



Resilient EV Charging and Minimizing Grid Impact

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Regional Freight Advisory Committee
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WHO WE ARE

Regional Planning Agency



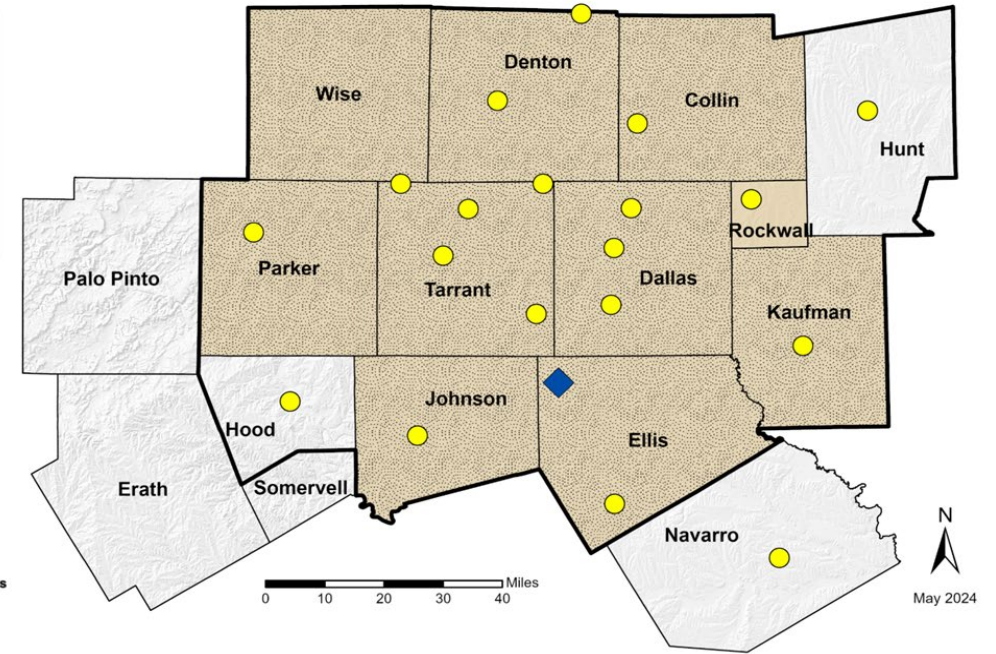
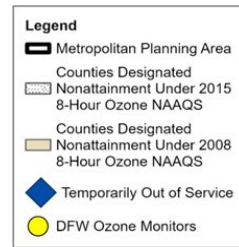
Metropolitan Planning
Organization (MPO)



Department of Energy-
Designated Clean Cities
Coalition



Sister Coalitions in Texas:
Alamo Area Clean Cities (San Antonio)
Houston-Galveston Clean Cities
Central Texas Clean Cities (Austin)



Resilient EV Charging and Minimizing Grid Impact

Need for Resilient EV Charging

Increasing EV adoption by local governments

More EVs assigned to critical operations

Emergency services, refuse collection,
public works, dump trucks, freight transport

