City of Atlanta
Electric Vehicle Supply Equipment Workbook
Updated January 2018

RESOURCES

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### Educational Materials

Local outreach organizations are a great way to get involved in local EV Readiness efforts.

#### Local Outreach

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<th>Website</th>
<th>Description</th>
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<tbody>
<tr>
<td>Clean Cities Georgia</td>
<td><a href="http://www.cleancitiesgeorgia.com">www.cleancitiesgeorgia.com</a></td>
<td>The Clean Cities Program is an initiative of the U.S. Department of Energy (DOE) and focuses on strategies to reduce petroleum consumption in transportation. There are nearly 100 Clean Cities Coalitions across the country and Clean Cities–Georgia holds the distinction of being the first coalition. DOE officially designated the coalition in 1993. Clean Cities–Georgia is the central coordinating point for alternative fuel vehicle (AFV) activities in the state of Georgia.</td>
</tr>
<tr>
<td>Southern Alliance for Clean Energy</td>
<td><a href="http://www.cleanenergy.org">www.cleanenergy.org</a></td>
<td>The Southern Alliance for Clean Energy (SACE) is a non-profit organization that promotes responsible energy choices that work to address the impacts of global climate change and ensure clean, safe and healthy communities throughout the Southeast. After more than 30 years, SACE remains the only regional organization solely focused on transforming the way we produce and consume energy in the Southeast.</td>
</tr>
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#### National Organizations and Resources

<table>
<thead>
<tr>
<th>Organization</th>
<th>Website</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrification Coalition</td>
<td><a href="http://www.electrificationcoalition.org/">http://www.electrificationcoalition.org/</a></td>
<td>The Electrification Coalition is a nonpartisan organization based in Washington, DC committed to reducing our dependence on oil by electrifying the United States transportation sector. They do this through partnerships with local governments and strategic solutions like fleet analytics, policy initiatives, and programming that show and support the benefits of electric vehicles.</td>
</tr>
<tr>
<td>Electric Power Research Institute</td>
<td><a href="http://www.epri.com">www.epri.com</a></td>
<td>The Electric Power Research Institute (EPRI) conducts research, development, and demonstration projects for the benefit of the public in the United States and internationally. As an independent, nonprofit organization for public interest energy and environmental research, we focus on electricity generation, delivery, and use in collaboration with the electricity sector, its stakeholders and others to enhance the quality of life by making electric power safe, reliable, affordable, and environmentally responsible.</td>
</tr>
<tr>
<td>Plug In America</td>
<td>Pluginamerica.com</td>
<td>Plug In America helps consumers, policy-makers, auto manufacturers and others to understand the powerful benefits of driving electric. They provide practical, objective information to help consumers select the best plug-in vehicle for their lifestyles and needs.</td>
</tr>
<tr>
<td>Alternative Fuels &amp; Advanced Vehicles Data Center</td>
<td><a href="http://www.afdc.energy.gov/afdc/fuels/electricity.html">www.afdc.energy.gov/afdc/fuels/electricity.html</a></td>
<td>Alternative Fuel Data Center with fuel information and infrastructure locators</td>
</tr>
</tbody>
</table>
EVSE Installation Guide

Off-Street EVSE Installations: An EV charging station guide for parking lots, parking decks, hotels, and multifamily parking

1. **Commercial and Multi-Family Lot Owners Only:** Obtain permission from your property owner, home owner’s association, or parent company prior to installation.

2. **Procure electric vehicle charging station (EVSE)**
   - a. Send out a request for proposals (RFP) for equipment specifying requirements
   - b. Make sure your charger has been certified for EV use. The equipment will be marked by a Nationally Recognized Testing Laboratory (i.e. UL and/or ETL)
      
      ![UL ETL logos]

   - c. Determine best charger structure for use:
     i. Conductive: Pedestals & Wall mounts
     ii. Inductive: Wireless Charging Stations
   - d. Determine the appropriate technology for the use

3. **If the entity owns but does not operate the equipment**, an RFP for a management company ought to be issued (or included in the RFP for the charging station).
   - a. Managing company is responsible for:
     i. Usage monitoring
     ii. Rate collection
     iii. Maintenance of the equipment
     iv. Any other items dictated in the contract agreement.

4. **Installation Site**
   - a. Locations in special planning zones need approval from the Department of Zoning and Development
   - b. Considerations
     i. Proximity to power source
     ii. Visibility
     iii. Networked vs. Non-networked Stations
     iv. Equipment protection
     v. ADA Accessibility
     vi. User Accessibility
     vii. Existing Landscape
     viii. Water Patterns

5. **Determine proper signage and space use**
   - a. Each EVSE should have a contact number such that a consumer may report a malfunctioning device.
   - b. Each EVSE device should have an identification number or label that can be easily located and read.
   - c. Refer to the Signage section below.
     i. Use commonly used designs to create a familiarity among constituents.
d. Signage should indicate:
   i. Location of EV charging stations
   ii. Restrictions on vehicle type (i.e. EV Only)
   iii. Restrictions on parking times (i.e. No Parking Between 8a.m. and 6pm)
   iv. Rate for charging
   v. Rate for parking (if not included in the charging rate)
   vi. Way finding

e. Identify restrictions on parking
   i. EV Only
   ii. EV Charging Only
   iii. No restrictions

