

6. Technology Integration

The Vehicle Technologies Office (VTO) supports research, development, demonstration, and deployment (RDD&D) of new, efficient, and clean mobility options that are affordable for all Americans. The office's investments leverage the unique capabilities and world-class expertise of the national laboratory system to develop new innovations in vehicle technologies, including: advanced battery technologies; advanced materials for lighter-weight vehicle structures and better powertrains; energy-efficient mobility technologies and systems (including automated and connected vehicles as well innovations in connected infrastructure for significant systems-level energy efficiency improvement); innovative powertrains to reduce greenhouse gas (GHG) and criteria emissions from hard to decarbonize off-road, maritime, rail, and aviation sectors; and technology integration that helps demonstrate and deploy new technology at the community level. In coordination with the other offices across the Office of Energy Efficiency and Renewable Energy (EERE) and the U.S. Department of Energy (DOE), VTO advances technologies that assure affordable, reliable mobility solutions for people and goods across all economic and social groups; enable and support competitiveness for industry and the economy/workforce; and address local air quality and use of water, land, and domestic resources.

The Technology Integration (TI) subprogram supports the decarbonization of the transportation sector through various initiatives that accelerate the adoption of electric vehicles (EVs) and charging infrastructure. The program covers a broad technology portfolio that includes alternative fuels (e.g., advanced biofuels, electricity, hydrogen, renewable natural gas) and energy efficient mobility systems. The successful deployment of these technologies can support the decarbonization of the transportation sector, strengthen national security through fuel diversity and the use of domestic fuel sources, reduce transportation energy costs for businesses and consumers, address the needs of underserved communities, and support energy resiliency with affordable alternatives to conventional fuels that may face unusually high demand in emergency situations.

At the national level, TI offers technical assistance, information resources, online training, and an array of data and analysis tools. At the local level, the subprogram administers Clean Cities and Communities, a DOE partnership to advance clean transportation nationwide. This federal partnership includes more than 75 DOE-designated Clean Cities and Communities coalitions that leverage DOE resources to create networks of stakeholders and provide hands-on technical assistance to communities and fleets. Clean Cities and Communities serves as a backbone for partnering with cities, towns, and rural areas across the country on clean transportation technology. The Heavy-Duty Truck Fueling Corridor activity funds an Integrated Heavy-Duty Zero Emission Vehicle (ZEV) Fueling and Connected Grid project to demonstrate integrated clean corridor solutions, connecting truck depots, ports, highways, and end users, providing electric vehicle charging infrastructure and freight solutions. The Clean Energy to Communities activity provides unbiased expertise, tools, and resources to cities and communities as they set clean energy, equitable transportation, and climate resilience goals. The Technical Assistance and Demonstration activity supports projects that provide information, insight, online tools, and technology assistance to cities, states, and regions working to implement clean transportation solutions and energy efficient mobility technologies and systems. The Data Collection and Dissemination activity collects and provides objective, unbiased data, information, and real-world lessons learned to fleets and local decision makers, while also funding the Alternative Fuels Data Center and the annual Fuel Economy Guide. Finally, TI supports STEM and workforce development through its EcoCar Mobility Challenge and Battery Workforce Challenge collegiate competitions, advancing powertrain systems, connected and automated vehicle technology and EV battery packaging to improve efficiency, safety, and consumer appeal.

Project Feedback

In this merit review activity, each reviewer was asked to respond to a series of questions, involving multiple-choice responses, expository responses where text comments were requested, and numeric score responses (on a scale of 1.0 to 4.0). In the pages that follow, the reviewer responses to each question for each project will be summarized: the multiple choice and numeric score questions will be presented in graph form for each project, and the expository text responses will be summarized in paragraph form for each question. A table presenting the average numeric score for each question for each project is presented below.

Table 6-1 – Project Feedback

Presentation ID	Presentation Title	Principal Investigator (Organization)	Page Number	Objectives	Approach	Accomplishments	Collaboration	Energy Equity and Environmental Justice (EEEJ)	Weighted Average
TI093	EVSE Innovation: Streetlight Charging in City Right-Of-Way	Miriam Bouallegue (Metropolitan Energy Center)	6-6	3.38	3.25	3.50	3.13	3.13	3.35
TI126	Twin Cities Electric Vehicle Community Mobility Network	Lisa Thurstin (American Lung Association)	6-10	3.88	3.75	3.25	3.50	3.25	3.50
TI127	The Mid-Atlantic Electrification Partnership: An Electrification Ecosystem of Intermodal Leadership and Intercity Travel	Alleyn Harned (Virginia Clean Cities)	6-15	3.50	3.75	3.25	3.50	3.25	3.43
TI128	Western Smart Regional Electric Vehicles Adoption and Infrastructure at Scale	James Campbell (PacifiCorp)	6-18	3.50	3.50	3.33	3.50	3.33	3.42
TI129	Helping America's Rural Counties Transition to Cleaner Fuels and Vehicles	Ken Brown (Transportation Energy Partners)	6-22	3.75	3.50	3.13	3.25	3.50	3.38
TI130	VoICE-MR: Vocation Integrated Cost Estimation for Maintenance and Repair of Alternative Fuel Vehicles (AFV)	Arvind Thiruvengadam (West Virginia University)	6-26	3.50	3.63	3.25	3.00	3.00	3.33

