

ADDRESSING THE NEED FOR ELECTRIC VEHICLE CHARGING STATION INFRASTRUCTURE IN THIS COMMONWEALTH

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I. Introduction

As more Americans transition from gasoline vehicles to electric vehicles (EVs), municipalities across the country are seeking to address the growing need for EV charging infrastructure. On June 30, 2019, there were more than 1.27 million EVs on United States roads.¹ The high costs of EV charging station equipment and installation are currently impeding local municipalities from building charging station networks. To address the needs of current EV drivers and to encourage the purchase of EVs, local governments need to adopt legislative proposals that ensure future investment in EV charging station infrastructure.²

The Electric Vehicle Charging Infrastructure and Parking Model Ordinance (EVCIPO) establishes an installation permitting process for property owners seeking to install EV charging stations. Except for property owners seeking to install a charging station for personal use, the proposal requires a permit in order to install a charging station in specific zoning districts.³ With public safety in mind, the installation of EV charging stations and EV “make ready” systems would require certification by a Pennsylvania licensed electrician.

The EVCIPO would increase the number of EV charging stations in a municipality by incentivizing property owners to install charging stations, thereby meeting the needs of

¹ *Electric Vehicle Trends & Key Issues*, Edison Electric Institute (Sept. 2019), https://www.eei.org/issuesandpolicy/electrictransportation/Documents/EV_Trends_and_Key_Issues_March2018.pdf

² *Id.*

³ Claire Cooke and Brian Ross, *Summary of Best Practices in Electric Vehicle Ordinances*, Great Plains Institute (June 2019), https://www.betterenergy.org/wp-content/uploads/2019/06/GPI_EV_Ordinance_Summary_web.pdf.

Pennsylvania EV drivers, while promoting the electrification of the transportation sector. An increase in charging infrastructure would coax residents out of their gas-powered cars and into EVs, allowing municipalities to benefit from long-term structural reductions in local air pollution, greenhouse gas (GHG) emissions and petroleum consumption.⁴ As witnessed in other municipalities, increased EV infrastructure can save residents money, result in more EVs which reduce emissions, and create economic growth.⁵

The following five sections aim to provide municipalities with additional research, a detailed discussion of the identified problem, and an analysis of the proposed solution. Section II highlights the specific problem that the drafters of the model ordinance aimed to address through policies that were selected for use in the ordinance. Section III discusses existing laws and programs that are currently available to property owners seeking to install charging stations in this Commonwealth. This section also provides the reasons why current laws and programs are failing to adequately address the need for charging station infrastructure. Section IV sheds light on proposals adopted in other municipalities across the country and analyzes the results and effectiveness of those efforts. Section V contains our recommendations for municipalities that are interested in adopting EV charging infrastructure related legislation. Finally, Section VI reviews the effectiveness of our proposal in addressing the problems outlined in this narrative. The conclusion also reiterates the environmental, economic and social benefits associated with the adoption of such an ordinance.

II. The problem: The lack of EV charging infrastructure

⁴ Deborah Gordon, et al., *Policy Priorities for Advancing the U.S. Electric Vehicle Market*, Carnegie Endowment for International Peace (Sept. 17, 2012), <https://carnegieendowment.org/2012/09/17/policy-priorities-for-advancing-u.s.-electric-vehicle-market-pub-49391>.

⁵ Edison Electric Institute, *supra* note 1.

As EV sales continue to rise across the United States, municipalities are finding it necessary to address the growing need for EV charging infrastructure. Due to the costs associated with charging stations, local governments are turning to the private sector for assistance with covering EV infrastructure purchase and installation costs.

A. A cart without a horse: Addressing increases in EV purchases and the rising need for EV charging infrastructure

The use of EVs would significantly reduce the transportation sector's GHG emissions. In 2017, the transportation sector accounted for 29 percent, the largest portion of the total United States GHG emissions.⁶ The largest sources of transportation related GHG emissions include passenger cars and light-duty trucks.⁷ One possible solution would be the use of EVs. According to the Edison Electric Institute (EEI), an association that represents United States investor-owned electric companies, as of 2018, the electric power industry reduced carbon dioxide emissions to 27 percent below 2005 levels.⁸ Powered by electricity, EVs have zero tailpipe emissions, which leverages the benefits of clean energy deployment in the electric power sector.⁹

EVs have lower carbon emissions than gasoline vehicles. The Electric Power Research Institute (EPRI) and the Natural Resources Defense Council (NRDC) released a comprehensive assessment in 2007, that found that widespread use of plug-in hybrid EVs in the United States could reduce GHG emissions and potentially improve air quality.¹⁰ In comparing carbon emissions from driving a mile on gasoline to driving a mile using grid electricity, the study found

⁶ United States Environmental Protection Agency, *Fast Facts from the Inventory of UNITED STATES Greenhouse Gas Emissions and Sinks:1990–2017* (2019), https://www.epa.gov/sites/production/files/2019-04/documents/2019_fast_facts_508_0.pdf.

⁷ Bridget Cave and Russell J. DeYoung, *Electric Vehicle Charging Stations as a Climate Change Mitigation Strategy*, NASA STI Publication Reports, March 2014, at 1.

⁸ Edison Electric Institute, *supra* note 1.

⁹ *Id.*

¹⁰ Electric Power Research Institute, *Nationwide Greenhouse Gas Emissions, 1 Environmental Assessment of Plug-in Hybrid Electric Vehicles* (July 2007).

that EVs had lower carbon emissions. In coastal states such as Virginia where power is nuclear, EVs will produce less carbon emissions than gasoline vehicles, reducing GHG emissions by more than 450 million metric tons annually by 2050.¹¹ “Fully EVs” have zero emission and thus substantially improve air quality.¹² To promote EV ownership in Pennsylvania, lawmakers need to explore proposals that would provide for the installation of EV charging stations. A report by the EEI and the Institute for Electric Innovation predicts that by 2030, United States EV sales will exceed 3.5 million per year, and that 18.7 million passenger EVs will be on United States roads, requiring about 9.6 million charging stations.¹³

Most EV drivers will charge their EV at home. The greatest need for EV charging infrastructure is in residential areas because this is where EVs would be charged for the longest amount of time.¹⁴ Since EVs are also parked at workplaces for substantial periods of time during the week, there is also a rising need for charging stations on business premises as well.¹⁵ For people who reside in single-family homes with carports or garages, residential charging problems are limited to the cost of installing an EV charging station and to a monthly electric bill.¹⁶ According to the 2017 American Housing Survey, approximately one-third of households do not have access to a carport or a garage.¹⁷ For households that only have access to public parking, the ability to charge an electric vehicle overnight is extremely problematic.¹⁸

¹¹ *Id.*

¹² *Id.* at 3.

¹³ Edison Electric Institute, *supra* note 1.

¹⁴ Transportation Research Board and National Research Council, *Overcoming Barriers to Electric-Vehicle Deployment: Interim Report*, 1, 33 (2013).

¹⁵ *Id.*

¹⁶ *Id.* at 19.

¹⁷ U.S. Department of Energy, *Fact of the week #1058: Two-Thirds of All Housing Units Had a Garage or Carport in 2017* (Dec. 3, 2018), <https://www.energy.gov/eere/vehicles/articles/fotw-1058-december-3-2018-two-thirds-all-housing-units-had-garage-or-carport>.

¹⁸ *Id.* at 20.

The presence of more EV charging stations could reduce traveling “range” concerns for EV drivers. With regard to refueling infrastructure, the United States has about 150,000 gasoline stations and about 50,000 public EV charging stations.¹⁹ The time it takes to charge an EV at fast-charging stations has reduced significantly in recent years, but uncertainty remains with regard to charging station locations and availability.²⁰ As it pertains to “range”—the traveling distance per charge—EVs can travel for 100 to 300 miles on a single charge.²¹ Gasoline vehicles, on the other hand, can last 400 to 500 miles on a single tank of gas, meaning a gasoline vehicle could travel from Susquehanna Township, PA to Winston-Salem, North Carolina without needing to fill up.²² While the difference in range is still significant, on a national average, it costs less than half as much to travel the same distance in an EV than a conventional vehicle.²³

B. Evaluating the different types of EV charging infrastructure

EV charging stations utilize units of electricity that many may not be familiar with. “Voltage, or the electrical pressure difference between two points connected by a conductor, causes electric energy to pass from one point to the other.”²⁴ Amp or ampere is a unit of current.²⁵ “A current of one ampere involves the flow of 6.2 billion electrons past any point in the conductor during one second.”²⁶ Electrical outlets throughout much of the world, including standard wall outlets in the United States, provide electrical energy by way of an alternating

¹⁹ Benjamin Leard and Virginia McConnell, *Are we approaching Range Serenity for Electric Vehicles? Resources for the Future* (Oct. 23, 2010), <https://www.resourcesmag.org/common-resources/are-we-approaching-range-serenity-electric-vehicles/>.

