



INDEPENDENT OFFICE OF THE CITY AUDITOR

Fleet Services Audit – Phase 1 Investigation of Service Disruptions in Saskatoon Transit

Investigation Report

November 7, 2022



Report Summary

Background

During the winter of 2021-2022, the City of Saskatoon Transit (Transit) services experienced significant disruptions. The primary reasons for the disruptions communicated to the public were extreme weather conditions, global parts shortage, and the age of the bus fleet. The situation escalated throughout January and February, and in March 2022, a press conference was held to discuss the disruptions. In April 2022, the City of Saskatoon City Council asked the Independent Office of the City Auditor to investigate the service disruptions. A Terms of Reference for the investigation was approved by the City Council on June 27, 2022.

Investigation Objective

The objective of the investigation was to conduct a root cause analysis of service disruptions during winter 2021-2022 and provide cost-effective and practical recommendations to avoid future disruptions in Saskatoon Transit.

Investigation Scope and Approach

The investigation was primarily focused on the events that happened during the winter of 2021-2022. Where required, historical and current documents were reviewed and evaluated to assist in the conduct of the investigation. The investigation was limited to assessing service disruptions pertaining to fixed-route buses; therefore, Access Transit was excluded from the investigation.

The areas of focus for the investigation included sourcing of parts, preventative maintenance and repairs, communication and reporting and the age of the bus fleet and resources.

The following approach was used to conduct the investigation:

- The City Auditor led the investigation and engaged consultants to assist in the investigation.
- The investigation team met with Transit Administration, transit staff including operators, stores and maintenance staff, staff from other departments and stakeholders, including the Amalgamated Transit Union (ATU) 615 and Bus Riders of Saskatoon.
- The investigation is evidence-based, and the investigation team conducted a detailed review of documents and records to conclude the reasons for the disruption of services in the winter of 2021-2022. The information presented here is based on the data received from Administration.
- The City Auditor met with Transit Administration to discuss preliminary findings and recommendations to ensure the lead time for fixing immediate issues before the next winter.

Investigation Results

Based on our investigation, we concluded that multifaceted factors resulted in service disruptions. The main reasons for the service disruptions include ineffective operations of stores in Transit, ineffective governance processes and an ineffective preventative maintenance program. These disruptions were due to internal factors and can be avoided in the future if proper actions are undertaken, as indicated in this report.

Ineffective Stores operations in Transit was the first main reason that resulted in delays in providing parts required for buses. We noted inadequate staffing levels at Stores, ineffective inventory management, non-utilization of new processes in the system and inadequate support provided to Stores staff in effectively using the new system.

Ineffective Governance process was the second main reason for service disruption. These include inadequate management of transit issues, lack of stakeholder engagement, lack of performance indicators for bus repairs, lack of data-driven decision making and ineffective communication processes.

An ineffective preventative maintenance program was the third main reason for the disruption of Transit services. During the last two years, 60% of the buses did not receive timely preventative maintenance, which resulted in more work during winter 2021-2022 when a breakdown occurred or increased the likelihood of breakdowns.

Key Recommendations

The following is a summary of key recommendations arising from the investigation:

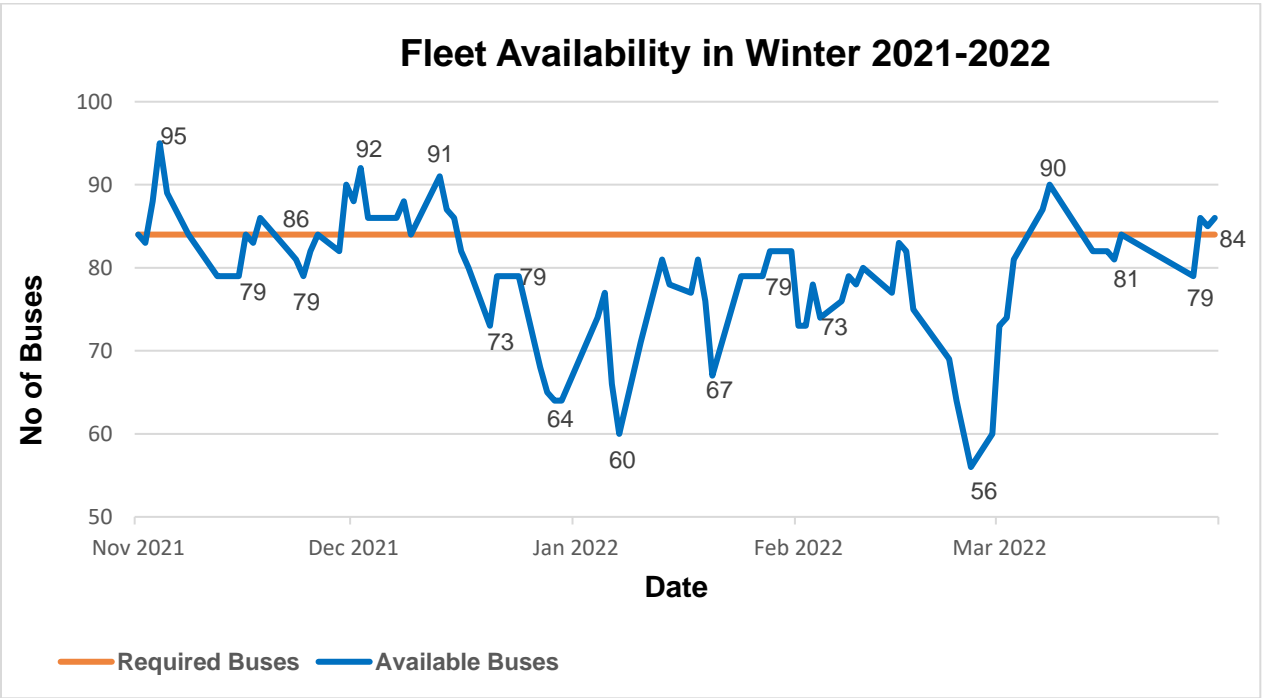
- Strengthen the Stores Operations within Transit, which includes developing and implementing policies and procedures, streamlining inventory management issues and continuing and enhancing support to the Stores staff in using the new fusion system.
- Improve governance processes by increasing management presence, identifying trends of actual service levels, implementing measures to increase spare buses, implementing accountability frameworks, building strong stakeholder relationships, obtaining accurate and timely data for informed decision-making, improving supervisor-to-staff ratio, and expediting the recruitment for Director of Transit.
- Improve the preventative maintenance program by tracking and monitoring the preventative maintenance against the maintenance schedule, identify non-conformance, and implement actions to ensure conformance to the schedule.
- Improve the communication and reporting of transit issues by:
 - carefully analyzing the information before providing it publicly to ensure accuracy and involving the City's Leadership early in the process for advice; and
 - implementing formal communication timelines for reporting service disruptions to the public and ensuring that adequate lead time is provided to riders to allow for alternative travel plans.
- Conduct a workplace culture audit at Transit and implement strategies to improve the workplace culture at Transit.

Saskatoon Transit Disruption Details

Transit is a public transit provider operated by the City of Saskatoon (City), with an annual budget of \$52.8 million, assets valued at approximately \$200 million and over 400 employees. Transit is an essential service that the City provides its residents.

Transit has 135 available buses serving fixed-route transit services. During the winter of 2021-2022, Transit was required to book out 84 fixed-route buses (62%) daily.

During winter 2021-2022, Transit services experienced significant disruptions due to bus shortages. These disruptions were communicated to the public via Public Service Announcements. The reasons for disruptions provided by the Administration include extreme weather conditions, global parts shortage, and an aging transit fleet. The situation escalated throughout January 2022 and February 2022, and in March 2022, a press conference discussed the disruptions.

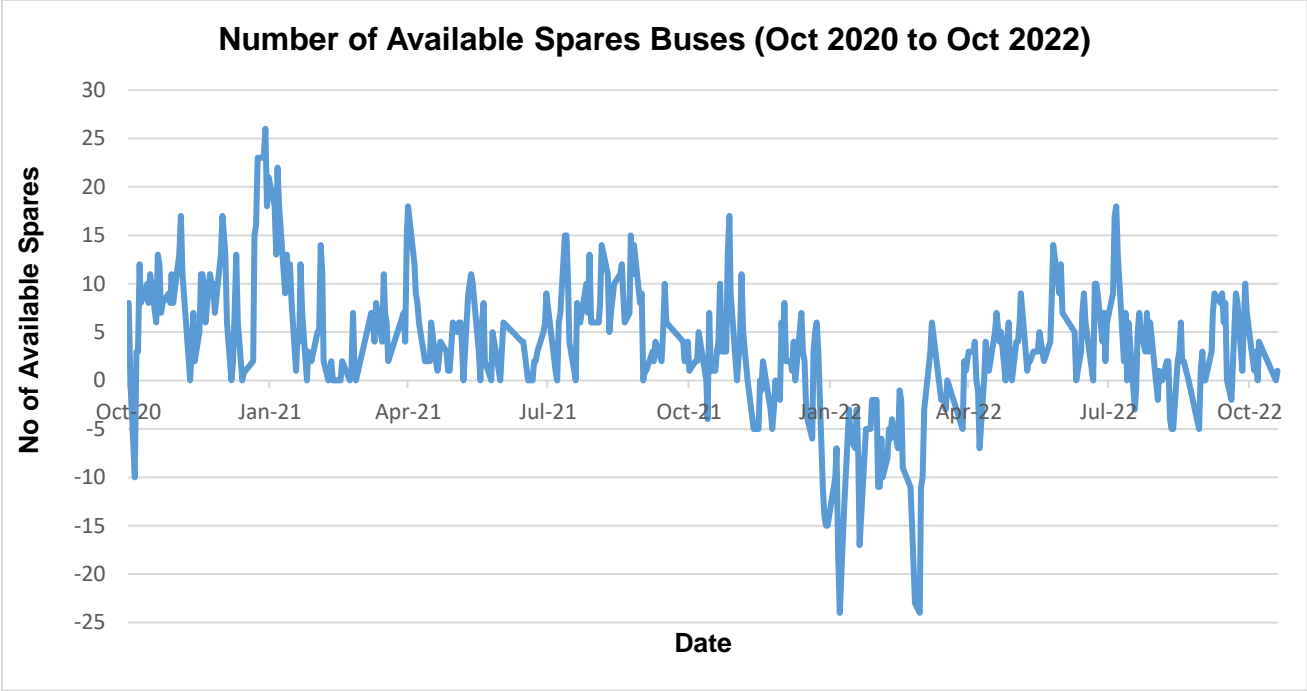


The above graph shows the availability of fixed-route buses in the winter of 2021-2022 (November 2021 to March 2022). The orange line shows the expected buses required daily to meet service demand, while the blue line shows the actual number of buses available at a given point in time of the day, usually in the morning. As depicted in the above graph, there were some bus shortages in November 2021, but the significant bus shortages started in late December 2021 and continued until March 2022. It is important to note that during the days when there were service disruptions, there was a reduction in the frequency of the bus routes, and no route was cancelled entirely.