2023 VTO ANNUAL MERIT REVIEW RESULTS REPORT – TECHNOLOGY INTEGRATION

Presentation ID	Presentation Title	Principal Investigator (Organization)	Page Number	Objectives	Approach	Accomplishments	Collaboration	Energy Equity and Environmental Justice (EEJ)	Weighted Average
TI131	DRIVE (Developing Replicable, Innovative Variants for Engagement) for EVs in the USA	Jonathan Overly (East Tennessee Clean Fuels Coalition)	6-30	3.67	3.50	3.67	3.50	2.67	3.52
TI132	NFPA Spurs the Safe Adoption of Electric Vehicles through Education and Outreach	Andrew Klock (National Fire Protection Association)	6-33	3.38	3.63	3.50	3.75	2.63	3.44
TI134	Delivering Clean Air in Denver: Propane Truck and Infrastructure in Mail Delivery Application	Bonnie Trowbridge (Drive Clean Colorado)	6-37	3.30	3.20	2.60	2.70	2.90	2.90
TI135	Advancing Climate and Innovation Goals of Memphis and Shelby County: Electrification of Key Fleet Vehicles to Capture Cost Savings and Climate Benefits	Leigh Huffman (Shelby County)	6-41	3.00	3.13	3.13	3.50	2.75	3.10
TI136	Zero Emission Freight Future	Tim Cho (Clean Fuels Ohio)	6-44	3.70	3.50	3.20	3.60	2.70	3.35
TI137	Cold-Weather Operation, Observation and Learning Electric Vehicles	Lisa Thurstin (American Lung Association)	6-48	3.70	3.20	2.70	3.00	3.40	3.10
TI138	Demonstrating Electric Shuttles for the New Orleans Region	Jordan Stewart (Tulane University)	6-52	3.13	3.13	2.38	2.75	2.88	2.76
TI139	Pilot Heavy-Duty Electric Vehicle (EV) Deployment for Municipal Solid Waste Collection	Kelli Toth (Municipality of Anchorage)	6-55	3.63	3.25	2.63	2.88	2.75	2.99

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Presentation ID	Presentation Title	Principal Investigator (Organization)	Page Number	Objectives	Approach	Accomplishments	Collaboration	Energy Equity and Environmental Justice (EEJ)	Weighted Average
TI140	St. Louis Vehicle Electrification Rides for Seniors (SILVERS)	Connor Herman (Forth Mobility)	6-58	3.63	3.63	3.75	3.88	3.88	3.73
TI141	Integrated Fuel Cell Electric Powertrain Demonstration	Patrick Kaufman (Cummins)	6-62	3.13	3.13	2.88	3.00	3.25	3.03
TI142	Field Demonstration of a Near-Zero, Tier 5 Compliant, Natural Gas Hybrid Line-Haul Locomotive	Ted Barnes (Gas Technology Institute)	6-66	3.50	3.50	3.13	3.50	3.13	3.31
TI143	Medium-Duty Electric Truck (Etruck): Pilot Electrified Fleets in Urban and Regional Applications	Junmin Wang (University of Texas-Austin)	6-69	3.63	3.38	3.50	3.63	2.88	3.45
TI144	Creating the NFPA Distributed Energy Resources Safety Training (DERST) Program	Andrew Klock (National Fire Protection Association)	6-73	3.33	3.50	3.50	3.67	2.67	3.40
TI145	Electric Vehicle Market Stimulation in Divested Economies	Miriam Bouallegue (Metropolitan Energy Center)	6-75	3.50	3.50	3.00	3.25	3.75	3.30
TI146	Rural Reimagined: Building an EV Ecosystem and Green Economy for Transforming Lives in Economically Distressed Appalachia	Pingen Chen (Tennessee Tech)	6-78	3.63	3.88	3.50	3.75	3.50	3.63
TI147	Affordable Mobility Platform	Connor Herman (Forth Mobility)	6-82	3.67	3.50	3.17	3.50	3.50	3.40
TI148	Upper Midwest Inter-Tribal Electric Vehicle (EV) Charging Community Network	Robert Blake (Native Sun Community Power Development)	6-85	3.63	3.88	3.63	3.88	3.88	3.73

2023 VTO ANNUAL MERIT REVIEW RESULTS REPORT – TECHNOLOGY INTEGRATION

Presentation ID	Presentation Title	Principal Investigator (Organization)	Page Number	Objectives	Approach	Accomplishments	Collaboration	Energy Equity and Environmental Justice (EEJ)	Weighted Average
TI149	Equitable Mobility Powering Opportunities for Workplace Electrification Readiness (EMPOWER)	Michael Graham (Western Washington Clean Cities)	6-89	3.60	3.50	3.60	3.80	3.70	3.61
TI150	Charge To Work USA	Jason Zimbler (CALSTART)	6-93	3.50	3.50	3.10	3.60	3.40	3.34
TI151	Leadership of Employers for Electrification Program	Steffani Cuff (Forth Mobility)	6-97	3.50	3.50	3.50	3.70	3.60	3.53
TI152	Project Sila: An Arctic CNG Pilot Test Program	Keith Patterson (ASRC Energy Services)	6-101	3.50	3.50	3.40	3.60	3.50	3.47
Overall Average				3.51	3.47	3.23	3.42	3.21	3.35

Presentation Number: TI093
Presentation Title: EVSE Innovation: Streetlight Charging in City Right-Of-Way
Principal Investigator: Miriam Bouallegue (Metropolitan Energy Center)

Presenter

Miriam Bouallegue, Metropolitan Energy Center

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the project very directly supports these objectives by providing increased access to EV fueling in a way that promotes resilience and equity. The reviewer added that more ubiquitous adoption of EVs will require novel, convenient solutions for charging, like what is being done here.

