

2021

CORPORATE ASSET MANAGEMENT PLAN Saskatoon Transit

*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 significantly improved the condition of its fleet in the period from 2014 to 2019 thanks to an active asset management plan and funding available through the Gas Tax Fund (GTF) and the Public Transit Infrastructure Funding (PTIF) program. The GTF funding provided 25 buses in 2014 and 2016, with PTIF funding 41 additional buses to the fixed-route fleet from 2017 through 2019. This brought the average fleet age into alignment with the industry standard of seven years. PTIF also provided nine buses to the Access Transit fleet in 2019, with two additional buses partially funded through the Provincial Government Transit Assistance for People with Disabilities (TAPD) program.

Saskatoon Transit has made significant strides improving the fleet condition, the absence of funding since 2019 has put the Saskatoon Transit fleet in a declining state of good repair. The fleet average age is now 9.5 years and this will continue to increase without new buses coming into the inventory.

INVENTORY

Saskatoon Transit has many assets, from buses to shelters to shop tools. The only shop tools that require a capital funded asset management plan, presently, are the column lift hoists, the remainder is handled as part of the operating budgets, until Bus Rapid Transit (BRT) shelters are built and brought into the system. Attached is the fixed-route fleet equipment, Access Transit fleet equipment, shelter inventory, and column lift inventory.

In 2018 Saskatoon Transit signed a new advertising contract with Pattison Outdoor Advertising for Bus and Shelter Advertising. As a part of the contract, Pattison is responsible for the installation and maintenance of new shelters, which after ten years become the property of Saskatoon Transit.

The hoists, 64 of which were bought new in late 2016 as part of the Civic Operations Centre project, will all have warranty expiration at the same time. The life expectancy of a hoist is 20 years and the replacement cost for one hoist is \$12,000 (in 2021 dollars) and Saskatoon Transit will develop a capital reserve for a as required one-time expenditures rather than a typical annual replacement plan. Hoists, by and large, last for 20 years and components rather than the whole system can be replaced, except in issues of critical failures – which good preventive maintenance helps to avoid.

*Saskatoon
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To replace the above noted assets would amount to the following 2021 dollars:

1. Fixed-route fleet	\$85,650,000
a. 30-foot buses (8)	\$3,600,000
b. 40-foot buses (119)	\$71,400,000
c. 60-foot buses (9)	\$8,550,000
d. 40-foot hybrid buses (3)	\$2,550,000
2. Fixed-route power mobile equipment (PME):	\$480,000
3. Access fleet	\$5,100,000
a. 26-foot lift-equipped buses (26)	\$2,990,000
b. 26-foot ramp-equipped buses (2)	\$170,000
4. Access PME	\$240,000
5. Column lifts	\$1,092,000
Total:	\$93,012,000

The PME are typically handled through smaller capital replacement programs and can typically be planned for a couple years in advance.

CONDITION OF ASSET

Saskatoon Transits assets are in a good state of repair and fulfill their required function. However, due to absence of funding for the last three years while negotiating the release of the federal Investing in Canada Infrastructure Program (ICIP) funds with contributing amounts from the Province and the City of Saskatoon, the fleet is starting to suffer, particularly the fixed-route equipment. If there is no short term injection of funds the fleet will reduce in size and availability and it will be more difficult to put service on the road which will affect both reliability and ridership.

30% of the fixed-route buses were replaced between 2017 and 2019, and no replacements since 2020. The earlier asset management plans recommended a replacement of up to ten 40-foot bus equivalents per year. The typical life span of a fixed-route bus is 16 years. If the replacement ratio is not maintained the average fleet age will increase and quickly interfere with the ability to put buses on the road.

37% of the Access Transit buses (11) were replaced in 2019. Having so much of a small fleet replaced at once is a risk. Previous asset management plans recommended up to five buses per year which can be funded with ICIP, TAPD and reserves as required. If only TAPD funding and Saskatoon Transit reserves are used there will only be two buses procured annually, also risking not making service.

