

NO: R255

COUNCIL DATE: December 17, 2018

REGULAR COUNCIL

TO: Mayor & Council **DATE: December 13, 2018**

FROM: General Manager, Engineering **FILE: 4520-20**
General Manager, Planning & Development

SUBJECT: Development Requirements for Electric Vehicle Charging Infrastructure

RECOMMENDATION

The Planning & Development Department and the Engineering Department recommends that Council:

1. Receive this report for information;
2. Approve amendments to Part 5 “Off-Street Parking and Loading/Unloading” of Surrey Zoning By-law, 1993, No. 12000, as documented in Appendix “I” of this report; and
3. Authorize the City Clerk to bring forward the necessary Amendment Bylaw for the required readings and to set a date for the related public hearing.

INTENT

The purpose of this report is to obtain Council approval to amend the Surrey Zoning By-law to include Electric Vehicle (“EV”) charging infrastructure requirements for 100% of all new residential parking spaces, 50% of visitor parking spaces, and 20% of commercial parking spaces in new developments.

BACKGROUND

EVs are a low-carbon mode of transportation that is a rapidly growing segment of the automobile market due to a variety of factors such as improving vehicle performance, declining vehicle costs, reduced operating and maintenance costs, and environmental considerations. Increased rates of EV uptake are also supported by advancements in charging technology and a growing network of charging infrastructure.

Demand for EVs is expected to grow significantly in the near future and was recently bolstered by the BC Government’s November 20, 2018 announcement of a zero emission vehicle (“ZEV”) mandate for the Province. The government will introduce legislation in the spring of 2019 to phase-in targets for the sale of ZEVs. This legislation will set targets of 10% ZEV sales by 2025, 30% by 2030, and 100% by 2040.

However, for prospective EV owners, access to charging remains a key barrier to EV adoption, as many households do not have reliable access to charging at home, at work, or on the go. In 2016, transportation accounted for approximately 60% of Surrey's greenhouse gases ("GHG"), and transportation emissions from personal vehicles were the largest single source of GHGs in the city. EVs represent a low-carbon alternative to typical gasoline vehicles, producing near zero GHG emissions when using power from BC's low-carbon electric grid. So, while EVs do not reduce congestion or the cost of supporting automobile transportation, widespread adoption of EVs is essential to begin to meet Surrey's climate change commitments and GHG reduction targets.

Requiring the development of EV charging infrastructure in private locations through bylaws and policy is critical to support the growing demand for EVs and achieve our climate change goals. EV charging in public and private locations is supported by numerous City strategies and policies, such as the Sustainability Charter 2.0 which has a goal of investing in effective infrastructure and services that meet the current and future needs of the city, while protecting the natural environment and supporting urban growth. The Sustainability Charter 2.0 advocates for supporting low-emissions vehicles and the necessary fueling infrastructure. Similarly, the City's Official Community Plan, the Community Climate Action Strategy, and the Transportation Strategic Plan all include objectives aligned to supporting EVs.

EV Charging Infrastructure Types

Charging technology is rapidly evolving. In addition to different levels of power, there are technologies that deliver, meter, and share power among multiple charging facilities, which can offer cost savings and improved efficiency. The charging facilities being considered for Surrey are:

- Level 2 AC ("L2") charging (208 or 240V), is considered the standard for residential charging, and is also the most common for workplace, commercial, and public charging locations. One to two hours of charging can be sufficient to "top-up", and four to five hours can fully charge most EVs on the market today. For some longer-range EVs, seven to nine hours may be required. Level 2 charging is widely considered to be most appropriate for residential applications.
- DC Fast Charging ("DCFC") bypasses a vehicle's internal charger to deliver DC power directly to the battery. DCFC is most commonly provided in strategic locations in public areas to provide charging for drivers on the go and to support longer distance driving. DCFC can provide an 80% charge to most EVs in approximately 30 minutes. However, the high costs per station make residential applications cost-prohibitive.