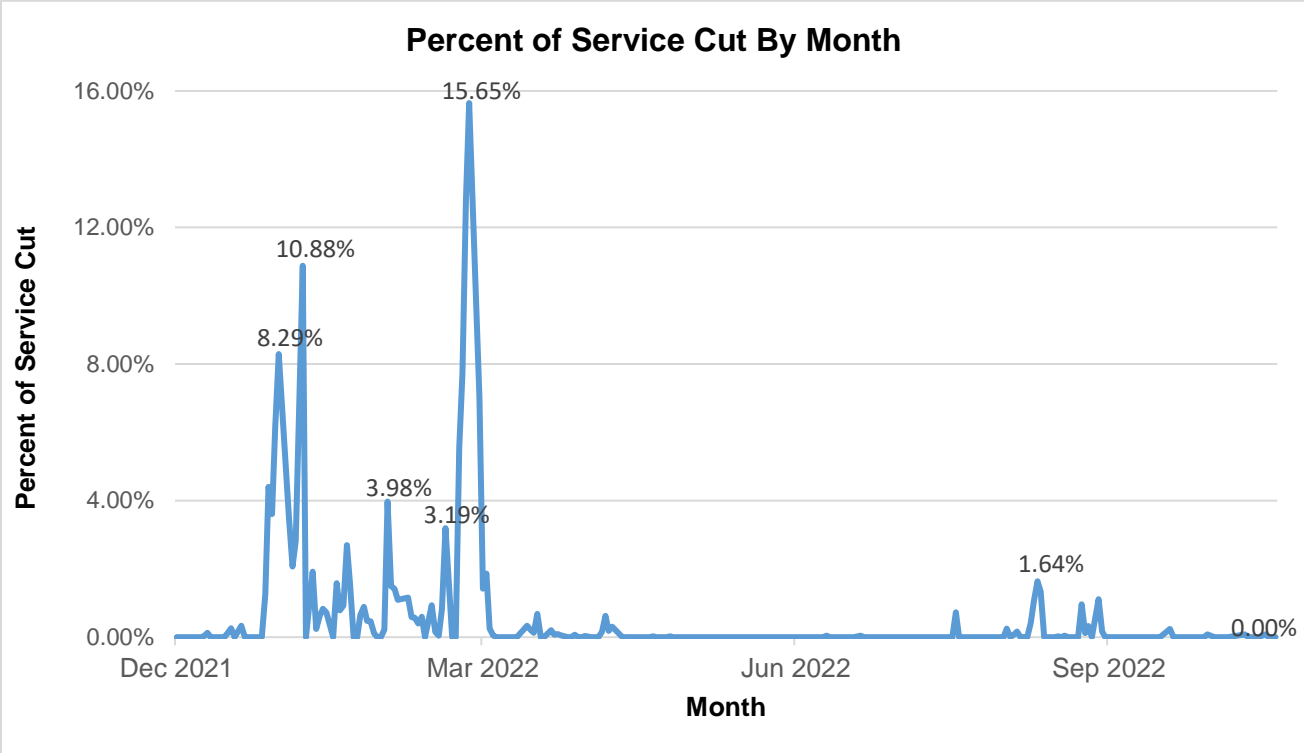
The number of spare buses (number of buses available after meeting service demand) is an indicator of whether Saskatoon Transit will be able to meet service demand. If the number is

positive, there are higher chances that the service demand will be met; if the number is negative, there is a shortage of buses, and service will be negatively impacted. The higher the number of available spare buses, the better Transit is equipped to maintain the required service levels in case of breakdown of buses.

Transit maintains a 38% spare ratio, which means that in a perfect scenario, there will be 51 spare buses available over the 84 buses required to meet the service demand. However, there will always be fewer than 51 buses due to mechanical issues, accidental repairs, warranty repairs, etc.



The above graph shows the number of spare buses from October 2020 to October 2022. As shown in the graph, Transit maintained a positive number of spare buses most of the time from October 2020 to October 2021. However, the number of spare buses went negative (shortage of buses) from the end of December 2021 to March 2022. Transit Administration has been able to bring back the spare buses into positive range with occasional days when there was a shortage of buses. Transit Administration should closely monitor the spare bus patterns and strive to keep the spare buses in a positive range to meet the service demand.



The above graph shows the actual impact on service in percentage terms due to the shortage of buses. During the disruption period, Transit services were cut by up to 15.65% due to a shortage of buses. However, there have been minimal service cuts in the last few months (April 2022 to October 20, 2022).

Key Reasons for Transit Service Disruptions

Our investigation identified three key reasons for the disruptions of Transit during the winter of 2021 and 2022.

Reason 1: Ineffective Stores Operations

Recommendation 1: We recommend that the Corporate Supply Chain and Transit should work together to strengthen the Stores Operations within Transit. This includes:

- 1.1 Developing and implementing policies and procedures for management of Stores operations in Transit and ensure compliance.
- 1.2 Streamlining the inventory management issues within Stores which includes ensuring that correct inventory levels are set for parts in the system based on demand, correct parts numbers are assigned to avoid any confusion, parts are placed in the right bins to reduce the time it takes to search the parts when required, conducting full inventory counts and ensuring that regular parts are always available in stock to meet demand.
- 1.3 Implementing the inventory and procurement features within the fusion system to improve process efficiencies, for e.g., automating the inventory levels for parts based on demand, automating the procurement of parts, implementing approval process flow for any changes to key fields such as re-order points within inventory management.
- 1.4 Developing contracts with vendors for obtaining high demand bus parts that would reduce the overall time it takes to procure the parts.
- 1.5 Strengthening the management oversight of Store Operations to ensure that resourcing and performance aspects are well managed.
- 1.6 Continuing and enhancing support to the Stores staff in the use of the new fusion system that would make the staff more effective in their day-to-day operations. A formal assessment should be made on the skill sets of the Stores staff in using the new system and actions should be taken accordingly.

The financial impact of implementing the above recommendation is low (estimated below \$100,000). The recent change in the reporting structure of Stores in Transit to the Corporate Supply Chain is already in place.

Stores Department within the Transit is responsible for managing inventory and procurement of parts required for maintenance of the buses, which includes timely ordering and receiving of parts.

During the investigation, we found that the operations in Stores were ineffective during the winter of 2021-2022, which resulted in delays in providing parts required for buses and was a primary factor in the disruption of Transit Services.

Data received from Administration showed that many buses were out of service and waiting for parts which peaked during the winter of 2021-2022. These issues were not due to a global supply chain issue stemming from the pandemic but instead due to ineffective Store operations.

Our comparison of the average time it took to issue the Purchase Orders between Winter 2020-2021 and Winter 2021-2022 showed an increase from 3.20 days to 5.16 days. Thus, resulting in delays in ordering parts for the buses and impacting the availability of buses to meet the service demand.

The following issues within the Store Operations were noted during the winter of 2021-2022:

i. Inadequate staffing levels at Stores and ineffective management of staff

Staffing within the Stores department at Transit experienced challenges during the winter of 2021-2022. Prior to transit disruptions, Stores was staffed with six full-time staff; however, during transit disruptions, Stores was operating at 66.66% capacity.

Before the service disruption, there was one transfer out, and a Stores supervisor retired. Neither position was filled, leaving Stores with only four people during the transit disruption, or short 33.33% of its planned staff. In preparation for a Store employee's departure in March 2022, an additional position was hired in February 2022, bringing the staffing level to five. However, this was only temporary, with staffing decreasing again to four positions upon the vacancy in March 2022.

With only four staff in Stores during Transit Disruption and staff absences due to sickness and vacation time, it caused challenges in managing the Stores workload. When fully staffed at six positions, four staff would typically be available during the day. Among these four staff, they would be able to unload part arrivals, enter goods receipts, purchase parts, manage inventory and perform various other duties to ensure Stores run efficiently. However, as per inquiry, it was not unusual that one Stores staff was present during the day during Transit disruption. It is unclear why additional staff were not hired, but we concluded that Stores staffing was not adequate during the period of disruption.

We also noted ineffective oversight of Staff operations during transit disruption. No dedicated, experienced Stores supervisor was responsible for managing the Stores during the service disruption. Stores staff issues related to support for using the new system and access during the disruption period needed to be better understood and resolved. Thus, inadequate staffing levels at Stores and ineffective staff management were key drivers in service disruption.

ii. New processes were not fully utilized in the new Fusion system

The objective of the implementation of the Fusion system was to automate the inventory and procurement process. However, we noted that the old manual processes were used during the procurement process outside of the Fusion system, which delayed the issuance of purchase orders.

An example of a manual process was a weekly vendor bid process used in parallel with the new Fusion system. This created an issue in Stores when the demand for parts increased during the winter of 2021-2022, as the weekly bid process was slow and ineffective, requiring staff to distribute, compile, and order parts manually.

The bid process begins every Monday when the Stores staff distributes a parts list to various vendors. Upon the vendors' responses, staff will manually compile the pricing and quantity information into a master spreadsheet. The spreadsheet is then used by staff to determine where to purchase parts. This causes inefficiencies due to the lead time of the spreadsheet distribution and vendor responses. By the time the information is received back, Transit's purchase requisitions have already grown, and the master list is outdated. With the evidence of legacy processes and the previously discussed implementation challenges, we can conclude that the legacy and ineffective processes within Stores contributed to the disruption.

iii. Ineffective Inventory Management

Effective inventory management ensures that regularly used bus parts are always available in stock to meet the demand. During our investigation, inventory levels were not effectively managed during the disruption period. For some regularly stocked items, the minimum and maximum inventory levels set in the system did not reflect the demand for the parts. This resulted in some of the requested parts not being available in stock during the disruption period and needing to be ordered with the vendors, which resulted in the delay in fulfilling the demand while the buses were waiting for the parts.

The Stores is increasing the inventory levels for regular stock items to meet the service demand, further confirming that the inventory levels were inadequate during the disruption period.

In addition, a full inventory count has not been completed since 2017. Cycle counts were done during this time, but with the implementation of SAP, unverified and potentially incorrect data was entered into the system and used during the disruption period. At the minimum, a complete inventory count should be done annually.

iv. Inadequate support provided to Stores Staff in the use of the new System

Like other City departments, Transit underwent implementation of SAP (fusion system) beginning in 2021, which continued into disruption. The procurement and inventory management processes were moved to Fusion system.

Our investigation found that due to ineffective supervision at the Stores during the disruption period, the staff did not receive adequate support in using the new system. Some Stores staff were not provided access to create purchase requisitions in the new system (a pre-requisite step to issue purchase orders), which further delayed the issuance of the purchase orders. This access issue was not resolved until after the disruption period.

We noted that many purchase requisitions were hung up in the system, and therefore the purchase orders could not be processed. In addition, the purchase requisitions and purchase orders were not created in accordance with each other. A review of the data showed that when the demand for bus parts increased during the disruption period, the purchase orders were backlogged and not processed timely, resulting in delayed receipt of bus parts. After the disruption period, there was a sudden increase in the processing of purchase orders to clear the backlog.

