ENABLING ELECTRIC VEHICLE CHARGING IN CONDOMINIUMS

A collaboration between the Canadian Condominium Institute-Toronto and Plug’n Drive with contributions made by the World Wildlife Fund Canada

Made possible with the support of the Automotive Recyclers of Canada
Enabling Electric Vehicle Charging in Condominiums

In July 2011, the first electric vehicle (EV) was sold in Canada, marking the beginning of a new era of transportation in the country. Since then, sales increase significantly as manufacturers release new models and consumer understanding and trust of the technology increases. As of June 2014, there are more than 7,485 EVs on the road in Canada with EVs in every Province, although the majority of sales have been in British Columbia, Ontario, and Quebec. Internationally, more than 400,000 EVs have been sold and sales are projected to continue to increase, with Navigant Research anticipating 3.8 million sales annually by 2020.1

While each make and model of EV is different, they all require access to an electricity source where they can be plugged in, providing energy to the car’s battery pack. Charging can be made possible in workplaces and public spaces by making chargers at these sites, but research suggests that 80-90 per cent of charging happens at home where it is most convenient for drivers. As such, the majority of the early adopters reside in single family homes where it is easy to have a charging station installed in a private garage. However, EVs tend to lend themselves to urban and suburban driving patterns, and interest from condominium residents is inevitable and on the rise.

1Electric Vehicle Market Forecasts, Navigant Research 2013
For the majority of condominium residents, there are a number of legal and logistical hurdles that may hinder them from installing a charging station, and ultimately prevent them from buying an EV or moving into the building. While some newer buildings are being designed to support increased EV adoption with extra electrical capacity being built into parking lot infrastructure, the barriers to EV charging in older buildings, and for many of the 1.6 million Canadians residing in condominiums, need to be addressed.

This guide is a tool to help enable EV charging in condominiums and has been developed with the existing legal and development framework in Ontario, Canada in mind. However, the information is applicable to other jurisdictions across North America as well.

**Condominiums in Ontario**

The *Ontario Condominium Act, 1998* is currently under review by the Ministry of Consumer Services and new legislation is expected soon. The Canadian Condominium Institute-Toronto, Plug’n Drive, World Wildlife Fund Canada and Zizzo Allan Professional Corporation have been working to ensure that changes are made to the legislation that make it easier for condominium owners and condominium corporations to install EV charging infrastructure. Until these changes are made, condominium corporations and condominium owners will need to navigate existing barriers to EV charging on their own, a challenge this guide is meant to address.

This document was made possible with the support of the Automotive Recyclers of Canada. Previous research and consultation was supported by the Ontario Ministry of Transportation.
The electric vehicle (EV) terminology is used generally to describe electric cars, which come in two distinct varieties: Battery Electric Vehicles (BEV) that run entirely on electricity from their battery packs, and Plug-in Hybrid Electric Vehicles (PHEV) that have smaller batteries and use a gasoline engine to provide additional range. Both have charging requirements although BEV owners have more stringent charging needs since they rely entirely on electricity.

1.1 Charging an Electric Vehicle

All makes and models of EVs can charge their batteries using a charging station (Electric Vehicle Service Equipment or EVSE) which provides the car with electricity. As with the vehicles, there are different makes of charging stations to choose from. For the most part, they all serve the same purpose and can be used interchangeably.

The Society of Automotive Engineers (SAE) has developed a standard nozzle for residential and commercial charging of EVs, allowing the same plug to be used between 120-240 volts and 12-100 amps. This nozzle, the J-1772, can be used to charge each model of EV available today and for the foreseeable future.
Battery Electric Vehicle (BEV)

BEVs are 100% electric and powered entirely by a lithium-ion battery pack which is charged from the electrical grid.

- BEVs use no gasoline and produce no tailpipe emissions
- Range varies from 100km to 500km depending on the make, model, weather, driving habits, etc.

Models Available in Canada (July 2014)
- BMW i3
- Chevy Spark EV
- Ford Focus EV
- Mitsubishi i-MiEV
- Nissan LEAF
- smart fortwo ED
- Tesla Model S

Plug-in Hybrid Electric Vehicle (PHEV)

PHEVs are powered by an electric motor and battery pack which, once depleted, switches to an internal combustion engine and/or generator.

