Updating Swatara Township's Local Zoning Requirements to Encapsulate Electric Vehicle Charging Stations

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I. Introduction

Given the abundance of federal spending that the Inflation Reduction Act[1] and Bipartisan Infrastructure Act[2] have unleashed upon the world of electric vehicles (EVs) and electric vehicle supply equipment (EVSE) – the charging station infrastructure that EVs can use in public – the need for local governments to utilize these dollars efficiently is growing urgent. EVs are soon to compete directly with internal combustion engine cars in sticker price; they are already generally cheaper for the owner over the first-five-year window of ownership[3], are much cleaner for the environment, and, in many ways, are more practical and user-friendly.[4] However, obstacles remain. Not everyone has a garage with a dedicated electric source to regularly charge their vehicle and, especially in rural areas like much of Pennsylvania, 'range anxiety' is a real concern that is diminishing the proliferation of EV's that urban centers are currently seeing.[5]

a. Range Anxiety

Range anxiety is the stress that can come with owning an EV and an EVSE location is not immediately apparent while the car is low on a charge. Not every owner can accurately calculate how far they will get on a charge and seeing their battery dwindle can be very stressful if there's somewhere a driver needs to be. EVSE is not nearly as ubiquitous as are gas stations. If

[1] Text - H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022, H.R.5376, 117th Cong. (2022), http://www.congress.gov/.
[2] Text - H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act, H.R.3684, 117th Cong. (2021), http://www.congress.gov/.
[3] Ezra Klein Show, The Single Best Guide to Decarbonization I've Heard, The New York Time (September 20, 2022), https://www.nytimes.com/2022/09/20/opinion/ezra-klein-podcast-jesse-jenkins.html.
[4] Environmental Protection Agency, Electric Vehicle Myths (June 30, 2022), https://www.epa.gov/greenvehicles/electric-vehicle-myths.
[5] Pennsylvania State Government, PennDOT, *Plug-in, Charge Up, Peel Out: Electric Vehicle Supply Equipment Development Guidebook for Pennsylvania Local Governments*, Harr Hansen-Fleischman, Et. Al., April 14, 2022.

the EV market is to stand on its own – which society desperately needs it to do – local governments will need to supply the infrastructure guidelines to allow it to thrive.

b. Role of Municipal Ordinances

This necessary revamp of our infrastructure, if not handled properly by local authorities, will eventually run headfirst into local zoning ordinances, which tend towards stasis.[6] However, if EVs are going to be a reality, stasis will not do. For these reasons, Swatara Township is looking to proactively revamp its ordinances to include language that will both enable homeowners to use EVs regardless of their dwelling situation, require new development to add EVSE, as well as to incent current commercial spaces to add EVSE and further build out the network. If Swatara can successfully do this, it will allow residents and guests in the Township to continue the market trend towards purchasing EVs and to enjoy all the benefits therein.

c. Key elements of ordinances other municipalities use to address the problem

There are a number of ways that municipalities around the country – and world – have begun to address this problem. Some municipalities get into the weeds on how big a parking spot should be and where in that parking spot the EVSE should be located, while others work with utility companies and within their zoning capabilities to guide a certain amount of EVSE and how much power must be run to EVSE. While these options certainly run the gamut – and are only going to expand from here – the most pervasive requirement seems to be thinking through what kind of charger can, and should, go where within the municipality. There are certainly a lot of options.

[6] Addressing Challenges to Affordable Housing in Land Use Law: Recognizing Affordable Housing as a Right, 135 Harv. L. Rev. 1104 (2022).

d. Social, environmental, and economic benefits those ordinances provide

The world is at an inflection point in terms of carbon release and climate change and that is acutely felt in automobile market. It is impractical and counterproductive to the movement of removing carbon from our economy to continue to prop up internal combustion engines that pump a massive amount of carbon into the atmosphere every day. EV's are a logical solution to that problem but require the infrastructure to be feasible. These municipal ordinances, coupled with the federal financing, can go a long way to making the user experience better, cheaper, and cleaner but it cannot happen without adequate and accessible EVSE or range anxiety will stand squarely in the way.

e. Brief explanation of the ordinance Swatara Township is looking at adopting

After evaluating several different options which this narrative delineates for how to solve this problem, Swatara Township has elected to include in their ordinance five of the most crucial aspects to solving the problem of range anxiety and support the EV market: 1. They require certain percentages of new parking spaces to be designated for EVs and contain EVSE; 2. The ordinance requires a Level 2 charger in the EVSE; 3. The ordinance sets practical and useable guidelines for these parking spaces; 4. The ordinance restricts those parking spots only to EVs; and, crucially, 5. The ordinance enforces those measures with teeth to ensure that the accessibility that is the goal of the ordinance comes to fruition.

f. Roadmap

This narrative will help to address this situation by first breaking down the problem, explaining how the current ordinances in Swatara are inadequate to solve this problem, providing

details of how other municipalities have addressed this problem, discuss recommendations, and finally, offer a conclusion.

