



Alternative Fuel Corridors and Signage

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#WeTheStates

EV CHARGING CORRIDORS

FHWA ALTERNATIVE FUEL CORRIDORS & SIGNAGE

TONIA BUELL, PROJECT DEVELOPMENT MANAGER
NGA Transportation Electrification Workshop, West Regional
Seattle, WA
April 5, 2019

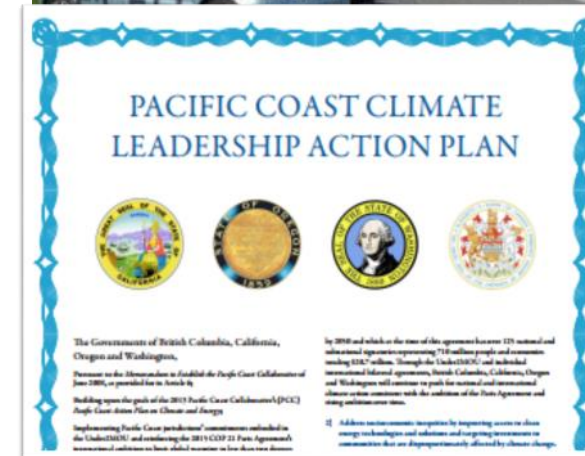
TODAY'S HIGHLIGHTS

- EV Charging Corridors
 - West Coast Electric Highway
 - Electrify America Corridor Charging Investments
 - Regional Electric Vehicle West (REV West)
- FHWA National Alternative Fuel Corridors and Signage



PROMOTING CLEAN FUELS BC TO BC

- Promotes petroleum reduction and sustainable transportation solutions on I-5 / Hwy 99 corridor
- Provides travelers with alternative fuel infrastructure
 - CNG
 - Hydrogen
 - Biodiesel
 - Electricity
- Green Highway from British Columbia, Canada to Baja California, Mexico “BC to BC”
- West Coast States, Province, and Cities



HIGHWAY CORRIDOR CHARGING



Accelerating EV adoption by promoting robust charging corridors.

Connecting Communities and Enabling Long Distance Travel

Seamless EV Driver Experience

- Equipment Specifications
- Highway Signs
- Branding and Marketing

I-5, Hwy 99, US 101, and other major highway corridors

Common vision, patchwork of funding and projects

www.westcoastgreenhighway.com

STATE FUNDS ENCOURAGE INVESTMENT IN DC FAST CHARGING



WEST COAST
ELECTRIC
HIGHWAY

ELECTRIC VEHICLE INFRASTRUCTURE PARTNERSHIP PROGRAM (EVIPP)



- Washington's Electric Vehicle Infrastructure Pilot Program uses a portion of the annual electric vehicle registration fee to provide matching grants.
- \$1M in state funding used to encourage private sector investment for 15 new locations totaling \$2.5M in investments.

www.wsdot.wa.gov/funding/partners/evib

EVIPP STATION REQUIREMENTS

Projects shall provide safe, convenient, cost-competitive, reliable, and easy access for drivers to recharge mass-produced plug in electric vehicles.

Locations

- Priority corridors include Interstate 5, U.S. Highway 2, Interstate 90, U.S. Highway 101, Interstate 82, U.S. Highway 395, and roadways connecting midsize communities and major tourist destinations
- Located every 40-50 miles along the corridor within a half mile (max 3 miles) from a highway interchange

Sites and Equipment

- Each site must include CHAdeMO and SAE Combo System Charging (CCS) DC fast charging capabilities (50kW) and Level 2 Electric Vehicle Supply Equipment (EVSE)
- All stations must be certified, stationary, connected to the grid, and networked
- Multiple charging/parking stalls, stubbed out with conduit and power access sufficient to accommodate future 150kW DC fast charging

Electric Vehicle Infrastructure Pilot Program (EVIPP)

ENERGY NORTHWEST / EVITA



Planned Locations:

- Cle Elum (OPEN)
- Connell (OPEN)
- Ellensburg (OPEN)
- Kennewick (OPEN)
- Moses Lake
- Pasco (OPEN)
- Prosser
- Richland
- Yakima (OPEN)

Linking Eastern and Western Washington

Project Lead: Energy Northwest on behalf of Electric Vehicle Infrastructure Transportation Alliance (EVITA)

In collaboration with Greenlots and EV4

\$405,000 EVIPP Grants

\$1,071,000 Total Projects

- Provides network of DC fast chargers in 9 communities along I-82, US 395, and I-90
- Bridges the charging gap between Tri-Cities and I-90 to both the west and north-east of Tri-Cities.



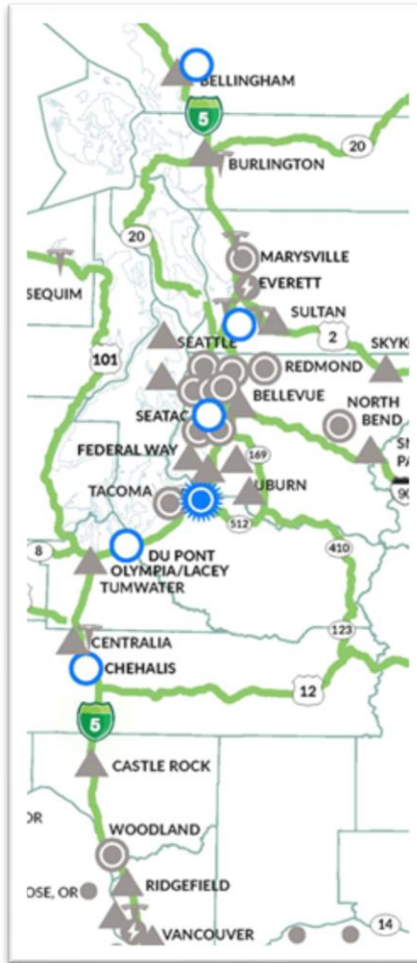
Electric Vehicle Infrastructure Pilot Program (EVIPP)

ENERGY NORTHWEST / EVITA



Electric Vehicle Infrastructure Pilot Program (EVIPP)

FORTH



I-5 Corridor Project

Project Lead: FORTH

In collaboration with EVgo

\$595,000 EVIPP Grant

\$1,461,689 Total Project

- Bolsters existing fast charging infrastructure along I-5 by providing 9 DC fast charging stations in 6 communities.
- Fills in gaps and provides redundancy

Planned Locations:

- Bellingham x2 DCFC (April 6)
- Lynnwood
- SeaTac x2 DCFC
- Tacoma x2 DCFC (OPEN)
- DuPont
- Chehalis



Electric Vehicle Infrastructure Pilot Program (EVIPP)

FORTH



INNOVATIVE PARTNERSHIPS

Public-Private Partnerships with electric utilities, nonprofits, businesses, federal/state/city governments, car manufacturers and dealers, researchers, associations, EVSE providers, and host site businesses.



