



Clean Corridors Meeting: Tools for Implementing Alternative Fuel Corridors

Workshop Summary Report

December 5, 2016

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Rensselaer Polytechnic Institute
Troy, NY

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This workshop was held as part of the Deployment of Alternative Vehicle and Fuel Technologies initiative, a joint project of Oregon Department of Transportation and other state DOTs, along with the U.S. Department of Transportation's Federal Highway Administration. The initiative is being supported by The Cadmus Group, Atlas Public Policy, and Vermont Energy Investment Corporation.



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Background

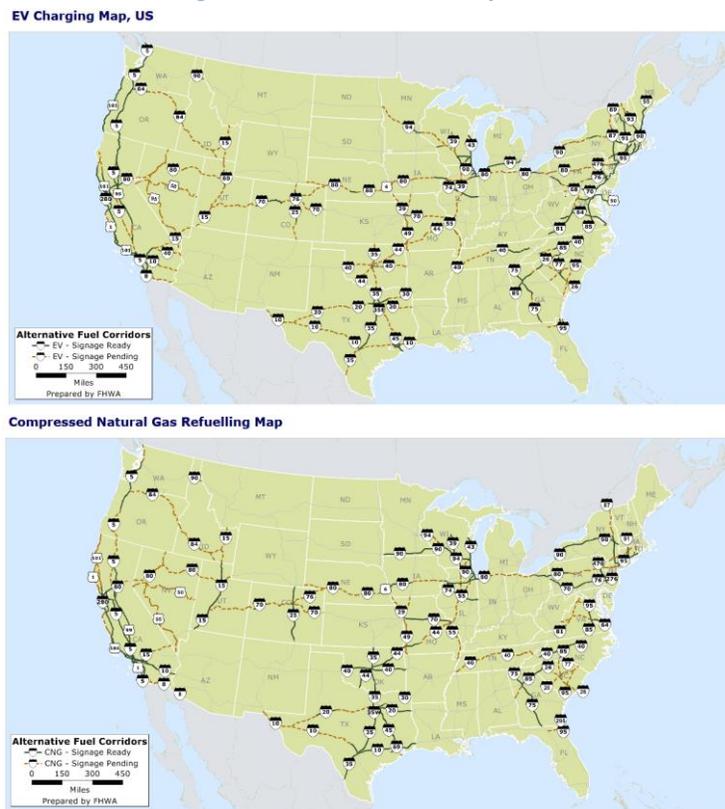
In June 2014, the Oregon Department of Transportation (ODOT) and the U.S. Department of Transportation's Federal Highway Administration (FHWA) initiated a pooled fund to assist state and local transportation agencies interested in promoting the use of alternative vehicle and fuel technologies at a state, regional, or corridor scale and provide tools, information, and knowledge to do so. The Deployment of Alternative Vehicle and Fuel Technologies initiative implements a series of workshops around the country and develops a "toolkit" for state and local transportation agencies that will facilitate their deployment of alternative fuel vehicle (AFV) and related technologies.



Workshop Summary

The fourth workshop under the pooled-fund initiative took place on November 4, 2016. The workshop was the second day of a two-day [Clean Corridors Meeting](#) which sought to increase collaboration across government, industry, and other stakeholders in order to advance clean freight corridors. A highlight from the first day of the Clean Corridors Meeting was when the Administrator of the Federal Highway Administration (FHWA), Greg Nadeau, [announced](#) the designations of the [National Alternative Fuel Clean Corridors](#) for compressed natural gas (CNG), liquefied natural gas (LNG), propane, hydrogen, and electric vehicle (EV) charging.

Figure 1: Examples of FHWA Designated Electric and Compressed Natural Gas Vehicle Corridors



The corridor designations set the stage for the pooled-fund workshop on the second day of the meeting, during which participants focused on tools and strategies for implementing alternative fuel corridors. The workshop consisted of two breakout sessions: one focused on using policy, planning, and outreach activities to deploy clean corridors and the second focused on deploying advanced technologies and fuels along clean corridors. Attendees of the workshop included transportation, environment, and energy officials at the national, regional, state, and local levels; academic and non-profit representatives; original equipment manufacturers (OEMs); Clean Cities coalition members; alternative fuel suppliers; and alternative fuel infrastructure providers. A breakdown of workshop attendees is provided below. The pooled fund workshop had a total of 81 participants.

Figure 2: Workshop Participants by Category

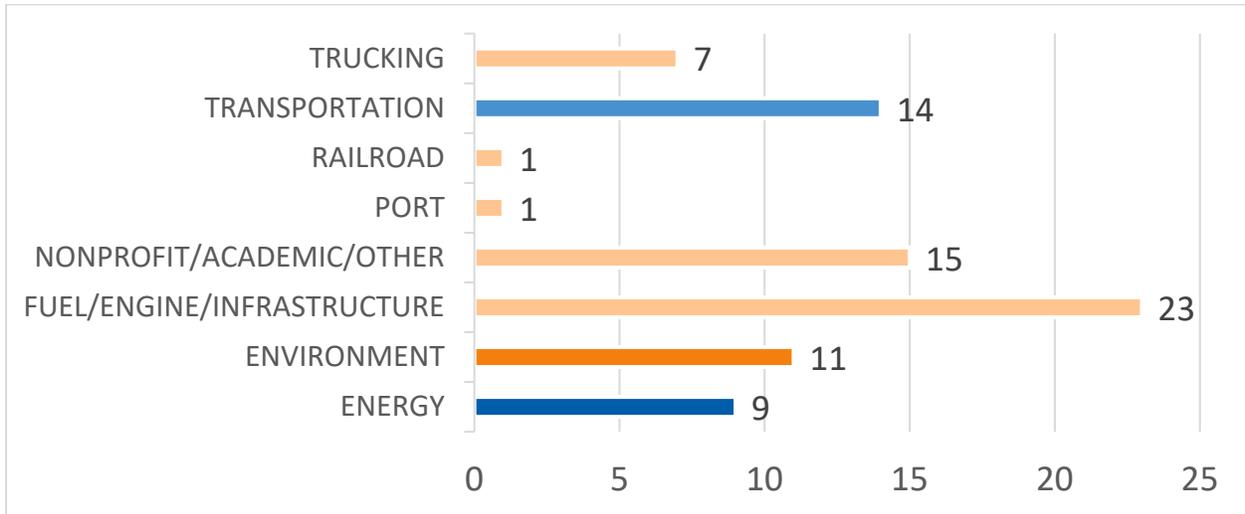


Figure 3: Public Officials by Type





Key Outcomes

The key outcomes from the workshop arose from the breakout session discussions, which explored how state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) can contribute to and advance clean corridor development. Each breakout group had a designated “subject matter expert” who provided an introduction to the topic. After the introduction, the group was led through a facilitated discussion by the Cadmus team. Fact sheets, which had been prepared ahead of time and distributed to participants, provided background information to the breakout groups. After each breakout session, participants came back together to debrief from the discussions.

