Staff Report

If this information is required in an alternate accessible format, please contact the Accessibility Coordinator at 905-623-3379 ext. 2131.

Report To:	**Planning and Development Committee**	
Date of Meeting:	January 17, 2022	**Report Number:** PDS-001-22
Submitted By:	Ryan Windle, Director of Planning and Development Services	
Reviewed By:	Andrew C. Allison, CAO	**By-law Number:**
File Number:	PLN 23.29	**Resolution#:**
Report Subject:	**5-year Corporate Electric Vehicle Action Plan**	

Recommendations:

1. That Report PDS-001-22 be received for information;

2. That Council endorse the Electric Vehicle Action Plan (EVAP) to guide the electrification of the Municipal fleet and the installation of public EV charge stations on Municipal properties (Attachment 1);

3. That Municipal staff consult the EVAP to inform annual budget recommendations related to the electrification of the municipal fleet and the installation of public electric vehicle (EV) charge stations on municipal properties;

4. That Council authorize staff to apply for funding opportunities to support the implementation of the EVAP, where/when identified; and

5. That all interested parties listed in Report PDS-001-22 and any delegations be advised of Council's decision.

Report Overview

This report provides an overview of the Clarington Electric Vehicle Action Plan (EVAP). The EVAP is a guide to transition the municipal fleet to zero-emissions electric vehicles (EV) and install fleet and public EV charging stations at municipal facilities between 2022 and 2026. The EVAP sets out the Municipality's annual EV purchases and infrastructure needs and makes recommendations for the timing and location of public EV charging stations to be included in the annual budget cycle.

By following the steps outlined by the EVAP the Municipality will transition 25 fleet vehicles to electric and install at least 60 EV charge points on municipal properties for public and fleet charging.

Fleet vehicles are responsible for 13.8 per cent of Municipal greenhouse gas (GHG) emissions. Transportation is responsible for approximately 47 percent of region-wide emissions. By implementing the EVAP, the Municipality will take significant steps to respond to climate change by directly reducing GHG emissions associated with corporate transportation; provide infrastructure to meet the community's need for public EV charging; and improve community wellbeing by promoting transportation options that reduce air and noise pollution.

1. Background

1.1 The Municipality's 2018 corporate GHG emissions inventory shows that municipal fleet vehicles are responsible for 13.8 per cent of Clarington's corporate GHG emissions. The 2019 Durham Community Energy Plan (DCEP) shows that the transportation sector is responsible for 47 per cent of region wide GHG emissions.

1.2 In November 2019, Clarington Council endorsed the DCEP though resolution #GG-551-19, which establishes a community energy reduction target of 80% by 2050 and the Low Carbon Pathway scenario as the preferred energy scenario for implementation, which includes a community-wide transition to electric vehicles (EVs).

1.3 In March 2020, the Municipality set targets to reduce corporate GHG emissions 35 per cent by 2030 from 2018 levels and achieve net-zero emissions by 2050.

1.4 On March 2, 2020, Council passed resolution #C-066-20: "*That it be policy for all future car and SUV purchases be electric vehicles or similar vehicles without tailpipe emissions where practicable.*"

1.5 In December 2020, Trent University completed a report as part of Communications and Critical Thinking Capstone course, which identifies best practices for the Municipality to reduce corporate GHG emissions thought the adoption of EVs.

1.6 Action 1.30 of the Clarington Corporate Climate Action Plan (CCCAP), which was approved by Council in March 2021, recommends updating the Municipal Fleet Strategy and establishing a five-year plan to electrify the Municipal fleet, where practicable.

1.7 Based on direction from Council outlined above, the EVAP was created to guide the Municipality's transition to EVs over the next five years (2022 to 2026). The EVAP is provided in **Attachment 1**.

1.8 The EVAP sets out the Municipality's annual EV purchases and infrastructure needs and makes recommendations for the timing and location of public EV charging stations.

1.9 By transitioning the municipal fleet from internal combustion engine vehicles (ICEs) to EVs and by helping the public to also make the switch to EVs, the Municipality is taking important steps to reduce both corporate and community GHG emissions and respond to climate change.

