“EV-Ready” or Not!
Electric Vehicles in Texas

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Sierra Club, Fort Worth Chapter
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Presentation Contents

- NCTCOG: Who We Are
- Air Quality Basics: NAAQS and Ozone
- Benefits of EVs
- EV and EV Charging Basics
- North Texas Efforts and Resources
North Central Texas Council of Governments (NCTCOG) is:

Council of Governments
  • Regional Coordination

Metropolitan Planning Organization
  • Transportation Planning
  • Air Quality

Dallas-Fort Worth Clean Cities Coalition (DFWCC)
  • Petroleum Reduction
  • Alternative Fuels
The Basics: Who We Are

NCTCOG Service Area
DFWCC Service Area
Metropolitan Planning Area (RTC Service Area)
Ozone Nonattainment Area
NAAQS and Ozone

- National Ambient Air Quality Standards (NAAQS)
  - Established by the Environmental Protection Agency (EPA)
  - Address Six “Criteria” Pollutants:

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Abbreviation</th>
<th>DFW Region Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Monoxide</td>
<td>CO</td>
<td>In attainment</td>
</tr>
<tr>
<td>Lead</td>
<td>Pb</td>
<td>In attainment</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>NO₂</td>
<td>In attainment</td>
</tr>
<tr>
<td>Ground-level Ozone</td>
<td>O₃</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>PM</td>
<td>In attainment</td>
</tr>
<tr>
<td>Sulfur Oxides</td>
<td>SO</td>
<td>In attainment</td>
</tr>
</tbody>
</table>

- Impacts of Nonattainment Status
  - Health
  - Economic
Ground Level Ozone Formation

- Point Sources
- Biogenic Sources
- Area Sources
- Mobile Sources

Protective Ozone Layer (Good Ozone)
Stratosphere
Troposphere (Bad Ozone)
Earth

30 miles
6 miles
Estimated 2017 Nitrogen Oxides (NO\textsubscript{X}) Emissions Inventory
Source Category Estimates = 296.77 tons per day (tpd)

- On-Road (Cars & Trucks): 130.77 tpd (44%)
- Non-Road (Construction, Agriculture, etc.): 45.54 tpd (15%)
- Off-Road (Locomotives, Aircraft, etc.): 25.24 tpd (8%)
- Point, Excluding Oil & Gas (Power Plants, Cement Kilns, etc.): 38.30 tpd (13%)
- Point - Oil & Gas: 16.50 tpd (6%)
- Area (Dry Cleaners, Bakeries, etc.): 26.55 tpd (9%)
- Oil & Gas (Production & Drill Rigs): 13.87 tpd (5%)

Source: Texas Commission on Environmental Quality, 2017 Dallas-Fort Worth 8-hour Ozone Attainment Demonstration State Implementation Plan
DFW Nonattainment Area Inventory

Estimated 2017 Nitrogen Oxides (NO\textsubscript{x}) On-Road Emissions Inventory
Source Category Estimates = 130.77 tons per day (tpd)

- Heavy-Duty Diesel
  - 63.46 tpd (48.53%)
- Light-Duty Gas
  - 49.65 tpd (37.96%)
- Medium-Duty Gas
  - 12.52 tpd (9.57%)
- Light-Duty Diesel
  - 1.15 tpd (0.89%)
- Heavy-Duty Gas
  - 1.65 tpd (1.26%)
- Medium-Duty Diesel
  - 2.34 tpd (1.79%)

Source: Texas Commission on Environmental Quality, 2017 Dallas-Fort Worth 8-hour Ozone Attainment Demonstration State Implementation Plan
2017 Ozone Season
Eight-Hour Ozone Historical Trends

1997 Standard < 85 ppb (Revoked)

2008 Standard ≤ 75 ppb (by 2017)

2015 Revised Standard ≤ 70 ppb (TBD; Moderate by 2023)

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

*2016 data not certified by the Texas Commission on Environmental Quality.

^Not a full year of data. Current as of 3/14/2017.

Source: NCTCOG TR Dept
2016 Ozone Season Exceedance Days

Eight-Hour Ozone Exceedance Days Based on <70 ppb

Exceedance Levels
- Orange (71-75 ppb)
- Orange (76-85 ppb)
- Red (86-105 ppb)
- Purple (106+ ppb)

Ozone Season (Year)
- 1998: 27
- 1999: 27
- 2000: 29
- 2001: 19
- 2002: 16
- 2003: 24
- 2004: 15
- 2005: 30
- 2006: 22
- 2007: 2
- 2008: 8
- 2009: 11
- 2010: 20
- 2011: 19
- 2012: 24
- 2013: 5
- 2014: 3
- 2015: 24
- 2016*: 1
- 2017*: 7

Exceedance Level indicates daily maximum eight-hour average ozone concentration. Exceedance Levels are based on Air Quality Index (AQI) thresholds established by the EPA for the revised ozone standard of 70 ppb.

