

PLANNING FOR A CHARGING STATION

GSA Fleet Electric Vehicle Training Series

2016



AGENDA

- Executive Order 13693
- Types of Charging Stations
- Determining Need
- Station Planning
- Ordering a Station
- Lessons Learned
- Resources



ACRONYMS AND DEFINITIONS

Acronyms commonly associated with charging stations:

- **EVSE – Electric Vehicle Supply Equipment**
 - » Refers to charging stations and related equipment used to charge an electric vehicle
- **EV – Electric Vehicle**
 - » Encompasses both all-electric (BEV) and plug-in hybrid electric vehicles (PHEV or PEV)

EXECUTIVE ORDER

Executive Order 13693 Implementing Guidance

“GSA shall ensure that charging stations are available through GSA with vehicle level data reporting capabilities. Agencies shall similarly procure charging stations and, where possible, infrastructure that will allow for vehicle level data reporting capabilities.”

TYPES OF EV CHARGING



Level 1

*2-5 miles of range
per hour*

120 volt charging, typically from a wall plug using cord provided by vehicle manufacturer with all EVs.



Level 2

*10-20 miles of range
per hour*

240 volt charging. Most stations can collect data. Data subscriptions vary depending on vendor.



Level 3 (DC Fast Charging)

*60-80 miles of range
per 30 minutes*

480 volt charging. Data subscriptions included on schedule. **Not all EVs can use DC fast chargers.**

WHY CHARGING STATIONS

- Level 2 stations offer faster charging than level 1 wall plug charging
- Data collection and recording
 - » Depending on vendor, charging data can be collected to meet federal reporting requirements and reduce administrative burden on fleet managers
- Multiple charging stations and dual ports for fleet charging
- Ease of access when wall outlets are not available/within distance to parking location.

DETERMINE AGENCY NEEDS

- Talk with your building and program management to think about your agency's charging needs. Things to consider:
 - » Current EV fleet size and make-up
 - » Future agency EV usage
 - Planning for near- and long-term vehicle replacements
 - » Agency location/building
 - Possibility for agency relocation in next 5 years
 - Current Routes/other buildings your vehicle may stop at
 - Opportunities for infrastructure sharing within your building
 - » Current budget for charging stations
 - How much is available for you to spend this year
 - Possibility for funding in future fiscal years

DETERMINE AGENCY NEEDS

- Number and types of stations needed
 - » Plot the electricity use and time requirements for each EV in your fleet. Calculate:
 - Average miles driven per vehicle per day
 - Average length of time to re-charge vehicle using level 1, level 2, and level 3 stations (if applicable)
 - When vehicles will be charged (business hours or overnight) to help gauge station usage and availability
 - » If your agency requires more than one charging station:
 - Dual port stations can charge two vehicles at a time for just a little more money than a single port station
 - Multiple stations in close proximity (100 feet “line of sight”)

LOCATE EXISTING CHARGING STATIONS

- Before purchasing agency stations, consider whether public stations can be used to fulfill agency needs.
 - » Download the WEX Connect mobile app or ChargePoint to locate charging stations that accept WEX payments.
 - Refer to the DOE Alternative Fuels Data Center Station Locator to see nearby stations and availability
<http://www.afdc.energy.gov/locator/stations/>
 - » Use Google Maps by typing in “EV charging stations”
- Consider whether agency sharing is possible.
 - » If located in/near a federal building, talk with neighboring federal agencies to determine if federally-owned stations exist and a sharing agreement is possible.