- PHEVs use both electricity and gasoline
- Smaller battery packs result in reduced electric range but overall range is higher
- Higher cost to drive and higher emissions than a BEV due to gas use.

Models Available in Canada (July 2014)
- Cadillac ELR
- Chevy VOLT
- Ford C-Max Energi
- Ford Fusion Energi
- Porsche Panamera S E-Hybrid
- Toyota Prius Plug-In Hybrid
1.2. Electric Vehicle Charging Stations

Charging stations are available in different voltage and amperage combinations, allowing flexibility for drivers to select a charger to match the specifications of their car. In general, there are two varieties of station that would be considered in a condominium, both of which use the J-1772 standard nozzle. The Tesla Model S uses a proprietary charging system but an adapter is available to allow for use with the standard J-1772 unit.

**Level 1 (110/120V, 12-15 amp):** Each EV has a portable charger (cordset) that comes with the car. These cordsets plug into a standard three-prong household outlet and can be ideal for PHEVs which have smaller battery packs, but is not ideal for BEV owners who may require more electricity.

**Level 2 (208/240V, 16-100 amp):** Charge times are minimized for both BEV and PHEV owners when charging at this configuration and manufacturers have numerous varieties to fit the needs of specific vehicles. A Level 2 charging station operating at 30 amps would be sufficient to meet the charging needs of all EVs today, though some configurations of the Tesla Model S can draw up to 100 amps continuously. Typically, Level 2 stations are installed by a certified electrical contractor, though they also have the option of being plugged into a ‘stove plug’ (NEMA 6-50).

<table>
<thead>
<tr>
<th>AC/DC</th>
<th>Volts</th>
<th>Amps</th>
<th>Approx kWh*</th>
<th>Charge Time**</th>
<th>Installation</th>
<th>Purchase Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level one</strong></td>
<td>AC</td>
<td>120</td>
<td>1.4 – 1.9</td>
<td>5-60 Hours</td>
<td>Portable / Hardwire</td>
<td>-$500 - $1,200</td>
</tr>
<tr>
<td><strong>Level two</strong></td>
<td>AC</td>
<td>240</td>
<td>3.8 – 19.2</td>
<td>2-8 Hours</td>
<td>Stove Plug / Hardwire</td>
<td>-$700 - $6,000</td>
</tr>
</tbody>
</table>

* Electrical code requires that EV charging stations be limited to 80% of their maximum load.
**Actual charge time depends on the vehicle model and the onboard ‘charger’ which charges the battery pack, see car specifications in APPENDIX 2 – Electric Vehicle Charging Efficiency.
1.3. Installation Tips

Contact your Board of Directors and Property Manager

Residents should notify building management and/or Board of Directors of their intent to install an EV charging station. A checklist is provided at the end of this document (page 21) to help residents undertake their own preliminary assessment.

Some of the key information that the resident can provide the Board and/or Property Manager with is:

- The location of the proposed charging station and distance from electricity source;
- The make and model of electric car; and
- The voltage and amperage requirements.

The location will determine how much effort is required to run electrical access to the spot, while information on the vehicle will determine the specifications of the charging station and its electrical draw.

Contact a Certified Electrical Contractor

An electrical contractor will be able to help estimate the cost of installing the charging station and mitigate impacts on the building’s electrical supply.

Building management may be able to recommend an electrical contractor who is familiar with the building, otherwise there are many in your community.

Contact your local electrical utility

It is important that you contact your local electrical utility as it can be helpful in streamlining your installation process and helping address any issues that may arise. Your utility provider may have a program to help monitor and minimize the impact of EV charging on your building and on the electrical grid.

Call Plug’n Drive at 1-855-3PLUGIN, visit chargemycar.ca or contact a certified electrical contractor to be put in touch with your local utility company.

