

# Approaches to Address Saskatoon Transit's Long-Term Fleet Renewal and Funding Strategy

## ISSUE

The City of Saskatoon transit fleet currently includes 134 buses. The average age of the transit fleet is 10.1 years and the average kilometres per bus is approximately 475,000 kms. The most recent bus replacements occurred in 2019, at which time Saskatoon took delivery of seven new buses. To upgrade its fleet, the City primarily uses funding from the federal government, augmented with own source contributions. Canadian transit properties are transitioning from primarily diesel fueled engines to include a mix of more sustainable energy sources. What long-term approaches can the City take to improve the health and reliability of its transit fleet?

## BACKGROUND

### History

City Council, at its 2015 Corporate Business Plan and Detailed Budget meeting held on December 3, 4, and 9, 2014, considered Item 14.3) 2015 Transit Fare Increase, of the Transportation Business Line and resolved, in part,

- “3. That the Administration report back on necessary steps to get transit to industry standards in terms of maintenance staff, equipment and operational consistencies”.

City Council, at its Regular Business meeting held on June 22, 2015, considered the Saskatoon Transit Fleet Renewal Strategy report, and resolved:

- “1. That Saskatoon Transit set as its target an average fleet age of 7 years to be achieved by 2020 in order to meet the current Canadian industry average, and;
2. That funding in the amount of \$4,950,000 be made from available gas tax funds and be transferred to Capital Project 583 – TR-Replace/Refurb Buses for the purchase of 10 new low-floor buses.”

This resolution was the basis for the development of the Saskatoon Transit Fleet Asset Management Strategy. Funding was made available through the Canada Community Building Fund (formerly the Federal Gas Tax Fund) for the years of 2014 through 2016 for the purchase of 25 buses.

In 2016 the federal Public Transit Infrastructure Fund (PTIF) became available and enabled the City to purchase 41 new buses over the next three years.

As a result of this direction and associated funding envelopes, several improvements were made to Saskatoon Transit's Fleet:

- The average age was reduced to 7.5 years by 2019, down from 13.4 in early 2015.
- The target of 100% low floor and accessible buses was achieved.
- The spare ratio was reduced from 58% to 36% by disposing of a large number of older, unreliable buses that had been needed to maintain service due to the overall unreliability of the fleet.

### Current Status

Given that 2019 was the last year in which the City purchased a new bus, the average age of Saskatoon Transit's fleet has increased to 10.1 years in 2022, up 2.6 years since 2019. Some other statistics regarding Saskatoon Transit's existing fleet are:

- It has a spare ratio of 41% while the industry standard is 25% to 30%. This can be attributed to the fleet's average age of 10.1 years, with over 16% (21 buses) of the fleet over 15 years old.
- The size has been reduced from 139 buses to 134 buses since March 2022. This is because one 1997 (1.3 million kms) and four 2002 (all over 1.0 million kms) buses were retired as they had reached the end of their useful service life due to either high maintenance repair costs or defects beyond repair (i.e., corroded frame).
- There are eight 20-year-old buses (between 865,000 kms and 1.27 million kms), six 17-year-old buses and seven 16-year-old buses that remain in the fleet that are beyond the useful service life of 15 years.
- 33% of the fleet is beyond the useful life of 800,000 kms, with over 10% of the fleet having more than 1.0 million kms.
- The eight 20-year-old buses are beyond the 800,000 km service life (range of 865,000 kms to 1.26 million kms) and will be 22 years old with all eight near or over 1.0 million kms in 2024, which is the earliest anticipated date new buses can be in the fleet if they are ordered in 2023.

### Useful Service Life of a Bus

According to industry standards and government studies on the lifespan of a bus, the average useful life of a bus ranges between 12 and 16 years. Appendix 1 summarizes these studies and offers a description of the factors used to determine the useful life of the asset.

Based on this information, Administration recommends a target of a 15-year useful life for both a battery electric and diesel heavy duty large bus, which includes the 40-foot conventional buses and 60-foot articulating buses. With a fleet uniformly distributed by age, this results in an average age of 7.5 years.

### City of Saskatoon's Current Approach

Saskatoon Transit's fleet renewal strategy is generally aligned with its existing Asset Management Strategy but is subject to annual funding approvals. The most recent [Saskatoon Transit Asset Management Plan and report](#) outlining the state of the conventional bus fleet was presented to the Standing Policy Committee on

Transportation in August 2021 in preparation for the 2022-23 Multi-Year Business Plan and Budget deliberations.