II. Lack of EVSE and the regulations therein is a problem that can lead to range anxiety

Governments all around the world are stepping up and recognizing that the internal combustion engine is not the future of personal vehicle travel if we are to successfully decarbonize the economy. The state of California recently enacted legislation that will permanently ban the sale of internal combustion engines in 2035.[7] Pennsylvania's Department of Environmental Protection has set the goal of 30% of the cars on the Commonwealth's roads will be powered by electricity by 2030, and 50% by 2050.[8] And while batteries have improved substantially in the last two decades, a typical EV, fully charged, has a range of 151-310 miles and Pennsylvania, as of 2019, only had 540 publicly listed EVSE.[9] This is going to require a massive network of EVSE to allow the EV market to flourish.

a. These ordinances are in their infancy and there is much to think through

However, building out the network itself will be just as important as what kind of network gets built. When municipal governments think through the logistical challenges and needs of the community properly, these problems can be solved. There are, as a general rule, three different "levels" of chargers for EVs. A Level 1 charger is the slowest and the cheapest, whereas a Level 3 charger is both incredibly fast and incredibly expensive. Thinking about where the cost/benefit will practically call for each form a charger will be a crucial factor in the

[7] Coral Davenport, California to Ban the Sale of New Gasoline Cars, The New York Times (August 24, 2022), https://www.nytimes.com/2022/08/24/climate/california-gas-cars-emissions.html.
[8] Holly Herman, Pennsylvania ranks 17th in U.S. in switching to electric vehicles, The Delco Times (August 19, 2021), https://www.delcotimes.com/2021/02/24/pennsylvania-ranks-17th-in-us-in-switching-to-electric-vehicles/.
[9] Pennsylvania State Government, Department of Environmental Protection, *Pennsylvania Electric Vehicle Roadmap*, Meister Consultants Group, February 2019.

proper installation of EVSE. For instance, a Level 1 charges an EV at an average rate of three to six miles of range an hour, whereas a "fast charger" can bring a battery back to 80% charge in 30-45 minutes, on average.[10] For EV's to be a practical reality, charging cannot be a major hinderance to road trips or errands because people can fill a gas tank in under five minutes. While "fast chargers" are more expensive, there are certainly going to be times that it's appropriate to require their placement. If a EV driver was stopped on a long road trip, they would shudder to see a Level 1 charger because that will mean it will take hours to recharge the vehicle and the driver will want to get back on the road. Conversely, there is no practical reason to put a Level 3 charger in one's home if they have all night to recharge the vehicle. Some of this is intuitive but there are certainly externalities that will need to be thought through by local township officials as they write these ordinances. While, as this narrative will show in a later section, some municipalities have begun to grapple with these ideas, there is much more work to do to strike the appropriate balance.

1. **Why is this a problem?**

Whether or not these policies are properly addressed adds to a sense of 'range anxiety' on behalf of the consumer – namely that if one purchases an EV and intends to use it as their main means of transportation, there is a concern that the current network of charging stations is inadequate to support their needs and they will be stranded, either at the grocery store or on a long road trip, without the means to charge their vehicle. That would leave them stranded with what would essentially be a very expensive hunk of useless metal. Or, one step removed, they

[10] Steven Loveday, How Long Does it Take to Charge an Electric Car?, U.S. News and World Report, (February 23, 2022), https://cars.usnews.com/cars-trucks/advice/ev-charging-time.

will be able to charge their EV, but doing so would take such a large amount of time that it would essentially be impractical to do so.

2. What can local governments to solve this problem?

For EVs to succeed as both a concept and a practical reality, local governments will need to partner with both state and federal authorities to ensure the network of EVSE is sufficient to alleviate these concerns and to allow the EV market to establish itself as a realistic option for consumers. The federal government – as well as state governments – will largely be responsible for the funding of these operations; it will be left to local governments to do the legwork to get the zoning and use permitting right to actually place ESVE appropriately.

The problem of range anxiety is further compounded by the fact that, while the EV market has been plodding along for years and growing increasingly capable of standing itself up in the marketplace, the billions of dollars that Congress recently unleashed on both the EV and EVSE side will supercharge both the implementation timeline and general demand.

For the individual municipalities, legislation generally – like almost any other form of work – is best done without the immediacy that is about to be brought to bear on EVSE infrastructure, so they have time to think the problem through and write rules and ordinances that make good sense, rather than doing something hastily at the last minute. Starting now is, therefore, imperative. Municipalities can do this by requiring certain levels of chargers in certain areas, and by requiring a certain amount of EVSE proliferate throughout their community in a searchable and useable way.

