OCC EXHIBIT NO. _____

BEFORE
THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to R.C. 4928.143, in the Form of an Electric Security Plan.	)))))	Case No. 16-1852-EL-SSO
In the Matter of the Application of Ohio Power Company for Approval of Certain Accounting Authority.	)))	Case No. 16-1853-EL-AAM

SUPPLEMENTAL TESTIMONY
OF
BARBARA R. ALEXANDER

IN OPPOSITION TO THE
JOINT STIPULATION AND RECOMMENDATION

On Behalf of
The Office of the Ohio Consumers' Counsel
10 West Broad Street, Suite 1800
Columbus, Ohio 43215-3485

October 11, 2017

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I. INTRODUCTION AND SUMMARY

Q1. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A1. My name is Barbara R. Alexander. I am the sole member of Barbara Alexander Consulting LLC located at 83 Wedgewood Drive, Winthrop, ME 04364.

Q2. ON WHOSE BEHALF ARE YOU TESTIFYING?

A2. I am testifying on behalf of the Office of the Ohio Consumer's Counsel (OCC).

Q3. PLEASE SUMMARIZE YOUR PROFESSIONAL QUALIFICATIONS.

A3. I opened my consulting practice in March 1996, after nearly ten years as the Director of the Consumer Assistance Division of the Maine Public Utilities Commission (1986-1996). While there, I managed the resolution of informal customer complaints for electric, gas, telephone, and water utility services, and testified as an expert witness on consumer protection, customer service quality, and low-income issues in rate cases and other investigations before the Maine Public Utilities Commission.

My current consulting practice focuses on regulatory and statutory policies concerning consumer protection, service quality and reliability of service, customer service, smart grid and advanced metering policies and cost-benefit analysis of such programs, and low-income program design and funding issues

associated with both regulated utilities and retail competition markets. I have testified in rate cases, rulemaking proceedings, and investigations before over 20 U.S. and Canadian regulators. My recent clients include the state consumer public advocate offices in Arkansas, Illinois, Maine, Maryland, Massachusetts, Pennsylvania, Washington, and West Virginia, as well as on behalf of national and state consumer advocates.

I have testified on proposals for advanced metering deployment in California, Oklahoma, Maine, Maryland, and Michigan. In those proceedings, I evaluated the costs and benefits proposed for these investments in formal testimony.

I am a graduate of the University of Michigan (1968) and I received a J.D. from the University of Maine School of Law (1976).

I have attached my resume with a list of my publications and testimony as Attachment BRA-1.

Q4. PLEASE IDENTIFY THE ISSUES YOU WILL BE ADDRESSING IN YOUR TESTIMONY.

A4. My testimony addresses certain provisions in the Joint Stipulation ("Settlement") submitted on August 25, 2017 and the testimony filed in support of the Settlement by Mr. William Allen on behalf of the Ohio Power Company ("AEP Ohio" or "Utility"), Ms. Krystina Schaeffer on behalf of the Public Utilities Commission of

Ohio's ("PUCO") Staff ("Staff"), and Dr. Abdellah Cherkaoui on behalf of the Electric Vehicle Charging Association ("EVCA") on September 13, 2017. Specifically, I will address the following provisions of the Settlement:

1. Section III (F), Smart City Rider and Power Forward Rider: The originally proposed Distribution Technology Rider is withdrawn, but a new Smart City Rider is established that requires customers to pay costs associated with micro grids and electric vehicle charging stations. The total cost of programs that will be charged to customers under the Smart City Rider is $21.1 million. The PowerForward Rider is proposed as a placeholder to recover future costs that the PUCO might authorize in the PowerForward initiative. Both Riders are authorized for four years.
2. Section III (G), Micro grid technology demonstration: The Settlement requires customers to pay up to $10.5 million for one or more "demonstration" micro grid projects.
3. Section III (H), EV Stations: Characterized as a "technology demonstration program,"[1] this program requires customers to provide rebates for the hardware, network services, and installation of charging stations for

[1] Testimony (Stipulation) of William Allen on behalf of AEP Ohio, page 10 line 8.

electric vehicles for up to 300 Level 2 stations and 75 DC Fast Charging (DCF) stations. At least 10% of the 300 level 2 charging stations and at least 10% of the 75 DCF charging stations initially will be set aside for "low income geographic areas," but this allocation is subject to the midstream evaluation.

4. Section III (J) (2), "PEV" Tariff[2]: This Settlement proposes another placeholder, in the form of a tariff, which will be used to establish program rules and cost recovery policies pursuant to the future findings of the Power Forward or Smart City Rider information. There is no specific language for this tariff included in the Settlement.

Q5. ARE YOU FAMILIAR WITH THE PUCO'S STANDARD FOR REVIEWING STIPULATIONS?

A5. Yes. The PUCO uses these criteria for evaluating the reasonableness of a proposed stipulation:

1. Is the proposed stipulation a product of serious bargaining among capable, knowledgeable parties?

[2] The term "PEV" is not defined either in the Settlement or the testimony supporting the Settlement.

2. Does the proposed stipulation, as a package, benefit customers and the public interest?
3. Does the proposed stipulation violate any important regulatory principle or practice?

In addition to these criteria, the PUCO also routinely considers whether the parties to the stipulation represent a diversity of interests.

Q6. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS.

A6. The PUCO should reject these provisions of the Settlement because they (1) violate important regulatory principles and practices and (2) do not benefit customers and are not in the public interest.

The micro grid and EV charging station projects violate important regulatory principles and practices for the reasons stated in my testimony, including because:

- they do not fall within the items that can be include in an ESP under R.C. 4928.143(B)(2);
- they result in improper subsidies; specifically distribution customers will be required to subsidize the generation component of public micro grid projects, and indirectly

subsidize the distribution rates of certain EV charging station owners;

- their costs should not be recovered in new riders, but subject to review in a distribution base rate proceeding in which a determination can be made if their expenses were prudently incurred and their investments used and useful in serving AEP Ohio's distribution service customers; and
- the EV charging station project does not protect "at-risk populations," who will be required to subsidize the projects but will not receive commensurate benefits.

The micro grid and EV charging station projects do not benefit customers and are not in the public interest for the reasons stated in my testimony, including because:

- they are not supported by specific evaluation plans and an analysis of their costs and benefits; indeed, although the Settlement caps customers' costs at $21.5 million, additional unknown costs will be charged to customers through incremental O&M expenses and Rider DIR;
- the programs are poorly designed and without any evidence of their need, how these programs will provide any

innovative or "new" information, or how they would be implemented to serve the public interest;

- they contain no evidence or justification that these customer subsidies will result in improved distribution service reliability, lower costs for customers, or other benefits related to AEP Ohio's statutory role as a distribution utility;
- customers will be forced to subsidize the research and development of the projects for the benefit of AEP Ohio's affiliate operating companies in other states;
- the Settlement merely allocates customer funds to support the unregulated entities that will own and operate the EV charging stations without any discussion of the benefits to AEP Ohio customers; it is not in AEP Ohio residential customers' interests to subsidize EV charging stations for the benefit of EV owners throughout the state and beyond; and
- even if the EV charging station program were to stimulate usage, it would not benefit AEP Ohio's distribution customers because there is no requirement for EV charging station owners to price usage based on time of day.

In short, handing out customer funds for some inchoate public purpose is an unreasonable and inappropriate basis for approving these programs in the Settlement.

At a minimum, if AEP Ohio is to seek approval of these programs, the PUCO should require that approval be sought within the context of an infrastructure modernization plan submitted after the PUCO concludes its PowerForward initiative. I have identified the crucial policy issues that should be resolved prior to undertaking investments of this nature later in my testimony.

II. THE PUCO SHOULD REJECT CUSTOMER FUNDING OF THE SMART CITY RIDER AND THE POWERFORWARD RIDER

Q7. IS THERE ANY DIFFERENCE IN PURPOSE OR OPERATION WITH THE SMART CITY RIDER IN THIS SETTLEMENT COMPARED TO AEP OHIO'S ORIGINAL PROPOSAL FOR A DISTRIBUTION TECHNOLOGY RIDER, WHICH YOU OPPOSED EARLIER?

A7. The only difference is that AEP Ohio no longer seeks authorization for the originally proposed smart street lighting and Next Generation Utility Communications System programs. The Settlement retains the proposals to require customers to subsidize the micro grid and EV charging station rebate programs. The Rider will be in effect for four years. Only the name of the rider has been changed – to the Smart City Rider from the Distribution Technology

Rider, which sought to collect expenditures for AEP Ohio's Distribution Technology Investment Plan ("DTIP"). The Settlement does not explain why the name of the Rider has been changed to "Smart City Rider,"[3] and contains a discussion that would link these projects to the Columbus Smart City grant program[4], the original impetus to AEP Ohio's micro grid and EV charging station subsidies in this proceeding. Except for a reference to the potential for locating a micro grid project in the Columbus area, there is nothing in the Settlement that requires that the projects included in this Rider will be located in Columbus or that they will be coordinated and implemented with the other Smart Columbus grantees. Another concern about the lack of any coordination or connection of these programs in the Settlement with the Columbus Smart City grant program is

[3] The name apparently was changed because the DTIP could not be supported as a sincere infrastructure modernization plan under R.C. 4928.143(B)(2)(h); and because the PUCO expressly reserved consideration of grid modernization plans to a separate proceeding, now identified as Power Forward. See *In re Ohio Power Company*, Case No. 14-1693-EL-RDR, Second Entry on Rehearing (November 3, 2016), at 60. This change in names does not alter the conclusion that the micro grid and EV charging station programs are the subject of the Power Forward initiative and should be considered in that proceeding, and not piecemeal in this ESP proceeding.

[4] The U.S. Department of Transportation approved a federal grant in the amount of $40 million to the City of Columbus on August 30, 2016. As part of this grant approval, the City of Columbus pledged $19 million. In addition, certain "Leveraged Partner Resources" were identified by third parties to participate in the overall purpose of the grant, the objectives for which included a reduction in congestion, improved traveler safety, using energy more efficiently, responding to climate change, and "both connect and create opportunities for underserved communities, and support economic vitality." The "Key" Leveraged Partner Resources identified in this Agreement included Paul Allen's Vulcan, Inc. ($10 million contribution), and 21 other entities for a total contribution of $44.2 million. These entities were identified as "key" because the grant agreement states that these partners are "essential to the demonstration and are, therefore, approved and incorporated in the award for informational and reporting purposes." AEP Ohio was not listed as one of these Key Partner Resources. However, in addition, the grant agreement identified Key Leveraged Electrification Partner Resources to "fund and perform demonstrations in conjunction with the Vulcan electrification grant." This list includes six entities with an estimated combined contribution of $53 million. The AEP Ohio contribution is listed as $29.1 million and described as "Decarbonization of power supply and deployment of electric vehicles and other carbon emission reduction strategies." Other entities also pledged funding for deploying electric vehicle and electric vehicle charging infrastructure (*e.g.*, Columbus Partnership, Mid-Ohio Regional Planning Commission, City of Columbus, and The Ohio State University). See, AEP Ohio Response to OCC-RPD-2-113, Attachment 2, "Cooperative Agreement Award No. DTFH6116H00013" (Attachment BRA-2).

the apparent failure to engage in any attempt to obtain additional funding for these programs from other grant participants, thus reducing the costs to consumers.

Q8. PLEASE IDENTIFY THE EXPENSES THAT ARE EXPLICITLY AUTHORIZED FOR AEP TO COLLECT FROM CUSTOMERS THROUGH THE SMART GRID RIDER

A8. The Settlement explicitly allows AEP Ohio to incur the following expenses and collect those expenses from customers as part of the $21.1 million Smart City Rider:

1. With regard to the micro grid program, AEP Ohio's incremental O&M expenses associated with the micro grid equipment; costs for software and control system needed to operate the micro grids and not otherwise recoverable through the DIR; costs of the rebate program to "partially cover the costs for public-serving, non-profit customer-owned renewable generation resources that integrally support a micro grid, to be administered by AEP Ohio."[5]
2. With regard to the rebate program for EV charging stations, AEP Ohio can recover the costs of the rebates and collect a 5% administrative fee to administer the rebate program.

[5] Stipulation, Section III (G) (2).

3. In addition to the costs of the micro grid and EV charging station programs, AEP Ohio can recover up to $200,000 for research and development that it will undertake and described as "needed to develop and maintain the Smart City program for the 4-year term,"[6] and an additional $400,000 to recover AEP Ohio's estimated costs of data collection and reporting.[7]

Q9. WHAT PERCENTAGE OF THE TOTAL BUDGET FOR THE SMART CITY RIDER IS AEP OHIO ALLOWED TO COLLECT FROM CUSTOMERS FOR ITS OWN INTERNAL COSTS INCURRED TO IMPLEMENT THESE PROGRAMS?

A9. The Settlement does not identify the budget allocated for the rebates for the micro grid program, but of the $10.5 million for this program, AEP Ohio can collect from customers its incremental O&M expenses (not estimated) and the costs to operate the micro grids not otherwise recoverable through the DIR (not estimated). As a result, it is not known what percentage of the micro grid project budget will actually be used for rebates to the property owners or sponsors of the micro grid projects.

[6] Stipulation, Section III (H) (1) (c).

[7] Stipulation, Section III (H) (2) (b).

With regard to the EV charging station program, the maximum rebate budget for the level 2 stations is identified as $3.7 million and the budget for the DCF stations is identified as $5.8 million, with specific rebate levels for type and location of the various charging stations, for a total of $9.5 million or most of the $10 million allocated to this project in total. However, in addition to the costs of the rebates themselves, AEP Ohio can collect from customers a 5% administrative fee calculated on the total rebates awarded.

In addition to the two specific projects, AEP can collect from customers an additional $200,000 for research and development, and $400,000 for costs of data collection and reporting. As a result, of the $21.1 million Smart City Rider budget, AEP Ohio will receive 5% of the total of the two charging station rebate budgets (estimated at $500,000), $200,000 for research and development, and $400,000 for data collection (for a total of $1,100,000), plus an unknown amount of O&M costs and costs to operate the micro grid projects if this Settlement is approved. All of these costs would be collected from customers.

Q10. IS THERE A POSSIBILITY THAT CUSTOMERS WILL HAVE TO PAY ADDITIONAL COSTS FOR THESE PROJECTS THROUGH OTHER RATES OR RIDERS?

A10. Yes. Section III (G) (1) of the Settlement states that "related distribution grid investments will be recovered through the DIR." As a result, there are potential unknown costs associated with these projects that AEP Ohio is apparently authorized to incur and collect from customers through the DIR.

Q11. PLEASE EXPLAIN THE INCLUSION OF THE PROPOSED POWERFORWARD RIDER IN THIS SETTLEMENT.

A11. The Settlement includes a proposal that a new Rider be approved to recover future costs that the PUCO might authorize in the PowerForward proceeding. This Rider will have an initial value of zero. The actual rate design and filing mechanisms of this Rider are also not identified, but are deferred until after the PowerForward initiative is concluded.

Q12. DO YOU RECOMMEND THAT THE PUCO APPROVE CUSTOMER FUNDING FOR THE SMART CITY RIDER AND THE POWERFORWARD RIDER?

A12. No. I recommend that the PUCO reject this method of cost recovery for several reasons that are applicable to both Riders.

First, in general, separate riders and surcharges should not be used to collect utility costs and expenses from customers, outside of a base rate case. There are no statutory or policy grounds to support the Settlement's proposal to isolate the Smart City projects and seek the collection of costs outside of a regular base rate case. This is particularly true in light of the relatively modest budget for these programs, as well as the deficient aspects of the Settlement with regard to determining the value of these costs at the conclusion of what are described (incorrectly in my opinion) as "demonstration" projects.

If the PUCO approves the projects described in this Settlement (which I do not recommend), to protect customers from unwarranted charges the actual costs and benefits, if any, should be reviewed in a distribution base rate case. There the utility will have the opportunity to demonstrate that the expenses were prudently incurred and that the investments are providing used and useful capabilities for serving consumers. This should happen before the utility is authorized to collect the costs from customers.

Second, these projects have no nexus to the ESP proceeding, which is primarily intended to address the obligation to provide default generation supply service. And, neither the Utility nor any proponent of this Settlement has demonstrated the required nexus to R.C. 4928.143.

Although the Utility originally sought to support the projects under R.C. 4928.143(B)(2)(h), relating to a specific proposal for "long-term energy delivery infrastructure modernization," the Settlement apparently eliminates this justification and none of the proponents reference this justification. None of the projects included in the Smart City Rider are related to each other or are part of any overall "plan" to improve AEP Ohio's distribution reliability.[8] Moreover, no link to the reliability of the distribution system has been shown. The Smart City Rider is nothing more than a combination of unrelated projects that are not accompanied by any analysis that either links the proposed projects together or links these proposed projects to the Utility's obligation to provide adequate, reliable, safe, efficient, nondiscriminatory, and reasonably priced retail distribution electric service.[9]

Third, AEP Ohio's proposed Riders actually violate the Utility's obligation to comply with certain policies of the State of Ohio, including avoiding improper subsidies[10] and protecting "at-risk populations."[11] The EV rebates in particular will indirectly permit certain EV charging station owners in the Smart City footprint to receive discounted prices for distribution service due to their receipt

[8] While it is possible that strategically located and operated micro grid projects could improve reliability in certain circumstances, such an investment by customers would need to be more thoroughly explored in terms of costs, benefits, and analysis of alternatives to achieve the least cost approach. AEP Ohio has not undertaken such an analysis or even recognized that it should be done prior to investing in undefined microgrid projects that would be paid in full by customers.

[9] R.C. 4928.02(A).

[10] R.C. 4905.33.

[11] R.C. 4928.02 (L).

of the rebates, unlike other charging station owners outside of the footprint (or not participating the program). EV charging station owners participating in the rebate program in turn will be able to charge their customers less than customers served by charging station owners who will not receive the discounted service as a result of their lower costs.

Further, low-income and at-risk customers would be required to fund these proposals without receiving proportionate benefits. The notion that handing out rebates in order to support the location of a few EV charging stations in "low income communities" somehow properly responds to this concern is not defensible. Importantly, requiring all distribution customers to fund these programs for the benefit of relatively few customers (the owners of electrically powered vehicles and the recipient of the rebate for one or more micro grid projects) raises serious concerns about the allocation of costs and the recovery of costs in a fair and reasonable manner.

Fourth, the Settlement's provision that AEP Ohio will conduct "research and development needed to develop and maintain the Smart City program for the 4-year term, with up to $200,000 of costs eligible, subject to a prudency review, to flow through the Smart City Rider," [Section III (H)(1) (c)] is not accompanied by any specific description of the "research and development" activities. Furthermore, this research and development activity will logically benefit other AEP affiliates, namely AEP's distribution utilities in other States, and should not

be reimbursed by AEP Ohio customers, but should be funded by AEP Ohio's shareholders. When asked to provide any details on these activities, AEP Ohio responded, "The Company has not yet determined the specifics of those activities."[12]

Fifth, there are defects in terms of the lack of specificity of the program design and the justification for these programs that I will describe in detail in my testimony. And, there is a lack of clarity concerning the percentage of costs that AEP Ohio can collect under this Rider compared to the projects identified in the Rider, given its $21.1 million total budget.

Q13. DO YOU HAVE A PARTICULAR CONCERN ABOUT THE PROPOSED POWERFORWARD RIDER IN THIS SETTLEMENT?

A13. Yes. The proposal to approve a new PowerForward Rider that has no current purpose is particularly troublesome. The PowerForward initiative is not a formal proceeding and the PUCO has not yet issued any policy directives. It has certainly not addressed the various forms of utility investments that might result from unknown future policy directives, identified the costs associated with those directives, or considered and resolved the various means by which utilities will collect costs associated with these unknown future policy directives.

[12] AEP Ohio Response to STIP-OCC-INT-1-037 (Attachment BRA-3).

When asked for the justification of including the approval for this Rider in this Settlement, AEP Ohio's response stated that the rider is reasonable "in order for AEP Ohio to comply with any directives or findings that may come out of the Power Forward initiative."[13] Further, AEP Ohio justifies this rider for future unknown purposes and costs as providing "advantages to AEP Ohio's customers by facilitating the Company's implementation of new technologies or offerings based on findings and directives of the Commission while allowing all parties the opportunity to participate in those future filings if identified through the Power Forward initiative."[14]

Neither of these justifications is credible. The intent of this particular provision of the Settlement appears to preempt the potential for considering alternative methods of cost recovery in the informal PowerForward proceeding itself. Thus, the rider should be rejected as unnecessary and inappropriate. Furthermore, taking it out of the Settlement will not adversely affect any of the other provisions of the Settlement. Indeed, the actual purpose of pre-approving the rider is to force customers to pay AEP Ohio as soon as possible for unknown additional projects approved in the PowerForward initiative, without the benefit of ensuring that the project expenses are prudently incurred and used and useful in providing customers' service.

[13] AEP Ohio Response to STIP-OCC-INT-1-018 (Attachment BRA-4).

[14] AEP Ohio Response to STIP-OCC-INT-1-019 (Attachment BRA-5).

III. THE STIPULATON'S MICRO GRID PROJECT LACKS ESSENTIAL DETAILS IN DESIGN AND IMPLEMENTATION AND THE PUCO SHOULD REJECT CUSTOMER FUNDING OF THIS PROJECT

Q14. WHAT SPECIFICALLY IS INCLUDED IN THE SETTLEMENT ABOUT THE DESIGN, LOCATION, PURPOSE, AND EVALUATION OF THE MICRO GRID PROJECT?

A14. The Settlement is vague and not very helpful in understanding the answer to these questions. Section III (G) (1) of the Settlement only states that one or more "demonstration" micro grid projects at a completed cost of $10.5 million will be implemented. The micro grid(s) will "target non-profit, public-serving AEP customers, such as fire and police stations, municipal facilities, medical facilities, social service agencies, emergency shelters, and water and sewer infrastructure facilities." There will be a "public process" for the design and sharing of information from the demonstration projects. The project is referred to as a "micro grid generator/battery facility" that is not defined or described in terms of design or functionality.

Contrary to the "public-serving" or "non-profit" characteristics stated in the beginning of this section, the Settlement then allows AEP Ohio to pursue development of a micro grid with other non-public-serving or non-profit customers. The costs eligible for this micro grid that will serve a private purpose

and be limited to the Utility's "investments on the distribution system and costs incurred on the Company's side of the meter." There is no specific locational requirement for any of these projects except that AEP Ohio commits to coordinating with Staff and Smart Columbus for at least 1 micro grid for the location and selection of the public serving entity selected for the micro grid project. With regard to the potential for a micro grid project that involves non-public-serving or non-profit customers, Staff has the right to reject the site selection, thus apparently allowing the Staff to take action on this matter without Commission notice and opportunity for customer participation. Finally, this provision states that AEP Ohio will not own the "generation resources and batteries" for these projects. There is an obligation to competitive bid the contract to "build and maintain the micro grid equipment," but this provision is explicitly not applicable to any of AEP Ohio's distribution investments. With regard to the nature of the "demonstration," the Settlement requires that the Utility undertake data collection to "measure the merits of the micro grid facilities" and consult with Staff on this process.

Q15. AS A RESULT OF THESE PROVISIONS, WHAT ARE YOUR CONCERNS AND WHAT ARE THE DEFICIENCIES OF THIS PROPOSAL FOR CUSTOMER FUNDING?

A15. The Settlement lacks sufficient detail and justification that the micro grid and EV charging station proposals benefit customers and in the public interest:

1. AEP Ohio has not identified the need for or relationship of this proposed micro grid project to its statutory duty to ensure reliability of service at a reasonable cost or linked the purpose of this program to any reliability plan or impact on reliability of service.

2. Neither the Settlement nor its proponents have actually identified the purpose of this project. Is it to test whether one or more customers can be isolated from the grid and rely on back up batteries and operate renewable energy resources during an extended power outages? Is the intent of the project to determine how such an "island" can produce generation supply to send into the grid with renewable energy resources? Is the purpose of the project to "scale up" a small scale project and test a specific technology or technologies to determine the potential implementation or cost effectiveness for a larger project? Is the purpose to test alternative technologies and/or integration techniques to allow power to flow from the renewable energy facilities in and out of the grid under circumstances that would be automated or responsive to power flows and grid capacities? Does this project test the potential for the required coordination between AEP Ohio and the public safety and first responders in the local

community to enable the "public" purpose of this proposed project to be implemented? None of these alternative purposes have been identified for this project. In short, this "demonstration" project does not inform the public as to the purpose of the "demonstration" and how this "demonstration" holds the potential for benefits to customers. For example, AEP Ohio has not identified the specific criteria for the winning micro grid proposals.[15]

3. The lack of any specific project or specific project location suggests that there is no identified partner, identification of partner resources, or funding from sources other than customers. There is no requirement that the beneficiary of the rebate is obligated to fund any portion of the project's costs, including, for example, grant funds from the Smart Columbus project. This is a troubling viewed in light of the lack of any information on the amount of any rebate that will be provided for an unknown number of projects. There is no provision, for example, that would prohibit AEP Ohio from using the entire $10.5 million budget for this project for one entity. The lack of any apparent intent to seek federal funding or contribution from other public or

[15] AEP Ohio Response to STIP-OCC-INT-1-029 (Attachment BRA-6).

private governments or entities that would benefit from this project is a significant defect.

4. There is no proposed budget or budget allocation in this Settlement that describes the cost components of any micro grid project and how the unidentified rebate amount will be allocated to ensure that the customer funded subsidy will be used effectively and efficiently. When asked to identify the estimated costs for the micro grid projects that will be incurred by the project proponent, AEP Ohio stated, "Until the specific micro grid projects are identified, the costs to be incurred by the project proponent (customer) cannot be estimated."[16]

5. The option to enter into a micro grid contract with a non-public serving customer suggests that the public purpose touted for this micro grid project may be illusory.

6. As a result of the lack of any specific project design or identification of the purpose of the "demonstration," there are no criteria or details concerning how or when any evaluation that will be done for this $10.5 million expenditure of customer funds. There is no evaluation plan or even a commitment to develop an evaluation plan. The

[16] AEP Ohio Response to STIP-OCC-INT-1-028 (Attachment BRA-7).

Settlement's commitment to "data collection" begs the question. What data? To evaluate what? In other words, the criteria by which these unknown projects at unknown locations will be evaluated are unknown. For example, AEP Ohio "does not intend to perform a cost benefit analysis," but relies on the Settlement's obligation to "gather and share data..." for a future audit of the entire Smart Grid Rider authorized in Section III (F) of the Settlement.[17] Further, "The Company has not determined the criteria that will be used to determine the value of the micro grid demonstration."[18] This audit is not defined, the criteria for determining prudence are not identified, and the schedule for the audit is not specified.

7. The vague and unidentified criteria governing the expenditure of customer funds in this Settlement is even more troubling because AEP Ohio has no specific experience in the design, construction, or operation of a micro grid in its distribution system, except an admission that AEP Service Corp. has conducted research on a micro

[17] AEP Ohio Response to STIP-OCC-INT-1-017 (Attachment BRA-8).

[18] AEP Ohio Response to STIP-OCC-INT-1-027 (Attachment BRA-9).

grid test site.[19] None of that "research" is referenced in or explained to justify this "demonstration" project.

8. There is no actual budget for any one of the potential micro grid project(s) and it is unknown, for example what level of O&M expenses AEP Ohio might seek to collect from customers through the Rider or what level of costs might be incurred by AEP for software and control systems to operate the micro grid that AEP Ohio would also be authorized to recover through the Rider.

9. The total costs of this initiative and potential costs to customers is unknown since the Settlement allows AEP Ohio to incur additional costs related to distribution investments without any cap on such expenditures and collect those costs through the DIR. The attempt to actually obtain an estimate of these additional costs was rebuffed by AEP Ohio.[20] This apparent proposal for AEP Ohio to conduct a project with an unknown impact on costs imposed on customers is simply improper as a matter of ratemaking policy.

[19] AEP Ohio Response to OCC-INT-2-308 (Attachment BRA-10).

[20] AEP Ohio Response to STIP-OCC-INT-1-022 (Attachment BRA-11), 023 (Attachment BRA-12), 024 Attachment BRA-13). In each of these responses AEP Ohio was unable to estimate the additional costs for distribution facilities necessary to deliver power to the technology, to put the new technology into service, or to get the site ready for delivery. All of these unknown costs would be eligible for collection pursuant to the DIR under this Stipulation.

10. Finally, AEP Ohio's distribution customers will fund the rebate program that will subsidize the generation/battery facility for the non-profit, public-serving micro grid.

IV. THE PROPOSED ELECTRIC VEHICLE CHARGING STATION PROGRAM DOES NOT JUSTIFY CUSTOMER FUNDING AND SHOULD BE REJECTED

Q16. DOES THE SETTLEMENT OR THE TESTIMONY IN SUPPORT OF THE SETTLEMENT PROVIDE SUFFICIENT JUSTIFICATION FOR REQUIRING CUSTOMERS TO FUND 375 EV CHARGING STATIONS?

A16. No. The Settlement merely allocates customer funds to support the unregulated entities that will own and operate the EV charging stations without any discussion of or justification for the use of customer funds for this purpose.

The testimony in support of the Settlement submitted by Mr. Allen on behalf of AEP Ohio merely describes and summarizes the Settlement, including the EV charging station project. It is significant that his testimony on behalf of AEP Ohio did not identify any specific benefits to the electric distribution system by funding 375 more EV charging stations. Nor does his testimony reference any statutory obligation of AEP Ohio to support the development of the EV charging market with customer funds. Finally, the fact that AEP Ohio has not performed any analysis to project the number of EV charging stations that would occur

without customer funding is another indication of the poorly designed and justification for this customer subsidy.[21]

The testimony submitted by Ms. Krystina Schaeffer on behalf of Staff includes a high level discussion of how the Smart City Rider programs will benefit customers and the public interest. According to Ms. Schaeffer, the "demonstration projects associated with the Smart City Rider will help to promote innovative technologies by providing rebates for micro grid project components and EV charging stations. In addition, the research and development being conducted as part of the scope of the projects will produce data and information that can better inform decision makers on related policy matters." Ms. Schaeffer then references the Settlement's provisions to produce a final report concerning the EV charging station project. She opines that this information "will allow Staff and other parties to better understand and assess siting considerations and pricing programs to optimize resources and ensure system reliability, which furthers state policy as defined in Chapter 4928.02(A) of the Ohio Revised Code."[22]

However, Ms. Schaeffer's testimony consists of conclusions without any analysis or evidence to support her conclusions. For example, and as I will describe later in my testimony, there is no definition of "innovative" technology in the design or operation of the EV charging stations in this Settlement, with the exception that

[21] AEP Ohio Response to STIP-OCC-INT-1-032 (Attachment BRA-14).

[22] Testimony (Stipulation) of Krystina Schaeffer on behalf of Staff, at 3-4.

they include the ability to capture usage data in interval increments, a feature of any "smart meter" and is certainly not "innovative" without reference to the characteristics of the current EV charging stations in use in this area. Nor is there any description of the technologies in use in the EV charging systems currently operating in the AEP Ohio service territory and how the customer funded EV charging stations will differ from the ones in current use. There is no requirement in this Settlement that the EV charging station owners operate their stations or charge for their services in any manner that would allow the PUCO to understand how EV owners would respond to price signals for charging. There is no identified connection in any of these programs to the utility's obligation to provide reliable service. Nor is there any obvious nexus in this program to the obligation of the PUCO to provide "adequate, reliable, safe, efficient, nondiscriminatory and reasonably priced retail service."[23] In conclusion, Ms. Schaeffer's testimony consists of conclusory statements without support in the record.

The testimony in support of the Settlement filed by Dr. Abdellah Cherkaoui on behalf of the Electric Vehicle Charging Association also describes the Settlement's EV charging station program in detail and supports customer funding for "accelerated deployment of smart EV chargers, both in Ohio and nationwide" with the purpose of developing a "robust and sustainable EV market that

[23] R.C. Chapter 4928.02(A).

promotes grid benefits for all customers."[24] It is understandable that an association that represents charging station providers would welcome this Settlement and its contributions to their members who develop, install, and operate EV charging systems. This concern is heightened by the requirement in the Settlement that the subsidized EV charging stations must comply with certain data capturing requirements, an advantage that may or may not provide these EV charging station owners with a competitive advantage in terms of how they implement their pricing programs or advertise their stations in comparison to existing nonsubsidized EV charging stations. However, when asked to document the basis for his testimony that funding EV charging stations will result in "grid benefits for all customers," Dr. Cherkouai referenced, *Engaging Utilities and Regulators on Transportation Electrification (2015),* and stated that this publication, "identified that increased EV load growth, combined with effective load management programs through networked charging solutions, could lead to a downward pressure on unit energy costs that can benefit all utility customers, regardless of EV ownership."[25] Again, this is a publication that seeks to identify the benefits for increasing the use of EV ownership, a potential societal benefit, but one not specifically identified or linked to AEP Ohio's distribution service obligations.

[24] Testimony (Stipulation) of Dr. Abdellah Cherkaoui on behalf of the EVCA, at 10.

[25] EVCA Response to OCC-INT-49 (Attachment BRA-15).

Neither the Staff nor AEP Ohio's testimony in support of the Settlement actually discusses the policies that were considered and relied upon to justify this customer funding. For example, no supporting party discussed the reasonableness of the role of a distribution utility in a restructuring state such as Ohio in promoting customer funding for a project designed to support electric vehicles, the attendant growth in the use of electricity, or the implications of increased usage during peak hours on the wear and tear on the distribution system or the impact on generation supply market prices that would impact the price of SSO purchased in the wholesale market.

Further, the testimonies do not link the structure and implementation of these programs to the recommendation to provide customer funding. No supporting party outlined the overall purpose of what is referred to as a "technology demonstration" project. While the Settlement mandates that the supported EV charging stations have certain functionalities, there is nothing in the Settlement that would require those functionalities (concerning time-based usage and demand features) be used in any manner. Because there is no requirement in this Settlement that the EV charging stations actually operate to serve the needs of AEP Ohio's distribution grid in terms of the rate design of the use of the charging stations, there is no obvious benefit to AEP Ohio's distribution customers to fund these charging stations. The PUCO should reject the Settlement or, at a minimum, reject the EV charging station program because, due to the defects that

I have outlined in detail in my testimony, the Settlement does not show that the program will benefit the customers who subsidize it.

Q17. DOES THE SETTLEMENT PRESENT ANY JUSTIFICATION FOR THE SCOPE AND SCALE OF THE SPECIFIC NUMBERS AND TYPES OF EV CHARGING STATIONS THAT CUSTOMERS WILL FUND?

A17. No. One of the most troubling aspects of this proposed program is the lack of any documentation concerning the number, type, and location of electric vehicles in the AEP Ohio service territory; the number and type of EV charging stations that already exist; how the current charging stations are configured and their usage characteristics (all of which are presumably connected to AEP Ohio's metering and billing system); or any information or prediction on how the expansion of the current EV charging stations as proposed will impact the use of current electric vehicles or stimulate customers to purchase electric vehicles.