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

²³ U.S. Department of Energy, *Electric Vehicles: Saving on Fuel and Vehicle Costs* (Nov. 16, 2019), <https://www.energy.gov/eere/electricvehicles/saving-fuel-and-vehicle-costs>.

²⁴ 8A Nichols on Eminent Domain § G26.01 (2019).

²⁵ *Id.*

²⁶ 8A Nichols on Eminent Domain § G26.01 (2019).

current (AC).²⁷ The electric current provided by such power outlets is called “alternating” because the direction of current flow reverses periodically.²⁸

There are three levels of EV charging stations available. AC level 1 EV chargers have 120 volts (V) and a maximum current of 12 amps.²⁹ A level 1 charger can typically provide a full charge within an eight-hour period.³⁰ An AC level 2 charger has 208-240V and a maximum current of 40 amps.³¹ A level 2 charger can provide a full charge in three to four hours.³² Level 3 equipment, commonly known as direct-current (DC) fast charging, charges through a 480V DC plug.³³ Most level 3 chargers provide an 80 percent charge in 30 minutes.³⁴

Level 1 chargers are the most affordable of the three charging station levels. EVs come with a basic cord that will plug into a 120V outlet, the standard outlet for homes in the United States.³⁵ As it pertains to a level 1 charger, individuals and families with access to a garage, carport or any outside outlet accessible to their vehicle, would only face costs stemming from their electricity bill. According to the United States Department of Energy, electricity prices are generally much more stable than gasoline prices.³⁶ In addition, some utilities offer even cheaper rates at night, which can further reduce electricity costs.³⁷

With regard to affordability, level 2 chargers come second to level 1 chargers. Most property owners seeking to address the needs of EV drivers, will elect to purchase a level 2 EV charging station. The greatest challenge for those interested in a level 2 charging station would

²⁷ 22A Chisum on Patents SCG-5229.31 (2019).

²⁸ *Id.*

²⁹ Cave, *supra* note 7.

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ EVTown, *Levels of Charging* (2015), <http://www.evtown.org/about-ev-town/ev-charging/charging-levels.html>.

³⁴ *Id.*

³⁵ OhmHome, *EV Charging Station Cost* (2018), <https://www.ohmhomenow.com/electric-vehicles/ev-charging-station-cost/>.

³⁶ U.S. Department of Energy, *supra* note 23.

³⁷ *Id.*

be the cost. According to “OhmHome,” a California website dedicated to “guiding consumers through the energy revolution including solar power, smart homes, electric vehicles and retail electricity,” one level 2 charging station typically costs at least \$1,000.³⁸ This amount would include equipment and installation.³⁹

Installation and equipment fees result in the higher cost of a level 2 charger. For businesses, retail or corporate locations, the cost of one level 2 charging station can be significantly greater than a level 1 home charger.⁴⁰ The equipment alone costs anywhere between \$2,000 and over \$5,000.⁴¹ The reason for the difference in cost is that business locations typically require equipment that is pedestal mounted and includes features such as an LCD screen, payment processing and other data tracking technology.⁴² A study by the Rocky Mountain Institute (RMI), a leading cleantech institute, determined that the installation of level 2 chargers for businesses is the largest component of the cost and can range between \$4,000 and \$7,000.⁴³ For those property owners and businesses that can mount their chargers on a wall, the cost would be less than curbside installation because the wiring is easier to install for a wall mounted charger.⁴⁴ A curbside charger is typically free-standing, which requires trenching or directional boring for wiring, resulting in increased installation costs.⁴⁵

The most expensive EV chargers are the level 3 chargers. Businesses and property owners in commercial and industrial zones would face the highest charging station costs if they opt to install a level 3 charging station. A level 3 charging station can cost more than \$50,000 to

³⁸ U.S. Department of Energy, *supra* note 23.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.*

⁴³ Josh Agenbroad, *Pulling Back the Veil on EV Charging Station Costs*, Rocky Mountain Institute (April 29, 2014), <https://rmi.org/pulling-back-veil-ev-charging-station-costs/>.

⁴⁴ OhmHome, *supra* note 35.

⁴⁵ *Id.*

install.⁴⁶ The installation costs are greater due to the fact that a level 3 charging station can require an up to 480V transformer and an electrician whose labor costs could exceed 40 hours.⁴⁷

Financial barriers continue to play a significant role in the installation of EV systems. The main financial barriers include the additional investments EV users and property owners must make to cover the costs of purchasing and installing charging stations, as well as the costs associated with upgrading a building's power distribution system.⁴⁸ These barriers directly influence a property owner or business' decision to pursue installation, which in turn influences a resident, consumer or employee's decision to acquire an EV over a conventional fossil-fuel vehicle.⁴⁹

Municipalities and EV drivers cannot tackle infrastructure expenses alone. Local governments are choosing to work with property owners in their communities and are encouraging them to install charging stations.⁵⁰ "Local governments can act as facilitators of information sharing and outreach, but the private sector will need to play a more active role in innovation of charging station deployment."⁵¹ From a "deep pockets" perspective, the private sector would have greater financial ability to aid in efficient transportation electrification.

III. Existing EV infrastructure related laws and programs

Pennsylvania is currently attempting to provide incentives and programs to encourage EV charging infrastructure deployment in this Commonwealth. While these incentives and programs are offered, municipalities have yet to adopt proposals that would address EV charging

⁴⁶ OhmHome, *supra* note 35.

⁴⁷ *Id.*

⁴⁸ *Id.* at 448.

⁴⁹ *Id.*

⁵⁰ Timothy Shah, et al., *Electric Vehicle Charging Stations: Lessons Learned from Municipalities in Washington and Oregon*, PEMBINA Institute Backgrounder, October 2012, at 1, 7.

⁵¹ *Id.*

infrastructure or provide standards for the installation of EV charging equipment and systems. Without these proposals and standards, the incentives and programs discussed later would not be beneficial to local municipalities.

While local ordinances provide for parking regulation and permits, current provisions are not designed to overcome regulatory barriers or ease deployment of and access to EVs and EV charging infrastructure.⁵² Article III, Section 10301(a)(3) of the Pennsylvania Municipalities Planning Code (MPC) requires a municipal comprehensive plan to include a plan for the movement of people and goods, which may include expressways, highways, local street systems, parking facilities, and other similar facilities.⁵³ Additionally, Section 10604(1) requires the provisions of zoning ordinances to promote, protect and facilitate vehicle parking and loading space.⁵⁴ In the City of Harrisburg, Section 5-703.3 provides for an annual license.⁵⁵ Under this section, an operator is prohibited from conducting business as a nonresidential parking lot without obtaining an annual license at a fee of \$1 per space from the Tax Enforcement Administrator. The fees are used to defray the costs associated with administering the Harrisburg parking tax law.⁵⁶ In Susquehanna Township, PA, Section 15-407 establishes special purpose parking zones, and prohibits people from parking a vehicle in those zones unless permitted.⁵⁷ In the course of our research, the drafters of the EVCIPO were not able to find local ordinances that specifically provided for EV charging infrastructure.

State EV infrastructure incentives are failing to include certain residential, commercial and industrial property owners. The Pennsylvania Department of Environmental Protection

⁵² PA Department of Environmental Protection, *Pennsylvania Electric Vehicle Roadmap* (2019), <http://files.dep.state.pa.us/Energy/OfficeofPollutionPrevention/StateEnergyProgram/PAEVRoadmap.pdf>.

⁵³ 53 P.S. § 10301 (2019).

⁵⁴ 53 P.S. § 10604 (2019).

⁵⁵ Harrisburg, Pa., Code § 5-703.3 (2019).

⁵⁶ *Id.*

⁵⁷ Susquehanna Township, Pa., Code § 15-407 (2019).

(DEP) currently offers competitive grants for the acquisition, installation, operation and maintenance of publicly available DC fast-charging equipment infrastructure.⁵⁸ Grant reimbursements are awarded after project completion, with the maximum reimbursement set at up to 75 percent, and the maximum award set at \$500,000.⁵⁹ The eligible project locations are restricted to transportation corridors, destination locations and locations that serve as community charging hubs.⁶⁰ Funding for the program is provided by Pennsylvania's portion of the Volkswagen Environmental Mitigation Trust, which is the result of three partial settlements the United States EPA resolved in a civil enforcement case against Volkswagen for allegations that the company violated the Clean Air Act.⁶¹ The restriction to transportation corridors, destination locations and community charging areas, ensures that the grants fail to address the needs of those EV drivers that are living in multi-unit dwellings without charging ports or garages, and businesses that wish to be reimbursed for installing charging stations on their properties.

