

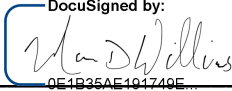


Texas Electric Vehicle Infrastructure Plan

Version 0.77 – September 29, 2023

Plan Update Approval

TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)

Signed:  Date: 9/29/2023

Marc D. Williams P.E., Executive Director

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Introduction –

The Texas Electric Vehicle (EV) Charging plan is a comprehensive framework to enable passenger EV travel across the state and spur economic development. The network will give Electric Vehicle drivers confidence and flexibility when traveling for work, recreation, or exploration regardless of distance traveled or weather conditions. In accordance with guidance, the plan will focus on interstate routes then transition to off interstate routes and urban areas. The 2022 plan was developed in cooperation with the Texas Commission on Environmental Quality, State Energy Conservation Office, Texas Parks and Wildlife, Texas Department of Transportation, the Electric Reliability Council of Texas, Public Utility Commission, Councils of Government, Counties, Metropolitan Planning Organizations (MPOs), utilities, energy service providers, and advocacy groups in Texas. The EV Plan supports the goals of Optimizing System Performance (economic development, connectivity, mobility, reliability) and Fostering Stewardship of the state’s natural, historic, and cultural resources as outlined in the Texas Transportation Plan 2050.

The 2023 plan update includes the addition of an EV Study Area in the city of San Marcos, the addition of a new MPO in Eagle Pass, an updated timeline, a summary of the implementation method (competitive grant) and documents to support the process. Various updates to dates/totals and an updated section on Freight charging in large MPOs.

TxDOT participated in numerous listening sessions with utilities, grid operators, consultants, fueling station providers, non-profits, and think tanks to better understand the needs, landscape, and trajectory of charging infrastructure in the state in 2022. TxDOT continued meeting with industry and interested parties in 2023 to refine the plan and guide the infrastructure program.

Recurring themes during listening sessions:

- Adequate power, emphasis to reach 350kW charging as soon as possible
- Competitive bidding process based on merit of proposals / How to submit proposals
- Amenities at charging locations
- Standardized ports
- Identifying profitable locations
- Contracting methods
- EV adoption rates
- Placement of stations in rural / urban areas
- User payment methods
- Data collection and reporting frequency
- Operations and Maintenance / Demand Charges

Initial planning for the network began with the passage of the Infrastructure Investment and Jobs Act (IIJA), Public Law 117-58 (Nov. 15, 2021). In late 2021, TxDOT began internal discussions with planning and legislative staff to understand the law and potential impacts/opportunities. Various scenarios were developed to conceptualize the network and begin the familiarization process on the topic. Early in 2022, existing EV charging stations and corridors from the US Department of Energy Alternative Fuel Data Center were published on the departments [Statewide Planning Map](#) to provide a single source of truth for planning, analysis, and education. An [EV Dashboard](#) was created to visualize and quantify types of EV charging and track changes over time. In mid-March 2022, TxDOT published EV study areas on the [Statewide Planning Map](#) to begin the review and analysis process for industry and interested parties. EV study areas were included in public involvement materials developed by TxDOT and posted to the department's website.

Critical to the Texas EV Charging plan are the Alternative Fuel Corridors. Starting in 2015 and working with planning partners across the state, TxDOT nominated sections of interstate highways to the Electric Alternative Fuel Corridors. In Round 6 of nominations (opened on Feb. 10, 2022), TxDOT took the opportunity to nominate almost all remaining non-business interstate highways as Corridor Pending segments.

TxDOT did not nominate additional highway segments to the Electric – Alternative Fuel Corridors during Round 7.

Dates of State Plan for Electric Vehicle Infrastructure Deployment Development and Adoption

The initial Texas EV Plan was developed in the spring of 2022, following the initial National Electric Vehicle Infrastructure (NEVI) Formula Program Guidance from FHWA. The 2022 EV Plan was accepted by FHWA on September 27, 2022.

February - July 2022

- Draft EV Plan
- Public Involvement
- Nominate additional non-business Interstate Highway segments to the Electric Alternative Fuel Corridors
- Texas Electric Vehicle Plan signed by Texas Commission on Environmental Quality (TCEQ), State Energy Conservation Office (SECO), Texas Department of Transportation (TxDOT)

August 1, 2022

- Submit Texas Electric Vehicle Plan to Federal Highway Administration

September 27, 2022

- Texas Electric Vehicle Plan approved by the Federal Highway Administration

February 3, 2023

- Published Phase 1 Dashboard
- Phase 1 EV Study Areas added to the STIP

February 15, 2023

- Final federal rules for NEVI published

March – June 2023

- Negotiations with FHWA Texas Division to open the competitive grant program for applications

June 15, 2023

- FHWA Texas Division approved the Texas Electric Vehicle Implementation Plan

August 16, 2023

- Texas EV Implementation Plan approved by the Texas Transportation Commission

August 17, 2023

- TxDOT opened Phase 1 of the Texas Electric Vehicle Infrastructure program for applications

State Agency Coordination –

Cross-Agency Coordination

Early in 2022, TxDOT established a cross agency EV Working Group to collaborate on the EV Charging plan. The group met twice a month until the plan was adopted by TxDOT, SECO, and TCEQ. Members attended regular meetings and contributed to the overall creation, review, and final acceptance of the EV Charging plan.

In March of 2022, TxDOT received a lessons learned briefing from the Texas Commission on Environmental Quality covering their experience administering VW Settlement grants for DC Fast Charging in Texas. This information was used to better understand the difficulties of the task and prepare the workgroup drafting the state EV plan. The main difference between the Texas Volkswagen Environmental Mitigation Program for DC Fast Charging and this plan will be the competitive nature of the proposals. TxDOT will develop a scoring mechanism to evaluate proposals and award contracts that provide the best value to the state. Scoring will be based on cost, quality, capacity, and satisfaction of NEVI guidance (categories are listed for reference, not in order of importance).

Each member of the EV Workgroup contributed to the drafting and review of the EV plan. TxDOT members utilized a shared document for review and editing. EV workgroup members outside TxDOT were emailed documents for their review and editing purposes.

The EV plan reflects close coordination between TxDOT, TCEQ and SECO. Coordination was critical to ensure DC Fast Charging stations developed by VW Settlement funds were included in overall network analysis.

EV Workgroup members:

- Texas Commission on Environmental Quality (TCEQ)
- State Energy Conservation Office (SECO)
- Texas Department of Transportation (TxDOT)
- North Central Texas Council of Government (NCTCOG)
- Houston-Galveston Area Council (H-GAC)

TxDOT continues to work with the Texas Commission on Environmental Quality to track progress of VW Emission Settlement progress grants for DC Fast Charging and the State Energy Conservation Office. As part of legislation passed in the 88th Texas Legislative session, TxDOT will work with the Texas Department of Licensing and Registration on standards for EV charging.

Public Engagement –

Stakeholders Involved in Plan Development

Following passage of the Bipartisan Infrastructure Bill in November 2021, TxDOT met with private sector companies, utilities, advocacy groups, and other interested parties. Information gathered from these meetings helped inform the plan and guide development of the overall Electric Vehicle Infrastructure program in Texas.

Organization Type	Number of Stakeholders Met With
Convenience Store	3
Non-Profit	3
Civil Engineering	4
Motor Vehicle Manufacturing	4
Engineering Consultant	5
Software Services	5
Retail	5
Tribal Government	6
Construction	7
Advocacy Group	11
Government	13
Utility	13
Consultant	17
Lobbyist	23
Miscellaneous	26
EV Charging	28
Grand Total	173

Public Outreach

In a short time, the TxDOT Public Involvement team put together a public involvement plan and resources for the Texas Electric Vehicle Infrastructure Plan. The resources included a landing page for the program, social pinpoint site with surveys, map based public input method for suggested charging locations, social media posts, and a virtual public meeting to discuss the plan. These resources opened a line of communication with the public for the program and input from the public was used to draft the plan. TxDOT will maintain these resources going forward as we develop the program. The interactive map for the public to suggest charging stations locations will be left up for the length of the NEVI program in Texas.

Key Public Involvement dates and resources:

- March 25, 2022 - Launch of Texas Electric Vehicle Infrastructure landing page
- March 25, 2022 - Launch of the Online Engagement Site (Social Pinpoint)
- May 23, 2022 - Facebook and Twitter Announcements of EV Planning Process and Resources
- May 23, 2022 - Email blast on the Draft Texas Electric Vehicle Infrastructure Plan
- June 7, 2022 - Virtual Public Meeting
- June 10, 2022 - Public Meeting Announcements (Twitter and Facebook)
- June 14, 2022 - Multi-state tribal outreach and consultation
- June 22, 2022 - Comment deadline for Virtual Public Meeting
- September 22, 2022 – Published first draft of the Scoring Worksheet for review and comment
- September 22, 2022 – Updated the EV Landing page with information for potential site owners and MPOs
- December 1, 2022 – Application, Request for Grant Applications, Site Host form and Scoring Worksheet posted for review and comment.
- January 20, 2023 – Added additional EV Study Area based on feedback
- August 17, 2023 - Opened 2023 NEVI plan for two-week review and comment period
- August 17, 2023 - Opened draft awardee contract for two-week review and comment period

Public Involvement Results

Public Involvement Method	Count 2022	Count 2023
Unique Webpage Visitors (EV Landing Page)	4,751	1,829
Webpage Visits, Views	7,056 - 8,041	3,078 - 4,158
Facebook Views, Comments, Reactions, Shares	566 - 258 - 261 - 47	31,527 - 166 - 126 - 19
Twitter Views, Likes, Retweets, Comments	6,414 - 20 - 18 - 1	9,657 - 15 - 13 - 7
Completed Surveys	692	340
Emails to TxDOT_NEVI@txdot.gov	192	842
Map - Comments	115	82
Map - Charging Location Suggestions	381	326
Texas EV Plan downloads	698	498
Pre-Recorded Virtual Public Meeting – Views	593	269
Written plan reviews from interested parties	32	8

Plan Vision and Goals –

Plan Vision

The Statewide EV plan for Texas is a multi-year plan to enable current and future drivers of electric vehicles to confidently travel across the state for work, recreation, and exploration. One measure of success of the plan for Electric Alternative Fuel Corridors will be how well it meets FHWA requirements of 50-mile spacing for DC Fast Chargers, 1 mile from the interstate exit, rated at 150kW or greater. The same power and minimum port requirements will be applied to stations at or near County Seats but since most County Seats are not on the Alternative Fuel Corridors the minimum spacing requirements do not apply. Spacing off the corridors could be slightly greater (70 miles) in rural counties due to distances between population centers and electrical supply lines in west Texas. Large urban areas will utilize a combination of DC and Level II charging across their respective areas. The mix and location of chargers will be determined based on equipment cost, access to power, community identified needs, and how long a vehicle is parked.

General execution of the plan:

- Expand Electric Alternative Fuel Corridors to include almost all non-business Interstate routes.
- Work with the private sector to install DC Fast Charge stations along Electric Alternative Fuel Corridors according to FHWA requirements. TxDOT will not own or operate the charging equipment.
- Work with Metropolitan Planning Organizations to identify suitable locations to install a combination of Level II and DC Fast Charging infrastructure inside large urban areas.
- Work with rural counties and small urban areas to install DC Fast Charge stations at or near county seats across the state.
- Collect data from the network to assess usage and identify trends for future development

High level goals of the EV Charging Network

Redundancy – The density, distribution, and power of the EV network outlined in this plan is targeted to support 1 million electric vehicles when built out (see page 22 for EV estimates). DC Fast charging stations will be 50 miles apart on the Electric Alternative Fuel Corridors and usually 70 miles apart anywhere else in the state. Drivers will have multiple options for EV Charging along their intended travel route. Each location will have at least four ports with pull through spaces for passenger vehicles pulling trailers or recreational vehicles. When drivers arrive at a location with four or more ports, it is likely a stall will be available even if several ports are occupied, down for maintenance, or otherwise unavailable. Locations will be discoverable online at the US Department of Energy Alternative Fuel Data Center and various third-party applications.

Adequate power – Each individual charging connector on the Alternative Fuel Corridors will be rated to deliver at least 150kW of power to the vehicle (4-port installations would require 600kW per location and scale up proportionally from there). In some cases, the maximum power provided could be higher if supply and costs for that power are not excessively high. In most cases 150kW power can recharge a vehicle from 10% to 80% in about 30 minutes. Charging speeds will vary by manufacturer, equipment installed on the vehicle, and battery characteristics like age and temperature.

Pull-through capability – Each DC Fast Charge station on the Alternative Fuel Corridors or near county seats can have at least one pull-through space for light duty vehicles pulling trailers or RV campers when space is available at the host location. Locations will not include spaces for heavy duty freight trucks or trailers. Freight charging will be addressed pending guidance from FHWA in the fall of 2022. Light duty panel trucks or delivery vans could utilize pull through spaces if they can safely navigate the location.

