City of Edmonton
Office of the City Auditor

Snow and Ice Control Audit

January 6, 2021

OCA00338 – Attachment 1

Report Highlights

Audit Objectives

On February 13, 2020, City Council received an anonymous letter which included a number of allegations of mismanagement of the City's Snow and Ice Control Program. In response to the concerns raised in this letter, the Office of the City Auditor decided to conduct a value-for-money audit of the City's Snow and Ice Control Program.

The objectives of this audit were to determine if the Parks and Roads Services Branch (PARS):

1. Has an effective governance structure in place to deliver the Snow and Ice Control program.

2. Measures and monitors the effectiveness, efficiency and economy of the Snow and Ice Control program.

3. Is planning, allocating, managing and monitoring program resources to ensure effective, efficient and economical delivery of the Snow and Ice Control program.

4. Has effective and efficient program processes and operations in place to meet the Snow and Ice Control program objectives and service levels.

5. Has effective processes in place to manage public expectations on program quality.

Scope and Methodology

For the purpose of this audit, the Snow and Ice Control (SNIC) program is defined as all activities that fall under the Snow and Ice Control policy. The audit also included the snow and ice activities under the Active Pathway Removal program.

The scope does not include spring clean-up activities, which include the removal and disposal of winter street sand.

We used the following methods to gather evidence to conclude on the above objectives:

- Reviewing related policies, procedures, bylaws, management plans and guidelines;
- Reviewing internal Snow and Ice Control documentation;
- Discussions with management and staff; and,
- Analysis of data.

Statement of Professional Practice

This project was conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.

Report Summary

Governance

There are opportunities to improve the governance structure of PARS as it relates to the delivery of the SNIC program.

Recommendation 1 Review and Update Policy and Guiding Documents	PARS should review and update the guiding documents relating to the SNIC program to improve their clarity, accuracy, and consistency.
Recommendation 2 Improve Decision-Making Processes	PARS should improve decision-making processes related to SNIC by: • Increasing opportunities to actively engage employees in operational decision-making processes, and • Assessing the effectiveness of communication tools to ensure that internal information is received and flows openly.
Recommendation 3 Improve Change Management Processes	PARS should strengthen and improve current change management practices to include people focused processes when implementing changes to SNIC organizational structure and program.

Performance Management

PARS can improve the measuring and monitoring of the effectiveness, efficiency and economy of the SNIC program.

Recommendation 4 Performance Management Framework	PARS should develop and implement relevant, sufficient, reliable, comparable, and consistent performance measures to support management decision-making and demonstrate achievement of Corporate, Branch and SNIC goals.
Recommendation 5 Improve Benchmarking Process	PARS should improve and formalize an ongoing benchmarking process to ensure PARS assesses and compares SNIC program's performance with other cities. This process should be aligned with the ongoing work of the Corporation and industry best practices.

Program Resources

PARS is planning, allocating, managing and monitoring program resources to ensure effective, efficient and economical delivery of the SNIC program. However, we identified a number of opportunities for improvements, cost reductions and potential revenue generation.

Recommendation 6 In-house versus Contracted Services Cost Analysis	PARS should perform regular assessments of the cost of in-house services (with owned or leased equipment) versus the cost of contracted resources for key SNIC activities and adjust the allocation of work based on the findings.
Recommendation 7 Document Service Level Commitments and Operational Arrangements	PARS and Facility and Fleet Services Branch should work together to clearly document service level commitments and operational arrangements with PARS to clarify roles and responsibilities, facilitate communication, set expectations, and define procedures.

Recommendation 8 Develop Cost-Reduction and Revenue Generation Opportunities	PARS should, as part of the Reimagine initiative underway, reevaluate and analyse the following cost-reduction and/or revenue opportunities: ● Community Sandbox program ● Tipping fees at snow storage sites ● Permanent versus temporary staff analysis

Program Processes and Operations

There are areas of opportunity to improve SNIC processes and operations.

Recommendation 9 Expand Standard Operating Procedures to Include All Key SNIC Activities	PARS should expand SOPs to include all key SNIC activities including but not limited to: ● Grader wing plow procedures ● Sanding locations operations ● Snowblowing operations ● Brushing operations ● Pavement temperature measurement ● Snowpack measurement ● Calibration of equipment
Recommendation 10 Improve Staff Oversight	PARS should improve staff oversight by developing and implementing a formalized process to monitor staff productivity and to determine whether staff are following documented procedures.

Public Expectations

PARS can improve its processes to manage public expectations on SNIC program quality. We identified a number of opportunities for improvements to strengthen public communication and the handling of citizen's concerns.

Recommendation 11 Improve Public Communication	To improve public communication, PARS, in collaboration with the Communication and Engagement Department, should ensure that: ● The Communication Plan is clear and complete; ● The information provided on the SNIC website is consistent, clear, and concise; and ● The interactive maps provided on the website are accurate and timely.
Recommendation 12 Strengthen Complaint Handling Processes	PARS should strengthen complaint handling processes by: ● Ensuring 311 scripts are consistent, complete and accurate. ● Centralizing receiving, recording and handling of Councillor inquiries. ● Analyzing 311 and Councillor inquiries for common themes and developing strategies to address common themes. ● Tracking and managing time spent dealing with 311 and Councillor inquiries. ● Deactivating the PARS email account or developing a process to enter these emails into the 311 stream.

Program Overview

## Snow and Ice Control Program

All roads and pathways cleared must meet the established City standards documented in City's SNIC policy (C409J).

The purpose of the Snow and Ice Control (SNIC) program is to reduce the hazards of winter conditions for motorists, cyclists and pedestrians, and facilitate the operation of Transit and Emergency Services vehicles. Snow and ice conditions on the transportation system have a dramatic impact on public safety, roadway capacity, travel time and economic costs. User safety, both pedestrian and driver, is the most important priority within the SNIC program. It is important that City roads and pathways (e.g., sidewalks, bike lanes, trails) are cleared of snow and ice on a timely basis, as failure to do so will impact the safety of City residents.

Infrastructure Operations

The City of Edmonton Infrastructure Operations business area, operating under the Parks and Roads Services Branch (PARS) within the City Operations Department, is tasked with delivering the SNIC program. Within Infrastructure Operations is Infrastructure Field Operations, which is split into two groups: Mechanical Roadways and Active Pathways.

Infrastructure Operations, in the City Operations Department, is tasked with delivering the SNIC program.

- City Operations Department
  - Parks and Roads Services Branch
    - Infrastructure Operations
      - Infrastructure Field Operations
        - Mechanical Roadways
        - Active Pathways
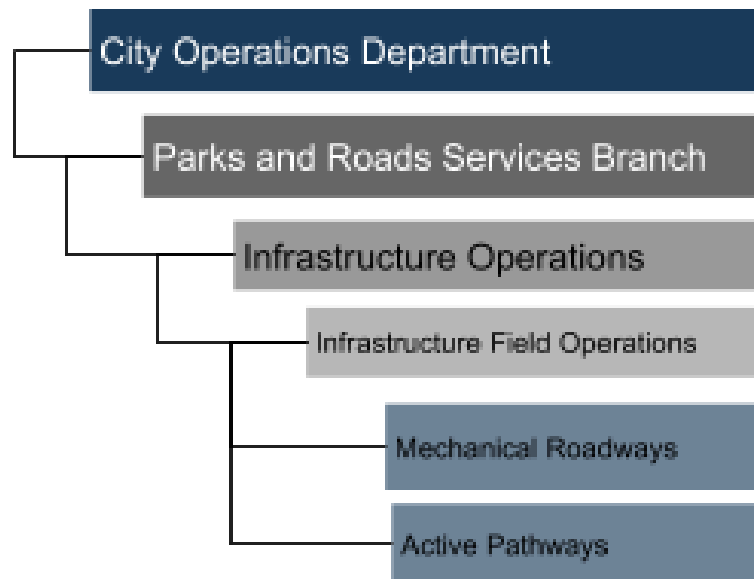
Roadways and Pathways Inventory

The City's SNIC program maintains a large inventory of roads and pathways.

Mechanical Roadways (Lane kilometers)[1]

Primary Highway	934
Arterial	3,232
Collector	1,705
Industrial	377
Residential	4,308
Alley	1,277
Total Paved Roads	**11,833**

Active Pathways

Routes in Kilometers	
Serviced Sidewalks	1,447
Bike Lane Routes	38
Bridge/Overpass Routes	50
Other Hand and Machine Routes	277

Routes in Meters Squared	
Facilities Routes[2]	181,814
Stair Routes	12,283
Outdoor Ice	17,120

Number of Structures	
Bus Stops	5896
Sandboxes	488

In the 2019/2020 winter season Infrastructure Operations maintained approximately 11,833 lane km of roads, 1,447 km of sidewalks, 38 km of bicycle paths, and 5,896 bus stops.
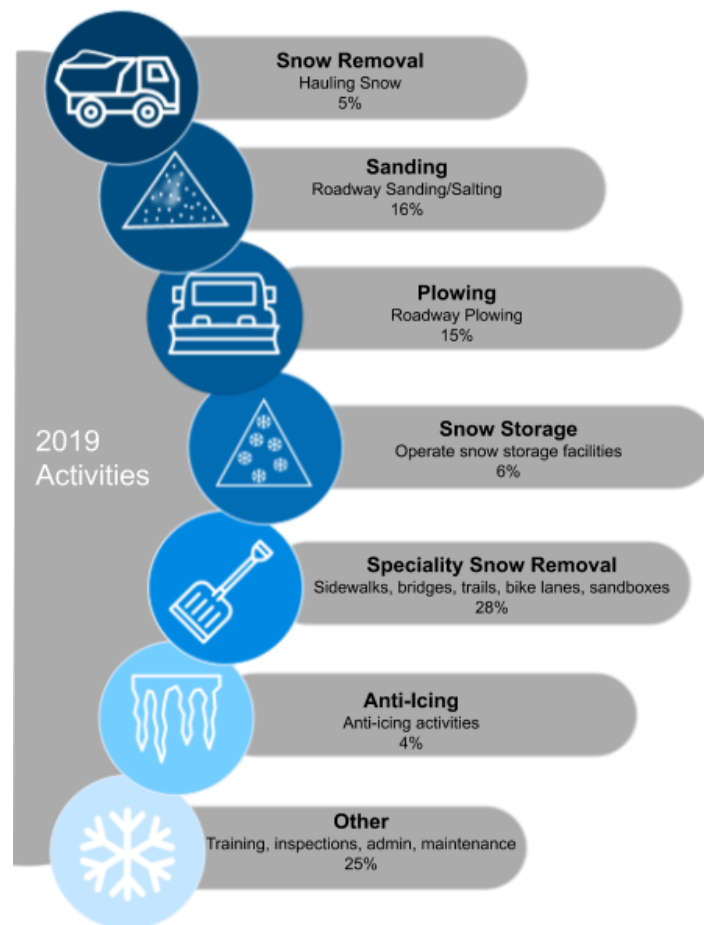
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[1] The **lane kilometer** method involves measuring the length of each lane that is maintained instead of counting the overall length of a road. For instance, one kilometer of a four lane highway will be counted as four kilometers under the lane kilometer method.

[2] Facility routes are routes linked to high priority sites (e.g. city facilities such as Claireview and Meadows recreation centres and senior centres). These routes include a combination of services e.g. stairs, bus stops, sidewalk clearing involving both machine and handwork. They are done as one route, instead of a piecemeal approach.

Program Delivery

In 2019, the City of Edmonton's expenditures for the SNIC program were $54 million. The SNIC expenditures are allocated to seven key activities:

Sanding and plowing of roads respectively comprise 16% and 15% of the 2019 SNIC expenditure for a combined total of 31%. Active pathway removal makes up 28%.

Snow Removal
Hauling Snow
5%

Sanding
Roadway Sanding/Salting
16%

Plowing
Roadway Plowing
15%

2019 Activities

Snow Storage
Operate snow storage facilities
6%

Speciality Snow Removal
Sidewalks, bridges, trails, bike lanes, sandboxes
28%

Anti-Icing
Anti-icing activities
4%

Other
Training, inspections, admin, maintenance
25%

Services are delivered from 5 main yards (for mechanical roadway services) and 6 smaller yards (for active pathway services) spread across five districts.

Infrastructure Operations provides services using a mix of internally owned and staffed equipment, and contracted resources. Contracted resources counted for 23% of total SNIC expenditures in 2019 ($12.5M).

Based on information provided by Administration approximately 600 employees (permanent, provisional and temporary) were engaged in the City's SNIC operations during the 2019/2020 winter season.

Governance

We defined governance as the structures, systems, and practices in place to[3]:

- Assign decision-making authorities, define how decisions are to be made, and establish the organization's strategic direction;

- Oversee the delivery of services; the implementation of policies, plans, programs, and projects; and the monitoring and mitigation of key risks; and

- Report on performance in achieving intended results and use performance information to drive ongoing improvements and corrective actions (covered in the next section).

To determine if the PARS Branch has an effective governance structure in place to deliver the SNIC program, we:

1. Reviewed the guiding policy documents to determine if the objectives and service levels of the SNIC program are clearly defined.