SIGNAGE IS STATE LAW

Roadway Directional Signs

State Highways, Local Roads, City Streets



D9-11b (alternate) EV Charging Station Symbol



British Columbia

Regulatory Signs & Striping

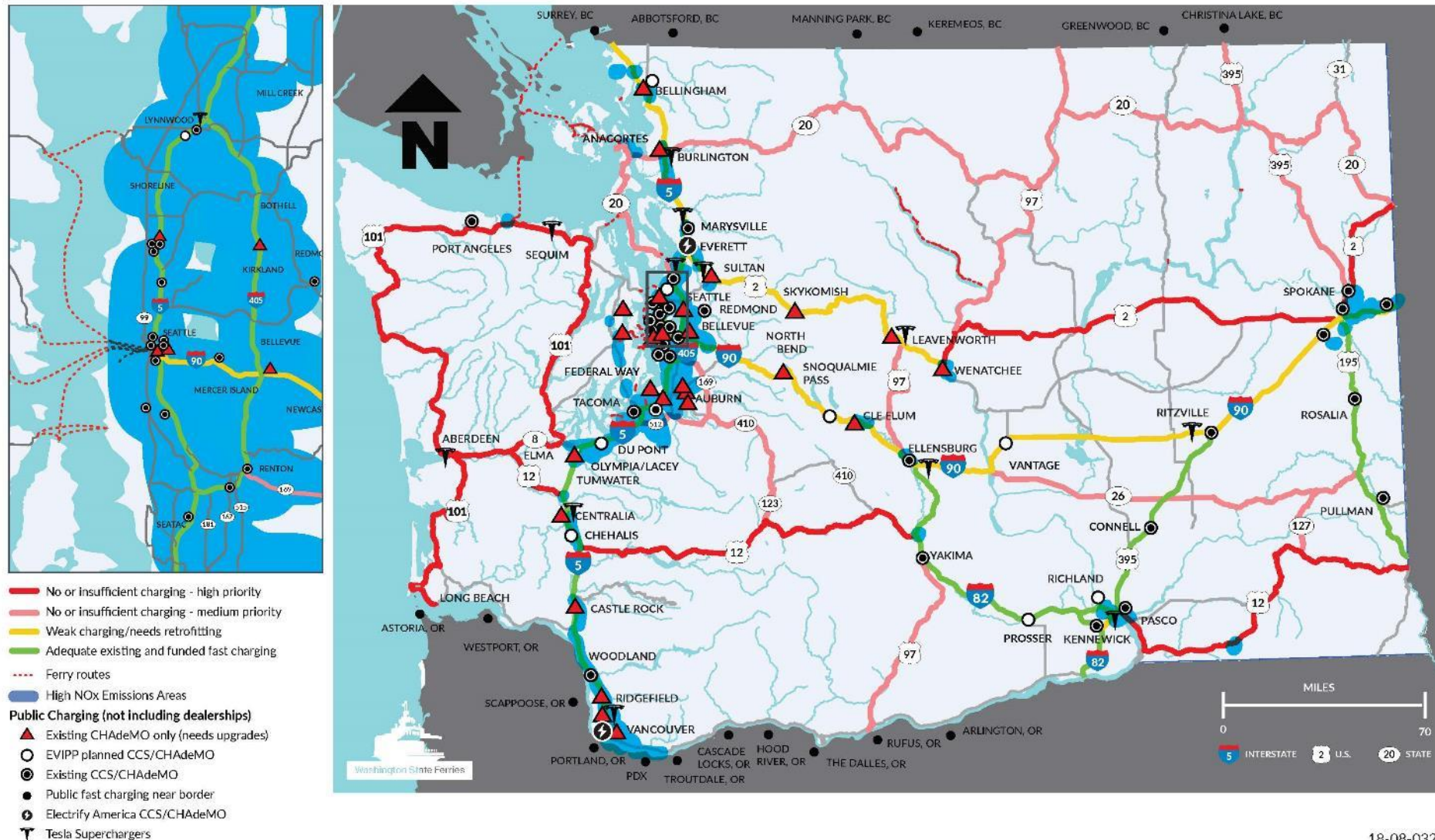
"No Parking Except Electric Vehicle Charging"



Washington state law "de-ICEing bill" (SB 5849)

Source: www.westcoastgreenhighway.com/evsigns.htm

WA HIGHWAY CORRIDOR GAP MAP



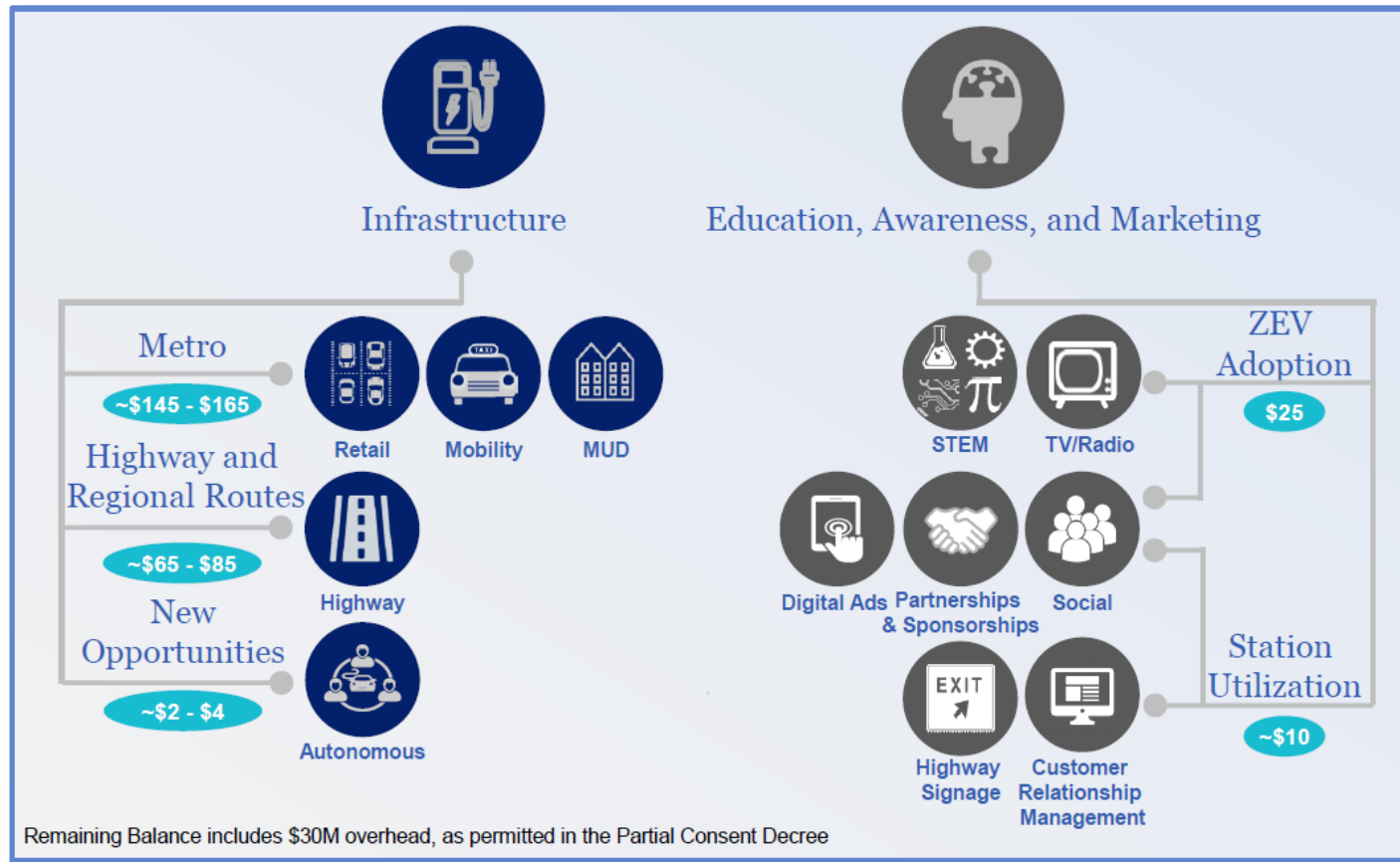
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ELECTRIFY AMERICA PLANS