According to my own research, as of September 2017, there are 348 active and open EV charging stations in the State of Ohio. Of these, 282 are "public" and 65 are "private." Of the "public" charging stations, 28 require a card key, 70 require a "call ahead" and 182 are "public." Of the 348 EV charging stations in Ohio, 46 are located in Columbus, Ohio, all of which are categorized as "public."[26]

[26] Attachment-BRA-16 is a copy of the database downloaded from the Department of Energy web site that reflects Ohio specific data on EV charging stations as of September 2017 (http://www.afdc.energy.gov/data_download).

It is unreasonable to require customers to subsidize 375 new charging stations, an amount that would increase the current number by a factor of eight, when the number of EV owners in Columbus, Ohio is unknown. It is unreasonable to hand out customer funds to private EV charging station developers for the potential convenience of an unknown number of EV owners in this area.[27] At the very least, it would be necessary to evaluate the current ownership, use and the EV charging profile in the greater Columbus, Ohio area prior to determining that customer funds are needed for such a significant expansion of this system.

Q18. HAS ANY PARTY TO THE SETTLEMENT ACTUALLY PREDICTED WHAT IMPACT THIS VAST INCREASE IN EXISTING CHARGING STATIONS WILL HAVE ON EV OWNERSHIP OR EV USAGE?

A18. No. The apparent assumption by the proponents is that more EV charging stations will lead to more EV usage and perhaps more EV ownership, but there is no evidence to support this assumption.[28] More importantly, there is no obvious benefit to consumers to stimulate EV usage without some consideration of when EV users connect to these charging stations because unless the increased usage occurs during off peak hours, the additional usage will only contribute to higher

[27] Of course, there is no benefit to AEP Ohio customers to subsidize services for EV owners passing through Columbus from other areas of the state, or country.

[28] The one reference to support the notion that more EV charging stations will result in more EV ownership is an academic publication referenced by Dr. Cherkouai in EVCA's Response to OCC-INT-47 (Attachment BRA-17). This publication describes a theoretical set of assumptions that are modeled to predict their impact on EV penetration. The study has no reference to or connection with this Stipulation to fund 375 EV charging stations without any knowledge of the EV ownership in the service territory or how the current EV charging stations are used.

peak usage costs paid by AEP's customers. The Settlement's failure to impose any requirement for the recipients of this customer funding to price the usage of their charging stations based on the time of day is a key component of my conclusion that the Settlement does not conform to the public interest, a key requirement for the consideration of a Settlement. As a result, it is entirely likely that EV vehicle owners will use the charging stations funded under this Settlement in a manner that does not take into account any impact of their usage portfolio on the costs and benefits to the electric grid. It is not necessary to subsidize 375 new charging stations to find out when EV owners use charging stations. There is no "demonstration" of any innovative technologies associated with this proposal that will link the customer subsidy to the operation of the electric grid or the price of electricity.

Q19. WILL THE SUBSIDIES THAT ALL CUSTOMERS WILL PAY FOR EV CHARGING STATIONS RESULT IN A BENEFIT TO EV OWNERS AND PARTICULARLY EV CHARGING STATION OWNERS AND OPERATORS RATHER THAN ALL CUSTOMERS?

A19. Yes. While it is understandable that the EVCA supports this Settlement because it helps expand the market for its unregulated members who can profit from the program, AEP Ohio appears to agree that the rebate incentive program is intended to support the development of the EV charging market.[29] There is little or no

[29] AEP Ohio Response to STIP-OCC-INT-1-030 (Attachment BRA-18).

nexus to the purpose of promoting the development of the EV charging market and benefits to the general body of customers who are required to subsidize this program.

Q20. DOES THE SETTLEMENT CONTAIN ANY OBLIGATION FOR A PROPER EVALUATION OF THIS USE OF CUSTOMER FUNDS TO HELP FUND 375 NEW EV CHARGING STATIONS?

A20. No. The Settlement does not contain any directives as to how this "technology demonstration" project will be evaluated. It appears to be an expensive project to gather data because there is no evaluation plan or evaluation criteria identified in either the Settlement or in the testimony from the proponents that would allow for any determination of the value of this project beyond collecting data. While there is a list of data that AEP Ohio has committed to collecting, how this data will be evaluated or for what purpose is unknown. According to AEP Ohio, "This data (referring to the usage patterns of the 375 charging stations) will need to be collected, stored, summarized and analyzed and ultimately reported."[30] There is no identification or description of how this data will be used to determine the impact of the customer funded EV charging stations on the reliability and duties of AEP Ohio as a distribution utility.

[30] AEP Ohio Response to STIP-OCC-INT-1-004 (Attachment BRA-19).

Q21. PLEASE DISCUSS YOUR REACTION TO THE PROPOSAL FOR CUSTOMER FUNDING OF CERTAIN CHARGING STATIONS IN "LOW INCOME GEOGRAPHIC AREAS."

A21. I understand the apparent desire to ensure that lower income customers receive some benefit from a program that is targeted to EV owners, the demographics of which are documented as higher than average income households.[31] However, proposing to install EV charging systems in "low income geographic areas" without any evidence of the penetration of EVs in such "geographic areas" would appear to put a bow on this subsidy program that is difficult to justify. None of the parties supporting this Settlement have actually identified the "low income geographic areas" served by AEP Ohio that would be eligible for this program beyond a reference in the Settlement to "census tracts."[32] Nor has any proponent identified the EV ownership pattern in such neighborhoods that would justify the appearance of the need for or use of EV charging systems. Furthermore, because AEP Ohio confirms that the reference to "multi-unit" structures in this provision of the Settlement could refer to commercial or residential property,[33] the actual impact of this subsidy for low income customers of AEP Ohio is questionable since a commercial owner of a multi-unit structure (such as an office building,

[31] This concern is particularly important because of the obvious barrier for low income households to purchase an EV, not only a function of the higher cost to purchase an EV, but the need to file a federal tax return to obtain the federal EV tax credit.

[32] AEP Ohio Response to STIP-OCC-INT-041 (Attachment BRA-20) did not provide the specific geographic areas that would qualify for this additional subsidy for EV charging stations, but identified that it is "considering" the reliance on the definition and methodology for "low income geographic area" found in 15 U.S.C. Section 6889(3).

[33] AEP Ohio Response to STIP-OCC-INT-1-039 (Attachment BRA-21).

medical facility, private commercial building owner, etc.) could qualify for the program based strictly on the building owner's location in a "low income geographic area."

Q22. DOES THE SETTLEMENT IDENTIFY HOW AEP OHIO WILL CHARGE FOR THE USE OF THE CHARGING STATIONS OR TAKE INTO ACCOUNT (CREDIT EXISTING CUSTOMERS) THE RESULTING REVENUES?

A22. No. This is a significant omission. AEP will meter and collect revenues from the charging stations pursuant to existing tariffs. Pursuant to the Settlement, EV charging station owners are not required to comply with any specific pricing schedule for the use of their systems by EV owners. It is not clear whether or if the PUCO would exercise oversight over the rebate program to include the pricing schedule for usage of the customer funded EV charging stations. The Settlement does not identify the rate design or pricing policies that will be applicable. Even more troubling is that there is no provision in this Settlement that recognizes the incremental revenues that will result from these 375 new EV charging stations and AEP Ohio has not estimated the future incremental revenues from this program.[34]

[34] AEP Ohio Response to STIP-OCC-INT-1-045 (Attachment BRA-22).

My concern is two-fold. First, AEP Ohio is not required to offset its revenues from these charging stations in the Smart Grid Rider. This appears to benefit AEP Ohio's shareholders rather than its customers. Second, the lack of any requirement in the Settlement that governs the pricing scheme that will be charged by the charging station owners to the EV owners raises concerns about the potential for allocating customer revenues to unregulated third parties who stand to benefit from these subsidies without any oversight or accountability. This provision is another important example to confirm my recommendation that the Commission reject the EV charging station provision of this Settlement since the lack of including an offset to the costs of the Smart Grid Rider with revenues that AEP Ohio will incur as a result of this program does not benefit customers and is not in the public interest.

V. THE PUCO SHOULD REJECT THE PROPOSAL TO CREATE THE "PEV TARIFF" THAT CUSTOMERS WOULD FUND

Q23. WHAT IS THE PURPOSE OF THE PEV TARIFF INCLUDED IN THIS SETTLEMENT?

A23. The undefined and vaguely explained PEV Tariff is apparently another tariff that will include a rider that is proposed to be adopted without any content or support in the Settlement or the testimony by the proponents. I recommend that it be rejected for the same reasons I described in my testimony seeking rejection of the Power Forward Rider.

VI. CONCLUSION

Q24. BASED ON YOUR EVALUATION OF THE SETTLEMENT THAT REQUIRES AEP CUSTOMERS TO FUND THE SMART CITY RIDER, THE POWER FORWARD RIDER, AND THE PEV TARIFF, DO THESE PROGRAMS MEET THE CRITERIA ESTABLISHED BY THE PUCO FOR APPROVAL OF A SETTLEMENT?

A24. No. The new Riders, the EV Charging Station, and the Micro grid projects raise important regulatory policies that are unanswered. There is no basis to conclude that these programs and new riders provide any benefits to customers, thus failing to meet the public interest test for approval of a Settlement. I recommend that the PUCO should reject the Settlement to create the Smart City Rider, to fund the micro grid and EV charging station projects, the Power Forward Rider, and the PEV Tariff. These programs and costs are fraught with unanswered questions and concerns. In addition, the Settlement's provisions are not consistent with the criteria for an ESP, do not reflect a proper distribution modernization "plan," are not linked directly to improved reliability of service, and do not conform to the PUCO's previously stated process for considering grid modernization investments. More specifically, the proposed projects are vague, undefined, and raise serious issues about whether distribution service customers should pay for these projects at all due to their implications for competitive markets or how the costs of the projects, even

if appropriate, should be recovered from those who stand to benefit. The PUCO should explore the following policy and evidentiary issues prior to considering funding projects of this type, as a part of its PowerForward initiative.

<u>With regard to the EV Charging Station proposal:</u>

1. What data should be developed concerning the penetration of EVs in Ohio at this time, such as the growth in sales, the demographics of EV owners, the geographic location of EV sales and sale trends? Is there a demonstrated need for any customer funded charging stations?

2. What information is available or should be gathered concerning the deployment of current EV charging stations of the various designs and capabilities? Who owns the charging stations? What fees are currently being charged? What is the usage factor and profile of usage for existing charging stations?

3. Is it proper to use utility customer funding to support the deployment of EV charging stations?

5. How should those who will benefit from these programs contribute to or fund EV charging stations?

6. Should utilities conduct small scale pilots to fund and deploy certain types of charging stations and, if so, with what criteria and evaluation protocols?

7. Should customer funded EV charging stations be required to be implemented with demand or time varying rate structures? Should privately owned or publicly owned charging stations be required to charge based on time of use rates?

8. Should all customers subsidize the costs for those customers who chose to purchase EVs?

9. Does utility funding and ownership in EV charging stations stifle the development of a competitive market for these types of services?

10. Can the market for charging stations develop independently of any subsidies?

11. Who should bear the risk of the developing EV market?

<u>With regard to Micro Grid Projects:</u>

1. What role should utilities play in the development and implementation of micro grid projects as compared with or in cooperation with the private or governmental public

sector? Should utility funded projects be required to obtain public funding to cover a portion of the costs?

2. What criteria should govern the interconnection of public or privately owned micro grids with the utility's distribution network?

3. What are the criteria that would govern the location of micro grids and how would those criteria be weighed to determine the appropriate locations?

4. Should utilities be required to conduct pilots or small-scale testing of various micro grid design concepts prior to larger scale deployment?

5. Should utility customers fund micro grid development? If so, what evaluation criteria should be developed to determine the costs to be funded by customers? Should micro grids funded by customers be evaluated primarily for their impact on reliability and storm restoration resiliency?

6. How should utility proposals and customer funding for micro grids be coordinated with or required to take advantage of U.S. Department of Energy funding for micro

grid demonstration grants and resulting evaluation results?[35]

7. What impact will micro grids have on the competitive deployment of after the meter energy storage services and renewables (e.g. wind and solar) within the confines of the micro grid? That is, how can competitive providers compete against captive customer funded Utility programs? This issue also raises concerns about the role of the distribution utility and/or its affiliates that may seek to enter this business and monetize the capacity resources, real time energy, and ancillary services that such micro grids may provide.

8. How and under what circumstances should captive customers (if at all) be responsible to fund micro grid storage and generation on the utility side of the meter?

9. If utility provided (before the meter) micro grid storage, generation, and/or demand response are permitted to participate in wholesale markets, how should such revenues

[35] For example, the U.S. Department of Energy has funded several micro grid demonstration projects and research on the costs and benefits of microgrids. This information and the results of the federally funded projects should be taken into account in developing micro grid programs and experiments in Ohio to avoid duplication of research and to take advantage of recommendations reflected in this research. See, https://www.energy.gov/oe/services/technology-development/smart-grid/role-microgrids-helping-advance-nation-s-energy-system [Page visited April 21, 2017].

from this market participation be used to defray the micro grid costs?

10. How should micro grid after-the-meter services revenues from the RTO's markets be accounted for to protect captive customers' investments in these services or offset funding from customers?

Q25. DOES THIS COMPLETE YOUR TESTIMONY?

A25. Yes. However, I reserve the right to supplement my testimony in the event that additional testimony is filed, or if new information or data in connection with this proceeding becomes available.

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing *Supplemental Testimony of Barbara R. Alexander on Behalf of the Office of the Ohio Consumers' Counsel* was served via electronic transmission to the persons listed below on this 11th day of October 2017.

/s/ William J. Michael
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Areas of Expertise:

- Default Service, Consumer Protection, Service Quality, and Universal Service policies and programs associated with the alternative rate plans and mergers;
- Consumer Protection and Service Quality policies and programs associated with the regulation of competitive energy and telecommunications providers;
- The regulatory policies associated with the regulation of Credit, Collection, Consumer Protection, Low Income, and Service Quality programs and policies for public utilities;
- Rate design and pricing policies applicable to residential customers; and
- Advanced Metering Infrastructure and Grid Modernization costs and benefits, time-based pricing proposals, and performance standards.

Prior Employment

DIRECTOR

1986-96

Consumer Assistance Division
Maine Public Utilities Commission *Augusta, Maine*

One of five division directors appointed by a three-member regulatory commission and part of commission management

team. Direct supervision of 10 employees, oversight of public utility consumer complaint function, appearance as an expert witness on customer services, consumer protection, service quality and low income policy issues before the PUC. Chair, NARUC Staff Subcommittee on Consumer Affairs.

SUPERINTENDENT

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Bureau of Consumer Credit Protection
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Director of an independent regulatory agency charged with the implementation of Maine Consumer Credit Code and Truth in Lending Act. Investigations and audits of financial institutions and retail creditors, enforcement activities, testimony before Maine Legislature and U.S. Congress.

Education

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1973-76

University of Maine School of Law *Portland, Maine*

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University of Michigan *Ann Arbor, Michigan*

Publications and Testimony

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- Presentation on Consumer Protection Policies for Solar Providers, New Mexico Public Regulatory Commission, Santa Fe, NM, January 2017
- Presentation on Residential Rate Design Policies, National Energy Affordability and Energy Conference, Denver, CO., June 2016
- Presentation on "Regulatory-Market Arbitrage: From Rate Base to Market and Back Again," before the Harvard Electricity Policy Group, Washington, D.C., March 2016.
- Presentation on Residential Rate Design and Demand Charges, NASUCA, November 2015.
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- Presentation on "Future Utility Models: A Consumer Perspective," for Kleinman Center for Energy Policy, U. of Pennsylvania, August 2015.
- Presentation, EUCI Workshop on Demand Rates for Residential Customers, Denver, CO [May 2015]
- Presentation, Smart Grid Future, Brookings Institute, Washington, DC [July 2010]
- Participant, Fair Pricing Conference, Rutgers Business School, New Jersey [April 2010]
- Presentation on Smart Metering, National Regulatory Conference, Williamsburg, VA [May 2010]
- Presentation on Smart Metering, Energy Bar Association Annual Meeting, Washington, DC [November 2009]
- Presentation at Workshop on Smart Grid policies, California PUC [July 2009]
- National Energy Affordability and Energy Conference (NEAUC) Annual Conference
- NARUC annual and regional meetings
- NASUCA annual an regional meetings
- National Community Action Foundation's Annual Energy and Community Economic Development Partnerships Conference
- Testimony and Presentations to State Legislatures: Virginia, New Jersey, Texas, Kentucky, Illinois, and Maine
- Training Programs for State Regulatory Commissions: Pennsylvania, Georgia, Kentucky, Illinois, New Jersey
- DOE-NARUC National Electricity Forum
- AIC Conference on Reliability of Electric Service
- Institute of Public Utilities, MSU (Camp NARUC) [Instructor 1996-2006]
- Training Programs on customer service and service quality regulation for international regulators (India and Brazil) on behalf of Regulatory Assistance Project
- Georgia Natural Gas Deregulation Task Force [December 2001]
- Mid Atlantic Assoc. of Regulatory Utility Commissioners [July 2003]
- Illinois Commerce Commission's Post 2006 Initiative [April 2004]
- Delaware Public Service Commission's Workshop on Standard Offer Service [August 2004]

U.S. Department of Transportation

Cooperative Agreement Award Number DTFH6116H00013

Title: "Smart City Challenge Demonstration"
(Phase 2 Award)

Signatures	
City of Columbus	U.S. Department of Transportation Federal Highway Administration
x Jennifer Gallagher	x Arlan E. Finfrock
Printed Name: Jennifer Gallagher	Printed Name: Arlan E. Finfrock
Title: Director of Public Service	Title: Agreement Officer
Date: 8-30-16	Date: 8/30/16

Award Information

Award Information

Award No.:		DTFH6116H00013
Effective Date:		August 30, 2016
Awarded to:		City of Columbus 90 West Broad Street Columbus, Ohio 43215-9004 DUNS No: 609679548 TIN No.: 316400223
Sponsoring Office/ Federal Agency Name:		U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) Office of Acquisition and Grants Management 1200 New Jersey Avenue, SE Mail Drop: E62-204 Washington DC 20590 Attn: Sarah Tarpgaard, HCFA-32
Total Amount:		Federal Share: $40,000,000 Recipient Cost Share: $19,000,000 Total Value: $59,000,000* *See also Leveraged Partner Resources clause, Section B
Catalog of Federal Domestic Assistance (CFDA) Number:		20.200 Highway Research & Development
Period of Performance		Four Years
Type of Award:		Cooperative Agreement (Cost Reimbursement, Cost-Sharing)
Authority:		23 U.S.C. §516(a)
Procurement Request (PR):		# HOIT212116168
Funds Obligated at Award:		$15,000,000
Accounting Data:		15X0447060-0000-021DT20672-2101-000000-41010-61006600, $15,000,000

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ATTACHMENTS

SECTION A – PROGRAM DESCRIPTION

1. STATEMENT OF PURPOSE

The purpose of the Smart City Challenge is to demonstrate and evaluate a holistic, integrated approach to improving surface transportation performance within a city and integrating this approach with other smart city domains such as public safety, public services, and energy. The United States Department of Transportation (USDOT) intends for this challenge to address how emerging transportation data, technologies, and applications can not only be integrated with existing systems in a city to address transportation challenges, but used to spur reinvestment in underserved communities. The Recipient shall carry out the Smart City Challenge to effectively test, evaluate, and demonstrate the significant benefits of smart city concepts.

The Recipient shall demonstrate how advanced data and intelligent transportation systems (ITS) technologies and applications can be used to reduce congestion, keep travelers safe, use energy more efficiently, respond to climate change, both connect and create opportunities for underserved communities, and support economic vitality.

The Smart City Demonstration is expected to provide safety improvements, enhance mobility, increase ladders of opportunity by incentivizing reinvestment in underserved communities, reduce energy usage, and address climate change.

2. LEGISLATIVE AUTHORITY

Specific statutory authority for conducting this effort is found in the Intelligent Transportation Systems Research Program in 23 U.S.C. §516(a), which authorizes the Secretary of Transportation to "…carry out a comprehensive program of intelligent transportation system research and development, and operational tests of intelligent vehicles, intelligent infrastructure systems, and other similar activities."

Funding is authorized under Section 6002(a) of Public Law 114-94, the Fixing America's Surface Transportation Act (FAST Act).

The authority to enter into a cooperative agreement for this effort is found under 23 U.S.C. § 502 - Surface Transportation Research, Development, and Technology, paragraph (b), which states:

(3) cooperation, grants, and contracts. — The Secretary may carry out research, development, and technology transfer activities related to transportation—
(A) independently;
(B) in cooperation with other Federal departments, agencies, and instrumentalities and Federal laboratories; or
(C) by making grants to, or entering into contracts and cooperative agreements with one or more of the following: the National Academy of Sciences, the American Association of State Highway and Transportation Officials, any Federal laboratory, Federal agency, State agency, authority, association, institution, for-profit or nonprofit corporation, organization, foreign country, or any other person.

3. BACKGROUND

In February of 2015, the USDOT released "*Beyond Traffic: Trends and Choices 2045.*" Beyond Traffic examines the long-term and emerging trends affecting our Nation's transportation system and the implications of those trends. It describes how demographic and economic trends, as well as changes in technology, governance, and our climate are affecting how people and goods travel today, and how they could affect travel in the future. It outlines choices that will require cities to think differently about how we move, how we move things, how we move better, how we adapt, and how we align decisions and dollars.

Smart cities are emerging as a concept that can be used to address these issues starting today. The trends identified in *Beyond Traffic 2045* have major implications for cities. Cities deliver many benefits – greater employment opportunities, greater access to healthcare and education, and greater access to entertainment, culture and the arts. People are moving to cities at an unprecedented rate. Our population is expected to grow by 70 million over the next 30 years, and most of this population growth will be concentrated in metropolitan areas or cities. Growing urbanization will continue to put significant strain on city infrastructure and transportation networks.

Transportation is critical to making a city work. Transportation is deeply connected to economic opportunity providing Americans with connections to employment, education, healthcare, and other essential services. Many cities see advantages in urbanization, but these cities are also saddled with concentrated growth, shrinking revenues, and increased transportation demand. Inefficiencies in our transportation system cost Americans, on average, each over 40 hours stuck in traffic each year – an annual financial cost of $121 billion. At the same time, Americans spend more on transportation than they do on food, healthcare, and clothing. Low-income Americans spend nearly a

quarter of their annual income on transportation while high-income American spend about one-tenth on transportation. Finally, research indicates that cities account for 67% of all greenhouse gases (GHGs) released into the atmosphere. The transportation sector is the second-biggest source of GHGs, responsible for 28% of U.S. emissions.

To overcome these challenges, cities must find ways to foster the emergence of technologies that have the potential to transform transportation. A number of trends in technology are taking place. Improvements to how we collect and analyze data, how communications and mobile platforms evolve, how rapidly connected and automated vehicle technologies emerge, and how soon all modes of transportation transition to using clean forms of energy hold the promise of making our future transportation system safer, more accessible and efficient, and more environmentally sustainable.

With Intelligent Transportation Systems (ITS) laying the groundwork for innovative transportation solutions, many cities are currently serving as laboratories for new types of transportation services and cleaner transportation options leveraging those solutions. Smart cities are emerging as a next-generation approach for city management by taking steps forward along the transportation technology continuum. Integrating ITS, connected vehicle technologies, automated vehicles, electric vehicles, and other advanced technologies – along with new mobility

EXPECTED OUTCOMES OF THE SMART CITY CHALLENGE

- **Improve Safety** – By using advanced technologies, including connected vehicle technologies, to reduce the number of collisions, fatalities, and injuries for both vehicle occupants and non-vehicle occupants.
- **Enhance Mobility** – By providing real-time traveler information and emerging mobility services to improve personal mobility for all citizens including people with lower incomes, people with disabilities, and older adults.
- **Enhance Ladders of Opportunity** –By providing access to advanced technology and its benefits for underserved areas and residents, increasing connectivity to employment, education and other services, and contributing to revitalization by incentivize reinvestment in underserved communities.
- **Address Climate Change** – By implementing advanced technologies and policies that support a more sustainable and cost-effective relationship between transportation and the environment through more efficient fuel use and emissions reductions.

concepts that leverage the sharing economy – within the context of a city will provide enhanced travel experiences and makes moving people and goods safer, more efficient, and more secure. By enhancing the effective management and operation of the transportation system, smart city solutions can leverage existing infrastructure investments, enhance mobility, sustainability, and livability for citizens and businesses, and greatly increase the attractiveness and competitiveness of cities and regions.

4. VISION AND GOALS OF THE SMART CITY DEMONSTRATION

This section describes the USDOT's vision of a successful Smart City, and the specific goals that collectively describe important elements of the demonstration.

To show what is possible when communities use technology to connect transportation assets into an interactive network, the USDOT's Smart City Challenge concentrates federal resources into one city, selected through a nationwide competition. The Smart City Challenge seeks to demonstrate and evaluate a holistic, integrated approach to improving surface transportation performance within a city and integrating this approach with other smart city domains such as public safety, public services, and energy. The USDOT intends for this challenge to address how emerging transportation and other data, technologies, applications, and clean energy can be integrated with existing and new systems in a city to address transportation challenges.

This section presents the USDOT's high-level vision and goals without making each item an award requirement. Rather, this section provides a framework for the Recipient to consider in conducting the demonstration.

The USDOT's vision for the Smart City Challenge is to identify an urbanized area where advanced technologies are integrated into the aspects of a city and play a critical role in helping cities and their citizens address the challenges in safety, mobility, access to opportunity, sustainability, clean energy, economic vitality, and climate change. Advancements in ITS, connected vehicles, automated vehicles, electric vehicles, and other advanced technology will be a critical part of meeting these transportation challenges, as will the merging Internet of Things (IoT) which offers data from various sectors (e.g., energy and weather) and sources (e.g., the private sector and connected citizens). A smart city uses these data to maximize efficiencies within their management systems while enabling an open, growing ecosystem of third party services that provide additional benefits to citizens.

The Smart City Demonstration shall seek to improve access to reliable, clean, safe, and affordable transportation for a wider spectrum of its underserved communities. The Smart City Demonstration shall develop novel ways to reform the digital divide and use smart technologies and concepts to strengthen connections to jobs, remove physical barriers to access, and strengthen communities through neighborhood redevelopment. The Smart City Demonstration shall sequence deployment of these technologies and innovations so they benefit underserved communities early in the process. The Smart City Challenge identifies these concepts as Ladders of Opportunities. Ladders of Opportunity projects may increase connectivity to employment, education, services and other opportunities, increase access to digital resources, broaden the availability of affordable clean transportation options, support workforce development, or contribute to community revitalization, particularly for underserved areas.

The Smart City Demonstration shall seek to improve safety, enhance mobility, enhance ladders of opportunity, accelerate the transportation to clean transportation, and address climate change. Specific goals of the Smart City Demonstration include:

- Identify the transportation challenges and needs of the citizen and business community and demonstrate how advanced technologies can be used to address issues in safety, mobility, access to opportunity, energy efficiency, and climate change, now and into the future.
- Determine which technologies, strategies, applications, and institutional arrangements demonstrate the most potential to address and mitigate, if not solve, transportation challenges identified within a city.
- Support and encourage cities to take the evolutionary and revolutionary steps to integrate advanced technologies – including connected vehicles, automated vehicles, and electric vehicles – into the management and operations of the city, consistent with the USDOT vision elements (see Attachment 1).
- Demonstrate, quantify, and evaluate the impact of these advanced technologies, strategies, and applications towards improved safety, efficiency, and sustainable movement of people and goods.
- Examine the technical, policy, and institutional mechanisms needed for realizing the potential of these strategies and applications – including identifying technical and policy gaps and issues – and work with partners to address them.
- Assess reproducibility of interoperable solutions and qualify successful smart city systems and services for technology and knowledge transfer to other cities facing similar challenges. Follow systems engineering best practices and utilize

available architectures and standards to develop interoperable, reproducible systems with national extensibility, including the use of open source technologies.

- Work with Federal partners and programs focused on providing technical and financial resources for optimizing the usage of advanced and affordable clean transportation options.
- Collaborate with regional agencies on the best use of a city's Federal transportation assets and Federal workforce to accelerate the deployment of clean transportation and connected and automated vehicle technologies.

The Smart City Demonstration shall include a commitment to integrating with the sharing economy; and a clear commitment to making open, machine-readable real-time and archived data accessible, discoverable and usable by the public to fuel entrepreneurship and innovation.

The USDOT identified twelve vision elements that comprise a Smart City. The Smart City Demonstration shall align to some or all of the USDOT's vision elements and foster integration between the elements. Through alignment with these vision elements, the Smart City Demonstration is expected to improve safety, enhance mobility, enhance ladders of opportunity, accelerate the transition to clean transportation, and address climate change. See Attachment 1, Smart City Vision Elements.

5. STATEMENT OF WORK

The Recipient shall conduct the Smart City Demonstration in accordance with the approved Technical and Budget Applications, incorporated herein as Attachments 2 and 3, subject to the terms of the award.

The Recipient shall perform and provide the following tasks (Tasks A – J, below) and deliverables needed to demonstrate, quantify, and evaluate the impact of advanced technologies, strategies, and applications towards improved safety, efficiency, ladders of opportunity, and sustainable movement of people and goods. The following tasks and deliverables are also needed to foster transferability/reproducibility to support technology and knowledge transfer to other cities facing similar challenges.

TASKS:

TASK A: PROGRAM MANAGEMENT

TASK B: SYSTEMS ENGINEERING APPROACH

TASK C: PERFORMANCE MEASUREMENT

TASK D: DATA PRIVACY REQUIREMENTS

TASK E: DATA MANAGEMENT AND SUPPORT FOR INDEPENDENT EVALUATION

TASK F: SAFETY MANAGEMENT AND SAFETY ASSURANCE

TASK G: COMMUNICATIONS AND OUTREACH

TASK H: INTERNATIONAL COLLABORATION

TASK I: PARTICIPATION IN RELEVANT ITS ARCHITECTURE AND STANDARDS DEVELOPMENT EFFORTS

TASK J: INTERIM AND FINAL REPORTING

Delineation of Tasks and Deliverables

TASK A: PROGRAM MANAGEMENT

Implementation of a Smart City Demonstration will require a disciplined approach to manage the execution of the work and make sure the team responsible for implementing the Smart City Demonstration delivers the highest quality products on time and within budget. Common processes and procedures should be used to ensure quality, timeliness, and cost control. Effective program management should consider:

- **Scope Management.** This includes ensuring that all required activities are performed. The Recipient should have mechanisms in place for verifying and controlling the overall scope of the Smart City Demonstration.
- **Schedule Management.** This includes managing the timely execution of work activities. A Project Schedule should list all activities required to bring all required work to a successful completion. Successful schedule management should identify how the team will monitor the project schedule and manage changes after a baseline schedule has been approved. Schedule management includes

identifying, analyzing, documenting, prioritizing, approving or rejecting, and publishing all schedule-related changes.

- **Communications Management.** This includes the systematic planning, implementing, monitoring, and revision of all the channels of communication within the project partners and with other stakeholders. For the purposes of the Smart City Challenge, a *partner* refers to an organization or individual on the Smart City Team. A *stakeholder* refers to an organization or individual potentially impacted by the Smart City demonstration itself, regardless of whether they are team members (partners) or not. Communications management ensures effective internal team communications and governance methods, as well as communications with the USDOT's Agreement Officer Representative (AOR).
- **Cost Management.** This includes the process of planning and controlling the budget for the Smart City Demonstration. Effective cost management should ensure that any issues with funding surface quickly, before cost overruns can occur.
- **Quality Management.** This includes effectively managing the quality of the products produced, from planning to delivery. Quality management includes procedures to be followed to implement a quality program and provide the USDOT with visibility into product quality (e.g., process and product evaluations, record keeping, nonconformance tracking, and reporting channels). Quality management addresses both Quality Control (QC) and Quality Assurance (QA) processes. QC is defined as the monitoring and controlling actions required during a project to ensure that a product – or performed service – adheres to a defined set of quality criteria. QA ensures that the appropriate quality planning and QC mechanisms are defined and utilized to prevent mistakes or defects.
- **Configuration Management.** This includes managing how items to be placed under configuration control are identified, when they are identified, and when they are placed into a configuration control process or system. Configuration management may include establishing a Configuration Control Board (CCB) and include procedures for handling proposed changes to items under configuration control, and the role of the USDOT in configuration control.
- **Risk Management.** This includes identifying, prioritizing, and managing program risks in a timely and efficient manner. Risks that may impact the schedule, scope, or costs of activities performed under the program should be identified, documented, and tracked. Plans for mitigating risks should be identified and implemented.

Shortly after award, representatives from the Recipient's Smart City Demonstration team shall attend a kick-off meeting to be held in Washington, DC, or the Recipient's location, with the AOR and its representatives to ensure that all parties have a common understanding of the AOR's requirements and expectations. The Recipient shall bring its key personnel to this meeting and the host (either USDOT or the Recipient) shall arrange the location, the agenda, and the list of other attendees. This kickoff meeting shall occur no later than four weeks after award of the Cooperative Agreement.

The Recipient shall prepare a Program Management Plan (PMP) that describes the activities required to perform the work, per current PMBOK guidance[1]. The PMP shall explain the roles and responsibilities of all key individuals within the program/project team. At a minimum, the PMP shall contain a Scope Management Plan, a Schedule Management Plan, a Communications Management Plan, a Cost Management Plan, a Quality Management Plan, Configuration Management Plan, and a Risk Management Plan.

The PMP shall be accompanied by a detailed Smart City Demonstration Project Schedule, considered to be a logical component of the PMP, although it may be a physically separate electronic file. The Project Schedule shall list all activities required to bring all required work to a successful completion and shall contain – at a minimum – three levels of the Work Breakdown Structure (WBS). The Project Schedule shall be updated monthly. The Project Schedule shall describe the following:

- Name of the work activity;
- Expected start and end dates;
- Name of the individual with the primary responsibility for accomplishing the work;
- Dependencies with other work activities in the Project Schedule; and
- All deliverables, procurements, or milestones resulting from the work activity.

The PMP shall be delivered in draft to the Agreement Officer's Representative (AOR). The AOR will provide the Recipient review comments on the draft PMP, estimated to be provided within two weeks after receipt of the draft PMP. After receiving the AOR's comments and resolving them, the Recipient shall provide the "final" version of the PMP and its related documents. During the course of the Smart City Demonstration, the

[1] PMI (2012), A Guide to the Project Management Body of Knowledge, 5th Ed.

Recipient may propose modifications to the PMP. Any such modifications shall go through the cycle of draft submission, AOR review and comment, comment resolution, and submission of a "final" version.

The Recipient shall document the status of developing and implementing agreements, contracts, and subcontracts among partner organizations in a Partnership Status Summary. This includes all agreements associated with the planning, development or implementation of the main elements of the ConOps, performance measures and targets, operational changes associated with the Smart City Demonstration, governance framework and processes, and financial agreements. This agreement shall also include a vision of how these arrangements are expected to be altered or adapted in the post-grant period to ensure a transition to permanent operational practice. The Recipient shall deliver a draft version of the Partnership Status Summary to the AOR for review in accordance with the project master schedule. The Recipient shall prepare a revised document in response to AOR comments. The AOR must accept and approve all comment resolutions before the revised document is considered final or return for re-revision with comments.

