

**Date:** 2022-04-13

**Subject:** Transit Bus Electrification Update

**Contact:** Alex Milojevic, General Manager, Transit  
[Alex.milojevic@brampton.ca](mailto:Alex.milojevic@brampton.ca), 905.874.2750 ext. 62332

**Report Number:** Brampton Transit-2022-427

### Recommendations:

1. That the report from Alex Milojevic, General Manager, Transit, dated April 13, 2022, to the Committee of Council Meeting of April 27, 2022 re: Transit Bus Electrification Update (Report Number Brampton Transit-2022-427, IB.C), be received; and,
2. That Council approve further engagement of CUTRIC<sup>1</sup> to substantially complete in 2022 the Brampton Transit Zero Emission Bus (ZEB) Implementation Strategy and Rollout Plan, with a net upset limit to the City of Brampton in the amount of \$350,000 (inclusive of applicable taxes). This budget amount was previously approved by Council (Capital Project # 204705-001); and,
3. That the General Manager, Transit or designate, be delegated authority to execute on behalf of the City any necessary contracts, agreements and or amending agreements, and other documentation as may be required to contract the services of CUTRIC, and/or the Government of Canada (Infrastructure Canada) as may be required under the Zero Emission Transit Fund, to complete the Brampton Transit Zero Emission Bus Implementation Strategy and Rollout Plan on the terms described in this report and otherwise satisfactory to the General Manager, Transit or designate and in a form acceptable to the City Solicitor or designate.

### Overview:

- **On March 29, 2022, the City of Brampton and Canada Infrastructure Bank (CIB) reached financial close of largest CIB investment to a municipal transit agency to date; up to \$400M available to Brampton between 2022 and 2027.**

<sup>1</sup> CUTRIC – Refers to the [Canadian Urban Transit Research and Innovation Consortium](#)

- **Status update of the two key studies required to support the development of the Brampton Transit electrification pathway to a full zero emission fleet:**
  1. **CUTRIC Predictive Modelling (Phase 1 of 2 completed)**
  2. **Zero Emission Bus (ZEB) Implementation Strategy and Rollout Plan**
- **Through this report, staff are seeking Council approval to:**
  - **Further engage CUTRIC, of which Brampton Transit is a (paying) member, through the Zero Emission Transit Fund (ZETF) to complete the ZEB Implementation Strategy and Rollout Plan within the upset limit of \$350,000 previously approved by Council (Capital Project #204705-001); and,**
  - **Delegate the necessary authority to the General Manager, Transit or designate, to engage CUTRIC as described within this report - acting in their capacity as the National ZEB Planning Service, duly appointed by the Government of Canada under the ZETF.**
- **Upon Council approval of the recommendations contained within this report, staff will execute a Contract for Services Agreement (CSA) with CUTRIC to undertake the ZEB Implementation Strategy and Rollout Plan.**
- **The CSA approach has been successfully utilized for previous research engagements with CUTRIC; in conformance to Schedule D, paragraph 9(e) of the City’s Purchasing By-law, whereby procurement of goods or services from non-profit organizations are exempt from the procurement processes set out in the Purchasing By-law.**
- **With over \$700M in combined electrification funding and financing confirmed and/or requested towards advancing electrification between now and 2027, staff will be reporting to Council with any budget impacts to support the deployment of a dedicated electrification team within Transit.**

**Background:**

As part of an earlier electric bus (eBus) status update, Council approved a number of key recommendations on September 30, 2020 (CW216-2020). Refer to Appendix A.

This report provides a status update regarding plans underway for the electrification of the Brampton Transit fleet, and seeks Council approval regarding the authority necessary for Transit to proceed with implementation planning as described in this report.