Current Situation: Stores Operations

At the end of August 2022, the Store Operations were moved under the Corporate Supply Chain Management. The objective of the change was to obtain supply chain expertise and best practices which would best be achieved through a formal reporting structure change. The Store Operations staff continues working from the Civic Operations Centre to support Transit. We understand that moving Stores under the Corporate Supply chain has been a positive experience for Stores staff. The subject matter expert from the Corporate Supply Chain has helped the Stores staff resolve Store issues and learn the new Fusion system, which is a continuous process. The Stores is in the early phase of implementing procurement and inventory best practices.

Reason 2: Ineffective Governance

Recommendation 2: We recommend that Transit Administration should strengthen the governance processes within Transit. This includes:

- 2.1 Enhancing monitoring of number of buses which are booked out every day compared to the service demand and identifying trends of actual service levels, identifying reasons for bus shortages or when the spare buses are running low and implementing measures to increase the spare buses to an acceptable level. Identifying roles and responsibilities within Transit that will be responsible for monitoring and implementing measures to meet the service demand.
- 2.2 Building strong stakeholder relationships with unions, transit staff, Bus Riders of Saskatoon, and City's Leadership by conducting regular meetings and communication on transit issues and working together to resolve such issues.
- 2.3 The City's Leadership should strengthen the oversight of Transit operations by probing into the Transit issues and obtaining regular reporting on the performance of the Transit.
- 2.4 Expediting efforts in the hiring a permanent position for Director of Transit and in the meantime, explore opportunities to appoint a full-time interim Director to lead the Transit operations.
- 2.5 Developing a triage process that would assist in prioritizing work on buses with less or complex maintenance issues to meet the service demand. Administration may explore the option of hiring a planning scheduler in the maintenance area to streamline the prioritization of repairs.
- 2.6 Developing key performance indicators or standard repair times and track and measure bus repair times against the standard repair times to align with other municipalities and private sector. Develop comprehensive policies and procedures at Transit and communicate widely to staff.
- 2.7 Implementing measures to obtain accurate and timely data related to preventative maintenance, buses waiting for parts, etc. for timely decision making.
- 2.8 Developing strong communication and accountability processes that will ensure that available buses are always booked out to meet the service demand.

Financial Impact in implementing the above recommendations is moderate (estimated between \$100,000 - \$250,000). The financial impact relates to acquiring resources and additional efforts required to strengthen the governance processes.

Good governance assists the departments in meeting their goals and objectives and increasing the operations' overall productivity and efficiency.

Our investigation identified ineffective governance as the second key reason for the disruption of Transit. It relates to ineffective governance processes, lack of data-driven decision-making, and ineffective communication.

i. Ineffective Governance Processes

We noted that the transit service disruptions issues were not well managed by Transit Administration. Trends of delays in receiving bus parts and reasons for the increase in defective buses were not well understood. Matters were not probed in detail by Administration even after a significant shortage of buses was seen every day from starting end of December 2021 to the beginning of March 2022.

There was a lack of stakeholder engagement with the union, transit staff and the City's leadership. It was essential to bring everyone together to discuss the transit issues and how these could be resolved. However, no deliberate effort was made to bring stakeholders to the table for discussion, input, and resolution of issues.

The Transit Administration did not engage the City's Leadership in discussing or obtaining advice on these issues early in the process. We also did not see evidence of the City's Leadership probing into the bus shortage issue before mid of February 2022. Due to a lack of stakeholder engagement, inaccurate reasons for service disruptions were provided to the public.

Some supervisors at Transit are responsible for managing many employees (15- 34), which is excessive. Due to the large span of control, the supervisors cannot effectively manage employees. This was confirmed through interviews with Transit staff and supervisors.

The departure of the Director of Transit at the end of May 2022 created a gap in the leadership in Transit. The General Manager of Transport and Construction has stepped up to spend more time at the Transit. The two Managers at Transit have taken an acting director role on a rotation basis until the recruitment process for the Director is completed. Hiring a full-time Director Transit position is critical to strengthening the governance process within Transit.

ii. Lack of Key Performance Indicators for Bus Repairs

We noted a lack of key performance indicators (KPI) or standard bus repair times and no tracking and measuring of actual repair times against standard repair times. Thus, it is difficult to assess the consistency in the performance of similar repair jobs, which can negatively impact the timeliness of the repairs. This contrasts with comparable municipalities, like Regina and Winnipeg, which have standard job repair timelines in alignment with the private sector.

Due to a lack of KPIs, no triage process to focus on buses with less maintenance and ineffective management oversight, it took longer for buses to be repaired, and buses were waiting in the defect line to be seen by mechanics in the winter of 2021-2022.

Standard repair times can also be used to motivate staff to complete a job efficiently, used for coaching and development conversations, identify jobs that are lengthy to complete and require changes, and give valuable insight into maintenance operations. After the disruption, a performance improvement coordinator was hired to establish KPIs, service agreements, and process standards.

We also noted a lack of comprehensive policies and procedures at Transit. In addition, we did not see evidence that the existing policies and procedures were widely communicated to staff. Lack of formal policies and procedures can lead to misunderstandings, lack of knowledge, and ultimately inconsistent or poor decision-making by staff at all levels.

iii. Lack of Data-Driven Decision Making

Accurate, timely and automated data helps Administration in making informed decisions. We noted that data-driven decision-making was virtually non-existent during the disruption period. Due to a lack of timely data, day-to-day transit decisions were made without referring to the data, which may result in ineffective decisions. For example, there was a lack of timely and system-available data to know the extent of preventative maintenance performed on buses. Similarly, there was a lack of available system data to know which buses were waiting for parts and the extent to which it could impact transit operations.

Thus, due to a lack of timely and adequate data, there was no early warning system available to alert the Administration on processes that were not operating as intended and any potential risk of bus shortages.

iv. Ineffective Communication Processes

Effective communication promotes trust, improves teamwork, and enhances productivity. We noted that lack of effective communication within and between various Transit operations continued to be a challenge and was one of the reasons for the disruption of service. For example, we noted that 3 or 4 times during the transit disruption period, buses were available for a book out but were not sent out due to a breakdown in the communication process and the issue was detected after the fact. This resulted in Transit not meeting the service demand, which could have been avoided through effective communication and accountability processes.

Reason 3: Ineffective Preventative Maintenance Program

Recommendation 3: We recommend that Transit Administration should improve the Preventative Maintenance Program (Program), which includes:

- 3.1 Defining clear roles and responsibilities and accountability processes for managing the Program.
- 3.2 Tracking and monitoring the performance of the Program against the preventative maintenance schedule.
- 3.3 Identifying reasons for non-conformance to the preventative maintenance schedule and developing strategies and actions to ensure conformance to the schedule.

The financial impact of implementing the above recommendation is low (estimated below \$100,000) as the Program is already in place and requires strengthening.

An effective Program extends the life of the fleet and decreases the repairs and maintenance costs in the long run. In essence, regular preventative maintenance (PM) reduces the likelihood of fleet failure. The City has a Program where the buses are periodically checked for potential defects, and routine maintenance is performed.

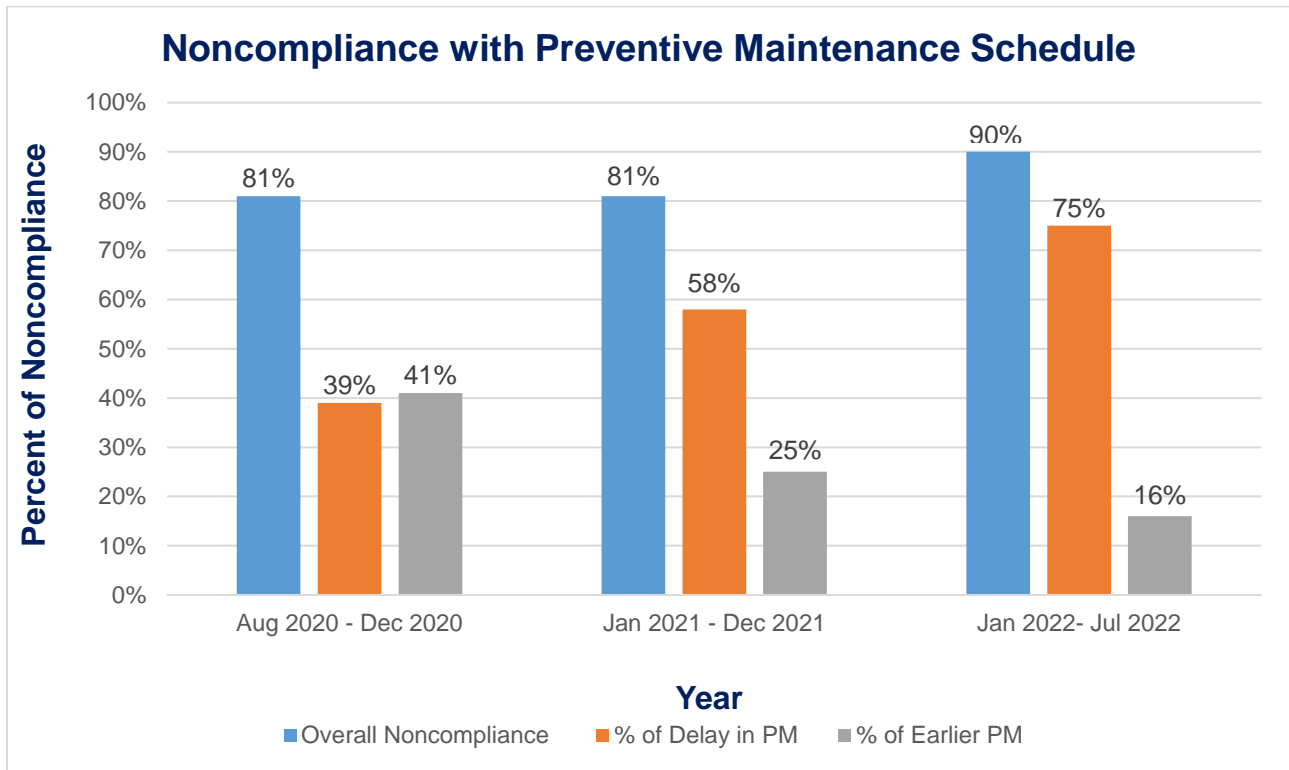
Our investigation revealed that an ineffective Program was the third main reason for the disruption of Transit services. This was due to a lack of adherence to the PM schedule. Our review of the last two years of available PM data showed that the buses did not receive work per the outlined schedule. Thus, lack of adequate PM resulted in buses that were not prepared for the season and therefore required more work when a breakdown occurred or increased the likelihood of breakdowns. This was evident from the data, which showed an increasing trend in the number of buses waiting in the defect line to be seen by the mechanics during the winter of 2021-2022.

As per the schedule, PM work should occur every 10,000 km (minor PM), 20,000 km (intermediate PM), and 40,000 km (major PM). This would allow for overlap, and PM 10,000 km, 20,000 km, and 40,000 km work can be completed on one work order if the bus is on the hoist and is due for work. For example, a bus that has driven 40,000 km is due for all 3 PM types. After that bus drives 10,000 more kilometres, it is due again for a PM10,000 km.