The USDOT requires the Recipient to provide Quarterly Progress Reports and Quarterly Progress Briefings. See Section C.3. Reporting, for format and due dates.

<u>Quarterly Progress Reports and shall include:</u>

- A narrative of accomplishments by task and projected activities in the next quarterly period.
- All list of all deliverables and deliverable status (not initiated, in progress X% complete, draft delivered, in revision X% complete, final delivered, accepted).
- Identification of any problems, planned solutions, and/or requests for USDOT assistance.
- An updated project schedule with a schedule risk narrative, a technical risk narrative, a partnership risk narrative.
- A summary of costs incurred for the reporting period and to date to include Federal share, Cost share, and total.
- A comparison of costs incurred to the budgeted costs for the reporting period and to date to include Federal share, Cost share, and total.
- Projected cost-to-complete.
- A summary of communication and outreach efforts.

- Subcontractor Status Summary: A summary of Subcontractor Coordination and Management activities to include as applicable:
    - Status of key procurements if available (do not provide procurement sensitive information but rather only general status information).
    - Status of key subcontract awards.
- Leveraged Partner Resources Status Summary: A summary of activities related to Leveraged Partner Resources, to include the following items as applicable.
    - Progress, achievements, deliverables/milestones, problems, risks.
    - Status of developing and implementing Partnership agreements.
    - Changes to partnership agreements, arrangements or plans.

For Quarterly Progress Briefings, the Recipient shall present the information contained in Quarterly Progress Reports. Briefings shall be conducted in person to the extent possible, alternating quarters between the Smart City Demonstration site and at the USDOT headquarters in Washington, DC, or as otherwise mutually agreeable to the parties.

Required Deliverables

- Kick-off Meeting
- Project Management Plan (PMP)
- Project Schedule and Monthly Project Schedule Updates
- Partnership/Stakeholder Status Summary (Draft and Final)
- Quarterly Progress Reports and Briefings

TASK B: SYSTEMS ENGINEERING APPROACH

Effective development and implementation of the technical and institutional solutions to enable an efficient, interoperable, and replicable smart city demonstration requires rigorous application of established systems engineering best practices. To reduce the risk of schedule and cost overruns and increase the likelihood that the demonstration will meet users' needs, the Recipient shall provide evidence of following a systems engineering process when implementing its vision. Benefits of following such -an approach include improved stakeholder participation; more adaptable, resilient systems; verified functionality and fewer defects; higher level of reuse from one project to the next; and better documentation.

The International Council of Systems Engineering (INCOSE) defines *Systems Engineering* as:

> *"An interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem.*
>
> *Systems Engineering integrates all the disciplines and specialty groups into a team effort forming a structured development process that proceeds from concept to production to operation. Systems Engineering considers both the business and the technical needs of all customers with the goal of providing a quality product that meets the user needs."*

The USDOT recognizes the benefits of following a systems engineering approach and supports innovative approaches that a Recipient may follow that are tailored to fit the needs of their demonstration. The USDOT also recognizes that components of the Smart City Demonstration may be digital in nature and may use other incremental and iterative development concepts, such as agile software development, to deliver applications. These modern systems engineering techniques represent practical approaches that allow for system developers to provide an initial capability followed by successive deliveries to reach the desired final product. Iterative development considers adaptive planning, evolutionary development, early delivery, continuous improvement, and encourages rapid and flexible response to change. This incremental, fast-paced style of development may help keep the solution open and flexible to accept new features and technologies. These techniques can be used to reduce the risk of failure and enable the ability to test and deploy so that features may be added often and put into production easily. By addressing the whole experience from start to finish (e.g., actions taken on-line, through mobile applications, and off-line touch point) system developers are able to identify pain points and prioritizes activities according to public needs. Incremental and iterative development emphasizes velocity and adaptability throughout the entire lifecycle.

To document how the Recipient plans to follow a systems engineering approach, a Systems Engineering Management Plan (SEMP) shall be developed. The SEMP shall describe what systems engineering process the Recipient plans to follow during the execution of the project's work and how the Recipient plans to manage the specific systems engineering activities that will be performed during the project.

Systems engineering deliverables to support the smart city demonstration include:

- **Concept of Operations (ConOps).** A Concept of Operations (ConOps) serves as the foundation document that frames the overall smart city system and sets the technical course for a project. Its purpose is to clearly convey a high-level view of the system to be developed. A Smart City Demonstration ConOps should describe the city's holistic, integrated solution to be deployed for the Smart City Demonstration, and how operational practice should be altered based on the introduction of new applications. Among other elements, the ConOps should include a set of proposed high-priority "needs" through structured stakeholder interaction, a context diagram, discussion of enhancements to operational practices, and use cases or scenarios. The ConOps shall explicitly describe how the Recipient plans to interface with all proposed partners including current and anticipated USDOT partners Paul Allen's Vulcan, Inc., Mobileye, Autodesk, Amazon Web Services, NXP, Alphabet's Sidewalk Labs, and others. IEEE Standard 1362-1998 includes guidelines for format and content to support development of a ConOps.
- **Demonstration Site Map and Installation Schedule.** The Demonstration Site Map should identify the specific geographic area and indicate locations related to key issues, current and proposed roadside technology locations, connected automated vehicle operations, and other explanatory features to support strategies that align with the city's proposed strategies. During the course of the effort, the Demonstration Site Map should be updated to reflect any changes decided during the demonstration effort. In addition, the Recipient Project Team should create a Site Installation Schedule that identifies infrastructure installation activities. For each type of infrastructure element to be installed, this schedule shall indicate:
    - The type of infrastructure element to be installed;
    - Planned installation start and end dates for each infrastructure element;
    - Organization or individual responsible for the installation;
    - Milestone(s) identifying when the installation of each type of infrastructure element is completed; and
    - Planned start and end dates for unit testing the operation of each infrastructure element (by type).

- **Systems Requirements Specification (SyRS).** System requirements define *what* the system will do but not *how* the system will do it. Working closely with stakeholders, requirements should be elicited, analyzed, validated, documented, and baselined. IEEE Standard 1233-1998 includes guidelines for format and content to develop a System Requirements Specification (SyRS). Requirements should include:
    - Functional Requirements. Including communications, security, and safety requirements.
    - Interface Requirements. Including identification of relevant standards (where appropriate).
    - Data Requirements. Including data-sharing requirements.
    - Performance Requirements. Including system performance targets and performance requirements.
    - Security Requirements. Including limits to physical, functional, or data access, by authorized or unauthorized users.

  The requirements should identify what the systems must accomplish; identify the subsystems; and define the functional and interface requirements among the subsystems. The role of each subsystem in supporting system-level performance requirements should be identified, including associated subsystem functional, interface, performance, security, data, and reliability requirements.
- **System Architecture and Standards Plan.** A Systems Architecture Document and Standards Plan should be developed that documents the architecture for systems associated with the Smart City Demonstration and associated standards that will be used. The architecture document should consider:
    - Enterprise Architecture. Describes the relationships between organizations required to support the overall system architecture.
    - Functional Architecture. Describes abstract functional elements (processes) and their logical interactions (data flows) that satisfy the system requirements.
    - Physical Architecture. Describes physical objects (systems and devices) and their application objects as well as the high-level interfaces between those physical objects.
    - Communications Architecture. Describes the communications protocols between application objects.

The National ITS Architecture is a mature architecture that provides a common framework for the ITS community to plan, define, and integrate ITS solutions. The Connected Vehicle Reference Implementation (CVRIA) was developed to extend the National Architecture to include detailed information to support development of fully interoperable regional connected vehicle architectures. The CVRIA and the associated SET-IT software tool will be fully integrated into a comprehensive National ITS Architecture and single comprehensive software toolset to support development of interoperable regional architectures including complete ITS infrastructure and connected vehicle capabilities along with interface information needed for standards selection. Prior to integration into a single comprehensive ITS architecture with a single integrated software tool, the CVRIA (and associated SET-IT tool) and the National ITS Architecture (and the associated Turbo Architecture Tool) will be available to support systems architecture efforts. The USDOT envisions that the Recipient will use the CVRIA, the National ITS Architecture, and published and under-development ITS standards to demonstrate interoperable ITS capabilities which are nationally extensible.

To the extent viable, the USDOT envisions the Recipient will define and demonstrate integration of ITS systems with other systems which comprise a smart city. As part of this effort, the Recipient shall develop a Standards Plan that identifies the nature of required interfaces to other systems, which should be defined to utilize existing networking or other standards when available. In following the systems engineering process, the Recipient shall identify information exchange needs and/or use cases. To the extent that such exchanges are supported by standards, the Recipient should catalog applicable standards that will be used. Where new standards are needed, these needs should be fully documented in the Standards Plan. Further, to the extent viable, these interfaces should be documented using the CVRIA system architecture tools and feedback should be provided to the USDOT to facilitate expansion of CVRIA to accommodate these additional interfaces. To support nationwide deployment of ITS infrastructure and connected vehicle technologies, the Recipient should use existing ITS standards, architectures, and certification processes for ITS and connected vehicle based technologies whenever viable, and document those cases where such use is not viable. To provide information required to refine ITS architecture and standards in support of nationwide deployment, the Recipient should also document their experiences and cooperate with architecture and standards developers to improve the quality of these products based on lessons learned in deployment.

- **System Design Document (SDD).** System design is created based on the system requirements specification (SyRS) including a high-level design that defines the overall framework for the system. Subsystems of the system are identified and decomposed further into components. Requirements are allocated to the system components, and interfaces are specified in detail. Detailed specifications are created for the hardware and software components to be developed, and final product selections are made for off-the-shelf components. IEEE Standard 1016-1998 (IEEE Recommended Practice for Software Design Descriptions) includes guidelines for format and content in to develop a System Design Document (SDD).
- **System Test Plan.** A System Test Plan should be used to demonstrate that the system satisfies all of the requirements. The System Test Plan should identify what methods (i.e., analysis, demonstration, inspection, and testing) will be used to ensure that the developed system satisfies the system's requirements.
- **Interface Control Documents (ICDs).** Since there will be likely be multiple organizations involved in the Smart City Demonstration development effort, Interface Control Documents (ICDs) should be developed so that all parties can build components of the system that will work together. ICDs inform different organizations building parts of the system that must interact with each other what the specific elements of that interface are and how those elements must be expressed. ICDs could be as simple as specifying what types of connecting wires must be used to couple two manufacturers' devices together. ICDs may be as complex as specifying the protocol suites and standards that must be used to ensure that two different computer devices can communicate over some form of telecommunications.
- **Testing Documentation.** System Integration should take place to ensure that the different pieces of the Smart City system interoperate correctly. Integration Unit testing should take place to ensure that individual components meet their specifications. Integration should take place to confirm that all interfaces have been correctly implemented and to confirm that all requirements and constraints have been satisfied. System testing should verify that the developed system satisfies the system's requirements To support testing the Recipient should consider the following:
    - o Test Descriptions. Test Descriptions include written descriptions of the individual verification and validation processes that will occur as part of the effort to ensure that the system was built correctly and that the correct system was built. Test descriptions should be linked back to the

requirements whose fulfillment they will determine. The document should include a requirements-to-test procedure matrix that shows the test coverage relationship among the tests and the requirements. Every requirement should have at least one test case associated with it and each test case should have at least one requirement associated with it.

- Test Cases. Each test case include a set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular path within a system or a software application or to verify compliance with a specific requirement or set of requirements.
- Test Procedures. Test Procedures spell out exactly how one verifies and validates that the component of the system undergoing integration actually functions as intended and as desired. If test data are going to be used as part of the verification and validation process in this step, the test procedures should also spell out how one will determine that the system actually performed the correct transformations on the data entered.
- Test Data. Test Data should include scripts used to execute software operations, data that must be entered by someone as part of the process of verification and validation of the system and its component integration, or a description of what system-generated data will flow through different components of the system to accomplish a system function.
- Test Results. Documents that describe the results of each test conducted.

- **Operations and Maintenance Plans.** Operations and Maintenance (O&M) plans should describe policies and high-level procedures governing operation and maintenance of the system. Minimally, it should address the activities described in the project's Concept of Operations and any other activities needed to achieve the project's objectives.

Note: The Recipient may elect to conduct formal walkthroughs (see IEEE Standard 1028-1997) for key systems engineering deliverables to solicit inputs and feedback from stakeholders to help ensure consensus.

To support knowledge and technology transfer efforts, all systems engineering documentation developed for the Smart City Demonstration should be developed with the intent to share publically and be formatted for Section 508 compliance.

Required Deliverables

- Systems Engineering Management Plan (SEMP)
- Concept of Operations (ConOps)
- Demonstration Site Map and Installation Schedule
- Systems Requirements Specification (SyRS)
- System Design Document (SDD)
- System Architecture and Standards Plan
- System Design Document (SDD)
- System Test Plan
- Interface Control Documents (ICDs)
- Testing Documentation
- Operations and Maintenance Plans
- Other Systems Engineering documents – as identified by the Recipient and agreed to by the USDOT – that provide evidence of following a systems engineering approach

TASK C: PERFORMANCE MEASUREMENT

A primary objective of the Smart City Challenge is to demonstrate, quantify, and evaluate the impact of advanced technologies, strategies, and applications toward addressing the city's challenges. To understand the impacts of smart city strategies, a set of rigorously defined performance measures and associated quantitative performance targets for each performance measure that are achievable within the timeframe of the Smart City Demonstration shall be defined. A Performance Measurement Plan shall be developed by the Recipient that identifies performance measures as well as plans for collecting data and reporting on performance.

The Smart City Demonstration should focus on combinations of technology solutions that align with the USDOT's twelve vision elements. As part of the demonstration, the Recipient shall identify performance measures and a set of quantitative performance targets associated with each performance measure. Performance measures shall be developed to address how integrated Smart City strategies impact safety, mobility, ladders of opportunity, a transition to clean transportation, economic vitality, and/or address climate change.

In particular, performance measures should describe how the Smart City Demonstration may:

- Reduce traffic-related fatalities and injuries;
- Reduce traffic congestion
- Improve travel time reliability;
- Increase the use and integration of electric vehicles;
- Increase the transition to clean energy;
- Reduce transportation-related emissions;
- Improve personal mobility and increase accessibility for all citizens, including low-income individuals and persons with disabilities;
- Optimize multimodal system performance;
- Increase the number of mobility options and services;
- Improve public access to real-time integrated multimodal transportation information;
- Provide cost savings to transportation agencies, businesses, and the traveling public;
- Increase the connectivity between city services and connected travelers;
- Increase connectivity to employment, education, services and other opportunities; and/or
- Provide other benefits to transportation users and the general public.

The Performance Measurement Plan should discuss the types of data the Recipient plans to collect and how the Recipient plans to collect the data to support ongoing performance of the Smart City Demonstration. Proposed hypotheses should be documented as well as methodologies for collecting: (i) pre-demonstration data that can be used as a performance baseline, (ii) continuous data during life of the demonstration to support performance monitoring and evaluation, (iii) cost data including unit costs and operations and maintenance costs, and (iv) information on the timeframe that applications or other technology solutions are deployed during the course of the demonstration period. The Performance Measurement Plan should also address how the Recipient will release these performance measures as open data.

As part of the Smart City Demonstration, the Recipient is expected to respond to the USDOT's Survey on Deployment Tracking. The USDOT's Deployment Tracking Project has conducted national surveys on a regular basis since 1997, with the most recent previous survey conducted in 2013. The purpose of this effort is to assist the USDOT in measuring the deployment of ITS technology nationally. The ITS Deployment Tracking

Project surveys transportation agencies in the largest U.S. cities on a regular basis. For more information, visit: http://www.itsdeployment.its.dot.gov/. In addition, the Recipient may also be asked to respond to other USDOT survey instruments related to ITS or other deployment tracking.

Required Deliverables

- Performance Measurement Plan
- Response to USDOT Deployment Tracking Surveys (as required)

TASK D: DATA PRIVACY REQUIREMENTS

As noted elsewhere in this document, data collected by the Recipient in connection with the Smart City Demonstration will include Personally Identifiable Information (PII) and Sensitive Personally Identifiable Information (SPII).

- **PII** is information that can be used to distinguish or trace an individual's identity, such as their name, Social Security number, biometric records, etc., alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name. The definition of PII is not anchored to any single category of information or technology. Rather, it requires a case-by-case assessment of the specific risk that an individual can be identified by examining the context of use and combination of data elements. Non-PII can become PII whenever additional information is made publicly available. This applies to any medium and any source that, when combined with other available information, could be used to identify an individual
- **SPII** is a subset of PII which if lost, compromised or disclosed without authorization, could result in substantial harm, embarrassment, inconvenience, or unfairness to an individual. Sensitive PII requires stricter handling guidelines because of the increased risk to an individual if the data are compromised. The following PII is always (de facto) sensitive, with or without any associated personal information:
    - Social Security number (SSN)
    - Passport number
    - Driver's license number
    - Vehicle Identification Number (VIN)
    - Biometrics, such as finger or iris print

- Financial account number such as credit card or bank account number
- The combination of any individual identifier and date of birth, or mother's maiden name, or last four of an individual's SSN

In addition to de facto Sensitive PII, some PII may be deemed sensitive based on context.

Categories of Records Collected. Typically, the Recipient may include many of the following forms of personal information about individual participants and their motor vehicle and motor vehicle use:

Participant Background Information

- Individual Identifiers;
- Full Name (First, Middle, Last);
- Demographic information, including age and gender;
- Individual subject research identifier created by DOT; and
- Driver's license number, issuing state, and qualifiers.

Vehicle Identifiers

- Personal vehicle identification number (VIN) and registration information;
- Vehicle Identification Number (VIN) of government issued vehicles; and
- Identifiers for equipment installed by DOT in personal or government issued vehicle.

Contact Information

- Mailing/Residential Address;
- Phone number(s);
- Email address(es);
- Institutional or organizational affiliation;
- Work/Business related contact information; and
- Occupation and work schedule.

Eligibility Information

- Driver history and habits;
- Medical history relevant to the scope of the research project; and
- Outcomes of criminal background check.

Project Information

- Vehicle sensor information;
- Video or still images, including infrared;
- Audio recordings;
- Dynamic information about a vehicle, including location, heading,
- proximity to and interaction with other vehicles and infrastructure;
- Dynamic information about a driver's interaction with the vehicle, including steering wheel, turn signal, and accelerator and brake pedal positions; and
- Data collected from drivers by means of surveys, focus groups, or interviews.

USDOT Data Privacy Policy. Improper handling of PII or SPII by a Recipient could have significant adverse impacts on the privacy of individuals. For this reason, USDOT is committed to ensuring that the Recipient institutes sufficient data privacy controls to mitigate the risk of harm to individuals that would result in the improper handing or disclosure of the PII and SPII collected from individuals in connection with a DOT-funded Smart City Transportation Project.

The Recipient shall:

- Devote sufficient resources, and develop and adhere to policies and procedures to ensure that privacy-risks stemming from a Smart City Demonstration are mitigated appropriately and in accordance with the privacy controls identified below;
- Develop and submit for USDOT approval a Data Privacy Plan that documents the technical, policy and physical controls that it will put in place (and require its sub-grantees and contractors to put in place) to mitigate potential privacy harms; the plan should include a System Security Plan (SSP) or other documentation sufficient to verify that the Recipient will store PII only on IT infrastructure that is subject to appropriate security controls;
- Ensure that sub-recipients, contractors, and partners who handle or may access PII or SPII developed by the Recipient in connection with a Smart City Demonstration adhere to the Recipient's Data Privacy Plan and have policies and procedures in place to safeguard the security and privacy of participant data. To this end, the Recipient shall include in all sub-grant agreements and contracts appropriate data security and privacy requirements;
- Upon request by USDOT, provide sufficient documentation to demonstrate that its IT infrastructure, policies and procedures (and those of any sub-grantee or

contractors having access to PII or SPII) comply with the privacy control requirements set forth below, including but not limited to confirming that PII and SPII will be stored only on IT infrastructure employing security controls commensurate with the risk to the individual that would result from unauthorized access, disclosure, or use of the information.

Required Privacy Controls. Generally, the Recipient (and their sub-awardees and contractors) shall develop and document in their Data Privacy Plan the following privacy controls, which shall apply (as appropriate) throughout the data lifecycle:

- Collection of PII
  - Collect only PII that the researcher has been authorized to collect by USDOT.
  - Collect the minimum PII required for the research and not more.
- Notice to Human Subjects
  - Provide appropriate advanced notice, if at all possible at the point of collection, to the individuals from whom the PII is being collected.
  - Obtain advanced approval for the notice from the USDOT Contracting Officer.

  Use and Sharing of PII
  - Ensure that Recipient personnel acknowledge PII responsibilities to ensure that PII is used only as authorized.
  - Not use PII for purposes other than those authorized by USDOT.
  - Ensure that access to PII is on a "need to know" basis for authorized purposes only.
  - Not exceed authorized access to PII, or disclose PII to unauthorized persons.
- Security
  - Protect all PII, electric or hardcopy, in their custody from authorized disclosure, modification, or destruction so that the confidentiality, integrity and availability of the information are preserved.
  - Store PII only on IT infrastructure employing security controls commensurate with the risk to the individual that would result from unauthorized access, disclosure, or use of the information.
  - Encrypt all PII in transit or at rest.
  - Encrypt all PII transmitted or downloaded to mobile computers/devices.

- Ensure that all individuals having access to PII have received training in the policies and procedures that protect PII**.**

- Maintenance and Disposal
  - Maintain PII in accordance with the applicable NARA records schedule (available from the NHTSA Contracting Officer or, in the case of NHTSA–conducted research, from the NHTSA Records Officer).
  - After conclusion of the research project, maintain PII only as permitted by the NARA schedule and, in the case of contractor-conducted research, relevant data rights classes in the applicable contract.
- Privacy Documentation
  - Document compliance with the provisions of the Recipient's Data.
  - Privacy Plan and the Data Privacy and Security provisions in the Grant Agreement.
  - Upon request, provide to the USDOT Contracting Officer sufficient documentation to demonstrate compliance with the Recipient's Data Privacy Plan and the Data Privacy and Security provisions in the Grant Agreement.
- Privacy Reporting
  - Immediately report to the USDOT Contacting Officer any suspected loss of control or any unauthorized disclosure of PII by the Recipient, its sub-grantees or contractors.
  - Immediately report to the USDOT Contacting Officer all suspected or actual unauthorized collection, use, maintenance, dissemination or deletion of PII by the Recipient, its sub-grantees or contractors.

Additional Information. There are many types of privacy and security controls available to safeguard the confidentiality of PII. NIST Special Publication 800-122 (Guide to Protecting the Confidentiality of PII)[2] provides guidelines for a risk-based approach to protecting the confidentiality of PII. Additional information about privacy and security safeguards that may protect PII can be found in Appendix J to NIST Special Publication 800-53.[3] Furthermore, NIST provides guidance regarding big data

[2] NIST Special Publication 800-122 (Guide to Protecting the Confidentiality of PII) may be found at: http://csrc.nist.gov/publications/nistpubs/800-122/sp800-122.pdf

[3] NIST Special Publication 800-53, Appendix J (Security and Privacy Controls for Federal Information Systems and Organizations) can be found at: http://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-53r4.pdf

architectures and security requirements in NIST Special Publication 1500-1[4] and NIST Special Publication 1500-4.[5]

The Recipient may wish to include in their Data Privacy Plan the following checklist to help demonstrate that they considered the privacy and security controls detailed above. It also may be used by the Recipient to help verify that its subawardees and subcontractors have done so.

Checklist. Please review NIST Special Publication 800-122 for additional information about the questions below or the information that the Recipient may be required to produce in connection with their Privacy Plans. If you still require assistance, please contact the Agreement Officer handling the relevant procurement/contract for additional information.

1. Has your organization ever performed work for a Federal agency that involved handling PII?

   Yes. The City handles Federal Tax Information governed by IRS Publication 1075. IRS Contact: Jackie Nielson, Fed State Coordinator, Ohio District Dept. of the Treasury, 614-280-8739

2. Does your organization have any policies/procedures to protect the security and confidentiality of PII?

   Yes. The City has Executive Orders, policies and procedures to protect the security and confidentiality of PII. City Executive Orders and Policies are posted at https://www.columbus.gov/hr/Executive-Orders-and-Policies/

3. Does your organization have any policies/procedures to control and limit access to PII?

   Yes. The City has Executive Orders and Policies to control and limit access to PII. City Executive Orders and Policies are posted at https://www.columbus.gov/hr/Executive-Orders-and-Policies/

[4] NIST Big Data Interoperability Framework: Volume 1 Definitions, http://dx.doi.org/10.6028/NIST.SP.1500-1

[5] NIST Big Data Interoperability Framework: Volume 4, Security and Privacy, http://dx.doi.org/10.6028/NIST.SP.1500-4

4. Does your organization store PII on network drives and/or in application databases with proper access controls (i.e., User IDs/passwords)?

   Yes. The City assigns unique identifiers and requires complex passwords.

5. Does your organization limit access to PII only to those individuals with a valid need to know?

   Yes. The City limits access to PII only to those individuals with a valid need to know.

6. Does your organization prohibit or strictly limit access to PII from portable and mobile devices, such as laptops, cell phones, and personal digital assistants (PDA), which are generally higher-risk than non-portable devices (e.g., desktop computers at the organization's facilities)?

   Yes. Executive Order 2007-03 prohibits such actions.

7. Does the information system used by your organization to store PII contain automated or easy-to-use process to ensure that only authorized users access PII – and only to the extent that each user has been authorized to do so?

   Yes. The City uses Active Directory to assign unique identifiers, require complex passwords and control access to private or sensitive information.

8. Does your organization monitor events that may affect the confidentiality of PII, such as unauthorized access to PII?

   Yes. The City monitors events and configures alerts for events that may affect the confidentiality of PII.

9. Does your organization audit its information systems on a regular or periodic basis?

   Yes. The City performs security assessments by various methods including access, rule and configuration reviews. The City is also subject to external audits including an IRS Safeguards Review.

10. Does your organization analyze information system audit records for indications of inappropriate or unusual activity affecting PII, investigate suspicious activity or suspected violations, report findings to appropriate officials, and take necessary actions?

    Yes. The City has a Security Incident Response Plan written to provide a well-defined, organized approach for handling any potential threat to systems and data.

11. Does your organization restrict access to information system media containing PII, including digital media (e.g., CDs, USB flash drives, backup tapes) and non-digital media (e.g., paper, microfilm)?

    Yes. The City maintains strict control over the internal or external distribution of any kind of media. Digital containing sensitive information is physically secured from unauthorized access, labeled, inventoried and is tracked via logs. Non-digital media containing sensitive information is only kept when necessary for business purpose and physically secured from unauthorized access.

12. Does your organization restrict access to portable and mobile devices capable of storing PII?

    Yes. Executive Order 2007-03 prohibits copying sensitive information to such devices.

13. Does your organization require that information system media and output (such as printed documents) containing PII be labeled to indicate appropriate distribution and handling?

    Yes. PO 22 requires that media must be classified so that the sensitivity of the data can be determined.

14. Does your organization securely store PII, both in paper and digital forms, until the media are destroyed or sanitized using approved equipment, techniques, and procedures?

    Yes. Physical and logical access to media containing PII is strictly controlled. Encryption is used on digital media.

15. Does your organization sanitize digital and non-digital media containing PII before disposing of or reusing the media?

    Yes. Paper media is destroyed using cross cut shredders. Digital media is sanitized prior to reuse or destroyed as part of disposal.

Required Deliverables

- Data Privacy Plan

TASK E: DATA MANAGEMENT AND SUPPORT FOR INDEPENDENT EVALUATION

Management systems within a smart city – both within transportation and across other sectors of a city – are expected to share data to allow for communication between cities and their citizens and enable an open, growing ecosystem of third part services that provide additional benefits to citizens. Systems that allow for data sharing also enable cities to maximize efficiencies through intelligent management of assets across sectors. Open data and technology enable the efficient coordination, use, and management of all mobility services in the system. A Data Management Plan should be submitted per requirement of the USDOT Public Access Plan. Requirements are outlined at http://ntl.bts.gov/publicaccess/creatingaDMP.html.

The Recipient shall develop a Data Management Plan that describes how data – including data across multiple sectors in a city – will be collected, managed, integrated, and disseminated before, during, and after the Smart City Demonstration. This includes real-time and archived data that are inputs to and outputs from systems managed by the city and its partners. The document shall discuss the city's plans for managing their data as a strategic asset and making open, machine-readable data available to the public – subject to applicable privacy, security and other safeguards – to fuel entrepreneurship and innovation to improve citizens' lives, create jobs, and spur economic development. In cases where the data includes PII or other restrictions, the document shall address how the city the city will make that data available, as possible, in a secure environment for the use of qualified researchers. The Data Management Plan shall also describe:

- The data the city currently collects and plans to collect as part of the Smart City Demonstration and how these data will be used by the lead agency, project partners, other agencies, and stakeholders to further address city challenges.

- Opportunities to integrate transportation data with other functions or services in a city (such as public safety, human services, transit, and public works) to improve the management and operations of the city. Likewise, it shall describe how other data could be integrated with transportation data to improve transportation operations.
- The terms of existing and future data sharing agreements that will be put in place during the project period and the city's approach to preserving project data for future use. If the city plans to partner with outside organizations (nonprofits, universities, corporations, etc.) it shall address whether and specify how (e.g., limitation on sharing or use) data from those organizations or interests will be collected, managed, and shared across sectors or with the public, if appropriate.
- The terms and conditions that exist or will be established and managed in partnership agreements, data or information sharing agreements, agency specific policies and operating procedures to establish and maintain the systems and interfaces to maintain the integrity of the data and share the information identified in the plan.
- Practices that safeguard data, privacy, and physical assets. The Data Management Plan shall identify the extent to which their system or systems will collect or store Personal Identifiable Information (PII) and PII-related information, and ensure that there is a legitimate need for this information to meet the goals of the system and that the data is only accessible for and used for these legitimate purposes. If PII is collected, practices for scrubbing or removing PII from data sets shall be described so that data may be used for independent evaluation and/or made available to the USDOT's Research Data Exchange (RDE).

As part of the Smart City Demonstration, an Independent Evaluation will be conducted by the USDOT. The Independent Evaluator will conduct an evaluation applying quantitative and qualitative evaluation methodologies to conduct before and after performance assessments; cost-benefit assessments of the demonstration; assess user acceptance/citizen satisfaction of the demonstration; document lessons learned, challenges and approaches for mitigating, addressing, and /or overcoming them; estimate total impacts, costs, and return-on-investment (ROI) of the demonstration; and assess if the Smart City Demonstration achieved its vision.

The Recipient shall develop an Evaluation Support Plan detailing their expected support to the independent evaluation effort. During demonstration, the Recipient shall execute its Evaluation Support Plan. The support may include provision of frequently collected

data and corresponding meta data; provision of frequently monitored performance measures estimates and desired targets; limited availability of the site for the independent evaluators to conduct additional field tests and experiments to supplement data not available from the site; and participation in surveys and interviews conducted by the independent evaluators.

Systems deployed as part of the Smart City Demonstration must be capable of generating the data needed to calculate measures over time – that is, to show how well the systems are performing with respect to performance measures and targets identified in the Performance Measurement Plan. Independent evaluation will also be required to validate site system performance with respect to the targeted measures, to collect or infer contextual data that allows for the isolation and mitigation of confounding factors, and to provide supplementary evaluation with respect to a broader set of safety, environmental, mobility and public agency efficiency measures of interest to USDOT. The Recipient is responsible for supporting the independent evaluator's access to the site and to site staff to conduct evaluation-related experiments, interviews, and surveys.

To support independent evaluation, the Recipient shall apply data quality measures and processes including security protocols to convert the raw data into processed, quality data and ensure that those data are stored in a secure database, with the database schema defined by the Independent Evaluator. The Recipient shall securely transmit these data to support evaluation, on a schedule and using a medium agreed upon with the Independent Evaluator, to the Independent Evaluator's location. Data collected for use by the Independent Evaluator shall be considered "owned" by the USDOT. The Recipient shall transmit only those data required to support evaluation by the Independent Evaluator; any additional data that the site collects for its own use shall also be stored in its own secure data storage system, but kept separate from data required by the Independent Evaluator and the USDOT. However, the Recipient may use data collected for the Independent Evaluator in its own analyses.

Connected vehicle, mobile device, and infrastructure sensor data captured during the Smart City Demonstration are expected to be broadly shared with the community to inform prospective deployers of smart city applications. Incorporating data sharing practices into the overall design of the Smart City Demonstration will also enable more innovation and participation. However, data sharing is subject to the protection of intellectual property rights and personal privacy and must be handled securely. Appropriately prepared system control, performance and evaluation data are expected to be shared with the USDOT and posted in timely fashion on resources such as the

Research Data Exchange (RDE) (www.its-rde.net) stripped of PII. The USDOT envisions that this data sharing capability will better support the needs of ITS researchers and developers while reducing costs and encouraging innovation. Data accessible through the RDE will be well-documented and freely available to the public. The USDOT expects appropriate data – determined by the Recipient and the USDOT – to be made freely available to the public on the RDE. Hence, the Recipient shall transfer appropriate data collected under the Smart City Demonstration to the RDE.

While the RDE currently only supports dissemination of archival data that has been stripped of PII, the USDOT may develop future capabilities to support the dissemination of real-time data, sharing sensitive data with qualified researchers, and automate cleansing of data sets to remove PII to enable public dissemination. The USDOT expects to work closely with the Recipient to ensure that data produced during the demonstration is shared efficiently and cost effectively, leveraging these and other shared resources as appropriate to increase the completeness and timeliness of data exchange.

Preference for real-time data from third party providers, etc.
The Recipient shall enter into Memoranda of Understanding (MOU) or equivalent with third party providers of data, including Contractors, that document the terms under which the data is being provided or acquired. The Recipient shall require, to the extent possible, such agreements to state that third party data sources shall be provided as real-time data streams and provide the Recipient with unlimited rights to use and disseminate the real-time and archived data for any purpose, consistent with applicable data security and privacy requirements.

Requirement for real-time BSM data feed, though flexibility on scale
During the Smart City Demonstration, the Recipient shall provide a real-time, streaming data feed from Connected Vehicles (CV), including but not limited to the Recipient's standards-compliant Basic Safety Message (BSM) data, for operational testing and use by the Recipient and third party users.

> Note: To control costs and complexity, the Recipient may choose to limit the scale and scope of this real-time data feed. For example, the Recipient may limit the geographic area from which this real-time data will be disseminated or the length of time the real-time feed will be made available.

Preference for open source tools
The USDOT strongly prefers that the Recipient acquire and develop open source technologies throughout the course of the Smart City Demonstration and that any code developed for the project is, via contract or equivalent mechanism, open source and available for license-free use and enhancement by third parties. Data rights under this agreement shall be in accordance with 2 CFR 200.315, Intangible property.