The following are some of the key outcomes from the day as identified by workshop participants:

- Inter-state coordination of the clean corridors is an important component of the success of clean corridors. While a few of FHWA’s designated corridors already have coordinating bodies and interest groups, most do not. It remains unclear how best to coordinate corridor-wide planning. One potential solution is to form corridor task forces made up of individuals from various planning agencies along the corridor.
- Before embarking on clean freight planning at the corridor level, it is important to define what is meant by “clean.” For example, it could be defined as having alternative fuel infrastructure for trucks or relieving congestion. Successful market campaigns will need a clear underlying message about the purpose of the corridors.
- Funding for clean corridors should encourage public-private partnerships and attempt to re-prioritize existing funding sources (e.g., Congestion Mitigation and Air Quality or CMAQ) for alternative fuels.
- Agencies and partners that should be engaged in the process of developing a clean freight plan include:
 - MPOs
 - DOTs
 - Rail authorities
 - Port authorities
 - Shippers and carriers
 - U.S. Environmental Protection Agency (EPA)
 - Air regulatory agencies
 - Economic development agencies
 - Clean Cities Coalitions
 - EPA SmartWay partners
 - Public utility commissions

Action Plan

To help assist transportation planning agencies in making concrete plans regarding clean freight corridors and, more broadly, clean corridors, an online toolkit accompanying this workshop is available at <http://www.altfueltoolkit.org>. This toolkit features a resource library of guides, websites, tools, and research reports meant as a “one-stop-shop” for AFV planning. The toolkit is accompanied by the AFV Planning Guide, an interactive guide showing a progression of actions state DOTs can take to advance through stages of engagement on AFVs, from no engagement (“Starting Points”) to advanced engagement (“Leader”).



Workshop Proceedings

Welcome and Introductions

Diane Turchetta, Transportation Specialist, Federal Highway Administration

Diane kicked off the workshop by explaining that the focus of the day will be to explore how state DOTs can play a role in clean freight corridors. She mentioned that state DOTs vary widely in their level of interest in AFVs. Diane added that the previous day's announcement regarding the designation of alternative fuel corridors had already received great press and there have been several press inquiries.

Art James, Project Director, Oregon Department of Transportation

Art provided attendees with more information about the pooled fund project. He explained that pooled funds are started when one agency suggests a topic area and then solicits interest from other agencies to contribute funds to study that area. ODOT is the lead agency for the current pooled fund to study and provide outreach for the deployment of AFV technologies. ODOT is joined by several other states and the Federal Highway Administration, which has contributed the bulk of the funds.

Art added that this is the fourth of six workshops, with the first held in Portland, Oregon focused on electric vehicle charging corridors and the West Coast Electric Highway; the second in Washington, D.C. about innovative finance opportunities; and the third in Austin, Texas focused on alternative fuel use in fleets. He mentioned that the current workshop was held in conjunction with the previous day's event coordinated by Alycia Gilde of CALSTART since many of the stakeholders in the Northeast United States would be in attendance, but it was a pleasant coincidence that the announcement of the alternative fuel corridor designations were also made on the same day.

Workshop Overview

Geoff Morrison, Associate, Cadmus

Geoff provided a thank you to the sponsors that made the two-day event possible and to the Rensselaer Polytechnic Institute (RPI) for hosting the event. He explained how the day will be structured, with one round of breakout sessions focused on policy, planning, and outreach and a second round focused on technologies. He explained that the breakouts are meant to foster discussion and that there will be a reporting back session after each breakout to allow for questions and answers. Geoff also presented the graphical breakdown of workshop attendees, indicating that there was a diverse group of people in the room, and representation of public officials at the local, state, regional, and national levels.

Nick Nigro, Founder, Atlas Public Policy

Nick explained that one of the key outcomes from each of the pooled fund workshops is an online toolkit that lives on after the workshop and serves as a source of information, including for those that were not able to attend the workshop. He indicated that the workshop attendees are encouraged to develop ideas for what should be included in the toolkits. All of the toolkits include a resource library, which is intended to be a one-stop-shop for existing tools, resources, research documents, and other

materials related to the workshop topic. In addition to the resource library, Nick provided some examples of the types of elements that could be developed and included in the toolkit:

- A template to help states put together a clean freight corridor plan.
- Fact sheets on specific topics related to clean freight corridor development.
- Interactive web-based dashboards containing charts and maps that allow users to interact with data.

Nick emphasized that these are just some examples of what could go in the toolkit, and ultimately what will be included should be what is most valuable for DOTs or MPOs. An audience member asked how AFVs would be defined on the website, as the definitions often shift from source to source and may not include biodiesel. Nick responded that the alternative fuels focused on will be the ones that make the most sense for freight movement, and biodiesel remains on the table.

Breakout Session 1: Using Policy, Planning and Outreach Activities to Deploy Clean Corridors

Group 1A: Funding Clean Corridors

Adam Ruder from the New York State Energy Research and Development Authority (NYSERDA) provided a brief overview of NYSEDA's history funding AFVs and fueling infrastructure. During discussions that followed the overview, the following items emerged as key points:

- State and federal funding programs operate differently.
 - State programs can be more flexible and innovative.
 - Some states have been able to re-prioritize old funding programs to advance AFVs.
 - Federal programs tend to be larger in funding, but restricted in use.
- Criteria for funding decisions from the state perspective include:
 - Leverage private funds to make the most difference.
 - When program officers have discretion on cost share requirements for grants, consider projects that will catalyze action.
- Sources of funding:
 - CMAQ – though it is unclear if it's a good fit for corridors.
 - The Regional Greenhouse Gas Initiative (RGGI) is sometimes used for transport (e.g., CHEAPR EV rebate in Connecticut).
 - Most transportation funds for NYSEDA come from legislative budget allocations that have been re-purposed.
 - Combining public sources of funding is an option.
 - Call to action often needs to come from outside to change funding priorities.



- National Cooperative Highway Research Program could be used to fund corridor planning activities.
- Electricity and natural gas ratebases can serve as a funding opportunity.
 - A natural gas utility in New Jersey is using ratebase funds for alternative fuel infrastructure.
- Criteria for designing and implementing program funding:
 - Need a solution for vehicles and infrastructure (consider partnership).
 - Cost share can be harder in times of low oil prices.
 - Needs to be tied into policy directive.
- An inventory of funding sources could serve as a component of the toolkit that is developed for this workshop.
- Without standing programs, DOTs can look to one-off projects from transportation and environmental agencies.
 - Propane on school buses currently has payback of less than two years.
 - Greater private investment through early publicly-funded demonstrations of technologies was more easily accomplished with high diesel prices.
- What's the role of government?
 - In New York, ARRA funds help demonstrate the value of propane-powered vehicles.
- DOTs/MPOs should work to ensure the work plan for the Volkswagen settlement includes a priority for clean freight infrastructure.
- Rolling funding opportunities are better for smaller fleets since they can operate different acquisition schedules.
- Limitations on funding use is a barrier (CMAQ can't be used for maintenance).
- The Federal Transit Administration (FTA) can only fund infrastructure that's exclusively used by public agencies, which makes shared-use projects impossible to fund through this source.
- Interstate coordination of MPOs is important for clean corridor planning.
- Economic development groups are a key entity to engage in looking at funding clean corridors.
- DOT should highlight the importance of clean corridors to MPOs.
 - Interstate MPOs could be the vehicle to foster coordination.
- One challenge associated with using public funding sources is that political priorities shift over time.
- The I-95 corridor designation is for EVs only, not other alternative fuels, so it will be challenging to leverage that designation for freight.

- Transportation and Climate Initiative (TCI) is another vehicle for doing work in clean corridor planning. TCI is considering what to do next now that the corridor designations have been announced.
- Coordinating corridor development with adjacent states is challenging, especially when it's being led by sub-state agencies, like MPOs.
- Some rural corridors do not have an associated MPO which means they may lack the same taxpayer-funded opportunities of corridors in cities.

