Regional Trends in Air Quality, Electric Vehicles, and Transportation

GSA Regional Sustainability Council Meeting
September 13, 2018

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North Central Texas Council of Governments
WHO AND WHAT IS NCTCOG?

• Voluntary association of local governments
• Established in 1966
• Assists local governments in:
  – Planning for common needs
  – Cooperating for mutual benefit
  – Recognizing regional opportunity
  – Resolving regional programs
  – Making joint decisions
• 1 of 24 COGs in Texas
• Also Serves as MPO
• Also Houses Clean Cities

COG = Council of Governments;
MPO = Metropolitan Planning Organization
Air Quality 101
CLEAN AIR ACT

Requires Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for 6 criteria pollutants:

- Carbon Monoxide (CO)
- Lead (Pb)
- Nitrogen Dioxide (NO\textsubscript{2})
- Ozone (O\textsubscript{3})
- Particulate Matter (PM)
- Sulfur Dioxide (SO\textsubscript{2})
DFW OZONE NONATTAINMENT AREA

Colors represent Air Quality Index breakpoints.

Attainment Goal - According to the US EPA National Ambient Air Quality Standards, attainment is reached when, at each monitor, the 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).
HOW IS OZONE FORMED?

Emission Source Categories

- Point Sources
- Oil and Gas
- Area Sources
- Biogenic Sources
- Non-Road Engines
- On-Road Vehicles
- Off-Road Engines

Volatile Organic Compounds (VOC) + Oxides of Nitrogen (NOx) = Ozone

Optimum conditions for the formation of ozone include high temperatures and low winds. Sections are not to scale and are for illustrative purposes only.
NITROGEN OXIDES (NO\textsubscript{X}) EMISSION SOURCES

Total NO\textsubscript{X} = 296.77 tons per day (tpd)

- On-Road Mobile: 130.77 tpd
- Heavy-Duty Trucks: 65.11 tpd
- Medium-Duty Trucks: 14.86 tpd
- Light-Duty Vehicles (Passenger Cars and Trucks): 50.8 tpd

- Non-Road Mobile: 45.54 tpd
- Off-Road Mobile: 25.24 tpd
- Point (Excluding Oil & Gas): 38.30 tpd
- Point (Oil & Gas): 16.50 tpd
- Oil & Gas (Production & Drill Rigs): 13.87 tpd
- Area: 26.55 tpd

Source: TCEQ, 2017 Dallas-Fort Worth 8-hour Ozone Attainment Demonstration State Implementation Plan
8-HOUR OZONE HISTORICAL TRENDS
DFW Nonattainment Area

As of September 13, 2018

1997 Standard < 85 ppb (Revoked)
2008 Standard ≤ 75 ppb (Moderate by 2017)
2015 Standard ≤ 70 ppb¹ (Marginal by 2020)

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).
## EPA Air Quality Index

<table>
<thead>
<tr>
<th>Color</th>
<th>Air Quality</th>
<th>Actions to Protect Your Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>🟢</td>
<td>good</td>
<td>None necessary</td>
</tr>
<tr>
<td>🟠</td>
<td>moderate</td>
<td>Unusually sensitive people should consider limiting prolonged outdoor exertion</td>
</tr>
<tr>
<td>🟡</td>
<td>unhealthy for sensitive groups</td>
<td>Active children and adults and people with respiratory disease, such as asthma, should <em>limit</em> prolonged outdoor exertion</td>
</tr>
<tr>
<td>🔴</td>
<td>unhealthy</td>
<td>Active children and adults and people with respiratory disease, such as asthma, should <em>avoid</em> prolonged outdoor exertion; everyone else, especially children, should <em>limit</em> prolonged outdoor exertion</td>
</tr>
<tr>
<td>🁊</td>
<td>very unhealthy</td>
<td>Active children and adults and people with respiratory disease, such as asthma, should <em>avoid all</em> prolonged outdoor exertion; everyone else, especially children, should <em>limit</em> prolonged outdoor exertion</td>
</tr>
</tbody>
</table>
8-HOUR OZONE HISTORICAL TRENDS
DFW Nonattainment Area
Based on ≤70 ppb (As of September 13, 2018)

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.

Source: TCEQ, [http://www.tceq.state.tx.us/cgi-bin/compliance/monops/8hr_monthly.pl](http://www.tceq.state.tx.us/cgi-bin/compliance/monops/8hr_monthly.pl)

ppb = parts per billion
Regional Electric Vehicle (EV) Efforts
EV BASICS & AVAILABILITY

Market Availability as of July 2018:
- 26 PHEVs
- 19 EV/PEVs

- Hybrid Electric Vehicle (HEV)
- Plug-In Hybrid Electric Vehicle (PHEV)
- All-Electric Vehicle (EV) or Plug-In Electric Vehicle (PEV)
HOW DO EVs AFFECT THE GRID?