Required Deliverables

- Data Management Plan
- Independent Evaluation Support Plan
- Data to support USDOT's Independent Evaluation
- Data provided to the USDOT's Research Data Exchange (RDE)

TASK F: SAFETY MANAGEMENT AND SAFETY ASSURANCE

The Recipient shall describe any underlying safety needs associated with the safety of all travelers, subjects, and other personnel associated with the Smart City Demonstration.

The Recipient shall develop a Safety Management Plan that includes a systematic approach to achieving acceptable levels of safety risk with the demonstration. The Recipient shall establish and define the methods, processes, and organizational structure needed to meet safety goals. These processes should build upon the processes and procedures that already exist for city operations, but also consider how new strategies deployed as part of the Smart City Demonstration may impact those processes. Safety scenarios shall be developed that are related to the applications and technologies – including but not limited to automated vehicle deployments – selected for demonstration. These scenarios shall include an analysis of likelihood and potential impact. Potential mitigating actions taken at various times and locations shall be identified for each scenario. A set of "safety needs" shall be derived from this scenario-based analysis. The Recipient shall identify levels of safety risk associated with the Smart City Demonstration, using established processes where possible, (e.g., ISO 26262 ASIL). The nature of these assessment processes will be dependent on the applications selected and the nature of the specific safety risks.

During the demonstration, the Recipient shall evaluate the continued effectiveness of implemented risk control strategies and support the identification of new hazards. The

Recipient shall continually provide insight and analysis regarding methods/opportunities for improving safety and minimizing risk.

If some or all components of the Smart City Demonstration plan to use human participants, the Recipient shall obtain Human Use Approval from an accredited Institutional Review Board (IRB). Under federal regulations, an IRB is a group of individuals that has been formally designated to review and monitor research involving human subjects. In accordance with federal regulations, an IRB has the authority to approve, require modifications in (to secure approval), or disapprove research. This review serves an important role in the protection of the rights and welfare of human research subjects. The purpose of IRB review is to assure, both in advance and by periodic review, that appropriate steps are taken to protect the rights and welfare of humans participating as subjects in the research. Certain IRBs have been "accredited" by private accreditation agencies. Note that the USDOT will not act as an IRB for the purposes of this award. The Recipient is responsible for obtaining IRB approval for human participation within the Smart City Demonstration.

Required Deliverables

- Safety Management Plan
- Human Use Approval Summary

TASK G: COMMUNICATIONS AND OUTREACH

The Recipient shall have a comprehensive communications and outreach program that covers both outreach activities and the accommodation of requests for site visits by media, researchers, and others. Communications and outreach should consider:

- Media strategy for both local and national press;
- Media coordination with the USDOT;
- Web/social media presence;
- Trade show strategy;
- Outreach strategy to promote the demonstration locally;
- Community awareness strategy;
- Crisis communications plan in case of unforeseen events, natural disasters, and other threats; and
- Accommodation of site visits and demonstration of capabilities.

Public relations and marketing should consider the delivery of:

- News articles, press releases, brochures, fact sheets;
- Photos;
- Website content;
- Videos;
- Talking points, press events, PowerPoint slide decks; and
- Trade show events.

For Recipient consideration, levels of outreach are expected to include:

- Two local press conferences each year;
- Three articles a year to be published in industry trade journals;
- A promotional video (6-12 minutes) about the Smart City Demonstration, including two additional updates;
- A Smart City Demonstration website;
- Travel and participation in six workshops/conferences/trade shows each year with one of them being international; and
- Participation in four public USDOT-organized webinars per year regarding Smart City Challenge Demonstration progress/performance and lessons learned.

The Recipient shall include regular coordination with USDOT communications staff, to facilitate the branding, re-use and re-distribution of materials developed by USDOT and the Smart City Demonstration team.

Required Deliverables

- Communications and Outreach Plan
- Public relations and marking materials defined by the Recipient
- Outreach Products, including:
    - A promotional video (6-12 minutes) about the Smart City Demonstration, including two additional updates;
    - A Smart City Demonstration website;
    - Travel and participation in six workshops/conferences/trade shows each year with at least one outside of the United States or in support of international cooperation; and
    - Participation in four public USDOT-organized webinars per year regarding Smart City Challenge Demonstration progress/performance and lessons learned.
- Other communications and outreach deliverables as identified by the Recipient

TASK H: INTERNATIONAL COLLABORATION

The USDOT is interested in sharing lessons learned from the Smart City Demonstration with its international partners. The USDOT currently has memorandums of understanding (MOUs) with the European Commission, Japan, Korea, Canada, and Mexico. The Recipient will be expected to collaborate on similar projects with international partners with which USDOT has research coordination agreements for the purpose of expanded learning. The format of the collaboration may include hosting foreign scanning tours, complementary alignment of evaluation activities, or it could involve a partial alignment of deployment or research activities and objectives to create twinned complementary project components. These exchanges assume that the international partners will fund projects on topics of relevance to the USDOT, and that an agreement can be reached among the international partners, USDOT, and the program managers of the research and deployment programs. The USDOT will identify areas of shared interest with its international partners from among awarded programs and initiate collaboration discussions. No funds will be exchanged between USDOT and foreign-funded programs; each side will have responsibility for their respective budgets.

The proposal should include an estimate of travel funds needed for three team members to participate in one international and one US meeting each year of approximately three days duration, plus six days of effort for meeting preparation, and six days for reports preparation associated with the collaboration aspects of this project. These terms are for planning purposes only and do not constitute a commitment by the USDOT to support research exchange with foreign-funded programs; USDOT reserves the right to renegotiate these terms as funding, priorities, and opportunities for collaboration with the international partners may change.

Required Deliverables

- Participation in one International Collaboration meeting each year of approximately three days duration, plus six days of effort for meeting preparation, and six days for reports preparation associated with the collaboration aspects of this project

TASK I: PARTICIPATION IN RELEVANT ITS ARCHITECTURE AND STANDARDS DEVELOPMENT EFFORTS

The Recipient shall assist in supporting activities of the ITS Architecture and Standards Programs where those activities are impacted by Smart City initiatives. Making use of published and developmental ITS architectures and standards, the Recipient will encounter cases where additional needs become evident as well as cases where improvements or corrections to existing architecture and standards are warranted. The Recipient shall take appropriate actions to assure that these lessons-learned are made available to support evolution of architecture and standards to improve suitability to support nationwide or greater interoperability of ITS as well as interoperability of ITS with other smart city systems and architectures. Such support will include participation in select Standards Development Organization (SDO) working groups/committees, including providing input to their work in the form of technical information (e.g., objectives, user needs, data requirements) about the Smart City initiative and lessons learned from Smart City Development and deployment activity. When appropriate, in-person participation in select meetings will be included. Participation in relevant ITS Standards development efforts may include providing technical input for multiple SDOs and standards-relevant organizations such as the International Organization for Standardization (ISO) Technical Committee 204 (TC204) and possibly TC22, European Telecommunications Standards Institute (ETSI), European Committee for Standardization (CEN), Institute of Electrical and Electronics Engineers (IEEE), SAE International (SAE), Institute of Transportation Engineers (ITE), American Association of State Highway and Transportation Officials (AASHTO), National Electrical Manufacturers Association (NEMA), and National Institute of Standards and Technology (NIST).

The Recipient is expected to provide one appropriately knowledgeable expert for this participation. In-person participation requirements are estimated at 6 meetings of 3 days each per year, of which 2 are expected to be held outside of the United States. Additional efforts are expected to be required including remote participation during conference calls/webinars as well as drafting of technical input. The Recipient shall request USDOT prior approval for all international travel. The USDOT covers labor and travel costs associated with architecture and standards participation from the Recipient and private sector participants. For each working group/committee meeting with in-person participation, the Recipient shall provide a report to the USDOT describing the meeting outcomes, any impacts to the Smart City Demonstration, and inputs made by the Smart City program.

Required Deliverables

- Attendance at 6 architecture and standards meetings, of which 2 are expected to be held outside of the United States
- Architecture and Standards Meeting Trip Reports

TASK J: INTERIM AND FINAL REPORTING

The USDOT requires the Recipient to submit interim and final reports. Interim reports shall be submitted each year discussing the progress to date and summarizing issues and opportunities. A final report for the Smart City Demonstration shall provide a summary of what was accomplished, the benefits and costs and lessons learned. This document shall be developed with the intent to share publically and be formatted for Section 508 compliance. The final report shall describe:

- Deployment costs (i.e., systems and unit costs) and operational costs (i.e., operations and maintenance costs) of the project compared to the benefits and cost savings the project provides; and
- How the project addressed city challenges and met the original expectations defined in the city's Smart City vision, such as —
    - Data on how the demonstration helped to improve safety, mobility, sustainability, ladders of opportunity, economic vitality, and/or address climate change;
    - The effectiveness of providing a holistic approach to addressing transportation challenges by deploying applications and strategies consistent with the USDOT's twelve vision elements; and
    - Lessons learned and recommendations describing how the demonstration met the objectives identified by the USDOT for the Smart City Challenge and recommendations for other locations considering implementation of similar solutions.

Required Deliverables

- Smart City Demonstration Interim Reports (annually)
- Smart City Demonstration Final Report

6. TABLE OF DELIVERABLES

The following due dates are based on an estimated award effective date of August 31, 2016.

In the event an update to the due dates contained in the following Table of Deliverables is required and/or deemed necessary by the parties, the update, when expressly approved by the AOR in writing, shall replace the previously approved version of the Table and will be considered incorporated into this award by reference with no formal agreement amendment needed. The Recipient shall comply with the latest version of the Table as expressly approved in writing by the AOR. The Recipient shall implement a version tracking approach to efficiently manage updates to the Table. The Recipient shall include the latest approved version of the Table in the Task A Project Schedule Monthly Updates, or if applicable, include a proposed Table update for consideration by the AOR. Proposed Table updates shall be supported by adequate narrative justification to fully explain the need for the update.

Task	Deliverable	Due Date	Section 508 Compliant?
A	Kick-off Meeting – conduct a kickoff meeting at the USDOT or the Recipient's site.	Within four weeks after award	No
A	Project Management Plan (PMP)	10/24/2016	No
A	Project Schedule	9/26/2016	No
A	Project Schedule Monthly Updates	Monthly	No
A	Partnership/Stakeholder Status Summary (Draft and Final)	9/26/2016	No
A	Quarterly Progress Reports and Briefings – submit progress reports to document technical activities performed. See Quarterly Progress Reports clause below.	Quarterly	No
B	Systems Engineering Management Plan (SEMP)	11/21/2016	Yes

Task	Deliverable	Due Date	Section 508 Compliant?
B	Concept of Operations (ConOps)	2/27/2017	Yes
B	Demonstration Site Map and Installation Schedule	3/31/2017	Yes
B	Systems Requirements Specification (SyRS)	6/12/2017	Yes
B	Interface Control Document (ICD)	7/3/2017	Yes
B	System Design Document (SDD)	9/18/2017	Yes
B	Test Plan (TP)	8/13/2017	Yes
B	System Architecture and Standards Plan	3/24/2017	Yes
B	Other Systems Engineering documents – as identified by the Recipient and agreed to by the USDOT – that provide evidence of following a systems engineering approach	TBD	Yes
C	Performance Measurement Plan	12/21/2016	Yes
C	Response to USDOT Deployment Tracking Surveys (as required)	TBD	No
D	Data Privacy Plan	7/31/2017	Yes
E	Data Management Plan	7/3/2017	Yes
E	Independent Evaluation Support Plan	12/21/2016	Yes
E	Data to support USDOT's Independent Evaluation	TBD	No
E	Data provided to the USDOT's Research Data Exchange (RDE)	TBD	No
F	Safety Management Plan	11/21/2016	Yes

Task	Deliverable	Due Date	Section 508 Compliant?
F	Human Use Approval Summary	2/1/2017	No
G	Communications and Outreach Plan	12/5/2016	Yes
G	A promotional video (6-12 minutes) about the Smart City Demonstration, including two additional updates;	TBD	Yes
G	A Smart City Demonstration website	11/18/2016	Yes
G	Travel and participation in six workshops/conferences/trade shows each year with one of them being international	TBD	No
G	Participation in four public USDOT-organized webinars per year regarding Smart City Challenge Demonstration progress/performance and lessons learned	TBD	No
H	Participation in one International Collaboration meeting each year of approximately three days duration, plus six days of effort for meeting preparation, and six days for reports preparation associated with the collaboration aspects of this project	TBD	No
I	Attendance at 6 architecture and standards meetings, of which 2 are expected to be held outside of the United States	TBD	No
I	Architecture and Standards Meeting Trip Reports	TBD	No

Task	Deliverable	Due Date	Section 508 Compliant?
J	Smart City Demonstration Interim Reports (annually)	Last Friday of September (annually)	No
J	Smart City Demonstration Final Report	9/23/2020	Yes

Note: Section 508 requirements are included in the General Terms and Conditions available online at: http://www.fhwa.dot.gov/aaa/generaltermsconditions.cfm.

7. PUBLICATION GUIDELINES

All ITS reports funded in full or in part by the USDOT'S ITS Joint Program Office (JPO), such as this award, must be published in the National Transportation Library (NTL), formerly EDL. NTL was established in 1998 by the Transportation Equity Act for the 21st Century (TEA-21) to maintain and facilitate access to statistical (and other) information needed for transportation decision-making at the Federal, State, and local levels and to coordinate with public and private transportation libraries and information providers to improve information sharing among the transportation community. All reports are cataloged, meta tagged, sourced, summarized in abstract form and are published by the USDOT.

For the documents designated to be Section 508 Compliant above, the ITS JPO Publication Guidelines apply. The Guidelines are available online:

http://its.dot.gov/communications/pubsguidance.htm

SECTION B – FEDERAL AWARD INFORMATION

1. TYPE OF AWARD

The award type is a Cooperative Agreement. This agreement is a cost-reimbursement award.

2. COST SHARING OR MATCHING

Cost sharing or matching is required in the amount cited on page 2 of this agreement. Per 2 CFR 200.29, Cost sharing or matching means the portion of project costs not paid by Federal funds. See 2 CFR 200.306, Cost sharing or matching. The following amounts, as included in the approved Budget Application (Attachment 3), are hereby incorporated into this award as required Cost Sharing or Matching, subject to the terms of the award and the requirements of 2 CFR 200.

Estimated Funding Source	**Estimated Cost Share Amount**	**Estimated Cash/In-kind**
City of Columbus	$8,000,000	Cash
State of Ohio (Ohio DOT)	$7,000,000	In-kind
Franklin County	$4,000,000	$1,000,000 cash, $3,000,000 in-kind
Total	$19,000,000	

Costs incurred by the Recipient to satisfy the cost sharing or matching requirement must be allowable under 2 CFR 200 and incurred during the period of performance of the agreement.

3. PERIOD OF PERFORMANCE

The period of performance for this Cooperative Agreement is four years from the effective date of the award.

The USDOT expects the demonstration to be implemented and tested within three years. The fourth year is expected to be used for finalizing the evaluation of the demonstration.

Ideally, the awardee, on a self-sustaining basis, will continue to operate the systems and services implemented in the Smart City Challenge after completion of the USDOT funded demonstration.

The Recipient may charge to the Federal award only allowable costs incurred during the period of performance (except as described in 2 CFR §200.461 Publication and printing costs) and any costs incurred before the Federal awarding agency made the Federal award that were authorized by the Federal awarding agency.

4. DEGREE OF FEDERAL INVOLVEMENT

The USDOT anticipates substantial Federal involvement between it and the Recipient during the course of this demonstration. The anticipated Federal involvement will include technical assistance, education and guidance to the Recipient.

5. LEVERAGED PARTNER RESOURCES

In addition to the Federal Share and the Recipient Cost Share identified on page 2 of the agreement, the Recipient shall use Leveraged Partner Resources to fund and perform the demonstration. Leveraged Partner Resources are resources from third party organizations in support of the demonstration. "Key" Leveraged Partner Resources, listed below, are considered essential to the demonstration and are, therefore, approved and incorporated into this award for informational and reporting purposes. The Key Leveraged Partner Resources listed herein are **not** subject to the requirements of 2 CFR 200, or the terms of the award, except as cited below.

The Technical Application and Budget Application dated July 29, 2016 are based on knowledge of partnership agreements as of the application date. Any new partnership agreements may affect the Applications, requiring updates/amendments in the future.

Requirement to Provide Copies of Key Partner Agreements: The Recipient shall provide to the Agreement Officer electronic copies of all signed Key Partner agreements, and any subsequent agreement amendments executed during the award period of performance. The Recipient shall submit such agreements and amendments within one week after execution of the agreement or amendment.

Requirement for Prior Approval of Changes to Key Partners and Agreements: The following list of Key Leveraged Partner Resources is hereby approved and incorporated into this award for informational and reporting purposes. In the event the Recipient

determines the need to remove, replace, or divert a Key Leveraged Partner Resource, or significantly change the nature of a Key Partner agreement, the Recipient must notify the Agreement Officer in writing to request prior written approval of the change. The Recipient's request shall provide details of the proposed change, describe the circumstances of the change, and provide the Recipient's assessment of the impact of the change upon the demonstration. The Recipient must obtain prior written approval from the Agreement Officer before entering into a new agreement with the proposed replacement partner or resource, or executing an amendment that significantly changes a Key Partner agreement. This requirement will enable the USDOT to review and approve in advance significant changes in the planned use of Key Leveraged Partner Resources.

Requirement for Notification of Non-Key Partner Changes: In the event the Recipient determines the need to remove, replace, or divert Leveraged Partner Resources that are part of the demonstration but are not designated as Key in the list below, the Recipient must notify the Agreement Officer in writing of the proposed change in partner, circumstances surrounding the change, and the Recipient's analysis of the impact upon the demonstration.

Key Leveraged Partner Resources		
Key Partner	**Description of Resources**	**Estimated Amount**
Paul Allen's Vulcan, Inc.	Funding to support the deployment of electric vehicles and other carbon emission reduction strategies.	$ 10,000,000
Mobileye	Installation of Mobileye's Shield +TM technology on transit buses.	$ 1,950,000
Autodesk	A year-long subscription to *Infraworks*, an information modeling platform that uses 3-D visualizations and real-world data to plan major engineering projects as well as on-site training.	$ 34,520

Key Leveraged Partner Resources		
Key Partner	**Description of Resources**	**Estimated Amount**
Amazon Web Services (AWS)	Credits to AWS Cloud services and AWS Professional Services. AWS will also provide solution architecture and best practices guidance to the Recipient.	$1,000,000
NXP	Wireless communication modules that allow cars to securely exchange data, such as hazard warnings, over distances of more than a mile to prevent accidents and improve traffic flow.	$2,500,000
Alphabet's Sidewalk Labs	Flow technology, an analytics platform that the Recipient can use to identify traffic-prone areas and parts of a city that are underserved by public transportation — all by using traffic patterns culled from aggregated, anonymized data. From that information the software can suggest solutions like ride-sharing, new transportation access or a rerouting of traffic to better serve the community.	$230,000
AT&T	AT&T has committed to provide in-kind partnering to the City to assist with the deployment of the Columbus Connected Transportation Network (CCTN). The proposed partnering includes professional services and technical support resources; communications and data management technologies; USB cellular modems and SIM cards and connectivity; hardware to support communications and data management services.	$1,000,000

Key Leveraged Partner Resources		
Key Partner	**Description of Resources**	**Estimated Amount**
DC Solar	DC Solar will partner with the City to deploy eight to ten mobile solar generators or EV charging stations in 11 month increments at locations in the City to be determined. Mobile solar generators and EV charging stations will demonstrate the use of renewable energy sources in support of fleet electrification and power generation.	$1,500,000
Continental	Continental will deploy a roadside infrastructure sensing system; onboard V2X system, and DSRC communication systems to enable communication between roadside and onboard systems; API interfaces on cloud backend comprised of APIs for accessing data from both onboard and roadside V2X systems; basic safety messages to demonstrate the effectiveness of the CCTN on alleviating transportation-related issues such as intersection safety warnings, traffic management, automated system to regulate the flow of traffic according to real time traffic information, in-car productivity and safety, V2X warnings based on driver profile, route optimization or navigation, and reduced traffic congestion through load balancing via rerouting services enhanced with real time navigation data; and gamification of driving with incentives for drivers to behave responsibly to improve traffic condition and safety.	$1,000,000
Experience Columbus	Included in Event Parking (Downtown)	$100,000

Key Leveraged Partner Resources		
Key Partner	**Description of Resources**	**Estimated Amount**
Ohio State University	Included in EAV (Commercial)/Program Management	$2,000,000
Greater Columbus Art Council	Included in Communications and Outreach	$1,000,000
HERE, Inc.	Included in Information Data Exchange (Enabling Technology)	$1,000,000
INRIX	Included in Information Data Exchange (Enabling Technology)	$1,424,000
Mass Factory (App&Town)	Included in Enhanced Human Services (Enabling Technology)	$40,000
SPARC	Included in CCTN Vehicles (Enabling Technology)	$388,200
Peloton	Included in Truck Platooning (Logistic)	$165,000
Honda	Included in CCTN Vehicles (Enabling Technology)	$2,600,000
Battelle	Included in Program Management	$1,000,000
Econolite	Included in CCTN (Enabling Technology)	$280,000
Columbus Partnership	Included in Testing of Autonomous Vehicles (Commercial)	$5,000,000
Columbus Partnership	Sustainment Cash Available as needed for USDOT and/or electrification deployments	$10,000,000
TOTAL		$44,211,720

In addition to the Federal Share and the Recipient Cost Share identified on page 2 of the agreement, the Recipient shall use Leveraged Electrification Partner Resources to fund and perform demonstrations in conjunction with the Vulcan electrification grant. Leveraged Electrification Partner Resources are resources from third party organizations in support of the Vulcan electrification demonstration. "Key" Leveraged Partner Resources, listed below, are considered essential to the Vulcan electrification demonstration and are, therefore, referenced and incorporated into this award for informational and reporting purposes. The Key Leveraged Electrification Partner Resources listed herein are **not** subject to the requirements of 2 CFR 200, or the terms of the award.

Key Leveraged Electrification Partner Resources		
Key Partner	**Description of Resources**	**Estimated Amount**
City of Columbus	Deploying EV and EV charging infrastructure.	$ 2,500,000
American Electric Power	Decarbonization of power supply and deployment of electric vehicles and other carbon emission reduction strategies.	$ 29,100,000
The Ohio State University	Deploying EV and EV charging infrastructure, and University investment in mobility and smart grid related research.	$ 13,000,000
Columbus Partnership	Deploying EV and EV charging infrastructure, and investment in mobility and smart grid related research.	$ 7,500,000
Mid-Ohio Regional Planning Commission	Installation of EV charging infrastructure	$ 600,000
FleetCarma	Installation of advanced telematics devices to track and optimize fleet fuel efficiency strategies.	$ 300,000
TOTAL		$ 53,000,000

6. ELECTRIFICATION TECHNICAL WORKING GROUP

To leverage, collaborate, align and integrate the USDOT-funded Smart City demonstration activities with the Smart City demonstration activities funded and managed by the Key Partner, Paul Allen's Vulcan, Inc., and other Partners, the Recipient shall establish and manage an Electrification Technical Working Group (TWG) to meet, communicate and coordinate on a regular basis with the goal of facilitating integration of electrification activities within the Smart City demonstration and beyond as appropriate. The TWG meetings and interactions shall be designed to facilitate communications, knowledge sharing, identification of project risks, review and provision of feedback on project deliverables of mutual interest, and allow for the Recipient to brief the TWG on progress, schedule and discuss any problems related to electrification activities in the Smart City demonstration.

7. DATA TECHNICAL WORKING GROUP

To leverage, collaborate, align and integrate the USDOT-funded Smart City demonstration activities with the Smart City demonstration activities funded and managed by Partner organizations, the Recipient shall establish and manage a Data Technical Working Group (TWG) to meet, communicate and coordinate on a regular basis with the goal of facilitating integration of data management activities within the Smart City demonstration and beyond as appropriate. The TWG meetings and interactions shall be designed to facilitate communications, knowledge sharing, identification of project risks, and using best practices to fulfil requirements around replicability, openness, independent evaluation, and sharing of open, controlled access, real-time, and archival data. The TWG will enable review and provision of feedback on project deliverables of mutual interest, and allow for the Recipient to brief the TWG on progress, schedule and discuss any problems related to data management activities in the Smart City demonstration.

8. INTEGRATION OF EMERGENT CONCEPTS AND TECHNOLOGY

During the period of performance, the parties anticipate new and updated concepts and technology to emerge and/or mature. In order to ensure the Smart City demonstration is adequately and flexibly positioned to embrace promising emergent new concepts and technology and/or reconsider use of planned concepts and technology, the parties agree to evaluate and discuss, on a regular basis, changes to the Smart City demonstration activities, plans, budget and schedule. During the course of performance, changes to the demonstration plans may be appropriate to adapt emergent concepts, enhance the goals of the demonstration, support other relevant research, and/or support relevant and related testing activities. If a change is deemed appropriate, necessary, and in the best interest of the Government and the Recipient, the agreement may be amended by mutual agreement of the parties accordingly.

SECTION C - FEDERAL AWARD ADMINISTRATION INFORMATION

1. FEDERAL AWARD NOTICES

Only the Agreement Officer (AO) can commit the USDOT. The award document, signed by the AO, is the authorizing document. Only the AO can bind the Federal Government to the expenditure of funds.

2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

General terms, conditions, and governing regulations that apply to this agreement are available online at: http://www.fhwa.dot.gov/aaa/generaltermsconditions.cfm

The online list dated March 6, 2015 of "GENERAL TERMS AND CONDITIONS FOR ASSISTANCE AWARDS" apply to this award and are incorporated herein by reference. The online general terms include Payment, Section 508 compliance, AOR authority, Travel, etc. The Recipient shall comply with the list of general terms available online at the website listed above.

In addition to the general terms available online, the following special terms and conditions apply to this agreement.

A. PUBLIC ACCESS TO DOCUMENTS

The Recipient agrees that the resulting deliverables/documentation submitted to the USDOT under this Agreement may be posted online for public access and/or shared by USDOT with other interested parties. The USDOT anticipates the documents cited herein may be posted on a USDOT website or other appropriate website.

B. INDIRECT COSTS

The Recipient is authorized for reimbursement of fringe benefits and insurance costs related to direct labor incurred. No other indirect costs are allowable under this Agreement. The following estimated rates are hereby approved for use under this agreement:

Type*	***Indirect Rate***	***Estimated Rate (%)***	***Base***
Prov.	Fringe	18.95%	City Direct Labor
Prov.	Insurance Rate	Varies by employee from 13.81% - 46.76%	City Direct Labor except Student Interns

*Types of Rates: Pred - Predetermined; Fixed - Fixed; Final – Final; Prov: Provisional/billing; or De minimus.

In the event the Recipient determines the need to adjust the above listed rates, the Recipient will notify the AO of the planned adjustment and provide rationale for such adjustment. In the event such adjustment rates have not been audited by a Federal agency, the adjustment of rates for billings must be pre-approved in writing by the AO.

This Indirect Cost provision does not operate to waive the limitations on Federal funding provided in this document. The Recipient's audited final fringe benefits and insurance costs are allowable only insofar as they do not cause the Recipient to exceed the total obligated funding.

C. DATA RIGHTS

The Recipient must make available to the FHWA copies of all work developed in performance with this Agreement, including but not limited to software and data. Data rights under this agreement shall be in accordance with 2 CFR 200.315, Intangible property.

D. PERSONALLY IDENTIFIABLE INFORMATION (PII)

Personally Identifiable Information (PII) as defined at 2 CFR 200.79 and 2 CFR 200.82 at will not be requested unless necessary and only with prior written approval of the AO with concurrence from the Agreement Officer's Technical Representative (AOR).

E. AVAILABLE FUNDING

The total estimated amount of Federal funding that may be provided under this Agreement is $40,000,000 for the entire period of performance, subject to the limitations shown below:

(1) Currently, Federal funds in the amount of $15,000,000 are obligated to this agreement.

(2) Subject to availability of funds, and an executed document by the AO, the difference between the current funding and the total estimated amount of Federal funding may be obligated to this Agreement.

(3) The FHWA's liability to make payments to the Recipient is limited to those funds obligated under this Agreement as indicated above and any subsequent amendments.

F. KEY PERSONNEL

Pursuant to 2 CFR 200.308(c)(2), the Recipient must request prior written approval from the AO for any change in Key Personnel specified in the award. The following person(s) are/have been identified as Key Personnel:

Name	Title/Position
Aparna Dial	Program Manager
Randy Bowman	Deputy Program Manager

G. PROGRAM INCOME

Pursuant to 2 CFR 200.307, Program income earned during the agreement period must be added to the Federal award and used for the purposes and under the conditions of the Federal award, unless otherwise approved by the AO. Program income must not be used to offset the Federal or Recipient contribution to this project.

H. SUBAWARDS AND SUBCONTRACTS APPROVAL

Note: See 2 CFR §200.330, Subrecipient and contractor determinations, for definitions of subrecipient (who is awarded a subaward) versus subcontractor (who is awarded a subcontract).

Note: Recipients with a procurement system deemed approved and accepted by the Government or by the AO are exempt from the requirements of this clause. See 2 CFR 200.317 through 200.326.

Unless described in the application and funded in the approved award, the Recipient must obtain prior written approval from the AO for the subaward, transfer, or contracting out of any work under this award. **This provision does not apply to the acquisition of supplies, material, equipment, or general support services.**

The following subawards and subcontracts are currently approved under the Agreement:

Name
NONE

Approval of each subaward and subcontract is contingent upon a fair and reasonable price determination, and approval by the AO for each proposed subcontractor/sub-recipient. Consent to enter into subawards and subcontracts will be issued through written notification from the AO or a formal amendment to the Agreement.

I. ORDER OF PRECEDENCE

The Recipient's technical and budget applications are accepted, approved, and incorporated herein as Attachments 2 and 3. In the event of any conflict between this agreement document and the Recipient's applications, this Agreement document shall prevail.

J. DESIGNATION AS RESEARCH OR NON-RESEARCH AGREEMENT

This agreement is designated as: RESEARCH

K. CONFERENCE SUPPORT RESTRICTIONS

The Recipient must obtain written approval from the AOR prior to incurring any costs for conference support. See the definition of conference as contained in 2 CFR 200.432.

Food and beverage costs are not allowable conference expenses for reimbursement under this Agreement.

Note: Costs of meals are allowable as a travel per diem expense for individuals on travel status and pursuant to the Travel clause of this Agreement.

L. AGREEMENT PERFORMANCE REQUIREMENTS SUMMARY

N/A

M. DISPUTES

The parties to this Agreement will communicate with one another in good faith and in a timely and cooperative manner when raising issues under this provision. Any dispute, which for the purposes of this provision includes any disagreement or claim, between the FHWA and the Recipient concerning questions of fact or law arising from or in connection with this Agreement and whether or not involving alleged breach of this Agreement, may be raised only under this Disputes provision.

Whenever a dispute arises, the parties will attempt to resolve the issues involved by discussion and mutual agreement as soon as practical. In no event will a dispute which arose more than three months prior to the notification made under the following paragraph of this provision constitute the basis for relief under this article unless FHWA waives this requirement.

Failing resolution by mutual agreement, the aggrieved party will document the dispute by notifying the other party in writing of the relevant facts, identify unresolved issues and specify the clarification or remedy sought. Within five working days after providing written notice to the other party, the aggrieved party may, in writing, request a decision from one level above the AO. The AO will conduct a review of the matters in dispute and render a decision in writing within thirty calendar days of receipt of such written request. Any decision of the AO is final and binding unless a party will, within thirty calendar days, request further review as provided below.

Upon written request to the FHWA Director, Office of Acquisition and Grants Management or designee, made within thirty calendar days after the AO's written decision or upon unavailability of a decision within the stated time frame under the preceding paragraph, the dispute will be further reviewed. This review will be

conducted by the Director, Office of Acquisition and Grants Management. Following the review, the Director, Office of Acquisition and Grants Management, will resolve the issues and notify the parties in writing. Such resolution is not subject to further administrative review and to the extent permitted by law, will be final and binding. Nothing in this Agreement is intended to prevent the parties from pursuing disputes in a United States Federal Court of competent jurisdiction.

N. DISADVANTAGED BUSINESS ENTERPRISE (DBE) PROGRAM REQUIREMENTS

The DBE regulatory requirements at 49 CFR Part 26 apply to this agreement, but rather than developing its own DBE Program, the Recipient may apply the FHWA-approved DBE Program Plan of the State Department of Transportation (State DOT) in which it is located. The Recipient should set a DBE goal for the project through procedures set forth at 49 CFR 26.45 and the State DOT's Program Plan, and make its own determination about whether or not race conscious goals are appropriate and necessary to help meet its project goal.

3. REPORTING

ADDRESSES FOR SUBMITTAL OF REPORTS AND DOCUMENTS

The Recipient must submit all required reports and documents, under transmittal letter referencing the Agreement number, as follows:

Submit an **electronic copy** to the Agreement Officer at the following address:

Sarah.Tarpgaard@dot.gov

Submit an **electronic copy** to the AOR at the following address:

Kate.Hartman@dot.gov

Submit an electronic copy to the ITS JPO at the following address:

ITSProjects@dot.gov

QUARTERLY PROGRESS REPORTS

The Recipient must submit an electronic copy of the Standard Form - Performance Progress Report (SF-PPR), to the AOR and the Agreement Officer on or before the 30th of the month following the calendar quarter being reported.

The SF-PPR content directions are available online in various locations such as:

http://www.fema.gov/media-library/assets/documents/29485

The Performance Progress Report must include the required certification pursuant to 2 CFR 200.415.

Calendar quarters are defined as:		Reports due on or before:
1st :	January – March	April 30th
2nd:	April – June	July 30th
3rd:	July – September	October 30th
4th:	October – December	January 30th

NOTE: The first Quarterly Progress Report shall include the period from award through December 2016, and is due January 30, 2017.

Include the following information as attached pages:

a. SF-425, Federal Financial Report, and

b. SF-425A, Federal Financial Report Attachment (if applicable).

The Recipient shall include in Block 10, Performance Narrative, the items listed in Task A above. USDOT recommends an attachment to the SF-PPR to provide the quarterly progress report content.

See the Statement of Work, Task A, for progress report content requirements.

ANNUAL BUDGET REVIEW AND PROGRAM PLAN

The Recipient must submit an electronic copy of the Annual Budget Review and Program Plan to the AOR and the Agreement Officer 60 days prior to the anniversary date of this Agreement. The Annual Budget Review and Program Plan must include the required certification pursuant to 2 CFR 200.415. The Annual Budget Review and Program Plan must provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming year. If there are no proposed deviations from the Approved Budget Application (Attachment 3), the Annual Budget Review must contain a statement stating such. The Recipient must meet via teleconference or web conference with the USDOT to discuss the Annual Budget Review and Program Plan. Work proposed under the Annual Budget Review and Program Plan must not commence until AO's written approval is received.

