

Electric Vehicle Chargers: Guidance for Installing and Managing Them Efficiently

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North Central Texas Council of Governments

September 2, 2021



Dallas-Fort Worth
CLEAN CITIES



North Central Texas
Council of Governments

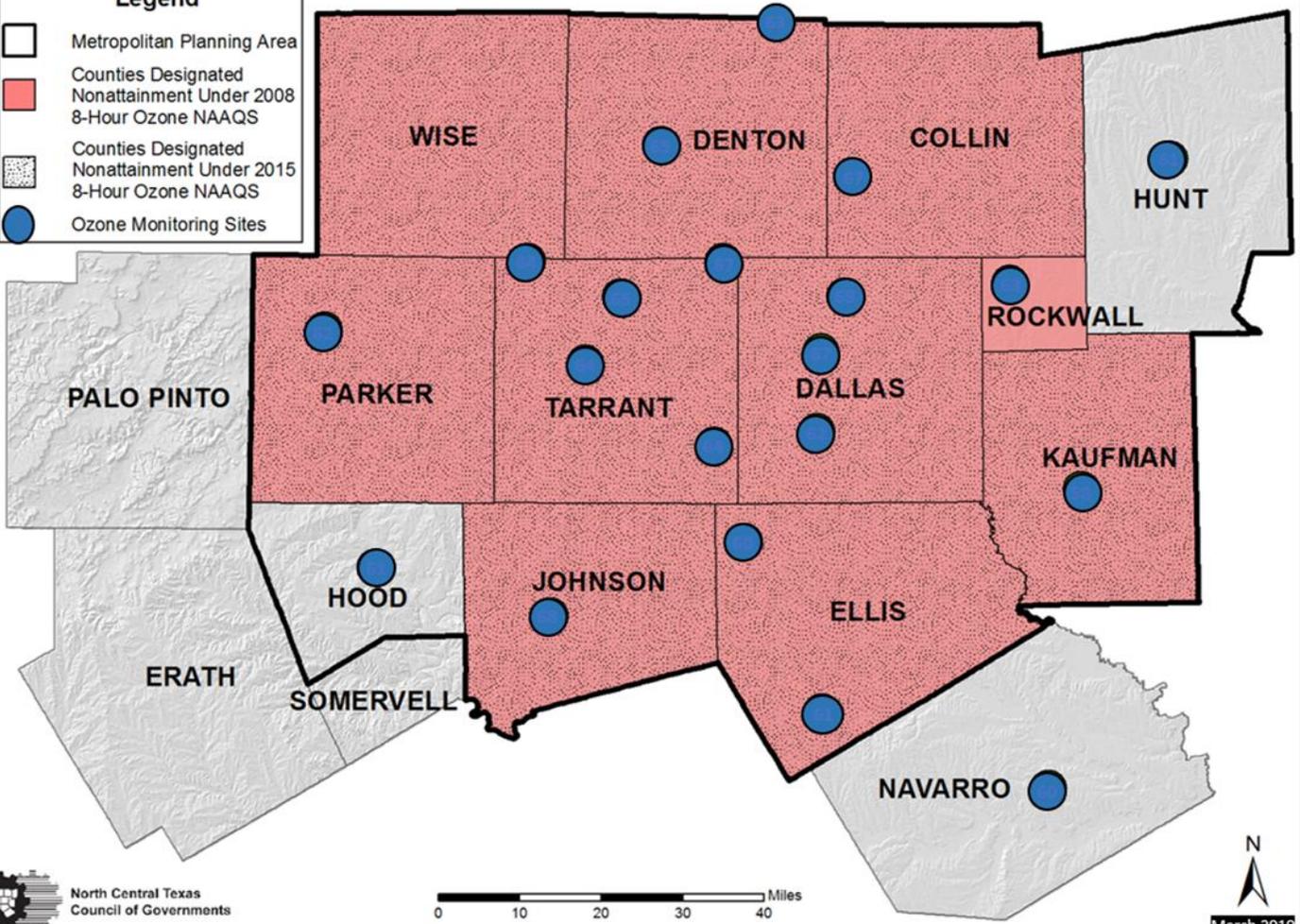
Public Works Round-Up



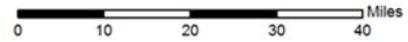
WHO WE ARE

Legend

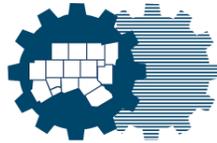
-  Metropolitan Planning Area
-  Counties Designated Nonattainment Under 2008 8-Hour Ozone NAAQS
-  Counties Designated Nonattainment Under 2015 8-Hour Ozone NAAQS
-  Ozone Monitoring Sites