Cycle 2 National ZEV Investment Plan: July 2019 – December 2021

\$300M nationally to increase ZEV adoption



Source: <https://www.electrifyamerica.com/our-plan>

ELECTRIFY AMERICA PLANS



Cycle 2 National ZEV Investment Plan: July 2019 – December 2021

Routes in the Pacific Northwest support travel to key destinations

Cycle 1 Corridors:

- WA/OR I-5
- WA I-90
- OR I-84

Cycle 2 Corridors:

- WA I-5
- WA US 101
- WA 12/8
- OR 26/29

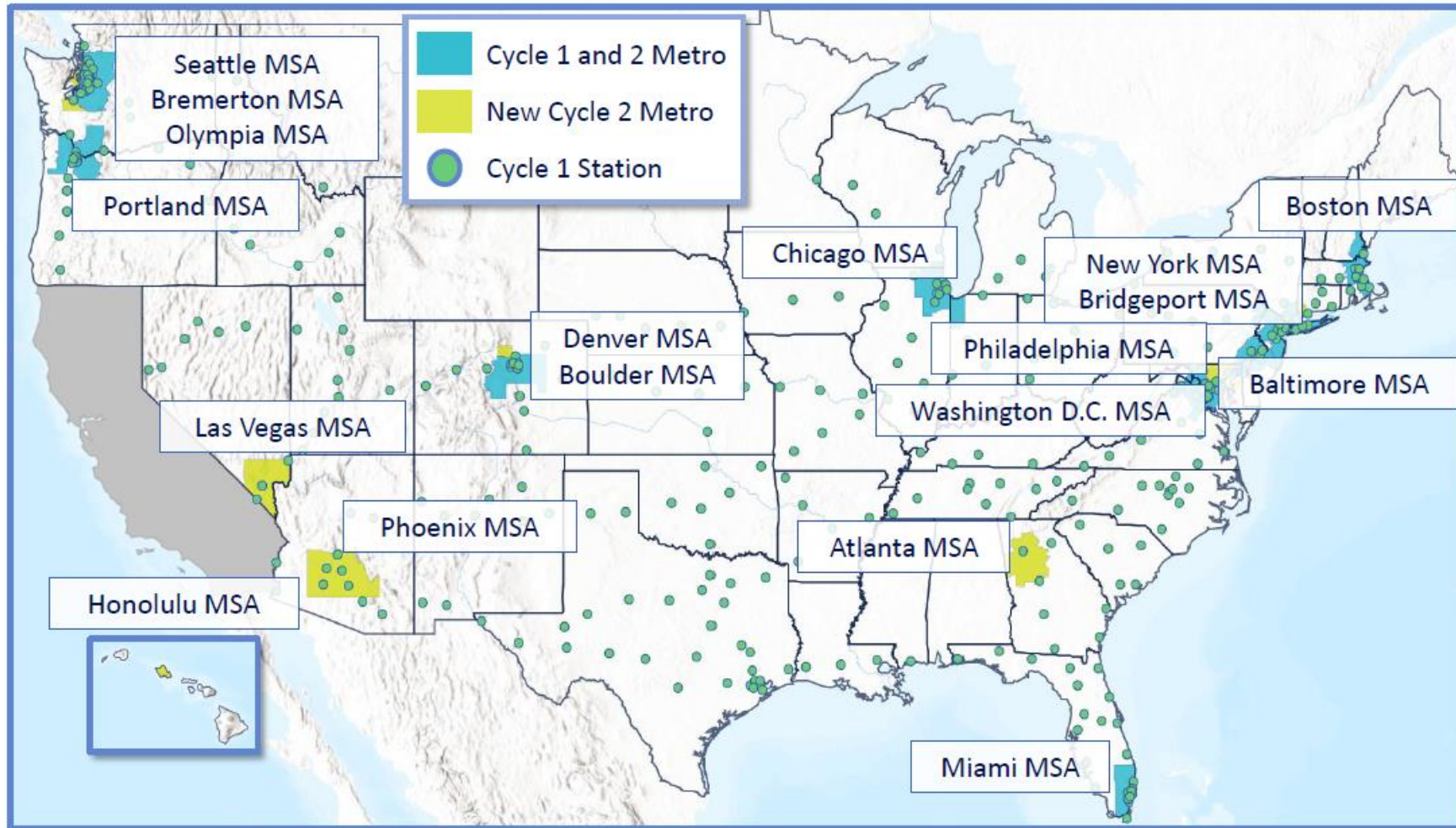


Source: <https://www.electrifyamerica.com/our-plan>

ELECTRIFY AMERICA PLANS



Cycle 2 National ZEV Investment Plan: July 2019 – December 2021



Source: <https://www.electrifyamerica.com/our-plan>

Regional Electric Vehicle West (REV West)

- Signed by 8 Western Governors
 - CO, UT, NV, WY, NM, AZ, ID, MT
- Establishes a framework for collaboration on an Intermountain West Electric Corridor.
- Develop best practices/voluntary minimum standards for stations, expand access to new EVs, and create consistent driver experience.

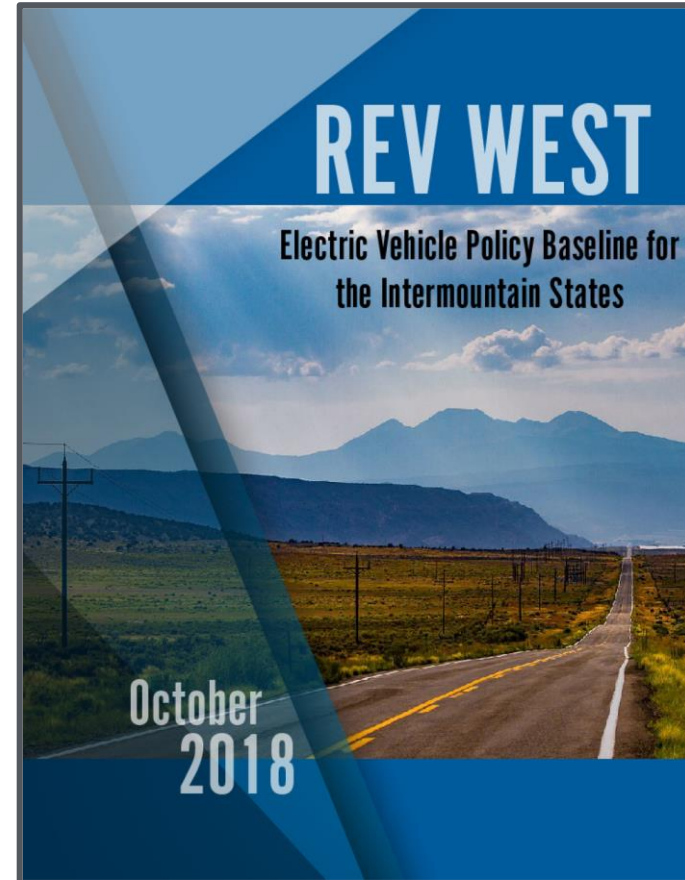
Intermountain West EV Corridor



REV West: Policy Baseline

Other updates:

- The Regional Electric Vehicle West (REV West) states released a policy baseline as a foundation to develop and coordinate best practices and infrastructure investment.
- REV West states released an RFI to assist in development of voluntary minimum guidelines for station development. States are currently working to finalize standards.
- CDOT updated its signing policy and guide for informational highway exit signing of DCFC that meet the same minimum criteria of gasoline and other fueling stations.