Current state programs also create timing constraints that cannot be met by everyone. DEP offers rebates for the acquisition, installation, operation and maintenance of level 2 electric vehicle supply equipment (EVSE) on publicly accessible, government-owned or non-government-owned property, such as at workplaces, or at multi-unit dwellings that are not publicly accessible.⁶² As it pertains to publicly accessible properties, the maximum reimbursement on non-governmental property could be up to 80 percent of the total project cost, and for non-publicly accessible properties, the program would reimburse up to 60 percent of the total project costs.⁶³ While this rebate program is certainly beneficial, DEP approves the

⁵⁸ U.S. Department of Energy, *Pennsylvania Laws and Incentives* (2019), <https://afdc.energy.gov/laws/all?state=PA>.

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ United States Environmental Protection Agency, *Volkswagen Clean Air Act Civil Settlement* (2017), <https://www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement>.

⁶² U.S. Department of Energy, *supra* note 58.

⁶³ U.S. Department of Energy, *supra* note 58.

applications and processes the rebates on a first-come, first-served basis, until funds are exhausted.⁶⁴ Projects must be completed within 180 days, and the rebate is only awarded after project completion.⁶⁵ Completing a project within roughly six months would be a challenge for any property owner but would significantly disqualify smaller businesses and property owners who may wish to be one of the first to apply for the rebate before funds are exhausted, but who do not have the funding available to hire the labor required to complete the installation in that limited amount of time.

With regard to private incentives, Duquesne Light Company (DLC) offers rebates to commercial customers for the installation of publicly accessible level 2 EVSE.⁶⁶ Rebates are available for 100 percent make ready installation costs, up to \$32,000 per site.⁶⁷ While DLC’s “Driving PA Forward” efforts benefit our communities, it must be noted that this private rebate is restricted to DLC customers only.⁶⁸ While there have been financial incentives provided by both the state and private entities, Pennsylvania still lacks proposals that equip local governments with guidelines and model language for the expansion of EV charging infrastructure across the state. Legislation in the form of this proposed model ordinance is necessary to ensure the involvement of all interested property owners, whether residential, commercial or industrial.

IV. Charging infrastructure proposals in other jurisdictions

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ Duquesne Light Company, *Electric Vehicles: Charging Station Rebates* (2019), <https://www.duquesnelight.com/energy-money-savings/electric-vehicles>.

Numerous municipalities across the United States have adopted EV friendly proposals that specifically address the need for charging infrastructure. While some have opted for voluntary proposals that encourage rather than mandate charging station installation, municipalities such as the City of Auburn Hills in Michigan have adopted mandatory proposals to ensure that charging infrastructure is installed within their jurisdictions.

A. Voluntary versus mandatory ordinances

i. Voluntary ordinances

The drafters of the EVCIPO analyzed several voluntary EV charging infrastructure related ordinances. The first type of voluntary ordinance treats charging station installation as a permitted land use.⁶⁹ Such ordinances either distinguish between the different charging station levels by charging speed, allow level 1 and level 2 installation in all zones while restricting level 3 stations to specific zoning districts, or allows all three levels in all zoning districts.⁷⁰ The City of Chelan, Washington adopted an ordinance that permits level 1 and level 2 EV charging stations in all zoning districts but restricts level 3 EV charging to warehouse and industrial and highway service commercial zoning districts.⁷¹ Meanwhile, the City of Des Moines, Iowa allows all three levels of EV charging stations in all zoning designations.⁷²

Other permitted land use ordinances require a conditional or special use permit for charging stations in specific zones.⁷³ In the City of Auburn Hills, Michigan, installation of an EV charging station is subject to permit approval administered by the Department of Community

⁶⁹Cooke, *supra* note 3.

⁷⁰ *Id.*

⁷¹ Chelan, Wash., Code § 17.63.030 (2019).

⁷² Des Moines, Iowa ch. 114 art. 1 § 114-361.02 (2019).

⁷³ Cooke, *supra* note 3.

Development.⁷⁴ In Chelan, Washington, level 3 EV charging stations require a conditional use permit in downtown mixed use and tourist accommodation zoning districts.⁷⁵

The second type of voluntary ordinance examined, establishes standards, known as “make ready standards,” for installing the infrastructure needed to support EV charging stations.⁷⁶ The City of Auburn Hills, MI, adopted an ordinance that states in part, “it is strongly encouraged, but not required, that all new and expanded non-residential development parking areas provide the electrical capacity necessary to accommodate the future hardwire installation of Level-2 electric vehicle charging stations.”⁷⁷ The third type of voluntary ordinance provides minimum standards for charging station equipment or infrastructure.⁷⁸ For example, in St. Louis Park, MN, EV charging equipment pedestals are to be designed to minimize potential damage by accidents, vandalism and to be safe for use in inclement weather.⁷⁹

ii. Mandatory ordinances

The drafters of the EVCIPO also analyzed several mandatory EV charging infrastructure related ordinances. The most common mandatory ordinance requires EV charging or parking spaces as part of the minimum parking space requirements.⁸⁰ These types of ordinances often require that a portion of parking spaces be designated for EV parking or be EV ready.⁸¹ Such ordinances are often specified as a percent or ratio, but they may also be based on land uses such as the number of residential units in a development.⁸² In St. Louis Park, MN, multiple-family residential land uses are required to have 10 percent of required parking as level 1 stations for

⁷⁴ Auburn Hills, Mich., Ordinance art. 18 §1834 (2) (2019).

⁷⁵ Chelan § 17.63.030.

⁷⁶ Cooke, *supra* note 3.

⁷⁷ Auburn Hills §1834 (4)(B).

⁷⁸ Cooke, *supra* note 3.

⁷⁹ St. Louis Park, Minn., Ordinance § 2550-19 (Jan. 7, 2019).

⁸⁰ Cooke, *supra* note 3.

⁸¹ *Id.*

⁸² *Id.*

resident parking, and one level 2 station for guest parking.⁸³ Additionally, non-residential land uses with parking spaces available for use by the general public are required to have at least one percent of required parking as level 2 stations with a minimum of two spaces served by level 2 charging.⁸⁴

B. The effectiveness of ordinances in other jurisdictions

The municipalities we examined witnessed an increase in the availability of charging infrastructure. The City of Chelan, WA, currently has eight level 2 and level 3 charging stations.⁸⁵ EV charging is free at five of these stations, compliments of Cascade Autocenter, a used vehicle dealership.⁸⁶ The City of Des Moines, IA has 44 level 2 and level 3 charging stations.⁸⁷ In July of 2019, MidAmerican, an energy company based in Des Moines, IA, committed to install publicly accessible DC fast-charging stations, with two charging plugs per station, in 15 urban and rural communities across Iowa.⁸⁸ The company is also accepting applications from businesses and community groups that are interested in hosting charging facilities that MidAmerican will purchase, install and maintain.⁸⁹

The Auburn Hills' ordinance can be tied to the increase in charging infrastructure in their city. While speaking at Michigan's Electric & Hybrid Vehicle Technology Expo in 2013, Auburn Hills' Director of Community Development stated that the City made an intentional decision to prepare for the fueling needs of plug-in electric vehicle drivers by implementing the

⁸³ St. Louis Park § 36-361(e)(2).

⁸⁴ *Id.*

⁸⁵ ChargeHub, *Charge your EV in Chelan* (2019), https://chargehub.com/en/countries/united-states/washington/chelan.html?city_id=1847.

⁸⁶ Chelan County Public Utility District, *Charging stations at PUD spots are open to the public* (2019), <https://www.chelanpud.org/environment/operating-responsibly/electric-vehicles>.

⁸⁷ ChargeHub, *Charge your EV in Des Moines* (2019), https://chargehub.com/en/countries/united-states/iowa/des-moines.html?city_id=1349.

⁸⁸ MidAmerican Energy Company, *Company seeks to jump-start EV use with fast charging stations at 15 locations* (2019), <https://www.midamericanenergy.com/news-ev-fastcharger-network>.

⁸⁹ *Id.*

state's first comprehensive electric vehicle infrastructure ordinance, creating best practice standards for on-street charging stations and developing Michigan's standard for EV charging station regulatory signs.⁹⁰ As a result, the City of Auburn Hills, currently has 74 level 2 and level 3 charging stations.⁹¹

Varying results were seen in municipalities that adopted voluntary versus mandatory ordinances. As it pertains to the voluntary ordinances, in Chelan, WA, the five free charging stations are the result of the Public Power Benefit Program, a program designed to improve the quality of life in Chelan County and funded using a portion of electric revenues, as determined annually by the Board of Commissioners.⁹² It is unclear if the other three stations could be attributed solely to the passage of the ordinance. In the City of Des Moines, the participation of a private company will impact the availability of charging stations. MidAmerican's efforts to provide charging stations could very well be the result of the City's charging station ordinance. With regard to the mandatory ordinance, the City of Auburn's charging station infrastructure growth has been attributed to the City's ordinance by the Director of Community Development. Overall, a system of measuring the effectiveness of these proposals was not identified but in one of the municipalities, a report was prepared after an analysis of existing legislation, in an effort to aid municipalities that are seeking to increase charging station infrastructure.

