Interstate Highway 45 ZEV Corridor: Infrastructure Development

Agenda:

1. Welcome/Housekeeping
2. Discussion

Tuesday, March 30, 2021

Call-In Information: +1 346 248 7799

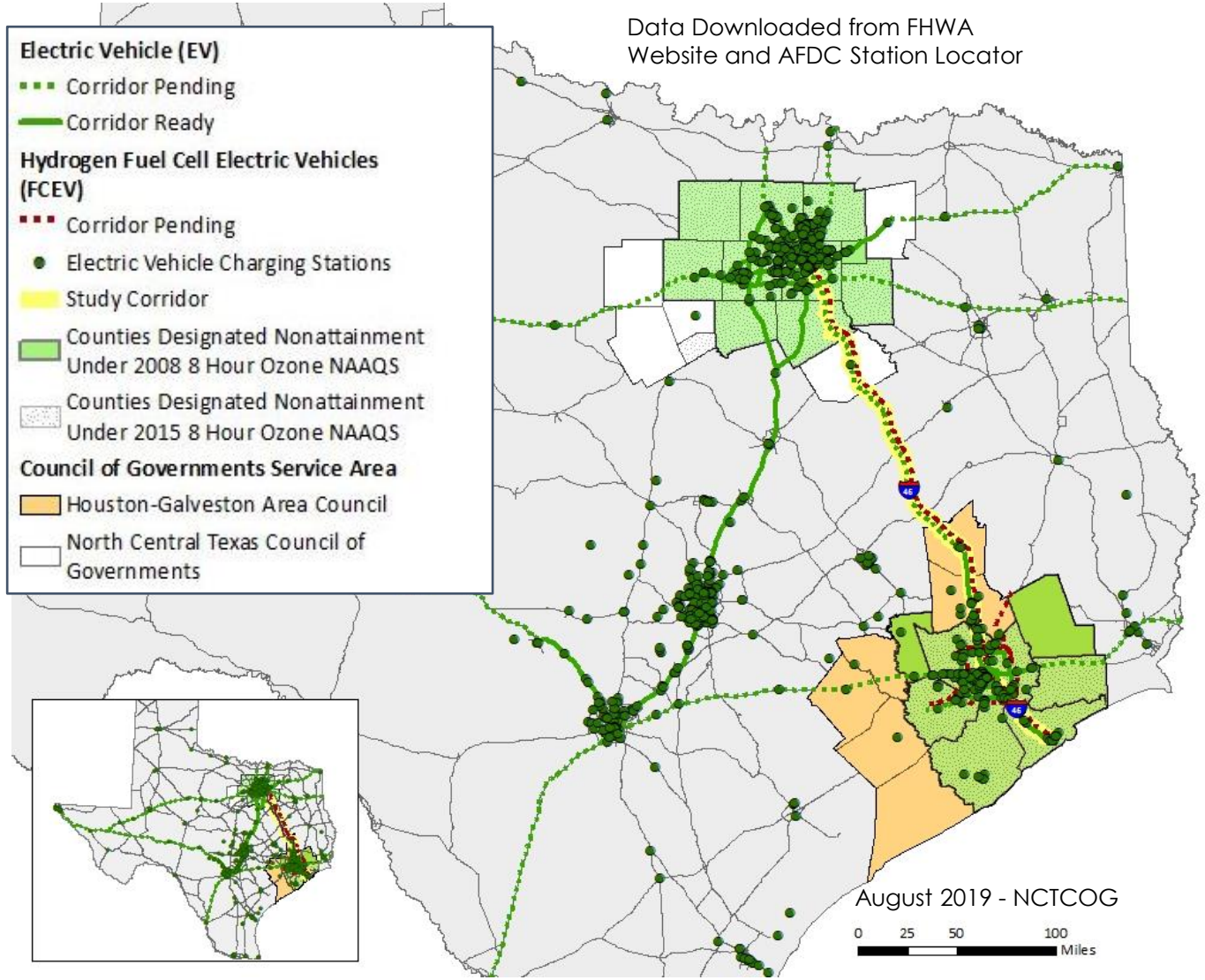
Meeting ID: 843 7314 2551

Please mute yourself when you are not speaking

Dallas-Fort Worth CLEAN CITIES

North Central Texas Council of Governments

IH-45 ZEV Corridor Plan Goals



Create an Actionable Infrastructure Plan that Facilitates BEV and FCEV Pilot Projects Along the Corridor

- **Focused on Medium and Heavy-Duty Applications**

Support Future Strategic Initiatives in the Corridor

- **AV Technology**
- **Truck Platooning**

Expect Plan will Need Revisiting in 3-5 years

Stakeholder Role: Guide Plan Development, Lend Expertise, Ensure Appropriate Details Addressed

BEV = Battery Electric Vehicle; FCEV = Fuel Cell Electric Vehicle; AV = Autonomous Vehicle

Key Takeaways

BEV

Inductive Charging
Not Powerful Enough to do much More Than Level 2 Equivalent

Cooperative Purchasing
May Make Sense for School Buses and Local Municipalities

Proof of Concept is Needed First

May Not Work for Private Companies

Hydrogen/FCEV

For a pilot of 10 Fuel Cell Electric Trucks:
2 Dispensers Per Station
240 kg/day
350-Bar Pressure

Driving Costs of Permanent Hydrogen Station Build-out
Hydrogen Fuel Delivery

Hardware/Equipment/Installation: Up to $30 Million

Land – Based on Location

Both

Funding Programs
Need to Include both Vehicle and Infrastructure

Scrappage Requirement is a Huge Impediment

Co-Locate Stations with Truck Stops as Much as Possible

David Raney has started a TERP Task Force
Preparing a "White Paper" for TCEQ to Review on TERP Guidelines