**Current Situation:**

Two separate companion reports entitled “*Brampton Transit Update – Moving Forward*” and “*eBus Trial Update (Phase I)*” are also included on the April 27, 2021 Committee of

Council Agenda. For further reference, this report provides details pertaining to a number of additional key electrification-related initiatives, including:

- Funding - ZETF
- Financing – Canada Infrastructure Bank (CIB)
- New Third Transit Facility + Electrification
- Zero Emission Bus (ZEB) Trials:
  - Phase I: Eight Battery Electric Buses (BEBs)
  - Phase II: Ten additional BEB's, Two Hydrogen Fuel Cell Electric Buses (FCEB), and up to three Diesel Bus Conversions to fully electric.
- Key Studies:
  - Feasibility: CUTRIC Fleet Electrification Feasibility Analysis & Simulation Based Planning Study
  - Implementation: ZEB Implementation Strategy and Rollout Plan
  - Transit 5-Year Business Plan Update (2023-2027)

### Funding/Financing

As noted in the companion report, *“Brampton Transit Update – Moving Forward”*, during this term of Council, Transit – through City Council’s leadership and support - has secured more external funding than ever before in its history. Electrification of the Brampton Transit fleet will form the single largest fleet and service transformation in our history.

#### *Phase I Trial:*

For details regarding the funding status of the Phase I BEB Trial, refer to the companion report entitled *“eBus Trial Update Phase I”*.

#### *Broader Electrification:*

New and innovative zero emission bus financing and funding programs are making the electrification transition possible. The City is taking maximum advantage of these new programs, for example:

- i. Financing - The Canada Infrastructure Bank (CIB), Region of Peel, and City of Brampton have been working diligently over the past many months since signing an MOU in July of 2021. The result was the recent financial closing (March 29, 2022) of three key Agreements with the CIB:
  - a. Credit Agreement between CIB and Peel,
  - b. ZEB Performance Agreement between CIB and Brampton, and
  - c. Funding Agreement between Peel and Brampton.

These agreements collectively now form the largest municipal transit investment in Canada by the CIB to date. This is a financing arrangement with CIB for up to \$400M made available to Brampton to finance the higher acquisition costs of up to 450 ZEBs between now and 2027.

- ii. Funding - In December 2021, the City submitted a consolidated Expression of Interest (EOI) to INFC under the ZETF for program contribution funding for eight

(8) key electrification projects totaling approximately \$395M. With INFC's acceptance of certain projects within this EOI portfolio, Transit is now working with INFC submitting the full applications for funding consideration.

These programs will directly help Brampton support the federal government's mandate of reaching 5,000 new zero emission buses and support the purchase of only zero emission buses beginning in 2023.

### ZEB Trial - Phase II

The scope of the Phase I BEB Trial is being expanded to include additional ZEB propulsion technologies. Based on funds approved within the 2022 Capital Budget, as part of an expanded Phase II ZEB Trial, the following zero-tailpipe emission buses are proposed to be added to the Brampton Transit fleet in 2023/24:

- An additional ten (10) BEBs to fully electrify the Route 23 – Sandalwood; and,
- Two (2) hydrogen fuel cell battery electric buses (FCEB); and,
- Conversion of up to three (3) diesel / diesel-electric hybrid buses to fully electric, zero-tailpipe emission buses.

EOI's have been submitted to INFC for ZETF funding of these Phase II projects, and staff are continuing to work closely with INFC to submit the required full applications.

### ZEB Transition Planning

The City of Brampton remains committed to greening the transit fleet and keeping our residents moving with the safe, reliable and sustainable service they depend on. In doing so, as previously reported to Council on September 30, 2020, through staff report Brampton Transit-2020-095 (CW216-2020), Council approved two key undertakings to establishing our pathway to a zero-tailpipe emission bus fleet.

The progression of Brampton's ZEB planning, including both of the undertakings noted below, are in conformance to both the prerequisite requirements within the ZETF program as well as the ZEB rollout process map (A 10-Step Guide to Reaching Transit Decarbonization Goals<sup>2</sup>) developed by CUTRIC for Natural Resources Canada.

