

REPORT TO MAYOR AND COUNCIL

PRESENTED:	SEPTEMBER 30, 2019 - REGULAR EVENING MEETING	REPORT:	19-143
FROM:	ENGINEERING DIVISION	FILE:	5280-31
SUBJECT:	LOW CARBON MOBILITY PLAN: ELECTRIC VEHICLES		

RECOMMENDATIONS:

That Council endorse the Low Carbon Mobility Plan: Electric Vehicles; and further

That Council give first, second and third reading to Township of Langley Zoning Bylaw 1987 No. 2500 Amendment (Electric Vehicle Charging) Bylaw 2019 No. 5396, and authorize staff to schedule the required public hearing.

EXECUTIVE SUMMARY:

In July 2018, Council directed staff to develop an Electric Vehicle (EV) Strategy for both community and corporate electric vehicle charging infrastructure and to complete industry consultation on a proposed EV charging requirements bylaw for residential construction.

The plan, titled the Low Carbon Mobility Plan: Electric Vehicles has been prepared with internal and external stakeholder consultation. The plan identifies various actions grouped into the following seven areas: 1) Leadership in Township Fleet, Equipment and Procurement 2) EV Charging on Private Property 3) Publically Accessible EV Charging 4) Strategies for Trucks, Buses and Off-Road Transportation 5) Public Education and Awareness 6) Electrifying Shared Mobility and 7) Advocacy for EV Leadership from Other Levels of Government and Utilities.

Langley builders and developers were consulted through a workshop on the proposed EV residential charging requirements bylaw. Attendees expressed support of requiring one energized outlet capable of providing Level 2 charging per dwelling unit.

If supported by Council, implementation of the key actions would begin immediately and span from 2019 to 2024. Low-cost action items will be completed with existing approved resources. Staff will bring forward necessary budget requests for Council consideration during the annual budget process.

PURPOSE:

The purpose of this report is to obtain Council's endorsement of the proposed Low Carbon Mobility Plan: Electric Vehicles, and, Township of Langley Zoning Bylaw 1987 No. 2500 Amendment (Electric Vehicle Charging) Bylaw 2019 No. 5396.

BACKGROUND/HISTORY:

Low Carbon Mobility Plan: Electric Vehicles

During the development of the EV Strategy, staff discovered the need to outline a clear and flexible framework for how EVs fit into the broader vision of low carbon-emitting mobility options for the Township. The framework of the strategy has been expanded and rebranded to the Low Carbon Mobility Plan: Electric Vehicles, with EVs highlighted as the first of several modalities to be explored.

For the purposes of this plan, *low carbon mobility* refers to electrification or alternative fuel sources that emit zero or low amounts of greenhouse gas (GHG) emissions, particularly carbon dioxide. For vehicles, this includes electric vehicles, hydrogen fuel-cell technology, or renewable fuels. Low carbon mobility also encompasses active modes of transportation including walking, cycling and rolling.

Low carbon systems are increasingly cost competitive in a range of transportation modes, including passenger vehicles, small vehicles (e.g. scooters, electric bikes and forklifts), passenger vehicles, medium- and heavy-duty vehicles, transit, cargo trains, watercraft, and aircraft.

The Low Carbon Mobility Plan (LCMP) is designed as a living framework to shape and organize the Township's plans for individual modes or sectors of mobility (Figure 1).





As vehicles represent over 55% of the Township's community emissions profile, actions that facilitate the adoption of zero and low emission vehicles, like electric vehicles, can make a significant impact on the climate.

British Columbia is in the top three provinces for EV sales. The effects of this can be seen locally: since 2013, the Township's Level 2 charging stations have seen a 3,000% increase in the number of charging sessions per year.

The objectives of the LCMP, in relation to EVs, are to:

- Respond to the growing demand for EV infrastructure and services both corporately and community wide,
- Encourage and support faster adoption of EVs to aid in reducing greenhouse gas emissions,
- Establish the roles of the Township and the private sector in providing EV infrastructure and services, and
- Increase awareness and educate the public and industry about EVs.

Several existing Township policies and plans support the transition to low carbon mobility, with a special focus on EVs, including:

Official Community Plan: reduce overall energy use, improve per capita energy efficiency and support EV charging infrastructure

Sustainability Charter: integrate transportation into community planning, invest in effective infrastructure, and reduce energy consumption

Community Energy and Emissions Plan: reduce transportation emissions 20% by 2020 and 30% by 2030

Strategic Energy Management Plan: reduce corporate emissions, increase electric vehicles in fleet, and develop additional EV charging infrastructure

Residential EV Charging Bylaw

Access to home charging is essential for EV drivers as it is the most convenient and reliable option to charge. EV charging can be installed for relatively low cost at time of construction as opposed to subsequent retrofitting of existing buildings.

An internal working group, with representation from Development Planning, Permit, Licence and Inspection Services, and Sustainability departments, drafted a proposed provision requiring EV charging infrastructure in new residential developments which was presented to Council in July of 2018. Council directed staff to conduct industry consultation on the proposed residential EV charging requirements bylaw. Staff hosted an industry consultation workshop as part of the LCMP external engagement sessions.

DISCUSSION/ANALYSIS:

Low Carbon Mobility Plan: Electric Vehicles

The LCMP was developed through extensive internal and external stakeholder engagement, and best practices research. Staff conducted a resident survey that gathered nearly 400 responses, and hosted three workshops for a variety of external stakeholders. Staff convened applicable departments to gather feedback on the proposed actions and policy measures.

The following is a non-exhaustive summary of external feedback gathered from the engagement sessions.

Resident Survey Results

Staff developed a survey to gauge Township resident's knowledge, interest and barriers to EV adoption in the community. Nearly 400 surveys were completed. Note-worthy survey results include:

- 86% of respondents drive to work/school, with 82% living within 45km of work/school (note: the common EV range is 200-400km)
- 69% of respondents are somewhat likely to very likely to purchase an EV as their next vehicle
- EV drivers said that a reasonable amount to pay for public charging is up to \$2/hour

<u>Workshops</u>

Staff conducted workshops with medium- and heavy-duty fleet managers from across the community as well as EV drivers and other applicable stakeholders. Attendees included: local municipalities, local truck and transport companies, the BC Trucking Association, electric vehicle supply equipment (EVSE) suppliers, BC Hydro, EV drivers, auto dealerships, and EV associations and experts. A summary of key feedback from the workshops is listed below:

- Local government must bridge the gap in knowledge and opportunity for EV adoption through leadership and advocating to other levels of government for increased charging infrastructure and incentives
- Cost barriers still exist for charging infrastructure and vehicle maintenance but no longer for capital cost of the vehicle thanks to Provincial and Federal incentives
- Local government should support or require businesses to install more public and workplace charging stations
- Reliability, capacity, and flexibility of available medium- and heavy-duty vehicle options remain a concern

Action items

The recommended action items included in the proposed Plan are grouped into seven key areas. The section below provides a brief summary and examples for each section. The LCMP provides a full list of actions and associated details (ATTACHMENT A).

1. Leadership in Township Fleet, Equipment & Procurement

Electrifying Township fleet vehicles and equipment is a key opportunity to lead in the transition to electric mobility and reduce corporate GHG emissions. In addition to its fleets, the Township can also show leadership by providing "at-work" charging for its employees. Example actions include:

- Install fleet and workplace-charging infrastructure at the Operations Centre and Civic Facility.
- Establish an "Electric First" policy that prioritizes electric vehicles and equipment.

