

# City of Grande Prairie **Snow and Ice Control Internal Service Review**





The City of Grande Prairie's Transportation and Parks Department acknowledges and thanks the following municipalities who provided information for this report.

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## Definitions

**Arterial Road:** Major roads carrying high traffic volumes. Generally, four lane roads at one mile spacing within City limits.

**Collector Road:** Roads that access arterial roads.

**Residential Road:** Roads or lanes in residential areas.

**Ice Control:** Application of abrasives and/or chemical de-icers to the surface of roads, lanes, parking lots, sidewalks, pathways, and Transit stops to improve traction.

**De-icing:** The process of removing snow, ice, or frost from a surface.

**Anti-icing:** Application of chemicals that not only de-ice but remain on a surface and continue to delay the reformation of ice for a certain period of time.

**Permanent Snow Routes:** Routes shown as Priority 1 or 2 in Policy 606 - Snow and Ice Control. Snow routes shall be permanently signed under the authority of Traffic Bylaw C-1166.

**Snow Plowing:** Pushing accumulated snow from roads, lanes, parking lots, sidewalks, pathways, and Transit stops to maintain traffic flow and pedestrian travel.

**Windrow:** A long line of material heaped up by the wind or by a machine.

**Snow Removal:** Windrowing accumulated snow and loading it onto trucks, for disposal at the City's snow dump or storage of snow on boulevards, cul-de-sacs, lanes, or public utility lots.

**Priority 1:** In the City of Grande Prairie this means arterial roads defined by Transportation Services as major roads carrying high traffic volumes and are generally four-lane roads at one (1) mile spacing within City limits.

**Priority 2:** In the City of Grande Prairie this means collector roads that access arterial roads.

**Priority 3:** In the City of Grande Prairie this means roads defined by Transportation Services as roads in Industrial and Commercial areas not identified as Priority 1 or 2.

## Executive Summary

The City of Grande Prairie (City) Council directed Administration to review Policy 606 - Snow and Ice Control service levels on roads and active transportation network. The goal of this review is to provide information to assist Council in considering service level adjustments for the 2022–23 snow season.

To support this analysis, a review of current Transportation and Parks department operational procedures related to service standards formalized in Policy 606 was completed and supplemented through discussions with the Manager and Assistant Manager of Transportation, department staff and relevant City departments. A review of financial records to best estimate costs for potential service level adjustments was completed. Services and operational adjustments for consideration are identified in the Service Adjustments and Costing section of the report and summarized in Table 2.0 and 3.0 of this summary.

### Grande Prairie Winter Operations and Policy Standards Department Operations

The City's Transportation and Parks Department clears over 240 km of roads (including rural), over 440 km of sidewalks, pathways and trails, 50 civic parking lots, and 305 transit stops as part of their winter operations. One regulated snow dump stores thousands of loads (8400, 2020-21 average) of snow windrowed and removed from City streets each winter and over 9,000 tonnes of sand and salt are used annually for ice control.

A mix of light and heavy equipment and a staff complement of 62 unionized FTEs work 24 hours Monday-Friday, with day shifts scheduled on Saturday and Sunday, from mid-October to mid-April each year. The department adds additional resourcing through contracted services as required, and fully contracts out the Residential Snow Clearing Program. Residents can sign-up for daily status updates or follow the City's social media accounts for updates on what crews

will be working on each day. Significant updates, such as parking bans, residential snow clearing, or the response to a significant snow event are communicated through media releases sent to local reporters and supplemental social media content. When residents see or experience concerns, AccessGP is available weekdays to manage concerns and coordinate investigation and resolution to priority issues. Newly implemented customer relationship management software tracks and reports back to residents on the status and closure of their service ticket.

The department provides Council with a wrap-up report at the end of each snow season and identifies improvements that can be implemented in future years.

### Council Defined Policy – Service Standards

Council Policy 606 – Snow and Ice Control guides the work of the department in delivering snow and ice control service across the city. Defined in the policy are the minimum triggers and service standards to clear snow and apply ice control. The policy addresses parking ban declarations, communications and City practices for snow plowing, windrowing, hauling and storage.

Policy 606 has several service standards that are not defined, particularly with respect to time. For example, priority trails/pathways are classified as priority 1 or 2, but no time standard is defined in the policy. Similarly, no time standard for clearing of transit stops or removal of windrows on Priority 2 (collector) roads is defined, although P2 service standards are 5 days following Priority 1 (Arterial), which are to be cleared within 24 hours.

Clearly defining service standards and time standards for priority clearing will support benchmarking and reporting and provide residents with additional clarity on the service standard the City has set for snow and ice control.

## Municipal Comparators

To understand and compare practices in similar jurisdictions, information was gathered from other comparable municipalities: Lethbridge, Regional Municipality of Wood Buffalo, Red Deer, Thunder Bay, Prince George and Saint John.

**Table 1.0 Comparator Jurisdictions: Location, Weather, Population, Budget**

Key Comparators	Municipality	Location (Latitude in degrees, north)	Average Annual Snowfall (inches)	Population (2021)	Annual Budget (2020)
	Grande Prairie	55°	60	64,141	\$5.2M
	Wood Buffalo (Urban)	52.7°	52.7	73,325	\$6.6M
	Prince George	53°	55.9	76,708	\$8.5M
	Red Deer	52.2°	41	100,844	\$5.3M
	Lethbridge	49.7°	55.6	98,406	\$3.8M
	Thunder Bay	48°	64	108,843	\$5.7M
	Saint John	45°	94	69,895	\$5.7M

Source: Statistics Canada, Environment Canada, Municipalities

Overall, the City provides a comparable level of snow and ice control services. Every municipality has defined a priority matrix for snow and ice control, although each defines priority 1 and 2 differently. Some focus on transit routes and major arterial roadways, while others focus on their downtown core, major business districts, school routes or bridges and overpasses. In addition to priority designations, different standards were applied. For some, the goal is to clear a drivable pathway within 7-12 hours from start of plowing, while others try to get as close to bare pavement with materials laid within 24-72 hours of end of snowfall. Snow storage along roadways significantly impacts whether snow is plowed to the side and stored on City property, or if windrowing and hauling it to a designated snow dump is required. Time standards and resources required are impacted as a result.

Approaches to residential clearing differ significantly between the municipalities, with some clearing residential

areas 12 times per season and others doing no clearing unless the area is inaccessible. Weather is a key factor, as is community preference for services. Windrow clearing across private driveways is an example of a resident driven service change. For some municipalities, clearing windrows on private driveways has been in place since the 1980's while others have only recently started to explore and implement this service. Transit stops, civic parking lots and trails are all cleared with varying levels of service and time metrics.

A mix of contracted services and City staff was found amongst all municipalities. Some contract out significant portions of their operation, while others focus primarily on internal resources and add contractors when significant snow events warrant. All municipalities have a mix of union and non-union staff. Shift schedules vary, but all municipalities run a continuous operation 24/7 when conditions warrant. All municipalities employ some measure of overtime to meet service standards.

The limitations of a per-capita comparison of snow and ice control budgets reflects differences in which services each municipality's snow and ice control budget includes. Some departments do not manage transit stops, sidewalks or pathway clearing, while others do. Some municipalities have a reserve or contingency fund, that is used to supplement their annual council approved budgets, while others use historical data in determining future budget requests. Of those reviewed, Prince George had the highest snow and ice budget at \$8.5M (2020). Lethbridge was the lowest at \$3.8M. The average of the six municipalities 2020 budget was \$5.9M. Grande Prairie had a Council Approved Budget of \$5.2M for snow and ice control in 2020. All municipalities have or are in the process of reviewing their service levels, budgets and community needs, looking for ways to better track and measure success and keep their residents and councils informed.

## Service Adjustments and Costing

While Grande Prairie provides a comparable level of services to the other municipalities, the review provided some insight into areas where a more defined or higher level of service could be considered.

### Defined levels of service and time standards

The City could consider formally defining a level of service for select priorities in Policy 606.

- a)** Define a time standard for Pathways and Trails (P1 and P2)
- b)** Define a time standard for the removal of windrows on Priority II (collector) roads
- c)** Define transit stop priorities and a time standard for transit stop clearing
- d)** Define a procedure for declaration of extreme snow and cold weather events

## Enhanced Services

Several enhanced services were costed, with consideration for delivery through internal staff resources and external contractors. For enhanced service standards within 0-48 hours of the end of a snow event, contracted services are likely to be the most cost-effective approach. If service enhancements can be spread out over 1-5 days following the end of snow event, additional internal staff and equipment may provide better value, as the staff can be re-deployed to other program areas as needed. In any snow event, resources are deployed to priority areas in the first 0-48 hours. Once priority tasks are completed, resources can be re-directed to addressing issues identified through AccessGP, and other areas to support meeting and exceeding service levels.

Where possible, historical actuals were used to estimate future costs including contractor costs, material and equipment costs and internal labour costs. The accuracy of the estimates is impacted by many variables such as: inflation, contractor labour and equipment rates, supply chain issues, additional staffing required for oversight and quality assurance, logistical and administrative costs.

Costed options, internal and contracted, are available for the following services:

- 1.** Transit Stops
- 2.** Special Zones (Downtown)
- 3.** Active Mobility Pathways and Multi-Use Trails
- 4.** Windrow Removal – Priority II Roads
- 5.** Residential Snow Removal Program
- 6.** School Zones and School Bus Stops (Service standard is impacted by P2 windrow removal standard, not costed.)



**Table 2.0 – Costed Services – Estimated Contractor Costs**

	Current Level of Service	Possible Change	Contracted Resources Required
2.1	Transit Stops cleared by one staff on day shift following each snow event and during residential clearing. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	Define stop priority. Priority 1 transit stops cleared within 24 hours after end of snowfall and all others in 48 hours after end of snowfall.	\$6,240/rotation
			\$37.5K to \$75K per year
2.2	Downtown Sidewalks along arterials are responsibility of business owners. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	Sidewalk clearing responsibility of City within 24 hours of end of snowfall.	\$6,240/rotation
			\$37.5K to \$75K per year
2.3	Snow is cleared from roads Downtown after 24 hours of snowfall ending. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	Snow is cleared from roads within 12 hours and park lanes completed within 24 hours after end of snowfall.	\$11K/rotation
			\$66K to \$132K per year
2.4	Downtown lanes are cleared on as needed basis. Typically budget 3-5 rotations per year (2021-2022: 3 actual rotations).	Downtown lanes cleared 72 hours after end of snowfall.	\$2,640/rotation
			\$16K to \$32K per year
2.5	Residential snow clearing completed as required. Typically budget 3-5 rotations per season (2021-2022: 5 actual rotations).	Budget additional rotations (up to 8 rotations). Reduce the trigger to clear to 7.5cm or 5cm.	\$200K to \$250K/rotation
			\$800K to \$1.0M per year
2.6	No windrow or cul-de-sac pick up in residential areas. Except for emergent issues as determined by Manager of Transportation.	Defined standard for cul-de-sac pile pickup within 10 days.	\$310K/rotation
			\$930K to \$1.55M per year
2.7	No defined standard for windrow removal on P2 roads. Typically removed within 2 weeks after end of snowfall. Typically budget 4-8 rotations per year (2021-2022: 6 actual rotations).	Windrows removed within 5 weekdays from the end of P2 plowing.	\$91.8K/rotation
			\$550K to \$1.1M per year

**Table 3.0 Costed Services – Estimated Internal Costs**

	Current Level of Service	Possible Change	Additional Internal Resources Required
3.1	Transit Stops cleared by one staff on day shift following each snow event and during residential clearing. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	Define stop priority. Priority 1 transit stops cleared within 24 hours after end of snowfall and all others in 48 hours after end of snowfall.	2 FTEs (full year) Equipment Maintenance Seasonal Labourer Savings (Parks)
\$130K to \$150K per year			
3.2	Downtown Sidewalks along arterials are responsibility of business owners. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	Sidewalk clearing responsibility of City within 24 hours of end of snowfall.	3 FTEs (winter season) Equipment Maintenance Capital Equipment (\$200K)
\$360K Year 1 and \$158K ongoing			
3.3	Pathways and trails are generally cleared within 5 days. Typically budget 4-8 rotations per year (2021-2022: 5 actual rotations).	P1 Trails cleared within 48 hours end of snowfall and P2 trails cleared within 96 hours after end of snowfall.	1 FTE (winter season) Equipment Maintenance
\$45K to \$55K per year			

In addition to service adjustments, several operational considerations were identified. These included:

1. Further develop targeted snow and ice control public communications and explore additional software and mapping technology to support real-time reporting and notifications.
2. Consider opportunities for integration of Benefit Driven Procurement into snow and ice contracting.
3. Develop a comprehensive education and enforcement protocol, including fines and procedures for snow compliance.
4. Define extreme events in Policy 606 or create a procedure for department response during Extreme Snow and Cold Events.
5. Support resident involvement in ice-control through a community sandbox pilot.
6. Explore revitalization of the Snow Angel program.