2. Rationale for Switching to Electric Vehicles

Environmental Benefits

2.1 GHG emissions from vehicles (tailpipe emissions) are some of the easiest emissions to pinpoint and eliminate, as they come from a single source and can be easily quantified.

2.2 Unlike internal combustion engines (ICEs), which burn fossil fuels and emit GHGs during operation, EVs rely on the electricity grid for their energy. EVs are as 'clean' as the electricity grid used to power them. Most of Ontario's electricity is produced from low or no carbon sources, including nuclear, hydro, and renewable energy sources, with some backup power coming from natural gas 'peaker plants', which compensate for spikes in energy demand.

2.3 A transition to EVs will result in reduced GHG emissions and air pollutants, and significantly contribute to achieving the Municipality's net-zero emissions target.

Community Benefits

2.4 The EVAP includes options for installing public EV charge stations in strategic locations on Municipal properties to support the public to transition to EVs.

2.5 By installing publicly accessible chargers, the Municipality is providing the community with needed EV charging infrastructure and actively promoting the reduction of community GHG emissions that contribute to climate change.

2.6 A community-wide transition to EVs will benefit the community in several ways:

- Reduced noise pollution in urban neighbourhoods.
- Improved air quality (EVs do not emit carbon monoxide, sulfur oxides or volatile organic compounds).

- Reduced GHG emissions (most notably carbon dioxide and methane).
- The simplicity of an electric motor and the reduced number of moving parts in an electric car means that EVs have been found to be more reliable and require less regular maintenance than ICEs.
- Lower maintenance costs are coupled with cheaper fuel prices to bring a lower total cost of ownership.
- EV fueling costs from municipal charging stations will remain predictable and relatively unchanging over the coming years.
- Gasoline and diesel prices are anticipated to rise with the federal carbon tax, EV drivers can expect to benefit from low fuel costs relative to petroleum-based alternatives.

Current Trends

2.7 The switch to EVs is already underway. In June 2021, the Federal government set a target for all passenger vehicles sold in Canada to be electric by 2035.

2.8 All major auto manufactures have publicly committed to continuing the transition to EVs, and now have models of EVs available, many of which are less expensive to operate and maintain than ICE vehicles.

Alignment with the Region of Durham

2.9 Clarington's direction to switch its fleet to EVs and develop EV charging infrastructure is supported by the Durham Community Energy Plan (DCEP), which was endorsed by Clarington Council on November 25, 2019, through Resolution #GG-551-19.The DCEP sets a goal to support the transition of the transportation sector in Durham to electric.

2.10 Clarington has already collaborated with the Region of Durham, Ajax, Whitby, and Oshawa on two applications to the federal Zero Emissions Vehicle Infrastructure Program (ZEVIP) for funding to install EV charging infrastructure across the region. Both applications have been funded. (More information in Sections 3.6 to 3.9 below).

EV Support in Ontario

2.11 As referenced in the Made-in-Ontario Environment Plan, the Provincial Government has signaled its support for an EV transition by investing $295 million into the Ford Oakville Assembly Complex. The investment will transform the automobile manufacturing facility into a battery electric vehicle production facility.

2.12 On November 17, 2021, the provincial government announced that it will work with the auto industry to prioritize EVs in Ontario by: 1) supporting vehicle and parts production for EVs; 2) establishing and supporting an electric battery supply chain ecosystem; 3) innovating on EV development; and 4) investing in auto workers.

2.13 Investment in domestic EV production is a positive indicator that the provincial government has confidence in the growing EV market.

Direction of the Federal government

2.14 On June 29, 2021, the Federal government announced a plan to ban the sale of new ICEs by 2035, accelerating their previously released timeline of 100 percent EV sales by 2040 by five years.

2.15 This mandatory target is part of the federal government's plan for nationwide carbon neutrality by 2050 and is supported by a series of policies and incentives to help consumers, manufacturers and governments prepare for the transition.

2.16 To spur demand from consumers, the federal government has committed $587 million to the popular federal EV rebate program, which offers those who buy zero-emissions vehicles up to $5,000 in purchasing rebates.

2.17 The Federal government has committed $460 million to build EV charging infrastructure across the country. The ZEVIP will distribute $240 million of the total committed funds to subsidizing EV charge station purchase and installation costs.