DISCUSSION

The Local Government Act ("LGA") provides local governments with the authority to regulate EV charging infrastructure requirements by establishing design standards for parking spaces. This report recommends incorporating EV charging requirements into the Zoning By-law, as it provides greater clarity for developers and allows for all types of development to be regulated under the same requirements.

The main barriers to widespread EV adoption are vehicle range and access to charging. Vehicle range continues to improve with advances in battery technology with some vehicles now enabling up to 300 km. However, reliable access to adequate charging remains as an important factor influencing EV adoption.

Nine (9) local municipalities have already adopted EV requirements for new residential developments with three (3) more moving forward with requirements, most requiring EV charging infrastructure in 100% parking spaces. Three (3) of the municipalities also require commercial developments to provide EV charging for 10-20% parking spaces. The policies and regulations in other BC municipalities are summarized in Appendix “II”.

Access to Charging

Having access to charging at home is the most convenient and reliable option, and is a critical factor in the decision to purchase an EV. Providing the necessary charging infrastructure at the time of construction is far more cost effective than retrofitting existing homes, particularly for multiple unit residential buildings (“MURB”). Modifying existing buildings for EV charging would require a majority of owners to support the change to the property, which in many buildings may be a bigger hurdle than the costs of the actual infrastructure. Requiring the necessary charging infrastructure at the time of construction future-proofs all new development and avoids these future complications and costs.

While EV ownership rates are currently low, there are numerous benefits to requiring 100% of residential spaces to be EV ready. The costs of providing EV infrastructure are not insignificant, but are considerably lower when installed at the time of new construction. Providing only “rough-ins” or partial EV infrastructure downloads the cost of wiring the parking spaces and system expansion onto future owners and strata councils. The 100% requirement also addresses the equity issues associated with fairly allocating access to EV charging among a limited number of parking spaces, which simplifies the administration for strata councils.

Requiring all residential spaces to provide L2 charging capabilities ensures that charging is available to residents regardless of the type or location of the building. Above all, the 100% requirement future-proofs new development while allowing for increased EV uptake and also accommodating charging systems and technologies as they evolve over time.

Based on the above and the direction being taken in other municipalities, the Zoning By-law amendment proposes a requirement for 100% of residential parking spaces and 50% of visitor parking spaces in new buildings to feature an electrical outlet capable of providing L2 EV charging.

Workplace charging also plays an important role in the decision to purchase an EV, and it is particularly important for those who do not have access to reliable charging at home and those who have longer daily commutes. Similar to MURBs, retrofitting existing commercial buildings can be challenging and costly. However, developing policy for commercial EV charging requirements is more complex than residential development given the variety of land uses, varying needs of commercial users, differing needs of employees and customers, and the complexities of ownership and management of commercial parking areas.

Final recommendations on EV charging for commercial, industrial and institutional land uses will be undertaken and brought to Council later in 2019. However, based on demand, requirements already implemented in other municipalities, and regional dialogue, it is recommended that an immediate interim requirement for commercial properties be introduced such that 20% of all new parking spaces feature an electrical outlet capable of providing L2 EV charging.

Public EV charging is also important and supports the adoption of EVs by helping to fill the gap between charging at home and at work. It also supports local businesses by providing charging infrastructure for their customers. The City has been working for a number of years to grow the public charging network under various programs and through partnerships with private enterprise and senior governments. Specifically, the City has invested in 21 publicly accessible chargers at City-owned sites, 9 fleet chargers, and 14 employee (workplace) chargers. The City is exploring opportunities and partnerships for a curbside charging pilot project, and is partnering with Tesla to provide fast-charging at 10 sites. Lastly, the City is working to install fast chargers at the former TREC site and in Cloverdale Town Centre in coordination with the BC Hydro and the Cloverdale BIA.

City of Surrey Performance Standard

The City retained a consultant to provide an EV performance analysis specific for Surrey, with the objective of establishing a minimum standard for EV charging infrastructure with energy management systems to ensure adequate overnight charging in MURBs.

Based on the consultant report and a review of requirements in other municipalities, staff recommends a configuration that accommodates up to four (4) load managed EV supply equipment (“chargers”) on a 40A circuit. Staff are confident that this performance standard will be sufficient to support EV charging in new residential developments in the coming decades.