In 2014, the Des Moines Area Metropolitan Planning Organization (MPO) released a report outlining three primary recommendations for municipal governments seeking support the adoption of EVs.⁹³ The first is to publicly site charging stations, the second is to incentivize local

⁹⁰ International City/County Management Association, *Auburn Hills, MI Leading Plug-in Electric Vehicle Efforts* (2019), <https://icma.org/articles/article/auburn-hills-mi-leading-plug-electric-vehicle-efforts>.

⁹¹ ChargeHub, *Charge your EV in Auburn Hills* (2019), https://chargehub.com/en/countries/united-states/michigan/auburn-hills.html?city_id=648.

⁹² Chelan County Public Utility District, *supra* note 86.

⁹³ Des Moines Area Metropolitan Planning Organization, *Electric Vehicle Readiness: Energy Efficiency through Regional Planning* (Aug. 2014), <https://dmampodemo.files.wordpress.com/2014/12/electric-vehicle-report1.pdf>.

charging station installation, and the third is to provide comprehensive plans and code updates. After mapping ideal locations for EV charging station installations based on the number of destination locations such as retail stores, theatres and restaurants, the Des Moines MPO first recommends that each municipal government install at least one charging station in each high-density location.⁹⁴ The report found that numerous organizations can host level 2 charging stations including parking garages, retail stores and universities.⁹⁵

With regard to its second primary recommendation, the Des Moines MPO report provides three tools a city can use to encourage installation of charging stations on private property.⁹⁶ The report emphasized that the focus should be placed on multi-unit residences, workplace sites and key inter- metropolitan sites.⁹⁷ The report found multi-unit residences to be a major obstacle to EV ownership.⁹⁸ Installing a charging station in a single family residence could be as simple as hiring an electrician to install a new outlet, while the resident of a multi-unit dwelling would need to work through a landlord or building management.⁹⁹

The report also examined the need for infrastructure in the workplace. Since vehicles tend to remain parked at a workplace for an average of eight to nine hours, workplace charging could be an alternative to residential charging for drivers who may not be able to charge their vehicle at home due to living in a multi-unit dwelling or having a detached garage with no electricity.¹⁰⁰ The report also emphasized the need for DC fast chargers in the Des Moines metropolitan area, to extend the driving range for EV drivers.¹⁰¹

⁹⁴ Des Moines Area Metropolitan Planning Organization, *supra* note 93.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

Several other recommendations were provided. The report recommends that municipalities strongly encourage new multi-family homes to provide a 240V outlet on a dedicated circuit in close proximity to designated vehicle parking to accommodate the future hardwire installation of a level 2 charging station.¹⁰² The report also recommends that ordinances strongly encourage new and expanding non-parking areas to provide electricity capacity for future level 2 stations as well. Additionally, the report recommends that ordinances speak to site design requirements, signage and the ability to remove illegally parked vehicles.¹⁰³ Incentives recommended in the report include low-cost installation permits, same day inspections and stream-lining electrical permitting.¹⁰⁴

The third and final primary recommendation in the MPO report encourages the inclusion of EVs and charging infrastructure in local comprehensive plans.¹⁰⁵ The report found that adopting EV friendly codes can encourage infrastructure deployment.¹⁰⁶ As evidenced by MidAmerican's voluntary commitment to install 15 publicly accessible DC fast-charging stations in Iowa, EV friendly codes can be very effective. The MPO report specifically provides that ordinances should define the types of charging stations allowable by land use type, request developers to install charging infrastructure or wiring for future charging installation, and establish design criteria for installations.¹⁰⁷

¹⁰² Des Moines Area Metropolitan Planning Organization, *supra* note 93.

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

V. Recommendations

As Pennsylvania boroughs and townships begin the process of adopting ordinances that address the need for EV charging infrastructure, model legislation based on ordinances passed in municipalities that have seen EV infrastructure growth, will be beneficial. After analyzing several proposals from other jurisdictions, the drafters of the EVCIPO have provided recommended ordinance language that municipalities can adopt in an effort to tackle the charging needs of their residents.

A. Recommendations based on the experiences of other municipalities

Based on the recommendations of and ordinance language adopted in municipalities we examined, we recommend the adoption of an ordinance that would treat charging station installation as a permitted land use. The EVCIPO adopts the approach taken by the City of Chelan, WA in adopting an ordinance that permits level 1 and level 2 EV charging stations in all zoning districts but restricts level 3 EV charging to industrial and commercial zoning districts. Utilizing similar language to that adopted by the City of Auburn Hills, MI, we also recommend that installation of EV charging stations be subject to permit approval. The drafters also recommend the establishment of standards, known as “make ready” standards, for installing the infrastructure needed to support EV charging stations. The EVCIPO’s make ready standards are modeled after the St. Louis Park, MN ordinance language.

The EVCIPO provides for the above recommendations in multiple sections. Specifically, in a municipality that adopts the EVCIPO, a permit would be required under Section 202, for property owners that wish to install EV charging stations on their property. It is important to note that a residential property owner installing a charging station for personal use or for the use of family members or long-term guests, would be exempt from the permit requirements. The

EVCIPO is designed with multi-unit dwelling residential, commercial and industrial property owners in mind. The EVCIPO allows a municipality to designate the responsibility of administration and regulation to an entity identified as “agency” in the ordinance. The permit application would include information such as the property owner’s proposed plan, a diagram of the site for installation, as well as any information deemed necessary by the municipality. The ordinance aims to encourage property owners to voluntarily seek to install EV charging stations by providing incentives that property owners may claim in their permit application.

The ordinance also provides for incentives. Incentives under Section 501, would include counting EV charging parking spaces towards meeting existing municipal parking requirements, and installing two charging stations under one application and certification price. Commercial and industrial property owners could count each EV parking space as three parking spaces with regard to meeting required municipal parking standards. Residential property owners could receive 200 additional square feet of building area for their property for each certified EV charging station that is installed.

The EVCIPO includes standards that allow for uniformity and public safety. Additionally, the ordinance would ensure the provision of EV-only parking at charging station locations. The ordinance creates parking provisions for residential areas as well as for industrial and commercial areas. Property owners would be required to abide by signage stipulations, specific parking space colors and station mounting regulations. This model ordinance prioritizes uniformity, EV driver safety and easy to follow instructions for permit applicants. Installation of EV charging stations and EV make ready systems would be conducted by a Pennsylvania licensed electrician, electrical contractor or technician, who would provide the property owner with a certificate of proper installation. A property owner would not be permitted to use the EV

charging stations, or make them available to others for use until the certificate of proper installation is submitted to the entity authorized by the municipality, and written approval is received by the property owner. With municipal fiscal challenges in mind, the ordinance authorizes a municipality to impose any fees necessary to implement the provisions of the ordinance.

With regard to owners of new properties or properties that would be reconstructed or expanded in the future, the ordinance provides for a make ready application. Section 301 of the EVCIPO allows for an EV make ready system application for those seeking to provide the electrical capacity necessary to accommodate the future hardware installation of EV charging stations. Make ready applicants would follow the same application process under section 202 except that their application forms would indicate that the installation is for an EV make ready system. These applicants would not be eligible for the incentives that are available to applicants seeking to actually install EV charging stations.

Additionally, we encourage municipalities to review building code requirements prior to the adoption of this ordinance. Based on comments received from members of the Susquehanna Township Department of Community Development, in adopting the provisions of the EVCIPO, we recommend examination of and compliance with the National Electrical Code (NEC), published by the National Fire Protection Association (NFPA), and the International Building Code (IBC), published by the International Code Council (ICC), the two model codes that relate most to the construction and electrical installation associated with charging station infrastructure.¹⁰⁸

B. Policy choices based on the experiences of other municipalities

¹⁰⁸ WXY Architecture + Urban Design, et al., *EV-Ready Codes for the Built Environment: Electric Vehicle Supply Equipment Support Study* (2012), http://www.transportationandclimate.org/sites/default/files/EV-Ready_Codes_for_the_Built_Environment_0.pdf.

Given the results seen in the municipalities we examined, the drafters of the EVCIPO opted for a voluntary rather than mandatory EV installation ordinance. A voluntary approach would receive a more positive reception in locations such as Harrisburg and Susquehanna Township. A majority of United States registered voters, 59 percent, think protecting the environment improves economic growth and provides new jobs.¹⁰⁹ Per a 2018 report by the Yale Program on Climate Change Communication, Conservative Republicans are the only political group more likely to think protecting the environment reduces growth and jobs, versus improves it.¹¹⁰ Given that 48 out of the 67 Pennsylvania counties are rural, this state is considered to be politically conservative.¹¹¹ It is for that reason, we recommend a voluntary ordinance rather than a mandatory proposal. Based on the political makeup of this state, we believe that a voluntary “emissions reducing” ordinance would receive a more positive reception than a mandatory one.

