Electric Vehicle Community Charging Pilot Options

ISSUE

In the 2020/2021 Multi-year budget, City Council approved funding for a Community Electric Vehicle (EV) charging infrastructure pilot to begin piloting EV charging stations and start addressing barriers to adoption. The Low Emissions Community (LEC) actions include electrification of private vehicles with a milestone target that 30% of all new vehicle sales are for electric vehicles by 2030, and 90% by 2050, for a total projected savings in emissions of 2,756,000 tonnes CO_2e.

An EV charging equipment supplier has been procured and two Civic Centres have been identified for installation of four charging ports.

Several municipalities offer fully subsidized EV charging during the pilot phases and introduce fees later in a post-pilot environment. Should the City of Saskatoon (City) follow the approach of a fully subsidized pilot or charge a fee when EV charging infrastructure is initially rolled out?

BACKGROUND

History

Actions related to electrification of vehicles are included in the LEC Plan, received by City Council in August 2019, as follows:

- Action 17: Electrify the Municipal fleet over the near-term.
- Action 18: Electrify the Municipal transit fleet.
- Action 21: Electrify personal vehicles through incentive programs, education, and automotive dealer partnerships.
- Action 22: Electrify commercial vehicles through incentive programs, education, and automotive dealer partnerships.

In November 2019, City Council approved $100,000 of capital funding through the 2020/2021 Business Plan and Budget, for a pilot project to encourage Community Electric Vehicle Adoption.

In November 2021, during the City's Business Plan and Budget Deliberations, the following funding was approved for capital project P.10015, EV Adoption Strategy:

- EV Adoption Roadmap-Plan - $45,000 in 2022 and $175,000 in 2023.
- EV Adoption Roadmap-Infrastructure & Charging - $175,000 in 2022.

Current Status

In 2019, 1,094,354 tonnes of CO_2e were emitted from on-road vehicle transportation (including transit) in Saskatoon, an increase of 6.2% between 2014 and 2019. These emissions represent 29% of Saskatoon's CO_2e total, the second highest source of emissions after stationary energy. According to the LEC Plan, if nothing is done to encourage an increase in EV adoption or reduce single passenger vehicle travel, it

is estimated that emissions from transportation will increase 47% by 2050. Common barriers to EV adoption are explained in Appendix 1 - Electric Vehicle Research.

The City has launched a pilot program to introduce battery powered light EVs into the City fleet. Four Chevrolet Bolts were purchased for use by Saskatoon Light & Power (SL&P), Facilities Management, and Parking Enforcement. The outcome of the pilot will help better understand opportunities to right-size the corporate fleet and, based on the assessment of a sample of EVs, determine costs, savings, and other considerations associated with the use of EVs and required infrastructure for civic operations.

Saskatoon Transit completed a one-year pilot with an electric bus, ending in September 2021. Results of the pilot were presented to the March 7, 2022 Standing Policy Committee on Transportation and plans to purchase two battery electric buses are underway for 2023.

The City's *High Performance Civic Building Policy* came into effect on January 1, 2022. Administrative procedures will include "Green Vehicles" building infrastructure as a mandatory LEED credit. The High Performance Civic Building toolkit will provide additional guidance to project managers including best practices for EV infrastructure.

As of February 2022, Plugshare, a web- and mobile-app that provides crowd-sourced data on the availability of EV charging stations, showed 39 Level 2 charging station locations in Saskatoon, with a total of 95 ports. None of these are owned by the City. According to the information on Plugshare, 25 of these locations are available for public use, while others are reserved for guests at the business (for example, hotels). Of the 25 Level 2 chargers available for public use, 21 are free for use (regular parking rates apply) and four charge $0.75/hour or more. Charging fees for energy used (per kwh) is currently not allowed under the *Electricity and Gas Inspection Act* and its attendant regulations, so an hourly rate is used. However, Measurement Canada is currently conducting a review and expects that kWh billing will be allowed for both new and existing charging infrastructure within the next 18 months. More information on EV charging infrastructure is available in Appendix 1.

