces.

Salt Management Plan – the most recent version of the City's "Plan" developed in accordance with Environment Canada's "Code of Practice for the Environmental Management of Road Salts".

Snow Event – a combination of snow or wind causing snow to accumulate on driving or walking surfaces. For the ice control activity, snow event shall also include rain or freezing rain or other weather conditions that have a similar effect on road surfaces. The end of a snow event is when winter precipitation no longer accumulates on roadway surfaces for a sufficient period of time to allow complete systematic plowing and ice control to be completed as specified in this Policy.

Snow Removal – refers to the reducing or cleaning away of snow ridges or piles. Typically, this is accomplished by redistributing this excess snow to existing snow ridges on the same block and if this is not possible then it is removed by loading and hauling off site.

Snow Ridge- the row of excess snow formed by plowing roads, alleys, or sidewalks.

Systematic Ice Control (Roads) – refers to a methodical approach taken to complete one ice control cycle on the road network as specified in this Policy following systematic road plowing or the end of a snow event.

Systematic Plowing (Roads) – refers to a methodical approach taken to complete one plowing cycle on the road network as specified in this Policy following the end of a snow event.

Typical Winter – refers to the average weather conditions for Regina between October and April including approximately: two blizzards lasting six hours or more per year; 30 blizzard hours per year; 50 days with snow fall per year; total annual snowfall of 105 cm; temperature ranges from 10°C to -50°C; and individual snow events less than 10 cm.

Windrowing – multiple snow ridges placed in an open field parallel with the road to minimize drifting snow from collecting on the road surface.

Policy Statement

1.0 GENERAL

The performance and end condition objectives outlined by this policy include the following underlying assumptions:

a) That the operational activities are being undertaken during a typical weather event during a typical winter season. The City acknowledges that Regina may be subject to extreme or extraordinary weather which may diminish the City's ability to achieve the policy objectives within the stated time frames.
b) The activities detailed herein attempt to reduce hazardous roadways conditions caused by winter weather; however, the City acknowledges that weather conditions are beyond the City's control and dangerous conditions may nonetheless result despite the City's efforts.
c) That winter road safety is a cooperative activity between users of the roadways and the City. The City expects that users of the roadways will

exercise reasonable care for their own safety when travelling the roadways during winter conditions.

There are several general objectives which support the purpose of the program policy:

Objective #1	All roads are made passable for emergency (fire, police, ambulance) response vehicles.
Objective #2	Normal winter driving conditions and reasonable sidewalk access are provided on key routes through systematic plowing and sanding operations on priority one roads.
Objective #3	Normal winter driving conditions and reasonable sidewalk access are provided along regional commercial developments and secondary routes through systematic plowing and sanding operations on priority two roads.
Objective #4	Normal winter driving conditions are provided along tertiary routes through systematic plowing and sanding operations on priority three roads.
Objective #5	Safety and travel efficiency are provided through the plowing and removal of windrows from in front of guardrails and off of bridge decks.
Objective #6	Alleys are passable for the collection of solid waste collection and access by utility companies and the public.
Objective #7	Normal winter driving conditions are maintained through snow removal operations.
Objective #8	Residential and low volume routes are made passable through plowing operations.
Objective #9	Snow clearing is provided at City owned facilities to provide reasonable parking and access.
Objective #10	Snow clearing is provided on pathways in some parks and connecting walkways and in some open spaces which are typically in the vicinity of recreation centres.
Objective #11	Reasonable sidewalk access is provided through enforcement of the Regina Clean Property Bylaw, 1997.

When severe weather conditions reach a point where winter maintenance operations can not continue without compromising public and/or employee safety, temporary road closures may be implemented.

The Manager of Winter Maintenance, or his/her designate, makes the ultimate decision to temporarily close a road. When this occurs, the Public Works Dispatch Office shall contact:

- Traffic Operations Command Centre;
- Fire, Police, and Emergency Medical Services;
- City Central and City Manager's Office;
- Communications Division;
- Local radio/television newsrooms and the Leader Post.

The Manager of Winter Maintenance is responsible for the day-to-day operation and coordination of the Roadway Operations Winter Maintenance Program.

2.0 PLOWING

There are three operating environments involved in the snow plowing operation:

- During a snow event;
- Systematic road plowing; and
- Routine maintenance

2.1 ROADS

The City will classify the road network for snow plowing activities. In all three operating environments, road snow plowing will be conducted in accordance with the Road Categories for Systematic Plowing and Ice Control.

a) During a Snow Event:

- **General**
  During a snow event, the first priority objective for road snow plowing is to maintain passability on roads for emergency response vehicles. As the end of the storm approaches, this operational objective becomes increasingly shared with the next operational objective, that of systematically plowing the road network. Plowing will be initiated on Category 1 and 2 roads when approximately 5 cm of snow has accumulated on the road surface during a snow event. When severe snow events occur, operations to establish and maintain passability may only focus on Category 1 and 2 roads.

- **Locations**
  All roads which are not passable for emergency response vehicles.

- **Time Frames**
  Time frames are not applicable during a snow event. Operations will continuously cycle for the duration of the snow event. Following typical snow events, all roads will be passable for emergency response vehicles within twenty-four hours from conclusion of snow event.

- **End Conditions**
  Passability is maintained on as many roads as resources and weather conditions permit.

  Snow and ice accumulation could remain on the road surface

  Snow ridges across driveways, intersections, alleys, transit stops, and around parked vehicles may not be reduced in height.

b) Systematic Plowing:

- **General**
  During systematic road plowing, the operational objective is to re-establish traffic flow in driving lanes and designated turning lanes. Systematic road plowing operations will be triggered by the following snow accumulations during a single snow event:

  Category 1 and 2 roads – 5 cm
  Category 3 and 4 roads – 10 cm
  Category 5 roads – 25 cm
  Category 6 roads – 10 cm

  Systematic road plowing operations may also be triggered in other circumstances where there are several snow accumulations of less than 5 cm, and the Manger of Winter Maintenance will make the determination to call a systematic response if warranted.

- **Locations**
  All roads provided snow accumulation has met or exceeded trigger values for each category.

- **Time Frames**

Systematic road plowing will be completed within the following time frames from end of snow event:

Category 1 roads within 24 hours
Category 2 roads within 36 hours
Category 3 roads within 48 hours
Category 4 roads within 60 hours
Category 5 roads – no time frames specified
Category 6 roads – within 60 hours

- **End Conditions**

  Systematic road plowing is considered to be complete when the following conditions are met.

  <u>All Roads</u>

  Snow ridges will be reduced to a maximum height of 30 cm across driveways, intersections, alleys and signed unloading zones (including for school buses adjacent to schools and in front of senior's complexes with over 20 units in a single building).

  Snow ridges will be reduced to a maximum height of 15 cm on Transit stops.

  Snow ridges of any height may be left around parked vehicles.

  Snow ridges placed in parking lanes may encroach up to 30 cm on to the sidewalk.

  The driving lanes and designated turning lanes will be plowed to the following conditions during systematic plowing:

  - Category 1 and 2 roads to bare pavement as defined
  - Category 3 and 4 roads to a compacted snow surface of approximately 8 cm or less depth
  - Category 5 roads to a compacted snow surface
  - Category 6 roads to a compacted snow surface of approximately 8 cm or less depth

c) Routine Maintenance

- **General**

During routine maintenance, the operational objectives are to:

a) Complete post snow event cleanup on the road network to establish normal winter driving conditions as defined for each category of road;

b) Maintain the road network to normal winter driving conditions and correct deficiencies which result from cumulative light snow events, spot drifting, or traffic effects; and

c) Prepare for future snow events.

Category 5 roads may be systematically plowed to reduce snow pack depth resulting from cumulative snow events.

- **Locations**
  Routine maintenance is conducted on all roads in accordance with the Road Categories for Systematic Plowing and Ice Control.

- **Time Frames**
  a) Post snow event cleanup will be completed within the following time frames following systematic plowing completion:

     - Category 1 and 2 roads – seven days
     - Category 3 and 4 roads – 14 days
     - Category 5 roads – 21 days
     - Category 6 roads – 14 days

  b) Time frames are not applicable when maintaining the road network to normal winter driving conditions and correcting deficiencies which result from cumulative light snow events, spot drifting, or traffic effects.

  c) Time frame requirements are not applicable when preparing for future snow events.

- **End Conditions**
  Normal winter driving conditions are considered to be established on roads when the following conditions are met:

  - Snow ridges will be reduced to a maximum height of 30cm across driveways, intersections, alleys and signed unloading zones

(including for school buses adjacent to schools and in front of seniors' complexes with over 20 units in a single building).

- Snow ridges placed in parking lanes may encroach up to 30 cm on to the sidewalk. The outside base edge of the snow ridge will not exceed 60 cm from the curb face.
- On bridge decks and in subways snow ridges will generally be less than 1 metre high or 1.5 metres wide.
- Snow ridges in front of guard rails will generally be less that 30 cm in height.
- Maximum height of snow ridges within transit stops will be 15 cm and will not encroach onto the sidewalk.
- Transit stops will be a minimum of 12 m in length.

Driving lanes and designated turning lanes will be maintained to surface conditions as follows:

- Category 1 and 2 roads to bare pavement including a portion of the parking lanes adjacent to a snow ridge.

- Category 3 and 4 roads rutting in excess of approximately 8 cm will be addressed.

- Category 5 roads rutting in excess of approximately 10 cm will be addressed.

- Category 6 roads rutting in excess of approximately 8 cm will be addressed.

2.2 ALLEYS

The City does not classify the alley network for the purpose of prioritizing snow plowing activities in alleys.

a) During a Snow Event

- **General**
  Typically, alleys will not be plowed during a storm event.

b) Systematic Plowing

- **General**
  During systematic alley plowing, the operational objective is to return the alley network to normal winter driving conditions. Systematic alley plowing operations are triggered by a 25 cm snow accumulation during a single snow event.

- **Locations**
  All alleys.

- **Time Frames**
  Systematic alley plowing will be completed within 96 hours from the end of a snow event.

- **End Conditions**
  Normal winter driving conditions are considered to be established on alleys when the following conditions are met:

  - The compacted snow surface width will provide single vehicle passage.
  - Snow ridges may be formed on both sides of the plowed surface.
  - Snow ridges are not reduced in height across garages, driveways, or parking lot entrances.

c) Routine Maintenance

- **General**
  During routine maintenance, the operational objective is to maintain normal winter driving conditions in alleys as defined. Alleys may be systematically plowed to reduce snow pack depth resulting from cumulative snow events.

- **Time Frames**
  No time frames specified.

- **End Conditions**
  The compacted snow surface width will provide single vehicle passage.

  Rutting in the compacted snow surface will not exceed approximately 10 cm.

2.3 SIDEWALKS

The City does not classify the sidewalk network for the purpose of prioritizing snow plowing activities on sidewalks.

a) During a Snow Event
Systematic sidewalk plowing operations will be triggered by 5 cm snow accumulations during a single snow event.

b) Sidewalk Plowing

- **General**
  The City will plow and maintain specific sidewalk locations.

