



**City of Kingston
Information Report to Council
Report Number 19-036**

To: Mayor and Members of Council
From: Lanie Hurdle, Commissioner, Community Services
Resource Staff: Peter Huigenbos, Director, Real Estate & Environmental Initiatives
Date of Meeting: January 22, 2019
Subject: Electric Vehicle Strategy Update

Executive Summary:

On October 3, 2017, City Council endorsed the implementation of Kingston's first Electric Vehicle Strategy as a means to reduce greenhouse gas emissions (GHG) from diesel and gasoline use by the municipality and the community. Implementation of the Electric Vehicle Strategy has been composed of four key components:

- Introduction of electric vehicles and related charging infrastructure into the municipal light duty fleet;
- Installation of a public electric vehicle charging station network;
- Examination of potentials for conversion of municipal heavy duty vehicles to electric; and
- Provision of public information regarding electric vehicles and charging opportunities.

As of the date of this report, forty two (42) Level 2 electric vehicle charging stations have been installed at nineteen (19) locations within municipal facilities, parking structures and on-street locations. Council also approved the installation of two Level 3 fast charging stations. An application for fifty percent grant funding (up to \$100,000) for these Level 3 stations from Natural Resources Canada has been successful, though the application for the funding resulted in a delay in installation from the original fall 2018 date to mid-2019.

The installed public EV charging stations have seen good usage, especially within the downtown area, with a total for all stations of 2,134 charging sessions and 16,879 kilowatt hours of electricity dispensed within the first 5 months of operation in 2018. This usage represents the avoidance of gasoline use equivalent to an estimated 27 tonnes of community GHG emissions. The most frequent complaint received from users of the charging stations has been associated with non-electric vehicles blocking parking spots intended for EV charging. To mitigate this issue

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the City has installed signage and applied pavement markings to indicate that the parking spots should only be used by an electric vehicle while charging. At present, the City's parking by-law does not reserve the parking spaces solely for use by electric vehicles. Parking Services staff will continue to monitor the EV charging station usage patterns and data and explore policy options that promote EV charging and are in alignment with broader public parking management practices prior to recommending to Council any changes warranted.

The EV Strategy approved by Council included a 24-month period where Level 2 charging would be provided without cost to users other than existing parking fees. The no-fee period will conclude at the end of 2019. Level 3 EV charging stations will charge a market rate fee as soon as they are installed and go live. Staff will bring a report to Council in the next few months with a recommendation to amend the fees and charges by-law with charging station fees.

Staff expect to complete the installation of the remaining components of the proposed EV charging network by mid-2019 and expect to do so with a capital budget surplus.

Recommendation:

This report is for information purposes only.

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Authorizing Signatures:

ORIGINAL SIGNED BY COMMISSIONER

Lanie Hurdle, Commissioner, Community Services

ORIGINAL SIGNED BY CHIEF ADMINISTRATIVE OFFICER

Gerard Hunt, Chief Administrative Officer

Consultation with the following Members of the Corporate Management Team:

Jim Keech, President & CEO, Utilities Kingston	√
Desirée Kennedy, Chief Financial Officer & City Treasurer	√
Commissioner, Corporate & Emergency Services	Not required

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Options/Discussion:

At its October 3, 2017 meeting, City Council endorsed the implementation of Kingston's first EV Strategy as a means to reduce GHG emissions from diesel and gasoline use by the municipality and the community. Implementation of the EV Strategy has been composed of four key components:

- Introduction of electric vehicles (EVs) into the municipal light duty fleet;
- Installation of a public EV charging station network;
- Examination of potentials for conversion of municipal heavy duty vehicles to electric; and
- Provision of public information regarding EVs and charging opportunities.

Through a Request for Proposals process, Flo Services Inc. (Flo) was selected to supply and install Level 2 and Level 3 charging stations. Level 2 EV charging stations operate at 220 volts and can provide a typical EV with a full charge in 3 to 4 hours. Level 3 EV charging stations (also called fast chargers) operate at 450 volts of direct current (DC) and can provide a full charge in less than one hour. Flo currently operates Canada's largest public EV charging network and each station installed in Kingston is connected via cellular network, allowing EV vehicle operators to discover their locations and availability via the Flo app, and in many cases via their onboard vehicle navigation systems. The network connectivity also allows staff to monitor station use and detect any interruption in operability requiring attention. Flo also provides 24/7 customer assistance via telephone and their smart phone app.