SaskPower is currently requesting applications for their Electric Vehicle Infrastructure Program which aims to help fund, develop, and install up to 20 public EV fast-charging (Level 3) stations in high-priority areas in Saskatchewan. Eligible organizations (including municipalities) can request up to $200,000 or 75% of their total project costs.

The City issued a Request for Information in 2020 to understand what interest there might be in partnering on installation of EV charging stations. Five responses were received from suppliers of EV charging stations but there was no interest on partnering on the installation at local sites. The City will continue to explore opportunities, including partnerships for funding the electricity usage at charging sites, as further detailed in Appendix 1.

Public Engagement

In 2020, the City conducted meetings with key stakeholders including SaskPower, SaskEV, Saskatoon Public Libraries, Sun Country Highways, and Flo. In late 2019,

Administration had also consulted with stakeholders on EV opportunities as part of engagement on the Low Emissions Community Plan with potential opportunities identified with Federated Co-op, SaskPower, and SaskEV. These discussions informed the City's understanding of EV driver behaviours and provided numerous considerations for choosing pilot locations, many of these are incorporated into Appendix 2 - Considerations and Implications for Electric Vehicle Charging Stations in Saskatoon.

More thorough engagement with the public will be needed as the City continues development of the EV Adoption Roadmap.

City of Saskatoon's Current Approach

Charging Station Procurement

The City issued a Request for Proposal for the procurement of EV charging equipment and awarded a contract to PowerTec Electric for up to 30 ChargePoint smart chargers that can manage EV charging, capturing data, reporting, and collecting fees. This would allow the City to monitor performance and develop a robust network. The City's Fleet department has procured and installed two dual-port EV charging stations at Saskatoon Light & Power and Avenue P civic facilities. The City will procure a contractor to install the public EV charging stations.

Charging Station Locations

Lawson and Lakewood Civic Centres have been identified as desirable locations for public EV charging stations because:

- There are services nearby where people tend to spend at least 1-2 hours;
- They are located in areas of the City that have few chargers;
- They have relatively simple access to electrical infrastructure that has no known capacity or grid-limitations (to be confirmed by electrical review); and
- They do not have parking limitations like those at other leisure centres or Downtown.

More information on location considerations, cost, and user analysis is available in Appendix 2. A dual-port charging station will be installed at both of the civic centres, meaning that each location can have two cars charging simultaneously.

Approaches in Other Jurisdictions

The following provinces had the highest proportion of EV sales (compared to internal combustion engine vehicles) at the end of 2018:

- Ontario 45% of national EV sales;
- Quebec 34% of national EV sales; and
- British Columbia 18% of national EV sales.

The widespread adoption of EVs in these provinces is largely due to comprehensive municipal and provincial EV strategies, subsidies and incentives for the purchase of EVs.

The City reviewed electric vehicle adoption strategies and conducted interviews to understand considerations and implications for installing publicly owned chargers.

According to that research, pilots for EV charging stations often start by being free to the users, but, as networks grow, municipalities look to recover costs for electricity and ongoing operations. Currently, many cities are charging between $1-$2 per hour for use of a level 2 charger. The results of this research are available in Appendix 1.

OPTIONS

With the completion of the technical specifications and the tender, costs for operations and maintenance of the public EV charging stations are now confirmed. How these costs are managed internally or charged back to the users requires further direction from City Council. The Administration is requesting direction from City Council on how much (if anything) should be charged for the use of the EV charging stations during the pilot period. Factors to be considered when deciding on whether to charge for use include:

- Precedence in Saskatoon and other jurisdictions;
- Financial implications to the City in the short and medium term;
- Projected use and user satisfaction; and
- Reputational risk and potential difficulty in imposing future charges.

Three options are proposed, assuming that a total of four ports will be installed at two locations (Lawson and Lakewood Civic Centres), including:

- Fully subsidized EV charging for pilot period;
- Partially subsidized EV charging of $2/hour for pilot period; and
- No subsidized charge $4/hour for pilot period.

