Bus Electrification Background

Canada Infrastructure Bank Zero Emission Bus Financing

Context

To support the Calgary Climate Strategy, Calgary Transit has developed a fleet transition plan to start replacing diesel buses that are due for replacement with zero and low-emission vehicles. The 2023-2026 budget cycle would see Calgary Transit purchasing up to 259 battery electric buses (BEB) to replace the oldest diesel buses in the fleet. Infrastructure upgrades will be required at two facilities to support the battery electric bus fleet.

Proposed Project Costs and Funding Sources

An opportunity exists to secure approximately 80% ($391 million) of the Program costs through federal grants and loans, with The City funding the residual amount of $100 million.

Table 1: Battery Electric Bus Project Costs

Cost Category	Total ($ millions)
40-foot Battery Electric Buses	310
Charging Infrastructure (Anderson and Spring Gardens Garages)	137
Other Costs	44
Total	**491**

Table 2: Battery Electric Bus Project Funding Sources

Funding Source	Total ($ millions)
Grants and Loans*	391
City of Calgary**	100
Total	**491**

*The Canada Infrastructure Bank will provide a credit facility. An application to the Federal Zero Emission Transit Fund is pending.
**Funding through the 2023-2026 proposed budget

Canada Infrastructure Bank (CIB)

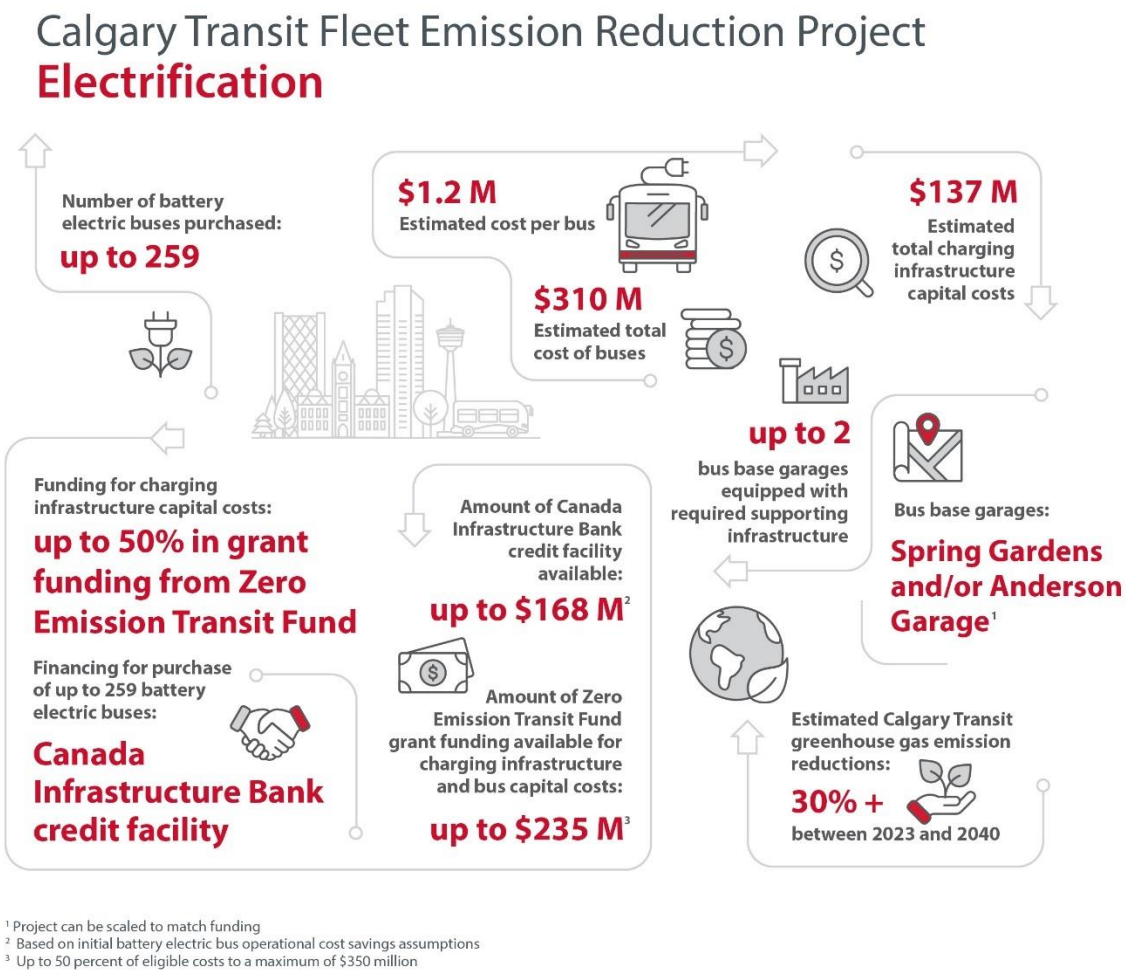
The Canada Infrastructure Bank provides low interest, flexible financing in the form of direct loans to support zero emission bus purchases. Repayment of the loan is sourced from cost savings generated from lower operating costs of zero emission buses compared to diesel buses. The availability period of

the loan is four years, where the applicant can draw on it over the zero emission bus implementation period.