Texas grid - Increasing power demand

Transportation electrification

Weather events

Population and economic growth



Source: City of Plano

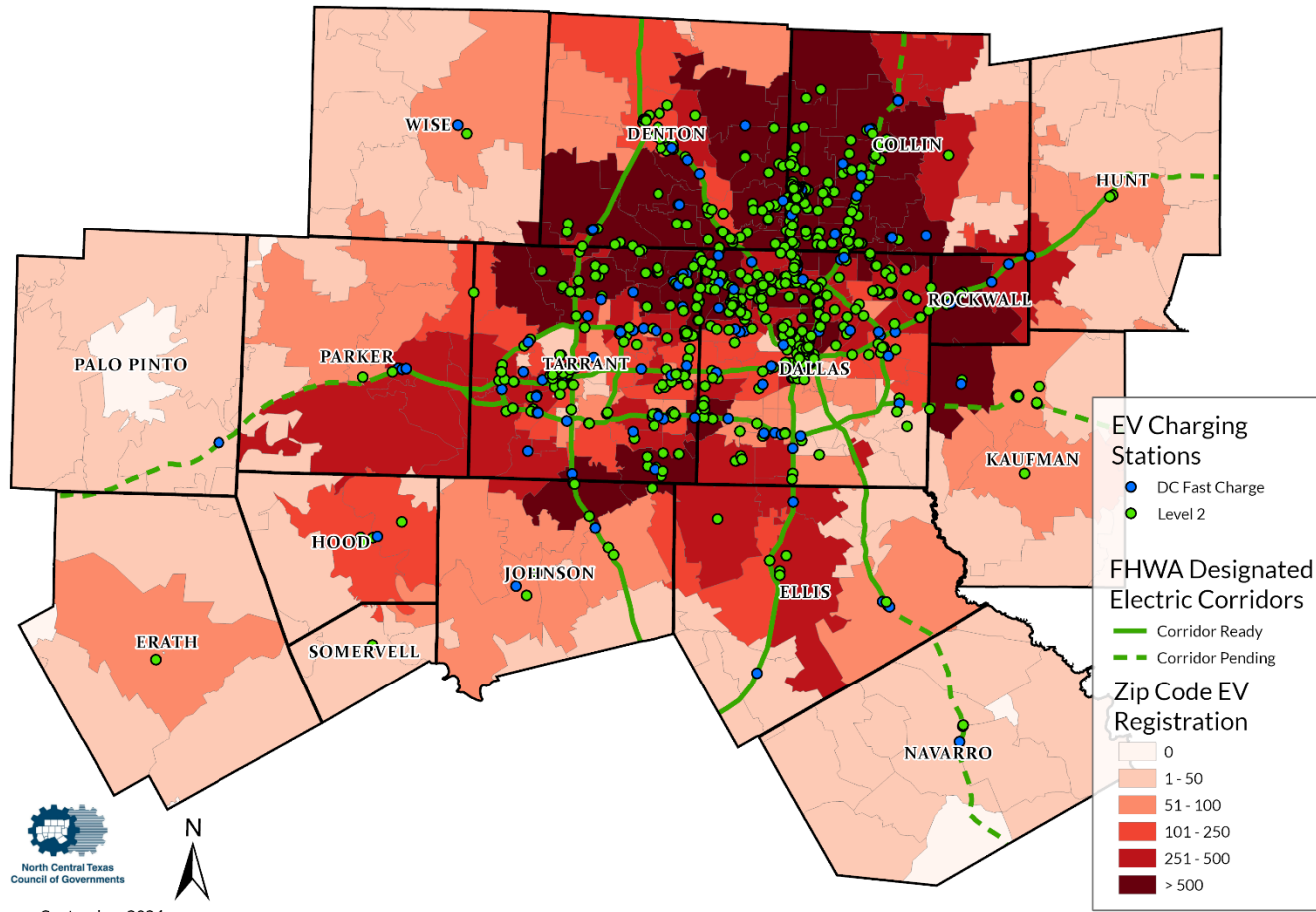
[Planning for Resilient EV Charging Infrastructure whitepaper](#)

Developed by NCTCOG under contract to Texas State Energy Conservation Office

www.conservenorthtexas.org -> Case Studies

Texas EV Data and Trends

Electric Vehicles and Charging Stations in North Texas



North Central Texas Council of Governments
September 2024

Electric Vehicle (EV) Registration Data

www.dfwcleancities.org/evnt -> EVs and Texas

Region	October 2023	October 2024	Increase
Texas	226,740	309,807	37%
Dallas-Fort Worth (DFW)	84,242	113,176	34%
Austin	44,552	61,696	38%
San Antonio	21,733	27,464	26%
Houston	55,135	77,749	41%

Charging Sites Statewide (includes Tesla):

- 3,007 Level 2
- 554 DC Fast

<https://afdc.energy.gov/stations>

Texas Grid Outages

More outages in last 5 years than any other state

Each outage in the last 5 years for all causes lasted an average of 160.4 minutes