How to find a qualified contractor

Alberta
Electrical Contractors Association of Alberta
www.ecaa.ab.ca

British Columbia
Safety Authority
www.safetyauthority.ca

Manitoba
Manitoba Electrical League
www.manitobaelectricalleague.ca

New Brunswick
Ministry of Public Safety
www.goo.gl/WX15wE (shortened URL)

Nova Scotia
Building, Fire and Technical Safety
1-800-559-3473

Newfoundland
Service Newfoundland
www.servicenl.gov.nl.ca

Ontario
Electrical Safety Authority
www.esasafe.com

Quebec
Régie du Bâtiment du Québec
www.rbq.gouv.qc.ca

Saskatchewan
Electrical Contractors Association of Saskatchewan (ECAS)
www.ecasask.ca
Legal Considerations

In Ontario, *The Condominium Act, 1998* is the main piece of legislation that governs condominiums and the actions of a condominium’s Board of Directors. The Act is currently under review by the Ministry of Consumer Services and new legislation and new implementation regulations are expected soon. While the review is in progress, solutions must be found that fit under the current legislative framework. Some of the key sections of the Act are Sections 97 & 98 which have been included as APPENDIX 1. The Act is available in its entirety at: www.e-laws.gov.on.ca

Section 97: Changes Made by Corporation

The Board of a condominium corporation may make changes to the common elements, the assets of the corporation or a change in service that the corporation provides to the owners if the procedures in Section 97 are followed. Section 97 outlines how the Board may get approval and when owner notification and an owner approval vote are required.

It is possible that modifications to the common elements may be required in order to install the necessary electrical wiring for an EV charging station. If the proposed modifications are sufficiently expensive to the condo corporation, or if the Board chooses to treat the installation as “substantial” (as defined by the Act) and puts the issue to the owners for their approval, a positive vote of 66 per cent of the unit owners will be required.

Section 98: Changes Made by Owners

Condominium Board approval is required for any proposal by a condominium for an addition, alteration or improvement to the common elements (either exclusive or non-exclusive use) under Section 98 of the act. This will apply to owners who would like to pay all costs associated with installing a charger, as well as for Boards who are interested in installing the infrastructure as an amenity. To address this challenge, individuals and condominium corporations will need to recruit support from other owners, clarify cost and payments, and likely involve a lawyer.

Section 98 is triggered where owners wish to make changes to the corporation’s common elements. Owners must satisfy the following three preconditions:
1. The Board must approve the proposed addition, alteration or improvement;
2. The owner and the corporation must enter into an alteration agreement that sets out who pays for the cost of the proposed addition, alteration or improvement and who is responsible for maintaining, repairing and insuring any improvement; and
3. Notice must be given to the owners if the change requires owner approval under Section 97 had the change been proposed by the condominium corporation. However, this notice is not required if the change relates to an exclusive use common element or if the Board is satisfied that the change does not (a) have an adverse effect on units, (b) will not cost the corporation and (c) does not detract from the appearance of the building.

The Section 98 alteration agreement does not take effect until the above-listed conditions are met and the agreement is registered against the title to the owner’s unit. Once this agreement is effective, it is binding on the unit and all subsequent purchasers.

In cases where the parking spaces are legal units and not common elements, owners wishing to install electrical wiring or EV charging stations in their parking unit would likely be required to enter into an alteration agreement under Section 98 to the extent that the modification requires alteration to the surrounding common elements.

Some jurisdictions, including California and Colorado, have taken steps to introduce new regulations making it easier to install charging stations in condominiums. WWF-Canada and CCI-Toronto have worked together to recommend similar changes to Ontario’s Condominium Act 1998, which would minimize some of these challenges.

2.1 Architecture & Design

The design of the building and its parking infrastructure are primary considerations when installing a charging station. While a resident in a townhome may have access to a private garage and have easy access to electrical capacity, there are many residents who live in buildings with underground parking that are not well served with electricity. In some cases, installation requires drilling through concrete to run conduit, trenching of landscaping or asphalt, as well as other aesthetic changes.
2.2 Parking Configurations

Flowing from building design, the parking layout and style of operation will affect how charging stations may be provided to residents. It is important to understand the legal status of the parking spaces which may impact decisions for the Board when considering the merits of making charging stations a common element.

2.2.1. Assigned Parking

In buildings where common element parking spaces are assigned to residents for exclusive use, EV drivers may prefer to install their own personal charging station in order to have constant and reliable access (as opposed to relying on a shared, common use station). When installation is not feasible at the assigned common element space, it may be possible for residents to swap spaces, allowing the EV driver to use a spot with easier access to electrical supply.