The typical life span of an Access bus is six years, the new buses from 2019 are almost at the midpoint of their life cycle. The short life span of these buses puts Access Transit in an increasingly difficult position as the condition of their buses can rapidly decline. As a means of deferring this risk, when there is a shortfall of funding, buses eight to nine years old go through extensive refurbishment to keep them in service. The refurbishment is paid out of the operating program.

The column lifts, used at both Access and fixed-route transit, are for the most part new, and with an expected life span of over 20 years, these can be funded through a capital reserve program where an annual contribution of \$50,000 would be adequate.

LIFECYCLE PROGRAMS

The Transit Fleet Renewal Strategy, developed for and approved by Council in 2015, stated that for Saskatoon Transit to maintain a state of good repair, and achieve an industry standard average age of seven years, ten buses per year need to be replaced. This also hinged on ten buses per year receiving structural refurbishment. This refurbishment program is paid for out of a capital program. The expected life span of a fixed-route bus is 16 years, condition is dependent on mechanical and structural condition and is usually disposed of after a set threshold of total operating cost is achieved. Typically, about \$750,000 to \$800,000, not including fuel or original purchase price.

Access Transit requires five buses a year to maintain the recommended average age. Access buses do not receive a midlife refurbishment, once they reach five or six years of age, they are used up and rusted beyond feasible means of repair and are disposed of through auction, unless as mentioned above without sufficient funding and they will not be replaced, then rust replacement process takes place funded out of operating.

SERVICE EXPENDITURE LEVELS

With the current funding levels, both fixed-route Transit and Access are at a level 'D', or a 'getting worse' expenditure service level.

Table 1: Condition Rating

Rating	Asset Condition	Action
A	Very Good	No problems evident. Only monitoring and maintenance required.
B	Good	Minor deficiencies noted, monitoring and maintenance required.
C	Fair	Equipment showing signs of deterioration. Corrosion is actively occurring, maintenance load increasing.
D	Poor	Equipment showing advanced deterioration, frequent maintenance required.
F	Very Poor	Equipment no longer capable of reliable operation, extremely high downtime and operating costs.

Table 2: Current Condition by Actual Inventory

Asset	Current Performance		Desired Performance
40' Buses	27%	Very Good	Good
	20%	Good	
	9%	Fair	
	36%	Poor	
	8%	Very Poor	
30' Buses	100%	Very Good	Good
60' Buses	67%	Fair	Good
	33%	Very Poor	
Access Buses	7%	Very Good	Good
	39%	Good	
	14%	Fair	
	25%	Poor	
	14%	Very Poor	
Shelters	15%	Very Good	Good
	22%	Good	
	14%	Fair	
	34%	Poor	
	15%	Very Poor	
Column Lifts	84%	Very Good	Good
	16%	Good	

Saskatoon Transit has done a good job of staying in line with industry best practices; however, without funding in place to maintain a yearly replacement cycle the current state of good repair is at risk. Saskatoon Transit does not want a repeat of 2014 and 2015 where service requirements were not met and resulted in cancellation of daily runs became inevitable.

Within the main fleet at fixed-route transit, there are three subfleets: the 60-foot fleet, the 40-foot fleet and the 30-foot fleet. The 30-foot fleet is a recent addition to Saskatoon Transit, and is in good shape with an average age of 3.5 years. Most of the main fleet is made up of 40-foot buses, with the oldest being a 1997 model. This subfleet is falling into a 'getting worse' state rapidly with an average age of 9.6 years. Finally, the 60-foot subfleet,

consists of only nine buses, with the oldest a 2002, and the newest a 2011. This subfleet has an average age of 13.8 years and is in critical need of partial replacement.

Transit's maintenance hoists are in good repair and need minimal maintenance. They are inspected annually and repaired as needed. These hoists will survive for many years however their life span is not infinite, and planning needs to start before it becomes a million-dollar problem. The preventive maintenance cycle is doing the job of preservation, but will require a reserve available for when the hoists will have to be replaced.