2. EV Charging on Private Property

Access to EV charging at home is one of the most important factors in supporting household adoption of EVs. Workplace charging and non-residential charging are also important factors to encourage EV adoption. Example actions include:

- Implement EV ready requirements for new residential developments.
- Establish requirements for non-residential parking spaces to include appropriate provisions for EV charging infrastructure.
- Explore incentives for multifamily buildings and workplaces to install private charging stations.

3. Publicly Accessible EV Charging

Publicly accessible EV charging stations support EV adoption by: increasing drivers' confidence that they can access convenient charging when they are "out and about"; providing for drivers on longer trips; providing for drivers without access to charging at home or at work; providing for vehicles used in shared mobility fleets; and increasing the visibility of EVs. Example actions include:

- Implement user fees at Township public EV charging stations to support cost recovery of EV charging infrastructure and increase turnover.
- Explore incentives for commercial properties to install charging stations for public use.

4. Strategies for Trucks, Buses and Off-Road Transportation

Commercial trucks and buses represent over 30% of "on-road" transportation energy use and GHG emissions in the Township. Of these emissions, over 80% come from vehicles making local or regional trips (vs. long-haul transportation), the sector best suited to electric trucks. Example actions include:

- Explore EV-Ready requirements for commercial truck parking and loading areas.
- Explore commercial charging hubs for medium- and heavy-duty vehicles.

5. Public Education & Awareness

While awareness and understanding of EV options and incentives is growing, the transportation sector is changing quickly. Many consumers lack the information they need to make a decision about what kind of vehicle would best suit their needs. Example action:

• Explore opportunities for the Township to host Ride and Drives, Test Drive Days, and other opportunities for residents to experience EVs and speak with current drivers.

6. Electrifying Shared Mobility

Shared mobility refers to a range of services that may change how we get around over the coming years. The LCMP considers three main types of shared mobility: car-sharing, ride-hailing, and little vehicles. Example action:

• Coordinate with other municipalities, the Passenger Transportation Board, and the Ministry of Transportation to develop regulations and programs to minimize per-passenger emissions and congestion.

7. Advocacy for EV Leadership from Other Levels of Government and Utilities

The transition to electric mobility requires policy changes at the local, provincial, national and electric utility level. Example action:

• Advocate for policy that is focused on the electrification of applicable transportation/mobility sectors.

If supported by Council, the above action items would be implemented from 2019 to 2024. It is expected that many recommendations will be ongoing such as education and advocacy and that the LCMP will be reviewed annually and expanded upon as future technologies advance.

Residential Charging Requirements Bylaw

Staff presented the draft bylaw for EV charging infrastructure in new residential developments to local builders and developers during a stakeholder workshop and discussed the proposed bylaw with UDI (ATTACHMENT A). Stakeholders expressed support of the proposed bylaw as follows.

The draft bylaw proposes changes to Section 107.3 Parking and Loading Requirements of Zoning Bylaw No. 2500. The bylaw proposes that an energized outlet capable of providing Level 2 charging or higher be required for one (1) parking space per dwelling unit in most residential uses. The amendment also proposes that seniors' housing will require an energized outlet for one (1) parking space per four (4) dwelling units and that community care facilities will require an energized outlet for one (1) parking space per four (4) parking space per four (4) occupants or residents

Costs associated with the EV charging requirements depend on the size of the building and therefore size of the electrical system required, building layout, and number of units. Staff have consulted with industry stakeholders on the estimated cost ranges below:

- Costs for townhomes and single-family/duplex homes will range from \$100-\$500 per stall to deploy an energized outlet capable of providing Level 2 charging.
- Costs for multi-family buildings (4-6 stories) will range from \$950-\$2700 per stall to deploy an energized outlet capable of providing Level 2 charging. Costs are dependent on whether an electric vehicle energy management system (EVEMS) is integrated into the electrical design or if dedicated circuits are used. To reduce the costs of EV infrastructure in multi-family developments, the Township has included the option to use EVEMSs as part of the bylaw amendment. EVEMS refers to technology that allows multiple EVs to charge simultaneously on one dedicated electrical circuit, as such they significantly reduce the costs of providing EV charging infrastructure as they reduce the size of the building electrical systems that must be installed. Figure 2 illustrates the cost comparison between the two options.



Figure 2: Costs per Parking Space to Provide Energized Outlet (MURB 4-6 Stories)

Source: AES Engineering. Costing Analysis – Prepared for City of Surrey and shared with Township of Langley

If supported by Council, the EV charging requirements would come into force and take effect on the date of the bylaw adoption. Complete and valid building permit applications, submitted prior to the date of adoption of this bylaw are exempt from the EV Charging Requirements provisions in Section 107.3 provided that the building permit is issued within 6 months of bylaw adoption.

A six month grace period has been drafted into the bylaw language in order to accommodate in-stream building applications that may have more difficulty adjusting the design of their parking areas or electrical components. EV charging requirements are not applicable to permits for replacement mobile homes, but will be applicable to permits for mobile homes in new mobile home parks.

Financial Implications:

If supported by Council, implementation of the key actions would begin immediately and span from 2019 to 2024. Low-cost action items will be completed with existing approved resources. Staff will bring forward the necessary budget requests for Council consideration during the annual budget process.

Respectfully submitted,

Tess Rouse MANAGER, ENERGY PROGRAMS for ENGINEERING DIVISION

This report has been prepared in consultation with the following listed departments.

CONCURRENCES		
Division / Department	Name	
FINANCE DIVISION	K. Sinclair	
COMMUNITY DEVELOPMENT DIVISION	S. Richardson	



LOW CARBON CARBON MOBILITY PLAN: ELECTRIC VEHICLES

Prepared for: Township of Langley 20338 65 Avenue Langley, BC, V2Y 3J1

Developed by: Integral Group Suite 180 - 200 Granville Street Vancouver, BC, V6C 1S4



ATTACHMENT A

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1. INTRODUCTION TO THE LOW CARBON MOBILITY PLAN

In light of global efforts to reduce greenhouse gas emissions, including a Council declaration of a climate emergency in July 2019, the Township recognizes the need to plan for new modes of low carbon mobility, and a shift towards sustainable transportation systems more broadly. For the purposes of this Plan, "low carbon mobility" encompasses the shift to transportation systems that emit zero or low amounts of greenhouse gas (GHG) emissions. For vehicles, these systems include electric vehicles (EVs), hydrogen fuel-cell technology, and renewable fuels. Low carbon vehicle systems are increasingly competitive in a range of transportation modes, including passenger vehicles, medium- and heavy-duty vehicles, transit (e.g. bus, Skytrain, and passenger trains), "little vehicles" (e.g. scooters and electric bikes), cargo trains, watercraft, and aircraft. Low carbon mobility also encompasses a shift to active modes of transportation – such modes include walking, cycling, and 'rolling'.

There are a wide range of emerging low carbon mobility systems, with some uncertainty regarding future technology development, and what systems will emerge as the most optimal for different transport modes. For this reason, the LCMP is designed as a living framework that will be revisited on a regular basis. The order of the individual components added to the LCMP does not necessarily speak to the priority or promise of the technology, but rather its imminence in the community and strategic planning timeline. Each chapter or entry into the LCMP will be implemented and revaluated on an independent timeline but within perspective of the LCMP as a whole to ensure that the Township is efficiently planning for contemporary mobility needs in real-time while pro-actively fostering deep GHG reductions to respond to the challenge of climate change.



