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Item No. 14.1.2
Halifax Regional Council
October 4, 2016

TO: Mayor Savage and Members of Halifax Regional Council

Original Signed by 

SUBMITTED BY:

Jacques Dubé, Chief Administrative Officer

Original Signed by 

Jane Fraser, Acting Deputy Chief Administrative Officer

DATE: September 6, 2016

SUBJECT: NSPI Partnership – Electric Bus Feasibility Study

ORIGIN

Halifax Transit 16/17 Budget and Business Plan – Alternative Fuel Study

LEGISLATIVE AUTHORITY

Section 79 of the Halifax Regional Municipality Act indicates that HRM has the power to expend money on services that require vehicle fleets including police, fire, public transit, snow and ice removal and solid waste collection.

RECOMMENDATION

It is recommended that Halifax Regional Council approve entering into a joint partnership and joint funding arrangement with Nova Scotia Power Inc. to undertake a third-party feasibility study on the usage of electric buses at Halifax Transit, in the amount of \$50,000 with funding to come from CMU01095.

BACKGROUND

Transportation currently contributes 22% of global greenhouse gas (GHG) emissions, a share which is often flagged as a target for potential reduction. Public transit is seen as key contributor to assisting in reduction of emissions because it encourages the public to abandon the car as the primary mobility choice based on cost and convenience. The nature of fixed routes and timely schedules offer an ideal environment in which to utilize electric powertrain technology. (Mahamoud, Ferguson, Garnett, & Kanaroglou, 2016)

While the use of electrical public transit vehicles (EV's) has become a standard in Europe, through a directive of the European Union Act, their usage is relatively new to the North American market – Canada specifically. This is because there has not been a wide variety of manufacturers approved for operation in Canadian jurisdictions under the Canadian Motor Vehicle Safety Act and its accompanying standards (CMVSS); this however has all changed in the last few years with a number of vendors providing CMVSS approved options to the market.

Another key contributor to the rather slow uptake among transit providers in Canada has been the lack of standardization with respect to charging systems in the industry; each vendor maintains a proprietary system which raises issues of obsolescence should technologies change as well as vulnerability with respect to sole source contracts. Obsolete equipment or having to introduce two charging standards increases financial risk and increases the overall complexity of the system.

Because of this concern many jurisdictions have elected to pilot electric buses, to “prove in” the technology and assess the pros and cons while the market matures. Jurisdictions that are piloting electric buses are listed below:

- The Province of Quebec in partnership with Hydro Quebec is leading the Country in electric vehicle utilization supported by the Running on Green Power strategy launched in 2011 which “seeks to transform Québec society into a North American leader in the field of sustainable mobility through the use of hydroelectricity”. The ultimate goal is to create an individual and collective transportation chain fuelled by electricity by 2020. (Province of Quebec, 2011). Under this umbrella program municipalities are incented to pilot EV’s. As a result, transit providers across Quebec are testing EV’s:
 - Quebec City has operated eight battery operated mini buses since 2008. These vehicles manufactured by Tecnobus, a European manufacturer, travel a 5.3km route (Societe de transport de Monteval (STM), 2013)
 - Laval, Que operates one 40’ conventional bus by a US manufacturer DesignLine that requires a 4 hour charge (Societe de transport de Monteval (STM), 2013)
 - The City of Montreal completed a 40’ conventional bus pilot using a BYD bus . The BYD bus is designed by a Chinese company that builds the vehicles in the US; these battery operated vehicles require a 4 hour charge. (Societe de transport de Monteval (STM), 2013)
 - The Société de transport de Montréal (STM), in partnership with Volvo Group’s North American Subsidiary NovaBus, will launch the first route under the City Mobility Program which will seek to have STM’s entire fleet converted to electric by 2025. (NovaBus, 2013). This pilot uses Nova Bus’s overhead opportunity charging system.
- In the Province of Manitoba, Manitoba Hydro has partnered with Winnipeg Transit and New Flyer Industries on the deployment of EV’s on an airport route. This pilot utilizes New Flyers overhead opportunity charging system. (Mass Transit, 2014)
- In the Province of Alberta:
 - The City of St Alberts ordered three 35’ BYD battery powered buses; St. Albert’s Transit will be the first transit operator to fully deploy EV’s on its routes (Business Wire, 2016)
 - The City of Edmonton completed a pilot of the three 40’ BYD vehicles in 2016. (Marcon, 2016) The City is contemplating the procurement of 40 battery operated EV’s in 17/18. (Stolte, 2016)
- In the Province of Ontario:
 - Ontario Premier Kathleen Wynn announced her government is providing \$10M over 4 years to the Canadian Urban Transit Research Consortium (CUTRIC) to help develop next generation transportation technologies.
 - CUTRIC is also partnering with Brampton Transit to lead the Pan-Ontario Electric Bus Demonstration Trial. The demonstration trial would involve testing 35 buses on routes run by eight municipal transit agencies. Local utility companies would also be partners in the demonstration project designed to test the feasibility of using these electric road vehicles for mass transit. (The Province of Ontario, 2016)

The usage of EV’s in the provision of public transit service is compelling from a number of perspectives; primarily they offer a cleaner alternative to the usage of fossil fuels; however they are also quieter, reduce noise pollution and are generally less costly to operate and maintain.

DISCUSSION

Halifax Transit is currently exploring opportunities for the adoption of alternative fuels in the operation of its transit fleet. The motivation to study available options hinges on the expansion and recapitalization of the Burnside Transit Centre (BTC) located at 200 Ilsley Ave. The Burnside Transit Centre has been operating beyond its capacity for a number of years. A Burnside Transit Centre Expansion feasibility study is currently underway, and will help to determine the next steps for accommodating the growth of the transit system. Therefore it is important to understand both the design and financial implications of moving to an alternative fuel source to inform the future design and planning for the transit centre.