- **Locations**
  - Any sidewalk adjacent to a City owned building or property that is located within the area noted in Schedule B of The Clean Property Bylaw No. 9881.
  - Any sidewalk adjacent to a City owned building or parking lot that is regularly used by the public during the winter season, excluding outdoor rinks.
  - Any sidewalk adjacent to bridge decks and subways.
  - Any sidewalk adjacent to transit stops on the Heritage bus route which is not covered by The Clean Property Bylaw No. 9881.
  - Adjacent to no frontage locations.
  - Adjacent to storm channel and railway crossings on Category 1 and 2 streets.

- Adjacent to vacant land on Category 1 and 2 streets.
- Adjacent to city owned parks on Category 1, 2, 3, and 4 streets.
- Adjacent to city owned parks that are next to a public school.
- Adjacent to city owned buildings or parks not accessed by the public in winter on Category 1 and 2 streets.
- Adjacent to hospital gateway (sidewalks both sides on 14th Avenue from Broad Street to the alley east of Halifax Street).
- Adjacent to Core Community Park (Quebec Street side).

- **Time Frames**
  Within 72 hours from end of snow event.

- **End Conditions**
  Sidewalk locations will be maintained to a general width of 1 metre.

  Sidewalk locations will be maintained to a compacted snow surface with a maximum depth of approximately 5 cm.

3.0 ICE CONTROL

There are three operating environments involved in the ice control operation:

- During a snow event;
- Systematic ice control; and
- Routine maintenance

Typically, ice control materials are only applied intermittently at spot sections along roads, alleys, or sidewalks. Continuous or uninterrupted application of ice control materials is not standard practice.

To determine if a spot section is treated with ice control material during any given cycle, staff judge the relative visibility of previously applied materials.

3.1 ROADS

The City will classify the road network for ice control activities. In all three operating environments, ice control will be conducted in accordance with the Road Categories for Systematic Plowing and Ice Control. For the ice control activity, time frames are typically expressed as a cycle frequency. Cycle frequency refers to the time interval between successive passes on a road to apply materials as judged by City staff.

a) During a Snow Event

- **General**
  During a snow event, the operational objective of the ice control activity is to slow the rate of deterioration in driving conditions.

- **Locations**
  During a snow event ice control operations on Category 1, 2, 3, and 4 roads will be initiated near the start of snow or freezing rain precipitation.

  As snow or freezing rain precipitation continues, ice control operations will be increasingly directed, as determined by City staff, to Category 1 and 2 roads only.

- **Time Frames**
  From near the start of snow accumulation to a point where approximately 2 cm of snow has accumulated during a single snow event on the road surface, cycle frequency will be as follows:

Category 1 roads (posted speeds > 70kph)	4 hour cycle
Category 1 roads (posted speeds < 70kph	12 hour cycle
Category 2 roads	12 hour cycle
Category 3 roads	24 hour cycle
Category 4 roads	24 hour cycle

  After approximately 2 cm of snow accumulation during a single snow event, cycle frequency will be as follows:

Category 1 roads (posted speeds) > 70kph	4 hour cycle
Category 1 roads (posted speeds) < 70kph	5 hour cycle
Category 2 roads	5 hour cycle
Category 3 and 4 roads	Not specified

- **End Conditions**
  The effectiveness of ice control can not be pre-determined.

  Spot sections of roads that are typically treated, based on the judgement of staff are:

  - sections leading up to sign or signal controlled intersections and crosswalks;

- bridge decks and subways including the approach to and exit from;
- grades greater than 5%;
- ramps and merging lanes;
- curves located on Category 1 – 4 roads; or
- public and separate school frontage roads and those intersections immediately adjacent to school properties.

b) Systematic Ice Control

- **General**
  During systematic ice control operations, the operational objective is to complete one cycle of ice control on spot sections of all roads which have been systematically plowed.

- **Locations**
  All roads which have been systematically plowed.

- **Time Frames**
  Systematic ice control will be completed within the following time frames:

  Category 1 and 2 roads within four hours of systematic plowing.
  Category 3 and 4 roads within eight hours of systematic plowing.
  Category 5 and 6 roads within 24 hours of systematic plowing.

- **End conditions**
  The effectiveness of ice control can not be pre-determined.

  Spot sections of roads that are typically treated, based on the judgement of staff are:

  - sections leading up to sign or signal controlled intersections and crosswalks;
  - bridge decks and subways including the approach to and exit from;
  - grades greater than 5%;
  - ramps and merging lanes;
  - curves located on Category 1 – 4 roads; or
  - public and separate school frontage roads and those intersections immediately adjacent to school properties.

c) Routine Maintenance

- **General**
  During routine maintenance for the ice control activity, the operational objectives are to:

  - Complete one cycle of ice control following post snow event cleanup operations. This cycle will be similar to that provided during systematic ice control.
  - Conduct routine ice control on each road category at a pre-determined cycle frequency.

- **Time Frames**
  The one cycle of ice control will be completed within eight hours following post snow event clean-up operations.

  Routine ice control cycle frequency will be as follows:

Category 1 roads (posted speeds> 70kph)	12 hour cycle
Category 1 roads (posted speed < 70 kph)	24 hour cycle
Category 2 roads	24 hour cycle
Category 3 roads	48 hour cycle
Category 4 roads	48 hour cycle
Category 5 roads	120 hour cycle
Category 6 roads	120 hour cycle

- **End Conditions**
  The effectiveness of ice control can not be pre-determined.

  End conditions are judged solely on whether cycle frequency time frames have been met.

  Spot sections of roads that are typically treated, based on the judgement of staff are:

  - sections leading up to sign or signal controlled intersections and crosswalks;
  - bridge decks and subways including the approach to and exit from;
  - grades greater than 5%;
  - ramps and merging lanes;
  - curves located on Category 1 – 4 roads; or

- public and separate school frontage roads and those intersections immediately adjacent to school properties.

3.2 Alleys

The City does not classify the alley network for the purpose of prioritizing ice control activities in alleys.

Ice control activities for alleys are conducted as time and resources permit. No time frames are specified for ice control in alleys.

- **Locations**
  Alleys that will be considered for ice control activity must:

  - Have a majority of commercial or apartment building properties adjacent to the alley;
  - Be adjacent to school parking lot entrances or school bus unloading zones that are located in an alley; or
  - Have grades exceeding 5%

- **End Conditions**
  The effectiveness of ice control can not be pre-determined.

  Ice control will be applied on spot sections at the alley exit points and on grades exceeding 5%.

3.3 Sidewalks

The City does not classify the sidewalk network for the purpose of prioritizing ice control on sidewalks.

- **Locations**
  - Any sidewalk adjacent to a City owned building or property that is located within the area noted in Schedule B of The Clean Property Bylaw No. 9881.
  - Any sidewalk adjacent to a City owned building or parking lot that is regularly used by the public during the winter season, excluding outdoor rinks.
  - Any sidewalk adjacent to bridge decks and subways.
  - Any sidewalk adjacent to Transit stops on the Heritage bus routes which are not covered by The Clean Property Bylaw No. 9881.
  - Adjacent to no frontage locations.

- Adjacent to storm channel and railway crossings on Category 1 and 2 streets.
- Adjacent to vacant land on Category 1 and 2 streets.
- Adjacent to city owned parks on Category 1, 2, 3, and 4 streets.
- Adjacent to city owned parks that are next to a public school.
- Adjacent to city owned buildings or parks not accessed by the public in winter on Category 1 and 2 streets.
- Adjacent to hospital gateway (sidewalks both sides on 14th Avenue from Broad Street to the alley east of Halifax Street).
- Adjacent to Core Community Park (Quebec Street side).

- **Time Frames**
  Ice control activities following freezing rain events will be completed within 72 hours from end of event.

  Ice control activities on compacted snow surfaces as determined by staff have no time frame for completion specified.

- **End Conditions**
  The effectiveness of ice control can not be predetermined.

  End conditions are not specified.

4.0 SNOW REMOVAL

- **General**
  Plowing and ice control activities take precedence over snow removal activities both during a snow event and during systematic plowing or systematic ice control operations. Snow removal operations may be suspended at the beginning of snow events or during systematic operations so resources can be reallocated to address non-typical winter conditions and higher priority objectives.

- **Locations/Time Frames/ End Conditions**
  a) At the following locations, snow ridges of any height caused by plowing will be cleared from those areas within the time frames noted.

     - In school bus unloading zones at schools within 48 hours of road plowing (curb face showing).
     - In unloading zones in front of seniors complexes with over 20 units in a single building within 14 days of plowing.

- In disabled metered parking stalls within 24 hours of plowing.

b) At the following locations, snow ridge heights caused by plowing will comply with the sight line controls as set out in section 69 and Schedule H of the Traffic Bylaw within the time frames noted:

- At intersections adjacent to school properties and, at school fence gates that are opening onto roads within seven days of plowing. The snow ridge will be reduced at these locations to a maximum height of 30 cm.
- At signal or sign controlled pedestrian corridors within 14 days of plowing.
- At intersections on Category 1 and 2 roads, within 14 days of plowing.

c) Snow removal involving load and hauling off site will generally be initiated when:

- On blocks where the school bus unloading zones are located, snow ridges in excess of 75 cm exist – within 14 days of plowing.
- In metered parking stalls, snow ridges in excess of 60 cm within 14 days.
- Snow ridges generally greater than 1 m in height that impact travel widths or sight lines as determined by City staff on:
  - Category 1 and 2 roads;
  - Roads within the area bounded by Victoria Avenue to College Avenue and Albert Street to Broad Street;
  - 4th Avenue to Dewdney Avenue and Albert Street to Toronto Street;
  - Roads immediately adjacent to Regina General Hospital;
  - 14th Avenue from Halifax Street to Broad Street;
  - 15th Avenue from Broad Street to Winnipeg Street; and
  - Category 3 roads needed to provide City Transit with adequate travel width.

Appendix C
Policy Review and Feedback

The Winter Maintenance Policy review process included research of other municipalities as well as extensive engagement with residents, and external and internal stakeholders. The feedback was used to identify the most critical common areas of improvement in winter maintenance that needed to be addressed.

Identification of Key Areas of Concern Based on Collective Feedback:

1. Ice control on intersections
2. General conditions of residential roads
3. Accessibility of sidewalks around transit stops
4. General conditions of sidewalks
5. Safety around school zones
6. General conditions around Transit routes
7. General conditions of Bike lanes
8. Simplifying Policy document

Survey:

A winter Maintenance Policy Review Survey was conducted under '*Be Heard Regina'* initiative during Q1, 2020 to gather feedback from residents, businesses and anyone who was impacted by Winter Maintenance Policy service levels and could provide some useful feedback.

Multiple communication methods were adopted to reach out to maximum residents, businesses, stakeholders and visitors. Some of the communication channels included Public Service Announcements (PSA), media interviews, City of Regina's social media handles like Facebook and Twitter, City's winter webpage and stakeholder engagement.

Approximately 3000 residents and businesses responded to the survey and provided valuable feedback by answering a range of multiple-choice questions and writing comments in response to open-ended questions designed to encourage a richer feedback for final evaluation and analysis purpose.
Quantitative and Qualitative data from the survey results was analyzed to identify top five areas of concern relating to winter maintenance.