Municipalities may still choose to adopt a mandatory proposal. While many residents may recognize the long term environmental, social and economic benefits of EV friendly legislation, we believe that the majority of Pennsylvanians would not support a proposal that could be deemed as forcing climate change measures on local businesses. However, there is no language in the EVCIPO that would prevent a municipality from adopting mandatory installation requirements if it chose to do so. As it applies to the experience of a municipality that took the voluntary approach, as of 2019, Des Moines, IA, has 44 level 2 and level 3 charging stations. It is clear that voluntary EV friendly legislation can produce impressive results.

¹⁰⁹ Anthony Leiserowitz, et al., *Politics & Global Warming*, March 2018, Yale Program on Climate Change Communication (May 8, 2018), <https://climatecommunication.yale.edu/publications/politics-global-warming-march-2018/2/>.

¹¹⁰ *Id.*

¹¹¹ The Center for Rural Pennsylvania: A Legislative Agency of the Pennsylvania General Assembly, *Demographics* (2015), https://www.rural.palegislature.us/demographics_about_rural_pa.html.

C. How the ordinance solves the problem: Encouraging EV charging infrastructure installation by property owners through incentives

The model ordinance aims to incentivize EV charging infrastructure installation by providing property owners and those with the ability to install charging stations with incentives. The ordinance would allow property owners to count designated EV spaces towards meeting existing municipal parking space requirements. For those property owners who fear the costs associated with adding EV parking spaces, this incentive would allow them to utilize existing spaces on their property towards meeting EV driver needs. To encourage the installation of more than one EV station, the proposed model ordinance would allow for the installation of two EV charging stations under one application and certification price. This ordinance attempts to reduce concerns of property owners who may be anxious about permitting and certification fees, by providing what is ultimately a “buy one, get one free” installation and certification fee package. With the understanding that level 3 chargers are significantly more expensive to install and purchase, this ordinance aims to provide a benefit to commercial and industrial property owners by allowing them to count each EV parking space towards three parking spaces that would be required under most municipal codes.

Additional incentives are provided for residential property owners. Residential property owners, excluding those installing a charging station for personal use, would be able to receive 200 additional square feet of building area for their property for each EV charging station that is installed and certified with the municipality. In municipalities that restrict the total square footage, this incentive would serve as an added bonus. Additionally, this incentive would allow a municipality to better serve the needs of residents by encouraging the installation of infrastructure on residential properties, where the greatest need for charging infrastructure lies.

D. Social, economic and environmental benefits stemming from this proposal

Adoption of the model ordinance would result in several benefits to a municipality. The EVCIPO will help boost EV sales in local municipalities due to greater accessibility to charging infrastructure, particularly for members of the community who do not have access to a garage or carport.¹¹² By encouraging more residents of our municipalities to transition to EVs, municipalities would benefit from long-term structural reductions in local air pollution, GHG emissions and petroleum consumption.¹¹³ 24/7 Wall St., a Delaware corporation that runs a financial news company, reviewed state tax levels from the American Petroleum Institute to identify the states with the highest and lowest gas taxes. According to the review, the state of Pennsylvania has the highest gas tax in the country.¹¹⁴ The ability to eliminate this tax of 58.7 cents per gallon, would be a direct benefit to residents of any township or borough in Pennsylvania.¹¹⁵ Additionally, investment in an EV charger for businesses, would quickly be returned through an increase in retail traffic which could result in more customers and visitors, if the business permits.¹¹⁶ For example, installation of EV chargers at the Giant Food Store on Linglestown Road in Susquehanna Township could result in EV drivers spending more time and money at the Giant eatery and grocery store while waiting for their vehicles to charge. For multi-unit dwelling owners and residential developers, a benefit resulting from charging infrastructure installation would be the increased interest in renting and purchasing property by EV drivers who currently have charging concerns.

¹¹² Gordon, *supra* note 4.

¹¹³ *Id.*

¹¹⁴ Michael B. Sauter, *States with the Highest and Lowest Gas Taxes*, 24/7 Wall St. (Jan. 26, 2018), <https://247wallst.com/special-report/2018/01/26/states-with-the-highest-and-lowest-gas-taxes-6/2/>.

¹¹⁵ *Id.*

¹¹⁶ OhmHome, *supra* note 35.

Three specific benefits would be realized by a municipality that adopts an EV charging related ordinance. First, EV infrastructure availability would save residents' money. According to the American Automobile Association (AAA), as of April 2019, gas prices in Pennsylvania were near \$3.00 per gallon, putting this state among the top 10 with the highest average gas prices.¹¹⁷ With regard to saving money, EV drivers spend the equivalent of about \$1.21 per gallon, based on average residential electric rates.¹¹⁸ As to the second benefit, electrifying transportation would reduce emissions. Powered by electricity, EVs have zero tailpipe emissions, which leverages the benefits of clean energy deployment in the electric power sector which would directly impact the health of individuals living in our municipalities.¹¹⁹ Finally, EVs would also result in economic growth. The expansion of EV options could increase economic output and generate new jobs, while saving residents money that can now be used on other goods and services within the local economy.¹²⁰

E. Fees and costs associated with the ordinance

A number of sections in the EVCIPO specifically relate to fees and costs. Section 208 provides that any funds necessary to administer the EVCIPO, such as funds from the application fees, may be established by municipality resolution following recommendation by the administering entity. This recommendation would be adopted as part of the schedule of fees of the township or borough. The language permitting use of the fee dollars to pay for this ordinance, was drafted with the understanding that most municipalities will require staff or a designated

¹¹⁷ Jeanette Casselano, *National Average Sees Smallest Weekly Increase in Eight Weeks*, American Automobile Association (2019), <https://newsroom.aaa.com/2019/04/national-gas-price-average-smallest-weekly-increase-eight-weeks/>.

¹¹⁸ *Electric Transportation Benefits Customers, Communities, and the Environment*, Edison Electric Institute (Sept. 2019), https://www.eei.org/issuesandpolicy/electrictransportation/Documents/Electric_Transportation_Benefits_Customers_and_Communities.pdf.

¹¹⁹ *Id.*

¹²⁰ *Id.*

entity to administer the EVCIPO. Based on the number of applications a municipality expects to receive and the cost of compensating an administrator of this ordinance, the municipality is provided with flexibility as it pertains to setting fee amounts sufficient to cover the anticipated costs of adopting this ordinance. Section 205(g) of the ordinance permits property owners to collect a service fee for the use of their EV charging stations. Additionally, Section 501 allows property owners who meet the parking capacity municipal requirements to request a reduction in permitting and certification costs.

VI. Conclusion

Local action is required to spur EV manufacturers, residents and property owners to fully commercialize EVs. The United States EV industry has seen impressive growth over the last decade with hundreds of companies saturating the transportation market with EV options. However, progress still needs to be made in assisting the public's transition to electric-drive vehicles. Residential property owners, specifically owners of multi-unit residential dwellings, and owners of property in commercial and industrial zones, would benefit from an ordinance aimed at meeting the charging needs of EV driving residents, employees and patrons in their municipality. The EVCIPO would encourage property owners to install EV charging infrastructure on their properties, rather than mandate the expensive installation. The goal of the proposed ordinance is to boost EV sales due to greater accessibility to charging infrastructure. By encouraging residents to transition to EVs, municipalities that adopt the EVCIPO will benefit from long-term structural reductions in air pollution, GHG emissions and petroleum consumption.

Electric Vehicle Charging Infrastructure and Parking Model Ordinance

Jacqueline Lynette Carter and Samantha Craley

ORDINANCE NO. _____

AN ORDINANCE OF THE _____ [TOWNSHIP/BOROUGH] OF
_____ COUNTY, PENNSYLVANIA, TO ESTABLISH REGULATIONS RELATED
TO THE PROVISION OF ELECTRIC VEHICLE CHARGING AND PARKING ON PRIVATE
PROPERTY

NOW, THEREFORE, BE IT ENACTED AND ORDAINED by the authority of the
[Council/Board] of the _____ [Township/ Borough] of _____ County,
Pennsylvania:

Chapter 1

Preliminary Provisions

Section 101 **Short title.**

This ordinance shall be known as the Electric Vehicle Charging Infrastructure and
Parking Ordinance of the [Township/Borough] of _____.

Section 102 **Legal authority.**

This ordinance is authorized under 8 Pa. C.S.A. § 1202 (2), (13), and (15) [Borough] 53
Pa. C.S. § 56549 (Parking and parking lots) [First Class Township] and 53 Pa. C.S. § 67328
(Regulation of parking) [Second Class Township].