WEST REGIONAL EV CORRIDORS





Alternative Fuel Corridors

NATIONAL GOVERNORS ASSOCIATION

TRANSPORTATION ELECTRIFICATION WORKSHOP

APRIL 4 & 5, 2019

SEATTLE, WA

DIANE TURCHETTA | U.S. DEPARTMENT OF TRANSPORTATION

 U.S. Department of Transportation
Federal Highway Administration

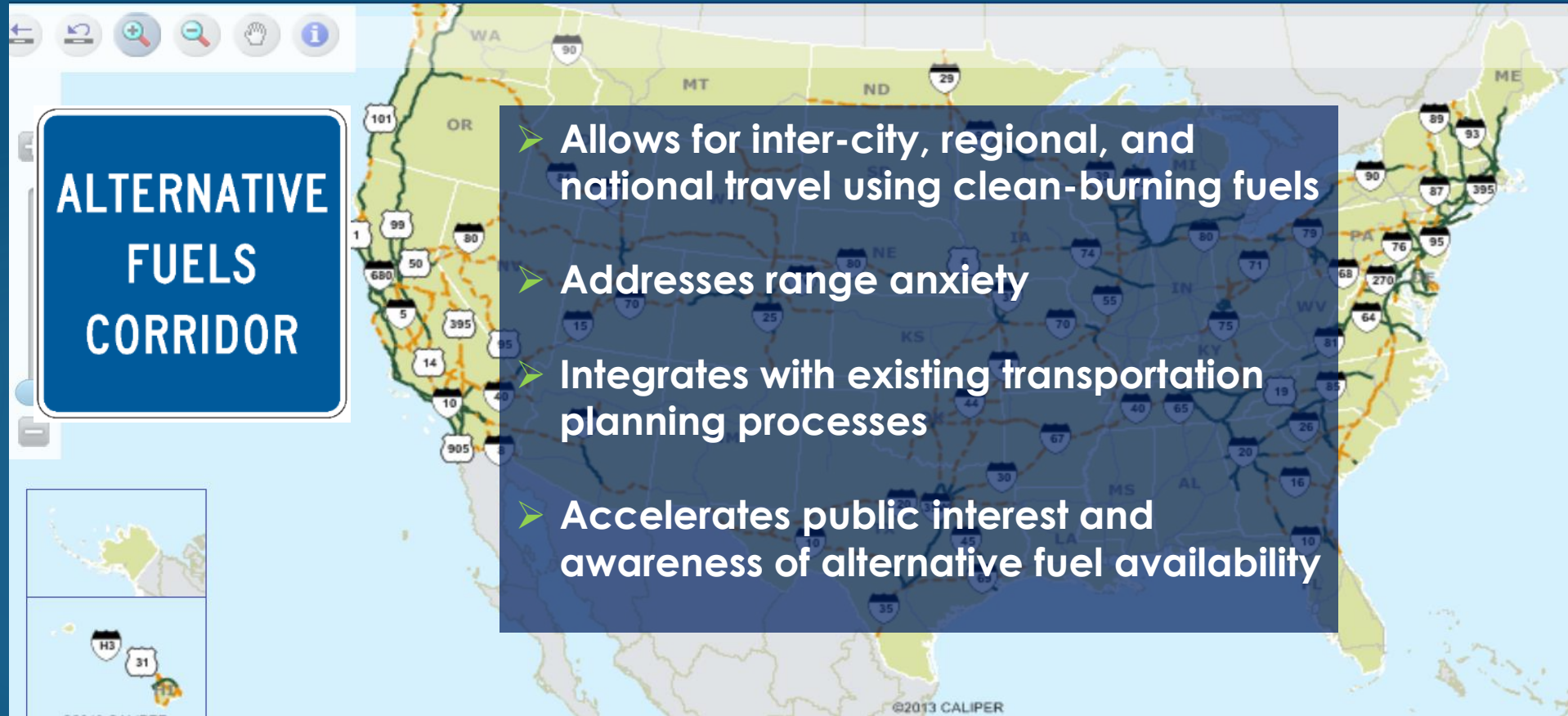
National Alternative Fuel Corridors



To improve the mobility of alternative fuel vehicles, the U.S. Department of Transportation (DOT) has designated national corridors in strategic locations along major highways for:

- ▶ Plug-in electric vehicle charging
- ▶ Hydrogen fueling
- ▶ Propane (LPG) fueling
- ▶ Natural gas (CNG, LNG) fueling

Benefits of a National System



Corridor-Ready Criteria

24

EV	CNG	LNG	Hydrogen	Propane
DCFC only	150 miles between stations	200 miles between stations	100 miles between stations	150 miles between stations
50 miles between stations	5 miles from highway			5 miles from highway
5 miles from highway	Public stations only	5 miles from highway	5 miles from highway	Public stations only
Public stations only (no Tesla)	Fast fill, 3,600 psi	Public stations only	Public stations only	Primary stations only

Highway Signage

➤ MUTCD Memorandum – Signing for Designated Corridors

- ✓ Provides guidance to State DOTs
- ✓ First corridor signs installed on I-94 and I-26
- ✓ FHWA developed FAQs to address commonly asked questions (see AFC website)

I-94 (Minnesota)



Pictured from left, Louisiana Department of Natural Resources Secretary Tom Harris, Louisiana Department of Transportation and Development (DOTD) Secretary Shawn Wilson, Gov. John Bel Edwards and [#LDEQ](#) Secretary Chuck Carr Brown.



I-26 (South Carolina)

Combined Results Rounds 1&2

- Designations....
 - ✓ **58** nominations
 - ✓ Includes portions/segments of **84** Interstates, along with **43** US highways/state roads
 - ✓ Comprise **44 states plus D.C.**
 - ✓ Covers **over 100,000** miles of the National Highway System (all fuels combined)

FY 2018 Request for Nominations

- Round 3 request for nominations - October 2018
- Distributed through FHWA Division Offices
- Nominations due the end of January 2019
- Designations made in spring 2019
- No change in designation criteria
- Some changes in shapefile submissions

**ALTERNATIVE
FUELS
CORRIDOR**

Federal Highway Administration Regional Alternative Fuel Corridor Convenings

- ▶ Team to hold 5 regional convenings:
 - ▶ To Date: Midwest (MN), Southeast (SC)
 - ▶ Next Up: South Central (TX) Northeast/Mid-Atlantic (RI) and REV West (Salt Lake City)
- ▶ Strengthen coordination b/w states, public and private partners
- ▶ Evaluate regional priorities & needs, programs, and resources to expand corridors
- ▶ Identify critical infrastructure gaps
- ▶ Discuss a regional strategy to promote clean vehicle adoption and corridor growth
- ▶ Foster partnership development