Reviewer 2:

The reviewer opined that the goal of using light poles owned by the city is a better approach than using telephone poles owned by the utilities and added that it is an excellent approach.

Reviewer 3:

The reviewer noted that this project provides excellent support for TI objectives by increasing access to alternative fuel use via the deployment of EV charging. The reviewer added that the use of existing infrastructure (streetlights in the right-of-way) additionally allows for greater affordability for local governments to deploy a substantial number of EV charging stations.

Reviewer 4:

The reviewer commented that the project objectives support improving fuel diversity, increasing local resiliency, and reducing GHG emissions in Kansas City. The reviewer added that the use of streetlight charging appears to be an efficient urban charging solution that can be expanded to other cities through a well thought-out, replicable process.

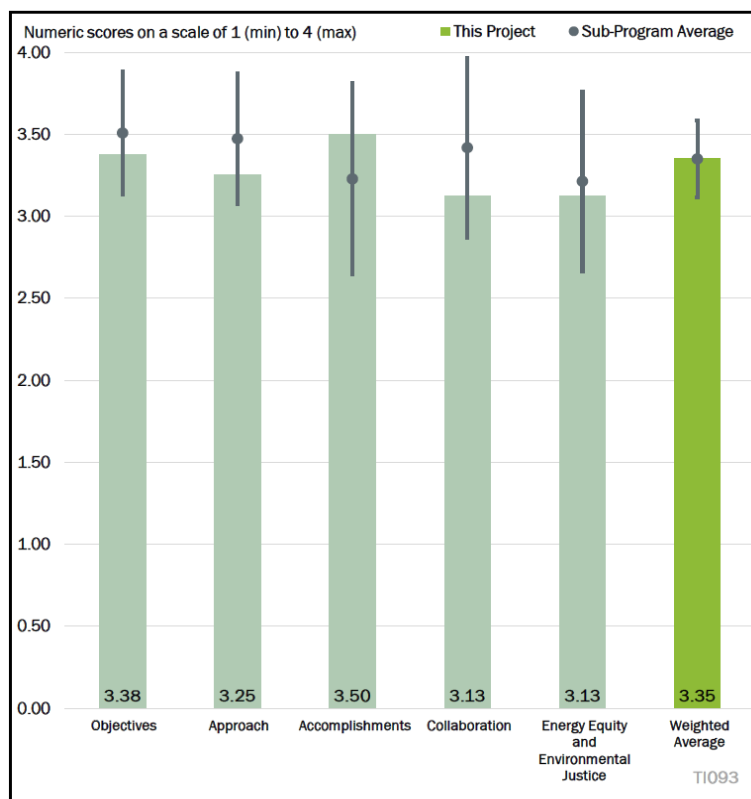


Figure 6-1 - Presentation Number: TI093 Presentation Title: EVSE Innovation: Streetlight Charging in City Right-Of-Way Principal Investigator: Miriam Bouallegue (Metropolitan Energy Center)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that this demonstration project will help advance the studied technology by implementing it in a real-world setting. The reviewer noted that successful case studies are particularly useful for other entities as they consider deploying this technology, and lessons learned from this effort will help those entities avoid pitfalls and employ best practices.

Reviewer 2:

The reviewer stated that while they have identified points of interest to locate electric vehicle supply equipment (EVSE) they should identify multi-family housing (MFH) such as three family units with no driveways or garages to locate EVSE on the street.

Reviewer 3:

The reviewer commented that the approach to determining where to install charging infrastructure is excellent, both in its teaming arrangement and in the market demand modeling approach. The reviewer noted that the project team is comprised of a number of industry stakeholders that are key to the success of deploying EV charging infrastructure in the right of way while also prioritizing increasing access to charging for MFH residents. The reviewer added that in addition to working with local governments to overcome barriers associated with utilizing streetlight infrastructure as a source for EVSE, the project has conducted ample community engagement throughout, including hosting public listening sessions, conducting outreach with local media, incorporating feedback from local residents during construction, and creating a plan for building awareness of the new chargers. The reviewer observed that, related to the community engagement, the project built a market demand model to look at a number of factors that inform EV adoption and access to charging and then used the data in the model to inform site selection, with an added prioritization for underserved communities.

Reviewer 4:

The reviewer noted that this project uses a straightforward approach to accomplish its objectives, specifically using a streetlight charging application, and it provides steps and milestones. The reviewer was interested to see further details on EV charging site selection criteria, benefits of streetlight technology, and community outreach results. The reviewer observed that other projects seemed to incorporate a much more regional approach and noted that it may be important for the gathered information to be applied in other parts of the Kansas City region. The reviewer expressed an interest in seeing more information on community engagement, city feasibility, future plans, how this opportunity will directly impact communities, and how to plan for other municipalities to use this project to inform their own streetlight charging initiatives.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer stated that the project has accomplished much of the challenging groundwork necessary to complete prior to implementation, like site surveys and hardware development.

Reviewer 2:

The reviewer noted that the project team seems to be on target to move to the next steps in this grant and added that the fact they have identified the technology is important so equipment can be ordered. The reviewer also noted that permits have been acquired, which is important.

Reviewer 3:

The reviewer commented that the project has achieved a majority of its key milestones, building upon previous milestones and lessons learned through the market demand modeling. The reviewer further noted that, throughout the process, the project has been able to focus on its overall objective to provide a more affordable solution for building an EV charging network while utilizing existing streetlight infrastructure.