   The guiding policy documents are not clear and are inconsistent.

2. Assessed the roles, responsibilities and accountabilities for business areas involved in the SNIC program to determine if they are clearly defined, documented, communicated and understood.

   Roles, responsibilities and accountabilities are generally clearly defined but improvements can be made to guiding documents for key SNIC activities.

3. Reviewed the decision-making processes as they relate to the SNIC program to determine if they are clear and well-defined.

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[3]Definition:https://www.caaf-fcar.ca/en/oversight-concepts-and-context/what-is-oversight-and-how-does-it-relate-to-governance/what-is-governance

> *Decision-making processes are to some degree clear and well-defined, however there are some opportunities for improvement.*

4. Assessed if PARS follows best practices when implementing changes to its organizational structure and the SNIC program.

> *PARS needs to strengthen and improve its change management processes most notably the parts relating to internal communication and resistance management.*

Based on our observations, we conclude that there are opportunities to improve the governance structure of PARS as it relates to the delivery of the SNIC program. We identified these opportunities and provide three recommendations in the sections below.

Guiding Documents

City Council has established service levels for its SNIC services. All roads and pathways cleared must meet the SNIC standards documented in the City's Snow and Ice Control Policy (C409J). Appendix A provides an overview of the SNIC standards by type of road or pathway.

Snow and Ice Control policy is unclear

We reviewed the SNIC policy for clarity, accuracy and consistency. PARS can improve the clarity of the SNIC policy by:

- Providing definition to key terms.

    Example
    "Prioritized sidewalks, trails and bike routes", "snow event", "major snowfall".

- Being consistent with terminologies.

    Example
    "Within 48 hours following the end of the snowfall", "within 48 hours of a snowfall", "within 48 hours of the end of snowfall", "within 24 hours from end of snowfall", and "within 24 hours after the snowfall". It is unsure if all these phrases mean the same thing.

- Providing details when specific information is given.

    Example
    The Policy indicates that residential roads will be bladed when the snowpack[4] is more than 5 cm. It does not specify whether the 5 cm is based on the measurement in one area of the City or city wide.

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[4] Snowpack is the mass of fallen snow that has been pressed down so that it has formed a hard layer.

> The Policy also indicates that windrows more than 30 cm in height will be cleared. It does not specify if the 30 cm is measured from bare pavement or above the snowpack. The Policy also does not specify if clearing the windrow means hauling all the snow away or just reducing the windrow to less than 30 cm in height.

- Including all services and operational activities.

> **Example**
> Community Sandbox program, snow clearing at City facilities are not mentioned in the Policy.

- Reviewing the priority list to ensure it is clear to citizens.

> **Example:**
> Infrastructure Field Operations is structured into two teams: Mechanical Roadways and Active Pathways. Each team maintains a different inventory with their own priority listing. The Policy is not updated to reflect the operational practices.

- Ensuring the Policy and operational practices are consistent.

> **Example:**
> The SNIC policy indicates that residential roads will be bladed to 5 cm snowpack condition and will be completed within 7 days, commencing within 48 hours following the end of the snowfall. It did not specify that this does not apply to Cul-de-sacs. Cul-de-sacs are cleared using hired loaders and skid steers and it can take up to 6 weeks to complete the process.

When the SNIC policy is not clear, it is open to different interpretations. On the one side it is difficult for management to understand the service levels it is required to meet. On the other side, it creates confusion for citizens on what can be expected. This can contribute to poor public perception of the services the SNIC program is providing.

In addition, the SNIC policy does not seem to be aligned with citizien's and Council's expectations. In the last few years, Council has requested, a number of times, that the Administration explore options on service levels that are above what is in the SNIC policy (e.g., full snow services in residential areas, removal of windrows less than 30 cm). Furthermore, Council has expressed interest in operational topics such as the public complaint process and material used for SNIC. These topics are not included in the SNIC policy.

We also reviewed the following guiding documents that made references to the SNIC policy for accuracy and consistency:

- City of Edmonton Approved 2019-2022 Operating Budget
- Parks and Roads Services Branch Action Plan 2019-2022
- Snow and Ice Control Manual
- 2018-2020 Active Pathway Removals Training Manual (This is a procedural document that does not include any policy related information.)

The SNIC policy and the 2019-2022 operating budget are public documents. The Branch Action Plan, Snow and Ice Control Manual and Active Pathway Removals Training Manual are internal documents.

There are inconsistencies around the program objectives, cul-de-sac snow removal, and residential blading between the guiding documents and the SNIC policy.

Citizens hold the City accountable to the service levels and information in the SNIC policy. The Snow and Ice Manual is an internal document which SNIC staff follow to make operational decisions. When there are discrepancies between the two documents, it creates confusion for Edmontonians and staff about the objectives and service levels of the SNIC program. This contributes to a higher number of complaints and a perception of the SNIC program not meeting its service levels.

PARS management is developing a new SNIC policy. This initiative is part of a larger corporate initiative to review the current City policies and develop a framework, tools and process for drafting City policies.

Recommendation 1
Review and Update
Guiding Documents

Recommendation

Review and update the guiding documents relating to the SNIC program to improve their clarity, accuracy, and consistency.

Responsible Party

Branch Manager, PARS

Accepted by Management

Management Response

Administration has policy conversations with Council - and by extension, the public - on a regular basis, with modifications implemented frequently. To further support these conversations, the Snow and Ice Control Policy (C409J) will be refreshed and presented to City Council in late Spring 2021. The refreshed policy will be aligned to City outcomes, and will follow best practices for policy development. The policy will be supported by a comprehensive Administrative Directive, which will include service levels, improved clarity for roles, responsibilities and accountabilities, and performance measures that will support Council and the public in determining if the Policy outcomes have been met.

Assuming Council approves the proposed policy refresh, this work will be completed for the start of the 2021/2022 winter season. Internal and external materials will be reviewed for accuracy and to align with the updated policy.

Implementation Date

December 31, 2021

Roles, Responsibilities and Accountabilities

Roles, responsibilities and accountabilities of business areas involved with the SNIC program are generally clearly defined.

Many other City business areas, to various degrees, are involved in the SNIC program. These are:

External to PARS

- Fleet and Facility Services Branch
- Corporate Procurement and Supply Services Branch
- Financial Services Branch
- Business Performance and Customer Experience Branch
- Corporate Communication and Engagement Department

Internal to PARS

- Business Integration section
- Planning & Monitoring unit within Infrastructure Operations section

It is important that roles, responsibilities and accountabilities between business areas are clearly documented and understood to ensure there are no gaps in processes or overlaps in functions, as these can lead to inefficiencies if SNIC staff are not clear on who does what.
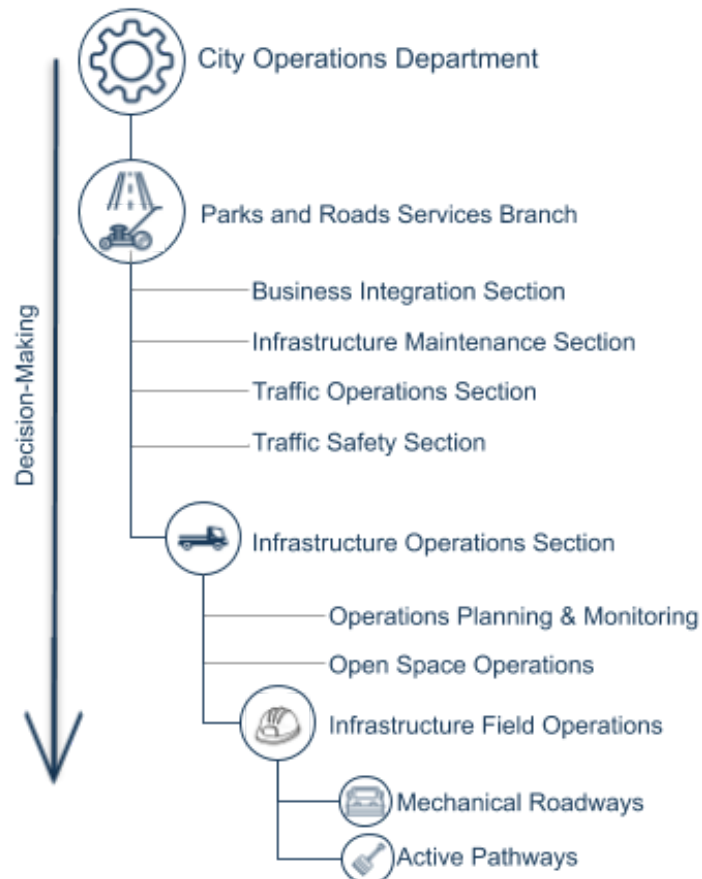
Roles and responsibilities are clearly defined for most of the business areas, however, the internal supporting operations had some unclear divisions. We were informed that these areas are currently working on aligning their roles and responsibilities. In addition, there is an opportunity for the Fleet and Facility Services Branch to clarify and document its roles and responsibilities related to the delivery of the SNIC program.

Recommendation 7 (page 35)

Decision-making Processes

One of the most important contributors to the way decisions are made in an organization is its organizational structure. There is a direct relationship between organizational structure and the "who" and "how" of the decision-making process. The current organizational structure of PARS is a hierarchical model by function. Groups that are doing similar work or providing similar services are grouped together to allow for better integration and sharing of expertise.The hierarchical organizational structure supports a top down decision-making process.

The current organizational structure of PARS is a hierarchical model by function.

- City Operations Department
- Parks and Roads Services Branch
  - Business Integration Section
  - Infrastructure Maintenance Section
  - Traffic Operations Section
  - Traffic Safety Section
  - Infrastructure Operations Section
    - Operations Planning & Monitoring
    - Open Space Operations
    - Infrastructure Field Operations
      - Mechanical Roadways
      - Active Pathways

Decision-Making

We reviewed four tactical decisions and conducted interviews with management and staff and found:

- Decisions are made at the top and permeate down through layers of management and staff. Decision-making power is assigned based on delegation of authority.

- Employees (supervisors, front-line and/or subject matter experts) are not directly involved in the decision-making process. They may be consulted but are not part of the decision-making.

- Internal communication is one-way, top-down communication, mostly after the decision has been made. Decisions are primarily communicated through emails. Information might not reach the front line as it is dependent on previous layers passing information on (various communication methods) and information might be forwarded using ineffective methods (email when most frontline staff don't have ability to check email). PARS has experienced a lack of resources to support internal communications. This has been partly addressed by adding an Internal Communications Advisor (0.5 FTE) to the Communications and Engagement PARS portfolio team. This Advisor is not specific to SNIC but supports all PARS internal communication.

The decision-making processes, as they relate to the SNIC program within PARS Branch, are clear and well-defined; however, there is an opportunity to improve the processes by:

- Increasing employees' ability to influence business decisions and with that create more buy-in for decisions. PARS Management should increase opportunities to actively engage employees in the decision-making processes.

  Example
  New routing maps were developed by the Business Integration business area. We received contradicting information regarding the type and level of input from frontline staff.

- Improving PARS internal communications with staff by using a variety of communication tools and assessing the effectiveness of communication tools to ensure that internal information flows openly (and both ways). Share the right information at the right time, in the right way.

Decision-making processes are generally clear and well-defined.

Recommendation 2

Improve Decision-Making Processes

Recommendation

Improve decision-making processes related to SNIC by:

- Increasing opportunities to actively engage employees in operational decision-making processes, and

- assessing the effectiveness of communication tools to ensure that internal information is received and flows openly.

Responsible Party

Branch Manager, PARS

Accepted by Management

Management Response

This recommendation is closely linked to the development of the Administrative Directive identified in Recommendation 1.

Once this Directive has been developed, staff will have a clearer picture of service levels, processes, roles, responsibilities and accountabilities. Staff will also have the flexibility to undertake work with the goal of achieving the outcome as defined in the policy, rather than being limited to specific policy requirements.

As Recommendations 2 and 3 are closely aligned, the focus of the Snow and Ice Control program team will be to integrate and align this work as needed.

Work is underway for the 2020/2021 winter season to begin these improvements. Work includes:

- Assessment of the current state of internal communication;

- Continued development of an integrated internal communication and change management plan;

Administration is actively undertaking work across the Corporation to improve employee empowerment and ensure a consistent feedback loop is maintained between frontline staff, management and leadership. This work is not specific to the Snow and Ice Control program, and will be integrated into the program as required.

Administration recognizes that both effective communications and change management are ongoing processes that require continuous focus and improvement, and can have a longer timeline to achieve meaningful success.

Implementation Date

December 31, 2021

Change Management

In the last five years the SNIC program and Infrastructure Operations have gone through a significant number of strategic, organizational and operational changes. Appendix B provides a detailed overview and timeline of these key changes.

The Three Biggest Organizational Changes

2016

The 2016 **Transformation Project** created a new City Operations Department. In September 2016, the PARS Branch was formed combining Parks Operations, previously in the Citizen Services Department and Transportation Operations, previously in the disbanded Transportation Services Department.

Roadway Maintenance

Parks Operations

Parks and Roads Services

2017- 2018

The 2017 **Integration Project** created two business areas: Infrastructure Maintenance and Infrastructure Operations. Infrastructure Field Operations, within Infrastructure Operations, was to provide SNIC services to maintain the City's roads and pathways.