All of this together clearly indicates a big problem for local governments such as Swatara Township, but if done correctly, is also an enormous opportunity.

III. Swatara Township's existing local ordinances cannot adequately address this problem because they are silent on the issue

a. Inadequacy of Current Ordinances

EVs are a relatively new phenomena – certainly at the scale with which they will need to be deployed – so while there are some municipalities (generally larger cities) that have begun to address the problem of the infrastructure that will be required to support this transition, EVSE is largely a nascent and developing field for the rest of the country.[11] As such, most political subdivisions around the country and in Pennsylvania – including Swatara Township – do not have any ordinances that specifically address these pending needs. It is largely a matter of first impression for which many political subdivisions are painting on a clean canvas.

Swatara Township's municipal code is extensive and well thought out, but it does not currently touch on this subject. While they do have chapters on 'Subdivision and Land Development'[12] and 'Vehicles and Traffic'[13], none of these yet address EVs or EVSE. This narrative and ordinance seek to remedy that reality.

b. This problem is also a great opportunity

This problem of no ordinances currently existing – coupled with the massive federal investment that has only just begun – presents an enormous opportunity to support the EV market. If done incorrectly, the lack of appropriate EVSE infrastructure would significantly hinder the EV market, as people generally avoid inconveniences. However, if done correctly, the

[11] Pennsylvania State Government, PennDOT, *Plug-in, Charge Up, Peel Out: Electric Vehicle Supply Equipment Development Guidebook for Pennsylvania Local Governments,* Harr Hansen-Fleischman, Et. Al., April 14, 2022.
[12] Swatara Township, Pa., Code § 253, *et. Seq.* (1990).
[13] Swatara Township, Pa., Code § 271, *et. Seq.* (2014).

very nature of our economy can be redesigned to support an EV market, which will ultimately provide a better and cleaner product for consumers, at a lower price.

c. There are many existing options to choose from

In order to do this correctly, there are many factors that need to be well thought out and incorporated in the ordinance that Swatara ultimately decides upon. The two biggest factors in terms of the clean energy realm are: 1. Grid load management and energy storage; and, 2. 'Future proofing' the EVSE.[14] This is because if the grid is inadequate to the number of vehicles that will need to utilize the EVSE at any given time, it could crash and none of the cars would be able to be charged, causing unreliability and leading to an increase in range anxiety. [15]

There are myriad ways to address this problem, but they all revolve around different methods of energy storage. In order to meet demand of when the most EVs will be connected to EVSE and requiring a charge, some storage or energy accumulated throughout the "down times" will be necessary and it will need to be held in some type of battery storage.[16] This problem is multiplied by the fact that peak charging times at commercial EVSE and residential EVSE are almost exactly inverse – people charge their EVs at home overnight and at the grocery store or office during the day – so when one type of EVSE requirement peaks, the other lulls.[17] This will require two streams of energy flow and storage that will work opposite of one another to make sure demand can be met when it is at its highest.[18]

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[14] Pennsylvania State Government, PennDOT, *Plug-in, Charge Up, Peel Out: Electric Vehicle Supply Equipment Development Guidebook for Pennsylvania Local Governments*, Harr Hansen-Fleischman, Et. Al., April 14, 2022.
[15] *Id.*
[16] *Id.*
[17] *Id.*
[18] *Id.*

The other crucial detail is building steps to "future proof" the network. EVs and EVSE are a quickly growing industry and they are only just getting started.[19] If the original infrastructure does not leave room to grow within the network that Swatara Township ultimately decides to employ, they run the risk of starting over again in just a few short years, at significant expense.[20] Charging technology is going to speed up, battery storage is going to increase, and the EVs themselves are going to change – providing latitude for the network to grow with the industry is a prudent investment to make today.

Finally, EV technology will need to fit within the existing infrastructure and ordinances that Swatara currently has. While the ordinances are starting on a clean slate in terms of addressing EVs and EVSE, Swatara already has an extensive and high-quality municipal code. Accordingly, all of these new features will need to fit as cleanly as possible into how the Township government operates and how the Township itself works on a day-to-day basis.

IV. How this Problem has been Addressed by Other Municipalities

There are five main categories of how other municipalities around the country, and world, have begun to address EVSE infrastructure regulation and needs by folding them into existing ordinances or creating new ones. They are: 1. EV charging stations as permitted land use; 2. EV make ready standards; 3. EV supply equipment standards; 4. EV parking space design and location; and, 5. Required EV parking capacity & minimum parking requirements.[21] This section will address each in turn but it should be noted that none of these are mutually exclusive and often work in concert with one another.