Identification of Critical Areas of Concern Based on Survey Feedback:

1. Ice control at intersections
2. General conditions of residential roads
3. Timely plowing of snow
4. General conditions of major roads
5. Sidewalks maintenance
6. Simplification of the policy document for better understanding

Survey Findings:

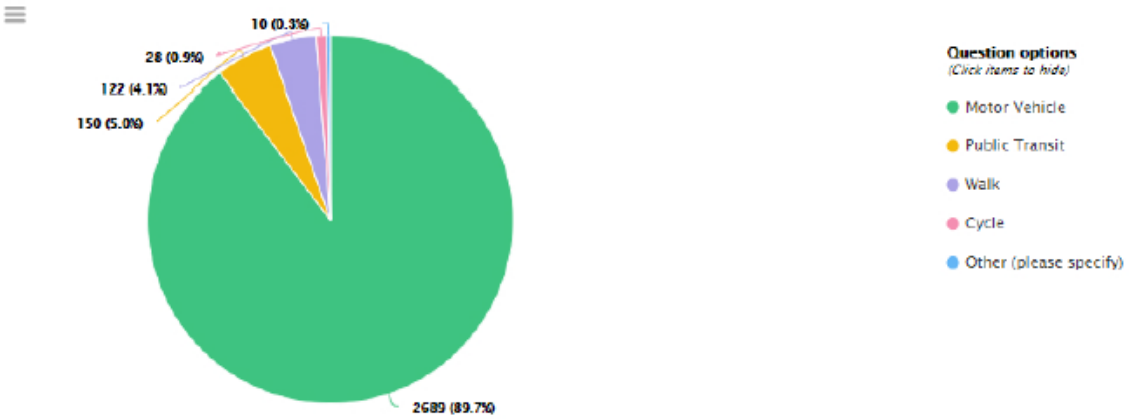
As evident from the Table 1 below, generally the respondents are satisfied with the current level of service towards majority of the policy parameters except '*general satisfaction with ice control and snow plow timelines on local/ residential roads*' for which the satisfaction level seems quite low (only 35%).

Table 1 Winter Maintenance Review Survey Findings

Key Policy parameter	**Respondents %** Satisfied with current LOS or No comments	**Respondents %** Not Satisfied
General satisfaction with road plowing and winter road maintenance	74%	26%
General satisfaction with snow plowing timelines	74%	26%
General satisfaction with ice control and snow plowing timelines on major roads	72%	28%
General satisfaction with ice control and snow plowing timelines on local/ residential roads	35%	65%
General satisfaction with current approach to snow removal	79%	21% However, 59% of these do not want an increased tax component to support snow removal enhancement
Sidewalks	76%	23% However, 53% of these do not want an increased tax-component to assist with the service enhancement
Priority Roads ·General satisfaction with road categorization	80%	20%

Survey Summary:

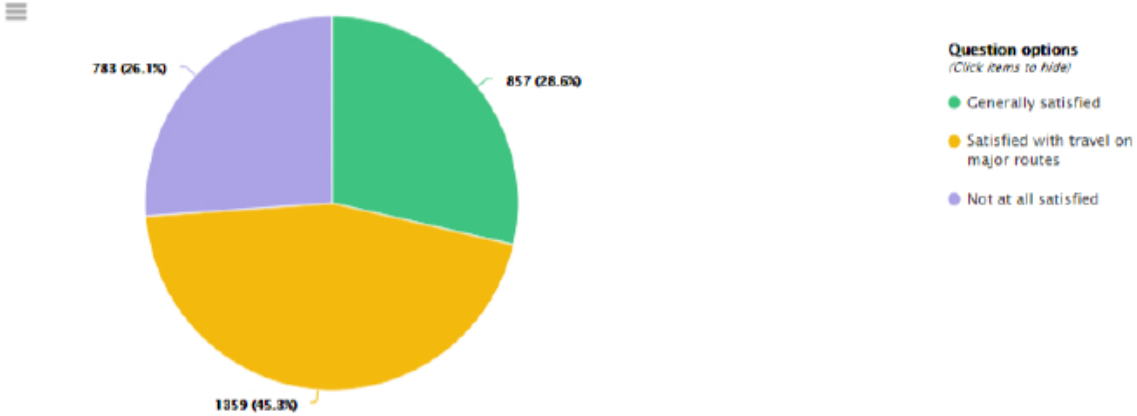
Q3 What is your primary way to get around Regina in winter?



Overview Pulse Responses

(2999 responses, 0 skipped)

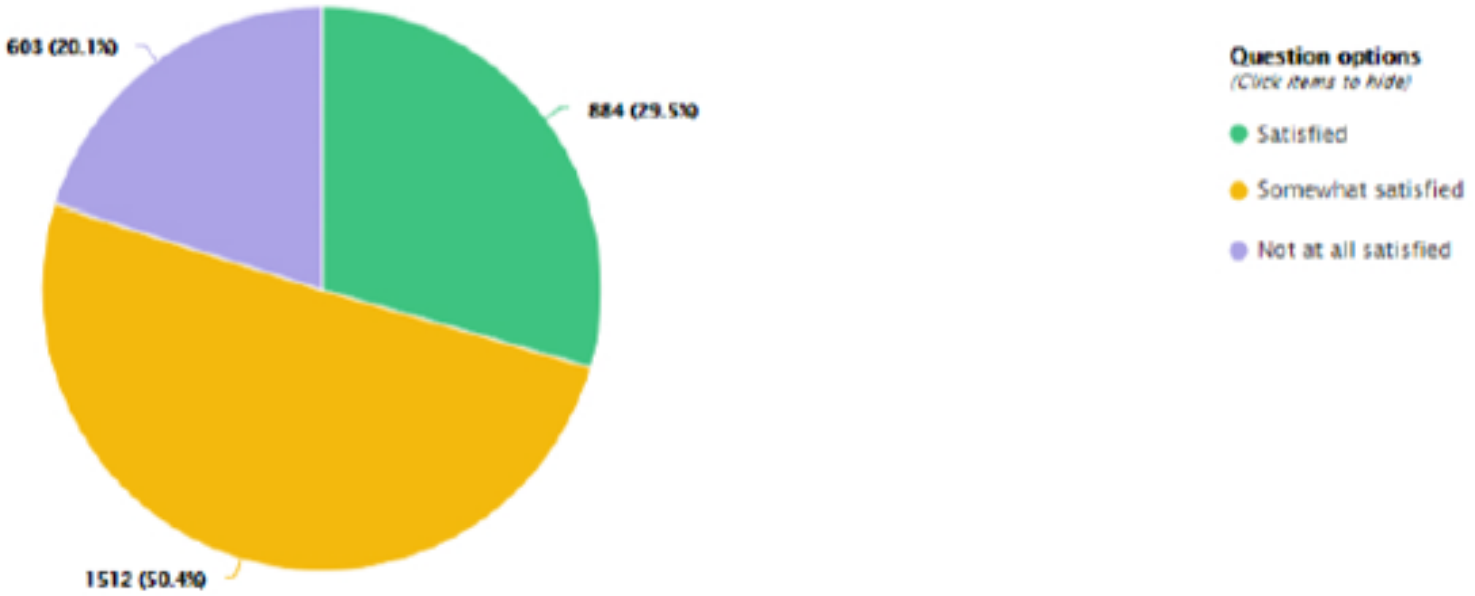
Q4 Thinking back over the last two winters, how satisfied are you with how the City plows and maintains roads from November 1 to March 31?



Overview Pulse Responses

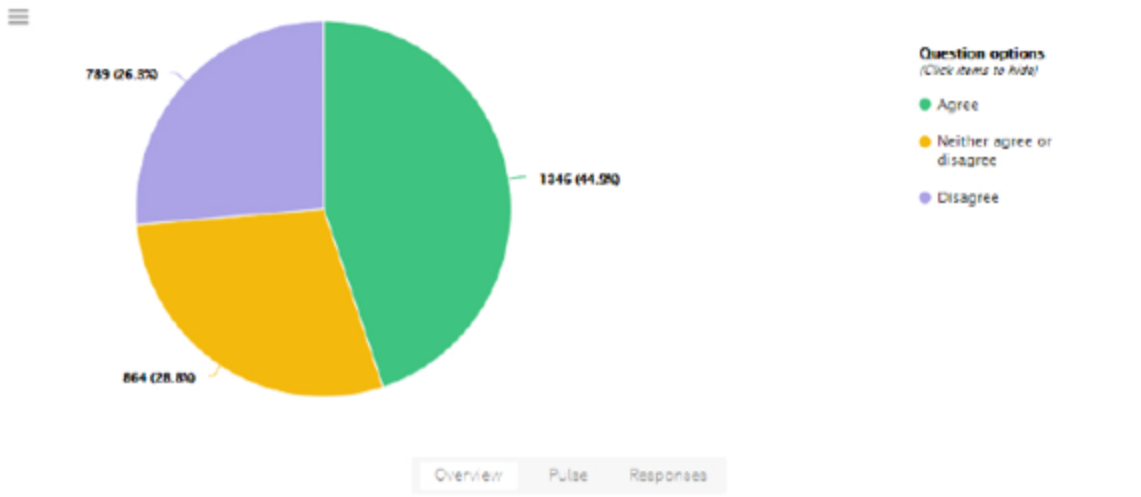
(2999 responses, 0 skipped)

Q5 How satisfied are you with the above categorization?

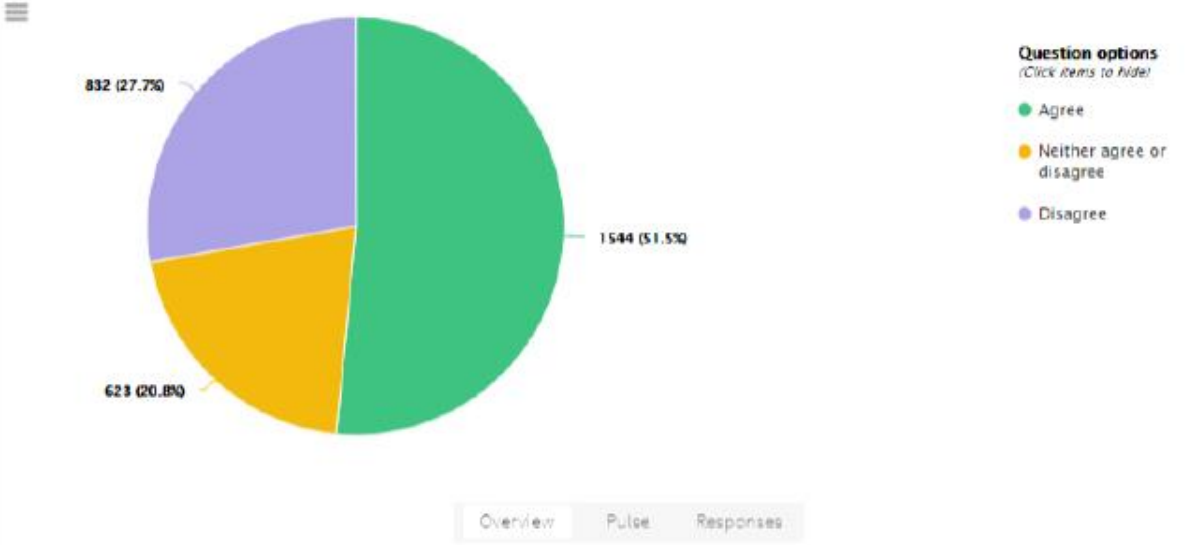


Overview Pulse Responses

Q8 The City of Regina's snow plowing activities typically occur within a reasonable amount of time.