In April, 2016 Halifax Transit completed a study that explored the design/cost implications of using compressed natural gas vehicles (CNG) at the BTC facility. The findings from this study will be used to inform a business case that is being developed between Heritage Gas and Halifax Transit. CNG buses are fully deployed in many jurisdictions and therefore significant benchmark data exists from which to derive cost/benefit analysis.

Halifax Transit is now embarking on a study of the feasibility of the use of electric vehicles in the operation of its transit service. Most jurisdictions across North America employ a mix of fuels to meet their service obligations, either: electric/diesel; electric/diesel/hybrid or electric/CNG. A mix of fuels is required because EV's have a limited range and operate more efficiently in areas of greater density with continuous service; vehicles using other fuel options are deployed for routes that are limited in duration or have a longer range.

Halifax Transit's desire to explore the feasibility of EV's is aligned with the Municipality's Integrated Community Sustainability Plan (Halifax Regional Municipality, 2010), as well as the Province's Sustainable Transportation Strategy, both of which seek to reduce the negative impacts of fossil fuels (Government of Nova Scotia, 2013)

NSPI's interest in partnering with the Municipality rests in the alignment of its mandate to produce renewable, cleaner and greener power, as set out in the Province of Nova Scotia's Electricity Plan entitled Our Electricity Future (Province of Nova Scotia, 2014). The deployment of EV's at Halifax Transit can be seen as important first step in large scale EV adoption.

Halifax Transit is therefore recommending entering into a partnership with NSPI to co-fund a feasibility study for the implementation of EV vehicles. The study will:

- Assess the cost/benefit implications of EV technologies - opportunity vs. overnight charging systems within the context of Halifax Transit's scheduled routes.
- Assess the operational considerations related to range limitations and impacts to scheduling.
- Recommend the best option with respect to technology and route for a pilot project.
- Provide the capital cost implications of moving to either opportunity/overnight charge technologies at both the Burnside and Ragged Lake Facilities.

On August 16, 2016 the Federal government agreed with the Municipality's direction on EV's and approved a 50/50 joint funding arrangement in the amount of \$500,000. Information gleaned from the study will be the used to determine the most suitable EV for procurement and trial in the region.

FINANCIAL IMPLICATIONS

The estimated cost of this study is \$50,000 with NSPI contributing \$10,000 to the completion. The estimated total contribution of the Municipality is \$40,000.

The feasibility study will be funded from Project Account No.CMU01095 - Transit Strategy. Budget Availability has been confirmed by Finance.

Budget Summary: **Project No. CMU01095 – Transit Strategy**

Cumulative Unspent Budget	\$ 88,934
Less Estimated cost of study	\$ 50,000
Plus NSPI contribution	<u>\$ 10,000</u>
Balance	\$ 48,934

RISK CONSIDERATION

There are no risks or obligation stemming from this study.

COMMUNITY ENGAGEMENT

N/A

ENVIRONMENTAL IMPLICATIONS

N/A

ALTERNATIVES

Council could recommend that Halifax Transit complete the study independently.

ATTACHMENTS

Attachment 1 - Bibliography

A copy of this report can be obtained online at <http://www.halifax.ca/council/agendasc/cagenda.php> then choose the appropriate meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

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Attachment 1 – Bibliography

- Business Wire. (2016, 03 23). *Business Wire News*. Retrieved 08 18, 2016, from Business Wire:
<http://www.businesswire.com/news/home/20160303006755/en/City-St.-Albert-Sets-Tone-Era-Canadian>
- Government of Nova Scotia. (2013). *Choose How you Move: Exploring Sustainable Transportation Nova Scotia*. Halifax: Province of Nova Scotia.
- Halifax Regional Municipality. (2010, 04 23). *Council Reports*. Retrieved 08 2016, from Halifax.ca:
<https://www.halifax.ca/council/agendasc/documents/100518cai10.pdf>
- Mahamoud, M., Ferguson, M., Garnett, R., & Kanaroglou, P. (2016). What Hinder Adoption of the Electric Bus in Canadian Transit? Perspectives of Transit Providers. *ScienceDirect*, 1-20.
- Marcon. (2016). *Electric Bus Feasibility Study*. Edmonton: Marcon.
- Mass Transit. (2014, 12 1). *Sustainability*. Retrieved 07 18, 2016, from Mass Transit:
http://www.masstransitmag.com/press_release/12023050/new-flyer-battery-electric-buses-enter-into-service-with-winnipeg-transit
- NovaBus. (2013, Nov 22). *Media*. Retrieved 08 18, 2016, from NovaBus:
<http://www.novabus.com/media/latest-news/montreal-to-become-city-of-electro-mobility.html>
- Province of Nova Scotia. (2014). *Our Electricity Future - Nova Scotia's Electricity Plan 2015-2016*. Halifax: Province of Nova Scotia.
- Province of Quebec. (2011, 04). *Running on Green Power*. Retrieved 08 2016, from Province of Quebec:
<http://www.international.gouv.qc.ca/en/tokyo/actualites/8982>
- Societe de transport de Monteval (STM). (2013). Evaluation of BTM eBus. *CUTA* (p. 14). Gatineau: Societe de transport de Monteval (STM).
- Stolte, E. (2016, 06 22). *News*. Retrieved 08 18, 2016, from Edmonton Sun:
<http://www.edmontonsun.com/2016/06/22/stakes-are-high-as-edmonton-city-council-debates-electric-ets-buses>
- The Province of Ontario. (2016, 04 25). *The Province of Ontario*. Retrieved 07 2016, from Newsroom:
CUTRIC is also partnering with Brampton Transit to lead the Pan-Ontario Electric Bus Demonstration Trial
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