Infrastructure Operations

Infrastructure Maintenance

Infrastructure Field Operations
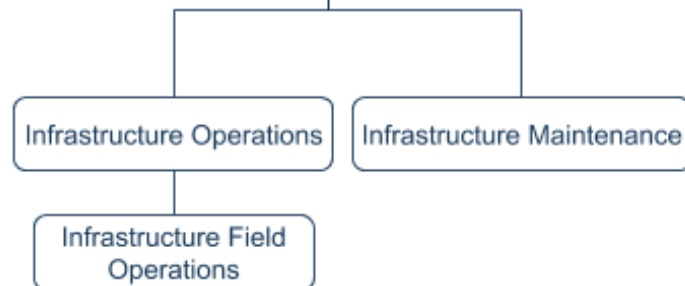
2019

In April 2019, PARS split Infrastructure Field Operations into **Mechanical Roadways and Active Pathways** to separate two types of snow removal activities (i.e., heavy equipment versus small equipment and manual snow removal).

Mechanical Roadways Snow Removal

Active Pathways Manual Snow Removal

High level of turnover in leadership positions between 2016 and 2019

From 2016 to the present day, there has been a high level of turnover in leadership positions. All levels of management (Deputy City Manager, Branch Manager, Director, General Supervisors) have seen one or more changes during this period. In most cases, the individuals taking on the leadership positions were external to the PARS Branch (or previous Parks Operations Branch and Roadway Maintenance Branches). This means that decision-makers were constantly changing and trying to keep abreast of the changing SNIC program.

Leadership turnover leads to change in leadership styles, which impacts the way decisions are implemented. This can lead to uncertainty in organizational functioning and long-term relationships with employees, contractors and other stakeholders.Trusted relationships are important during times of change and big decisions. With the management team constantly in flux, relationships between front-line staff and management have eroded.

In addition, the current SNIC standards have evolved through a number of policy changes in recent years.The following is a summary, by policy version, of key service level changes over the past five years. Arrows up indicate a service level increase, arrows down indicate a service level decrease, horizontal arrows indicate a change in the program but no significant impact to service levels.

Policy 409H (November 26, 2014)
- ⇧ Required plowing residential roads to bare pavement if 5 cm snowpack cannot be maintained with one cycle of blading
- ⇧ Set less than 3.2 m clear lane width as trigger for snow removal
- ⇧ Established "windrow free zones" at schools
- ⇔ Required alleys to be plowed first (to get cars off streets)

Policy 409I (November 3, 2015)
- ⇧ Expanded windrow free zones to include school drop off zones
- ⇔ Required alleys adjacent to roadways subject to seasonal parking ban to be addressed first

Policy 409J (September 25, 2018)
- ⇔ Removed Roadway Sanding Section
- ⇔ Removed frequency of sanding during an event by priority
- ⇔ Removed sand-recycling program
- ⇔ Replaced Roadway network with Transportation Network
- ⇧ Added in Active Transportation Modes

The changes that the SNIC program and Infrastructure Operations have undergone since 2015 have had a significant and lasting impact on how the SNIC program is delivered and on the people that are delivering it.

There are two sides to implementing a change[5]:

Project Management

The technical side, focused on ensuring that the change is developed, designed and delivered effectively. The discipline of project management provides the structure, processes and tools to make this happen.

Change Management

The people side, focused on ensuring that the change is embraced, adopted and utilized by the employees who have to do their jobs differently as a result of the project. The discipline of change management provides the process, tools and techniques to manage the people side of change to achieve the required business outcome.

Ideally, project management and change management are integrated. The efforts of both can be focused toward a singular objective - improving the performance of the organization by successfully implementing a change that delivers the intended results and outcomes.

The change management processes were more focused on the **project management perspective**, and were less focused on the **change management perspective** that concerns the people side of change

For the three major organizational changes impacting the SNIC program, management was more focused on the project management perspective, and was less focused on the change management perspective.

We assessed the change management processes for the three major organizational changes impacting the SNIC program against the Prosci ADKAR model's nine key elements of a successful change management process[6].

Most elements of successful change management were not managed or could have been managed better. Including but not limited to:

- They did not assess the readiness of the organization for the change. Without adequate readiness assessments, the change management team is unable to make the best informed decisions about their approach to managing changes.

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[5] Definitions obtained from: https://www.prosci.com/resources/articles/integrating-change-management-and-project-management
[6] Prosci is a global leader in change management solutions. The name **ADKAR** is an acronym that is based on five building blocks that bring about successful **change**. The letters **stand** for Awareness, Desire, Knowledge, Ability and Reinforcement.

- Communication activities existed for all three changes. However, a formal communication plan was not in place until months after the Integration project that created Infrastructure Maintenance and Infrastructure Operations. In addition, there was no formal communication plan for the Active Pathway restructure. With changes happening one after another, the risk with a lack of a clear communication plan in place prior to the announcement of changes is that employees lack awareness of why changes are being made and how those changes will impact their roles. This, in turn, increases resistance to the change.

- Resistance has been identified as a top obstacle to successful change in all of Prosci's best practices benchmarking studies. In the three changes we reviewed there were no formal processes in place to identify, help understand and assist SNIC management to manage employee resistance to changes. Without identifying the root causes of the resistance and managing them, there is a risk of not achieving the intended outcomes or objectives of the change, productivity declines, loss of valued employees, inefficiency, and low morale.

- There were informal feedback collection processes, but there were no formal plans or processes to guide the data collection, feedback analysis and corrective action implementation. The risk of not collecting employee feedback is that employees do not feel that they are engaged in the changes. When suggestions are not being analyzed and addressed, employees may feel that the management does not value and hear what they have to say; this may lead to disconnect between the management and the employees.

Overall, PARS needs to strengthen and improve its current change management practices to include people focused processes when implementing changes to its organizational structure and the SNIC program.

Recommendation 3
Improve Change
Management Processes

Recommendation

Strengthen and improve current change management practices to include people focused processes when implementing changes to SNIC organizational structure and program.

Responsible Party

Branch Manager, PARS

✓ Accepted by Management

👤 Management Response

Administration recognizes the importance of people-focused change management, and acknowledges that improvement opportunities exist.

Change management has been a focus with recent initiatives occurring throughout the Corporation; examples include Reimagine and the Online Idea Generation process to solicit staff ideas for cost savings and improvements This will continue to be a primary focus of organizational change efforts moving forward. As Recommendations 2 and 3 are closely aligned, the focus of the SNiC program team will be to integrate and align this work as needed.

Work is underway for the 2020/2021 winter season to begin these improvements. Work includes:

- Assessment of the current state of change readiness, to identify gaps;

- Continued development of an integrated internal communication and change management plan; and

- Formalization of existing processes, and development of new processes to support people-focused change management.

Administration recognizes that both effective communications and change management are ongoing processes that require continuous focus and improvement, and can have a longer timeline to achieve meaningful success.

📅 Implementation Date

September 30, 2022

Performance Management

Summary of Findings

The purpose of a performance measurement framework is to provide a consistent approach for systematically collecting, analyzing, utilizing, and reporting on the performance of programs and activities in achieving their established goals and intended outcomes.

To determine if PARS measures and monitors the effectiveness, efficiency and economy of the SNIC program, we

1. Evaluated PARS performance measurement framework and performance measures.

   PARS performance measurement processes and publically reported performance measures do not provide sufficient and reliable information to conclude on the effectiveness and efficiency of the City's SNIC control activities. PARS also does not consistently track if it is meeting its service levels for all activities as identified in the SNIC policy for each of the priority levels.

2. Determined whether PARS benchmarks the SNIC program performance against other cities.

   PARS conducts benchmarking with other municipalities inconsistently and on an as-needed basis. The benchmarking information is limited to operational statistics rather than comparing performances against other cities.

   We were unable to obtain comparable data for our benchmarking analysis. Therefore, we could not conclude on how Edmonton's SNIC program performs compared to other cities.

Based on our observations, we conclude that PARS can improve the measuring and monitoring of the effectiveness, efficiency and economy of the SNIC program. We identified opportunities for improvements in the two recommendations in the following sections below.

Performance Management

PARS does not have a formal performance management process.

PARS reports Key Performance Indicators (KPIs) for the SNIC program on a bi-weekly basis. These reports are shared with SNIC supervisors. Variances in the KPI results are investigated and discussed. However these reported KPIs provide operational statistics rather than performance information of the SNIC program. For example, material usage information gives an indication of how much material was used. Without providing context such as material used per kilometer of road, it does not provide information about whether the material usages were efficient. Without comparing the performance to a target or historical data, it is difficult to determine if the SNIC program's performance is meeting its goals, deterioration or improving. Therefore, these KPIs contribute little to operational and management decision making.

PARS also currently does not have a formal performance management process to assess the SNIC's performance against the SNIC program objectives.The KPIs reported do not directly link to the SNIC program objectives stated in the SNIC policy.

Since the bi-weekly KPI reports are the only reports that provided performance statistics to the SNIC supervisors, we assessed the reliability (results are accurate and replicable) and comparability (methodology is consistent with previous years) of the following five KPIs included in the Snow and Ice 2019/2020 Season End report:

1. Customer Experience Excellence - 311 Inquiries Received by SNIC

2. Operational Excellence - Snow Plowing (Plow Pass Km and Spot Plow per Location by month)

3. Material Usage - Sand and Salt Usage (by month)

4. Financial Accountability - Budget vs. Actual Cost

5. Organizational Excellence - Staff Levels (planned versus actual)

Based on the KPI validation, we found that:

- There is no formal process in place to ensure supporting documentation is retained. We were unable to assess the completeness and accuracy for the Staff Level results.

- There is no formal review process in place to ensure the completeness and accuracy of the KPI results. The Spot Plowing results and 311 Inquiries received by Active Pathways results are incomplete and inaccurate.

- There are no comparators such as historical data or targets in place to assess whether program performance is improving, deteriorating, or meeting the target.

Meeting Service Levels

Edmonton has established service levels for its SNIC activities which are documented in the SNIC policy. The SNIC policy has not yet been fully updated for Active Pathways. Appendix A provides an overview of the service levels.

PARS does not consistently track if it is meeting its service levels for all activities as identified in the SNIC policy for each of the priority levels identified.

According to SNIC management, some of the reasons it is challenging to meet service levels are the detail of work expected to be completed as part of the process (e.g., removal of windrows over 30 cm in front of driveways), having sufficient trained staff available to operate equipment during snow events, and obstacles such as parked cars. SNIC management stated that cars parked on the street are especially a major challenge for blading and may result in streets that are not well cleared.

PARS management informed us that the SNIC program will be developing a comprehensive performance measurement framework and reporting structure that builds on existing metrics and measures. This framework will align with work already underway with Enterprise Performance Management. The framework is anticipated to be in place for the 2021/2022 winter season.

Recommendation 4

Develop performance measures that support decision-making

Recommendation

Develop and implement relevant, sufficient, reliable, comparable, and consistent performance measures to support management decision-making and demonstrate achievement of Corporate, Branch and SNIC goals.

Responsible Party

Director, Infrastructure Operations

Accepted by Management

Benchmarking Against other Cities

PARS performs some benchmarking, but it could be improved.

Both the Business Integration and the Planning & Monitoring areas of PARS conduct benchmarking exercises for various purposes such as environmental scans to add to Council reports, continuous improvement or to see from a customer experience point of view what is happening in other Cities. Benchmarking information obtained included general statistics (e.g., population), inventory (e.g., road km), service levels (e.g., cleaning of windrows), materials used (e.g., salt, brines), and financial information (e.g., budget and actual spending).

We reviewed a number of benchmarking exercises that were conducted in the last few years, including processes for obtaining the information, and found the following:

- The benchmarking information is limited to obtaining operational statistics related to SNIC activities. PARS did not benchmark its performances against other cities (e.g., percentage of priority 1 roads plowed within 24 hours).

- SNIC benchmarking is done on an as-needed basis. There is no formal process in place to:

  ○ Perform scheduled benchmarking to review the City's performance compared to other cities on an ongoing basis.

- ○ Ensure the accuracy and consistency of the information presented in the different benchmarking documents.

- ○ Ensure consistent cities are used in the benchmarking for comparability.

To understand and compare Edmonton's winter maintenance practices against those of different winter cities, we selected three cities for comparison, based on similarities in size, weather, and/or proximity and availability of data.

In general, all of the cities categorized their priorities according to the types of inventory (i.e., arterial roads, collector roads, residential roads). The City of Edmonton has more road inventory in the priority 1 category than other cities. For example, the City included freeways, arterial roadways, business districts, busways, etc. as priority 1 where Calgary only included business district streets with 8,000 vehicles per day and arterial roads with more than 20,000 vehicles per day as priority 1. In addition, the City of Edmonton is the only city that included inventory other than roads as priority 1; such as bus stops, sidewalks, trails and bike routes. We also observed that the City of Edmonton sets service levels higher in certain categories and lower in others.

The table below lists the comparison of Edmonton and the three selected cities for the 2018/2019 winter season.