Reviewer 4:

The reviewer observed that 60% of this project is completed, with one year left in the timeline to complete the project, and there appears to be good progress made in selecting EVSE technology and urban charging sites. The reviewer noted that there is further work required to finish installing EVSE, activate data monitoring, and complete project analysis and reporting. The reviewer stated that the market demand and underserved models are promising deliverables for this project. The reviewer is interested in more information regarding how communities will be involved in this project and how these deliverables can inform other urban areas/cities.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted that the project team has collaborated with a diverse set of partners including local municipalities, utilities, universities, advocacy organizations, and national laboratories.

Reviewer 2:

The reviewer stated that while the National Renewable Energy Laboratory (NREL) is involved, it would be better to have a Clean Cities coalition involved.

Reviewer 3:

The reviewer commented that the project team is appropriate for the scale and scope of this project. The reviewer added that this project has the potential to provide takeaways and replicable solutions for other cities and communities across the country, and the data-driven approach which relies on public-private partnerships is an excellent foundation towards that goal.

Reviewer 4:

The reviewer stated that the list of partners provided appears to be relatively diverse but noted that there is not much detail provided on how these partners will be involved with collaboration and coordination.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer expressed the view that this project stands to provide a tangible benefit to disadvantaged communities (DACs) by creating accessible and low-cost charging solutions that are practical for EV owners that cannot charge at home. The reviewer added that this is an essential feature of an equitable charging network, as most EV owners charge at home, but doing so is often not an option for those who do not live in detached single-family homes.

Reviewer 2:

The reviewer stated that while the project team points out some environmental justice (EJ) communities, there were no specific goals for how many EVSEs would be located in these targeted areas in the communities.

Reviewer 3:

The reviewer noted that this project does have a focus on underserved communities as key voices in the determination of where to site charging, and that considerations about current barriers to charging/EV access have been incorporated into the market modeling. The reviewer stated that this work has centered around MFH properties, but the presentation did not speak to EJ community engagement in this work although there are key partners as part of the project team.

Reviewer 4:

The reviewer commented that this project has the potential to benefit underserved and overburdened urban communities and added that the communities' needs could be central to the EVSE siting decision-making process. The reviewer opined that further discussion regarding additional feasibility information to guarantee streetlight chargers are placed in areas that provide service to urban communities and bring economic opportunity, without inhibiting local residents' ability to use parking spaces, may be needed.

Presentation Number: TI126
Presentation Title: Twin Cities Electric Vehicle Community Mobility Network
Principal Investigator: Lisa Thurstin
 (American Lung Association)

Presenter

Lisa Thurstin, American Lung Association

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that this project's objectives are supporting TI objectives in a way that is specific to the region while also providing an example that can be replicated in other regions. The reviewer noted that the project objectives are to reduce GHG emissions and improve fuel diversity by increasing the number of EVs and charging stations in the geographic region, especially for communities that have more barriers to these technologies. The reviewer added that the objective of creating a community-focused mobility network specifically helps reduce GHG emissions and increases local resiliency.

Reviewer 2:

The reviewer stated that the team presented a compelling project, describing the opportunities and the obstacles they faced, and added that the overarching impacts (increased EV adoption and awareness, increased awareness of vehicle charging infrastructure and documented best practices) were well conveyed. The reviewer noted that the effort is squarely within the overall TI objectives, specifically GHG emissions.

Reviewer 3:

The reviewer commented that the combination of EVs and EV infrastructure, outreach, partnerships, and intended benefits of this project support the overall TI objectives in these communities. The reviewer stated that emphasizing MFH properties is an important element in promoting and supporting fuel diversity and transportation efficiency, and that the EV car share offers another cleaner mobility option for community members and supports a more resilient local transportation system. The reviewer indicated that it would be great to understand how local community engagement efforts contribute to the co-design of project elements, as this kind of activity supports resiliency. The reviewer observed an overall excellent degree of support for objectives.

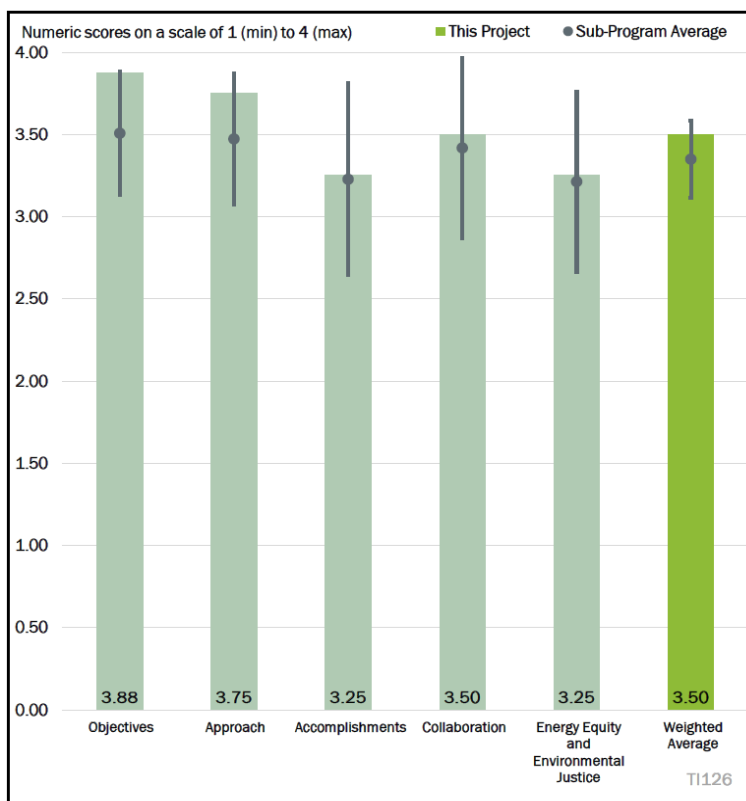


Figure 6-2 - Presentation Number: TI126 Presentation Title: Twin Cities Electric Vehicle Community Mobility Network Principal Investigator: Lisa Thurstin (American Lung Association)

