West Coast Partnership to Promote Alternative Fuel Corridors

Medium- and Heavy-Duty Alternative Infrastructure Needs & Opportunities in Washington

Alternative Fuel Infrastructure Corridor Coalition (AFICC)

Webinar Session #5
Monday, December 10, 2018
1:00 p.m. – 2:30 p.m. PT
Overview

• AFICC Roadmap Progress

• Status of Washington Alternative Fuel Corridors

• Discussion Leader Presentations: Alternative Fuel Infrastructure Needs & Opportunities for Washington

• Workgroup Discussion
**Alternative Fuel Infrastructure Corridor Coalition (AFICC)**

**2018 Washington Workgroup Roadmap**

### Webinar Sessions

**Session #1**
M/HD Alternative Fuel Landscape and Opportunities
Friday, Sept. 21, 2018
10:30 a.m.– 12:00 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
Monday, Dec. 10, 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
  11:00 – 12:00 p.m.

- **Session # 2:**
  Fri. 10/12/18
  11:00 – 12:00 p.m.

- **Session # 3:**
  Fri. 11/30/18
  1:00 – 2:00 p.m.
AFICC Project Overview

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

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

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

What's Next!

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

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
## Corridor-Ready
### Criteria for 3rd Round of Designations

<table>
<thead>
<tr>
<th>FUEL</th>
<th>DCFC only</th>
<th>150 miles between stations</th>
<th>50 miles between stations</th>
<th>5 miles from highway</th>
<th>Public stations only</th>
<th>Fast fill, 3,600 psi</th>
<th>200 miles between stations</th>
<th>5 miles from highway</th>
<th>Public stations only</th>
<th>Public stations only</th>
<th>Public stations only</th>
<th>150 miles between stations</th>
<th>5 miles from highway</th>
<th>Public stations only</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propane</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Round 3 Applications Due January 31, 2019**

[https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/nominations/]
West Coast Alternative Fuel Corridors

Alternative Fuels Data Center
Station Data for Nominating Alternative Fuel Corridors.

Alternative Fuel Corridors (09/10/2018)
- Corridor Ready
- Corridor Pending

Potential Electric Corridors - Areas with enough stations to nominate new corridors or where a single station would lead to an extension of an existing corridor or a new corridor.

https://afdc.energy.gov/corridors
West Coast Alternative Fuel Corridors

As of September 5 2018
Washington Alternative Fuel Corridors

Designated Interstate: I-5
Designated Route/State Highway: 101

Key
- Corridor Ready
- Corridor Pending
- Potential Corridor

As of 9/05/18
Alternative Fuels Data Center
Station Locator and Corridor Tools

Johanna Levene - johanna.levene@nrel.gov

Resources:

Station Locator: https://afdc.energy.gov/stations

Station Data for Corridors: https://afdc.energy.gov/corridors
Webinar Objectives

Ports, fleets, industry associations and state agencies provide input on infrastructure needs and opportunities to advance medium- and heavy-duty alternative fuel corridors in Washington.

1) Clean Transportation Goals
2) Infrastructure Gaps
3) Resource & Partnership Needs
4) Opportunities for Coordination and Support
Today’s Discussion Leaders

Program Facilitators

- Alycia Gilde, Director, Fuels & Infrastructure, CALSTART
- John Mikulin, Environmental Protection Specialist, EPA Region 9

Presentations by:

- Jason Jordan, Director of Environmental Programs, Port of Tacoma and Northwest Seaport Alliance
- Alex Adams, Senior Environmental Program Manager, Port of Seattle
- Jeff Hove, Vice President, Alternative Fuels Council, National Association of Truck Stop Operators
- Sheri Call, Executive Vice President, Washington Trucking Association
- Danny Ilioiu, Zero Emissions Fleet Strategic Planning Manager, King County Department of Transportation
- Peter Moulton, Alternative Fuels & Vehicles Policy Advisor, Washington State Energy Office
Jason Jordan
Director of Environmental Programs,
Port of Tacoma and Northwest Seaport Alliance
Port of Seattle
Medium- and Heavy-Duty Alternative Fuel Infrastructure Needs in Washington

Alex Adams
adams.a@portseattle.org
December 10, 2018
Overview

Port of Seattle is:
- Sea-Tac International Airport
- Seattle’s Seaport operations including cruise and grain terminals, fishing and recreational marinas, industrial and commercial real estate

Port of Seattle’s Century Agenda set ambitious GHG reduction targets by 2050
- Port-controlled sources will be carbon neutral or negative
- Port-influenced sources will be reduced 80-percent

Port of Seattle’s Key Alternative Fuel Interests: Policy and infrastructure to support access to sustainably-sourced, renewable vehicle and aviation fuels and provide additional clean electricity to ships, vehicles, and cargo handling equipment

Access to Low Carbon Fuels is a Key to Achieve Port Emission Reduction Targets
Port Alternative Fuel Successes

Sea-Tac Airport
- R99 being piloted in all diesel fleet vehicles fueled on-site
- Hybrid and electric fleet vehicles in use
- EV charging available for public and Port vehicles
- 50% of airport ground support equipment is electric
- 45-bus fleet powered by natural gas

Seaport
- Shore power available at 2 of 3 cruise ship berths
- Hybrid and plug-in hybrid fleet vehicles in use
- B20 used in all diesel fleet vehicles fueled on-site
- EV charging available for public and Port vehicles

Port of Seattle has a Long History of Alternative Fuel Use and Innovation
Airport-Related Fuels

**Infrastructure Challenges**

- Limited global supply of Sustainable Aviation Fuels (SAF)
- Indirect control over airline SAF use
- High SAF costs in a very cost-sensitive industry and requires integration into conventional fueling procedures
- Access to Renewable Natural Gas (RNG) to power natural gas bus fleet and gas-fired terminal boilers
- Electric ground support equipment requires unique charging infrastructure