Our analysis of the PM data for August 2020 to July 2022 showed that **83%** of the PM work was not conducted in accordance with the PM schedule, i.e., the preventative maintenance was performed either before or after the preventative maintenance schedule (as a conservation approach, we only considered non-conformance beyond the 10% range)

Further analysis of the PM data for August 2020 to July 2022 showed that **60%** of the PM work was delayed, i.e., conducted after the PM schedule, while **23%** of the PM work was performed early.

The below graph shows the breakdown of non-compliance with the PM schedule by year.



The below table shows the % delay in preventative maintenance based on the type of PM.

Type of PM	% Delay in Preventative Maintenance		
	Aug 2020 to Dec 2020	Jan 2021 to Dec 2021	Jan 2022 to July 2022
PM 10,000 Kms (Minor PM)	45%	74%	88%
PM 20,000 Kms (Intermediate PM)	14%	50%	80%
PM 40,000 Kms (Major PM)	0%	20%	47%

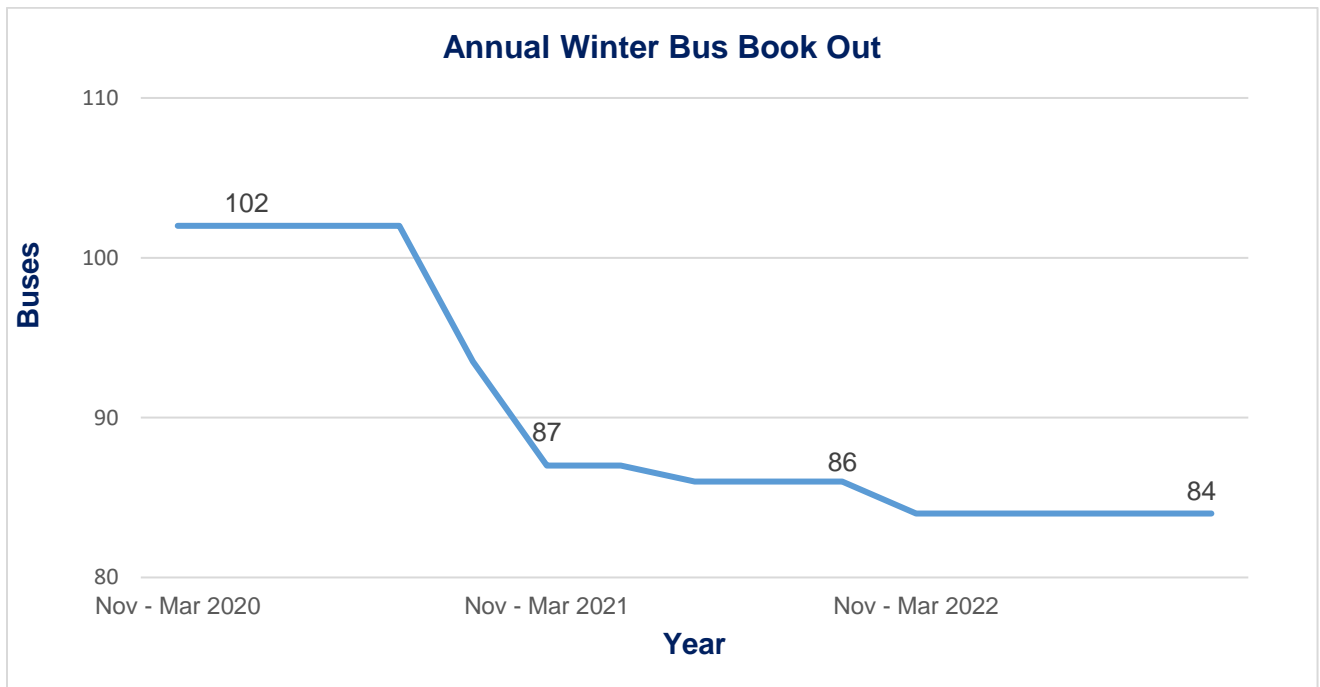
Delays in conducting PM work may result in more repairs, bus shortages, and more costs to the City. On the other hand, when the PM work is completed too early, it takes an available bus off the road or keeps a bus in the garage longer than required when it could be in service to meet the transit demand.

According to the Transit Administration, PM is sometimes done with other defects when a bus is already on the hoist. At other times, PM is skipped to get the buses on the road to meet service demand.

Age and Sufficiency of Bus Fleet

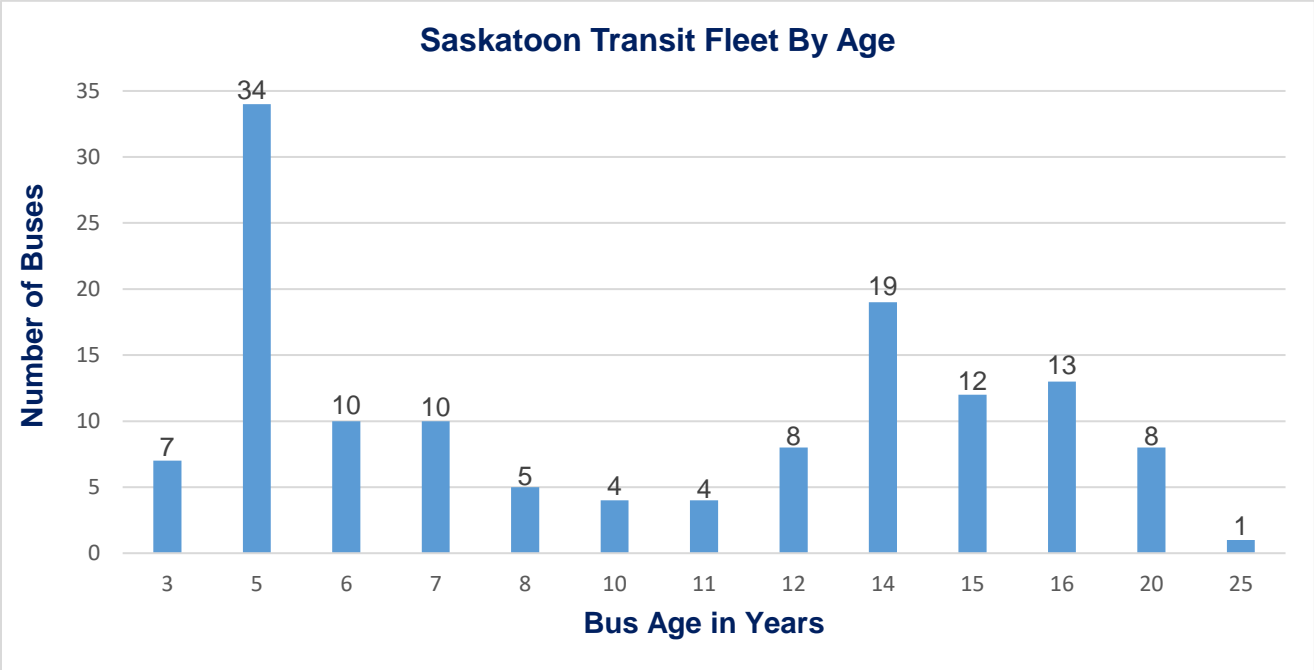
During our investigation, we assessed whether the age of buses serving fix-route transit services was a factor in service disruptions and compared the age of buses with other municipalities. In addition, we assessed whether the number of buses was sufficient to meet the current Transit services demands and whether adequate funding was available to replace buses.

The active fleet at Transit is comprised of 135 buses. To meet demand, Transit deployed 84 buses every day in the winter of 2021-2022. In prior years, the book out was around 102 buses. The below graph shows the decline in book out over the last three years:

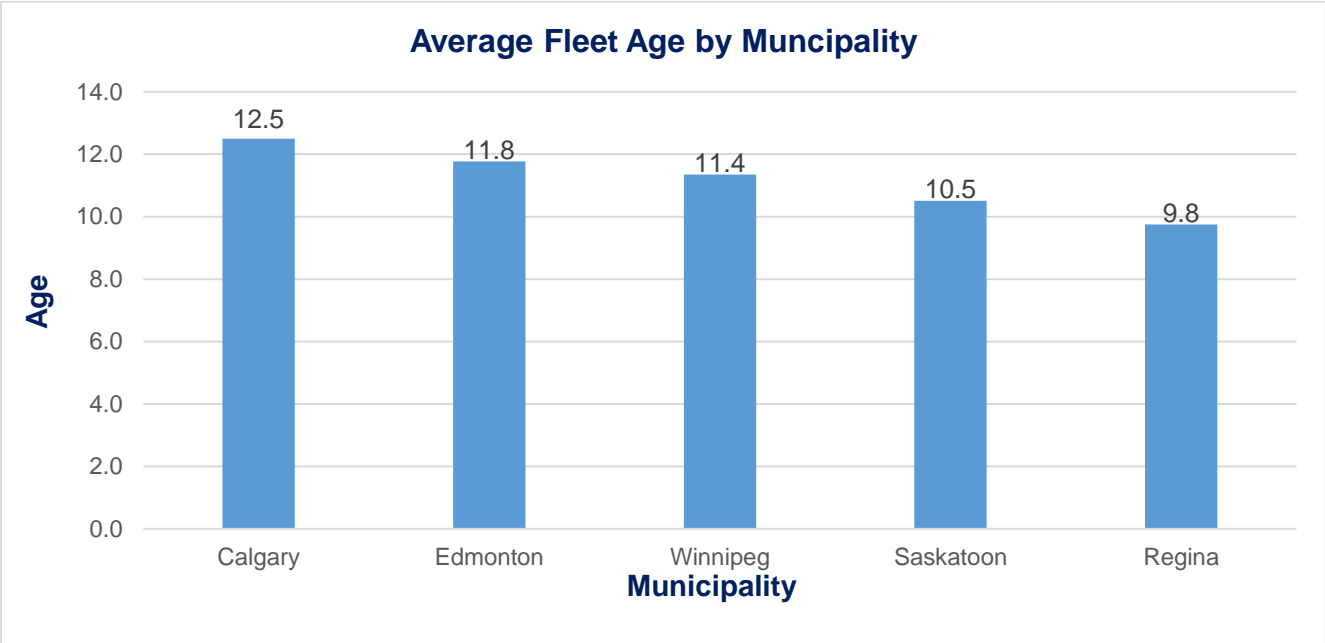


Transit maintains a 38% spare ratio to meet the Transit demand (51 spare buses out of the total inventory of 135 buses), which is higher than the industry average, typically between 30 and 35%. Thus, we concluded that Transit has sufficient buses to meet the current service demand.