Reviewer 4:

The reviewer stated that the project is addressing the TI objectives of improving fuel diversity by creating a community focused EV charging and shared EV network, facilitating electric mobility access for those without private EVs. The reviewer commented that the Twin Cities project is decreasing GHG emissions from tailpipes by having deployed over 100 EVs in the car sharing programs and EVSE at five MFH properties, and the principal investigators documented and presented over 10,000 monthly trips in March 2023.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that the project model and approach have built on best practices in EV car sharing and show how to successfully implement an EV car sharing project that is iterative, responsive to community feedback, and increases participation in the program. The reviewer added that the project approach also has strong community engagement which allows for community members to be more aware of the program while using community engagement to improve the project.

Reviewer 2:

The reviewer stated that the approach was clearly communicated and showed efforts to solve real-world problems in an area of the country that faces extreme cold. The reviewer observed that the obstacles the team faced were real—supply chain issues, vehicle recalls, launching in MFH areas, taking a community focused approach—and are all issues that take time and sophistication to overcome.

Reviewer 3:

The reviewer stated that the combination of infrastructure, outreach, partnerships, and benefits—EVs (car sharing), different charger types (Level 2 [L2], direct current fast charger [DCFC]), partnerships, access for MFH, and outreach—is comprehensive and shows promise of addressing community mobility needs and improving uptake of EVs as users will have access to another mobility option that is intended to serve their needs. The reviewer added that it would be great to understand how local community engagement efforts contribute to the co-design of project elements or adjusting the original project proposal, as this kind of activity supports understanding the real-world need, and what new local organizations have committed to supporting the project. The reviewer further stated that it would be good to see information about how the project objectives/outcomes align with other community/city initiatives (General Plan, Transportation Plan, etc.) as a way of supporting sustainability and aligning project benefits to other community priorities. The reviewer noted that the continued investment in outreach and partnerships is an important element, specifically, working with MFH communities supports expanding access and benefits of these technologies.

Reviewer 4:

The reviewer commented that this project's approach for integrating advanced transportation technologies and practices aligns with and addresses the real-world challenges of integrating EVSE and EVs to provide access to electric driving in communities otherwise lacking this mobility option. The reviewer observed that the project team is using education and outreach through community events as well as marketing and social media to develop membership in the service offering. The reviewer stated that specializing in providing car sharing and targeting MFH areas, especially economically disadvantaged parts of the Twin Cities where private vehicle access is less common, are effective approaches to solve the real-world challenge of making electrification benefits available on an equitable basis to those whom historical transportation decisions have most burdened.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer observed that the project has faced some challenges with supply chain issues that have impacted how quickly charging stations and EVs could be acquired and deployed, but that, despite those challenges, there has been significant progress made on the project. The reviewer noted specifically that 2600 unique users and 63,000 trips were taken. The reviewer commented that, in light of the project team asking for an extension, the reviewer scored the project 3 and 3.5 on two successive questions. The reviewer further noted that the project team has completed one out of 10 rides and drives, and it seems that more ride and drives should have happened earlier in the implementation of the project to increase awareness and exposure to the project. The reviewer stated that one project accomplishment is that Access Plus Trips, which are based on income, are at 36% of all rides. The reviewer further stated that the project is looking to expand with four new community-based organizations (CBOs) adding 10 charger hubs in two square miles and commented that a good measure of success is that other CBOs are looking to join the project in the communities that they serve.

Reviewer 2:

The reviewer stated that the project clearly identified the challenges faced along the way and demonstrated an ability to pivot when things did not go as planned.

Reviewer 3:

The reviewer stated that deployment at five low-income MFH properties is an accomplishment, and that, given engagement and outreach priorities of this project, this will allow community members to understand how the technologies and infrastructure meet their needs and provide more feedback. The reviewer added that installation of 46 L2 charging hubs is also a good start and will be an important element in offering diverse charging options. The reviewer remarked that it would help if the map of the charging locations also included or distinguished the information about the MFH properties. The reviewer stated that collaborating with agencies and local CBOs is critical to the outreach for and deployment of infrastructure. The reviewer opined that it would be great to understand how local community engagement efforts contribute to the co-design of project elements or adjusting project elements through implementation, as this kind of activity supports understanding the real-world need, and what new local organizations have committed to supporting the project. The reviewer commended the project team for managing the vehicle recall and supply chain challenges.

Reviewer 4:

The reviewer observed that the principal investigator reported that the project is 70% complete and was originally scheduled to end in December 2023, but the team is asking for a 6-month extension due to supply chain lead times and the region's short construction season; the team is waiting on the car share program to install EVSE before leasing the corresponding EVs. The reviewer noted that positive progress can be seen, however, from the team's measuring and demonstrating steady growth in increased car share trips, exceeding 10,000 per month by March 2023. The reviewer commented that the team noted that vandalism has been a challenge, and they have added cameras to deter destructive activities involving the vehicles and EVSE. With 46 L2 charging hubs commissioned, 10 DCFC ordered, 150 deployed as a one-way car sharing network, and 21 vehicles for use at MFH secured, the reviewer found that there is good progress even though the project is behind schedule.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented that the project team has a diverse set of partners that are collaborating on this project, including government, nonprofits with specific project-related expertise, utility, industry, and

community partners. The reviewer recommended in the future clearly laying out the different roles that community partners play, as they are often critical to the project being used by community members and added that it would be helpful to understand how they are being utilized. The reviewer stated that collaboration with private funders helps with the sustainability of the project. The reviewer found no notable weaknesses on the project team.