SMART CITY VISION ELEMENTS

The USDOT identified twelve vision elements that comprise a Smart City. The Smart City Demonstration shall align to some or all of the USDOT's vision elements and foster integration between the elements. Through alignment with these vision elements, the Smart City Demonstration is expected to improve safety, enhance mobility, enhance ladders of opportunity, accelerate the transition to clean transportation, and address climate change.

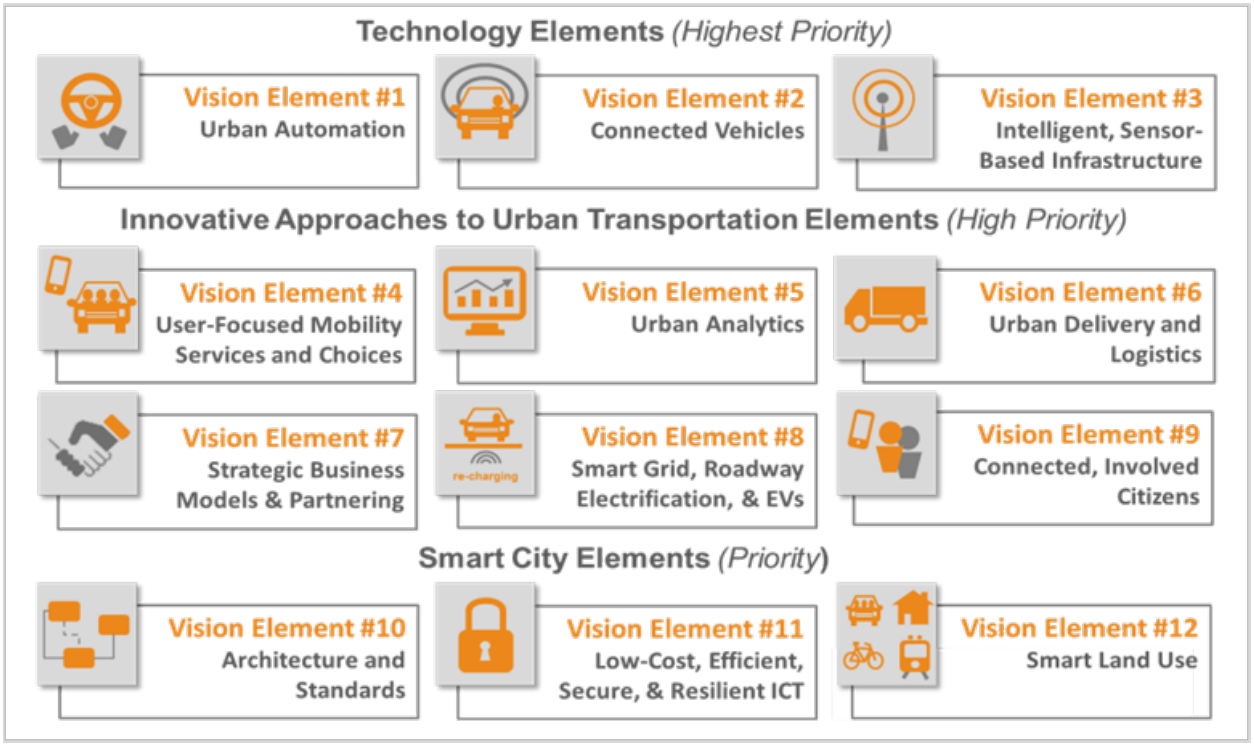

Figure 1. Beyond Traffic: The Smart City Challenge Vision Elements

The vision elements reflect the strategic priorities and themes put forth in the USDOT's ITS Strategic Plan 2015-2019 (http://www.its.dot.gov/strategicplan/) and the USDOT's Strategic Plan 2014-2018 (https://www.transportation.gov/dot-strategic-plan). Vision elements were derived from foundational research conducted by the ITS JPO's Connected Cities Research Program and communicated to 570 stakeholders during a free public webinar held by the ITS JPO on February 26, 2015. The USDOT vision elements build on enablers defined by the Smart Cities Council (http://smartcitiescouncil.com/smart-cities-information-center/the-enablers). The twelve vision elements are depicted in Figure 1 and described in more detail below.

TECHNOLOGY ELEMENTS

This group of three Vision Elements includes technologies that are of the highest priority to the USDOT.

Vision Element #1: Urban Automation. Automated transportation offers tremendous possibilities for enhancing safety, mobility, accessibility, equity, and the environment. The Smart City can provide national leadership through its demonstration and assessment of automated transportation applications and systems for the movement of goods and people. There are many ways to incorporate automated transportation into a Smart City. For the purpose of illustration, some examples of automated transportation in an urban environment include:

- Self-driving vehicles coupled with smart infrastructure;
- Self-driving shuttles and other forms of fully automated vehicles operating at low speeds to enable new mobility options for services such as first/last mile travel to local destinations and access to public transportation;
- Fully automated trucks and buses used in intermodal facilities, such as ports, depots, and maintenance facilities to improve driver and vehicle efficiencies; and
- Driver-assisted automation to reduce congestion and localized pollution and smog.

Vision Element #2: Connected Vehicles. Connected vehicles use vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications to provide connectivity that will enable countless safety, mobility, and environmental applications. Connected vehicle technologies allow vehicles to send and receive information about their movements in the network – offering cities unprecedented opportunities to provide more responsive and efficient mobility solutions in real-time and in the long term. Data derived from connected vehicles provide insights to transportation operators, help to understand demand, and assist in predicting and responding to movements around a city. When made accessible to a broader ecosystem of developers, these data can enable new research and applications that further benefit citizens.

A successful Smart City may demonstrate safety, mobility, and/or environmental applications. These applications – which can increase efficiency and accessibility, enhance safety and reduce congestion – may provide more responsive mobility solutions in real-time. Applications may be developed and managed by cities or third parties. In deploying connected vehicle and infrastructure services, Smart Cities may seek to integrate a variety of commercially available communication technologies including cellular, satellite, Wi-Fi and others. At the same time, Dedicated Short Range Communication (DSRC) technology operating in the 5.9GHz range may be used to

expand demonstrations of V2V and V2I applications based on DSRC[1]. (For more information on the USDOT's Connected Vehicle Research Program and potential applications, visit: http://www.its.dot.gov/research.htm.)

Vision Element #3: Intelligent, Sensor-Based Infrastructure. Smart cities contain and use a collective intelligent infrastructure that allows sensors to collect and report real-time data to inform transportation-related operations and performance and trends of a city. These data allow city operators to evaluate how the city is operating and how to enhance the operation of facilities, systems, services, and information generated for the public. Intelligent infrastructure includes sensors that collect traffic, pedestrian, bicyclist, environmental data, and other information available throughout the city. A successful Smart City will integrate these data with existing transportation data and operations, allowing the city to improve operations of the transportation network. Additionally, infrastructure could be used to monitor transportation assets to improve infrastructure management, reduce maintenance costs, prioritize investment decisions, and ensure a state of good repair. Where possible, a Smart City will make these data accessible to a broader ecosystem of developers to enable new research and applications. Smart Cities should leverage existing infrastructure investments, including sensors operated by other public sector agencies, academia, the private sector, and personal mobile devices.

INNOVATIVE APPROACHES TO URBAN TRANSPORTATION ELEMENTS

This group of six Vision Elements includes innovative approaches to urban transportation and is categorized as a high priority by the USDOT.

Vision Element #4: Urban Analytics. This vision element includes platforms for understanding and analyzing data to address complex urban challenges (e.g., personal safety and mobility, network efficiency, and environmental sustainability) and/or measure the performance of a transportation network. In a data-rich environment, cities and citizens are increasingly able to share, use, and leverage previously unavailable datasets to address complex urban problems and improve current operations and capabilities. Urban analytics create value from the data that is collected from connected vehicles, connected citizens, and sensors throughout a city or available from the Internet using information generated by private companies. Analytics that utilize data from across various systems in a city have tremendous potential to identify new insights and unique solutions for delivering services, thereby improving outcomes. Analytics can be used to predict future conditions and the potential benefits of implementing different

[1] Specifically, IEEE P1609, 802.11p , and, SAE J2945/1 and J2735 standards

operational strategies, control plans and response plans coordinated among agencies and service providers. Furthermore, analytics can be applied across sectors to create new and different applications. One example might be an application of travel demand management that also factors in environmental and energy consumption as part of the optimization – providing more context to citizens' personalized recommendations. Additionally, data analytics can also be used to understand the potential benefits of deployed solutions. To do so, transportation-related performance measures and evaluation are needed to quantify the intended and measured impact of all proposed solutions on personal safety and mobility, network efficiency, and environmental sustainability, representing the priorities of this challenge. For example, performance measurement may indicate greater access to jobs and services; reduction in congestion and delays; increase in transit, walking, or cycling; a reduction in crashes, injuries, and or fatalities; improved incident response and clearance times; and reductions in emissions. In a Smart City, these performance measures should be made publicly available as open data.

Vision Element #5: User-Focused Mobility Services and Choices. This vision element consists of strategies, initiatives, and services that increase transportation choices and options by supporting and improving mobility across all modes for all travelers, including aging Americans and persons with disabilities. A major component includes advanced traveler information systems that provide real-time traffic, transit, parking, and other transportation-related information to travelers. Smart cities support sustainable mobility using traveler-oriented strategies that deliver innovative solutions across all transportation modes, including transit, bicycling, electric vehicles, and shared use mobility services, to improve the mobility of all travelers, including older Americans as well as people with disabilities. Shared-use transportation has grown tremendously in recent years with the increase in smartphone applications. The sharing economy and new transportation services provide people with more options and help to overcome barriers to the use of non-driving forms of transportation. Advanced technology and services deployed throughout a city empower people to adopt "car-free" and "car-light" lifestyles with dramatically less driving if they so choose. For people to be willing to share assets there must be a seamless, low-friction way to do so. Mobility on Demand (MOD) is an emerging concept built on shared use approaches and a shift in mass transit. It augments public transportation and supports the efficient movement of people. Open data and technology enable the efficient coordination, use, and management of all mobility services in the system. From the user's perspective, travel choices are simplified through open data and communications technology that provides personalized information – including traveler information, travel options, and integrated mobile payment – directly to the user. In smart cities, the integration of new

technologies into the transportation system facilitates a dynamic supply of mobility services and operations by leveraging emerging mobility services, integrated transit networks and operations, real-time data, connected travelers, and cooperative ITS. The result is a more traveler-centric, transportation system-of-systems approach, providing improved mobility options to all system users.

Vision Element #6: Urban Delivery and Logistics. This vision element includes innovative solutions that support efficient goods movement through use of data or technology to create opportunities for a more efficient supply chain approach that delivers safer logistics management, improved on-time pickups and delivery, improved travel time reliability, reduced energy use, and reduced labor and vehicle maintenance costs. As populations increase and urbanization continues, cities need to identify innovative ways to effectively and efficiently move goods – including food, energy, and manufactured goods – into and throughout cities. The Smart City may consider improving urban goods movements by including freight-specific information exchanges that enable dynamic travel planning to improve freight movement efficiency, including load matching and drayage operations. Additional strategies may leverage urban delivery hubs that use connected urban delivery vehicles and flexible (shared use) commercial delivery solutions.

Vision Element #7: Strategic Business Models and Partnering Opportunities. Opportunities exist to leverage creative strategic partnerships that draw in stakeholders – including those from the private sector, non-profit organizations, foundations and philanthropic organizations, academia/University Transportation Centers (UTC), Federal agencies, and other public agencies – to advance smart city solutions. The private sector is pushing innovation and developing new technologies and approaches that can be augmented through new collaborations with government. The public sector is also pushing innovation, creating new opportunities/models for governance and interagency partnerships that will increase return on investment while accelerating deployment. Successful implementation of a Smart City will likely rely on strategic partnering opportunities between public agencies and the private sector – especially for cities that have limited resources to bring to bear on the challenges they face. Innovative partnerships among city or local government, regional Federal agencies, planning organizations, the private sector, vehicle manufacturers, academia, associations, and other stakeholder groups are needed to advance smart city solutions and identify sustainable business models to maintain and expand capabilities in the future. Through cooperation, city governments may partner with non-governmental organizations that can bring resources to the city.

Note: The Connected Vehicle Reference Implementation Architecture (CVRIA) and associated SET-IT software tool provides a means to depict the institutional relationships with the enterprise layer of the architecture. For more information, visit: www.iteris.com/cvria.

Vision Element #8: Smart Grid, Roadway Electrification, and Electric Vehicles. This vision element includes strategies and initiatives that leverage the smart grid – a programmable and efficient energy transmission and distribution system – in an effort to support the adoption or expansion of roadway electrification, robust electric vehicle charging infrastructure, and the acceleration of electric vehicle deployment. With electric vehicles (note: the term electric vehicles or "EVs" include full Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), and Extended Range Electric Vehicles (EREVs)) becoming more prevalent and more advanced, increasing opportunities exist for the vehicle to interact with the smart grid. Opportunities also exist for the integration of intelligent transportation systems with the smart grid and other energy distribution and charging systems. For example, smart-grid technology can enable electric vehicle-charging [grid-to-vehicle (G2V)] load to be shifted to off-peak periods, thereby flattening the daily load curve and significantly reducing both generation and network investment needs. Technology like this can help bring the numerous economic and environmental benefits of electric vehicles to the forefront of a city by coupling and integrating with a robust deployment of electric vehicle charging infrastructure. Likewise, wireless inductive charging technologies increase opportunities for uninterrupted usage of electric vehicles, allowing electric vehicles to charge their batteries wirelessly while the vehicle is stopped or, with certain technologies, even while in motion. Electric vehicles are increasingly available across vehicle class (e.g., transit buses and medium duty vehicles) and price points. Providing access to electric vehicles through car share programs can provide increased access for underserved communities, reduce total operational costs, and contribute to improvements in local air quality.

Vision Element #9: Connected, Involved Citizens. Connected citizens generate, share, and use data and information in new and useful ways. This vision element consists of strategies, local campaigns, and processes to proactively engage and inform citizens at the individual level by deploying hardware, software, and open data platforms in an effort to increase personal mobility. Advanced technologies would be used to enhance overall mobility for all citizens including people with disabilities, older adults, and young Millennials who will act as an important engine of the future economy. One example of connected, involved citizens is leveraging the use of crowdsourcing. Crowdsourced data provides communication conduits through mobile technologies to

connect citizens with city operators about a myriad of topics. In a successful Smart City, citizens would provide user-generated content to cities, opting-in to provide data from smartphones. Another example of connected, involved citizens includes leveraging broad access to open government data providing a platform for citizens and entrepreneurs to serve as co-creators and co-producers of new and innovative transportation services.

SMART CITY ELEMENTS

This group of Vision Elements includes three smart city elements and is categorized as a priority by the USDOT.

Vision Element #10: Architecture and Standards. This vision element emphasizes complete and well-documented systems architectures – governed by rules, documentation, and standards – that may be extended to a nationwide or broader deployment and support interoperability between systems. Because vehicles and travelers move broadly across regions, uniform operation that is accessible to everyone is essential for safe and efficient transportation operations. Interoperable regional ITS and other infrastructure system architectures that can be extended to a nationwide or broader deployment based on accessible, well-defined standards is needed for consistent implementations that will lead to the required uniformly accessible operation. Multiple system architectures will need to interoperate with the ITS architecture to efficiently support a smart city.

Vision Element #11: Low-Cost, Efficient, Secure, and Resilient Information and Communications Technology (ICT). This vision element includes strategies and practices that advance information and communications technology (ICT) that is affordable, adaptable, scalable, efficient, secure and resilient. This may include telecommunications platforms, enterprise software, storage, visualization systems, and operations to inform decision making. This will include ICT that contributes to one common operating platform to inform city government decision-making. ICT infrastructure, technologies, and services are a critical part of a Smart City. ICT consists of interoperable, unified communications and the integration of telecommunications, and computing as well as necessary enterprise software, storage, and visualization systems, which enable users to access, store, transmit, and manipulate information. The success of a Smart City depends upon affordable ICT that enables dynamic ingest, sharing, and use of data. The ICT in a Smart City, including telecommunications and computing, needs to be resilient, secure and respectful of privacy. Resilient design includes supporting standards common technology architectures and integrative policies. If one

part of the system fails or is compromised, the entire system should not collapse, and the gap in service should be bridged effectively and restored quickly.

Privacy and security play a critical role in enabling smart cities because they build trust with people. Privacy and security constitute practices that safeguard data, privacy, and physical assets. Private information relates to any data emitted, collected, or stored about individuals. A key concept in privacy analysis is Personal Identifiable Information (PII). PII is any information that can be used to distinguish or trace an individual's identity, which is not specific to any category of information or technology; each case and associated risks must be individually examined for context and the combination of data elements that are provided or obtainable. The Smart City needs to determine the extent to which their system or systems will collect or store PII and PII-related information, and ensure that there is a legitimate need for this information to meet the goals of the system and that the data is only accessible for and used for these legitimate purposes which may include sharing it with qualified researchers. Wherever possible, efforts should be made to provide public access to versions of the data that remove any PII-related elements.

> Note on Smart City Challenge Demonstration Award: The USDOT is developing a prototype security credential management system (SCMS) which will be available for use in DSRC-based communications in the Smart City Demonstration. The SCMS will provide digitally signed certificates that can be used to ensure trusted DSRC communications between connected vehicle devices, roadside devices and the SCMS. The USDOT will provide the Recipient technical support for interfacing with the prototype SCMS, as well as tools intended to support the Smart City. Physical security of the deployed devices and security for non-DSRC communications are not covered by the SCMS and should be addressed using existing appropriate best practices in the demonstration. Rigorous, proven processes are needed to ensure that security mechanisms are embedded in systems and infrastructure to protect against attacks. Secure solutions must be integrated into architecture designs and security risks must be continually managed. Smart cities are expected to use industry best practices as they relate to objects and interfaces used in their installations.

Vision Element #12: Smart Land Use. This vision element includes strategies and practices that ensure land use is optimized through a combination of planning and innovation deployments designed for a better connected community that expands the range of transportation choices and access to employment, housing, education, and health services. A successful Smart City ensures that land use is efficiently optimized. Urban land use concentrates growth in compact walkable urban centers to avoid sprawl. It also advocates compact, transit-oriented, shared-use, walkable, bicycle-friendly land use, including neighborhood schools, complete streets, and mixed-use development with a range of housing choices. Smart land use values long-range, regional considerations of sustainability and citizen needs with the goals of achieving a unique sense of community and place; expanding the range of transportation, employment, and housing choices; equitably distributing the costs and benefits of development; preserving and enhancing natural and cultural resources; and promoting public health.

OHIO POWER COMPANY'S RESPONSE TO
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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-037

Referring to the Settlement section III. H (1) (c), with regard to the provision, "AEP Ohio will conduct research and development needed to develop and maintain the Smart City program for the 4-year term, with up to $200,000 of cost eligible, subject to a prudency review, to flow through the Smart City rider," please explain the specific "research and development" activities that AEP will conduct up to a cost of $200,000.

RESPONSE

The Company has not yet determined the specifics of those activities.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-018	What is the purpose of authorizing the Power Forward Rider for an unknown purpose and unknown cost at this time?

RESPONSE

It is reasonable for the Power Forward Rider to be included for potential future costs in order for AEP Ohio to comply with any directives or findings that may come out of the Power Forward Initiative.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-019	Please explain the advantage of approving the Power Forward Rider at this time versus other alternative methods of seeking cost recovery for any expenditures that may be approved or identified as potentially the subject of future cost recovery in the Power Forward proceeding. It is reasonable to provide the Company a cost recovery mechanism for any directives or findings that result from the Power Forward Proceeding.

RESPONSE

The approval of the Power Forward Rider at this time will provide advantages to AEP Ohio's customers by facilitating the Company's implementation of new technologies or offerings based on findings and directives of the Commission while allowing all parties the opportunity to participate in those future filings if identified through the Power Forward Initiative.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-029	What criteria will be used to determine the winning bids for the Microgrid projects?

RESPONSE

The Company has not determined the specific criteria for the winning proposals.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-028	Identify the estimated costs for the Microgrid projects that will be incurred by the project proponent.

RESPONSE

Until specific microgrid projects are identified the costs to be incurred by the project proponent (customer) cannot be estimated.

Prepared by: William A. Allen

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FIRST SET-STIPULATION**

DATA REQUEST

STIP-OCC-INT-1-017

With regard to the Smart City Rider authorized in Section III.F, please describe the nature of the "annual audit" that is authorized for expenditures under this Rider.
a. Who will conduct this audit?
b. What will be the purpose of the audit? In your response, identify the criteria that will be relied upon to determine the "prudency" of the expenditures.
c. Will this audit include an evaluation of the specific projects authorized for recovery of costs for this Rider? If so, what criteria will be used to determine whether the projects have achieved or will achieve their intended purpose? If not, why not?
d. Will cost benefit studies be performed for each of the specific projects? If not, why not?
? e. When will each of the audits be undertaken and when will the audit results be available to the parties and the public? In your response, link the production schedule for the audit with the recovery of costs in the Rider.

RESPONSE

The Company anticipates an annual audit by the PUCO staff for the Smart City Rider in accordance with the other annual rider audits they conduct for AEP Ohio's rider filings.

a. Staff or its designee.

b. See page 11 of the stipulation. The annual audit will be a prudency review

c. The Company cannot determine the criteria that will be used by the Staff

d. The Company does not intend to perform a cost benefit analysis. The purpose of the pilot is to gather and share data as it relates to these new technologies. The information gathered may aid in future cost/benefit analysis if this type of technology continues within the AEP Ohio service territory.

e. The specific schedule has not yet been identified.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-027	Provide the criteria that will be used to determine the value of the Microgrid demonstration projects to customers. In your response, distinguish the measureable criteria that will be used to identify the quantifiable benefits to the project participants and the quantifiable benefits for customer generally.

RESPONSE

The Company has not determined the criteria that will be used to determine the value of the microgrid demonstration.

Prepared by: William A. Allen

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SECOND SET

INTERROGATORY

OCC-INT-2-308 Has AEP Ohio ever designed, constructed, or connected a microgrid to its distribution system? If so, please provide the location, design, size, and cost (if known) of such microgrid, including any report or other document that describes the operation of the microgrid and impact on reliability, energy usage, demand response, and environmental benefits.

RESPONSE

AEP Ohio has not designed, constructed, or connected a microgrid to its distribution system to serve customer load. However, the AEP Service Corporation has conducted research on a microgrid located within the AEP Ohio region. This microgrid location is a test site allowing AEP and the AEP Operating Companies to gain knowledge on this type of technology.

Prepared by: Scott S. Osterholt

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-022 Please identify any other incremental costs that AEP estimates it may incur to implement the Smart City Rider projects that will be recovered outside the Smart City Rider.

RESPONSE

The Company has not specifically identified any additional costs it may incur to be recovered outside of the Smart City Rider. However, if the deployment of the charging stations or microgrids require additional distribution investment in order to get the site ready for delivery, those costs could be capitalized and recovered through the DIR, however the impact to customers would continue to be addressed by the annual DIR caps..

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-023

According to the Settlement section III.G (1), "The demonstration micro grid project(s) will be funded through the Smart City Rider, except that the related distribution grid investments will be recovered through the DIR."
a. What is meant by "related distribution grid investments" in this sentence?
b. Identify the estimated "related distribution grid investments" that are referred to in this sentence by type of expenditure and dollar amount over the 4 year Smart City Rider.
c. Does this provision mean that costs incurred to implement the Smart City Rider may exceed $21.1 million? If so, please identify the total budget expected to be incurred and recovered from customers for all the projects included in the Smart City Rider and any incremental expenditures that will be incurred by AEP Ohio and recovered through other riders or rate mechanisms.

RESPONSE

a. Any distribution investment necessary to get delivery of Power to the new technology. In order to be recovered through the DIR the investment would have to be included in a FERC distribution accounts.

b. The Company has not identified certain costs or investments that may be necessary to put the new technology in service.

c. The collection through the Smart City Rider is limited to $21.1 million. If additional costs are incurred to connect certain distribution assets to the new technologies and meet the criteria for recovery through the DIR, those costs will be recovered through the DIR at the Stipulated caps.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-024	With regard to the Settlement section III.G (3), please identify the meaning of the term "generator/battery" related expenditures that will be included in the authorized expenditures for the Microgrid demonstration projects under the Smart City Rider and any additional expenditures that AEP Ohio may incur and seek recovery from customers through the DIR during the term of this Stipulation.

RESPONSE

There is no reference to generator/battery in section III G (3). Additional expenditure through the DIR could include additional distribution facilities necessary to deliver power to the technology.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-032	Please explain how the customer funding for EV charging stations included in this Stipulation promotes the EV charging market on a "competitively neutral basis." In your response, project the number of EV charging stations that would occur without ratepayer funding as reflected in this Stipulation based on current trends for EV ownership and installation of EV charging stations by public or private entities.

RESPONSE

The rebate program is competitively neutral because it provides the same level of incentive for all qualified EV charging station providers. The Company has not performed an analysis to project the number of EV charging stations that would occur without ratepayer funding.

Prepared by: William A. Allen

INT-49. Referring to Cherkaoui's testimony at 10:12, please identify the "grid benefits for all ratepayers."

RESPONSE: EVCA notes the findings of *Engaging Utilities and Regulators on Transportation Electrification (2015),* which identified that increased EV load growth, combined with effective load management programs through networked charging solutions, could lead to a downward pressure on unit energy costs that can benefit all utility customers, regardless of EV ownership.

Prepared by: Dr. Abdellah Cherkouai

INT-50. Referring to Cherkaoui's testimony at 10:15, identify the near-term goals for wider EV adoption.

RESPONSE: EVCA believes that the primary near-term goals for electric vehicle programs is to accelerate adoption, support the competitive market, and increase awareness and education on electric vehicles and charging technologies.

Prepared by: Dr. Abdellah Cherkouai

INT-51. Referring to Cherkaoui's testimony at 10:15, identify the longer-term goals for wider EV adoption.

RESPONSE: EVCA believes that the primary long-term goals for electric vehicle programs is to sustain electric vehicle adoption, maintain ownership, and ensure charging station availability for all addressable segments of the market.

