

Opportunity to Expand Edmonton's Electric Vehicle Charging Station Network

Recommendation:

That Administration include an unfunded service package and capital profile for consideration in the Fall 2016 Supplemental Operating and Capital Budget Adjustment process as detailed in the September 28, 2016, Sustainable Development report CR_3961.

Report Summary

This report proposes a pilot project to establish approximately 200 publicly-accessible electric vehicle charging stations. With matching funding from Natural Resources Canada, the pilot project will assess the feasibility, costs, benefits and siting of such a network in Edmonton. As well, it will both position Edmonton as Alberta's electric vehicle leader and support the uptake of electric vehicles within the City's municipal fleet.

Previous Council/Committee Action

At the September 19, 2016, Agenda Review Committee meeting, this report was rerouted to the September 28, 2016, Urban Planning Committee meeting.

Report

The transportation sector accounts for 30 percent of Edmonton's greenhouse gas emissions, making it a focus of the City's intent to reduce community greenhouse gas emissions as described in *The Way Ahead*. City Policy C585 - Edmonton's Community Energy Transition Strategy provides direction in this regard, calling for "increased electrification of Edmonton's transportation system with passenger vehicles, buses, light trucks and trains powered by clean electricity." The focus on electrification is essential, given that plug-in electric vehicles emit significantly less greenhouse gas than their internal combustion counterparts.

The Eight-Year Action Plan supporting Edmonton's Community Energy Transition Strategy outlines a number of initiatives to advance electric vehicle ownership in Edmonton including:

- Tactic 4.4.9B: Conduct a study to understand how Edmonton should prepare for electric vehicles in the community. As part of the study, assess infrastructure needs (e.g., charging stations throughout the community and in new buildings) and supporting bylaws.

To advance this tactic, Administration is proposing a pilot project that will evaluate the feasibility of a small scale, publicly-accessible, electric vehicle charging station network in Edmonton. The timing of this pilot project in 2017-2018 is sound given the opportunity

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that exists for matching funding from Natural Resources Canada. In May 2016, Natural Resources Canada issued two requests for proposals for projects that will evaluate and advance electric vehicle charging station infrastructure in Canada. City of Edmonton applications for this funding were submitted in July 2016 for this one-time funding, with approvals pending at the time of this report. The applications requested \$1.2 million from Natural Resources Canada, to be matched equally by the City of Edmonton (\$850,000 in operating funding and \$350,000 in capital funding).

With City Council's approval, Administration would proceed with the development of a detailed pilot project plan that would be submitted for further review along with an unfunded service package and capital profile as part of the fall 2016 Supplemental Operating and Capital Budget Adjustment process.

Pilot Project Concept

The goals of the proposed pilot project are to evaluate:

- the reliability, operating considerations, operating costs, siting considerations, and maintenance costs of electric vehicle charging stations in Edmonton
- the importance of a publicly-accessible electric vehicle charging station network in encouraging the ownership of electric vehicles in Edmonton
- different ownership and partnership approaches for increasing the number of publicly-accessible charging stations in Edmonton

Key components of the pilot project will include:

- **Level II Charging Network:** The pilot project will establish a network of approximately 200 publicly-accessible Level II charging stations, situated strategically throughout Edmonton. These stations will provide electric vehicle drivers an opportunity to top-up as they go about their daily travels. It is anticipated that approximately 30 stations will be owned and operated by the City of Edmonton and sited on City property where they can be easily accessed by the public (e.g., recreation facilities, City Hall, tourist destinations, City buildings that are frequently visited by citizens). The other 170 publicly accessible stations will be awarded to private companies/organizations who will own, operate and maintain them at their own privately-owned facilities (e.g. shopping centres, downtown locations, universities and colleges, tourist destinations, hotels, restaurants, etc.). The City of Edmonton has submitted an application to Natural Resources Canada for matching funding for the purchase of these stations. This request for \$1 million is currently under review.
- **Level III Fast Charge Network:** The pilot project will establish four Level III charging stations (situated in Edmonton) on major corridors entering and leaving the city (e.g. Calgary Trail, Yellowhead East, Yellowhead West). Level III stations support electric vehicle drivers who are travelling long distances, providing a full charge in 30 minutes or less. The City of Edmonton has submitted an application to

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Natural Resources Canada for matching funding for the purchase of these stations. This request for \$200,000 is currently under review.

- **Fleet Services Participation:** Fleet Services will participate in the pilot project by exploring a Green Fleet Car Sharing program for the downtown core staff. This will include a small fleet of electric or plug-in electric vehicles stationed out of City Hall, Century Place and/or the Edmonton Tower to be utilized by City staff. This pilot project supports the Sustainable Fleet Management Plan which anticipates the purchase of City-owned electric work vehicles (vans, pick-ups, etc.) as soon as they are available in industry.
- **University of Alberta Participation:** The University of Alberta will support the pilot project by providing a variety of evaluation and advisory services. As well, the University has also applied for funding from Natural Resources Canada for one Level III charging station that, if approved, could be included in the Pilot Project evaluation.
- **Potential Participation by Other Municipalities:** The City's application to Natural Resources Canada also requested up to 50 percent additional funding to accommodate other local and corridor municipalities that had expressed interest in this federal funding, but did not have a project of the required scale to advance an application. If approved, the scope of the pilot project could be expanded to include those municipalities, but it would be incumbent on the other participating municipalities to provide their own matching funding.

Policy

- *The Way Ahead* has approved a Corporate Target to reduce community greenhouse gas emissions.
- City Policy C585 Edmonton's Community Energy Transition Strategy

Risk Assessment

Risk Element	Risk Description	Likelihood	Impact	Risk Score	Current Mitigations	Potential Future Mitigations
Wasted Resources	A risk exists that the charging stations installed through this program will be underutilized, resulting in wasted public resources.	3 - Possible	2 - Moderate	6 - Low	The scale of the program will be limited to 200 Level II and four Level III charging stations until such time as further expansion is deemed justified.	This risk will be mitigated through strong public marketing and communication efforts that will create awareness about the purpose and availability of the expanded charging station network.