The pieces of the Township's Low Carbon Mobility Plan 3

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2. ELECTRIC VEHICLES

There has been a marked increase in the prevalence of electric vehicles (EVs) over the last several years, both in Canada and internationally. The rise of EVs is largely a product of their increasing affordability, greater efficiency and lower cost to operate than gasoline or diesel vehicles, and supportive government policy. Consumers are also turning towards EVs as a way of reducing their environmental impact, as they release few if any greenhouse gas emissions and air pollutants into the atmosphere. EVs offer several other benefits to consumers and local governments alike, from reduced maintenance costs, to improved community health and quieter streetscapes.

The number of EV models available on the market has never been higher, making EVs an increasingly viable choice for British Columbian drivers. Despite this increase, however, there are still many barriers to EV adoption, which is why the Township of Langley has created a plan for electric vehicles in their Low Carbon Mobility Plan (LCMP). The EV plan will provide a framework that will guide efforts to support further electrification of the transportation sector in Langley, including public and municipal vehicles. Specifically, it has been designed to:

- Encourage and support further adoption of EVs to help reduce community and fleet GHG emissions;
- Establish the role of the Township and the private sector in providing EV infrastructure and services;
- Aid the Township in responding to growing demand for EV infrastructure, both by Township employees and the community; and
- Increase public and industry awareness about the EV industry.

The EV plan combines industry leading knowledge with feedback from local stakeholders and Township residents to provide a strong foundation for the Township's pursuit of electric mobility, and provides a foundation from which the Township can achieve its broader sustainable transportation goals.

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2.1 WHAT ARE EVs?

This EV plan focuses on supporting adoption of plug-in EVs. Plug-in EVs include:

BATTERY ELECTRIC VEHICLES (BEV)



are propelled by electricity from onboard batteries charged via an external power source, typically the electric grid. Many BEVs available today are capable of travelling over 300km on a single charge.

PLUG-IN HYBRID ELECTRIC VEHICLES (PHEV)



come equipped with all-electric and fossil-fuel capabilities. PHEVs feature batteries that power an electric motor and can be charged via an external power source. They also can use another fuel, such as gasoline, to power an engine or generator. PHEVs usually run on batteries for shorter trips, and then can automatically switch to another fuel.

Other vehicle technologies, such as hydrogen fuel cell vehicles, may be important to achieve zero emissions transportation in certain applications, such as long-haul trucking. However, because of the very different infrastructure needs they present, they will be addressed in later additions to the LCMP.

Plug-in EVs are currently the most efficient and sustainable option to replace traditional fossil fuel powered vehicles – Plug-in EVs will represent the most competitive option for the vast majority of passenger vehicles, as well as most commercial trucking and off-road applications.



DEFINITION: Electric vehicles (EVs) or Zero-emissions vehicles (ZEVs)?

Zero emissions vehicles (ZEVs) are vehicles that have no tailpipe emissions of GHGs or air pollutants.

ZEVs include Plug-in EVs, both BEVs and PHEVs when propelled by their batteries. ZEVs also include Hydrogen fuel cell vehicles (HFCVs), which are fueled with hydrogen, then produce electricity to power an electric motor via a hydrogen fuel cell. Hybrid hydrogen fuel cell and battery EVs may likewise emerge in the future.

How fast can you charge an EV?

Different kinds of EV infrastructure have different charging rates, depending on the size of the battery.

LEVEL 1	Use a 120-volt system to fully charge an EV in 8-20 hours
LEVEL 2	Use a 240-volt system to fully charge an EV in 4-6 hours
LEVEL 3	Use a 480-volt system to fully charge EV in under an hour

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2.2 WHY PLAN FOR EVs?

The idea of EVs in the Township was first introduced with the Sustainability Charter in 2008. Since then, several other related strategies (see below) have been released, all with the general goal of reducing overall emissions and managing energy within the Township. The EV Plan is important to bring these goals together in a cohesive way to ensure the Township is prepared for the future of EVs.

OFFICIAL COMMUNITY PLAN 2013

GOALS

- Policy to support EV charging infrastructure
 Pursue a low-carbon lifestyle

SUSTAINABILITY CHARTER 2008

GOALS



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2.3 FEDERAL ACTION ON EVs

In 2016, the Government of Canada pledged to reduce national GHG emissions by 30% relative to 2005-year emissions by 2030¹. It further established a Framework² to reduce emissions, grow the clean economy, and develop resilience to the changing climate. In respect to clean growth and transportation, the Framework highlighted the need to increase the number of zero-emission vehicles (ZEVs) on the road and shift from higher- to lower-emitting modes of transportation.

In an effort to green government operations, the federal government has additionally committed to purchasing ZEVs or hybrids for 100% of their new executive vehicles and 75% of new light-duty unmodified administrative vehicles³. For the broader population, a set of Canada-wide targets will see an increase in sales of new ZEVs to 10% by 2025, 30% by 2030, and 100% by 2040. Steady progress towards these goals are projected to put 14.1 million new ZEVs on the road by 2040.

Effective May 2019, the federal government began providing purchase and lease incentives through the *Incentives for Zero-Emission Vehicles Program* (iZEV).⁴

The iZEV program is designed to help Canadians afford clean transportation technology through pointof-sale incentives for individuals, and tax writeoffs for businesses. Program features include:

- \$5,000 in incentives for battery-electric, hydrogen fuel cell, and longer-range PHEVs;
- \$2,500 in incentives for shorter range PHEVs; and
- A 100% tax write-off for ZEVs to support adoption by businesses.



2.4 PROVINCIAL ACTION ON EVs

The Government of British Columbia's 2018 *CleanBC*⁵ plan sets a goal of reducing provincial GHG emissions and growing the low-carbon economy, and renews the Province's commitment to emissions reductions of 40% by 2030, 60% by 2040, and 80% by 2050 (relative to 2007 levels)⁶. With respect to transportation, *CleanBC* outlines two key actions: bring down the price of clean vehicles and speed up the switch to cleaner fuels.

CleanBC also establishes an active transportation strategy, with measures to promote cycling, walking, and other methods of non-motorized transport.

The Province will further support active transportation through the provision of incentives for local governments and public-sector organizations that reduce the need for commuting.

There are a number of programs available in British Columbia that encourage EV adoption. Relevant programs are listed below in Table 1, along with a description of the key features of each program.

Program Name	Program Description
Clean Energy Vehicles for British Columbia (CEVforBC) ⁷ Program	 Introduced in 2011 and has since committed more than \$71 million to vehicle point-of- sale incentives and charging infrastructure.
BC SCRAP-IT Program ⁸	• Provides a potential rebate of up to \$6,000 for early retirement of old vehicles that are replaced with EVs. While 2019 funding has been exhausted, additional funding is expected in 2020.
Specialty Use Vehicle Incentive (SUVI) Program ⁹	 Offers between \$2,000 and \$50,000 for other vehicle types such as e-motorbikes, forklifts, trucks and buses.
ZAPBC Program ¹⁰	• Provides a free Level 2 ChargePoint Charger for home use. 2019 funding has been exhausted; however, additional funding is expected in 2020.
Charging Incentives and Solutions Program ¹¹	 Provides incentives towards the purchase and installation of eligible electric vehicle charging equipment and support services for homes, multiple unit residential building (MURBs) and workplaces (program fully subscribed, additional funding expected).