Section 103 **Purpose.**

(a) **Affirmative purpose.** – This ordinance is enacted to promote, protect and facilitate all of the following:

- (1) Make this [Township/Borough] more accessible to those individuals who drive electric vehicles.
- (2) Meet the needs of residents with electric vehicles who need to charge their vehicles to be mobile.
- (3) Balance the interests of residents with electric vehicle charging needs and property owner profitability.
- (4) Reduce carbon emissions through use of electric vehicles and the deployment of electric vehicle charging stations to aid in this reduction.
- (5) Create specific parking/charging spaces to allow for this use.
- (6) Create procedures for authorizing and establishing a uniform permitting system for interested residents to use to set up their own electric vehicle charging stations.

(b) **Preventative purpose.** – This ordinance is enacted to prevent one or more of the following:

- (1) Impermissible and unregulated installation of electric vehicle charging stations.
- (2) Unapproved dangerous installation of electric vehicle charging stations whether via hazards to walkways or to the power grid.
- (3) Unmaintained electric vehicle charging stations that present a danger to the electric grid and potential damage to vehicles when connected.

- (4) Vehicle congestion at electric vehicle charging stations in areas with limited parking accessibility.

Section 104 **Definitions**

For the purposes of this ordinance, the words and phrases used herein shall have the meaning given to them in this section unless the text clearly indicates otherwise¹²¹:

“Agency.” The entity authorized by the municipality to administer, regulate and enforce this ordinance. This term may include, but is not limited to, an individual or contracted third party organization set forth by the municipality by resolution

“Bollard.” A cement filled cylinder attached to the ground to protect sensitive equipment and restrict vehicle movement.

“Charging levels (1, 2, &3).” The standard indicator of electric force or voltage at which an electric vehicle is recharged as follows¹²²:

“Level 1.” A slow charging system with a voltage range of 0 through 120 AC¹²³.

“Level 2.” A medium charging system with a voltage range of 121 through 240 AC¹²⁴.

“Level 3.” A fast charging system with a voltage range of greater than 240 AC¹²⁵.

“Electric vehicle.” Any vehicle that operates in any way on electrical energy which includes but is not limited to the following¹²⁶:

- (1) – A battery electric vehicle.

¹²¹ Language adopted from the “Long Term Planning for Short Term Rental Ordinance” sustainability ordinance for Susquehanna Township (Fall 2018). <https://widenerenvironment.files.wordpress.com/2019/01/short-term-rentals-final.pdf>

¹²² Auburn Hills, Mich., Ordinance art. 18 §1834 (2)(D) (2019).

¹²³ Energy Sage, *Charging Your EV: How do EV Charging Stations Work?*, (Sept. 13, 2019) <https://www.energysage.com/electric-vehicles/charging-your-ev/>.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ Des Moines, Iowa ch. 114 art. 1 § 114-1 (2019).

- (2) – A plug-in hybrid electric vehicle.
- (3) – A neighborhood electric vehicle.
- (4) – A medium-speed electric vehicle.

“Electric vehicle charging space.” An off-street parking space designated for an electric vehicle to park while charging.

“Electric vehicle charging station.” A parking area that is served by electric vehicle charging station equipment for the purpose of transferring electric energy to a battery or other energy storage device in an electric vehicle¹²⁷.

“Electric vehicle make ready.” Infrastructure that will support the future installation of an electric vehicle charging station

“Free-standing.” Charging station that is standing alone and is not mounted to a wall or any other vertical surface.

“Property Owner.” The individual, corporation, any other legal entity that holds either legal or equitable title to the real estate as set forth on any deed, agreement of sale, or any other document recorded in the Office of the Recorder of Deeds for the applicable jurisdiction.

“Wall mounted.” Charging station that is mounted to a wall or any similarly substantial vertical surface.

Chapter 2

Electric Vehicle Charging Station Installation and Maintenance Standards

Section 201 Permissible locations for installation of electric vehicle charging stations

- (a) All electric vehicle charging space regulations authorized by this ordinance shall be read in conjunction with any other parking regulations in this municipal code. To the

¹²⁷ Id.

extent that there is a conflict between the ordinances, the more restrictive ordinance shall prevail.

(b) Electric vehicle charging stations shall be permitted in the following zones as set forth in the zoning ordinance of [Borough/Township]:

(1) Level 1 and level 2 electric vehicle charging stations are permitted in all zones¹²⁸.

(2) Level 3 electric vehicle charging stations are permitted only in commercial and industrial zones¹²⁹.

(c) Installation of all electric vehicle charging stations, unless excluded by Section 202(a)(2), shall be subject to permit approval administered in accordance with Section 202 (relating to permitting process)¹³⁰.

Section 202 **Permitting process**

(a) **Prohibition of installation without permit.**

(1) A property owner may not install any electric vehicle charging station on a property until an installation permit has been issued to the property owner by agency¹³¹ unless they are excluded in Section 202 (a)(2).

(2) Exclusions include installation of a level 1 or level 2 charging station for personal use by the property owner and installation of a level 1 or level 2 charging

¹²⁸ Chelan, Wash., Code § 17.63.030 (2019).

¹²⁹ *Id.*

¹³⁰ Auburn Hills, Mich., Ordinance §1834 (3)(A) (2019).

¹³¹ Language adopted from the “Workforce Housing Model Ordinance” sustainability ordinance for the Pennsylvania State Association of Township Supervisors and the Pennsylvania State Association of Boroughs (Fall 2018). <https://widenerenvironment.files.wordpress.com/2019/01/inclusionary-zoning-for-workforce-housing-final.pdf>

station for personal use by a residential property owner's family or long term guests.

(3) Except as exempted in Section 202 (a)(2), all installation of electric vehicle charging stations and electric vehicle make ready systems shall be conducted by an electrician, electrical contractor, or electrical technician licensed by the Commonwealth of Pennsylvania.

(b) **Application for installation permit.**

(1) The property owner shall be the only individual or entity who may apply for an application for installation permit.

(2) The application for installation permit shall be submitted on a form designated by the agency and shall include a proposed plan, diagram of the installation site, any fees designated by agency and all other information required by the agency¹³².

(3) The application shall not be deemed to be complete and reviewable until all portions of the necessary forms are filled in legibly and the proposed plan, diagram, and other information are received.

(4) The proposed plan in Section 202(c)(2) shall include:

- (i) Name and legal address of the property owner.
- (ii) Address and location of the property of installation.
- (iii) Tax map/parcel number.
- (iv) Copy of the deed for the property including any restrictions, covenants, easements, or conditions applicable to the proposed application.

¹³² Id.

- (v) A general description of the installation,
 - (vi) A designation of whether the unit to be installed will be an electric vehicle charging station or an electric vehicle make ready system.
 - (vii) The level of electric vehicle charging stations to be installed
 - (viii) The total number of each level of electric vehicle charging stations to be installed.
 - (ix) The name, business address, and Commonwealth of Pennsylvania license number for the electrician, electrical contractor, or electrical technician to be used for installation.
 - (x) Any restrictions to be imposed by the property owner regarding persons who would be permitted to charge their vehicles in the proposed space.
 - (xi) A designation of the incentive in Section 501, if any, the property owner plans to claim for their property.
 - (xii) An identification of any prior electric vehicle charging stations have been installed on the property and if so, how many.
 - (xiii) A description of any protective equipment the property owner may install to protect the equipment from damage or weather.
 - (xiv) The address to which the agency is to mail the grant or denial of the permit.
- (5) The diagram in Section 202(c)(2) shall include:
- (i) A scaled drawing of the footprint or a scaled aerial view of the property area for the proposed installation of the electric vehicle charging

stations and all parking spaces that would provide access to the charging stations.

(ii) All measurements related to proper placement of the following items:

- (A) Signage – size and physical location on the ground.
- (B) Electric vehicle charging space.
- (C) Electric vehicle charging station.

(6) Any application that is incomplete shall be ineligible for review. The receipt of an incomplete application shall not prejudice the property owner from submitting a revised application or new application for the same location.

(7) The grant or denial of the installation permit by the agency shall be given to the property owner within 20 business days of the receipt of the complete installation permit application. The following shall apply:

(i) The burden of proof and burden of persuasion to show compliance with all applicable provisions and requirements of this ordinance shall be on the property owner at all times.

(ii) The agency shall send notice of grant or denial of the installation permit to the address set forth on the permit application.

(iii) Property owners shall be deemed to have received notice of the grant or denial upon the date of the notice, not upon the date of receipt.