The Electrical Load of 3 EVs Is Approximately Equal to That of 1 Average House
REGIONAL EV TRENDS

North Texas Electric Vehicle (EV) Registration

As of August 1, 2018
Texas Registration: 13,911
DFW Area: 5,061 (36% of TX)

*Other EV includes the BMW i3, Chevrolet Bolt, Fisker Karma, Ford Focus Electric; Other PHEV includes the BMW i8, Ford C-Max Energi, Ford Fusion Electric, Chevrolet Bolt, Chevrolet Spark EV, Fiat 500e, and Mercedes B250e
## ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)

<table>
<thead>
<tr>
<th>Type</th>
<th>Specs</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>AC 100-120 V 12 or 16 amps 1.44, 1.92 kWh</td>
<td>2 to 5 miles per 1 hour of charge</td>
</tr>
<tr>
<td>J1772 charge port</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td>AC 208-240 V 16-80 amps 3.3-19.2 kWh</td>
<td>10 to 20 miles per 1 hour of charge</td>
</tr>
<tr>
<td>J1772 charge port</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level 3/DC Fast Charge</strong></td>
<td>DC 200-450 V ≤ 200 amps ≤ 90 kWh</td>
<td>60 to 80 miles per 20 minutes of charge</td>
</tr>
<tr>
<td>J1772 combo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHAdeMO combo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tesla combo</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Alternative Fuels Data Center
REGIONAL EV TRENDS AND STATIONS

*Note: DC Fast Charging Stations may include Level 2 Charging Stations
**Note: Level 2 Charging Stations may include Level 1 Charging Stations

July 2018
ALTERNATIVE FUELS DATA CENTER TOOLS: Station Locator and Route Planner

http://www.afdc.energy.gov/
### Day in the Life of an Average Car

<table>
<thead>
<tr>
<th>Workplace</th>
<th>Leisure Destination</th>
<th>Shopping Centers</th>
<th>Travel Stops</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5-8+ hours</td>
<td>47 min-2 hours</td>
<td>28-48 min</td>
<td>15-53 min</td>
</tr>
</tbody>
</table>

An individual who has access to EV charging at work is **20X** more likely to buy a plug-in.  

*Source: U.S. DOE Workplace Charging Presentation, July 2015*
Funding Opportunities
## CURRENT EV INCENTIVES

<table>
<thead>
<tr>
<th>Vehicle Incentives</th>
<th>Amount</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-In Electric Drive Motor Vehicle Credit</td>
<td>Up to $7,500</td>
<td>Federal</td>
</tr>
<tr>
<td>Light-Duty Motor Vehicle Purchase or Lease Incentive Program (LDLIP)</td>
<td>Up to $2,500</td>
<td>State of Texas</td>
</tr>
<tr>
<td>AirCheckTexas Drive a Clean Machine Program</td>
<td>Up to $3,500</td>
<td>Participating Counties</td>
</tr>
</tbody>
</table>

**Total Possible Savings Per Vehicle**: Up to $13,500

**An Additional $3,000 Rebate on a Nissan LEAF Available to Oncor Customers; Must Present Incentive Flyer**
VOLKSWAGEN SETTLEMENT

Total Settlement to Date: $14.7 Billion

Zero Emission Vehicle (ZEV) Investment - Managed by Electrify America

Environmental Mitigation Trust (EMT) - Distributed to States

Settlement Breakdown ($ in Billions)

- Vehicle Buyback and Modification
- ZEV Investment
- Environmental Mitigation Trust

Texas’ Share: $209 Million

https://www.nctcog.org/trans/air/VWsettlement/
www.TexasVWFund.org
Regional Transportation Updates
WATCH FOR THESE TRANSPORTATION DEVELOPMENTS!!!

TEXRail – Anticipated Opening January 2019

Electric Transit Buses for DART and Trinity Metro

Autonomous Vehicle Projects – Arlington and Frisco

New Trail Segments Along Cotton Belt Rail Corridor

Reconstruction of I-635 East

Find Major Transportation Plans at https://www.nctcog.org/trans/study
MEDIUM-RANGE PLANNING
Dallas-Fort Worth Regional 10 Year Plan Projects
FY 2017 - FY 2028

Legend
- 10 Year Plan Projects
- 2016 10 Year Plan Update
- Mobility 2045 Roadways
- County Boundary
- Lakes

Date: 7/5/2018
LONG-RANGE PLANNING

Major Roadway Recommendations

Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics will be determined through ongoing project development.
LONG-RANGE PLANNING
Transit Corridor Projects

Facility recommendations indicate transportation need. Corridor-specific alignment, design, and operational characteristics will be determined through ongoing project development.
FOR MORE INFORMATION

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DFW Clean Cities and Electric Vehicles
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Major Transportation Plans
https://www.nctcog.org/trans/study