Prepared by: Dr. Abdellah Cherkouai

ELEC	Ohio Northern University - Pharmacy Building	525 S Main St		Ada	OH	45810	216-407-7580	E	Public - Credit card at all times	24 hours daily	A D M V		1					200-8	41.503373	-81.639054	3/3/2017	37097 2017-03-03 18:36:06 UTC	P			12/15/2010		J1772
ELEC	Ohio Northern University - The Inn	401 W College Ave		Ada	OH	45810	614-247-6277 855-443-3873	E	Public - Credit card at all times	Garage business hours; pay lot	A D M V			2	Greenlots	http://greenlots.com/		GPS	39.997769	-83.032407	3/3/2017	38116 2017-03-03 19:41:15 UTC	P			7/1/2011		CHADEMO J1772COMBO
ELEC	Fred Martin Nissan	3388 S Arlington Rd		Akron	OH	44312	216-987-5330	E	Public - Card key at all times	MO: Not Specified; TU: Not Specified; WE: Not Specified; TH: Not Specified; FR: Not Specified; SA: Not Specified; SU: Not Specified			2					GPS	41.36684	-81.7638	3/3/2017	40613 2017-03-03 19:42:44 UTC	P			8/1/2014		J1772
ELEC	Fred Martin Nissan	3388 S Arlington Rd		Akron	OH	44312		E	Public - Card key at all times	MO: Not Specified; TU: Not Specified; WE: Not Specified; TH: Not Specified; FR: Not Specified; SA: Not Specified; SU: Not Specified		2	2					GPS	39.0997124	-84.509338	7/6/2017	42196 2017-07-06 17:27:14 UTC	T			11/15/2011		J1772
ELEC	CARCHARGING	834 W Market St	WALGREENS #3278; Station is located to the left of the store entrance	Akron	OH	44303		E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			5					200-8	39.985903	-82.823365	3/3/2017	42639 2017-03-03 19:39:53 UTC	P			12/1/2011		J1772
ELEC	FIRSTENERGY	341 White Pond Dr	STATION 2; Building Parking Lot - Along the Side STATION 1; Building Parking Lot - Along the Side	Akron	OH	44320	614-728-2564	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			8					200-8	39.9602755	-82.999125	3/3/2017	42640 2017-03-03 19:42:12 UTC	SG			11/4/2011		J1772
ELEC	Superblock Parking Garage	11 W Mill St	Located on level 3	Akron	OH	44308		E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			2					200-9	39.3748807	-84.548148	3/3/2017	42641 2017-03-03 19:42:02 UTC	LG			1/1/2012		J1772
ELEC	Papa Joe's - Tesla	1561 Akron Peninsula Rd		Akron	OH	44313	800-663-5633	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			2		SemaCharge Network	http://www.semacharge.com/		GPS	40.7627596	-84.149043	9/26/2017	44220 2017-09-26 07:54:39 UTC						J1772
ELEC	DAVE WALTER BMW	408-416 OH-162	STATION PA01	Akron	OH	44302	800-663-5633	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			2		SemaCharge Network	http://www.semacharge.com/		GPS	39.951075	-83.851801	9/26/2017	44222 2017-09-26 07:55:08 UTC						J1772
ELEC	AKRON METRO RTA	310 Kenmore Blvd, Akron Akron Metro RTA	METRO RTA; -	Akron	OH	44301	330-644-8888	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	40.979048	-81.493235	8/2/2017	45708 2017-08-02 19:06:41 UTC	P			1/31/2012		J1772
ELEC	Broadway Deck	120 S Broadway	Located on level 2	Akron	OH	44308	330-644-8888	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	40.979048	-81.493235	8/2/2017	45709 2017-08-02 19:06:41 UTC	P			1/31/2012		J1772
ELEC	David A Levy & Associates	345 Springside Dr		Akron	OH	44333	937-306-0041	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					GPS	39.708775	-84.026292	8/2/2017	45710 2017-08-02 19:06:24 UTC	P			1/31/2012		J1772
ELEC	Northwest College	22600 OH-34		Archbold	OH	43502	937-306-0041	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					GPS	39.708775	-84.026292	8/2/2017	45711 2017-08-02 19:06:24 UTC	P			1/31/2012		J1772
ELEC	McCluskey Chevrolet	399 E Galbraith Rd		Arlington Heights	OH	45215	440-439-5785	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	41.401627	-81.552314	8/2/2017	45712 2017-08-02 19:06:43 UTC	P			1/31/2012		J1772
ELEC	BELLSTORES 132	1923 OH-60	EV 1; BellStores and Subway at Route 60 Exit off Route 30	Ashland	OH	44805	440-439-5785	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	41.401627	-81.552314	8/2/2017	45713 2017-08-02 19:06:43 UTC	P			1/31/2012		J1772
ELEC	Ohio University - Lot 111	28 W Green Dr		Athens	OH	45701	330-726-5555	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required		1	1					200-8	41.010979	-80.661812	8/2/2017	45714 2017-08-02 19:06:32 UTC	P			1/31/2012		J1772 CHADEMO
ELEC	Ohio University - Lot 132	100 Richland Ave		Athens	OH	45701	330-726-5555	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	41.010979	-80.661812	8/2/2017	45715 2017-08-02 19:06:32 UTC	P			1/31/2012		J1772
ELEC	Ohio University - Lot 147	169 W Union St		Athens	OH	45701	419-353-5271	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	41.4153885	-83.650807	8/2/2017	45716 2017-08-02 18:59:38 UTC	P			1/31/2012		J1772
ELEC	Ohio University - Lot 90	24 Race St		Athens	OH	45701	419-353-5271	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	41.4153885	-83.650807	8/2/2017	45717 2017-08-02 18:59:38 UTC	P			1/31/2012		J1772
ELEC	Ohio University - Baker Garage	Oxbow Trail	Located beneath Lot 122 next to Baker Center	Athens	OH	45701	513-771-8100	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.2853057	-84.447111	8/2/2017	45718 2017-08-02 19:06:44 UTC	P			12/1/2012		J1772
ELEC	Walmart 3250 Aurora	7235 Market Place Dr		Aurora	OH	44202	513-771-8100	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.2853057	-84.447111	8/2/2017	45719 2017-08-02 19:06:44 UTC	P			1/31/2012		J1772
ELEC	Walden Inn - Tesla	1119 Aurora Hudson Rd		Aurora	OH	44202	855-444-1160	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.229049	-84.588905	8/2/2017	45720 2017-08-02 18:55:44 UTC	P			11/29/2011		J1772
ELEC	Hampton Inn - Tesla	2900 GH Dr		Austinburg	OH	44010	855-444-1160	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.229049	-84.588905	8/2/2017	45721 2017-08-02 18:55:44 UTC	P			11/29/2011		J1772
ELEC	Walmart #S5066	35901 Chester Rd		Avon	OH	44011	513-697-9770	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.295743	-84.311407	8/2/2017	45722 2017-08-02 18:43:04 UTC	P			1/31/2012		J1772
ELEC	OHAP 1 (QR 2000340)	650 Miller Rd		Avon Lake	OH	44012	513-697-9770	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			1					200-8	39.295743	-84.311407	8/2/2017	45723 2017-08-02 18:43:04 UTC	P			1/31/2012		J1772
ELEC	Public Parking Lot	132 S Detroit St	Located in the parking lot across from the Post Office	Ballafonaine	OH	43311	614-418-4500	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required		1	1					200-8	40.056983	-82.885048	8/2/2017	45724 2017-08-02 18:42:55 UTC	P			1/31/2012		J1772 CHADEMO
ELEC	Apostolic Church of Barberton	1717 Turkeyfoot Lake Rd		Barberton	OH	44203	614-418-4500	E	Public - Card key at all times	MO: 12:00am-12:00am; TU: 12:00am-12:00am; WE: 12:00am-12:00am; TH: 12:00am-12:00am; FR: 12:00am-12:00am; SA: 12:00am-12:00am; SU: 12:00am-12:00am			1					200-8	40.056983	-82.885048	8/2/2017	45725 2017-08-02 18:42:55 UTC	P			1/31/2012		J1772
ELEC	Jeff Wyler Nissan	1117 State Route 32		Batavia	OH	45103	614-463-5282	E	Public - Card key at all times	24 hours daily; EVgo network subscription and key fob required			5					200-8	39.9742126	-83.028614	7/6/2017	45727 2017-07-06 17:26:57 UTC	P			2/1/2012		J1772
ELEC	Jeff Wyler Nissan	1117 State Route 32		Batavia	OH	45103	330-923-8000	E	Public - Call ahead	Dealership business hours			1					200-8	41.119701	-81.483068	8/2/2017	45728 2017-08-02 18:59:39 UTC	P			1/31/2012		J1772
ELEC	Jeff Schmitt Nissan	725 Alpha Rd		Beavercreek	OH	45434	330-923-8000	E	Public - Call ahead	Dealership business hours			1					200-8	41.119701	-81.483068	8/2/2017	45729 2017-08-02 18:59:39 UTC	P			1/31/2012		J1772
ELEC	Jeff Schmitt Nissan	725 Alpha Rd		Beavercreek	OH	45434	937-434-4723	E	Public - Call ahead	Dealership business hours			1					200-8	39.639568	-84.22375	8/2/2017	45730 2017-08-02 19:06:40 UTC	P			1/31/2012		J1772
ELEC	Bedford Nissan	18115 Rockside Rd		Bedford	OH	44146	937-434-4723	E	Public - Call ahead	Dealership business hours			1					200-8	39.639568	-84.22375	8/2/2017	45731 2017-08-02 19:06:40 UTC	P			1/31/2012		J1772
ELEC	Bedford Nissan	18115 Rockside Rd		Bedford	OH	44146	330-364-6659	E	Public - Call ahead	Dealership business hours			1					200-8	40.522809	-81.489164	8/2/2017	45732 2017-08-02 18:43:14 UTC	P			1/31/2012		J1772
ELEC	City of Bellefontaine	126 W Chillicothe Ave	Located in public parking lot	Bellefontaine	OH	43311	330-364-6659	E	Public - Call ahead	Dealership business hours; must ask for charger to be turned on inside			1					200-8	40.522809	-81.489164	8/2/2017	45733 2017-08-02 18:43:14 UTC	P			1/31/2012		J1772
ELEC	Riverside Gables Bed & Breakfast - Tesla	50 N Rocky River Dr		Berea	OH	44017	513-682-2500	E	Public - Call ahead	Dealership business hours; Nissan LEAFs only		1	1					200-8	39.329091	-84.517271	8/2/2017	45734 2017-08-02 18:42:56 UTC	P			1/31/2012		J1772 CHADEMO
ELEC	City of Bexley - City Hall	2242 E Main St		Bexley	OH	43209	513-682-2500	E	Public - Call ahead	Dealership business hours			1					200-8	39.329091	-84.517271	8/2/2017	45735 2017-08-02 18:42:56 UTC	P			1/31/2012		J1772
ELEC	AAA Blue Ash	9401 Kenwood Rd		Blue Ash	OH	45242	419-423-7161	E	Public - Call ahead	Dealership business hours			1					200-8	41.0565548	-83.606348	8/2/2017	45736 2017-08-02 18:45:06 UTC	P			1/31/2012		J1772
ELEC	Wingate by Wyndham - Tesla	4320 Glendale Milford Rd		Blue Ash	OH	45242	419-423-7161	E	Public - Call ahead	Dealership business hours			1					200-8	41.0565548	-83.606348	8/2/2017	45737 2017-08-02 18:45:06 UTC	P			1/31/2012		J1772
ELEC	Boardman Nissan	7809 Market St		Boardman	OH	44512	614-771-2345	E	Public - Call ahead	Dealership business hours		1	1					200-8	40.0318841	-83.125116	8/2/2017	45738 2017-08-02 19:08:34 UTC	P			1/31/2012		J1772 CHADEMO
ELEC	Boardman Nissan	7809 Market St		Boardman	OH	44512	614-771-2345	E	Public - Call ahead	Dealership business hours			1					200-8	40.0318841	-83.125116	8/2/2017	45739 2017-08-02 19:08:34 UTC	P			1/31/2012		J1772
ELEC	Thayer Nissan	18039 N Dixie Hwy		Bowling Green	OH	43402	419-227-7400	E	Public - Call ahead	Dealership business hours			1					200-8	40.757389	-84.146132	8/2/2017	45740 2017-08-02 18:59:40 UTC	P			1/31/2012		J1772
ELEC	Thayer Nissan	18039 N Dixie Hwy		Bowling Green	OH	43402	419-227-7400	E	Public - Call ahead	Dealership business hours			1					200-8	40.757389	-84.146132	8/2/2017	45741 2017-08-02 18:59:40 UTC	P			1/31/2012		J1772
ELEC	Bowling Green State University - Parking lot 20	E Wooster St	Just south of the BGSU Welcome Center between Stadium Dr and E Wooster St	Bowling Green	OH	43403	419-529-4000	E	Public - Call ahead	Dealership business hours			1					200-8	40.757606	-82.567977	8/2/2017	45742 2017-08-02 18:57:18 UTC	P			1/31/2012		J1772
ELEC	Bowling Green State University - Parking lot 8	707 E Merry	Behind Falcon Heights residence hall; E Merry and Thurstin St	Bowling Green	OH	43403	419-529-4000	E	Public - Call ahead	Dealership business hours			1					200-8	40.757606	-82.567977	8/2/2017	45743 2017-08-02 18:57:18 UTC	P			1/31/2012		J1772
ELEC	Bowling Green State University - Parking lot E	Pike St and Thurstin Ave	Next to BGSU Heat Plant and railroad tracks; across the street from Bowen-Thompson Student Union on Thurstin St	Bowling Green	OH	43403	330-478-1801	E	Public - Call ahead	Dealership business hours; $10 fee for vehicles not bought from the dealership			1					200-8	40.7923741	-81.45329	8/2/2017	45744 2017-08-02 18:42:24 UTC	P			1/31/2012		J1772
ELEC	City of Bowling Green - Parking Lot 1	119 E Court St	Space #120. Between N Main and N Prospect	Bowling Green	OH	43402	330-478-1801	E	Public - Call ahead	Dealership business hours			1					200-8	40.7923741	-81.45329	8/2/2017	45745 2017-08-02 18:42:24 UTC	P			1/31/2012		J1772
ELEC	City of Bowling Green - Parking Lot 2	125 S Prospect St	Space #294. Between E Wooster and Clough St	Bowling Green	OH	43402	440-449-9500	E	Public - Call ahead	Dealership business hours			1					200-8	41.5197581	-81.461231	8/2/2017	45746 2017-08-02 19:06:42 UTC	P			1/31/2012		J1772
ELEC	City of Bowling Green - Parking Lot 3	132 S Church St	Space #300. Between W Wooster and W Washington St	Bowling Green	OH	43402	440-449-9500	E	Public - Call ahead	Dealership business hours			1					200-8	41.5197581	-81.461231	8/2/2017	45747 2017-08-02 19:06:42 UTC	P			1/31/2012		J1772
ELEC	Dunkin Donuts - Broadview Heights	1057 W Royalton Rd		Broadview Heights	OH	44147	330-721-0500	E	Public - Call ahead	Dealership business hours		1	1					200-8	41.134257	-81.793779	8/2/2017	45748 2017-08-02 18:43:22 UTC	P			1/31/2012		J1772 CHADEMO
ELEC	CEP Door3 (QR 2000337)	17601 Brookpark Rd		Brookpark	OH	44142	330-721-0500	E	Public - Call ahead	Dealership business hours			1					200-8	41.134257	-81.793779	8/2/2017	45749 2017-08-02 18:43:22 UTC	P			1/31/2012		J1772
ELEC	CEP Lot (QR 2000338)	17601 Brookpark Rd		Brookpark	OH	44142	440-951-1100	E	Public - Call ahead	Dealership business hours			1					200-8	41.682015	-81.340459	8/2/2017	45750 2017-08-02 18:59:41 UTC	P			1/31/2012		J1772
ELEC	CANAL FULTON	146 High St NE	CF EV STATION 1; Far right side of parking lot next to the gas station	Canal Fulton	OH	44614	440-951-1100	E	Public - Call ahead	Dealership business hours			1					200-8	41.682015	-81.340459	8/2/2017	45751 2017-08-02 18:59:41 UTC	P			1/31/2012		J1772
ELEC	The Villas at Gervasi Vineyard - Tesla	1700 55th St NE		Canton	OH	44721	440-734-6900	E	Public - Call ahead	Dealership business hours			1					200-8	41.4095099	-81.937738	8/2/2017	45754 2017-08-02 18:43:06 UTC	P			1/31/2012		J1772
ELEC	City of Centerville - City Hall	100 W Spring Valley Rd	Located at Spring Valley and Kalaman Way	Centerville	OH	45458	440-734-6900	E	Public - Call ahead	Dealership business hours			1					200-8	41.4095099	-81.937738	8/2/2017	45755 2017-08-02 18:43:06 UTC	P			1/31/2012		J1772
ELEC	Downtown Public Parking	39 W Franklin St	Located at N Main and Franklin St	Centerville	OH	45459	440-934-6001	E	Public - Call ahead	Dealership business hours			1					200-8	41.423696	-82.088181	8/2/2017	45756 2017-08-02 18:43:15 UTC	P			1/31/2012		J1772
ELEC	Duke Energy	139 E 4th St	E 4th and Main	Cincinnati	OH	45202	440-934-6001	E	Public - Call ahead	Dealership business hours			1					200-8	41.423696	-82.088181	8/2/2017	45757 2017-08-02 18:43:15 UTC	P			1/31/2012		J1772
ELEC	Busam Motor Sales	1501 E Kemper Rd		Cincinnati	OH	45246	330-422-7300	E	Public - Call ahead	Dealership business hours			1					200-8	41.2489295	-81.362117	8/2/2017	45758 2017-08-02 18:43:17 UTC	P			1/31/2012		J1772
ELEC	Busam Motor Sales	1501 E Kemper Rd		Cincinnati	OH	45246	330-422-7300	E	Public - Call ahead	7am-8pm M-Th, 7am-6pm F-Sat			1					200-8	41.2489295	-81.362117	8/2/2017	45759 2017-08-02 18:43:17 UTC	P			1/31/2012		J1772
ELEC	Clay Cooley Nissan	8680 Colerain Ave		Cincinnati	OH	45251	800-848-9275	E	Public - Call ahead	By appointment only			1					200-8	41.6760563	-83.685162	8/2/2017	45760 2017-08-02 18:42:59 UTC	P			1/31/2012		J1772
ELEC	Clay Cooley Nissan	8680 Colerain Ave		Cincinnati	OH	45251	800-848-9275	E	Public - Call ahead	Garage business hours			1					200-8	41.6760563	-83.685162	8/2/2017	45761 2017-08-02 18:42:59 UTC	P			1/31/2012		J1772
ELEC	Kings Nissan	9819 Kings Auto Mall Rd		Cincinnati	OH	45249	937-898-6200	E	Public - Call ahead	8am-5pm M-F; call if the charging cable is not outside the charging station			1					200-8	39.887743	-84.217964	8/2/2017	45762 2017-08-02 18:43:11 UTC	P			1/31/2012		J1772
ELEC	Kings Nissan	9819 Kings Auto Mall Rd		Cincinnati	OH	45249	937-898-6200	E	Public - Call ahead	Dealership business hours			1					200-8	39.887743	-84.217964	8/2/2017	45763 2017-08-02 18:43:11 UTC	P			1/31/2012		J1772
ELEC	AAA	3998 Red Bank Rd	FAIRFAX 01; Located at Bob Sumerel Tire & Service.	Cincinnati	OH	45227	330-372-3500	E	Public - Call ahead	Dealership business hours; for customer use only			1					200-8	41.2628664	-80.783475	8/2/2017	45764 2017-08-02 18:43:03 UTC	P			1/31/2012		J1772
ELEC	BMW OF CINCI	105 W Kemper Rd	JAKE SWEENEY; -	Cincinnati	OH	45246	330-372-3500	E	Public - Call ahead	24 hours daily; for Tesla guest use only			1					200-8	41.2628664	-80.783475	8/2/2017	45765 2017-08-02 18:43:03 UTC	P			1/31/2012		J1772
ELEC	THE BMW STORE	6131 Stewart Rd	STATION 01	Cincinnati	OH	45227		E	Public - Call ahead	24 hours daily; for Tesla guest use only			1					GPS	39.283991	-84.301826	8/2/2017	46422 2017-08-02 18:48:57 UTC	P			8/9/2011		J1772
ELEC	University of Cincinnati - Medical Campus	3225 Eden Ave	Located in Lot 13 near the west facade of Wherry Hall	Cincinnati	OH	45229	330-478-0281	E	Public - Call ahead	24 hours daily; for Tesla guest use only			2					200-8	40.794772	-81.462062	3/3/2017	46423 2017-03-03 18:53:17 UTC	P			4/15/2012		J1772
ELEC	Kroger Blue Ash Technical Center	11450 Grooms Road		Cincinnati	OH	45252	330-478-0281	E	Public - Call ahead	24 hours daily; for Tesla guest use only			1					200-8	40.794772	-81.462062	3/3/2017	46424 2017-03-03 18:53:17 UTC	P			4/15/2012		J1772
ELEC	University of Cincinnati	2906 Woodside Dr	Located at the Myers Alumni Center	Cincinnati	OH	45219	614-645-7602	E	Public - Call ahead	24 hours daily; for Tesla guest use only			1					200-8	39.9635597	-83.002541	3/3/2017	47399 2017-03-03 18:47:24 UTC	LG			12/31/2011		J1772
ELEC	Xavier University	1624 Herald Ave	Located at the Cintas Center	Cincinnati	OH	45207	614-645-3111	E	Public - Call ahead	24 hours daily; for guest use only			1					200-8	39.97538	-83.0048	3/3/2017	47452 2017-03-03 19:44:26 UTC	LG			10/7/2016		J1772
ELEC	Findlay Market	1801 Race St	Located in spot 66	Cincinnati	OH	45202	800-663-5633	E	Public - Call ahead	24 hours daily; for guest use only			2		SemaCharge Network	http://www.semacharge.com/		GPS	40.0739666	-83.131485	9/26/2017	48096 2017-09-26 07:55:08 UTC						J1772
ELEC	Cincinnati Zoo	3400 Vine St		Cincinnati	OH	45220		E	Public - Call ahead	24 hours daily; for guest use only			1					200-8	41.4187475	-81.854496	9/6/2017	48690 2017-09-06 15:14:28 UTC	FG	22 National Aeronautics and Space Administration		8/1/2012		J1772
ELEC	21c Hotel	609 Walnut St		Cincinnati	OH	45202	888-758-4389	E	Public - Call ahead	24 hours daily; for guest use only			1		ChargePoint Network	http://www.chargepoint.com/		GPS	41.0967216	-81.544472	9/26/2017	49041 2017-09-26 09:37:38 UTC						J1772
ELEC	Hilton Netherland Plaza - Tesla	35 W 5th St		Cincinnati	OH	45202	419-372-2531	E	Public - Call ahead	24 hours daily; for guest use only			1					GPS	41.37558	-83.6218	4/6/2017	49042 2017-04-06 14:15:22 UTC	P			7/15/2012		J1772
ELEC	Cincinnati State College	3520 Central Parkway		Cincinnati	OH	45223	419-372-2531	E	Public - Call ahead	24 hours daily; for guest use only			1					GPS	41.382575	-83.642614	4/6/2017	49043 2017-04-06 14:15:23 UTC	P			7/15/2012		J1772
ELEC	Tesla Service Center - Tesla	9111 Blue Ash Rd		Cincinnati	OH	45242	419-372-2531	E	Public - Call ahead	24 hours daily; for guest use only			1					GPS	41.37716	-83.6444	4/6/2017	49044 2017-04-06 14:12:24 UTC	P			7/15/2012		J1772
ELEC	Sawyer Point Park	801 E Pete Rose Way		Cincinnati	OH	45201	419-354-6246	E	Public - Call ahead	24 hours daily; for guest use only			1					200-8	41.376194	-83.649652	3/3/2017	49045 2017-03-03 18:45:50 UTC	P			7/15/2012		J1772
ELEC	AAA Cherry Grove	471 Ohio Pike		Cincinnati	OH	45255	419-354-6246	E	Public - Call ahead	24 hours daily; for guest use only			1					200-8	41.3739884	-83.648724	3/3/2017	49046 2017-03-03 18:45:48 UTC	P			7/15/2012		J1772
ELEC	University of Cincinnati	321 Clifton Ct		Cincinnati	OH	45219	419-354-6246	E	Public - Call ahead	24 hours daily; for guest use only			1					200-8	41.3739558	-83.652056	3/3/2017	49047 2017-03-03 18:49:03 UTC	P			7/15/2012		J1772
ELEC	Envision Cinemas Bar & Grille - Tesla	4780 Cornell Rd		Cincinnati	OH	45241	888-758-4389	E	Public - Call ahead	24 hours daily; for guest use only			1		ChargePoint Network	http://www.chargepoint.com/		GPS	39.9724236	-82.9049	9/26/2017	49049 2017-09-26 09:37:37 UTC						J1772

ELEC	Walmart 4609 - Colerain	10240 Colerain Ave		Cincinnati	OH	45251	888-758-4389	E	Public - Call ahead	24 hours daily; for guest use only			1		ChargePoint Network	http://www.chargepoint.com/	GPS	39.928299	-83.089981	9/26/2017	49051 2017-09-26 09:37:38 UTC					J1772
ELEC	AAA Red Bank	3998 Red Bank Rd		Cincinnati	OH	45227	888-758-4389	E	Public - Call ahead	24 hours daily; for guest use only			1		ChargePoint Network	http://www.chargepoint.com/	GPS	39.5629082	-84.276985	9/26/2017	49053 2017-09-26 09:37:37 UTC					J1772
ELEC	3CDC	309 E 8th St	STATION 2; Level 1 of parking garage next to entrance STATION 4; Level 1 parking garage next to entrance STATION 1; Level 1 of parking garage next to entrance	Cincinnati	OH	45202	888-758-4389	E	Public - Call ahead	Dealership business hours			1		ChargePoint Network	http://www.chargepoint.com/	GPS	40.0209885	-83.06144	9/26/2017	49056 2017-09-26 09:37:39 UTC					J1772
ELEC	Bob Sumerel Tire and Service	9167 Union Cemetery Rd		Cincinnati	OH	45249	937-748-4345	E	Public - Call ahead	Dealership business hours; for customer use only			1				200-8	39.5692419	-84.237821	3/3/2017	49375 2017-03-03 19:53:23 UTC	LG		6/1/2012		J1772
ELEC	Kings Ford	9555 Kings Auto Mall Rd		Cincinnati	OH	45249	888-758-4389	E	Public - Call ahead	24 hours daily; 2 chargers in service center available only during business hours			1		ChargePoint Network	http://www.chargepoint.com/	GPS	40.878727	-81.442017	9/26/2017	49587 2017-09-26 09:37:42 UTC					J1772
ELEC	McCluskey Chevrolet	9673 Kings Automall Dr		Cincinnati	OH	45249	888-758-4389	E	Public - Call ahead	Dealership business hours; see inside for PIN to access exterior charger			1		ChargePoint Network	http://www.chargepoint.com/	GPS	40.1452637	-82.924294	9/26/2017	49588 2017-09-26 09:34:49 UTC					J1772
ELEC	Porsche of Kings Auto Mall	9847 Kings Auto Mall Rd		Cincinnati	OH	45249	513-752-3447	E	Public - Call ahead	7:30am-6pm M-F, 8am-4pm Sat; for customer use only			1				200-8	39.0918896	-84.252027	8/2/2017	49680 2017-08-02 19:06:39 UTC	P		10/25/2012		J1772
ELEC	Camargo Cadillac	9880 Montgomery Rd		Cincinnati	OH	45242	513-752-3447	E	Public - Call ahead	8am-6pm M-F			1				200-8	39.0918896	-84.252027	8/2/2017	49681 2017-08-02 19:06:39 UTC	P		10/25/2012		J1772
ELEC	Columbia Chevrolet	9750 Montgomery Rd		Cincinnati	OH	45242	614-836-6251	E	Public - Call ahead	7am-7pm M-Th, 7am-6pm F, 7am-3pm Sat			1				GPS	39.891489	-82.887892	8/2/2017	49682 2017-08-02 19:04:20 UTC	P		11/15/2012		J1772
ELEC	Porsche of the Village	4113 Plainville Rd		Cincinnati	OH	45227	614-836-6251	E	Public - Call ahead	24 hours daily			1				GPS	39.891489	-82.887892	8/2/2017	49683 2017-08-02 19:04:20 UTC	P		11/15/2012		J1772
ELEC	Mac's Pizza Pub	205 W McMillan St		Cincinnati	OH	45219	888-758-4389	E	Public - Call ahead	24 hours daily			4		ChargePoint Network	http://www.chargepoint.com/	200-9	41.106782	-81.584795	9/26/2017	50396 2017-09-26 08:16:40 UTC					J1772
ELEC	84.51 Parking Garage	100 W 5th St		Cincinnati	OH	45202	614-410-4757	E	Public - Call ahead	Dealership business hours			2				200-8	40.1071879	-83.138971	3/3/2017	50398 2017-03-03 18:45:59 UTC	LG		12/20/2012		J1772
ELEC	Kroger Store #465	4613 Marburg Ave		Cincinnati	OH	45246		E	Public - Call ahead	24 hours daily	10		4				200-8	39.143841	-84.248958	4/6/2017	50399 2017-04-06 14:20:11 UTC	P		8/31/2011		J1772 NEMA520
ELEC	3CDC	309-313 E 8th St	STATION 3; -	Cincinnati	OH	45202	937-433-7171	E	Public - Call ahead	24 hours daily			1				200-8	39.6135655	-84.162892	3/3/2017	51096 2017-03-03 19:40:59 UTC	LG		2/1/2013		J1772
ELEC	3CDC	1322 Sycamore St	ZIEGLER 3; To the right after entering ZIEGLER 4; - ZIEGLER 2; - ZIEGLER 1; -	Cincinnati	OH	45202	937-433-7151	E	Public - Call ahead	Dealership business hours			1				200-8	39.628696	-84.160318	3/3/2017	51097 2017-03-03 19:54:29 UTC	LG		2/1/2013		J1772
ELEC	Duke Energy	11783 Solzman Rd		Cincinnati	OH	45249	614-861-7150	E	Public - Call ahead	Dealership business hours			2				200-8	39.9531528	-82.877111	3/3/2017	51691 2017-03-03 18:38:30 UTC	P		11/1/2012		J1772
ELEC	Duke Energy	2130 Dana Ave		Cincinnati	OH	45207	614-889-7777	E	Public - Call ahead	24 hours daily			3				200-8	40.1134257	-83.090453	3/3/2017	51692 2017-03-03 18:33:11 UTC	P		3/1/2013		J1772
ELEC	Duke Energy	5445 Audro Dr		Cincinnati	OH	45247		E	Public - Call ahead	Dealership business hours			2				200-9	40.0612387	-82.970349	3/3/2017	51693 2017-03-03 19:48:34 UTC	P		2/1/2013		J1772
ELEC	Duke Energy	424 Gest St		Cincinnati	OH	45203	614-836-6260	E	Public - Call ahead	Dealership business hours			1				GPS	39.888206	-82.8859	3/3/2017	51694 2017-03-03 19:54:27 UTC	P		11/1/2012		J1772
ELEC	Baker Electric Building	7100 Euclid Ave	Euclid Avenue and E 71st St	Cleveland	OH	44103	614-836-6260	E	Public - Call ahead	Dealership business hours			1				GPS	39.888206	-82.8859	3/3/2017	51695 2017-03-03 19:54:27 UTC	P		11/1/2012		J1772
ELEC	Glenn Research Center	21000 Brookpark Rd	Building 104.	Cleveland	OH	44135	740-654-1122	E	Public	24 hours daily			2				200-8	39.746419	-82.64717	1/11/2017	51697 2017-02-28 13:09:06 UTC	P		12/27/2016		J1772
ELEC	Contemporary Art Space	1460 W 29th St		Cleveland	OH	44113	800-998-9596	E	Public	24 hours daily			2				200-8	39.8891652	-84.216964	3/3/2017	51698 2017-03-03 18:54:34 UTC	P		3/1/2013		J1772
ELEC	Shooters on the Water	1148 Main Ave		Cleveland	OH	44113	330-375-2596	E	Public	7am-10pm daily			2				200-8	41.08352	-81.518947	3/3/2017	52033 2017-03-03 18:33:35 UTC	P		5/15/2013		J1772
ELEC	The Ritz-Carlton - Tesla	1515 W Third St		Cleveland	OH	44113	800-686-3139	E	Public	24 hours daily			1				200-8	41.151759	-81.380359	3/3/2017	52034 2017-03-03 18:33:13 UTC	P		4/1/2013		J1772
ELEC	Airport Nissan	13930 Brookpark Rd		Cleveland	OH	44135	800-686-3139	E	Public	MO: Not Specified; TU: Not Specified; WE: Not Specified; TH: Not Specified; FR: Not Specified; SA: Not Specified; SU: Not Specified			2				200-8	41.151759	-81.380359	3/3/2017	52035 2017-03-03 18:33:13 UTC	P		4/1/2013		J1772
ELEC	Airport Nissan	13930 Brookpark Rd		Cleveland	OH	44135	888-998-2546	E	Public	MO: Not Specified; TU: Not Specified; WE: Not Specified; TH: Not Specified; FR: Not Specified; SA: Not Specified; SU: Not Specified			1		Blink Network	http://www.blinknetwork.com/	GPS	41.400765	-81.595494	9/26/2017	52064 2017-09-26 07:09:56 UTC					J1772
ELEC	Rainbow Garage	2101 Adelbert Rd		Cleveland	OH	44106	937-226-7100	E	Public	24 hours daily			2				200-8	39.7325304	-84.20785	3/3/2017	53037 2017-03-03 18:46:21 UTC	P		4/1/2013		TESLA J1772
ELEC	Garage 59	2100 Circle Dr		Cleveland	OH	44106	888-758-4389	E	Public	Dealership business hours		1	1		ChargePoint Network	http://www.chargepoint.com/	GPS	39.1491992	-84.404176	9/26/2017	53132 2017-09-26 09:25:38 UTC					NEMA520 J1772
ELEC	Cornell Garage	2049 Cornell Rd		Cleveland	OH	44106	937-667-6305	E	Public	24 hours daily; meter parking	Cash D M V		1				200-8	39.9618453	-84.171103	3/3/2017	53455 2017-03-03 18:36:23 UTC	LG		10/14/2013		J1772
ELEC	University Hospitals - UH Drive Garage	11100 Euclid Ave		Cleveland	OH	44106	937-667-6305	E	Public	24 hours daily; meter parking	Cash D M V		1				200-8	39.9582486	-84.185892	3/3/2017	53456 2017-03-03 18:40:17 UTC	LG		10/14/2013		J1772
ELEC	Cleveland Clinic Hospital	9500 Euclid Ave	Located in parking garage 1 on the first level	Cleveland	OH	44195	937-667-6305	E	Public	MO: 12:00am-12:00am; TU: 12:00am-12:00am; WE: 12:00am-12:00am; TH: 12:00am-12:00am; FR: 12:00am-12:00am; SA: 12:00am-12:00am; SU: 12:00am-12:00am			1				200-8	39.965759	-84.192402	3/3/2017	53457 2017-03-03 19:49:02 UTC	LG		10/14/2013		J1772
ELEC	Uptown Parking - University Circle	1473 Euclid Ave	Located behind Constatino's Market	Cleveland	OH	44106	614-459-3775	E	Public	24 hours daily			2				200-8	40.051846	-83.047444	3/3/2017	53693 2017-03-03 19:54:31 UTC	P		10/1/2013		J1772
ELEC	Ohio State University - Center for Automotive Research	930 Kinnear Rd	Located in front of center	Columbus	OH	43212	440-775-7286	E	Public	24 hours daily			2				200-8	41.28975	-82.216939	3/3/2017	53977 2017-03-03 18:35:35 UTC	LG		12/20/2013		J1772
ELEC	Frito Lay LLC	6611 Broughton Ave	E Broad St and Brice Rd	Columbus	OH	43213	440-934-3673	E	Public	24 hours daily			1				200-8	41.420755	-82.085521	3/3/2017	53978 2017-03-03 18:36:37 UTC	P		4/1/2013		J1772
ELEC	Ohio Statehouse Parking Garage	60 E State St	Capitol Square. Green level of garage, managed by the Capitol Square Review and Advisory Board	Columbus	OH	43215	888-758-4389	E	Public	24 hours daily			1		ChargePoint Network	http://www.chargepoint.com/	GPS	40.0508208	-83.132427	9/26/2017	58337 2017-09-26 09:21:25 UTC					J1772
ELEC	Germain Nissan	4300 Morse Rd		Columbus	OH	43230	800-663-5633	E	Public	24 hours daily; pay lot			2		SemaCharge Network	http://www.semacharge.com/	GPS	39.4370264	-84.334873	9/26/2017	58505 2017-09-26 07:55:11 UTC					J1772
ELEC	Germain Nissan	4300 Morse Rd		Columbus	OH	43230	877-798-3752	E	Public	24 hours daily; pay lot				6	Tesla	http://www.teslamotors.com/supercharger	200-8	41.312212	-81.518363	3/7/2016	60107 2017-01-18 00:41:09 UTC	P		1/1/2014		TESLA
ELEC	The Electrical Trades Center	947 Goodale Blvd		Columbus	OH	43212	877-798-3752	E	Public	24 hours daily; pay lot				6	Tesla	http://www.teslamotors.com/supercharger	200-8	41.5791899	-83.666468	3/7/2016	60108 2017-01-18 00:42:18 UTC	P		1/1/2014		TESLA
ELEC	City of Columbus - City Hall	50 W Gay St	On Gay St near the corner of Front St	Columbus	OH	43215	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.2865374	-84.470979	9/26/2017	60166 2017-09-26 09:22:48 UTC					J1772
ELEC	City of Columbus - Goodale Park	120 W Goodale St	Goodale St Between Park and Dennison St	Columbus	OH	43215	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.8504309	-84.188259	9/26/2017	60398 2017-09-26 09:20:00 UTC					J1772
ELEC	Mall at Tuttle Crossing	5043 Tuttle Crossing		Columbus	OH	43016	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.1791087	-84.396014	9/26/2017	60643 2017-09-26 09:20:44 UTC					J1772
ELEC	CARCHARGING	3583 E Broad Street	WALGREENS #6118; Station is located to the right of the entrance.	Columbus	OH	43213	937-225-4572	E	Public	24 hours daily			2				200-8	39.7591036	-84.194414	8/3/2016	60723 2017-02-28 15:08:06 UTC	LG		2/12/2014		J1772
ELEC	CARCHARGING	1280 Demorest Rd	WALGREENS #6981; Station is located to the left of the store entrance	Columbus	OH	43204	888-758-4389	E	Public	Dawn to dusk daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.6272342	-84.174592	9/26/2017	61324 2017-09-26 08:51:29 UTC					J1772
ELEC	CARCHARGING	3141 Tremont Rd	WALGREENS#10053; Station is to the left of the store entrance.	Columbus	OH	43221	513-556-2283	E	Public	24 hours daily			2				200-8	39.1388858	-84.505235	3/3/2017	61497 2017-03-03 18:32:29 UTC	P		4/19/2014		J1772
ELEC	Dick Masheter Ford	1090 S Hamilton Rd		Columbus	OH	43227	937-748-4345	E	Public	24 hours daily			1				200-8	39.5458566	-84.266601	3/3/2017	61533 2017-03-03 18:40:08 UTC	P		4/18/2014		J1772
ELEC	Germain Ford	7250 Sawmill Rd		Columbus	OH	43235	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	40.0601832	-82.905527	9/26/2017	61642 2017-09-26 09:20:21 UTC					J1772
ELEC	Krieger Ford	1800 Morse Rd		Columbus	OH	43229	330-923-7999 877-798-3752	E	Public	24 hours daily			2		Tesla	http://www.teslamotors.com/supercharger	200-8	41.1377049	-81.546741	3/7/2016	61817 2017-01-18 00:45:53 UTC	P		5/22/2014		TESLA
ELEC	Ricart Ford	4255 S Hamilton Rd		Columbus	OH	43125	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	41.0848785	-81.53687	9/26/2017	62141 2017-09-26 09:16:15 UTC					J1772
ELEC	Ricart Ford	4255 S Hamilton Rd		Columbus	OH	43125	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	40.8748184	-81.423458	9/26/2017	62148 2017-09-26 09:20:22 UTC					J1772
ELEC	Honest-1 Auto Care	1030 Old Henderson Rd		Columbus	OH	43220	330-263-5336	E	Public	Dealership business hours		1	1				200-8	40.7974234	-81.941412	6/3/2016	62282 2017-02-28 14:35:50 UTC	P		6/23/2014		NEMA520 J1772
ELEC	KELLY BMW	4050 Morse Rd	STATION 01	Columbus	OH	43230	888-758-4389	E	Public	24 hours daily			1		ChargePoint Network	http://www.chargepoint.com/	GPS	41.3768817	-81.795296	9/26/2017	62408 2017-09-26 09:18:25 UTC					J1772
ELEC	Hilton Columbus at Easton	3900 Chagrin Dr		Columbus	OH	43219	937-592-4376	E	Public	Dealership business hours			4				GPS	40.360389	-83.76175	3/3/2017	62462 2017-03-03 18:44:08 UTC	LG		7/7/2014		J1772
ELEC	Lane Avenue Parking Garage	2105 Neil Ave		Columbus	OH	43210	866-597-3673	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours			2				200-8	41.675555	-83.675659	3/3/2017	62832 2017-03-03 19:39:45 UTC	P		9/1/2014		J1772
ELEC	9th Avenue Garage - East	345 W 9th Ave		Columbus	OH	43210	937-592-5771	E	Public	24 hours daily			2				GPS	40.360408	-83.76147	3/7/2016	63518 2017-02-28 18:21:19 UTC	P		8/1/2014		J1772
ELEC	South Campus Gateway Station	75 W 11th Ave		Columbus	OH	43201	937-229-2128	E	Public	24 hours daily			2				200-8	39.7389832	-84.179973	8/2/2017	63519 2017-08-02 18:49:35 UTC	P		7/1/2014		J1772
ELEC	GE WattStation	930 Kinnear Rd		Columbus	OH	43212	330-929-1904	E	Public	24 hours daily			2				200-8	41.171348	-81.507345	3/3/2017	63596 2017-03-03 18:33:36 UTC	P		4/1/2013		J1772
ELEC	GE WattStation	930 Kinnear Rd		Columbus	OH	43212	440-449-1000	E	Public	24 hours daily			2				200-8	41.519266	-81.455388	3/3/2017	63606 2017-03-03 18:55:35 UTC	P		6/1/2013		J1772
ELEC	Hilton Columbus Downtown	401 N High St		Columbus	OH	43215	330-633-6222	E	Public	24 hours daily			2				200-8	41.114032	-81.459692	3/3/2017	63983 2017-03-03 18:39:23 UTC	P		1/1/2014		J1772
ELEC	Walmart #S2098	3900 Morse Rd		Columbus	OH	43219	440-934-3673	E	Public	24 hours daily; no overnight parking			2				200-8	41.420755	-82.085521	3/3/2017	64128 2017-03-03 18:36:37 UTC	P		4/1/2013		J1772
ELEC	EASTON	117 Easton Station	EAST GARAGE 1; Next to stair well across from 2D on 2nd floor. CPE200 EAST1; Level 2 next to stairwell	Columbus	OH	43219	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	200-9	41.474586	-81.894391	9/26/2017	64370 2017-09-26 09:18:22 UTC					J1772
ELEC	AAA Reynoldsburg	6971 E Broad St		Columbus	OH	43213	877-798-3752	E	Public	24 hours daily; for Tesla use only				8	Tesla	http://www.teslamotors.com/supercharger	GPS	39.858702	-84.277027	3/7/2016	65107 2017-01-18 00:31:21 UTC	P		1/1/2015		TESLA
ELEC	AAA Car Care NW	1335 Bethel Rd		Columbus	OH	43220	877-798-3752	E	Public	24 hours daily; for Tesla use only				8	Tesla	http://www.teslamotors.com/supercharger	GPS	40.726668	-84.071932	3/7/2016	65108 2017-01-18 01:58:31 UTC	P		1/1/2015		TESLA
ELEC	EASTON	4194 Easton Gateway Dr	GATEWAY 1; Located in second isle over. GATEWAY CPE-1; Second parking lot off Stelzer Rd. GATEWAY CPE-3; Second GATEWAY CPE-2; In second parking lot off from Stelzer Rd	Columbus	OH	43219	419-898-0014	E	Public	24 hours daily			2				200-8	41.6146125	-83.225768	4/6/2017	65404 2017-04-06 14:17:26 UTC	P		12/20/2014		J1772
ELEC	AAA Gahanna	5486 N Hamilton Rd		Columbus	OH	43230	888-758-4389	E	Public	24 hours daily			2		ChargePoint Network	http://www.chargepoint.com/	GPS	40.0999254	-83.14777	9/26/2017	65759 2017-09-26 09:23:30 UTC					J1772
ELEC	CLEANFUELSOHIO	530 W Spring St	CLEAN FUELS EV1	Columbus	OH	43215	800-663-5633	E	Public	24 hours daily			2		SemaCharge Network	http://www.semacharge.com/	GPS	41.5416734	-81.493153	9/26/2017	65826 2017-09-26 07:54:35 UTC					J1772
ELEC	Holly Clubhouse	1401 Holly Ave.	The stations are open access. The parking lot is available to the public from 10 am - 6pm. Outside of these hours, the parking lot is for tenants only. Those who park here without a permit outside of those hours will be towed at vehicle owner's expense.	Columbus	OH	43212	888-998-2546	E	Public	24 hours daily; pay lot			1		Blink Network	http://www.blinknetwork.com/	GPS	39.275191	-84.364774	9/26/2017	66238 2017-09-26 07:11:35 UTC					J1772
ELEC	Walgreens	34 S Napoleon Ave		Columbus	OH	43213	513-556-4344	E	Public	24 hours daily				2			200-8	39.1342082	-84.514693	3/3/2017	66814 2017-03-03 19:48:38 UTC	P		5/1/2015		CHADEMO J1772COMBO