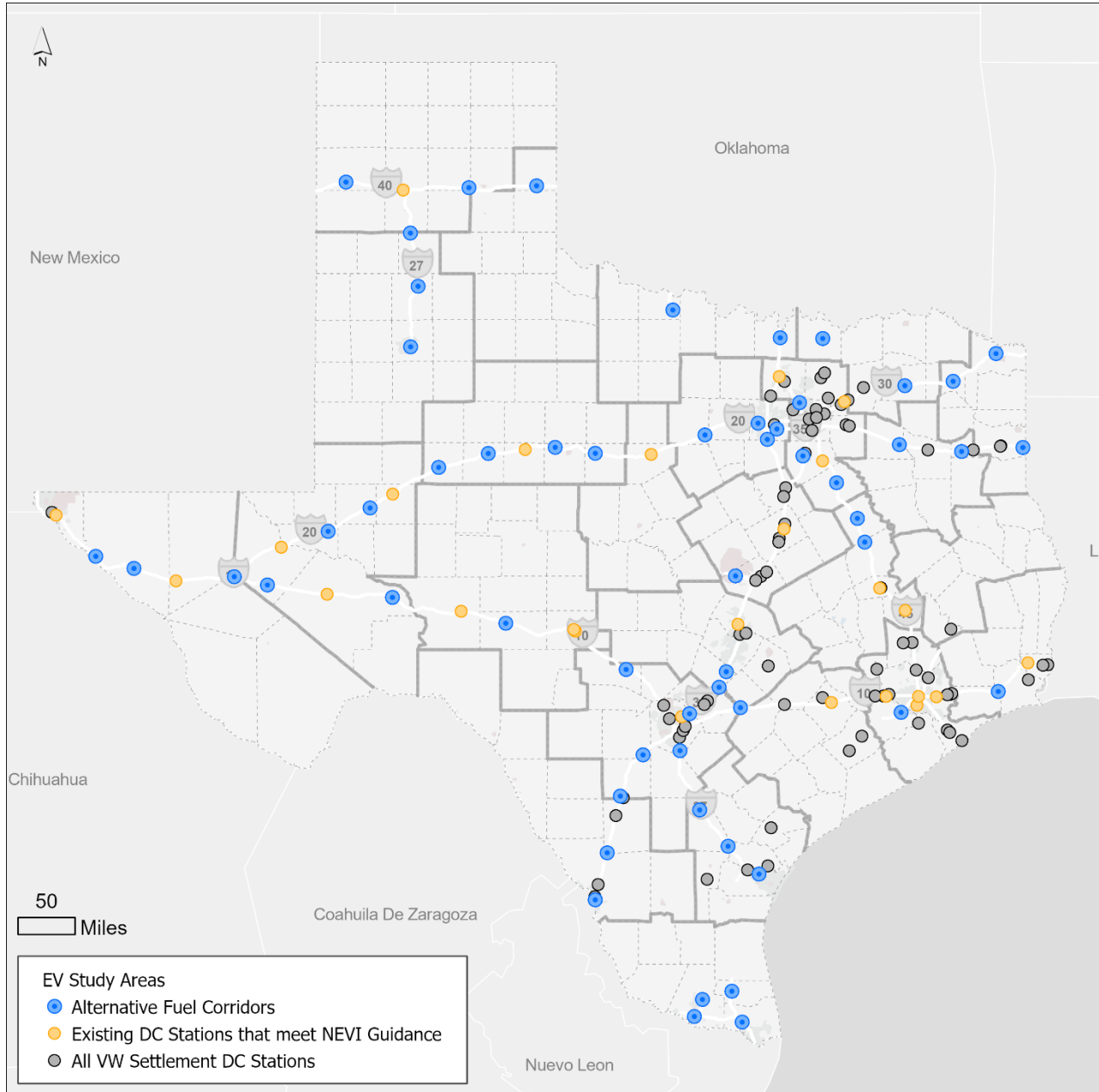
Standardization – Per FHWA requirements for DC Fast Charge stations on Alternative Fuel Corridors, a minimum of 4 ports will be available at each location. Stations at or near county seats are expected to have a minimum of 4 ports but conditions in the area will ultimately determine the number of ports and power levels. Cable length should accommodate vehicles with charge ports in various vehicle locations. Stations will have adequate lighting, signage, and instructions for station usage and reporting inoperable stations.

Education – Outreach materials will be developed to educate the public on good charging habits, station location, station usage, equipment capability, and how to provide feedback on the network.

Evaluation – As required by guidance, TxDOT will develop a framework to collect and evaluate station usage information from equipment owners and adjust the network as needed based on this information.

Charging Network Timeline –

Phase One will focus on building out the Electric Alternative Fuel Corridors to meet FHWA guidance. This will include rapid re-evaluation of the network to assess private sector development outside the National Electric Vehicle Infrastructure (NEVI) program. Approximately 56 new locations will be needed to satisfy the 50-mile maximum spacing requirements from FHWA. The 56 new locations will complement 45 existing locations installed by the private sector and 34 planned locations resulting from VW settlement grants that meet FHWA requirements. A full list of Electric Alternative Fuel Corridors and Stations can be found in the Existing and Future Conditions section of this document.



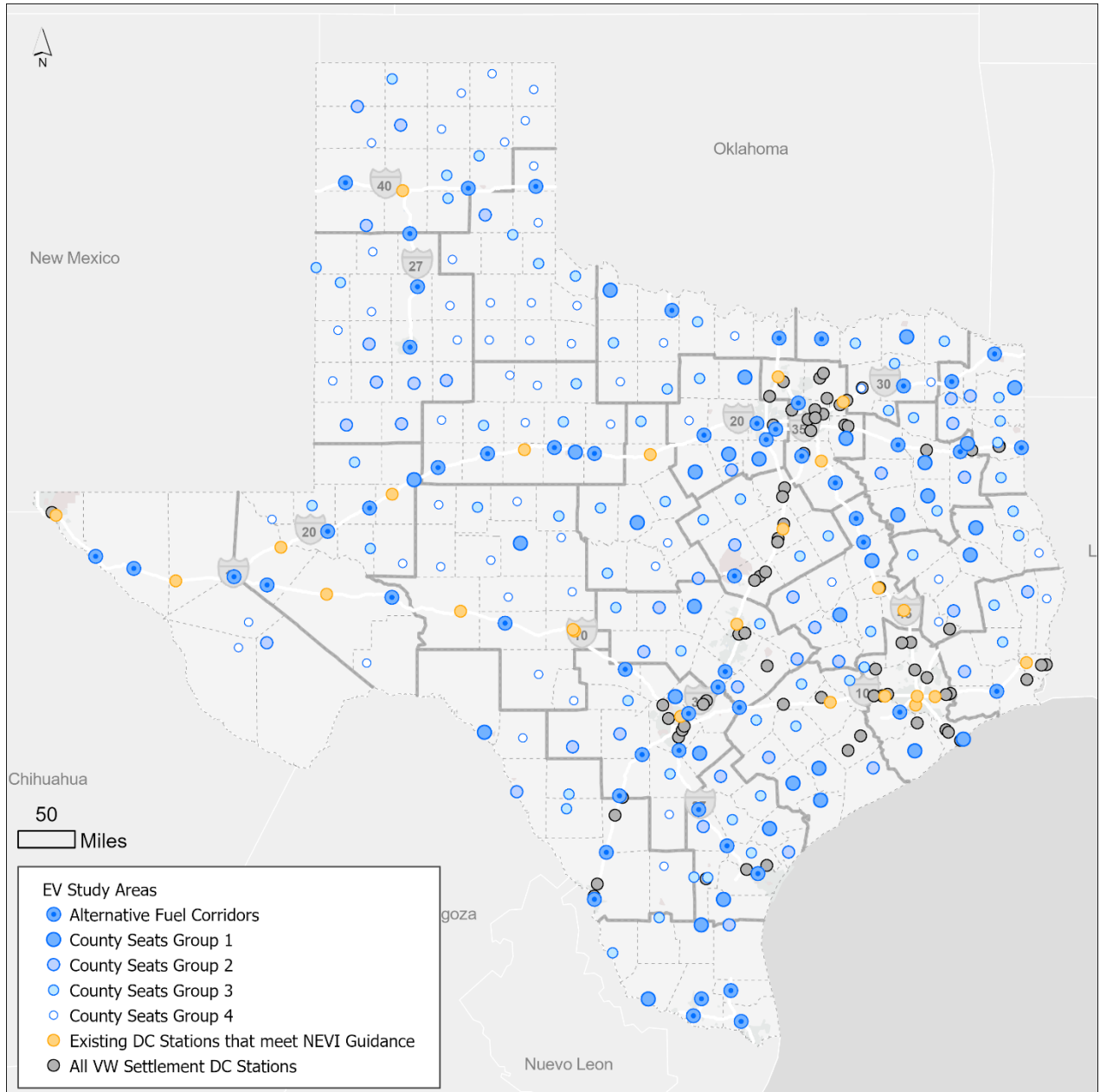
Phase Two, after the Electric Alt Fuel Corridors are completed, the program will focus on rural counties, small urban areas, and MPOs. TxDOT will utilize a modified formula from our Unified Transportation Program to estimate funds for EV Charging inside MPOs (not shown on the map). Large urban areas will require a combination of Level II charging and DC Fast Charging dependent on the time a vehicle is parked at a location. Ultimately, placement decisions and power ratings will be proposed by the MPOs and consistent with FHWA requirements.

In rural areas the focus will be installing DC Fast Charging stations at or near County Seats. County seats are usually centrally located in the county (all roads lead to the county courthouse) and provide good spacing between urban clusters in rural areas. Vehicle Miles Traveled (VMT) was used to establish a priority list of most traveled non-interstate routes through rural areas. Installing DC Fast Charge stations at county seats with a power rating of 150kW and minimum four ports will fill gaps across rural Texas for off-interstate travelers and enable local farm and work trucks to access the charging network.

Statewide coverage will improve, and the network will progress into more rural areas of the state. As the charging network spreads to more rural areas the equipment installed may adjust to accommodate varying power supply in the region.

Multiple vendors could be engaged to complete the work and TxDOT will balance contractual agreements to ensure rural and urban areas are represented and progress at an equal rate. Phase Two map is on the next page.

Phase Two map (lists of VW Settlement and existing DC Stations meeting NEVI requirements can be found on pages 33-35).



Contracting –

TxDOT will manage a competitive grant program to develop EV charging stations across the state. A series of program documents and scoring process were created to manage the program:

- Request for Grant Applications
- Program Manual
- Grant Application
- NEPA Clearance Form
- Site Host Form
- Scoring Worksheet
- Scoring Process
- Contract
- SharePoint site

Each grant recipient will work to identify specific installation sites within TxDOT identified EV Study Areas and work with property owners, utilities, and municipalities to complete the installation. The grant recipient will be responsible for all state and federal requirements and working with TxDOT on environmental clearance. It is anticipated that EV Study Areas could shift/expand during the development process to better meet FHWA requirements.

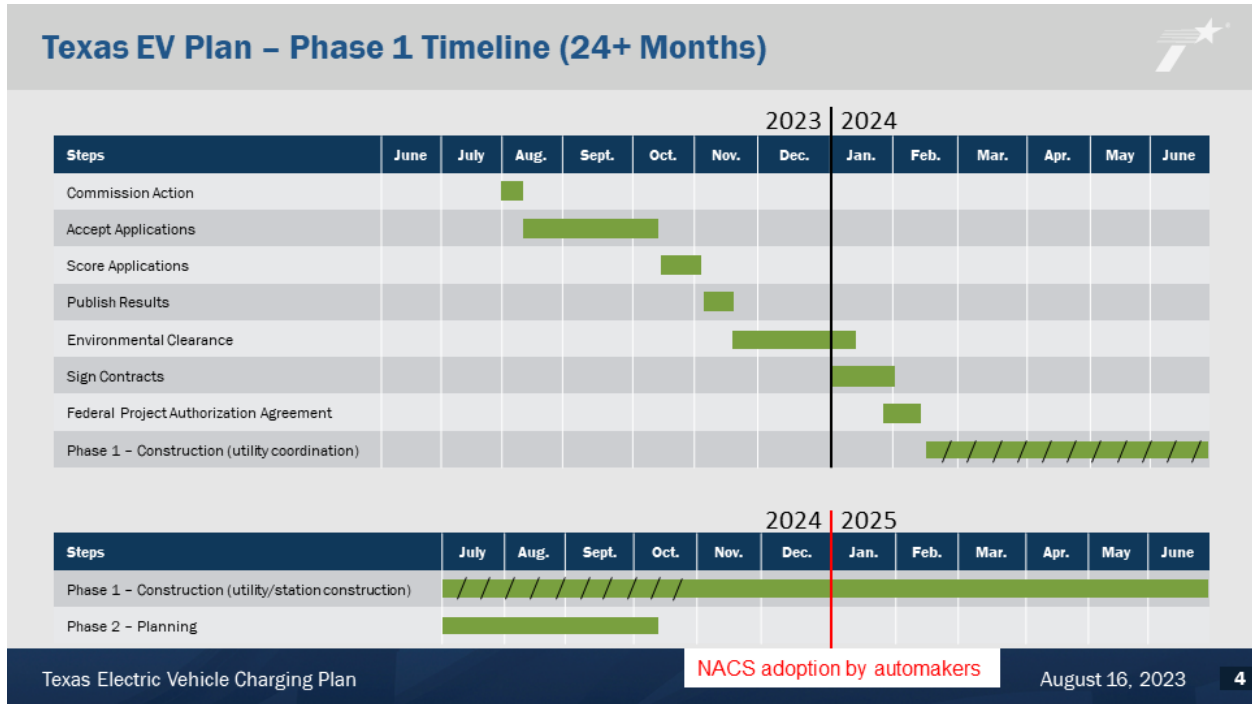
Language will be added to the contract to outline 5 years of operations and maintenance as needed per location. Language will also be added to handle situations where the owner/operator chooses not to continue station operation after the 5-year operation and maintenance assistance ends. This will ensure another operator can be located/contracted to keep the station open and accessible to the public.

Grants have two creation/approval tracks for charging stations depending on whether the location is inside or outside an MPO.

- Alternative Fuel Corridor or Non-Alternative Fuel Corridor Outside an MPO
 - TxDOT determines charging station types and study areas
 - TxDOT drafts request for grant application
 - TxDOT scores responses
 - TxDOT selects grant recipients
 - Awardees constructs and operate stations for 5 years
 - TxDOT collects station usage reports from awardees and reports to FHWA
- Inside MPOs
 - TxDOT provides resources to MPOs through an Inter-Agency Contract to write regional EV charging plans using the Texas EV Plan as a template
 - TxDOT drafts request for grant application based on regional EV charging plans
 - TxDOT scores responses
 - TxDOT selects grant recipients
 - MPO updates TIP (group projects to avoid tip updates for individual stations)
 - Awardees construct and operate stations for 5 years
 - TxDOT collects station usage reports from awardees and reports to FHWA

Status of Contracting Process

The Competitive Grant Program opened for applications on August 17, 2023.



Awarded Grants

None; planned for early 2024.