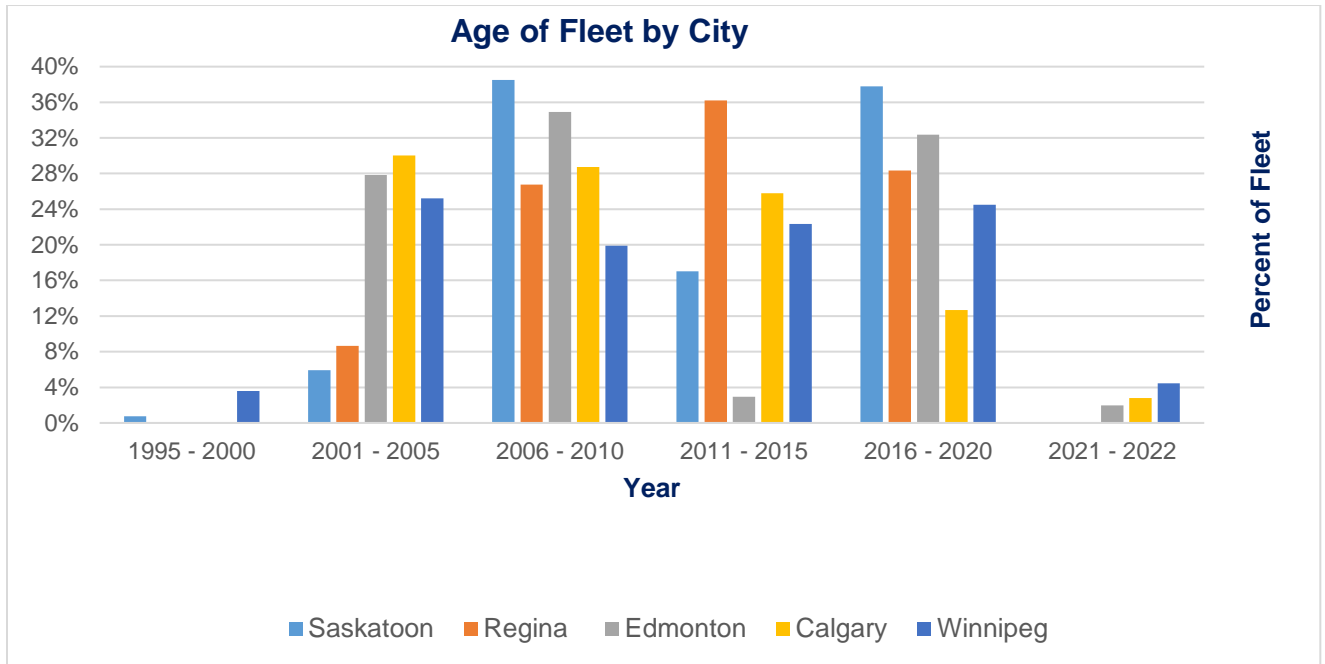
The City's average current bus fleet age is 10.5 years. The below table shows the distribution of the bus fleet by age.



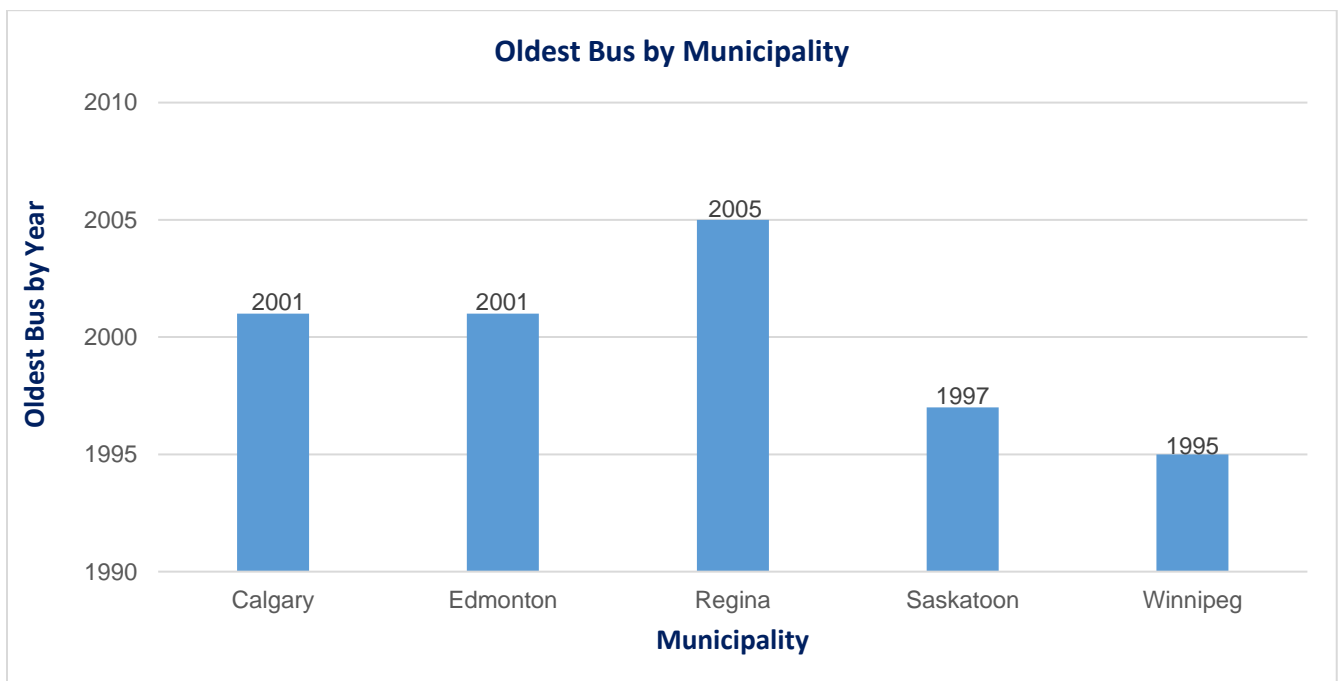
When compared to other municipalities which have similar weather conditions, such as the City of Calgary, City of Edmonton, City of Winnipeg and City of Regina, the City of Saskatoon is considered to have a younger fleet on average, i.e., 10.5 years, with the average fleet age of the municipalities under comparison being 11.17 years. As depicted in the graph below, the City of Saskatoon has the second lowest average fleet age compared to four other municipalities.



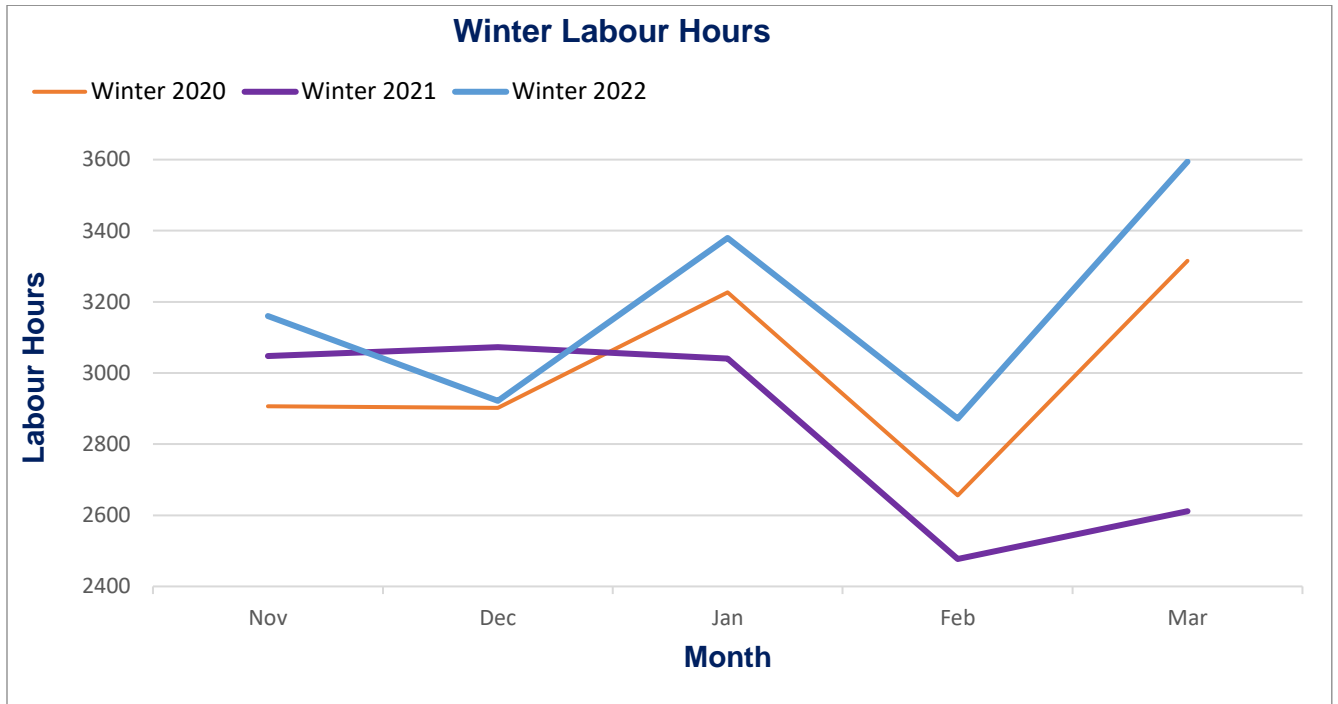
The below graph shows the distribution of fleet by age by various municipalities. As depicted in the graph, Saskatoon has the highest percentage of the fleet (38%) aged between 2016 and 2020 and between 2006 and 2010 compared to other municipalities. Although the overall City's fleet is aging, it is still in proportion to other municipalities' fleet age under comparison.



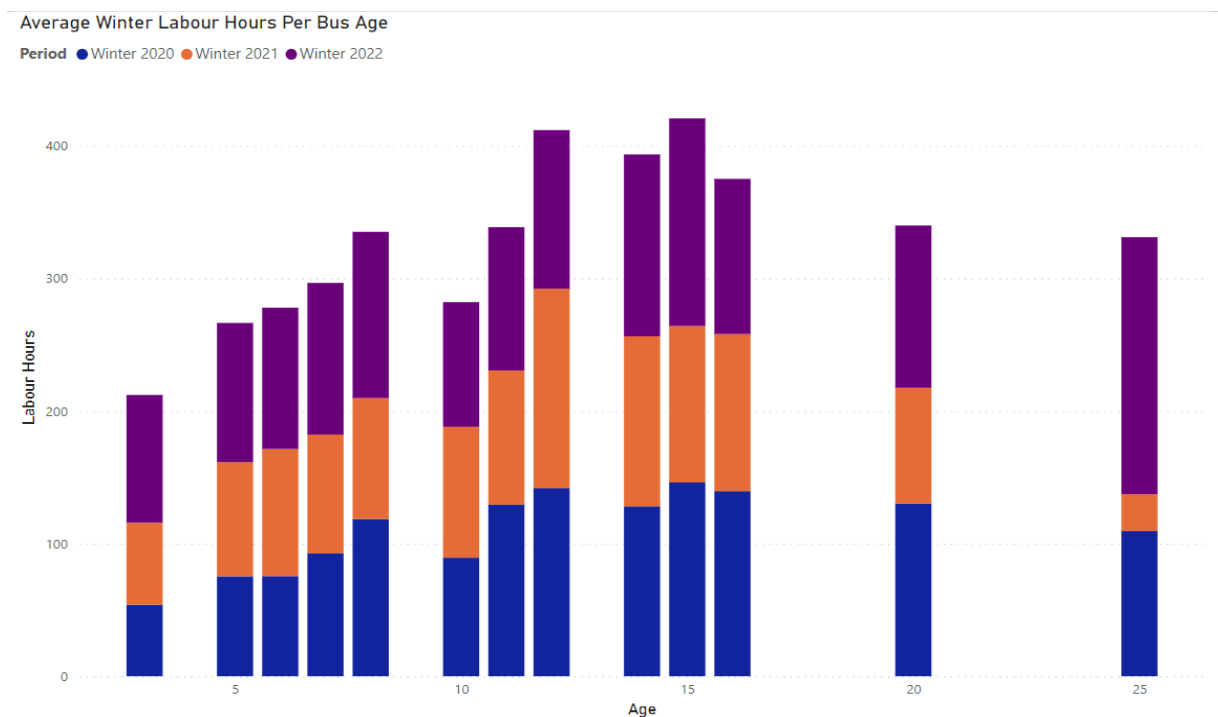
The City's oldest bus is 25 years old, with the newest being three years old. The below graph shows the oldest bus in service from each municipality.



