Electric Vehicle Chargers: Guidance for Installing and Managing Them Efficiently

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WHO WE ARE

Regional Planning Agency
Metropolitan Planning Organization (MPO)
Local Clean Cities Coalition
Electric Vehicles produce no emissions, so higher EV adoption rates can help decrease ozone trends.
50,570 EV’s in Texas as of August 2021

- Battery Electric Vehicle (BEV) ~73% of Registered EVs
- Plug-In Hybrid Electric Vehicle (PHEV) ~27% of Registered EVs
- Fuel Cell Electric Vehicle (FCEV)
18,083 Electric Vehicles in North Texas in August 2021
32.5% Average Annual Growth Rate of EVs in North Texas from 2015-2020

North Texas Historic EV Trendline 2011-2021

All EV registration data can be found on interactive online tools housed on Electric Vehicle North Texas webpage at www.dfwcleancities.org/evnt
% of U.S. Fleet Composition Projected to be EVs

2018: ~0.2%

Nationwide Charger Deployments:
Current: ~44,000¹
Biden Administration goal: 500,000 by 2030

¹Alternative Fuels Data Center: Alternative Fueling Station Locator (energy.gov)
AUTO INDUSTRY SHIFT

**Ford:** 40 EVs by 2022: 16 BEVs, 24 PHEVs; investing $11 billion by 2022

**General Motors:** 30 EV models by 2025, Carbon Neutral by 2040; investing $27 billion by 2025

**Honda:** 2/3 of all sales to be electric by 2030; every car in the lineup will be EV or hybrid by 2022

**Hyundai/Kia:** 34 EV models by 2025; investing $87 billion by the end of 2025

**Toyota:** Half of all sales electric by 2025

**Volkswagen:** 70 electrified models by the end of 2028; investing $91 billion in vehicle electrification

**Volvo:** Half of all sales electric by 2025, fully electric by 2030

**Mazda, Mitsubishi, Nissan:** Carbon Neutral by 2050
<table>
<thead>
<tr>
<th>Type</th>
<th>Connector</th>
<th>Range per Hour of Charging Time</th>
<th>Typical Station Cost with Installation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 Volts AC</td>
<td>J1772 charge port</td>
<td>2 to 5 miles</td>
<td>Nominal</td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>208/240 Volts AC</td>
<td>J1772 charge port</td>
<td>10 to 20 miles</td>
<td>$1,100-$21,000</td>
</tr>
<tr>
<td><strong>DC Fast Charge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>200-500 Volts DC</td>
<td>CCS charge port, CHAdeMO charge port, Tesla charge port</td>
<td>180 to 240 miles</td>
<td>$23,000-$90,000</td>
</tr>
</tbody>
</table>

Range per Hour source: [https://afdc.energy.gov/fuels/electricity_infrastructure.html](https://afdc.energy.gov/fuels/electricity_infrastructure.html)

Based on Location Type and Average Time Spent, Different Charging Levels May be Better Suited by Site than Others

ELECTRIC VEHICLE ADOPTION IN NORTH TEXAS (BY ZIP CODE)

Legend:
- Level 2 Chargers
- Level 2 Chargers (Limited Access)*
- DC Fast Chargers
- DC Fast Chargers (Limited Access)*
- Tesla Destination Chargers
- Tesla Superchargers

Count of EVs:
- 1 - 85
- 86 - 170
- 171 - 254
- 255 - 339
- 340 - 423

*These stations are limited access due to their inability to be available 24 hours or are located at specific car dealerships.
BRINGING EV CHARGING TO YOUR PROPERTY

1. Determine Property Considerations & EVSE Policies
2. Engage your Electric Utility
3. Funding, Installation & Operation
4. Ensure Visibility & Promote
Determine Property Considerations & EVSE Policies
There are three basic approaches for local governments to installing EVSE depending on electrical access and parking space considerations.

**EVSE Installed for:**

- **Fleet Use**
  Light-duty & Medium/Heavy-duty

- **Employee Use (Workplace Charging)**

- **Public Use**
  Site examples: publicly owned land parcels, public parks, park and ride facilities, transit stops, points of interest (stadiums, conference centers, shopping areas, amusement parks), hospitals, schools/universities
What type of charging do you want to provide?
- How long do people typically stay on-site?
- Do you have adequate electrical capacity to support either, or would DC Fast Chargers require additional upgrades?

Do you want a “networked” or “dummy” charger?
- Networked can track usage data, monitor equipment health, but are more expensive

Do you want to offer charging for free, or require users to pay?
- Free, fixed rate, variable rate by time, etc.

What type of costs are you willing to cover? How do you want to manage the site?
- Installation only
- Operations and maintenance
Consider Creating a EVSE Policy for Your Chargers:
Rules are needed to ensure the charging stations are properly used and maintained:

**Topic Considerations:**
- Guidelines for time limits to encourage people to move their vehicle once charging is complete
- Whether available for, fleet use, employees, visitors, or general public
- Appropriate enforcement of non-EV drivers blocking the spaces
- Unplugging someone else’s vehicle
- Payment structure: Free, fixed rate, variable rate by time, etc
- Determining maintenance and repair responsibilities at time of install
- Standard Signage, as guided in the Manual of Uniform Traffic Devices (MUTCD)
To be enforceable, any signs posted in a public right of way must be supported by local ordinances that specify time limits, penalties, and definitions.

Any signs posted in the public right of way must meet MUTCD requirements.

Private parking areas that are not open to the public (such as employee parking areas) are not required to meet MUTCD signage requirements.

Consistency with the standards helps all drivers understand and recognize charging station signage.

https://mutcd.fhwa.dot.gov/resources/policy/rsevcpfmemo/
Engage your Electric Utility
As EV adoption continues to grow, it’s critical to engage with your local utility early about EVSE plans, so they can prepare for the need to generate and deliver more electricity to the site.