2 Regional Convenings to Date

Midwest AFC
St. Paul, MN
June 12, 2018

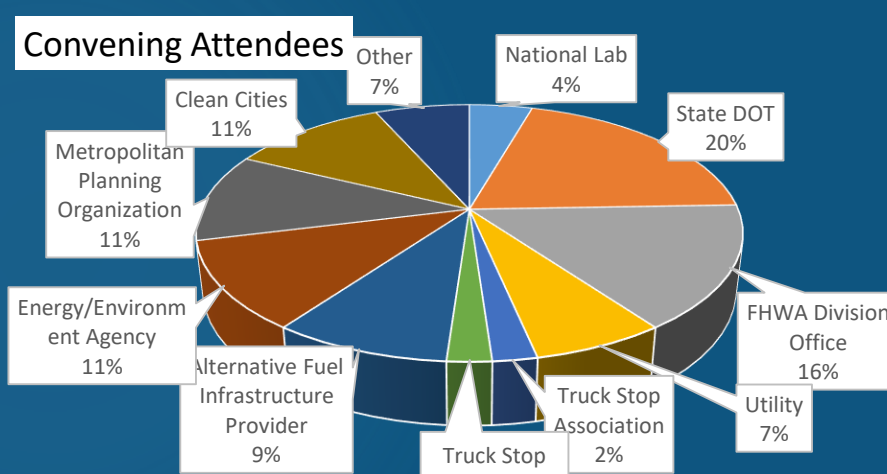


Southeast AFC
Charleston, SC
September 25, 2018

Convening Results

MIDWEST – St. Paul, MN (June 12, 2018)

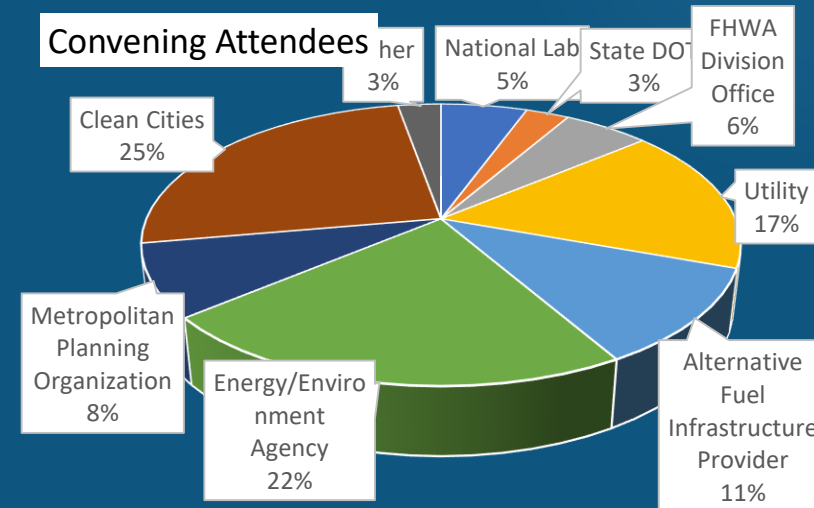
- ▶ 9 States: ND, SD, MN, WI, MI, OH, IL, IN, IA
- ▶ 52 stakeholders
- ▶ Fuels of Interest: EV, CNG and H2
- ▶ # of Designated Corridors: 26 (SD none)



SOUTHEAST – Charleston, SC

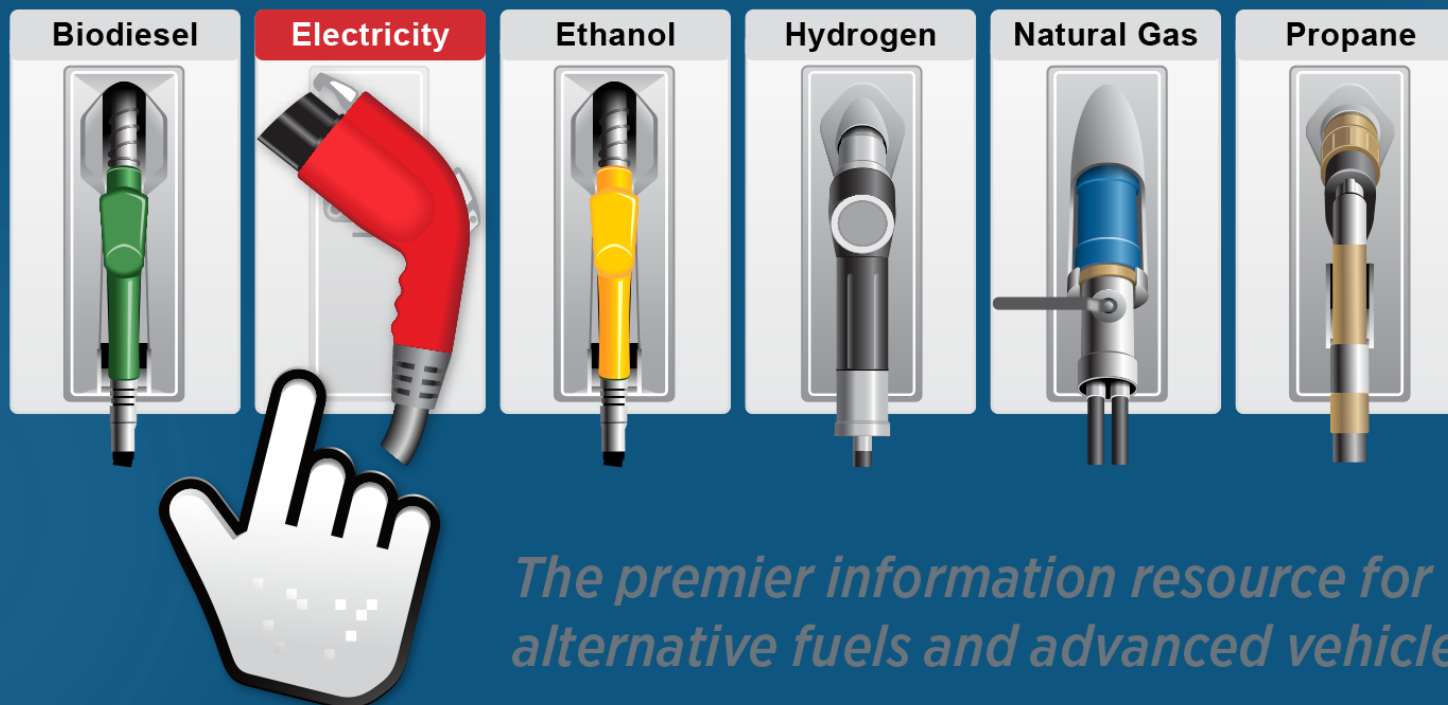
(Sept. 25, 2018)

- ▶ 8 States: KY, TN, NC, SC, AL, MS, GA, & FL
- ▶ 45 stakeholders
- ▶ Fuels of Interest: EV, CNG, LNG and LPG
- ▶ # of Designated Corridors: 30 (MS none)