GSA ACQUISITION SOLUTIONS

- FY16 Solution
 - » GSA acquires Level 2 EV charging stations on behalf of agencies
 - » Order off of existing BPA
 - » Vendor: Apollo Sunguard (sub: ChargePoint)
 - » One year free data subscription
 - » Delivery within 45 days of order placement
- FY17 Plans and Beyond
 - » Multiple award, self-service BPA



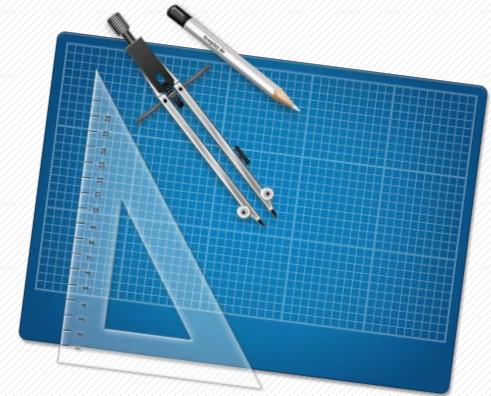
PLANNING FOR YOUR STATION

- Adequate planning is needed before selecting and ordering charging station hardware.
- Steps agencies should follow before selecting a station:
 1. Site planning
 2. Calculate installation costs
 3. Think through long-term needs and factors
 4. Finalize station requirements
 5. Ensure funding is available/accessible for stations and their installation



STEP 1: SITE PLANNING

- Contact contractor(s), facilities manager(s), and/or electrician(s) needed to complete the job.
 - » Obtain 3 cost estimates
- Have various charging station specs handy
- Get recommendation for:
 - » Station location
 - » Type of station (mounting)
 - » Installation costs
- Plan for data requirements
 - » Cellular reception and/or wireless connectivity
- Ensure charging station plan is in sync with VAM and EV acquisition/deployment plan



STEP 1: SITE PLANNING

- When choosing the charging station location, consider:
 - » **Convenience**
 - » **Avoiding hazards**
 - Cords and wires should not interfere with pedestrian traffic
 - » **Battery temperature limits**
 - If located in an area with extreme climate, consider placing stations in covered areas when possible
 - » **Pooled water and irrigation**
 - Charging stations can operate in wet (uncovered) areas, but consider user accessibility during rain events. Do not place in direct line of lawn/plant irrigation streams.
 - » **Preventing impact**
 - Curbs, wheel stops, and setbacks should be used to prevent vehicles from colliding with station equipment

STEP 1: SITE PLANNING

- When choosing the charging station location, consider:
 - » **Signage**
 - Use signs to designate EV-only parking
 - » **Vandalism**
 - Think through preventative strategies such as placing stations under lighting and in locked enclosures
 - » **Accessibility**
 - Address requirements for complying with ADA as well as state and local policies. Compliance measures include: adjusting receptacle and connector heights, cutting curbs, and providing handicap-accessible parking spaces.



STEP 2: INSTALLATION COSTS

- Look to market research and experienced contractors in your area as baseline for average costs
- Average cost of installation for GSA pilot customers ranged between \$1,000-\$5,000
 - » Building infrastructure and proximity to conduit/wiring can substantially affect cost
- Consider multiple options to bring costs down, such as the station location and mounting type



STEP 3: THINK LONG TERM

- Take holistic view of agency needs and outside factors into consideration, such as:
 - » Agency re-location
 - » Paying for electricity
 - Payment systems or agreements
 - WEX vendor or other form of payment
 - Work with building manager/agency
 - » How stations fit into overall agency greening goals
 - » EV fleet size, both current and future
 - It is usually less expensive to install extra panel and conduit capacity during initial construction than to modify the site later



STEP 3: THINK LONG TERM

- Consider whether your agency will participate in privately owned vehicle (POV)/workplace charging for employees
 - » H.R. 22 - FAST Act Section 1413(c) authorizes Agency heads to install and operate charging stations on a **reimbursable** basis for Federal employee POV charging
 - Includes the use of 120V wall plugs
 - POVs cannot impede access by Federal fleet vehicles



STEP 4: FINALIZE REQUIREMENTS

- Select:
 - » Mount type
 - » Single/dual port
 - » Data requirements
- Estimate total cost, including installation and equipment
- Clearly communicate station goals with agency managers
- Maintain good relations with vendor



STEP 5: ENSURE AVAILABILITY OF FUNDING

- After determining station type, quantity, and location and estimating installation costs, verify that funding is available and accessible
 - » Leave room in your project budget for unexpected installation costs