 North Central Texas Council of Governments




March 2019



North Central Texas Council of Governments

Regional Planning Agency



Regional Transportation Council

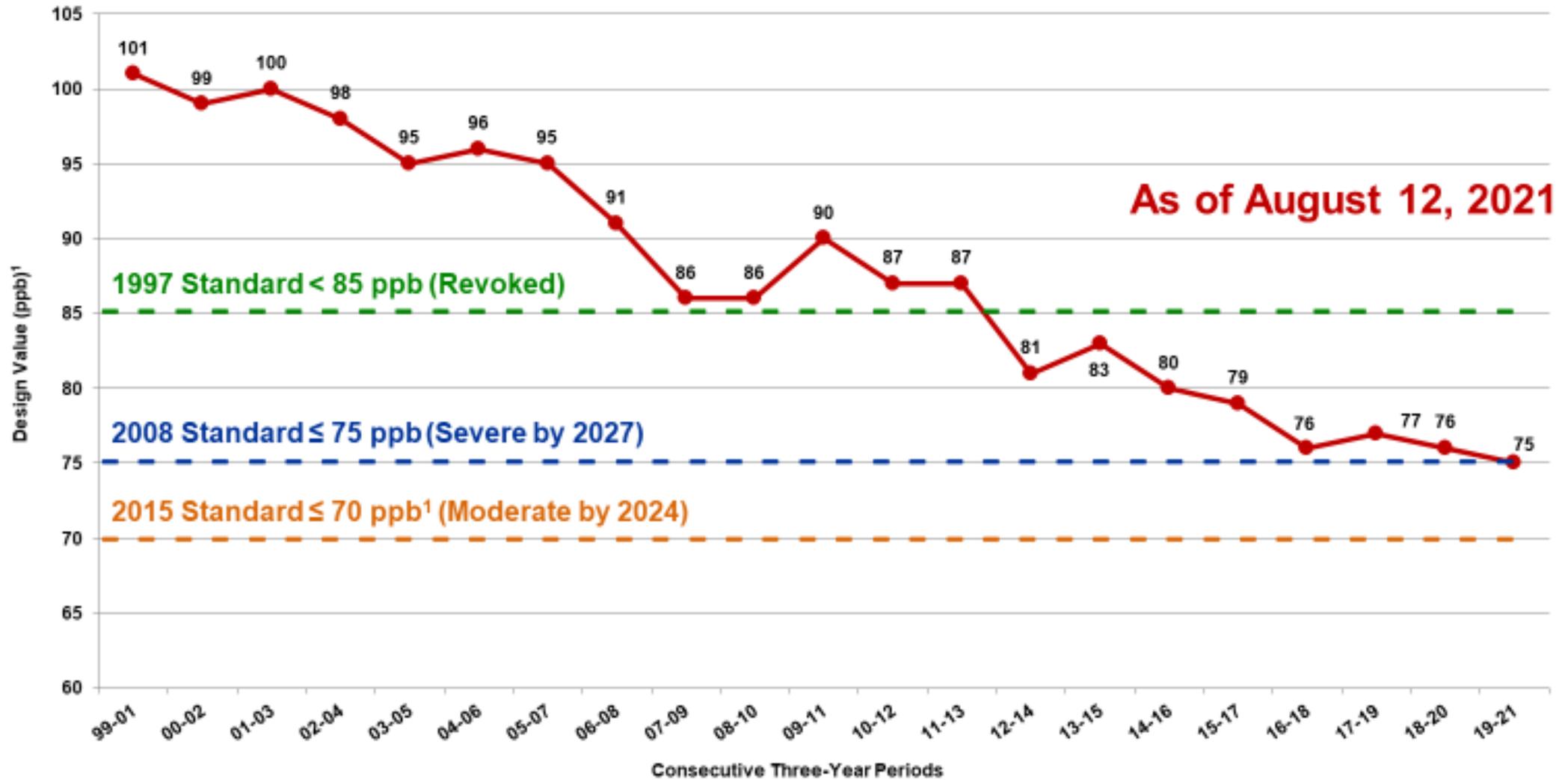
Metropolitan Planning Organization (MPO)



Dallas-Fort Worth CLEAN CITIES

Local Clean Cities Coalition

8-HOUR OZONE NAAQS HISTORICAL TRENDS



¹Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the Design Value (three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration) is equal to or less than 70 parts per billion (ppb).