As of the date of this report, forty two (42) Level 2 electric vehicle charging stations have been installed at 19 locations within municipal facilities, parking structures and on-street locations. Additionally, two Level 2 stations will be installed at Norman Rogers Airport in early 2019. Exhibit A provides a list of charging station locations, types and installation status. Staff had also proposed the installation of two Level 3 fast charging stations. A 50% (up to \$100,000) grant for these Level 3 stations was applied for from Natural Resources Canada's (NRCan) Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative, and was successful; however, the participation in the granting program application process has resulted in a delay in installation from the original autumn 2018 date to mid-2019, and the relocation of the Level 3 station intended for the INVISTA Centre to the Frontenac Parking Lot downtown. The relocation of the Level 3 station was done because the downtown area was noted by NRCan as an underserved area while the Gardiners Road area is anticipated to become well serviced with fast charging opportunities in the near future. The planned installation within the Frontenac Parking Lot will result in the creation of two Level 3 and two Level 2 spaces for EV charging. An additional three existing parking spaces will be removed from the current layout of the gravel surfaced lot to accommodate the equipment required (transformer, distribution panel and charging stations) for the new EV charging infrastructure for a total of 7 spaces.

The installed public Level 2 EV charging stations have seen good usage, especially within the downtown area, with a total for all stations of 2,134 charging sessions and 16,879 kilowatt hours of electricity dispensed. This usage represents the avoidance of gasoline use equivalent to an estimated 27 tonnes of community GHG emissions. Station use patterns suggest stations within the high demand downtown parking areas (Clarence Street, Hanson and Chown Garages) are

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used predominantly by commuters and those visiting the downtown likely for shopping, entertainment or personal appointments, while the usage patterns at other locations suggest usage by facility visitors (Woodbine Park, Lake Ontario Park) and some overnight use by EV owners who may not have access to home charging (PumpHouse Steam Museum, Portsmouth Olympic Harbour, Artillery Park). The most popular charging locations have been at the PumpHouse Steam Museum parking lot, Clarence Street and Artillery Park with average utilizations of 3.0, 2.6 and 1.9 charging sessions per day respectively. The average time of use varies based on location but has so far tended to be just under 2 hours per charging session at the Clarence Street and Artillery Park locations and just under 3 hours per session at the PumpHouse Steam Museum and Chown Parking Garage locations. Exhibit A provides details of each charging station's usage since installation to the end of 2018.

The most frequent complaint received from users of the charging stations has been associated with non-electric vehicles occupying spaces equipped with charging stations. The most frequent locations where these conflicts have been reported are at higher demand parking locations such as Clarence Street, the Chown Parking Garage and Artillery Park. To mitigate this issue, the City has installed signage and applied pavement markings to alert motorists of the purpose of the new EV charging stations and promoted the desired use of stations via social media and customer service replies.

At present, the City's parking by-law does not reserve these parking spaces solely for use by electric vehicles. Regulation of charger-equipped parking spaces to dedicate them solely for use by electric vehicles while charging has been enacted in communities such as London, Burlington and Ottawa to support their EV infrastructure investments. Although the October 2017 staff report indicated the intention to create by-laws to enforce the intended use of these spaces, dedication of Kingston's existing EV charging spaces solely for EV use while charging will be considered by Parking Services staff using a more complete usage data set than is currently available. This review will be conducted within the context of the City's broader parking management principles and supply pressures that exist in the high demand downtown parking areas. Given the relatively recent introduction of the public EV charging service in the City, Parking Services staff will continue to monitor the utilization of these spaces and examine policy options that promote EV charging and are in alignment with broader parking management practices prior to recommending to Council any changes warranted.

