

## EDMONTON TRANSIT SERVICE

### Bus Fleet Replacement Plan

<b>Recommendation</b>			
That the March 19, 2024, City Operations report CO02086, be received for information.			
<b>Requested Action</b>		Information only	
<b>ConnectEdmonton's Guiding Principle</b>		<b>ConnectEdmonton Strategic Goals</b>	
<b>CONNECTED</b> This unifies our work to achieve our strategic goals.		<b>Climate Resilience</b>	
<b>City Plan Values</b>	ACCESS.		
<b>City Plan Big City Move(s)</b>	Community of Communities	<b>Relationship to Council's Strategic Priorities</b>	Mobility Network
<b>Corporate Business Plan</b>	Serving Edmontonians		
<b>Council Policy, Program or Project Relationships</b>	<ul style="list-style-type: none"> <li>• City Policy C539A - Transit Service</li> <li>• City Policy C598- Infrastructure Asset Management</li> </ul>		
<b>Related Council Discussions</b>	<ul style="list-style-type: none"> <li>• August 29, 2023, City Operations report CO01337, Edmonton Transit Service in Newer Developing/Developed Communities</li> <li>• November 7, 2023, FCS02052 Fall Supplemental Operating Budget Adjustment - 2023-2206 Operating Budget</li> </ul>		

### Previous Council/Committee Action

At the August 29, 2023, Urban Planning Committee meeting, the following motion was passed:  
That Administration provide a report to Committee outlining a bus fleet replacement plan that identifies efficiencies that can be reinvested into the bus network to address the service gaps described in the August 29, 2023, City Operations report CO01337.

## EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN

### Executive Summary

- Fleet renewal is a key element to ensure Edmonton Transit Service reliability. Vehicles that surpass their useful life become more susceptible to mechanical failures, directly impacting service.
- The current conventional transit service fleet includes 968 buses, of which 797 are 40-foot units. ETS has a bus fleet replacement plan that is not currently funded to achieve its intended outcomes.
- Over the last 17 years, ETS replaces an average of 48 conventional buses per year. The ETS fleet replacement plan indicates that a total of 322 buses need to be replaced over the 2023-2026 budget cycle at a cost of \$257.6 million. Due to financial constraints, a total of 22 conventional buses are funded to be replaced over the four years of the 2023-2026 budget cycle at a cost of \$17.6 million. The shortfall of \$240 million creates a significant gap in bus renewal, with a total of 300 conventional buses scheduled for replacement this cycle but without funding to support this renewal.
- Renewing the bus fleet and decreasing the average fleet age enables a reduction in the bus spare ratio. This means more buses would be available for service and could be used to grow conventional bus service to address bus service gaps. Furthermore, replacement of older buses with newer buses will result in operational savings which could be reinvested to address service gaps.

### REPORT

At the August 29, 2023, Urban Planning Committee meeting, Administration presented report CO01337, Edmonton Transit Service in Newer Developing/Developed Communities, which outlined that transit service levels have not kept up with the city's growth, contributing to a gap of 260,000 annual service hours between the current service levels and the Transit Service Standards. This report outlined four opportunities to address the service gap, including:

1. Repurposing the temporary Valley Line Southeast LRT precursor bus service hours to permanently add them to the bus network.
2. Growing service hours through the use of a small satellite transit garage.
3. Growing service hours once the new transit garage in the southeast opens.
4. Fleet renewal to lower the fleet age of buses, reducing the number of buses used as spare buses for service and allowing them to be put into regular service.

In response to this report, Committee directed Administration to bring forward the first two opportunities for consideration during the Fall Supplemental Operating Budget Adjustment, and made a motion for Administration to provide a report with further information on the fourth opportunity related to fleet renewal.

In the Fall 2023 Supplemental Operating Budget Adjustment, Council made further investments in growing transit service through two of these opportunities: redeploying the Valley Line Southeast Precursor bus hours to support citywide transit service growth (equal to 70,000 annual service hours) and through the lease of a satellite garage facility and purchase of 20 growth

## **EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN**

buses, which will contribute 50,000 hours to the network. Combined, these two investments will contribute 120,000 hours to the transit network.

Until commissioning of the new southeast transit garage, there are very limited opportunities to address the remaining service hour gap. Combined with having room to accommodate 20 growth buses in the satellite facility, accelerating bus fleet renewal may provide opportunities to address some of the needs.