ELEC	Byers Imports - Porsche	401 N Hamilton Rd		Columbus	OH	43213	513-745-3900 855-900-7584	E	Public	Lot hours; university parking pass required		2	Greenlots	http://greenlots.com/	200-8	39.1501409	-84.472117	6/2/2017	66815 2017-06-02 16:13:22 UTC	P		8/31/2015	CHADEMO J1772COMBO	
ELEC	Whole Foods Market	4100 Easton Gateway Dr		Columbus	OH	43219	513-665-4839	E	Public	Dawn to dusk daily		2	Greenlots	http://greenlots.com/	200-8	39.1153984	-84.518481	3/3/2017	66816 2017-03-03 18:44:54 UTC	P		4/1/2015	CHADEMO J1772COMBO	
ELEC	Tesla Service Center	3435 Morse Rd		Columbus	OH	43231	513-281-4700	E	Public	24 hours daily	6	2			200-8	39.1430444	-84.50858	3/3/2017	67156 2017-03-03 18:45:07 UTC	LG		4/1/2015	J1772 CHADEMO J1772COMBO	
ELEC	Nationwide Children's Research Building 3	564 Livingston Ave		Columbus	OH	43215	888-758-4389	E	Public	24 hours daily; for Tesla use only	4		ChargePoint Network	http://www.chargepoint.com/	200-9	39.618426	-83.601155	9/26/2017	67165 2017-09-26 08:53:45 UTC				J1772	
ELEC	Joseph Garage - Russell Street	53 W Russell St		Columbus	OH	43215	877-798-3752	E	Public	24 hours daily		8	Tesla	http://www.teslamotors.com/supercharger	200-8	39.877568	-83.063	7/18/2016	67213 2017-01-18 01:23:19 UTC	P		3/1/2015	TESLA	
ELEC	Tesla Service Center	3435 Morse Rd		Columbus	OH	43231	513-578-6600 877-798-3752	E	Public	24 hours daily	3		Tesla	http://www.teslamotors.com/supercharger	200-8	39.1030545	-84.512001	3/7/2016	67251 2017-01-18 01:58:11 UTC	P		10/1/2014	TESLA J1772	
ELEC	EASTON	108 Easton Station	CPE200 WEST 2; Level G next to stairwell CPE200 WEST 1; Level G next to stairwell	Columbus	OH	43219	614-875-7770 877-798-3752	E	Public	24 hours daily; donations accepted	1		Tesla	http://www.teslamotors.com/supercharger	200-8	39.879803	-83.045049	3/7/2016	67252 2017-01-18 00:31:16 UTC	P		5/1/2015	TESLA	
ELEC	Georgesville Nissan	1260 Automall Dr		Columbus	OH	43228	513-421-4291 877-798-3752	E	Public	24 hours daily	2		Tesla	http://www.teslamotors.com/supercharger	200-8	39.1008434	-84.514183	3/7/2016	67253 2017-01-18 01:59:39 UTC	P		5/1/2015	TESLA	
ELEC	IKEA - Columbus	1900 IKEA Way		Columbus	OH	43240	773-564-9568 877-798-3752	E	Public	24 hours daily	1		Tesla	http://www.teslamotors.com/supercharger	200-8	40.1206909	-82.022745	3/7/2016	67254 2017-01-18 00:52:37 UTC	P		5/1/2015	TESLA	
ELEC	DC SOLAR	Panther Pkwy	SCT20HEV 171417; -	Columbus	OH	43219	740-599-6107 877-798-3752	E	Public	24 hours daily	1		Tesla	http://www.teslamotors.com/supercharger	200-8	40.3832914	-82.211721	3/7/2016	67255 2017-01-18 00:45:57 UTC	P		3/1/2015	TESLA	
ELEC	DC SOLAR	1229-1297 Sunbury Rd	SCT20HEV-170481; -	Columbus	OH	43219	330-735-2824 877-798-3752	E	Public	24 hours daily; available for permit holder use only	2		Tesla	http://www.teslamotors.com/supercharger	200-8	40.555581	-81.241472	3/7/2016	67256 2017-01-18 00:45:57 UTC	P		5/1/2015	TESLA J1772	
ELEC	THE VIEW	601 Flarestar Avenue	STATION 1; -	Columbus	OH	43240	888-998-2546	E	Public	Dealership business hours	2		Blink Network	http://www.blinknetwork.com/	GPS	40.072135	-83.13052	9/26/2017	68289 2017-09-26 07:11:54 UTC				J1772	
ELEC	Best Western Plus - Tesla	160 Montrose W Ave		Copley	OH	44321	855-900-7584	E	Public	24 hours daily		2	Greenlots	http://greenlots.com/	200-8	39.1496174	-84.536134	3/3/2017	68370 2017-03-03 18:37:25 UTC	SG		5/1/2015	CHADEMO J1772COMBO	
ELEC	Ron Marhofer Nissan	247 Howe Ave		Cuyahoga Falls	OH	44221	855-900-7584	E	Public	24 hours daily		2	Greenlots	http://greenlots.com/	200-8	40.034484	-83.161596	3/3/2017	68371 2017-03-03 18:37:27 UTC	LG		5/1/2015	CHADEMO J1772COMBO	
ELEC	Ron Marhofer Nissan	247 Howe Ave		Cuyahoga Falls	OH	44221	740-385-4070 877-798-3752	E	Public	24 hours daily	2		Tesla	http://www.teslamotors.com/supercharger	200-8	39.5195845	-82.566354	3/7/2016	68856 2017-01-18 01:58:12 UTC	P		7/1/2015	TESLA J1772	
ELEC	Al Spitzer Ford	3737 State Rd		Cuyahoga Falls	OH	44223	888-998-2546	E	Public	24 hours daily; for Tesla use only	2		Blink Network	http://www.blinknetwork.com/	GPS	40.766393	-84.150892	9/26/2017	69029 2017-09-26 07:14:58 UTC				J1772	
ELEC	Cascade Audi	4151 State Rd		Cuyahoga Falls	OH	44223	888-758-4389	E	Public	24 hours daily; for Tesla use only	2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.8773523	-84.137439	9/26/2017	70112 2017-09-26 08:44:43 UTC				J1772	
ELEC	White Oak Inn - Tesla	29683 Walhonding Rd		Danville	OH	43014	888-998-2546	E	Public	Sunrise to sunset daily	2		Blink Network	http://www.blinknetwork.com/	GPS	45.30356	-122.76056	9/26/2017	70145 2017-09-26 07:14:58 UTC				J1772	
ELEC	Matt Castrucci Nissan	3013 Mall Park Dr		Dayton	OH	45459	440-596-3440	E	Public	24 hours daily	2				200-8	41.4800987	-81.839505	3/3/2017	70267 2017-03-03 18:32:47 UTC	P		8/1/2015	J1772	
ELEC	Matt Castrucci Nissan	3013 Mall Park Dr		Dayton	OH	45459	877-798-3752	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours		8	Tesla	http://www.teslamotors.com/supercharger	200-8	39.2244699	-84.38389	3/7/2016	70299 2017-01-18 01:25:05 UTC	P		8/1/2015	TESLA	
ELEC	BookFactory	2302 S Edwin C Moses Blvd	Located at rear of building. McDonald's and Wendy's are next door.	Dayton	OH	45417	513-352-6180	E	Public	24 hours daily; maximum stay of one hour	4				GPS	39.100813	-84.499785	3/3/2017	70532 2017-03-03 18:50:38 UTC	P		10/1/2015	J1772	
ELEC	BMW OF DAYTON	7124 Poe Ave	STATION 01	Dayton	OH	45414	888-758-4389	E	Public	24 hours daily; parking permit required	2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.3704403	-84.371484	9/26/2017	70939 2017-09-26 08:50:21 UTC				J1772	
ELEC	Dayton City Hall Municipal Garage	123 W 3rd St		Dayton	OH	45402	877-455-3833	E	Public	24 hours daily	2	1	eVgo Network	https://www.evgonetwork.com/	GPS	41.3455658	-81.820831	9/26/2017	71056 2017-09-26 10:26:49 UTC				J1772 J1772COMBO	
ELEC	VOSS BMW	620 Miamisburg Centerville Rd	STATION 01	Dayton	OH	45459	614-414-5000	E	Public	Zoo business hours; pay lot	2		Tesla	http://www.teslamotors.com/supercharger	200-8	40.0497614	-82.912129	3/3/2017	71072 2017-03-03 18:31:15 UTC	P		11/12/2015	J1772 TESLA	
ELEC	University of Dayton	300 College Park Dr		Dayton	OH	45469	877-455-3833	E	Public	24 hours daily	1	2	eVgo Network	https://www.evgonetwork.com/	GPS	41.350441	-82.067795	9/26/2017	71174 2017-09-26 10:26:50 UTC				CHADEMO J1772COMBO J1772	
ELEC	Meijer - Tesla	9200 N Main St		Dayton	OH	45415	877-455-3833	E	Public	24 hours daily; for Tesla use only	1	1	eVgo Network	https://www.evgonetwork.com/	GPS	41.351059	-81.389778	9/26/2017	71231 2017-09-26 10:26:51 UTC				J1772 J1772COMBO	
ELEC	AAA	8381 Troy Pike	AAA HUBER HTS; Main parking lot	Dayton	OH	45424	877-455-3833	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours	1	2	eVgo Network	https://www.evgonetwork.com/	GPS	41.2519798	-81.361938	9/26/2017	71565 2017-09-26 10:27:01 UTC				CHADEMO J1772COMBO J1772	
ELEC	Dorothy Lane Market	6177 Far Hills Ave		Dayton	OH	45459	877-455-3833	E	Public	24 hours daily	2	1	eVgo Network	https://www.evgonetwork.com/	GPS	39.3107491	-84.317741	9/26/2017	71567 2017-09-26 10:27:02 UTC				J1772 J1772COMBO	
ELEC	Wright Point Office Park	5200 Springfield St		Dayton	OH	45431	877-455-3833	E	Public	24 hours daily	1	2	eVgo Network	https://www.evgonetwork.com/	GPS	41.1617966	-81.860062	9/26/2017	71569 2017-09-26 10:27:03 UTC				CHADEMO J1772COMBO J1772	
ELEC	Sinclair Community College - Building 20	50-172 Ohio 4	West Fifth Street at South Edwin C. Moses Blvd	Dayton	OH	45402	877-455-3833	E	Public	24 hours daily; for guest use only; see front desk for access	1	1	eVgo Network	https://www.evgonetwork.com/	GPS	41.1652107	-81.479111	9/26/2017	71570 2017-09-26 10:27:03 UTC				J1772 J1772COMBO	
ELEC	Sinclair Community College - Building 9	50-172 Ohio 4	Located in Parking Lot EE along West Fifth Street between South Perry and South Wilkinson	Dayton	OH	45402	855-443-3873	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours	1		GE WattStation	https://www.gewattstation.com	GPS	40.0060397	-83.014194	9/26/2017	72740 2017-09-26 10:36:37 UTC				J1772	
ELEC	Whole Foods Market	8075 McEwen Rd		Dayton	OH	45458	855-443-3873	E	Public	24 hours daily	1		GE WattStation	https://www.gewattstation.com	GPS	39.9931519	-83.015844	9/26/2017	72749 2017-09-26 10:33:35 UTC				J1772	
ELEC	Fifth Third Field	219 N Patterson Blvd	Located across from the stadium	Dayton	OH	45402	855-443-3873	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours	1		GE WattStation	https://www.gewattstation.com	GPS	39.9942417	-83.005445	9/26/2017	72750 2017-09-26 10:33:36 UTC				J1772	
ELEC	Whispering Pines Bed & Breakfast	1268 Magnolia Rd SW		Dellroy	OH	44620	855-443-3873	E	Public	24 hours daily	1		GE WattStation	https://www.gewattstation.com	GPS	39.9977639	-83.032384	9/26/2017	72822 2017-09-26 10:36:49 UTC				J1772	
ELEC	Parkway Nissan Lincoln Mercury	877 Commercial Pkwy		Dover	OH	44622	855-443-3873	E	Public	24 hours daily; for Tesla use only	1		GE WattStation	https://www.gewattstation.com	GPS	39.997845	-83.032384	9/26/2017	72855 2017-09-26 10:34:51 UTC				J1772	
ELEC	Parkway Nissan Lincoln Mercury	877 Commercial Pkwy		Dover	OH	44622	855-443-3873	E	Public	Park business hours	1		GE WattStation	https://www.gewattstation.com	GPS	41.4857828	-82.06741	9/26/2017	72980 2017-09-26 10:35:34 UTC				J1772	
ELEC	Inn at Dresden - Tesla	209 Ames Dr		Dresden	OH	43821	855-443-3873	E	Public	24 hours daily	1		GE WattStation	https://www.gewattstation.com	GPS	39.2712068	-84.423234	9/26/2017	73094 2017-09-26 10:34:27 UTC				J1772	
ELEC	City of Dublin - Recreation Center	5600 Post Rd		Dublin	OH	43017	740-593-1917	E	Public	24 hours daily	2				200-8	39.3241327	-82.105123	3/3/2017	73229 2017-03-03 18:53:38 UTC	P		8/25/2015	J1772	
ELEC	MAG BMW	5825 Venture Drive	STATION 01; -	Dublin	OH	43016	740-593-1917	E	Public	24 hours daily	2				200-8	39.321205	-82.103673	3/3/2017	73230 2017-03-03 18:32:05 UTC	P		8/25/2015	J1772	
ELEC	The Mall at Tuttle Crossing	5043 Tuttle Crossing Blvd, Suite #200		Dublin	OH	43016	740-593-1917	E	Public	24 hours daily	1				200-8	39.3292534	-82.107806	3/3/2017	73231 2017-03-03 18:53:43 UTC	P		8/25/2015	J1772	
ELEC	Walmart #S2774	7730 Sawmill Rd		Dublin	OH	43016	740-593-1917	E	Public	24 hours daily	2				GPS	39.324213	-82.096586	3/3/2017	73232 2017-03-03 19:53:29 UTC	P		8/25/2015	J1772	
ELEC	AAA Dublin	6600 Perimeter Loop Rd		Dublin	OH	43017	740-593-1917	E	Public	24 hours daily	2				GPS	39.324895	-82.10191	3/3/2017	73233 2017-03-03 18:53:36 UTC	P		8/25/2015	J1772	
ELEC	Walmart 4255 Elyria	1000 Chestnut Commons Dr		Elyria	OH	44035	877-455-3833	E	Public	24 hours daily		2	eVgo Network	https://www.evgonetwork.com/	GPS	41.4889183	-81.710739	9/26/2017	73282 2017-09-26 10:27:24 UTC				CHADEMO J1772COMBO	
ELEC	Innovative Business Computer Solutions, Inc	303 Shady Tree Ct		Englewood	OH	45315	877-455-3833	E	Public	24 hours daily		2	eVgo Network	https://www.evgonetwork.com/	GPS	39.2267342	-84.378052	9/26/2017	73530 2017-09-26 10:27:06 UTC				CHADEMO J1772COMBO	
ELEC	Wright State University - Allyn Hall	3640 Colonel Glenn Hwy		Fairborn	OH	45324	877-455-3833	E	Public	24 hours daily		2	eVgo Network	https://www.evgonetwork.com/	GPS	39.0710144	-84.309387	9/26/2017	73690 2017-09-26 10:27:06 UTC				CHADEMO J1772COMBO	
ELEC	Jeff Wyler Nissan Fairfield	5829 Dixie Hwy		Fairfield	OH	45014	513-556-2283	E	Public	24 hours daily	2				200-8	39.1343011	-84.517308	3/3/2017	73698 2017-03-03 18:49:10 UTC	P		2/1/2016	J1772	
ELEC	Jeff Wyler Nissan Fairfield	5829 Dixie Hwy		Fairfield	OH	45014	330-670-0888 877-798-3752	E	Public	Garage business hours; valid parking permit required	2		Tesla	http://www.teslamotors.com/supercharger	200-8	41.1298078	-81.654395	3/7/2016	73737 2017-01-18 00:21:25 UTC	P		2/1/2016	TESLA	
ELEC	Warner Nissan	1070 Bright Rd		Findlay	OH	45840	937-434-1294	E	Public	24 hours daily	3		Tesla	http://www.teslamotors.com/supercharger	200-8	39.6572359	-84.159656	3/7/2016	73749 2017-01-18 00:53:32 UTC	P		2/1/2016	TESLA J1772	
ELEC	Warner Nissan	1070 Bright Rd		Findlay	OH	45840	513-421-3000 877-798-3752	E	Public	24 hours daily	2		Tesla	http://www.teslamotors.com/supercharger	200-8	39.2700093	-84.374003	3/7/2016	73752 2017-01-18 02:00:35 UTC	P		2/1/2016	TESLA	
ELEC	Reineke Ford Lincoln Inc	12000 County Rd 99		Findlay	OH	45840	614-384-8600	E	Public	24 hours daily	3		Tesla	http://www.teslamotors.com/supercharger	200-8	39.9708025	-83.002737	3/7/2016	73756 2017-01-18 01:33:56 UTC	P		2/1/2016	TESLA J1772	
ELEC	CARCHARGING	1300 E 2nd St	WALGREENS #9733; Station is located to the left of the store entrance.	Franklin	OH	45005	740-385-7489 877-798-3752	E	Public	24 hours daily	1		Tesla	http://www.teslamotors.com/supercharger	200-8	39.4335437	-82.548646	3/7/2016	73760 2017-01-18 02:00:37 UTC	P		2/1/2016	TESLA	
ELEC	Fort Stephenson House	600 W State St		Fremont	OH	43420	877-687-7446 877-798-3752	E	Public	24 hours daily	1		Tesla	http://www.teslamotors.com/supercharger	200-8	38.8790229	-83.472163	3/7/2016	73771 2017-01-18 01:59:35 UTC	P		2/1/2016	TESLA	
ELEC	McDonald's - Garfield Heights OH	12690 Rockside Road		Garfield Heights	OH	44125	330-626-2888 877-798-3752	E	Public	24 hours daily; for Tesla use only	2		Tesla	http://www.teslamotors.com/supercharger	200-8	41.2418878	-81.351719	3/7/2016	73773 2017-01-18 00:31:39 UTC	P		2/1/2016	TESLA	
ELEC	Charles Auto Family Chevrolet Buick	10851 North St		Garrettsville	OH	44231	440-973-7026 877-798-3752	E	Public	24 hours daily	1		Tesla	http://www.teslamotors.com/supercharger	200-8	41.370089	-81.854563	3/7/2016	73775 2017-01-18 02:34:43 UTC	P		2/1/2016	TESLA	
ELEC	The Lodge and Conference Center at Geneva on the Lake	4888 N Broadway		Geneva	OH	44041	216-861-6900	E	Public	24 hours daily	3		Tesla	http://www.teslamotors.com/supercharger	200-8	41.4982854	-81.70697	3/7/2016	73778 2017-01-18 00:53:33 UTC	P		2/1/2016	TESLA J1772	
ELEC	City of Gahanna	101 Mill St		Ghana	OH	43230	330-674-7600 877-798-3752	E	Public	24 hours daily	2		Tesla	http://www.teslamotors.com/supercharger	200-8	40.5727861	-81.869366	3/7/2016	73785 2017-01-18 00:53:10 UTC	P		2/1/2016	TESLA	
ELEC	Derby Square Shopping Center - Tesla	2221 Stringtown Rd		Grove City	OH	43123	440-466-7100	E	Public	24 hours daily; for Tesla use only; for guest use only; see front desk for access	3		Tesla	http://www.teslamotors.com/supercharger	200-8	41.8572919	-80.966158	3/7/2016	73794 2017-01-18 00:53:33 UTC	P		2/1/2016	TESLA J1772	
ELEC	Best Western Executive Inn - Tesla	4026 Jackpot Rd		Grove City	OH	43123	216-623-1300 877-798-3752	E	Public	24 hours daily	2		Tesla	http://www.teslamotors.com/supercharger	200-8	41.4973165	-81.694402	3/7/2016	73797 2017-01-18 00:31:35 UTC	P		2/1/2016	TESLA	
ELEC	City of Grove City - Public Parking	4069 1st St	Located in the parking lot behind the library	Grove City	OH	43123	440-884-7800	E	Public	24 hours daily	1				200-8	41.419174	-81.790778	8/2/2017	73817 2017-08-02 18:51:00 UTC	P		2/1/2016	J1772	
ELEC	Grove City Police Department	3360 Park St		Grove City	OH	43123	440-884-7800	E	Public	24 hours daily	1				200-8	41.419174	-81.790778	8/2/2017	73825 2017-08-02 18:51:00 UTC	P		2/1/2016	J1772	
ELEC	Ricart Nissan	4255 S Hamilton Rd		Groveport	OH	43125	877-455-3833	E	Public	24 hours daily	1	2	eVgo Network	https://www.evgonetwork.com/	GPS	40.1243057	-83.088112	9/26/2017	73884 2017-09-26 10:27:41 UTC				CHADEMO J1772COMBO J1772	
ELEC	Ricart Nissan	4255 S Hamilton Rd		Groveport	OH	43125	877-455-3833	E	Public	Garage business hours	1	1	eVgo Network	https://www.evgonetwork.com/	GPS	40.0597496	-82.912216	9/26/2017	73926 2017-09-26 10:27:42 UTC				J1772 J1772COMBO	
ELEC	City of Hamilton	2210 S Erie Blvd		Hamilton	OH	45011	877-455-3833	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours	1	1	eVgo Network	https://www.evgonetwork.com/	GPS	41.4665337	-82.016937	9/26/2017	73927 2017-09-26 10:27:49 UTC				J1772 J1772COMBO	
ELEC	Coughlin Nissan	1459 Hebron Rd		Heath	OH	43056	888-758-4389	E	Public	24 hours daily	2	2	ChargePoint Network	http://www.chargepoint.com/	GPS	40.0509146	-82.914218	9/26/2017	74108 2017-09-26 08:37:33 UTC				J1772 CHADEMO J1772COMBO	
ELEC	Buckeye Nissan	3820 Parkway Ln		Hilliard	OH	43026	614-559-4200	E	Public	24 hours daily; for Tesla use only; for guest use only; see front desk for access		2			200-9	39.9575074	-82.939164	3/3/2017	74215 2017-03-03 18:31:17 UTC	LG		7/1/2015	CHADEMO J1772COMBO	
ELEC	Buckeye Nissan	3820 Parkway Ln		Hilliard	OH	43026	614-277-3000	E	Public	24 hours daily	2	2			200-8	39.8813654	-83.093282	3/3/2017	74216 2017-03-03 18:44:11 UTC	LG		5/1/2015	CHADEMO J1772COMBO J1772	
ELEC	BMW HILLIARD	4770 Britton Pkwy	STATION 4	Hilliard	OH	43026	877-455-3833	E	Public	MO: 10:00am-06:00pm; TU: 10:00am-06:00pm; WE: 10:00am-06:00pm; TH: 10:00am-06:00pm; FR: 10:00am-06:00pm; SA: 10:00am-06:00pm; SU: 10:00am-06:00pm		2	eVgo Network	https://www.evgonetwork.com/	GPS	39.9812202	-82.817535	9/26/2017	74299 2017-09-26 10:27:16 UTC				CHADEMO J1772COMBO	
ELEC	City of Hilliard - Early Television Museum	5396 Franklin St		Hilliard	OH	43026	877-455-3833	E	Public	24 hours daily; for Tesla use only		2	eVgo Network	https://www.evgonetwork.com/	GPS	40.0631943	-83.054932	9/26/2017	74312 2017-09-26 10:27:16 UTC				CHADEMO J1772COMBO	
ELEC	Tu Lakes Motel	7420 North Beach Rd		Hillsboro	OH	45133	877-455-3833	E	Public	24 hours daily	1	1	eVgo Network	https://www.evgonetwork.com/	GPS	39.2599983	-84.598297	9/26/2017	74333 2017-09-26 10:28:04 UTC				J1772 J1772COMBO	