2.2.2. Deeded Parking

Where parking spots are owned by the resident and assigned by deed, swapping with other residents may be more challenging since changes may require a legal transfer of property. The condominium’s declaration may restrict which parking units are assigned to which residential units. Also, the valuation of some parking locations may differ based on personal convenience and preference, requiring negotiations amongst residents.

2.3 Electrical Service

The electrical requirements of a charging station are primarily dependent on the vehicle being charged as it is the car’s internal controller that regulates the flow of electricity, not the station itself. The charging station is somewhat poorly named and is actually more of a sophisticated extension cord that can communicate with the vehicle to ensure that the car’s on-board charger is safely activated.

The amount of electricity that a vehicle will draw is dependent on the vehicle technology and the owner’s driving habits. Generally speaking, it may require 4,000 kWh in a BEV and 3,000 kWh in a PHEV to travel 20,000km. At any given time, an EV can accept anywhere from 2 – 20 kW of electricity during its charging session.

See APPENDIX 2 – Electric Vehicle Charging Efficiency for a breakdown of currently available vehicles and charging specifications.

2.3.1. Building Electrical Capacity

A building’s ability to support charging stations depends on the original design of its electrical system as well as its remaining capacity to accept additional loads. If capacity is available, the installation may be as simple as having an electrical contractor install a second electrical panel from the main service which can be reserved for future installations.

Where capacity is limited and there is an inadequate supply of electricity to accommodate charging stations, it can be beneficial to investigate energy efficiency gains, particularly lighting in the parking structure or installing timers to ensure night time charging. Again, the electrical requirements will depend on the vehicle selected and many models of PHEV can use a simple 120v outlet instead of a Level 2 (240v) charging station.
2.3.2. Distance to Electrical Access

The distance required to run conduit (wiring) from the electrical panel or source to the charging station will be a primary consideration for estimating the cost of installation. As such, the location of the station should be chosen strategically to limit unnecessary drilling, trenching or other aesthetic changes which will increase the cost substantially.

It may be prudent to install a larger conduit to allow for future expansion of EV charging and to limit future installation costs. Similarly, there may be merit in running conduit on the ceiling above the drive-lanes, allowing for future installations to be more easily branched off from the main conduit. These corporation-paid additions would fall under Section 97 of the Condominium Act, 1998 and may be deemed “substantial” enough to require notice and approval by 66% of the units of the corporation.

2.3.3. Transformer Capacity

Upon assessment from an electrical contractor and/or the local utility, there will be more information available about the capacity of the building and whether it can accept the additional load of charging stations. If there is insufficient capacity, it is best to consult with the local electrical utility about potential solutions as generally it is not practical to upgrade the service for the entire building. Such upgrades have been estimated by Brookfield Residential Services to cost between $200,000 - $300,000 in Ontario.

2.3.4. Monitoring Electrical Load/Usage

It is important to track the usage of the charging station(s) in order to ensure that residents pay their share of the electricity used. This can be accomplished in a number of ways, including:

- **Direct** - Connecting the charging station through a direct link to the resident’s existing power meter allows the utility company to bill the owner directly for the electricity used. This option would work for individuals who want to have exclusive charging at their parking space.

- **Sub-meter** - Installing a separate sub-meter to the charging station can allow the utility company to track electricity usage and bill directly to the EV owner. This option would accrue additional expenses through maintenance fees for the separate sub-meter, but could be a good option for exclusive stations for individuals.

- **User fee** - In lieu of a metered solution, the resident, Board and/or Property Manager may enter into a cost recovery system that can be as simple as charging the owner a flat fee or ‘usage fee’ for use of the station. Please note, as per Ontario law, electricity cannot be resold without a license and this fee would not be to pay for the electricity (on a kWh basis), but instead would be considered a service fee. This option could be used for individual, exclusive use charging stations, or for multi-user public charging stations.

- **Public Network** - Some charging units are network enabled (able to connect to the internet) allowing multiple users to use the same station while maintaining private access through a system that bills the users for their time at the station. These networked solutions are typically more expensive but logistically less complicated than other shared models. They also allow for more flexibility should the uptake of EVs increase amongst residents in the complex.
3.0 INSTALLATION, OPERATING AND MAINTENANCE COSTS

There are many installation solutions that can be deployed in any given building and with each solution comes different configurations. To find the ideal charging solution for the given site and its charging needs, consider the following options:

- Wall mounted or pedestal/stand-alone
- Hard-wired or plug-in to wall
- Single charging wand or multi-wand
- Reservation & payment system
- Commercial or residential grade
- Publically available or for private use
- Indoor or outdoor installation
- High/Low Amperage & Voltage

3.1 Installation Costs

As previously mentioned, installation costs will be largely dependent on the specific requirements of each building and where the charging station will be located. As an example, we can use the table on page 14 to provide a preliminary estimate of the costs to purchase and install a charging station where a few upgrades are required.