6. Public Parking
   a. Metered space: amend contract with parking management
      i. *Example:* Duncan manages parking for the City of Atlanta. If the proposed parking changes
         would breach the contract with Duncan, the City of Atlanta would need to identify to Duncan
         where lost funds would be reclaimed and gain approval on the amendment.
      ii. Non-metered space: no changes in parking rate structure because no spaces are removed from
          current list nor are spaces designated for specific vehicles

7. Complete electrical permitting guide (See Commercial Installation or Multi-Family Installation)
   a. Contact contractor (unless using Level 1 and do not need to re-route)
   b. Contact Utility Planner (if upgrade needed)
   c. Contractor presents to the customer Statement of Work with cost estimate
   d. Upon customer approval, contractor submits Statement of Work and electrical permit application form
   e. Permit approved/denied

8. *For commercially and privately owned EVSE that is installed on public property,* complete easements request
   a. Right of way easements
      i. Obtain a Qualified Contractors Permit
      ii. Obtain a Lane/Sidewalk Closure Permit if the installation will require blocking the sidewalk.
      iii. City of Atlanta manages right of way on City owned streets.
         1. Encroachment forms must be completed and submitted to Department of Public Works.
      iv. State of Georgia manages the right of way for state-owned streets
   b. Legislation for 3rd party-owned EVSE installations on city property is strongly suggested.
   c. Contact: City of Atlanta’s Public Works, Department of Transportation:

9. Installation
   a. City of Atlanta follows National Electric Code 2017
   b. See Installation Considerations
   c. Follow the National Electric Code for permissible installations.
Residential EVSE Installations

1. If residence is regulated by a home owner’s association or exists in a special district, identify requirements set forth by the appropriate entity.
   a. If location is in a Special Planning, obtain design approval through the Department of Zoning and Development
      i. Shall not be installed on or in front of the home’s façade,
      ii. Shall not compromise historical materials used in, on, or around the home, and
      iii. Shall have signs (if applicable) that match the style and color of other signs in the district.

2. Purchase electric vehicle charging station (EVSE)
   a. Determine the appropriate technology for the use
   b. Determine best structure for technology
      iv. Conductive: Pedestal or Wall Mount
      v. Inductive: Wireless Charging
   c. Make sure your charger has been certified for EV use. The equipment will be marked by a Nationally Recognized Testing Laboratory (i.e. UL and/or ETL)

3. Installation Site
   a. Indoors: inside of an enclosed garage. The charging equipment is inside and the charging occurs inside of the garage where the device is not exposed to the environment.
   b. Outdoors: outside of any environmental protection, carports, and situations where the EVSE is inside a conditioned space (i.e. a garage) but charging occurs outside.
   c. Considerations:
      i. Location (indoor/outdoor)
      ii. Placement
      iii. Distance from electricity source
      iv. Visibility
      v. Existing landscape
      vi. Flood zones

4. Complete electrical permitting guide (See Permitting Process for Residential Installation)
   a. Contact contractor (unless using Level 1 or do not need to re-route)
   b. Contact Utility Planner (if upgrade needed)
   c. Contractor presents to the customer Statement of Work with cost estimate
   d. Upon customer approval, contractor submits Statement of Work and electrical permit application form
   e. Permit approved/denied

5. Complete easements request (if necessary)
   a. Contact: City of Atlanta, Department of Public Works, 55 Trinity Avenue, Suite 4900, Atlanta, GA 30303 or call 404-330-6501 and request for encroachment checklist
      i. If installation requires access to, or construction through the public right-of-way, complete right of way easement request.

Case Studies

Employment Center Case Study: Kirk-Rudy, Woodstock, GA

Woodstock Business Installs Electric Vehicle Charging Station (EVCS) for Employee Use

Overview:

• Kirk-Rudy, a Green and Sustainability-oriented company, commissioned a Solar Parking Canopy with one EVCS for the use of their employees and visitors.
• 100 kW Photovoltaic (PV) canopy; 475 feet long; 432 solar panels; 12 inverters; shade for 50 parking spots.
• Cost: in excess of $500,000 with investment payback expected to be 3.5 years.
• Parking canopy structurally easier to install than rooftop - less maintenance overall.
• Set up with Feed-In Tariff to GA Power at $.17/kWh.
• Tied directly to power grid w/ no tie-in to facility. This is a GA Power requirement for Feed-In Tariff. KR gets credit in the form of a monthly check intended to offset their electricity bill.
• The EVCS is a 208 Volt / 40 amp unit. Provides 6.6 kWs of charging power. Connected directly to the facility’s electrical system (behind the meter) and does not interface with the solar panel array at all. This is for the following reasons:
  • Feed-In Tariff requires the solar array to be completely isolated from all loads. In essence, this is a dedicated power station for GA Power.
  • Connecting the EVCS the grid is far cheaper than installing a battery back-up system for times of non-solar production

Major Issues Encountered:

• Erroneous Plot Plans:
  o An erroneous plot plan incorrectly showed a large water drain pipe six feet south of actual position.
  o Pipe was damaged during footer drilling. Extensive time and cost required for repairs.
• Permitting:
  o Permitting offices not sure how to classify parking canopy with solar pv panels. Is it a structure? Is it a utility? Is it an enclosure?
• Inspections:
  o Inspectors generally unfamiliar with solar and EV charging station installations. We had to identify the various components and explain their function; and also educate them on code requirements.