3. Cost Considerations

Shifting Vehicle Lifecycle Costs

3.1 Transitioning to an EV fleet requires a reconceptualization of municipal vehicle budgets. Currently, electric vehicles have higher Manufacturer Suggested Retail Prices (MSRP) than similar ICE models. Despite their higher MSRPs, EVs offer lower fuel and maintenance costs over the lifespan of the vehicle.

3.2 While maintenance costs between ICEs and EVs vary significantly depending on vehicle make, model, drive cycle and other factors, research shows that EVs have substantially lower maintenance and fuel costs. EVs contain fewer moving parts and have fewer fluids to change than ICE vehicles.

3.3 The Ontario Ministry of Transportation estimates that, for a car driven 20,000 km/year, the average yearly fueling cost for EVs is approximately $530; a similar size ICE would cost $2,500. The estimates assume overnight (off-peak) charging and a gasoline price of $1.20/L (2020).

3.4 Most municipal vehicles in Clarington are replaced within 7 years, before they require serious or ongoing repairs. EVs offer savings on routine maintenance costs as the electric motor and drive train do not need regular servicing (such as the oil changes and engine maintenance required by ICEs). The relative simplicity of EVs compared to ICE vehicles reduce the risk of unexpected malfunctions.

3.5 A 2021 report by the Clean Air Partnership that compares EV and ICE vehicles in fleet applications in London, Ontario and the Fraser Valley Regional District found that

switching fleet vehicles to **EVs saved more than $3,000 per vehicle in fuel and maintenance costs** (based on average 13,000km/year and service life of 7 years).

3.6 A 2018 report from the 2 Degree Institute estimates that combined fuel and maintenance costs are **66 per cent less per year for EVs than similar ICE vehicles** in Ontario. Taking into consideration upfront purchase cost, fuel, and maintenance, **EVs cost on average $27,000 less than ICEs over a 15-year life** of life of the vehicle (250,000km)

3.7 With current government incentives, carbon taxes, declining EVs prices, and increasing petroleum fuel prices it is likely that EVs will continue to outperform ICEs on total cost of ownership as fleet vehicles in Clarington.

3.8 As such, departmental budgets will need to account for a higher upfront purchase price for EVs with the understanding the Municipality will likely save money over the 7-year replacement life of the vehicle. Please see Appendix C of the EVAP (**Attachment 1**) for more information about these figures.

EV and Charge Station Purchasing Incentives

3.9 To encourage electric vehicle purchases, the Government of Canada has launched the Incentives for Zero Emissions Vehicles Program (iZEV), which offers rebates of up to $5,000 on the purchase of new electric vehicles.

3.10 The federal government has also made funding available to assist with the proliferation of EV charging infrastructure through the Zero Emission Vehicle Infrastructure Program (ZEVIP). The ZEVIP program has committed $280 million in funding until 2024 to subsidize up to 50 per cent of the costs associated with installing charging infrastructure.

3.11 Clarington has already benefited from federal ZEVIP funding.

3.11.1. In Fall 2019, Clarington received approximately $21,400 from NRCan, subsidizing the cost of five public charge points in downtown Bowmanville.

3.11.2. In the Spring of 2020, Clarington received approval for $82,000 from NRCan to subsidize the installation of 18 charge points across the Municipality ($4,554 per charge point).

3.12 Guided by the EVAP, staff will continue to take advantage of external funding opportunities for EVs and EV charging stations.

4. Other Considerations

Emergency Vehicle Exemptions

4.1 Emergency and Fire Services staff expressed concerns regarding EV performance during emergency situations. Specifically, staff brought forward concerns regarding

towing capacity, battery life and vehicle range during prolonged vehicle use in cold weather.

4.2 Electric pickup trucks have only recently come to market. As such, there has not been a significant amount of time to assess their performance in real-world emergency situations.

4.3 To ensure the proven reliability of vehicles during extended emergency situations, Emergency and Fire Services vehicles designated as an emergency vehicle by the Fire Chief are exempted from the EVAP. Fire prevention vehicles must comply with Council's EV policy.

4.4 The EVAP recommends that Emergency and Fire Services prioritize vehicles with high energy efficiency and low carbon emissions when selecting vehicles moving forward.