3.2 Operating Costs

Typically, the only ongoing operating cost for a charging station would be from its use of electricity during charging sessions. For a 20,000km driving distance, an EV owner in Ontario could expect to pay $544 - $975 in electricity (including delivery and taxes), based on an efficiency of 4.78/kWh. Actual consumption will depend on the make and model of vehicle, primarily whether it is a BEV or PHEV.

3.3 Maintenance Costs

There are few maintenance requirements for charging stations. Expected wear and tear can be minimized by installing a sturdy device designed for use in public spaces. Also, consider some these proactive maintenance measures:

- Ensure that the charger cord is stored safely and securely, not on the ground;
- Install the charger indoors or sheltered if possible;
- Test system on an annual basis, inspecting the equipment and power quality; and
- Repair damage from accidents and vandalism.
## Estimated Labour

<table>
<thead>
<tr>
<th>Description</th>
<th># of Hours</th>
<th>Labour Rate</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Site Visit</td>
<td>2</td>
<td>$75</td>
<td>$150</td>
</tr>
<tr>
<td>Permit Application</td>
<td>1</td>
<td>$85</td>
<td>$85</td>
</tr>
<tr>
<td>Installation</td>
<td>4-8</td>
<td>$100</td>
<td>$400 - $800</td>
</tr>
<tr>
<td>Inspection or Approval</td>
<td>2</td>
<td>$75</td>
<td>$150</td>
</tr>
<tr>
<td>Legal Support</td>
<td>-</td>
<td>-</td>
<td>$500 - $3,000</td>
</tr>
</tbody>
</table>

**Labour sub-total**

$1,285 - $4,185

## Estimated Materials

<table>
<thead>
<tr>
<th>Description</th>
<th># of Units</th>
<th>Cost per Unit</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2 Non-networked Charger</td>
<td>1</td>
<td>$1,500 - $10,000</td>
<td>$1,500 - $10,000</td>
</tr>
<tr>
<td>Electrical Capacity Requirements</td>
<td>1</td>
<td>$780</td>
<td>$780</td>
</tr>
<tr>
<td>#12 THHN Wire</td>
<td>400 ft</td>
<td>$0.50</td>
<td>$200</td>
</tr>
<tr>
<td>Conduit 3/4 EMT</td>
<td>100</td>
<td>$10</td>
<td>$100</td>
</tr>
<tr>
<td>40 Amp Fused Disconnect</td>
<td>2</td>
<td>$150</td>
<td>$300</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>n/a</td>
<td>$400</td>
<td>$400</td>
</tr>
</tbody>
</table>

**Materials sub-total**

$4,180 - $12,680

**Cost Total**

$5,465 - $16,865
4.0 BENEFITS OF CHARGING STATIONS IN YOUR BUILDING
4.1 Tenant Retention / Attraction

The EV buying demographic is a growing segment who are passionate about their cars and their choice in property will inevitably come down to where they can charge their car(s). Newer buildings have started to prepare for the requirements of EV charging in their designs and some municipalities are building them into their city planning initiatives.

For existing buildings, however, it can be challenging to install charging stations as it requires patience and preparation by all parties involved. Despite these challenges, it is important that buildings consider implementing charging stations as they will provide a foundation for new transportation options for current and future residents.

4.2 EV Charging as an Amenity

It can be easiest to consider EV charging as an amenity that helps augment the overall reputation of the building and parking complex. Just as buildings invest in upgraded exercise or leisure systems for residents, EV charging can be an excellent addition and may attract a more affluent and/or environmentally conscious clientele.

