West Coast Partnership to Promote Alternative Fuel Corridors

The Landscape & Opportunities for Medium- and Heavy-Duty Vehicles

Alternative Fuel Infrastructure Corridor Coalition (AFICC)

Oregon Workgroup

Webinar Session #1

Thursday, September 20, 2018
Overview

• AFICC Goals and Objectives

• Oregon Workgroup Roadmap

• Discussion Leader Presentations: Oregon Alternative Fuel Vehicle and Infrastructure Priorities, Needs and Opportunities

• Workgroup Discussion
Today’s Discussion Leaders

Program Facilitators

• John Mikulin, Environmental Protection Specialist, EPA Region 9
• Alycia Gilde, Director, CALSTART

Presentations by:

• Diane Turchetta, Transportation Specialist, FHWA
• Andrew Dick, Policy Advisor, ODOT
• Dan Avery, Senior Policy Analyst, ODOE
• Tim Collins, Senior Transportation Planner, Freight Planning, Metro
• Mike Montero, Principal, Montero & Associates, LLC
West Coast MD/HD Alternative Fuel Corridors

Interstate collaboration is needed to develop west coast corridors for MD/HD AFV fueling similar the one shown here for LD ZEVs. This would help to address:

- Emission reductions
- Fuel supply diversity
- Sustainable freight, public works, refuse collection, transit & school bus
- Local job creation and economic development
MD/HD Alternative Fuel Infrastructure Corridor Coalition

1. Convene a stakeholder coalition focused on M/HD alternative fuel infrastructure deployment.

2. Conduct stakeholder workgroups & targeted outreach to identify desired/unfunded M/HD alternative fuel stations.

3. Synthesize stakeholder input into a plan document.

4. Use the plan to support project development, leverage existing funds, and seek joint applications to US DOT and other competitive funding programs.

5. Obtain federal funding assistance to help implement infrastructure in California, Oregon and Washington (i.e., natural gas, propane, electric vehicle charging and hydrogen for public and private M/HD fleets).
AFICC Project Overview

Establish Framework
- Define Workgroup Discussion Objectives
- ID Key Stakeholders
- ID Coalition-Supporting Resources
- ID Direct Outcomes

Facilitate Workgroup Sessions [CA, OR & WA]
Collect Feedback, Compile Info, & Research Q's

Develop AFV Stakeholder Synthesis
- Summarize Workgroup Feedback
- Respond to Questions
- Outline Critical Barriers & Challenges
- Evaluate Needs & Costs for AFV Infrastructure

Draft Implementation Plan
- Include Themes & Priorities
- Outline Strategy & Actions
- Provide Recommendations
- ID AFV Project Partnerships
- Estimate Project Costs & ID Funds

Needs
- Prioritize Hot Spots (Areas of Congestion, Communities, Intermodal Freight Hubs)
- ID Alt. Fuel Infrastructure Gaps
- ID Best Techs/Fuels for Vocational/Transportation Activities/Project Areas

Opportunities
- ID partnerships with Freight Shippers, Carriers, BCOs, Ports, Railroads, Truck Associations (LMCs/IOOs) Truck Stops, Warehouses, EDCs, and Cities on Coordinated Alt. Fuel Corridor Projects

Present Outcomes to Partners
- Prioritize Hot Spots (Areas of Congestion, Communities, Intermodal Freight Hubs)
- ID Alt. Fuel Infrastructure Gaps
- ID Best Techs/Fuels for Vocational/Transportation Activities/Project Areas

- Facilitate Workgroup Sessions [CA, OR & WA]
- Collect Feedback, Compile Info, & Research Q's

- Develop AFV Stakeholder Synthesis
  - Summarize Workgroup Feedback
  - Respond to Questions
  - Outline Critical Barriers & Challenges
  - Evaluate Needs & Costs for AFV Infrastructure

- Draft Implementation Plan
  - Include Themes & Priorities
  - Outline Strategy & Actions
  - Provide Recommendations
  - ID AFV Project Partnerships
  - Estimate Project Costs & ID Funds

Needs

Opportunities
Alternative Fuel Infrastructure Corridor Coalition (AFICC)
2018 Oregon Workgroup Roadmap

**Webinar Sessions**

**Session #1**
M/HD Alternative Fuel Landscape and Opportunities
Thursday, Sept. 20, 2018
1:00 – 2:30 p.m. PT

Partners provide an update on alternative fuel activities & opportunities to promote emission reductions, advance clean techs, & transportation sustainability through alternative fuel corridors.