Alternative Fuels Data Center

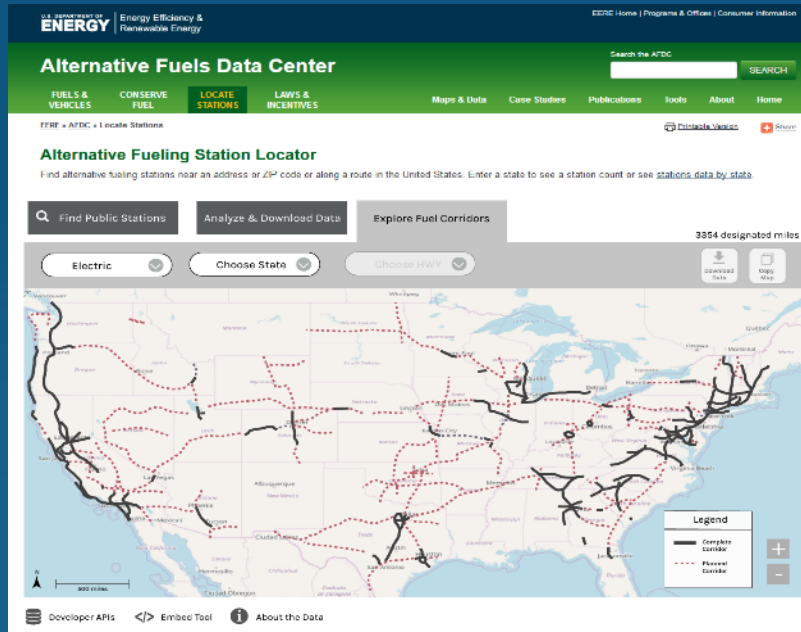
afdc.energy.gov



*The premier information resource for
alternative fuels and advanced vehicles*

Embeddable Application

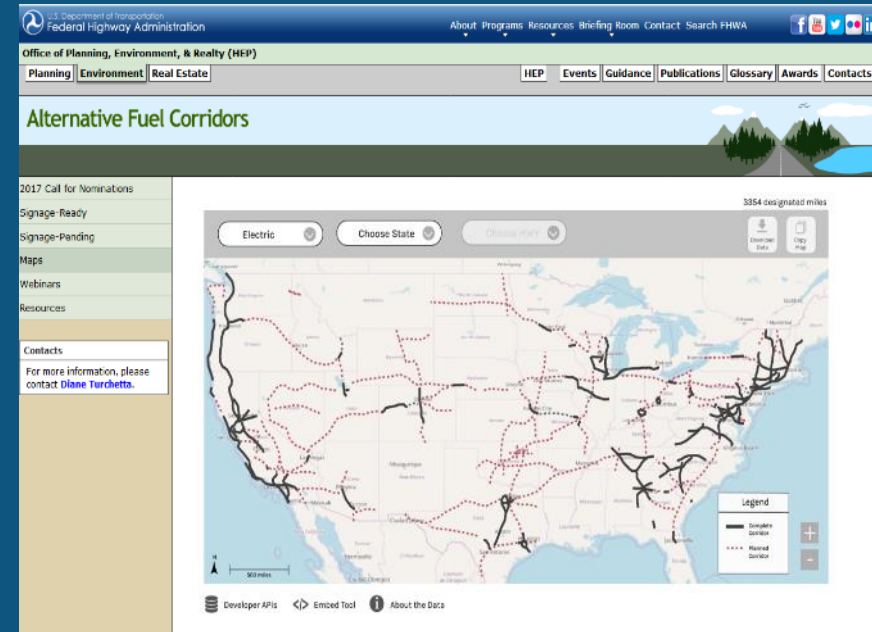
afdc.energy.gov/corridors



1

Alternative Fuels Data Center

The corridor mapping tool will be available as a third tab on the Alternative Fueling Station Locator.



2

Federal Highway Administration

The corridor mapping tool can be embedded as a standalone application on the FHWA website or any other website.

Resources for Nominating Corridors

afdc.energy.gov/corridors

Alternative Fuels Data Center

Search the AFDC

SEARCH

FUELS & VEHICLES

CONSERVE FUEL

LOCATE STATIONS

LAWS & INCENTIVES

Map & Data

Case Studies

Publications

Tools

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Station Data for Nominating Alternative Fuel Corridors

The table below provides station data and shapefiles by state and fuel type. These datasets include public stations with the following filters applied to meet the criteria for nominating alternative fuel corridors:

- **EV charging** – only DC fast electric vehicle (EV) charging stations, excluding Tesla
- **Hydrogen** – only retail stations (Non-retail stations may be used in corridor nominations if the stations are compliant with SAE J2601 standards and meet all of the criteria for a hydrogen corridor.)
- **Propane** – only “primary” liquefied petroleum gas (LPG) stations, which have fuel for vehicles and vehicle-specific fueling services that are consistently offered during business hours
- **CNG** – only fast-fill compressed natural gas (CNG) stations that offer a fill pressure of 3,600 psi
- **LNG** – all liquefied natural gas (LNG) stations
































The data downloads are CSVs with current station data pulled automatically from the [Alternative Fueling Station Locator](#). The shapefiles are ZIP downloads with a static snapshot of the stations as of Sept. 5, 2018, including stations outside state borders within 25 miles.

Learn more about corridor designations from the [Federal Highway Administration](#).

Explore Potential Corridors

Use the prototype mapping tool to explore potential corridors by fuel:

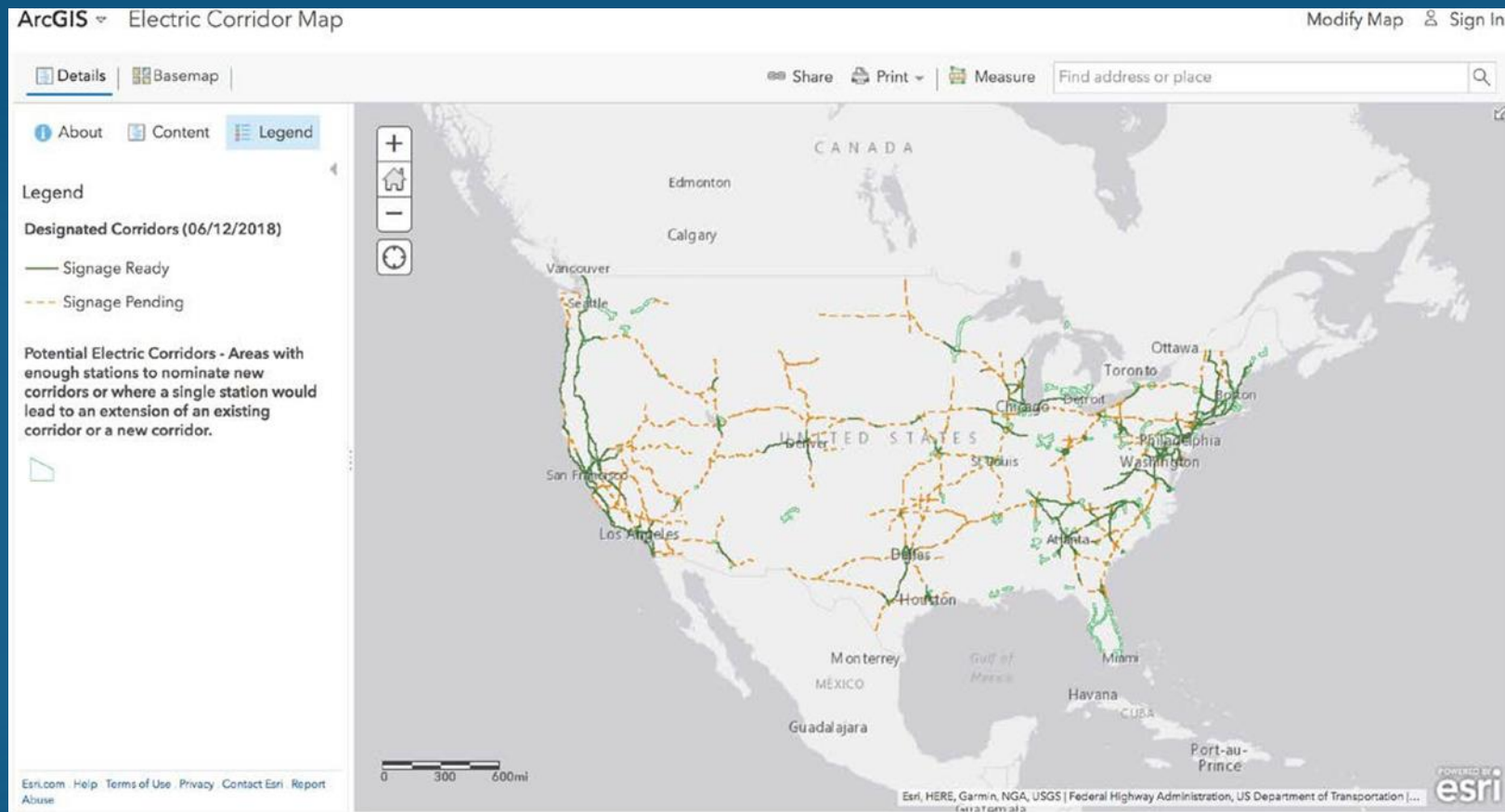
- EV charging
- Hydrogen
- Propane
- CNG
- LNG