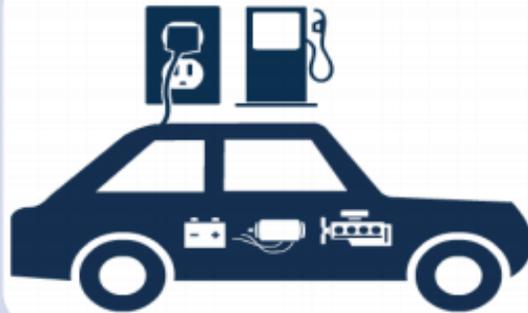
Electric Vehicles produce no emissions, so higher EV adoption rates can help decrease ozone trends

STATE OF EVs IN TEXAS

50,570 EV's in Texas as of August 2021



**Fuel Cell
Electric
Vehicle
(FCEV)**



**Plug-In Hybrid
Electric Vehicle
(PHEV)**

**~27% of
Registered EVs**



**Battery Electric
Vehicle (BEV)**

**~73% of
Registered EVs**

ELECTRIC VEHICLES BY THE NUMBERS



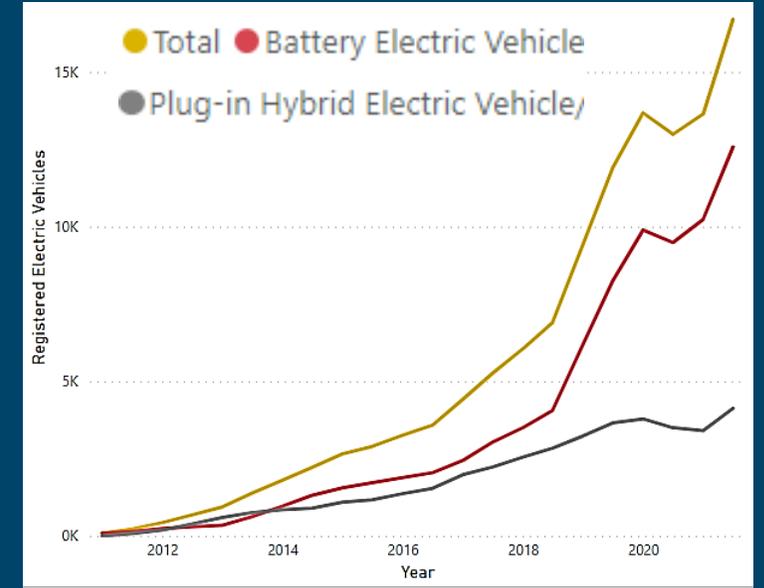
18,083

Electric Vehicles in North Texas in August 2021



32.5%

Average Annual Growth Rate of EVs in North Texas from 2015-2020



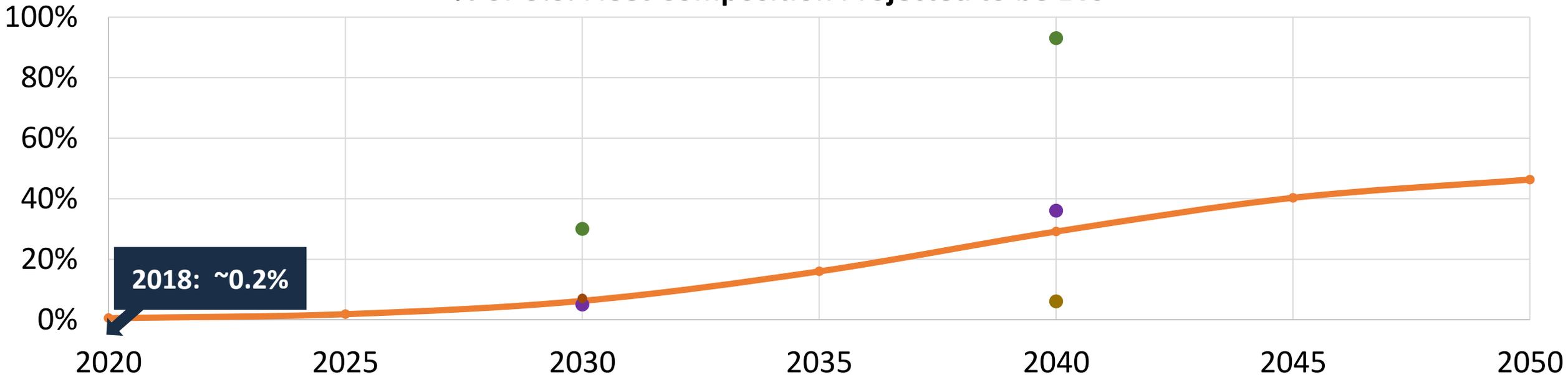
North Texas Historic EV Trendline 2011-2021