**Session #2**
Natural Gas & Propane Technologies
Thursday, Nov. 1, 2018
2:30 – 4:00 p.m. PT

Technology manufacturers and fueling infrastructure providers provide information on the latest emerging technologies, operational suitability, infrastructure considerations, & fleet best practices. These sessions are open to CA, OR and WA partners.

**Session #3**
Plug-In Electric & Hydrogen Fuel Cell Technologies
Tuesday, Nov. 6, 2018
10:30 a.m. – 12:00 p.m. PT

**Session #4**
M/HD Alternative Fuel Infrastructure Needs
Thursday, Dec. 13, 2018
1:00 – 2:30 p.m. PT

Partners provide input on critical gaps & infrastructure needs along key corridors & evaluate actions and funding opportunities to support partnership, coordination & project implementation.

**Champion Strategy Calls**

**Session # 1:**
Thurs. 8/30/18
2:00 – 3:00 p.m.

**Session # 2:**
Thurs. 10/11/18
1:00 – 2:00 p.m.

**Session # 3:**
Fri. 11/30/18
10:00 – 11:00 a.m.

WEST COAST COLLABORATIVE
A public-private partnership to reduce diesel emissions
FHWA Alternative Fuels Corridor Program

WEST COAST COLLABORATIVE – ALTERNATIVE FUEL INFRASTRUCTURE CORRIDOR COALITION WEBINAR

DIANE TURCETTA | U.S. DEPARTMENT OF TRANSPORTATION
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
Combined Results

- 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)
Anticipate issuing Round 3 request for nominations in September 2018
Distributed through FHWA Division Offices
Nominations due the end of January 2019
Designations made in spring 2019
No anticipated change in designation criteria
Some changes in shapefile submissions
Regional Alternative Fuel Corridor Convening's

The purpose is to help state and local agencies identify Interstate corridors that are potential candidates for designation or need additional facilities to change the designation from Corridor-Pending to Corridor-Ready.

Representatives from states in the targeted region will be invited and multiple cross-state corridors will be discussed and analyzed for designation potential.
Regional Alternative Fuel Corridor Convening's

- Midwest – June 12 (St. Paul, MN)
- Southeast – Sept 25 (Charleston, SC)
- REV West States – Spring/Summer 2019
- NE/Mid-Atlantic – Fall 2019
- Texas and surrounding states - 2019
Future of AFC Program

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

DOTAlternative Fuel Corridor Team Contact Information

<table>
<thead>
<tr>
<th>Name</th>
<th>U.S. Department of Transportation</th>
<th>U.S. Department of Transportation</th>
<th>U.S. Department of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diane Turcetta</td>
<td>Federal Highway Administration</td>
<td>Volpe Center</td>
<td>Volpe Center</td>
</tr>
<tr>
<td>Mike Scarpino</td>
<td></td>
<td>617-494-3373</td>
<td>617-494-3852</td>
</tr>
<tr>
<td>Stephen Costa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>202-493-0158</td>
<td><a href="mailto:michael.scarpino@dot.gov">michael.scarpino@dot.gov</a></td>
<td><a href="mailto:stephen.costa@dot.gov">stephen.costa@dot.gov</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:diane.turchetta@dot.gov">diane.turchetta@dot.gov</a></td>
<td></td>
</tr>
</tbody>
</table>

Resources

FHWA Alternative Fuels Corridor website:
http://www.fhwa.dot.gov/environment/alternative_fuel_corridors/

MUTCD Memorandum – Signing for Designated Alternative Fuel Corridors

DOE/NREL Alternative Fueling Station Locator
https://www.afdc.energy.gov/locator/stations/
Rounds 1 & 2 EV Map for HI - Corridor Ready and Pending
Rounds 1 & 2 CNG Map – Corridor Ready and Pending
Rounds 1 & 2 LPG Map – Corridor Ready and Pending
Rounds 1 & 2 HYD Map – Corridor Ready and Pending
ZEVs and Oregon
WIC – AFICC Webinar No. 1: Alternative Fuel Landscape and Opportunities
September 20, 2018