[19] *Id.*
[20] *Id.*
[21] 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.

a. EV charging stations as permitted land use

The first group of ordinances address EVSE through land use.[22] This can really be broken into two sections which include both where the EVSE can be placed and whether or not a permit is needed. These ordinances break down into three basic categories: Addressing different pre-ordained land uses and potentially assigning different levels of EVSE to different uses (or allowing throughout all the uses); requiring a special use permit for EVSE in certain zones; and potentially placing restrictions on EVSE in the right of way.[23] Ordinances that regulate EVSE can address this problem by requiring sufficient EVSE to be adequately placed in convenient locations. By ensuring there are enough chargers that are convenient for EV drivers to find, while still out of the way of society generally, the EV market can flourish without anyone in the community finding it to be a hinderance. As was previously noted, it is crucial to think through what kind of charging stations are permitted or required to go where. The distinction here is important because if a Township wants to have sustainable infrastructure that is both practically useable to avoid range anxiety and remains cost-effective for property or business owners, certain EVSE will need to be required in specified areas, to be supplemented by EVSE that is further permitted. This is environmentally friendly because it encourages the use of EVs over internal combustion engines, socially beneficial because it allows EV users to not "get in the way", and economically friendly because electricity is much cheaper than continuously filling a car with gasoline.

1. Addressing different pre-ordained land uses through zoning districts

Municipalities, in some instances, utilize different levels of charging stations within

[22] *Id.*
[23] *Id.*

different zones of their political subdivision.[24] This is best thought of as a mechanism by which a municipality can guide the new infrastructure in an effort to maximize use and conveniences for users. There is a big difference between a municipality allowing EVSE and requiring EVSE. The allowance of the infrastructure might have been adequate pre-congressional investment, but the requirement will be crucial once those funds begin to be realized otherwise range anxiety will kick in and EVs will not be as successful as they otherwise could have been. There are currently three levels of chargers deployed in EVSE: As is cited in the ordinance accompanying this narrative, a "Level 1" charging system uses a voltage range of 0-120; "Level 2" uses a voltage range of 121-240; and, "Level 3" chargers use a voltage range greater than 240.

Chelan, WA, allows Level 1 or 2 in all zoning districts but only allows Level 3 charging stations in industrial or highway zoned districts.[25] This allowance can be useful but it is more effective for a Township to encourage or even require certain EVSE within certain zoning districts to ensure the property infrastructure is present and useable. Des Moines, WA, allows a Level 1, 2, or 3 charger anywhere. [26] The Chelan example is more typical than the Des Moines example. This is a useful approach because Level 3 chargers are incredibly fast but also incredibly expensive and, for everyday errands, probably unnecessary. The ability to make different decisions about what is appropriate provides the Township with the infrastructure that meets the needs on both the supply side of energy and the cost side of installation.

2. Requiring a special use permit

Alternatively, prior to the installation of EVSE, some municipalities require a special use

[24] *Id.*
[25] Chelan, Wash., Code § 17.63.030 (2011).
[26] Des Moines, Wash. Code § 18.205.060 (2014).

permit to be awarded by the municipality.[27] Auburn Hills, MI, requires all EVSE to be permitted,[28] whereas Chelan only requires Level 3 charging stations to be permitted if it is located in a "Downtown Mixed Use (DMU), [or] Tourist Accommodation (T-A) … zoning district."[29] There are certainly tradeoffs between levels of chargers and costs and the decision of which is most appropriate in different circumstances is best left for local political leaders who best know the needs of the community.

3. Restrictions on EVSE in the right of way

The third approach to land use permits is to simply place restrictions on EVSE in the right of way.[30] For example, Des Moines, WA, prohibits EVSE in the right of way.[31] This is a commonsense approach which will not impose the infrastructure too abruptly on society and potentially cause any kind of unintended resentment towards EVs and EVSE by the public but will still provide the necessary accessibility for current and future drivers of EVs.

b. EVSE make ready standards

When new construction within a township is already under way, it makes practical sense for a municipality to create minimum standards for surrounding infrastructure to support the installation of EVSE.[32] Municipal ordinances can utilize make ready standards to solve the range anxiety problem because ensuring that EVSE is capable of charging the vehicles in a timely matter is crucial to the ease and useability of the EV market thriving. This is a very important

[27] 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.
[28] Auburn Hills, Mich., Code § 1834, et seq. (2011).
[29] Chelan, Wash., Code § 17.63.030 (2011).
[30] 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.
[31] Des Moines, Wash. Code § 18.205.060 (2014).,
[32] 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.