		Edmonton	Calgary	Toronto	Winnipeg
1.	Snow fall (cm)	190.6	169.8	143.4	95.0
2.	Salt tonnes/Lane km	3.8	4.3	9.7	2.9
	Sand tonnes /Lane km	4.4	2.9	1.0	6.9
3.	Actual $/Lane km	$5,275	$3,064	$6,250	$4,893
4.	Actual $/Capita	$65	$39	$33	$50

1. Edmonton had 12% more snowfall than Calgary. In addition, Calgary sees about 25 chinook days per winter (December to January). This warming effect can be very dramatic with temperature swings of 20 to 30 degrees. These factors can help explain the lower cost per lane km for Calgary.

2. Edmonton puts less dry materials (sand and salt) per lane KM on the roads than Toronto and Winnipeg. Calgary puts less dry materials per lane KM on the road than Edmonton, but contrary to Edmonton, Calgary uses Calcium Chloride brine directly on road surfaces.

3. Edmonton's actual spending per lane kilometer is 72% more than Calgary, comparable to Winnipeg, and 16% lower than Toronto.

4. Edmonton's actual spending per lane KM ranks in the middle, but Edmonton's actual spending per capita is the highest.

Due to differences in data, we cannot conclude on how Edmonton's SNIC program performs compared to other cities.

Without additional information, such as the makeup of inventories (roadways and pathways) and level of services (e.g. height of residential snowpack, windrows), it is difficult to compare Edmonton's SNIC program performance to that of other cities.

PARS is currently not participating in third party benchmarking organizations such as Municipal Benchmarking Network Canada and the Alberta Municipal Benchmarking Initiative for its SNIC program. These benchmarking organizations identify and gather comparable data and prepare benchmarking reports. By actively participating in a formal and systematic benchmark process, participating municipalities can compare their performance against other partner municipalities. Through participation, PARS will be able to collect data that is comparable and draw conclusions about its performance against other cities.

Recommendation 5
Improve Benchmarking Processes

Recommendation

Improve and formalize an ongoing benchmarking process to ensure PARS assesses and compares SNIC program's performance with other cities. This process should be aligned with the ongoing work of the Corporation and industry best practices.

Responsible Party

Director, Business Integration

Accepted by Management

Management Response

In conjunction with the work undertaken for Recommendation 4, work is underway to identify potential benchmarking measures and complete a readiness assessment for each identified measure. The SNIC program will build processes and data infrastructure to support repeatable data collection for these measures as needed.

Work is underway as part of Corporate Enterprise Performance Management to determine which benchmarking organizations the City will join. If necessary, the SNIC program will identify other municipalities the City will benchmark against if there is no appropriate existing benchmarking program. The SNIC program will be prepared to contribute once Corporate memberships have been confirmed.

Implementation Date

December 31, 2021

Program Resources

Summary of Findings

Infrastructure Operations provides SNIC services using a mix of internally owned and staffed equipment, and contracted resources. We identified program resources to be:

- Financial (budget)
- Staffing
- Contracted resources
- In-house equipment

To determine if the PARS Branch is planning, allocating, managing and monitoring program resources to ensure effective, efficient, and economical delivery of the SNIC program, we:

1. Reviewed the planning process in place to establish operational capacity and related budget requirements for the SNIC program.

   The SNIC operational budget has not kept pace with growth in population, roadway, and active path inventory, and City boundaries.

2. Assessed the process in place to allocate, manage and monitor program resources to ensure delivery of the SNIC program.

   PARS has seen a reduction in staffing resources in recent years, equipment availability is below target and there are concerns with equipment utilization. As well, PARS is not conducting regular assessments of the cost of in-house versus contracted services for key SNIC activities.

3. Determined if resources are optimized to meet the SNIC program objectives and service levels.

   PARS conducted a review of its mechanical road clearing routes to optimize resources. However, PARS is not following best practices related to equipment calibration to ensure optimal, consistent and effective use.

4. Determined if PARS identifies cost reductions and potential revenue opportunities relating to the SNIC program.

> *PARS has a process to identify and implement cost reductions. We also identified additional cost reduction and potential revenue opportunities.*

Based on our observations, we conclude that overall PARS is planning, allocating, managing and monitoring program resources to ensure effective, efficient and economical delivery of the SNIC program. However, we identified a number of opportunities for improvements, cost reductions, and potential revenue generation which are included in the three recommendations below.

Operational Budget

PARS develops the SNIC operational budget based on historical analyses and the level of services determined in the SNIC policy. Council approves the budget. In theory, the budget should be enough to deliver the approved level of service in an "average" winter. Actual expenditures in any given year are highly dependent on a number of factors.

Environmental Factors

- Temperature
- Number of snow and ice events
- Number of freeze/thaw cycles
- Amounts of snow drifting

Other Factors

- Service levels
- Hired equipment rates
- Number of residential blading cycles completed

As a result, variances between budgeted and actual expenditures can differ greatly year-over-year.

Total Budget and Actual Expenses 2015 to 2019
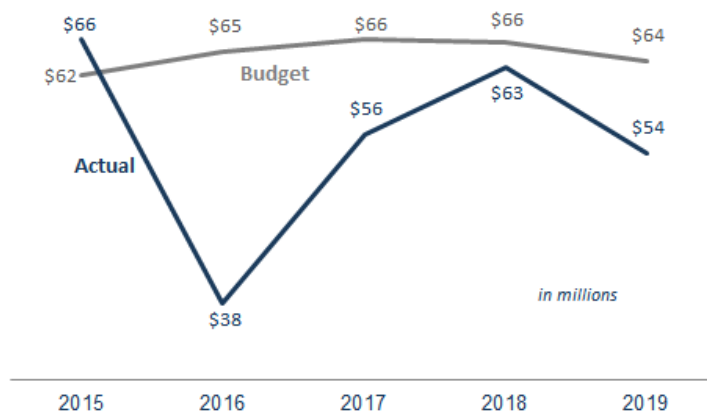
2015 is the only year where the net position was over budget.

Between 2015 and 2020, the SNIC operational budget has not kept pace with growth in population, roadway and active pathway inventory, and City boundaries. In addition, based on the changes in the SNIC policy since 2014, service levels have increased as well.

SNIC operational budget has not kept pace with growth in population, roadway and active pathway inventory, City boundaries, and service levels (between 2015 and 2020).
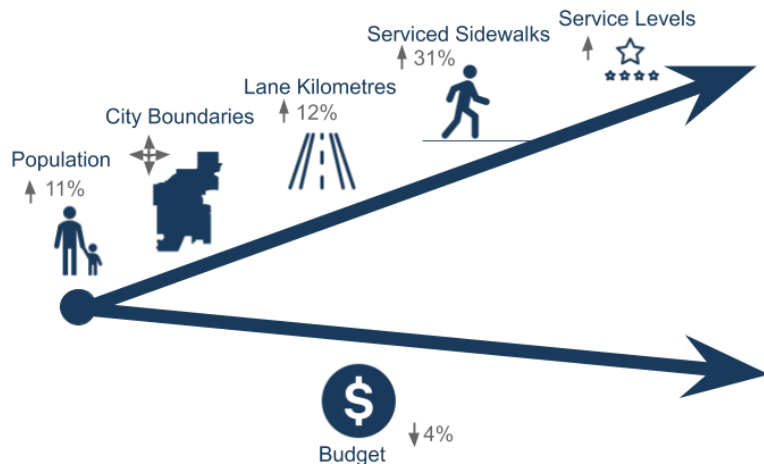
The population growth indicates that the transportation network maintained by Infrastructure Operations is used by more and more people. This has an impact on service expectations and delivery.

In line with the population growth, roadway and active pathway inventory have increased, as have the City's boundaries (on January 1, 2019, two areas of land from Leduc County and the City of Beaumont became part of the City of Edmonton).

If PARS was able to meet their SNIC service levels with the current budget and despite the growth in service area, this would demonstrate efficiency gains (i.e., PARS is able to do more with less). However, based on issues identified in the audit, such as rising complaints (page 55), uncertainty about meeting service levels (page 23) and intensive reliance on overtime to deliver service (page 31), the SNIC budget may not be sufficient to meet the current service demands.

Staffing

SNIC staff numbers have seen a decline in recent years, specifically:

- A decrease of 28 actual permanent front line employees from 2018 to 2020. This decrease was offset by an increase in temporary staff. Temporary staffing numbers were increased by 29 from 2018 to 2020.

- The SNIC labour pool was reduced by 56.4 FTEs or $4.5 million between 2018 and July 2020. The budgeted labour pool is defined as all full-time equivalent positions (FTE) regardless of whether the position was vacant or not.

There are multiple ways in which a reduction in permanent staff can be managed, for example; through the increased use of temporary employees, overtime and contracted resources.
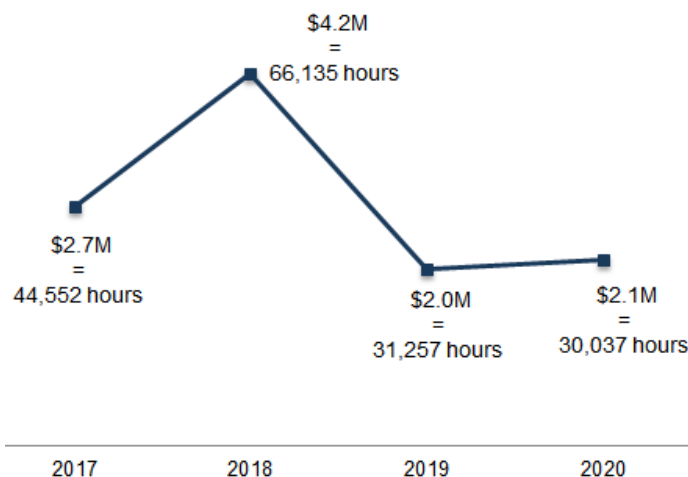
Staff overtime

City employees work overtime for a variety of reasons, including responding to emergencies (equipment breakdown, public safety issues, etc.), managing workload when an area has a staff shortage (vacant positions, sickness, etc.), and addressing temporary or seasonal spikes in workload (snow events, etc.). Overtime cannot be eliminated but should be managed. Management may be underestimating the harmful consequences of ongoing reliance on overtime. Potential consequences include safety issues, staff fatigue, declining service quality, morale issues, and employees relying on overtime pay to meet their financial commitments.

SNIC Actual Overtime Expenditures and Hours

The SNIC program makes extensive use of overtime to deliver services.

For 2019, Infrastructure operations used 31,257 hours of overtime, which is equivalent to 3,907 8-hour shifts.

$2.7M = 44,552 hours	(2017)
$4.2M = 66,135 hours	(2018)
$2.0M = 31,257 hours	(2019)
$2.1M = 30,037 hours	(2020)

SNIC management indicated that the implementation of a 12 hour shift schedule for the 2020/2021 winter season is expected to reduce overtime. In the previous 8-hour format, there were three rotating shifts as well as one 8-hour straight day shift and one 8-hour straight night shift Monday to Friday. According to SNIC management, this structure has led to inefficiencies in planning, under utilization of equipment, time lost in shift changes, and excessive overtime. Moving towards a 12-hour rotating shift is expected to eliminate these inefficiencies by a more evenly distributed workforce over a 24/7 period and eventually enable the City to deliver better

service to the citizens. For example, previously during snow events employees on an 8-hour shift would be required to work 4 hours overtime (extending their shift to 12 hours). Going forward during snow events off-shift staff might be asked to work overtime, with overtime hours depending on operational need.

Contracted Services

The City performs winter operations with both city-owned and hired equipment. Hired equipment is primarily used for street plowing (graders), snow removal operations, and cul-de-sac and sidewalk clearing. In addition, the City hires contractors for general contract work such as snow removal on sidewalks/civic walk, parking lots, and bus stops.

The total cost for all contracted work are broken out into two categories:

Hired Equipment
2019: $5.2 million (9.6%)

Relates primarily to mechanical roadways.

Responds to a call for support in a snow event or for cul-de-sac clearing and includes equipment and operators.

The total cost for all contracted work for 2019 was **$12.6 million** (23.3% of the total 2019 SNIC expenditures).

The use of contracted resources in 2019 was down from **$19.7 million in 2018** and **$14.4 million in 2017**.

Contractors
2019: $7.4 million (13.7%)

Relates primarily to active pathways.

Work for the City on an ongoing basis, either alongside City staff or with defined responsibilities. Involved with snow removal on sidewalks/civic walk, parking lots, and bus stops.

PARS does not regularly conduct an analysis of owned versus hired equipment to determine the optimal mix per type of equipment. As a result, we are unable to conclude on whether or not they are using an appropriate mix of resources.

In a 2009 audit report we recommended that the City regularly perform own versus hire analyses on the equipment it uses in the Winter Road Maintenance Program. This recommendation was repeated in the 2016 Winter Road Maintenance consultants report.

Without this analysis, it is unclear if the City has an optimal mix of hired, leased and owned equipment. There may be potential for cost savings based on results of these types of analyses.

Recommendation 6

In-house versus contracted services cost analysis

Recommendation

Perform regular assessments of the cost of in-house services (with owned or leased equipment) versus the cost of contracted resources for key SNIC activities and adjust the allocation of work based on the findings.