CUTRIC is a not-for-profit member-based consortium of public and private transportation innovation leaders:

- Since – 2015
- Founding Members: Brampton Transit, Toronto Transit Commission, ARTM (Quebec), York Region Transit, Burlington Transit, Metrolinx.
- Members: 140+ (Transit Agencies, Utilities, Government, Industry, Consultancy, Academia, and Not-for-Profits)
- National Operations: Ontario, Quebec, British Columbia, Alberta, and Manitoba

---

<sup>2</sup> CUTRIC website: <https://cutric-crituc.org/zero-emissions-consulting/start-your-decarbonization-journey/>

### *1 – Feasibility Study:*

As approved by Council in 2020, CUTRIC was engaged to undertake the initial Fleet Electrification Feasibility Analysis & Simulation Based Planning Study beginning in December 2020. This study includes two phases:

- Phase one - successfully completed in December 2021. Phase 1 was fully funded by Brampton (\$250K) with CUTRIC reimbursement of \$47K provided through an eligible provincial grant program (through the MEDJCT); and,
- Phase two - currently underway, with completion scheduled in June of 2022. Phase 2 is being fully funded directly by FCM to CUTRIC (\$175K).

### *2 – Implementation Strategy:*

With Phase 2 of the feasibility study now underway, staff are currently preparing to initiate and substantially complete the ZEB Implementation Strategy and Rollout Plan (Plan) in 2022.

Through recommendations contained in CW216-2020, Council previously provided approval for staff to begin procurement for the Plan, which was at that time envisioned to be initiated by way of a competitive procurement process. Over the past eighteen (18) months, much has changed. Based on new information made available in Q1 of 2022, staff are now recommending a different approach.

Firstly, over the course of 2021 and 2022, CUTRIC has built significant capacity within their not-for-profit consulting arm “*Zero Emission Bus (ZEB) Consulting Services*”<sup>3</sup>. This increased capacity and expertise is enabling CUTRIC to provide innovative and highly technical consulting services to its members (of which Brampton Transit is a founding member of CUTRIC) at not-for-profit rates. This enables CUTRIC to be technology agnostic, transparent, and client-focused.

Secondly, recently on March 30, 2022, the Government of Canada officially announced CUTRIC as having been named (and selected by way of a competitive procurement process) as the National ZEB Planning Service for the Government of Canada<sup>4</sup>. CUTRIC is working directly with INFC to deliver the planning components of the ZETF described further in this report, with up to 80% of ZETF funding available to transit agencies within a fast-tracked process.

By engaging CUTRIC directly in their capacity as the not-for-profit National ZEB Planning Service, there are numerous benefits to the City in doing so. These include, but are not limited to:

- Ability to negotiate the required scope of services directly with CUTRIC, including the budget without the need of a lengthy RFP process.

---

<sup>3</sup> CUTRIC ZEB Consulting Services: <https://cutric-crituc.org/zero-emissions-consulting/>

<sup>4</sup> Government of Canada: <https://www.canada.ca/en/office-infrastructure/news/2022/03/government-of-canada-advances-supports-for-zero-emission-bus-transportation.html>

- Ability to include technical advisors as may be required for specialized areas of electrification expertise (e.g. energy service providers including Ontario Power Generation / PowerON, Alectra, etc.)
- Brampton executes a Contract for Services directly with CUTRIC, mutually agreeing upon the work program.
- CUTRIC recovers up to 80% of eligible project costs directly from INFC through the ZETF.
- Brampton then pays CUTRIC directly for the remaining 20% of eligible project costs, which remain within CUTRIC as the transit industry's not-for-profit.
- Having completed the feasibility work already, CUTRIC has a significant amount of highly technical feasibility planning data at its ready that will enable CUTRIC to execute quickly. This will ensure substantial completion of the Plan in 2022.
- Staff are confident in working directly with CUTRIC will result in the best overall value for the City.

It is for the reasons stated above; staff are now recommending and seeking Council's approval to proceed in furthering CUTRIC's engagement to include the completion of the Plan. Furthermore, at the appropriate time, staff will be seeking Council's future endorsement of strategic zero-emission transit goals developed as part of the plan.

### **Corporate Implications:**

#### Financial Implications:

At this time, there are no financial implications regarding the Trials (Phase I or II) or the required planning studies (feasibility or implementation).