Scoring Methodologies Utilized

Applications will be scored against the following criteria
1. Staffing plan and experience installing, operating, maintaining, and reporting usage for DCFC stations
2. Financial plan for site construction until reimbursement
3. Plan to achieve station up time of 97% or greater
4. How the proposed hardware and software will accept payments from the public for DCFC usage
5. Plan to collect usage information by connector and report the data to TXDOT on a quarterly basis
6. Training and certification plan for employees and contractors that install, operate, and maintain DCFC equipment
7. Cyber security plan to protect equipment and user data
8. Number of ports meets the desired number of ports in the TxDOT EV Study Area (minimum of 4)
9. Power rating per port (power sharing is acceptable if each port can charge at 150kW or greater simultaneously).
10. Estimated price per fully functional port installed
11. Estimated Operation and Maintenance price for 5 years
12. Restrooms available to the public (restrooms do not have to be owned and operated by the site host or equipment provider. Charging stations located in the same parking lot of shopping malls, restaurants, convenience stores, or other retail locations are acceptable.)
13. Pull through space for light duty vehicles with trailers when host location will support it
14. Retail agreement in place to host stations
15. Equipment and software ability to enforce Idle Fees when the charging session complete and the grace has period expired
16. Dedicated support with contact information posted on site
17. Buy America Compliant DCFC equipment and construction materials

Data collected from the applications will be aggregated into a response file as an individual record. After the application window closes the response file will be exported to an .XLS document for processing and scoring.

The seven qualitative items from the applications are scored by a five-member TxDOT scoring team averaged and added to scores from the ten quantitative items scored programmatically to produce a total score by applicant for each EV Study Area. The scores for each EV Study Area are ranked and the top three are identified programmatically.

Company names/scores are from test data -

First Place		Statewide Charging, No Level II	70.5	Chargers Are Us	78
Second Place		Statewide Charging, No Level II	70.5	Statewide Charging	73
Third Place		Chargers Are Us, AFC 1st	63	DCFC Company	68
Company Name	Qualitative Score	Sugar Land Tech Score	Sugar Land Total Score	Arlington Tech Score	Arlington Total Score
Name of the entity sub	20	35.5	55.5	43	63
E Trucking	25	28	53	33	58
Chargers Are Us	30	33	63	48	78
Statewide Charging	35	35.5	70.5	38	73
AFC 1st	30	33	63	30.5	60.5
DCFC Company	25	33	58	43	68
No Level II	20	50.5	70.5	30.5	50.5
Electrify Texas	15	30.5	45.5	35.5	50.5

The final analysis step involves mapping the top results by EV Study area to identify how consistent the results are by corridor.

Output table from scoring process -

1	ID	EV Study Area	TxDOT Plan Connectors	Latitude	Longitude	Company Name	Total Score
2	1	Sugar Land	8	29.599259	-95.621616	Statewide Charging, No Level II	70.5
3	2	Arlington	8	32.675808	-97.174513	Chargers Are Us	78
4	3	Carrollton	8	32.953967	-96.911068	Statewide Charging	80.5
5	4	Fort Worth	8	32.735865	-97.436854	Statewide Charging	80.5
6	5	Selma	8	29.5845	-98.305398	AFC 1st	75.5

Scoring results mapped -



Scoring Worksheet

	Criteria	Description	Points
1.	Staffing plan and experience installing, operating, maintaining, and reporting usage for DCFC stations.	Evaluation of staffing plan and experience.	10
2.	Financial plan for site construction until reimbursement.	Evaluation of the financial plan.	10
3.	Plan to achieve station up time of 97% or greater.	Evaluation of the up-time plan.	10
4.	How the proposed hardware and software will accept payments from the public for DCFC usage.	Evaluation of the payment methods available to users.	5
5.	Plan to collect usage information by connector and report the data to TxDOT on a quarterly basis.	Evaluation of the data reporting plan.	5
6.	Training and certification plan for employees/contractors that install, operate, and maintain DCFC equipment.	Evaluation of the training and certification plan.	5
7.	Cyber security plan to protect equipment and user data.	Evaluation of the cyber security plan.	2
8.	The number of ports meets the desired number of ports in the TxDOT EV Study Area.	Full points for meeting the desired number of ports in the study area, half points for less than the desired ports per study area, no points for less than 4 ports. Less than 4 = Disqualified	5
9.	Power rating per port.	Full points if 250kW or greater per port. Half points if less than 250kW per port. No points if less than 150kW per port. Less than 150kW = Disqualified	5
10.	Estimated price per fully functional port installed.	Full points if less than 125K per port, Half points if 125K to 175K per port, quarter points if 175K or greater per port.	20
11.	Operation and maintenance estimate for 5 years.	Percentages based on full site installation price estimate. Full points if O&M is less than 25% of installation price, half points if O&M is between 25% and 50% of installation price, quarter points if O&M is greater than 50% of installation price.	5
12.	Restrooms available to the public.	Full points for yes or zero points for no.	5
13.	Pull through space for light duty vehicles with trailers.	Full points for at least 1 pull through space. No points for any other scenarios.	2
14.	Retail agreement in place to host stations.	Full points for entities with signed hosting agreements with property owners to utilize parking spaces open to the public 24/7. No point for any other scenarios.	5
15.	Equipment and software ability to enforce idle fees.	Full points for the ability to monitor charging session and enforce idle fees when sessions are complete after a 10-minute grace period (length of grace period is negotiable). No points for any other scenarios.	2
16.	Dedicated support with contact information posted on site.	Full points for phone support 24/7, half points for web support 24/7, no points for any other options.	2
17.	Buy America compliant DCFC equipment and construction materials.	Full points for 100% compliant. No points for any other scenario.	2
			100

Plan for Compliance with Federal Requirements

TxDOT developed a Grant Agreement (contract) for awardees. The contract lists state and federal requirements that awardees must meet as part of the NEVI program. The Texas EV Program Manual outlines how TxDOT staff will administer the program and monitor the program/awardees for compliance.

Between February and June 2023, TxDOT and FHWA worked closely to meet all federal requirements, including 23 CFR 635 and 23 CFR 636. FHWA and TxDOT looked at the CFRs line by line to address any possible miscommunication and differences in terminology, tackling any areas of discomfort on the federal side while working within the contractual and statutory constraints on the state side.

Among the portions further fleshed out were areas related to reporting and operating requirements:

- Applicants agree to meet Federal reporting requirements to provide charging station location, pricing, real-time availability, and accessibility free of charge to third party software developers through application programming interface (680.116(c)).
- Applicants agree to meet Federal reporting requirements outlined in 680.112 - Data Submittal
- Grant recipients are instructed to see 680.116 for exclusions for total hours of outage.

Among applicable laws and standards, several important additional federal requirements are listed:

- CFR Part 200 Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards
- 12. 2 CFR Part 200, Grants and agreements
- 13. 2 CFR 200.317, "State procurement policies and procedures"
- 14. 2 CFR 200.333 Fixed amount subawards

Buy America

In April 2022, the Office of Management and Budget (OMB) released a [memo](#), directed at federal agencies titled, “Initial Implementation Guidance on Application of Buy America Preference in Federal Financial Assistance Programs for Infrastructure.” In part, the memo reads, “This guidance applies to all Federal financial assistance... whether or not funded through IJA—where funds are appropriated or otherwise made available and used for a project for infrastructure.” “Federal financial assistance” refers to aid that non-federal organizations (for example, states or local governments) receive or administer in the form of cooperative agreements, grants, donations of property, loans, etc. In that light, TxDOT will adhere to Buy America requirements issued for NEVI. TxDOT understands that FHWA has continued to interpret and apply Buy America requirements based on a 100% domestic content and domestic assembly threshold for iron, steel, and protective coatings, save for a de minimis threshold of \$2,500 or one-tenth of one percent of the total value of the contract, whichever is greater. TxDOT notes that other agencies under USDOT have more flexible/workable definitions of Buy America compliance. While TxDOT hopes for a more flexible definition than what FHWA has implemented to date, or for reasonable allowance of waivers, the agency is prepared to adhere to whatever requirements FHWA issues, both in the initial April 2022 guidance and beyond. It should be noted, however, that the stricter the requirements are, the greater the risk of prompt deployment due to limited equipment availability and/or supply chain concerns.

Existing and Future Conditions Analysis –

Current EV Ownership in Texas –

218,889 electric vehicles (plug-in hybrid and fully electric) are registered in the state of Texas as of August 29, 2023. Of the 254 counties across Texas, there are electric vehicles registered in 239 counties. Registered EV distribution is 73.8% Battery Electric and 26.2% Plug-In Hybrid Electric. Non-Tesla vehicle models make up 41% of all EVs registered across the state. Electric vehicles (plug-in hybrid and fully electric) currently constitute around 1% of all vehicles registered in Texas. However, since 2020, the total number of electric vehicles across Texas has increased by a factor of 5 as more people adopt the technology. With rapidly growing adoption rates, it is necessary to ensure Texas will be able to meet the demand of these new vehicles on the road.

For EV registration data, The Texas Department of Motor Vehicles is the authoritative source of current Texas vehicle registrations and publishes an annual report. The North Central Texas Council of Governments uses DMV data and summarizes it to create an interactive EV dashboard that's updated every week ([EV Registration Dashboard](#)).

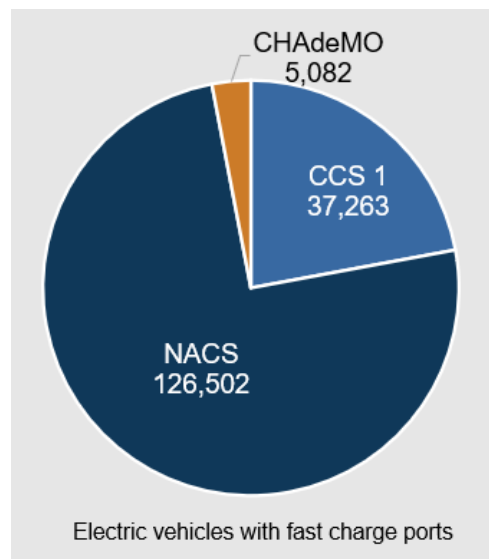
Full Battery Electric Registrations by Fiscal Year					
Year	2018	2019	2020	2021	2022
Total	18,990	29,540	36,418	60,528	105,807

Source: [DMV 2022 Alternative Fueled Vehicle Report](#)

Connector Types in Texas (does not include vehicles without DCFC ports) -

DCFC Type	Count	Market Share %
CHAdEMO	5,082	3
CCS 1	37,263	22
NACS	126,502	75

Source: EV Registration Dashboard as of August 8, 2023.



Current and Future temperature and precipitation

Texas experiences a wide range of temperatures and extreme weather events, including ice and snowstorms, tornados, hurricanes and tropical storms, and wildfires in dry conditions. Performance during extreme weather events is important, particularly when we anticipate it will affect infrastructure such as power and communications outages, etc. We learned during the February 2021 winter storm that not all electric grids are fully resilient under some conditions. Charging stations need to be reliable for continued travel, and ready to help the public evacuate from extreme conditions, especially in remote areas. We will include the need to plan for emergencies in choosing the sites for charging stations. Keeping stations near interchanges and crossroads that are easily accessible, suitable commercial or public sites, adequate power aligned to priority grid capabilities, communications and security are all considerations not only for operational feasibility, but also to support the public in extreme conditions. Below we identify our general climate conditions. Later in the plan we provide early thoughts on resiliency risk reducing actions, and the need for physical and cyber security.

Current and future temperature and precipitation patterns provided by John Nielsen-Gammon, Texas State Climatologist, Texas A&M University.

Texas has a warm climate, with hot summers throughout the state, mild winters in southern Texas, and cooler winters in northern Texas. Normal July maximum temperatures are typically above 90 °F, while average January minimum temperatures vary from the 20s °F in the north to the 40s and 50s °F in the south. All present-day climate statistics are based on the standard normals period of 1991-2020 unless otherwise noted.

The number of days in which the temperature reaches 100 °F is less than once per year (fewer than thirty times in thirty years) along the Gulf Coast and mountains in West Texas. Most of the state sees on average between 5 and 20 100 °F days per year. More than 30 100°F days per year are common in western portions of South Texas and along the Rio Grande and Pecos River in West Texas. Days reaching 110 °F are extremely rare, with frequencies of once per year found only in West Texas along the Rio Grande and Pecos River and near Childress in northwestern Texas.

The period 1991-2020 was unusual in Texas for the absence of extreme cold compared to the 1980s and 2021-2022. To obtain more representative statistics, extreme cold is examined for the 41-year period 1981-2021. Temperatures drop below freezing less than once per year along the Texas coast and westward to the Laredo area, while in the Panhandle over 90 days per year have temperatures below freezing. Below-zero (°F) temperatures did not occur at all in the southern half of the state, while the extreme northern Panhandle averaged two per year.

Normal annual precipitation varies dramatically from west to east across the state. Low-altitude far western locations, such as El Paso, average less than 10 inches per year, while the southeast corner of the state near Beaumont averages over 60 inches per year. Heavy rain is common in southeast Texas and rare in west Texas. Much of western Texas did not experience a single day with more than 5 inches of rainfall during 1991-2020, while for the Houston and Beaumont areas it was almost an annual occurrence.

Measurable snow is extremely rare at the southern end of the state and quite common at the northern end. Typical annual snowfall totals during 1890-2021 were less than 3 inches in the southern half of the state and over 8 inches in the Panhandle.

According to CMIP6 global climate model simulations and recent historical observations, Texas temperatures may be expected to increase by about 1.25 °F for every 1 °F of global temperature increase, with the relative increase smallest along the coast. If global temperatures increase by an additional 2 °F, which the IPCC assesses could happen in some scenarios around the middle of the 21st century, it could double the number of 100 °F days in most areas of the state and could make 110 °F days considerably more common. The number of extremely cold days could decrease slightly.