Full details of each of the costed services and operational considerations are included in the report.

## Conclusion

Across the winter program, the City can enhance residents understanding and awareness of winter operations by further defining snow and ice control priorities and setting levels of service in Policy 606. This may include defining and enhancing service standards (minimum trigger and time standard) for transit stops, pathways and trails, windrow removal on priority roads, special zones (e.g. downtown core), residential snow removal, and management of extreme snow or cold weather events. In all cases, clearly communicating the City's approach to residents is important in managing expectations and delivering exceptional service. Everyone has a role to play in achieving effective snow and ice control to support safe mobility during the winter season.

## 1.0 Background

The City of Grande Prairie (City) Council directed Administration to review snow and ice control practices in the city and compare with municipalities with similar characteristics to Grande Prairie, including other Canadian and international municipalities in northern jurisdictions.

**Council direct Administration to, prior to the 2022/2023 snow season, present Council with a review of the City's Snow and Ice Control Service Levels on Roads and Active Transportation Network. This review should include estimated pricing of alternative service levels and a survey of service levels in other northern municipalities. This review should include opportunity for Council to adjust service levels prior to the 2022/2023 snow removal operations beginning.**

The report provides information and analysis on the following:

1. City demographics, commuter, and climate data.
2. Current Service Standards as outlined in Policy 606 – Snow and Ice Control Policy.
3. Comparison of similar municipalities in Alberta and Canada with respect to priority road snow clearing and ice control standards, staffing and contracted operations, communication practices, cost comparisons, benchmarking and innovation.

Similar municipalities engaged and compared include:

- City of Lethbridge, Alberta
- City of Red Deer, Alberta
- Regional Municipality of Wood Buffalo, Alberta
- City of Prince George, British Columbia
- City of Thunder Bay, Ontario
- City of Saint John, New Brunswick

The review provides insight into the challenges facing the City in delivering its winter program and approaches of other jurisdictions in managing their snow and ice operations.

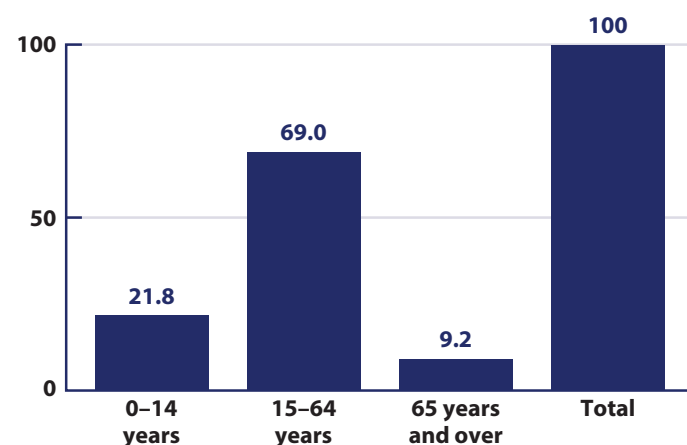
The report contains high level costing for related services and impacts to service levels, staff, and budget to maintain, increase or decrease service levels for the 2022-23 winter operations season. Costed services were selected based on service areas not currently defined the policy, Council identified areas of interest and analysis of other jurisdiction's practices.

## 2.0 Introduction

### 2.1 Overview – City of Grande Prairie

Grande Prairie is the youngest city in Canada with a median age of 31.9, and one of the fastest growing communities in North America. The city is home to 64,141 (2021) residents and serves a wider trading area of nearly 300,000 as a retail hub for trade and commerce.<sup>1</sup>

**Figure 1.0 Population, City of Grande Prairie**  
Population Demographics (%)



Source: Statistic Canada, 2021 Census

<sup>1</sup> Statistics Canada, 2021 Census and Invest Grande Prairie

## 2.2 Transportation and Active Mobility Infrastructure

A complex and multifaceted transportation network supports the daily movement of people and goods within and through the City and surrounding region. The network includes arterial, collector, and local roads; an active transportation network comprised of multi-use pathways and trails used for transport and recreation; public transit; truck and dangerous goods routes; and several rail crossings managed by the private sector. The City has one airport, serving northwest Alberta and the Peace Region and is managed through an Airport Authority.

The City's 2020 Transportation Master Plan (TMP) guides the growth and development of the network to ensure it reflects the transportation needs of the community, both now and in the years to come. The TMP outlines the community's desire to reduce the local reliance on the private automobile, and to increase the attractiveness and integrity of the active transportation network and transit system. There is a strong focus on removing physical barriers to achieve accessibility and connectivity to key destinations for all system users, based on several strategic documents, including: Moving Forward – A Strategy for Active Transportation in Grande Prairie (2014); and the Grande Prairie Area – Joint Recreation Master Plan (2016).

The City maintains an extensive network of infrastructure assets, including over 200 km of roads and 340 km of sidewalks. A summary of City infrastructure assets requiring snow and ice control are listed in Table 1.0.

Thousands of individuals travel and transport goods on City-maintained infrastructure each day. With a workforce of over 40,000<sup>2</sup>, the majority of residents commute to their place of employment by private car, truck, or van.<sup>3</sup>

**Table 1.0 City Maintained Transportation, Transit and Active Mobility Infrastructure**

Infrastructure Type	Total Infrastructure cleared/ice control applied
Total Roads	203.65 km
Arterial Priority I	66 km
Collector Priority II	112.14 km
Industrial Commercial Priority III	25.51 km
Residential	159.32 km
Rural Service Roads	40 km
School Bus Stops	160 km
Parking Lots	50 km
Sidewalks	340 m
Pathways and Trails	Priority 1 - 56.38 m Priority 2 - 30.86 m
Muskoseepi Trails	21.06 km
Transit Stops	305

The City's Transit System has an annual ridership of over 617,000 (2019), and a fleet comprised of conventional diesel busses (13), electric buses (5) and accessible and community transit buses (15). There is 117 km of transit routes with an average trip length of 2.01 km. There are over 305 transit stops throughout the city cleared of snow and eligible for ice control during the winter months.<sup>4</sup>

<sup>2</sup> [cityofgp.com/economic-development](http://cityofgp.com/economic-development) <sup>3</sup> [townfolio.co/ab/grande-prairie/transportation](http://townfolio.co/ab/grande-prairie/transportation) <sup>4</sup> Stats provided by Department of Transit, City of Grande Prairie



## 2.3 Climate and Weather

Located at 55 degrees north latitude, Grande Prairie is a winter city, with a moderate northern climate. Temperature extremes between +40 degrees in summer and -40 degrees in winter are not uncommon, and high winds increase the severity of the windchill factor.

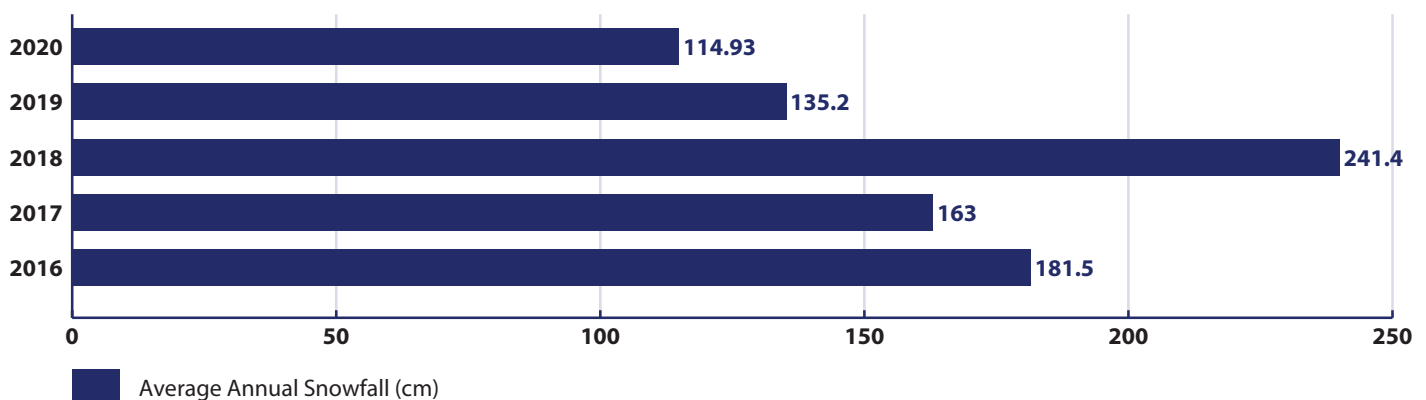
**Table 2.0 Average Annual Temperature**

Days Above 0°C						
	Nov	Dec	Jan	Feb	Mar	Total
2021-22	21	4	17	14	22	78
2020-21	14	15	13	7	28	77
2019-20	17	6	6	14	12	55

Source: Transportation Department Records, City of Grande Prairie

Over the past 5 years (2017-2021), Grande Prairie has experienced an average annual snowfall of 147.7 cm. As a result, the City has hauled (on average) between 10, 000 and 28,000 loads of snow annually to its municipal snow dump.

**Figure 2.0 Grande Prairie Annual Snowfall (January-December) in centimeters (cm)**



Source: Total Daily Snowfall, Environment Canada

With unpredictable weather patterns, delivering snow and ice control operations across the city is challenging, which is why maximizing snow and ice control measures is critical for operational success.

## 3.0 Snow and Ice Control Program – City of Grande Prairie

### 3.1 Program Background

The City manages snow and ice priorities in accordance with both the Municipal Government Act and Traffic Bylaw C-1166. Service levels are defined and operationalized based on Policy 606 - Snow and Ice Control.

The policy is focused on minimizing economic loss, reducing the inconveniences and hazards of winter conditions (vehicle/resident), facilitating the operation of transit and Emergency Services, and assisting pedestrians walking with care. Service standards and priority roads within the city's extensive transportation network are reflected through the priority ranking, placing the most frequently travelled roads and emergency routes as the highest priority, while ensuring that the network supports all modes of transportation, including active transportation and public transit.