### **Transit Fleet Replacement Plan**

Edmonton Transit Service (ETS) currently owns and operates a fleet of 968 conventional transit buses, including 797 forty-foot units. The City of Edmonton plans for conventional buses to have a refurbishment typically scheduled around the nine to 10-year mark to enable longer useful life. The North American average for retiring forty-foot buses is 15.1 years<sup>1</sup> with 81 per cent of these buses adhering to a 12-year age standard; currently Edmonton is retiring buses at 18 years. Further details about the fleet replacement plan is outlined in Attachment 1. During the 2023-2026 budget cycle, to mitigate the impact of a lower level of renewal and managing an aging bus fleet, many buses are undergoing a second refurbishment to try to enable a longer useful life. This approach is not common in transit and introduces additional risks for service disruptions and reliability issues.

Over the last 17 years, ETS has consistently replaced an average of 48 conventional buses per year as part of a fleet renewal plan to replace aging buses. Transit Fleet renewal is supported by composite capital profile CM-66-3600 Bus Fleet & Equipment Rehab and Replacement. For the period of 2023-2026, a transit fleet renewal investment of \$257.6 million was identified, which includes replacement of 322 conventional buses. In the 2023-2026 capital budget, this profile was approved with funding only to replace 22 conventional buses over the four-year cycle, compared to the 322 proposed. For reference, there was an average of 192 buses replaced in previous capital budget cycles. This leaves a significant gap, with 300 buses needing replacement this cycle, but without necessary funding to complete this renewal. When including the 103 bus replacements needed in 2027, this number increases to 425 bus replacements, which represents almost half of the total forty-foot bus fleet.

### **The Transit Service Context**

Renewal of all City assets is supported by City Policy C598 - Infrastructure Asset Management Policy, and is pivotal to support service delivery to Edmontonians and ensure long-term sustainability and resiliency. ETS is committed to providing safe, fast, convenient and reliable service, with fleet renewal standing out as a key element in ensuring service reliability.

To maintain service levels, ETS garages operate continuously, with buses entering and leaving 24 hours-a-day, seven days-a-week. Managing the fleet involves designating a portion of the fleet as "spare buses," which creates a pool of buses available at any given time for maintenance, cleaning, fueling and contingency bus and LRT service. Transit agencies commonly aim for a spare ratio of 18 to 20 per cent, with older fleets requiring a higher spare ratio due to increased

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<sup>1</sup> U.S. Department of Transportation Federal Transit Administration (2017). Useful Life of Transit Buses and Vans. Report No. FTE VA-26-7229-07.1

## EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN

maintenance needs. The spare ratio for ETS' conventional fleet is 24 per cent (which is approximately 236 spares), above the standard in transit, allowing for a maximum of 732 conventional buses to be in service at any given time.

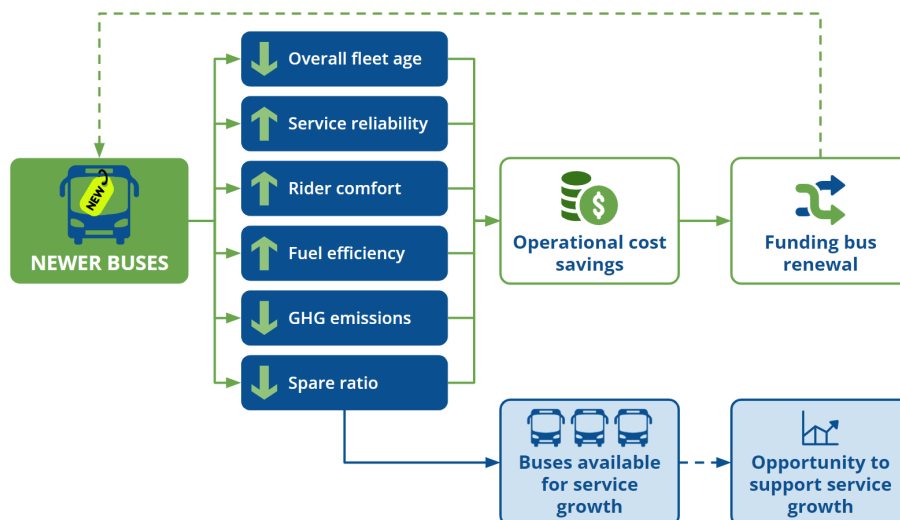
Fleet renewal policies and practices directly impact fleet reliability and result in a higher frequency of failures. A less reliable fleet means buses may encounter failures when in service, which directly impacts riders and on time performance goals. The City monitors the number of kilometres a bus travels between breakdowns. A healthy fleet should reach the inspection interval of 7,000 KMs, resulting in the majority of maintenance performed to be planned. Older ETS buses do not meet this target, which means that breakdowns occur when in service.