Precipitation over the past century has had little trend in western Texas but has increased by about 15% in eastern Texas. Global climate model projections are mixed, with the overall model consensus being a slight decrease in annual precipitation. Rainfall intensity during the wettest days of the year has increased across the state by an average of about 10-15% and is expected to continue increasing at a rate of about 3-4% per 1°F of global rise in temperature. Snow frequency and intensity is expected to decrease, because the amount and frequency of snow in Texas is limited by the frequency of below-freezing temperatures during wintertime storm events.

EV Adoption and Market Conditions –

The Electric Reliability Council of Texas (ERCOT) estimates there will be 1 million electric vehicles on the road in Texas by 2028. Using current growth trends for EVs the Texas Department of Motor Vehicles estimates Texas will reach 1 million EVs by 2031. As part of the network evaluation process in this plan TxDOT will monitor the adoption rate of EVs in Texas and adjust/develop the network going forward.

The production of battery electric vehicles is increasing in the US with notable developments in Texas. Likewise major automakers are rapidly developing battery production capacity in the US to electrify their vehicle lineups.

Existing and planned battery factories in North America:

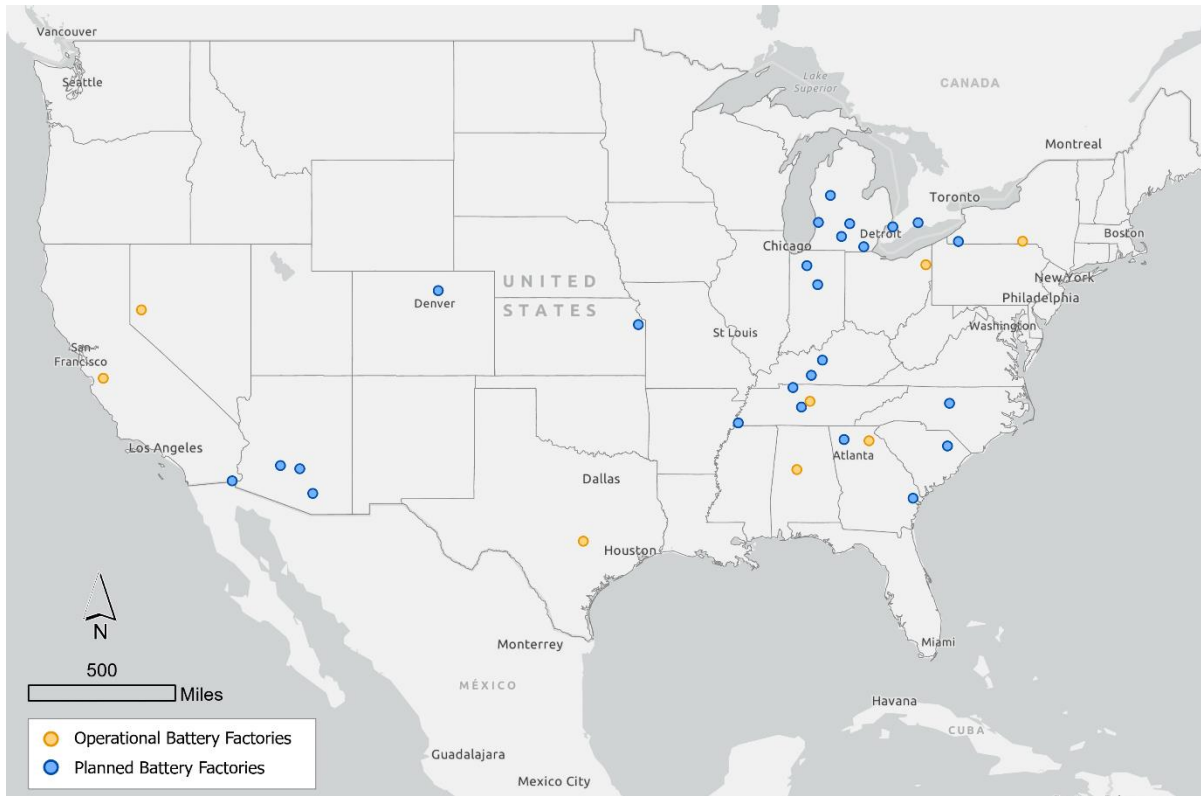


Table of existing and planned battery factories in North America:

Owner/Operator	Location	Annual Capacity	Year
AESC	Florence, SC	30 GWh	2026
AESC	Bowling Green, KY	30-40 GWh	2025
AESC	Smyrna, TX	3 GWh	2018
American Battery Factory	Tucson, AZ	3 GWh	2024
Ampricus Technologies	Brighton, CO	5 GWh	2027
Electrovaya	Jamestown, NY	1 GWh	2023
Ford	Marshall, MI	35 GWh	2026
Ford	Memphis, TN	43 GWh	2025
Ford/SK Innovation	Glendale, KY	86 GWh	2025
GM/LG	Spring Hill, TN	50 GWh	2023
GM/LG	Warren, OH	40+ GWh	2022
GM/LG	Lansing, MI	50 GWh	2024
GM/Samsung	New Carlisle, IN	30 GWh	2026
Gotian	Green Charter Township, MI	TBD	TBD
Hyundai/LG	Bryan County, GA	30 GWh	2025
Hyundai/SK Innovation	Bartow County, GA	35 GWh	2025
iM3NY	Endicott, NY	1.8 GWh (to 38 GWh)	2023
KORE Power	Buckeye, AZ	12 GWh	2024
LG	Queen Creek, AZ	43 GWh	2025
LG	Holland, MI	25 GWh	2025
Mercedes	Woodstock, AL	TBD	2022
Microvast	Clarksville, TN	2-8 GWh	2023
ONE	Van Buren Township, MI	20 GWh	2027
Panasonic	De Soto, KS	30 GWh	2025
SK Innovation	Commerce, GA	21.5 GWh	2023
Statevolt	Imperial Valley, CA	54 GWh	2026
Stellantis/LG	Windsor, Ontario, CAN	45 GWh	2025
Stellantis/Samsung SDI	Kokomo, IN	33 GWh	2025
Tesla/Panasonic	Sparks, NV	38 GWh (to 100 GWh)	2022+
Tesla	Fremont, CA	10 GWh	2022
Tesla	Austin, TX	100 GWh	2022+
Toyota	Liberty, NC	17 GWh	2025
Volkswagen	St. Thomas, Ontario, CAN	TBD	2027
Various Manufacturers	VA	80 GWh	2022+
Estimated Annual Capacity by 2027 = 1,073 GWH			
1 GWh = 13,000 electric vehicles with a battery pack of 77 kWh			
Annual Capacity refers to the yearly output of battery capacity produced at each factory			

Grid Capacity and Considerations –

Texas has been an energy leader for many years with strong growth in wind generation since 2000 and more recently from solar generation. In 2006, Texas became the #1 state for wind power and is now showing similar rapid growth in solar power. Short-term ERCOT projections show these trends accelerating at least through 2024.

The document titled “Report on the Capacity, Demand and Reserves (CDR) in the ERCOT Region, 2022-2031” published by ERCOT provides power generation estimates from 2022 – 2031. The first 5 years are displayed in the table below.

	2022	2023	2024	2025	2026
Firm Peak Load	74,977 MW	76,542 MW	77,767 MW	78,795 MW	79,819 MW
Total Capacity	92,884 MW	106,684 MW	110,179 MW	110,521 MW	110,683 MW
Reserve Margin	23.9%	39.4%	41.7%	40.3%	38.7%

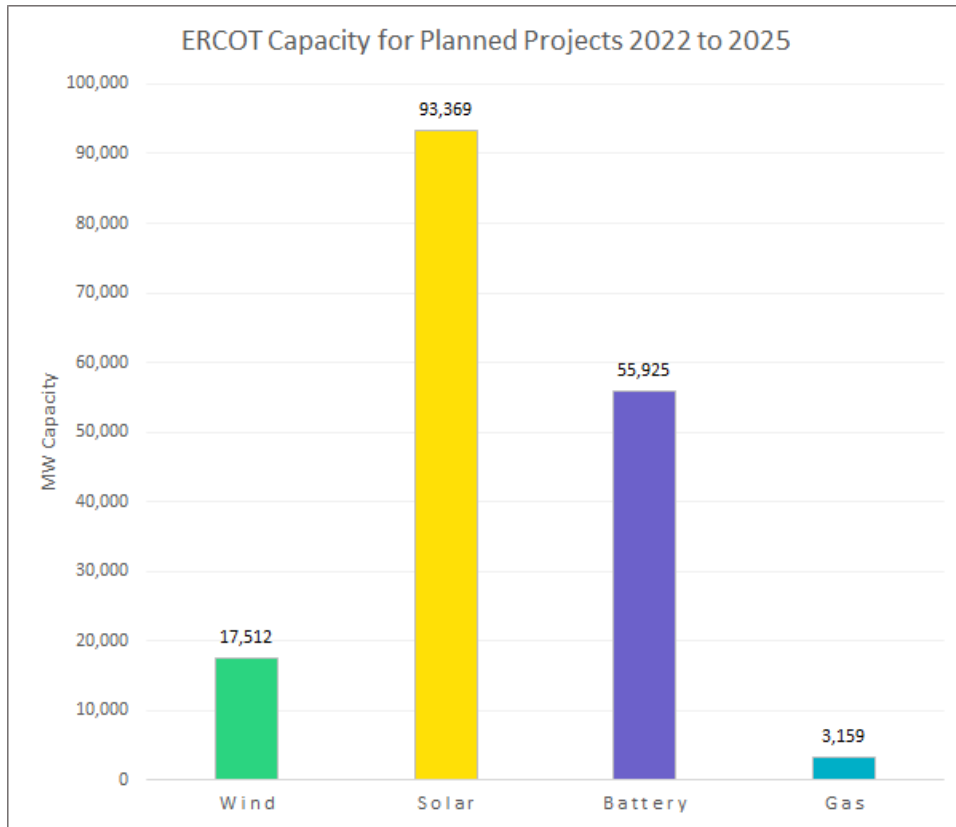
Theoretical max energy consumption of the EV Charging Network outlined in this plan is 666.7 MW (see page 37 for details).

The newest and rapidly growing "source" on the Texas grids is battery storage, breaking 500MW in 2021. Appropriately sited battery storage could reduce variability and congestion issues. More detail can be seen on page 24 from the June 2022 Generator Interconnection Status report provided by ERCOT.

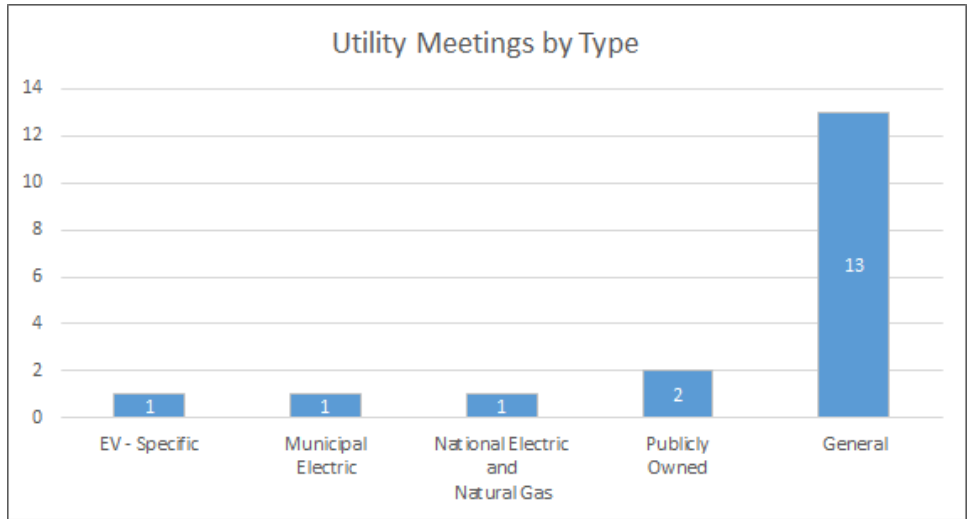
Texas is a unique state in the number and variety of grids to be considered, spanning all three major grids in the contiguous USA.

1. ERCOT is fully contained within Texas and services about 90% of electrical demand. ERCOT is isolated with a few minor connections to the Eastern Interconnect and to Mexico, typically representing around 0.25% of annual net ERCOT electricity.
2. Portions of West Texas are serviced by the Western Interconnect, the portion in Texas by El Paso Electric.
3. Portions of East and North Texas are serviced by two separate Independent System Operators (ISOs) within the Eastern Interconnect- the Southwest Power Pool (SPP) and the Midcontinent ISO (MISO).
4. NOTE: the Lubbock area is in transition from the Southwest Power Pool to ERCOT.

Forecast new installations for Wind, Solar, Battery, and Gas from the ERCOT [Generator Interconnection Status Report](#) June 2022 (with and without interconnection agreements or full interconnection studies)



TxDOT held numerous meetings with utility stakeholders while developing the plan. The topics included estimated power supply, expected usage, demand charges, and sufficient lead time for program roll out in rural areas. Numerous utility stakeholders submitted comments on the plan including the Texas Public Utility Commission and the Electric Reliability Council of Texas. Texas Electric Cooperatives is using the plan to facilitate conversations with rural electric providers about plans for electric vehicle charging.



State Geography, Terrain, Climate and Land Use Patterns

Texas enjoys varied geography across vast distances from the coastal Barrier Islands along the Gulf of Mexico to the Franklin Mountains in El Paso. Each region has its own unique properties and flair that distinguishes itself from equally stunning far-flung reaches of the state. The transportation system is the backbone of the state carrying people and goods between sea and inland ports, agricultural regions, energy sectors, and metropolitan areas. Varied terrain and geography are not a deterrent to travel as Texans move about the state year-round.

Population continues to grow with the majority estimated to occur inside large metro areas. Vehicle miles traveled are expected to rebound following the pandemic as Texans return to traditional travel patterns. The transportation system in Texas will continue to connect people and places in the most remote regions of the state. The addition of infrastructure under the NEVI program will enhance the travel experience and provide options for future growth and development in Texas.

See the Current and Future temperature and precipitation sub section in the Existing and Future Conditions Analysis Section for the Climate summary.