4.3 LEED Accreditation

New buildings are encouraged to install charging stations as part of their design and are rewarded with an additional three LEED points from the Canada Green Building Council. Commercial buildings of any size and multi-family residences over four stories are eligible under the New Construction (NC) Sustainable Sites Credit #4.3 “Alternative Transportation, Low-Emitting and Fuel Efficient Vehicles”. For existing buildings seeking LEED accreditation under the Existing Buildings (EB) program, there are between 3-15 LEED points under Sustainable Sites Credit #4.0 “Alternative Commuting Transportation” for installing one or more chargers.

For multi-family residences under four stories and single-family residences that are new or under major renovations, there is one possible credit under LEED for Homes Credit #3 “Innovation Design” for installing one or more EV chargers.

4.4 Signage

It is recommended that signage be included when installing public or communal charging stations, making sure to minimize confusion and preventing gas cars from parking in those spots. Some of the information you may want to include on a sign is details about the initiative as well as indications on the charger voltage, amperage, fees and safety information. You may also consider painting the parking spot as an additional indicator of its reserved use, particularly if it is a common element. At this point, a standard sign has not yet been agreed upon.
APPENDIX 1


Changes made by corporation
97. (1) If the corporation has an obligation to repair the units or common elements after damage or to maintain them and the corporation carries out the obligation using materials that are as reasonably close in quality to the original as is appropriate in accordance with current construction standards, the work shall be deemed not to be an addition, alteration or improvement to the common elements or a change in the assets of the corporation for the purpose of this section. 1998, c. 19, s. 97 (1).

Changes made without notice
(2) A corporation may, by resolution of the board and without notice to the owners, make an addition, alteration or improvement to the common elements, a change in the assets of the corporation or a change in a service that the corporation provides to the owners if,
(a) it is necessary to make the addition, alteration, improvement or change to comply with an agreement mentioned in section 113 or the requirements imposed by any general or special Act or regulations or by-laws made under that Act;
(b) in the opinion of the board, it is necessary to make the addition, alteration, improvement or change to ensure the safety or security of persons using the property or assets of the corporation or to prevent imminent damage to the property or assets; or
(c) subject to the regulations made under this Act, the estimated cost, in any given month or other prescribed period, if any, of making the addition, alteration, improvement or change is no more than the greater of $1,000 and 1 per cent of the annual budgeted common expenses for the current fiscal year. 1998, c. 19, s. 97 (2).

Changes made on notice
3) A corporation may make an addition, alteration or improvement to the common elements, a change in the assets of the corporation or a change in a service that the corporation provides to the owners if,
(a) the corporation has sent a notice to the owners that,
   (i) describes the proposed addition, alteration, improvement or change,
   (ii) contains a statement of the estimated cost of the proposed addition, alteration, improvement or change indicating the manner in which the corporation proposes to pay the cost,
   (iii) specifies that the owners have the right, in accordance with section 46 and within 30 days of receiving the notice, to requisition a meeting of owners, and
   (iv) contains a copy of section 46 and this section; and
(b) one of the following conditions has been met:
   1. The owners have not requisitioned a meeting in accordance with section 46 within 30 days of receiving a notice under clause (a).
   2. The owners have requisitioned a meeting in accordance with section 46 within 30 days of receiving a notice under clause (a) but have not voted against the proposed addition, alteration, improvement or change at the meeting. 1998, c. 19, s. 97 (3).

Approval of substantial change
(4) Despite subsection (3), the corporation shall not make a substantial addition, alteration, improvement to the common elements, a substantial change in the assets of the corporation or a substantial change in a service that the corporation provides to the owners unless the owners who own at least 66 per cent of the units of the corporation vote in favour of approving it. 1998, c. 19, s. 97 (4).

Meeting
(5) The vote shall be taken at a meeting duly called for the purpose of subsection (4). 1998, c. 19, s. 97 (5).

Meaning of substantial change
(6) For the purposes of subsection (4), an addition, alteration, improvement or change is substantial if,
   (a) its estimated cost, based on its total cost, regardless of whether part of the cost is incurred before or after the current fiscal year, exceeds the lesser of,
      (i) 10 per cent of the annual budgeted common expenses for the current fiscal year, and
      (ii) the prescribed amount, if any; or
   (b) the board elects to treat it as substantial. 1998, c. 19, s. 97 (6).

Cost of changes
(7) The cost of an addition, alteration, improvement or change that the corporation makes under this section shall form part of the common expenses. 1998, c. 19, s. 97 (7).