In December of 2021, as part of budget deliberations, City Council approved \$2.64 million of funding for the purchase of two battery electric buses. Work began early in 2022 researching and developing specifications, consulting with ATU on specification development and preparing the tender documents. The tender has closed and the proposals are currently in the evaluation phase. Delivery of these buses is expected to be anywhere from 18 to 24 months from point of order. By the time these buses arrive on site (end of 2024), Saskatoon Transit will have an average fleet age of 11.7 years if no additional new buses are added to the fleet in that timeframe, with 50 buses over 15 years of age (37% of the fleet).

The City's transit funding strategy is aided by transfers and grants from other orders of government, most notably, the federal government. As described in Appendix 2, the Government of Canada has existing and emerging public transit funding programs that the City is exploring to support its fleet replacement asset management plan. Three of the four programs noted in the appendix are short-term in nature, while the emerging permanent transit fund is still under development.

### **Approaches in Other Jurisdictions**

Saskatoon Transit is often compared to immediate transit property neighbours in Western Canada on various metrics. Calgary, Edmonton, and Winnipeg are much larger municipalities with very different purchasing power, economies of scale, operations, and business practices to manage fleets that are five-to-eight times larger than Saskatoon's fleet. To compare transit operations who serve a population of similar size, the Canadian Urban Transit Association (CUTA) has grouped municipalities into categories based on population. Category 3 municipalities have populations ranging from 150,000 to 400,000. Across Canada there are 11 Category 3 municipalities reporting.

While average age of a fleet is a relevant measurable comparator for fleet condition, it is only one variable to be considered in evaluating the condition state of a transit fleet. Other measures such as average kilometers per bus per year are useful to consider. By industry standards, mileage of 800,000 kms or a physical age of 15 years is considered end of useful life for a standard transit bus. For properties that put on higher kilometres per year per bus, the mileage for buses on average will be higher than those that put on lower kilometres per year per bus.

Using this measure, Saskatoon has averaged approximately 50,000 kms per year per bus over the last four years (Table 3, Appendix 4), resulting in buses reaching 750,000 kms at 15 years of age on average. For comparison, Regina at approximately 42,000 kms per year per bus over the last four years translates into approximately 630,000 kms at 15 years of age on average. Saskatoon puts on approximately 18,000 more kms per year per bus than Gatineau's fleet (Gatineau has a slightly higher population than Saskatoon) and 8,000 more kilometers than Regina, our nearest similar sized city. More than 33% of Saskatoon's fleet is over the useful service life mileage of

800,000 kms (Table 5, Appendix 4). Table 8 in Appendix 4 also illustrates that based on the four-year average of kms per bus per year and the average fleet age, Saskatoon has one of the highest average kms per bus of the comparison municipalities.

Appendix 4 displays comparisons of Category 3 cities as well as Saskatoon's Western Canadian neighbours. Data in Appendix 4 was obtained both from CUTA's annual statistics report as well as through gathering of data directly from representatives at various municipalities.

In terms of transit funding in other jurisdictions, the Administration reviewed the budget documents of Edmonton, Calgary, Winnipeg, and Regina to understand their approaches and asset management funding strategies for transit. As noted in the appended Saskatoon Transit Fleet Comparison to Other Jurisdictions document, each of these municipalities operate a general fund reserve strategy to differing degrees which results in varied investment in transit renewal every year. This makes it difficult to draw appropriate comparisons on funding strategies. In general, however, all cities rely heavily on one-time funding from other orders of government to keep their fleet current while maintaining the flexibility to allocate internal reserve funds through their general fund reserve strategy.

For context, general fund reserve strategies maximize flexibility and allow for the ability to transfer funds between programs such as roadways, bridges, fleet renewal and other general fund capital projects on an as-needed basis. Imagine this strategy as one large (or several large) pots of funding with minimal restrictions that need to be allocated out every budget cycle, projects such as road maintenance, transit and facility renewal are weighed against each other on which ones will receive funding. This approach provides flexibility to fund differing priorities as they arise. By contrast, Saskatoon's reserve approach places funds aside for specific purposes and are utilized in the intended manner.