TERP = Texas Emissions Reduction Program

Phased Deployment Approach

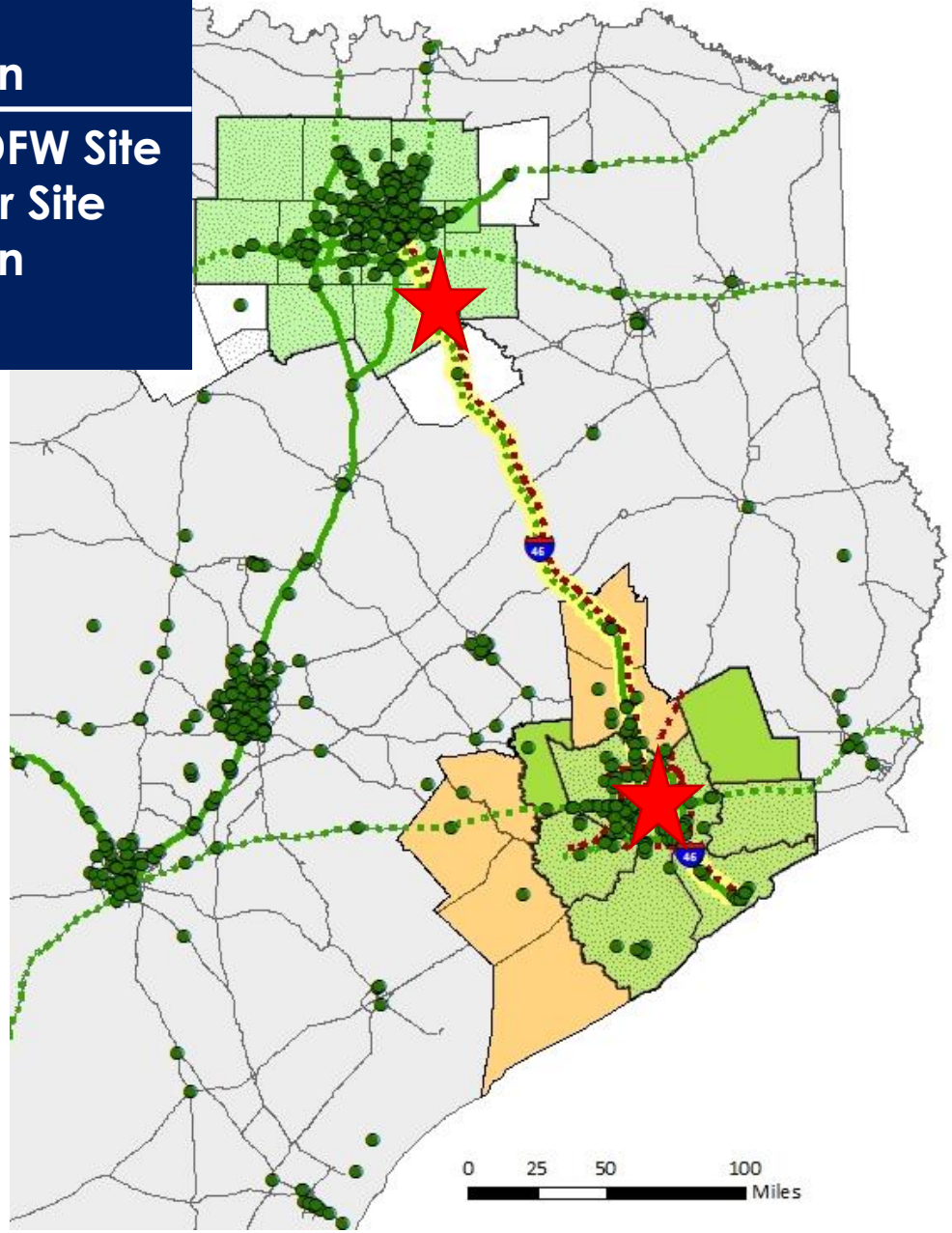
	ZEV Pilot	ZEV Launch	ZEV Scale Up	ZEV Deployment
Intent/Purpose	Demonstrate Feasibility With Controlled Expenses	Demonstrate Business Case in Texas	Engage Early Adopters	Expand Fleet Adoption
H2 Stations	1 Modular DFW Site 1 Modular Houston Site	1 Permanent DFW Site 1 Permanent Houston Site	2 DFW Sites 1 Houston Site 1 Mid-Corridor (6 Dispensers per Station)	Cluster in DFW Cluster in Houston 2 Mid-Corridor (8 Dispensers per Station)
EV Stations (2-4 Charging Ports per Station)	N/A	1 DFW Site 1 Houston Site 1 Mid-Corridor	2 DFW Sites 1 Houston Site 2 Mid-Corridor	Cluster in DFW Cluster in Houston 3-4 Mid-Corridor
Vehicle Deployment Size	2-3 Vehicles	10 Vehicles	Up to 50 Vehicles	>50 Vehicles

Hydrogen Corridor Examples

ZEV Launch	**1 DFW Site** **1 Houston Site** **10 Trucks** **~$50-70 Million**
ZEV Scale-Up	**1 Additional DFW Site** **1 Mid-Corridor Site** **~$40-60 Million**

Estimated Costs: $20-30M/Station, $1M/Truck

Key Partners:
OEM
Station Developer
Fuel Provider
Fleet



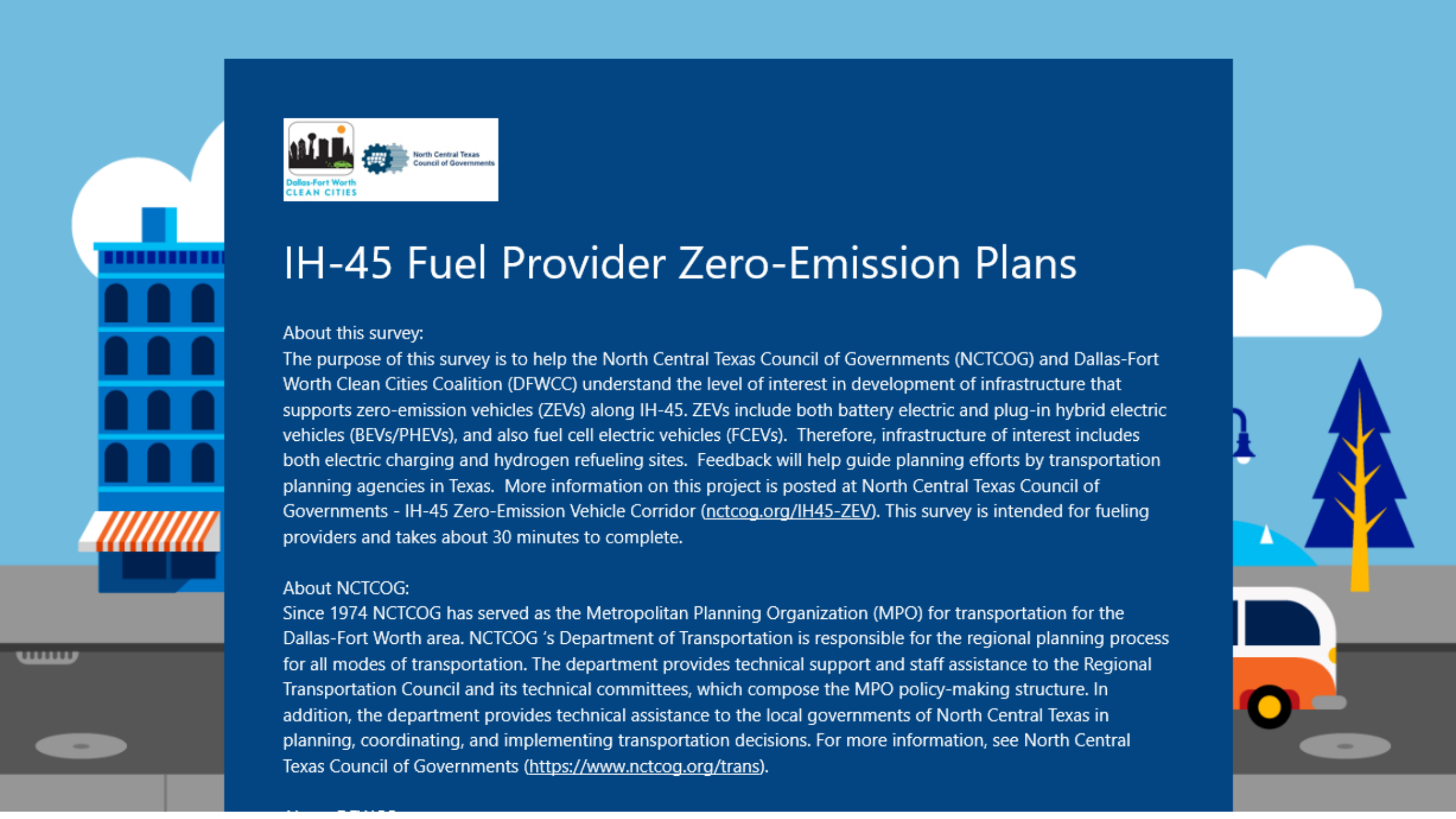
Seeking Input

Map your Experience – Developing Comparable Tool for Alternative Fuel Stations

Released Surveys

Fueling Providers – **LIVE** **www.nctcog.org/IH45-ZEV**
Fleets/Shippers– **LIVE** **www.nctcog.org/IH45-ZEV**

Responses Requested by Friday, April 30



IH-45 Fuel Provider Zero-Emission Plans

About this survey:
The purpose of this survey is to help the North Central Texas Council of Governments (NCTCOG) and Dallas-Fort Worth Clean Cities Coalition (DFWCC) understand the level of interest in development of infrastructure that supports zero-emission vehicles (ZEVs) along IH-45. ZEVs include both battery electric and plug-in hybrid electric vehicles (BEVs/PHEVs), and also fuel cell electric vehicles (FCEVs). Therefore, infrastructure of interest includes both electric charging and hydrogen refueling sites. Feedback will help guide planning efforts by transportation planning agencies in Texas. More information on this project is posted at North Central Texas Council of Governments - IH-45 Zero-Emission Vehicle Corridor (nctcog.org/IH45-ZEV). This survey is intended for fueling providers and takes about 30 minutes to complete.