Table 1 Summary of EV Programs and Incentives in British Columbia

2.5 WHY EVs?

The electrification of mobility is an important policy objective at the municipal, provincial, and federal government levels. This collective pursuit of low-carbon transportation is due in large part to the benefits of EVs; experts widely agree that EVs are better for humans and the environment than conventional internal combustion engine (ICE) vehicles. EVs can provide a number of financial and non-financial benefits for both EV owners and non-owners (see Table 2).

Table 2 Benefits of EVs

Economic Benefits Lower In BC, electricity is currently less expensive than both gasoline and diesel Operational With an annual driving distance of 20,000 km, EVs can save more than \$2,000 in fuel costs per year¹² Costs EV motors, batteries, and drivetrain electronics require no regular maintenance Lower In BC, EV owners spend approximately \$375 less annually on maintenance than ICE vehicle owners¹³ Maintenance · For municipal and company fleets, it is estimated that ZEVs' maintenance costs are approximately two-thirds Costs less than ICE vehicles, resulting in lower lifecycle costs for the fleet Electricity in BC is primarily produced in-province, resulting in EV owners' expenditures on this power source Local benefitting local and regional economies¹⁴ Economy EV adoption has also been shown to generate employment in research and development, manufacturing, charging infrastructure installation, and charging infrastructure maintenance¹⁵ **Environmental Benefits** GHG EVs substantially reduce GHGs by partially or completely eliminating tailpipe emissions¹⁶ Emissions In BC, EVs can reduce vehicular travel emissions by 80-98%, compared to an ICE vehicle¹⁷ Reductions · Most EVs come standard with lithium-ion batteries, which are 90% recyclable **Battery Life &** • Lithium-ion batteries can also be repurposed for energy storage because they retain about 70% of their Recycling capacity, supporting lower cost and lower carbon electricity systems¹⁸ EV charging can occur during times of low electricity demand, resulting in lower costs for EV drivers, as well as lower electricity rates for all utility customers Grid • Flexibility in EV charging can also help integrate sources of renewable energy (e.g. solar and wind). In the Integration & future, EVs and associated charging infrastructure may be designed to allow excess battery-stored energy to Resilience be sold back to the local utility, used to meet residential energy needs, and/or provide a source of emergency power and battery storage **Health Benefits** Because electric motors do not combust fossil fuels, EVs do not emit carbon monoxide (CO), volatile organic **Reduced Air** compounds (VOCs), nitrogen oxides (NOx), or fine particulate matter, which are major contributors to air Pollution pollution and associated health problems¹⁹ Reduced · Constant or repeated exposure to high levels of environmental noise can negatively affect health Noise Because EVs produce little to no road noise (especially at low speeds), they have significant potential to Pollution reduce noise pollution in the urban environment The urban heat island (UHI) effect is a process in which densely populated urban areas trap heat²⁰ Lower Urban • The UHI effect primarily occurs because buildings and paved roads absorb and hold warmth more effectively **Heat Island** than rural areas and naturally vegetated ecosystems, but is exacerbated by the use of vehicles and other Effects equipment EVs can help mitigate the UHI, as they generate ~20% of the total heat of ICE vehicles²¹

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3. ELECTRIC VEHICLES IN PERSPECTIVE

3.1 MARKET TRENDS

Electric mobility is growing rapidly in many parts of the world, due in large part to the falling cost of EVs, supportive government policies and incentives, as well as increased consumer familiarity with the technology. In 2018, the global EV fleet reached a total of 5.1 million vehicles, an increase of two million vehicles over the previous year²².

GROWTH IN THE EV MARKET





3.2 EVs IN LANGLEY TOWNSHIP

The availability of charging infrastructure in the Township has increased substantially since the first charging stations were installed in 2013. As of April 2019, the Township offers free public access to seven Level 2 EV charging stations, although fees may be incurred in the future. Charging stations are located at:

- Aldergrove Credit Union Community Centre;
- Township Civic Facility;
- Langley Events Centre;
- Walnut Grove Community Centre; and
- W.C. Blair Recreation Centre

The Township is also host to a BC Hydro-owned DC Fast Charger, located at the Langley Events Centre, and plans to add an additional Level 2 charger at the George Preston Recreation Centre, as well at two more chargers at local shopping centres. This growing number of charging stations will support the growing interest in EVs among Langley Township residents.



WHAT WE HEARD

Results from the Township's 2019 Resident EV Survey suggest that **69% of** survey respondents were somewhat to very likely to purchase an EV.

A majority of residents see the potential for EVs to mitigate the environmental impact of vehicular travel. Out of 394 responses, **79% of respondents felt that electric vehicles are better for the environment** than conventional vehicles, while only 10% felt that EVs are worse for the environment.

Feedback from the Township's 2019 Resident EV Survey also suggest that planned locations for future charging infrastructure should be in line with the desires of the community. Suggested locations for charging capacity include shopping locations, public parks, community centres, and gas stations, among other locations.



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3.3 FACTORS AFFECTING EV ADOPTION

There are a number of factors that strongly influence rates of EV adoption, including incentives and initial cost, availability of charging infrastructure, vehicle availability and selection, public education and awareness, and shared mobility. Each of these factors is discussed below.

Incentives and Initial Cost \$

The availability of financial incentives has a dramatic influence on EV purchase rates in Canada, with more than 97% of EV purchases taking place in provinces that offer substantial financial incentives²³. The provision of these incentives helps offset the initial cost of EVs which, despite recent increases in affordability, is still greater than comparable fossil fuel-powered vehicles. Even without rebates or incentives, many electric models can now be purchased for between \$35,000 and \$45,000, with the least expensive options available for as low as \$27,000²⁴.

Availability of Charging Infrastructure 🛛 🗡

The availability of adequate charging infrastructure can strongly influence consumers' EV purchase decisions. In past years, undersupply of charging infrastructure in British Columbia acted as a barrier to EV purchasing. However, the availability of publicly accessible charging stations has increased dramatically, particularly in the Lower Mainland and eastern portion of Vancouver Island. As of summer 2019, there are more than 1700 charging stations throughout British Columbia, including nine Level 3 fast charger sites recently built by the province, and another six planned for construction in 2019 and 2020²⁵. Moreover, FortisBC has announced a "40 by 2020" plan that will see 40 Level 3 charging stations in the Kelowna-Creston-Princeton area by the end of 2020²⁶. The growth of this province-wide Level 3 network should help to alleviate range anxiety for Township families, opening up the majority of the province to EV travel.

Despite recent investments in charging infrastructure, concerns over EV battery range and performance in cold weather continue to influence purchase decisions. A 2019 BC Hydro study revealed that nearly 70% of survey respondents indicated that they are hesitant to purchase an EV due to concerns over the reliability of EVs for travel on out-of-town road trips²⁷. However, the survey also reported that the majority of out-of-town road trips are less than 300 kilometers each way, which is well within the range of most EVs (see *Figure 1*).

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Figure 1 Road Trips and EV Range Hesitations (BC Hydro, 2019)

The results of BC Hydro's 2019 survey highlight the importance of educating the public about EV capabilities. In addition, it will be important for utilities, private organizations, and government to ensure that the provision of charging infrastructure keeps pace or exceeds that of EV purchasing.