Group 1B: Developing a Clean Freight Plan

Gerry Bogacz, New York Metropolitan Transportation Council (NYMTC), provided an overview of the approach NYMTC has taken to incorporate clean corridors into the regional freight plan component of its next required update of its overall [Regional Transportation Plan](#). While NYMTC updates this plan every five years, in the most recent iteration they decided to start from scratch and include a clean corridors component in the plan.

During discussions that followed the overview, the following items emerged as key points:

- There is an environmental component that is required in state freight plans, but it is not well defined; states could benefit from more guidance from FHWA on this.
- MPOs and states should work together on clean freight planning.
 - MPOs can target federal dollars and make connections between corridors in different regions.
 - It's important to work with adjacent states in order to capture through-trips.
 - MPO plans can be "nested" within state plans.
- Before embarking on clean freight planning at the corridor level, it is important to define what is meant by "clean." For example, it could be defined as having alternative fuel infrastructure for trucks or relieving congestion.
- Having environmental group representation on state freight advisory committees can serve as a way to ensure inclusion of clean freight principles within plans.
 - In order to get SmartWay partners onto state freight advisory committees to help define clean from a logistics and technology standpoint, state DOTs could ask regional SmartWay liaisons who to invite, or look it up on the website: <https://www.epa.gov/smartway/smartway-partner-list>.
- Some of the driving forces behind the development of such plans can include environmental mandates, having non-attainment areas for pollutants, congestion issues, emissions, advocacy from Clean Cities coalitions, and the economic impact of goods movement.
- Agencies and partners that should be engaged in the process of developing a clean freight plan include:
 - MPOs



- DOTs
- Rail authorities
- Port authorities
- Shippers and carriers
- EPA
- Air regulatory agencies
- Economic development agencies
- Clean Cities Coalitions
- EPA SmartWay partners
- Public utility commissions
- States vary highly in terms of their level or sophistication and involvement with clean freight planning, so how do we account for these differences?
 - There is an AFV Planning Guide as part of the altfueltoolkit.org website, which allows states to indicate how far along they are in terms of AFV deployment and see which action steps they would need to take in order to become more of a leader in this realm. Perhaps items related to clean freight corridor planning could be incorporated into this guide.
- Establishing metrics to measure success of freight plans remains a key challenge in clean freight planning.

Group 1C: Clean Corridor Marketing

This session focused on developing a marketing plan for clean corridors. Tonia Buell of the Washington State Department of Transportation began the session with a short presentation of marketing of the West Coast Electric Highway. Tonia said that branding was very important in marketing of the corridor; the project was originally known as the “I-5 Transportation Electrification Project” but gained more public awareness when the name was changed to “West Coast Electric Highway.” Tonia worked with a graphic designer to create a logo that emphasized clean, green, safety, and reliability. Susan McSherry of the New York City Department of Transportation also served as a subject matter expert for the group. Susan discussed the [Hunt’s Point Clean Truck program](#) that she coordinates.

The group discussed the following steps of creating a clean corridor marketing plan:

- Goals. The first step to developing a new marketing program is to identify goals. The group discussed the following goals:
 - Suggested goals: greenhouse gas reduction, number of jobs created, number of gallons of fuel displaced or emissions reduced.
 - A program will get the most traction if the message is an economic message.
- Target audience. The following stakeholders are important to engage when marketing clean corridors:
 - Users of the corridors

- Fleet vehicles, including heavy-duty vehicles
- Coalitions, such as the I-95 Coalition
- Trucking companies
- Media
- Regional coordination bodies (like TCI)
- Auto dealerships
- Gas stations
- One participant stated that the target audience is very different for marketing to public versus private entities.
- Key messages. Every clean corridor marketing plan needs a key message. The following were discussed as possible messages:
 - Refueling stations are convenience.
 - Corridor is green and brings environmental benefits.
 - Corridor brings tangible economic benefits to the region.
- Tactics/tools. The following tools and tactics were discussed by the group:
 - Location of signage and advertising is visible and attractive.
 - Finding the cool factor.
 - Indicating locations of clean corridors on Google Maps or other popular mapping platforms.
 - At rest stops, show videos that explain the benefits of clean corridors.
 - Icons on vehicles to indicate AFVs.
 - Issue special license plates to AFVs.
 - Organize “Drive Electric” week to create buzz for clean corridors.
 - Work with local schools to get information about clean corridors into schools. Not only does this educate kids, it provides information to parents when helping kids with homework.
 - Create recognition programs to incentivize businesses or individuals who drive AFVs on corridors.
 - Provide information on the internet and through social media to reach young generations.
 - Leverage one fuel or technology to increase momentum for another.

Breakout Session 2: Deploying Advanced Technologies and Fuels Along Clean Corridors

Group 2A: Access to Alternative Fuel Infrastructure

Chuck Feinberg from Greener by Design and New Jersey Clean Cities provided a brief overview of his experience with deploying AFV fueling infrastructure and some of the key considerations to improving



access that stakeholders should consider. During discussions that followed the overview, the following items emerged as key points:

- State policy and priorities can limit fuel focus by prioritizing only select alternative fuels for programs, acquisition requirements, etc.
- State might not be out in front on access improvements. Attention should be brought to the issue.
- DOTs may not be the leaders, but they can clearly play a role in understanding how to improve AFV access but incorporating alt fuels into existing plans.
- Information access
 - Access means having stations in place *and* making sure they are in operation.
 - The current level of information access is insufficient.
 - The level of detail provided on the Alternative Fuels Data Center (AFDC) is limited; it is missing access information for Class 8 operators.
 - Data on station availability needs to be updated in real time.
 - Education is needed to familiarize users with fuel options, availability, and suitability.
 - Local stakeholder education is a key element of expanding access.
 - Stakeholders need more information so they can answer key questions from potential users like expected fuel price and fueling availability.
 - Any public funding entity could potentially make reporting a funding requirement (common practice for Clean Cities Coalitions).
 - Lack of experience/changes in station operations can be a barrier, i.e. more time is spent refueling.
- Elements for siting
 - Need to consider how to weigh priority of redundancy versus coverage when siting.
 - Need to identify demand opportunities to make investors feel more comfortable with funding.
 - Need to reach out to fleets to generate local support.
 - Good working relationships are necessary to provide evidence of demand.
 - “Start with best case” – Deployments would be at the rest stop or at nearby truck stop.
 - Connect with anchor fleets that could provide steady local use of stations.
 - Work with the “right fleets” that are willing to take on the risks associated with potentially reduced availability and reliability of infrastructure.
 - If fleets have a bad experience with fueling stations, then they could avoid making future purchases.
 - Need to make sure that the trucks can make end-to-end trips.
 - For stations that have been deployed, the goal is to increase load on the station.
 - How can deployments be combined with ports and drayage needs?
 - For CNG and DC fast charging siting, it is necessary to know where the pipeline/grid infrastructure is.

- Fuels and vehicles best uses as of today:
 - CNG, Biodiesel (Class 8)
 - Electric (Drayage, short haul)
 - Propane (Class 6)
- Toolkit Elements
 - Tools for local stakeholder, community, and fleet education.
 - Do stakeholders/ the public have experience with the fuel?
 - Information for fleet providers.
 - Access to travel info, pipelines, environmentally compromised areas, multi-modal facilities, and land use.
 - Freight flows, present and future.
 - Physical access considerations.
 - Maps for fleets, MPOs/DOTs.
 - Technologies available and how to best utilize them.
 - Decision tree/resource to map application to fuel.
- Potential DOT/MPO roles in improving access:
 - Leverage existing corridor plans.
 - Share travel data for freight.
 - Support improved access to information and timing of data.
 - Identify better use for multi-modal applications.
 - Consider deployments in environmentally sensitive zones.
 - Deploy signage.
 - Address physical access considerations.