Responsible Party

Director, Infrastructure Operations

Accepted by Management

Management Response

Work is underway for the 2020/2021 winter season to develop processes and gather data to support this analysis on an ongoing basis. The SNIC program will be integrating the cost analysis with the service levels developed in Recommendation 1. This model will support analysis on the cost and delivery model for each service, allowing the program to identify which services should be performed, when they should be performed, and how that service should be delivered to achieve the policy outcomes. This work will support benchmarking efforts, both within the program and to other municipalities.

Full analysis will be complete prior to the 2021/2022 winter season, with data-informed in-house versus contracted decisions made as required to support the 2021/2022 season. This process will be designed to support reviews on an ongoing basis. Implementation of changes may be impacted by existing contracts or other procurement limitations.

Implementation Date

December 31, 2021

Equipment

City owned SNIC equipment numbers have grown in the last 5 years by 44 units. SNIC equipment includes, among other things, sander plow combination trucks, graders, sidewalk tractors and tractor toolcats.

The Fleet and Facility Services Branch owns and maintains the equipment used by PARS. The Fleet and Facility Services

Branch is responsible for purchasing and maintaining the complete City fleet of vehicles, not just PARS.

We looked at two elements related to equipment:

1. Equipment availability
2. Equipment utilization

Equipment availability is the percentage of time that a piece of equipment is available for SNIC operations and not being serviced by the Fleet and Facility Services Branch.

Equipment Availability (2019/2020 Winter Season)

The Fleet and Facility Services overall availability equipment target of 85% was not met for roadways or active pathway equipment in the 2019/20 winter season.

- Active Pathways Equipment: 80%
- Mechanical Roadways Equipment: 78%
- Fleet Services Equipment Availability Target 85%
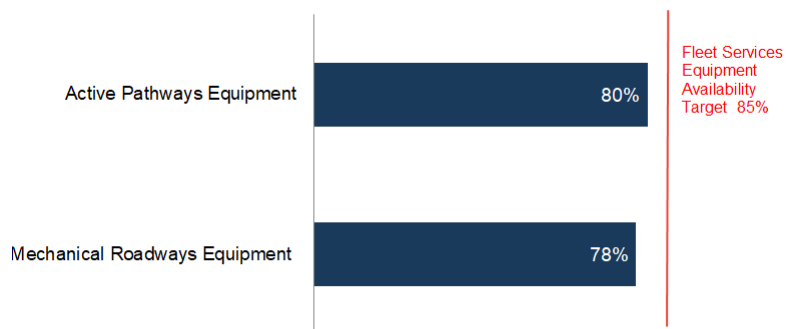
We found that some of the drivers of equipment downtime has been caused by the scheduling of annual maintenance during the winter season, and by accidents. The key concern underlying equipment availability is that there currently is no partnership or service level agreement in place with Fleet and Facility Services. There are only informal service level standards.

A formal service level or partnership agreement would clarify roles and responsibilities, facilitate communication, set expectations, and define procedures (e.g., drop off and pick up of equipment). This service level or partnership agreement should directly connect to the SNIC service levels citizens receive.

Recommendation 7

Document service level commitments and operational arrangement

Recommendation

PARS and Facility and Fleet Services Branch should work together to clearly document service level commitments and operational arrangements with PARS to clarify roles and responsibilities, facilitate communication, set expectations, and define procedures.

Responsible Party

Branch Manager, PARS

Accepted by Management

Management Response

Parks and Roads Services looks forward to deepening the partnership with Fleet and Facility Services and co-creating Partnership Agreements and other operational arrangements to best support the unique operational requirements of the Snow and Ice Control program. The Partnership Agreement will provide a clear line-of-sight between the service levels for Fleet equipment and the public-facing service levels of the Snow and Ice Control program.

Work will begin in Q4 2020, with completion targeted by the end of the 2021/2022 winter season. To support continuous improvement, agreements and arrangements will be modified and adjusted as necessary on an ongoing annual basis between winter seasons.

A number of processes between Fleet and PARS were established in 2020. In 2021, these processes will be reviewed to ensure the services provided to operational teams are streamlined and effective. Any new processes or adjusted processes will be communicated to all operational teams.

Implementation Date

June 30, 2022

Equipment utilization

Equipment utilization is the percentage of time that adequately trained staff are available to operate the available equipment.

Up until the 2019/2020 winter season, for mechanical roadways, each of the 5 districts has staff on 3 types of shifts: rotating 8 hour shifts (day, night and afternoon), one 8 hour day shift and one 8 hour night shift. The rotating eight hour shifts were the basic response to winter events. In 2016, each rotating eight hour shift had about 11 to 13 operators on duty per district. Due to the staffing reductions, there are currently only about 10 operators on duty per district during the rotating eight hour shift.

The trained and experienced staff has elected to work mostly the straight day shift. This has left the other time periods (afternoons and nights) at risk of low equipment utilization due to unavailability of experienced and trained staff. PARS analyzed equipment utilization for 2017.

Plow/Sander "Combo" Truck Utilization (2017)

Equipment utilization is down for the afternoon and night shifts. Snow events that occur during these periods would have fewer operators.

Day	100%
Afternoon	50%
Night	58%
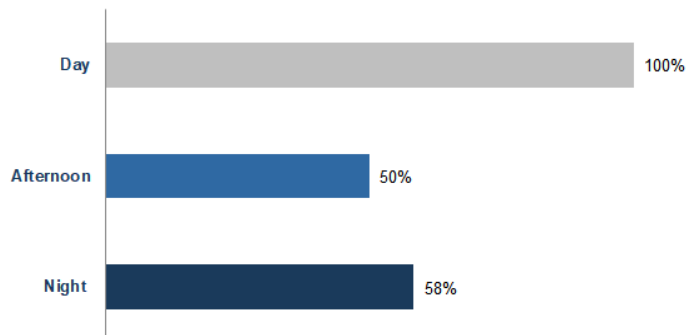
Grader Utilization (2017)

Day	100%
Afternoon	0%
Night	25%
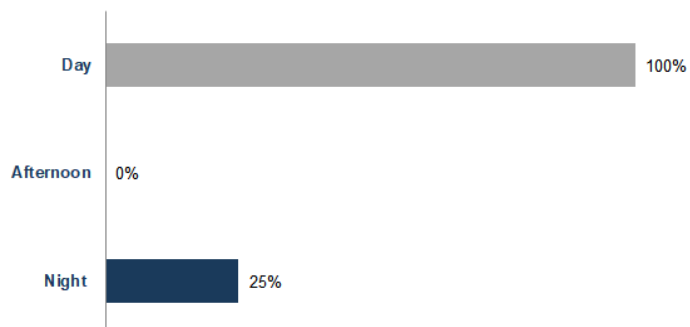
As previously indicated, to address these and other issues PARS is going to switch Mechanical Roadways to a 12 hour rotating shift with no straight day or straight night shifts starting for the 2020/2021 winter season. This will increase the crew sizes and distribute skilled operators over two shifts to improve utilization of graders and plow/sander trucks.

We did not observe the same equipment utilization issues on the Active Pathways side. Active Pathways switched to two 10 hour straight shifts prior to the 2019/2020 season.

In addition, we were informed there is not enough trained staff for the key SNIC equipment both on the Mechanical Roadways and Active Pathways. There were various reasons identified for the shortage of trained staff:

1. There are limited resources to facilitate training for the whole PARS Branch. Prioritizing training needs is required.

2. Limited training is provided outside of normal business hours.

3. Operational areas have limited resources on certain shifts (cannot take plow operators out of plows to train them as grader operators).

Improving training and resource planning in the Branch could help address the shortage. We were informed that the Branch recently moved to a centralized training approach and is working on building a proactive training program.

Optimization of Resources

To determine if PARS optimizes resources to meet the SNIC program objectives and service levels, we looked at how:

1. Routes are determined

2. Equipment is calibrated

Routing changed from equipment-based to priority-based

The SNIC activities are carried out using routes, which are assigned to a particular operator or team. Well-designed routes result in SNIC services that are efficient and cost-effective, because roads are cleared more rapidly, and deadheading[7], route overlap and other inefficiencies are reduced or eliminated.

Prior to the 2019/2020 winter season, PARS conducted a review of its Mechanical Roadways clearing routes and changed its approach from equipment based routing (e.g., a

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[7] Dead heading or dead mileage is the distance between a yard and the starting point of a route, when a sander truck is not putting any materials down and/or a plow truck or grader does not have its blades down.

grader routes, sander routes, truck plow routes) to a priority based routing (e.g., priority 1 routes as included in the SNIC policy).

PARS used newer technology, the Geographic Information System, to assist with re-designing the routes. Currently, PARS is working at entering the mechanical sidewalk routes and manual pathway routes in the system. Performance targets still need to be developed for each route and each type of equipment.

Equipment calibration not done according to best practice

Calibration is a procedure to verify salt/sand spreader application rates in order to ensure operators of equipment are able to apply materials at application rates that are appropriate for the condition and level of service being sought.

An effective equipment maintenance and calibration program ensures equipment works consistently and as intended. Calibration of equipment is essential for optimal and effective use.

According to best practices, PARS should calibrate equipment based on the following frequency:

- Annually

- When new equipment is received

- Following maintenance or modification

Other sources also advise that calibration should be done two to three times during the season, any time a change in materials is made and/or any signs of application issues.

SNIC equipment is calibrated once a year at the beginning of the winter season. We did not find evidence that equipment is recalibrated after maintenance/repairs during the winter season. The risk of not calibrating equipment frequently enough is that equipment may not perform to PARS' standards. In addition, SNIC management and staff indicated that there were issues with the current fleet of sander spreaders which were not designed to load and dispense finer materials such as salt. A higher concentration of salt in the sand/salt mix therefore requires additional calibration.

Recommendation 9 (page 47)

Cost Reduction Opportunities

PARS identifies cost reductions and potential revenue opportunities related to SNIC. They have a process in place to bring ideas to the Planning & Monitoring business area. Planning & Monitoring reviews the ideas and if deemed feasible develops a business case to present to management.

PARS has recently implemented the following changes:

Snow Dump Management – Contractors will be paid by volume of snow built up during the winter season instead of hourly. Responsibility for the most efficient way of moving snow is now placed on Contractor. It is expected that this will bring contract costs down.

Stockpiling of Winter Street Sand – A contract is in place for on-demand delivery of pre-mix sand versus mixing in one yard and stockpiling at district yards. Previously large amounts of sand and salt were delivered separately at the start of the season to a yard, then mixed in this yard and then transported to districts. Having this contract in place is expected to reduce transportation costs.

General Hired Equipment – PARS is moving responsibility for managing hired equipment to a few key contractors. Managing over 100 contracts required a lot of resources. There is an expectation of some cost savings, but the primary benefit is reduced workload in managing a large number of contracts.

Shift Change for Mechanical Roadside – On August 12, 2020, PARS announced that they will be implementing a 12-hour rotating shift schedule which is expected to reduce inefficiencies in planning, under utilization of equipment, time lost in shift changes, and overtime by distributing the SNIC workforce more evenly over a 24/7 period and eventually enable the City to deliver better service to the citizens.

As most of these changes are going to be taking effect in the upcoming 2020/2021 winter season, it is too soon to conclude on the financial impact of these changes.

We identified three additional areas where we believe the City could save money and/or recover cost on the SNIC program:

1. The Community Sandbox program

2. Snow storage tipping fees

3. Seasonal hiring and staffing mix

Program costs have increased from approximately $300,000 in 2016 to $890,000 in 2019.

Edmonton's Community Sandbox program has been in place for over 30 years. There is no program documentation that clearly defines the objectives of the program, criteria for when a box gets placed, how often boxes get refilled or who is allowed to use it. The program is not mentioned in the SNIC policy. As a result there are currently 488 boxes in the City (this does not include boxes placed at ETS stations).
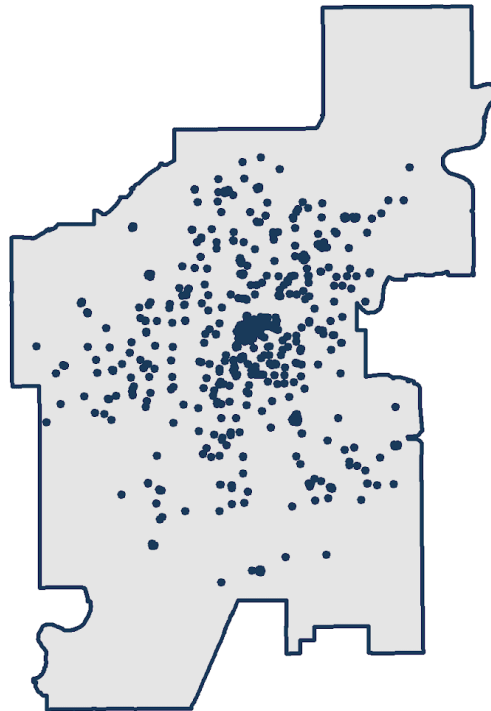
There are currently 488 sandboxes in the City with a high concentration in the Downtown area.