The ETS Annual Service Plan includes a series of key performance measures, including rider satisfaction with on time reliability. In 2023, satisfaction with on-time reliability averaged 77 per cent for the year which is five per cent lower than 82 per cent in 2022. Reliability of service is one of the guiding principles for City Policy C539A - Transit Service Policy and a critical component of the rider journey. In addition to fleet reliability, there are several factors that influence rider perception of reliability, including weather, construction, traffic volumes, ridership volumes, driver behaviour, collisions, security disorder on buses and accuracy of published schedules.

In addition to impacts of major mechanical issues resulting in breakdowns, there are components that are not part of the refurbishment program which have very unpredictable failure rates for older vehicles, such as electrical systems and fuel tanks. These vehicles also have non-standard parts, which means they are more difficult to procure and repair upon failure. Since these repairs are not part of planned maintenance, the failures directly result in vehicles being removed from service.

Fleet renewal provides “like for like” replacement of vehicles, and converting the fleet to zero emission technology would be supported through growth funding. That being said, while renewal does not tie directly to energy transition, older vehicles do have higher GHG emissions because they do not have the same exhaust systems and generally have lower fuel efficiency.

The associated benefits associated with fleet renewal are illustrated in the image below.



## EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN

### Bus Fleet Renewal Opportunity

Renewing the bus fleet and decreasing the average fleet age enables a reduction in the bus spare ratio. This means more buses would be available for service and could be used to grow conventional bus service to address bus service gaps.

Beyond the immediate impacts on reliability and bus availability, a sustained fleet replacement strategy yields operational savings. Comparing newer buses with those over 12 years old reveals substantial savings in parts, labour and vendor expenses. Maintaining an older bus costs approximately \$0.54 per kilometre more than a newer bus. Considering the overall size of the ETS fleet, and assuming an average bus usage of 55,000 kilometres annually, reducing the fleet age could result in significant cost savings. For example, renewing the additional 300 buses that were planned for replacement this budget cycle, and assuming an average bus usage of 55,000 kilometers annually, could result in approximately \$8.9M in annual savings. (300 buses x 55,000 kilometers per year x \$0.54 cost reduction). This underscores the economic advantages and operational efficiencies associated with implementing a comprehensive and timely transit fleet renewal plan.

With a stable level of annual vehicle replacements per year, it would take several years to realize the full operational savings from this model and to achieve a sufficient decrease in the fleet age to support a decrease in the spare ratio. It means additional service growth opportunities associated with a lower fleet age would be available for consideration in the 2027-2030 budget cycle.

The bus fleet replacement plan can be further supported through capital funding, requiring \$240 million during the 2023-2026 budget for diesel buses, as shown in Attachment 2. Administration is currently collecting data on the hydrogen fuel cell bus; if there is a desire to accelerate the transition towards hydrogen fuel cell buses additional funding would be required to support existing facility retrofits to accommodate hydrogen technology.

A lease approach can also be explored to address transit fleet replacement. A lease scenario to fund bus replacement is not a well established practice in Canada; however, it is more commonly used in European cities such as London and Manchester, England. A lease approach would provide a mechanism to fund bus renewal using the operating budget, with the operating budget being funded through savings associated with reducing the fleet age. As the fleet age is lowered, the spare ratio can also be decreased; thereby freeing up more buses to put in service to support growth.

If the City is deemed to have the substantial benefits and risks of ownership, leased buses would be treated as City assets for accounting and budgeting purposes (referred to as a "capital lease"). Under capital leases, both the assets and related lease obligation would be reflected on the City's Financial Statements and lease payments would be treated as debt service payments (repayment of a long-term obligation) as per the City's Debt Management Fiscal Policy (C203D). As per the December 31, 2023, Capital Financial Update presented to City Council on March 12, 2024, there is no debt servicing room forecast to be available to support capital lease payments until 2029. As a result, this approach to fleet renewal through leasing buses may not be feasible in the near term, and could be considered a future opportunity when debt capacity can support this

## **EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN**

approach. Administration will bring forward a debt update with comparison of debt servicing against related debt servicing limits for the Spring 2024 Supplemental Capital Budget Adjustment report in May/June 2024.