Changes made by owners
98. (1) An owner may make an addition, alteration or improvement to the common elements that is not contrary to this Act or the declaration if,
   (a) the board, by resolution, has approved the proposed addition, alteration or improvement;
   (b) the owner and the corporation have entered into an agreement that,
      (i) allocates the cost of the proposed addition, alteration or improvement between the corporation and the owner,
      (ii) sets out the respective duties and responsibilities, including the responsibilities for the cost of repair after damage, maintenance and insurance, of the corporation and the owner with respect to the proposed addition, alteration or improvement, and
      (iii) sets out the other matters that the regulations made under this Act require;
(c) subject to subsection (2), the requirements of section 97 have been met in cases where that section would apply if the proposed addition, alteration or improvement were done by the corporation; and
(d) the corporation has included a copy of the agreement described in clause (b) in the notice that the corporation is required to send to the owners. 1998, c. 19, s. 98 (1).

**No notice or approval**
(2) Clauses (1) (c) and (d) do not apply if the proposed addition, alteration or improvement relates to a part of the common elements of which the owner has exclusive use and if the board is satisfied on the evidence that it may require that the proposed addition, alteration or improvement,
(a) will not have an adverse effect on units owned by other owners;
(b) will not give rise to any expense to the corporation;
(c) will not detract from the appearance of buildings on the property;
(d) will not affect the structural integrity of buildings on the property according to a certificate of an engineer, if the proposed addition, alteration or improvement involves a change to the structure of the buildings; and
(e) will not contravene the declaration or any prescribed requirements. 1998, c. 19, s. 98 (2).

**When agreement effective**
(3) An agreement described in clause (1) (b) does not take effect until,
(a) the conditions set out in clause (1) (a) and subsection (2) have been met or the conditions set out in clauses (1) (a), (c) and (d) have been met; and
(b) the corporation has registered it against the title to the owner’s unit. 1998, c. 19, s. 98 (3).

**Lien for default under agreement**
(4) The corporation may add the costs, charges, interest and expenses resulting from an owner’s failure to comply with an agreement to the common expenses payable for the owner’s unit and may specify a time for payment by the owner. 1998, c. 19, s. 98 (4).

**Agreement binds unit**
(5) An agreement binds the owner’s unit and is enforceable against the owner’s successors and assigns. 1998, c. 19, s. 98 (5).
# APPENDIX 2

## Electric Vehicle Charging Efficiency

Below is an updated list of the specifications for all Electric Vehicles for sale in Canada as of April 1, 2014.

<table>
<thead>
<tr>
<th>EV Specifications</th>
<th>Battery Size</th>
<th>Max Continuous Electrical Draw from Vehicle</th>
<th>Estimated Time to Charge (0-100% battery)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Level 1 (120V, 15A)</td>
</tr>
<tr>
<td>BMW i3 BEV</td>
<td>18.8 kW</td>
<td>7.4 kW</td>
<td>13 hrs</td>
</tr>
<tr>
<td>Chevy Spark BEV</td>
<td>21 kW</td>
<td>6.6 kW</td>
<td>14.5 hrs</td>
</tr>
<tr>
<td>Ford Focus EV BEV</td>
<td>23 kW</td>
<td>6.6 kW</td>
<td>16 hrs</td>
</tr>
<tr>
<td>Mistubishi I-MiEV BEV</td>
<td>16 kW</td>
<td>3.3 kW</td>
<td>11 hrs</td>
</tr>
<tr>
<td>Nissan LEAF BEV</td>
<td>24 kW</td>
<td>3.3/6.6 kW</td>
<td>16.5 hrs</td>
</tr>
<tr>
<td>smart fortwo ED BEV</td>
<td>17.6 kW</td>
<td>3.3 kW</td>
<td>12 hrs</td>
</tr>
<tr>
<td>Tesla Model S BEV</td>
<td>60/85 kW</td>
<td>10/20 kW</td>
<td>41/59 hrs</td>
</tr>
<tr>
<td>Cadillac ELR PHEV</td>
<td>16.5 kW</td>
<td>3.3 kW</td>
<td>11.5 hrs</td>
</tr>
<tr>
<td>Chevy VOLT PHEV</td>
<td>16.5 kW</td>
<td>3.3 kW</td>
<td>11.5 hrs</td>
</tr>
<tr>
<td>Ford C-Max Energi PHEV</td>
<td>7.6 kW</td>
<td>3.3 kW</td>
<td>5.25 hrs</td>
</tr>
<tr>
<td>Ford Fusion Energi PHEV</td>
<td>7.2 kW</td>
<td>3.3 kW</td>
<td>5 hrs</td>
</tr>
<tr>
<td>Porsche Panamera S E Hybrid PHEV</td>
<td>9.4 kW</td>
<td>3.6 kW</td>
<td>6.5 hrs</td>
</tr>
<tr>
<td>Toyota Prius Plugin PHEV</td>
<td>7.6 kW</td>
<td>2 kW</td>
<td>5.25 hrs</td>
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I Want to Buy An Electric Car…
And I Live in a Condo