State Travel Patterns, Public Transportation Needs, Freight and Other Supply Chain Needs

Texas has over 3,400 centerline miles of interstate highways, and interstates represent the largest percentage of vehicle miles traveled in the state. TxDOT agrees focusing on Electric Alternative Fuel Corridors and the interstate highways first is the best way to build out a statewide charging network. We look forward to guidance from FHWA on freight and heavy-duty vehicles.

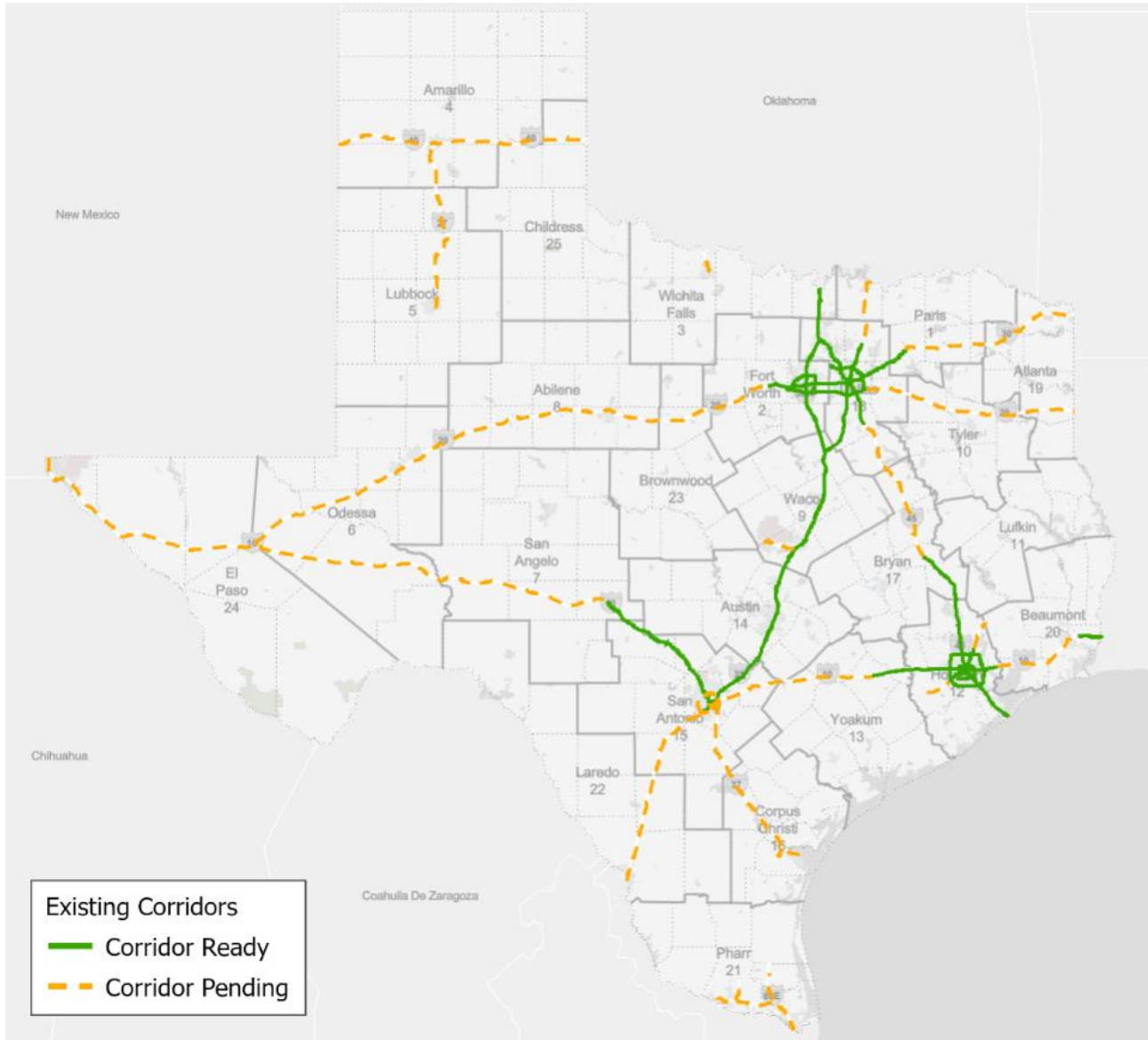
FHWA guidance recommended a minimum of 4 ports rated at 150kW per connector. However, in this plan each location can have up to 8 ports per location depending on traffic volume, urban area size, and special considerations like evacuation routes.

The ongoing equipment, labor, precious metals, and microchip shortages have the potential to lengthen timelines and limit private sector capabilities. TxDOT acknowledges the difficulties brought on by these situations and will do our best to work with vendors and planning partners to complete the network/installation process as soon as possible.

Alternative Fuel Corridor - Corridor Networks

TxDOT expanded the Electric – Alternative Fuel Corridors in 2022 to include almost all non-business interstate routes in Texas. The Texas EV Plan is working to build out the currently designated Corridor Ready and Corridor Pending segments. No additions were requested in 2023.

Electric - Alternative Fuel Corridors in Texas



Existing Locations of Charging Infrastructure Along AFCs –

TxDOT utilized station location information from the US Department of Energy Alternative Fuel Data Center (June 20, 2023). TxDOT will continue to re-evaluate private sector charging stations as the program evolves.

ID	Plugs	EV Network
39727	4	Non-Networked
121817	4	Electrify America
121829	6	Electrify America
121830	4	Electrify America
121834	4	Electrify America
121840	4	Electrify America
121841	10	Electrify America
121842	4	Electrify America
121849	4	Electrify America
121852	8	Electrify America
122241	6	Electrify America
122600	4	Electrify America
122652	4	Electrify America
123054	4	Electrify America
123484	4	Electrify America
123638	4	Electrify America
123687	4	Electrify America
127441	4	Electrify America
127935	4	Electrify America
133327	4	Electrify America
136700	4	Electrify America
145373	4	Electrify America
170246	4	Electrify America
170512	4	Electrify America

ID	Plugs	EV Network
228299	4	eVgo Network
231045	4	EV Connect
231120	6	eVgo Network
240739	4	eVgo Network
255436	4	eVgo Network
256250	8	EV Connect
257077	6	eVgo Network
257132	8	eVgo Network
257133	4	eVgo Network
257753	4	eVgo Network
257825	4	eVgo Network
259402	4	GRAVITI_ENERGY
259404	4	GRAVITI_ENERGY
259434	4	eVgo Network
259974	4	Non-Networked
259975	4	Non-Networked
260072	4	eVgo Network
260676	8	EV Connect
261146	6	eVgo Network
261476	4	RED_E
262628	4	eVgo Network

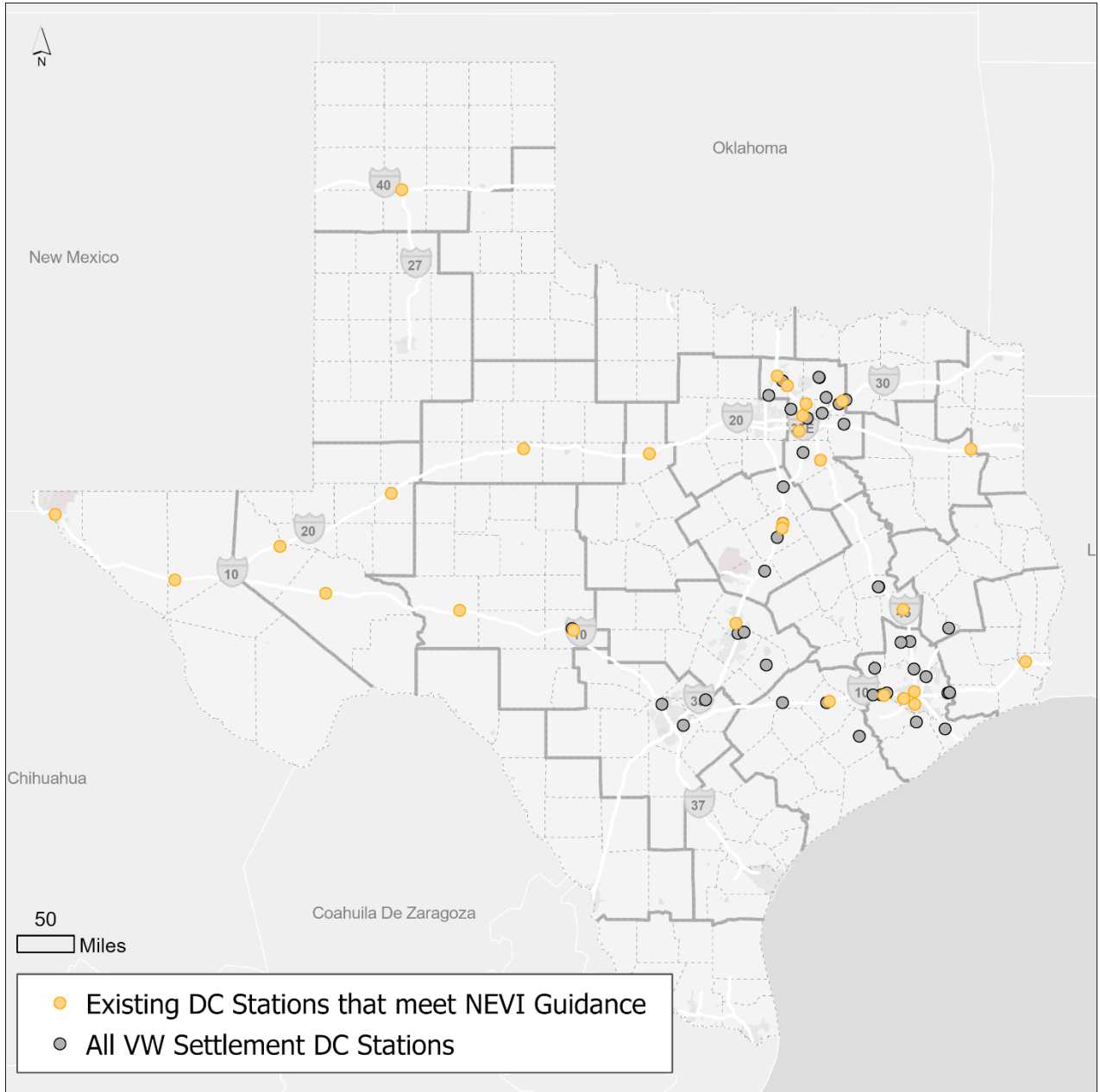
Additional DC Fast Charge stations are under development using the Texas Volkswagen Environmental Mitigation Program funds administered by TCEQ. While not deployed, many will meet FHWA requirements along the Alternative Fuel Corridors. TCEQ data as of June 16, 2023.

Grant ID	Facility Address	Units	KW
2022-24-0008-VW	4080 East Freeway, Baytown, TX 77521	6	150
2022-24-0011-VW	1550 Central Expressway, Melissa, TX 75454	6	150
2022-24-0012-VW	205 I-45, Madisonville, TX 77864	6	150
2022-24-0013-VW	5005 East I-30, Royse City, TX 75189	6	150
2022-24-0014-VW	27700 Katy Freeway, Katy, TX 77494	6	150
2022-24-0016-VW	15901 N Freeway Service Road E, Fort Worth, TX 76177	6	150
2022-24-0017-VW	506 West IH-20, Terrell, TX, 75160	6	150
2022-24-0018-VW	4155 North General Bruce Drive, Temple, TX 76501	6	150
2022-24-0020-VW	40900 US-290, Waller, TX 77484	6	150
2022-24-0021-VW	10484 US-59, Wharton, TX 77488	6	150
2022-24-0022-VW	2760 I-35, New Braunfels, TX 78130	6	150
2022-24-0023-VW	2800 South I-35 East, Denton, TX 76210	6	150
2022-24-0024-VW	1700 Highway 71 East, Bastrop, TX 78602	6	150
2022-24-0002-VW	160 State Highway 77, Hillsboro, TX 76645	4	150
2022-24-0005-VW	496 South Good Latimer Parking, Dallas, TX 75226	4	150
2022-24-0007-VW	6615 North IH-35, Lacy Lakeview, TX, 76705	4	150
2022-24-0019-VW	6170 IH-10 East, San Antonio, TX 78219	4	150
2022-24-0088-VW	3002 East Main Street, Madisonville, TX 77864	4	150
2022-24-0089-VW	1200 League Line, Conroe, TX 77303	4	150
2022-24-0090-VW	1001 FM 1764, La Marque, TX 77568	4	150
2022-24-0091-VW	15900 North Interstate Highway 35, Austin, TX 78728	4	150
2022-24-0092-VW	25200 I-10, San Antonio, TX 78257	4	150
2022-24-0093-VW	306 FM 359, Brookshire, TX 77423	4	150
2022-24-0094-VW	1807 West Grand Parkway North, Katy, TX 77449	4	150
2022-24-0095-VW	17510 Morris Avenue, Manvel, TX 77578	4	150
2022-24-0096-VW	709 La Grange, Flatonia, TX 78941	4	150
2022-24-0097-VW	18040 US Highway 59, Humble, TX 77396	4	150
2022-24-0098-VW	2215 South Highway 71, Columbus, TX 78935	4	150
2022-24-0099-VW	15476 TX-105, Montgomery, TX 77356	4	150
2022-24-0100-VW	2416 North Main, Junction, TX 76849	4	150
2022-24-0101-VW	4700 US-59, Shepard, TX 77371	4	150
2022-24-0102-VW	7100 Garth Road, Baytown, TX 77521	4	150
2022-24-0103-VW	1909 Kelly Lane, Pflugerville, TX 78660	4	150
2022-24-0104-VW	110 East Louetta, Spring, TX 77373	4	150

Additional grants administered by TCEQ under the Alternative Fueling Facilities Program (AFFP) were evaluated under this plan. While not deployed, we will continue monitoring their progress for quantity, power level, and proximity to the Alternative Fuel Corridors. TCEQ data as of June 16, 2023.

