



ChargePoint, Inc.

June 28, 2016

Commissioner Matt Carlin
Department of Public Safety

Re: Updates to Draft 9th Edition of the MA State Building Code

Dear Commissioner Carlin,

ChargePoint appreciates the opportunity to submit written testimony regarding the Updates to the Draft 9th Edition of the Base and Residential Building Codes (780 CMR). We strongly support the proposed EV Ready additions to the Base Code¹ and Residential Code², which will ensure that new building stock will be able to meet the needs of businesses and families in Massachusetts.

ChargePoint operates the world's largest and most open electric vehicle (EV) charging network, with nearly 29,000 total charging spots, including more than 1,100 in the Commonwealth of Massachusetts. We design and build EV charging stations, including Level 2 commercial and residential products as well as DC fast chargers. We sell these stations to people and businesses and then provide services for billing and intelligent energy management solutions. ChargePoint also helps EV drivers find stations on our network through our mobile app, website, and in-vehicle navigation.

ChargePoint does not install charging stations. The people and businesses that purchase our stations have the ability to choose their own local installer. Therefore, we do not directly profit from the labor costs associated with installing a station, or the conduit or paneling or trenching discussed in this proposal. That said, the cost of installation, particularly in a retrofit, remains the largest barrier for property owners that want EV charging stations.

There are currently more than 6,600 electric vehicles in the Massachusetts. Navigant Research projects that number to grow to more than 79,000 EVs on the road in this state by 2020³, and Massachusetts has committed to putting more than 300,000 EVs on the road by 2025. By requiring EV infrastructure in new construction, rather than requiring a certain number of charging stations installed, this code change enables sites to respond to EV need and grow their number of stations over time, as more employees, tenants or customers adopt EVs. Even though ChargePoint sells charging stations – not the installation infrastructure for charging stations – we agree that this is the best approach to plan for growth and ensure full utilization of the charging stations once they have been installed.

¹ Section C405.10 Electric Vehicle Service Equipment Capable (Mandatory)

² Section N1104 (R404.2) Electric Vehicle Service Equipment (EVSE) Ready (Mandatory)

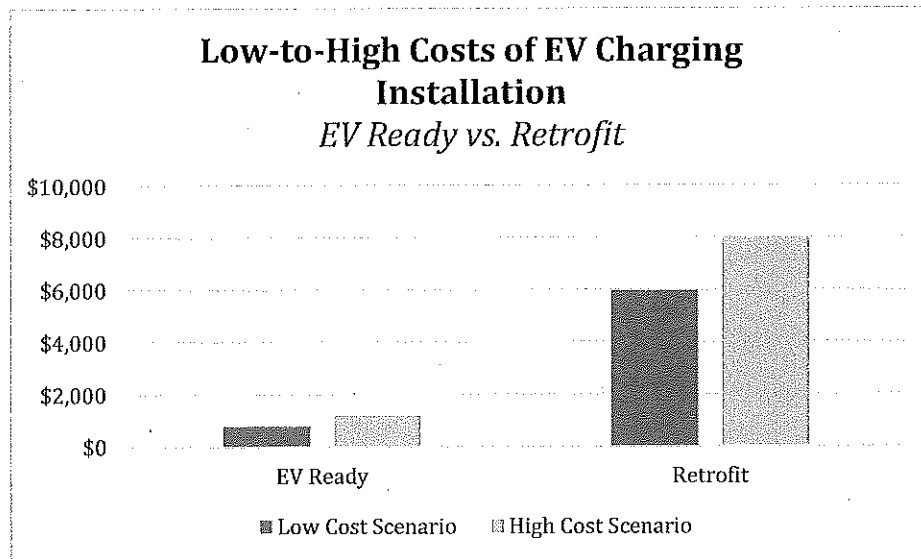
³ Shepard, Scott and Jerram, Lisa. "Electric Vehicle Geographic Forecasts: Battery and Plug-In Hybrid Electric Vehicle Sales and Populations in North America". Navigant Research. 2Q 2016



ChargePoint has found that in almost every case, the cost per port to install a charging station in an existing parking lot is equal to or more than the cost of the hardware itself. In a sample of 180 site quotes received by our commercial customers seeking to install in retrofitted facilities, we found that the average cost per port for installation totaled \$3,769, compared to our cost of about \$3,500 for hardware per port.