About NCTCOG:
Since 1974 NCTCOG has served as the Metropolitan Planning Organization (MPO) for transportation for the Dallas-Fort Worth area. NCTCOG 's Department of Transportation is responsible for the regional planning process for all modes of transportation. The department provides technical support and staff assistance to the Regional Transportation Council and its technical committees, which compose the MPO policy-making structure. In addition, the department provides technical assistance to the local governments of North Central Texas in planning, coordinating, and implementing transportation decisions. For more information, see North Central Texas Council of Governments (https://www.nctcog.org/trans).

Figure 26: Fleet Funding Needs for Alternative Fuel Vehicles

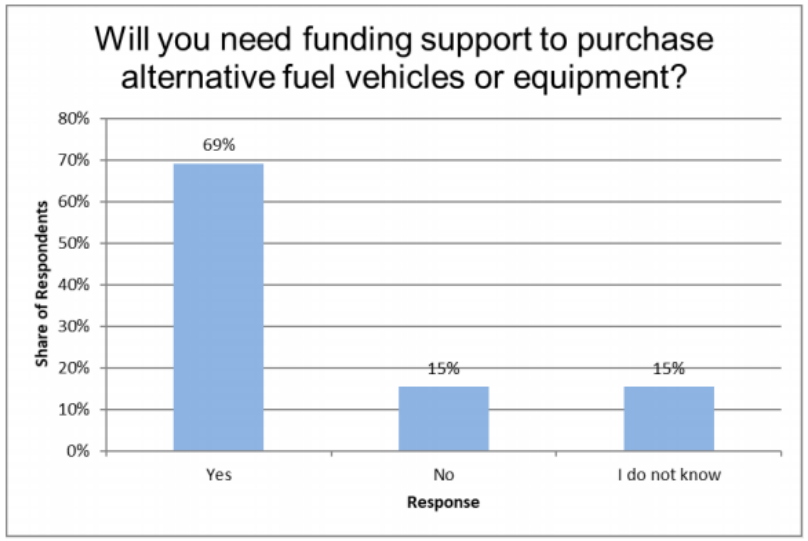
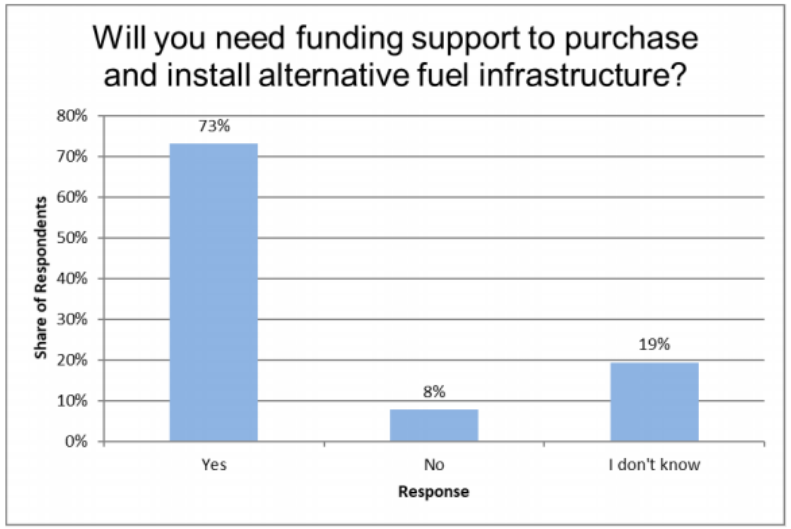
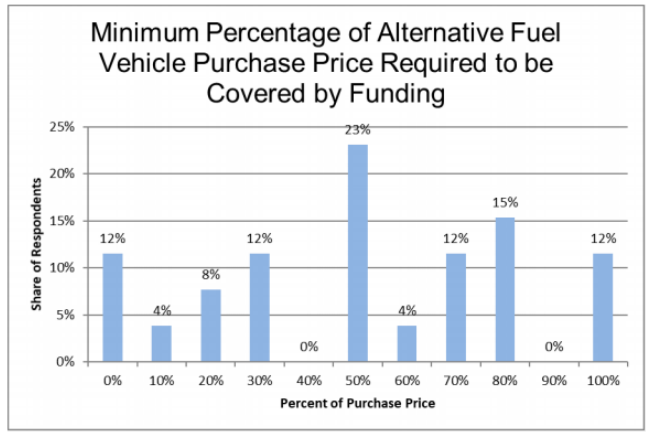


Figure 27: Fleet Funding Needs for Alternative Fuel Infrastructure



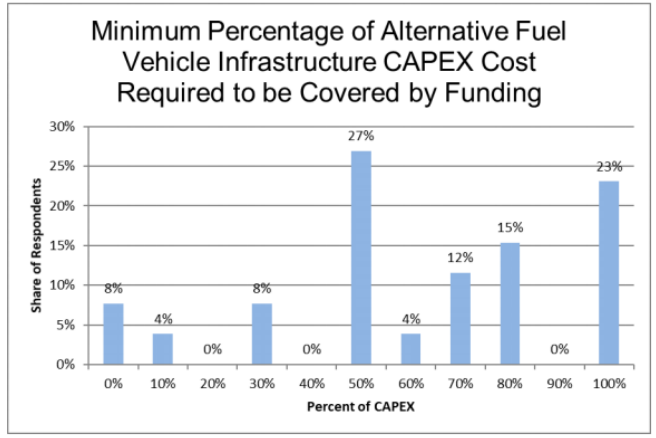
Cost Share Potential: CALSTART was interested to know what sort of cost share requirement would be best suited for an alternative fuel infrastructure funding program. As such, CALSTART asked respondents if funding were available to help them purchase an alternative fuel vehicle or off-road equipment unit, what would be the minimum percentage of the total vehicle purchase price which funding must cover to justify purchase of that vehicle. The answer with the most responses was 50%, while a sizeable number of respondents also said 0%, 30%, 70%, 80%, and 100%.

Figure 28: Minimum Fleet Funding Needed for Alternative Fuel Vehicles



Additionally, CALSTART asked respondents if funding were available to help them cover the capital expenses for installing alternative fuel infrastructure, what would be the minimum percentage of the total CAPEX which funding must cover to justify development. The two answer choices with the most responses were 50% and 100%, with 27% and 23% of respondents, respectively.

Figure 29: Minimum Fleet Funding Needed for Alternative Fuel Infrastructure CAPEX



Figures Provided by West Coast Collaborative Medium and Heavy-duty Alternative Fuel Infrastructure Strategic Development Plan

EV Chargers

Table 24 Oregon Proposed Alternative Fuel Infrastructure Projects (Readiness Categories not Shown)

Number	Fuel Type	Proposed State	Proposed City or County	Proposed Address or Interchange	Estimated Annual Fuel Throughput / # of Vehicles the Station Would Serve	Public, Private, or Limited Access	Reported CAPEX Estimate	Funding Needed (Percentage of CAPEX)
1	EV	OR	Bend	US-20 / US-97	750 kW minimum (1 MW ideal)	Public	$2,017,499	50%
2	EV	OR	Bend	US-97 & US-20	500 vehicles @ 350kW	Public	$100,000	70%
3	EV	OR	Boardman	I-84 & South Main Street	500 vehicles @ 350kW	Public	$100,000	70%
4	EV	OR	Eugene	I-5 & OR-126	500 vehicles @ 350kW	Public	$100,000	70%
5	EV	OR	Eugene	3500 E 17th Ave Eugene OR 97403	N/A	Private	Not reported by participant; See Table 7 for estimated average CAPEX	N/A
6	EV	OR	Hood River County	N/A	N/A	Private	Not reported by participant; See Table 7 for estimated average CAPEX	N/A
7	EV	OR	Josephine County	N/A	N/A	Private	Not reported by participant; See Table 7 for estimated average CAPEX	N/A
8	EV	OR	La Grande	I-84 & OR-82	500 vehicles @ 350kW	Public	$100,000	70%
9	EV	OR	Medford	I-5 & OR-62	500 vehicles @ 350kW	Public	$100,000	70%
10	EV	OR	Ontario	I-84 & US-30	500 vehicles @ 350kW	Public	$100,000	70%
11	EV	OR	Pendleton	I-84 & US-395	500 vehicles @ 350kW	Public	$100,000	70%
12	EV	OR	Portland	I-84 & I-205	30 vehicles	Public and Private	$2,000,000	50%
13	EV	OR	Portland	I-5 & I-405	500 vehicles @ 350kW	Public	$100,000	70%
14	EV	OR	Salem	I-5 & OR-22	500 vehicles @ 350kW	Public	$100,000	70%