Utilities Can Help:
- Determine if the local electrical distribution service is adequate to support the planned EV charging activity.
- Provide information to the property owner and EV customers on utility rates.
- Advise customers about the electrical service and metering equipment options necessary to support their installations.

Email cleancities@nctcog.org to find the best EV contact for your utility service area.

In Oncor’s Territory? Download their free New Construction EV Management Handout for Guidance on www.dfwcleancities.org/evnt.
ERCOT LONG-TERM SYSTEM ASSESSMENT ASSUMPTIONS

**Charging Technologies as a Resiliency Tool**

**Storage** – Utilizes onboard batteries that store electricity to allow faster charging and charging off-grid.

**Solar** – Enables off-grid charging for greater resiliency, may integrate with other charger brands and have onboard storage. No additional infrastructure required.

**Mobile** – Allows for portable and emergency charging of EVs without any additional infrastructure.

**Bi-Directional Capacity** – Enables vehicle batteries to power buildings or return back to the grid in peak demand or power outages. More vehicles are becoming bi-directional capable.
Funding, Installation & Operation
Installation & Operation Costs

Installation Primary Cost Factors:

- EVSE purchase and installation costs
- Adequate building wiring electrical capacity
- Distance between the electrical service access point and the desired charging site(s) and other construction requirements including trenching
- Transformer and/or service capacity serving the community

Permitting:
EVSE installations generally require a building permit, electrical permit, or both. Permitting fees vary from jurisdiction to jurisdiction and are non-negotiable.
Operation Costs:

May include monthly EVSE network access fees, if applicable

Unanticipated equipment maintenance costs

Demand charges to commercial electric rates if the property owner pays for EVSE

Utilities can assist with this billing analysis so properties can plan to recover those costs
APPLY NOW FOR LEVEL 2 CHARGERS

Texas Volkswagen Environmental Mitigation Program – Level 2 Charging Equipment

- Application Deadline **September 9, 2021**, ~24 Months to Complete Project
- Up to $2,500 per Charger
- Can Combine w/Federal Tax Credit of 30% if Installed by 12/31/2021
- [www.texasvwwfund.org](http://www.texasvwwfund.org), click on “Grants”

**Good For:**
- Workplaces
- Multifamily Properties
- Public Sites with Long Dwell Times
  - Includes Hotels

1701 Sites Requested Statewide  
Data Posted as of 8/23/21

- Multi-Unit Dwelling
- Public Place
- Work Place

For a full list of available funding opportunities, visit [www.nctcog.org/aqfunding](http://www.nctcog.org/aqfunding)
Light-Duty Motor Vehicle Purchase or Lease Incentive Program (LDPLIP) 
OPENS SOON!

Has Funded: Passenger light-duty Electric or Hydrogen Vehicles  
Up to $2,500 rebate for EVs with a battery at least 4kW  

Plug-In Electric Drive Vehicle Credit- AVAILABLE NOW  
Funds: Passenger, light-duty trucks, and certain 2 and 3 wheeled EVs  
$2,500 - $7,500 per new passenger and light-duty EVs and PHEVs purchased  
10% of cost of vehicle up to $2,500 for 2 and 3 wheeled vehicle purchased  

*Phases out based on manufacturer market sales  
(Public entities are not eligible for the credit)
DFW Clean Cities
“Try and Drive Alternative” Program

Offers Ranging from 1 Day – 2 Months

4 Participating Vendors

1 Light-Duty Sedan
1 Truck for Refuse Applications
1 Truck for Delivery Applications
1 Truck for Regional Haul/Drayage Applications
2 Terminal Tractors

www.nct cog.org/dfwtrydrive
**Volkswagen Settlement Texas Mitigation Plan (TxVEMP): Zero Emissions Vehicle Infrastructure – DC Fast Chargers**

**Funds:** DC Fast Charging Stations

Funding levels not yet announced, but will be greater than level 2 reimbursement level

**Alternative Fueling Facilities Program (AFFP)**

**Funds:** Alternative fuel stations, including EV chargers

50% of the total eligible costs with a maximum of $600,000 for EV Chargers

Public Stations considered before private stations

Last Round: 122 EV Charging Station applications received, totaling $4.9 Million

**PRO TIP:** Plan ahead for stations, so when funding is announced, you are ready to move forward
Ensure Visibility & Promote
Vital to **increasing station usage**

- Adequate standard signage for awareness of stations and exact locations
- Paint parking spots / differentiate the area to increase awareness
- Adequate lighting for safety
- Compliance with ADA requirements for full accessibility
- Promote use and availability to maximize usage

**EVSE available to the public?**

Add station data to EVSE search tools including [AFDC Station Locator](https://www.afdc.energy.gov/stations) and [PlugShare](https://www.plugshare.com) so all EV users can become aware of your stations and further increase usage and awareness.

*Image: https://mutcd.fhwa.dot.gov/resources/policy/rsevcpfmemo/*
HOW TO GET STARTED

Contact Your Utility to Start Conversations:
Contact cleancities@nctcog.org for the best point of contact at your utility

Review Key Resources:
- EV Charger Selection Guide
- The Fuels Institute EV Council: www.fuelsinstitute.org/research
  ➢ Installing and Operating Public EV Charging Infrastructure
  ➢ EV Consumer Behavior

Contact DFW Clean Cities for Support: cleancities@nctcog.org

Get Plugged In to the Incentives: www.texasvwwfund.org

TIP: Many EVSE providers will provide a full suite of services including site planning, engineering, etc. Don’t get overwhelmed, plenty of resources are available to help you!
Text DFWCLEANCITIES to 22828 to Join the DFWCC Mailing List

www.dfwcleancities.org
cleancities@nctcog.org