Weather-related outages are expected to increase

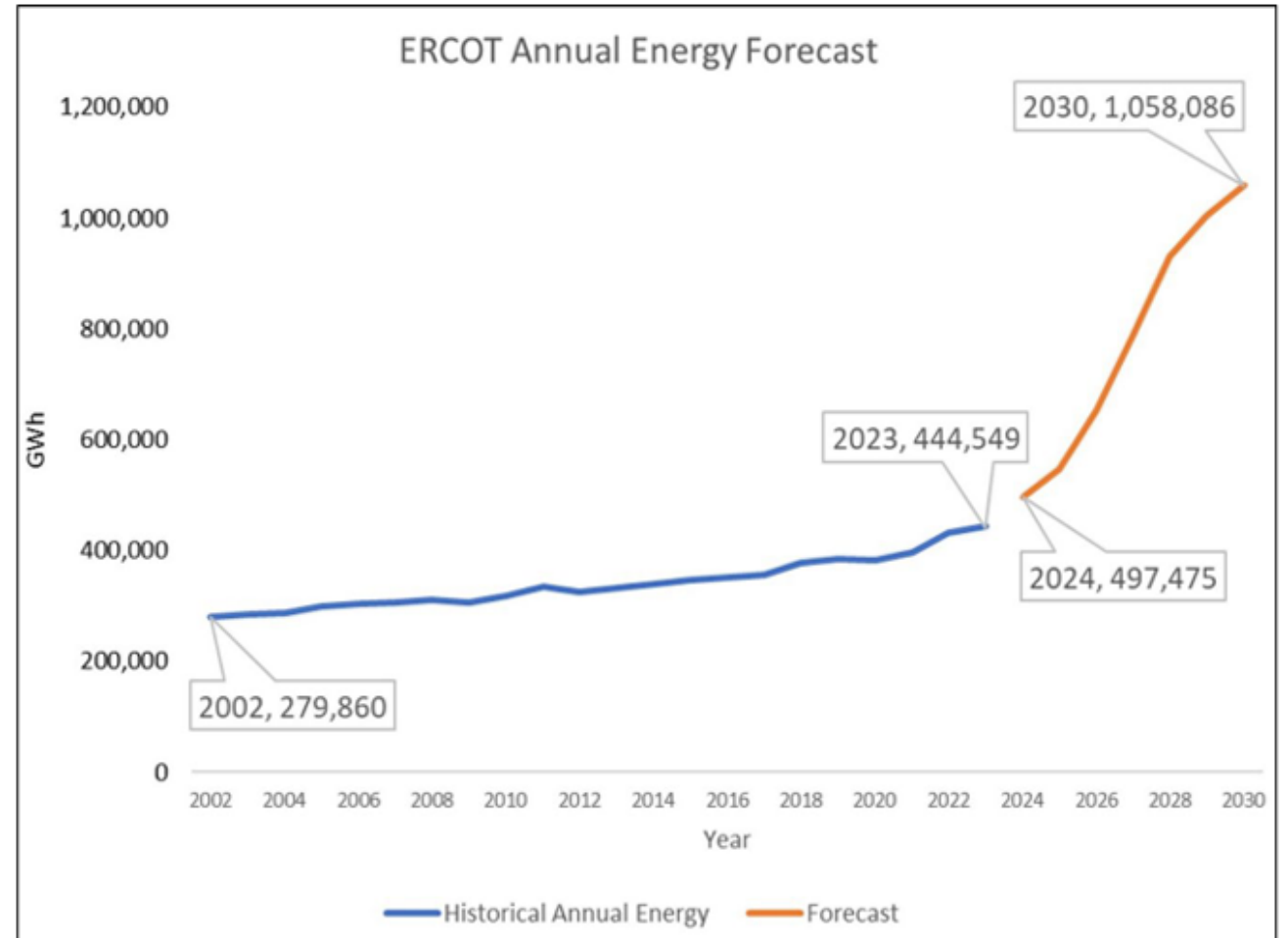
Cause of Outage	Outages Last 5 Years (2019-2023)	Outages Last 20 Years (2003-2023)	Percent of Outages in Last 20 Years Occurring in Last 5 Years
All Causes	263	435	60%
Severe Weather	111	193	58%

Source: [Payless Power](#)

ERCOT Annual Energy Forecast

Average annual growth rate

- 17.1% from (2024-2027)
- 3.1% (2014-2022)



Source: www.ercot.com/gridinfo/load/forecast -> Long-Term Hourly Peak Demand and Energy Forecast