The program has many facets, including the physical removal of snow and application of ice control, public communication and issues management in collaboration with Communications and AccessGP, coordination of snow removal from pathways, transit stops, fire hydrants, catch basins and civic facility parking lots through Transit, Parks and Facilities and the hiring of contractors in collaboration with the City's Finance and Procurement departments. To support operations, coordination with the Human Resource department and Fleet Services is required to ensure adequate personnel and equipment are ready to mobilize when the snow falls.

#### Snow and Ice Program Areas

- Winter Weather Monitoring
- Priority 1-3 Roads Snow Removal, Anti-Ice and Ice Control
- Residential Snow Removal Program

- Pathways, Trails and Muskoseepi Trails
- Transit Stop Snow Removal and Ice-Control
- Civic Facilities Parking Lot Snow Removal
- External Corporate Communications on Snow and Ice Control Program
- AccessGP Requests
- Annual Tracking, Benchmarking and Reporting

### 3.2 Policy 606 – Current Standards and Practices

Policy 606 identifies priorities, service standards and procedures that the Transportation and Parks department operationalizes during the winter season, which commences annually on October 15 and runs through to April 15 of the following year.

The City's service standards for snow and ice control are determined by Council. Service levels are reviewed annually by Administration to identify areas for improvement and a summary report is prepared for Council at the end of each winter season.

Reviews of the Snow and Ice Policy were completed in 2020, 2014, 2010 and 2005. Based on snow events, operational capacity and continuous improvement service level changes were made over these years. These included service changes such as adding private driveway windrow removal service, scheduled and increased rotations of residential snow removal, and adjusting clearing timelines from 12 to 24 hours following a snow event to reflect operational capacity.

Service standards most recently adopted by Council on July 12, 2021, for implementation during the 2021-22 winter season include:

- Priority 1 (Arterials) – Sufficient accumulation, cleared within 24 hours, end of snowfall
- Priority 2 (Collectors) – Sufficient accumulation, cleared within 5 days after Priority 1
- Priority 3 (Commercial/Industrial) – Cleared after P1, 5 days after the end of snowfall
- Residential - Commences at 10 cm, 24 hours after the end of snowfall, completed within a two-week rotation
- Transit Stops – One staff (day shift) and skid steer following each snow event and during residential clearing, no defined standard

- Pathways – 10cm trigger, no defined standard
- Parking Lots – 10cm trigger, no defined standard
- Windrows – Removed from all private driveways
- Ice Control is applied as required based on Manager approval, operator expertise and resident identified needs

Diagrams showing how the City clears snow and snow storage adjacent to properties are in Appendix 3.

### 3.3 Budget

The City spends roughly 3% of the overall operating budget on snow and ice control measures. The actual cost will vary depending on the winter season, snow conditions, and the need for both materials, equipment, personnel and contractors.

**Table 4.0 City of Grande Prairie Snow and Ice Control Budget 2016-2022**

Year	2016	2017	2018	2019 <sup>5</sup>	2020	2021	2022
Council Approved Budget (in Millions)	\$5.37	\$5.42	\$5.31	\$4.96	\$5.17	\$5.48	\$ 5.60
Actuals (in Millions)	\$4.21	\$5.06	\$6.72	\$4.91	\$5.12	\$4.55	N/A

In 2019, the province handed over ownership of the Highway 43 bypass to the City. In order to reduce the impact of the increased repairs and maintenance to the city offsetting revenue of \$500K was included in the Snow and Ice Control budget. The offsetting revenue will decrease annually to gradually adjust the impacts to the tax base (2019: \$500K, 2020: \$312K, 2021: \$200K, 2022: \$175K).

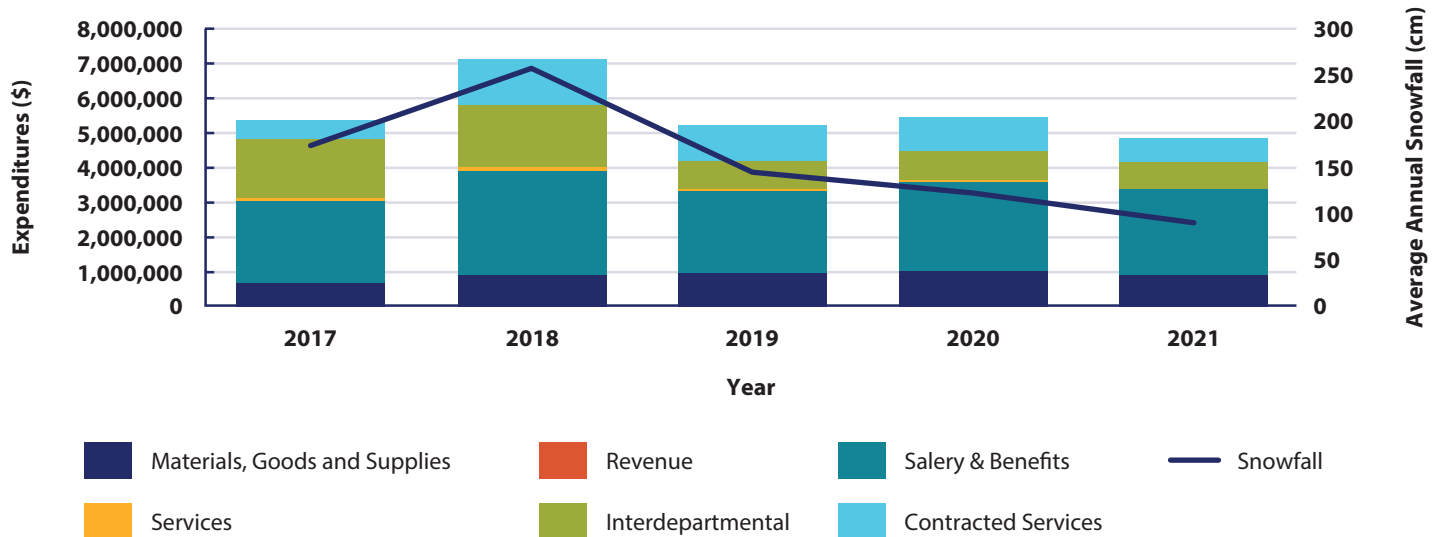
Not included in the City's Snow and Ice budget line is an additional \$144K for snow removal on the Muskoseepi Park

Trail System, including some neighbourhood ice rink clearing, which is the responsibility of the Parks staff. The budget line also does not include the additional \$277K (2020) annually allocated to Service Areas to procure a contractor to remove snow from all the sidewalks and walkways directly in front of civic facilities such as the Eastlink Centre.

Spring clean-up required after each winter season, including street sweeping, is reflected in the City's street cleaning budget.

<sup>5</sup> The 2019 Snow & Ice control budget per the Budget Engagement Website (\$5.9M) differs from the 2019 budget amounts included in this report (\$4.9M) due to a change in how interdepartmental fleet charges were calculated which reduced internal fleet costs by approximately \$465K. Additionally, in 2019 the city took on ownership of Highway 43 from the province so included in the 2019 budget amounts in this report is \$500K of revenue to offset additional expenses anticipated to maintain Highway 43.

**Figure 5.0 Snow and Ice Program Expenses (Actuals) and Annual Snowfall**



Source: City of Grande Prairie

### 3.4 Equipment and Human Resources

The City owns a fleet of heavy and light equipment for snow removal operations including:

- 6 Tandem Salt/Sand Trucks with Front Plow
- 1 Single Axle Truck with Front Plow
- 1 One Ton Sander with Front Plow
- 2 Tandem with Front/Wing Plow
- 6 Tandem Snow Haul Trucks
- 1 Snowblower
- 6 Graders
- 5 Loaders with Blade
- 1 Loader with Bucket (sand/salt loading)
- 1 Municipal Tractor
- 3 Skid Steers
- 2 Tool-Cats

See Appendix 6 for equipment replacement costs.

The Transportation and Parks winter operations consists of 62 CUPE full-time equivalents (FTE) who work three shifts covering 24 hours Monday to Friday during normal winter operations and 7 days a week when operations require. Collective agreements are in place and identify mutual responsibilities of employees and the employer, including hours, pay, overtime and contracting out. With respect to contracting out, the current collective agreement explicitly prevents a reduction in City staff as a result of contracting out existing services.

The City's Fleet department manages the preventative and active repair and maintenance of snow and ice vehicles and heavy and light equipment.



### 3.5 Contracted Services

To support snow removal operations, the City puts out a Request for Proposals (RFP) for contractors interested in supporting snow removal in residential areas, and trucking services. The RFP is posted every two years for Residential Snow Clearing Program: Teams of three pieces of equipment + operators (grader + 2 loaders); and Trucks for hauling – end dumps and truck+pups.

### 3.6 Materials and Storage

The City's main equipment storage site is located at the Service Centre in the Richmond Industrial Park. Several additional sites are used to store smaller equipment. Proximity to resources, equipment, materials and personnel is important for efficient operations. Movement of equipment to different sites can add time and complexity to operations, so site preparation and onsite equipment is considered and actioned accordingly.

The City maintains one snow dump on Park Road in the southeast corner of the city. The site is designed to hold over 3 million cubic meters of snow and is undergoing a \$3 million capital upgrade including hard surfacing and runoff treatment that complies with the Federal Code of Practice for Road Salt Environmental Management and Alberta Environment Protection Snow Disposal Guidelines. The City uses between 2000 and 3000 tonnes of road salt annually. Any organization that uses over 500 tonnes of road salt annually must create a salt management plan which identifies actions to improve salt storage, use of salt on roads, snow disposal and protection of vulnerable areas.

An additional snow dump has been considered in previous years, but the cost to add another snow dump would be upwards of \$10M.

### 3.7 Communications

The City begins each snow season by distributing an updated Snow and Ice Control Brochure to each household in the City and to support awareness of snow clearing operations including: priority road clearing and service levels, how and when residential roads are cleared, parking bans, snow storage, how to access daily updates, rural service area clearing, and property owner responsibilities.

The transition to winter operations is announced to the community and local reporters through a media release and supplemental social media content.

Throughout the snow season, communication with residents regarding snow and ice operations is an ongoing process. Daily Service Updates are available to residents regarding snow and ice operations. The City's Corporate Communications team works with the Transportation and Parks department to ensure timely communication and updates are available to residents. In the 2020-21 winter season, 110 Service Updates regarding snow and ice operations were shared with registered users (who have signed up to receive email updates) and were shared on social media. During the 2021-22 winter season, Approximately 95 Service Updates were provided to residents. The number of Service Updates to residents are dictated by the length of the snow season. A service update regarding specialized ice removal operations was also issued.

In the 2021-22 winter season, 9 additional press releases with supplemental social media content were published to notify the community of Parking Bans, Residential Snow Clearing, and the City's response to snow events. The news was picked-up by local reporters and shared on the radio and in news articles.

Newcomers to the City are also provided with a welcome package, which includes information on the City's snow and ice control policies and practices. See Appendix 2 for the winter brochure.

AccessGP is the City's one stop shop for resident enquiries and has a series of knowledge articles that support operators when communicating with residents. All correspondence received through the City's 311 portal are logged in the Customer Relationship Management System (CRM) and actioned based on priority. Residents are provided a timely response, via email, including a tracking number and all requests are reviewed by department management and supervisors to address reoccurring issues and action changes immediately where required with available resources. The CRM system was newly integrated with the department in 2021-22, and in future, available analytics and reports will support enhanced reporting and trend analysis over time.