The below graph shows the total number of labour hours performed over the last three winters.



The below graph shows the labour hours spent per winter, by age group of the buses. As the fleet ages, more maintenance labour hours are required to service the buses.

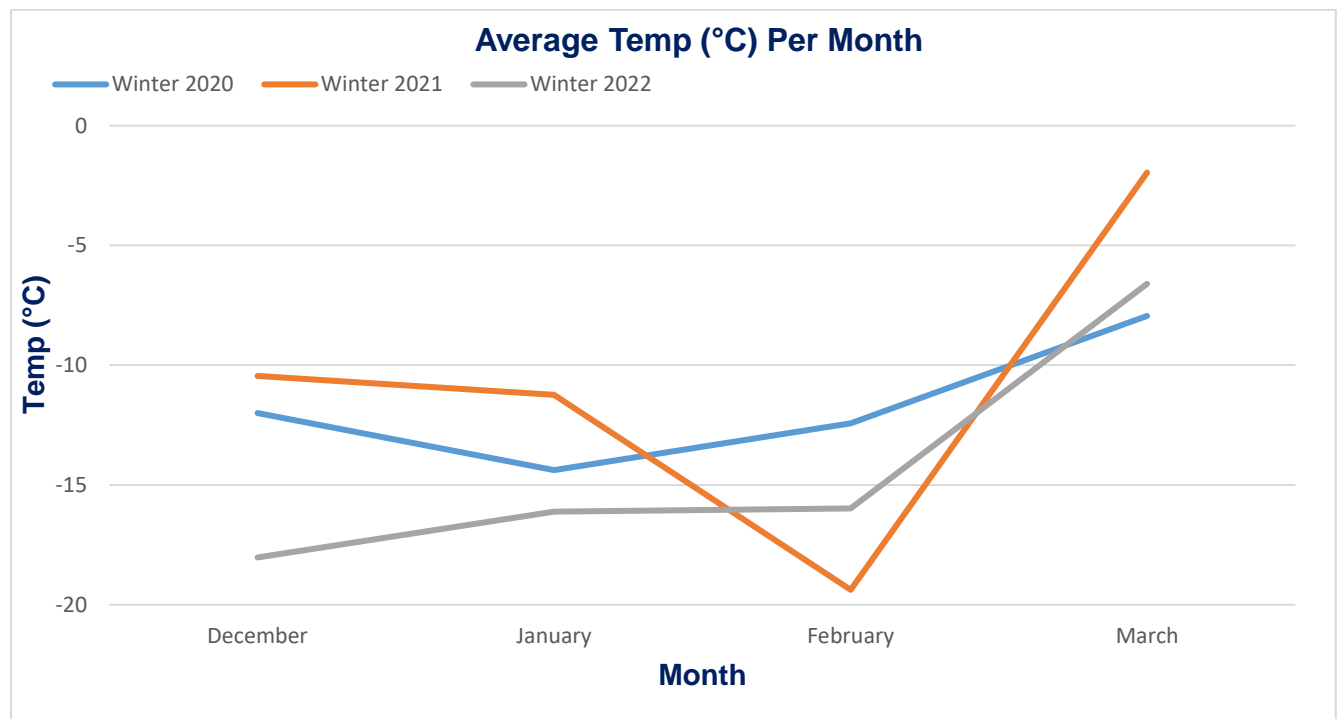


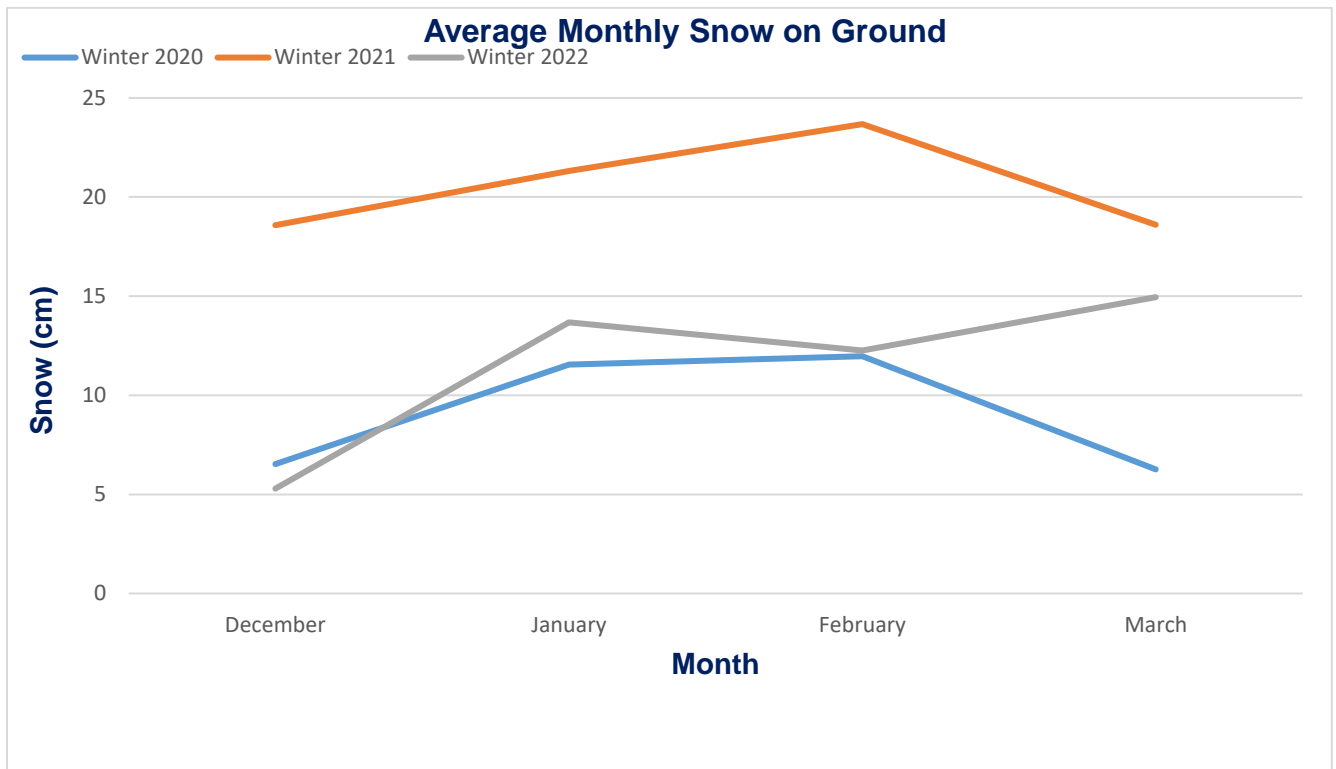
The City's capital funding plans from 2015 indicate a commitment to bring the fleet age down to 7.3 years by 2020. In 2019 a fleet age of 7.5 years was obtained. However, after 2019, no new buses were purchased, and the average fleet age continued to climb and now sits at 10.5 years.

Based on our analysis, we conclude that bus fleet age or size was not a key factor in the disruption of transit service in the winter of 2021-2022.

Cold Weather

Transit Administration issued several public service alerts during the winter of 2021-2022 which indicated cold weather was the main factor in service disruption. Reviewing the weather data for the last two years suggests that the prior year (winter 2020-2021) experienced a lower average temperature than the disruption period, and no significant service disruption was noticed during that time. While we know cold weather can trigger emissions system issues and impact the operation of the buses, we conclude it was not a key driver for the significant service disruptions in winter 2021-2022.





The above graphs show the average monthly temperature for the last three winter periods and snow for the same period.

Communication and Reporting

Reasons Provided for service disruption

Recommendation 4: We recommend that in future, Transit Administration should carefully review and analyze the Transit information before making a public disclosure to ensure accuracy of information.

The Administration provided several reasons for service disruption during the winter of 2021-2022. These include cold weather conditions, the global shortage of parts due to COVID and the age of the fleet. During the investigation, we did not find compelling evidence that support the primary reasons provided by the Administration for the disruption of service. As per our investigation, ineffective store operations, ineffective governance and an ineffective preventative maintenance program were the main drivers for the service disruption. The table below shows the key activity timelines related to service disruption:

Date	Activity Timelines
December 30, 2021	The Transit Administration email to Councillors and the Executive Leadership Team indicates that extreme cold weather conditions have resulted in cancellations of transit service. The primary reasons provided were engine lights and air system issues.
December 30, 2021	A Public Service Alert issued by Transit indicated the extended cold temperatures are causing a shortage of buses and delays.
January 5, 2022	A Public Service Alert was issued by Transit indicating that the extended cold temperatures continue to affect buses.
January 10, 2022	The disruption in Saskatoon Transit was discussed at the Standing Policy Committee on Transportation public meeting . A resident provided a letter indicating that there have been service alerts from Transit indicating that extended cold temperatures are causing a shortage of buses and delays. Transit Administration indicated extreme cold weather, insufficient spare buses etc., as the main causes of service disruption.
January 20, 2022	A Public Service Alert issued by Transit indicating that Transit continues to experience delays or cancellations because of cold weather, lack of spare parts or delays in the shipment of parts due to the Omicron Variant
February 14 – February 24, 2022	Councillors' emails to City Leadership questioning the reasons for disruption. The Administration responded, citing mechanical breakdown / mechanical issues, the age of the bus fleet, delays and difficulty in obtaining parts due to COVID as reasons for disruptions.
February 24, 2022	Transit issued a Public Service Alert indicating that cold weather continues to affect service.
February 28, 2022	The Transit Disruption issue was discussed in the Regular Meeting Council . On the Councillors' concern about the disruption of transit service, Administration responded by indicating that cold weather, an aging fleet, and difficulty in sourcing parts in a timely manner due to supply chain issues were the main reasons for service disruptions. The Administration also indicated that steps had been taken throughout the year through preventative maintenance, and several actions are being implemented to reduce the service disruptions.
March 2, 2022	Transit issued a Public Press Release which indicated that global and national parts shortages related to the pandemic and mechanical breakdowns with an aging fleet impacted the bus service.
March 7, 2022	The Transit service disruption issue was discussed in detail at the Standing Policy Committee on Transportation public meeting . The Committee received a presentation from a resident on transit disruption. Several topics were discussed regarding the sourcing of parts, check engine lights, age of the fleet, inventory levels, overtime, etc. The Committee asked Administration to report back on the framework of the proposed investigation into the transit operations.
March 8, 2022	ATU Canada issues a Press Release indicating that Transit has become unreliable and failure of management to provide scheduling and preventative maintenance planning is a key reason for service disruption.

