
2023
CORPORATE ASSET MANAGEMENT PLAN
Saskatoon Transit
BAY 28
BAY 27
BAY 26
BAY 25
BAY 24
City of Saskatoon
We invest in what matters…financial and physical resources under our care are used to address the needs of citizens today — and tomorrow.

INTRODUCTION

Saskatoon Transit's assets are valued at **$124.3 million.**

Saskatoon Transit serves nearly a million rides each month. Fixed-route transit, with 40 routes and more than 1,600 stops, and Access Transit serve all corners of the city providing eco-friendly and safe alternative transportation for residents.

The department's mission is to provide cost-effective, safe and affordable public transit services using clean and environmentally friendly equipment to get people to work, education, health care, shopping, social and recreational opportunities.

Saskatoon Transit is funded by fare revenue, the Department of Community Resources Passes and Accessible Transit Grant and a City contribution. The City's funding model for transit fleet replacement relies primarily on federal government grants, which weren't available from 2019-2022.

While its demonstrating leadership in applying new technology to its preventative fleet maintenance program, Transit is lagging in many important indicators relative to the asset management plan, industry standards and its peers. At the current funding level and without federal funding opportunities, Saskatoon Transit cannot replace vehicles according to their estimated life expectancy. Renewing the fleet to a state that meets industry standards will require time and a dedicated plan to finance and support it.

A ten-year funding plan (2022-2031) to spend $102.5 million on new fixed-transit buses was approved in November 2022 to renew the fleet as the City prepares to build a Bus Rapid Transit system. Another $20.4 million was approved for new conventional zero-emission electric buses. The funding is all contingent on being awarded grants which haven't been awarded to date. There is no contingency plan if the funding is not awarded to the City of Saskatoon.

LEVEL OF SERVICE

Saskatoon Transit Service Standards were established and approved in November 2021. Transit's fixed-route service operates 365 days per year with peak, midday and night service on weekdays; morning, midday and night service on Saturdays; and Sunday/ Statutory Holiday service. Access Transit operates 365 days per year with weekday, Saturday and Sunday/ Statutory Holiday service.

Table 1: Types of fixed-route transit service

Service Type	Service Characteristics
Frequent	15-minute or better frequency during peak hours
Basic	30-to-60-minute frequency on weekdays; may or may not operate throughout the entire day or seven days per week
Peak Only	Service offered only in peak periods and only on weekdays.
Special	Special services that perform unique purposes (e.g., Wanuskewin, downtown loop)
Extras	Added to the regular service on specific routes during morning and evening peak based on the passenger load to provide higher frequency for limited hours.
OnDemand Transit	Flexible routes from bus stop to bus stop during designated hours and within a designated service area. These schedules are dynamic and depend upon passenger requests. OnDemand Transit compliments and supports other fixed-routes and the overall network.

Table 2: Performance measures: Fixed-route assets

Description	Measure	2021	2022	2023 *(at July 31, 2023)*
Average fleet age (years)	7.5	10.1	10.7	
Service reliability - kilometres between breakdowns (road calls)	*Min. 8,000 km*	7,127 km	8,071 km	
Spare ratio	*25–30%*	39%	41%	51%
Bus to mechanic ratio	*6:1*	7:1	7.3:1	
On-time (tolerance is up to 5 minutes late or 3 early departures)	*85%*	*90.53%*	*82.1%**	

Cleanliness (# of buses cleaned per day)	8	*8*	*8*	
Preventable accidents per 160,000 kilometres	*0–6.0*	1.57	2.17	
Passenger injuries per 100,000 boardings	N/A	0.49	0.37	

*April-December for 2022 data

Table 3: Performance measures: Access Transit assets

Description	Measure	2021	2022	2023 *(at July 31, 2023)*
Average age of fleet (years)	3.0		4.5	5.8
Service reliability - distance between breakdowns (road calls)	*8,000–11,200 km*	*9,000*	*8,725*	
Spare ratio	25-30%	27%	27%	23%
Denial rate	Actual	3%	6.5%	
Taxi trips used		*3,368*	*5,986*	
On-time	85%	98.77%	97%	

CURRENT INVENTORY

Saskatoon Transit has many assets including buses, shelters and column lifts/hoists. Other shop tools are handled as part of the operating budgets. Table 4 provides a breakdown of all assets, including fixed-route fleet equipment, Access Transit fleet equipment, shelter inventory and column lifts.