Group 2B: System Optimizations with Routing and Intermodal Considerations

This breakout group addressed questions about the system-wide efficiency of the clean corridors, including ports, highways, and intermodal facilities. Richard Hendrick, General Manager, Port of Albany, served as the subject matter expert of the group. Mr. Hendrick began the session with a description of the Port of Albany.

During discussions that followed the overview, the following items emerged as key points:

- Ports can have more stakeholders than a highway, meaning coordination on clean transportation is more challenging.
- Mr. Hendrick provided some fundamental information about ports:
 - The owner of the freight, not the port, makes the decision on the mode of transport.
 - The downside to using rail is the cost and impact of multiple handlings of cargo (i.e., multiple loadings and offloadings).
 - During periods of high oil prices, rail has a high value for petroleum movement which pushes other cargo away from rail to trucks.
- The group discussed how all ports are connected, so shifting more cargo from one port to another or shifting from truck to rail will inevitably have impacts on the system efficiency of other areas of the country.



- Some participants suggested that [vehicle automation and port automation can have positive job benefits](#) by removing barriers to job access for large numbers of non-drivers, boosting their labor force participation.
- A major selling point for reducing port emissions are the health benefits to the truck drivers.
- The Port of Savannah, Georgia uses a short rail spur to move cargo inland about 20 miles before shifting cargo to trucks. This has the benefit of moving emissions away from population centers.
- Possible items for the toolkit:
 - Description of the Port of Long Beach “Pier Pass” program (appointment system for trucks).
 - Case studies on programs like the Green Marine program.

Group 2C: Idle-Reduction and Advanced Fuel Efficiency Technologies

Bill Van Amburg, CALSTART, provided an overview of existing and well established idle-reduction technologies, as well as emerging technologies in the earlier stages of adoption. During discussions that followed the overview, the following items emerged as key points:

- A lot of idle-reduction and advanced fuel efficiency technologies are already certified by EPA through their SmartWay program.
- Often the easiest approach to take is through driver training and education so that they operate vehicles in more fuel-efficient ways. Telematics could be used to track and enforce that behavior changes are actually happening. At the same time, incentives or rewards could be provided in correlation with cost savings achieved.
 - As an alternative approach to training drivers, another method is to increase automatization within a vehicle to optimize for fuel efficiency.
- These technologies are not always penetrating at the DOT level. Yet their adoption at that level will increase volumes and drive down prices, while taking away fear factors around emerging technologies.
 - The value proposition for state-owned vehicles is there. Others such as truck stop electrification, are subject to public planning and operational oversight.
 - Having strings attached to federal money, or inserting language about idle reduction strategies in contract language could help facilitate adoption within state fleets. Northeast Diesel Collaborative’s (NEDC) standards for construction vehicles could serve as a model.
 - Massachusetts is developing a statewide contract spec, [VEH102](#), for a wide range of advanced vehicle technology equipment, supplies, and services, including electric vehicle supply equipment, anti-idling technologies, and after-market conversion technologies.
 - Clean Cities and Argonne National Lab serve as sources of unbiased information on idle reduction. Idle reduction will also be added to the AFLEET tool.

- DOTs must be shown that any new technologies will not undermine their ability to fulfill their missions under difficult conditions, and that the vehicles and technologies are easily serviceable.
- Turner Construction hires monitors at job sites to track air quality and thus police idle reduction practices. This practice could be emulated by other fleets, or built into bid specs by DOTs on public jobs to leverage companies' adoption of these types of practices.
- With the adoption of any idle reduction or fuel efficiency technologies, crew comfort and safety still need to be valued as top priorities. Otherwise, drivers may find ways to circumvent the technologies, or have negative reactions to their implementation.
- Utilizing terminology such as "advanced" fuels instead of "alternative" fuels may have a broader appeal.
- Tools that would be helpful for DOTs to have in order to foster adoption of these technologies include:
 - A listing of idling regulations, currently available from the Department of Energy's (DOE) [IdleBox Toolkit for Idling Reduction Projects](#).
 - Compilation of contract language examples.
 - Exchanging of information and case studies among DOTs on their experiences.
 - Increased visibility of this topic at American Association of State Highway and Transportation Officials (AASHTO) and Transportation Research Board (TRB).

Review Key Findings, Identify Critical Needs and Next Steps

During the final session of the day, attendees discussed their takeaways and made suggestions as to what type of information would be helpful to include in the toolkit that will be developed following the workshop. The key remarks made during the session included the following:

- Clean corridor planning will differ between corridors. Identifying effective corridor strategies that are scalable across different areas is key.
- Every clean corridor marketing campaign needs the following: goals, target audience identification, key message, and tools/tactics.
- Marketing best practices include:
 - Location of signage and advertising is visible and attractive.
 - Finding the cool factor.
 - Indicating locations of clean corridors on Google Maps or other popular mapping platforms.
 - At rest stops, show videos that explain the benefits of clean corridors.
 - Icons on vehicles to indicate AFVs.
 - Issue special license plates to AFVs.
 - Organize "Drive Electric" week to create buzz for clean corridors.



- Work with local schools to get information about clean corridors into schools. Not only does this educate kids, it provides information to parents when helping kids with homework.
- It's important to think about who convenes the discussion about clean freight corridors.
 - In California, it was the governor's office but will that be the case in other states?
 - DOTs may be a part of the process, but they will likely not lead it.
 - Governor's offices are also convening the VW settlement and plan, so strong leadership can come from there.
 - Clean Cities Coalitions can also lead these discussions, as they have a history of working together, and across state boundaries. Designated funding for this type of effort is key to making it happen.
- There are two parts to a successful clean freight corridor development: having both intra- and inter-state corridor planning.
 - Inter-state planning groups like TCI could take the lead. TCI's specific focus is on passenger EVs, due to the Zero Emission Vehicle (ZEV) commitment, so their role would need to be widened to include freight planning.
 - MPOs are important for intra-state coordination.
 - Federal agencies (DOE, DOT, and EPA) need to work as a joint group to advance clean freight corridors.
 - DOE's Argonne National Lab, DOT's Volpe, and an EPA-contract lab equivalent could collaborate to channel federal support to bolster corridor development.
- The items that would be helpful to have in the toolkit for DOTs and MPOs include:
 - Linkages to freight planning, signage policies, and corridor planning, including what DOTs already do and what could be done differently.
 - Identification of the roles of different agencies involved, not just the DOTs and MPOs.
 - Information about how to engage with MPOs on clean corridors.
 - Guidance on how to develop a Scope of Work (SOW) for a freight plan.
 - Model signage policies related to the deployment of the new signage for designated alternative fuel corridors.
 - Information on the Northeast Clean Freight Corridors Initiative, which will be carrying this effort further.
 - Data related to the cost of infrastructure.
 - National Renewable Energy Laboratory (NREL) has all data from the American Recovery and Reinvestment Act of 2009.
 - NYSERDA can share its cost data.