### 3.8 Innovation and Benchmarking

The City has been pro-actively researching and piloting new technology and software. In 2019, ARTY an automated mower/snow removal robot was procured and tested to determine its use in snow removal operations on pathways and sidewalks. Unfortunately, the company was bought out by a larger competitor. The City was reimbursed for the cost of the robot and the funds were re-allocated to new heavy equipment.

Many of the City's fleet vehicles are equipped with GIS technology. The City continues to explore opportunities to integrate this technology into their tracking and reporting procedures and support enhanced communications around completed routes and service standards that are met throughout each snow event.

The Transportation department has identified that enhanced tracking and real-time reporting on service standard metrics will facilitate communication and keep both Council and residents better informed of winter operations. Enhanced tracking and benchmarking will also provide the information needed for budget discussions and support capital asks for additional equipment and personnel as required.

### 3.9 Property Damage and Claims

Any damages inflicted upon persons or property by assets of the City are investigated by the Transportation and Parks department and managed through the City's Legislative Services department. Information, including the required forms and documentation is listed on the City's website.

### 3.10 Challenges

The City's Transportation and Parks Department has identified several challenges that impact winter operations, including:

**Weather:** Unpredictable snow conditions and significant snow and cold weather events present difficulties in predicting when and where snow crews will be needed. When significant snowfall events happen, crews work overtime, and additional contractors are hired to meet service levels, but resources cannot be spread evenly across each day of the winter season. The spring thaw requires that snow in certain areas be hauled to minimize flooding in the spring, adding costs and time to meet service standards.

**Snow Route Compliance:** Street parking is a common practice in the City. Unfortunately, vehicles parked illegally on snow routes slow down and/or impede snow clearing operations. While Enforcement Services are authorized to ticket and tow vehicles as per Traffic Bylaw C-1166, the preferred approach is to educate and make residents aware of parking bans, educating and encouraging alternate parking arrangements. Residents adhering to the Parking Bans on Permanent Snow Routes and ensuring vehicles are moved off the road during regular rotations of residential clearing may enhance service delivery standards and timelines. Added enforcement, including fines and towing may also be needed to ensure operators can access areas for snow plowing and removal.

**Tracking and Benchmarking:** Administration is working towards enhanced tracking to support reporting and data collection. Strong reporting and regular benchmarking of service standards against other municipalities will further support continuous improvement efforts and allow for trend analysis and action plans. At this time, tracking real time snow clearing against service standards is not completed, and technologies are still being explored to move to digital records and real time tracking.

### 3.11 Historic Engagement and Feedback on Snow and Ice Control

In the City's Budget 2021 – What We Heard Report, residents who completed the survey were split between increasing and decreasing funding to Snow and Ice Control.<sup>6</sup> Of the responses, 17% wished to see the budget increase or decrease by 5%, and 65% wished to maintain the current funding levels.

In 2020, Snow and Ice Control ranked among the top ten out of 30 resident ranked services that were most valued. with Ice Control on Priority 1 and 2 ranked as third most valued City service; residential snow clearing ranked as fourth most valued City service; removal of snow from centre windrows ranked as eighth most valued City service; and driveway windrow plowing ranked as ninth most valued service.<sup>7</sup>

The 2020 Citizen Satisfaction survey asked residents how important and how satisfied residents were with city services. Snow and ice removal was rated 98% somewhat or very important for service importance. Of the responses, 14 % were not at all satisfied, 22% were not very satisfied, 45% were somewhat satisfied and 19% were very satisfied with the service. The consultant noted that snow and ice removal was an area that could provide improvement to overall citizen satisfaction with City services.<sup>8</sup>

Of the residents who participated in the City's Did You Know: All About Snow & Ice Control online survey in 2019, which saw 904 visitors and 316 survey responses, 53% wished to see the City's snow and ice budget increased, while 41% wanted to see it maintained. During the engagement, residents suggested that the City:

- Post signage in the areas the day before snow clearing day
- More firmly enforce parking bans
- Establish and email notification subscription for operational snow updates.

<sup>6</sup> Budget Allocator - Ran June 25 to July 15, 2020. A total of 46 responses were received.  
-17% Increase Funding by 5%  
-65% Maintain Existing Funding  
-17% Decrease Funding by 5%

<sup>7</sup> Budget 2020 – What We Heard Report. The report also indicated that of 96 total comments, 9 focused on snow removal, including suggestions for operational changes to snow plowing, ice control (sanding and salting), snow storage, snow hauling, and accessibility to sidewalks.

<sup>8</sup> City of Grande Prairie 2020 Citizen Satisfaction Survey, Forum Research

## 4.0 Comparing to Similar Jurisdictions

### 4.1 International Practices

Snow and ice control varies across the globe, depending on the local conditions, weather patterns, wind intensity, temperature, physical infrastructure, traffic density and defined service standards. In some northern jurisdictions, drivers are required to have winter tires, all weather or studded, on their vehicles. With more density, transit use and cycling in many European cities, snow removal to accommodate transit routes and commuters, either walking on pedestrian routes or cycling is first priority for clearing. In Stockholm, a unique gender-based policy approach was adopted in 2018 that garnered worldwide attention and some criticism for prioritizing sidewalks and bicycle lanes for first clearing over roads. A gender-based analysis of their policy revealed that women were disadvantaged by roads being prioritized over sidewalks, as more women and mothers walked, and drivers tended to be male.<sup>9</sup> Similar analyses are being applied by all levels of government, to understand biases and consider select groups that may be uniquely impacted, as part of policy development.

Service standards vary in European cities. Clearing triggers start as low as 5cm with the goal of having clearing complete at 7am the next morning, following a snow event. Bare roads are the standard, primarily for high trafficked roads. In Norway, a bare road strategy is applied to 20 per cent of the road network. Salt is applied at the beginning of a snow event to support scraping the snow to achieve the bare road standard.<sup>10</sup> Unique approaches including nighttime snow removal, as in Helsinki, are used to minimize traffic disruption.

In Copenhagen, property owners living on a public road are required to clear snow and put down salt or grit outside of their property. They are required to “clear snow up till the middle of the road, while [the] neighbour opposite is responsible for clearing the other half of the road.”<sup>11</sup> Using salt and other chemicals for ice control is weighed equally against impact on individual property owners and impact on the natural environment.<sup>12</sup> In Moscow, snow is either taken to traditional snow dumps or melted in concrete pools and discharged into the Moskva River via the storm sewer.<sup>13</sup> The dumping of snow into bodies of water adjacent to cities is a practice that has been largely discontinued in Canada due to the environmental impacts and regulations developed in the last decade.

For some northern cities, having staff and equipment on standby to prepare for and manage snow events is driven by economic necessity. Achieving an acceptable level of preparedness aligned with local needs and expectations are considerations weighed by all municipalities in determining what service levels that can be achieved with available human and financial resources.

### 4.2 Provincial and National Comparators

Recognizing that no community is identical to Grande Prairie, a scan of municipal websites, policy documents, and bylaws was done to gather information on how comparable municipalities approached their winter operations.

<sup>9</sup> Emma Smith. *What Halifax might be able to learn from Stockholm about snow clearing.* (2019, March 8). [cbc.ca/news/canada/nova-scotia/stockholm-sweden-snow-clearing-gender-balance-halifax-storm-sidewalks-1.5048952](https://www.cbc.ca/news/canada/nova-scotia/stockholm-sweden-snow-clearing-gender-balance-halifax-storm-sidewalks-1.5048952)

<sup>10</sup> Gemini. *How To Use Less Salt on Snowy Roads.* (2019, May 19). [How To Use Less Salt On Snowy Roads In Norway \(lifeinnorway.net\)](https://www.lifeinnorway.net/how-to-use-less-salt-on-snowy-roads-in-norway/)

<sup>11</sup> City of Copenhagen. *Clearing snow on your property.* [international.kk.dk/live/housing/settling-into-your-new-home/clearing-snow-on-your-property](https://international.kk.dk/live/housing/settling-into-your-new-home/clearing-snow-on-your-property)

<sup>12</sup> *Guidelines for Snow Plowing and Ice Control for the Village of Denmark.* (2019, January 17) [denmark-wi.org/wp-content/uploads/2020/11/guidelines-for-snow-plowing-and-ice-control-jan-17-2019.pdf](https://denmark-wi.org/wp-content/uploads/2020/11/guidelines-for-snow-plowing-and-ice-control-jan-17-2019.pdf)

<sup>13</sup> Victoria Ryabinkova. (2020, Nov. 30). *Russia Beyond. How does Russia cope with its HUGE amounts of snow?* [rbth.com/lifestyle/333064-how-does-russia-cope-with-snow](https://rbth.com/lifestyle/333064-how-does-russia-cope-with-snow)



Standards across the country vary greatly with some communities clearing all residential sidewalks, windrows and walkways, and others only clearing main arterial and collector roadways.

The City of Leduc boasts that it has one of the highest standards in the province, blading and clearing all windrows and clearing Priority 1 roads within 12 hours after 2-5 cm accumulation. Priority pathways are cleared within 48 hours of 2 cm of snow accumulation and Priority 2, including outdoor ice surfaces, are cleared within 72 hours following a snow event. In residential areas, operations commence when accumulation reaches 15 cm or more.<sup>14</sup>

**Table 5.0 Selected Comparable Jurisdictions in Alberta and Canada**

Municipality	Contacts
City of Lethbridge	Manager, Transportation Manager, Operations Operations Coordinator
City of Red Deer	Manager, Transportation Roads Superintendent
Regional Municipality of Wood Buffalo (Urban only)	Supervisor, Parks and Roads Services 3 Staff, Supervisors
City of Prince George	Manager, Roads and Fleet Supervisor, Roads Operations
City of Thunder Bay	Manager, Roads Roads Maintenance Supervisor (North) Patrol Supervisor (South)
City of Saint John	Director, Public Works and Transportation 1 Staff

With many differing standards, three municipalities within the province and three in other areas across Canada were selected based on similar geographic location, annual temperature and snowfall, and population size. Discussions were coordinated with these six municipalities between October 2021-January 2022. Where possible, management and operational supervisors/staff that the municipality identified were invited to participate in discussions to further understand how policy standards are applied to operations during snow events.

A comparison of standards is listed in Appendix 3 Relevant service standards are summarized below.

## 4.3 Budget

The City allocates over \$5.0M annually towards its winter snow and ice control program, comparable to peer municipalities. A few municipalities have a higher budget, but it is important to note that in some municipalities, multiple departments manage parts of their snow and ice program, and in others only one department is allocated a budget for all snow removal services.