For simplicity, the optimal level of subsidization is partially dependent on the objectives of the program and the beneficiaries of the service. Where there is wide public benefit (with little congestion) then full subsidization may be warranted. Public parks and roads are good examples. Where there are benefits to society, but also individual benefits to the user of the service then partial subsidization may be warranted. Examples here include public transit and leisure centre access. Finally, where benefits accrue exclusively to the user of the program or service, then no subsidization is warranted. Examples here include market-based or regulatory services such as permits and licenses. On the latter point, the program costs are fully recovered by the fee or charge.

Another key consideration to ponder with respect to subsidization is affordability and accessibility. Given the cost of EVs, it is highly unlikely that low-income individuals would own an EV. Fully subsidized EV charging would not induce them to do so as income to purchase an EV is a considerable barrier. As such, full subsidization of EV charging stations is likely to benefit higher income households. While more EV charging stations improves accessibility for owners of EVs, they do not generate broad accessibility to the service for those unable to own an EV.

With that context in mind, the annual operating costs for the pilot project include fixed fees charged by Powertec as well as electricity which will vary depending on use. Administration has developed three usage scenarios to project operating costs and revenue, these are:

- Low use - 1 hour per month at each port;

- Moderate use - 3 hours on 15 days per month at each port; and
- High use - 3 hours 30 days per month at each port.

Table 1 shows the operating costs and revenues for each use scenario and rate. More information is available in Appendix 2.

Table 1. Two-year total (4 ports) usage, operating costs, and revenues

	Low	Moderate	High
Usage			
Expected usage per port	1 hour per month	3 hours, 15 days per month	3 hours, 30 days per month
Total hours (4 ports) for two years	96	4320	8640
Operating Costs			
PowerTec Fees	$4,800	$4,800	$4,800
Electricity	$12,400	$15,200	$18,000
Total Operating Cost	**$17,200**	**$20,000**	**$22,800**
Free	$0	$0	$0
$2/hour	($180)	($7,830)	($15,570)
$4/hour	($360)	($15,660)	($31,140)
Net Cost or (Surplus)			
Free	$17,200	$20,000	$22,800
$2/hour	$17,020	$12,170	$7,230
$4/hour	$16,840	$4,340	($8,340)

*10% of session fees are charged by ChargePoint, the service application provider, in exchange for its collection and processing of session fees on behalf of the City.

Option 1 **-** Fully Subsidized EV Charging for Pilot Period of Two Years

This option proposes to install one dual-port ChargePoint charger (supplied by Powertec) at Lawson Civic Centre and one dual-port charger at Lakewood Civic Centre. Under this option the chargers would be free to the user (i.e., fully subsidized) for the pilot period, at which time the pilot results would be reviewed to determine if the pilot should be continued and with what fees (if any).

Financial Implications

- No revenue collection means that the net cost for the two-year pilot will range between $17,200 and $22,800.

Social/Economic/Environmental Implications

- Fully subsidized EV charging is expected to result in higher use, especially for those that might experience barriers such as multi-unit residents and rural commuters.

- Research indicates that fully subsidized EV charging is expected to increase use and contribute to EV adoption through improved visibility of EV charging stations and showcase the City as an environmental leader.
- Providing fully subsidized EV charging only benefits those that can afford to purchase an EV and could negatively impact those that cannot afford an EV but are still contributing (through taxes) to the subsidized cost; however, as a pilot this effect will be minimal.

Advantages

- Aligns with most other public charging rates in Saskatoon.
- Aligns with most other municipalities during pilot projects for EV charging infrastructure.
- May result in increased use, contribute to EV adoption, and show the City as an environmental leader.

Disadvantages

- Most expensive as there is no revenue from fees.
- After two-years, a fee for EV charging may need to be introduced to fund ongoing operations. It may be challenging to start charging fees later if precedent is set now for full subsidization.
- In the medium and long-term, fully subsidized EV charging is neither sustainable nor equitable as benefits accrue directly to higher income households who can afford to purchase an EV.
- Small risk that costs could be even higher than projected if use is more than three hours on 30 days per month, with no ability to mitigate through revenue collection.