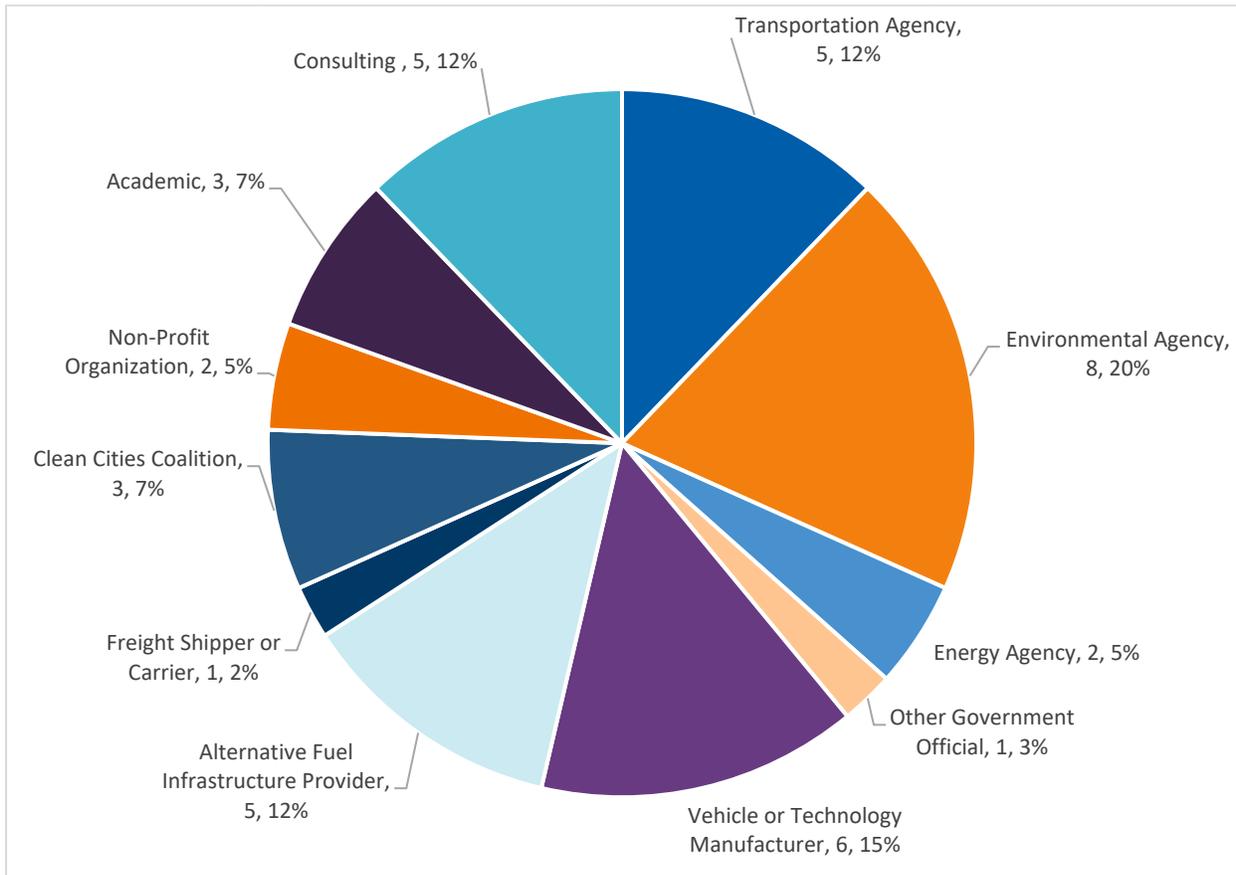
- The toolkit should reflect the changing economy of mobility, i.e. the “uber-ization” of everything.
- Local economic development agencies and organizations are a key partner in developing clean freight corridors.
 - These groups often work directly with the private sector to catalyze investment.
- While the mainstream press focus around the alternative fuel corridor designation announcement has been around EVs, other fuels such as CNG, LNG, and propane will continue to be included as key components of alternative fuel corridors and will benefit truckers around the country.
- Outreach to the AASHTO standing committee on Manual on Uniform Traffic Control Devices (MUTCD) sign standards would be beneficial, as well as education to the public, in order to set guidance and expectations for the new signage around alternative fuel corridors.
 - Roadway signage is important from a perception stand point, so drivers are aware of available alternative fuel infrastructure.
 - While many passenger vehicles are equipped with technologies to help navigate and provide information about available infrastructure, trucks need better access to this type of in-vehicle information.



Summary of Workshop Evaluations

An online survey was distributed to meeting attendees on November 17, 2016. The survey was sent to all attendees of the meeting, and was intended to assess the effectiveness of the workshop, help build the workshop toolkit, as well as inform the development of future workshops. A total of 41 attendees responded to the overall survey, and 26 responded to the questions about the workshop specifically. Their answers are summarized below.

Figure 4: What best describes your role in corridor development?

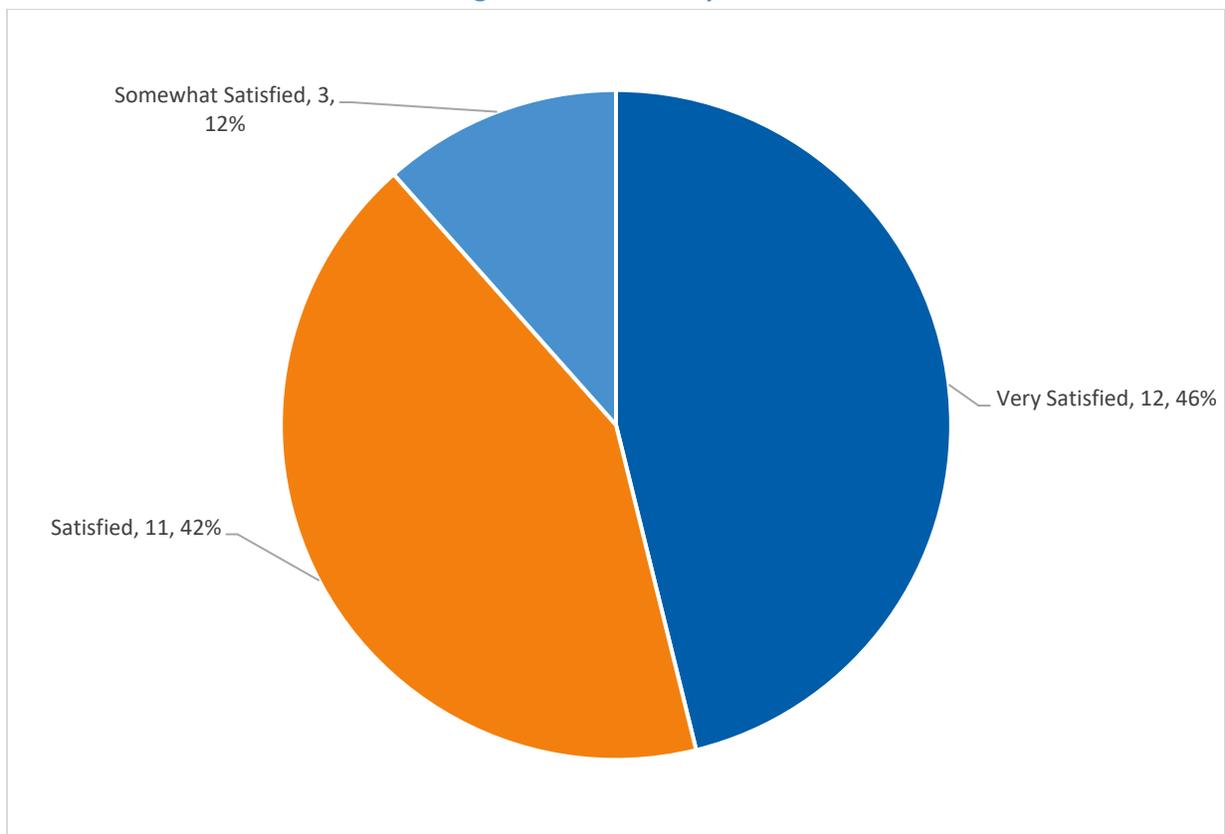


All meeting attendees responded to this question, so it is representative of survey respondents that attended one or both days of the meeting, not just the workshop. Survey respondents were mostly environmental agency representatives, followed by vehicle or technology manufacturers. The next most represented categories were transportation agency staff, alternative fuel infrastructure providers, and consultants.