Table 4: Saskatoon Transit asset inventory

Asset	Inventory	Replacement value (2023)
Fixed-route fleet		
30-foot buses	8	$4,800,000
40-foot buses	112	100,800,000
60-foot buses	6	7,800,000
40-foot hybrid buses[1]	1	1,500,000
Total fixed-route fleet	**127**	**$114,900,000**
Fixed-route power mobile equipment[2]	**7**	**$480,000**
Access paratransit fleet		
26-foot lift-equipped buses	24	$4,982,000
26-foot ramp-equipped buses	2	540,000
Total Access paratransit fleet	**26**	**$5,522,000**
Access power mobile equipment	**4**	**240,000**
Column lifts/ hoists	**69**	**1,324,800**
Shelters	**223**	**1,827,000**
Total replacement value		**$124,293,800**

[1] Assume replacement with battery electric bus

[2] Refers to light vehicles, skid steer and other light power equipment that is managed through shorter planning and budget periods.

CONDITION OF ASSETS

The rating structure in Table 5 is used in the industry to rate vehicles and equipment from “Very Good” to “Very Poor” condition. Saskatoon Transit’s assets are evaluated for condition based on the percentage of the estimated service life (ESL) used and the timeframe (asset age) when the asset is estimated to reach the end of its service life. Ideally, equipment would be replaced at its optimum point based on its economic lifecycle, which is before the equipment becomes more costly to maintain. In addition to these considerations, before considering an asset for replacement, is inspected and prioritized based on factors such as safety and cost of maintaining. This assessment along with the current economic and market supply factors are considered when deciding when to replace assets in the “Poor” or “Very Poor” category based on the percentage of the ESL used.

Table 5: Condition rating structure

Condition Description	% of Estimated Service Life Used	Explanation
Very Good (VG)	0–20%	New unit, no wear/tear.
Good (G)	21–50%	Normal maintenance cost, good overall condition, low km.
Fair (F)	51–80%	Maintenance cost begins to rise, moderate km usage.
Poor (P)	81–100%	Unit needs to be replaced, high km, maintenance costs at a steep incline, body condition deteriorating.
Very Poor (VP)	>100%	Units no longer operational, potential safety issues, not economically feasible to maintain.

Both battery electric and diesel heavy-duty large buses for fixed-route typically have a useful life of 15 years. Each year, buses are retired from the fleet, leading to a reduction in the overall number of buses. Unfortunately, there were no replacement buses introduced between 2020 and 2023, resulting in an outdated fleet that's more prone to breakdowns, and challenges in finding replacement parts. This has led to an increase in the average age of the fleet and its overall deterioration.

Table 6 shows the fixed-route fleet average condition is assessed at ‘poor’, with 35% of the fleet in ‘very poor’ condition; and half of the Access Transit fleet at ‘very poor’ condition.

Risk Mitigation

Without dedicated funding in place to maintain a yearly replacement cycle, the average age and condition of the fleet will continue to increase. To manage the risk and extend the life of the current fleet, extensive efforts went into improving maintenance processes and staffing structure for efficiency and savings. Transit also applies some temporary methods for extending the life of its ageing buses:

1. Perform extensive refurbishment on buses at eight to nine years old to keep them in service;
2. Reduce daily book out for older buses to keep kilometres lower; and
3. Redeploy stores staff to corporate procurement to streamline acquisition of parts and materials to reduce wait times for bus parts.

Fixed-Route Fleet

The most recent buses replacements were the seven delivered in 2019. Nearly half of the 127 fixed-route buses are in 'poor' condition with an average age of 10.7 years, higher than Canadian national industry standards of 7-7.5 years. There are 21 buses aged 17-21 years that remain in the fleet beyond expected life with high costs for repairs and maintenance.

Access Transit Fleet

Half of the paratransit fleet is in 'very poor' condition, with 11 buses expected to be retired at one time. Once they reach five or six years in service, they are worn and rusted beyond feasible means of repair and are disposed of through auction. The average age of the 26 paratransit buses is 5.8 years/4.5 years. To maintain the industry standard of a three-year average age and avoid having several units retired at one time, Access Transit must purchase five buses per year.