### **OPTIONS**

Given the preceding analysis and the accompanying documents in Appendices 1 to 4, renewing the fleet to a state that meets industry standards will require time and a dedicated plan to finance and support it. Three options have been developed as outlined below. Option 1 takes a moderate, linear approach, while Options 2 and 3 accelerate the strategy by taking advantage of existing and emerging government funding opportunities.

All options described below include the two electric buses that are currently being procured. Options 2 and 3 strive to achieve the following objectives:

- Average age at or near 7 years;
- Maximum age no more than 15 years;
- Increase articulated bus fleet to at least 30 buses to meet expected increases in service demand; and
- Increase the proportion of Zero Emission Vehicles (ZEVs) within the fleet over time.

Of note, the approximate cost of new buses (\$2022 excluding taxes) is as follows:

- 40-foot conventional diesel bus \$0.7M;
- 60-foot articulating diesel bus \$1.0M;
- 40-foot conventional battery electric bus \$1.2M; and
- 60-foot articulating battery electric bus \$1.5M.

All options are evaluated on how well they support the Saskatoon's Transit's fleet asset management strategy, including, how quickly the City can meet its average age targets, transition to zero-emission (or low-emission) fuel sources, meet current and future service demands, and support fiscal partnerships with other orders of government.

### **Option 1 – The Moderate Approach**

This option follows the City's funding model for fleet renewal, which relies primarily on funding from the federal government. Under this option, the City would utilize funding from the Government of Canada's Investing in Canada Infrastructure Program (ICIP). The City is currently working with the Province of Saskatchewan (Saskatchewan) to complete its formal application to the Government of Canada (Canada) in support of the Bus Rapid Transit (BRT) project. A total of \$60M in new buses forms part of this application. If approved, funding through the ICIP program is currently anticipated to begin in late 2023 or 2024. City Council approved the funding plan for the BRT project at its [December 16, 2019 meeting](#). Under this option, the City would purchase 30 articulated buses and 25 conventional ZEVs over five years (2024-28).

The table provided in Appendix 5 summarizes the buses purchased, delivered, and retired over the next decade under this option, including the impacts to the overall average age and maximum age. As the appendix shows, the City's average age falls from 11.7 years in 2024 to 8.4 years in 2029 but then begins increasing again to 12.4 years in 2033, with 55 buses (41% of the fleet) over the age of 15 years. This option does not achieve industry standard targets.

Advantages:

- Limits investment in transit fleet renewal to a program with contributions from other orders of government that has an approved funding plan for the City's contribution.

Disadvantages:

- Does not significantly reduce the overall age of the fleet (i.e, maximum age still 19 to 23 years over the next decade);
- Insufficient funding to replace fleet assets reaching the end of their useful service life and ensure sufficient spare buses are available based on target service levels, resulting in increased frequency of service disruptions; and
- By 2033, 55 buses would be 15 years or older with an average fleet age of 12.4 years, which would need to be addressed by additional funding (\$66M if conventional ZEVs are purchased).

This option will require \$60M of funding through the ICIP BRT application. To address the 55 buses over the age of 15 years in 2033 would require an additional \$66M if conventional ZEVs are purchased, for a total investment of \$126M.

### **Option 2 – The Moderate-Acceleration Approach**

Like Option 1, this option includes the ICIP application and the City would attempt to pursue funding under the Government of Canada's Zero Emissions Transit Fund (ZETF) program. Here, the City would aim to purchase 30 – 40-foot conventional buses for \$36M in new ZEVs. The main difference between Option 2 and Option 1 is it provides for the purchase of an additional 30 ZEV buses and achieves industry standard targets by 2029.

As described in the appended Federal-Provincial Public Transit Funding Programs document, bus purchases through the ZETF are limited to the infrastructure capacity of the transit agency. The current infrastructure capacity of the Civic Operations Centre is 30 battery electric buses. The ZETF program runs through 2025. To balance the influx of new buses against the varying age of the existing fleet, the City would purchase 15 conventional ZEVs in each of 2024 and 2025 through ZETF funding, an additional 25 conventional ZEVs in 2026 through 2031 using ICIP funding, and 30 articulated diesel buses in 2024 through 2029 using ICIP funding.

The table provided in Appendix 6 summarizes the buses purchased, delivered, and retired over the next decade under this option, including the impacts to the overall average age and maximum age. As the appendix notes, the fleet achieves the industry standard targets (average age near 7 years and maximum bus age of 15 years) by 2029.