aspect for future proofing the EVSE infrastructure that was referenced above. The two ways this breaks down is to: 1. "Require or recommend the installation of appropriate electrical capacity and conduits to support future EVSE", or 2. To assign the zoning districts which permit EVSE to be installed.[33] This is economically and socially beneficial because installing this infrastructure up front will support the EV market at a relatively low cost and allow EV users to enjoy the benefits therein. If there is new construction, the upfront cost of installing the conduits and infrastructure to support EVSE adds very little to the immediate cost of the project but sees large gains on the back end once the actual installation of the EVSE is significantly reduced in cost. This can be done cart blanch throughout the township or can be done in specific zoning districts – that also is a political decision to be made by the township – but it is the most practical time to do this installation so it's certainly worth thinking through as ordinances are being authored. These ordinances have worked reasonably well in urban centers where EVSE is well ahead of rural deployment and using those successful tactics across the board makes good sense.

1. Required or recommended capacity

Many municipalities (such as Auburn Hills, MI) each have different required minimum standards to support the installation of EVSE for all *new* residential, multiple-family residential, and non-residential construction that would be capable of supporting the installation of EVSE if and when it becomes appropriate.[34] This can include anything from a certain number of conduits extending to a specified area where the EVSE will one day be installed to regulating the amount of power that will be designed to support the appropriate charger for that location. This is a wise approach. The future of cars is electric and if the biggest impediment to the implementation of

[33] *Id.*
[34] Auburn Hills, Mich., Code § 1834(6), (2011).

that future is range anxiety, then building in the infrastructure to support the EVSE during the course of ordinary construction makes good sense and is a practical step to implement this program. It is atypical for a local municipality – as opposed to a utility company – to get involved at this granular of a level, but the urgency with which this problem needs to be addressed may require it in this instance.

2. Assigned districts to permit EVSE

A slightly different approach is to identify districts where the infrastructure to support EVSE is allowed.[35] Mountlake Terrace, WA, employs a form of this which would only permit certain districts to install the make ready infrastructure.[36] This is better than nothing, but ignores the future needs and capacity that will be required to support the EVSE which will ultimately support the EV's. To remedy real concerns about range anxiety, the residents and guests of the township need to know the infrastructure is there not simply that it can be at some point.

c. EV supply equipment standards

The third approach addressing the needs that will come with the EVSE evolution and implementation is to impose supply equipment standards both on capacity and logistics.[37] Ensuring this is in an ordinance solves the problem of range anxiety by ensuring that the EVSE is useable. This approach can be shaped a number of different ways. For instance, Atlanta, GA, requires all EVSE be up to the standards delineated in the National Electric Code.[38] This is a good way to regulate the amount of power that will be needed to support the EVSE once its in

[35] 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.
[36] Mountlake Terrace, Wash., Code § 19.126.030 (2010).
[37] 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.
[38] Atlanta, Ga., Code § 101.8(a)(3) (2021).

and any current EVSE that comes in after it. This is economically beneficial because it provides access to the charging stations over requiring the purchase of gasoline (making it also environmentally and socially friendly to the EV market).

On the other hand, Montgomery County, MD, requires that all EVSE spaces be "constructed such that all conduits leading to the electrical room, including electrical service conduit, service size, and the electrical room are appropriately sized to accommodate future electrical equipment necessary for the number of electric vehicle charging station ready parking spaces required."[39] Still, St. Louis Park, MN, requires all EVSE to be designed to withstand vandalism and potential accidents.[40] Mountlake Terrace, WA, requires EVSE to be at least two feet from the curb.[41] These are good ways to preserve the EVSE and prevent range anxiety. Being out in the elements – especially in Swatara Township where it can get very cold in the winter and very hot in the summer – has the potential to be hard on the equipment all on its own, there's no sense in allowing human vandals to tinker with it as well. Furthermore, if a charging station is delineated on a map, it needs to work and can be broken down by the hand of foul play or have insufficient capacity compared to the operators needs.

There are any number of rules, regulations, or requirements a municipality may want to utilize to ensure the success of their EVSE infrastructure and, depending on the municipalities' needs and unique characteristics, good arguments can be made for all. It is ultimately up to the municipality to balance these interests appropriately.

d. EV parking space design and location

[39] Montgomery County, Md., County Code § 6.2.5 (2014).
[40] St. Louis Park, Minn. Code § 36-361(d)(4) (2019).
[41] Mountlake Terrace, Wash., Code § 19.126.050(c)(2) (2010).