(iv) Grounds for denial of a complete application shall include, but are not limited to:

- (A) Agency determination that the proposed electric vehicle charging stations are incompatible with the electric grid in the area.
 - (B) Agency determination that there is overcrowding in the area based on parking need and population density.
 - (C) The installation of the electric vehicle charging station is improper because of existing covenants, conditions or restrictions applicable to the property.
- (8) A denial of an installation permit shall not prejudice a property owner from reapplication in the future for the same location.
- (9) Upon being granted an installation permit, property owner shall install designated electric vehicle charging stations in compliance with the submitted plan and all provisions of the application.
- (10) Upon completion of installation, property owner shall receive a certification of proper installation from the electrician, electrical contractor, or electrical technician.
- (11) Property owner shall not commence any usage (except testing by the installer) of the electric vehicle charging station(s) without first submitting to agency the certification of proper installation along with any fees designated by agency, and receiving written approval to begin usage from agency.
- (12) Upon completion, agency shall issue approval, request information to amend the permit to conform to the installation or deny approval to begin usage within __ business days. The following shall apply:

- (i) All notices shall be mailed to the address indicated on the installation permit.
- (ii) Property owner shall be deemed to have received notice of the grant or denial upon date of mailing, not upon receipt.

Section 203 **Electric vehicle charging station standards**

- (a) The installation of electric vehicle charging stations shall conform to the following specifications:
 - (1) All electric vehicle charging stations shall be securely mounted on a wall or similarly substantial structure, or on a pedestal¹³³.
 - (2) Free standing electric vehicle charging stations shall be securely mounted above the ground no less than 36 inches and no higher than 48 inches from the ground surface where mounted¹³⁴.
 - (3) Free standing electric vehicle charging stations shall be a minimum of 24 inches clear from the edge of a curb¹³⁵.
 - (4) Wall mounted electric vehicle charging stations shall be mounted no less than 42 inches above the ground in which the parking area is located¹³⁶.
 - (5) Wall mounted electric vehicle charging stations shall be no more than 48 inches from the electric vehicle charging space¹³⁷.

¹³³ Nicki Schill, *A Simple Guide to EV Charging*, GEOTAB (August 28, 2019), <https://www.geotab.com/blog/ev-charging/>.

¹³⁴ Montgomery County, Md. Code Ordinance ch. 8 §R109.1 – adapted the requirements for sign placement (2019).

¹³⁵ Mountlake Terrace, Wash., Code § 19.126.050 (2010) – adapted the requirements for placement of charging equipment from the curb for safety of the equipment.

¹³⁶ *Id.*

¹³⁷ *Id.*

- (6) All electric vehicle charging stations shall be equipped with either a retractable cord or a fixture to store the cord and connector above ground level¹³⁸.
 - (7) Wall mounted electric vehicle charging stations must be installed to permit unimpeded pedestrian passage while being utilized to recharge vehicles.
 - (8) Any electrical cords connected to any electric vehicle charging station shall be configured so as not to obstruct a driveway, sidewalk or any other access for pedestrian, bicycle, or vehicle traffic while in use¹³⁹.
- (b) Agency may grant property owners authorization to install features to protect the charging equipment from the weather, vandalism or from damage. Protective features may include the following:
- (1) Covers for the equipment which do not block access to the functionality of the equipment.
 - (2) Concrete-filled bollards.
 - (3) Wheel stops.
- (c) The following information shall be posted in a visible location on the electric vehicle charging station¹⁴⁰:
- (1) Phone number and name of an individual to contact in case of malfunction or damage¹⁴¹.
 - (2) Usage fees.
 - (3) Safety information.
 - (4) Voltage and amperage levels.

¹³⁸ New Orleans, La. Ordinance 27,238 MCS §1 (2017).

¹³⁹ *Id.*

¹⁴⁰ Chelan, Wash., Code § 17,63.040 (2019).

¹⁴¹ St. Louis Park, Minn., Ordinance 2550-19 (Jan. 7, 2019).

- (d) All Electric Vehicle charging stations shall be installed, mounted and operable in compliance in all relevant American with Disabilities Act (ADA) requirements¹⁴².

Section 204 Electric vehicle charging space design and location

- (a) All electric vehicle charging Stations shall have a designated charging space in which individuals park in to charge their vehicles.
- (b) All electric vehicle charging spaces shall conform to standards set forth for other parking spaces for non-electric vehicle charging spaces as set forth in this municipal code.
- (c) Electric vehicle charging spaces in residential zones shall be designated and conform to the following specifications:
 - (1) All electric vehicle charging spaces shall be entirely painted green and marked by white letters that read “Electric Vehicle Charging Only.”
 - (2) All curbs which abut electric vehicle charging spaces shall be painted green.
- (d) Electric vehicle charging spaces in industrial and commercial zones, but not contained within a parking garage, shall be designated and conform to the following specifications:
 - (1) All electric vehicle charging space boundary lines shall be painted green.
 - (2) All electric vehicle charging spaces shall be marked with white lettering that reads “Electric Vehicle Charging Only.”
 - (3) All curbs which abut electric vehicle charging spaces shall be painted green.

¹⁴² St. Louis Park, Minn., Ordinance 2550-19 (Jan. 7, 2019).

(e) All electric vehicle charging spaces in parking garages shall be designated and conform to the following specifications:

(1) All electric vehicle charging spaces shall be entirely painted green and shall be marked with white letters that read “Electric Vehicle Charging Only.”

(2) All walls which abut parking electric vehicle charging spaces shall contain a 24-inch by 36-inch green painted rectangle beginning 48 inches from the ground.

(3) The green rectangle in Section 204(e)(2) shall be marked with white lettering that reads “Electric Vehicle Charging Only.”

(f) Agency shall determine the standard shade of green to be used.

(g) Electric vehicle charging stations shall not be located in areas deemed by the agency as inconvenient, undesirable, or difficult-to-access.

(1) Inconvenient, undesirable, or difficult-to-access areas include, but are not limited to:

(i) Spaces in areas not typically trafficked by customers.

(ii) Spaces in areas not typically utilized by commuters, workers, students, or other daily users of the space.

(2) The design and location of the electric vehicle charging station should be appropriate to the location and use¹⁴³.

(h) All electric vehicle charging spaces shall be able to be readily identified by electric car users but at the same time shall blend into the surrounding

landscape/architecture for compatibility with the character and use of the site¹⁴⁴.

¹⁴³ Methuen, Mass. Ordinance § V-T 4(b) (2018).

¹⁴⁴ Methuen, Mass. Ordinance § V-T 4(a) (2018).

(i) Exhibit 1, setting forth a photo example of a space design using some, but not all, of the requirements set forth in Section 204, is attached. Photo Exhibit 1 is for illustrative and presentative purposes. All requirements in Section 204 supersede any conflicts in the photograph.

Section 205 Signage, safety and other standards

- (a) All electric vehicle charging spaces shall be accompanied with a sign to indicate that the space is only for electric vehicle charging purposes¹⁴⁵.
- (b) All electric vehicle charging signs shall be located in clear view of the designated charging area and shall not be further than 3 feet from the charging area.
- (c) Electric vehicle signage shall conform to the following specifications:
- (1) Signs shall be eighteen inches by twelve inches¹⁴⁶.
 - (2) Reflective green background. The standard shade of green shall be determined by agency for all Electric Vehicle Signage.
 - (3) White Lettering which reads “Electric Vehicle Charging Only.”
 - (4) White lettering which indicates any penalty that could be enforced against a violating vehicle.
- (d) Property owners may install directional wayfinding signage which effectively guides motorists to the electric vehicle charging stations in accordance with other

¹⁴⁵ Douglas County, Wash., Code § 18.16.340 (2019).

¹⁴⁶ My Parking Sign, *Electric Car Sign: Electric Vehicle Parking Only Sign*, https://www.myparkingsign.com/signs/electric-vehicle-sign/sku-k-8559.aspx?engine=googlebase&keyword=Electric+Vehicle+Signs&skuid=K-8559-RE-12x18-D1&gclid=CjwKCAjwibzsBRAMEiwA1pHZrQy6Kwly_Efp8IL4OopffNS7bhUiTeqgiYV8UvjGPS10DkrWCJ1hPBoCvzMQAvD_BwE.

ordinances of the municipality, including but not limited to zoning and traffic ordinances¹⁴⁷.

(e) Any signs shall be placed as to not interfere with any charging space, drive lane, or exit¹⁴⁸.

(f) Lighting shall be provided as to illuminate the electric vehicle charging sign 24 hours a day¹⁴⁹.

(g) Property owners may collect a service fee for the use of an electric vehicle charging station on their property¹⁵⁰. If a property owner elects to collect a service fee, certification and calibration must be in compliance with all regulations set forth by the Pennsylvania Department of Agriculture.

(h) Property owners shall keep electric vehicle charging stations operational and properly maintained at all times.

(1) Property owners shall notify agency if an electrical vehicle charging station is not operational for more than 14 consecutive days with reasonable explanation for the nonfunctional station.

(2) Agency shall review the notification by property owner and determine if the reason for non-operation is acceptable or if the electric vehicle charging station is in violation.

(i) Acceptable reasons for non-operation include, but are not limited to, awaiting ordered equipment to replace or repair, scheduling conflict with electricians, and/or other compelling justifications for lack of service.