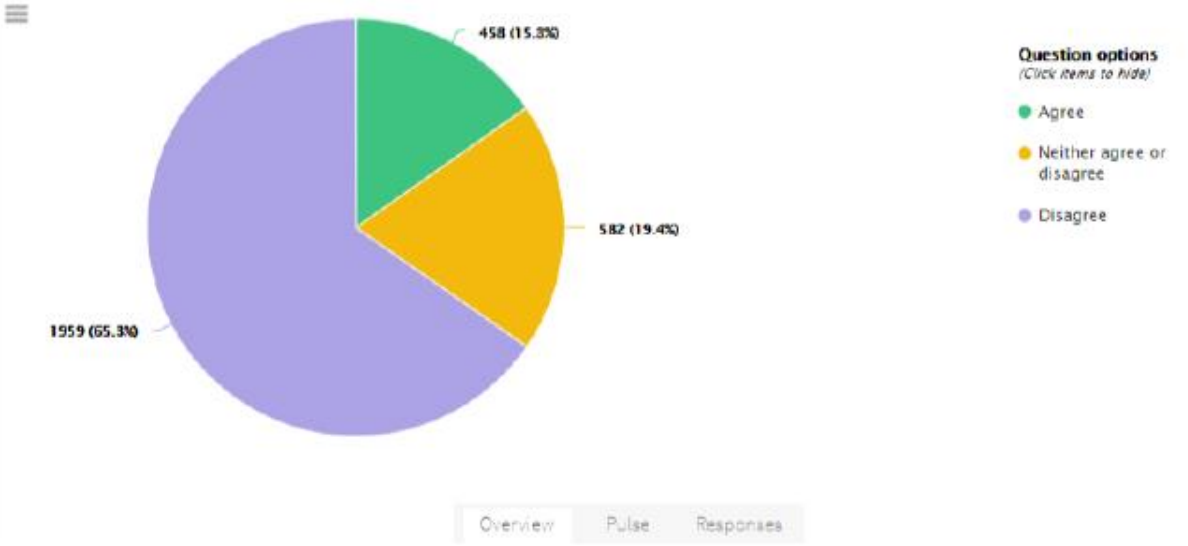


Q9 I am satisfied with ice control and snow plowing of major roads.

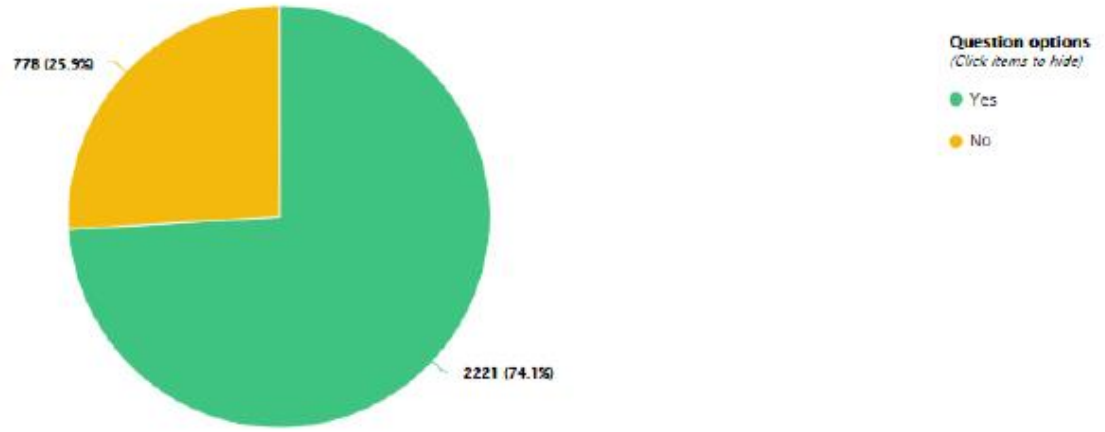


(2999 responses, 0 skipped)

Q10 I am satisfied with ice control and snow plowing of residential streets.



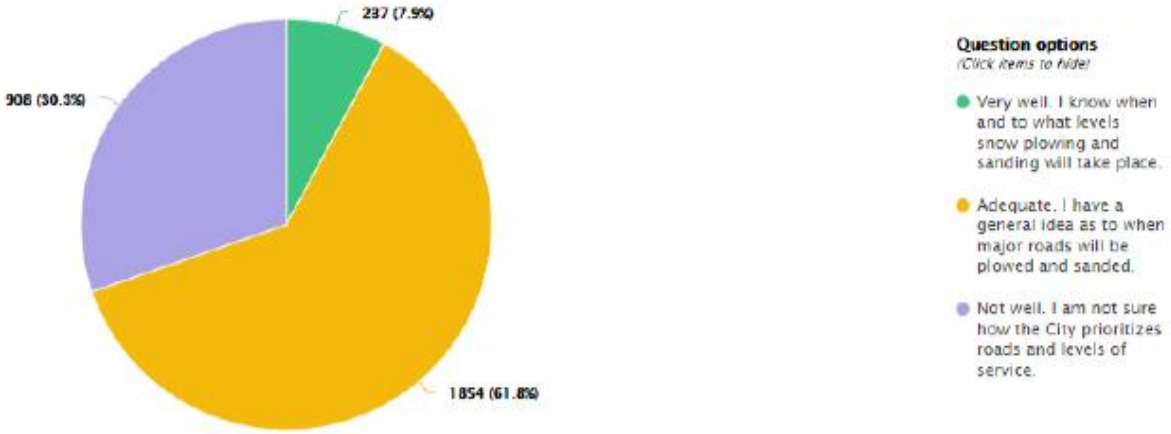
Q14 Were you aware that the City has a Winter Maintenance policy to guide how streets are plowed during the winter?



Overview Pulse Responses

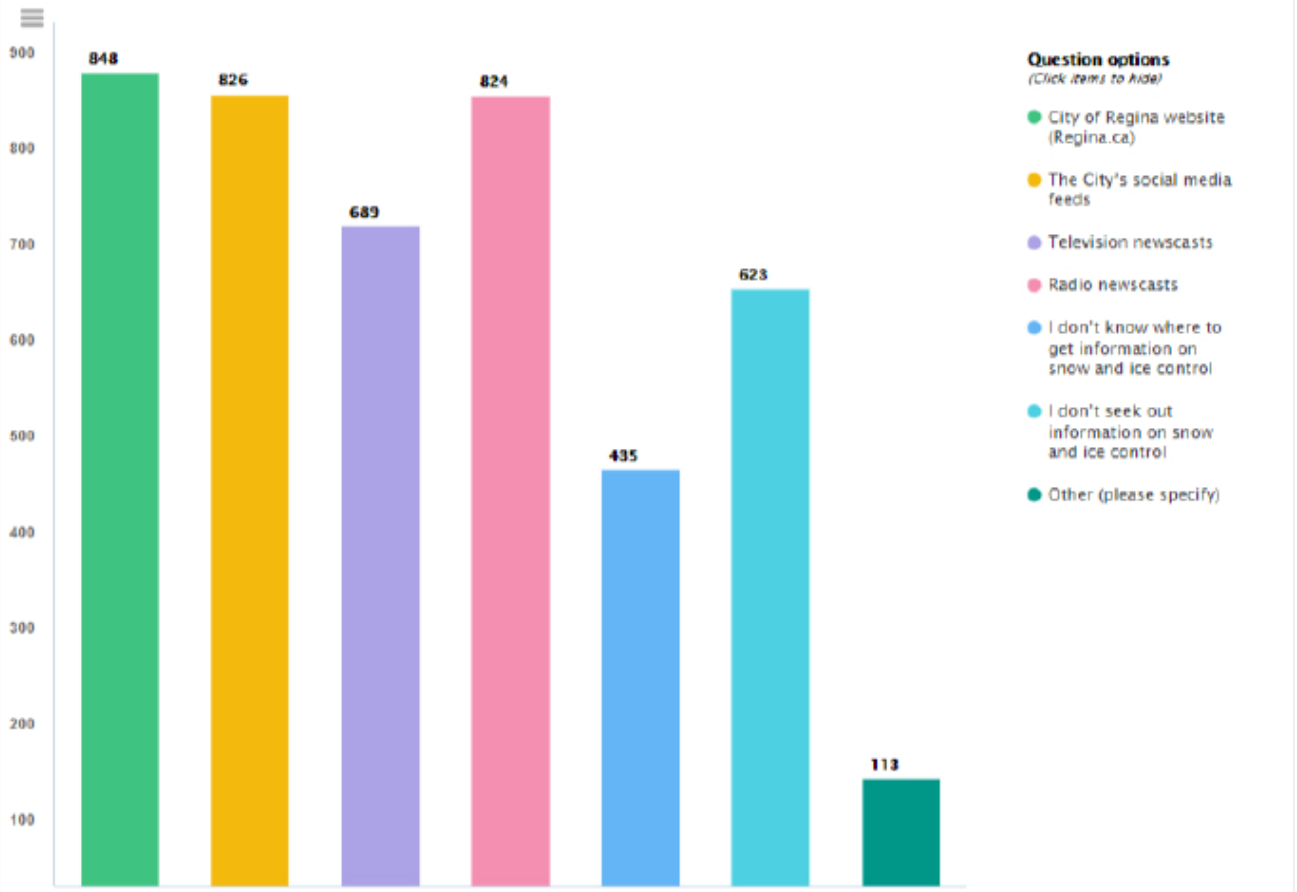
(2999 responses, 0 skipped)

Q15 How well does the City communicate its priorities for winter snow plowing and maintenance?

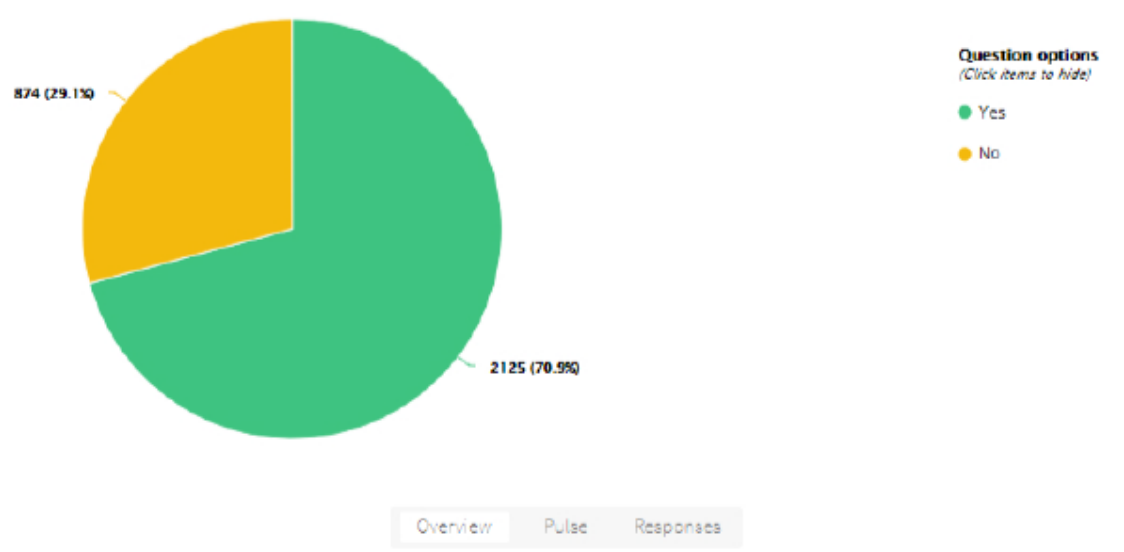


Overview Pulse Responses

Q16 How do you get information about winter road maintenance?