Figures Provided by West Coast Collaborative Medium and Heavy-duty Alternative Fuel Infrastructure Strategic Development Plan

Hydrogen Fueling Facilities

Table 27 Proposed H2 Infrastructure Projects (Readiness Categories not Shown)

Number	Fuel Type	Proposed State	Proposed City or County	Proposed Address or Interchange	Estimated Annual Fuel Throughput / # of Vehicles the Station Would Serve	Public, Private, or Limited Access	Reported CAPEX Estimate	Funding Needed (Percentage of CAPEX)
H2-1	H2	CA	Long Beach	I-710 & I-405	N/A	Public	Not reported by participant; See Table 7 for estimated average CAPEX	20%
H2-2	H2	CA	Long Beach	1926 East Pacific Coast Highway	547,500 kg/year (12 vehicles)	Private	$10,000,000	80-85%
H2-3	H2	CA	Ontario	4325 East Guasti Road	547,500 kg/year (12 vehicles)	Public	$10,000,000	80-85%
H2-4	H2	CA	Redding	I-5 & CA-44	365,000 kg/year	Public	$4,000,000	30-100%
H2-5	H2	CA	Sacramento	N/A	N/A	N/A	Not reported by participant; See Table 7 for estimated average CAPEX	N/A
H2-6	H2	CA	Sacramento	N/A	N/A	N/A	Not reported by participant; See Table 7 for estimated average CAPEX	N/A
H2-7	H2	OR	Bend	US-97 & US-20	222,650 kg/year	Public	$4,000,000	80%
H2-8	H2	OR	Boardman	I-84 & South Main Street	222,650 kg/year	Public	$4,000,000	80%
H2-9	H2	OR	Eugene	I-5 & I-105	365,000 kg/year	Public	$4,000,000	30-100%
H2-10	H2	OR	Eugene	I-5 & OR-126	222,650 kg/year	Public	$4,000,000	80%
H2-11	H2	OR	Grants Pass	I-5 & CA-99	365,000 kg/year	Public	$4,000,000	30-100%
H2-12	H2	OR	La Grande	I-84 & OR-82	222,650 kg/year	Public	$4,000,000	80%
H2-13	H2	OR	Medford	I-5 & OR-62	222,650 kg/year	Public	$4,000,000	80%
H2-14	H2	OR	Ontario	I-84 & US-30	222,650 kg/year	Public	$4,000,000	80%
H2-15	H2	OR	Pendleton	I-84 & US-395	222,650 kg/year	Public	$4,000,000	80%
H2-16	H2	OR	Portland	I-5 & I-84	365,000 kg/year	Public	$4,000,000	30-100%
H2-17	H2	OR	Portland	I-5 & I-405	222,650 kg/year	Public	$4,000,000	80%

Figures Provided by West Coast Collaborative Medium and Heavy-duty Alternative Fuel Infrastructure Strategic Development Plan

Seeking Input/Sources for GIS Layers

Boundaries	Utilities	Infrastructure	Ports
Cities	Electric Substations	Highways	Port of Galveston
Counties	Natural Gas Storage Facilities	Planned ZEV Stations*	Port Houston
Council of Governments	Electric Power Transmission Lines	Freight-Oriented Developments	Southern Inland Port of Dallas
Ozone Non-Attainment Counties	Electric Retail Utility Service Territories	Truck Stops and Fueling Stations	International Inland Port of Dallas
Sam Houston National Forest	Natural Gas Pipelines	Evacuation Routes	Dallas-Fort Worth International Airport
Environmental Justice Data (Total Minority Pop., Low Income Pop., etc.)		Weigh Stations	
		Truck Volumes	

*Planned ZEV Stations are available from AFDC Station Locator. As of March 2021, there are no planned ZEV stations along the IH-45 ZEV Corridor.

Project Assumptions – Heavy-Duty BEVs

ZEV Transition in Class 3-6 Will Consist of BEV, as Already Near Parity to Diesel

Reference: North American Council for Freight Efficiency (NACFE) guidance report

CCS Will Become Standard Port for Heavy-Duty BEV Charging

CCS charge port

CCS (also known as J1772 combo) Uses the Same Charge Port when charging with Level 1, 2, or DC fast equipment. The only difference is that the DC fast charge connector has two additional bottom pins (as shown in image).

Imagery Provided by: https://afdc.energy.gov/fuels/electricity_infrastructure.html

Is Existing Federal Weight Exemption for NG and Electric Battery Power Trucks Enough?

May Exceed Federal Max GVW Limit for Comparable Conventional Fuel Vehicles by up to 2,000 pounds

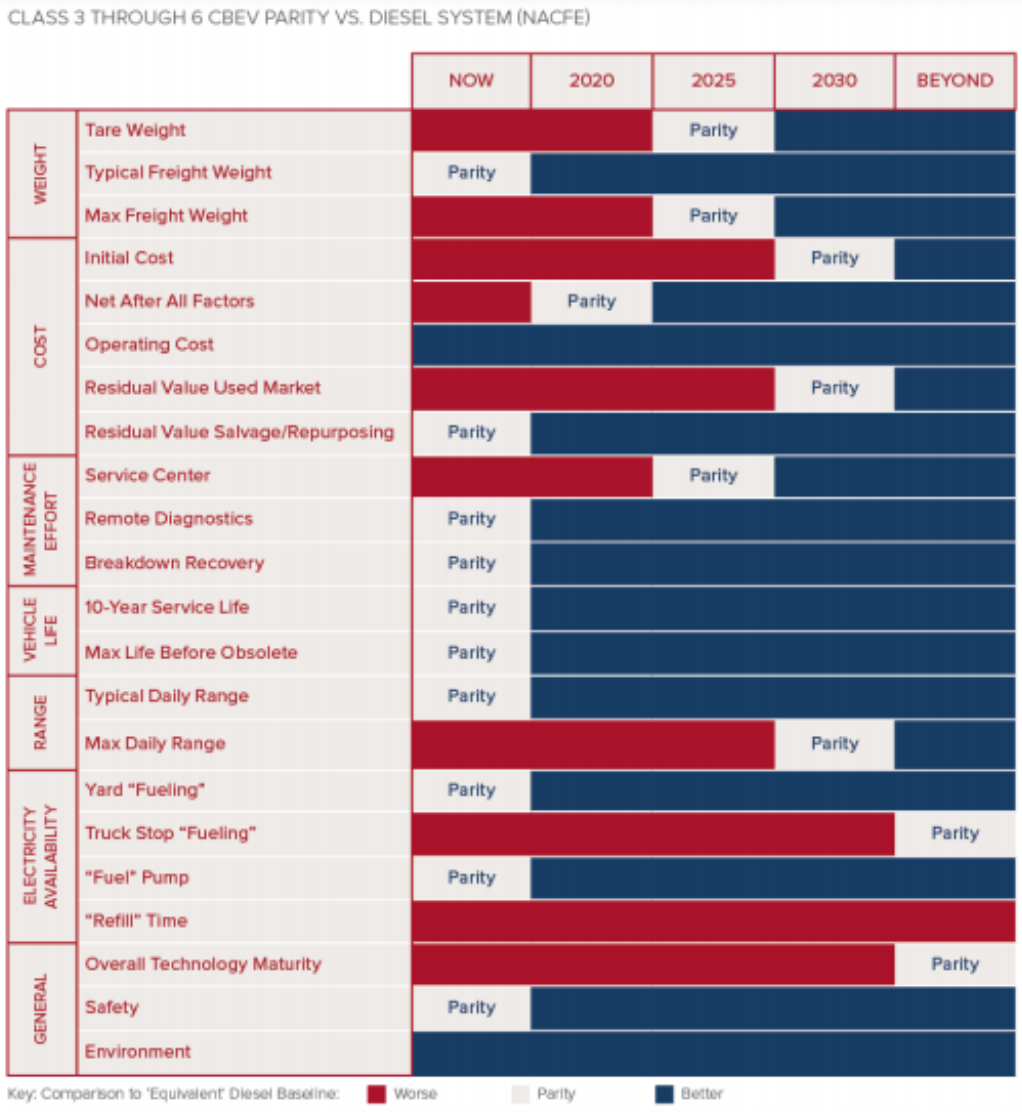
Applies to NG and Electric Battery Power Vehicles