Table 6: Current condition of assets

Asset	**Average age** (years)	**Target average age** (years)	**Condition of assets**				
			Very Good	Good	Fair	Poor	Very Poor
30-foot buses		7.5		100%			
40-foot buses		7.5		32%	20%	13%	35%
60-foot buses		7.5				83%	17%
Paratransit buses	5.8	3			50%		50%
Shelters	n/a	25	15%	22%	14%	34%	15%
Column Lifts	6	20	84%	16%			

PREVENTATIVE MAINTENANCE

The maintenance team was restructured in 2022 and challenged to make improvements to various functions to shift from mostly reactive to a preventative maintenance approach. Being open to introducing new technology, Saskatoon Transit partnered with tech company Preteckt on a pilot test in 2022 to use artificial intelligence (AI) for predicting maintenance needs. The maintenance team noticed immediate benefits with the test group with reductions in parts costs and more than 50% fewer labour hours.

The software analyzes millions of data points collected by sensors on the buses and uses AI to predict upcoming maintenance issues before they become critical interruptions to service. The contracted team of Red Seal technicians and data analysts review and analyze the data to develop repair plans for Saskatoon Transit technicians to carry out.

Early detection, performance metrics and prescriptive actions empowers the maintenance team to make repairs earlier than previously possible. The pilot test demonstrated 55% less time spent diagnosing mechanical issues, 45% fewer breakdowns and service delays, and a savings of 73% in parts. The first full year of using this predictive maintenance solution is 2023.

SERVICE EXPENDITURE LEVELS

The Administration evaluates the condition of the City's assets to develop annual programs and maintain the assets at a minimum lifecycle cost. Condition assessments are conducted and used to establish condition levels as well as develop fleet renewal or investment plans.

To compare the level of investment required for all assets, five levels of expenditures are identified in Table 7. It should be noted that expenditure levels are not condition assessments but lead to a change in the asset condition over time. "A" represents the highest level of expenditure and "F" represents no expenditure.

Table 7: Expenditure levels

Expenditure Level	Asset Condition	Description
"A"	Getting better quickly	Sufficient expenditures to keep assets in the desired condition and to increase asset condition/value quickly over time.
"B"	Getting better	Sufficient expenditures to keep assets in the desired condition and to increase asset condition/value slowly over time.
"C"	Maintain assets in current condition	Sufficient expenditures to keep asset in constant condition over time.

"D"	Getting worse	Insufficient expenditures to maintain asset condition. Over time asset condition will deteriorate.
"F"	Getting worse quickly	No expenditures. Asset condition/value decreased rapidly.

Based on the condition assessment ratings shown in Table 8, both fixed-route and Access Transit fleets are at an Expenditure Level 'D' or a 'getting worse'.

The approved Transit Asset Management Plan (2015) established that ten fixed-route and five Access paratransit buses would be purchased each year to achieve and maintain the industry standards for a healthy and reliable fleet. This also hinged on ten fixed-route buses per year receiving structural refurbishment when they reach 8 or 9 years. When the replacement ratio is not maintained, the average fleet age increases leading to higher maintenance costs and may impair the ability to meet service.

Table 8: Service Expenditure Levels (2023 dollars)

Asset	**Required Annual Funding** (to meet Expenditure Service Level)	**2023 Budgeted Annual Funding**	**Annual Funding Gap** (to meet Expenditure Service Level)
Fixed-route	$12,750,000[3]	$6,400,000	$6,350,000
Access paratransit	$1,045,000	$440,000	$605,000
Shelters	$200,000	$100,000	$100,000
Column lifts/ hoists	$130,000	$50,000	$80,000
Total assets	**$14,125,000**	**$6,990,000**	**$7,135,000**
Total bus assets	13,795,000	$6,840,000	$6,955,000

Fixed-Route Transit

The most recent bus replacements (totaling seven) were delivered in 2019, which didn't meet the goal of ten buses per year approved in the Transit Asset Management Plan (2015). Since January 2019, 15 aged units were taken out of service, reducing the fleet by 11% to 127 units.

Transit purchased two zero-emission electric buses in 2021, and five 40-foot and three 60-foot buses in 2022 – all ten expected to arrive in 2024.

[3] Average of total funding ($102,400,000) needed between 2024 and 2031

Access Paratransit Fleet

Access Transit is awaiting six new lift-style buses that were purchased in 2020 and 2021 to be delivered in 2023. The new buses will replace two worn-out buses and add four to the total fleet.