ERCOT Demand Forecast

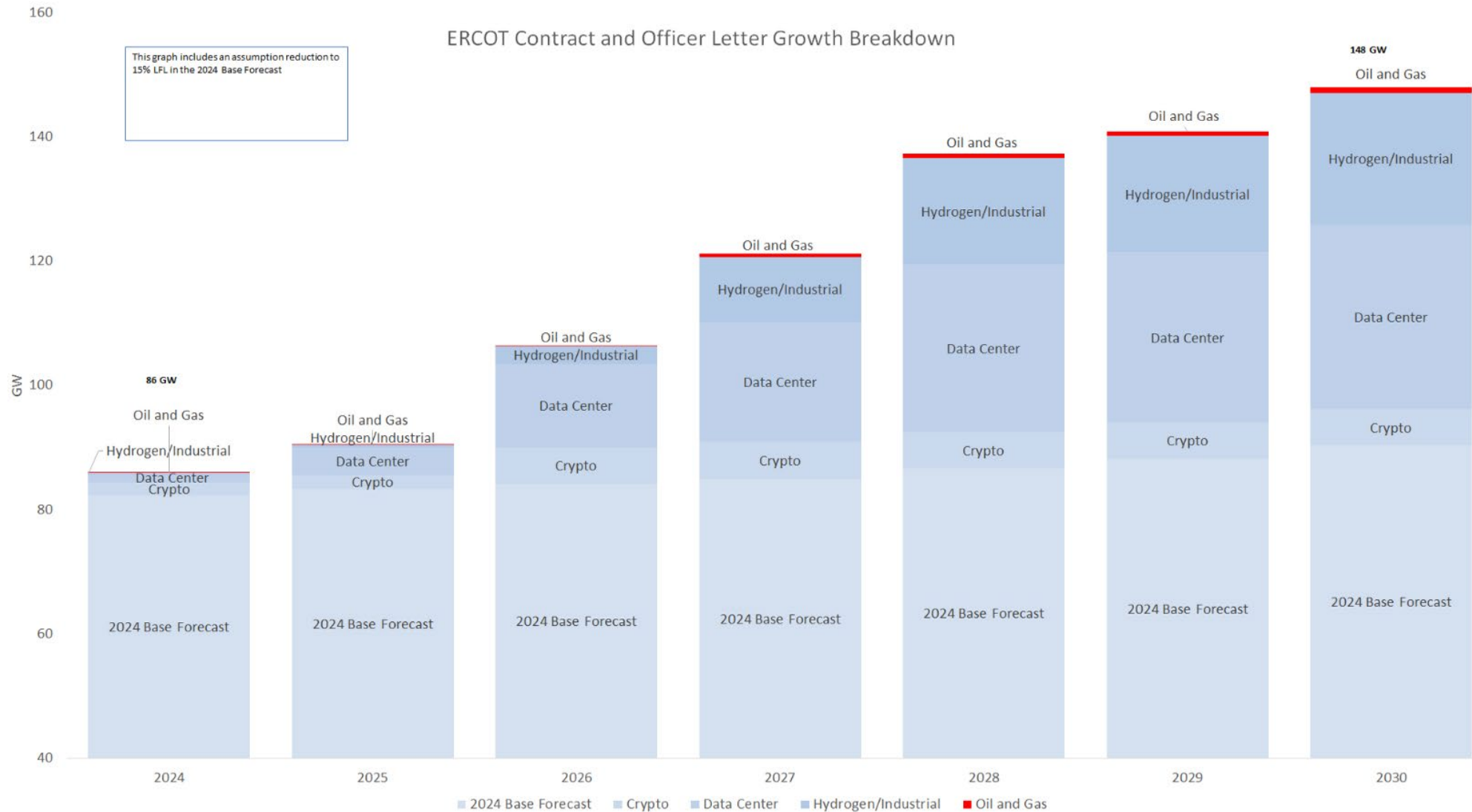
Largest contributors to demand increase (Large Load)

- Cryptocurrency mining
- Data centers – artificial intelligence (AI) usage contributing factor
- Hydrogen production
- Large industrial

EV Registration 2029 Forecast

- 998,000 light-duty and 103,000 medium- and heavy-duty vehicles will be EVs
 - 96% of light-duty EVs and 93% of medium- and heavy-duty EVs in ERCOT territory
- **EV charging will only add 1.25% to ERCOT's load forecast**
 - up from 0.2% in 2023

ERCOT Large Load Growth



Minimizing Grid Impact of EV Charging

Comply with conservation requests (13 issued in 2023)

Texas Advisory and Notification System (TXANS) – ERCOT early notification of higher demand

- ERCOT Weather Watch
 - Weather conditions and expected demand may lead to lower reserves
- Voluntary Conservation Notice
 - Voluntarily conserve power during specific periods if safe to do so
- Conservation Appeal – potential for ERCOT to enter emergency operations
 - Voluntarily conserve power during specific periods if safe to do so

Avoid EV charging when grid is most constrained

- Based on ERCOT Monthly Outlook on Resource Adequacy reports for March–October, **7 PM– 9 PM had highest risk for conservation requests**
- Smart Charging Management – can optimize charging based on grid constraints, electricity prices, vehicle’s charging capacity, etc.