<u>Option 2 – Partial Subsidization by Charging $2/Hour for Pilot Period of Two Years</u>

Like Option 1, this option proposes to install one dual-port ChargePoint chargers (supplied by Powertec) that would be installed at Lawson Civic Centre and another dual-port charger at Lakewood Civic Centre. However, under this option, users would be charged a partially subsidized time-based fee of $2/hour for the pilot period. At the end of the pilot period, results will be reviewed to determine if the pilot should be continued and with what fees (if any).

Financial Implications

- Revenue from charging a $2/hour fee will partially offset operating costs. Net cost for the two-year pilot is projected to be between $7,230 and $17,020.

Social/Economic/Environmental Implications

- Provides low cost, public EV charging which can reduce barriers for certain user groups such as multi-unit residents and rural commuters to increase EV adoption.
- Providing partially subsidized EV charging only benefits those that can afford to purchase an EV and could negatively impact those that cannot afford an EV but are still contributing (through taxes) to the subsidized cost; however, as a pilot this effect will be minimal (and less than a fully subsidized rate).

Advantages

- Provides revenue generation potential to offset some operating costs. Potential to cover more of these costs as use increases.
- $2/hour rate is charged by other municipalities and is less than what is charged at some Saskatoon privately-owned EV charging stations.
- Expected to have higher uptake compared to Option 3 and will still showcase the City as an environmental leader.
- Lower risk (compared to Option 1) of cost-over runs if use projections are higher than anticipated. As use increases, more of the costs are covered.

Disadvantages

- Unlikely that costs will be fully recovered.
- May reduce use resulting in reduced ability to collect data on the project, be less effective in promoting EV adoption, and impact the City's environmental reputation compared to free EV charging.
- Benefits accrue directly to higher income households who can afford to purchase an EV.

Option 3 – No Subsidization - Charge $4/Hour for Pilot Period of Two Years

Like Options 2 and 3 this option also proposes to install one dual-port ChargePoint chargers (supplied by Powertec) that would be installed at Lawson Civic Centre and another dual-port charger at Lakewood Civic Centre. However, unlike Options 2 and 3, no subsidization is offered and thus, users would be charged a time-based fee for use of $4/hour.

Financial Implications

- Revenue from charging a $4/hour fee will offset or fully recover operating costs for the two-year pilot. Ranging from a cost of $16,840 or even generate a surplus of $8,340.

Environmental/Social/Economic Implications

- Provides public EV charging which may reduce barriers for certain user groups such as multi-unit residents and rural commuters to increase EV adoption.
- Charging fees for use may result in lower use which may diminish EV adoption and environmental benefits.
- Close-to cost recovery fees increase equity for non-EV users (especially those that cannot afford an EV).

Advantages

- At moderate to high-use, fees will cover most, or all, of the operating costs during the pilot.
- Establishes a precedent for charging fees for electricity which is required for long term financial sustainability and equity.

Disadvantages

- Risk that the higher fees will reduce use (and satisfaction) meaning operating costs will still not be covered, that the City's reputation could be impacted, and that little data from the pilot project is collected for future projects.

RECOMMENDATION

That the Standing Policy Committee on Environment, Utilities and Corporate Services recommend Option 1 to City Council that for a two-year electric vehicle charging station pilot, user fees will not be charged.

RATIONALE

Option 1 allows the City to install four EV charging ports at two desirable locations in the city and offer them free to users during a two-year pilot. This is a very common approach in other municipalities as it allows cities to show environmental leadership and promote the use of these chargers, measure their use, and set the expectation that a fee will be introduced later.

EV's are relatively new and prospective users continue to be uncertain about their benefits and barriers. Reducing barriers by improving the visibility and access to EV charging infrastructure is likely more beneficial at this time for EV adoption than recovering operating costs. The costs to offer free EV charging over two years is projected to range from $16,800 to $22,800 looking at both low and high use scenarios.

Equitable application of fees has been considered, and non-EV users should probably not be subsidizing electricity for EV users in the long-term. However, given the small scale of this pilot, the impact is small, and a fee can be introduced at a later time.

FINANCIAL IMPLICATIONS

The total cost of the pilot project with Option 1, including operational costs with no cost-recovery fees, is expected to range between $117,200 and $122,800 (see Table 2).