Date	Activity Timelines
April 11, 2022	The Standing Policy Committee on Transportation recommended that City Council approve the option that the City Auditor leads the investigation with a co-source arrangement.

Reporting of service disruptions to Public

Recommendation 5: We recommend that Transit Administration should strengthen the process for reporting of service disruptions to Public. This includes:

- Developing and implementing formal communication timelines for reporting of service disruptions to public and ensure that adequate lead time is provided to riders to allow for alternative travel plans.
- Revising the wordings for service disruption alerts and news release for better clarity purposes.
- Maintain records of times when the service alerts are posted.

Communication to the public on Transit service reductions is conducted via the Transit app, Twitter, and Public Service Announcements (PSAs). As per Transit Administration, the alerts to the public are posted according to the following practice:

- Bus stop changes are posted the night prior.
- Known detours and cancellations are posted at 5:00 am the day of or a minimum 1-hour in advance.
- Unexpected or unplanned events are posted as they happen.

During the investigation, we did not find historical evidence of the times when service disruption alerts were sent to the public. According to the Administration, the times posted on the public alerts were not maintained. However, based on our interviews with Transit staff, the service disruption alerts were usually sent at 6 am for the morning service reductions, at noon for afternoon service reductions and as they occur in the evenings. We were further informed that this practice was also not consistently followed as, at times, the communication to the public was further delayed so that more buses could be booked out for service.

The bus service begins at 5:30 am, and therefore 6 am disruption alert was not sufficient lead time provided to riders to adjust their travel plans, which resulted in several complaints from riders who did not see the alert in time due to short notice and waited at the bus stop.

A review of the service alerts showed indications of stops that were impacted due to mechanical issues, messaging to customers indicating that the next bus will arrive shortly and that the customers need to check the following route schedule and expect delays.

We noted that the wording and narratives in the service alerts and news releases sometimes lacked clarity and likely confused the riders. For example, the word “cancellation” may have

resulted in the riders thinking that their routes were not operating while there was reduced service on specific routes.

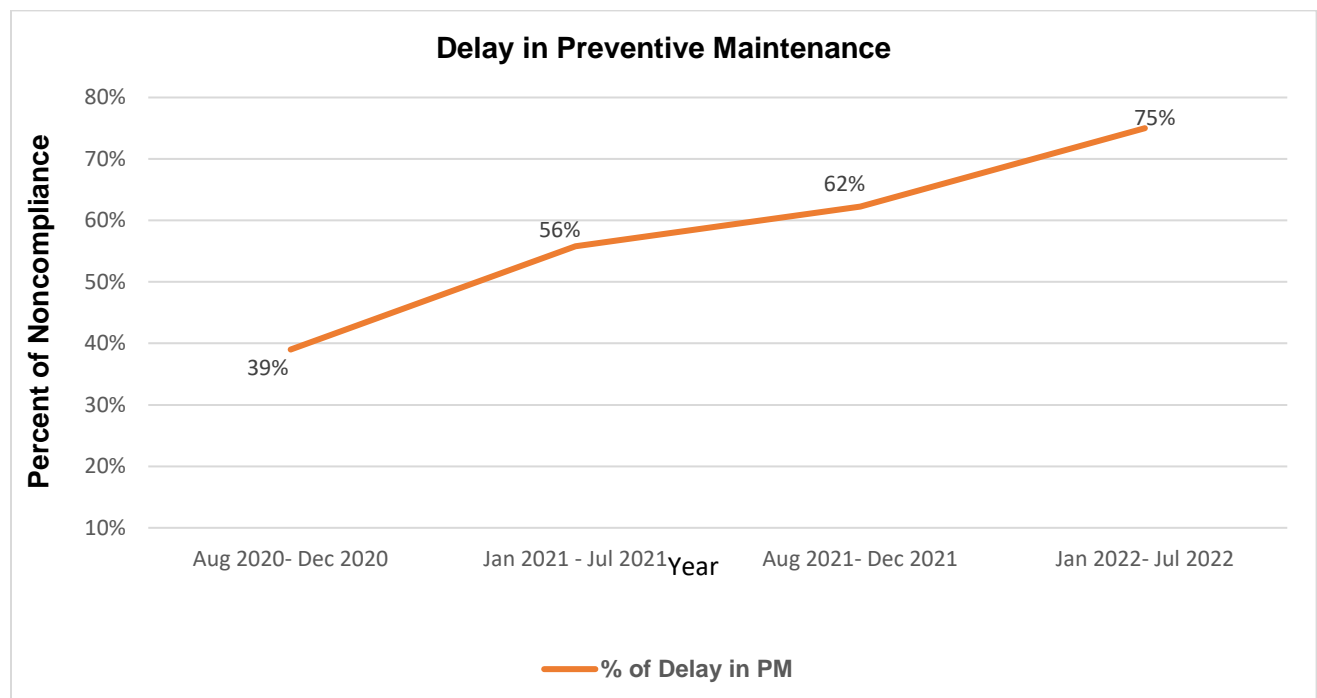
Repairs and Maintenance

Impact of Service Line on Preventative Maintenance

The Service Line Staff within Transit are responsible for conducting non-trade work or trades work below an apprentice. This includes performing preventative maintenance on vehicles, including oil and filter changes.

In mid-2021, Transit Administration reduced the Service Line so that apprentice and journeyman mechanics conduct increasingly complex preventative maintenance. The service line was intended to transition into more apprentices, which would fill into mechanics and provide Transit with more educated and experienced staff.

Before the service disruption, there was one service line position filled and two vacancies in the pool for conventional transit. We noted that these two vacancies were moved to apprentice positions and not filled until January 2022. As a comparison, the City of Regina no longer operates with service line staff.



As shown in the above graph, although there were delays in preventative maintenance in 2020, after the reduction of the service line in mid of 2021, there were increased delays in preventative maintenance. The percentage of delays in conducting preventative maintenance increased from 56% in January to July 2021 (pre-service line reduction) to 62% in August to

December 2021 and 75% in January to July 2022 (post-service line reduction). Based on our analysis, the service line reduction model was not effectively implemented.

Check Engine Light

The check engine light on a bus is a warning sign indicating a malfunction in the vehicle's emissions, ignition, fuel or exhaust systems and needs to be checked by a certified mechanic.

Historical practice at Transit was that the occurrence of a check engine light would cause the bus to complete its route and then return to the depot. The bus would then wait to be diagnosed and fixed. During the Disruption period, this practice was changed, with drivers instructed to continue operating buses after the occurrence of a check engine light unless performance issues were noted. Mechanics were told to diagnose the engine light and, depending on its code and severity, were instructed to clear the code and send the bus back on the road, if possible.

Using the bus book-out data in combination with supporting email chains, it was found that the decision to keep buses running with the check engine light on had minimal or no impact on the Disruption period, positive or negative. Therefore, we can conclude that the check engine light practice was not the main factor in service disruption.

It should also be noted that no formal policy was in place to guide mechanics or operators on what exactly to do when a check engine light came on. So even if Transit Administration had decided to change the common practice, there was no evidence that this was effectively communicated to staff and that operators were aware of what type and level of performance issues would constitute stopping the bus.

Subject matter professionals involved in this investigation agreed that neither practice (i.e., continued operation of buses with the check engine light on or removal from service for repair) executed by the City was unreasonable, but it is a risk tolerance decision.

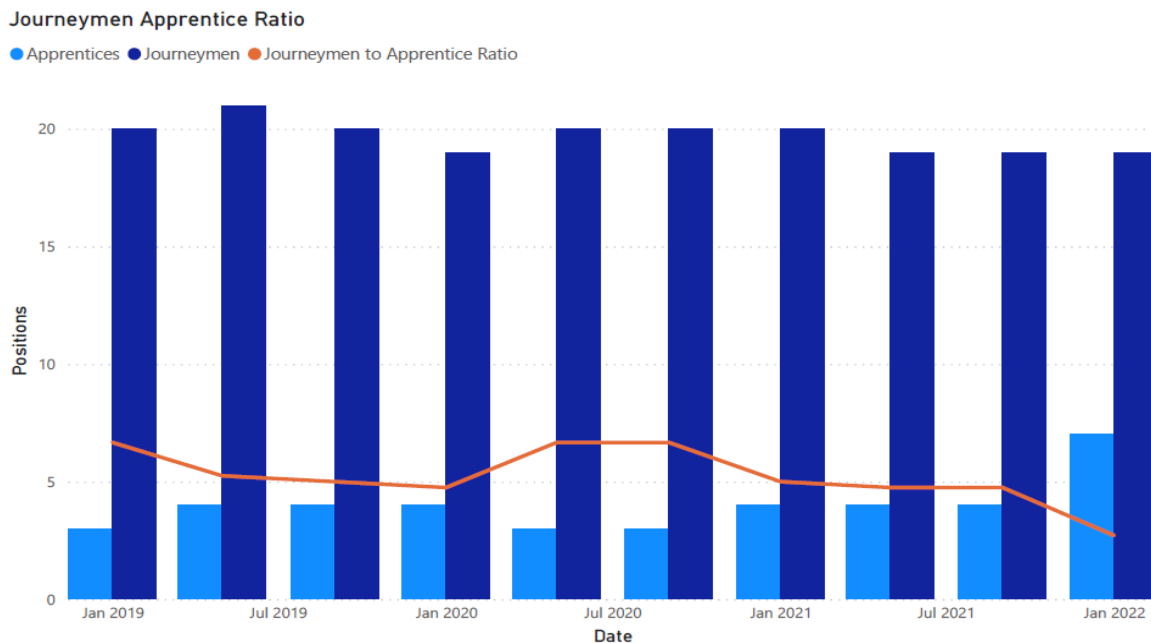
Private Sector Repairs

The private sector was used for repairs at times during the period of Disruption at Transit. Transit currently lacks agreements or contracts with private garages in the City, so work is booked in as it arises and is mainly used for warranty work. Use of the private sector is limited as the large buses require work bays that can accommodate the buses. Transit currently does not hold contracts with any private garage within the city for repairs. We understand that Transit is continuously exploring ways to use more private-sector repairs where required. It is unlikely that the use of the private sector was a key factor in the service disruption.