Costs

The costs for new developments can be significantly reduced when energy management systems are utilized. The costs of providing EV charging infrastructure depend on a multitude of variables, including charging performance. Estimates for the average cost of electrical infrastructure for new construction across the range of MURB types, is approximately \$750 per parking space for four (4) chargers on a 40A circuit. This compares favourably to the cost of installing dedicated circuits, which is approximately \$2,710 per parking space. For single-family and townhouse applications, the cost for 2-share is estimated at \$500 per parking space.

These costs are the estimated average cost of the electrical infrastructure to provide the appropriate plug-in for the charger. The chargers are not a requirement of the developer so could be installed later by homeowners or the strata.

While some stakeholders, including members of the Development Advisory Committee (“DAC”), raised concerns regarding the additional costs of the proposed requirements, the overall consultation with stakeholders and other municipalities revealed that cost is not an overriding concern. In fact, some developers in the region are beginning to recognize EV charging infrastructure as an amenity and have been providing the infrastructure voluntarily and incorporating it into their marketing strategies.

EV Charging Consultation

In September/October of 2017, the City conducted two surveys of Surrey residents on Surrey's EV Strategy that solicited a total of 871 responses.

- CitySpeaks Panel: September 7 – September 25, 2017 (798 responses).
- Open Community (general public): September 7 2017 – October 31, 2017 (73 responses).

This survey generated data on EV ownership, benefits and challenges to EV ownership, charging needs and preferences, and EV purchase intentions. One key finding was that respondents strongly favoured policies that would see developers providing a minimum amount of EV charging infrastructure (78% strongly agreed or somewhat agreed).

From April through August 2018, staff had meetings, conversations, and correspondence with representatives of the following stakeholder groups:

- Surrey Board of Trade;
- Downtown Surrey BIA;
- Greater Vancouver Homebuilders Association;
- Condominium Home Owners Association;
- Building Owners & Managers Association of BC;
- BC Hydro;
- Urban Development Institute;
- Local development community; and
- EV charging service providers.

Staff have liaised with other local government staff as part of the Local Government EV Peer Network. Additionally, staff have convened an informal EV Advisory group comprised of EV experts and key stakeholders to advise staff on an EV Charging Policy in the City. In addition, staff presented information and preliminary recommendations to DAC, Environmental Sustainability Advisory Committee ("ESAC"), and Transportation and Infrastructure Committee ("TIC"). Each of these committees expressed support for the proposed amendments.

Proposed Zoning By-law Amendment for EV Charging Requirements

The proposed requirements apply city-wide, for all new residential and commercial development, and are intended to balance a number of objectives, including minimizing upfront costs; minimizing costs of retrofits; simplified strata administration; simplified City administration, inspection, and approvals; equitable access regardless of the type or location of the building; and the desire to future-proof all new development.

As described above, the Zoning By-law amendment proposes to require that all residential parking spaces, 50% of visitor parking spaces, and 20% of commercial parking spaces in new buildings feature an electrical outlet capable of providing Level 2 EV charging or higher. The proposed amendment also allows for EV Energy Management Systems to be implemented, where the minimum performance standard is achieved, as specified by the General Manager of Planning and Development Department.

Implementation

The proposed requirements would be effective for any development permits applications received after Council adoption of these requirements, and for all building permit applications received after the implementation date of June 1, 2019. For in-stream applications that may face greater difficulty adjusting the design of parking areas and electrical system designs for EV charging, Schedule J of the Zoning By-law provides details on the phasing, key dates, and applicability of the new requirements (Appendix "I", Attachment "A").

Implementation Resources

Following the adoption of the proposed EV charging requirements, staff will develop an information bulletin to explain the new requirements and implementation process. The bulletin will be distributed to applicants and made available online.