NG and BEV must not exceed 82,000 pounds GVW Max

NG= Natural Gas

BEV Parity to Diesel

Class 3-6



Class 7-8

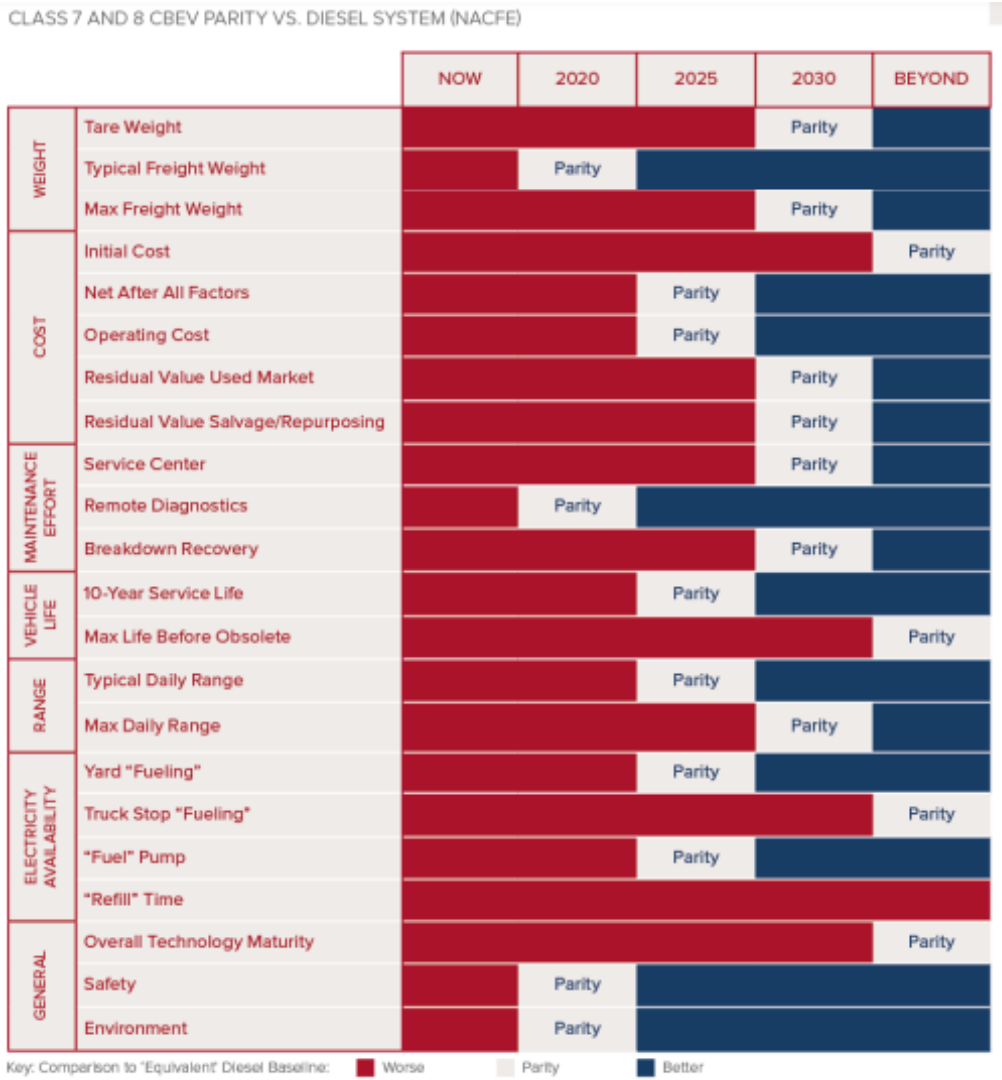


Table Provided by: [NACFE Guidance Report: Electric Trucks Where They Make Sense]

Discussion

Are there special autonomous truck considerations that are impactful?

- Middle-Mile Model
- Robo-Pumps
- Distinctive Charging/Refueling Hubs (e.g. a logo or marked spot)

What policies need to be in place in Texas to drive Fleet deployments here?

- Accommodating Utility Rates
- Renewable Power Generation

Where along IH-45 do we have significant changes in truck flows?

- TxDOT Statewide Planning Map
- Feedback on Moving North of I-20

Project Assumptions - Infrastructure

Hydrogen Stations Will Provide More Than 1 Dispenser Per Station
Hydrogen Stations Will Dispense Between 1,000-4,800 kg/Day

BEV Charging Stations Will Need to have 1 MW Peak Capacity for Heavy-Duty BEVs

Table 20 Estimated Funding Needed to Build Proposed Infrastructure Projects in This AFICC Effort [xxxii,xxxiii]

Fueling Type	Number of Sites Proposed by Outreach Participants	Average Assumptions for Each Station	Average Estimated CAPEX Per Station	Total Cost
EV	62	750kW-1MW Peak Capacity	$2,000,000	$124,000,000
H2	23	1,000-4,800 kg/Day	$6,000,000	$138,000,000
LPG	13	1,000 gallons/Day	$1,700,000	$22,100,000
CNG	36	1,695-2,260 DGE/Day	$2,000,000	$72,000,000
LNG	7	1,695-2,260 DGE/Day	$2,500,000	$17,500,000
Total	**141**			**$373,600,000**

Table Provided by West Coast Collaborative Medium and Heavy-duty Alternative Fuel Infrastructure Strategic Development Plan

Total Truck Counts Along Corridor

FHWA-Scheme F Classification	Corresponding EPA GVWR Classes for Trucks Based on TxDOT Weigh-in-Motion (WIM) Data	Average Traffic Counts (2-Way) for 8 Weigh Stations along I-45 Corridor from Dallas to Houston	Min. Counts from 8 Weigh Stations along I-45 Corridor	Max. Counts from 8 Weigh Stations along I-45 Corridor
Class 5 - Two Axle, Six Tire Single Unit	Class 3-6; 10,000-26,000 lbs. GVWR	1,952	710	4,875
Class 6 - Three Axle, Single Unit	Class 7; 26,0001 -33,000 lbs. GVWR	30	4	85
Class 7 - Four or More Axle, Single Unit				
Class 8 - Four or Less Axle, Single Trailer	Class 8a; 33,001 – 60,000 lbs. GVWR	9,364	8,015	10,485
Class 9 - 5-Axle Tractor Semitrailer				
Class 10 - Six or More Axle, Single Trailer	Class 8b; More than 60,001 lbs. GVWR	408	256	521
Class 13 - Seven or More Axle, Multi-Trailer				
	Total	11,753		

Data Provided by: TxDOT Traffic Count Database System (TCDS)

Corridor Freight Forecasts

Total Corridor Truck Freight:

591.5M Tons (62% Mode Share) in 2010 → 1.4B Tons (67% Mode Share) in 2040
Estimated 133% Increase