To explore a lease option, Administration will conduct further analysis through a Request for Information procurement process. The Request for Information process is solely for gauging market insight and interest and would not result in a contract award. This process would allow Administration to engage the private sector to understand the level of interest and understanding of potential vendor solutions. Subsequent to completing the Request for Information process, Administration could return to Council with an update and recommended next steps.

### **Budget/Financial Implications**

The bus fleet replacement plan is not currently funded to achieve its intended outcomes. Without additional funding to implement the fleet replacement plan, operational costs will increase as the fleet ages and service reliability will be a growing concern. As discussed in Attachment 3 of FCS02052 Fall Supplemental Operating Budget Adjustment - 2023-2026 Operating Budget, as part of the 2023-2026 Capital Budget and based on the available funding, transit fleet renewal funded through unconstrained funding received less funding than the ideal renewal investment requirements.

### **Community Insight**

ETS regularly engages with riders through an online monthly transit rider satisfaction survey that assesses satisfaction with various aspects of service provided, including several aspects influenced by the bus fleet such as on-time performance (reliability) and level of on-board comfort. In 2023, approximately 3,000 responses were collected from transit riders through the monthly transit rider satisfaction survey. During this period, 78 percent of riders were satisfied that their bus or train arrived on time, and 65 percent of riders were satisfied with their level of comfort on-board transit. When respondents were asked to elaborate on the reasoning for their on-board comfort levels through an open-ended comment, key themes that emerged included cleanliness and maintenance of the vehicles, crowding, having enough room, seat configuration, and safety and security measures. A factor analysis also demonstrated that level of comfort on-board is a key driver for overall satisfaction with transit for both frequent riders and occasional riders, while bus/train reliability is a key driver for frequent riders.

### **GBA+**

Lowering the fleet age would result in increasing vehicles available for service growth, which would help close the service gaps identified in report CO01337. Transit service gaps are felt more acutely by equity-deserving groups. A preliminary review of Edmonton's transit network with an equity lens was presented to the Urban Planning Committee within the City Operations report CO01450 Transit Network Equity Analysis on November 22, 2022. Ongoing work will review the network to align with GBA+ principles, with the aims of identifying equity-deserving populations who may not be receiving adequate transit service to meet their needs, removing barriers, and continually working towards an equitable transit network that enables mobility for all

## **EDMONTON TRANSIT SERVICE - BUS FLEET REPLACEMENT PLAN**

Edmontonians. In March 2024, Administration will present a Bus Network Service Plan Update report which will outline how the service hour growth approved during the Fall 2023 Supplemental Operating Budget Adjustment will be allocated in the network, including analysis from a transit equity lens.

An older average fleet age also results in declining service reliability, and reliable transit service is a critical need for those who rely on public transit to travel for their daily needs. Data from the 2023 transit rider satisfaction surveys shows that transit riders from equity-deserving population groups are more likely to rely on transit as their primary mode of transportation. Over 40 per cent of survey respondents who have household incomes below \$30,000 annually, identified as persons with disabilities, parents with children under 18 years, youth under 24 years and Indigenous peoples were all-purpose riders who rely on transit more frequently for both work/school and non-work/school trip purposes such as medical appointments, shopping, running errands and leisure.

Additionally, unpredictable wait times caused by lower on-time performance create additional transportation barriers for persons with mobility and accessibility challenges including seniors, persons with disabilities and parents with strollers. This results in a decrease in transit trips taken by persons with mobility challenges and lower participation in civic life activities. In addition to improving reliability, a newer bus fleet provides a more comfortable experience for transit riders, featuring easy-to-clean seating material, modern seating design and air conditioning which will improve rider satisfaction.

Demographics of survey respondents from the ETS 2023 transit rider satisfaction surveys are outlined below:

- 19 per cent of respondents indicated their annual household income was below \$30,000
- 16 per cent of survey respondents were between the ages 15 and 24
- 9 per cent of survey respondents were aged 65 and older
- 51 per cent of survey respondents identified as a woman
- 9 per cent of respondents identified as Indigenous

### **Attachments**

1. ETS Bus Fleet Renewal Plan
2. ETS Bus Renewal Funding