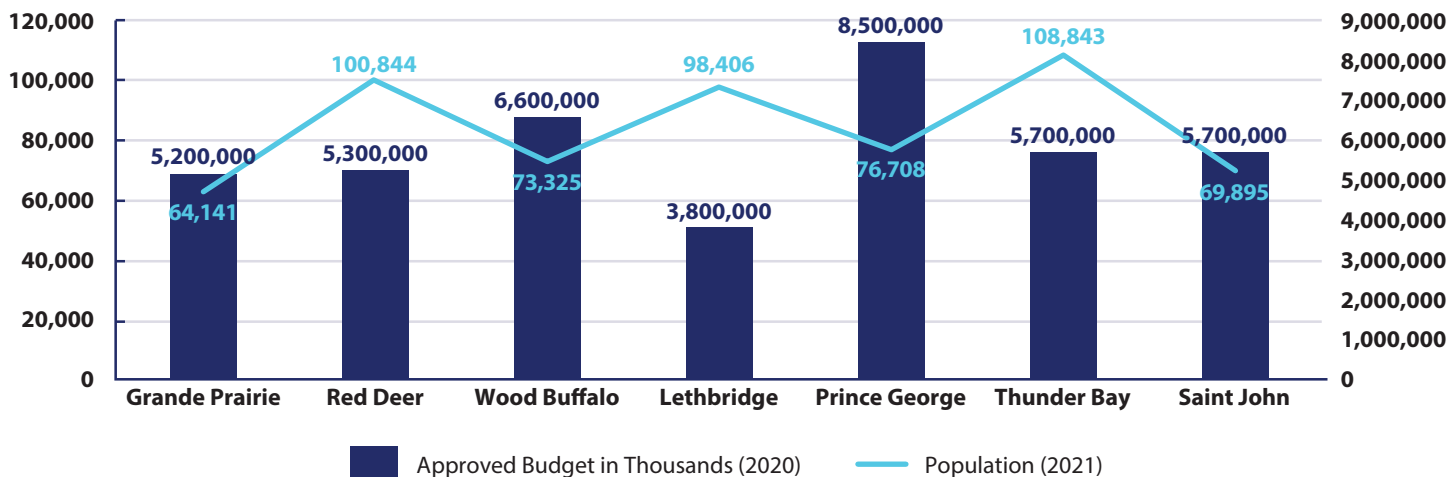
In some municipalities, a contingency or winter reserve fund is available to cover costs associated with extreme snow events and is funded when there are favourable variances resulting from a low snow year. In other cases, historical actuals and forecasting is used to determine snow and ice removal budgets with increases year over year to adequately fund operations. In all cases, additional funding must be approved by Council.

<sup>14</sup> City of Leduc. Snow Removal. [leduc.ca/snow-removal](http://leduc.ca/snow-removal)

**Table 6.0 Highest and Lowest Budget Comparisons to Grande Prairie (2020)**

	Higher	Lower
Grande Prairie	Prince George	Lethbridge
\$5.17M *An additional \$144K is allocated to Parks for Muskoseepi Trails and \$277K for facilities sidewalk clearing	\$8.5M	\$3.8M *An additional \$700K is allocated to Parks for pathway clearing

**Figure 6.0 Comparison of Similar Municipalities Snow and Ice Budget and Population**  
**Comparison of Budget and Population - Comparable Jurisdictions**



Source: Statistics Canada 2021 Census of Population, Budget 2020 Provided by Municipalities

## 4.4 Organizational Structure

The City's winter snow removal program is administered through the Transportation and Parks Department, with a manager, supervisors, lead hands and a workforce of 62 permanent FTEs assigned to winter operations. Priority I, II and III roads are cleared by the department, along with pathways, transit stops, and civic parking lots. Residential roads are cleared through contracted services, managed by the department.

A similar structure, including manager, supervisors/operational leads and unionized FTEs assigned to winter

operations was reflected in most similar jurisdictions. All municipalities have some heavy and light equipment in their snow fleet, and all supplement their internal resources in some capacity through contract services. Most significant differences were noted in the following areas:

- Services delivered through the municipality vs contracted
- Total equipment owned and operated by the municipality vs contracted equipment
- Shift rotations (length/timing)

- In Thunder Bay sidewalk plows and graders are retained on contract and paid a standby rate. Most staff work 8:30am-4:30pm. Four staff are on a midnight sander shift from 12:00am-8:00am, arterial/collector plowing commences at 2am, with a midnight - 4am shift for snow removal.
- In Prince George, additional graders are contracted on a monthly retainer and available 24 hours/day. Operator shifts in the afternoon are reduced and prioritize sidewalk/sanding and ice control, while mechanics and fleet run at full operation to service and get the equipment ready for the next shift.
- In Red Deer, snow clearing is managed through 12 snow zones, reflecting priority clearing across the city. Priority groupings include arterials, the downtown core, emergency routes, facilities, bridges and overpasses. Highway 2 is provincial responsibility and has a separate contract for snow clearing. A hybrid model is implemented for residential areas where a combination of city trucks and contracted trucks and graders are used. Two 10 hour shifts from 7am-5pm and 5am-3pm are the norm, with a 3am-1pm early morning shift used as needed.
- In Lethbridge, if the snow sticks, 24 hours after the snow stops, the clock starts. If emergency snow removal is required due to drifting, everything outside of arterials, collectors, controlled intersections and bus routes are cleared by a contractor. When a city-wide run is implemented, contractors are called in to support hauling.
- In Saint John, the workforce is 100 percent union, with two 8 hour shifts, 7:30am-4pm and 11pm-7:30am, weekdays. If staff are required for events during Friday 4pm-Sunday 11pm, they are called in on overtime. Previously, some hauling and select routes were contracted out, but with downsizing, almost all snow removal/plowing is done internally. With all internal staff and unpredictable weather, it can be hard to maintain resourcing for a certain threshold, and difficult to resource up on short notice for surge responses during significant snow events.

## 4.5 Heavy Snowfall Declarations

The City does not have a policy or special operational procedures for heavy snowfall events. Major snowfall declarations are used by only a few municipalities examined, although for most, a heavy snowfall will trigger additional contracted resources and all available staff and equipment. For some, historic heavy snowfall events resulted in the introduction or re-introduction of a contingency fund for snow removal but did not change how they manage regular winter operations.

- In Prince George, a heavy snowfall declaration is issued when at least 20 cm of snow accumulates within a 24-hr. period. The declaration 'resets the clock' by extending snow removal times by 24-hours for each additional eight cm of snow accumulation. It also gives Enforcement/Bylaw additional rational to ticket vehicles that are blocking snow routes. While it has not been used in 2 years, it is available if needed.
- In Lethbridge, parking bans are declared during heavy snow events. When declared, are in effect for 3 days and can be re-declared if it starts snowing again. The declaration has only been used 2-3 times. Lethbridge also maintains over 17 km of snow fencing to help with the drifting, a significant impediment to clear winter roads that happens as a result of the high winds the city regularly experiences.

## 4.6 Priority Clearing

The City clears snow based on a priority ranking of major roadways and commences plowing with sufficient accumulation. The standard for clearing is 24 hours following a snow event for arterial roads and collectors following arterials within 5 days following P1 completion. Snow is plowed to the boulevard and stored on the City right-of-way or public utility lot. If required to create space, snow removal crews will come back and push the snow further back to create more room or haul the snow away. Plowing onto the boulevard reduces clearing times and saves money, as snow hauling takes additional time and is costly. When storage on

the boulevard is not possible, snow is windrowed and hauled. For arterials, the goal is to have bare pavement within 24 hours following a snow event. In the City, the downtown core is part of first priority plowing. Maps with priority plowing are included in Policy 606 - Appendix 1.

Most municipalities have a defined priority ranking system for major routes on arterial and collector roadways. Some include emergency routes, high load corridors and public transit to determine priority routes for plowing.

- In Prince George, the service standard for both Priority 1 and 2 roads is at 48 hours within the end of snowfall.
- In Red Deer, arterials and high collision intersections are priority for adequate traction within 72 hours. Dual windrows are created on arterials and hauled away. With many arterials being provincial highways with no snow storage, hauling on arterials is common practice.
- In Lethbridge, defined Priority 1 and 2 arterials and designated collectors are cleared within 24-hours for Priority 2 and 24-hours following completion of Priority 1.
- In Thunder Bay, a 5cm accumulation on arterials and 10cm on locals triggers an event with a service standard of 7 hours from beginning of plowing on arterials, and 72 hours on locals for plowing to be complete. Transit routes within arterial or collector roadways are part of the service standard.
- In Wood Buffalo, 5cm triggers a plowing operation. Priority clearing is based on the event, with rush areas and de-icing as the primary focus.
- In Saint John, Priority 1 and 2 roads are cleared in 8 hours following a snowstorm and Priority 3 and 4 routes within 12 hours. A 10cm snowfall triggers a measurable snow event, but 5cm accumulation will trigger plowing operations. During a snow event, Priority 1 and 2 roads are the priority with a two-standard approach. First, a passable path is the goal, and second, snow is pushed back with ice-control material placed.

## 4.7 Residential Snow Clearing

In the City, hired contractor's clear residential areas, completing on average three to five rotations per season at a cost of approx. \$200-250K for each round of clearing. Clearing commences within 24 hours after a major snow event, or accumulation >10cm. Crews on the day prior to garbage pickup to help residents prepare for clearing and the standard is to complete a full rotation within 2-weeks (10 business days). If crews do not get to a residential street in week one, they will complete it in week two.

Residential snow removal practices vary across municipalities. Some apply a hybrid model where both city and contract crews work together, others are strictly contracted. In some areas, no residential clearing is done, unless the roads are impassable and would restrict emergency vehicles or residents from travelling in and out of the area.

- Red Deer clears collector and residential roads when snowpack reaches 5-10cm, and on a rotation. Contracted trucks are used for residential clearing and aim to clear within 15 days.
- Prince George clears residential areas when snowfall reaches 12cm in a 24-hour period, to a 2.5m compact vs bare pavement standard. Five to six rounds of residential clearing are done per season.
- Wood Buffalo starts residential clearing at 5cm accumulation and clears residential roads to maintain parking and when driving width is reduced to 5.5m or less. Residential clearing is offset by garbage pickup days.
- In Thunder Bay, residential areas are cleared when 5 cm accumulates with a service standard of 3 days. Residential areas are cleared roughly 12 times per season, cost dependent. This is the highest most frequent residential clearing standard out of the comparable municipalities.
- Lethbridge does not typically clear residential roads unless impassable for emergency vehicles and 'properly equipped' resident vehicles.



### 4.8 Contracted Services

The City changed its procurement process for contractors in 2021, now initiating a Request for Proposals (RFP) every 2 years. The City's residential snow removal program (initiated in 2014) is fully contracted. Contracted services are also called in to support windrow pick up and hauling.

Contracted services vary amongst municipalities. Some rely heavily on both contracted equipment and staff, while others contract only for specific tasks or areas within the municipality. Some contractors are retained on stand-by with an additional hourly rate for services rendered as required by snow events.

- In Prince George, contractors are on stand-by and called upon as required.
- In Thunder Bay, two sidewalk plows and 11 additional graders are contracted to support the city's 13 sidewalk plows and 11 grader, 9 plow truck and 9 sander fleet. The contract includes a daily stand-by rate and an hourly rate.
- In Wood Buffalo, the municipality has a standing offer for both heavy and light equipment, and operations are coordinated with the department
- In Red Deer, trucks are contracted to complete residential clearing and an industrial area across Highway 2.
- In Lethbridge, contractors are used primarily to haul snow when required. If residential areas become impassable with drifts, and can't be managed by city crews, the city will seek additional contracted supports as needed. Various pieces of heavy equipment with operators are available on a contractual basis. A tender is prepared yearly by the Public Operations Account Support Technician, with available contractors and equipment. Contractors are used for transit stop clearing.
- In Saint John, few services are contracted out, as a result of downsizing and operational changes. Internal resources are available to manage regular winter conditions. Resourcing for surge responses is more difficult on short notice without contractors on retainer.