All meeting attendees were also presented with a question asking them to leave any additional feedback or suggestions for future workshops. The comments relevant for future pooled fund workshops were:

- As an environmental agency staffer, it was important to hear from stakeholders with unique perspectives such as supermarket chains and port terminal operators.
- As long as this involves highways, an effort must be made to involve more state DOTs at future events. The FHWA should put pressure on having the DOT representatives at the events. This type of meeting is important, but lacks impact without the key players in attendance.
- The beginning of the event should set aside 25 minutes for each person to introduce themselves so you knew who was there. However, your name tags were PERFECT and large print so you could read a person's name and affiliation.
- It was a great cross section of industry and government working together to a common goal, continuing open discussions benefit all parties.
- The federal government needs to raise the national motor fuel tax to fund improvements to existing infrastructure. With the current lack of funding we are in a preservation-first mode, with no real innovation within our transportation systems.

Figure 5: How satisfied were you with the use of breakout sessions as a means to learn about clean freight corridor development?

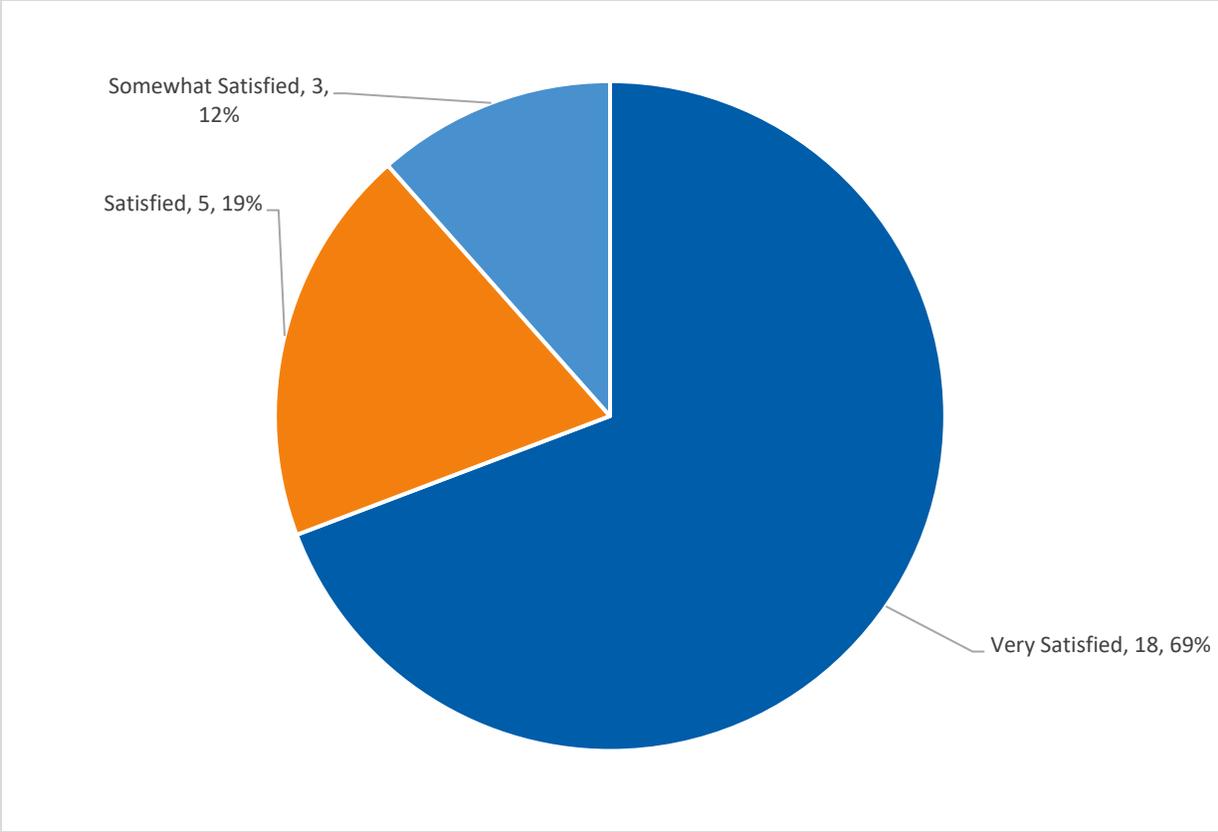


This question, and all subsequent questions documented here, were answered only by those that indicated they had attended the workshop portion of the Clean Corridors Meeting. The vast majority of respondents (88%) were either satisfied or very satisfied with the use of breakout sessions as a means to



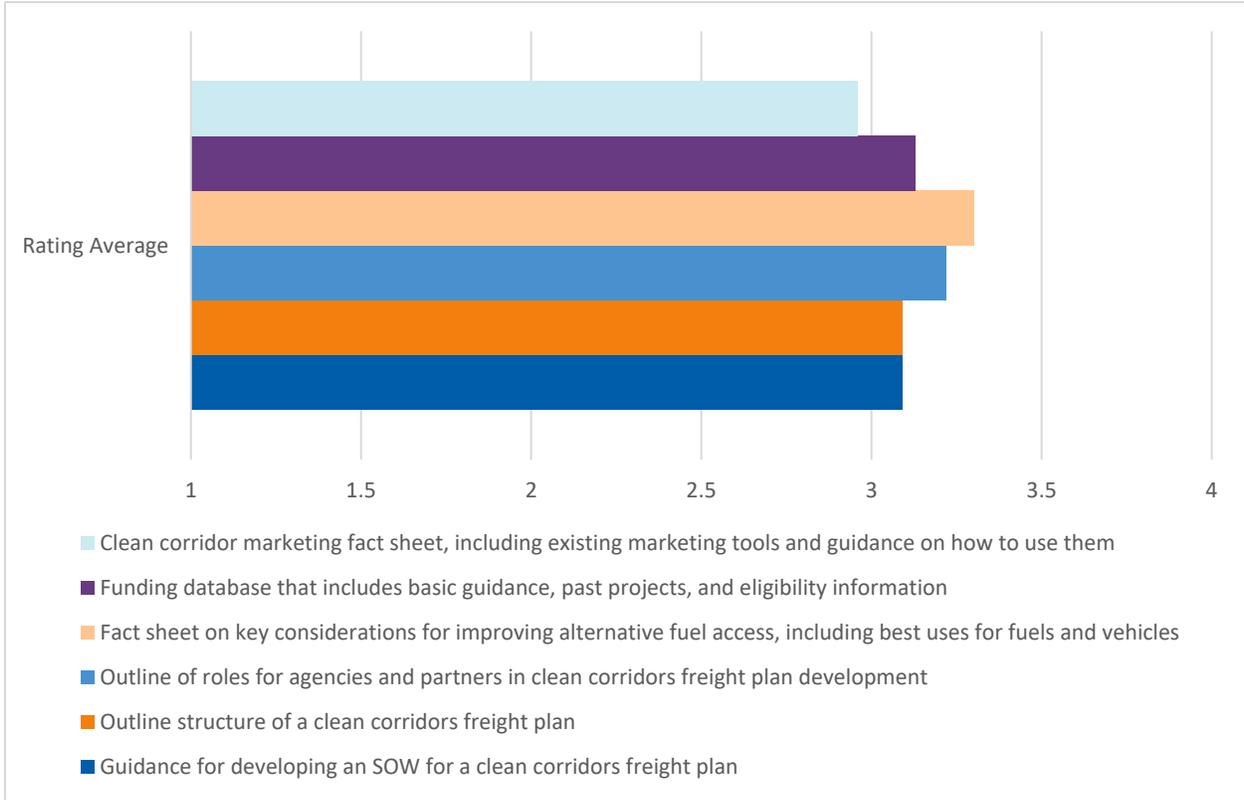
learn about clean freight corridor development. No respondents indicated that they were “Not Satisfied,” which would have required further explanation.