WHAT WE HEARD

Results from the Township's 2019 EV Survey revealed that EV range is the most common factor influencing respondents' decisions regarding whether to purchase and EV. Interestingly, **82% of respondents live within 45 kilometers of work or school** (90 kilometers round-trip), suggesting that EV ranges should not be an issue for the majority of Township residents' day-to-day travel.



WHAT WE HEARD

Results from the Township's 2019 EV survey suggest local awareness of EVs is moderate, with **67% of respondents indicating awareness of available incentives**. It should be noted that the maximum EV incentive has reduced to \$14,000 since the survey was completed in spring, 2019.

Vehicle Availability and Selection 🛛 🚘

Despite an increase in the number of available EV models in recent years, a 2018 study by Clean Energy Canada²⁸ found that only 40% of dealerships in British Columbia had EVs on their lots available for purchase. EV availability varied within the province, from 54% of dealerships in the Lower Mainland to only 7% in Northern BC. The study also reported that:

- Wait times for EVs are generally multiple months to a year;
- EVs are often sold almost immediately after arriving at dealerships; and
- British Columbia has a particularly hard time keeping up with EV demand.

British Columbia's targets of increasing new EV sales to 10%, 30%, and 100% for 2025, 2030, and 2040, respectively will likely shift this trend by requiring dealerships to sell a minimum share of EVs every year. While there are now several BEV options for passengers cars and SUVs, the industry is less developed for other vehicle types such as pickup trucks and medium- and heavy-duty vehicles; therefore, it may take longer for EV technology to gain a meaningful market share for these vehicle types.

Availability of Charging Infrastructure

As recently as 2014, 59% of Canadian seniors were unfamiliar with EVs, and only 18% of the population believed EVs were a viable alternative to conventional vehicles²⁹. To help address this gap, *Emotive: The Electric Vehicle Experience³⁰* was launched in 2013 to provide a public outreach campaign designed to increase awareness about EVs in British Columbia. Emotive includes a Community Outreach Incentive Program that offers funding and support for communities and local governments in the Province to deliver EV outreach. While *Emotive*'s work has helped to increase awareness overall, public education and awareness of the benefits of EVs is still necessary to ensure increased EV uptake in the future.



Active Transportation 🚲

British Columbia has made increasing active transportation a priority. The *Move. Commute. Connect*³¹ Strategy is the Province's approach to encourage more active transportation, reduce GHG emissions, and improve quality of life for residents. The Strategy's main goal is to double the percentage of trips taken by active transportation by 2030, through education and awareness, incentives, and policy development. As part of the Strategy, the Province developed the *Transportation Options Program* under the existing *Scrap-It Program*, which provides \$850 towards the purchase of an electric bike (e-bike) for individuals scrapping high-emission vehicles. The increasing availability of electric-assist bikes, scooters, and other "little vehicles" may increase the viability of active transportation, and the demand for active transportation networks.

While there are several supportive trends to indicate that EVs are on the rise across the country, there is still an important role for the Township in directly supporting the reliability, availability, and accessibility of electric mobility in the community. The remaining sections of this report outline the key actions the Township will take to increase awareness and adoption of EVs, including a description and the timeframe for completion.

These actions were developed through extensive research of North American EV fleets and technology, external stakeholder engagement through workshops and a public survey, and internal stakeholder workshops with various Township divisions.

Timeframe	Description
Short	1-2 years
Medium	2-4 years
Long	5+ years



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4.1 LEADERSHIP IN TOWNSHIP FLEET, EQUIPMENT AND PROCUREMENT

Electrifying Township vehicles and equipment is a key opportunity to lead in the transition to electric mobility, reduce corporate GHG emissions, and improve local air and noise pollution. An increasing variety of EVs suitable to municipal fleets are commercially available, with more models announced for the future – including pick-up trucks, vans, dump trucks, service trucks, tractors, mowers, and others. As battery and other component costs decline, electric vehicles and equipment will increasingly represent a fiscally prudent way to reduce life cycle costs and maximize value for the Township.

Adopting EVs into the Township's vehicle fleet will require adequate fleet charging infrastructure at Township facilities. As more and larger vehicles electrify, electrical upgrades to facilities may be required, which can present a challenge to cost-effectively transitioning to EVs. To minimize costs, it is important for the Township to carefully plan for future charging needs, optimize charging strategies and minimize electrical demand, and "future-proof" initial charging infrastructure projects to ease the expansion of EV charging infrastructure as needs grow.

In addition to its fleet, the Township can also show leadership by providing "atwork" charging for its employees. "At-work" charging is important to encourage drivers to make the switch to EVs – particularly for those with longer commutes or who may not have access to "at-home" charging. Providing for Township employees will support overall EV adoption across the community, while showcasing EV friendly strategies to other Township employers and businesses.

	Initiative	Timeframe
1.1	Install fleet and workplace-charging infrastructure at Operations Centre and Civic Facility: assess and increase electrical capacity at the facilities and install Level 2 charging stations. Where possible, consider funding opportunities for Level 3 charging stations.	Short
1.2	 Evaluate other Township facilities: assess Township facilities for EV charging potential for fleet, workplace charging, and the public. Include evaluation of potential for efficiency improvements and solar power to increase the available electrical power to EVs at Township facilities. For "at work" charging, focus on providing relatively slow charging (e.g. "Level 1" or "Level 2" with substantial load sharing), so that employees can remain parked all day and not need to move their vehicles. Implement user fees, to recover costs (full operating cost recovery, at minimum). 	Long

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1.3	Enact an "Electric First" policy: establish an "Electric First" policy that prioritizes efficient EVs, and equipment, in Township fleet and for contracted services, unless a life cycle cost analysis demonstrates it is not viable or cost-effective. Develop a vehicle replacement schedule to plan for upcoming EV purchases that includes adding a low carbon levy to vehicle charge outs.	Short
1.4	 Implement Staff training: 1) Support EV maintenance training for fleet staff and contractors. 2) Educate staff on distinguishable driving experience differences between EVs and PHEVs in the fleet from ICE fleet vehicles. Consider charging, operation, and safety. 	Long
1.5	Learn from best practices of Medium- and Heavy-Duty Vehicles (M/HDV): look to City of Vancouver and other municipalities for research and opportunities on electric M/HDV. Explore signing the "Drive to Zero" pledge.	Medium

4.2 EV CHARGING ON PRIVATE PROPERTY

Access to EV charging at home is one of the most important factors determining whether a household will choose EVs. While most Langley single-family homeowners can readily implement EV charging in their garage or driveway, residents that live in multifamily housing or who park on the street can face significant challenges to accessing "at-home" charging. As a result, it is important for the Township to ensure access to EV charging in both newly constructed and existing multifamily buildings, as well as provide solutions for those who park on the street. Likewise, access to EV charging in workplace parking is important to both complement at-home charging, and to further support EV drivers who do not yet have access to EV charging at home. "Atwork" charging can also present an opportunity to integrate charging with solar power, which is growing rapidly globally and may become a more important part of BC's power supply in future decades.