### 4.9 Windrows, Hauling, and Storage

The City increased the service level in residential areas in 2014 by clearing windrows across private driveways that are a result of residential clearing operations. This service is not offered in all municipalities, and only a few municipalities also identify a maximum standard for windrow removal or opening width that they will clear as part of the service. The City operates one snow dump that aligns with environmental provincial standards and regulations. The City has access to the public road allowance adjacent to private property to store snow and uses this space to maximize efficiency in operations.

- In Prince George, private driveways are opened to a maximum of 8.0m wide. The city has four snow dumps. Two main dumps and two smaller ones in specified areas of the city. Larger dumps are granular, not concrete. One dump is used by private contractors for a fee. This is a service provided only to resolve contractors not having alternate dump locations.
- In Red Deer, private driveways facing a street or roadway are cleared, with snow added to existing windrows. With arterial roads, the snow is windrowed and hauled, particularly common on provincial highways with limited to no storage capacity. Other windrows are hauled when they reach 30cm. No private dumping is allowed. Snow dump capacity was exceeded in some years, resulting in additional approvals required for temporary storage.
- In Wood Buffalo, if windrows narrow the street width less than 5.5m or are over 1.0m high, they are removed. In 2020, if windrows across private driveways were over 15cm high, they were removed.
- In Thunder Bay, windrows will be considered for removal only if the travel lane is restricted by encroaching snowbanks. Windrows across private driveways are the responsibility of the business/homeowner in Thunder Bay, Lethbridge and Saint John.
- In Lethbridge, if hauling is required, it is windrowed and hauled based on the plowing priority map. Most snow on

arterials is plowed to the boulevard, but in residential areas when clearing is needed, snow is windrowed and hauled. Snow is hauled to two designated sites (north and east), which were specially constructed to store the snow.

## 4.10 Parking Bans and Enforcement

In Grande Prairie, parking bans are declared when required by the Transportation Manager. Parking bans on permanent snow routes are in effect weekdays from 7am-9pm from November 15 to April 15 annually. Enforcement can ticket and tow vehicles parked illegally on snow routes. The Transportation Department employs a variety of education and communication tools to drive compliance and avoid having to tow vehicles parked illegally on parking routes. When required, Enforcement Services does ticket and tow vehicles. During the 2021-22 snow season, 62 vehicles were ticketed.

Similar municipalities noted that enforcement is difficult and used as a last resort. Communication strategies are continually evaluated to ensure residents are aware of when parking bans are in effect. In some municipalities, reducing fines has resulted in reduced compliance and across the board, additional resources were identified as a need for effective enforcement.

- In Wood Buffalo, coordinated towing has proved effective when there are significant vehicles blocking snow routes and operations will be ineffective without corrective action.
- In Red Deer, vehicles are ticketed on no-park routes, roughly 250-300 tickets annually.
- In Thunder Bay, roadways are classified as arterial and collector (no parking between 2am-7am) and local streets (no parking on one side of the street restrictions based on calendar year). Towing is not typical, but when required, Transportation and Enforcement Services will coordinate a day ahead of plowing to remove vehicles that are blocking plowing routes. This is normally actioned in problem areas like the downtown core.
- In Lethbridge enforcement must hire their own Enforcement Officer for any snow route parking enforcement. The department informally covers this role and is working to establish possibilities for integrating the service directly under the department for better coordination of service. The city's street sweeping program does not have any no parking signs and hires their own Enforcement Officer. A similar approach is being considered for winter parking enforcement.
- In Saint John, parking enforcement for snow removal has been a complex issue, resulting in recent changes to the bylaw to support ticketing and towing. The city has identified the hours between 11pm-7am as prime clearing, and they prioritize and enforce the parking ban during these hours. In New Brunswick, the provincial Motor Vehicle Act only allows the RCMP to tow vehicles. RCMP are constrained and work with the municipality to tow on municipal roads but not any provincially designated highways.

## 4.11 Ice Control

The City approaches ice control from an as needed basis, determined by the Transportation Manager. Continuous application, if required, may be carried out 7 days per week, but is normally applied to priority 1-3 roads during day shifts on weekdays and weekends. Pre-wetting is being tested with more frequency to support snow removal on major routes but requires specialized adaptation on equipment. The City budgets \$800K for ice control materials (sand/salt) annually.

- In Red Deer, anti-icing is used on hills and bridges only, with additional ice control applied as needed. If the weather is warm, a combination of salt with sand in addition to pre-wetting is applied. Brine is used for pre-wetting, 'tiger' calcium road guard, a product out of St. Albert is used at -10 degrees or cooler. Some existing and all new equipment has calibration installed and is used in addition to operator judgement.

- In Thunder Bay, no anti-icing is used, pre-wetting routes is done consistently, and ice-control is used in the approach to intersections and to assist with snow removal. Sanding is used continuously in rural areas.
- In Lethbridge, beet juice and calcium chloride are used. The wind in Lethbridge makes de-icing difficult, and therefore only used on snow removal routes. As a result of wind and temperatures, ice control is typically used 2-3 times per year, with a focus on Priority 1 routes.
- In Wood Buffalo, pre-wetting is a technology the municipality is looking to further test and implement beyond the spot testing they are currently applying. De-icing is not typically done in residential areas but is applied to hilly or steep areas during freezing rain events.
- In Prince George, sand, salt and fracture are used for ice control. Fracture is a straight rock product (fractured rock, gravel and small rock), producing little to no dust in spring. Ice control is applied through pre-set calibration and operator discretion, where and when extra materials are needed. Liquid calcium/salt brine is used, and the municipality has purchased a brine tank to make the solution themselves. Calcium is not used in the downtown core, but hills and downtown are done by 1-2 trucks. All products are pre-wet before being laid down.
- In Saint John, crews use a special truck equipped with liquid brine to spray into the road surface in advance of a storm. Priority 1 roads have sand/salt applied within two days after a storm ending, Priority 2/3 sidewalks have sand/salt applied within 3 days following storm and Priority 4 streets will have sand/salt applied within 4 days following a storm. Priority 2 roads have travel lanes pushed back and anti-icing applied 4 hours after a storm and Priority 3 and 4 roads have travel lanes pushed back and anti-icing applied 72 or 96 hours after a storm.

## 4.12 Rural and Gravel Roads

The City maintains 40km of rural service roads, which are cleared as part of Priority 1 rotation. Most comparable municipalities are responsible for some rural roads. There was variation between the use of truck and plow or graders. Some municipalities used truck and plow exclusively, while others did not use plows as they felt they ended up tossing much of the gravel into the ditch. Windrow removal is not practical on gravel roads. Driveway windrows are not typically cleared on rural roads, unless driving width is impacted. Private driveway clearing is property owner responsibility.

## 4.13 Public Parking Lots

The City clears its facilities through a Priority 1 and 2 ranking, with emergency services (fire) cleared first. Snow is hauled, only if snow storage capacity is not available onsite. Private and commercial parking lots are the responsibility of the property owner.

- In Red Deer, city owned lots and downtown are cleared, but other properties are required to manage their own snow removal.
- In Thunder Bay, Parks and Facilities are responsible for civic facility parking lots and a contractor is hired to complete parking lots in cemeteries.
- In Wood Buffalo, parking lots are done by the Parks Department with a separate budget and staff. Urban crews do clear back alleys (removal) using a grader, loader and two trucks. This usually happens once/season in January.
- In Lethbridge, a contractor is hired to manage snow removal at city facilities. Larger parking lots are the responsibility of business owners and snow is stored onsite.
- In Saint John, a Parking Commission managed all the aspects of parking/clearing/equipment etc. until October 2021 when it was de-commissioned and the responsibilities transferred to a city department along with resource allocations previously managed by the Commission.

## 4.14 Sidewalks, Pathways and Trails

In City, paved lanes in residential areas are cleared by contractors as part of the residential clearing program. City crews clear lanes with one truck with a blade and Parks staff is responsible for trail maintenance and clearing in Muskoseepi Park using a tool cat and tractor with blade. Sidewalks adjacent to City owned property, such as public utility lots, easements, fire hydrants, catch basins, mailboxes and school bus stops are cleared during residential plowing.

In some municipalities, the pandemic resulted in an increased use of outdoor assets such as pathways and trails and municipalities responded by increasing service levels and providing enhanced service for residents. The continuation of these enhanced service levels will be revisited as normal operations resume and service levels are re-evaluated.

- In Prince George, only sidewalks that are part of the major pedestrian network are cleared.
- In Red Deer, pathways in residential areas are not cleared, but due to the pandemic, some clearing has been initiated. Pathways in green spaces and transit stops are cleared.
- In Thunder Bay, the service standard is high with all sidewalks and trails are cleared at 5cm accumulation. This includes residential sidewalks.
- In Wood Buffalo, the Parks department clears all pathways, in addition to sidewalks, rinks and firehall parking lots.
- In Saint John, all sidewalks are cleared by the city. Snow is pushed onto lawns and sidewalks during plowing/blowing operations. Plowing is done for approximately 55 percent of the city's sidewalk inventory.

## 4.15 Public Transit Stops

The City has one staff member assigned to transit stops. A skid steer is used and stops are cleared following each snow event and during residential clearing. Transit stops are generally cleared within 5 days of the end of snowfall.

Clearing of transit stops is approached differently with several indicating that another department (Parks) handles transit clearing or it is done by an external contractor. In these instances, the budget for transit clearing is not included in the Snow and Ice control budget. The contracted service in some municipalities was approximately \$75K.

## 4.16 Weather Monitoring and Forecasting

The City currently relies on the Environment Canada weather station situated at the airport as a standard source for weather and accumulation information. Administration is always on the lookout for new technologies that may enhance the department's ability to predict and document weather events.

All municipalities studied conducted some sort of winter weather monitoring, from a rudimentary ruler in the snow to more sophisticated software such as Wood Weather (AMEC) which provides timely weather information using specialized weather forecasting, government issued bulletins and local weather observations. Robust forecasting can support resource planning and decision making.

## 4.17 Communications

The City's Communications & Marketing Department works with the Transportation and Parks Department to identify and share information on snow and ice control activities happening across the city on a daily basis between October and April. This information is emailed directly to residents who have signed up to receive the information and is also posted daily on the City's social media platforms.

The Access GP Portal and 311 are the City's primary resident inquiry response tools. The City's new Customer Relationship Management (CRM) software enables the City to better track, analyze and report on snow and ice calls and concerns. Internally, it supports enhanced management of citizen concerns related to snow and ice control by understanding

frequency of calls, identifying and targeting crews to areas of high citizen concern and report back to the citizen when the department has actioned and closed the ticket.

- In Red Deer, sandwich board signs are used for street sweeping, and have been requested to be brought back to support awareness of clearing. Administration would like to see an automated system to support the department, as no central call system (e.g. 311) is in place and all calls must be managed through the Public Works Department staff. Corporate Communications has been engaged to support their winter operations messaging and social media, and works with a new analyst in the department to identify and report on progress of the snow and ice program.
- In Prince George, one FTE is responsible for communication from the department. Social media posts usually trigger and interview with local media, which are given 2-3 times by the department head annually.
- In Lethbridge, Public Service Announcements are drafted with input from the department but managed through Corporate Communications. A 311 Contact Centre is operational and shift schedules, processes, knowledge articles and background information is provided to operators to support in answering citizen questions.
- In Saint John, a CRM system similar to Grande Prairie is in place. Winter scripts are built at the outset of the season and representatives are trained to manage calls and processes to best support operations. When more severe issues are reported, the department has a process in place to investigate and deal with these on a priority basis. Calls from elected officials are managed and investigated in accordance with a defined process, to avoid unnecessarily diverting operators from their pre-set routes.