The fourth approach is to have rules and regulations which specify parking space design and location.[42] The municipality can choose to require a parking space to be a certain size, regulate where the parking spot is within the general parking rubric, have minimum protections for EVSE, or completely delegate this authority to a different entity within the municipality.[43] Having this guidance within the ordinance is crucial to solving the problem of range anxiety. If an EV user is actually to be able to use the EVSE, they will need to access the parking space and equipment in a convenient and reasonable manner. This is economically beneficial because it allows one to utilize the EVE as intended and actually charge their car, environmentally friendly because it removes the carbon caused by gasoline, and socially friendly because parking spaces are reserved for myriad reasons to which society never blinks an eye. It is crucial, however, based on the experience of other municipalities, that these ordinances have the ability to be enforced. If an internal combustion engine car is in an EVSE-designated parking space, and the township cannot ticket that car, then the EVSE is useless and there is nothing the municipality can do to remedy the situation.

1. Parking spot size and reservation

The regulation of size and reservation of parking spot is a crucial component to ease of access for EV consumers. For instance, Methuen, MA, requires spots to be of a "standard size" but to also "discourage non-electric car vehicles from using them."[44] This makes practical sense. If an owner of an EV pulls into a parking lot only to find an internal combustion engine car in a spot with EVSE, this makes it complicated if the car is not sufficiently charged to continue on

[42] 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.
[43] *Id.*
[44] Methuen, Mass., Code § V-T(4)(c).

the owners' way. Furthermore, if the spot is not accessible due to size, it will prove equally as difficult to charge the vehicle, potentially rendering it useless. These commonsense requirements are vital to the success of the EV marketplace and can easily be enforced through existing township mechanisms (i.e., a parking ticket), but are often not well thought through.

2. Location within a general parking rubric

Still another approach would be to regulate where EVSE can be in relation to parking generally.[45] Salt Lake City, UT, requires spots with EVSE to "be located in the same lot as principal use."[46] Atlanta, GA, requires street spots with EVSE to "use the last space on a block face in the direction of travel".[47] This is the kind of detail that must be thought through at the local level for the EV market to flourish.

e. Required EV parking capacity & minimum parking requirements

The final approach worth considering is capacity and minimum parking requirements that a municipality imposes upon offered parking.[48] This generally manifests itself by setting a minimum number of spots with EVSE either as a number or proportion of total available parking spots. While this may seem to be somewhat mundane, ordinances that require a certain number of designated parking spaces for EVs solve the problem by providing the accessibility that EVs require to EVSE. This can only be socially, economically, and environmentally beneficial if the car can actually access the updated and clean power source. However, some municipalities have allowance for certain delays in implementation to provide for flexibility on the business owner if

[45] 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.
[46] *Id.*
[47] Atlanta, Ga., Code § 16-28.017. (2014).
[48] 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.

they can demonstrate need.[49] These programs have generally worked well in municipalities – so well, in fact, that the original rubrics that elucidate percentages or quantities of parking spots with EVSE will probably need to be increased to support the EV market that is about to flourish.

1. Minimum number of spots with EVSE

Municipalities often designate or require a certain number of parking spots have EVSE.[50] For instance, Mountlake Terrace, WA, requires that different entities have a certain percentage of their spots be equipped with EVSE.[51] They break it down into seven different categories which include: multi-household residences; lodging; retail, eating and drinking; office, medical; industrial, institutional, municipal; recreation/entertainment/cultural; and, other.[52] These percentages range from 1-10% of the total offered sports be equipped with EVSE.[53] On the other hand, Salt Lake City, UT, requires that parking lots with 0-49 spots have zero spots with EVSE, 50-99 spots have one spot with EVSE, and parking lots with 100+ spots have two spots with EVSE, and one additional for every extra 100 spots.[54] This was probably a better approach when the market was being guided by traditional supply and demand incentives. At the very least, current rubrics will need to be increased and future rubrics should recognize this need and adjust upwards accordingly.

2. Flexibility on cost

While EVSE is going to be critical infrastructure in the near future, implementing the necessary infrastructure immediately is likely not worth closing down businesses if finances are

[49] *Id*.
[50] *Id.*
[51] Mountlake Terrace, Wash., Code § 19.126.040(B) (2010).
[52] *Id.*
[53] *Id.*
[54] 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.

that tight. Given the business climate as the pandemic ends, that may well be the case with some businesses. That is why municipalities like Middletown, CT, allows waivers for minimum requirements to be sought from the Planning and Zoning Commission.[55] One day it will be critical for all businesses to have a substantial amount of EVSE, but that day isn't necessarily today, and the economy needs to keep working.

V. Recommendations

While there are certainly many options to choose from, the ordinance that Swatara Township ultimately decided upon includes five key traits: 1. Requirements for percentages of spots to be equipped with EVSE; 2. Requiring charger levels that both suit the needs of the consumer and the costs to the owner; 3. Requiring certain guidelines for those spots; 4. Restricting those spots to only EVs; and, 5. Enforcement mechanisms.