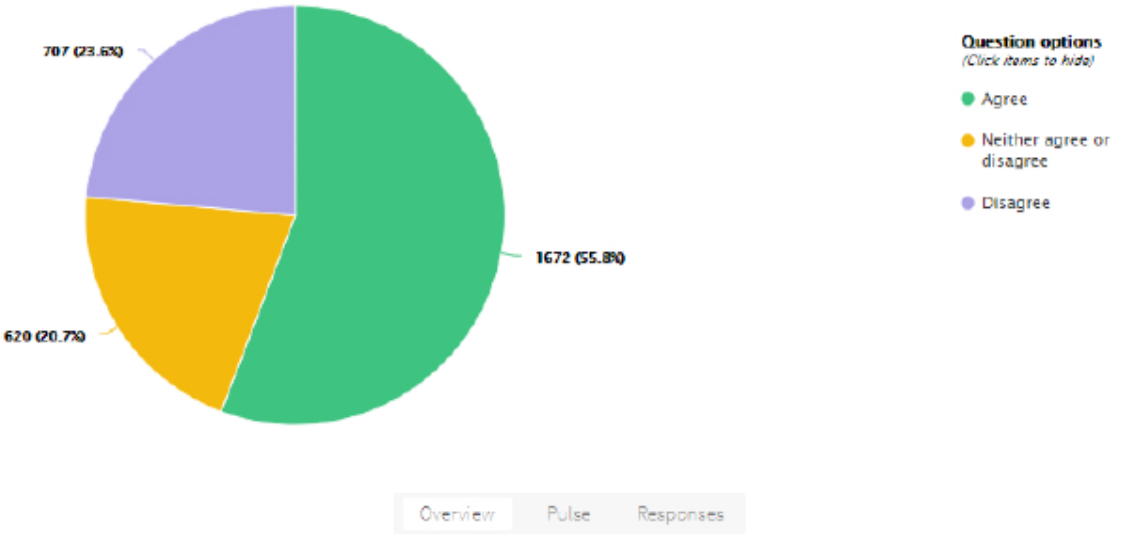


Q17 I am aware of the City's approach to winter sidewalk maintenance.

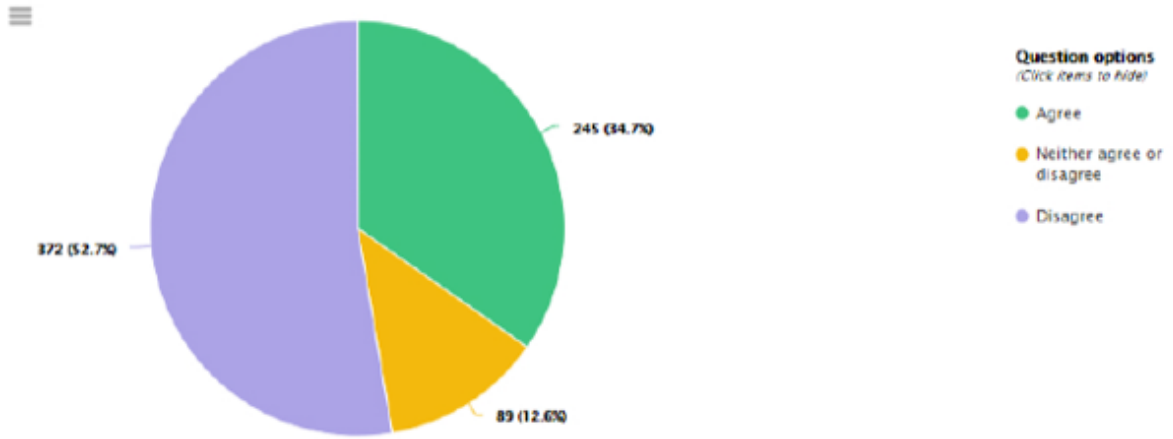


(2999 responses, 0 skipped)

Q18 I can support the approach the City is taking to sidewalk maintenance, including requiring businesses and encouraging citizens to be responsible for their own sidewalk clearing.

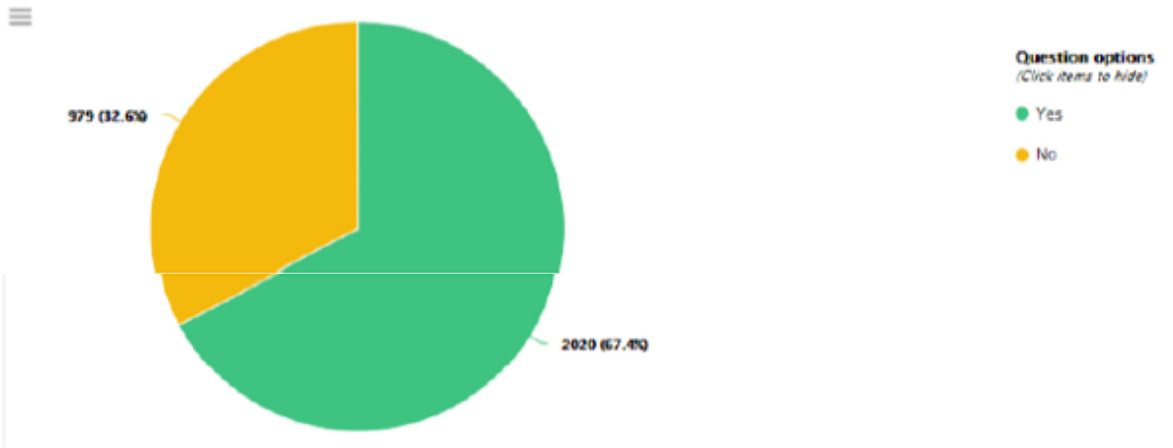


Q19 If Disagree, I can support increasing taxes to support enhanced sidewalk maintenance.

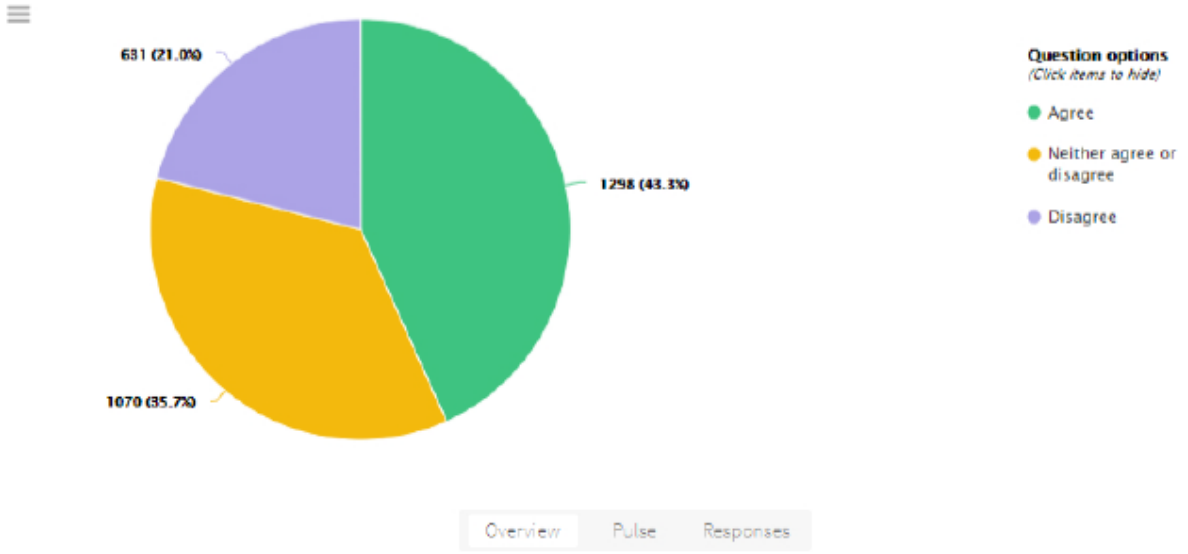


Optional question (706 responses, 2293 skipped)

Q20 I am aware of the City's approach to removing snow.

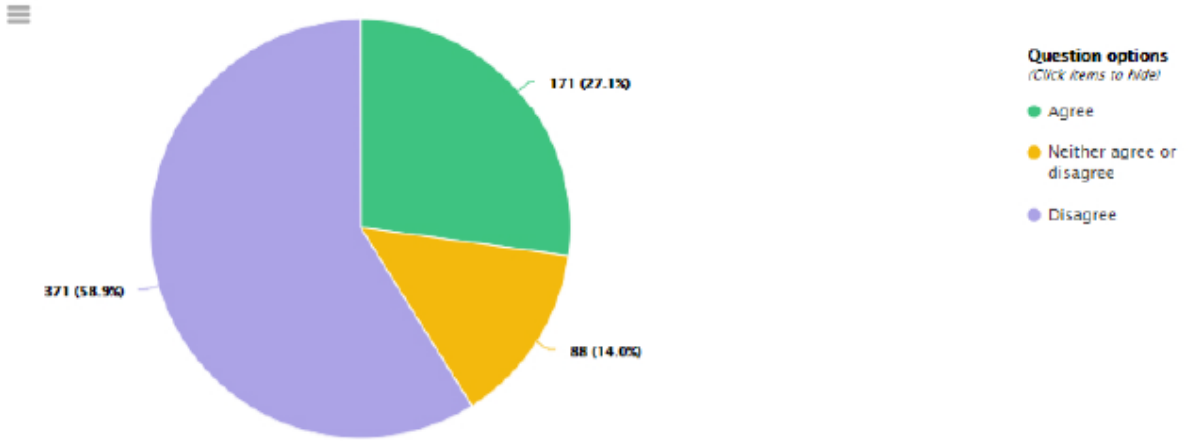


Q21 I can support the City's approach to removing snow.



(2999 responses, 0 skipped)

Q22 If Disagree, I can support increasing taxes to support enhanced snow removal.



Q25 As a resident, I would prioritize the following three areas for improvements to winter road maintenance.Please select your top three choices.