## 4.18 Benchmarking and Innovation

The City is working to enhance data collection to better measure and report on progress of operations during snow events. Tracking is currently done manually, at the end of each shift, and work is ongoing to use GPS tracking and mapping apps to better track and communicate route completions.

All municipalities noted that enhanced tracking, measurement and reporting are desired. As resources and technology become more accessible, departments have additional tools to support real time and post-shift reporting and can better report the detailed information and statistics that councils and residents are looking for with respect to snow and ice control operations.

- In Thunder Bay, a reduction in budget for the snow bank removal line item, resulted in an innovation to focus on creating access points in snowbanks and focussing efforts of the sidewalks plows on areas that will maximize customer access to core business areas. To offset overages, a winter reserve fund was created where any favourable variances in winter operations are re-directed to the winter reserve fund and at council's decision, any other roads favourable variance funds can also be directed to this fund.
- In Red Deer, two reviews were conducted between 2009-2014, resulting in changes to how the department approached operations, including the addition of a Roads Analyst position, who reports on the performance of crews and works with fleet and supervisors to source resources and support field operations and staff. The municipality is moving towards a remote automated form of tracking, combining GPS and AVL systems with physical patrols to track work completed. In the past, colored maps with corresponding dates was used to track what had been completed. Red Deer has tested the use of 'gator gates' to clear windrows from driveways, used winter sand for fill and used recycled sand from the previous snow year.



- In Lethbridge, results of a contracted study by KPMG is expected to support the municipality in determining best practices and next steps for tracking and benchmarking.
- In Prince George, crews are connected to City Works and track what was done in the previous 24 or 72 hours. Sky Hawk GPS is used in the equipment and it can tell how many times the road was plowed, blade up/down, sander on-off. This technology is being explored for application to their street sweeping program.
- In Saint John, a new AVL system, Geotab, through Northern Business Intelligence (NBI) is being implemented. The software creates plowing routes, completion, material spreading and can give managers and supervisors updates on progress. It will also support in-cab operators with when to turn, how much to dump and what has been completed. Implementation is still early stages, but once technology is refined and tested, it could be considered for garbage dump routes in addition to snow routes. Reporting is done internally and as determined by council. Any real-time reporting will be for internal reporting and tracking only. Status updates can be provided at the discretion of the supervisor or requests by council.

### 4.19 Challenges

Some specific challenges were noted during discussions with peer municipalities, these included:

**Staff Absences:** Staff absences can have a significant impact on snow removal operations. During winter events finding other resources that are willing and have the necessary skills to fill the void is an ongoing challenge. To cover shortages, staff have been drawn from other sections (Parks/Waste) to assist, but usually are needed to return to their normal section during daytime operations. Similar challenges are also faced by contractors.

**Snow Storage:** In years with significant snowfall, snow storage can be an issue forcing some municipalities to seek temporary locations to store snow, when the primary snow storage sites reach capacity. In one case, the municipality approached the province for special permission to store snow on the right of way and another opened a private dump (with tipping fee) when contractors faced challenges finding places to store snow. A new snow dump can cost upwards of \$10M and some municipalities have had to hire security to monitor dumping to ensure compliance.

**Workforce Planning:** Most municipalities identified that they have an experienced staff complement. Some are actively building into their operations opportunities to use experienced staff to train new staff and leverage technology to optimize training. All municipalities noted that there is a notable shift in the desire for work-life balance for younger staff and overtime pay is not as attractive as it may have been to previous generations. Succession planning and planning for a future workforce is an important consideration for municipal councils and administrators.

## 5.0 Service Adjustments and Costing

### 5.1 Summary

City Council identified a desire for both a review of current practices and an understanding of what other comparable jurisdictions are doing so that service level adjustments could be considered and implemented in the 2022-23 snow season. Previous Councils have identified a desire to increase the attractiveness and integrity of the active transportation network, reduce green house gas emissions and enhance public engagement and awareness.

Based on the Council's current strategic goals and analysis of other jurisdictions, the following section identifies where gaps exist in defined service levels, and areas where adjustments to the level of service may positively impact resident satisfaction with the City's winter program as defined by Policy 606.

Each of the following services is accompanied by the existing service level provided and if adjusted, implications for budget, equipment and staffing.

There are many variables to consider in calculating the estimated cost to increase the levels of service to the Snow and Ice Control program. Internal costs include salaries and benefits, equipment maintenance and replacement costs,

goods and supplies and administrative overhead. Internal salary and benefits costs have been included for either full year or seasonal positions and would be redeployed to assist with other services within the transportation program. Contractor costs have been estimated using current rates and estimates of hours and equipment required to achieve the enhanced service levels. Where applicable, costing has been provided to complete the services internally or through contracted services. It is important to note that the most cost effective way to increase service levels may be a combination of both internal and contracted resources, along with adjustments to service levels to achieve efficiencies in staffing. Additionally, in some cases contractor costs have been identified, however, there may be industry constraints that would require contractors to increase their fleets in order to meet the city's enhanced service levels if approved.

### 5.2 New or Defined Level of Service Considerations and Costing

#### 5.2.1 Transit Stops

The City works to provide services to enable accessibility for all transit riders through regular clearing of transit stops across the city.

Current Level of Service	Possible Change(s)	Additional Internal Resources Required	Contracted Services
Transit Stops cleared by one staff on day shift following each snow event and during residential clearing.	Define stop priority. Priority 1 transit stops within 24 hours end of snowfall and all others in 48 hours end of snowfall.	\$130K-150K per year	\$37.5K - \$75K per year
The internal resources includes the cost of hiring two additional equipment operators for the full year with the assumption they would transfer to the Parks during the summer. This would also have an impact on the number of seasonal staff hired in parks. There would also be additional maintenance costs required for the equipment used to clear the transit stops.			

## 5.2.2 Special Zones - City Centre (Downtown)

The City currently clears the downtown business zone as part of the Priority 1 and 2 service, but the downtown is unique in that all roads must be plowed into windrows, picked up and hauled to the snow dump on the same night shift. Road design, on-street parking and high traffic volumes does not allow for on-street windrow storage. A defined service standard for the City Centre (downtown), potentially as a Priority 1-A would support more efficient mobility for pedestrians and motorists in the city's core. All work in the City Centre begins on the second nightshift after the snow event ends and is completed on the third nightshift. City Centre lanes are cleared on the fourth night shift following the end of

a snow event. This allows the first nightshift to clear P1 roads leading in and out of the core and gives an opportunity for downtown businesses to clear their sidewalks into the parking lane for pick-up and removal. Adjusting the level of service in the City Centre so that the area is plowed and snow removed on the first nightshift will require extra resources, including clearing sidewalks ahead of the road crew and extra resources to clear the P1 roads leading in and out of the City Centre to meet the current level of service on P1 roads.

Sidewalks along arterials are currently the responsibility of business owners and are cleared through private contractors.

Current Level of Service	Possible Change(s)	Additional Internal Resources Required	Contracted Services
Sidewalks along arterials are responsibility of business owners.	Sidewalk clearing responsibility of City within 24 hours end of snowfall.	\$160K – \$180K per year \$200K Capital Equipment Purchase	\$37.5K - \$75K per year
The internal resources includes the cost of hiring three additional operators for winter season only, additional equipment maintenance costs and a capital purchase of a municipal tractor.			
Snow is cleared from roads 24 hours after snowfall ending.	Snow is cleared from roads within 12 hours and park lanes completed within 24 hours after end of snowfall.	N/A	\$66K - \$132K per year
The use of internal resources required to enhance this level of service would require significant capital investment for equipment and additional staff, or would result in a decreased level of service to P1 roads.			
Lanes are cleared on an as needed basis.	Lanes cleared 72 hours after end of snowfall.	N/A	\$16K - \$32K per year
The use of internal resources required to enhance this level of service would require significant capital investment for equipment and additional staff, or would result in a decreased level of service to P1 roads.			

## 5.2.3 Active Mobility Pathways and Trails

The City does not currently identify a service standard for the removal of snow from pathways and trails. Priority 1 and 2 pathways are identified in Appendix 1, with a trigger of >10cm of snow accumulation, but no service standard (time standard for clearing, i.e. within 72 hours) is identified for priority 1 and 2 pathways or the Muskoseepi trail system. P1 and P2

pathways and trails are generally cleared within 5 days end of snowfall. Muskoseepi trails are cleared within five weekdays. Defining a time standard in the policy would clearly define a level of service. If a higher level of service is desired, additional staff resources and or equipment would be required, depending on the level of service identified.

Current Level of Service	Possible Change(s)	Additional Internal Resources Required	Contracted Services
Pathways and trails are generally cleared within 5 week days.	P1 Trails cleared within 48 hours end of snowfall and P2 trails cleared within 96 hours after end of snowfall.	\$45K - \$55K per year	N/A
The internal resources includes the cost of hiring one additional operator for winter season only and additional equipment maintenance costs.			

## 5.2.4 Windrow Removal on Priority II Roads

Policy 606 identifies that where possible, snow will be plowed and stored on the city boulevard. In cases where there is no adjacent snow storage capacity, snow is windrowed for pick up at a later date. While the service standard for clearing arterial, collector and commercial/industrial roads is defined, removal (hauling) of windrows from Priority 2 roads is done as soon as possible after defined service standards are met as per

the policy, typically within 2 weeks (10 weekdays) following the end of snowfall.

Identifying a time service standard for windrow removal would require additional funding and resources. Removal of windrows from the priority II road network where the roadway width is less than 5.5 m could enhance accessibility and safety.

Current Level of Service	Possible Change(s)	Additional Internal Resources Required	Contracted Services
No defined standard for windrow removal. Typically removed within 10 week days after end of snowfall.	Establish in policy a two-week (10 weekday) time standard, from the end of P2 plowing.	N/A	N/A
There would be no additional financial impacts to defining this level of service.			

Current Level of Service	Possible Change(s)	Additional Internal Resources Required	Contracted Services
No defined standard for windrow removal. Typically removed within 2 weeks after end of snowfall.	Establish a one-week (5 weekday) standard from the end of P2 plowing.	N/A	\$550K – \$1.1M per year
The use of internal resources would require significant purchases of capital equipment and additional staff.			
No defined standard for windrow removal. Typically removed within 2 weeks after end of snowfall.	Establish a three-week (15 weekday) standard from the end of P2 plowing.	N/A	\$178K - \$356K Savings per year
The internal cost savings of this decrease in service level would be minimal as existing staff and equipment would be reassigned to other snow removal operations.			

## 5.2.5 Residential Snow Clearing Program

- Adding rotations of residential snow clearing with a minimum accumulation**
- Increasing the service standard from 2 weeks/rotation to 1 week**
- Complete haul out – from residential**

The City's current residential snow removal contract stipulates that snow removal will be completed within two weeks (10 weekdays). Snow removal in residential areas has happened between 3-5 times per season in the past 3 snow seasons. In 2022, significant snow and ice resulted in four residential

rotations between January 1-April 1, 2022. Additional funding would need to be allocated to increase the level of service provided through the residential snow removal program. Increasing the number of active days for snow removal to include weekends is an option, but could be problematic, as on-street parking typically increases over the weekend when residents are home, and enforcement would likely require additional resources.

Significant funding would be required to increase the level of service in residential areas to one week from two weeks for clearing. Additional contracted services would be required.