Figure 6: How satisfied were you with the overall content and organization of the workshop?



The vast majority of respondents (88%) were either satisfied or very satisfied with the overall content and organization of the workshop. No respondents indicated that they were “Not Satisfied,” which would have required further explanation.

Figure 7: Please rate the relevance of the following potential toolkit elements to your future work with alternative fuel corridor development.



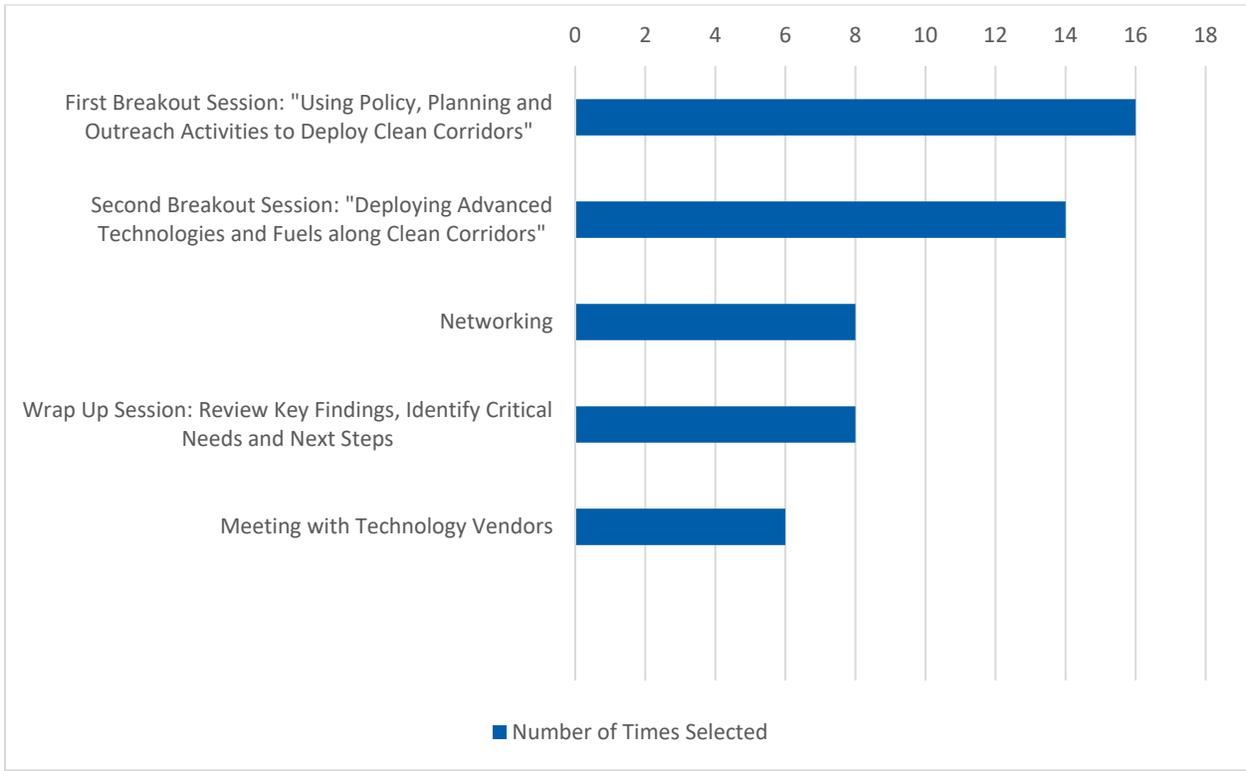
This question presented respondents with several potential toolkit components that could be developed following the workshop. Respondents were provided with the options listed above and asked to rank them on a four-point relevancy scale, ranging from very irrelevant to very relevant. All options received relatively similar reactions, with a fact sheet on key considerations for improving alternative fuel access emerging as the most popular choice. The second and third most popular options were an outline of roles for agencies and partners in clean corridor freight plan development and a funding database that includes basic guidance, past projects, and eligibility information.

Another question in the survey asked respondents to provide links to any key existing resources or tools that they believed would be helpful for state DOTs to have in advancing the development of clean freight corridors. Respondents replied with the following:

1. Just the usual tools Clean Cities Coordinators have and their ability to connect all interested parties
2. Clean Cities Coalitions
3. NYSERDA and the 6 DOE Clean Cities Coalitions would be relevant for New York state
4. AFDC Website



Figure 8: What were the most valuable aspects of the workshop for you?



Survey respondents indicated that the first breakout session, focused on policy, planning, and outreach activities to deploy clean corridors, was the most valuable portion of the workshop. Respondents were allowed to select more than one answer to this question, and there was an “other” option, but it was not selected by any of the respondents.

Another question in the survey, which was indicated to be for state DOTs only, asked how likely it is that the strategies identified in the breakout groups will be influential for the respondent’s future corridor development plans. Respondents were provided with a five-point likeliness scale, from highly unlikely to highly likely. Five respondents answered this question, with one responding “highly likely,” three responding “likely,” and one responding “possibly.”

Respondents were also asked if they would be willing to participate in a “beta” review of the workshop’s toolkit, and nine respondents indicated they would be and provided their email address. These respondents will be notified when a draft version of the toolkit becomes available and their feedback will be sought.

Appendix I: Workshop Agenda

**DAY 2: U.S. DOT FHWA POOLED FUND WORKSHOP
TOOLS FOR IMPLEMENTING ALTERNATIVE FUEL CORRIDORS**

Workshop Objective: The objective of this workshop is to identify opportunities for state transportation agencies to support greater use of alternative fuels in goods movement along corridors in the Northeast. Key questions addressed by the workshop include:

- Who are the key public and private stakeholders to engage on a clean corridor project?
- What fuels and technologies are most suitable for different transportation modes considering near-term market conditions?
- What funding strategies are available to implement clean corridors?

Outcomes from this workshop will be used to create an online toolkit to aid transportation agencies with implementing clean freight corridors.