% of Freight Moved Between Houston and Dallas Regions:

28% in 2010 → 46% in 2040
Fraction Moving North of Dallas Forecasted to Decrease
53% Tonnage by Truck in 2010 → 68% Tonnage by Truck in 2040

Freestone County is Only Major Origin Point Between DFW and Houston Metros

Power Plant, Quarry, and Oil Well Products; Most Moved by Rail
Freight Provides Little Value to Local Economies Along Corridor Beyond Carriers' Food, Fuel, and Intermodal Expenses

Source: I-45 Freight Corridor Plan (state.tx.us)

Corridor Freight Forecasts

Table 3-12: Major Freight Commodities (I-45 Corridor Counties)

		2010		2040		
STCC2[3]	Commodity	Tons (in 000s)	Percent of Total	Tons (in 000s)	Percent of Total	Percent Change
29	Petroleum or Coal Products	158,486	17%	163,461	8%	3%
28	Chemicals or Allied Products	135,513	14%	310,887	15%	129%
50	Secondary Traffic	120,832	13%	359,070	18%	197%
14	Non-metallic Minerals	100,279	11%	209,071	10%	108%
20	Food or Kindred Products	74,989	8%	142,351	7%	90%
32	Clay, concrete, glass or Stone	68,936	7%	175,295	9%	154%
01	Farm Products	48,648	5%	99,090	5%	104%
11	Coal	43,091	5%	22,150	1%	(49%)
13	Crude Petroleum or Natural Gas	34,951	4%	65,117	3%	86%
40	Waste or Scrap Materials	23,484	2%	69,862	3%	197%
	Other	144,134	15%	426,229	21%	196%
	Total	953,343	100%	2,042,583	100%	114%

Source: TRANSEARCH® 2011

Source: I-45 Freight Corridor Plan (state.tx.us)

Seeking Input - Truck and Fuel Data Points

	% ZEV Transition to Technology by 2030	Level of Adoption by 2030	Fuel Consumption per Truck per mile	Average Annual VMT Traveled by Vehicle Category	Typical Annual Fuel Capacity per Dispenser
Battery Electric Trucks (BETs)	100% Class 3-6 (NACFE) X% Class 7-8	X%	X kWh/mi	X miles, per vehicle class	X kWh
Fuel Cell Electric Trucks (FCETs)	0% Class 3-6 X% Class 7-8	2.5% (Hydrogen Council)	X kg/mi		X kg

Along with Volume Data, Will Be Used to Calculate Estimated # Trucks in Each Technology Platform

Will Be Used to Calculate Annual Fuel Consumption

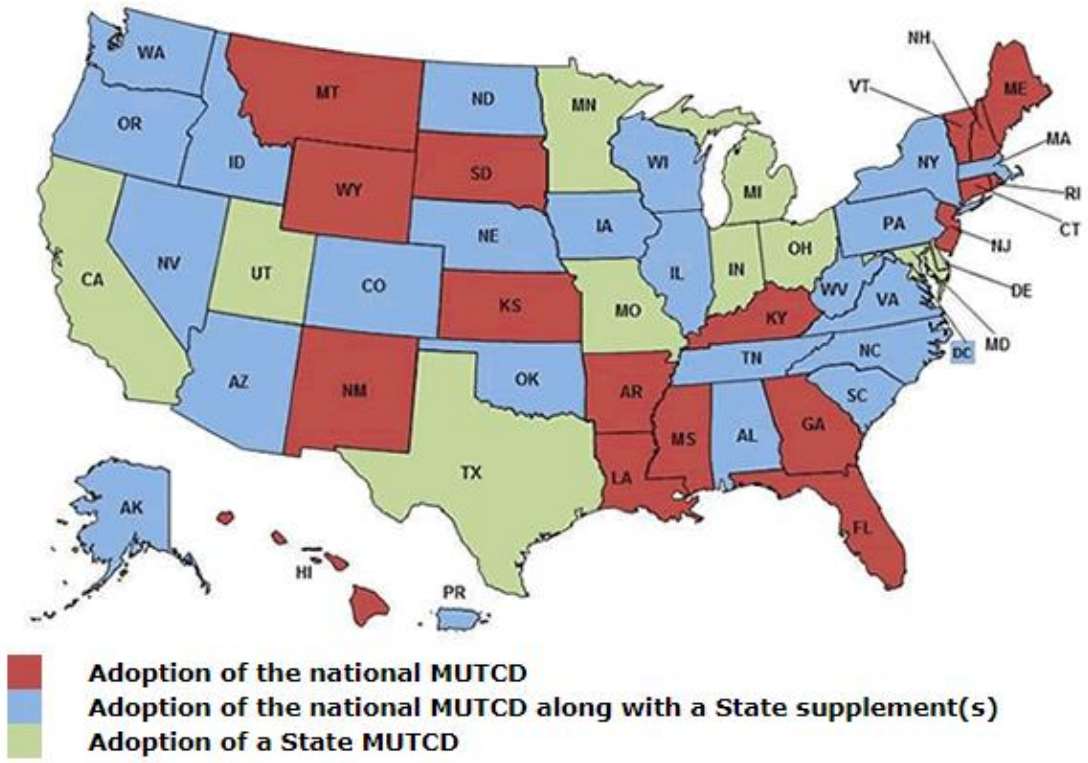
Will Be Used to Calculate # Dispensers

Items of Note

Manual On Uniform Traffic Control Devices (MUTCD)

Manual on Uniform Traffic Control Devices (MUTCD)

- States May Adopt:
  - National MUTCD
  - State Version of MUTCD (Must Be in Substantial Conformance of National MUTCD)
  - National MUTCD with State Supplement
- Applies to All Public Roads and Private Roads Open to Public Travel



Imagery Provided By FHWA

MUTCD TIMELINE

December 2009 and May 2012
Latest Edition and Revision

November 28, 2016
FHWA Revisions Related to Alternative Fuel Corridors

December 13, 2020
Current Proposed Comments Released

March 15, 2021
Current Proposed Comments Original Due Date

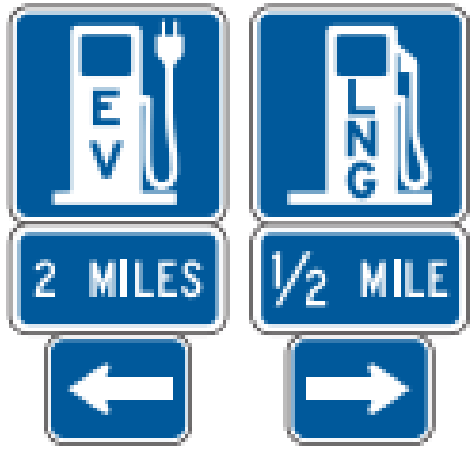
February 2, 2021
Deadline Extended

May 14, 2021
Current Proposed Comments Final Due Date

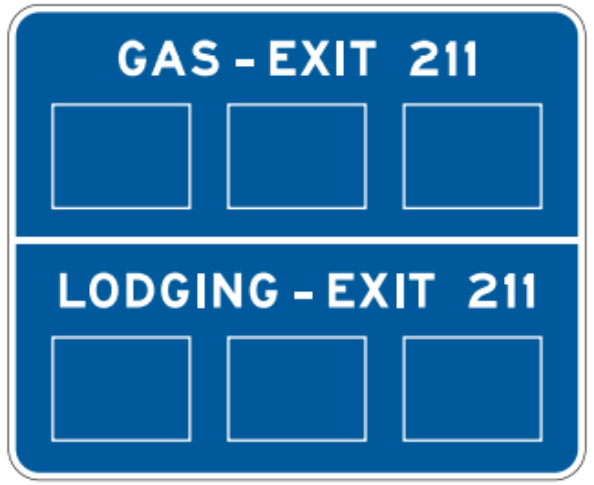
Imagery Provided By Gene Hawkins, Jr., Ph.D., P.E.
https://ceprofs.civil.tamu.edu/ghawkins/MUTCD-History.htm