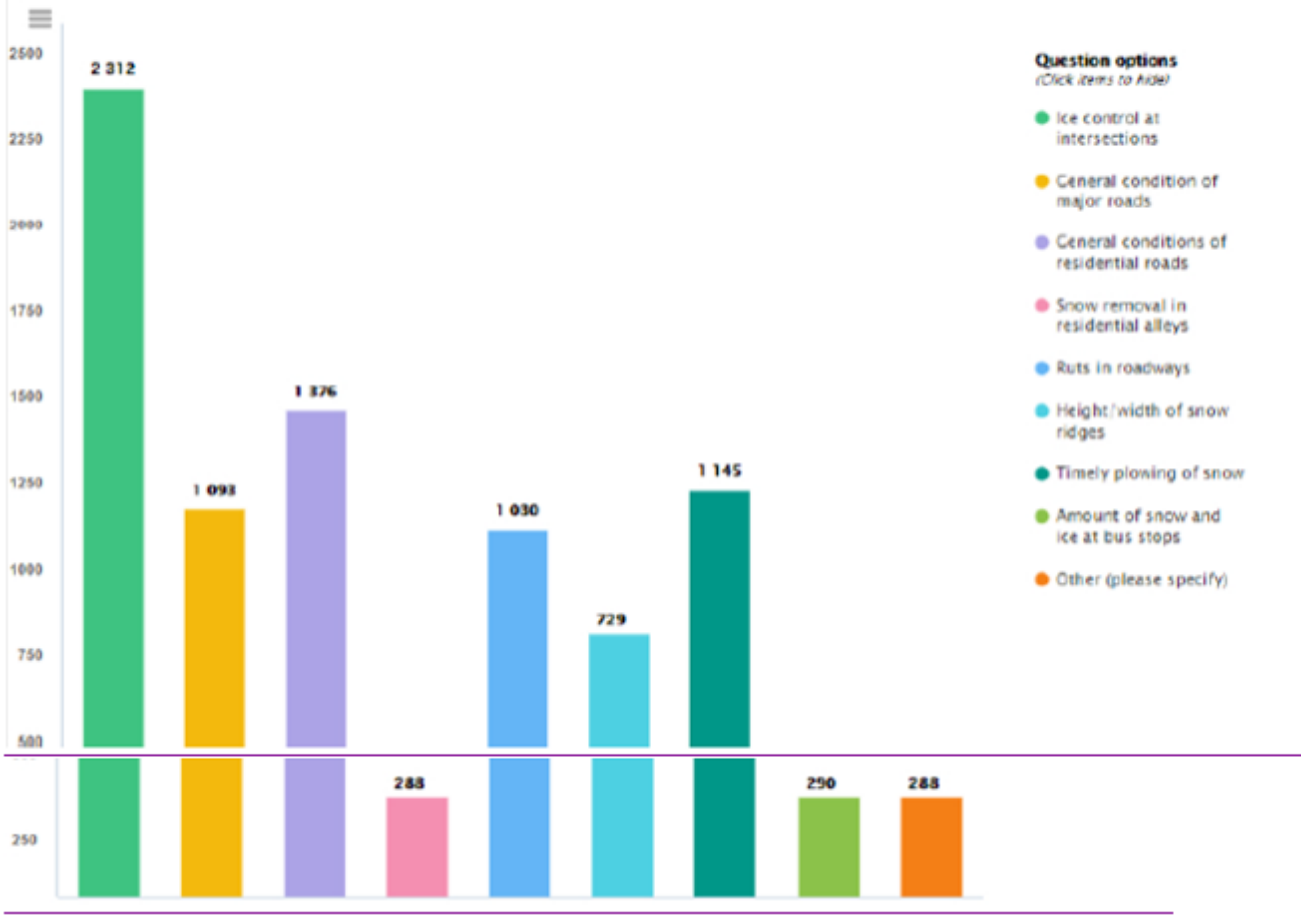


Table 2: Qualitative data from the Winter Maintenance Policy Review Survey:
(based on responses to the open-ended questions)

Other Observations from Survey Results	Evidence
Demand for enhanced residential winter maintenance programs including ice control, road plowing and frequent removal to avoid slippery conditions and ruts	Over 350 comments
Better coordination required between plowing and sanding activities. Especially, the time gap between plowing and sanding activity should be minimized	Over 300 comments
- Residents' want to establish a system of getting accountability and assurance from those private property owners who do not clear their sidewalks on time causing inconsistency around the city. - Demand for strict enforcement of existing sidewalk clearing clause in the *Clean Property Bylaw* for businesses, commercial property owners. - Some suggestions for creating a new bylaw provision enforcing citywide residents/ private property owners to clear their walks within 48 hours like in other jurisdictions.	Over 300 comments
Suggestions regarding making small changes in the current operational practices in order to achieve compliance to the levels of service for several policy parameters	Based on over 300 comments
Feedback to not raise taxes to achieve desired levels of service	Over 100 comments
Improve School zones plowing and removal. Do not leave ridges on either side of the streets around schools	Over 100 comments
Eliminating unnecessary cycling of roads with sanding equipment when no freeze thaw conditions	Over 100 comments
Finding: Residents' general awareness about current Winter Maintenance Policy not sufficient. Several comments could have been avoided if sufficient awareness was there.	Several examples in the survey comments
Improve communication relating to winter activities as well as policy.	Over 70
Full scale plowing activity on all roads should start while it is still snowing. Residents want all plows to be out even when <5cm snow on the ground or just at the start of snowfall	Over 60 comments
Many residents commented that the current WM policy is very good. No need to change. Just need to properly implement	Over 100 comments

Stakeholder Feedback:

Several internal and external stakeholders in the city and their associates get impacted by City's Winter Maintenance Policy. City Administration identified such stakeholders and engaged with them through meetings, phone calls and emails to get their feedback on current policy as well as expectations relating to improved winter maintenance service levels.

Feedback received from the stakeholders was utilized to identify their key concerns relating to winter maintenance.

Following are the key stakeholders who were approached for feedback:

Internal Stakeholders:
Transit and Fleet (including Transit Operations, Paratransit & Revenue Services, Fleet Maintenance), Regina Fire & Protective Services, Emergency Preparedness and Business Continuity, Service Regina, Parking Services, Bylaw Enforcement, Citizen Services

External Stakeholders:
Regina Public and Catholic School Boards, Regina Downtown business Improvement District (RBID), Saskatchewan Health Authority (SHA), City of Regina Accessibility Committee, Pedestrian School Traffic Safety Committee, Saskatchewan General Insurance (SGI)/ City of Regina/ Regina Police Service Traffic Safety Committee, Regina Police Services, Business Owners & Managers' Association (BOMA)

Identification of Critical Areas of Concern Based on Stakeholder Feedback:

1. Transit routes & Bike lanes to get higher priority and enhanced levels of service
2. Sidewalks around transit stops to get enhanced LOS especially for wheelchair accessibility
3. Safer school zones. Snow ridges to be removed from both sides of roads around schools
4. General sidewalk clearing all over the city
5. Simplification of the policy document for better understanding

Address Gaps in the current Winter Maintenance Policy:

The review of the current Winter Maintenance Policy indicated that although we are currently performing the work, there are some general activities under current Winter Road Maintenance Program that were identified "*to be inserted at later date"*

The review indicated that it would be appropriate to include these general activities in the program in the new policy document as these are critical components of the program and significantly impact residents or businesses in the city.

Following general activities should be considered for inclusion in the new Winter Maintenance Policy:
1. Snow storage sites
2. Snow fencing (ridging)

Research:

Research was carried out to study snow and ice control policies and level of service for municipalities in Western Canada that face similar operational challenges during winter season. These municipalities included Saskatoon, Moose-Jaw, Edmonton, Calgary and Winnipeg. Some of these cities have already gone through the process of updating their snow and ice control policies/ programs in recent years.

Research activity also included evaluating past feedback on winter activities based on Service Requests, engagement with City Council, operational staff, and recommendations, operational challenges, and outcomes of the best practices as recorded in previous Winter Maintenance Summary Reports.

Identification of Critical Areas of Concern Based on Research:
SRs, Council and Operations Staff/ field interactions, previous years' Annual Winter Summary Report, MBN report

1. Priority Roads/ Categorization of roads
2. Sidewalks
3. Residential Roads
4. Snow Ridges
5. School Zones
6. Simplification of the policy document for better understanding

Municipal Benchmarking Network Canada (MBNCanada)
The following graphs from the MBN Canada Performance Measurement Report 2018 indicate the comparison of winter maintenance costs (per lane km) of different municipalities in Canada. The costs are incurred to meet the Policy guidelines relating to the level of winter maintenance service for different programs.
Figures 28.4 and 28.3 below indicate the following:

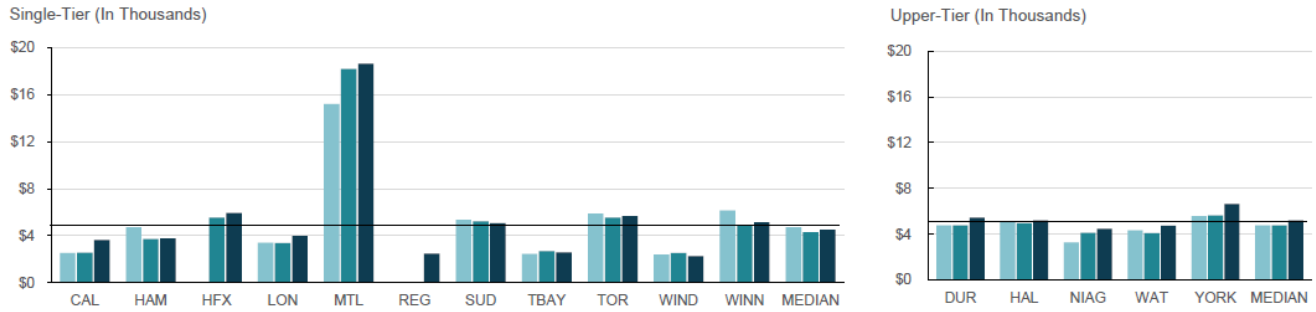
- Total cost for winter maintenance of roads per lane km for Regina is lower than most other municipalities in Canada that face similar challenges during winter but provide higher customer level of service. This shows that the cost of providing winter maintenance service in Regina could increase due to proposed enhancements of level of service.
- Total cost of winter maintenance per lane km of roads is fairly consistent for most municipalities. If required, this finding would be further studied and verified considering influencing factors like weather conditions and traffic volumes.

MBN Report 2018:

Roads

Figure 28.4 Total Cost for Winter Maintenance of Roads per Lane Km Maintained

This measure represents the total cost for winter maintenance of a single lane km. It includes all functions included in clearing and maintaining the roadway, and is not inclusive of sidewalk snow clearing and parking lots.



2016	$2,541	$4,736	N/A	$3,406	$15,189	N/A	$5,352	$2,464	$5,872	$2,406	$6,147	$4,736		$4,760	$5,148	$3,277	$4,322	$5,600	$4,760
2017	$2,566	$3,725	$5,538	$3,383	$18,167	N/A	$5,215	$2,693	$5,553	$2,534	$4,905	$4,315		$4,779	$4,975	$4,108	$4,089	$5,642	$4,779
2018	$3,637	$3,788	$5,946	$3,974	$18,624	$2,496	$5,065	$2,580	$5,665	$2,275	$5,159	$3,974		$5,450	$5,202	$4,459	$4,729	$6,643	$5,202

Source: ROAD309T (Efficiency)

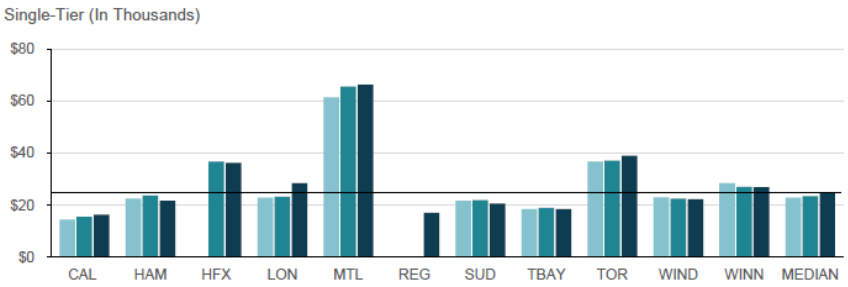
Montreal: The service thresholds for responding to weather incidents and the volume and type of snow removal required due to population density contribute to Montreal's higher cost.