SASKATOON TRANSIT FUNDING

As established in the Transit Asset Management Plan, the City must purchase ten new 40-foot-equivalents ($900,000 each in 2023) for fixed-route and five new paratransit buses ($210,000 each in 2023) for Access Transit to maintain the industry standard average fleet age. In 2023 dollars, this would equal $10,050,000 annually.

Without access to federal funding grants and minimal new bus purchases from 2019-2022, the average age of the fleets is higher than targeted.

Fixed-Route Fleet

To achieve the desired average fleet age by 2028, the 10-year Saskatoon Transit Fleet Renewal Strategy was approved in November 2022 allocating $102.5 million for fixed-route bus replacements, contingent on successful applications for funding. The plan maximizes available federal funding for capital transit fleet replacement and builds a balanced fleet mix with diesel buses and newer technology (zero-emission vehicles - ZEV).

Funding sources are $60 million through Government of Canada's Investing in Canada Infrastructure Program (ICIP), $36 million through Government of Canada's Zero Emissions Transit Fund (ZETF) program and $6.5 million through Government of Canada's Support for Transit and Housing Program (STHP) in 2023. In 2033, 17 buses would be over 15 years or older and would need additional funding ($20.4 million). This plan accounts for buses that will be removed through attrition.

To balance the influx of new buses against the varying age of the existing fleet, the City would purchase:

1. Three articulating 60-foot buses in 2023
2. Five conventional 40-foot buses in 2023
3. 15 conventional ZEVs in each of 2024 and 2025
4. 25 conventional ZEVs total 2026 through 2031
5. 30 articulating 60-foot buses in 2025 through 2031

Access Transit

Nine paratransit buses were funded by Government of Canada's Infrastructure Fund (PTIF) in 2019 and another two buses were funded by Transit Assistance for People with Disabilities Funding (TAPD) and supplemented with Access Transit reserves in 2020. To achieve and maintain the desired average age of the fleet and minimize lifecycle costs, funding is required to address the current funding level gap (see Table 8) of $605,000.

The Bus Rapid Transit Funding Plan was approved for the 2020 and 2021 multi-year budget, which allocated $2.9 million for paratransit fleet replacement beginning in 2022.

CLIMATE ADAPTATION STRATEGY

Saskatoon Transit expects delivery of two new battery-electric buses in 2024. The long-range battery-electric bus can travel more than 300 kilometres on a single charge. This will save approximately $44,000 in fuel costs annually per bus and could reduce greenhouse gas emissions by almost 60 tonnes per bus annually.

The City plans to introduce 55 additional zero emission buses by 2031 beginning with hybrid buses and phasing into battery-electric. This is a critical step towards achieving climate targets outlined in the City of Saskatoon's Low Emissions Community Plan and Climate Action Plan.

While these buses come with a higher initial capital cost, $900,000 per hybrid bus and $1,200,000 per electric bus, there will be reduced operating and total life cycle cost, equating to $32,000 per bus per year.

Transit is working with the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) on a long-range planning study to assist with the transition to a zero-emission fleet. It is proposed that the cost savings that will be realized from migrating to electric buses would be designated toward replenishing the Transit Vehicle Replacement Reserve (TVRR) fund.

THE WAY FORWARD

The 10-year Transit Fleet Renewal Strategy prepares the fixed-route and Access Transit fleets for a Bus Rapid Transit (BRT) system. When fully operational, 97 buses will be required to be on the road to meet morning peak service levels and service standards, and 95 buses to meet afternoon peak service levels and service standards. Transit staff actively support the BRT project planning and public engagement opportunities, including the pilot station on site at the Civic Operations Centre.

Saskatoon Transit will continue to discuss operational issues with other municipal transit properties and seek consistent, tried and tested solutions to help in moving forward with a reliable and attractive service. Transit staff participate in programming and share knowledge and benchmarks through the Canadian

Urban Transit Association and the Canadian Urban Transit Research and Innovation Consortium.

Transit staff meet regularly with volunteer advocacy group Bus Riders of Saskatoon to discuss concerns, opportunities for engagement and share updates on transit projects. This stakeholder group advocates for better public transit, shares information with other stakeholders and participates in City Council and committee discussions.

Saskatoon Transit has a full-time Process Improvement Coordinator to facilitate exercises that rethink day to day operations. Many activities in the maintenance area were reviewed and improved recently for noticeable progress in the shop's operations effectiveness, safety and employee engagement. The team will be learning about ridership pattens to look for efficiencies in asset management planning.