- 7:30 AM – 8:00 AM** **Breakfast with Technology Vendors in the Exhibit Hall**
- 8:00 AM – 8:15 AM** **Day 2 – Welcome and Introductions**
FHWA and Oregon Department of Transportation welcome participants to Day 2.
- 8:15 AM – 8:30 AM** **Workshop Overview**
Geoff Morrison from the Cadmus Group and Nick Nigro from Atlas Public Policy will review the workshop goals and structure of the breakout group discussions.
- 8:30 AM – 9:30 AM** **Using Policy, Planning and Outreach Activities to Deploy Clean Corridors**
Freight stakeholders have a number of policy and outreach tools at their disposal to deploy clean corridors. Each breakout group will identify clean corridor strategies for policy or outreach that can be incorporated into a comprehensive clean freight corridor or regional plan.

Group A: <i>Funding Clean Corridors</i>	Group B: <i>Developing a Clean Freight Plan</i>	Group C: <i>Clean Corridor Marketing</i>
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Subject Matter Experts

- * **Group A: Adam Ruder**, *Transportation Manager, NYSERDA*
- * **Group B: Gerry Bogacz**, *Planning Director, NYMTC*
- * **Group C: Tonia Buell**, *Project Development Manager, Innovative Transportation Partnerships, Washington State Department of Transportation* and **Susan McSherry**, *Program Manager, Alternative Fuels, New York City Department of Transportation*



9:30 AM – 10:00 AM Breakout Groups Report Back to All Attendees
Breakout Groups will report back to all attendees their findings, including lessons learned, major opportunities, and key information gaps.

10:00 AM – 10:30 AM Fuel Up! – Coffee Break in Technology Exhibit Hall
Enjoy a quick coffee break while learning about the technologies and fuels available to support clean corridors in the Technology Exhibit Hall.

10:30 AM – 11:30 AM Deploying Advanced Technologies and Fuels along Clean Corridors
Clean Corridors can help in the deployment of complementary technologies that reduce emissions, save energy, and improve traffic flows. Each breakout group will identify strategies to help deploy advanced technologies and increase alternative fuel access that can be incorporated into a comprehensive clean freight corridor or regional plan.

Group A: Access to Alternative Fuel Infrastructure

Group B: System Optimizations with Routing and Intermodal Considerations

Group C: Idle-Reduction and Advanced Fuel Efficiency Technologies

Subject Matter Experts

- * **Group A: Chuck Feinberg**, Clean Cities Coordinator, New Jersey Clean Cities
- * **Group B: Rick Cameron**, Managing Director of Planning and Environmental Affairs, Port of Long Beach
- * **Group C: Bill Van Amburg**, Senior Vice President, CALSTART

11:30 AM – 12:00 PM Breakout Groups Report Back to All Attendees
Breakout Groups will report back to all attendees their findings, including lessons learned, major opportunities, and key information gaps.

12:00 PM – 12:30 PM Review Key Findings, Identify Critical Needs and Next Steps
Participants will discuss the most promising solutions raised throughout the day. Following the discussion, the Cadmus Group and Atlas Public Policy will summarize findings and offer next steps.

12:30 PM Workshop Adjourns

Appendix II: Workshop Participant List

*Note: This is a list of all attendees that indicated they would participate in the workshop portion of the two-day Clean Corridors Meeting.

First Name	Last Name	Affiliation
Guiselle	Aldrete	Starcrest Consulting Group, LLC
Roy	Bant	Air Liquide
Richard	Batchelder	New York State Department of Transportation
Daniel	Birkett	U.S. Environmental Protection Agency
Gerry	Bogacz	The New York Metropolitan Transportation Council
Rhea Courtney	Bozic	Clean Fuels Consulting
Tonia	Buell	Washington State Department of Transportation
Bob	Buick	Volvo Trucks North America
Allison	Callahan	Rhode Island Department of Environmental Management
Gina	Campoli	Vermont Agency of Transportation
Barry	Carr	Clean Communities of Central New York
Christian	Castanien	Neste
Jennifer	Ceponis	Capital District Transportation Committee
Maria	Chau	U. S. Department of Transportation, FHWA
Wayne	Clark	Milton CAT
Thomas	Condon	New Jersey Natural Gas
Juan	Corcino	Manhattan Beer Distributors
Stephen	Costa	U. S. Department of Transportation, Volpe Center
Joseph	Darling	Darling Transportation Energy Solutions
Mary Lou	Darling	Darling Transportation Energy Solutions
Steven	Dorn	Milea Truck Sales Corp.
Rita	Ebert	Greater Long Island Clean Cities Coalition
Sam	Elrahman	Rensselaer Polytechnic Institute
Jody	Ernst	Cummins Sales and Service
Dawn	Fenton	Volvo Group North America
Wendy	Ferguson	Virginia Transportation Corporation
Darin	Franklin	LivElite International
Alycia	Gilde	CALSTART
Matthew	Goetz	Georgetown Climate Center
Carlos	Gonzalez-Calderon	Rensselaer Polytechnic Institute
Lee	Grannis	Greater New Haven Clean Cities Coalition
Ronald	Gulmi	Emerald Alternative Energy Solutions, Inc.
Gerry	Hyde	Cummins Inc.
Joseph	Iannotti	New York State Department of Environmental Conservation
Art	James	Oregon Department of Transportation
Christopher	Johnson	Ballard Power Systems
David	Keefe	Genesee Region Clean Communities



Geraldine	Kelpin	New York City Department of Environmental Protection
Ray	Kenard	Northeast Transportation Electrification Alliance
Charles	Knutson	Office of the Governor, Policy Office, WA State
Benoit	LaCroix	Effenco
Oana	Leahu-Aluas	Cadmus
Eva	Lerner-Lam	BYD Motors
Carl	Lisek	South Shore Clean Cities
Pete	Morano	South Jersey Gas
Geoff	Morrison	Cadmus
Timothy	Mosher	Pan Am Southern Railways
Kara	Murphy	Northeast States for Coordinated Air Use Management
Juvena	Ng	Rensselaer Polytechnic Institute
Nick	Nigro	Atlas Public Policy
Mark	Parece	Town of Brookline, Massachusetts
Marygrace	Parker	I-95 Corridor Coalition
Jim	Petrecky	Plug Power
Simon	Poulin	Effenco
Michael	Press	SCOUT Economics
Diana	Ramirez-Rios	Rensselaer Polytechnic Institute
Gary	Rennie	U.S. Environmental Protection Agency
Jose	Rivera	The New York Metropolitan Transportation Council
Marcy	Rood	Argonne National Laboratory
Bryan	Roy	Energetics Incorporated
Adam	Ruder	New York State Energy Research and Development Authority
Steve	Russell	Massachusetts Clean Cities
Erin	Russell-Story	U.S. Department of Energy, National Energy Technology Laboratory
Mike	Scarpino	U. S. Department of Transportation, Volpe Center
James	Sherman	Climate Change Mitigation Technologies LLC
Gabriel	Sherman	Massachusetts Department of Transportation
Aaron	Spies	Capital District Transportation Committee
Jeremiah	Sullivan	ChemBioPower, Inc.
Abby	Swaine	U.S. Environmental Protection Agency
James	Symon	New York State Department of Environmental Conservation
Diane	Turchetta	U. S. Department of Transportation, FHWA
Robert	Venuti	Atlantic Coast Energy Group
Alexander	Walsh	Atlas Public Policy
Alan	Warde	New York State Department of Transportation
Robert	Waterfall	New York State Department of Environmental Conservation
Stephen	Whaley	Agility Fuel Solutions
Tim	White	New Hampshire Department of Environmental Services
Gregory	Wilcox	Eastern Research Group
David	Word	Power Drives, Inc.
John	Zamurs	Zamurs and Associates