• Electric Vehicle Charging Station:
  o Original contract called for a 100 amp charging station. During the electrical installation phase of construction, it was discovered the facility’s electric service could not handle the 100-amp load without installing another transformer – an expensive solution and not covered by GA Power.
  o The EVCS was swapped out for a 40 amp charging station.
Parking Garage Case Study: Midtown Atlanta Office Building, Spring and 8th

Cousins and the NCR Campus: Cousins relationship with building NCR’s Global Headquarters began in April 2015 when Cousins competed and won the development right to build the campus at Spring and 8th Streets. Having recently completed the COX Corporate Headquarters in Sandy Springs, Cousins was uniquely qualified to develop, fund, build and deliver the campus that NCR envisioned. With six (6) months of planning & approvals and twenty-four (24) months of construction, the phase one 500,000 square foot Class A/LEED Platinum building was delivered and ready for occupancy on January 1st, 2018. The phase two 250,000 square foot building will be delivered fall of 2018 completing the Midtown campus.

Reason for the chargers: Cousins had the intent to develop a Green office building and attain a high level of LEED Certification (Platinum). To accomplish this all energy-saving features were evaluated and EV charging was the first decision made. NCR had the need to offer incentives to those employees that were making the switch to EV and wanted to be able to offer on-site secure and non-public chargers. These two perspectives merged with an initial installation of (20) chargers for NCR with a capacity to add more chargers in the future.

Info on chargers and installation:
Installation Size: 20 chargers located on AC level (10 dual port Level 2 Commercial charging Stations)
Type of Chargers: ChargePoint Model CT4000
Charging Network: ChargePoint
Type of Mount: Pedestal

Charging rates: NCR has elected to provide free charging to employees. It has considered applying a service fee to encourage EV drivers to unplug and re-park once the charge is complete. That fee structure is an NCR decision but would likely be set in a range to motivate an EV user to free that charging station for the next employee.

Installation Considerations: Charging station power requirements and wiring configurations can vary greatly depending upon how the charging stations are intended to be used. For example, the CT4000 stations used at the NCR Headquarters can be configured up to 6 different ways depending on how quickly the customer intends for vehicles to charge, how much money the customer intends to spend on electrical infrastructure to support charging stations, etc. Early discussions regarding desired charge times and infrastructure costs will benefit all parties to ensure that the appropriate solution is selected day 1. In addition, the load demanded by vehicle charging stations during use can be quite extensive. Anyone considering an implementation should engage a qualified electrical engineer to analyze the estimated operational loads and ensure all associated electrical equipment can handle loads created by their specific charging station configuration. Depending on the desired configuration, an electrical engineer may recommend isolating charging station loads to its own dedicated electrical panel.

Contact information (optional) on installer/or project manager: John Ganter/Holder Construction: jganter@holder.com/ (404) 405-9677
Hospitality Case Study: Hilton Garden Inn, Atlanta, GA

Hilton Garden Inn

Hilton Garden Inn installed their 1st public PEV charging stations on September 6th, 2011 in the parking lot located at 3045 Windy Hill Rd, Atlanta GA, 30339. Eric Gray, General Manager with Hilton Garden Inn.

Type(s) of Unit(s): Pedestal Mount DuraStations Level 2

Manufacturer: General Electric       Contact: Chris Crawford
Number of Units: Two

Ongoing Unit Management Company and Responsibility (Who is responsible for ongoing maintenance and paying for the electricity?): Hilton Garden Inn will be responsible for providing the electricity and routine maintenance. Cole Technology will be responsible for any warranty issues. (Cole also can provide for a fee routine maintenance)

Information about the units installed and why these were chosen for this location: Installed two pedestal mounted DuraStations. These stations are both level 2 stations with the SAE approved J1772 connector.

Did you prepare a plot plan for this installation? If so please provide supporting documentation that outlines the technical specifications of the EVSE installation.

There was not plot plan developed for this installation.

Installation Information
Start date: Sept 6, 2011          Completion Date: October 10, 2011
Consultant (if applicable): N/A     Phone: N/A
Installer: Cole Technology Inc.    Phone: 404-472-1213
Contractor: Cole Technology Inc. (Ken Adams) Phone: 404-472-1213

Description of signage: Green and White “Reserved Parking Electric Vehicles Only.”

Parking information: (Will there be a fee for parking? Will there be a fee for charging? If so what rate/method) Currently there is no fee for parking and from my understanding there are no plans for a fee in the future.

Information about the installation process (barriers to success, achievements, unique issues that were overcome):

The installation did not pose any significant obstacles.
Although the location chosen for the stations was across the parking lot from the building so power had to run underground for approximately 125 feet. We accomplished this using a boring machine to bore under the drive and lot so as not to disrupt the driveway and parking area. We installed two bollards for protection against impact from automobiles.
Georgia Tech Case Study

As the Georgia Institute of Technology (Georgia Tech) is known throughout the world as one of the finest engineering and research institutions, the campus administration and its constituents have been on the forefront of embracing innovative technology. The Institute also has a serious mandate to focus on sustainability. These two factors were instrumental in developing Tech’s robust electric vehicle charging program which began in 2011.

After an early launch with Level II non-networked chargers, Tech saw growing demand and a need to collect usage data and monitor power output. They expanded throughout campus and partnered with ChargePoint to install two dual-port Level 2 chargers in the location of the previous ones and have expanded further with grant funding.