Current Level of Service	Possible Change(s)	Contracted Services
As required. Typically 3-5 rotations per season is budgeted.	Budget additional rotations. Up to eight rotations of residential clearing as required. A change in minimum trigger would be required (7.5cm or 5cm) in addition to additional budget.	\$800K-\$1M
Financial implications include the cost of 4 additional rotations of residential clearing.		



Current Level of Service	Possible Change(s)	Contracted Services
As required. Typically 3-5 rotations per season is budgeted.	Budget fewer rotations. Up to three rotations of residential clearing as required.	\$250K-\$500K Savings per year
Each round of residential clearing costs the City between \$200-250K. Reducing the trigger for residential clearing from 10cm to 15cm or greater, would reduce the contracted services cost for the Residential Clearing Program. If residential rotations are reduced, subsequent rotations may be impacted.		
When initiated, residential clearing is done over a two week rotation.	Increase service standard from 2 weeks to one week.	N/A
While increased contractor costs of this increase in service level would be minimal, this option may be unviable due to industry constraints. This option would also require additional staff to be hired to oversee contractors.		
Residential clearing is done M-F over the course of a two week rotation.	Complete residential snow removal seven days/ week.	N/A
There are no significant financial implications of this option, however the increased parking on residential streets over the weekend is a barrier to provide effective service 7 days a week.		
No level of service for windrow or cul-de-sac pick up in residential areas. (Except for emergent issues as determined by Manager of Transportation)	Defined standard for cul-de-sac pile pick up for road width encroachment of 5.5m or more (10 days).	\$930K - \$1.55M per year
The contractor costs include costs for end dump trucks, loaders and dozers to remove piles from cul-de-sacs.		

### 5.2.6 School Zones and School Bus Stops

The City has 16 Public and nine Catholic schools and 160 bus stops across priority, residential and private roads. Due to congestion around school sites and high traffic periods, Transportation and Parks has had an unofficial service priority of removing windrows at school sites before starting on city-wide removal. Council could add this to the policy to make this an official service level priority.

There are currently 160 school bus stops throughout the

city, and there is no enhanced level of service for windrow removal at these sites. School bus stops are cleared as part of the P2 and Residential Clearing program. In looking at the 2021-22 school bus stop map, there are currently 43 located on residential streets, 114 on Priority 2 streets and three on private roads. Overall enhancement of windrow removal service on P2 would be the best way to speed up removal of school zone windrows.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications
School zone windrows removed first once hauling begins (unofficial).	Formally establish Priority windrow removal from school zones.	None
School bus stop windrows are removed without heightened priority during the regular windrow removal process.	Windrow removal from school bus stops prior to commencement of regular windrow removal.	Initiating partial, targeted windrow removal at 114 locations would result in a piecemeal service that greatly increase the amount of time required for city-wide removal. In addition, there may be contractor capacity constraints to consider.

## Operational Considerations and Adjustments

### 5.2.7 Snow and Ice Inquiries, Reporting and Citizen Engagement

*Further develop targeted snow and ice control public communications and explore additional software and mapping technology to support real-time reporting and notifications.*

The City completed the Did you Know – All about Snow and Ice Campaign in 2019 and continues to engage residents throughout the winter season to communication information about the program and status of snow removal activities across the City.

Additional targeted communications specifically designed to raise awareness and understanding around Policy 606, operations and residents' role in effective snow removal in the city may support increased compliance and enhance resident engagement.

Identifying additional technologies could support

increased awareness through real-time reporting, citizen communication and engagement apps. Transportation and Parks are also investigating the increased use of video content to provide more engaging information on the various aspects of the snow removal process and are working with the City's IT Department to develop additional route tracking and reporting through GIS software and applications.

The city is currently working on an internally developed system to better track and report snow removal activity to the public. The system, which should be in place for the 2022-23 snow season, will update residential and priority 2 plowing activities at the end of each shift and update a street level map to inform residents and council about which streets have been completed and when. Should the pilot be successful, additions for windrow tracking could be added in subsequent years.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
Current communications practices include seasonal snow brochure mailout, press releases, daily social media and Snow Clearing Updates.	Corporate Communications to determine more targeted initiatives in consultation with Transportation and Parks.	None	More targeted communications with residents and enhanced resident awareness of snow and ice control.

## 5.2.8 Benefit Driven Procurement

*Consider opportunities for integration of Benefit Driven Procurement into snow and ice contracting.*

An emerging approach to procurement of services is Benefit Driven Procurement, enabling wider community and economy benefits by applying a different methodology to the bidding and procurement process.

While procurement changes are outside of the scope of the snow and ice control policy, the City's Procurement Department is moving in this direction and will be actively considering this as they identify opportunities to build these principles into upcoming contracts and procurement policies.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
No formal benefit driven procurement is practiced.	As developed by the City's Procurement department, benefit driven considerations will be identified.	None	Wider benefits to the community and economy for contracted services.

## 5.2.9 Enforcement

*Develop a comprehensive education and enforcement protocol, including fines and procedures for snow compliance.*

Compliance and enforcement on permanent snow routes continues to be one of the most significant challenges facing all municipalities in delivering effective snow removal on city streets. Better coordination of enforcement resources for parking compliance on snow routes, could provide added benefit to clearing activities. A review and adjustment to the fines for parking on snow routes and increased towing are also options that Council could consider in addition to

enhanced education and awareness campaigns.

Additional ticketing and towing within residential areas for snow removal is currently limited by the wording of bylaw C-1166, which allows for removal of street parking upon declaration by the director and the erection of temporary signage. A future revision of C-1166 could harmonize the wording of the bylaw with the current weekday system of residential snow removal and allow greater participation by enforcement staff in difficult areas.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
Enforcement services issues tickets to vehicles in active snow removal areas when parking bans are declared. No ticketing/towing in residential.	Coordinated ticketing and towing in advance of snow removal operations.	TBD – additional enforcement staff may be required.	Increased compliance during snow removal operations.

## 5.2.10 Extreme Snow Events

*Define extreme snow events in Policy 606 or create a procedure for Extreme Snow Events*

Occasionally, Grande Prairie experiences snow events that overwhelm the department's ability to deliver council's adopted service levels. Adoption of a provision for the relaxation or reset of service standards during these events would allow crews to put continual focus on the arterial

network, preserving emergency vehicle mobility, and an opportunity to communicate appropriate safety information to citizens.

The establishment of such a threshold would not have a direct financial or staffing implications, unless the reaction to such a declaration would involve enhanced service.

*\*Extreme snowfall and extreme cold*

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
No defined standard for extreme snow events. All events are treated the same.	Define service standard triggers for extreme snow events, >18cm within a 24 hr. period of time) or extreme cold (-30 or below).	None	Clarity for department and residents on service level adjustments allowable during extreme snow and cold weather events.

## 5.2.11 Ice Control - Community Sandbox

*Support resident involvement in ice-control through a community sandbox pilot.*

Several communities surveyed indicated that they provide a way for residents who are so inclined to obtain free sand to address the conditions on the sidewalks around their homes and neighborhoods.

Administration could explore a small-scale pilot program to identify actual costs and to design appropriate containers and refill strategies. Once staffing and material costs can be accurately extrapolated from the popularity of the trial, future amendments to the policy can be costed and considered.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
Residents are currently responsible for the purchase and application of ice-control materials.	Free sand would be available at the Service Centre for residents. Limit would be 5 gallons/resident.	Minimal	Residents have increased access to ice-control materials – free of charge.

## 5.2.12 Neighbourhood Snow Angel Program

*Support residents and encourage good neighbour initiatives such as the Snow Angel program.*

Many communities have implemented some sort of Snow Angel program. The City has in the past had a similar program in place. Revitalization of this program may help

promote community pride and service.

Administration could explore previous project scope, identify actual costs and potential sponsorship opportunities so future amendments to the policy can be considered.

Current Level of Service	Possible Change(s)	Financial and Staffing Implications	Expected Outcomes
Property owners are responsible for clearing sidewalks adjacent to their property as per the Traffic Bylaw.	Incentives are offered through a Community Snow Angel Program.	Minimal	Increased support for seniors and others who require assistance with clearing, through 'good neighbour' Snow Angel program. Increase in neighbourhood pride and aesthetics during the winter months.



## 6.0 Conclusion

Compared to similar jurisdictions across Canada, the City offers a comparable level of snow and ice control service to residents. With a city of drivers, the current approach to clear main arterial and collector roadways first is a reasonable approach to ensure commuter traffic and emergency service vehicles can safely and efficiently access the road network. If increasing the level of service and accessibility throughout the active mobility network for pedestrians and cyclists is desired, further examination of service standards and resources available should be explored.

Council can enhance resident understanding and awareness of winter operations by further defining the City's snow removal priorities and setting levels of service in Policy 606. This may include defining a service standard (minimum trigger and time standard) for transit stops, pathways and trails, windrows on priority roads, special zones (e.g. downtown core) and management of extreme snow or cold weather events and clearly communicating the City's approach to residents.

Compliance with street parking on permanent snow routes and during priority road and residential clearing continues to be a significant issue facing all municipalities, including Grande Prairie. The City can consider strategies to increase public awareness and compliance to ensure resources

allocated to snow and ice control are able to effectively achieve the defined levels of service.

As the City is identifying and incorporating more environmentally sustainable practices, the use of de-icing and pre-wetting materials should be evaluated through this lens and where possible, snow removal and storage practices should continue to actively identify and mitigate any risks to the environment and resident safety.

The City has taken steps in recent years to explore new technologies and automation and should continue to identify and pilot new equipment and keep informed of industry best practices. More robust tracking and reporting measures will help the department keep Council informed of progress and performance targets being achieved throughout the winter season. Emerging technologies for mapping, and public engagement and communication are increasing the City's ability to capture real-time feedback from residents, businesses and stakeholders; manage resources; and distribute information in a timely fashion, building confidence and engagement with residents, which is critical for community satisfaction and compliance.

Everyone has a role to play in achieving effective snow and ice control to support safe mobility during the winter season.

## Appendices

**Appendix 1 – Policy 606 – Snow and Ice Control**

**Appendix 2 – 2021 Snow Brochure**

**Appendix 3 – Snow Removal and Snow Storage Diagrams**

**Appendix 4 – Municipal Comparators – Priority Clearing**

**Appendix 5 – Municipal Comparators – Workforce and Tracking**

**Appendix 6 – Equipment Replacement Costs**

**Appendix 7 – Levels of Service Scenarios**

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## Web Resources

City of Grande Prairie	<a href="http://cityofgp.com">cityofgp.com</a>
City of Lethbridge	<a href="http://lethbridge.ca/Pages/default.aspx">lethbridge.ca/Pages/default.aspx</a>
City of Prince George	<a href="http://princegeorge.ca/Pages/default.aspx">princegeorge.ca/Pages/default.aspx</a>
City of Red Deer	<a href="http://reddeer.ca">reddeer.ca</a>
City of Thunder Bay	<a href="http://thunderbay.ca/en/index.aspx">thunderbay.ca/en/index.aspx</a>
City of Saint John	<a href="http://saintjohn.ca/en">saintjohn.ca/en</a>
Regional Municipality of Wood Buffalo	<a href="http://rmwb.ca/en/index.aspx">rmwb.ca/en/index.aspx</a>
Environment Canada	<a href="http://weather.gc.ca">weather.gc.ca</a>
Statistics Canada	<a href="http://statcan.gc.ca/en/start">statcan.gc.ca/en/start</a>