Zero Emission Transit Fund

The Canada Infrastructure Bank Zero Emission Bus initiative works in coordination with Infrastructure Canada's Zero Emission Transit Fund (ZETF) which provides a direct grant to cover the capital cost of building charging infrastructure, as well purchasing zero emission buses. Combined with Canada Infrastructure Bank financing, this stackable funding can cover a large portion of the capital costs for zero emission bus implementation. The Zero Emission Transit Fund program may contribute up to 50% of eligible costs to a maximum of $350 million.

Project Summary



[1] Project can be scaled to match funding
[2] Based on initial battery electric bus operational cost savings assumptions
[3] Up to 50 percent of eligible costs to a maximum of $350 million

Project Timeline

2021 November

Discussions with the Canada Infrastructure Bank and the Zero Emission Transit Fund began in 2021 November. A full-time project manager was hired to support fleet transition planning and the battery electric bus project.

2021 December

The City of Calgary (The City) contracted engineering consultant, WSP Canada Inc. (WSP), to undertake a study to assess the costs and service requirements to transition to an electric bus fleet. The study outlines both short-term and long-term strategies for zero emission bus adoption and will be used to inform discussions around the 2023-2026 capital budget cycle, as well funding and financing applications for the Zero Emission Transit Fund and Canada Infrastructure Bank, respectively.

For the 2023-2026 budget cycle, Calgary Transit intends to purchase up to 259 40-foot battery electric buses. The buses will be charged at Anderson and Spring Gardens garages using in-depot overhead pantograph charging.

2022 January

From 2022 December/January, Administration and the Canada Infrastructure Bank are working collaboratively to understand Program details and timelines as it pertains to The City of Calgary. Meetings are set up periodically, on an as needed basis, to discuss documentation and Program expectations. This collaboration continues to date.

2022 March/April

In 2022 March, The City of Calgary submitted an Expression of Interest for Capital funding under the Zero Emission Transit Fund. Infrastructure Canada completed the review of the Expression of Interest and in 2022 April, invited The City of Calgary to Stage II of the application process, which included an indicative screen of the Program's candidacy for financing from the Canada Infrastructure Bank. The Program was screened as a potential candidate.

2022 May

In 2022 May, the Canada Infrastructure Bank engaged The City to share the outcome of the indicative screen and discuss next steps in the due diligence process to secure financing from the Canada Infrastructure Bank Zero Emission Bus Program.

2022 September

The Calgary Transit Fleet Electrification Planning Study Final Report was received from WSP and will be used to finalize the application to the Zero Emission Transit Fund. Calgary Transit is aiming to be the first transit agency in Western Canada to apply to the Zero Emission Transit Fund.

Previous Work on Bus Electrification

The City has contracted engineering consultant, WSP, to undertake several studies to explore the feasibility to transition to an electric bus fleet.

The following studies have been completed in past years:

Electrification Feasibility Study (WSP, 2017)
In 2017, a study was undertaken to determine the feasibility of implementing electric transit technology into Calgary Transit's operations. The study provided a comprehensive industry market scan, developed high level conceptual plans for infrastructure improvements required to support 100% electric fleet conversion, and developed detailed site plans and cost-estimates for select candidate routes identified for electrification.

Electrification Operational Analysis (WSP, 2018)
Building on the 2017 feasibility study, WSP conducted an operational impact analysis to help Calgary Transit develop a deeper understanding of the impacts that various electrification infrastructure strategies may have on transit operations. This included on-route and depot charging station conceptual designs and project scope definition for the introduction of electric buses to the fleet, a transit operations impact assessment to estimate relative impacts to labour efficiency and scheduling flexibility, and a transmission and distribution rate structure analysis. The study helped to facilitate discussions with regulatory bodies and the utility to determine opportunities for improving electrical rates for transit and transportation electrification.

ETransit Pilot Planning and Deployment (WSP, 2020)
In 2020, Calgary Transit initiated a pilot program to introduce 14 battery electric buses to their fleet of 30-foot community shuttles. WSP supported the project through pilot visioning, program design and evaluation, route selection and service planning guidelines, procurement, and technical design support, engineering advisory services for construction project delivery, and ultimately pilot monitoring and reporting.

Etransit Pilot Project Update
In 2020 Calgary Transit initiated a battery electric bus pilot project after receiving a grant from Emissions Reduction Alberta (ERA). The project will deploy 14 battery electric 30-foot shuttles with the goal of building capacity and collecting lessons learned on operating an electric fleet. Construction of indoor plug-in charging infrastructure started in September 2022 and buses are expected to be deployed in Summer 2023. As part of the agreement with the Emissions Reduction Alberta, after a one-year data gathering pilot period, the City will report on the pilot findings including operational impacts as well as greenhouse gas reductions achieved by the project compared to the base case gasoline shuttle fleet.

Next Steps

The Zero Emission Transit Fund grant is expected to be approved by Infrastructure Canada in Spring 2023 after which the City can start incurring eligible costs. An owners engineer RFP will be released in early 2023. The owner's engineer will guide technical specifications for bus and charging infrastructure procurement which will be released in Fall 2023. Construction of charging infrastructure is expected to start in 2024 with the first buses arriving in mid-2025. Based on the timing of commissioning activities, Calgary Transit will start operating 40-foot battery electric buses in mid 2026.