Grant ID	Facility Address	Units	Ports
2022-12-0117-AF	2602 NW Loop 410, San Antonio, TX 78230	2	4
2022-12-0121-AF	8690 ERL Thorton Freeway, Dallas, TX 75228	3	5
2022-12-0124-AF	5109 and IH-30, Greenville, TX 75401	3	5
2022-12-0125-AF	10921 Estate Lane at 635 & Plano Road, Dallas, TX 75238	3	5
2022-12-0129-AF	8540 FM 1765, Texas City, TX 77591	3	5
2022-12-0132-AF	2655 IH-10, Orange, TX 77630	3	5
2022-12-0133-AF	1006 West Calton Road, Laredo, TX 78041	3	5
2022-12-0140-AF	815 IH-35 South, New Braunfels, TX 78130	3	5
2022-12-0141-AF	2612 Gillmeister Lane, Temple, TX 76502	3	5
2022-12-0143-AF	720 Spring Valley, Hewlitt, TX 76643	2	NA
2022-12-0146-AF	9350 SE Loop 410, San Antonio, TX 78223	2	NA
2022-12-0150-AF	1062 FM 117, Dilley, TX 78017	3	5
2022-12-0154-AF	5239 Rigsby Avenue, San Antonio, TX 78222	2	NA
2022-12-0159-AF	1614 State Highway 34 South, Terrell, TX 75160	3	5
2022-12-0164-AF	200 North Memorial Freeway, Nederland, TX 77627	3	5
2022-12-0170-AF	6655 Gateway Boulevard West, El Paso, TX 79925	3	5
2022-12-0172-AF	500 South US Highway 281, Alice, TX 78332	3	5
2022-12-0174-AF	10446 IH-37, Corpus Christi, TX 784410	3	5
2022-12-0178-AF	1520 IH-35, Belton, TX 76513	3	5
2022-12-0190-AF	5601 East End Boulevard South, Marshall, TX 75672	2	NA
2022-12-0191-AF	5925 East End Boulevard South, Marshall, TX 75672	2	NA
2022-12-0194-AF	921 North IH-35, Cotulla, TX 78014	2	4
2022-12-0195-AF	1011 Beltway Parkway, Laredo, TX 78045	2	4
2022-12-0196-AF	1815 North Foster Road, San Antonio, TX 78244	2	4
2022-12-0201-AF	7425 Bonnie View Road, Dallas, TX 75241	2	4
2022-12-0202-AF	3000 US 77, Hillsboro, TX 76645	1	NA
2022-12-0203-AF	1876 East Freeway, Baytown, TX 77521	2	4
2022-12-0223-AF	4155 North General Bruce Drive, Temple, TX 76501	48	NA
2022-12-0229-AF	7112 IH-10 West, Orange, TX 77630	2	4
2022-12-0244-AF	12881 FM Road 14A, Tyler, TX 75706	2	4
2022-12-0245-AF	14555 IH-35 South, Vor Ormy, TX 78075	2	4
2022-12-0257-AF	1414 Palacios Street, El Campo, TX 77437	NA	8
2022-12-0275-AF	920 Victoria Highway, Refugio, TX 78377	3	5
2022-12-0278-AF	1801 Highway 181, Portland, TX 78374	3	5
2022-12-0281-AF	100 IH-20, Marshall, TX 75672	3	5
2022-12-0282-AF	160 Lucy Drive, Longview, TX 75602	3	5
2022-12-0286-AF	7220 Broadway Street, Galveston, TX 77554	3	5
2022-12-0287-AF	2020 Regal Drive, Corsicana, TX 75109	3	5

Existing DC Fast Charge stations that meet NEVI requirements and all VW Settlement locations:



Known Risks and Challenges

TxDOT began tracking the development of DC Fast Charge stations in Texas on February 10, 2022. Existing stations that met FHWA guidance were combined with planned stations from the VW Settlement funds administered by the Texas Commission on Environmental Quality. Gaps were identified and candidate locations were proposed that meet FHWA guidance. It is anticipated that TxDOT will be able to meet or exceed requirements for DC Fast Charge station spacing and power ratings in most locations.

Two sections of IH 10 in far west Texas will be dependent on a small number of private sector businesses hosting stations due to the sparsely populated nature of the region. If during site selection these locations are found unviable TxDOT will update the Discretionary section of the plan.

Any additional deficiencies identified along the corridors during site selection will be documented in the Discretionary section of the plan in the annual update. TxDOT will rapidly re-evaluate the network to assess impacts of private sector non-NEVI stations added to highways that meet FHWA guidance and refine candidate locations accordingly. This will allow TxDOT to better fund other areas and increase the overall density of the charging network.

The ongoing equipment, labor, precious metals, and microchip shortages have the potential to lengthen timelines and limit private sector capabilities. TxDOT acknowledges the difficulties brought on by these situations and will do our best to work with vendors and planning partners to complete the network as soon as possible.

TxDOT acknowledges the risk posed to charging infrastructure from natural and man-made disasters and will rely on our experience working with planning partners, fellow state and federal agencies, and the private sector to mitigate issues. As with the adoption of any new technology, acceptance of infrastructure for electric vehicle charging comes with risks of vandalism and general acceptance that could impact serviceability and user experience of EV charging locations. Methods to mitigate these risks and recover from issues will be evaluated in vendor proposals.

EV Charging Infrastructure Deployment –

TxDOT will partner with the private sector to develop the EV Charging Network. Per FHWA guidance the plan will start with the Electric Alternative Fuel Corridors then work with rural/small urban areas and MPOs across the state. Non-Alternative Fuel Corridors will be ranked by VMT and developed in succession. County Seats will be the primary focus in rural areas with DC Fast Charge stations and MPOs will install a combination of DC and Level II stations determined by the MPOs.

1. The DCFC equipment must be accessible to the public 24 hours per day/seven days per week and have dusk to dawn lighting (without requirements to purchase goods or services from businesses hosting the stations).
2. All permits, regulatory authorizations/approvals, utility service connections, and necessary licenses to legally operate in the State of Texas, along with required insurance coverage, must be obtained before opening the site to the public.
3. Each port must have at least one SAE CCS 1 connector and one NACS connector.
4. DCFC equipment must be rated at 150kW per port or greater.
 - a. Sharing acceptable if each port can charge at 150kW or greater simultaneously
5. Minimum of 4 ports per location.
6. DCFC equipment must support the following:
 - a. Open Charge Point Interface (OCPI 2.2.1 within 1 year of final rules).
 - b. Open Charge Port Protocol 1.6J or higher (OCPP 2.0.1 within 1 year of final rules).
 - c. ISO 15118-2,-20,-3 (-2 Plug and Charge within 1 year of final rules).
7. The proposed station must be inside a TxDOT designated EV Study Area along the Electric Alternative Fuel Corridors (AFC). If after grant award a study area is deemed insufficient to support a four port DCFC station at 150kW per port simultaneously, the grant recipient can identify an alternate location (with TxDOT approval) also on the AFC that does not break the 50-mile spacing, and 1 mile from highway exit, federal requirements.
8. Provide multiple payment options for DCFC users including but not limited to:
 - a. Contactless payment method that accepts major credit and debit cards
 - b. Payment through either an automated toll-free phone number or a short message/messaging system (commonly abbreviated as SMS).
 - i. Payment methods must be accessible to persons with disabilities, not require a membership, not affect the power flow to vehicles, and provide access for those that are limited English proficient.
9. Chargers must remain functional if communication with the charging network is temporarily disrupted.
10. Real-time pricing and fee information shall be displayed on the unit, payment screen, or associated phone or vehicle-based application.
11. Enforce idle fees after charging sessions are complete and the grace period has expired.
12. A mechanism to report issues with charging infrastructure
 - a. The reporting mechanisms must provide multilingual services and be compliant with the American with Disabilities Act of 1990.
13. One pull through space for light duty vehicles with trailers when host location will support it.
14. Work with TxDOT Environmental Affairs division on clearance for the study areas.
15. Provide ADA accessible EV chargers consistent with U.S. Access Board Design Recommendations for Accessible EV Charging Stations.

Funding Sources

TxDOT will develop a program where third parties fund the non-federal share of the NEVI Formula Program. Operations and Maintenance funds will be available for the first five years of station operations for select locations (typically rural). Third parties will collect fees from station operation and be responsible for maintenance going forward.

Estimated cost to develop an EV Charging Network in Texas:

Description	Locations	DC Fast*	Level II	Federal	Private Sector	5 YR Operations & Maintenance (Fed)
Alt Fuel Corridors	56	312	0	\$36.96M	\$9.24M	\$11.55M
County Seats	190	1,014	0	\$121.68M	\$30.42M	\$38.02M
Inside MPOs**	TBD	1,274	25,150	\$151.56M	\$37.89M	\$47.36M
Totals		2,596	25,150	\$310.2M	\$77.55M	\$96.93M

* 150kW minimum on Alt Fuel Corridors and County Seats, could vary based on situation, estimated at \$150K per connector.

**MPOs will propose the quantity of DC or Level II locations in their areas up to the target dollar amount, estimate for DC stations inside MPOs is 50K per connector at 50kW max power, Level II is estimated at 5K per connector at 10kW max power.

2022 Infrastructure Deployments/Upgrades

For Electric Alternative Fuel Corridors, TxDOT examined existing charging locations using the Alternative Fuel Data Center and applied round 6 requirements to identify stations that met requirements. TCEQ planned locations were examined and filtered by round 6 requirements as well. Resulting coverage gaps greater than 50 miles were examined for suitable electrical supply and candidate locations were placed near communities or incorporated cities.

After Alternative Fuel Corridors are complete the focus will shift to rural areas and MPOs. County seats will be the location of choice for DC Fast Charge stations in rural areas due to their central location in the region. County seats along the gulf coast will have more ports per location to assist with peak demand during evacuation scenarios. Larger cities and MPOs without interstate access will also have more ports per location.

Estimates for EV Charging inside MPOs – Activities inside MPOs begin after building out Electric Alternative Fuel Corridors (preference will be toward maximizing resources for installation).

ID	MPO Name	Allocation (Fed + Private)	5 YR Operations & Maintenance
1	Abilene MPO	\$765,303	\$191,326
2	Alamo Area MPO	\$18,672,318	\$4,668,079
3	Amarillo MPO	\$1,452,407	\$363,102
4	Bryan-College Station MPO	\$1,200,824	\$300,206
5	CAMPO	\$18,342,083	\$4,585,521
6	Corpus Christi MPO	\$1,775,402	\$443,850
7	Eagle Pass MPO	\$327,061	\$81,765
8	El Paso MPO	\$5,941,734	\$1,485,434
9	Grayson County MPO	\$1,224,867	\$306,217
10	HGAC	\$53,588,122	\$13,397,030
11	Killeen-Temple MPO	\$2,324,076	\$581,019
12	Laredo Webb County Area MPO	\$1,063,244	\$265,811
13	Longview MPO	\$794,230	\$198,557
14	Lubbock MPO	\$1,486,663	\$371,666
15	North Central Texas COG	\$64,497,274	\$16,124,319
16	Permian Basin MPO	\$1,915,692	\$478,923
17	Rio Grande Valley MPO	\$6,325,223	\$1,588,056
18	San Angelo MPO	\$548,860	\$137,215
19	South East Texas RPC	\$2,502,701	\$625,675
20	Texarkana MPO	\$389,114	\$97,279
21	Tyler MPO	\$1,453,176	\$363,294
22	Victoria MPO	\$719,299	\$179,825
23	Waco MPO	\$1,846,634	\$461,658
24	Wichita Falls MPO	\$593,756	\$148,439

Estimates are based on a modified Category 2 formula from TxDOT's Unified Transportation Program. Allocation estimates include 20% of private sector funds. Each attribute percentage is calculated based on the sum (inside MPOs) of each attribute. The attributes are 2020 Population, 2020 Vehicle Miles Traveled, Lane Miles, EV Ownership (to June 20, 2023) and Non-Attainment status. Estimates are subject to change and factors will be updated/recalculated before work on Phase 2 begins.

Formula (each attribute divided by sum (inside MPOs) and converted to percent, then averaged):

$$((\text{MPO POP}/\text{POP}) * 100 + (\text{MPO VMT}/\text{VMT}) * 100 + (\text{MPO LM}/\text{LM}) + (\text{MPO EV}/\text{EV}) * 100) + \text{Non-Attainment Factor} / 5 = \text{MPO \%}$$

Abilene Example:

$$((133449/25617630) * 100 + (2775942/555360389) * 100 + (2547/309446) * 100 + (84/47807) * 100) + 0 / 5 = .00403$$

$$.00403 * \$189.45\text{M} = \$756,303 \quad (\$756,303 * .25 = \$191,326 \text{ for 5 years of O\&M})$$

Energy Usage Estimates

Estimating energy usage is difficult since owners do not charge their cars at the same time and vehicles do not charge at the same rate throughout a battery charging cycle.

Realistically, electric vehicles cannot sustain a high charge rate over the entire session. Batteries with a low state of charge will accept the high rate for a few minutes then start tapering down as battery pack voltage increases. However, it is easy to estimate a theoretical max usage scenario for illustration purposes.

The following table displays estimates for theoretical max power consumption by area and type.

Area	Type	Max Power (KW)	Connectors	Est. Max Power (MW)
Alt Fuel Corridors (50%)	DC Fast	150	154	23.1
Alt Fuel Corridors (35%)	DC Fast	250	107	26.75
Alt Fuel Corridors (15%)	DC Fast	350	47	16.45
Near County Seats (80%)	DC Fast	150	811	121.65
Near County Seats (15%)	DC Fast	250	152	38
Near County Seats (5%)	DC Fast	350	50	17.5
Inside MPOs (50%)	DC Fast	50	637	31.85
Inside MPOs (25%)	DC Fast	150	318	47.7
Inside MPOs (15%)	DC Fast	250	191	47.75
Inside MPOs (10%)	DC Fast	350	127	44.45
Inside MPOs	Level II	10	25,150	251.5
Totals			27,744	666.7

In summary, if all DC and Level II charging stations in this plan were utilized at the same time at their max rate, they would consume 667.3 MW of electricity from the grid. The [Electric Reliability Council of Texas](#) hosts an assortment of dashboards displaying near real time grid conditions. On May 3rd Operating Reserves ranged from 3,751 MW to 6,066 MW. The potential impact on the overall statewide grid appears minimal for the type and quantity of EV Chargers outlined in this plan.