Stations by State and Fuel Type					
State	EV Charging	Hydrogen	Propane	CNG	LNG
Alabama	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
Alaska	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
Arizona	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
Arkansas	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
California	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
Colorado	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile
Connecticut	 data shapefile	 data shapefile	 data shapefile	 data shapefile	 data shapefile

- Shapefiles
- Interactive maps
- CSV downloads

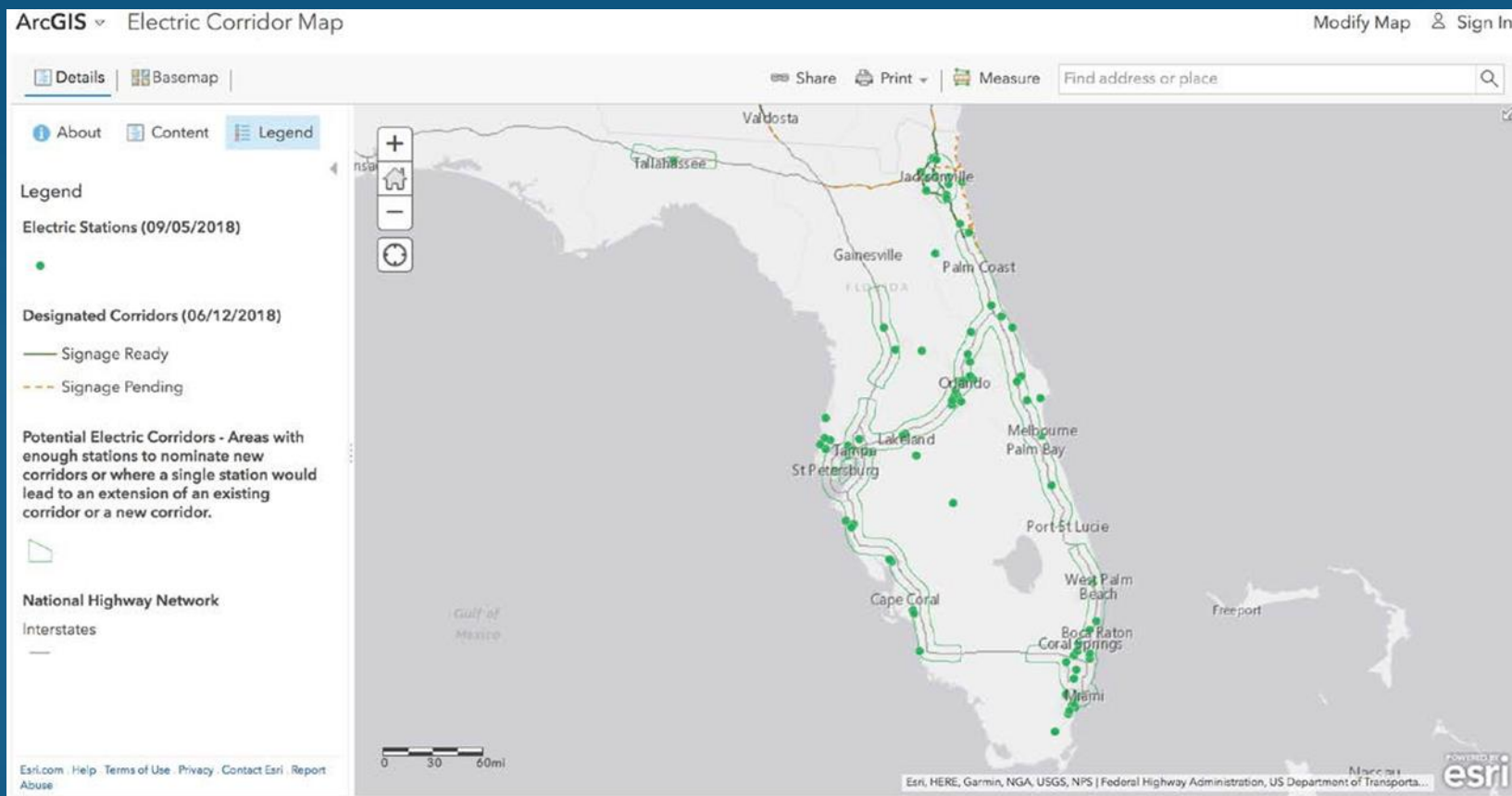
Interactive Map

afdc.energy.gov/corridors



Stations Layer - FL

afdc.energy.gov/corridors



Future of AFC Program



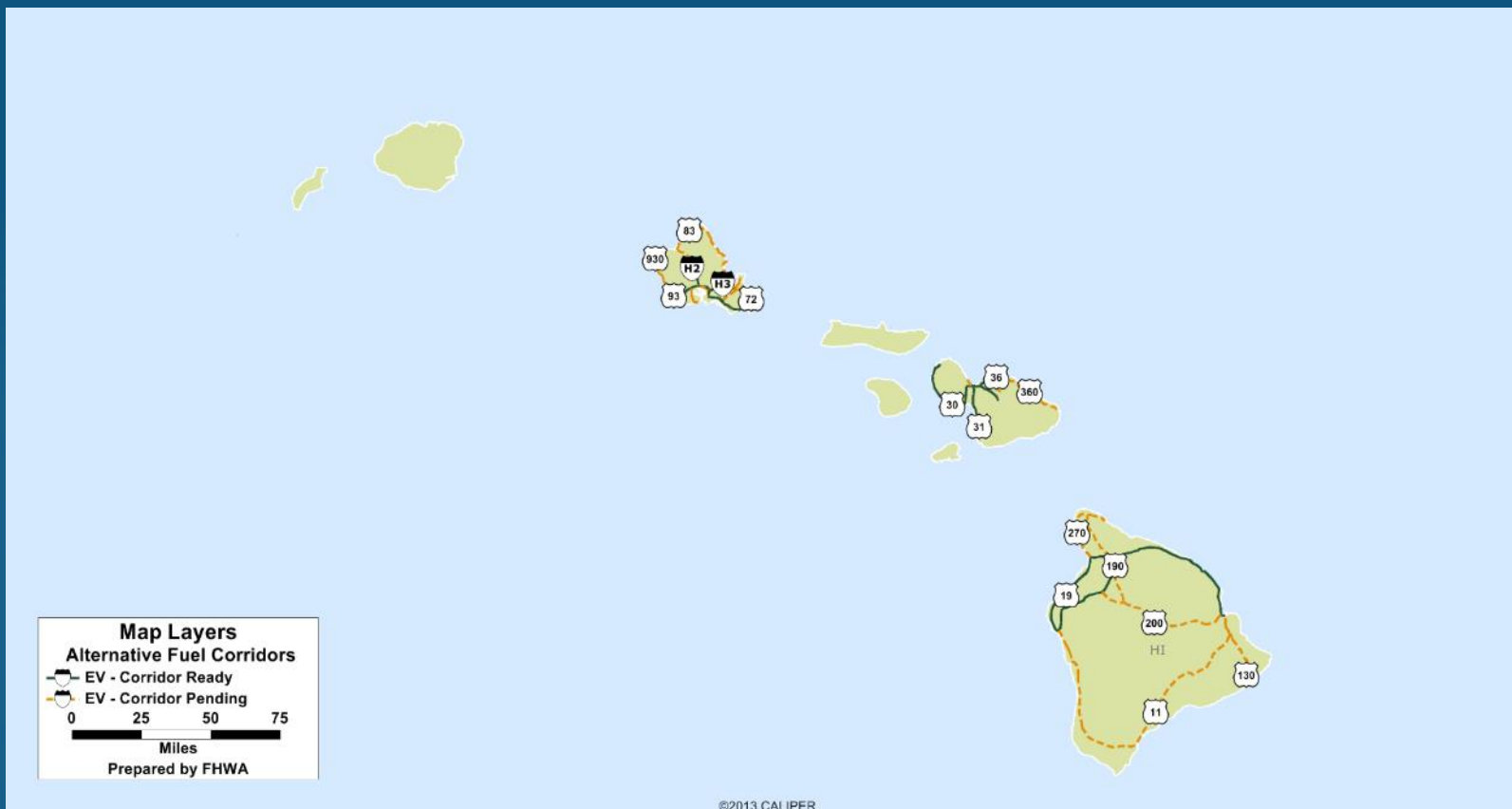
- Request for Nominations on an annual basis under life of FAST Act
- Possible inclusion in the next transportation reauthorization bill or other legislation
- Enhanced coordination efforts with Clean Cities Program/NREL
- Enhanced collaboration with stakeholders including industry