In 2014, Rocky Mountain Institute did a detailed analysis of the breakdown of cost of Level 2 charging stations for home, parking garages, curb-side and also for DC Fast Charging.⁴ For Level 2 parking garage installation, the electrician labor alone ranged from \$1,240-\$2,840 per port. Factoring in electrician materials (including \$1.50-\$2.50/ft for conduit and wire) as well as trenching (\$25-\$100/ft) and other costs (mounting, signage, etc.) the non-hardware costs for installation were estimated to range from \$1,800-\$5,000 per port or if a new breaker is required, more than \$6,000 per port. These installation costs are unlikely to experience significant reductions over time as compared to equipment costs which may experience reductions over time do to economies of scale, improved manufacturing efficiencies, and competition in the market. The RMI numbers are very similar to those in a report by the US Department of Energy in November 2015.⁵

A central benefit of requiring new construction to be EV Ready is that the incremental cost of including that infrastructure in the construction project is significantly less than the cost of a retrofit. For the purpose of illustrating anecdotal comparisons, ChargePoint has reviewed the per-port installation costs associated with installing our EV charging stations. Installation costs vary depending on the specific features of any given site, and these cost estimates are drawn from several different types of installation projects (e.g., garage vs. open parking, different types of business verticals). As shown by the graph below, average installation costs for EV charging stations per port drop by 85% for "EV Ready" sites compared to sites requiring retrofit installation:



ChargePoint cautions against relying solely on direct comparisons of installation costs in new construction verses retrofits. This is not an "apples to apples" comparison, and may actually undervalue the savings of EV-readiness in new construction because the "scope of work" in a retrofit vs. new construction are very different. It is difficult in a new construction to define the scope (and cost) in the same manner as a retrofit.

⁴ Source: http://blog.rmi.org/blog_2014_04_29_pulling_back_the_veil_on_ev_charging_station_costs

⁵ US Department of Energy, Costs Associated with Non-Residential Electric Vehicle Supply Equipment, November 2015. http://www.afdc.energy.gov/uploads/publication/evse_cost_report_2015.pdf



In new construction, the benefit is that you have a large capital budget in place and all the scoping activities including design, engineering, permitting, product specification/acquisition, and construction are part of a larger project, so "leveraging" these elements requires fractionally less effort and the overall cost is buried within many other pieces.

EV Ready requirements do not tie new construction to a specific type of charging station. As EV charging technologies in hardware and software continue to evolve, tenants with access to EV Ready parking will have the ability to take advantage of these new developments. Networked Level 2 charging stations can allow for the management of energy use, and pilot projects are underway across the country to leverage the ability of EVs and networked EV charging stations to manage the energy footprint of buildings.

Requiring EV infrastructure in new construction will save money for property owners and future-proof the Commonwealth's businesses, workplaces, retail properties, and homes for an influx of electric vehicles. These critical updates to the 9th Edition of the Massachusetts State Building Code will ensure that infrastructure in new construction will enable sites to respond to EV need and grow their number of stations over time, as more employees, tenants or customers adopt EVs. Even though ChargePoint sells charging stations – not the installation infrastructure for charging stations – we agree that this is the best approach to plan for growth and ensure full utilization of the charging stations once they have been installed.

Thank you for considering this important issue to advance EV adoption.

V/R,

A handwritten signature in black ink, appearing to read "Kevin Miller".

Kevin George Miller
Director, Public Policy
ChargePoint

CC:

Richard Crowley, Chair, Massachusetts Board of Building Regulations and Standards
Matthew Beaton, Secretary, Executive Office of Energy and Environmental Affairs
Judith Judson, Commissioner, Department of Energy Resources
Felix Zemel, Chief of Inspections – Buildings, Department of Public Safety