**Installation:**
- 22 Spaces Level 2 charging – Mix of dual port wall mounted (8) and pedestal (14) charging units
  - 18 on-campus in 6 locations
  - 4 at Tech Square Parking Deck

**Procurement:** A state grant that would match up to $40,000 for the purchase and installation of visitor-accessible EV chargers.

**Planning:** Multiple site visits were conducted throughout the campus to identify and prioritize potential locations based on high demand and infrastructure-feasibility (convenient access to power source). Through this grant award they were able to install an additional nine Level 2 chargers, bringing the campus total to 22 publicly accessible L2 charging spaces.

**Benefits:** Tech can monitor usage, energy output, revenue, and other data. They also keep track of the number of EVs registered to park on campus to determine whether their program is meeting demand adequately and serving the community satisfactorily. By incentivizing time limits on all their chargers (by increasing the cost to charge after four hours) to encourage turnover, demand is met by allowing users adequate time to charge without infringing on others’ opportunity. Feedback is positive.

Contact info: Lisa Safstrom is the Campus Transportation Planner for Georgia Tech and oversees the EV charging program. She can be reached at 404-385-6030 or commute@gatech.edu.
Choosing Appropriate Charging Station Level

<table>
<thead>
<tr>
<th>Charger Type</th>
<th>Feature</th>
<th>Best Use</th>
</tr>
</thead>
</table>
| AC Level 1   | > 120V, 16A (dedicated circuit). Designed for the standard American home.  
> Typically uses the standard three-prong plug (NEMA 5-15/20P)  
> Takes 8-22 hours to charge a full battery (battery-size dependent)  
> Simple and easy accessibility and installation  
> Uses a SAE J1772 plug for the vehicle | > Residential Applications  
> Long Term Parking  
> Workplace Applications |
| AC Level 2   | > 208/240 VAC, up to 80 A, but typically at around 40 A – 60A  
> Takes 2-4 hours for full charge  
> Uses SAE J1772  
> Safety requirements described in the National Electric Code 625, 2008 and beyond | > Residential Applications (requires electrical contractor for install)  
> Workplace Applications  
> Commercial Applications  
> On Street Parking |
| DC Charge    | > 480VOC, 100+ A  
> 80% charge in 30 minutes  
> Existing equipment uses CHAdeMO Connectors | > Retail Applications  
> Commercial Applications  
> On Street Parking |
| Wireless Charger | > 208/240V electrical outlet to your vehicle’s existing on-board battery charger.  
> Charging time depends on the battery capabilities on the vehicle. | > Home  
> Parking garages  
> Fleet Parking |
Residential EVSE Location Selection

Indoor or Outdoor Charging

- Garage/carport installations are generally wall mounted installations.
- Outdoor installations can be on pedestals. EVSE should be protected from damage due to temperature extremes by keeping the cord from freezing to the ground or submersion in flood plain.

Placement

- EVSE shall be placed in a location that does not impede driver’s ability to park.
- Location of the charging port on the vehicle should be taken into consideration.
- EVSE shall be placed in a clutter-free location.
- Wall-mounted EVSE shall be installed at a height of between 36” and 48.”
- New outlets shall be installed 4’ or better from the ground to prevent exposure of wires in the case of an accident.
- Place charger such that changes to the immediate environment are minimized.
- Shall be installed in a location free of flammable materials (NEC 625). 

Power Accessibility

- Level 2 installations or greater require hiring an electrician.
- Place the EVSE as close to the utility panel and/or outlet as possible.
  - As the distance from a power source increases, so does the cost of installation due to the cost of excavation and/or piping of electric lines.
- Installing a new meter:
  - When pulling power from a source that is not already metered
  - New service shall be established with the local utility company
  - This is not common in residential applications

Visibility

- Location ought to be well lit to reduce tripping hazard, EV/EVSE damage, and entanglement with other garage accessories.

Flood Zones

- Identify flood zones at http://map.georgiadfirm.com/.
- The Code of Federal Regulations, Title 44 Emergency Management and Assistance, Part 60 Criteria for Land Management and Use states: "If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall
  - (i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,
  - (ii) be constructed with materials resistant to flood damage,
  - (iii) be constructed by methods and practices that minimize flood damages, and
  - (iv) be constructed with electrical heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

- Methods of protection for pedestals include "Wet flood proofing" (elevation of the equipment), "Component Protection" (waterproofing techniques), and "Dry flood proofing" (combination of wet flood proofing and component protection).

- Ensure no water puddles where drivers will stand.

\(^1\) See attached: NEC 625
Off Street EVSE Location Selection: Parking lots and decks

Power Accessibility

- Distance from power source determines cost of installation
  - As the distance from a power source increases, so does the cost of installation due to the cost of excavation and/or piping of electric lines.
  - Electric wires can be run through conduit (generally less expensive) or under the concrete (generally more expensive).
- When to install a new meter:
  - When pulling power from a source that is not already metered
  - New service shall be established with the local utility company
  - Example: City of Raleigh connected their charging stations to street lights. Therefore, new addresses were required to meter electricity usage of the charging stations.
- As the distance from a power source increases, so does the cost of installation due to the cost of excavation and/or piping of electric lines.

Visibility

- Signs ought to be easily located from the road
- Lighting - Reduces tripping, EV/EVSE damage, and safety concerns
- See Southeastern EVSE Signage to review usable signs.