*Additional level orange exceedance days under the revised standard that were not exceedances under the previous 75 ppb standard. (AQI level orange = 71-75 ppb)

*Data not certified by TCEQ.
Source: TCEQ, [http://www.tceq.state.tx.us/oap-bin/compliance/monops/8hr_monthly.pl](http://www.tceq.state.tx.us/oap-bin/compliance/monops/8hr_monthly.pl)

ppb = parts per billion
Design Value (DV) - three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentration is less than or equal to 70 parts per billion (ppb).

*2017 DV based on 2016 data, current as of 10/26/2016
Source: US Energy Information Administration, //www.eia.gov/forecasts/aeo/source_oil.cfm
Benefits of EVs

- Reduced Emissions
  - Zero Tailpipe Emissions & Lower Well-to-Wheels Emissions
- Energy Security
- Noise-free Driving Experience
- Local Economic Support
- Lower Fuel and Maintenance Costs
- Convenience of Charging at Home
- Smart Features
Benefits of EVs

- Well-to-Wheels Emissions Comparison

- Tailpipe Emissions

## Benefits of EVs, Costs

<table>
<thead>
<tr>
<th></th>
<th>Mileage</th>
<th>Internal Combustion Engine</th>
<th>Electric Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$</td>
<td>Trips</td>
</tr>
<tr>
<td>Tires</td>
<td>Every 7,500 miles</td>
<td>$400</td>
<td>13</td>
</tr>
<tr>
<td>Oil Change</td>
<td>Every 5,000 miles</td>
<td>$400-$800</td>
<td>20</td>
</tr>
<tr>
<td>Automatic Transmission Fluid</td>
<td>At 100,000 miles</td>
<td>$30-$100</td>
<td>1</td>
</tr>
<tr>
<td>Fuel,</td>
<td>varies</td>
<td>$7,142</td>
<td>400</td>
</tr>
<tr>
<td>Park Plugs &amp; Wires</td>
<td>within first 100,000 miles</td>
<td>$200</td>
<td>1</td>
</tr>
<tr>
<td>Muffler</td>
<td>within first 100,000 miles</td>
<td>$100-$250</td>
<td>1</td>
</tr>
<tr>
<td>Brakes</td>
<td>2x within first 100,000 miles</td>
<td>$400</td>
<td>2</td>
</tr>
<tr>
<td>Big 100,000</td>
<td>100,000 miles</td>
<td>$600-$800</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Timing Belt</td>
<td>$300 (if combined with timing belt service)</td>
<td>1</td>
</tr>
</tbody>
</table>
Basics of EVs, History

- EVs Were First Invented in the 1830s
- First Road-Ready EV – 1890
- First Electric Taxi Cabs – New York City, 1897
Basics of EVs, History

- Downfall of the Early EV
  - 1908 – Model T
  - Desire for Longer-Distance Vehicles
  - Lack of Horsepower
  - Discovery of Texas Crude Oil
  - Electric Starter
Basics of EVs, The Vehicles

- Hybrid Electric Vehicle (HEV)
- Plug-In Hybrid Electric Vehicle (PHEV)
- All-Electric Vehicle (EV) or Plug-In Electric Vehicle (PEV)
Basics of EVs, The Vehicles

Source: Plug In America, https://pluginamerica.org/vehicles/
Resources


- **Plug In America** [https://pluginamerica.org/](https://pluginamerica.org/)
Resources

Alternative Fuel and Advanced Vehicle Search

Find and compare alternative fuel vehicles (AFVs), engines, and hybrid systems. Some of the light-duty AFVs in this tool may count toward vehicle-acquisition requirements for federal fleets and state and alternative fuel provider fleets regulated by the Energy Policy Act (EPAct).

Vehicles by Type

- Sedan/Wagon
- Truck
- SUV
- Van
- Step Van
- Vocational/Cab Chassis
- Street Sweeper
- Refuse
- Tractor
- Shuttle Bus
- Transit Bus
- School Bus

Vehicles by Manufacturer

- Light-Duty
  - All
- Medium- and Heavy-Duty
  - All

Engines and Hybrid Systems

For medium- and heavy-duty vehicles:

- ENGINE & POWER SOURCES
- HYBRID PROPULSION SYSTEMS

ABOUT THE DATA
# Resources

## Alternative Fuel and Advanced Vehicle Search

Find and compare alternative fuel vehicles (AFVs), engines, and hybrid systems. Some of the light-duty AFVs in this tool may count toward vehicle-acquisition requirements for federal fleets and state and alternative fuel provider fleets regulated by the Energy Policy Act (EPAct).