**Opportunities**

- Port success as convener to address barriers to SAF use
- Onsite natural gas bus fueling infrastructure already in place
- National RNG solicitation coming soon for bus and terminal supply
- Continued Low Carbon Fuel Standard interest in WA—Port supported previous legislation

Affordable Access to SAF and RNG are Key to Reduce Emissions at Sea-Tac Airport
Maritime Fuels

Infrastructure Challenges

• Affordable, consistent access
• Costly electric infrastructure
• Alternative fuel technologies for ships are nascent (except for LNG)
• Ports have indirect control over largest sources of emissions
• Higher costs and availability for alt. vessel fuels a major barrier to widespread use

Opportunities

• Strong statewide, regional and Port support for climate action
• Interest in maritime electricity use across jurisdictions—a partnership opportunity
• State, federal funding available to support innovation
• Industry access to alt. fuel may be a future competitive advantage

Alt Fuel Use is Challenged by Fuel Availability, Technology and Infrastructure Costs
Jeff Hove
Vice President, Alternative Fuels Council, National Association of Truck Stop Operators
Sheri Call
Executive Vice President,
Washington Trucking Association
Metro’s Zero-Emission Fleet

Presented by:

Danny Ilioiu
Zero-Emissions Fleet
Strategic Planning Manager
King County Metro’s Trek to a Sustainable Future

- **Strategy options:**
  - **study:** learn from others, observe
  - **deploy:** test, evaluate and scale
  - **convert:** start replacing now

**ELIAS**
King County Metro, Transit Operator
Seattle, Washington

“I have been driving for King County Metro for 5 years. Basically I’ve driven every single bus that we have in King County. The riders actually love these buses. I don’t think they realize it’s a 100% battery operated bus. When I tell them it’s an electric bus they just love it because it’s good for the environment.”
Bus Fleet – 1,500 (58% 60’ Articulated)

- Current technology electric buses (AEB, BEB, ZEB) can theoretically meet 70% of KC Metro operational requirements
  - 174 Zero-Emissions **Electric Trolley Buses (110 Artics)**
  - 11 Zero-Emissions **Battery Electric Buses (Std. 40’)**
  - 10 additional Zero-Emissions **Battery Electric Buses 2018Q4 (6 Std 40’ and 4 Artics 60’)**
Infrastructure needs for successful scaling

- Base, Terminal, and Transit Hub location of chargers
- Charging Standards and Interoperability
- Automation & Controls
- Software that integrates operations and charging
  - Dispatch, crew scheduling, service planning, charging, and full facility energy management
Renewable Energy

- Sourcing and alignment partners: Seattle City Light, Puget Sound Energy
  - Goals and contracts in place for Renewable energy sourcing
  - Goals for GHG reductions
  - Solar, Wind, Energy Storage (secondary life for batteries), …?
    - Upstream of the Meter
    - Downstream of the Meter

Renewable energy (abstract from eia.gov site)
Washington ranks second in the nation, after California, in the amount of electricity generated from renewable resources. On average, about 80% of the state's net electricity generation originates from renewable energy, mostly hydroelectric power, and Washington produced about one-eighth of the total electricity generated nationwide from renewables in 2017.
Electric Bus Ecosystem
Sustainability and Metro’s Zero-Emission Fleet
13% there, 87% to go…

Thank you!

Danny Ilioiu
Zero-Emissions Fleet
Strategic Planning Manager

Danny.Ilioiu@kingcounty.gov

West Coast Collaborative – December 2018
Promoting RNG Development in Washington State

Peter Moulton
Senior Energy Policy Specialist

October 2018
2017 RNG Roadmap

Power Sales Model Mature
- Utility RPS targets met
- Market in transportation

Incentives Need Overhaul
- Previous tax breaks expired
- Definitions dated, conflicting

Pipeline Quality Standards

Uncertain Policy Framework

Link: bit.ly/2mowmWn
2018 Legislation (HB 2580)

- Restore and expand production incentives
- Broader techno-economic assessment
- Update policy options
- Public sector preferential purchasing
- Regional voluntary pipeline standards
First Step: Better data, focus on pipelines

- Facilities within 5-10 miles
- Feedstocks within 30 miles
- Public-private partnerships, priorities for public funding
- Data sets dated, incomplete and/or inferred
Next Step: Align feedstocks & facilities

- RNG currently ~1.5% of gas supply, what would it take to be 3%, 5%...
- Near-term: 30+ projects >500 scfm (LFG, WWTP, dairies, MSW organics)
- Medium-term: 70+ projects >500 scfm (deeper dive, especially food processing)
Future Policy Considerations

- **Clean Fuel Standard** (statewide vs Puget Sound)
- **Renewable Portfolio Standard** (carbon-weighted?)
- **100% Clean** (RNG for peak generation)
- **Tax incentives** (distribution and sale of RNG)
- **Quality standards for pipeline injection** (WA, OR, ID)
For more information:

Peter Moulton
(360) 725-3116
peter.moulton@commerce.wa.gov
Discussion

What infrastructure needs do you have for your alternative fuel fleet?

*Please raise hand to speak or submit a question via GoToWebinar.*

**Project Description**
- Project Location
- Distance to Nearest Corridor
- Project Partners
- Fleet Vocation *(Delivery, Regional, Refuse, Transit, School Bus, etc.)*
- Vehicle Technology/Fuel Type
- Number of Vehicles
- Project Timeline

**Infrastructure Needs**
- Station Type
- Number of Dispensers/Chargers
- Estimated Fuel/Energy Use
- Equipment Costs
- Development Costs
- Operational Costs
- Construction Schedule
Contact Us

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

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