All EV registration data can be found on interactive online tools housed on Electric Vehicle North Texas webpage at www.dfwcleancities.org/evnt

US FLEET COMPOSITION EV PROJECTIONS

% of U.S. Fleet Composition Projected to be EVs



Nationwide Charger Deployments:

Current: ~44,000¹

Biden Administration goal: 500,000 by 2030

- Energy Innovation Policy & Technology LLC - Policy Simulator (2019)
- International Monetary Fund (Fast-adoption)
- International Monetary Fund (Slow-adoption)
- Edison Electric Institute Report (November 2018)
- Texas A&M Transportation Institute: Alternative Fuel Vehicle Forecasts (April 2016)

¹[Alternative Fuels Data Center: Alternative Fueling Station Locator \(energy.gov\)](https://www.energy.gov/alternative-fuels-data-center/alternative-fueling-station-locator)

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

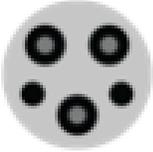
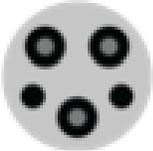
Toyota: Half of all sales electric by 2025

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

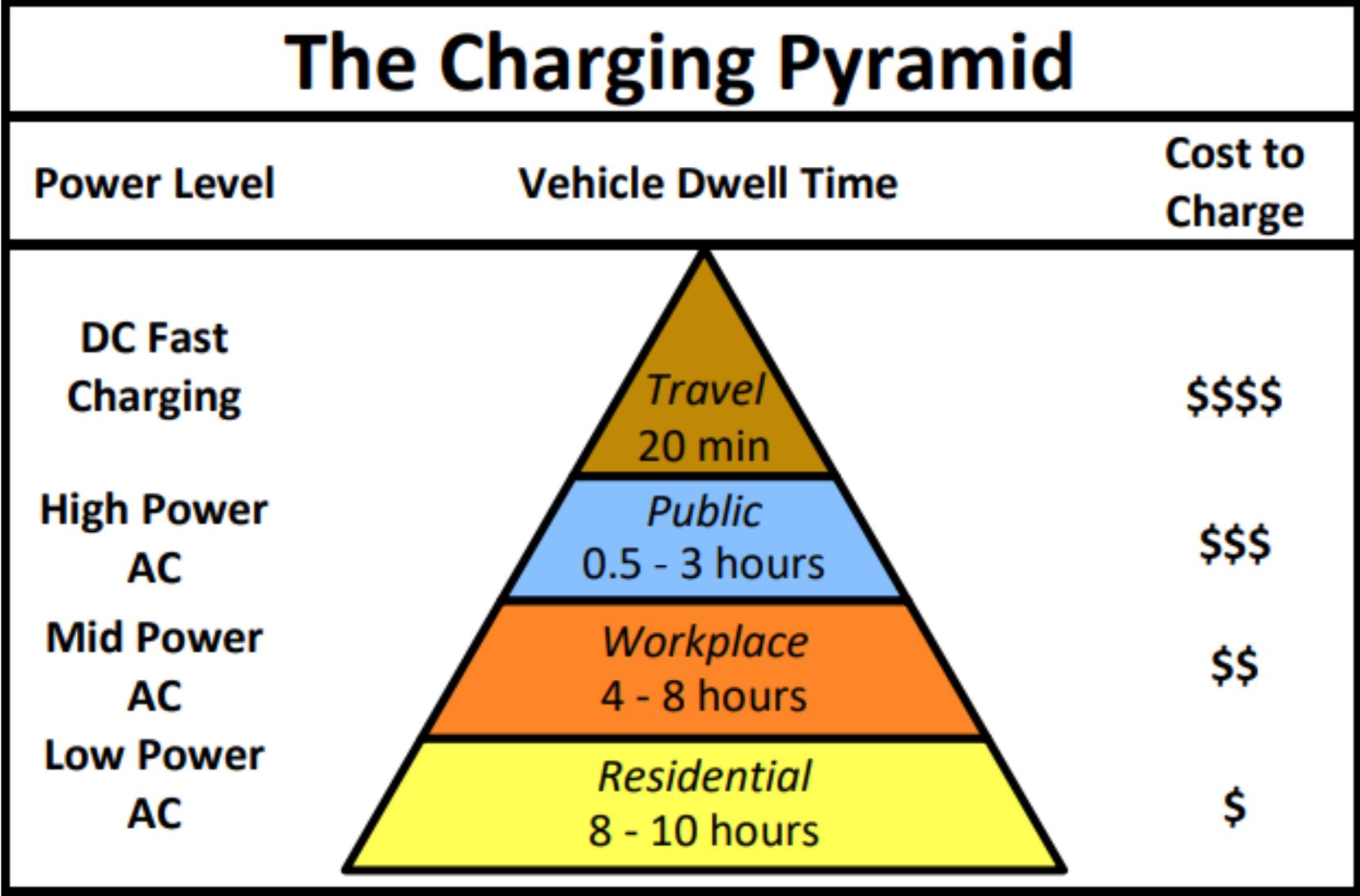
LEVELS OF EV CHARGING INFRASTRUCTURE

Type	Connector	Range per Hour of Charging Time	Typical Station Cost with Installation
Level 1 120 Volts AC	 J1772 charge port	2 to 5 miles	Nominal
Level 2 208/240 Volts AC	 J1772 charge port	10 to 20 miles	\$1,100-\$21,000
DC Fast Charge 200-500 Volts DC	   CCS charge port CHAdeMO charge port Tesla charge port	180 to 240 miles	\$23,000-\$90,000

Range per Hour source:
https://afdc.energy.gov/fuels/electricity_infrastructure.html

Station cost estimates provided from AFDC Electric Vehicle Charger Selection Guide:
https://afdc.energy.gov/files/u/publication/EV_Charger_Selection_Guide_2018-01-112.pdf

CHARGING HIERARCHY



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

Charging Pyramid Sourcing: https://afdc.energy.gov/files/u/publication/EV_Charger_Selection_Guide_2018-01-112.pdf

ELECTRIC VEHICLE ADOPTION IN NORTH TEXAS (BY ZIP CODE)