Staff will also develop a technical bulletin to assist designers, developers, and builders comply with the new requirements. The technical bulletin will be developed in consultation with key stakeholders, and will include:

- Summary of the EV charging requirements;
- Definitions of key terms;
- Description of individual parking applications (single-family, two-family, ground-oriented townhouses);
- Description of shared parking applications (apartments and townhouses with underground parking, commercial developments);
- Details of the minimum performance standard for the implementation of EV energy management systems; and
- Model strata rules or bylaw content to guide strata's in governing EV charging infrastructure.

Building By-law Amendments

The Planning & Development Department anticipates needing to amend sections of the Building By-law in response to the new EV charging requirements. These amendments will be brought forward for Council consideration early in 2019 in conjunction with other Building By-law amendments required in response to updates to the BC Building Code.

Future Phases

As noted above, Staff will be undertaking further review and stakeholder consultation on commercial, industrial, and institutional charging requirements prior to reporting back to Council. It is anticipated that these recommendations will be brought forward for Council consideration in 2019.

LEGAL SERVICES

Legal Services has reviewed the proposed amendments to Part 5 of the Zoning Bylaw and have no concerns.

SUSTAINABILITY CONSIDERATIONS

The proposed approach to require electric vehicle charging infrastructure in new residential and commercial developments will assist in achieving the objectives of in the City's Sustainability Charter 2.0 by supporting the following Desired Outcomes (DO) and Strategic Directions (SD):

Built Environment & Neighbourhoods

- DO09: All aspects of planning, design and construction include climate change impacts, greenhouse gas (GHG) mitigation, adaptation, and resiliency strategies
- SD05: Leverage, incentivize and enhance community benefits through the planning and construction of new development.
- SD17: Better integrate community and corporate green building and infrastructure strategies.

Economic Prosperity and Livelihoods

- DO14: Surrey is the region's innovation hub, focusing on health and clean technologies, and creating significant local and regional economic impacts.
- SD10: Support the development and growth of key sectors including health technology, clean technology, advanced manufacturing, agri-innovation and the creative economy.

Ecosystems

- SD08: Work with senior governments, TransLink, other local governments, non-governmental organizations and the private sector to reduce greenhouse gas emissions and ensure good air quality throughout Surrey.

Infrastructure

- DO7: Per capita emissions are low, and align with global, national and provincial GHG reduction targets.
- DO13: Low-emission vehicles predominate and are supported by the necessary fueling infrastructure.
- SD05: Work collaboratively with diverse stakeholders to lower greenhouse gases and to improve air quality.

CONCLUSION

Based on the above discussion, it is recommended that Council:

1. Receive this report for information;
2. Approve amendments to Part 5 “Off-Street Parking and Loading/Unloading” of Surrey Zoning By-law, 1993, No. 12000, as documented in Appendix “I” of this report; and
3. Authorize the City Clerk to bring forward the necessary Amendment Bylaw for the required readings and to set a date for the related public hearing.

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Appendix “I”: Proposed Amendments to Surrey Zoning By-law, 1993, No. 12000, as amended
Appendix “II”: Metro Vancouver EV Charging Infrastructure Requirements

Appendix “I”

Surrey Zoning By-law, 1993, No. 12000

The following amendments are proposed to Surrey Zoning By-law, 1993, No. 12000, as amended:

Part 5, Parking and Loading/Unloading

Amend Section A. General Requirements, as follows:

- Insert a new Sub-section 7 as follows:

7. Provision of Electric Vehicle Charging Infrastructure

- (a) Every owner of a new *building* or a *building* containing a new use, must construct and install for every residential *parking space*, 50% of visitor *parking spaces*, and 20% of commercial *parking spaces*, an energized electrical outlet capable of providing Level 2 or a higher level of electric *vehicle* charging, as defined by SAE International's 11772 standard, as amended or replaced from time to time, for each such *parking space*; or
- (b) The owner of a *building* referred to in sub-section 7.(a) must install an electric *vehicle* energy management system that controls electrical loads for the electrical *vehicle* supply equipment with a minimum performance standard approved by the City to ensure a sufficient rate of electric *vehicle* charging; and
- (c) The owner of a *building* referred to in sub-sections 7.(a) and (b) must label each such energized electrical outlet for its intended use for electric *vehicle* charging; and
- (d) The requirements set out in section 7.(a) through (c) apply to the owners in accordance with the transitional provisions set out in Schedule J, Table J.1 of this By-law.