#### Advantages:

- Reaches the industry standard for the useful life of a bus by 2029; and
- Potential to diversify fleet stock with ZEVs.

#### Disadvantages:

- Buses purchased with ZETF and ICIP funding are not anticipated to enter service until at least 2025 or possibly 2026, resulting in risk of increased frequency service disruptions over the short term (next 3 years) as the average age of the fleet is near 12 years and maximum age begins exceeding 20 years (starting in 2023 and peaking in 2024 before improving in 2025);
- Additional funding is required by 2031 to address fleet assets reaching the end of their useful service life, and to ensure sufficient spare buses are available based on target service levels;
- By 2033, 25 buses would be older than 15 years, which would need to be addressed by additional funding (\$30M if conventional ZEVs are purchased); and
- The ZETF provides up to 50% funding for buses. Funding for the City's 50% share (or \$18M based on a \$36M application) has yet to be identified.

This option will require \$60M of funding through the ICIP BRT application and \$36M in ZETF funding, for a total of \$96M. To address the 25 buses over the age of 15 years in 2033 would require an additional \$30M if conventional ZEVs are purchased, for a total investment of \$126M.

### **Option 3 –The Fully Accelerated Approach**

This option builds off Option 2 but integrates another funding source to accelerate fleet renewal. Here, the City would use the ICIP and the ZETF programs, and in addition utilize one-time funding from the federal Support for Transit and Housing Program (STHP). This program is estimated at \$6.5M in federal contributions and can be used to purchase new buses.

To balance the influx of new buses against the varying age of the existing fleet, the City would purchase three articulating buses (to replace the three articulating buses retired in summer 2022) and five conventional buses in 2023 using STHP funding, 15 conventional ZEVs in each of 2024 and 2025 with ZETF funding, an additional 25 conventional ZEVs in 2026 through 2031 using ICIP funding, and 30 diesel articulating buses in 2025 through 2031 using ICIP funding.

The table provided in Appendix 7 summarizes the buses purchased, delivered, and retired over the next decade under this option, including the impacts to the overall average age and maximum age. As the appendix notes, the average of the fleet achieves the average age near 7 years by 2028 (a year sooner than Option 2) and no buses over the maximum bus age of 15 years by 2029. In addition, the purchases in 2023 reduce the average age and number of buses greater than 15 years of age in as early as 2024 and 2025.

#### Advantages:

- The average age of the fleet will near 7 years by 2028 with no buses over the age of 15 years by 2029;
- New buses will be purchased and placed into service as quickly as possible in order to minimize service disruptions over the short term (next 3 years); and
- Maximizes the amount of federal funding available to the City in support of transit fleet renewal.

#### Disadvantages:

- Additional funding is required by 2032 to address fleet assets reaching the end of their useful service life and ensure sufficient spare buses are available based on target service levels;
- By 2033, 17 buses would be older than 15 years with an average fleet age of 8.4 years, which would need to be addressed by additional funding (\$20.4M if conventional ZEVs are purchased);
- The ZETF provides up to 50% funding for buses. Funding for the City's 50% share (or \$18 million based on a \$36M application) has yet to be identified; and

- Details surrounding the STHP funding and associated timing have not yet been released and may require the City to cash-flow the \$6.5M until the funding is received.

This option will require \$60M of funding through the ICIP BRT application, \$36M in ZETF funding and \$6.5M in STHP funding, for a total of \$102.5M. To address the 17 buses over the age of 15 years in 2033 would require an additional \$20.4M if conventional ZEVs are purchased, for a total investment of \$122.9M.

**RECOMMENDATION**

That the Standing Policy Committee on Transportation recommend to City Council:

1. That the fleet replacement strategy provided in Option 3 – The Fully Accelerated Approach be approved, subject to a funding strategy for the city contributions for the ZETF program; and
2. That in 2023 funding of \$6.5M be approved for the purchase of five 40-foot conventional diesel buses and three 60-foot articulating diesel buses to be funded by the Federal Support for Transit and Housing Program (STHP).

**RATIONALE**

As the background section explains, the Saskatoon Transit fleet is lagging in many important indicators relative to its asset management plan, industry standards, and its peers. This report offers three potential approaches that aim to make improvements to the transit fleet.