Alternative Fuel Highway and Exit Signage

Alternative Fuel Corridor Signage (Section 2H.14)



General Services Signage (Section 2I)



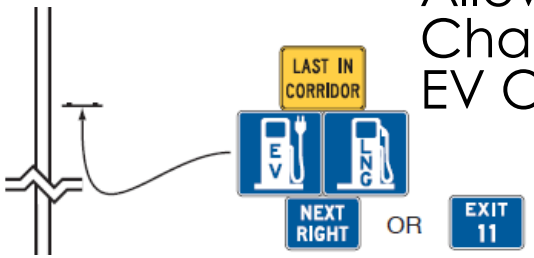
Specific Services Signage (Section 2J)

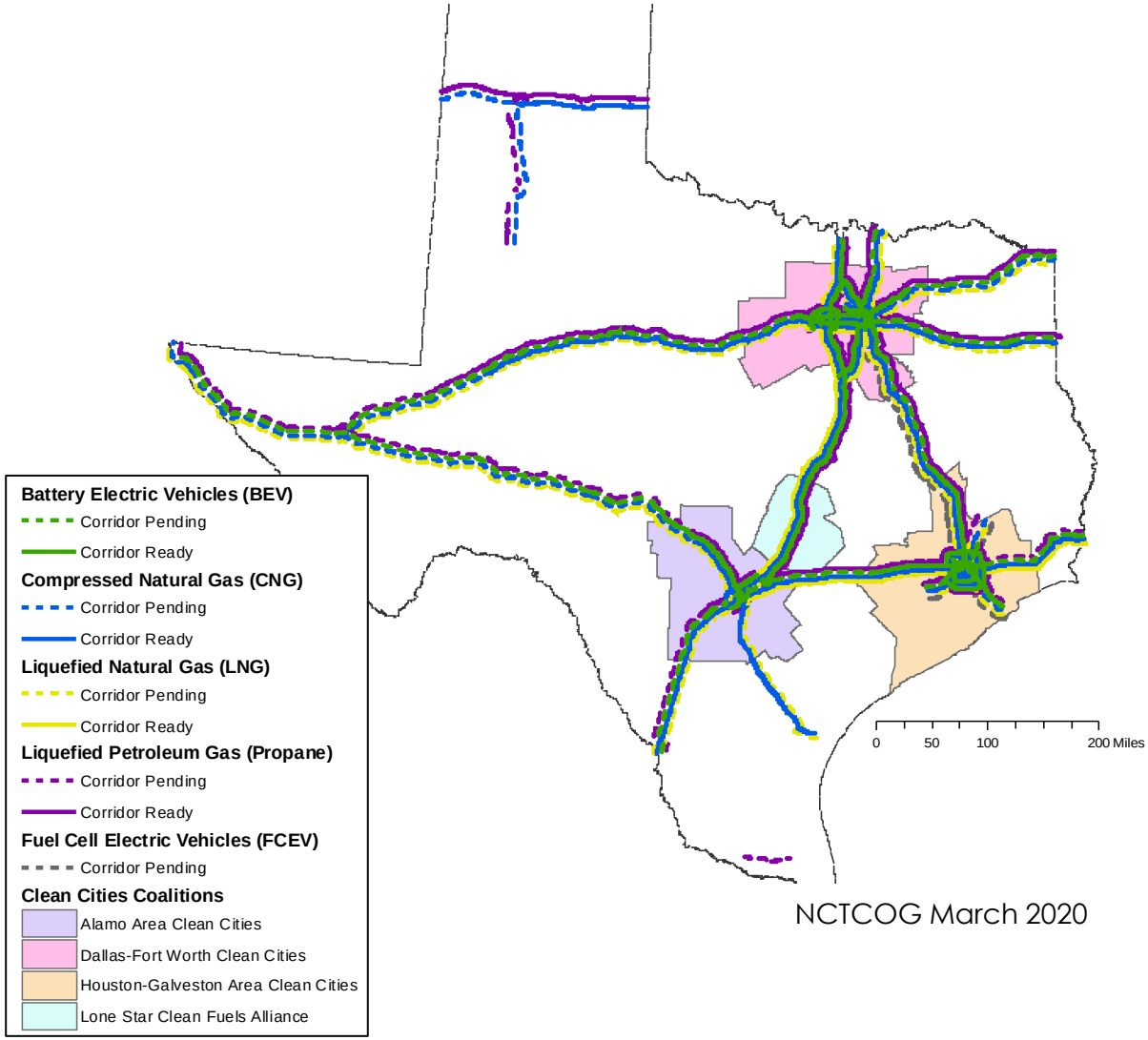
Alternative Fuel Corridor Signage

(New - Section 2H.14 and Examples from Figure 2H-10)

PROPOSED PLACEMENT

- ☑ Standard: Only Along FHWA-Designated Corridor-Ready Highways in a Sign Assembly
- ☑ Standard: One At/Near Beginning of Corridor
- ? Option: Additional Placement Beyond Major Interchanges; Allowed to Communicate Changes in Fuel Mix (e.g. End of EV Only)





NCTCOG March 2020

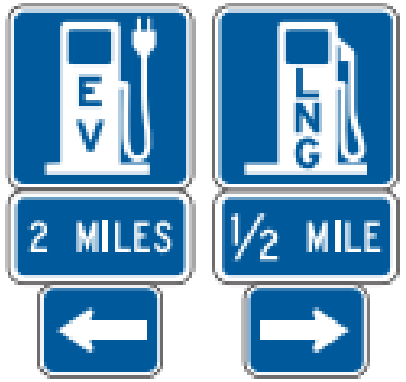
General Services Signage
(Section 2I and Examples from Figure 2I-1)

☑ Placed At Exits Where Posted Service is Available

? **Existing Guidance (Proposed Changes in Strike-Through)**

Gas, Diesel~~, LP Gas, EV Charging,~~ and/or ~~other~~ alternative fuels if all the following are available:

1. Vehicle services such as gas, oil, and water;
2. Modern sanitary facilities and drinking water
3. Continuous operations at least 16 hours/day, 7 days/week; and
4. Public telephone



☑ **New Support and Option Statements Added that Acknowledge that Motorist Expectations and Criteria for Alternative Fuel Facilities May be Different**

Specific Services Signage
(Section 2J and Examples from Figure 2I-1)

☑ Proposes **Standard** that a State Shall have a Statewide Policy

? Proposes **Guidance**: To Quality for Placement on a "GAS" Business Identification Sign, Must Offer:

1. Gasoline, Oil, and Water;
2. Continuous Operation at Least 16 Hours/Day, 7 Days/Week or 12 Hours/Day, 7 Days/Week Depending on Roadway Type
3. Modern Sanitary Facilities and Drinking Water
4. Public Phone