Reviewer 2:

The reviewer observed that, while not in the documentation, the project team did convey information in the presentation on the stakeholder connections and collaborations they undertook during the planning and implementation phases. The reviewer added that this effort took a level of sophistication and outreach, both from a technical perspective and a community relationship perspective.

Reviewer 3:

The reviewer commented that deployment of infrastructure and services of this kind is only available and possible as a result of collaborative partnerships—CBOs, multi-sectoral, local agency, and other community groups, and stated that establishing a connection with MFH communities is a critical factor here, too. The reviewer added that it would be great to understand how local community engagement efforts led to new local organizations participating in this project and how they will continue to be involved in supporting it when the project ends. The reviewer noted that the continued engagement and education in these communities will be helpful here.

Reviewer 4:

The reviewer noted that the principal investigator reported on the collaboration of project partners in promoting the project at community events that allow people to learn about the Evie program. The reviewer added that the American Cities Climate Challenge and involvement of the Clean Cities are ways that the team has leveraged its internal connections to achieve project goals.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that the project team has incorporated community engagement as a core part of the project and continues to do community engagement to increase project awareness and communicate project changes. The reviewer observed that project users are approximately 36% Access Plus Trips which means the program is reaching low-income residents. The reviewer further noted that the project is partnered with CBOs and Affordable Housing which directly serve low-income communities that historically have more barriers to transportation and to clean transportation. The reviewer commented that the project has prioritized adding new EV Hubs to areas where there are none currently and in areas of concentrated poverty, and the project is expanding the service area to add more charging and work with more CBOs. The reviewer stated that this Eastside expansion appears to be in or near an area of concentrated poverty.

Reviewer 2:

The reviewer remarked that in reviewing the documentation and the presentation, one is left to infer in some places on energy equity and environmental justice (EEEJ) benefit and stated that more direct data/information on the impact would help the evaluator.

Reviewer 3:

The reviewer commented that installing infrastructure at MFH and the outreach show that progress has been made, and there is still opportunity here to meet the communities where they are. The reviewer stated that it

would be great to understand how local community engagement efforts led to new local organizations participating in this project and how they will continue to be involved in supporting it when the project ends. The reviewer said it was not possible to tell how low-income groups were included as part of the planning or design processes in the initial phase of the project—type of chargers, vehicles, and potential site hosts. The reviewer commented on a lack of information about how the project objectives/outcomes align with other community/city initiatives (General Plan, Transportation Plan, etc.) as a way of supporting sustainability and aligning EV benefits to other community priorities that identify transportation as a barrier—access to healthcare, food deserts, air pollution, etc. The reviewer found that overall, it was a good approach.

Reviewer 4:

The reviewer stated that the Twin Cities project is meaningfully contributing to EEEJ by targeting underserved communities and noted that about one third of trips through the program are Access Plus trips taken in DACs. The reviewer added that the project demonstrates a strong focus on MFH areas and Areas of Concentrated Poverty where 50% or more of residents are people of color (ACP50s).

Presentation Number: TI127

Presentation Title: The Mid-Atlantic Electrification Partnership: An Electrification Ecosystem of Intermodal Leadership and Intercity Travel

Principal Investigator: Alleyn Harned (Virginia Clean Cities)

Presenter

Alleyn Harned, Virginia Clean Cities

Reviewer Sample Size

A total of two reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the combination of infrastructure, outreach, partnerships, analysis tool, and benefits of this project support the overall TI objectives in these communities. The reviewer commented that including multiple EV types (light duty and bus) is an important element in supporting alternative fuel use and transportation efficiency, this supports other mobility options for consideration for community members, and it would help to see a timeline for deployment of these. The reviewer stated that it would be great to understand how local community engagement efforts contribute to the co-design of project elements, as this kind of activity supports resiliency, and the inclusion of new local community groups. The reviewer added that the intake call process is also an important innovation here, that offers another opportunity for community members to engage. Overall, the reviewer found an excellent degree of support for project objectives.

Reviewer 2:

The reviewer stated that this project is improving fuel diversity and GHG emissions through over 100 charging ports deployed to date and further DCFC chargers to come, as well as the new publicly available Geospatial Energy Mapper analysis tool that partner Argonne National Lab launched.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that the combination of infrastructure, outreach, partnerships, and benefits – multiple EVs (types), L2 chargers (affordable), partnerships, especially with Historically Black Colleges and Universities (HBCUs), and outreach is innovative and shows promise of addressing community mobility needs and improving uptake of EV technologies. The reviewer added that it would be great to understand how local