The EV Strategy approved by Council included a 2-year period (2018 and 2019) where Level 2 charging would be provided without cost to users other than regular parking fees. The no fee period was implemented as a method of incentivizing people to consider electric and plug-in hybrid vehicles as an alternate to conventional gasoline or diesel fuelled vehicles. Usage data recovered to date indicates an average of 4,000 kW-hours of electricity dispensed per month (although this is expected to rise with increased EV uptake) which equates to a cost to the City of approximately \$500 per month or approximately \$77 per tonne in avoided GHG emissions per month. In consideration of the recent removal of Provincial electric vehicle incentives and the relatively minor cost of electricity provision, no change is recommended to Council to alter the no fee period for Level 2 EV charging stations. Level 3 fast charging stations will require a fee to use that is consistent with current market rates (approximately \$10 to \$20 per hour). Once the fee-holiday for Level 2 stations ends, a fee also consistent with market rates (\$1 to \$2 per

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session) will be implemented. Anticipated usage fees are expected to be sufficient to recover electricity supply and station maintenance costs especially as usage increases with an anticipated increased uptake of EVs. These fees are in addition to any parking rate that is applicable to the space.

Because Flo is a cellular network-enabled EV charging system, it is possible to collect detailed real-time usage data from each station. Staff have been working with Flo to examine options for making anonymized usage data available more broadly as part of the City's open data initiative.

In addition to the installation of the public EV charging network, the City has also procured nine (9) light duty fleet vehicles that are either battery electric or plug-in hybrid models. The use of light duty electric vehicles by the City is estimated to provide reductions in fuel cost and GHG emissions of approximately \$300 to \$400 and 0.9 tonnes GHG per year per vehicle, respectively. However, with the recent cancellation of provincial purchase incentives, the capital costs for acquiring electric vehicles has become higher than conventional units.

The City continues to monitor the availability of electric vehicles for heavy duty applications such as public transit and solid waste. The City is a member of the Canadian Urban Transit Research & Innovation Consortium (CUTRIC). CUTRIC supports projects that develop the next-generation of mobility and transportation technologies for Canadians. CUTRIC is leading an Electric Bus Demonstration and Integration Trial with an objective to achieve successful integration of interoperable, standardized electric buses and charging infrastructure for regular public transit operations across Canada.

The City of Toronto is currently undertaking a large evaluation of electric transit vehicles, committing to the operation of 30 vehicles from three different manufacturers by mid-2019. Staff are monitoring their progress and expect to benefit from the information produced from their work.

The City was successful in receiving a grant of \$556,875 from the Federation of Canadian Municipalities (FCM) to incorporate electric buses into the Kingston Transit fleet. Council approved the submission of a grant application to the Government of Ontario's Municipal GHG Challenge Fund - Round Two to supplement FCM funding for the purchase of one (1) 60-foot fully-electric, long-range articulated transit bus and hoist system in June 2018 ([Report Number 18-181](#)). However, the GHG Challenge Fund was cancelled.

At this time, no commitment has been made to purchase an electric bus due to the lack of funding opportunities.

Other heavy duty electric vehicles, such as solid waste and recycling trucks, are beginning to appear in the U.S., European and Asian markets but few examples of Canadian municipal applications have materialized at this time. Financial incentives to offset the higher capital costs of heavy duty EVs are not available at this time.

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The City, in collaboration with Sustainable Kingston, SWITCH, The Wintergreen Energy Co-op, the Kingston EV Society, and Plug n Drive, has also undertaken the promotion of electric vehicles and the public EV charging network. Outreach has occurred through:

- Social media (Twitter, Facebook, YouTube) and website information;
- News releases and media events;
- EV charging network launch event;
- EV demonstrations at Sustainable Kingston and Wintergreen events;
- Information visits to local automobile dealerships;
- Information sharing at SWITCH meetings; and
- EV demonstrations at City of Kingston staff events.

Existing Policy/By-Law:

Not applicable

Notice Provisions:

Not applicable

Accessibility Considerations:

Not applicable

Financial Considerations:

At the time of Council's approval of the EV strategy in 2017, it was anticipated that there was a reasonable probability of receiving grant funding from the Provincial Electric Vehicle Charging Opportunities (EVCO) program and NRCan Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative. A second round of EVCO was not issued and the program, and related electric vehicle purchase incentives, was cancelled by the provincial government. The City applied to NRCan's Alternative Fuel Infrastructure Deployment Program and was successful in receiving a grant for up to \$100,000 in support for two Level 3 fast charging stations. The NRCan program may also end up supporting other privately operated Level 3 stations within Kingston.