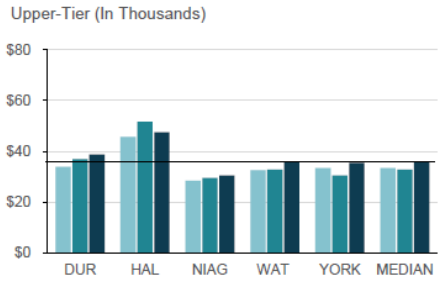
York: Expenditures for the renovation of Central Maintenance Yard and additional snowplows to maintain new Rapidways.

Roads

Figure 28.3 Total Cost for Roads - All Functions Per Lane Km

This measure represents the total cost of all functions related to road maintenance. This includes operating costs and amortization associated with capital costs for paved and unpaved roads, bridges and culverts, traffic operations, roadside maintenance, and winter control for roadways, sidewalks, and parking lots.





2016	$14,454	$22,507	N/A	$22,966	$61,492	N/A	$21,698	$18,486	$36,759	$23,014	$28,459	$22,966	$33,808	$45,667	$28,472	$32,568	$33,341	$33,341
2017	$15,607	$23,785	$36,780	$23,250	$65,657	N/A	$21,958	$18,983	$37,131	$22,506	$27,128	$23,518	$36,956	$51,644	$29,461	$32,838	$30,538	$32,838
2018	$16,394	$21,722	$36,402	$28,430	$66,366	$17,045	$20,704	$18,560	$39,117	$22,356	$26,953	$22,356	$38,775	$47,542	$30,425	$35,718	$35,441	$35,718

Source: ROAD308T (Efficiency)

Halton: Roads restoration costs, contracted services costs and road and bridges amortization increased due to Halton Region's continuous growth, new construction and roads rationalization.

London: Increase in 2018 expenditures due to some project contributions related to non-City owned assets.

Montreal: The higher cost can be attributed to investments in infrastructure and higher amortization costs.

Winter Maintenance Policy Comparison:

Table B below provides summary of the comparison of winter maintenance policies of some municipalities in Western Canada. The table provides comparison of road network classification of different jurisdictions for the purpose of providing winter maintenance and brief information about major winter maintenance programs like road plowing, residential plowing, sidewalk plowing etc.

Table B: Summary of Winter Maintenance Policy LOS & Timelines for Different Cities in Western Canada

	Regina	Saskatoon	Edmonton	Calgary	Moose Jaw	Winnipeg
Facts	**Roadways**: 1100Km **Sidewalks>**1300 Km **Equipment:** Access to 30 graders, 16 sanding plow trucks, 8 sidewalk machines, 4 blowers, 4 loaders, 2 under body plow trucks, 32 dump trucks-semis/tandems **Budget:** 8.8 million (2019)	**Roadways:** 4000 lane Km **Sidewalks:** n/a **Equipment:** n/a **Budget:** 12.59 million (2017)	**Roadways:** 11,000 Km **Sidewalks:** 1,380 Km (walks & trails) **Equipment:** Access to 150 plows, 300 graders, 260 end dumps **Budget:** 65 million (2019)	**Roadways:** 16,000 lane Km **Sidewalks:** 2,000km (city), 4500km (private) **Equipment:** 27 graders, 74 tandem trucks with underbody plow, 18 tandems with front plow and 6 blowers **Budget:** 40.4 million (2019)	**Roadways:** 200 Km **Sidewalks:** 210 Km **Equipment:** n/a **Budget:** n/a	**Roadways:** 7200 Km **Sidewalks:** 3000 Km **Heavy equip:** 300 **Budget:** 30-40 million
Policy Document	Winter Maintenance Policy	Service Level for Snow and Ice Maintenance	Snow & Ice Control Policy	Snow & Ice Control Policy	Winter Maintenance Policy	Snow Clearing & Ice Control Policy
Road Classification	**Category 1 to 6** **Category 1** Freeway, major arterials, designated hospital emergency route. **Category 2** Minor arterials, major collectors with traffic volumes > 5,000 vpd, downtown. **Category 3** Major collectors (traffic volumes < 5,000 vpd),industrial/ commercial roads, minor collector or major residential local roads on a designated transit or truck route. **Category 4** Minor collectors and major residential local roads leading into school bus unloading zones. **Category 5** Residential local roads **Category 6** Gravel roads.	**Priority 1 to 3** **Priority 1:** Freeways, High-use roads, Emergency routes **Priority 2:** Medium use roads & Transit routes **Priority 3:** School zones, bus stops, downtown, business districts	**Priority I to 4** **Priority1** - Freeways, Arterial roadways - Business districts, Busways - Bus stops adjacent to City property - Prioritized sidewalks, trails and bike routes **Priority 2** - Collector/Bus Route Roadways, Transit Park and Ride access roads **Priority 3** Local Industrial Roadways **Priority 4** Residential Roadways, Alleys	**Priority I to 4** **Priority 1** - Streets in Central business district with traffic volumes > 8,000 vpd - Designated routes on high-traffic-volume arterials (> 20, 000 plus vpd). **Priority 2** - Designated streets 5,000 to 19,999 vpd - Traffic lights and controlled crosswalks - Designated emergency routes (adjacent to hospitals and police and fire stations) - Roadways which facilitate marked, on-street bike lanes - Problem areas **Priority 3** - Designated feeders, collectors and bus routes - School and playground zones. - Designated hills. - Stop/yield signs. - Bus stops. **Priority 4** - Residential areas at:	**Priority I to 6** **Priority 1** arterial roads emergency services buildings. **Priority 2** bus routes **Priority 3** remaining collector roads and areas with potential drainage issues. **Priority 4** local collector routes **Priority 5** all remaining roads **Priority 6** parking lots.	**Priority 1 to 3** **Priority 1**All Regional Streets, hospital route **Priority 2** Non-regional bus routes and collector streets based on traffic counts, some streets in industrial areas **Priority 3** Residential and/or little used industrial streets.

		Regina	Saskatoon	Edmonton	Calgary	Moose Jaw	Winnipeg
					- School and playground zones - Designated hills		
Plow Triggers	Arterials	5 cm	5 cm	-	5 cm	-	3 cm
	Collectors	5-10 cm	5 cm	-	5 cm	-	5 cm
	Residential	25 cm	15 cm	-	12 cm (using graders); 5 cm (plow trucks)	-	10 cm
Plow Timelines	Arterials & Collectors	PLOWED & SANDED in 60 Hours to Bare pavement	PLOWED & SANDED in 72Hours to Bare pavement	PLOWED & SANDED in 48Hours to Bare pavement	PLOWED & SANDED in 48Hours to Bare pavement	PLOWED & SANDED in 48Hours to Bare pavement	PLOWED & SANDED in 36Hours to Bare pavement
	Residential	Residential systematic plow timeline not specified. Typically completed in 12-14 days after snow event	Residential plow timeline not specified	completed within 7 days, commencing within 48 hours following the end of the snowfall.	completed within 4 days, commencing within 48 hours following the end of the snowfall.	maintained based on rutting and drainage Residential streets are not normally completed as part of the Snow Management program	The snow plowing operations shall be completed within five working days
Sidewalk Policy		Encouragement model	Enforcement model	Enforcement model	Enforcement model	-	City clears
Transit Routes		Category 3	Priority 2	Priority 2	Advanced priority when plowing	-	Advanced priority when plowing
School Zones		Snow removed completely from one side of school unloading zones	Snow removed completely from both sides of school unloading zones	Snow removed completely from both sides of school unloading zones	The policy document does not specifically mention details of the school zone snow clearing. The only reference about schools in the main policy comes under road classification.	-	Priority shall be given to remove snow from high piles located at intersections and lane entrances in the vicinity of elementary schools. (No mention of the pile height in policy document)

Appendix D
Road Network Reclassification

Current Classification:
Based on the current Winter Maintenance Policy, the City of Regina roads including expressways, arterials, collectors, locals, gravel roads etc. are classified into six categories primarily based on the daily traffic volumes.

Category	Length Km	Timeline-Hour	Snowfall trigger-cm
Category1: Freeways/ Expressways including ramps and loops, major arterials, and any road on a designated hospital route	157	24	5
Category2: Minor arterial roads, major collector roads with traffic volumes greater than 5,000 vehicles per day (VPD) and all roads in the area referred to as Regina downtown	114	36	5
Category3: Major collector roads with traffic volumes less than 5,000 VPD, industrial/ commercial roads, and any minor collector or major residential local roads on a designated transit or truck route	178	48	10
Category4: Minor collector roads and major residential roads which lead into school bus unloading zones	59	60	10
Category5: Residential local roads	541	No	25
Category6: Gravel roads	47	60	10
Total	1096 Km		

Concern: Based on survey feedback, major roads like transit routes, high traffic residential roads, gravel roads getting lower level of service. In addition the road classification needed to be simplified.
Recommended Classification: Roads classified into 5 categories only

Category	Length Km	Expected Timeline-Hour	Snowfall trigger-cm
Category 1: Freeways/ Expressways, major arterials, roads on a designated hospital route	157	24	5
Category 2: Minor arterial roads, major collector roads with traffic volumes greater than 5,000 vehicles per day (VPD), transit routes, all roads in the area referred to as Regina downtown, and all bike lanes	204	36	5
Category 3: Major collector roads with traffic volumes less than 5,000 VPD, minor collector roads, industrial / commercial roads. Residential / local with traffic volume greater than 1500 VPD and roads which lead into school bus unloading zones.	156	48	5
Category 4: All gravel roads	47	60	5
Category 5: All local/ residential with traffic volume less than 1500 VPD	532	No	15
Total	1096 Km		

CATEGORY 1:
No changes in the road categorization for Category 1 roads. Levels of service remain the same as in the existing Policy.

CATEGORY 2:
Significant change in this category as all transit routes and bike lanes are added to this category. This would ensure enhanced level of service for transit routes and bike lanes in comparison with the existing policy.

CATEGORY 3:
Reclassification of the roads would allow all roads currently classified under existing policy as category 3 and 4 to be classified as category 3 roads. All residential / local roads with traffic volume greater than 1500 VPD would also be escalated to category 3, receiving an increased level of service. The Category 3 road network would include remaining collectors, roads in industrial and commercial zoning areas, roads leading to school bus unloading zones as well as all residential / local roads with traffic volume greater than 1500 VPD.

CATEGORY 4:
Gravel roads within City limits.

CATEGORY 5:
All residential roads with traffic volume less than 1500 VPD to be classified as category 5 roads.

Cost of Enhancement: As specified in Appendices E to M

Advantages:

- plowing all arterial and collector roads after a 5-centimetre event
- plowing residential roads after a 15-centimetre event
- transit routes and bike lanes upgraded to Category 2 roads or higher
- school unloading zones upgraded to a Category 3 road or higher
- residential roads with traffic volumes greater than 1500 VPD upgraded to a Category 3 road
- snow removal would take place on arterial and collector roads when lane widths and/or sightlines negatively impacted due to repeated plowing operations
- simpler classification

Disadvantages:

- None

Appendix E
School Unloading Zones

Current Policy:
The current Winter Maintenance Policy for snow clearing in front of schools specifies that snow ridges are removed when they exceed 30 centimeters in the School Bus Unloading Zone and exceed 75 centimeters on the remainder of the road adjacent to the school. However, there are no provisions for snow removal on the side of the road opposite of the school.