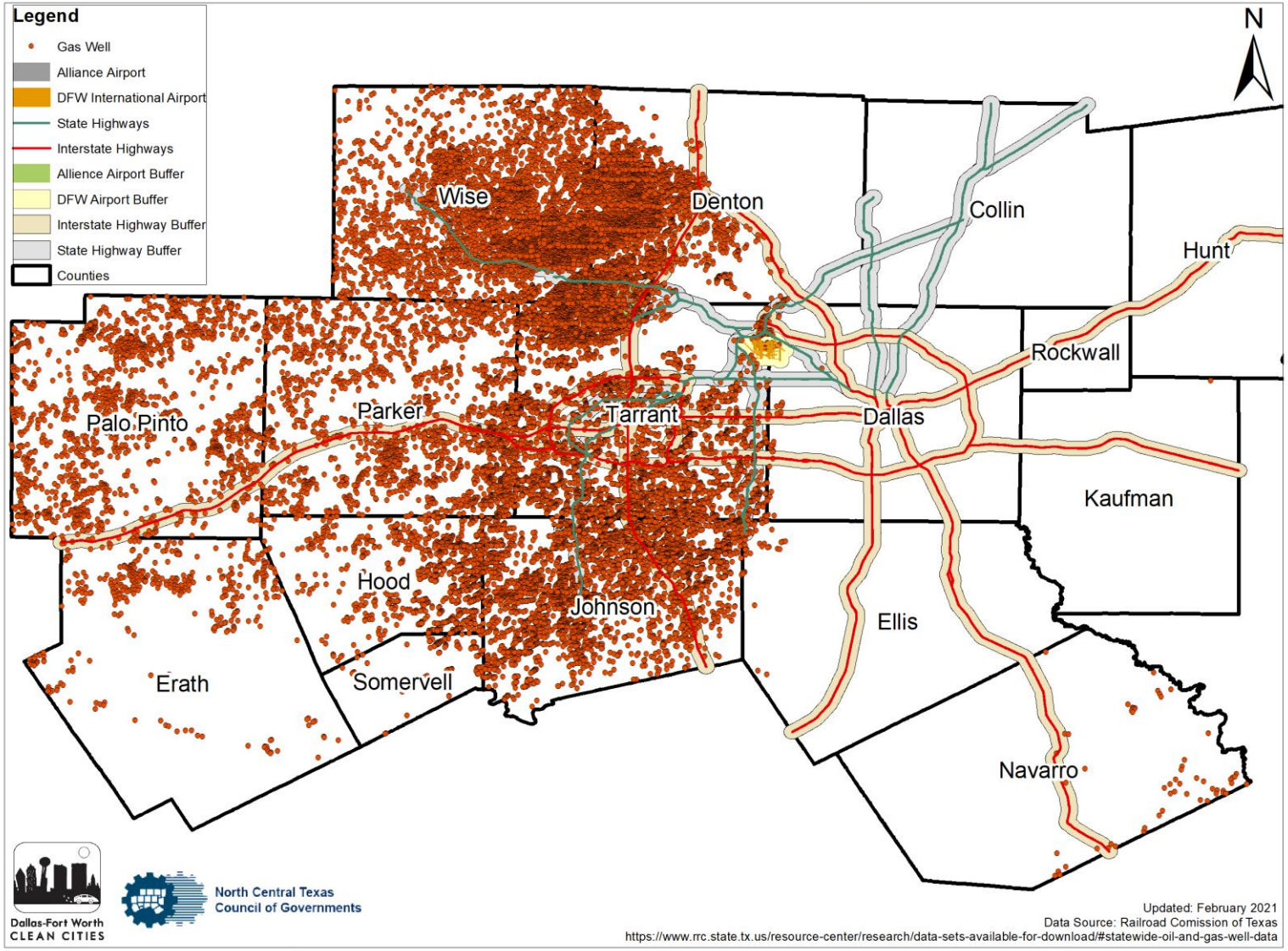
? Proposes **Standard**: Alternative Fuel Facilities that do not Offer Gasoline Shall Not be Signed Using GAS Signs

☒ Proposes **Option**: Supplemental Message for Alternative Fuel Availability May Only be Added to GAS Signs for Gasoline Facilities that Also Provide Alternative Fuels

Imagery Provided by Alabama Clean Fuels

Other Items

Gas Wells with Select Roadways



Interstate/Highway	Number of wells within a 1-mile buffer
IH-20	513
IH-30	271
IH-35E	49
IH-35W	806
IH-35	48
IH-45	8
Loop 635	36
Loop 820	369
State Highway 114	679
State Highway 121	543
State Highway 170	96
Alliance Airport	137
DFW Airport	44

Items of Note – Federal Actions

Growing Renewable Energy and Efficiency Now (GREEN) ACT – Reintroduced by US House of Representatives Committee on Ways and Means

- Supports widespread adoption of zero-emission cars, vans, and buses through tax credits for purchasing vehicles and supporting deployment of publicly accessible EV charging
- Expands investment tax credit to provides an additional uncapped 20% tax credit (latest version includes hydrogen in addition to EV charging)

Webinars

June 9 - Opportunities for Renewable Hydrogen Production Using RNG (BayoTech)

Department of Energy (DOE) Webinar

DOE's Request for Information (RFI) in Support of Medium- and Heavy-Duty Truck Research & Development Key Findings Webinar – Presentation and Recording Now Available

- Webinar held in Dec. 2020 to discuss key findings from the RFI regarding the Medium- and Heavy-Duty Truck Research and Development Activities & SuperTruck Initiative.
- Gathered Input from Industry, Academia, Research Laboratories, and Government Agencies on Issues related to Medium- and Heavy-Duty Freight Trucking.
- RFI and discussions will help identify gaps and barriers to commercializing new technologies and help inform DOE's R&D and competitive funding strategy into the next ten years.

Items of Note

Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE)
Released 3 Notices of Intent; Funding Opportunities Expected within ~1 Month:

SuperTruck3	Low Greenhouse Gas Vehicle Technologies Research, Development, and Deployment	Bioenergy Technologies Office Scale-Up and Conversion
Projects to develop medium- and heavy-duty vehicles with higher efficiency and lower emissions such as: • Powertrain electrification (including hydrogen and fuel cell, batteries, and electric drive systems) • Refueling or charging alternatives • Biofuels and related technology • Vehicle light-weighting • Systems optimization	Supports projects to increase efficiency and reduce emissions through: • EV charging community partner projects and workplace charging • Reduced cost of DC fast charging • Increased efficiency and electrification of off-road vehicles • Advanced engines and fuels that reduce emissions such as natural gas and propane	Will fund projects to enable innovation of low carbon biofuels such as: • Scale-up of biotechnologies • Affordable, clean cellulosic sugars for high yield conversion • Separations to enable biomass conversion • Residential wood heaters • Renewable natural gas

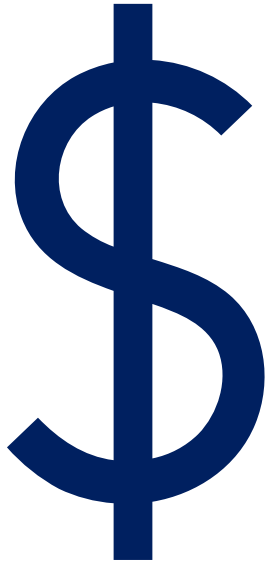
Items of Note

NACFE High-Potential Regions for Electric Truck Deployments Report:

Texas Triangle is behind California as one of the highest potential regions for BEV truck deployment but an extra push in the form of policies is needed.

- Did Not Consider TERP as Incentive Program (Only VW Funding)
- Considered Income Tax Credits for Incentives- Texas Does Not Have Income Tax
- Did Consider Utility Funding as Funding Availability
  - Texas operates differently and utilities are restricted from funding activities that increase grid demand.
  - Ability to work with utilities is a factor fleets consider on where to deploy EV trucks.
- Considered Polices Such as Advanced Clean Truck Rule and NESCAUM Multi-State Medium- and Heavy-Duty Zero Emission Vehicle MOU Supporting Truck Electrification

ZEV Incentives



Volkswagen Environmental Mitigation Program Level 2 Charging Infrastructure

Funds: Up to $2,500, Not to exceed 70% Funding per Activity

Deadline: First-Come, First-Served Until **August 11, 2021**

North Texas Emissions Reduction Project & Clean Fleets North Texas

Funds: Up to 45% Funding to Replace Diesel Trucks with Electric Trucks
**Includes charging pedestal and installation cost, one per purchased vehicle*

Deadline: **April 9, 2021**

TERP Government Alternative Fuel Fleet (GAFF) Program Coming Soon!

Funds: Up to $70,000 for the Purchase or Lease of Eligible Vehicles

Webinar: **April 21, 2021** at **1 PM CT**; Email terp@tceq.texas.gov to RSVP

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

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www.dfwcleancities.org/altfuelcorridors
www.nctcog.org/IH45-ZEV

North Central Texas Council of Governments

Dallas-Fort Worth CLEAN CITIES