Upgrades of Corridor Pending Designations to Corridor Ready Designations

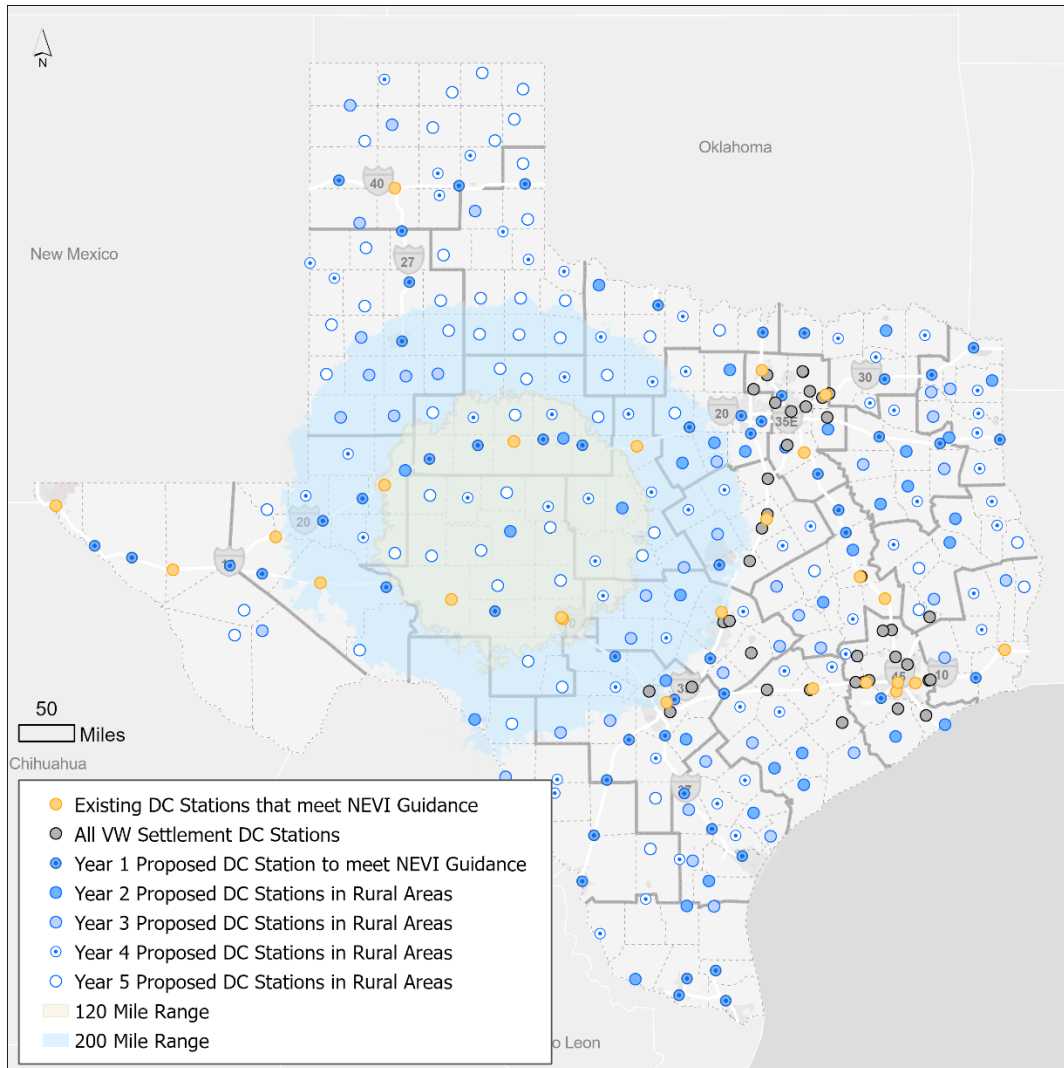
TxDOT elected to nominate missing non-business Interstate routes to the Electric Alternative Fuel Corridors as pending segments during the round 6 call for nominations. This was done in anticipation of cities, counties, and other municipal entities pursuing grant funds as part of the \$2.5B program. Expanding the corridors to all Interstate routes also connected as many MPOs as possible across the state. It should be noted that San Angelo, Bryan-College Station, and Victoria MPOs are not on Interstate routes. TxDOT was careful not to nominate too many segments to the Electric Vehicle Corridors due to the FHWA requirement to finish the corridors before spending funds on other roadways.

Increases of Capacity/Redundancy along Existing AFC

TxDOT applied FHWA guidance for station spacing, power ratings and number of ports to the Alternative Fuel Corridors. We evaluated the estimated range of an 80% charge from a 30-minute charge session for low and mid-range electric vehicles.

On the low end, a 150-mile range electric vehicle would have an estimated 120-mile range after completing an 80% charge. A 250-mile mid-range electric vehicle would have an estimated 200-mile range after completing an 80% charge. The resulting range from a recommended 80% charge would provide EV drivers ample options to traverse the state when the network is fully built out.

The following map depicts an estimated range of 120 miles and 200 miles resulting from an 80% charge at a proposed DC Fast Charge station in San Angelo. It is clear from the estimated range map that users of the network would have numerous options for traveling across the state.



Minutes to Charge for 100 Miles of Range:

	Tesla Model 3	Nissan LEAF	Ford Mustang Mach-E	Ford F-150	Volvo XC40 Recharge	Rivian R1T
Level I	1,080	1,400	1,560	1,560	1,720	2,040
Level II	135	175	195	195	215	255
DC 50kW	35	42	47	47	52	61
DC 150kW	11	14	16	16	17	20
DC 350kW*	5	6	7	7	7	9

Source: Grid Integration of EV Charging Infrastructure: A Workshop to Share Knowledge between the Grid Industry and States (NASEO GridWise Alliance) 3/14/2022 (Ford F-150 added by TxDOT and charges at the same max rate as Mach-E).

*It should be noted that none of the vehicles in this list will support a charge rate of 350kW. At present one electric vehicle on the market can briefly reach a charge rate of 350kW before tapering down.

Electric Vehicle Freight Considerations

TxDOT reviewed guidance from FHWA on May 18, 2023, regarding the establishment of Electric Freight Corridors and did not request modifications to the proposed network. As part of the Phase 2 rollout for EV charging, TxDOT will ask large MPOs (NCTCOG, HGAC, CAMPO, and Alamo Area) to identify 1-3 areas in their regions suitable for medium and heavy-duty freight EV charging.

Additionally, TxDOT will coordinate with border MPOs on the feasibility of deploying a medium and heavy-duty freight EV charging station along the southern border.

It is envisioned that each charging station will have at least 4 ports rated at 150kW per port or greater with full pull through capability to support heavy-duty trucks. All NEVI rules would apply to the stations.

Public Transportation Considerations

Transit agencies in the metropolitan areas of Texas have already deployed electric buses through grants received through the FTA Low or No Emission Vehicle Program and plan to increase the number of electric buses in the future. Dallas Area Rapid Transit currently has seven transit buses and will purchase up to 10 more electric buses before the end of FY 2024. Trinity Metro, which serves Tarrant County in North Texas, has six transit buses and plans to add eight more electric buses in the future. STAR Transit, a smaller transit provider in the Dallas-Fort Worth area, will deploy eight electric transit vehicles in 2023-2024 with funds received through the Rebuilding American Infrastructure with Sustainability and Equity Grant program.

FY24-27 Infrastructure Deployments

TxDOT will concentrate on the Alternative Fuel Corridors first then move to County Seats and MPOs. The following table outlines approximate years for each region and charging type. This is an early estimate and subject to change going forward. Additional FY would be added until funds are expended.

Year	Description	Location	DC Fast Connectors	Level II Connectors
FY 2024	Alt Fuel Corridors	56	312	0
FY 2025	MPO	TBD	424	8,383
FY 2025	County Seats	63	338	0
FY 2026	MPO	TBD	424	8,383
FY 2026	County Seats	63	338	0
FY 2027	MPO	TBD	424	8,383
FY 2027	County Seats	63	338	0

State, Regional, and Local Policy

The EV Plan will rely on third party entities to coordinate with local property owners and municipalities on zoning and permitting. Discussions with equipment providers during the development of the EV Plan demonstrated third party providers were well equipped to handle these tasks as part of their normal business practices. TxDOT will monitor developments at the state and local level during the implementation of this plan and provide updates to state and local officials when requested.

Implementation –

Strategies for EVSE Operations & Maintenance

Grant awardees will follow agreed-upon requirements for operation and maintenance. Monitoring and service level agreements for station performance will be specified in the contract and TxDOT will monitor station up time through vendor reported usage data and general user satisfaction on publicly accessible third-party charging web sites. Operation and maintenance costs were estimated at 25% of installation cost and will be evaluated per location over time. Enforcement of idle fees will be the responsibility of the station operator.

Strategies for Identifying Electric Vehicle Charger Service Providers and Station Owners

TxDOT will use the EV Landing page, EV contact list, and TxDOT grant opportunities page to advertise, select, and award grants to electric vehicle charging equipment service providers/property owners. As part of the discovery process for EV plan development, it became clear charging equipment companies and private sector entities have the expertise and ability to locate suitable locations for charging stations within TxDOT’s recommended EV study areas. TxDOT will monitor progress with regular meetings between the vendor and project team as spelled out in the contract.

Phase 1 - Electric Utility Contacts

Utility	Name	Phone	Email
AEP Texas	Javier P Juarez	361-881-5401	jjvarez@aep.com
Oncor	Jennifer Deaton	817-739-4373	Jennifer.williamsdeaton@oncor.com
CenterPoint Energy	Zachary Henson	281-561-3249	zachary.henson@centerpointenergy.com
Bowie-Cass Electric Coop	Tod Corbin	903-846-2311	todc@bcec.com
City of San Marcos	Raymond Nutall	512-393-8326	rnutall@sanmarcostx.gov
Entergy Texas, Inc.	Chris Hutcherson	409-785-2317	chutche@entergy.com
Lubbock Power & Light	Mike Keen	806-775-2347	CustomerFirst@CityofLubbockUtilities.com
Central Texas Electric Coop	Mitch Elmore P.E.	830-992-2250	mitch.elmore@ctec.coop
Pedernales Electric Coop	Rachel Williams	888-554-4732 ext 6609	Rachel.Williams@peci.com
Rio Grande Electric Coop	Ruben E. Quiroga	800.749.1509 x7011	rquiroga@rgec.coop
Southwest Texas Electric Coop	Chuck Jones	325-853-2544	cjones@swtec.com
Southwestern Electric Power Company	Jeff Thigpen	318-673-3372	jthigpen@aep.com
United Cooperative Services	Seth Rosser	817-556-4063	seth@ucs.net
Wood County Electric Coop	Tommy Brown	903-763-6555	tommyb@wcec.org

Strategies for EVSE Data Collection & Sharing

Contracts with awardees will include requirements to provide anonymized quarterly usage for analysis. Data and trends from charging station usage will be published on the [Statewide Planning Map](#), and ArcGIS Online dashboards like the [EV Dashboard](#) published during EV Plan creation. Data will be reported to FHWA and be available on TxDOT's Open Data Portal for visualization or analysis by the public, researchers, or other interested parties.

Strategies to Address Resilience, Emergency Evacuation, Snow Removal/Seasonal Needs

As stated earlier, charging stations need to be reliable for continued travel, and ready to help the public evacuate from extreme conditions. We will include considerations to address extreme weather, infrastructure degradations, and cyber and physical security. We will explore and establish readiness capabilities to mitigate these risks. It starts with placing charging stations in suitable locations near interchanges and crossroads that are easily accessible, near commercial or public sites, and with adequate physical and cyber security, communications systems, and power aligned to priority grid capabilities. Beyond that, there are several developing capabilities which we will assess and implement when proven capable and needed.

There is a fledgling industry for mobile EV charging for these types of events. AAA currently offers this service to EV drivers in states such as Oregon and Colorado, where it has installed a large battery with Level II or DC Fast Charge capability on a truck. Similarly, Tesla installed super chargers on semi-truck trailers to provide surge capacity at high volume stations, a strategy that state DOTs could adopt in the future to assist motorists during emergency evacuation events.

There are also companies such as Ample that are pioneering modular, building-block-style EV battery technology that allows batteries to be changed in minutes and can accommodate any make, design, model, or driving profile. With a small footprint equivalent to two parking spots, they can be located at gas stations, grocery stores, or the side of the road on an evacuation route.

Strategies to Promote Strong Labor, Safety, Training, and Installation Standards

TxDOT expects vendors selected under this program to emphasize safety in all aspects of station development, installation, and maintenance. Various programs are available to ensure local contractors are knowledgeable and trained on the subject and the selected vendor is expected to take advantage of those resources. TxDOT will add training and certification criteria to the scoring matrix for vendor evaluation in the solicitation process.

Certification programs for EV Charging equipment

<https://evitp.org/>

Or other registered Electrical Apprenticeship program that includes EVSE-specific training.

Civil Rights –

All proposed planned guidelines and recommendations for the deployment of Electric Vehicle (EV) charging stations will be created pursuant to all federal, state, and local laws, regulations, and statutes to ensure compliance with the Americans with Disabilities Act (ADA) and Title VI of the Civil Rights Act of 1964 (Title VI). The ADA prohibits discrimination against persons with qualified disabilities regarding the usability and/or participation of all programs, services, activities, or benefits offered by TxDOT. TxDOT ensures that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity.