Networked vs. Non-Networked Stations

- Determine between networked or non-networked charging stations based on what is best for your site
  - Networked:
    - Ideal for smart management capabilities
    - Pricing
    - Billing
    - Demand Management
  - Non-Networked:
    - Ideal for sites that don’t want to add a cost to users for charging vehicles

Protection of EV and EVSE

- It is suggested that concrete bollards be installed to protect cords, reduce tripping hazard, and protect equipment.
- Bollards:
  - Should not block wheelchair access to the EVSE,
  - Shall not compromise to the vehicle,
  - Shall not impede pedestrian flow, and
  - Shall not shorten the length of a parking space.
  - If the equipment is built to the strength of a bollard, less expensive structures may be used to block pedestrian traffic across the path of the cord.

ADA Accessibility

- See summary of relevant 2010 ADA Standards.
- Currently, there are no ADA requirements for EV charging, however, accessibility ought to be considered in

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2 See attached: ADA Standards
the design of the parking space. However, accessibility requirements under ADA/ABA 2004 and ANSI A117.1 2003 states:

- Accessible controls: operable with one hand, and not requiring grasping, pinching, or twisting of the wrist or force of more than 5 pounds.
- Accessible route width: minimum of 36" (403.5.1).
- Accessible route slope/cross slope (403.3): max 1:20 (5%) running slope and 1:48 (2%) cross slope. Accessible vehicle spaces 1:48 (2%) in all directions.
- Parking space width must exceed 8’ for a car and 11’ for a van (502.2).
- Side access aisle: Side access aisle of 60" wide (can be shared between to spaces) (502.3.1), shall extend the full length of the space (502.3.2), and shall be appropriately marked to avoid illegal parking (502.3.3).
- Vertical clearance must be greater than or equal to 98” for a van.

- A curb cut may be made if needed to access the EVSE
- Landings shall be designed to prevent the accumulation of water.
- Aisles must remain free of barriers over ¾” high (Level-2 charging equipment cables are approximately ¾” thick).
- Turn-around areas can be next to the device and must follow the dimensions in the figure below:

- ADA Compliance: Reach Range and Operable Parts
  - Section 308.2.1 of the 2010 ADA Standards states that the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground where no obstruction to the device exists. If installed on an existing curb, fuel dispensers are permitted to be 54 inches (1370 mm) maximum. See the figures below.

- In the situation where a wheelchair is between 10” and 20” from the device, forward reach shall be a maximum of 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm). If a person must reach further than 20”, the maximum height of an accessible controller is 44” (1120mm). If the space is designed for a side reach, the maximum height for the controller is 48” where a chair is 10” or less from the device and 46” maximum if one’s chair accesses the device from 10”-24” away. If installed on an existing curb, fuel dispensers are permitted to be 54 inches (1370 mm) maximum. See the figures below.
User Accessibility

- Non-Wireless: Locate the charger in between two parking spaces to maximize chargers’ usability.
- Non-Wireless chargers should not obstruct minimum pedestrian clearance widths as defined by Atlanta Municipal Code Sec 138-102.
- Wireless: Place the wireless charger such that it correlates with the location of the receiver plate on the vehicle. See Installation Considerations.
- *(Pull in spaces only)* Consider locating the charging station to maximize user accessibility.
  - Example, hang the charger from the ceiling so the charger can reach charging portals on all vehicles.
  - Example: place the EVSE in between spaces so that cords can easily reach to the rear of a vehicle.
- It is suggested to minimize impact on existing infrastructure and environment when deciding the location.
- All conductive chargers must have a cord management device to prevent cords from lying on the ground.
  - Cord management may include retractable cords, coiling cords, springy cords, and hanging devices.

Flood Zones

- Identify flood zones at http://map.georgiadfirm.com/.
- The Code of Federal Regulations, Title 44 Emergency Management and Assistance, Part 60 Criteria for Land Management and Use states: "If a proposed building site is in a flood-prone area, all new construction and substantial improvements shall
  - (i) be designed (or modified) and adequately anchored to prevent flotation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy,
  - (ii) be constructed with materials resistant to flood damage,"
• (iii) be constructed by methods and practices that minimize flood damages, and
• (iv) be constructed with electrical heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Methods of protection for pedestals include "Wet flood proofing" (elevation of the equipment), "Component Protection" (waterproofing techniques), and "Dry flood proofing" (combination of wet flood proofing and component protection).

Ensure no puddling occurs where wireless chargers are installed.

**Signage Guide**

1. Placements and Clearances
   a. Signs should be no smaller than 12”W x 18”H.
   b. Bottom of sign shall be 7’ above ground.
   c. Poles shall be located from 24” from the curb.
   d. Signs shall not be hidden by other signs or objects.
   e. Intersections: Signs may be no closer than:
      i. 20’ from the closest edge of a cross walk or
      ii. 30’ from the corner of an intersection if no cross walk exists.
   f. Fire Hydrant: Signs may be placed 15’ from either side of a fire hydrant.
   g. Driveway/Curb Cur: Signs may be placed 10’ from a driveway/curb cut.
   h. ADA: signs shall not be placed within 48” of another pole.
   i. See Sec.138-13 – Affixing signs within right-of-way of Municipal Code. This document provides guidelines on how and where signs can be placed in the public right of way.