ORDERING A CHARGING STATION

EV Station Requirements Finalized

Self-Service (Option 1)

Order station from GSA directly utilizing Multiple Award Schedules (through GSA Advantage)

Installation

If not included in MAS selection, Agency must select and arrange contractor and/or electrician installation services

Data Plan (optional)

Purchase and set up

Full-Service (Option 2)

Send GSA-provided order form to GSA at GSAfleetafvteam@gsa.gov

Installation

Agency must select and arrange contractor and/or electrician installation services

ChargePoint Account

Agency sets up account and activates cards

SELF-SERVICE (OPTION 1)

MANUFACTURERS ON SCHEDULE

Purchase through [GSAAdvantage](#)

MFR	Source (Schedule)	Vendor	Options	Average Price
ChargePoint	23V, 56	Apollo Sunguard, Verdek	Single Port	\$4,200-\$6,000
			Dual Port	\$6,000-\$8,500
Leviton (exclusively for gated/private use)	51V, 56	W.W. Grainger, Noble Supply & Logistics, Coronado Distribution Co., Westcarb Enterprises, The Office Group	Single Port	\$4,300-\$6,200
			Dual Port	\$5,500-\$8,000
General Electric	23V, 51V, 56	Autoflex, W.W. Grainger, Noble Supply & Logistics, The Office Group, SPS Industrial	Single Port	\$3,900-\$9,300
			Dual Port	\$7,500-\$8,000
Schneider Electric	51V, 56, 70	Verdek, Noble Supply & Logistics, W.W. Grainger, The Office Group, SPS Industrial	Single Port	\$1,400-\$2,800
			Dual Port	\$3,700-\$4,300
Pep Stations	51V	Noble Supply & Logistics, W. W. Grainger, Inc. Coronado Distribution Company Inc., Westcarb Enterprises	Dual Port	\$9,526-\$13,500

*Data plans can be offered by the manufacturer or by other companies. Some are included with the initial cost of the hardware and some are separate, but almost all are subscription based so must be renewed in order to record charging (kWh) data.

FULL-SERVICE (OPTION 2)

AVAILABLE CHARGING STATIONS

**Bollard/Pedestal
Mount - Single Port**



CT4011-GWN
\$4,958.19

**Bollard/Pedestal
Mount - Dual Port**



CT4021-GWN
\$7,063.98

**Wall Mount -
Single Port**



CT4023-GWN
\$4,474.81

FULL-SERVICE (OPTION 2)

HOW TO PLACE AN ORDER

- After proper site planning, send email to gsafleetafvteam@gsa.gov to receive order form
- Fill out order form and return to GSA
- Station delivery within 45 days of order placement
- Upon delivery customer will receive invoice from GSA



LESSONS LEARNED FROM PILOT

- Charging stations are best suited in locations where vehicles are driving 8,000 miles/year or more for better return on investment
- Charging stations **must** be set on private access per federal regulation, but will have a free pricing policy.
- Ensure stations are located in areas that work for the driving patterns of the vehicles.
 - » Think through the number of miles typically driven in a day and the routes that drivers take.
- Maintain good relations with the vendor and sub-contractor; ensure that all parties are on the same page throughout the project.

RESOURCES

- GSA Alternative Fuel Vehicle Team - GSAFleetAFVTeam@gsa.gov
- Useful Resources for Fleet Managers
 - » [DOE Plug-In Electric Vehicle Handbook for Fleet Managers](#)
 - » [GSA Fleet Drive-thru and Training](#)
 - » [Alternative Fuel Vehicle Guide](#)
 - » [New EO 13693](#)
 - » [DOE Station Locator](#) / [Wex Connect](#)
 - » [Short Term Rental Program](#)
 - » [Dispatch Reservation Module](#)
 - » [Car Sharing](#)
 - » [Telematics](#)
- Case Studies and Lessons Learned from State and Municipal Governments
 - » [California Department of General Services Fleet EVSE Guide](#)
 - » [City of Houston, TX](#)
 - » [City of Loveland, CO](#)