Refer to Appendix B for a breakdown of the approved capital budgets for these projects.

As Transit's capital and major infrastructure electrification projects are funded or financed, there may be requests for municipal capital and operating contributions in order to implement and administer these projects. Such approvals will occur through the regular budget process, or amendments as may be required.

#### Other Implications:

Purchasing:

ZEB Implementation Strategy and Rollout Plan:

- Under Schedule D, paragraph 9(e) of the City's Purchasing By-law, procurement of goods or services from non-profit organizations are exempt from the procurement processes set out in the Purchasing By-law.

Resourcing requirements:

Electrification of the Transit fleet represents the single most significant technological change for bus operations in the history of Brampton Transit. This massive initiative requires an additional technical workforce to bring to fruition. Electrification includes not

only the conversion of the existing conventional diesel and diesel-electric hybrid bus fleet to a fully electric zero emission fleet, it also includes significant new electrical infrastructure and retrofits to our existing Clark and Sandalwood Facilities.

With the CIB arrangement now financially closed and ZETF funding applications in queue, BEBs are expected to be in operation through to the earliest 2044. A dedicated team that will focus on Transit's overall electrification program is now required. Staff will present a budget amendment request to Council at a future date.

#### Future Potential Opportunities for Energy Services

- Future potential opportunities exist for the City in pursuing a partnership arrangement with a third party energy services provider.
- Possibility to lock in electricity rates in step with forecasted CIB model to minimize risk.
- Provisioning for design, build, finance, operate, maintain (DBFOM model) of on street and facility related electrification infrastructure.
- Guaranteed service uptime and redundancies.
- Smart charging, energy storage provisions further reducing City's costs.
- Staff continue to explore options related to the provision of an energy services partnership, and will report to Council as required.

#### **Term of Council Priorities:**

Transitioning to a green and sustainable transit fleet through electrification supports the Brampton 2040 Vision and the 2019-2022 Term of Council Priorities, which established commitments to improve transit, implement a green framework for sustainable growth, and lead in environmental innovation. Transit electrification builds on Council's Climate Emergency declaration in support of building a Green City, and helps to achieve the goals established by the Government of Canada including the ultimate goal of becoming net zero emissions by 2050.

As Transit accounts for almost 71% of the Corporate City of Brampton GHG emissions<sup>5</sup>, the electrification of the transit fleet will significantly contribute to reducing the City of Brampton's GHGs, in keeping with the City's established corporate reduction targets:

- Short-term: 20% GHG emission reduction target by 2024.
- Long term: targets to achieve GHG emission reductions of 30% in 2030 and 80% in 2050.

A well-connected environmentally sustainable transit network is critical to building Brampton's position on Canada's Innovation Corridor, and these zero emission electric bus initiatives will continue to drive more Brampton innovation to the Corridor, while continuing to position Brampton Transit as a leader in sustainable transportation and Brampton as a Green City.

---

<sup>5</sup> Based on the 2018 data; City of Brampton Community Energy & Emissions Reduction Plan (CEERP) and Environmental Master Plan Refresh (Brampton Grow Green).

**Conclusion:**

Investments in public transportation help reduce commute times, create jobs, promote economic growth, and fight climate change. Key considerations for moving forward along the electrification pathway include the administrative requirements, funding and financing considerations, timeframe for implementation, and development of key strategic partnerships for the design, build, funding/financing, operation, and maintenance of electrical infrastructure required to sustain a fully electric zero tailpipe emission transit fleet. Brampton Transit is proud to help lead Canada into a new era of electric zero emission public transit.

Authored by:

Scott Gillner  
Senior Policy Advisor, Transit Services

Reviewed by:

Ivana Tomas  
Director, Transit Services

Approved by:

Alex Milojevic  
General Manager, Transit

**Attachments:**

Appendix A - CW216-2020; Council Resolution, eBus Update, September 30, 2020  
Appendix B - Approved Capital Project Budgets, Transit Electrification Studies