Andrew Dick
Oregon Department of Transportation
West Coast Electric Highway

• Network of corridor DC fast chargers

• “BC to BC”: British Columbia to Baja California

• Built to expand EV charging access and enable distance travel
West Coast Electric Highway

- Funded via stimulus funds, TIGER grant
- First station in 2012
- 44 Stations in Oregon, Level 2, DCFC at each
- More than 100,000 charging events
- Nearly 1,000 MWh of charging
- 3 million miles of all-electric driving
M/HD ZEV Deployment Goals

• Identify opportunities to pilot alt-fuel M/HDVs in Oregon
• Identify early candidates for fueling stations and growing alt-fuels networks
• Find willing fleet partners to be early adopters of new technology
Where is there a need for alt fuel infrastructure in Oregon?
What are the priority fuels, locations and opportunities?

• Population centers (Portland, Eugene) for back-to-base fueling operations
• If possible, corridors beginning with I-5 and expanding to I-84, US 101, etc.
• Areas with bad air quality, other complementary factors
What is ODOT hoping to get out of the effort?

• Align strategy with California and Washington
• Build relationships with local and regional government
• Develop list of priority deployment areas
• Create high-level plan to cite when/if funding is available
Questions?
Oregon Department of Energy

Leading Oregon to a safe, clean, and sustainable energy future

Oregon Biogas/ RNG Inventory - SB 334 (2017)

Presented to: WCC AFICC

September 20, 2018

Dan Avery
Fuel Production Pathways

Anaerobic Digestion
- Agricultural Manure
- Landfills
- Municipal Wastewater
- Waste Food

Thermal Gasification
- Forest Harvest Residuals
- Agricultural Harvest Residuals

Other Near-Commercial Technologies
- Power to Gas
- PyroCatalytic Hydrogenation
- Hydrothermal Liquefaction

See page 2 and 7 in the report
## Annual potential production of CH₄ - Summary

<table>
<thead>
<tr>
<th>Source – Anaerobic Digestion</th>
<th>Annual CH₄ production scf³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural manure</td>
<td>4,639,626,825</td>
</tr>
<tr>
<td>Wastewater</td>
<td>1,225,228,606</td>
</tr>
<tr>
<td>Landfill</td>
<td>4,351,052,420</td>
</tr>
<tr>
<td>Waste food</td>
<td>138,571,656</td>
</tr>
<tr>
<td>Subtotal</td>
<td>10,354,479,507</td>
</tr>
</tbody>
</table>

71,936,081 DGE

**Context:** In 2016 Oregon consumed ~226,978,752,000 cf of methane

Estimated technical potential for RNG is 22% of Oregon's N.G. consumption (4.5% AD, 17.5 TG)

<table>
<thead>
<tr>
<th>Source – Thermal Gasification</th>
<th>Annual CH₄ production scf³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Harvest Residuals</td>
<td>16,998,108,771</td>
</tr>
<tr>
<td>Agricultural Harvest Residuals</td>
<td>22,686,775,137</td>
</tr>
<tr>
<td>subtotal</td>
<td>39,684,883,908</td>
</tr>
</tbody>
</table>

275,704,348 DGE

**Total Potential Annual CH₄ = 50,039,363,416 scf**

347,640,429 DGE
ODOE Recommendations

1. Allow the natural gas companies to buy and sell RNG to and for their customers.

2. Allow local gas distribution companies to recover pipeline interconnection costs through their rates.

3. Study how best to expand natural gas transportation fueling infrastructure.

4. Explore development of voluntary gas quality standards for injection of RNG into the natural gas pipeline.

5. Explore financial incentives to help drive the nascent industry forward.

6. Coordinate with RNG stakeholders and state agencies to develop a tracking and accounting protocol for production and use of RNG.