To support the assurances provided by the Executive Director of the agency, the following steps should be integral to the deployment and plan:

To comply with the ADA -

1. TxDOT will develop EV charging stations in accordance with ADA standards related to accessible parking spaces, including but not limited to Public Right-of Way Accessibility Guidelines (PROWAG) and Texas Department of Licensing and Registration (TDLR) guidelines.
2. TxDOT will follow the procedures based on the swim lane outlined in the ADA Transition Plan.
3. Procedures require signature authorization outlined in the ADA Transition Plan.
4. Recommend that TxDOT's Design Division (DES) leads the ADA compliance effort as it has with the design of curb ramps, sidewalks, and other accessibility requirements.
5. Public outreach events must be held in accordance with Section 504 of the Rehabilitation Act of 1973 (as amended) to generate public feedback from the disability community.
6. Recommend that the EV charging stations be included in the State Transportation Planning Map and included in the ADA "living" Transition Plan (Web App Viewer Tool).

To comply with Title VI -

1. Develop and complete an environmental checklist to meet program requirements.
2. TxDOT provides training to districts/division personnel regarding EV charging stations.
3. Educate the public regarding the availability of EV charging stations.
4. Conduct necessary public outreach events providing translation and interpretation services as needed to generate public feedback.

Equity Considerations –

Identification and Outreach to (DACs) in the State

TxDOT and the state are committed to addressing not only initial EV range anxiety, but to enabling EV growth across the state regardless of location, demographics or economic levels. Not surprisingly, initial EV growth in the state is largely in urban areas and related to areas with greater wealth, directly correlating with the high prices of initial EVs and the early needs to charge them at home or access limited charging sites. As the vehicle industry grows, and the models and prices decrease, we expect more overall affordability and access to passenger and light truck vehicles, either through direct ownership or shared vehicle services. As cities and metro regions commit local resources and are awarded grants, they will also be able to support transit fleets and local delivery freight.

Texas is aware some of its communities do not have sufficient resources or experience with EV and need both to improve their opportunities and access to their benefits. With the NEVI funding, we are equitably planning for EV charging capabilities between our rural and urban areas. Texas has extensive rural regions not only in the western half of the state, but also along the Texas-Mexico border, and areas along our borders with Oklahoma, Arkansas and Louisiana. In the rural areas, we understand the initial densities of EVs may be lower but must ensure that the infrastructure reliably enables the long-range travel common in those areas as well as provide assurance that initial charging infrastructure is sufficiently nearby to supplement charging for local needs. To address this, approximately half of the NEVI formula funding for Texas is for proposed locations in rural areas. In addition to the charging stations along our alternate fuel corridors, which are through many of our rural areas, we have proposed charging stations near every county seat in the state. Those locations are at the crossroads of every county and are strong opportunities to support those areas with initial capabilities. This also ensures an expected common level of capability in every county. After the Electric Alternative Fuel Corridors are complete, TxDOT will host public outreach for counties and the communities they represent to validate the county seat approach. We are following a similar approach in the urban areas. We will start by using formulas to plan allocations according to similar approaches used in our infrastructure planning and accepted by our MPOs. This will allocate approximately half of the NEVI formula funding for Texas. We are engaging the MPOs to collaborate with all their communities and develop local needs, that recognize already existing infrastructure and focus on where needs aren't addressed in underserved areas. In both our rural and urban areas, we will develop those plans with local leaders informed by their communities. Outreach to communities will occur through TxDOT Social Media channels and invitations to community leaders to attend statewide planning and coordination meetings with local governments during site selection and rollout. As we contract for capabilities, we will require the selected vendor to review, evaluate, and site locations within the TxDOT EV Study Area using federal requirements and guidelines made available by the Joint DOT/DOE office.

Process to Identify, Quantify, and Measure Benefits to DACs

TxDOT is experienced with measuring performance and reporting according to FHWA requirements. We recognize the value of performance-based planning and decision-making. As stated above, TxDOT and the state are committed to addressing not only initial EV range anxiety, but to enabling EV growth across the state regardless of location or economic levels. We anticipate the Joint DOE/DOT office or FHWA will establish national standards for measuring the benefits to the public such as air quality or job creation. In the meantime, there are examples from industry, other states, and current practices that we'll adapt to begin to internally track, measure and assess our performance through the lifecycle of managing the EV program. TxDOT will use resources made available on DriveElectric.gov to identify disadvantaged areas across the state. This information will be made available to planning partners and vendors to assist in site planning and analysis.

Benefits to DACs through this Plan

TxDOT acknowledges there may be initial difficulties measuring direct or indirect benefits in this plan. As mentioned earlier, we anticipate the Joint DOE/DOT office or FHWA will establish national standards for measuring the benefits. For example, installing charging stations in disadvantaged communities in both rural and urban areas does little for households with low vehicle ownership rates. However, the presence of charging stations could increase access to locally owned businesses while travelers charge their vehicles, providing additional income to local economies that can translate to overall growth in prosperity and wealth. Further indirect benefits shared by the greater community would be improved air quality due to zero mobile emission rates of electric vehicles. Finally, as electric vehicles become more available to all, access to charging stations will present decreased cost of ownership and operation.

Using resources available from DriveElectric.gov, TxDOT compared disadvantaged census tracts with proposed EV Study Areas on Alternative Fuel Corridors and County Seats. At the time of this draft 161 of 245 (65.7%) EV Study Areas are in census tracts identified as disadvantaged. \$135M of \$198M (68.1%) of the estimated funds for Alternative Fuel Corridors and County Seats are in census tracts identified as disadvantaged.

Labor and Workforce Considerations –

In compliance with [23 CFR 680.106\(j\)](#) to ensure that the installation and maintenance of chargers is performed safely by a qualified and increasingly diverse workforce of licensed technicians and other laborers, all electricians installing, operating, or maintaining Electric Vehicle Supply Equipment must receive certification from the Electric Vehicle Infrastructure Training Program (EVITP) or a registered apprenticeship program for electricians that includes charger-specific training developed as part of a national guideline standard approved by the Department of Labor in consultation with the Department of Transportation, if and when such programs are approved.

Texas is quickly becoming a hub of innovation and activity for the EV workforce. On December 1, 2021, Tesla relocated its corporate headquarters to its “Gigafactory Texas” just outside of Austin. As the largest EV vehicle manufacturer in the world and one of the largest owners of charging infrastructure, Tesla’s presence in Central Texas has already begun to attract related sectors and corollary activities such as charging infrastructure.

But even prior to Tesla’s arrival, Texas had already begun to ramp up its EV workforce. The Texas Advanced Energy Business Alliance (TAEBA) reported that Texas had 48,800 jobs in advanced electricity generation (i.e., solar, bioenergy, natural gas, wind, and nuclear power), 13,200 jobs in advanced grid and energy storage (i.e., battery storage, microgrid, and other grid technologies), 17,300 jobs in advanced vehicles (i.e., hybrid, electric, natural gas, and fuel cell vehicles).¹ More specifically, TAEBA reports that the electric transportation sector specifically employed more than 7,000 workers in more than 1,200 companies across the state in 2019. The number of workers is expected to grow to over 13,000 workers by 2024, and there are more than 5,000 Texas companies and more than 400,000 Texans in industries that could directly benefit from growth in the electric transportation sector.² Throughout the NEVI Formula Program, TxDOT expects the capacity of Texas’ EV-related workforce to expand greatly and supply TxDOT with increasingly more and better providers to contract work with.

¹ TAEBA, Advanced Energy Jobs in Texas 2020, at <https://www.texasadvancedenergy.org/hubfs/TX-Fact-Sheet-2020-TAEBA.pdf>.

² TAEBA, Electric Transportation Supply Chain in Texas, at <https://info.aee.net/hubfs/TAEBA/TAEBA-TX-Supply%20Chain-Study-2020.pdf>.

Cybersecurity –

TxDOT is committed to ensuring that critical infrastructure transportation technologies of the future, including Electric Vehicle Charging Networks, do not pose a cybersecurity or personal privacy risk to Texas or the United States. Third parties contracted will own, operate, and maintain the EV charging stations as well as the data produced. They will be required to provide TxDOT anonymized data on a recurring basis. Third Parties will also be required to publish station location, power ratings, and costs to the various sites tracking EV charging stations, including the US Department of Energy Alternative Fuel Data Center.

As part of the contract, prior to issuance of the award or other funding, the third party will be required to provide a cybersecurity plan that demonstrates the cybersecurity maturity of the recipient and its compliance with applicable Texas, regulatory, and Federal cybersecurity requirements. The plan must also demonstrate how the recipient will maintain and improve cybersecurity throughout the life of the proposed solution. This will include requirements to maintain compliance with current and future cybersecurity requirements as well as alerting TxDOT and the Cybersecurity and Infrastructure Security Agency (CISA) of any known or suspected network or system compromises. At the end of the project the third party must provide evidence that the cybersecurity plan was properly implemented.

Program Evaluation –

Using tools developed to draft the EV plan, TxDOT will re-evaluate the network on an annual basis. This includes monitoring private sector development, examining usage data returned from installed equipment, and working with our planning partners to develop new locations and make necessary adjustments to existing locations.

Charging statistics and summaries will be included in the annual roadway inventory report found on TxDOT's website. Charging locations will be found in the departments [Statewide Planning Map](#), and the [EV Dashboard](#) will continue tracking charging stations with weekly data updates from the Alternative Fuel Data Center.

Discretionary Exceptions –

TxDOT will document exceptions for DC Fast Charge stations that cannot meet FHWA requirements. At the time of this draft, TxDOT does not anticipate any issues meeting FHWA requirements for DC Fast Charge stations on the Electric Alternative Fuel Corridors. Any potential issues with placement, utilities, communications, or security for stations in rural areas of Texas will be communicated and coordinated with FHWA as the program develops.

Phase 1 - EV Study Areas –

Study Area Latitude/Longitude coordinates are provided for reference and do not indicate a preferred location for EV charging. EV charging sites proposed by applicants can be up to 1 mile from the Latitude/Longitude coordinates. Click on the study area to view the map.

ID	EV Study Area	LATITUDE	LONGITUDE
1	Sugar Land	29.599259	-95.621616
2	Arlington	32.673822	-97.198451
3	Carrollton	32.953967	-96.911068
4	Fort Worth	32.735865	-97.436854
5	Selma	29.584500	-98.305398
6	San Marcos	29.875433	-97.931254
7	Buda	30.045982	-97.840347
8	McAllen	26.192108	-98.244858
9	Burleson	32.562974	-97.318876
10	San Benito	26.127911	-97.638202
11	Killeen	31.092090	-97.722385
12	Sherman	33.634403	-96.616112
13	Wichita Falls	33.934934	-98.517834
14	Lubbock	33.546684	-101.844987
15	Winnie	29.828987	-94.389200
16	Laredo	27.511444	-99.503084
17	Gainesville	33.642243	-97.155628
18	Corpus Christi	27.801082	-97.424512
19	Waxahachie	32.385844	-96.867809
20	Corsicana	32.098885	-96.440897
21	Odessa	31.827271	-102.359371
22	Sulphur Springs	33.134957	-95.574128
23	Rolling Meadows	32.433202	-94.853786
24	Van	32.506818	-95.644292
25	Mt Pleasant	33.181377	-94.962017
26	Buffalo	31.458584	-96.082473
27	New Boston	33.475127	-94.417473
28	Fairfield	31.714529	-96.176281

ID	EV Study Area	LATITUDE	LONGITUDE
29	Waskom	32.476105	-94.076490
30	Sandy Oaks	29.175879	-98.427168
31	Luling	29.651199	-97.659593
32	Big Spring	32.263084	-101.489077
33	Merkel	32.477497	-100.010847
34	IH20 and US281	32.610687	-98.109994
35	Clyde	32.413882	-99.501839
36	Edinburg	26.385425	-98.142289
37	Devine	29.129580	-98.896203
38	Dilley	28.671343	-99.183903
39	Three Rivers	28.517790	-98.177438
40	Mathis	28.112364	-97.817508
41	Fort Hancock	31.304606	-105.840043
42	Colorado City	32.412310	-100.859979
43	Encinal	28.039310	-99.350893
44	Monahans	31.574931	-102.891564
45	Plainview	34.183943	-101.749937
46	Sierra Blanca	31.173414	-105.355442
47	Shamrock	35.231164	-100.246426
48	Fort Davis RA	31.083259	-104.082205
49	Raymondville	26.479103	-97.769098
50	Adrian	35.269678	-102.664981
51	Kerrville	30.070708	-99.110864
52	Groom	35.212113	-101.105004
53	Sonora	30.576717	-100.637407
54	Happy	34.74033	-101.847651
55	Iraan	30.858683	-102.075882
56	Balmorhea	30.993669	-103.661938

Glossary of Terms

AC – Alternating Current

AFC – Alternative Fuel Corridor

CCS – Combined Charging System or plug type for DC Fast Charging

Connector – Plug that connects the electric vehicle to the charging equipment

Corridor Pending – Corridor does not satisfy FHWA requirements

Corridor Ready – Corridor meets FHWA requirements

DC – Direct Current

DC Fast Charging – High power charging 400-800 volt, 150-600 amps, 3 phase

DOE – Department of Energy

DOT – US Department of Transportation

EV – Electric Vehicle

EVSE – Electric Vehicle Service Equipment

FHWA – Federal Highway Administration

Justice40 – Federal program outlining 40% of federal climate investments go directly to frontline communities most affected by poverty and pollution

kW – Kilowatt (1,000 watts)

kWH – Kilowatt Hour (1,000 watts for 1 hour)

Level I – Low power charging 120-volt, 10-20 amps, single phase

Level II – Medium power charging 240-volt, 15-50 amps, single phase

Location – Physical location where electric vehicles charge

MPO – *Metropolitan Planning Organization*

mW – Megawatt (1,000 kilowatts)

mWH – Megawatt Hour (1,000 kilowatts for 1 hour)

NACS – North American Charging Standard, DC Fast Charging connector or plug

NEVI – National Electric Vehicle Infrastructure

Port – Charging hardware, usually a pedestal design with connectors for charging electric vehicles

PIP – Public Involvement Plan

SECO – State Energy Conservation Office

TCEQ – Texas Commission on Environmental Quality

TxDOT – Texas Department of Transportation

3 Phase – Electrical supply from 3 power lines