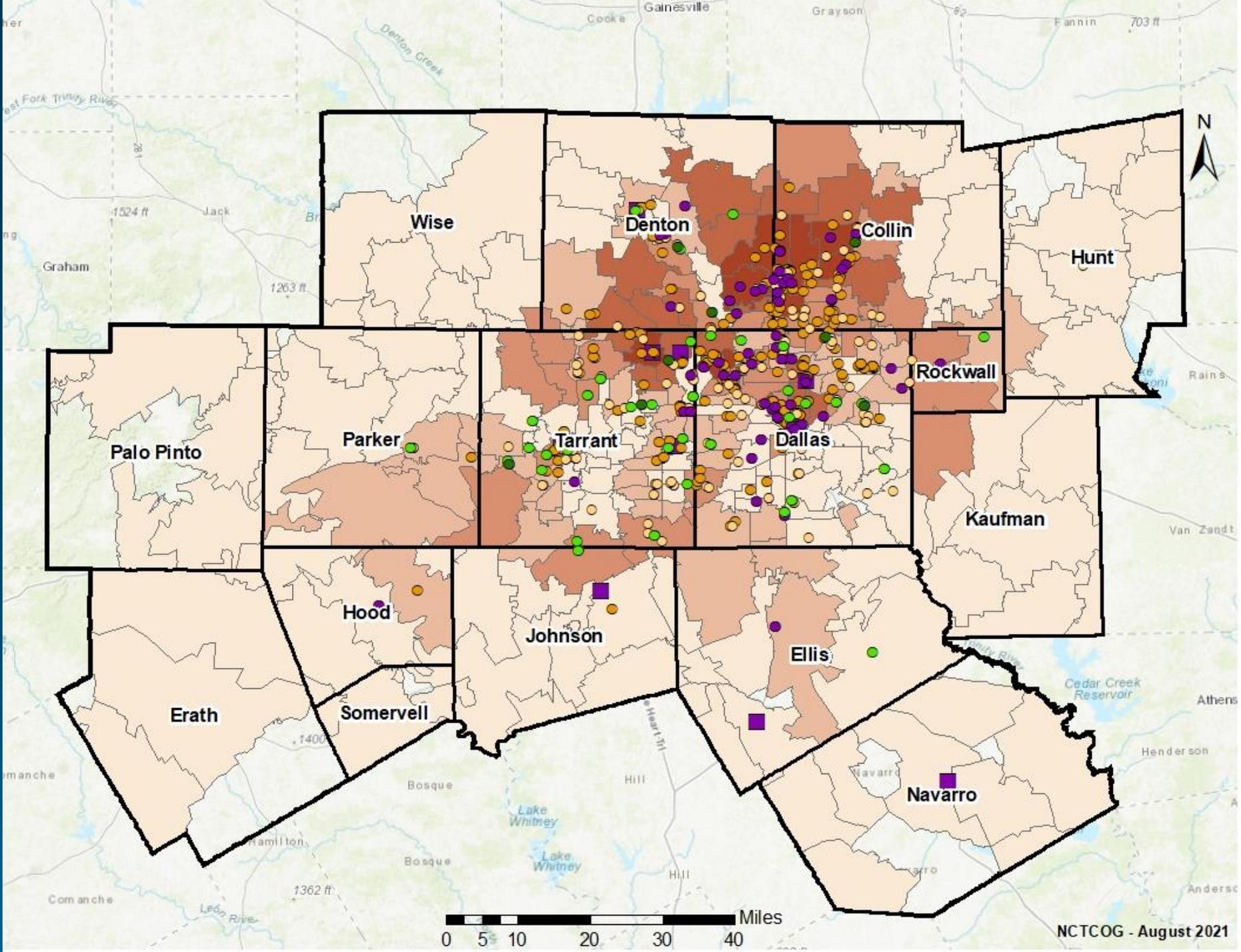
Legend

- Level 2 Chargers
- ◐ Level 2 Chargers (Limited Access)*
- DC Fast Chargers
- ◐ DC Fast Chargers (Limited Access)*
- Tesla Destination Chargers
- Tesla Superchargers
- Counties