2. Sign installation
   a. Where possible, signs shall be attached to City light poles or u-channel poles.
   b. If existing poles to do not correlate with the placement of the EVSE, new u-channel poles shall be installed. Other signs that are not location-sensitive will be moved to the new pole.
   c. Signs shall not be adhered to wooden poles, trees, or way-finding signs.
   d. If 2 or more signs exist on the same pole, then parking restriction signs (red) shall be placed above general service signs or regulatory signs (green).
   e. If 2 or more signs exist on the same pole, then parking restriction signs (red) shall include a 6”x12” sign with a RED arrow indicating where the restriction applies with respect to the sign.
   f. Here forward, way-finding signs associated with EVSE general service signs will utilize WHITE arrows with BLUE background unless otherwise directed by the City of Atlanta.
Way-finding Signs

Advance Turn and Directional Arrow Auxiliary Signs for use with General Service Signs

1. M5-1
2. M5-2
3. M6-1
4. M6-2
5. M6-3

General Service Signs

i. D9-11b, EV Charging (MUTCD)³

Regulatory Signage

i. EV Parking Only
ii. EV Charging Only

Striping

iv. EV Parking Only
v. EV Charging Station

³ Sign placed along the interstate to indicate fueling stations at the next exit.
Installation Considerations

I. On-Street Placement and Clearance
   - Intersections: Signs may be no closer than:
     - 20’ from the closest edge of a cross walk or
     - 30’ from the corner of an intersection if no cross walk exists.
   - Fire Hydrant: Signs may be placed 15’ from either side of a fire hydrant.
   - Driveway/Curb Cut: Signs may be placed 10’ from a driveway/curb cut.
   - ADA: signs shall not be placed within 48” of another pole, parking meter, or EVSE.
   - EVSE will typically be located 12” from the outside edge of the curb with a tire bumper. The center of the EVSE shall be placed 36” from a curb without a tire bumper.

II. Residential Placement and Clearance
   - Outlets ought to be installed no less than 4’ from the surface to avoid vehicle damage that would expose dangerous wiring

III. Electricity
   - It is strongly suggested that a licensed electrician perform EVSE installations such that they comply with the National Electric Code.
   - Refer to permitting guides in this workbook for electrical permitting guidance in the City of Atlanta.
     - Single phase device: The figures below are the most common service transformer secondary wiring formats in the United States. One wire (the Neutral) must be earth grounded in order to ensure ground-fault protection. If no ground is provided by the electrical service, a grounding stake must be driven into the ground nearby in accordance with local electrical codes. The grounding stake must be connected to the ground bar in the main breaker panel, and the Neutral Connected to the ground at that point.
     - Possible Existing Electricity Sources
       - Street lights
       - Traffic lights
       - Electric parking meters
       - Electric box

IV. ADA Compliance: Reach Range and Operable Parts
   - See summary of relevant 2010 ADA Standards.
   - Section 308.2.1 of the 2010 ADA Standards states that the high forward reach shall be 48 inches (1220 mm) maximum and the low forward reach shall be 15 inches (380 mm) minimum above the finish floor or ground where no obstruction to the device exists. If installed on an existing curb, fuel dispensers are permitted to be 54 inches (1370 mm) maximum. See the figures below.

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4 King of Prussia Mall, Upper Merion Township, PA, 2011
5 Contra Costa County, CA
6 Note: Always follow installation instructions provided by the EVSE manufacturer.
7 All installations shall adhere to local codes. Example, the City of Atlanta adheres to the National Electric Code.
8 Liability falls on the homeowner/property owner if a licensed electrician does not carry out the installation.
In the situation where a wheelchair is between 10" and 20" from the device, forward reach shall be a maximum of 48 inches (1220 mm) maximum where the reach depth is 20 inches (510 mm). If a person must reach further than 20”, the maximum height of an accessible controller is 44” (1120mm). If the space is designed for a side reach, the maximum height for the controller is 48” where a chair is 10” or less from the device and 46” maximum if one’s chair accesses the device from 10”-24” away. If installed on an existing curb, fuel dispensers are permitted to be 54 inches (1370 mm) maximum. See the figures below.

V. Installing Wall-Mounted EVSE

Figure 308.2.1 Unobstructed Forward Reach

Figure 308.3.1 Unobstructed Side Reach

Figure 308.2.2 Obstructed High Forward Reach

Figure 308.3.2 Obstructed High Side Reach

Location:
- A minimum height of 18” from the bottom of the EVSE to the ground is suggested.
- For ADA standards, see item IV that is a summary of the 2010 ADA Standards.

<table>
<thead>
<tr>
<th>Hollow-Wall Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Locate the device such that at no fewer than 2 mounting holes take advantage of solid structural frames inside of the wall.</td>
</tr>
<tr>
<td>- Holes which do not engage support structures must use proper anchoring hardware such as drywall toggles or molly bolts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solid-Wall Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Pre-drill hole that are sized for the hardware required.</td>
</tr>
<tr>
<td>- Use multi-set or wedge anchor hardware for all points.</td>
</tr>
<tr>
<td>- Sleeve anchors ought to be used in brick or stone walls.</td>
</tr>
</tbody>
</table>

VI. Installing Pole-Mounted EVSE

- Location:
  - A minimum height of 18” from the bottom of the EVSE to the ground is suggested.
  - A high tension-banding tool is required for this type of installation.
  - Charging anchor shall be no more than 36” from the ground (See 2010 ADA Standards)

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VII. Installing a Pedestal

- Standard mount is 2’x2’x2’. Subcontractors will apply for easements if there are obstacles (i.e. underground subway, other electrical conduit).