4.5 The use of EVs in Emergency and Fire operations will be revisited as more information about the use of EVs in emergency situations becomes available.

Expanding EV Options and Technology

4.6 The EVAP includes only light-duty cars, vans, and pickup trucks up to one half-ton (equivalent to a Ford F-150). The EV options coming to market in 2022 and beyond are expanding, providing more options for the Municipality when purchasing vehicles. This is especially relevant for truck and van replacements.

4.7 The EVAP will be reviewed annually to evaluate expanding EV availability to assess potential EV options for light, medium, and heavy-duty vehicles as they become available.

4.8 Moving forward, staff will consider the practicality of less conventional EVs such as ice resurfacers, fire trucks, e-mobility scooters, e-bikes, and other ZEV options as they become available.

4.9 Currently the average range of EVs is already around 400 kilometres per charge, the range will continue to increase as battery technology continues to improve. This will provide more flexibility, some vehicles could likely go several days without charging if the need arose.

4.10 Staff will monitor the real-word performance and repair costs of EV fleet vehicles and municipally owned EV charge stations on an ongoing basis to inform ongoing decisions related to the municipality's transition to EVs.

5. EVAP Methodology

EV Inventory

5.1 The EVAP is a plan to transition the Municipality's existing fleet from ICEs and EVs as vehicles reach the end their service life.

5.2 To create the EVAP the Municipal Interdepartmental Climate Change Working Group (ICCWG) convened to set the objectives of the plan and establish milestone dates. The ICCWG has been updated monthly throughout the creation of the plan to guide the development of the plan and review its content.

5.3 To begin, staff created a list of key stakeholders from all departments with direct knowledge of future vehicle acquisitions. Identified stakeholders submitted a list of all anticipated new and replacement vehicle purchases between 2021 – 2026.

5.4 This list was analyzed, and all light-duty vehicles with suitable EV replacement options (cars, SUVs, transport vans, and light-duty trucks) were counted to create an anticipated 5-year EV inventory.

5.5 Once the number of EVs expected to be purchased over the next five years was established, it was used to determine how many charge points would need to be installed each year to ensure sufficient charging capacity to accommodate yearly EV purchases.

5.6 As a precautionary measure, and to leverage available federal funding, the installation of EV charge stations over the next five years was prioritized for installation early in the 2022-2026 period, with most of the fleet charging locations scheduled to be installed in the next three years.

5.7 Once the EVAP was drafted and reviewed by the ICCWG, it was circulated more broadly to department heads for internal feedback. Several one-on-one meetings were held with key representatives from Community Services, Emergency and Fire Services and Public Works to address the specific challenges or circumstances and these were incorporated into the plan.

EV Charger Site Selection

5.8 The EVAP focuses on retrofitting existing buildings and parking lots to install the charging capacity needed by fleet and public vehicles. It is expected that all new municipal buildings will integrate public and fleet EV charging into their designs, taking into consideration the site selection criteria outlined below

5.9 A list of potential sites was compiled from all municipal properties, including buildings and parking lots. This list was assessed and refined by Community Services facilities staff and Public Works staff to eliminate locations that were deemed unsuitable for infrastructure installation.

5.10 Five criteria were used to measure the suitability of locations for fleet EV charger installation. Suitability criteria include:

- Near municipal offices or depots
- Near where staff are working
- There are enough parking spaces for staff personal vehicles and fleet vehicles
- There is enough space for an adequate grouping of EV chargers (4-8 stations)

- There is a transformer or electrical panel with sufficient capacity to accommodate the EV chargers

5.11 Five criteria were used to measure the suitability of locations for public EV charger installation. Suitability criteria include:

- Significant traffic at the site
- Potential to attract users
- The area is currently underserved by charging stations
- There is enough space for an adequate grouping of EV chargers (4-8 stations)
- There is a transformer or electrical panel with sufficient capacity to accommodate the EV chargers

5.12 For each list, locations scoring a 'Medium' or 'High' were prioritized for charge station installation within the next five years. Eight public charging locations and nine fleet charging locations were identified for development between 2021 – 2026.

5.13 Locations that can accommodate large banks of stations and locations where many fleet EVs can conveniently be parked and charged have been prioritized for early installations.