### Search Results

- **Filter by:** Fuel/Technology: Electric, Plug-in Hybrid Electric, Hybrid Electric | Class/Type: Sedan/Wagon | Manufacturer: All

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Fuel Type</th>
<th>Fuel Economy</th>
<th>Compare (up to 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acura RLX Hybrid 2016</td>
<td>Hybrid Electric</td>
<td>28 mpg city / 32 mpg hwy</td>
<td></td>
</tr>
<tr>
<td>Acura RLX Hybrid 2017</td>
<td>Hybrid Electric</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>Audi A3 e-tron 2017</td>
<td>Plug-in Hybrid Electric</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>Audi A3 Sportback e-tron 2016</td>
<td>Plug-in Hybrid Electric</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>BMW 330e 2017</td>
<td>Plug-in Hybrid Electric</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>BMW 740e xDrive 2017</td>
<td>Plug-in Hybrid Electric</td>
<td>64 mpg city</td>
<td></td>
</tr>
<tr>
<td>BMW ActiveHybrid 5 2016</td>
<td>Hybrid Electric</td>
<td>23 mpg city / 30 mpg hwy</td>
<td></td>
</tr>
<tr>
<td>BMW i3 2016</td>
<td>Electric</td>
<td>137 mpg city / 111 mpg hwy</td>
<td></td>
</tr>
<tr>
<td>BMW i3 BEV 2017</td>
<td>Electric</td>
<td>129 mpg city / 106 mpg hwy</td>
<td></td>
</tr>
<tr>
<td>BMW i3 BEV 2017</td>
<td>Electric</td>
<td>137 mpg city / 111 mpg hwy</td>
<td></td>
</tr>
<tr>
<td>BMW i3 REX 2016</td>
<td>Plug-in Hybrid Electric</td>
<td>117 mpg Electric city</td>
<td></td>
</tr>
<tr>
<td>BMW i3 REX 2017</td>
<td>Plug-in Hybrid Electric</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>BMW i8 Plug-in Hybrid 2016</td>
<td>Plug-in Hybrid Electric</td>
<td>76 mpg Combined Gas + Electric city</td>
<td></td>
</tr>
<tr>
<td>Cadillac ELR 2016</td>
<td>Plug-in Hybrid Electric</td>
<td>85 mpg Electric city</td>
<td></td>
</tr>
</tbody>
</table>

- **Refine Your Search**
  - Fuel/Technology:
    - All Fuels
    - Biodiesel (B20)
    - Ethanol (E85)
    - Hydrogen Fuel Cell
    - LNG - Liquified Natural Gas
    - CNG - Compressed Natural Gas
    - Propane
    - Electric
    - Plug-in Hybrid Electric
    - Hybrid Electric
    - Hybrid - Hydraulic
    - Hybrid - CNG
    - Hybrid - Diesel
  - Class/Type:
    - All Classes/Types
    - Sedan/Wagon
    - Truck
    - SUV
    - Van
    - Step Van
    - Vocational/Cab Chassis
    - Street Sweeper
    - Refuse

---

**Note:** The highlighted number 78 indicates a specific vehicle model or category within the search results.
## Alternative Fuel and Advanced Vehicle Search

Find and compare alternative fuel vehicles (AFVs), engines, and hybrid systems. Some of the light-duty AFVs in this tool may count toward vehicle-acquisition requirements for [federal fleets](#) and [state and alternative fuel provider fleets](#) regulated by the Energy Policy Act (EPAct).

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*Find a Dealer*
Resources, Calculators

Vehicle Cost Calculator
This tool uses basic information about your driving habits to calculate total cost of ownership and emissions for makes and models of most vehicles, including alternative fuel and advanced technology vehicles. Also see the cost calculator.

Choose vehicles to compare
Select up to eight vehicles to compare from the makes and models below or create your own custom vehicle.

Create Custom Vehicle

Tell us how you use your car
Because vehicle efficiencies vary depending on how you use your car, this information allows the tool to more accurately calculate fuel usage.

