

City of Mississauga  
**Corporate Report**



<p>Date: February 22, 2022</p> <p>To: Chair and Members of General Committee</p>	<p>Originator's files:</p>
<p>From: Geoff Wright, P.Eng, MBA, Commissioner of Transportation and Works</p>	<p>Meeting date: March 9, 2022</p>

## Subject

**MiWay Hydrogen Fuel Cell Electric Bus Update – March 2022**

## Recommendation

1. That the report "MiWay Hydrogen Fuel Cell Electric Bus Update – March 2022" dated February 22, 2022 from the Commissioner of Transportation and Works be approved.
2. That the Purchasing Agent or designate be authorized to execute a contract on a single source basis with the Canadian Urban Transit Research & Innovation Consortium (CUTRIC) in the amount of \$19,429 to assist with the completion of Stage 2 ZETF funding application. MiWay can accommodate this additional funding request within the approved 2022 budget.
3. That the Commissioner of Transportation and Works be authorized to negotiate and enter into a non-binding Memorandum of Understanding (MOU) with all project partners, including all necessary documents ancillary thereto, in a form satisfactory to Legal Services.
4. That a by-law be enacted to authorize the City Clerk and the Commissioner of Transportation and Works to execute, on behalf of The Corporation of the City of Mississauga, the Memorandum of Understanding (MOU) with CUTRIC, Enbridge, Cummins (Hydrogenics), New Flyer, and Ballard.

## Executive Summary

- The Phase 1 – Feasibility Study commenced in April 2021 and is on track to be completed in April 2022. It will deliver the lifecycle energy, emissions, and economic performance analyses of the Fuel Cell Electric Buses (FCEBs) and fuelling infrastructure, along with a preliminary Zero-Emission Bus (ZEB) roadmap for MiWay based on fuel cell electric transit buses.

- As of February 2022, a CUTRIC MOU in its draft form has been reviewed by the City's legal counsel and is awaiting approval and signatures from the other project partners. The City is requesting approval from General Committee to enter into the MOU (as per recommendation by Legal) with CUTRIC and other project partners which include Enbridge, Cummins (Hydrogenics), New Flyer, Ballard, and City of Mississauga.
- As of January 2022, Infrastructure Canada completed their review of our Expression of Interest (EOI) submission, and have subsequently invited the City to Stage 2 of the application process. In order to proceed with the Stage 2 ZETF, \$19,429 will be paid to CUTRIC to assist with the application on behalf of MiWay.
- The provincial government has yet to commit funding opportunities that the City would be able to use for the project. The province currently has no active funding streams for any initiatives related to the FCEB project. CUTRIC and the project partners will continue to encourage political decision-makers to designate one-off funding for the project.

## Background

### Introduction

The purpose of this project is to deploy innovative Fuel Cell Electric Bus (FCEB) technology within the City of Mississauga's bus fleet, coupled with a local green hydrogen fuel supply chain in the Greater Toronto and Hamilton Area (GTHA). Supported by an ongoing feasibility assessment, the commercialization phase of this trial will facilitate the procurement, operation, and performance assessment of 10 Hydrogen FCEBs and critical fuelling infrastructure at MiWay facilities. The project aims to demonstrate the viability of this technology as a zero-emission solution for transit decarbonization while fostering integration of green hydrogen to kick-start the hydrogen ecosystem in Mississauga and surrounding GTHA.

As of February 2022, there are still no dedicated hydrogen fuel cell electric buses operating in Canada. An initial deployment is therefore important and necessary for MiWay to examine the feasibility of introducing this zero-emission carbon technology into its fleet on a larger scale to meet the City's climate change targets. The benefits of this FCEB initial deployment project include long-term fuelling solution, scalable green hydrogen delivery, outdoor storage for ZEB technology without Battery-Electric Bus (BEB) range and infrastructure limitations, and creation of local jobs in Mississauga and surrounding GTHA.

A preceding Corporate Report on this matter was provided to General Committee in June 2021, which was to provide an update on the Phase 1 Feasibility Study, as well as the Phase 2 Funding Strategy to fund the initial deployment project. Since then, there has been progress on both Phase 1 and Phase 2 of the project as mentioned in this report.

## Current Situation

### **Zero-Emission Transit Fund (ZETF)**

In the summer of 2021, Infrastructure Canada officially invited applicants to apply for funding under the ZETF program. As a result, the City, in conjunction with CUTRIC, submitted an Expression of Interest (EOI) in October 2021. As of January 2022, Infrastructure Canada completed their review of our EOI submission, and the City has been invited to Stage 2 of the application process. This funding program will allow the City to partially fund the following:

- Program management costs to monitor the project;
- Costs for five years of empirical analysis of the operational performance of the equipment and systems installed as part of this project;
- Capital costs of FCEB equipment;
- Capital costs of the fuel supply equipment on the transit agency property, that is, fuel dispensing equipment to be installed at MiWay's Malton bus depot; and
- Capital costs of Malton bus depot / facility modifications.

For Stage 2 of ZETF, City staff will work with CUTRIC and other project partners to complete the application. The funds, in which the City can accommodate using existing 2022 budget, would allow CUTRIC to execute funding contribution agreements with all levels of government which include project management, development of project steering committee and agreements, government advocacy and lobbying, funding applications to both the federal and provincial government, marketing, and public relations. The costs associated with the pre-funding service agreement is shared amongst all project partners.