These are all practical considerations based on the experience of other municipalities who have been proverbial trail blazers in this realm. In order for there to be sufficient EVSE within a community to support the burgeoning EV market, a certain percentage of spots in each parking lot will need to be so equipped. Having the basic infrastructure to charge a vehicle is crucial otherwise the vehicles could go uncharged. Furthermore, striking a balance between the need for EVSE to charge vehicles quickly, while also not burdening the property owners with the most expensive option, is a reasonable compromise that will be acceptable to all parties. Ensuring the spots are useable, accessible, and convenient will also go a long way to ensuring not only their use, but their ease of accessibility. That is accomplished both by having minimum standards for each spot as well as restricting those spots only to EVs. Finally – and most importantly – the

[55] Middletown, Conn., Code §§ 44.01-.08.

municipality can enforce the ordinance. Well wishes are fine but in order for the EV market to flourish, citizens cannot simply ignore the ordinance in favor of their own convenience.

The ordinance that accompanies this narrative smartly and reasonably accomplishes all of those objectives and can serve as a model for other municipalities who are seeking to also avail themselves of the federal funding that is about to be unleashed in the name of supporting this market.

This is a big undertaking but thankfully the logistics seem to be the last remaining complication as Congress has ensured that the funding will be present to support the endeavor – this ordinance only seeks to harness those funds in the most efficient manner possible.

VI. Conclusion

The impending problem with EV and EVSE infrastructure is also a phenomenal opportunity for municipalities that the federal government has met with funding, which, if utilized properly, will allow municipalities the ability to craft infrastructure and zoning ordinances that will proactively address a rising need for EV and EVSE infrastructure. If local governments can get the infrastructure right through their ordinances and best practices, EVs will offer a practical and commonsense solution to customers because they will be cheaper and more efficient and will ultimately benefit the planet because of the reduced carbon emissions. There are a number of factors to consider – and some municipalities have already begun considering – in order to pass these ordinances in a well thought out manner rather than with haste. Not every consideration is right for every municipality, but it is crucial that all municipalities follow Swatara's lead and begin to work through these problems now to best utilize robust federal funds and to best provide for their citizens. This is, and will continue to be, one of the great challenges of our time and it is imperative that we get it right.

Electric Vehicle Infrastructure

Molly Furlong and Max Flessner

SWATARA TOWNSHIP

DAUPHIN COUNTY, PENNSLYVANIA

Ordinance No. _____ of 2022

AN ORDINANCE OF THE TOWNSHIP OF SWATARA, DAUPHIN COUNTY, PENNSYLVANIA, REGULATING ELECTRIC VEHICLE CHARGING PARKING SPACES ON NEW COMMERCIAL DEVELOPMENT.

NOW THEREFORE, be it enacted and ordained by the authority of the Board of Supervisors of Swatara Township, Dauphin County, Pennsylvania:

Chapter 254

Electric Vehicle Infrastructure

Article I

Preliminary Provisions

Section 254-1. **Title**

This ordinance shall be known and may be cited as the Swatara Township Electric Vehicle Infrastructure Ordinance.

Section 254-1.1. **Purpose**

The purpose of this ordinance is to:

(1) facilitate and encourage the use of electric vehicles;

(2) expedite the establishment of a convenient, cost-effective electric vehicle infrastructure;

(3) establish minimum requirements for electric vehicle infrastructure to serve owners of new commercial development and users, residents, and visitors; and

(4) reduce carbon emissions through use of electric vehicles and the deployment of electric vehicle charging stations.

Section 254-2. **Legal authority**

This ordinance is enacted and ordained under the grant of powers contained in section 3301-A(b) of the act of June 24, 1931 (P.L. 1206, No. 331), known as The First-Class Township Code.

Section 254-3. **Definitions**

The words and phrases as used in this ordinance shall have the meanings given to them in this section unless the context clearly indicates otherwise:

“Charging Level.” The standard indicator of electric force or voltage at which an electric vehicle is recharged and that is identified as follows[56]:

Charging Level 1. A slow charging system with a voltage range of 0 through 120[57].

Charging Level 2. A medium charging system with a voltage range of 121 through 240[58].

Charging Level 3. A fast charging system with a voltage range of greater than 240[59].

"Charging station.” An area that contains electric vehicle supply equipment.

“Electric vehicle.” A vehicle that operates on electrical energy. The term includes:

[56] Auburn Hills, Mich., Ordinance art. 18 §1834.
[57] Id.
[58] Id.
[59] Id.

(1) A battery electric vehicle[60].

(2) A plug-in hybrid electric vehicle[61].

"Electric vehicle parking space." An off-street parking space:

(1) designated for an electric vehicle to park while charging; and

(2) outfitted with electric vehicle supply equipment.