The program claims to provide traction aids when needed to Edmontonians. However, according to SNIC management safe walking surfaces are achieved by removing snow and applying anti-icing agents (e.g., salt). Sand provides limited effectiveness in improving safety when sidewalks are snow packed or covered in ice.

We looked at a number of other municipalities and observed that:

- There are only a limited number of municipalities that provide free sand, salt or sand/salt mix to residents.

- The number of sandbox locations in the City of Edmonton is significantly higher than the benchmarked cities. With the biggest numbers in Calgary with 29 locations and St. Albert with 33 locations, versus Edmonton's 488.

- In three of the six Cities with a sandbox program, the free material is only intended for residents to use on

private property. Two of the six Cities had no information and one specifically included business owners as well.

PARS, as part of the City's Reimagine work, should reevaluate the Community Sandbox program to determine if the program should continue and in what format.

Recommendation 8 (page 43)

Snow storage tipping fees

In cities where the snow does not melt for the entire winter season, snow storage facilities are an essential component of winter maintenance. Edmonton has five snow storage sites which are located mainly at the outskirts of the City. Snow is stockpiled until it melts and ultimately drains into their respective outfalls, which then discharges into the North Saskatchewan River.

Average annual operating costs of snow removal sites between 2015 and 2019 was $3.2 million.

Managing a snow storage site involves not only contractor costs for hired equipment but also the costs associated with environmental testing, utilities, waste removal and site maintenance. A tipping fee to help offset operating costs could be charged by the City for accepting snow into the snow storage sites that are not coming from City of Edmonton streets.

As the sites are not staffed and open to public use, there is no tracking of who brings what and how much snow to the site. Currently, PARS has no indication of how much snow is brought by the City of Edmonton crews, private users, users from outside the City and other municipalities. We do know that the City has accepted snow from at least two municipalities without any compensation.

At least two municipalities have been dumping snow in the City's snow dumps without any compensation.

There have been issues with garbage being dumped on the site (mixed in with snow). Everyone can dump snow for free and the City is responsible for the snow storage management and dealing with waste removal and contaminated water.

We looked at a number of other Cities for, which information was available, and found the following:

- Calgary and Ottawa do not allow public use of the City's snow storage sites.
- Montreal, Regina, Red Deer, Fredericton, and Sudbury charge tipping fees.
- Winnipeg and Toronto are similar to Edmonton in that they allow public use without a tipping fee.

SNIC management informed us that they have reached an agreement with one municipality, which will start paying tipping fees with the 2020/2021 winter season. We were also informed that talks with another municipality are underway.

However, again as part of the City's Reimagine work, there is an opportunity to expand tipping fees to all public, private and commercial users. As disposal of snow is a form of waste disposal, it should be treated the same as waste disposal, which the City charges tipping fees for.

Recommendation 8

More analysis is needed regarding seasonal hiring and staffing mix to determine if cost reductions can be obtained.

Seasonal hiring and staffing mix

In 2019 over 3,000 personnel moves took place in PARS: starts, exits, moves to other City branches or within PARS

Seasonal hiring and changes to staffing mix refers to a group of activities associated with the high volume of personnel moves during the time when the winter season work is changing to summer season work and vice versa. In 2019 over 3,000 personnel moves took place in PARS: starts, exits, moves to other City branches or within PARS. There are lots of stakeholders involved in the process and lots of resources needed to process these changes every fall and spring.

Based on numbers obtained from PARS (primarily Infrastructure Operations area), even at the slowest times in the year, it still needs a minimum of approximately 100 to 200 temporary staff in addition to permanent positions to do the work. PARS has not yet completed a cost analysis. The question is if the total cost of switching to hiring permanent positions, combined with operational efficiencies of using permanent staff, is higher/or lower than the total cost under the current model.

Recommendation 8

Develop Cost-Reduction and Revenue Generation Opportunities

Recommendation

As part of the Reimagine initiative underway, PARS should reevaluate and analyse the following cost-reduction and/or revenue opportunities:

- Community Sandbox Program

- Tipping fees at snow storage sites

- Permanent versus temporary staff analysis

Responsible Party

Director, Infrastructure Operations

⊘ **Accepted by Management**

Management Response

A pilot for tipping fees is currently underway, and will be evaluated at the completion of the 2020/2021 winter season. Lessons learned will be integrated into the program evaluation and recommendations identified below.

Work will be undertaken to:

- Conduct a jurisdictional scan, program evaluation, and public engagement required to determine the future of the Community Sandbox program;

- Conduct a jurisdictional scan, program evaluation, and public engagement required to determine the viability of continuing public access to the snow storage sites and the implementation of tipping fees; and

- PARS will work with internal teams and staff in the Employee Services Department to conduct a cost analysis of the current staffing structure, and implement identified improvements. This work will be connected with the work undertaken for Recommendation 6 to ensure cost and service delivery analysis occurs together.

📅 **Implementation Date**

December 31, 2022

Program Processes and Operations

Summary of Findings

To determine if the PARS Branch has effective and efficient program processes and operations in place to meet the SNIC program objectives and service levels, we:

1. Determined if PARS has clearly documented procedures and guidelines that meet its operational needs.

    Overall PARS has clearly documented procedures and guidelines that meet its operational needs. However, there are a number of gaps in documented procedures.

    In addition, the City processes and operations are not in line with industry practices when it comes to the use of materials both in type of material and application (anti-icing/de-icing). The City's focus is to optimize mechanical plowing in combination with the use of the current salt/sand mixes.

2. Reviewed if PARS has processes in place to ensure staff adhere to policies, procedures and guidelines.

    There is an opportunity to develop a more formalized process to monitor staff productivity and to determine whether staff are following documented procedures.

3. Assessed if there is a process in place to identify and implement innovation opportunities to improve service delivery.

    PARS has introduced a number of innovations over the last few winter seasons or is in the process of implementing them. Despite these innovations, there is a lack of technology utilized by PARS for the SNIC program.

Based on our observations, we conclude that there are areas of opportunity to improve SNIC processes and operations. We made two recommendations in the sections below.

Documented Procedures

Standard Operating Procedures (SOPs) are crucial to ensure quality and consistency of service. They also increase safety and are a tool for training purposes. SOPs also guide staff and

reduce the possibility of missed steps or errors that impact the quality of completed services. PARS has a number of SOPs for Active Pathways, but limited SOPs for Mechanical Roadways.

We selected a sample of SOPs that are directly related to the removal of snow and ice (not sweeping operations) for both Active Pathways and Mechanical Roadways. Overall, the PARS Branch has clearly documented procedures and guidelines that meet its operational needs. However, we identified a number of gaps in documented procedures. Most notabilty PARS could benefit from the following SOPs:

PARS Branch has clearly documented procedures and guidelines that meet its operational needs, but there are a few gaps.

As an example of why an SOP is needed we took a closer look at snowpack measurements. The current process is that SNIC staff take weekly snowpack measurements to determine the height of the snowpack in residential areas. Measurements are taken at 6 points in each district. This information is entered into a spreadsheet. According to the SNIC policy, when the snowpack measurement is above 5 cm residential blading will occur. In actuality, SNIC management indicated that a residential blading cycle is only called when the snowpack measures more than 5 cm in all 5 districts, so throughout the City.

We reviewed the snowpack measurement spreadsheet for the 2019/2020 winter season. The snowpack measurements were missing for some areas. As well, the requirements for a residential blading cycle were met on January 28, 2020, yet a residential blading cycle was not called until February 12, 2020.

As per discussion with SNIC management, snowpack measurements are being looked at less and less. Decisions on residential blading are more influenced by the number of citizen complaints received and by professional experience/judgement of the staff.

The SNIC policy does not specify that the condition of a 5 cm snowpack has to exist City wide. By creating an SOP and setting clear criteria, SNIC management could ensure that staff take snowpack measurements consistently throughout the City. In addition, Management could decide that a residential blading cycle is called for example after 3 of 5 districts measure snowpacks above 5 cm. This way management is proactive, sensitive to the various conditions that can exist in the City and still ensuring consistent service levels for all citizens.

Recommendation 9

Expand Standard Operating Procedures to include all key SNIC activities

Recommendation

Expand SOPs to include all key SNIC activities including, but not limited to:

- Grader wing plow procedures
- Sanding locations operations
- Snowblowing operations
- Brushing operations
- Pavement temperature measurement
- Snowpack measurement
- Calibration of equipment

Responsible Party

Director, Infrastructure Operations

Accepted by Management

Management Response

Throughout 2020, PARS and Infrastructure Operations business section have centralized and enhanced the SOP process, including: identifying new SOP requirements, creating, reviewing and approving SOPs and strengthening document controls for the SOP catalogue. Currently, existing SOPs are required to be reviewed every 3 years, and new SOPs are identified and created on an annual basis.

The SNIC program will review and, where required, enhance the process to communicate SOP changes to impacted staff, and ensure the staff acknowledgement is documented fully.

Work on this recommendation will be undertaken with the following areas of focus:

- The creation of new SOPs as identified by this audit.

- A comprehensive gap analysis to identify and develop any missing SOPs for all areas of the SNIC program.

Implementation Date

September 30, 2021

Use of Materials

PARS has documented procedures regarding the use of materials. PARS applies a sand/salt mix to roadways and pathways. In addition, Active Pathways uses a dry sand mix on sidewalks and trails, and calcium chloride brine on bike lanes. Mechanical Roadways use different mixes dependent on various factors but primarily road surface temperature. It uses higher ratios of salt in warmer temperatures.

Material Usage in Recent Winter Seasons
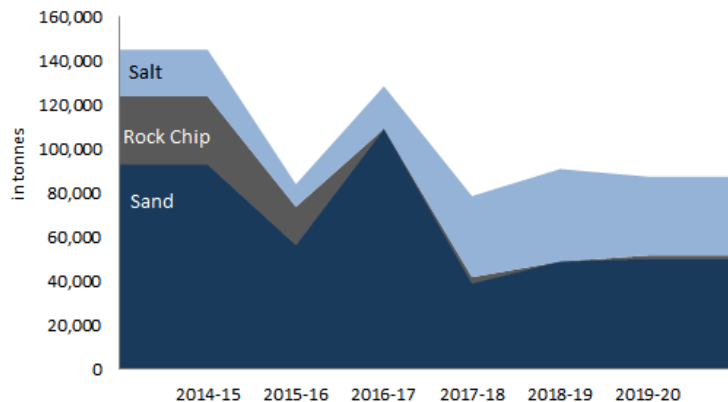
Average material usage over the past **10 years** was **123,926 tonnes**, and over the past **5 years 93,905 tonnes.**

For the 2017/2018 winter season, the City changed its sand/salt matrix based on industry practices and a desire from Council to achieve bare pavement through increased mechanical blading with the least amount of materials put on the road. This has resulted in an overall reduction of materials on the road.

Currently, the City is only using sand and salt (in solid form) on roadways, which both have benefits, but also impacts.

Sand	Impacts

Impacts
- Impairs groundwater, lakes and streams. Clogged streams and drains.
- Impairs air quality in spring.
- Not recommended for use on high traffic volume or high speed roads.
- Requires clean up after season. Collected sand is a contaminated product.
- More passes and application required than if alternative materials (e.g. salt) were used.

Benefits
- Ability to provide temporary traction.
- More effective than chemicals at low temperatures and for spot traction.
- Less corrosion issues.
- Provides for safety and mobility but not as well as alternative materials.

	• Useful alternative in environmentally sensitive locations (no salt roads) or roads with snow-packed treatment standard (versus bare pavement). • Can be left on gravel roads without clean up.
Salt	**Impacts** • Impairs groundwater, lakes and streams. • Infrastructure damage. • Vehicle corrosion. • Vegetation, pets, and wildlife (animal attractant). **Benefits** • Improved public safety and mobility compared to basic practices (e.g., plowing and sanding). • Faster recovery time after snow storms versus basic practices. • Less material application versus abrasive (e.g,. sand). • Melting capacity, but starts losing its effectiveness at approximately -12 °C (reports vary). • Breaks the bond between snow and pavement to assist with bare pavement plowing.

Therefore it is very important that what is put out on roadways and pathways does what it needs to do and PARS only puts out what is needed.

Other industry developments include:

• Moving from solids to brines (liquids): Industry has moved from using solids to brines. Brines are more cost effective and have fewer environmental impacts (less concentrated). The use of brines reduces the amount of salt put on the roads and into the environment.

• Moving from de-icing (reactive) to anti-icing (proactive): Anti-icing is aimed at preventing the formation of a bond between snow and ice and the road pavement. According to industry, anti-icing has the potential to provide the benefit of increased traffic safety at the lowest cost.

• Calibration and application: Calibration of equipment is essential for optimal and effective use and reducing the amount of materials put out into the environment.

The City is not in line with industry practices when it comes to the use of materials, both in type of material and application (anti-icing/de-icing). As industry continues to develop liquid brines, there is an opportunity for the City to revisit the use of liquids and align their material usage with industry practices.

Staff Oversight

Staff oversight helps ensure compliance with policies, procedures and guidelines.