ELEC	JEFFERSONVILLE	8800 Factory Shops Blvd	TANGER EV 2; The station is located in the parking area near Tommy Hilfiger TANGER EV 1; The station is located in the parking area near Tommy Hilfiger	Jeffersonville	OH	43128	877-455-3833	E	Public	24 hours daily		1	1	eVgo Network	https://www.evgonetwork.com/	GPS	39.1586876	-84.279251	9/26/2017	74570	2017-09-26 10:27:22 UTC					J1772 J1772COMBO
ELEC	Klaben Ford Lincoln	1089 W Main St	Located on Rt 59, 1 mile West of Rt 43.	Kent	OH	44240	877-455-3833	E	Public	24 hours daily		2	2	eVgo Network	https://www.evgonetwork.com/	GPS	39.3446388	-84.39357	9/26/2017	74685	2017-09-26 10:27:46 UTC					CHADEMO J1772COMBO J1772
ELEC	Klaben Ford Lincoln	1089 W Main St	Located on Rt 59, 1 mile West of Rt 43.	Kent	OH	44240	888-758-4389	E	Public	24 hours daily		2	6	ChargePoint Network	http://www.chargepoint.com/	200-8	40.048151	-82.913225	9/26/2017	74691	2017-09-26 08:44:09 UTC					J1772 CHADEMO J1772COMBO
ELEC	KCG PARKING	201 E Erie St	STATION 2; First parking spots at top of entrance ramp. Connect with PARTA for discounts on Charging and Parking permits are available to save on parking fees. STATION 1; First parking spot at top of entrance ramp. Connect with PARTA for discounts on Charging and Parking permits are available to save on parking fees.	Kent	OH	44240	855-443-3873	E	Public	10am-4pm T-W, 10am-9pm Th-F, 10am-5pm Sat, 12pm-5pm Sun		1		GE WattStation	https://www.gewattstation.com	GPS	39.2711821	-84.423644	9/26/2017	74743	2017-09-26 10:37:21 UTC					J1772
ELEC	Kent State University - Office of Institutional Advancement	350 S Lincoln St		Kent	OH	44242	855-443-3873	E	Public	7:30am-6pm T-W & F, 7:30am-9pm M & Th		1		GE WattStation	https://www.gewattstation.com	GPS	41.4186396	-81.820552	9/26/2017	74834	2017-09-26 10:35:04 UTC					J1772
ELEC	Kent State University - Heer Hall	635 Loop Rd		Kent	OH	44242	855-443-3873	E	Public	24 hours daily		1		GE WattStation	https://www.gewattstation.com	GPS	40.7742282	-84.084832	9/26/2017	74835	2017-09-26 10:35:01 UTC					J1772
ELEC	Kent State University - Student Center	1075 Risman Dr		Kent	OH	44242	855-443-3873	E	Public	24 hours daily		1		GE WattStation	https://www.gewattstation.com	GPS	41.4186396	-81.820552	9/26/2017	74836	2017-09-26 10:37:20 UTC					J1772
ELEC	Kettering Medical Center	3535 Southern Blvd	Located at the central garage	Kettering	OH	45429	855-443-3873	E	Public	24 hours daily		1		GE WattStation	https://www.gewattstation.com	GPS	40.7742286	-84.084907	9/26/2017	74837	2017-09-26 10:35:02 UTC					J1772
ELEC	Bob Boyd Ford	2840 N Columbus St		Lancaster	OH	43130	888-758-4389	E	Public	24 hours daily		3		ChargePoint Network	http://www.chargepoint.com/	200-9	41.152691	-81.355863	9/26/2017	75077	2017-09-26 08:33:32 UTC					J1772
ELEC	Lima Mall	2400 Elida Road		Lima	OH	45805	877-455-3833	E	Public	24 hours daily			2	eVgo Network	https://www.evgonetwork.com/	GPS	40.1093216	-83.015686	9/26/2017	75288	2017-09-26 10:27:17 UTC					CHADEMO J1772COMBO
ELEC	Reineke Nissan	1350 N Cable Rd		Lima	OH	45805	877-455-3833	E	Public	24 hours daily			2	eVgo Network	https://www.evgonetwork.com/	GPS	40.0766335	-82.862175	9/26/2017	75573	2017-09-26 10:27:17 UTC					CHADEMO J1772COMBO
ELEC	Reineke Nissan	1350 N Cable Rd		Lima	OH	45805	937-748-6800 877-798-3752	E	Public	24 hours daily; for Tesla use only		2		Tesla	http://www.teslamotors.com/supercharger	200-8	39.5772216	-84.229352	6/3/2016	75739	2017-01-18 01:01:42 UTC	P		5/1/2016		TESLA
ELEC	Hampton Inn - Tesla	1933 Roschman Ave		Lima	OH	45804	877-455-3833	E	Public	24 hours daily			2	eVgo Network	https://www.evgonetwork.com/	GPS	40.1015015	-83.156487	9/26/2017	76206	2017-09-26 10:27:17 UTC					CHADEMO J1772COMBO
ELEC	Lima Mall	2400 Elida Road		Lima	OH	45805	877-455-3833	E	Public	24 hours daily			2	eVgo Network	https://www.evgonetwork.com/	GPS	39.1489754	-84.40387	9/26/2017	76460	2017-09-26 10:27:06 UTC					CHADEMO J1772COMBO
ELEC	LIMA_E 2 (QR 2000336)	1155 Bible Road		Lima	OH	45801	888-758-4389	E	Public	24 hours daily		2		ChargePoint Network	http://www.chargepoint.com/	GPS	40.2591146	-82.922732	9/26/2017	76920	2017-09-26 08:21:28 UTC					J1772
ELEC	LIMA_W 1 (QR 2000346)	1155 Bible Road		Lima	OH	45801	888-758-4389	E	Public	24 hours daily			2	ChargePoint Network	http://www.chargepoint.com/	GPS	41.0519282	-81.538747	9/26/2017	77341	2017-09-26 08:32:10 UTC					CHADEMO J1772COMBO
ELEC	Inn & Spa at Cedar Falls - Tesla	2190 Highway 374		Logan	OH	43138	888-758-4389	E	Public	24 hours daily; for patient, visitor, and employee use only		6		ChargePoint Network	http://www.chargepoint.com/	200-8	39.105246	-84.50845	9/26/2017	77568	2017-09-26 08:29:51 UTC					J1772
ELEC	Firelands Apartments	1025 W Erie Ave		Lorain	OH	44052	440-275-2000 877-798-3752	E	Public	24 hours daily		1		Tesla	http://www.teslamotors.com/supercharger	200-8	41.7844243	-80.856941	9/2/2016	77974	2017-01-18 00:37:36 UTC	P		8/15/2016		TESLA
ELEC	Amp Electric Vehicles	100 Commerce Blvd		Loveland	OH	45150	888-758-4389	E	Public	24 hours daily		1		ChargePoint Network	http://www.chargepoint.com/	GPS	40.8904886	-81.596936	9/26/2017	78384	2017-09-26 08:34:53 UTC					J1772
ELEC	Tesla Service Center	5180 Mayfield Rd		Lyndhurst	OH	44124	937-767-7202	E	Public	24 hours daily		2				200-8	39.8082345	-83.887553	3/3/2017	78429	2017-03-03 18:51:08 UTC	LG		8/15/2016		J1772
ELEC	Macedonia Commons - Tesla	8210 Macedonia Commons Blvd	I-80 Exit 180	Macedonia	OH	44056	216-844-8447	E	Public	24 hours daily		1				200-8	41.505155	-81.606174	4/6/2017	78497	2017-04-06 14:33:36 UTC	P		8/15/2016		J1772
ELEC	Sohar's All Season Mower Service Inc	600 Highland Rd		Macedonia	OH	44056		E	Public	24 hours daily		1				200-8	41.5064044	-81.601784	4/6/2017	78498	2017-04-06 14:29:51 UTC	P		8/15/2016		J1772
ELEC	Nissan of Mansfield	1455 Park Ave W		Mansfield	OH	44906		E	Public	24 hours daily		1				200-8	41.5075844	-81.604449	4/6/2017	78499	2017-04-06 14:33:41 UTC	P		8/15/2016		J1772
ELEC	Nissan of Mansfield	1455 Park Ave W		Mansfield	OH	44906	888-758-4389	E	Public	See front desk for access		2		ChargePoint Network	http://www.chargepoint.com/	GPS	39.9666831	-83.0158	9/26/2017	78775	2017-09-26 08:22:18 UTC					J1772
ELEC	LIBERTY CENTER	7628 Liberty Way	CHEESECAKE 1; Main entrance near The Cheesecake Factory	Mason	OH	45069	614-342-4041	E	Public	24 hours daily; see front desk to access			2			200-8	40.0201782	-82.879886	7/6/2017	78915	2017-07-06 17:25:52 UTC	LG		6/1/2015		CHADEMO J1772COMBO
ELEC	Walmart 1441 Mason	5303 Bowen Dr		Mason	OH	45040	888-998-2546	E	Public	24 hours daily		1		Blink Network	http://www.blinknetwork.com/	GPS	41.54167	-81.49337	9/26/2017	79178	2017-09-26 07:11:34 UTC					J1772
ELEC	Luxottica Retail	4000 Luxottica Pl		Mason	OH	45040	800-643-7460	E	Public	9am-9pm daily; by appointment only		2				200-9	41.1096922	-83.209967	3/3/2017	79229	2017-03-03 18:31:31 UTC	P		1/1/2014		J1772
ELEC	Waikem Nissan	4325 Lincoln Way E		Massillon	OH	44646	513-733-1142 877-798-3752	E	Public	24 hours daily		2		Tesla	http://www.teslamotors.com/supercharger	200-8	39.2526319	-84.388027	12/1/2016	79760	2017-01-18 01:53:26 UTC	P		11/1/2016		TESLA
ELEC	Waikem Nissan	4325 Lincoln Way E		Massillon	OH	44646	888-758-4389	E	Public	24 hours daily		4		ChargePoint Network	http://www.chargepoint.com/	200-8	41.462909	-81.950694	9/26/2017	80079	2017-09-26 08:19:39 UTC					J1772
ELEC	Waikem Mitsubishi	3710 Lincoln Way E		Massillon	OH	44646	800-663-5633	E	Public	24 hours daily		1		SemaCharge Network	http://www.semacharge.com/	GPS	39.9879594	-83.033574	9/26/2017	80107	2017-09-26 07:55:09 UTC					J1772
ELEC	Waikem Mitsubishi	3710 Lincoln Way E		Massillon	OH	44646	800-663-5633	E	Public	24 hours daily		6		SemaCharge Network	http://www.semacharge.com/	GPS	41.5064005	-81.606111	9/26/2017	80132	2017-09-26 07:54:35 UTC					J1772
ELEC	Meijer - Tesla	1391 Conant St	I-80/90 Exit 59	Maumee	OH	43537	877-798-3752	E	Public	24 hours daily			8	Tesla	http://www.teslamotors.com/supercharger	200-8	40.4928284	-82.71007	1/11/2017	80213	2017-01-18 01:10:23 UTC	P		12/1/2016		TESLA
ELEC	Ganley Nissan	6060 Mayfield Rd		Mayfield Heights	OH	44124	888-758-4389	E	Public	24 hours daily; for guest use only		2		ChargePoint Network	http://www.chargepoint.com/	GPS	40.7818456	-82.261805	9/26/2017	80522	2017-09-26 08:22:32 UTC					J1772
ELEC	Ganley Nissan	6060 Mayfield Rd		Mayfield Heights	OH	44124	419-530-4100	E	Public	24 hours daily		1				200-8	41.6557576	-83.614036	1/11/2017	80587	2017-05-16 20:15:31 UTC	P		1/1/2012		J1772
ELEC	Nick Mayers Marshall Ford	6200 Mayfield Rd		Mayfield Heights	OH	44124	419-530-4100	E	Public	24 hours daily		1				200-8	41.6439325	-83.594092	7/6/2017	80588	2017-07-06 17:19:39 UTC	P		1/1/2012		J1772
ELEC	Ken Ganley Nissan	5180 Montville Dr		Medina	OH	44256	419-245-1300 844-410-8727	E	Public	24 hours daily		3				200-8	41.6529938	-83.534837	6/2/2017	80591	2017-06-02 16:14:12 UTC	LG		1/1/2013		J1772
ELEC	Ken Ganley Nissan	5180 Montville Dr		Medina	OH	44256	419-255-8000	E	Public	24 hours daily		2				GPS	41.658295	-83.559497	6/2/2017	80592	2017-06-02 16:16:18 UTC	P		12/1/2016		J1772
ELEC	Walmart 1894 Medina	4141 Pearl Rd		Medina	OH	44256	800-587-6797	E	Public	24 hours daily		2				200-9	41.6373203	-83.481263	3/3/2017	80593	2017-03-03 19:50:06 UTC	P		1/1/2014		J1772
ELEC	Mentor Nissan	6960 Center St		Mentor	OH	44060	866-276-4294	E	Public	24 hours daily		1				200-8	41.5425449	-83.635852	3/3/2017	80594	2017-03-03 18:31:44 UTC	P		12/1/2016		J1772
ELEC	Mentor Nissan	6960 Center St		Mentor	OH	44060	419-874-1188	E	Public	24 hours daily		1				200-9	41.5398196	-83.635497	3/3/2017	80595	2017-03-03 18:41:33 UTC	P		1/1/2012		J1772
ELEC	Holiday Inn Express & Suites - LaMalfa Conference Center	5785 Heisley Rd		Mentor	OH	44060	614-861-2512	E	Public	24 hours daily		1				200-9	39.9377486	-82.789597	3/3/2017	80596	2017-03-03 18:31:45 UTC	P		12/1/2016		J1772
ELEC	Classic Chevrolet	6877 Center St		Mentor	OH	44060	614-237-9123	E	Public	24 hours daily		1				200-8	39.972113	-82.905244	3/3/2017	80597	2017-03-03 18:31:46 UTC	P		12/1/2016		J1772
ELEC	Classic Cadillac	8470 Tyler Blvd		Mentor	OH	44060	419-307-1010	E	Public	24 hours daily		1				200-9	41.3489728	-83.116831	3/3/2017	80598	2017-03-03 19:51:07 UTC	P		6/15/2014		J1772
ELEC	Classic Ford Lincoln	8540 Tyler Blvd		Mentor	OH	44060	614-864-5180	E	Public	24 hours daily		4				GPS	39.985017	-82.870525	1/11/2017	80599	2017-02-28 15:22:51 UTC	P		6/1/2015		J1772
ELEC	GANLEY BMW	6976 Pearl Rd	PUBLIC STATION; The station lies inbetween the two buildings by a yellow post.	Middleburg Heights	OH	44130		E	Public	24 hours daily		1				200-8	40.0984053	-82.831106	1/11/2017	80600	2017-02-28 15:51:25 UTC	P		6/15/2014		J1772
ELEC	Melink	5140 River Valley Rd	Round Bottom Rd & River Valley Rd	Milford	OH	45150	419-734-4092	E	Public	By appointment only; call station for access		1				200-9	41.5245306	-82.859492	3/3/2017	80601	2017-03-03 18:40:56 UTC	P		12/1/2016		J1772
ELEC	Walmart	201 Chamber Dr		Milford	OH	45150	614-536-0570	E	Public	8am-6pm M-F		2				200-9	40.0570329	-82.909566	3/3/2017	80602	2017-03-03 18:51:50 UTC	P		12/1/2016		J1772
ELEC	Duke Energy	1099 State Route 28		Milford	OH	45150	614-336-2042	E	Public	7:30am-8pm M-F, 8am-5pm Sat		2				200-8	40.0572104	-82.927999	1/11/2017	80603	2017-01-18 01:54:03 UTC	P		1/1/2014		TESLA
ELEC	The Barn Inn Bed and Breakfast - Tesla	6838 County Road 203		Millersburg	OH	44654	330-263-0564	E	Public	24 hours daily		1				200-8	40.797179	-81.889584	3/3/2017	80604	2017-03-03 18:31:50 UTC	P		11/1/2015		J1772
ELEC	Cincinnati Premium Outlets	400 Premium Outlets Dr		Monroe	OH	45050		E	Public	24 hours daily		1				200-8	39.9532801	-82.983412	3/3/2017	80605	2017-03-03 19:44:56 UTC	P		1/1/2015		J1772
ELEC	Cincinnati Premium Outlets	400 Premium Outlets Drive		Monroe	OH	45050	419-307-1010	E	Public	24 hours daily		1				200-8	41.467206	-82.18154	3/3/2017	80606	2017-03-03 19:51:38 UTC	P		12/1/2016		J1772
ELEC	Bonecutter Hollow - Tesla	6200 State Route 95		Mt Gilead	OH	43338	513-315-2451	E	Public	24 hours daily		4				200-9	39.9753139	-83.004096	3/3/2017	80607	2017-03-03 18:41:26 UTC	P		3/1/2016		J1772 TESLA
ELEC	Gramercy Apartments	5935 Central College Rd		New Albany	OH	43054	614-879-9993	E	Public	24 hours daily; for Tesla use only; for guest use only; see front desk for access		1				200-9	39.9445309	-83.266395	3/3/2017	80608	2017-03-03 19:45:41 UTC	P		12/1/2016		J1772
ELEC	CARCHARGING	6733 Frank Ave NW	WALGREENS#11810; Station is located to the right of the store entrance	North Canton	OH	44720	440-249-6044	E	Public	24 hours daily; for Tesla use only; for guest use only; see front desk for access		4				200-9	41.4104828	-81.936626	3/3/2017	80609	2017-03-03 19:45:16 UTC	P		1/1/2015		J1772
ELEC	CAIN BMW	6461 Whipple Ave NW	STATION 01; -	North Canton	OH	44720	888-461-1425	E	Public	24 hours daily		2				200-9	41.3840874	-81.777554	3/3/2017	80610	2017-03-03 19:45:15 UTC	P		12/1/2016		J1772
ELEC	Port Jackson Business Center	8310 Port Jackson Ave NW		North Canton	OH	44720	216-444-2200	E	Public	24 hours daily		1				200-8	41.5027329	-81.620153	6/2/2017	80611	2017-06-02 16:14:12 UTC	P		12/1/2016		J1772
ELEC	Alger Arms Apartments	475 Portland Way		North Galion	OH	44833	216-721-6000	E	Public	MO: Not Specified; TU: Not Specified; WE: Not Specified; TH: Not Specified; FR: Not Specified; SA: Not Specified; SU: Not Specified		2				200-8	41.5111233	-81.604256	6/2/2017	80612	2017-06-02 16:54:07 UTC	P		12/1/2016		J1772
ELEC	Nissan of North Olmsted	28500 Lorain Rd		North Olmsted	OH	44070	440-461-1016	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours		4	1			200-8	41.5191779	-81.493795	3/3/2017	80613	2017-03-03 19:51:39 UTC	P		12/1/2016		TESLA
ELEC	Nissan of North Olmsted	28500 Lorain Rd		North Olmsted	OH	44070	216-751-2320	E	Public	24 hours daily		1				200-8	41.477249	-81.527401	3/3/2017	80614	2017-03-03 18:31:53 UTC	P		12/1/2016		J1772
ELEC	Porsche North Olmsted	28400 Lorain Rd		North Olmsted	OH	44070		E	Public	24 hours daily		1				200-9	41.2983372	-81.50243	3/3/2017	80615	2017-03-03 18:31:48 UTC	P		12/1/2016		J1772
ELEC	Ottawa National Wildlife Refuge	14000 W State Route 2	Located at the Visitor Center	Oak Harbor	OH	43449		E	Public	24 hours daily		1				200-9	41.2875769	-81.099395	3/3/2017	80616	2017-03-03 18:31:49 UTC	P		12/1/2016		J1772
ELEC	City of Oberlin	69 S Main St	Located in the municipal parking lot behind 69 South Main St.	Oberlin	OH	44074	330-394-3606	E	Public	24 hours daily		1				200-8	41.283097	-80.824945	7/6/2017	80617	2017-07-06 17:29:35 UTC	P		10/1/2013		J1772
ELEC	Matthews Ford Oregon	2811 Navarre Ave		Oregon	OH	43616	440-357-0384 877-98-3752	E	Public	MON: 24 hours | TUE: 24 hours | WED: 24 hours | THU: 24 hours | FRI: 24 hours | SAT: 24 hours | SUN: 24 hours		2		Tesla	http://www.teslamotors.com/supercharger	200-8	41.7137157	-81.299007	6/2/2017	80618	2017-06-02 16:58:59 UTC	P		12/1/2016		J1772 TESLA
ELEC	Cuyahoga Community College - Advanced Automotive Technology Center	11000 Pleasant Valley Rd		Parma	OH	44130	440-953-1070	E	Public	24 hours daily		1				200-9	41.684253	-81.338263	3/3/2017	80619	2017-03-03 18:35:50 UTC	P		12/1/2016		J1772
ELEC	Liberty Ford	6600 Pearl Rd		Parma Heights	OH	44130		E	Public	24 hours daily		1				200-9	41.6828592	-81.336097	3/3/2017	80620	2017-03-03 18:53:28 UTC	P		1/1/2013		J1772
ELEC	Ed Schmidt Volvo VW	26875 N Dixie Hwy	Located in the Volvo service center	Perrysburg	OH	43551	440-266-3000	E	Public	24 hours daily		2				200-9	41.6846084	-81.333144	3/3/2017	80621	2017-03-03 18:44:29 UTC	P		1/1/2013		J1772
ELEC	RE/MAX Masters	810 W South Boundary		Perrysburg	OH	43551	330-745-5550	E	Public	24 hours daily		2				200-9	40.991048	-81.577286	8/2/2017	80622	2017-08-02 18:51:05 UTC	P		11/1/2015		J1772
ELEC	McDonald's	18 NE Catawba Rd		Port Clinton	OH	43452	330-375-2597	E	Private - Government only	Also accessible through chip keys	Proprietor Wright_Exp	1				200-8	41.0810763	-81.515923	3/3/2017	80623	2017-03-03 19:47:35 UTC	P		1/1/2014		J1772
ELEC	Walgreens	2300 State Route 256		Reynoldsburg	OH	43068	888-415-1142	E	Private			2				GPS	41.18485	-81.508228	3/3/2017	80624	2017-03-03 18:32:55 UTC	P		7/1/2016		J1772
ELEC	Richmond Town Square	691 Richmond Road		Richmond Heights	OH	44143	330-672-4432	E	Private			1				GPS	41.150865	-81.351347	3/3/2017	80625	2017-03-03 18:40:47 UTC	P		12/1/2016		J1772
ELEC	Richmond Town Square	691 Richmond Road		Richmond Heights	OH	44143	330-672-4432	E	Private			1				GPS	41.14603	-81.334706	3/3/2017	80626	2017-03-03 18:31:37 UTC	P		12/1/2016		J1772
ELEC	Glenlaurel	14940 Mt Olive Rd		Rockbridge	OH	43149	937-573-4400	E	Private			2				200-8	40.0307683	-84.222549	3/3/2017	80627	2017-03-03 18:35:05 UTC	P		2/28/2017		J1772
ELEC	Whole Foods Market	19607 Detroit Rd		Rocky River	OH	44116		E	Private			2				200-9	39.9022112	-84.148192	3/3/2017	80628	2017-03-03 18:34:59 UTC	P		1/1/2013		J1772
ELEC	First Unitarian Church of Cleveland	21600 Shaker Blvd		Shaker Heights	OH	44122	937-604-4170	E	Private			2				GPS	39.867302	-84.31646	3/3/2017	80629	2017-03-03 19:47:57 UTC	P		11/2/2012		TESLA
ELEC	The Dealership	3558 Lee Rd		Shaker Heights	OH	44120		E	Private			2				200-8	39.7815804	-84.118909	7/6/2017	80630	2017-07-06 17:26:57 UTC	P		6/1/2014		J1772
ELEC	STP 2 (QR 2000334)	3000 E Sharon Road		Sharonville	OH	45241	937-512-4529	E	Private			2				200-8	39.7594481	-84.187021	5/4/2017	80631	2017-05-04 13:15:08 UTC	SG		8/1/2014		J1772
ELEC	STP 1 (QR 2000655)	3000 E Sharon Road		Sharonville	OH	45241	937-512-4529	E	Private			2				200-8	39.7594481	-84.187021	5/4/2017	80632	2017-05-04 13:17:51 UTC	SG		8/1/2016		J1772

ELEC	Spitzer Mitsubishi	4840 Transportation Dr		Sheffield	OH	44054	855-536-7543	E	Private			2					GPS	39.6983	-84.191703	3/3/2017	80633 2017-03-03 18:52:11 UTC	P		12/1/2016		J1772	
ELEC	I-90 Nissan	5013 Detroit Rd		Sheffield Village	OH	44054	937-999-6880	E	Private			2					GPS	39.626837	-84.189753	3/3/2017	80634 2017-03-03 18:40:50 UTC	P		12/1/2016		J1772	
ELEC	I-90 Nissan	5013 Detroit Rd		Sheffield Village	OH	44054	888-235-2097	E	Private			2					200-8	39.557472	-84.255402	7/6/2017	80635 2017-07-06 17:27:14 UTC	P		1/1/2014		J1772	
ELEC	Mike Bass Ford	5050 Detroit Rd	Located outside by the Ford and Used Car buildings	Sheffield Village	OH	44035	937-393-1917	E	Private			1					200-9	39.2157821	-83.485314	3/3/2017	80636 2017-03-03 19:44:57 UTC	P		12/1/2016		TESLA	
ELEC	Mike Bass Ford	5050 Detroit Rd	Located outside by the Ford and Used Car buildings	Sheffield Village	OH	44035	740-617-0910	E	Private			1					200-8	39.9904932	-82.025483	3/3/2017	80637 2017-03-03 18:41:30 UTC	P		1/1/2012		J1772	
ELEC	North Park	195 Tamarack Trail		Springboro	OH	45066	304-243-4000	E	Private			2					200-8	40.1047993	-80.659346	3/3/2017	80638 2017-03-03 18:34:39 UTC	P		12/1/2016		J1772 TESLA	
ELEC	Clearcreek Park	3500 Lower Springboro Rd		Springboro	OH	45066	419-772-2222	E	Private			1					200-8	40.7693676	-83.828569	3/3/2017	80639 2017-03-03 18:51:41 UTC	SG		12/1/2016		J1772	
ELEC	Dorothy Lane Market - Tesla	740 N Main St		Springboro	OH	45066	513-677-5000	E	Private			1					200-9	39.2883355	-84.305892	3/3/2017	80640 2017-03-03 18:34:54 UTC	P		12/1/2016		J1772	
ELEC	Total Cable Solutions	475 Victory Dr		Springboro	OH	45066	513-683-0220	E	Private			2					200-9	39.2953897	-84.307398	3/3/2017	80641 2017-03-03 18:40:48 UTC	P		12/1/2016		J1772	
ELEC	Upper Valley Mall	1475 Upper Valley Pike		Springfield	OH	45504	513-697-5200	E	Private			6					200-8	39.2988039	-84.307019	3/3/2017	80642 2017-03-03 18:40:55 UTC	P		12/1/2016		J1772	
ELEC	Walmart #52323	3520 Hudson Dr		Stow	OH	44224	513-851-5900	E	Private			3					200-8	39.294956	-84.311927	3/3/2017	80643 2017-03-03 18:41:32 UTC	P		11/1/2015		J1772	
ELEC	Nissan of Streetsboro	885 Classic Dr		Streetsboro	OH	44241		E	Private			2					200-9	39.3274538	-84.423505	3/3/2017	80644 2017-03-03 18:44:30 UTC	P		8/1/2014		J1772	
ELEC	Nissan of Streetsboro	885 Classic Dr		Streetsboro	OH	44241	513-891-9400	E	Private			1					200-8	39.2362863	-84.349214	3/3/2017	80645 2017-03-03 19:44:59 UTC	P		12/1/2016		J1772	
ELEC	Walmart 2313 Streetsboro	905 Singletary Dr		Streetsboro	OH	44241		E	Private			2					200-8	39.2329962	-84.35145	3/3/2017	80646 2017-03-03 18:35:03 UTC	P		12/1/2016		J1772	
ELEC	Quality Inn - Tesla	9420 State Route 14		Streetsboro	OH	44241	513-679-9100	E	Private			1					200-8	39.2119955	-84.460086	3/3/2017	80647 2017-03-03 18:34:55 UTC	P		12/1/2016		J1772	
ELEC	Walmart 2266 Strongsville	8585 Pearl Rd		Strongsville	OH	44136	513-271-3200	E	Private			1					200-9	39.1500197	-84.380388	3/3/2017	80648 2017-03-03 18:51:42 UTC	P		12/1/2016		J1772	
ELEC	TANGER COLUMBUS	400 South Wilson Road	TANGERCOLUMBUS1; Near Playground by Old Navy Outlet Store	Sunbury	OH	43074	513-241-6227	E	Private			1					200-9	39.1276361	-84.519659	3/3/2017	80649 2017-03-03 19:50:04 UTC	P		12/1/2016		J1772	
ELEC	TANGER COLUMBUS	I-71	TANGERCOLUMBUS2; Between Levis Outlet Store and UnderArmor Outlet Store	Sunbury	OH	43074	513-381-8555	E	Private			6					200-8	39.1015296	-84.515175	3/3/2017	80650 2017-03-03 19:44:55 UTC	P		12/1/2016		J1772	
ELEC	Dave White Chevrolet	5880 Monroe St		Sylvania	OH	43560	614-336-2042	E	Private			3					200-8	40.0572104	-82.927999	1/11/2017	80651 2017-01-18 01:54:03 UTC	P		12/1/2016		TESLA	
ELEC	Park Ford	400 W Ave		Tallmadge	OH	44278	888-758-4389	E	Private				4	ChargePoint Network	http://www.chargepoint.com/		GPS	40.0508138	-82.916406	9/26/2017	80857 2017-09-26 08:24:01 UTC					CHADEMO J1772COMBO	
ELEC	Tiffin Ford Lincoln	2020 W Market St		Tiffin	OH	44883	888-758-4389	E	Private			2		ChargePoint Network	http://www.chargepoint.com/		GPS	40.2597335	-82.926476	9/26/2017	80858 2017-09-26 08:32:46 UTC					J1772	
ELEC	Tipp City - Downtown	20 N 3rd St	Located in Downtown Tipp City on N 3rd St just north of Main St	Tipp City	OH	45371	888-751-8560 614-277-3004	E	Private				2	Greenlots	http://greenlots.com/		GPS	39.8818533	-83.092274	2/1/2017	81154 2017-05-24 17:08:25 UTC	LG		9/15/2016		CHADEMO J1772COMBO	
ELEC	Tipp City - Government Center	260 S Garber Dr	Located on the northwest edge of the Government Center public parking lot	Tipp City	OH	45371	800-893-9036	E	Private			2					200-9	41.7144691	-83.683792	2/1/2017	81164 2017-02-01 20:14:21 UTC	P		12/1/2016		J1772	
ELEC	Tipp City - Menards	75 Weller Dr	Located on the North edge of the Menard's parking lot	Tipp City	OH	45371	513-765-6000	E	Private			2					200-9	39.3388917	-84.296055	2/1/2017	81165 2017-02-01 20:11:15 UTC	P		12/1/2016		J1772	
ELEC	Aileron Entrepreneurship Center	8860 Wildcat Rd		Tipp City	OH	45371	419 267-5511	E	Private			2					200-9	41.4510211	-84.299416	2/1/2017	81167 2017-02-01 20:11:17 UTC	LG		12/1/2016		J1772	
ELEC	Yark Nissan	5957 W Central Ave		Toledo	OH	43615	330-352-2141	E	Private	Employee and visitor use only		1					200-8	41.141516	-81.639991	2/1/2017	81168 2017-02-01 20:11:13 UTC	P		1/1/2012		TESLA	
ELEC	Yark Nissan	5957 W Central Ave		Toledo	OH	43615	866-980-1434	E	Private			1					200-8	41.426331	-82.086464	2/1/2017	81169 2017-02-01 20:05:46 UTC	P		12/1/2016		J1772	
ELEC	Kistler Ford	5555 W Central Ave	Located at the west end of the building	Toledo	OH	43615	888-378-3480	E	Private			1					200-9	41.0890155	-83.653442	2/1/2017	81170 2017-02-01 20:11:18 UTC	P		12/1/2016		J1772	
ELEC	University of Toledo - Parking Area 31	2925 E Rocket Dr		Toledo	OH	43606	937-775-5690	E	Private			2					200-8	39.781523	-84.064099	2/1/2017	81171 2017-02-01 20:06:14 UTC	P		12/1/2016		J1772	
ELEC	University of Toledo - Parking Area 22	457 Parkside Blvd		Toledo	OH	43606	419-834-9045	E	Private		2	1					GPS	40.739369	-82.800261	6/2/2017	81172 2017-06-02 16:16:29 UTC	P		12/1/2016		TESLA NEMA1450 NEMA520	
ELEC	City of Toledo	393 N Superior St	Located at metered parking near North Superior and Adams Street	Toledo	OH	43504	330-672-4432	E	Private			1					200-8	41.1475579	-81.343454	3/3/2017	81527 2017-03-03 18:53:39 UTC	P		6/15/2016		J1772	
ELEC	Toledo Museum of Art	2445 Monroe St	Lot 1	Toledo	OH	43604	419-772-2500 419-772-2222	E	Private			1					200-9	40.7647114	-83.827459	3/3/2017	81591 2017-03-03 18:44:17 UTC	P		12/1/2016		J1772	
ELEC	YARK BMW	7600 Central Ave	STATION 1; - STATION 2	Toledo	OH	43617	330-562-5508 877-798-3752	E	Private			1		Tesla	http://www.teslamotors.com/supercharger		200-8	41.2873735	-81.361798	4/6/2017	81863 2017-04-06 14:18:04 UTC	P		3/1/2017		TESLA	
ELEC	Kroger Marketplace	731 W Market St		Troy	OH	45373	330-499-1000 877-798-3752	E	Private			1		Tesla	http://www.teslamotors.com/supercharger		200-8	40.8572727	-81.353396	4/6/2017	81864 2017-04-06 14:34:18 UTC	P		3/1/2017		TESLA	
ELEC	Beau Townsend Nissan	1050 W National Rd		Vandalia	OH	45377	888-758-4389	E	Private			4		ChargePoint Network	http://www.chargepoint.com/		200-9	41.673795	-83.725289	9/26/2017	82241 2017-09-26 08:12:01 UTC					J1772	
ELEC	Beau Townsend Nissan	1050 W National Rd		Vandalia	OH	45377	937-333-3333	E	Private			2					200-8	39.763437	-84.18743	5/4/2017	82282 2017-05-04 13:21:33 UTC	LG		1/1/2015		J1772	
ELEC	Beau Townsend Ford	1020 W National Rd		Vandalia	OH	45377	800-663-5633	E	Private			2		SemaCharge Network	http://www.semacharge.com/		GPS	39.8082345	-83.887553	9/26/2017	82302 2017-09-26 07:55:10 UTC					J1772	
ELEC	Sims Buick-GMC-Nissan	3140 Elm Rd NE		Warren	OH	44483	888-998-2546	E	Private			3		Blink Network	http://www.blinknetwork.com/		GPS	40.030711	-84.221684	9/26/2017	82546 2017-09-26 07:14:00 UTC					J1772	
ELEC	Sims Buick-GMC-Nissan	3140 Elm Rd NE		Warren	OH	44483	330-526-0480	E	Private		1	3					200-9	40.901181	-81.44588	6/2/2017	82591 2017-06-02 16:16:29 UTC	LG		12/1/2016		J1772 NEMA1450	
ELEC	IBEW Local 573	4550 Research Pkwy NW		Warren	OH	44483	877-455-3833	E	Private				2	eVgo Network	https://www.evgonetwork.com/		GPS	41.3133049	-81.686554	9/26/2017	82609 2017-09-26 10:24:45 UTC					CHADEMO J1772COMBO	
ELEC	Walmart	8288 Highland Pointe Dr		West Chester	OH	45069	888-758-4389	E	Private			2		ChargePoint Network	http://www.chargepoint.com/		GPS	39.1051173	-84.508435	9/26/2017	85775 2017-09-26 08:29:21 UTC					J1772	
ELEC	Contech Engineered Solutions LLC	9025 Centre Pointe Dr		West Chester	OH	45069	888-758-4389	E	Private	For resident use only		8		ChargePoint Network	http://www.chargepoint.com/		200-9	39.1107	-84.51039	9/26/2017	85875 2017-09-26 08:14:40 UTC					J1772	
ELEC	Subway	97 E Main St		West Jefferson	OH	43162	614-369-4444	E	Private	Employee use only			2				200-8	39.926031	-83.12483	8/2/2017	85971 2017-08-02 18:58:25 UTC	P		3/1/2017		CHADEMO J1772COMBO	
ELEC	Murphin Ridge Inn - Tesla	750 Murphin Ridge Rd		West Union	OH	45693	740-915-8501	E	Private			2					200-8	40.012238	-82.458184	8/2/2017	85973 2017-08-02 18:45:22 UTC	P		3/1/2017		J1772	
ELEC	CARCHARGING	748 N State St	WALGREENS #7940; Station is located to the right of the store entrance.	Westerville	OH	43082	614-334-4110	E	Private	Service center use only		1					GPS	40.1403474	-83.018441	8/2/2017	85974 2017-08-02 19:06:33 UTC	P		3/1/2017		J1772	
ELEC	GANLEY BMW	24690 Sperry Dr	WESTLAKE PUBLIC; - WESTLAKE SA01	Westlake	OH	44145	888-758-4389	E	Private	Service center use only		2		ChargePoint Network	http://www.chargepoint.com/		GPS	41.5977586	-81.439327	9/26/2017	86006 2017-09-26 09:22:05 UTC					J1772	
ELEC	GEMINI TOWER I	1991 Crocker Rd	EV CHARGE2; Rear of Building EV CHARGE1; Rear of Building	Westlake	OH	44145	888-998-2546	E	Private			3		Blink Network	http://www.blinknetwork.com/		GPS	40.150612	-82.967172	9/26/2017	86012 2017-09-26 07:09:49 UTC					J1772	
ELEC	Oglebay Resort and Conference Center	465 Lodge Dr		Wheeling	OH	26003		E	Private			4					200-9	39.282615	-84.344914	8/2/2017	86182 2017-08-02 18:59:23 UTC	T		7/31/2017		J1772	
ELEC	CLASSIC BMW- OH	2571 Som Center Rd	STATION 01	Willoughby Hills	OH	44094		E	Private	For building tenant use only		6					200-8	39.145695	-84.46	8/2/2017	86183 2017-08-02 19:06:11 UTC	T		7/31/2017		J1772	
ELEC	Local Roots Market	140 S Walnut St	Located in east parking lot behind Local Roots at S Walnut St and W South St	Wooster	OH	44691		E	Private	Service center use only		1					200-9	39.195946	-84.233532	8/2/2017	86184 2017-08-02 19:06:12 UTC	T		12/19/2014		J1772	
ELEC	G&S Titanium	4000 Lincoln Way E		Wooster	OH	44691		E	Private	Service center use only		2					200-9	39.189936	-84.602939	8/2/2017	86185 2017-08-02 19:10:18 UTC	T		12/25/2014		J1772	
ELEC	AAA Worthington	90 E Wilson Bridge Rd		Worthington	OH	43085		E	Private	Employee and fleet vehicle use only		3					200-9	39.099032	-84.526061	8/2/2017	86186 2017-08-02 19:10:18 UTC	T		12/19/2014		J1772	
ELEC	Nissan North	8645 N High St		Worthington	OH	43085	888-758-4389	E	Private	Employee and fleet vehicle use only		2		ChargePoint Network	http://www.chargepoint.com/		GPS	39.9942396	-82.943837	9/26/2017	86745 2017-09-26 08:04:46 UTC					J1772	
ELEC	John Bryan Community Center	100 Dayton St		Yellow Springs	OH	45387	888-758-4389	E	Private	Fleet vehicles only		1		ChargePoint Network	http://www.chargepoint.com/		GPS	39.9946491	-82.942193	9/26/2017	86748 2017-09-26 08:07:52 UTC					J1772	
ELEC	Bryan Center	100 Dayton ST		Yellow Springs	OH	45387	888-758-4389	E	Private	Employee and fleet vehicle use only		2		ChargePoint Network	http://www.chargepoint.com/		GPS	40.1369109	-83.001137	9/26/2017	87614 2017-09-26 08:11:43 UTC					J1772	
ELEC	Jeff Drennen Chevrolet	3657 Maple Ave	Located in the service center	Zanesville	OH	43701	216-912-5655	E	Private	Employee and fleet vehicle use only		1					200-9	41.462881	-81.564921		87653 2017-09-14 14:08:06 UTC	LG		9/12/2017		J1772	

INT-44. If the answer to INT-43 is in the affirmative, identify the results.

RESPONSE: n/a

INT-45. Has EVCA conducted any studies or analyses to determine whether the EVCS Proposal in the Stipulation is the most cost-effective way to accelerate expansion of EVCS's and EV adoption?

RESPONSE: EVCA has not performed that analysis.

Prepared by: Dr. Abdellah Cherkouai

INT-46. If the answer to INT-45 is in the affirmative, identify the results.

RESPONSE: n/a

INT-47. Referring to Cherkaoui's testimony at 10:18-20, has EVCA conducted any studies or analyses regarding the current expansion rate of EVCS's and EV adoption?

RESPONSE: EVCA has not performed that analysis. EVCA notes the findings of *The Market for Electric Vehicles: Indirect Network Effects and Policy Design*, a study through Cornell University, which identified the interdependence between increased charging station deployments and increased electric vehicle sales. EVCA also notes that in the second quarter of 2017, the State of Ohio's electric vehicle registrations increased 40% over the previous year.

Prepared by: Dr. Abdellah Cherkouai

INT-48. If the answer to INT-47 is in the affirmative, identify the results.

RESPONSE: n/a

OHIO POWER COMPANY'S RESPONSE TO
THE OFFICE OF THE OHIO CONSUMERS' COUNSEL'S
DISCOVERY REQUEST
PUCO CASE NO. 16-1852-EL-SSO et al.
FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-030	Does AEP Ohio agree that there is a competitive market already in existence for the development of and installation of EV charging stations? Please identify the number of market participants active in the EV charging market in the AEP service territory in Ohio.

RESPONSE

The EV charging market is a developing market and the rebate incentive program is intended to support the development of that market. See the Company's response to OCC-INT-3-378.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-004	Has PJM Interconnection called any interruptions on AEP Ohio customers since the inception of the IRP-D tariffs?

RESPONSE

See STIP-OCC-INT-1-003. All events were initiated by PJM.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-041	With regard to the rebates for EV charging stations in "low income geographic areas," please provide any information available to the parties concerning the penetration of EVs by low income households in any "low income geographic area" within AEP Ohio's service territory. In your response, identify the potential "low income geographic areas" by census track in AEP Ohio's service territory.

RESPONSE

The Company is considering use of an established definition or standard such as the definition of "low income geographic area" found in 15 U.S.C. Section 689(3).

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-039	With regard to the "multi-unit" structures that are eligible for EV charging station rebates, define the term "multi-unit" in terms of the number of units, the criteria with respect to the location of the EV charging station on the property owned or operated by the owner(s) of the multi-unit structure, whether this refers to commercial or residential property, and other criteria as applicable.

RESPONSE

The term multi-unit is self-explanatory. The location of the EV charging station would be site specific. Multi-unit structures could include commercial or residential property.

Prepared by: William A. Allen

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FIRST SET-STIPULATION

DATA REQUEST

STIP-OCC-INT-1-045	With regard to the revenues from the EV charging stations referenced in the Settlement section III. H (1) (o), identify the estimated annual revenues from each type of EV charging station assuming the all the authorized charging stations are installed as authorized for each year of the Smart City Rider.

RESPONSE

The Company has not performed that calculation.

Prepared by: William A. Allen

Summary: Testimony Supplemental Testimony of Barbara R. Alexander on Behalf of the Office of the Ohio Consumers' Counsel electronically filed by Ms. Deb J. Bingham on behalf of Michael, William J. Mr.