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9 Clipper Creek. 2011. Standard EVSE Pedestal Installation Guide v1 1 (2)
• The pedestal can be located in between two spaces, if electrical availability allows, to access two spaces. The center of the pedestal shall be installed 36” from the edge of the curb or 12” from the curb if a tire stop exists (for pull-in spaces only). See Error! Reference source not found..
Permitting Process for Electrical Vehicle Supply Equipment (EVSE) in a Commercial Area

Commercial EVSE permitting occurs when a property owner in a non-residential area wants to install EVSE in the parking area of their property. Plug-in electric vehicles (PEVs) with internal charging units that plug into existing 120 volt receptacles do not require modification to your electrical system; this is called Level 1 EV charging.

EVSE that must be wired directly to the electrical system is Level 2 charging and above, these installations will require a permit. Level 2 EVSE is designed to accommodate destination-charging scenarios.

More information about EV charging can be found at the Department of Energy’s Advanced Vehicle Data Center and Clean Cities Georgia.

Level 2 EVSE Guidelines
According to the National Electrical Code® installations above 125 volts, shall have the supply equipment wired permanently to the electrical supply circuit. The supply equipment may vary in design depending on the manufacturer and vehicle type. EVSE to be installed must meet specifications set forth in NEC Section 625.

FOLLOW THESE STEPS TO PERMIT A COMMERCIAL EVSE
- Property owner selects a licensed electrical contractor to access EVSE installation site
- Then fills out Atlanta’s Electrical Permit Form with their electrical contractor
- Afterwards the contractor will submit the completed application; fees are due to the City of Atlanta, Office of Buildings at the time the permit is ready to be issued.
- Permit is issued
- Electrical contractor installs EVSE
- Property inspection conducted
  - Failed inspections, the City of Atlanta will grant up to three more inspections
  - A charge of $50 will be applied for every re-inspection

*Note, newly installed Level 2 EVSE may be added to the Department of Energy’s Alternative Fuels and Advanced Vehicles Data Center just complete the Fueling Station Submission Form

Key Considerations for Property Owners Installing Level 2 EVSE

Prepare property to meet EVSE requirements
As you plan to install Level 2 EVSE coordinate with licensed electric contractors and EVSE providers to avoid miscommunication and avoid delay.

Take advantage of available resources and heed the advice of EVSE manufactures
The Georgia Power Electric Transportation team can help guide you through planning and installation: 770-216-1400. Clean Cities Georgia outlines many electric vehicle supply equipment and installation service providers.
Permitting Process for Electrical Vehicle Supply Equipment (EVSE) for a Multi Family Residence

Multi Family Residence EVSE permitting occurs when a tenant of an apartment or condominium wants EVSE installed in the parking area they rent from. Plug-in electric vehicles (PEVs) with internal charging units that plug into existing 120 volt receptacles do not require modification to your electrical system; this is called Level 1 EV charging.

EVSE that must be wired directly to the electrical system is Level 2 charging and above, these installations will require a permit. Level 2 EVSE is designed to accommodate destination-charging scenarios.

More information about EV charging can be found at the Department of Energy’s Advanced Vehicle Data Center and Clean Cities Atlanta.

Level 2 EVSE Guidelines

According to the National Electrical Code® installations above 125 volts, shall have the supply equipment wired permanently to the electrical supply circuit. The supply equipment may vary in design depending on the manufacturer and vehicle type. EVSE to be installed must meet specifications set forth in NEC Section 625.

FOLLOW THESE STEPS TO PERMIT MULTI FAMILY RESIDENCE EVSE

- Tenant must identify their EVSE requirement and be proactive with property owner
- Property owner selects a licensed electrical contractor to access EVSE installation site
- Then fills out an Electrical Permit Form with their electrical contractor
- Afterwards the contractor will submit the completed application; fees are due to the City of Atlanta, Office of Buildings at the time the permit is ready to be issued.
- Permit is issued
- Electrical contractor installs Electric Vehicle Supply Equipment
- Property inspection conducted
  - Cost of the initial inspection is included with the permit fee.
  - If the initial inspection fails there is no cost for the follow up inspection, as long as the second inspection is successful.
  - Otherwise up to three more inspections can be scheduled, with a minimum charge of $50 for each subsequent re-inspection.

Key Considerations When Installing Level 2 EVSE

Prepare property to meet EVSE requirements
As you plan to install Level 2 EVSE coordinate with licensed electric contractors and EVSE providers to avoid miscommunication and avoid delay.

Take advantage of available resources and heed the advice of EVSE manufactures
The Georgia Power Electric Transportation team can help guide you through planning and installation: 770-216-1400. Clean Cities Georgia outlines many electric vehicle supply equipment and installation service providers.
Permitting Process for Electrical Vehicle Supply Equipment (EVSE) in a Single Family Residence

Single Family Residence EVSE permitting occurs when a homeowner wants EVSE installed on their property. Plug-in electric vehicles (PEVs) with internal charging units that plug into existing 120 volt receptacles do not require modification to your electrical system; this is called Level 1 EV charging.

EVSE that must be wired directly to the electrical system is Level 2 and above, these installations will require a permit. Although faster than Level 1 PEV charging, Level 2 charging is best utilized in destination-charging scenarios from 4-6 hours.

More information about EV charging can be found at the Department of Energy’s Advanced Vehicle Data Center and Clean Cities Georgia.