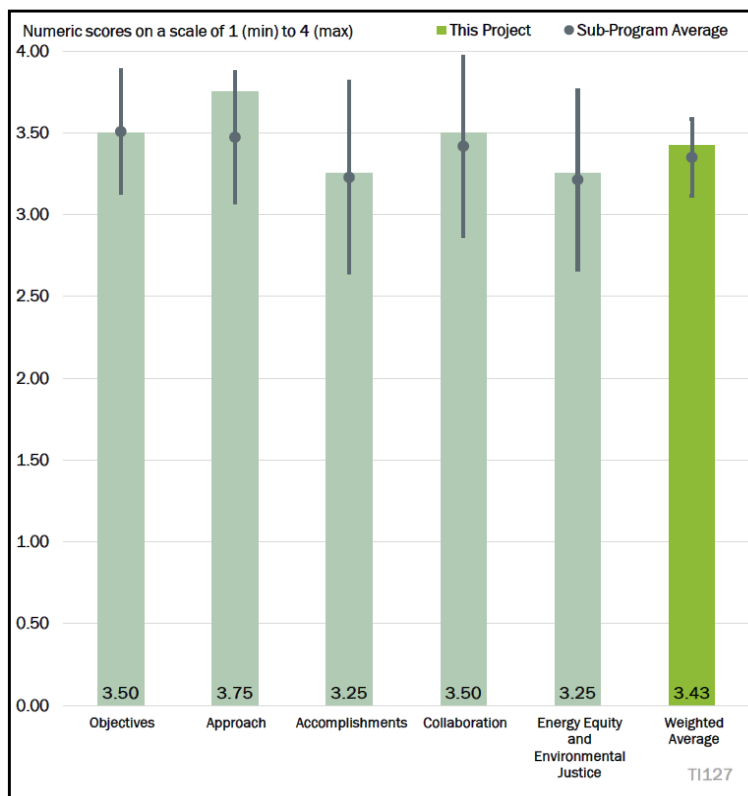


Figure 6-3 - Presentation Number: TI127 Presentation Title: The Mid-Atlantic Electrification Partnership: An Electrification Ecosystem of Intermodal Leadership and Intercity Travel Principal Investigator: Alleyn Harned (Virginia Clean Cities)

community engagement efforts contribute to the co-design of project elements or adjusting the original project proposal, as this kind of activity supports understanding the real-world need, and what new local organizations have committed to supporting the project. The reviewer further commented that it would be great to see information about how the project objectives/outcomes align with other community/city initiatives (general plan, transportation plan, housing plan, etc.) as a way of supporting sustainability and aligning project benefits to other community priorities. Investment in outreach and partnerships are an important element. The reviewer noted that, specifically, administering the intake call center is a critical element that also supports expanding access and benefits of these technologies.

Reviewer 2:

The reviewer noted that the project relies on virtual and in-person education, infrastructure studies and modeling tools, and vehicle/ports planning and deployment the main approaches for integrating transportation technology and practices. The reviewer pointed out that utility capacity mapping is an approach that this project somewhat uniquely brings to the challenge.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer commented that deployment of charging stations (L2s and DCFCs) and vehicles is an accomplishment and given engagement and outreach priorities of this project this will allow community members to understand how the technologies and infrastructure meet their needs and provide more feedback to the project team. The reviewer found the intake call process to be a great element, adding that it would be helpful to know what that it is and how people find out about it. The reviewer stated that collaborating with agencies, local CBOs, and HBCUs is critical to the outreach for and deployment of infrastructure. The reviewer found managing the vehicle recall and supply chain issues to be commendable. The reviewer stated that it would be great to understand how local community engagement efforts contribute to the co-design of project elements or adjusting project elements (number of vehicles, previously unknown community groups) through implementation. Based on the presentation, the reviewer was unsure of the charging station plan/progress—375 stations for the project, then plan for 200 fast charging L2 ports, then (80 L2 ports, two hubs, and 20 DCFCs), and was unsure of the purpose/benefits of and the audience for the mapping tool, at least in its distinction from other web-based screening tools, and the technical report.

Reviewer 2:

The reviewer noted that the project is 40% complete, which appears to be behind schedule for a period of performance from November 2020 to December 2024; however, the team noted that they are ahead of schedule and targets for the consumer education task, with 27 events completed. The reviewer commented that it is also notable that the Joint Office profiled the project as a case study and that a new publicly available analysis tool launched as part of the effort.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that the deployment of infrastructure and services of this kind is only available and possible as a result of collaborative partnerships involving the project team, CBOs, multi-sectoral, local agency, and other community groups. The reviewer added that establishing a connection with HBCUs is a critical factor here, too, as these are important community and institutional anchors. The reviewer commented that it would be great to understand how local community engagement efforts led to new local organizations participating in this project and how they will continue to be involved in supporting it when the project ends; the continued engagement and education in these communities will be critical.

Reviewer 2:

The reviewer noted that the project exhibits a robust teaming arrangement with utilities and installation firms, as well as with consultant EV Noire, Dominion Energy, and other utilities in the mid-Atlantic, including making daily grid capacity mapping data freely, publicly available to show the megawatt capacity in different locations.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer commented that, through the partnership with HBCUs and intake call process, and the 80 L2s and 20 DCFCs, progress has been made, and there is still opportunity here to meet the communities where they are. The reviewer stated that the intake call process is wonderful, as is the partnership with the HBCUs. The reviewer found it difficult to tell how low-income groups were included as part of the planning or design processes in the initial phase of the project—type of chargers, vehicles, and potential site hosts. The reviewer also did not see information about how the project objectives/outcomes align with other community/city initiatives (general plan, transportation plan, other kinds of plans, etc.) as a way of supporting sustainability and aligning EV benefits to other community priorities that identify transportation as a barrier—access to healthcare, food deserts, air pollution, etc. Overall, the reviewer found it to be a good approach.

Reviewer 2:

The reviewer found that the project contributes significantly to EEEJ with 25 regional/local partners focused on rural and disadvantaged areas and noted that project partners are focusing on community pollution and expanding the economic opportunities of clean vehicles. The reviewer stated that mapping utility capacity makes it possible to put this data in front of community decision makers; however, the chargers so far are not being deployed in DACs, and the team is still figuring out metrics for and how to measure who benefits from the EV chargers.