¹⁴⁷ Atlanta, Ga., Ordinance § 16-28.017 (2014).

¹⁴⁸ *Id.*

¹⁴⁹ St. Louis Park, Minn., Ordinance 2550-19 (Jan. 7, 2019).

¹⁵⁰ Kansas City, MO ordinance

(ii) Unacceptable reasons for non-operation include, but are not limited to, insufficient funds to repair or replace and/or inability to locate a replacement system.

(3) If any electric vehicle charging station ceases to be in operation for 14 or more consecutive days without good cause provided to agency, the owner of the electric vehicle charging station will be in violation of this ordinance¹⁵¹.

(i) If the electric vehicle charging station is in violation, the property owner shall reapply for an installation permit and a certification of installation.

(ii) In addition to determination of violation, the original incentive, Section 501(c), shall be revoked and the property owner must come back into compliance with original standards as set forth in the municipal code.

(iii) If the property owner elected to take a square footage incentive as set forth in section 501(c)(3), the property owner shall be fined monthly until the electric vehicle charging station is operational.

(i) Exhibit 2 setting forth a photo example of a space design using some, but not all, of the requirements set forth in Section 205 is attached. Photo Exhibit 2 is for illustrative and presentative purposes. All requirements in Section 205 supersede any conflicts in the photograph.

Section 206 **Appeal process**

¹⁵¹ Atlanta, Ga, Ordinance § 16-28.017 (2014).

- (a) The denial of installation permit and certification of installation may be appealed in writing by the property owner only. This appeal shall be made to the [Board/Council] within ___ business days following notice of the denial¹⁵².
- (b) The property owner shall be given an opportunity for a hearing at the following regularly scheduled [council/board] meeting.
- (c) The decision of the [council/board] shall be deemed a final action unless appealed to court within the appropriate time period¹⁵³.

Section 207 Fees

- (a) Any fees necessary to administer this ordinance such as, but not limited to, application for installation fees or fees for approval of usage, may be established by [Council/Board] resolution following recommendation by the agency.
- (b) The recommendation under Section 207(a) shall be adopted as part of the schedule of fees of [Township/Borough]¹⁵⁴.

Chapter 3

Electric Vehicle Make Ready

Section 301 Electric vehicle make ready standards

- (a) All new, expanded and reconstructed parking areas may provide for the electrical capacity necessary to accommodate the future hardware installation of electric vehicle charging stations¹⁵⁵.

¹⁵² Language adopted from the “Workforce Housing Model Ordinance” sustainability ordinance for the Pennsylvania State Association of Township Supervisors and the Pennsylvania State Association of Boroughs (Fall 2018). <https://widenerenvironment.files.wordpress.com/2019/01/inclusionary-zoning-for-workforce-housing-final.pdf>

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ St. Louis Park, Minn., Ordinance 2550-19 (Jan. 7, 2019).

(b) Property owners may apply for an installation permit for an electric vehicle make ready system at the time of construction or renovation of appropriate charging areas.

(1) Property owners shall follow the same application process under Section 202 (relating to permitting process) but shall indicate that the installation of an electric vehicle make ready system shall be installed.

(2) A property owner who installs an electric vehicle make ready system rather than an electric vehicle charging station may not qualify for any incentive listed in Chapter 5 until the electric vehicle charging station is later installed.

Chapter 4

EV Recommendations

Section 401 Municipal recommendations based on parking capacity

(a) A property owners may meet the following proportions in regards to electric vehicle charging capacity compared to overall parking capacity¹⁵⁶:

(1) Ten percent for multi-household residential.

(2) Five percent for commercial.

(3) Three percent for industrial.

(4) One percent for all other.

(b) A property owner that meets these proportions under Section 401(a) may apply for an additional incentive as listed under section 501(c)(1).

Chapter 5

Enforcement and Incentive

¹⁵⁶ Mountlake Terrace, Wash., Code § 19.125.120 (2010).

Section 501 **Incentive provisions**

- (a) A property owner may count electric vehicle charging spaces associated with electric vehicle charging stations towards meeting existing parking requirements set forth under this municipal code.
- (b) A property owner may elect to receive an incentive during the application process which will be granted contingent on the completion of installation and certification of the electric vehicle charging station.
- (c) Incentives are available to zones as follows:
 - (1) All property owners may install two electric vehicle charging stations under one application and certification price. This incentive may be extended to electric vehicle charging stations installed in different applications.
 - (2) Commercial and industrial property owners may count each electric vehicle charging space as three parking spaces towards required parking standards as set forth by the municipal code¹⁵⁷.
 - (i) This incentive shall not exceed 20% of total parking required by the municipal code¹⁵⁸.
 - (ii) This incentive shall not be used to decrease the amount of specifically designated parking spaces required by the municipal code and state and federal law.
 - (3) A residential property owner may receive 200 additional square feet of building area for the property in addition to the maximum provided in the zoning ordinance for each electric vehicle charging station installed and certified. In

¹⁵⁷ Indianapolis, Ind., Code ch.744 art.4 § 03-A (2019).

¹⁵⁸ Middletown, Conn. Code art. 4 § 40.02.03 (2019).

addition, a residential property owner may also receive 200 square feet of lot coverage in excess of the maximum set forth in the zoning ordinance for each electric vehicle charging station properly installed and properly certified, provided that all requirements of the municipal stormwater management ordinance are met. The total additional square footage of building area and additional lot coverage shall not exceed 600 additional square feet on any lot pursuant to this incentive.

(4) All property owners who meet the parking capacity municipal recommendations as set forth under section 401(a) may request a reduction in permitting and certification costs¹⁵⁹.

Section 502 **Permissible restrictions and enforcement**

(a) Each electric vehicle charging station and electric vehicle charging space shall be reserved for electric vehicle charging only except as follows:

(1) All charging spaces will be available for parking for all vehicles, electric or otherwise powered, between the hours of 11:00 p.m. and 6:00 a.m. unless otherwise posted.

(2) All electric vehicles shall be permitted to remain in the charging area for 12 hours only unless otherwise posted. At the expiration of this time, the vehicle will be treated as a non-electric vehicle for enforcement purposes.

(b) A person who parks or stands in any designated electric vehicle charging station, for any reason other than to charge an electric vehicle, shall be deemed a trespasser subject to removal from the space by the property owner.

¹⁵⁹ Middletown, Conn. Code art. 4 § 40.02.01 (2019).

- (1) Exception shall be made in accordance with the provisions of Section 502 (a)(1).

(c) At the request of the property owner, a police agency or a governmental agency may provide for the removal of a vehicle or in violation of Section 502 in the following circumstance¹⁶⁰:

- (1) A sign provides notice that the space is reserved for electric vehicle parking/charging only¹⁶¹.

- (2) The sign designates that violators will be subject to fine or towing of the vehicle.

- (3) The space is in a publicly designated electric vehicle charging station.

(d) A private entity shall have the authority to remove a vehicle in violation of the above ordinance or any private restrictions in the following circumstance:

- (1) A sign shall designate that the space is for electric vehicle parking/charging only.

- (2) The sign shall indicate that a violating vehicle shall be towed at the owner's expense pursuant to state law [insert state law].

Section 503 Responsibility upon sale or transfer of ownership.

Once installed, electric vehicle charging stations and all accessories shall become fixtures to the real estate and remain with the land. All subsequent owners shall be bound by all terms and conditions of this ordinance and any subsequent amendments thereto, and any conditions of approval.

¹⁶⁰ Auburn Hills, Mich., Ordinances § 1834 (6) (F)(2)

¹⁶¹ Id.

Chapter 6

Severability, Repeals, and Effective Date.

Section 601 Severability.

All provisions of this ordinance are severable. If any provision of this ordinance or its application is held invalid, such invalidity shall not affect any other provision or application of this act which can be given effect without the invalid provision or application.

Section 602 Repeals.

No other sections of the ordinances of the [Township/Borough] shall be repealed. All parts of the ordinance of the [Township/Borough] are to be read together. To the extent that there are inconsistencies that cannot be read together, this ordinance shall be construed as to supersede other ordinances for purposes relevant to the provisions and purpose of this ordinance.

Section 603 Effective Date.

This ordinance shall become effective 90 days after enactment [and approval of the mayor – Borough].

Exhibit 1



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Exhibit 2



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¹⁶² Nikki Gordon-Bloomfield, *Public EV Charging: Think Before you Plug In*, Plugincars (May 14, 2013), <https://www.plugincars.com/public-charging-why-its-time-think-plugging-127217.html>.

¹⁶³ *Reserved Parking Sign: Electric Vehicle Parking, Only While Charging with Graphic*, MyParkingSign (November 10, 2019), <https://www.myparkingsign.com/MPS2/electric-vehicle-parking-while-charging-parking-sign/sku-k2-0764>.