Level 2 EVSE Guidelines
According to the National Electrical Code® installations above 125 volts, shall have the supply equipment wired permanently to the electrical supply circuit. The supply equipment may vary in design depending on the manufacturer and vehicle type. EVSE to be installed must meet specifications set forth in NEC Section 625.

FOLLOW THESE STEPS TO PERMIT SINGLE FAMILY RESIDENCE EVSE

- Homeowner selects a licensed electrical contractor to access EVSE installation site
- Then fills out Atlanta’s Electrical Permit Form with their electrical contractor
- Afterwards the contractor will submit the completed application; fees are due to the City of Atlanta, Office of Buildings at the time the permit is ready to be issued.
- Permit is issued
- Electrical contractor installs EVSE
- Property inspection conducted
  - Cost of the initial inspection is included with the permit fee.
  - If the initial inspection fails there is no cost for the follow up inspection, as long as the second inspection is successful.
  - Otherwise up to three more inspections can be scheduled.

Key Considerations When Installing Level 2 EVSE

Prepare property to meet EVSE requirements
As you plan to install Level 2 EVSE coordinate with licensed electric contractors and electric equipment providers to avoid miscommunication and avoid delay.

Take advantage of available resources and heed the advice of EVSE manufactures
Clean Cities Georgia outlines many EVSE and installation service providers. For more info about EVs gotoelectricdrive.com
Q. **When will enforcement begin?**  
A. July 1, 2018. Electrical drawings for commercial construction submitted after that date will need to note EV Readiness on design plans. Residential does not require drawings but must put a note for application for permitting.

Q. **Does the builder have to run conduit to the locations where the future chargers will be installed and/or stubbed up, but not have to pull any wire?**  
A. No. Wire does not need to be pulled. Just rope with hook for future wire when chargers are needed.

Q. **With power sharing capabilities of today’s chargers, i.e., to install multiple chargers behind one breaker. Would this be sufficient for the ordinance as it would significantly reduce panel size and costs?**  
A. Yes, if the equipment is approved for power sharing.

Q. **Do plans all get signed off together i.e., plumbing, electrical, etc. or is it approved in sections?**  
A. It depends; If the project is under 10,000 sq. ft. then the same individual in Office of Buildings will review, but if the project is over 10,000 sq. ft. multiple individuals and both building and electrical inspectors will check. The inspectors review plans at the same time.

Q. **Will the City of Atlanta require any subsequent inspections following the approval of the EV Ready plans?**  
A. Possibly, nothing additional to what’s already required in the inspection process. This will be just another line item to be added to the plans and another check box for the inspector.

Q. **Are there multiple site inspections for electrical? Which one applies?**  
A. Yes, there are rough and final inspections and there is more emphasis during rough inspection.

Q. **Does “expansion or remodel” count as “new construction” for commercial purposes?**  
A. Yes, but only applies to the new spaces in the case of expanded parking.  
*Example 200 existing spaces but adding 200 new spaces. EV Requirement only applies to the new spaces.*

Q. **Will there be a subsequent inspection required for panel size once hardware is installed?**  
A. Yes, they will have to get an electrical permit either way and there will be a rough and final inspection.

Q. **Is there a duty to report installation of hardware?**  
A. Yes, because it is required to get a permit for the installation of the physical hardware.
Q. Will there be any public facing signage requirements until EVSE is installed?
A. No, only the internal signage required in the electrical room.

Q. Are there rules about striping and signage for EV Charging when you install hardware?
A. Yes, there is in the city code, but not in this ordinance. Signage standards and examples can be found in Part III Land Development Code, Part 16, Zoning Chapter 28 “General and Supplementary Regulations”. Section 16-28-017 Design standards and other criteria for Electric Vehicle Charging.
## Electrical Permit Application

### General Information
- **Building Permit Number:**
- **Job Address:**
- **Issued By:**
- **Job Address:**
- **Issue Date:**
- **Contractor Information:**
- **Please Select One:**
  - Disconnect and Reconnect of Service - FEE $150
  - General Permit - New Building or Existing Building (Alter or Repair)
  - Low Voltage System - Requires Low Voltage License - License not required for Homeowner
  - Temporary Pole - FEE $75 Each (include job trailer if installed) Number of Temp. Poles = _____ X $75 = ______

### Fee Schedule

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>FEEDERS</th>
<th>BRANCH CIRCUITS</th>
</tr>
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<tbody>
<tr>
<td>FEEDERS (IF YOU INSTALL, MODIFY, SERVICE OR REPAIR SERVICES, FEEDERS, BRANCH CIRCUITS OR LOW VOLTAGE WIRING)</td>
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<tr>
<td><strong>AMPS</strong></td>
<td><strong>FEE</strong></td>
<td><strong>QTY</strong></td>
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</table>
| Over 4000 | $300 | $ | Over 4000 | $300 | $ Over 4000 | $300 | $

### Low Voltage Systems (Under 30 Volts)
- There is a minimum Low Voltage fee of $45 for the First 3000 Square Feet and $1.50 For Each Additional 1000 Square Feet

### Comments / Job Description
(In comments section list types of Low Voltage Systems you will be installing.)

### Contractor’s Signature

Permitting Fees: $ Technology Fee: $25.00

Total Fees: $
Office of Buildings:
Phone: (404) 330-6150
https://www.atlantaga.gov/government/departments/planning

Office of Resilience
Phone: (404) 865-8715
www.resilientatlanta.com
Twitter: @ATLResilience
Facebook: www.facebook.com/atlresilience