Transit: 30-foot Buses

In 2018, Saskatoon Transit took possession of eight 30-foot buses. These low-floor buses are equipped to kneel, and four of them have rear door ramps and a third wheelchair securement area. These buses are also equipped with air conditioning and the same amenities as the low-floor 40-foot bus. Saskatoon Transit will continue purchasing 30-foot buses as part of its operational mix and the fleet life cycle will be planned from inception to disposal. Estimated costs for a 30-foot bus is \$450,000. The company that produces the buses Saskatoon Transit purchased recently released an electric version with an estimated cost of \$800,000.



30-foot bus

Transit: 40-foot Buses

40-foot low-floor buses are the work horse of Saskatoon Transit's fleet. There are two variants currently in the fleet: NOVA bus and New Flyer, of which the NOVA buses are the newest. Over the period from 2016-2019 the following 40-foot buses were ordered and delivered. The cost of a diesel 40-foot bus is approximately \$636,000.

➤ **2016:** 10 ➤ **2017:** 11 ➤ **2018:** 15 ➤ **2019:** 7



40-foot bus

Transit: 60-foot Articulating Buses

Low floor articulating buses allow higher capacity on high demand routes. The goal is to have a fleet that is comprised of 1/3 articulating buses to 40-foot low-floor buses. The original goal determined in 2015 with the Fleet Renewal Strategy has not yet been achieved. Saskatoon Transit is working on this mix with the plans for the BRT in mind. The cost of a 60-foot articulating diesel bus is approximately \$950,000.



60-foot articulated bus

Transit: Hybrid Buses

With the potential ICIP funding available, Transit's plan was to go to market for the purchase of hybrid buses while the electric trial was in place, as a bridge between diesel and electrification. Transits experience with the hybrid buses has not been a positive one, however the buses that Saskatoon Transit has in the fleet are 13 and 15 years old. In the time that has lapsed since then, hybrid technology has advanced tremendously, and we believed it would be a technology worth exploring. The cost of a 40-foot hybrid bus is approximately \$900,000.



Access Transit bus



Electric bus

Access Transit: Coach

There are 27 Access buses. This allows for nine spares, and only six during pre-COVID times. The fleet average age is four years, where industry standard for a cutaway coach is three. To maintain the three-year average age that Access had achieved two years ago, five buses per year need to be replaced with new buses at an estimated cost of \$170,000 each.

This year saw the delivery of two new low-floor Access Transit buses. The expectation is these buses will be safer for both passengers and operators by being truly accessible. These buses were more expensive but better meet the needs of the Access customer.

Fleet Electrification

With the plan to electrify the fleet in the future, the funding requirements will change considerably. The estimate for a new electric 40-foot low-floor bus and charger is around \$1.2 million, in order to purchase ten of those per year annual funding would need to be approximately \$12 million.

The advantage of the electric bus is the expected reduction in operational costs, namely in the fuel usage and parts to maintain the bus. The total cost of ownership is expected to start showing savings after year ten or eleven. Over the life of the bus, an expected total cost of ownership savings of \$500,000 per bus is expected to be realized, equating to \$69.5 million over the life of the entire fleet, or an estimated \$3.86 million annually.

At the time of writing, Saskatoon Transit is in the middle of its electric bus trial with very positive results. Being a leased bus, it wasn't exactly the bus Transit wanted, however in the first seven months of usage, an issue with the ramp was the only required maintenance on the bus. Even through the cold months of winter, the typical after-treatment issues seen on a diesel bus were non-existent, and the bus saw regular and reliable service.

There are funds currently available as a part of the ICIP Transit Stream for bus purchases but the detail and permission to spend have not yet been received from the federal government through the province. Without this funding being released there have been no additional requests for capital funding for new buses. Currently, Saskatoon Transit is conducting an electric bus trial, though a one-year lease of an electric 40-foot bus built by BYD. This electric bus trial will conclude in September of 2021 and at that time the data collected will be used to determine the feasibility of switching to electric propulsion versus diesel power.