Policies, procedures and guidelines are only effective if staff are following them. PARS does not have a formalized process to monitor front line staff and ensure that they are adhering to policies, procedures and guidelines. There is a heavy reliance on spot checking by the Roadway Maintenance Supervisors and leaders to identify whether employees are following procedures. This spot checking is random and not documented.

In addition, PARS relies on the 311 notification system to identify whether employees are not doing their job and not meeting service standards. This is a reactive approach.

SNIC management indicated that with the current amount of 311 notifications and Councillor Inquiries, time spent responding to these notifications by district managers, roadway maintenance supervisors, leaders, and inspectors inhibits their ability to effectively supervise staff, particularly during snow events.

There is an opportunity to develop a more formalized process to monitor staff productivity and to determine whether staff are following documented procedures. For example, document spot checks, use standardized checklists, and set a minimum number of spot checks per employee per month.

Recommendation 10
Improve staff oversight

Recommendation

Improve staff oversight by developing and implementing a formalized process to monitor staff productivity and to determine whether staff are following documented procedures.

Responsible Party

Director, Infrastructure Operations

Accepted by Management

Management Response

This Recommendation will be addressed in conjunction with the roles, responsibilities and accountabilities work undertaken for Recommendation 1, and improvements to complaint handling processes undertaken for Recommendation 12.

It is anticipated that enhancing the roles, responsibilities and accountabilities of staff, in conjunction with a reduction in complaints to be

handled, supervisor and management staff will be more generally available to support frontline staff in service delivery activities. It is also anticipated that empowering staff to make required operational decisions within their scope of authority - and the support to deliver the program outcome - will be reflected in improvements to the operational metrics used in Enterprise Performance Management.

PARS will work in partnership with staff in the Employee Services Department to ensure people leaders are able to provide effective staff oversight and monitoring, and to ensure this work is conducted in a fair, transparent and repeatable process.

Work already underway to support this Recommendation includes:

- The establishment of strategic measures for the SNIC program, as well as the identification of benchmark measures, as supported by Enterprise Performance Management;

- The creation of operational dashboards to provide SNIC management and field supervisors with insights into day-to-day performance; and

- Ongoing enhancements of existing technology and implementation of new technology to support staff productivity measurement.

Implementation Date

September 30, 2022

Innovations

Since 2017, the entire SNIC program has been overhauled to bring it closer to industry standards. SNIC management attended SNIC conferences and used information from the Alberta Public Works Association and American Public Works Association to align their operations to best practices. However, no one at the City has certifications issued by the American Public Works Association for Winter Operations.

PARS introduced a number of innovations over the last few winter seasons. For example:

GPS: As part of a city-wide project, the City is installing active GPS on every vehicle. The new GPS system will be able to work with the sander control system to track how much material is being applied to the roads, whether the blade on a plow is up or down, and other metrics that could assist with operations.

Drone use: PARS will use drone technology to measure the snow storage sites as part of a new contract. The contractor will no longer be paid by hour but by volume of snow moved. Previously, the contractor decided how many pieces of equipment would be "on the clock", now it is in the contractor's interest to move as much snow in the most efficient way. In addition, drone technology is used to measure sand pile quantities. This allows for a more accurate comparison with information in the City's inventory tracking system.

Road Weather Information Systems (weather stations): Industry developments are showing that real-time and forecasting pavement temperature are the next big thing to fine tune what type of material and how much to put on roads. Instead of having staff go out with a heat gun to measure road temperature, weather stations are accessed remotely and data is analyzed on a real-time basis.

We encourage PARS to continue to follow industry developments and implement further innovations.

Public Expectations

Summary of Findings

We live in a winter City where snow and ice impact Edmontonians at least six months of the year. The City's priority is to deliver a safe and livable mobility network for all users throughout the winter season. Public expectations on SNIC activities shape the SNIC program.

To determine if PARS has effective processes in place to manage public expectations on SNIC program quality, we:

1. Assessed if PARS has an effective strategy to communicate with citizens.

> *PARS has a documented strategy to communicate with citizens. However, improvements can be made to the Communication Plan, website and process to update interactive maps to strengthen public communications.*

2. Assessed if PARS has an effective process in place to deal with citizens' concerns.

> *PARS has processes in place to deal with citizen concerns. However, we identified some improvements to strengthen the process.*

Based on our observations, we conclude that PARS can improve the processes in place to manage public expectations on SNIC program quality.

We identified a number of opportunities for improvements to strengthen public communication and the handling of citizen's concerns. We made two recommendations in the sections below.

Public Communication

The effective and efficient delivery of the SNIC program depends in large part on the cooperation of citizens with parking bans, sidewalk clearing, voluntarily moving cars away during residential blading cycles, giving crews room to work,

PARS has a documented
communication plan for
SNIC

etc. Communication is key in making citizens understand, respond to, comply with, and influence policies and programs.

PARS has a documented communication plan for SNIC. The plan identifies goals, objectives, strategies and tactics. The plan lists a combination of proactive and reactive strategies. For example:

- Meeting with City Council members at the beginning of snow season to provide them with information about the SNIC program.
- Before the first snowfall (early November) – media availability to show preparations, remind citizens to think about where they can park in the event that seasonal bans/residential blading cycles are initiated.
- During each major snow event – detailing the City's plan to clear City streets (through a media availability and/or media release) and the progress done on arterial and collectors.

However, we did identify some areas of improvement in the communication plan. These include:

- Linking of goals, strategies and tactics can be improved to identify any gaps.

- Tactics are identified but not clearly defined (who does what, when, where, and how). No links to additional information or indication where to find additional information.

- The plan does not define how PARS evaluates strategies and tactics to ensure objectives (and outcomes) are met. The plan mentions two quantitative measures (reduction in complaints and social media ratings), however the plan does not clearly define who measures what, when, where, and how.

- The plan does not mention that public engagement is sought when PARS tests or considers new initiatives. This is an important way that PARS communicates with the public.

We reviewed a sample of City communications related to the SNIC program. We assessed the sample against the 7Cs of effective communication processes. If information posted on the website, interactive maps, social media etc. is not meeting the 7Cs of effective communication then the City will lose credibility and public confidence in ability to deliver service.
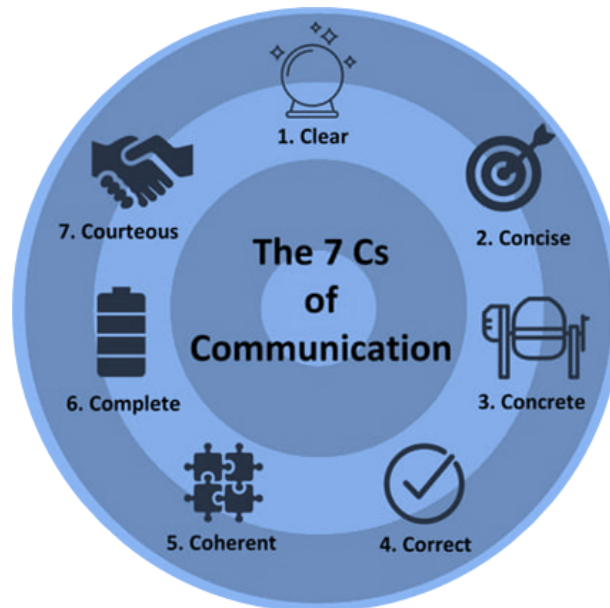
With the exception of the website (including interactive residential plow map), communications tactics used by the City generally met the 7 Cs of effective communication.

There are some areas for improvement related to website:

- Accuracy and timeliness of interactive maps. On the City of Edmonton website there are 3 maps available to provide information to Citizens (Community sandbox locations map, residential clearing map, City plow map).

- Consistency and clarity of information within websites and across platforms, especially as it relates to SNIC service levels that the public can expect.

- Timeliness of information. Some information posted on the website is outdated.

- Conciseness of information. Website is wordy, information could be presented more to the point.

In addition, the City could explore different and proactive ways of interacting with the public. For example: participate in "Emergency Preparedness in the Park" or "Salt Wise Cup" promotion.

Example of Salt Wise Cup. Source:wisaltwise.com

We also observed that the City and Councillors are active on social media. Social media can have a profound impact on public perception. In many ways, social media is still a new outlet for local governments. New communication channels such as blogs and social media outlets bring a measure of accuracy and accountability with them.

PARS management informed us that the biggest challenge currently is the resources and support to deliver on public communications.

We also reviewed a sample of external media reports by various media outlets for the 2019/2020 winter season (e.g., newspaper articles and TV news clips). Information presented in these external media reports is mostly accurate but not complete (only selective information is being reported by outlets). The information is presented to support or confirm a particular point, giving disproportionately less attention to information that contradicts or softens it. The information is therefore leading the reader towards a predetermined position. In these cases putting the City's SNIC program in a negative light (presumably intended to confirm an already existing "negative public perception").

Recommendation 11

Improve public communications

Recommendation

To improve public communication, in collaboration with the Communication and Engagement Department ensure:

- The Communication Plan is clear and complete;

- The information provided on the SNIC website is consistent, clear, and concise; and

- The interactive maps provided on the website are accurate and timely.

Responsible Party

Director, Infrastructure Operations

✓ Accepted by Management

Management Response

Administration recognizes the importance of effective communication to the success of the SNIC program. The communications focus going forward is to build partnerships with residents and continue building trust in the SNIC program.

This work is done on an annual basis and has been largely completed in preparation for the 2020/2021 winter season. Work completed includes:

- Annual refresh of the communication plan including additional tactics and methods that are new for this winter season.

- The annual refresh of the public website (edmonton.ca/SafeTravels) has been completed, including a full content and design refresh. This was done with the intent of presenting key information in an easy to understand manner.

- The interactive map has been redesigned, and is now always available. A single map now exists.

- The SNIC program provides active and ongoing support to members of Council as they interact with their constituents and the public, including an annually reviewed and refreshed information package, weekly program and operational updates and ongoing support to answer and direct questions or feedback received by their offices.

Work actively underway for the 2020/2021 season includes:

- Enhancements to the online map, including information provided as well as the timeliness and accuracy of information are being put in place and will be tested for the 2020/2021 winter season. Adjustments will be made as necessary.

- Ensuring communication strategies and tactics are appropriately measured and

> reported.
>
> - Integrating Communications activities with Engagement activities where appropriate.
>
> 📅 Implementation Date
>
> March 31, 2021

311 Notifications and Council Inquiries

Citizens have multiple avenues to submit inquiries and complaints:

Call 311 and Use 311 App: 311 is Edmonton's non-emergency phone line for City government information and services. It provides residents, businesses and visitors with a convenient way to obtain information, submit inquiries, and report suspected Bylaw infractions or complaints. Since 2014, 311 can also be reached through the 311 app. We reviewed the 311 intake process, 14 scripts that are used by 311 operators to address SNIC calls, and PARS follow up process.

Council Inquires: Citizens can also complain to councillors and their offices. We reviewed the intake process for Councillor inquiries and the process for forwarding inquiries to Infrastructure Operations for follow up.

PARS Email: There is a PARS email account that citizens are able to contact with their SNIC related complaints. PARS is no longer promoting the use of this account, but it is still active.

In general the City has adequate processes in place to receive citizen's inquiries and complaints. However, we did observe the following:

The City has adequate processes in place to receive citizen's inquiries and complaints.

- Instances of inconsistent, incomplete and outdated information in 311 scripts. Inaccurate information can lead to confusion and citizen's dissatisfaction with service levels (or expectations).

- Councillor inquiries are not consistently recorded in the central tracking system when received. Councillor offices can forward inquiries as emails directly to various individuals in the City Operations Department (Deputy City Managers Office, Branch Managers Office, Director, General Supervisor or District Supervisors). There is a risk that inquiries are not entered in the central tracking system. In addition, all Councillor inquiries received by PARS are supposed to be entered and traced on the PARS dashboard. This is not done consistently.

- The PARS email account is still active. PARS is monitoring and forwarding the emails coming in. From October 14, 2015 to April 30, 2020 there were 577 emails that related to snow and ice. However, we were unable to confirm if this number is accurate as emails could have been deleted. In addition, there is no tracking to ensure the inquiries have been dealt with. We did not include this data in our data analysis.

Data Analysis

We obtained and analyzed 311 data from 2015 to 2020. In total there were 116,367 snow and ice related notifications. 24,909 of them were directed to the Citizen Services Department and were for bylaw complaints concerning citizens who may not have been complying with the bylaw. 91,456 were directed to the City Operations Department. Our analysis was done on these records.