### **Provincial Hydrogen Strategy**

In January 2022, CUTRIC sent a letter to the Ministry of Energy urging the Province to move forward expeditiously with a robust hydrogen strategy that would lay the foundation for a cutting-edge and dynamic hydrogen economy across the Province with a particular focus on transit, which is ready to deploy today. In November 2020, the Province launched stakeholder consultations on developing a provincial hydrogen strategy, in which the City has provided feedback. The City signed off on this recent letter, as well as other CUTRIC members and project partners. We are awaiting a response back.

### **Memorandum of Understanding (MOU) – Project Partners**

In order to receive commitment from all project partners for this project over the first five years, CUTRIC has developed a non-binding MOU in conjunction with all project partners which include MiWay, New Flyer, Ballard, Cummins (Hydrogenics), and Enbridge. The purpose of the MOU includes language related to goals and objectives of the project, description of the

components of the project, intended roles and responsibilities of the project partners, intended collaborative relationship between the project partners, and project management and governance details of the project. The MOU contains several overarching goals and objectives associated with the Project, which are shared by all signatory agencies. Key goals and objectives relate to:

- Demonstration and integration of the operation of 10 FCEBs at MiWay;
- Development of green hydrogen distribution and refueling infrastructure;
- Safe, secure and reliable supply of green hydrogen fuel for operation of the buses for their full 12 year lifecycle;
- Program management and governance;
- Public affairs; and
- Empirical analysis of the operational performance of the buses and the fuel supply equipment for the first five years of the lifecycle of the buses

As of February 2022, a non-binding MOU in its draft form has been reviewed by the City's legal counsel and the other project partners have already signed the MOU. City staff is requesting approval from General Committee to enter into the MOU (as per recommendation by Legal) with CUTRIC and other project partners which include Enbridge, Cummins (Hydrogenics), New Flyer, Ballard, and City of Mississauga. The MOU commits the parties to enter into subsequent binding agreements (e.g. purchase orders, service agreements) if required funding is approved.

### **Project Outreach and Advocacy**

Over the past year, MiWay staff have also contributed significantly to the advocacy for this project by presenting at many different conferences including Global Mass Transit, CUTRIC, Canadian Hydrogen and Fuel Cell Association, and others. MiWay has publicized the importance of a project of this nature and members from all levels of government have attended these conferences and presentations.

## **Comments**

### Phase 1 Feasibility Study – Hydrogen Fuel Cell Electric Bus

The feasibility study commenced in April 2021 and is on schedule to be completed in April 2022. It will deliver the lifecycle energy, emissions, and economic performance analyses of the FCEBs and fuelling infrastructure, along with a preliminary ZEB roadmap for MiWay based on fuel cell electric transit buses.

As of February 2022, CUTRIC has completed the literature review of the Canadian hydrogen electric bus landscape, data collection, GIS mapping of entire fleet, duty cycle generation, and

energy consumption analysis. The GHG and total cost of ownership analysis is in progress and the final report will be available to City staff in April 2022.

### Phase 2 - Hydrogen Fuel Cell Electric Bus Funding Strategy

The City, in collaboration with CUTRIC, have been committed in securing funding for this project. As of February 2022, the only funding application submitted and pending to be confirmed is the ZETF.

The Federal government has announced program(s) where the City has applied for funding however, the Provincial government currently has no active funding streams for any initiatives related to the FCEB project. We therefore need to encourage political decision-makers to designate one-off funding for the project.

In order for this project to be successful, the minimum viable project requirements still exist. This includes a turn-key solution option, upgrades to the maintenance facility, and MiWay must retain the ability to sole source the FCEBs and other project components such as fuel production, hydrogen transportation, hydrogen fuelling station, and maintenance support contracts.

## Strategic Plan

The introduction of FCEBs would contribute to two strategic goals: **Move** (Develop Environmental Responsibility) and **Green** (Lead and Encourage Environmentally Responsible Approaches). Mississauga has been proactive in sustainability and climate change governance for over two decades. This includes joining the FCM Partners for Climate Protection program in 1999, integrating climate change and environmental considerations into the City's Strategic Plan in 2009, developing the City's Living Green Master Plan, integrating climate change considerations into its Official Plan in 2012, and becoming a signatory to the Global Covenant of Mayors for Climate and Energy (coalition of 10,000 Cities) in 2017. In 2019, recognizing the need for urgent and significant action on climate change, Council declared a Climate Emergency and later approved the Climate Change Action Plan (CCAP). Through the CCAP the City has committed to replace the transit bus fleet with low or zero emission vehicles and to pursue innovative low or zero emission pilot and partnership opportunities (actions 17-5 and 17-6). The FCEBs support both these actions and showcase the City as a leader on climate change.

## Financial Impact

For **Phase 1** – there is no funding impact and the project is on track to be completed in April 2022. No additional funds are required.

For **Phase 2** –the \$19,429 to complete the Stage 2 ZETF application can be accommodated from the 2022 approved budget (Account 23505-715601).

## Conclusion

In summary, this initial FCEB deployment project will be one of Canada's first, and represents an opportunity for Mississauga to be a National leader in innovative clean technology. This project will see the creation of many new highly-skilled jobs in Ontario, lower greenhouse gas emissions, and provide positive impacts to the hydrogen ecosystem.

Once a decision has been made regarding the Stage 2 ZETF application, City staff will provide another status update report outlining the financial situation and impact for the Hydrogen FCEB project.



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Geoff Wright, P.Eng, MBA, Commissioner of Transportation and Works

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