Concern:
Leaving snow ridges on the opposite side of the school hinders with the parking of the vehicles especially during pick-up and drop-off times. The snow ridges also pose as a safety hazard for children and others accessing the schools. The snow ridge on one side of the school may impact the road capacity in front of the schools.

Feedback from the survey, stakeholders and Service Requests suggested that snow ridges should be removed from both sides of the road after a snowfall and systematic plowing operations.

Recommendation:
Upgrade the road plowing classification of all school unloading zones to Category 3 or higher and remove the snow ridges completely on both sides of the road adjacent to a school after a systematic plowing event. Removal activity would be performed during off peak school hours.

Cost of Enhancement:
The cost for this enhancement is $100,000 annually.

Advantages:
- snow ridge free school drop-off zones
- provide safer school unloading zones and would improve road capacity around schools
- no equipment on school zones between 8 am and 4 pm

Disadvantages:
- operational flexibility lost as maintenance work around schools would be restricted during daytime

Appendix F
Transit Stop Accessibility

Current Policy:
The current Winter Maintenance Policy for snow plowing on sidewalks includes maintaining sidewalks adjacent to City-owned parks and facilities, bridge decks and subways, and locations that do not have a property owner fronting the sidewalk.

Examples of the locations where City crews clear sidewalks:

- Adjacent to city owned buildings
- Adjacent to Bridge decks and subways
- Adjacent to Transit stops on the Heritage bus route
- Adjacent to No frontage locations on all Category streets
- Adjacent to Storm channel and railway crossings on Category 1 and 2 streets
- Adjacent to Vacant land on Category 1 and 2 streets
- Adjacent to city owned parks on Category 1, 2, 3, and 4 streets
- Adjacent to city owned parks that are next to a public school
- Adjacent to the General Hospital gateway (sidewalks both sides on 14th Avenue from Broad Street to the alley east of Halifax Street)
- Adjacent to Core Community Park (Quebec Street side)

Sow clearing on these sidewalks is triggered with the systematic plow and the target is to clear within three days following a winter storm.

Concern:
The above locations only represent a small percentage of sidewalks in the community, with most of the responsibility assigned to the property owners adjacent to the sidewalk.
There is a requirement for commercial properties to clear their sidewalk as outlined in *The Clean Property Bylaw*, however residential properties are not included. The City uses an encouragement approach rather than an enforcement approach to motivate residents to be a good neighbor and clear their sidewalks. Unfortunately, this does not always happen, and it creates accessibility challenges for users of the transit system when the pick-up and drop-off locations are not consistently cleared.

Feedback from the survey, Service Requests and engagement with stakeholders suggested that there was a need to significantly improve snow clearing efforts around transit stops. This is also in alignment with OCP goals of offering a range of year-round sustainable transportation choices for all, as well promoting active transportation.

It should be noted that this option would not be required if City Council opted to implement a Bylaw requiring all property owners to clear the sidewalk adjacent to their property.

Recommendation:
Plow all sidewalks adjacent to transit stops. This will mean plowing snow from approximately 160 kilometres of sidewalks with over 1400 transit stops all over the community. The complete stretch of the sidewalk with transit stop will be plowed for the entire block.

Cost of Enhancement:
The cost for this enhancement is $339,000 annually

Advantages:

- improved accessibility of transit stops
- meet long standing request of stakeholders
- benefit community's aging demographics, persons with disabilities and accessibility challenges, transit users and pedestrians in general
- aligns with City's OCP/ TMP goals

Disadvantage:

- sidewalks not adjacent to the transit stops will not be cleared and there may be a negative perception that the City is clearing some residents sidewalks and not others
- does not address accessibility on the remaining sidewalk network

Appendix G
Transit Route General Conditions

Current Policy:
The current Winter Maintenance Policy states that all transit routes are to be classified as a Category 3 priority or higher. This means that during systematic plowing operations, many of the transit routes in the community can take up to 48 hours to complete after a snow event.

Concern:
Regina Transit needs clear and safe roads to carry out consistent service level commitments and schedules thereby elevating the role of public transit and optimizing the road network capacity. Regina transit routes cover a total of 650 km of the road network.

Regina Transit may be the primary mode of transportation for many residents after a snowfall. This may be especially true during a major snow event when major roads are cleared relatively quickly but residential roads take more time.

Feedback from Service Requests and internal stakeholders such as Regina Transit and Winter Maintenance staff suggest that transit routes should be classified as a higher priority and cleared faster.

Recommendation:
Upgrade the road plowing classification of all transit routes to Category 2 or higher. This will ensure the transit routes are plowed earlier and more frequently. Administration will also recommend frequent quality checks after maintenance work is completed at the end of each storm.

Cost of Enhancement:
There are no costs associated with this level of service enhancement and Administration will utilize existing tools and resources to implement this enhancement for the 2021/2022 season.

Advantages:
- elevates the role of public transit (OCP/ TMP Goal 2)
- enhanced level of service for transit routes
- reduced snow build-up on transit routes due to frequent plowing with 5 centimetres accumulation
- all transit routes will be plowed within 36 hours

Disadvantages:
- transit routes may change every season

Appendix H
Residential Road General Conditions

Current Policy:
The current policy classifies the residential roads as Category 5 roads and specifies that they are plowed after a snow event greater than 25 centimetres or when rutting exceeds ten centimetres. The City performs ice shaving activity to reduce ruts generally throughout the season to keep rutting to a minimum.

In the previous years, with more snowfall residential roads were generally plowed twice. However, in the last five years, on an average the residential plow was performed only once annually due to reduced amount of snowfall during this period. Currently the length of the residential road network is approximately 541 kilometres. The residential road network is almost half of the entire road network in the community. Plowing the residential roads comes with several challenges like parked cars and narrow streets.

Concern:
Feedback from the survey and Service Requests suggest that general satisfaction is low regarding snow clearing on residential roads.

Recommendation:
Administration is recommending that residential roads that are acting more as collector roads serving over 1500 vehicles per day be classified as a higher priority Category 3 roads and included in systematic plowing operations that starts with five centimetres snow accumulation.

In addition, Administration also recommends that residential roads be included in systematic plowing operations after snow events greater than 15 centimetres. Based on historical data, this will provide one additional residential plow during the season. The City will continue utilizing the Ice Shaving Program to maintain ruts and have discretion to plow all residential roads if there are unusual or extenuating circumstances during the winter.

Cost of Enhancement:
The cost for this enhancement is $304,000 annually.

Advantages:
- all high traffic residential roads would get enhanced level of service
- significant improvement in general residential road conditions
- increased resident satisfaction during winter seasons
- rutting will be reduced
- more frequent ice control cycles and inspections on major residential roads
- changes in line with municipalities like Calgary, Edmonton

Disadvantages:
- increased cost
- snow ridges created as a result of plowing more often and reducing on-street parking availability

Appendix I
Bike Lane General Conditions

Current Policy:
The current Policy does not include any reference to bike lanes. Majority of the existing bike lanes are located on Category 1 or 2 roads; therefore, they are plowed within 36 hours of a snowfall event. There are some bike lanes located on Category 3 roads.

Concerns:
Feedback received from the survey and stakeholder engagement indicated that the bike lanes should get enhanced level of service including snow plowing and ice control in order to ensure safer winter biking conditions. The feedback also indicated that availability of ice, snow and slush especially during spring and shoulder season could become safety hazards for the bike lane users.

Recommendation:
To meet corporate goals of providing a range of year-round transportation choices and promote active transportation, all existing and future bike lanes will be classified as Category 2 or higher. With this, the bike lanes currently located on Category 3 roads would be upgraded to Category 2 or higher, as well as any bike lanes added to the network in the future.

The enhanced level of service will include plowing and ice control activities after a snowfall, as well as routine inspections to ensure ice, snow, and slush is cleared from the bike lane especially during spring and shoulder seasons.

Cost of Enhancement:
As most of the bike lanes are already located on higher priority roads, there are no costs associated with this enhancement. Routine inspections will be built into current inspection program.

Advantages:
- safer bike lanes
- supports City's Official Community Plan (OCP) goals # 1, 3, 4 and 5:
    - offer a range of year-round sustainable transportation choices for all
    - integrate transportation and land use planning in order to facilitate better walking, cycling and transit trips.
    - optimize road network capacity.
    - promote active transportation for healthier communities

Disadvantages:
- None

Appendix J
Intersection Ice Control

Current Policy:
The current Winter Maintenance Policy for ice control outlines minimum cycling times based on category during snow events and when slippery conditions are present. Sand and salt is placed on the road in advance of intersections, crosswalks, ramps and merge lanes, curves and adjacent to school properties. After a snowfall, ice control material is placed on the road up to 24 hours after systematic plowing operations have been completed.

Concern:
Frequent freeze thaw cycles during the season require special attention of the sanding crews as the pavement conditions can change significantly during the day or night. While 2019/ 2020 winter season saw 64 freeze thaw days, last five-year average was 71 freeze thaw days.

Feedback from the survey showed general satisfaction of ice control operations, however comments suggested a need to enhance ice control activities in the community especially around the busy intersections. Comments also suggested there could be better coordination between snow plowing and ice control activities.

Recommendation:
Enhancement of ice control at intersections through operational efficiency. This will include:

- categorizing intersections based on traffic volume and collision history and prioritizing ice control activities as required
- quicker response time to Service Requests and frequent inspections by supervisors
- implementing routes based on priority and classification for both ice control and plowing operations for greater consistency and for reducing the time delay between the coordinated activities.

Cost of Enhancement:
There is no cost associated with this level of service enhancement and Administration will utilize existing tools and resources to implement this enhancement for the 2021/2022 season.

Advantages:

- sustainable option that would continue providing safer driving conditions through future seasons
- low implementation cost
- routing plan can include both ice control and plowing activity for a better coordinated maintenance activity
- categorization of intersections would ensure safer winter driving conditions by prioritizing ice control activities on high traffic and high-risk intersections
- improved safety and satisfaction of intersection users like drivers and pedestrians
- reduced claims due to less collision

Disadvantages:

- None

Appendix K
Snow removal on Category 1-3 Roads

Current Policy:
The current Winter Maintenance Policy specifies that snow removal will generally take place when snow ridges impact sight lines and lane widths on Category 1 and 2 roads, as well as Category 3 Transit routes.

Concern:
After each snow event greater than five centimetres, a systematic plow is completed and snow is plowed and placed in the parking lanes and centre medians. As the season progresses, snow ridges become higher and wider with each plow and snow storage capacity is reduced and sight lines become negatively affected as motorists cannot see around or over the snow ridge. In addition, lane widths become narrow as the snow ridge becomes wider and, causing traffic congestion and unsafe driving conditions.

Feedback from the survey indicated that the snow removal activities should be further enhanced on major roads after each systematic plow. Removing the snow from all arterial and collector roads that are plowed after each five-centimeter snow event would provide safer winter driving conditions by improving road capacity and visibility.

Recommendation:
Remove snow on all Category 1, 2, 3 roads when sightlines and lane widths are impacted.

Cost of Enhancement:
There is no cost associated with this level of service enhancement as Administration has gained efficiencies in snow removal operations in the last few years and has typically performed this work out of necessity. Administration will utilize existing tools and resources to implement this enhancement.

Advantages:
- safer driving conditions on major roads
- increased visibility at intersections
- maintain regular traffic flow

Disadvantages:
- None