EV Registration By Zip Code

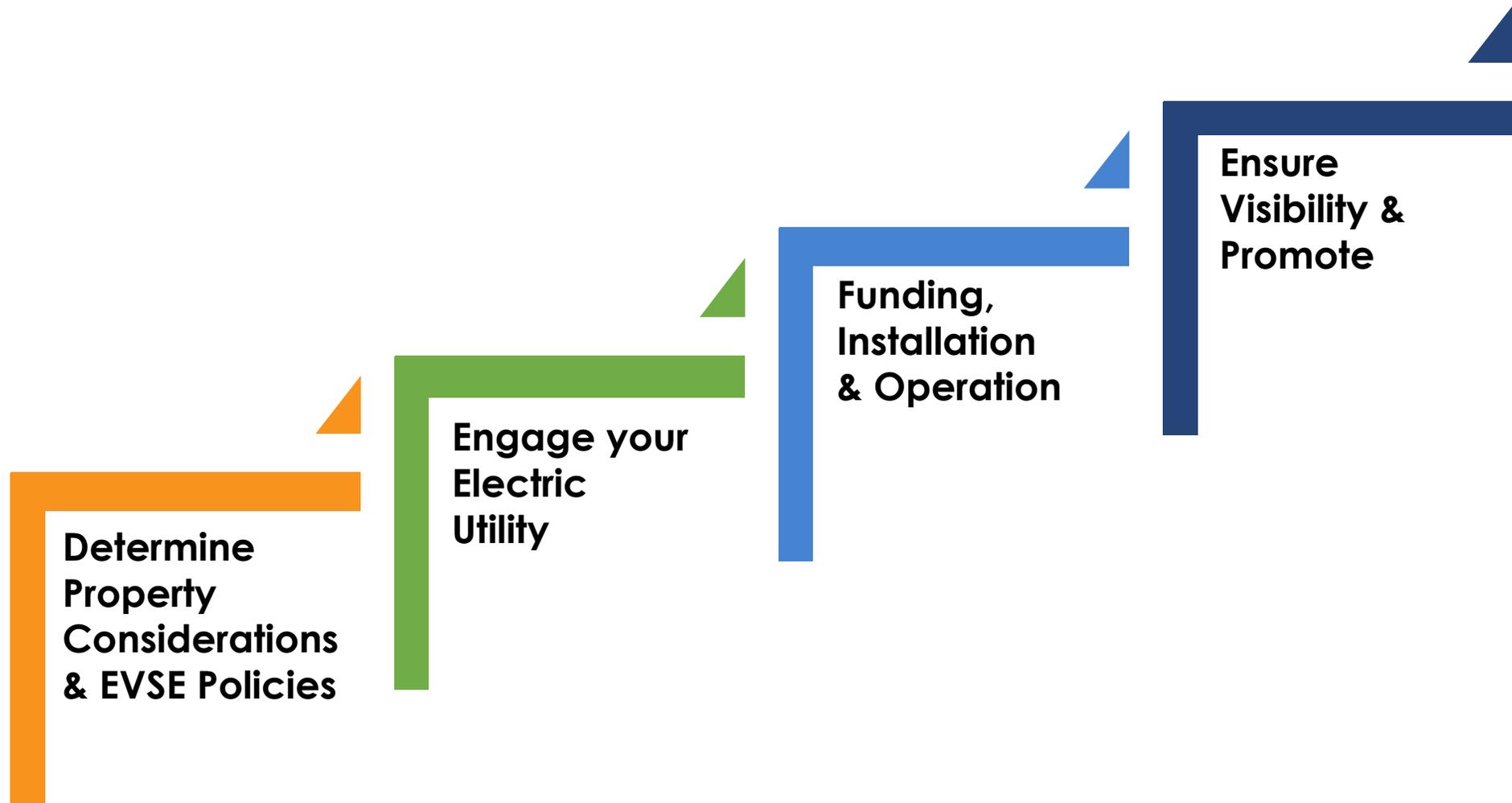
Count of EVs

	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





**Determine
Property
Considerations
& EVSE Policies**

DETERMINE EVSE SITE POSSIBILITIES

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

CHARGER CONSIDERATIONS

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

PROPERTY POLICIES AND ETIQUETTE GUIDELINES

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)