See chapter 6, page 43 in the report
Existing Infrastructure

CNG Fueling Stations - 2018

Legend
- CNG Stations Oregon
  - Private
  - Public
  - Oils

Source: Esri, HERE, DeLorme, USGS, Intermap, iDEAS, IGN, Nelles, MapmyIndia, MapmyIndia, Ltd., © OpenStreetMap contributors. Find the GIS User Community.
Questions?

Dan Avery
Oregon Department of Energy
503-373-2295
Daniel.Avery@Oregon.Gov

Link to the ODOE Biogas/RNG Inventory:
Near and Zero-Emission Freight and Goods Movement Opportunities

Tim Collins, Senior Transportation Planner
Freight Planning
Metro
Regional Freight Policy & Action Plan

• AFICC supports Policy #4 of the Regional Freight Policy
  “Pursue a sustainable, multi-modal freight transportation system that supports the health of the economy, communities and the environment though clean, green and smart technologies and practices”

• AFICC addresses 4.2 of the Freight Action Plan
  “Pursue greenhouse gas and other pollutant reduction policies and strategies for freight that transitions the region to lower or zero emission freight vehicles and equipment”
Freight Action Plan States: (continued...)

• “Research into this action should identify strategies, projects or programs that best meet transportation, safety and air quality goals that are synonymous with efficient goods movements.

• Metro will work with DEQ and other regional partners to explore and define potential environmental benefits in the following area:
  Programs, policies and projects for cost--effective net reduction of greenhouse gas and other pollutants, such as ... incentives for zero/low emission delivery vehicles and alternative fueling stations.”
Opportunities for Near- to Zero-Emission Freight

• Need for a Medium- and Heavy-Duty Alternative Fuel Vehicle Incentive Program for Goods Movement and Freight Activities

• Monitor state and three state (WA, OR and CA) corridor efforts for Medium- and Heavy-Duty Alternative Fuel Vehicles and required Infrastructure

• Seeks collaboration with DEQ and ODOT to determine funding and feasibility for alternative fuel infrastructure

• Interest in supporting AFICCC effort by sharing information on related strategies, programs and projects
Alternative Fuel Initiative

Mike Montero
Montero & Associates, LLC
Consultants in Urban Development
Discussion Questions

• What alternative fuel technologies is your organization interested in?

• What infrastructure needs to you have for your business, community, or region?

• What funding resources are available to support implementation?

• What more would you like to learn about medium- and heavy-duty alternative fuel vehicles and infrastructure?
Alternative Fuel Infrastructure Corridor Coalition (AFICC)
2018 Oregon Workgroup Roadmap

Webinar Sessions

Session #1
M/HD Alternative Fuel Landscape and Opportunities
Thursday, Sept. 20, 2018
1:00 – 2:30 p.m. PT

Partners provide an update on alternative fuel activities & opportunities to promote emission reductions, advance clean techs, & transportation sustainability through alternative fuel corridors.

Session #2
Natural Gas & Propane Technologies
Thursday, Nov. 1, 2018
2:30 – 4:00 p.m. PT

Technology manufacturers and fueling infrastructure providers provide information on the latest emerging technologies, operational suitability, infrastructure considerations, & fleet best practices. These sessions are open to CA, OR and WA partners.

Session #3
Plug-In Electric & Hydrogen Fuel Cell Technologies
Tuesday, Nov. 6, 2018
10:30 a.m. – 12:00 p.m. PT

Session #4
M/HD Alternative Fuel Infrastructure Needs
Thursday, Dec. 13, 2018
1:00- 2:30 p.m. PT

Partners provide input on critical gaps & infrastructure needs along key corridors & evaluate actions and funding opportunities to support partnership, coordination & project implementation.

Champion Strategy Calls

Session # 1:
Thurs. 8/30/18
2:00 – 3:00 p.m.

Session # 2:
Thurs. 10/11/18
1:00 – 2:00 p.m.

Session # 3:
Fri. 11/30/18
10:00 – 11:00 a.m.

WEST COAST COLLABORATIVE
A public-private partnership to reduce diesel emissions
Contact Us

John Mikulin
Environmental Protection Specialist
U.S. EPA Region 9
(415) 972-3956
mikulin.john@epa.gov

Alycia Gilde
Director
CALSTART
(626) 744-5613
agilde@Calstart.org