There is sufficient funding available for the proposed pilot. City Council approved $100,000 for Project P.01957.01 during the 2020-2021 Business Plan and Budget deliberations. In 2022, $175,000 for EV Adoption Roadmap, Infrastructure & Charging was approved.

Table 2. Capital and Operating Cost Summary

	Costs
Staff	$60,000
Communications	$7,000
Chargers and Install	$35,000
Electricity and PowerTec Fees	$17,200 to $22,800
Total	**$117,200 to $122,800**

The Administration will continue to pursue sponsorships for electricity costs for the pilot stations that may offset costs during the pilot period.

ADDITIONAL IMPLICATIONS/CONSIDERATIONS

Triple Bottom Line Implications

A Triple Bottom Line (TBL) Review was completed for the project, and the results are included as Appendix 3 - Triple Bottom Line Review – Electric Vehicle Community Charging Pilot. Overall, the results of the TBL review indicate that the scaling up of the pilot is required before full TBL benefits can be realized; however, small benefits, especially in environmental and good governance outcomes, will be realized from the pilot itself. Negative social impacts may also occur if the pilot is scaled up and EV charging remains free.

Some of the more significant TBL impacts include:

- Reduced GHG emissions - EVs emit approximately 30% less greenhouse gas emissions than gasoline vehicles, even with the high emissions intensity of Saskatchewan's fossil fuel-based grid. As we switch to renewable and zero-emission sources of electricity, the emissions from EVs will also decrease. Increased electricity use at the two Civic facilities, piloting the chargers, may cause an increase in Corporate GHG emissions but these should be offset by reduced community GHG emissions;
- Improved air quality and health benefits by decreasing combustion of gasoline and diesel;
- Lower costs for users - research points to EVs saving their users money for operating and maintenance; and
- Revenue for the City – while providing EV charging, especially if it is free for the user, has cost implications for the City. An analysis of converting 12 corporate vehicles to electric has shown that, over the useful life of these units, SL&P could see revenues of approximately $7,500 per vehicle.

Legal Implications

Currently, EV charging can only be charged based on time, not electricity. However, many EV charging equipment suppliers are advocating for allowing fee charging per kwh to account for variations in how long it takes to charge such as vehicle limitations, cold weather, or battery state.

IT Implications

The chargers must be integrated with City IT systems. An IT project has been initiated to complete this work in alignment with smart chargers for the City's fleet EVs.

Crime Prevention by Environmental Design (CPTED)

A CPTED review of the proposed EV charging station locations was completed in November 2021, and made recommendations around signage, communications, monitoring, and data collection, which will be followed during installation and launch of the stations. The CPTED Report, including recommendations, are included as Appendix 4 - CPTED Review Report – EV Charging Stations.

COMMUNICATION ACTIVITIES

A communication strategy will be developed to promote the EV charging stations once installed, to educate on the benefits of EV's, and to dispel myths and barriers. Communication activities will include signage at the sites (using branding developed for the City's fleet vehicles), social media, news media, and community events such as "Charged Up" which the City participated in on September 26, 2021.

NEXT STEPS

If the recommendations are approved by City Council, the Administration will:

- Continue to pursue sponsorships with external parties;
- Purchase, install, and test chargers;
- Launch communications and open EV charging stations to the public – targeting Q2 of 2022; and
- Follow up reporting in year 2 of the pilot.

Funding for the development of an Electric Vehicle Adoption Roadmap was approved by City Council in 2022/2023 and the Administration plans to hire a consultant to complete this work. The Roadmap will outline the phased action plan for the adoption of EV's within the City's municipal and transit fleets, and actions to encourage adoption of private vehicles in the community. The Administration plans to apply to the Federation of Canadian Municipalities Green Municipal Fund to support the feasibility studies required for this Roadmap.

Whether to charge/subsidize employees fees for electricity when charging EV's while at work will be considered through the Roadmap.

APPENDICES

1. Electric Vehicle Research
2. Considerations and Implications for Electric Vehicle Charging Stations in Saskatoon
3. Triple Bottom Line Review – Electric Vehicle Community Charging Pilot
4. CPTED Review Report – EV Charging Stations

Report Approval

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