Since it is far more cost effective to install EV charging infrastructure in new construction projects than to retrofit it into an existing building, it is important to "future-proof" new developments with EV charging infrastructure to anticipate future demand. This is particularly true in shared parking areas in multifamily or commercial developments. However, it is also important to renovate existing buildings to provide residents with access to EV charging, as many of these buildings will be standing for decades. Fortunately, there are innovative strategies that can reduce the costs of EV charging in existing buildings, especially when multifamily and commercial building owners plan to provide access to charging to a large percentage of parking stalls as part of a single comprehensive project.

G.1

		2
	Initiative	Timeframe
2.1	Implement EV Ready requirements for new residential developments: Establish requirements for residential parking spaces to include an adjacent energized electrical outlet capable of providing Level 2 EV charging.	Short
2.2	Implement EV Ready requirements for new non-residential developments: Establish requirements for non-residential parking spaces to include appropriate provisions for EV charging infrastructure.	Short
2.3	Advocate for "Right-to-Charge" legislation: send a letter of support to the Province to amend the Strata Property Act to prevent stratas from denying electric vehicle supply equipment (EVSE) for residents.	Short
2.4	Educate residents and workplaces: Coordinate with BC Hydro, the Province of BC, Metro Vancouver, the EV charging industry and others to provide information to homeowners, multifamily condominiums, rental owners, and commercial buildings on strategies to implement EV charging.	Long
2.5	Pilot incentives for single family, multifamily buildings and workplaces: Explore opportunities to complement future provincial and/or utility EV charging infrastructure incentive programs. Focus especially on programs providing access to charging for large parking areas in multifamily buildings and workplaces.Expand existing TOL rebate programs, including electrical panel upgrades.	Medium

4.3 PUBLICLY ACCESSIBLE EV CHARGING

Publicly accessible EV charging stations support EV adoption by:

- Increasing drivers' confidence that they can access convenient charging when they are "out and about"
- Providing for drivers on longer trips
- Providing for drivers without access to charging at home or at work
- Providing for vehicles used in shared mobility fleets
- Increasing the visibility of EVs

In addition to supporting EV infrastructure on private property, the Township can support continued EV adoption by leading the expansion of publicly available charging infrastructure through the existing Township-owned network, as well as supporting private sector charging infrastructure deployment. With EV adoption increasing, Langley community members will benefit by having access to the Township's publicly accessible EV charging network. Implementing fees for the use of the network can provide a recoverable offset source to help make this service financially sustainable. As charging stations become more accessible, fees can also help increase station turnover and availability, encouraging EV drivers to only charge their vehicles when necessary.

As EV adoption increases, it is likely the private sector and utilities will increasingly invest in public charging infrastructure. This may lessen the need for ongoing municipal investment. For the time being, however, the Township's

investment in charging infrastructure is essential to supporting the transition to electric mobility.

The kind of infrastructure needed to support EV drivers depends on how long they are likely to be parked in a particular location. In general, publicly accessible Level 2 charging infrastructure is appropriate where vehicles are typically parked for an hour or more. DC Fast Chargers provide rapid charging at greater expense, and are best suited when vehicles will be parked for 10 minutes to an hour. DC Fast Charging is especially important to support drivers without access to other forms of charging, as well those taking long-distance trips.

	Initiative	Timeframe
3.1	Implement user fees for Township EV charging: implement fees for EV charging to support cost recovery of EV charging infrastructure and increase turnover. Consider fee levels set by other municipalities in the region.	Short
3.2	Develop an incentive program for commercial EVSE installation: develop a grant program for Langley businesses or institutions to apply for funding for a public EVSE project.	Medium
3.3	Expand the Township's publicly accessible EV charging network: explore feasibility based on facility power availability and station needs, grant opportunities, and a gap analysis.	Long
3.4	Explore on-street charging: explore options to provide on-street charging infrastructure where on street parking is provided. Consider integration with retrofitted street-lights, among other options.	Long
3.5	Explore advertising on TOL public stations : explore the permissibility and feasibility of selling advertising space on digital screens of TOL public EVSE to recoup some costs of station installation. Alternatively, use for in-house advertising.	Medium
3.6	Increase awareness of permitted EV charging station use: educate users that stations are for charging only, not parking, and to obey posted time limits. Monitor voluntary compliance and evaluate the need for enforcement.	Medium



WHAT WE HEARD

Respondents to the Township's Resident EV Survey suggested that **drivers desire access to charging on both public property** (e.g. street right-of-way, community centres, parks), **as well as private locations** such as shopping malls and gas stations.



WHAT WE HEARD

Participants in the Township's Medium- and Heavy-Duty Vehicles Workshop were supportive of a Township pilot of M/HD EVs to reduce the risk for private industry, and noted that **electrical infrastructure upgrades represented a key barrier to adoption**.

4.4 STRATEGIES FOR TRUCKS, BUSES AND OFF-ROAD TRANSPORTATION

The number of commercially available plug-in electric trucks and buses is rapidly increasing, with electric models now available for all truck size classes. Many lightduty and medium-duty electric trucks already have a viable business case for many applications, and heavy-duty electric trucks' viability are rapidly improving. Commercial trucks and buses represent over 30% of "on-road" transportation energy use and GHG emissions in the Township. Of these emissions, over 80% come from vehicles making local or regional trips (vs. long-haul transportation).³² These relatively shorter urban and regional trips are the most feasible for the use of electric trucks. As such, the most promising markets to electrify in the near term include delivery vehicles, refuse trucks, drayage, and buses.

Another category of heavier-duty vehicles that can be electrified are off-road vehicles. These vehicles are responsible for nearly the same volume of GHG emissions as on-road commercial trucking in the Township, and include:

- Tractors and other agricultural equipment (approximately 60% of the Township's off-road GHG emissions);
- Construction equipment (14%)
- Specialty vehicles used in commercial, industrial, port and airport settings (20%); and
- Landscaping, boats, and recreation equipment (6%).

Fortunately, a growing amount of electric equipment is available to serve these needs. Today, electric models of forklifts, low-speed commercial vehicles, and airport and port specialty vehicles are already widely available. Battery electric and/or grid connected tractors, backhoes, and other agricultural and construction equipment have also been released, though these are currently in very early stages of deployment.

The adoption of electric trucks, buses, and off-road vehicles will have a significant impact on reducing air and noise pollution, as well as GHGs. To help support this transition, municipalities can incentivize their adoption through financial and non-financial means, support improved access to appropriate charging infrastructure, and pilot different electric vehicles to test their capability and reliability under normal operating conditions.

G.1

	Initiative	Timeframe
4.1	Advocate for zero emissions requirements for M/HDV vehicles: advocate that the province and/or Metro Vancouver (as part of its mandate to manage air quality) develop requirements for new vehicle sales and/or fleets to be zero emissions.	Long
4.2	Champion school bus electrification: engage with School District No. 35 to encourage policies to convert to an electric school bus fleet.	Long
4.3	Explore EV Ready requirements for commercial truck parking and loading areas: study appropriate strategies and establish requirements for "EV Ready" truck parking on private and public property.	Long
4.4	Share information/educate about zero emissions trucks and off-road equipment: work with BC Hydro, other local governments, the provincial government, Port Metro Vancouver, and industry organizations to regularly engage the trucking, agriculture, construction and industrial sectors about electric vehicle opportunities.	Long
4.5	Explore commercial charging hubs: engage with landowners, fleet managers, BC Hydro, Port Metro Vancouver and other stakeholders to explore opportunities to implement electric truck charging infrastructure in industrial and commercial lands (e.g. Northwest Langley, Gloucester).	Long
4.6	Consider opportunities to support ZEVs as part of any future mobility pricing: encourage TransLink and Mayors' Council on Regional Transportation to encourage zero emissions vehicles as part of any future mobility pricing regime, including the establishment of zero emissions zones.	Long
4.7	Explore bulk purchase: Engage with manufacturers to explore the business case for coordinating a bulk purchase programs for trucks or off-road equipment for Township fleet, local municipalities, and private business.	Long

4.5 PUBLIC EDUCATION AND AWARENESS

While awareness and understanding of EV options and incentives is growing, the transportation sector is changing quickly. Residents and businesses are rarely fully aware of the opportunities and benefits of adopting EVs, including the array of federal and provincial incentives that exist to support their purchases. Many consumers lack the information they need to make a decision about what kind of vehicle would best suit their needs – even in jurisdictions like California, where EV numbers are high, consumer awareness has been found to remain low.