Resource Availability

Human Resource Considerations

During the disruption period, the bus-to-mechanic ratio was 136:18 or 7.5:1, which means 7.5 buses to 1 mechanic. The mechanics (journeymen) to apprentice mechanic ratio during disruption was 19:7 or 2.7:1, which was down from the prior quarter due to an increase in apprentices. Supervisor ratios were as follows: Manager to mechanics 34:1, Manager to body shop/Stores 9:1, Night manager – night shift 15:1, Maintenance manager 7:1



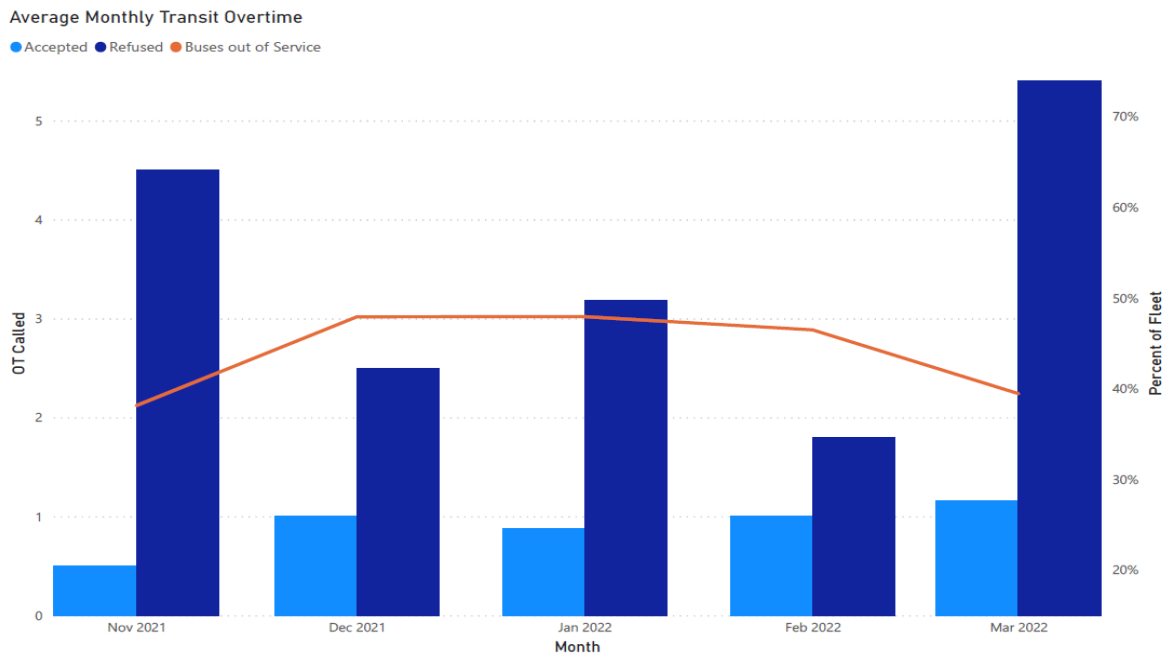
The above graph shows the number of journeymen compared to apprentices and the journeymen-to-apprentice ratio over the last two years. We also noted that managers could not effectively manage employees due to a large span of control in some areas.

Per the Transit Cooperative Research Program Report, sponsored by the Federal Transit Administration, a ratio of 5.7 buses to one mechanic is recommended for a fleet size of 100 to 249. The bus-to-mechanic ratio for the City was 7.5:1 (i.e., 7.5 buses to one mechanic) for a fleet size of 135, indicating further opportunities to increase mechanics at Transit. However, we did not consider staffing levels other than resources at Stores as a key driver for service disruption.

Overtime

Overtime data for maintenance staff was evaluated to determine if overtime was called for and used to repair buses. The overtime data provided indicated there were multiple times during the disruption period when overtime was called. However, it should be noted that there was a significant overtime refusal rate indicating that staff are not enticed to work overtime with Transit. This could be due to many factors, such as the work culture, short notice for overtime, lack of desire, exhaustion, and pandemic-related concerns. By evaluating the

overtime data combined with the bus book-out data, we conclude that overtime was not the main factor in the service disruption.



The above graph shows the average number of times overtime was accepted, refused and the buses out of service is graphed over this period.

Workplace Culture

Recommendation 6: We recommend that Transit Administration should conduct a workplace culture audit at Transit and develop and implement strategies to improve the workplace culture at Transit.

Effective and positive workplace culture increases staff morale, improves efficiency, productivity, performance, and reduces employee turnover.

We did not conduct a full audit to assess the workplace culture at Transit and, therefore, cannot conclusively state whether culture was the main factor in service disruption. However, we interviewed many staff across Transit who suggested several areas to strengthen the workplace culture in Transit. These include having more presence of supervisors on the floor to deal with the issues facing employees, reducing the number of employees managed by one supervisor, creating a positive environment which is more appreciative, building more trust with employees, providing regular feedback to staff on their work performance and conducting formal performance assessments, providing a feedback loop to employees when suggestions are provided, building strong relationships and effective communication with stakeholders, breaking silos within various areas of transit and enhancing the staff morale.

In 2017, the City engaged an external consultant to conduct an employee engagement. A review of the survey results for Transit showed low satisfaction scores in management of all levels, culture, relationships, learning and development, and rewards and recognition.

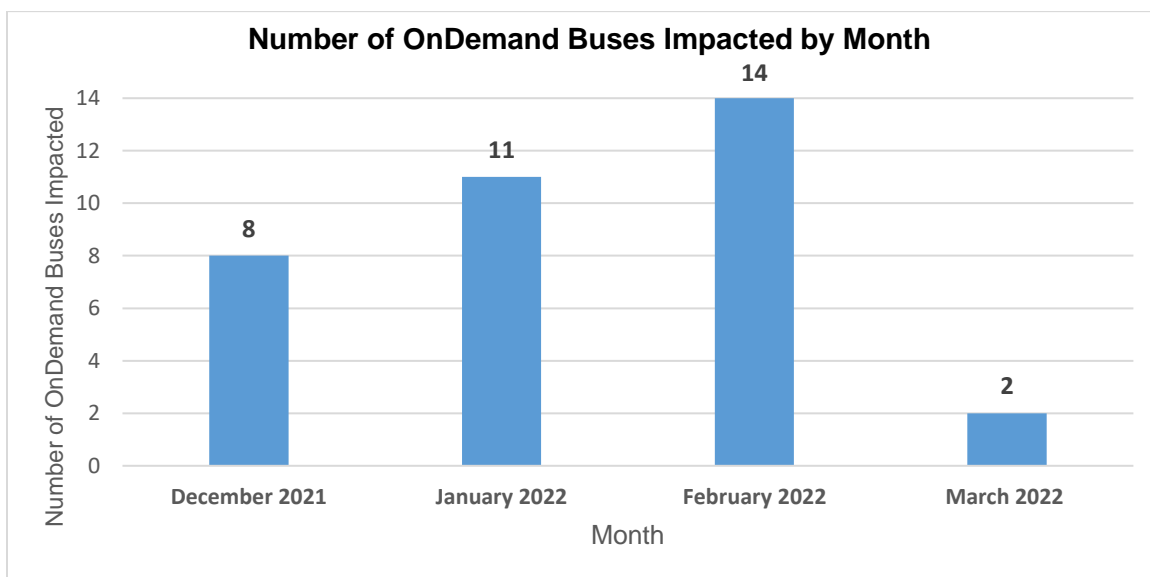
ATU has also conducted a workplace culture survey with the union staff in Transit, and the summary of the survey results was shared with the City’s Human Resources.

Other Areas

On-Demand Transit

On-Demand Transit is a public transit service that helps people get to where they need to go and adds another layer to the City’s public transit service. The On-demand transit model has recently been changed from “any stop-to-any stop” to a “stop-to-hub” model. This model relies on connection to and from transit hubs where riders can integrate their trip with a fixed route.

Per our review of the On Demand Transit book-out data during the disruption period, it did not experience full cancellations. While it did experience some disruptions, such as times when not all buses were available for use, it experienced a total of 35 impacts or periods where at least one of the buses was unavailable from December 2021 to March 2022. Our analysis concludes that On Demand Transit did not experience the same level of disruptions.



The above graph shows the total number of times an On-Demand bus was impacted from December 2021 to March 2022.

Access Transit

Access Transit provides on-demand services to individuals who cannot take fixed-route transit due to physical or cognitive disabilities. It operates seven days a week, including state holidays. The City has 28 lift-equipped buses to provide services.

Based on our inquiry and review of the evidence provided, Access Transit was not impacted by the disruptions. While Access Transit sometimes experienced a lack of spare buses, it did not fail to meet book-out. Access Transit has mechanics assigned to it, and the mechanics opt to work at Access during sign-ups. The Transit Cooperative Research Program report, sponsored by the Federal Transit Administration, recommends a ratio of 8.1 buses to one mechanic for a fleet size less than 50. There is a ratio of 8.5 buses per mechanic at Access, which is appropriate and aligns with the recommendations.

Photos - Transit

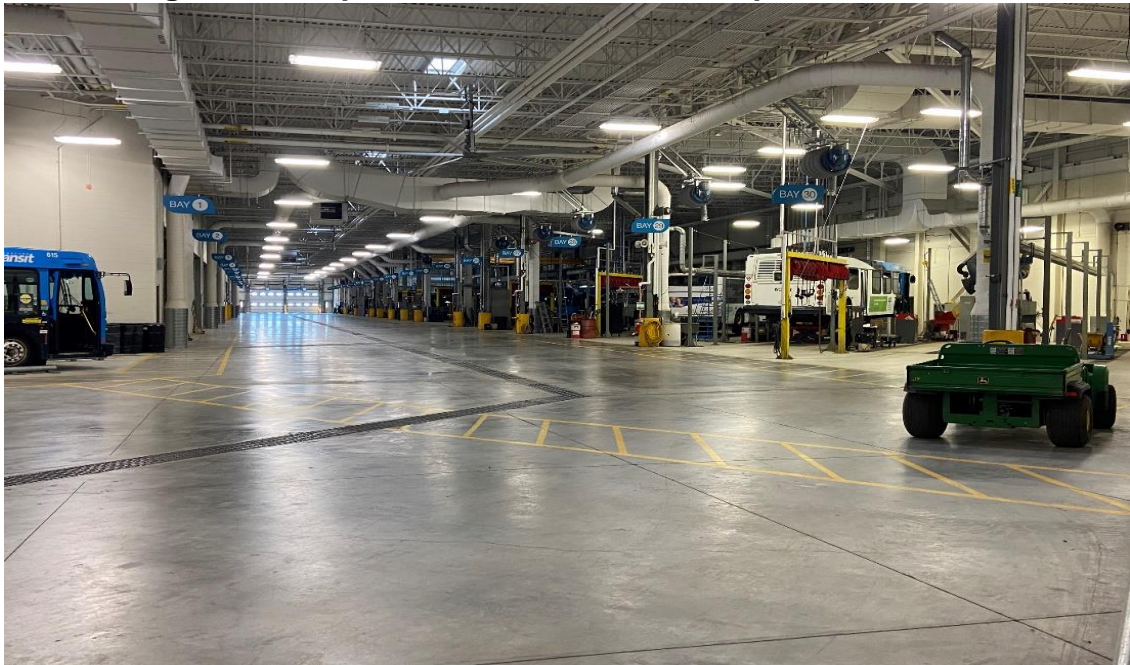
Under-carriage wash area and where the buses first enter the garage



Lanes where available buses are parked overnight for book out



Garage where repairs and maintenance are performed – View 1



Garage where repairs and maintenance are performed – View 2



Command Centre – Bus Routes are monitored in real-time