Rounds 1 & 2 EV Map – Corridor Ready and Pending



Rounds 1 & 2 EV Map for HI - Corridor Ready and Pending



Rounds 1 & 2 CNG Map – Corridor Ready and Pending



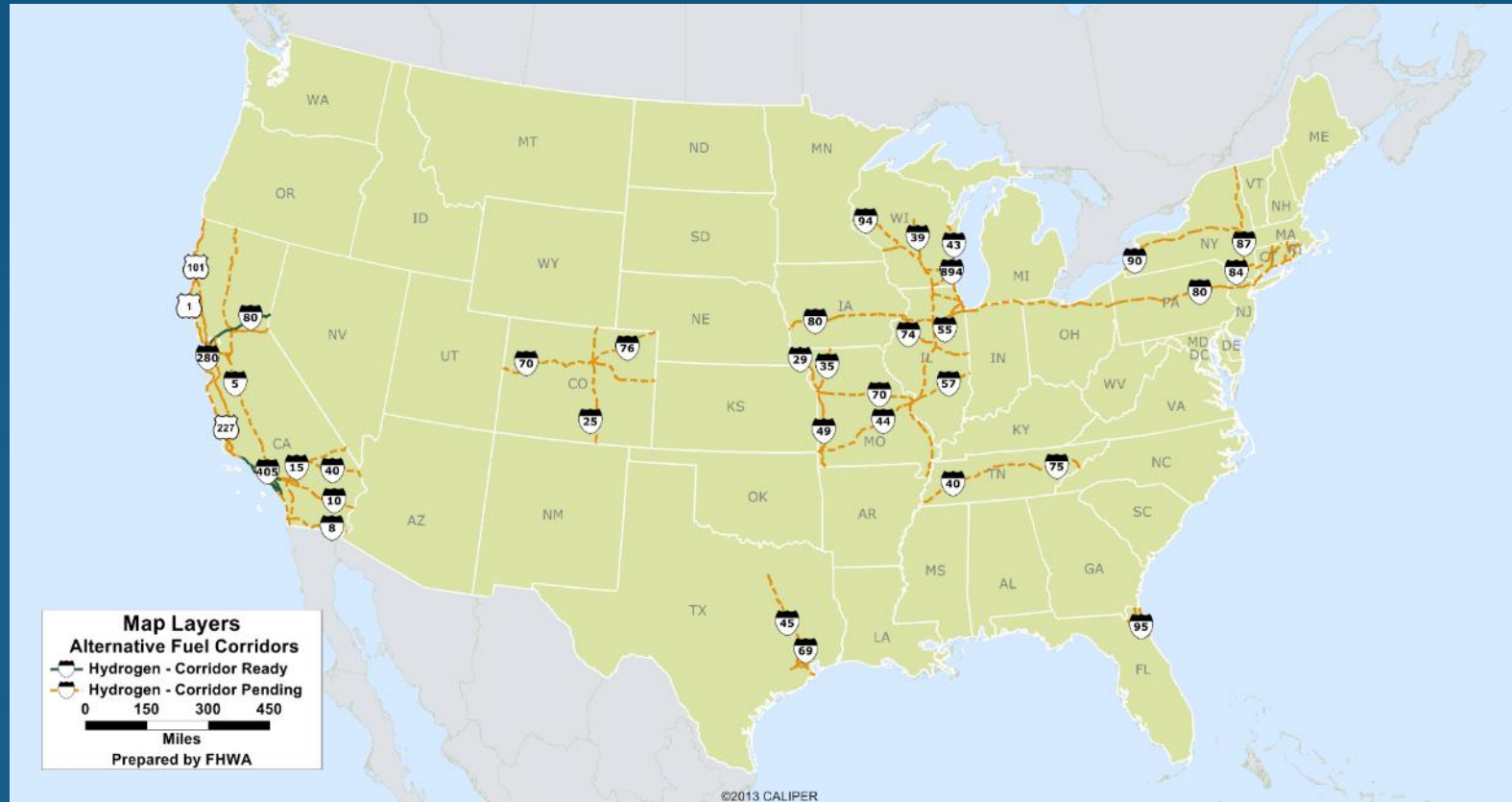
Rounds 1 & 2 LNG Map – Corridor Ready and Pending



Rounds 1 & 2 LPG Map – Corridor Ready and Pending



Rounds 1 & 2 HYD Map – Corridor Ready and Pending



For More Information

DOT Alternative Fuel Corridor Team Contact Information

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Resources

FHWA Alternative Fuel Corridor website:

http://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

MUTCD Memorandum – Signing for Designated Alternative Fuel Corridors:

https://mutcd.fhwa.dot.gov/resources/policy/alt_fuel_corridors/index.htm

DOE/NREL Alternative Fueling Station Locator:

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

THANK YOU

For information on the West Coast Electric Highway or
WSDOT's Electric Vehicle Infrastructure Partnerships Program (EVIPP),
please contact:

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