Provinces, municipalities and industry organizations all have a role to play in providing consumers with information on EV model availability and cost, EV range, charging access points, ongoing fuel and maintenance savings, and available incentive programs. An array of education and experiential programs can help grow consumer confidence in EVs, from website updates to "Ride and Drive" experience events that offer drivers the chance to experience what it's like to drive an EV.

G.1

	Initiative	Timeframe
5.1	Support EV education: partner with other local governments, BC Hydro, and other organizations to educate the general public about EVs.	Long
5.2	Host "Ride and Drive" events: explore opportunities for the Township to host Ride and Drives, Test Drive Days, and other opportunities for residents to experience EVs and speak with current drivers.	Medium
5.3	Support a Bulk Purchase Program: Explore opportunities for a bulk purchase program for local dealerships to reduce costs for EVs.	Medium
5.4	Showcase Township EVs: highlight Township EVs through vehicle graphics.	Long
5.5	Encourage the creation of an EV Drivers Group: explore with EV enthusiasts the possibility of establishing an EV drivers group for South of Fraser residents (similar to Vancouver Electric Vehicle Association) as a resource pool for volunteers and peer-to-peer education.	Long

4.6 ELECTRIFYING SHARED MOBILITY

"Shared mobility" refers to a range of services that may change how we get around in profound ways over the coming years. This strategy considers four main types of shared mobility, as well as conventional taxi services.

Car-sharing

Car-sharing can play an important role in a sustainable transportation system, and can take a few different forms:

- One-way/free-floating fleets that allow pick-up and drop-off at different locations (e.g. car2go; Evo)
- Two-way/station-based fleets that require vehicle pick-up and drop-off at the same location (e.g. ZipCar; Modo)
- Peer-to-peer fleets that allow car sharing between individual owners (e.g. Turo)

While car-sharing increases vehicle travel for some users, studies suggest that it tends to reduce overall vehicle travel by reducing households' vehicle ownership; this is particularly true for two-way car-sharing. While car-sharing is not widely available in the Township yet, it could be an increasing part of Langley's transportation system in the future as its urban communities become more dense. Two-way car-sharing has particularly good potential to be electrified if EV charging is provided in a vehicle's home base parking spot.

Ride-hailing

Ride-hailing services, such as Uber, Lyft and other transportation network companies, are expected to be seen in the region in late 2019 or early 2020.

While ride-hailing has potential to reduce individual car-ownership, studies show that ride-hailing services to date actually tend to increase total vehicle kilometers traveled, increasing congestion and pollution as they displace transit use and active transportation, and experience significant "deadhead" travel (i.e. when there are no passengers). EVs, therefore, present an attractive opportunity to reduce both emissions and operational cost-savings for this sector. Likewise, ride-sharing services (e.g. UberPOOL or Lyft Line) and vehicle right-sizing can be encouraged to reduce congestion and emissions.

"Little Vehicles"

"Little vehicles" refer to bikes, scooters, and other small, speed-limited vehicles that can access traditional bike or pedestrian infrastructure, as well as travel on roadways. Electrification and/or sharing of bikes, scooters and other little vehicles holds the potential to promote sustainable, healthy travel choices in the Township. The same factors support adoption of electric and/or shared little vehicles as support traditional bicycles – access to safe, dedicated, convenient and complete transportation routes.

	Initiative	Timeframe
6.1	Advocate for regulatory options to drive sustainable ride-hailing and taxis: coordinate with other municipalities, the Passenger Transportation Board, and the Ministry of Transportation to develop regulations and programs to minimize per-passenger-emissions and congestion.	Long
6.2	Encourage electric ride-hailing and taxis: engage ride-hailing companies to explore how EVs can be used in their services. Consider opportunities for ride-hailing vehicles to use Township EV charging infrastructure, and opportunities to support leasing of vehicles.	Long
6.3	.3 Encourage electric car sharing: as car-sharing is introduced into Langley, engage car-sharing companies regarding strategies to support electrification. Support two-way car-sharing in new developments by securing access to Level 2 EV charging with relatively high-power capacity and third-party station management.	
6.4	Plan for electric and/or shared little vehicles: consider the potential for electric and/or little vehicles to increase demand for bicycle infrastructure. Consider opportunities to expedite the build out of the Township's Ultimate Cycling Network, with a focus on completing safe, convenient routes.	Long

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4.7 ADVOCACY FOR EV LEADERSHIP FROM OTHER LEVELS OF GOVERNMENT AND UTILITIES

The transition to electric mobility requires policy changes at the local, provincial, national and electric utility level. The federal and/or provincial government have enabled EV uptake through incentive programs, BC's zero emissions vehicle sales mandate, BC's *Low Carbon Fuel Requirement* and the federal *Clean Fuel Standard*, and other policies – continuing to strengthen these and other policies is crucial to an optimal transition to electric mobility. Likewise, electric utility rate structures, grid service connection and extension policies, and vehicle-grid interconnection strategies, can significantly impact the viability of different types of electric mobility. Utility regulation should evolve towards a focus on beneficial electrification, helping to save consumers money, facilitating better grid management, and resulting in greater uptake of EVs and other efficient electrical technologies that can eliminate emissions.

	Initiative	Timeframe
7.1	Advocate for policy that is focused on the electrification of applicable transportation/mobility sectors: work with other local governments and industry to regularly articulate key priorities for senior levels of government to support electrification. Consider Union of BC Municipalities resolutions and direct communication to the provincial and federal government.	Long
7.2	Advocate for increased EV supply at dealerships: work with local municipalities and auto dealerships to explore opportunities to increase supply of EV models from original equipment manufacturers.	Medium
7.3	Encourage learning from Township fleet leadership: provide feedback to BC Hydro and the province on key barriers and/or opportunities to support electrification based on experience at Township facilities.	Long
7.4	Advocate for training and support for EV maintenance: advocate for local technical schools and mechanics to receive training and resources to prepare for market shift to EVs.	Medium

5. MOVING FORWARD

The Township's Low Carbon Mobility Plan: Electric Vehicles provides the background information and key strategies necessary to meet the Township's goals of responding to the growing demand for EVs and supporting EV adoption across the community. It also positions the Township as a leader in EV adoption by setting strategies that will support EV adoption both community-wide and within the Township fleet, helping to achieve significant emissions reductions and meeting its sustainable transportation goals.