Number of Snow and Ice Control Notifications (2015-2020)

SNIC related notification increased by 337% over 5 years
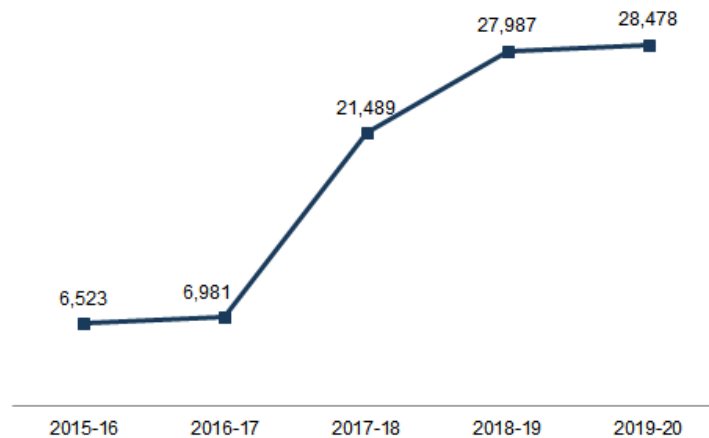
The biggest jump in 311 notifications was in the 2017/2018 winter season. According to SNIC management in Q4 of 2017 there was a push to use the 311 mobile application for reporting parking enforcement and winter sidewalk maintenance complaints.In addition, Edmonton experienced above average snowfall in 2017 and 2018 and the calcium chloride pilot was underway. Since then, 311 notifications per winter season have remained high.
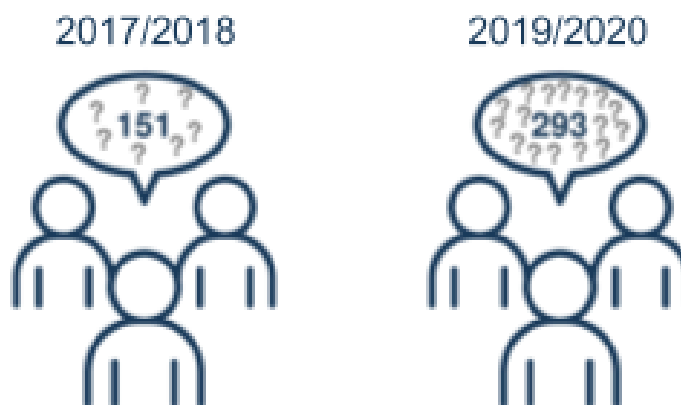
In the 2019/2020 winter season, Infrastructure Operations averaged 4 days to close 311 notifications.

Average Days to Close Notifications

Tracked Councillor SNIC related inquiries increased 94% in 3 years.

Councillor Inquires

Councillor inquiries take longer to complete than 311 inquiries, which may be because the process involves more steps. In the 2019/2020 winter season, PARS was able to improve the response time by 5 days compared to the 2018/2019 winter season (from 12 to 7 days).

We also looked at notifications by district. All districts are receiving a similar number of calls within a winter season.

Based on the numbers obtained, PARS can get 100 to 300 notifications a day during a snow event. According to SNIC Management, supervisors can barely address 20 to 30 in a day if each results in an inspection and then documenting a decision on the appropriate outcome and a response to the citizen or Councillor. SNIC management also indicated that time spent responding to 311 notifications by supervisors and inspectors inhibits their ability to effectively supervise staff, particularly during snow events. However, PARS is currently not tracking time for dealing with these complaints.

Of the 91,458 311 notifications received in the past 5 years; 76% (69,456) were for requests for action and the other 24% (22,002) were for requests for information.

There are certain types of complaints that increased significantly in the past 5 years :

Complaint Types	5 year % Increase
Snow: Road Windrows	2,211%
Plow: Residential Road Plow Request	2,185%
Info: Windrow on Sidewalk	1,700%
Plow: Road Snow Blocked	1,118%
Snow: Amenity Bldg Removal	925%
Info: Residential Plowing	793%
Plow: Road Plow Request	770%
Snow: Road DATS Assistance	700%
Snow: Sidewalk Windrow	462%
Snow: Bus Stop Snow/Ice	374%

The complaint types with the largest increases are for windrows and residential plowing.

Confusion around service levels leads to numerous 311 calls

Confusion around service levels due to unclear policy documents and inconsistencies between policy documents and actual services provided can lead to numerous 311 calls. For example, cul-de-sacs are not mentioned separately in the SNIC policy but receive a different service level than other residential streets. Consequently, some of these categories could benefit from increased public communication on service levels, which could bring the number of calls down.

In addition, we compared the 311 data for the 2019/2020 winter season to the dates of certain events. We established a correlation between the 311 inquiries received on a given day and:

- Ice or snow events;
- Seasonal parking bans; and
- Publication of PARS complaint letter on February 18, 2020 and Council update on SNIC.

Based on these observations, SNIC Management should implement a process to evaluate 311 and Councillor inquiries for common themes or correlations with events. By conducting such an analysis during and/or at the end of the winter season, SNIC management could develop strategies (e.g., public communication, staff training) to address these themes.

Improvements can be made to handling of citizens concerns

PARS does have processes in place to deal with citizen concerns; however, improvements in the following areas should be considered to strengthen the process:

- Scripts should be reviewed to ensure information within them is consistent, complete, and up to date. This should take place annually.

- Councillor inquiries should be received by one person or area (e.g., Dispatch Centre), to ensure proper entry in the tracking system and adequate follow up.

- SNIC management should implement a process to evaluate 311 and Councillor inquiries for common themes or complaints. In addition, SNIC management should develop strategies to proactively address the highest types of complaints or the types of complaints that see the most increase.

- Time spent dealing with 311 or Councillor inquiries should be tracked to assist in managing and monitoring how much effort is spent.

- The PARS email account should be set to inactive or a process to enter these emails into the 311 stream should be developed.

Recommendation 12

Strengthen complaint handling processes

Recommendation

Strengthen complaint handling processes by:

- Ensuring 311 scripts are consistent, complete and accurate.
- Centralizing receiving, recording and handling of Councillor inquiries.
- Analyzing 311 and Councillor inquiries for common themes and developing strategies to address common themes.
- Tracking and managing time spent dealing with 311 and Councillor inquiries.
- Deactivating the PARS email account or developing a process to enter these emails into the 311 stream.

Responsible Party

Director, Infrastructure Operations

Accepted/Not Accepted by Management

Management Response

This work is done on an annual basis and has been largely completed in preparation for the 2020/2021 winter season. Work completed includes:

- 311 scripts have been completely rewritten to contain relevant content and to best support agents in answering resident questions and concerns.

- A process has been developed to ensure service requests sent to the PARS email address are being forwarded to 311 in a timely manner.

Work actively underway for the 2020/2021 season includes:

- Identification and implementation of process improvements to the Councillor inquiry process. This work includes developing solutions to the ongoing challenge of reconciling duplicate resident requests received from both 311 and via a Councillor inquiry.

- Developing processes to receive, review and analyze inbound feedback (311, Councillor inquiries and website feedback) for common themes and adjust communication and messaging as needed. This analysis will support adjustments to service as needed throughout the winter season.

- Developing processes to track time spent managing and responding to both 311 and Councillor inquiries, and implementing changes and supports as necessary to reduce the resources required to effectively manage and resolve the inquiries.

Implementation Date

September 30, 2021

Conclusion

What did we find?

On February 13, 2020, City Council received an anonymous letter which included a number of allegations of mismanagement of the City's SNIC program. In response to the concerns raised in this letter, the Office of the City Auditor decided to take a broad approach and conduct a value-for-money audit of the City's SNIC program.

In this audit, we assessed if the PARS Branch

1. Has an effective governance structure in place to deliver the SNIC program.

2. Measures and monitors the effectiveness, efficiency and economy of the SNIC program.

3. Is planning, allocating, managing and monitoring program resources to ensure effective, efficient and economical delivery of the SNIC program.

4. Has effective and efficient program processes and operations in place to meet the SNIC program objectives and service levels.

5. Has effective processes in place to manage public expectations on program quality.

As the PARS Branch continues to strengthen the SNIC program to provide quality service to Edmontonians and meet service level expectations, this review identified obstacles and opportunities for management to consider as they strengthen their governance structure, improve program delivery, and manage public expectations.

Opportunities for improvements identified relate to:

- Clarity of SNIC policy and consistency between policy and other SNIC guiding documents.

- Actively engaging employees in operational decision-making processes, and assessing the effectiveness of internal communication tools to improve decision-making processes.

- Strengthening current change management processes to include more people-focused processes.

- Performance measurement and benchmarking.

- Implementation of a service level agreement or partnership agreement between PARS and Fleet and Facility Services.

- Assessment of the cost of in-house versus contracted services for key SNIC activities.

- Cost reduction and potential revenue opportunities (Community Sandbox Program, snow storage tipping fees, staffing analysis).

- Expanding Standard Operating Procedures for identified gaps.

- Improving efficiency and effectiveness of staff oversight.

- The SNIC communication plan, website and process to update interactive maps to improve public communications.

- Revising and updating 311 and Council inquiry processes to strengthen complaint handling processes.

The Office of the City Auditor has provided 12 recommendations that can support PARS to leverage these opportunities to improve the City's SNIC program.

We thank PARS management and staff for their cooperation, support and openness during this audit.

Appendix A - SNIC Service Levels

According to Snow and Ice Control Policy (C409J)

Priority Listing

Priority	Type of Inventory	Service Level
1	Freeways, arterial roadways, business districts, busways	Maintain to a bare pavement standard within 36 hours from end of snowfall
1	Bus stops adjacent to City property	Maintain to a bare pavement standard within 48 hours from end of snowfall
1	Prioritized sidewalks, trails and bike routes	Maintain to a bare pavement standard within 24 hours from end of snowfall
2	Collector, bus route roadways, transit Park and Ride access roads	Maintain to a bare pavement standard within 48 hours from end of snowfall
3	Local industrial roadways	Maintain to a bare pavement standard within 5 days from end of snowfall
4	Residential roadways, alleys	Blade level snowpack, starts within 48 hours after snowfall and completes in 5 days. Alleys adjacent to roadways subject to seasonal parking ban will be done first.
n/a	Transit facilities - sidewalks, ramps, stairs and bus platforms at transit facilities	Clear snow within 24 hours after the snowfall
n/a	Transit facilities - transit zone pads	Clear snow within 48 hours after the snowfall
n/a	Active Transportation Modes - multi-use trails, sidewalks adjacent to city owned land	Plow within 48 hours of snowfall where there is an accumulation of 2 cm or more

Services

Service	Service Level
Roadway Plowing	Plow snow from all freeways, arterial and collector roadways, bus routes and busways during and following the end of a storm to achieve bare pavement. Plow snow as required from roadways (other than freeways, arterial and collector roadways, roadways abutting schools and bus routes) carrying in excess of 1500

	vehicles per day and emergency access routes.
Residential Blading	In any given snow event, a city-wide residential blading program will be initiated (including Alleys) immediately after the Arterial and Collector road network has been plowed and considered to be in safe condition. Residential Roads will be bladed to a 5 cm snowpack condition. Service level will only involve the blading of snow. In the event that a 5 cm snowpack cannot be maintained on residential roads within one cycle of blading, plowing to bare pavement will be initiated where required.
Residential Blading - Windrows	Windrows (less than 30 cm in height) left behind blocking driveways will be the responsibility of the adjacent property owner. Windrows (more than 30 cm in height) left behind will be cleared as to not block driveways
Snow Removal	Remove snow from business districts as required. Remove snow from arterial roadways when curb lanes are reduced to less than 3.2 metres in width by windrowed snow. Remove snow from collector roadways and bus routes as required when the driving width or parking area restricts safe vehicular movement. Remove snow from roadways in the designated windrow free zone and school drop off zones adjacent to schools on both sides of the roadway, after every major snowfall when a full plowing cycle is completed. Remove snow as required from roadways (other than, arterial and collector roadways, and bus routes) carrying in excess of 1500 vehicles per day, when the driving width or parking area restricts safe vehicular movement.

Appendix B - Timeline of Changes (2015-2020)

Date	Description of Change	Type of Change
2015		
July	New Director Roadway Maintenance	Leadership Changes
November	Policy change 409I	Policy or Bylaw Changes
2016		
January	Start of Transformation Project (2016)	Organizational Structure Changes
March	Creation of City Operations Department	Organizational Structure Changes
May	New Acting DCM City Operations Department	Leadership Changes
July	New DCM City Operations Department	Leadership Changes
September	Winter Street Sand Recycling and Mixing Program Audit	Operational Changes
October	Start of Calcium Chloride Pilot	Operational Changes
November	PARS Branch formed	Organizational Structure Changes
	New Branch Manager PARS	Leadership Changes
2017		
May	Start of Integration Project (2017-2018)	Organizational Structure Changes
July	New Director Infrastructure Operations	Leadership Changes
October	Change in material application guidelines. Sand/Salt matrix changes. Increase in mechanical plowing away from sanding.	Operational Changes
2018		
March	New DCM City Operations Department	Leadership Changes
	New Acting Branch Manager PARS	Leadership Changes
September	Policy Change 409J	Policy or Bylaw Changes

2019

February	New Branch Manager PARS	Leadership Changes
April	Forming of Active Pathways TeamF	Organizational Structure Changes
September	New Director Infrastructure Operations	Leadership Changes
October	10 hr straight day and night shift for Active Pathways	Operational Changes
	End of Calcium Chloride Pilot	Operational Changes

2020

January	Field Supervisory Structure Project (on hold)	Organizational Structure Changes
October	12 hr rotating shift for Mechanical Roadways	Operational Changes
	City Wide Seasonal Parking Ban (Bylaw 19438/5590)	Policy or Bylaw Changes
November	Residential Blading (to be decided)	Operational Changes