A Unit Owner’s Checklist

Your purchase of a battery powered electric vehicle (EV) has major benefits for the environment and for your personally.

EV users typically charge at their residential parking spots. This can lead to challenges for condominium dwellers because of the special procedures they and their condominium boards need to follow to enable a charging station installation. As a result, it’s a good idea for condominium owners to ensure they will have access to charging in their building before purchasing an EV.

This checklist is intended to help condominium dwellers consider the viability of installing EV charging equipment prior to purchasing an EV. In almost every case, installation of charging equipment is likely to require approval by condominium board and, in some cases, a vote of unit owners. Many installations will also require one or more legal agreements between the condominium owner and the corporation.

Checklist:

☐ Determine the type of charger you hope to install

☐ Review the legal status of your parking spot, which will help determine the type of condominium board approval required (owned outright, exclusive use common element, or licensed from condominium corporation or third party)

☐ Check the area around your parking spot: are there any standard outlets nearby that could be adapted for Level I charging? Will wiring cables need to be run through common element areas?

☐ Consider reaching out to other condominium owners to see if they have an interest in installing charging stations

☐ Contact your local electrical utility to determine if it has any resources available for installation and to ask if there are any known restrictions in your area

☐ Check with your condominium board on its requirements for the installation process, which could include asking whether it:

   ☐ Has an electric vehicle charging policy or is willing to form an electric vehicle working group for interested residents

   ☐ Has any questions or concerns from a technical or aesthetic perspective

   ☐ Has a list of approved electrical contractors who you can consult on a quote for a feasibility study
Ask a certified electrical contractor for a quote that considers:
- Any installation restrictions from your condominium board
- Current building electrical capacity
- Cost of any installation, wiring and concrete removal required
- Cost recovery options (like installation of a sub-meter)

Based on the quote from your contractor, discuss the type of approval that will be required from your condominium board and/or other residents

Trouble-shooting
- If the quote is too expensive, consider:
  - Whether it is possible to enter into (1) an agreement to change parking spaces with another owner or (2) an agreement with the condominium corporation to use unused space that is easier to access for charging
  - Consider seeking the assistance of a condominium lawyer who has worked on EV charging. CCI-Toronto has an online directory of local area lawyers who specialize in condominium law

Charging Agreement

Common issues to consider in an agreement to install charging equipment can include:
- Cost of installation
- Compliance with applicable building codes and the Condominium Act, 1998, declaration/bylaws, as well as reasonable aesthetic and technical requirements of the condominium corporation
- Use of a licensed contractor for installation
- Cost and metering of electricity consumed (either sub-metered, metered by charging equipment, or a fixed access fee)
- Maintenance and repair responsibilities (as applicable within the Condominium Act, 1998)
- Requirement to carry insurance (typically for Level II charging or specialized Level I)
- Removal obligations (for instance, if there is major maintenance of parking area or sale of parking spot)

EV charging in condos can create a bit of a conundrum – so gather your facts, and explore your options. For more information, resources are available through Plug’n Drive, WWF Canada and the CCI Toronto & Area Chapter:

- www.ccitoronto.org
- www.plugndrive.ca/condo
- www.wwf.ca
A collaboration between the Canadian Condominium Institute-Toronto and Plug’n Drive with contributions made by the World Wildlife Fund Canada

Made possible with the support of the Automotive Recyclers of Canada

Sources:


Ontario Ministry of Transportation, Sustainable Transportation Branch, Toronto

Written by: Josh Tzventarny