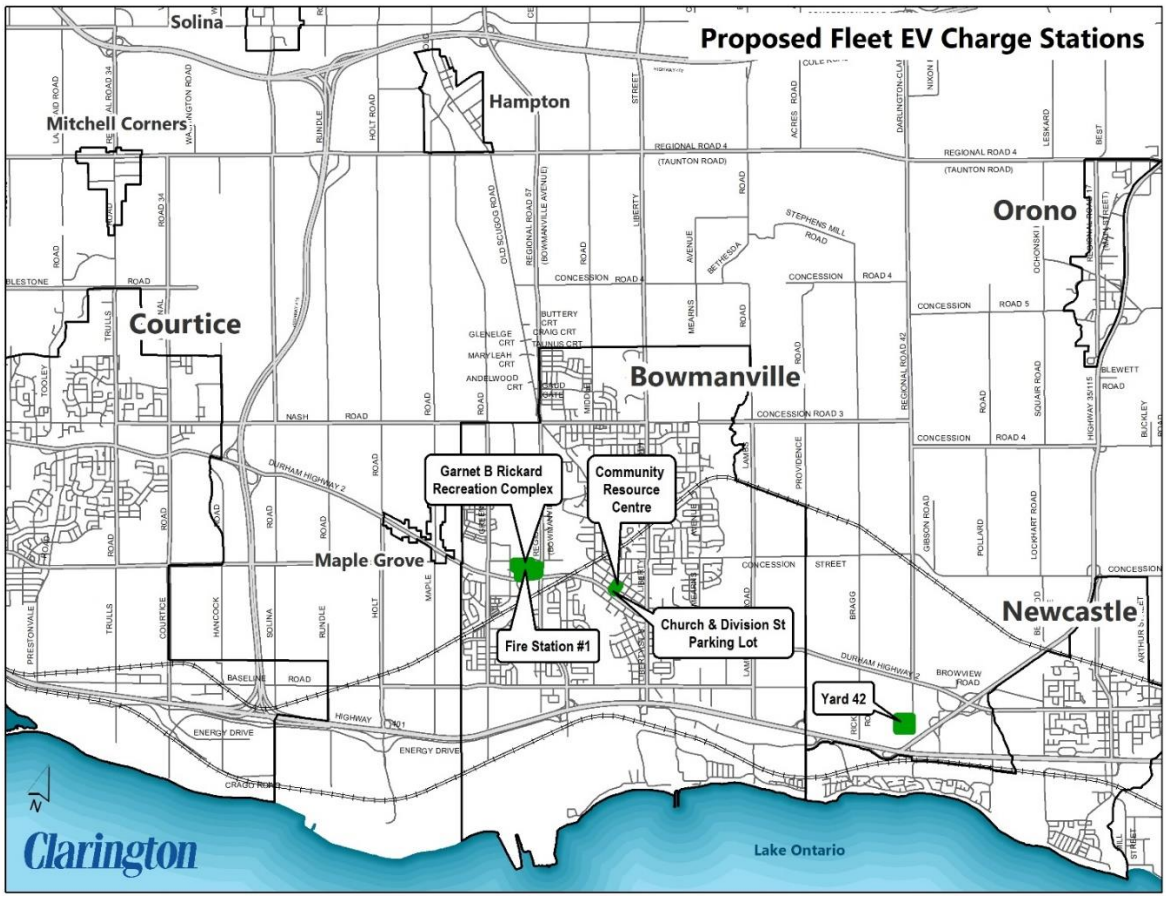

Figure 1 – Proposed Fleet EV Charge Stations

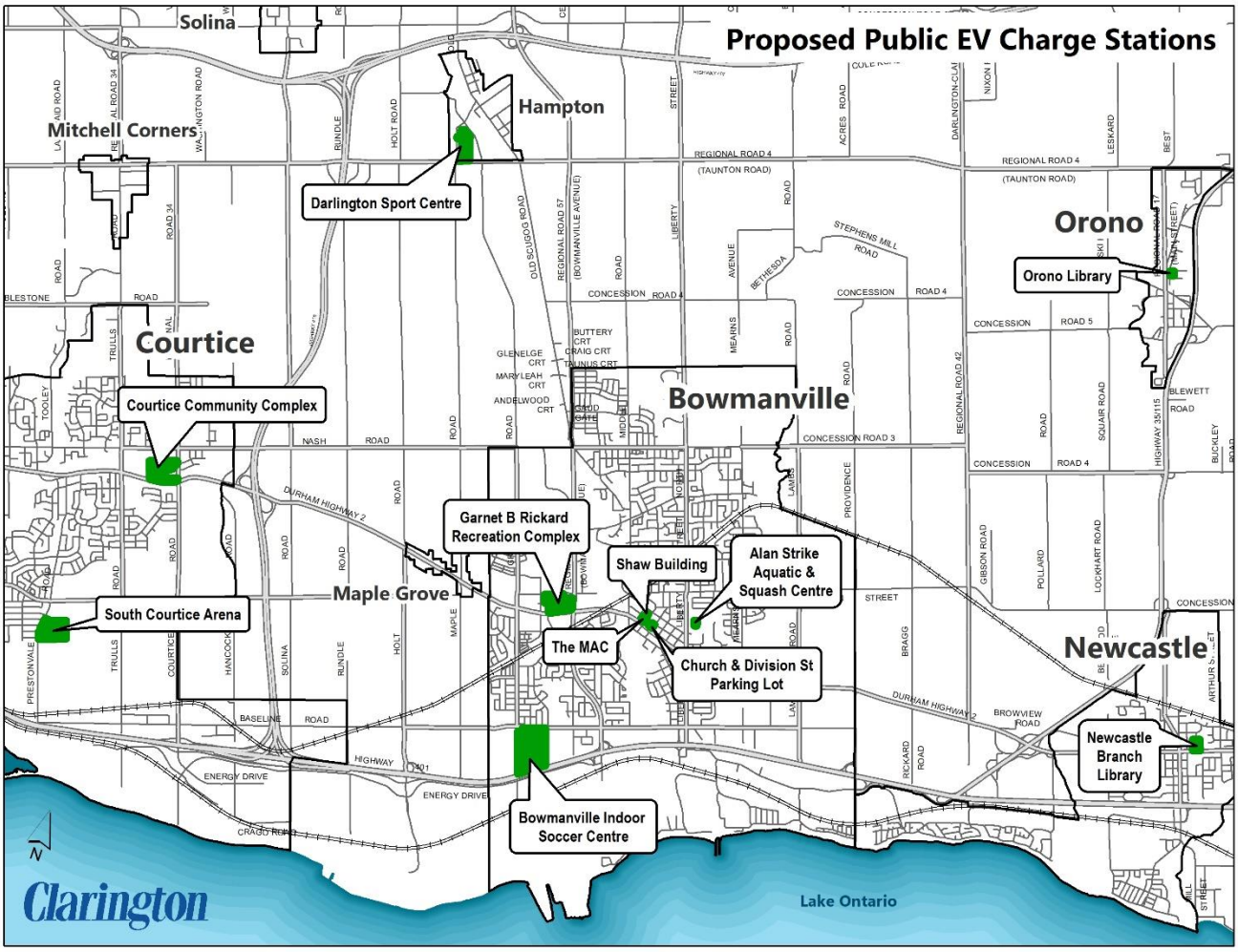

Figure 2 – Proposed Public EV Charge Stations

6. Yearly EV and EV Charge Station Breakdown

6.1 The EVAP contains a yearly breakdown of the costs associated with the purchase of new fleet EVs and the purchase and installation of fleet and public EV charge stations.

6.2 The EV and EV charge station cost summaries outlined below are subject to change, as departments and Council may shift priorities regarding the purchases or as external funding opportunities become available.

6.3 Vehicle purchasing years are subject to change, as departments may opt to delay or expedite new vehicle purchases as approved during budget review by Council.

EV Purchases by Year

6.4 As the Municipality's fleet vehicles reach the end of their service life, they will be replaced with zero emission EVs between 2022 and 2026.