Normal Daily Use
Average daily driving distance 34 miles
Days per week 5
Weeks per year 49
Percent highway 45

Other Trips
Annual mileage 3596 miles
Percent highway 80

Annual Driving Distance 11926 miles
City Distance 5301 miles
Highway Distance 6625 miles
### Basics of EVs, Range

#### Electric Range per Model (all 2017)

- **Tesla, Model S**: 335 miles
- **Tesla, Model X**: 295 miles
- **Chevrolet, Bolt**: 238 miles
- **Volkswagen, e-Golf**: 125 miles
- **Ford, Focus**: 115 miles
- **BMW, i3**: 114 miles
- **Nissan, Leaf**: 107 miles
- **Kia, Soul**: 93 miles
- **Mercedes-Benz, B250e**: 87 miles
- **Fiat, 500e**: 87 miles
- **Chevrolet, Volt**: 53 miles
- **Ford, C-MAX Energi**: 21 miles
- **Ford, C-MAX Hybrid**: 19 miles

**Data Source:** Plug In America

- Yellow bar: Indicates range minimum
- Green bar: Indicates models common to the DFW area
Electric Vehicle Supply Equipment (EVSE)

<table>
<thead>
<tr>
<th>Type</th>
<th>Specifications</th>
<th>Time Needed to Charge 10 Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>AC 110–120 V 12 or 16 amps 1.44, 1.92 KW</td>
<td>1h 40 min</td>
</tr>
<tr>
<td>Level 2</td>
<td>AC 208–240 V 16 - 80 amps 3.3 - 19.2 KW</td>
<td>~ 30 min</td>
</tr>
<tr>
<td>Fast Charging</td>
<td>DC 200–450 V ≤ 200 amps ≤ 90 KW</td>
<td>&lt; 5 min</td>
</tr>
</tbody>
</table>
Alternative Fuels Data Center Tools: Station Locator & Route Planner

Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. Enter a state to see a station count or see stations data by state.

Find Stations Plan a Route

Search for stations:
- dallas, tx
- berkeley, ca

More search options

303 Electric stations along the route
Excluding private stations

Download spreadsheet of matching stations

Location details are subject to change. We

http://www.afdc.energy.gov/
Regional EV Efforts and Resources

Dallas-Fort Worth Clean Cities

Clean Transportation, Made Easy

Subcommittees

- Natural Gas Working Group
- Biofuels Subcommittee
- Propane Subcommittee
- Electric Vehicles North Texas
Regional EV Efforts and Resources

Website: https://www.dfwcleancities.org/evnt
Contact: Kristina Ronneberg, kronneberg@nctcog.org
National Drive Electric Week (NDEW)

NATIONAL DRIVE ELECTRIC WEEK

Save the Date!

September 9th, 2017

Grapevine Mills Mall

Activities, giveaways, ride & drives, and more!

Be part of the TX record for the most EVs in one place.

Calling all EV owners: come show off your electric vehicle!

#texasEV
NCTCOG staff plans to include additional models including: Cadillac ELR, Chevrolet Spark, Fiat 500e, Honda Accord Plug-In & Fit EV, Toyota Plug In Prius, & RAV4 EV

Total EV Registration:
Texas: 8933
DFW Area: 3484
39% of TX total
(As of February 2017)
Alternative Fuel Corridors

Recently Designated Corridors
Clean Cities 2017 OEPT Cooperative Agreements: Sub-task 3.3

Included DCFC and Level 2
50 miles between stations
5 miles from highway
Public stations only (no Tesla)

Source: Clean Cities; Outreach, Education, and Performance Tracking
Volkswagen Settlement Impacts: Zero Emission Vehicle Investments

As part of the Volkswagen Settlement, $1.2 Billion Available to Fund Zero Emissions Vehicles Projects Outside of California.
Available Incentives

- **Existing Vehicle Incentives**
  - **Federal:** [Qualified Plug-In Electric Drive Motor Vehicle Tax Credit](#)  
    - Ranges from $2,500 - $7,500  
    - IRS Form 8936  
  - **Regional:** Air Check Texas a Clean Machine  
    - Voucher of $3,500 to replace a vehicle unable to meet state air quality inspections with an EV  
  - **Regional:** Nissan FleetTail Offer, in partnership with EVgo  
    - $10,000 off a new Nissan Leaf

- **Potential State Incentives**
  - Up to $2,500 Rebate on Electric Vehicle Purchase/Lease  
    - Senate Bill 26  
  - Up to 50% Grant for Public-Access Infrastructure through Texas Emissions Reduction Plan Alternative Fueling Facilities Program  
    - Senate Bill 26, House Bill 1979, House Bill 3479
Questions?
Contact Us

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