Option 3, the proposed recommendation, best positions the City to meet its long-term asset management targets. Specifically, it enables the City to maximize available federal funding for capital transit fleet replacement and provide for a balanced fleet mix with diesel buses and newer technology ZEVs. Operational experience with Transit ZEVs are still in the early stages in Canada so blended fleet purchases help the City make a gradual transition by better understanding the technological and operational opportunities and challenges of these new models, and enables the City to purchase more buses in the short term than a strictly ZEV approach.

The recommendation to purchase eight diesel buses in 2023 versus battery electric buses is based on maximizing the number of bus purchases with available STHP funding. With the same funding envelope of \$6.5M, only five electric battery buses could be purchased. Purchasing five electric battery buses in 2023 would also reduce the amount of electric battery buses that could be purchased under the ZETF from 30 buses to 25 buses with a federal contribution of 50% as the number of buses eligible for funding is limited to the infrastructure capacity of COC, which is 30 buses in total.

More importantly, the recommendation also places Saskatoon Transit on a clear trajectory to meets its current and future service pressures.

When the BRT system becomes fully operational, it is anticipated that 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. With a consistent and reliable long-term funding strategy in place to position for meeting the industry standard of having a fleet age distribution with all buses 15 years or newer and the average age at approximately 7 years, the opportunity will exist to decrease the spare ratio to the industry standard of 25% to 30%. With a 30% spare ratio this equates to a total fleet size of 138 buses.

Under Option 3, by 2032, the fleet will consist of 33 articulating buses and 101 conventional buses (total of 134 buses). It is important to note that this level of investment does not include a growth rate to keep up with the city's population growth, funding that may be required for infrastructure improvements to support the ZEV fleet beyond 30 ZEV buses, or any significant increases in ridership or service levels beyond pre-pandemic levels. Those impacts will be largely based on City growth and will be monitored regularly and included in annual transit reporting as well as step growth in the Multi-Year Business Plan and Budget Process.

### **FINANCIAL IMPLICATIONS**

If approved, Option 3 is planned to result in a \$102.5M investment in Transit Replacement from 2023 to 2031. Most of this investment (\$60M) will come from part of the City's ICIP application, which was approved by City Council at the September 26, 2022 Regular Meeting of City Council. The City's share of funding for this program has already been approved as part of the Bus Rapid Transit Funding program.

The second biggest component of this investment is \$36M from the City's ZETF application. As outlined in the report, if successful, 50% of this investment would be funded by the ZETF, with the City being responsible for the remaining 50% or \$18M. The City's share for this program has not yet identified a funding source, however, is planning to be included as part of the 2024-2035 Major Capital Prioritization Process and Administration will report back as part of that funding plan.

The final component of this funding plan is \$6.5M from the STHP, which would provide 100% funding with no contribution from the City required. Details surrounding the STHP funding and associated timing have not yet been released and may require the City to cash-flow the \$6.5M until the funding is received.

Saskatoon Transit has also applied to the planning component of the ZETF to allow for undertaking additional studies, modelling, and feasibility analysis for the operation of a ZEV fleet beyond the existing infrastructure capacity at COC that can support 30 ZEVs. If this funding is approved, and when the work is completed, the scope of work and funding needed to support additional ZEVs beyond the 30 ZEVs planned for purchase in 2024 and 2025 can be better defined.

As more information becomes available from the federal government on the Permanent Public Transit Funding program announced to start in 2026-27, Administration will look for opportunities to leverage this funding for infrastructure enhancements to support the

ZEV implementation plan for 2026 and beyond, and for funding transit replacement in the outer years (2032 and 2033) of Option 3 when current federal program funding has been exhausted.

**ADDITIONAL IMPLICATIONS/CONSIDERATIONS**

There are no privacy, legal, social, or environmental implications identified.

**APPENDICES**

1. Useful Service Life of a Bus
2. Federal-Provincial Public Transit Funding Programs
3. Saskatoon Transit Fleet Comparison to Other Jurisdictions
4. Transit Fleet Replacement Funding in Other Jurisdictions
5. Option 1 Overview
6. Option 2 Overview
7. Option 3 Overview

**Report Approval**

Written by: Tracey Davis, Transit Fleet and Maintenance Manager  
Dan Willems, Director, Technical Services  
Mike Jordan, Chief Public Policy and Government Relations Officer

Reviewed by: Clae Hack, Chief Financial Officer

Approved by: Terry Schmidt, General Manager, Transportation and Construction