The capital budget authorized for implementation of the public EV charging station network was \$796,000. Based on the work undertaken to date, the NRCan grant funding and the remaining work to be completed, staff are projecting a capital budget surplus that will be known in more detail by the end of 2019.

Contacts:

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Other City of Kingston Staff Consulted:

Sheila Kidd, Deputy Commissioner, Operations, Transportation & Infrastructure Services

Ian Semple, Director, Transportation Services

Exhibits Attached:

Exhibit A Public EV Charging Station Locations and Installation Status and Usage

Exhibit B Map of Public EV Charging Station Locations

LEVEL 2 EV CHARGING STATION STATUS AND USAGE

August - December 2018

Location	Chargers	Install Date	Sessions	Power Delivered (kWhrs)	Connection Time (hrs)
362 Montreal Street	2	27-Jul-18	21	210.6	29.9
Portsmouth Olympic Harbour	2	27-Jul-18	130	917.2	304.8
PumpHouse Steam Museum	2	27-Jul-18	384	3935.1	990.2
Woodbine Park	2	27-Jul-18	92	1263.6	292.8
Belle Park	2	29-Jul-18	63	452.6	60.2
Grass Creek Park	2	31-Jul-18	35	180.9	72.5
John Machin Soccer Park	2	31-Jul-18	38	184.1	46.5
Memorial Centre	2	31-Jul-18	163	1077.2	207.9
Center 70 Arena	2	2-Aug-18	99	650.4	144.5
Lake Ontario Park	2	15-Aug-18	71	356	58.3
1211 John Counter Boulevard	2	15-Aug-18	105	614.3	201.8
Catarauqui Arena	2	16-Aug-18	89	560	129
Rideau Heights Community Centre	2	20-Aug-18	21	155.4	28.1
Clarence Street	2	23-Aug-18	375	2863.2	495.2
Emily Street (MacDonald Park)	2	14-Sep-18	46	212.7	39.5
Artillery Park Aquatic Centre	2	20-Sep-18	192	1396	280.3
Chown Parking Garage	4	17-Oct-18	91	866.3	218.2
Hanson Parking Garage	2	18-Oct-18	91	799.3	166.9
INVISTA Centre	4	10-Dec-18	28	184.3	37.5
Kingston Airport	2	Early 2019	-	-	-
Frontenac Parking Lot	2	Mid 2019	-	-	-
Totals	46		2,134	16,879	3,804



Public Electric Vehicle

1 INVISTA Centre, 1350 Gardiners Rd	8 Rideau Heights Community Centre, 85 MacCauley St	15 Belle Park, 731 Montreal St
2 Clarence Street: on-street, 50 Clarence St	9 Frontenac Parking Lot, 11 Queen St	16 Kingston Airport, 1114 Len Birchall Way
3 Chown Garage, 197 Brock St	10 Kingston Community Services, 362 Montreal St	17 Lake Ontario Park, 520 King St W
4 Hanson Memorial Garage, 105 Brock St	11 City & UK Offices, 1211 John Counter Blvd	18 Woodbine Park, 1180 Woodbine Rd
5 Pump House Steam Museum, 23 Ontario St	12 Cataraqui Community Centre, 1030 Sunnyside Rd	19 John Machin Soccer Park, 1307 John Marks Ave
6 Emily Street: on-street, 5 Emily St	13 Centre 70 Arena, 100 Days Rd	20 Grass Creek Park, 2991 Hwy 2
7 Memorial Centre Lot, 303 York St	14 Portsmouth Olympic Harbour, 53 Yonge St	21 Artillery Park, 382 Bagot St

Location #1 has four (4) Level 2 EV Stations
 Location #9 has (2) Level 3 EV Station and two (2) Level 2 EV Stations
 Location #3 has (4) Level 2 EV Stations
 All other locations have a quantity of two (2) Level 2 EV Stations
 Note: For up to date and interactive maps of all public EV Chargers please refer to PlugShare.com or CAA.ca/evstations/.

Source: GIS Enterprise Geodatabase
 Disclaimer: The Corporation of the City of Kingston assumes no responsibility for inaccurate or misclassified data set out in this map product. EVstationsChargers.mxd



Public Electric Vehicle Chargers provided by the City of Kingston