Technology Options for Off-Grid Charging

Technology	Lessens Grid Impact	Enables Off-Grid Charging	Case Study
Smart Charging Technology	X		X
Energy Storage System (Battery, Hydrogen)	X	X	X
Solar	X	X	X
Wind	X	X	
Generators (propane, diesel, natural gas)		X	
Mobile Charging		X	
Vehicle to Vehicle (V2V) Charging	X	X	
Microgrids	X	X	X

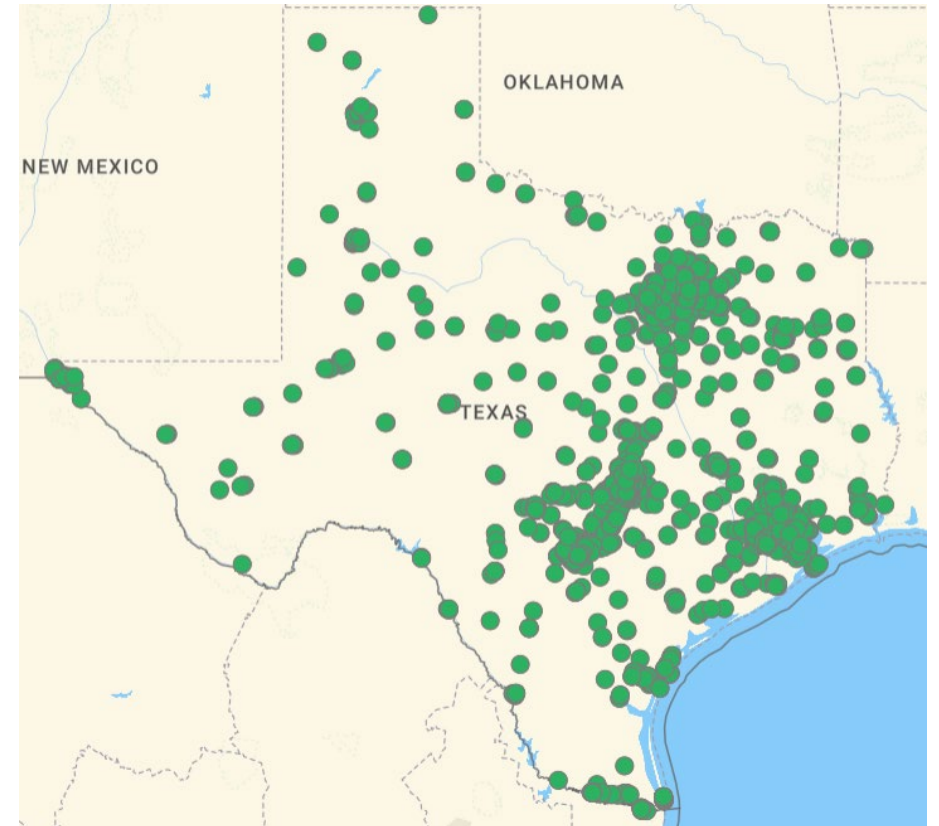
Challenges and Considerations

Delayed planning for EV charger resiliency
Greater financial and time impact

Lack of visibility to real-time status of EV
chargers

Lack of risk assessment to convey need for
resilient EV charging

Lack of staff and resources



Source: [Alternative Fueling Station Locator](#)

Next Steps for Local Governments



Reach out to peers who have successfully implemented resilient charging infrastructure



Learn about available resilient technologies



Avoid EV charging when grid is most constrained – 7 PM–9 PM



Consider resilient technologies when planning procurements of EVs and EV infrastructure



Next Steps for NCTCOG

Objectives:

- Create resilient EV charging plan for North Central Texas region
- Implement plan & enhance critical EV infrastructure
- Evaluate strategies & equipment via:
 - Tabletop Scenario
 - Technology Demonstration

Impacts:

- Guide stakeholders with actionable recommendations
- Ensure critical EV travel continuity:
 - Evacuation routes
 - Critical facilities & services
 - Freight operations

Contact Us



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