Next Steps for EVs

This report is only a starting point for EVs– as new technologies become available and information changes, the EV plan and its implementation will be updated over time to reflect actions achieved and new priorities. Township staff will continue to monitor EV trends and update the report to reflect on the status of each action item, make necessary modifications, and add initiatives as appropriate.

Next Steps for the LCMP

Township Staff will continue to explore other low-carbon mobility options beyond EVs. These will be explored in tandem and, at times, be over-lapping with existing entries to the LCMP. On the horizon for exploration is Active Transportation, Renewable Fuels, and Hydrogen Fuel Cell Technology.



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THE CORPORATION OF THE TOWNSHIP OF LANGLEY

TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AMENDMENT (ELECTRIC VEHICLE CHARGING) BYLAW 2019 NO. 5396

EXPLANATORY NOTE

Bylaw 2019 No. 5396 amends the Zoning Bylaw by incorporating provisions related to electric vehicle charging for residential uses.

THE CORPORATION OF THE TOWNSHIP OF LANGLEY

TOWNSHIP OF LANGLEY ZONING BYLAW 1987 NO. 2500 AMENDMENT (ELECTRIC VEHICLE CHARGING) BYLAW 2019 NO. 5396

A Bylaw to amend Township of Langley Zoning Bylaw 1987 No. 2500

The Municipal Council of the Corporation of the Township of Langley, in Open Meeting Assembled, ENACTS AS FOLLOWS:

- 1. This Bylaw may be cited for all purposes as "Township of Langley Zoning Bylaw 1987 No. 2500 Amendment (Electric Vehicle Charging) Bylaw 2019 No. 5396."
- 2. The "Township of Langley Zoning Bylaw 1987 No. 2500" as amended is further amended
 - (1) By amending "Section 102 Definitions" by inserting the following definitions

"EV (ELECTRIC VEHICLE)" means a *vehicle* that uses electricity for propulsion, and can use an external source of electricity to charge the *vehicle*'s batteries.

"ELECTRIC VEHICLE ENERGY MANAGEMENT SYSTEM" means a system to control *electric vehicle* supply equipment electrical loads comprised of monitor(s), communications equipment, controller(s), timer(s) and other applicable devices.

"ELECTRIC VEHICLE SUPPLY EQUIPMENT" means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch electric circuit and an *electric vehicle*.

"ENERGIZED OUTLET" means a connected point in an electrical wiring installation at which current is taken to supply utilization equipment.

"LEVEL 2 CHARGING" means a Level 2 electric *vehicle* charging level as defined by SAE International's J1772 standard, as amended or replaced from time to time. The standard currently defines it as a 208/240 volt circuit with a 20 to 100 amp rating.

(2) By amending "Section 107.3 – Required Off Street Parking Spaces" by adding the following text after the first paragraph, immediately before the table of uses and parking requirements:

The General Manager of Engineering and Community Development may specify utility and billing communication protocols, minimum charging performance, electrical infrastructure required for the use of *electric vehicle energy management systems*, and/or management guidelines as specified in the associated Township of Langley technical bulletin, as amended or replaced from time to time.

(3) By inserting a new column beside the Parking Requirements column of Sections 107.3a) through e), inclusive, as follows:

USE	EV CHARGING REQUIREMENTS*	
a) Residential Uses		
i) single family dwellings,	1.0 space per <i>dwelling unit</i>	
two family uwellings, mobile homes		
mobile homes as temporary		
accessory dwellings		
, , , , , , , , , , , , , , , , , , ,		
ii) townhouses	1.0 space per dwelling unit	
	1.0 space per <i>dwelling unit</i> if parking is provided by <i>tandem parking</i>	
iii) apartments	1.0 space per <i>dwelling unit</i> for studio apartments	
	1.0 space per <i>dwelling unit</i> for	
	apartments having one or more	
	bedrooms	
iv) dwalling units as part of a	1.0 apage per dwelling unit	
commercial or industrial	1.0 space per <i>dwenning unit</i>	
buildina.		
J		
v) seniors' housing	1 space per 4 dwelling units	
vi) accessory home occupation	Not Applicable	
b) Institutional Uses;		
i) assembly uses, excluding	Not Applicable	
educational uses	1 space per 1 occupants or residents	
excluding seniors' housing	r space per 4 occupants or residents	
iii) educational uses:	Not Applicable	
kindergartens, elementary		
schools and group children's		
daycare secondary schools and		
iv) government institutional	Not Applicable	
buildings		
v) recreational <i>uses</i> and	Not Applicable	
facilities including commercial		
recreational uses		
i) botols and motols	Not Applicable	
camparounds		
ii) commercial assembly uses	Not Applicable	
(other than institutional and		
recreation uses), including		
theatres and funeral homes		

USE	EV CHARGING REQUIREMENTS*
iii) <i>bowling</i> alleys	Not Applicable
iv) retail stores, service	Not Applicable
establishments, personal	
service use and licensee	
retail store uses except as	
otherwise stated.	
v) offices, financial institutions	Not Applicable
vi) restaurants including food	Not Applicable
primary uses and brewery or	
distillery lounge areas	
vii) <i>liquor primary use</i>	Not Applicable
viii) golf driving ranges driving	Not Applicable
tee	
ix) golf courses	Not Applicable
 golf driving ranges 	Not Applicable
 liquor primary and food 	Not Applicable
primary uses accessory to	
a golf course shall comply	
with Subsection 107.3 c)	
vii)	
 for golf course 	Not Applicable
developments located	
adjacent to a Provincial	
Highway, the Ministry of	
Transportation and	
Highways should be	
contacted regarding site	
access and additional	
parking requirements.	
x) marina class 'A' and 'B'	Not Applicable
xi) marina class 'C'	Not Applicable
xii)vehicle servicing	Not Applicable
d) Industrial Uses	
i) service, general, heavy and	Not Applicable
other industrial uses	
ii) laboratories	Not Applicable
e) <u>Greenhouses</u>	
greenhouses when permitted to	Not Applicable
exceed a total lot coverage of	
33% shall provide one parking	
space for every 1000 m ² of	
greenhouse gross floor area	
space, plus one space for every	
15 m ² of gross floor area uses	
tor accessory retail sales	
purposes.	

(4) By inserting the following footnotes at the end of the table after Section 107.3e)

* Spaces listed under the EV Charging Requirements column are included as part of the total Parking Requirements column specified in the table included in Section 107.3 of the Zoning Bylaw.

Parking spaces with EV charging requirements shall feature an *energized outlet* capable of providing *Level 2 Charging* or higher, installed adjacent to the parking space, intended solely to be used by *Electric Vehicle Supply Equipment* (EVSE) and labelled accordingly.

In residential uses i) and ii), where there are two adjacent parking stalls, the energized outlet must be placed in equal proximity to both parking stalls to facilitate the use of dual head *EVSE*.

3. This bylaw is to come into force and take effect on the date of its adoption. Complete and valid building permit applications, submitted prior to the date of adoption of this bylaw are exempt from the EV Charging Requirements provisions in Section 107.3 provided that the building permit is issued within 6 months of bylaw adoption.

READ A FIRST TIME the	day of	, 2019.
READ A SECOND TIME the	day of	, 2019.
PUBLIC HEARING HELD the	day of	, 2019.
READ A THIRD TIME the	day of	, 2019.
RECONSIDERED AND ADOPTED the	day of	, 2019.

Mayor

Township Clerk