Zoning By-law Schedules

- After Schedule I, add a new Schedule J, Transitional Provisions, shown as Attachment “A”.

Schedule J Transitional Provisions

Table J.1 Electric Vehicle Charging Requirements Transitional Provisions

The following transitional table applies to the requirements set out in Part 5, Section A, Sub-section 7 of this By-law as of the date of adoption:

Application Type	Previous Requirements	New Requirements of Part 5, Section A, Sub-section 7
<i>Building</i> Permits – Issued	<i>Building</i> permits that have been issued, may build according to the previous requirements for the duration of the permit.	n/a
<i>Building</i> Permits – In-stream	Complete <i>building</i> permit applications received, may build according to the previous requirements for the duration of the permit.	n/a
<i>Building</i> Permits – New	Complete <i>building</i> permit applications received prior to June 1, 2019; and/or Complete <i>building</i> permit applications received prior to the expiry date of a development permit issued prior to June 1, 2019, may build according to the previous requirements for the duration of the permit.	<i>Building</i> permit applications received on or after June 1, 2019; or (if applicable) <i>Building</i> permit applications received on or after the expiry date of a development permit issued prior to June 1, 2019, must build under the new requirements.
Development Permits – Issued	Development permits issued prior to June 1, 2019 must have a <i>building</i> permit issued and have substantially started any construction within the duration of the development permit (2 years), in order to build according to the previous requirements.	Projects with issued development permits prior to June 1, 2019 that fail to have their <i>building</i> permit issued within the duration of their development permit must build under the new requirements.
Development Permits – In-stream	Complete development permit applications received, have until December 31, 2020 to have their development permit and <i>building</i> permit issued, and have substantially started any construction within the duration of the development permit (2 years), in order to build according to the previous requirements.	Complete development permit applications received that fail to have their building permit issued by December 31, 2020, must build under the new requirements.
Development Permits – New	n/a	All new development permit applications received must build under the new requirements.

Appendix “II”

South Coast Region (Langley to Squamish) EV Charging Infrastructure Requirements

Local Government	Building Type	Requirement	Method	Date Adopted	Effective Date
Burnaby	Residential – All	100% Level 2		April 25, 2018	September 1, 2018
City of North Vancouver	Residential – Multi-family Residential – Single-family	20% Level 2, capacity for 100% Capacity for 100%	Sustainable Development Guidelines	unknown	in effect
Coquitlam	Residential – Multi-family Residential – Single-family	100% Level 2 100% Level 2	Zoning Bylaw	September 1, 2018	
District of North Vancouver	Residential – Multi-family Commercial/Industrial	20% Level 2, conduit for 100% 10% Level 2	Policy	unknown	2015
District of West Vancouver	Residential – Multi-family	Aim for 100%, Level not specified	Council Resolution	unknown	in effect
New Westminster	Residential – Multi-family Residential – Single-family	100% Level 2 100% Level 2	Zoning Bylaw	October 1, 2018	April 1, 2019
Port Coquitlam	Residential – Multi-family Residential – Single-family Mixed Use	100% Level 2 roughed-in 100% Level 2 roughed-in 100% Level 2 roughed-in	Zoning Bylaw	November 20, 2017	July 23, 2018
Port Moody	Residential – All Commercial	100% Level 2 20% Level 2	Zoning Bylaw	pending	
Richmond	Residential – Multi-family Residential – Single-family	100% Level 2 100% Level 2	Zoning Bylaw	December 17, 2017	April 1, 2018
Squamish	Residential – Multi-family	100% Level 2	Zoning Bylaw	pending	
Township of Langley	Residential – Multi-family Residential – Single-family	100% Level 2 100% Level 2	Zoning Bylaw	pending	
Vancouver	Residential – All Commercial	100% Level 2 10% Level 2	Building Bylaw	March 14, 2018	January 1, 2019