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Obsolete Technology	Charging station technology could become obsolete faster than expected.	3 - Possible	2 - Moderate	6 - Low	Charging stations installed through this program can be future-proofed by installing units that exceed the charging requirements of the City's current electric vehicle stock.	
Cost Overruns	Charging stations might be more expensive to operate and maintain than expected.	3 - Possible	2 - Moderate	6 - Low	Feedback from large owners of this technology is positive. Reliability of Level II stations is high and maintenance costs are low.	5-year warranties will be established for the stations installed through this program.

Public Consultation

Edmontonians were consulted on this subject as part of the Citizens' Panel on Edmonton's Energy and Climate Challenges. 92 percent of participants supported a recommendation (put forward by the Panel) that "the City of Edmonton take the measures needed to become a low carbon city by 2050." 75 percent supported (and 25 percent opposed) the recommendation to "reduce the amount of gasoline and diesel used in the vehicle fleet through capacity building, incentives and regulations." Additional stakeholder consultation will be undertaken in developing the detailed pilot project plan, including electric vehicle owners, local car dealerships and owners of private facilities where these stations may be sited.

Budget/Financial Implications

Two components for the funding request

(1)The Unfunded Operating Service Package (Attachment 1), half of which would come from Natural Resources Canada (grant approval is pending as this report is being written). This funding would support the establishment of 170 Level II, privately-owned, publicly-accessible electric vehicle charging stations. The proposed ownership model will require privately-owned facilities where these stations are situated to cover all operating and maintenance costs. While the City will have an administration and oversight role going forward, the related costs are expected to be minimal and funded through existing operating budgets.

(2)The Unfunded Capital Profile (Attachment 2) identifies the need for \$700,000, half of which would be funded with grants from Natural Resources Canada (with grant approval also pending). This funding would support the establishment of 34 City-owned charging stations - 30 Level II and 4 Level III.

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It should be noted that in the event that the application for Natural Resources Canada funding is not approved, the pilot project will not proceed.

Possible Funding Option

The City's Green Fleet Fund is one possible source of funding. In 2008, an energy management consultant was contracted to develop a Sustainable Fleet Management Plan aimed at advancing vehicle technologies to reduce dependence on fossil fuels, carbon dioxide emissions, and energy costs within the City's fleet. As part of Booz Allen Hamilton's recommendations, a Sustainable Fleet Long Term Action Plan was established with a Council-approved Green Fleet Fund of \$4.5 million to be used to offset incremental costs of sustainable technology. This funding was set aside in the Municipal Fleet Replacement Reserve but has not been utilized as expected as hybrid and electric vehicle development has not progressed beyond small passenger vehicles. As this Pilot Project will support the City of Edmonton's Green Fleet strategy, this funding could be put toward the installation of an electric car charging infrastructure for City of Edmonton fleet vehicles to utilize.

Ongoing Operational Cost for Maintenance and Electricity Usage for Electric Charging Station

Preliminary research suggests that the operating and maintenance cost of electric charging stations is low and can be accommodated within existing operating budgets. This assumption will be further tested as the detailed pilot project plan is developed.

Provincial Stand on Electric Charging Station Funding

When developing the applications for Natural Resources Canada grants, Administration made enquiries with the Province of Alberta to determine Provincial support for the projects including possible financial contributions. Although the Province of Alberta was generous in providing letters of support to Natural Resources Canada, it explained that it would not be making electric vehicle program decisions or offering program funding until the Energy Efficiency Advisory Panel's work was completed. An announcement on such a program is not expected until the First Quarter of 2017.

Metrics, Targets and Outcomes

Metrics	<ul style="list-style-type: none">• Number of charging stations installed in Edmonton• Maintenance cost per charging station per year
Targets	<ul style="list-style-type: none">• 30 level II and 4 level III plug in stations delivered through the pilot project• Less than \$100 maintenance cost per station per year
Outcomes	<ul style="list-style-type: none">• Electric vehicles comprise a larger proportion of Edmonton's vehicle stock; internal combustion vehicles a smaller proportion

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Justification of Recommendation:

- City Policy C585 (Edmonton's Community Energy Transition Strategy) states that the City of Edmonton will lead Edmonton in becoming an energy sustainable city, exemplified by a number of things including: "Increased electrification of Edmonton's transportation system with passenger vehicles, buses, light trucks and trains powered by clean electricity."
- The greenhouse gas reduction benefits of electric vehicles are significant. Even in Alberta (where the carbon intensity of the Alberta electricity grid is relatively high) plug-in electric vehicles emit less greenhouse gas than their internal combustion counterparts. This pilot project will position Edmonton as Alberta's electric vehicle leader and will help transition the City's municipal fleet to electric vehicles by providing essential charging station infrastructure.
- It is possible that this pilot project could be supported with matching federal government funding which has been applied for by the City of Edmonton and is currently under review.

Attachments

1. Unfunded Service Package - Privately Owned, Publicly Accessible, Electric Vehicle Charging Station Program
2. Unfunded Capital Profile - City Owned, Publicly Accessible, Electric Vehicle Charging Station Program

Others Reviewing this Report

- G. Cebryk, Acting Deputy City Manager, City Operations
- A. Laughlin, Deputy City Manager, Integrated Infrastructure Services
- T. Burge, Chief Financial Officer and Deputy City Manager, Financial and Corporate Services
- R. Smyth, Deputy City Manager, Citizen Services
- C. Campbell, Deputy City Manager, Communications and Public Engagement