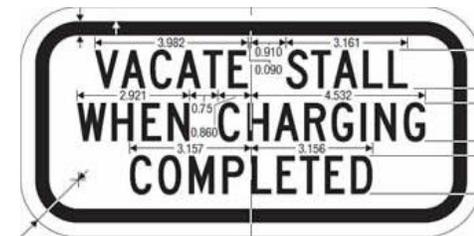
POLICY ENFORCEMENT

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



A green L-shaped graphic element consisting of a vertical bar on the left and a horizontal bar on top, with a small green triangle at the top right corner.

**Engage your
Electric Utility**

UTILITY ENGAGEMENT

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

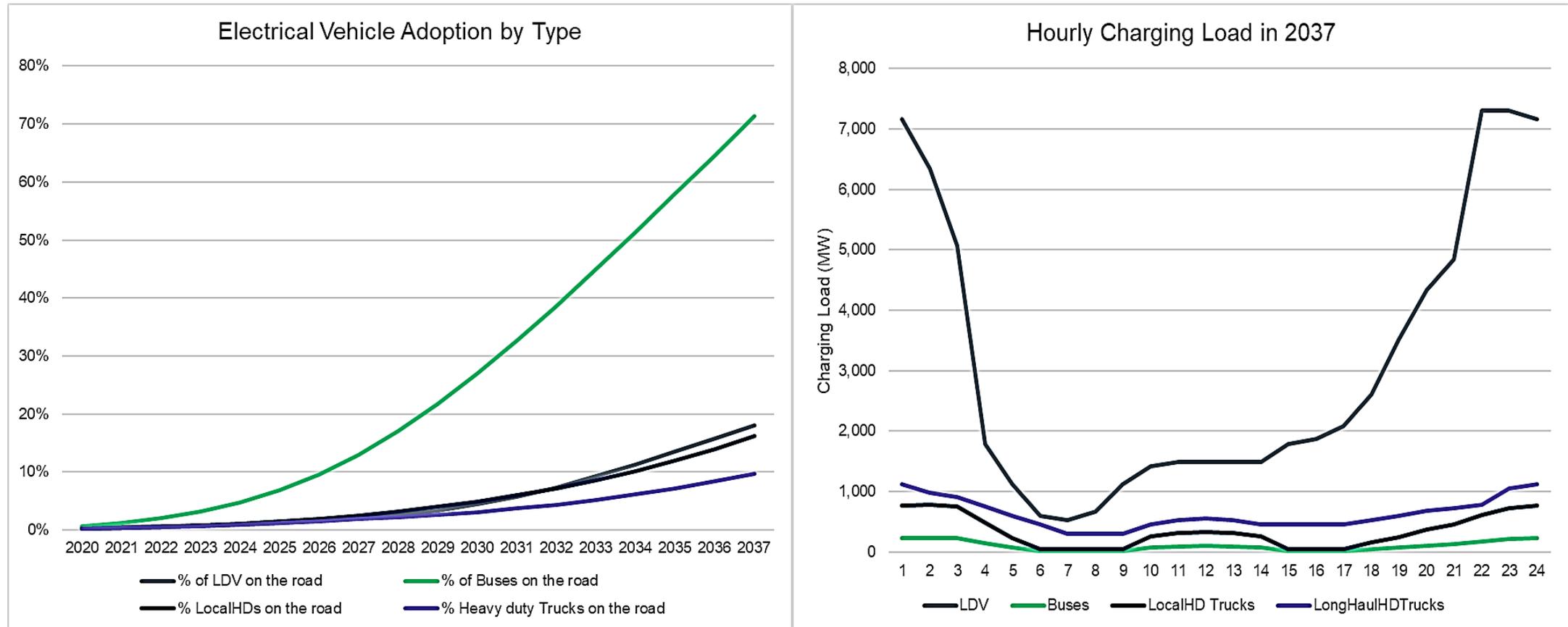
Provide information to the property owner and EV customers on utility rates