Year	New EVs/Hybrids purchased	Estimates upfront EV costs by year.	Potential Savings to the Municipality over the lifespan (7 years or 91,000 km)
2021	7	$315,000	$21,000
2022	3	$155,000	$9,000
2023	9	$543,000	$27,000
2024	1	$73,000	$3,000
2025	2	$167,000	$6,000
2026	3	$165,000	$9,000
Total	**25**	**1,418,000**	**$75,000**

Table 1 – Fleet EV Purchases by Year and Saving on Fuel and Maintenance over the lifespan of EVs

6.5 Please see Appendix B of the EVAP for a detailed breakdown of the EV purchasing costs.

6.6 Staff will seek all available subsidies at the time that vehicles are purchased.

Municipal Fleet EV Charge Station installations by Year

6.7 EV charge stations for fleet vehicles will be installed ahead of vehicle purchases.

Year	Charge Points Installed	Total Estimated Cost	Potential ZEVIP Contributions	Estimated Cost to Clarington
2021	9	$95,525.00	$40,724.44	$54,800.56
2022	8	$93,550.00	$40,000.00	$53,550.00
2023	6	$66,162.50	$30,000.00	$36,162.50
2024	0	$0.00	$0.00	$0.00
2025	2	$24,137.50	$10,000.00	$14,137.50
2026	0	$0.00	$0.00	$0.00
Total	**27**	**$279,375.00**	**$120,724.44**	**$158,650.56**

Table 2 – Fleet EV Charge Station Installations by Year

6.8 Please see Appendix A of the EVAP (**Attachment 1**) for a detailed breakdown of the Fleet EV charge station purchase and installation cost by year.

Public EV Charge Points Installed

Year	Charge Points Installed	Total Estimated Cost	Potential ZEVIP Grant Contribution	Estimated Cost to Clarington
2021	4	$52,025.00	$17,120.00	$34,905.00
2022	6	$89,912.50	$10,000.00	$79,912.50
2023	8	$120,222.50	$40,000.00	$80,222.50
2024	8	$104,050.00	$40,000.00	$64,050.00
2025	2	$24,137.50	$10,000.00	$14,137.50
2026	10	$118,187.50	$50,000.00	$68,187.50
Total	**38**	**$508,535.00**	**$167,120.00**	**$341,415.00**

Table 3 – Public EV Charge Station Installations by Year

6.9 Please see Appendix A of the EVAP for a detailed breakdown of the public EV charge station purchase and installation cost by year.

7. Conclusion

7.1 To achieve the Municipality's GHG emissions reduction targets, the Municipality must transition its fleet to low carbon options.

7.2 With broader community adoption of EVs already underway, the Municipality should also act to ensure community EV charging infrastructure is available.

7.3 The EVAP is a guide for the Municipality to electrify its fleet and provide much-needed public EV charging infrastructure at Municipal facilities between 2022 and 2026.

7.4 Under this plan, the Municipality over the next 5 years is proposing to acquire over 25 electric vehicles to replace ICE vehicles and install more than 60 EV charging spaces, to meet fleet and community EV charging needs at municipal facilities.

7.5 By implementing this plan, the Municipality is taking significant steps to respond to climate change by directly reducing GHG emissions associated with transportation, providing needed infrastructure to meet the community's needs for EV charging, promoting community wellbeing and transportation options that reduce air and noise pollution.

7.6 Municipal staff will consult the EVAP during its annual budget cycle to guide the electrification of the municipal fleet and the installation of public EV charge stations on municipal properties.

8. Concurrence

8.1 This report has been reviewed by the Director of Community Services, the Director of Financial Services, the Director of Public Works and the Director of Emergency and Fire Services, who concur with the recommendations of this report.

9. Recommendations

9.1 The Electric Vehicle Action Plan (EVAP) be endorsed to guide the electrification of the Municipal fleet and the installation of public EV charge stations on municipal properties (**Attachment 1**);

9.2 The EVAP will be used by Staff to inform annual budget recommendations related to the electrification of the municipal fleet and the installation of public electric vehicle (EV) charge stations on municipal properties;

9.3 Staff will continue to seek out and apply for funding to support the implementation of the EVAP.

Staff Contact: Doran Hoge, Energy and Climate Change Response Coordinator, 905-623-3379 ext. 2429 or dhoge@clarington.net.

Attachments:

Attachment 1 – Clarington Electric Vehicle Action Plan

Interested Parties:

List of Interested Parties available from Department.