"Electric vehicle supply equipment." Equipment or an electrical component used in charging electric vehicles at a specific location. The term does not include equipment located on an electric vehicle[62].

"New commercial development." Construction or redevelopment of real property that commences after the effective date of this ordinance and involves:

(1) a building or off-street parking facility;

(2) an addition or improvement to an existing building that increases the building's size or patronage capacity by more than 50%; or

(3) an addition or improvement to an existing building, site, or parking facility that increases the parking capacity on the real property by more than 50%.

"Property owner." An individual, corporation or other legal entity that holds either legal or equitable title to the real property:

(1) identified in a deed, agreement of sale, or other document recorded in the Office of the Recorder of Deeds; and

[60] Id.
[61] Id.
[62] St. Louis Park, MN

(2) on which a charging station is located.

Article II

Electric Vehicle Parking Spaces Standards

Section 254-4. **Minimum Number of Electric Vehicle Parking Spaces for New Development**

(a) A new development with any of the following land uses shall comply with the percentage of electric vehicle parking spaces specified:

Land Use Type	**Percentage of Parking Spaces Designated for Electric Vehicles**
Multi-household residential	10%
Lodging	3%
Retail, eating and drinking establishment	3%
Office, medical	3%
Industrial	1%
Institutional, municipal	3%
Recreational/entertainment/cultural	1%
Other	3%

(b) A standard size parking space shall be used for a charging station where the charging station is required.

(c) A new commercial development shall incorporate a Charging Level 2 capacity or greater and comply with local and regional standards for electrical connections.

Section 254-5. **Electric vehicle supply equipment standards and use restrictions**

(a) An electric vehicle parking space shall meet the following standards:

(1) An electric vehicle parking space shall be posted with clear signage indicating the space shall only be used for electric vehicle charging purposes. Days and hours of operation shall be included on the signage, if time limits or tow-away provisions may be enforced by the property owner.

(2) Charging station equipment mounted on pedestals, light posts, bollards or other devices shall be a minimum of 24 inches clear from the face of a curb.

(3) When the electric vehicle parking space is perpendicular or at an angle to a curb face and electric vehicle supply equipment, wheel stops, concrete-filled steel bollards or other safety devices, shall be used[63].

(4) Electric vehicle supply equipment shall be maintained by the property owner. A phone number or other contact information of the property owner shall be placed on the electric vehicle supply equipment with instructions on how the property owner may be contacted to report a malfunction of the electric vehicle supply equipment.

(b) A property owner may limit the number of hours that an electric vehicle may charge at the electronic vehicle charging station, and may prohibit indefinite charging or parking, or both. If the property owner imposes a time limit, the property owner must post a notice to inform users about hours of use and possible actions affecting electric vehicle charging stations that are not being used according to posted rules

(c) A property owner may deactivate electric vehicle supply equipment after normal business hours provided that the hours of deactivation are displayed on the electric vehicle parking space or electric vehicle supply equipment.

(d) A property owner reserves the right to charge consumers for the use of the electric vehicle supply equipment.

Section 254-6. **General restrictions on parking in spaces designated for electric vehicles**

(a) No person operating a motor vehicle, other than an electric vehicle, may stop, stand, or park the motor vehicle in a parking space designated by the property owner through signage as an electric vehicle charging station or electronic vehicle parking space. The property owner may remove a motor vehicle that is in violation of this subsection.

(b) (1) An electric vehicle parked in an electric vehicle parking space that:

(i) is not electrically charging; or

(ii) is parked beyond the days and hours designated on signage posted at the electric vehicle parking space shall be subject to removal as posted by the property owner.

(2) For purposes of this subsection, “charging” means an electric vehicle is parked at an electric vehicle charging station and is connected to the charging station equipment.

Article III

Enforcement Provisions

Section 254-7. **Property owner compliance**

(a) The property owner of a new commercial development must count the electric vehicle parking spaces with electric vehicle charging stations that comply with this ordinance toward meeting existing parking space requirements specified in the township's municipal code[64].

(b) The property owner of a new commercial development may count each electric vehicle parking space as three parking spaces towards parking requirements of the municipal code, not to exceed 20% of total parking required by the municipal code[65].

Section 254-8. **Enforcement**

(a) A parking space designated for electric vehicles shall be reserved for electric vehicle charging only unless otherwise designated by the property owner.

(b) The property owner of a new commercial development may deem the use of an electric vehicle parking space for a purpose other than charging of an electric vehicle as a trespass and may remove a motor vehicle from the electric parking space that is not in compliance with this ordinance.

Article IV

Miscellaneous Provisions.

[64] Middletown, Conn. Code art. 4 § 40.02.03 (2019).
[65] Id.

Section 254-12. **Effective date**

This Chapter shall take effect six months following the date of enactment.