Advise customers about the electrical service and metering equipment options necessary to support their installations



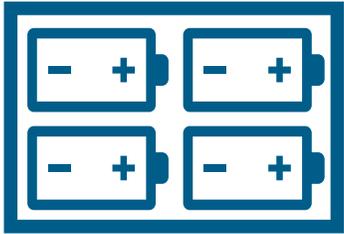
Email cleancities@nctcog.org to find the best EV contact for your utility service area

ERCOT LONG-TERM SYSTEM ASSESSMENT ASSUMPTIONS

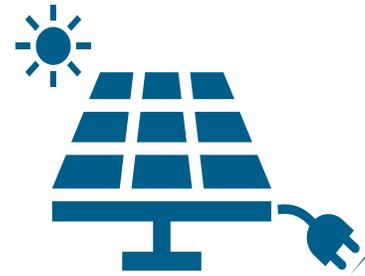


Source: Electric Reliability Council of Texas (ERCOT) Long-Term System Assessment, http://www.ercot.com/content/wcm/key_documents_lists/213867/2022_LTSA_Update_InputAssumptions_August2021.pdf. Uses an adjusted forecast from Bloomberg New Energy Finance Electric Vehicle Outlook (<https://about.bnef.com/electric-vehicle-outlook/>) and National Renewable Energy Laboratory charging load profiles.

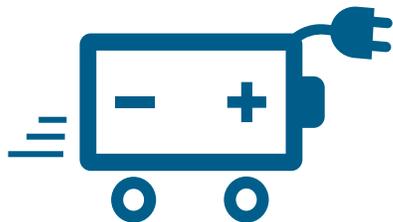
CHARGING TECHNOLOGIES AS A RESILIENCY TOOL



Storage – Utilizes on board 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 on board 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.

INSTALLATION & OPERATION COSTS

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

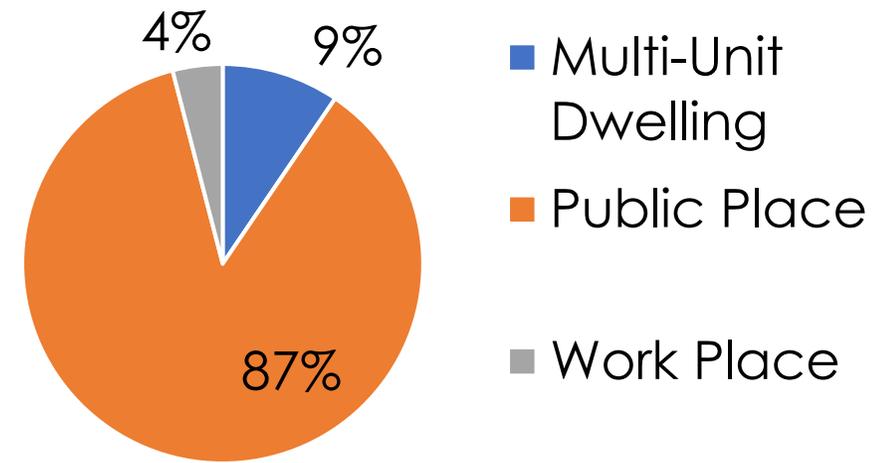
- **Application Deadline **September 9, 2021**, ~24 Months to Complete Project**
- Up to \$2,500 per Charger
- Can Combine w/Federal Tax Credit of 30% if Installed by 12/31/2021
- www.texasvwfund.org, click on “Grants”

Good For:

- Workplaces
- Multifamily Properties
- Public Sites with Long Dwell Times
 - Includes Hotels

1701 Sites Requested Statewide

Data Posted as of 8/23/21



For a full list of available funding opportunities, visit www.nctcog.org/aqfunding

INCENTIVES FOR EVs

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)



EXTENDED “TEST DRIVES” AVAILABLE

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



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www.nctcog.org/dfwtrydrive

COMING SOON!

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**

PROMOTE AND ENGAGE CHARGERS

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](#) and [PlugShare](#) so all EV users can become aware of your stations and further increase usage and awareness

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.texasvwfund.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!

CONTACT

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**Text [DFWCLEANCITIES](https://www.dfwcleancities.org)
to **22828** to Join the
DFWCC Mailing List**

www.dfwcleancities.org

cleancities@nctcog.org