The total bus purchase envelope planned under the ICIP is \$60 million which will also include some electric infrastructure costs. The current cost of a diesel 40-foot bus is approximately \$636,000. An electric battery bus costs up to \$1.2 million however, there are dramatically reduced operating costs over time.

Plan to Address Funding

After the Fleet Renewal Strategy was approved in 2015, Saskatoon Transit received funding for bus replacement through the GTF. Funding was available in 2017 through 2019 by means of the PTIF program. Regardless of the stalled status of the ICIP funding, reliance on these one-time funding sources is not a sustainable strategy. The funding Saskatoon Transit received from these sources did allow better alignment with industry best practice.

Table 3: Service Expenditure Levels

Asset	Actual Average Fleet Age	Desired Average Fleet Age	Required Annual Funding (to meet expenditure Service Level)	2021 Budgeted Annual Funding	Annual Funding Gap (to meet Expenditure Service Level)
Fixed-Route Buses	9.4	7	\$9,000,000	0	\$9,000,000
Access Buses	4.5	3	\$850,000	\$350,000	\$500,000
Shelters	N/A	25-year life	\$200,000	\$100,000	\$100,000
Column Lift Hoists	4	20-year life	\$50,000	\$50,000	0

To achieve the required \$9,000,000 in funding, property tax phase-ins of approximately \$1,800,000 per year or equivalent to a 0.70% property tax increase would be required, as illustrated below. Regardless, if ICIP funds are approved a sustainable funding source will be required at the end of the five-year period ICIP is expected to cover:

Table 4: Funding from Property Tax

	2022	2023	2024	2025	2026
Existing Funding	0	0	0	0	0
Property Tax Phase-in	\$1,800,000	\$1,800,000	\$1,800,000	\$1,800,000	\$1,800,000
Equivalent Property Tax Increase Required	0.70%	0.70%	0.70%	0.70%	0.70%
Funding Available	\$1,800,000	\$3,600,000	\$5,400,000	\$7,200,000	\$9,000,000



INFRASTRUCTURE RESILIENCE AND CLIMATE CHANGE ADAPTATION STRATEGY

The results of the electric bus trial are expected in Q3 of 2021. Saskatoon Transit has seen positive results thus far and by moving to electric buses, the City could see a savings of 50.3 tonnes of CO₂ emissions per bus per year. For the entire fleet, this translates to almost 7,000 tonnes of CO₂ emissions not making its way into the environment. This reduction aligns well with the Low Emissions Community Plan. This move however, comes with a large upfront cost, with the capital investment double what a diesel bus costs, in addition to the upgrade to the 'fueling' system. However, the long-term savings outweigh the initial cost and will save money over the entire life cycle of the bus, not including spinoff benefits like energy storage in batteries as an after-life use.

Fringe benefits could include an already-proposed partnership with SaskPower as a beneficial electrification project, where the two parties work to develop policies and practices to better manage electricity demand, reduction in energy costs, and to reduce the need for immediate infrastructure upgrades to the SaskPower network.



THE WAY FORWARD

Saskatoon Transit continues to focus on increasing ridership and bringing riders back after the pandemic by providing strong customer service and delivering service that is safe, convenient, efficient, and affordable.

These initiatives support the Strategic Goal of Moving Around and Environmental Leadership with the electrification plan, and the Growth Plan to Half a Million. Saskatoon Transit's mission is to provide transportation options that are viable options as part of the overall transportation network.

As mentioned, Saskatoon Transit has been moving forward with the strategy that with potential ICIP funding we could move forward with hybrid bus purchases during the electrification trial. The motivation is that hybrids are moving in the right direction regarding our environmental responsibilities and are a cheaper solution than electric. For 2022, Saskatoon Transit proposes to move forward with the purchase of five hybrid and five battery-electric buses (BEB), and for 2023, to purchase ten BEBs.



*We strive to maintain and fund
our key infrastructure assets to
minimize total life cycle costs.*