Presentation Number: TI128
Presentation Title: Western Smart Regional Electric Vehicles Adoption and Infrastructure at Scale
Principal Investigator: James Campbell (PacifiCorp)

Presenter

James Campbell, PacifiCorp

Reviewer Sample Size

A total of three reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer found the presentation to be very clear in describing an approach that leveraged diverse stakeholders to make impact at a strategic/regional level and addressed mobility needs of rural and underserved communities. The reviewer commented that, while the overarching goal of the work was to create an enduring ecosystem to accelerate growth in freight, business, and consumer use of EVs in the Intermountain West, the effort also addressed workforce training and closed education gaps about alternate fuels.

Reviewer 2:

The reviewer stated that the combination of infrastructure, outreach, partnerships, and benefits of this project support the overall TI objectives in these communities and added that including multiple EV types (consumer/freight) and infrastructure at affordable housing is an important element in supporting alternative fuel use and transportation efficiency, and this supports another mobility option for community members. The reviewer commented that the EV training activities are also an important element here, that offer another opportunity to engage community members and an opportunity for them to learn new skills. The reviewer suggested that it would be great to understand how local community engagement efforts contribute to the co-design of project elements, as this kind of activity supports resiliency. Overall, the reviewer found an excellent degree of support for objectives.

Reviewer 3:

The reviewer found that this project addresses the TI objectives of fuel diversity and reducing GHG emissions as it considers multiple transportation modes: freight, business, and consumer, and it also addresses resilience by planning for grid impacts and planning for reliability. The reviewer pointed out that, amidst the broad scope, the project appears to lack a plan for defining and measuring success. The reviewer stated that, per the discussion, infrastructure metrics were straightforward to set up, as were the number of affordable housing

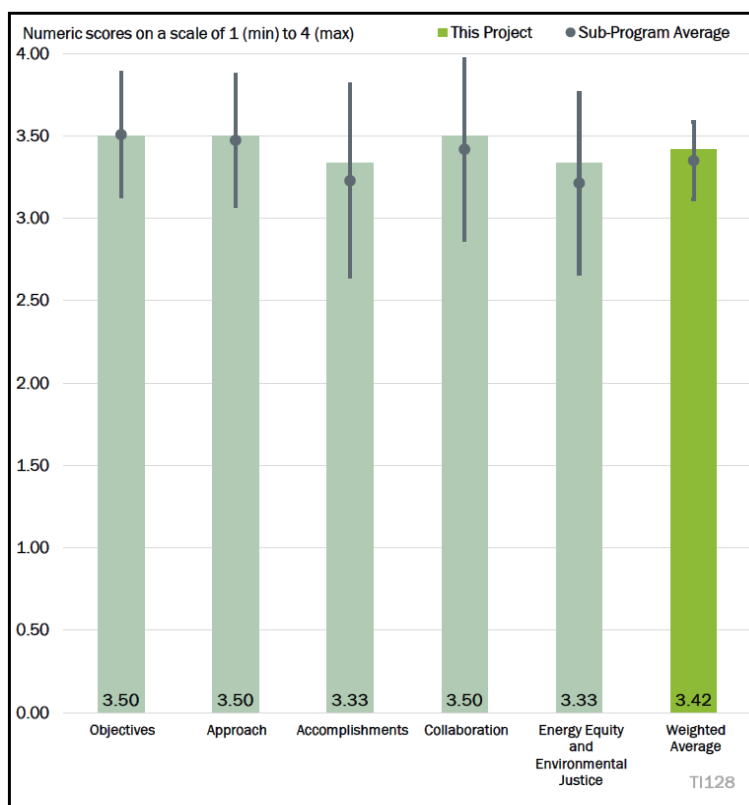


Figure 6-4 - Presentation Number: TI128 Presentation Title: Western Smart Regional Electric Vehicles Adoption and Infrastructure at Scale Principal Investigator: James Campbell (PacifiCorp)

residents using EVs, but it is unclear how the “30% EV adoption” target relates to success metrics for the many individual sub-projects or for the project as a whole.

Question 2: Please comment on this project’s approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that the project addressed challenges both at a fleet level and for personal mobility, and the work included Clean Cities, International Brotherhood of Electrical Workers, academics, and utilities. The reviewer noted that, often, there are competing interests in diverse working groups such as this and the management approach to align the work helped to achieve the goals. The reviewer stated that this would be a good model to replicate in other regions of the US.

Reviewer 2:

The reviewer stated that the combination of infrastructure, outreach, partnerships, and benefits—multiple EVs (types), mobile training, partnerships, and outreach—is innovative and shows promise of addressing community mobility needs and improving uptake of EV technologies and added that investment in outreach and partnerships is an important element. The reviewer commented that, specifically, deploying a mobile education unit for rural students is a critical element that also supports expanding access and benefits of these technologies, and upskilling the workforce, and aligning with existing public transportation infrastructure (Union Station) will support sustainability, accessibility, and intermodal activities. The reviewer questioned what the preliminary timeline for the intermodal/heavy duty vehicles portion of project is. The reviewer commented that it would be great to understand how local community engagement efforts contribute to the co-design of project elements or adjusting the original project proposal, as this kind of activity supports understanding the real-world need, and what new local orgs have committed to supporting the project. The reviewer further commented that it would be great to see information about how the project objectives/outcomes align with other community/city initiatives (General Plan, Transportation Plan, Housing Plan, etc.) as a way of supporting sustainability and aligning project benefits to other community priorities.

Reviewer 3:

The reviewer commented that the project approach extends beyond interstate corridors, and the approach of co-locating charging infrastructure seems like an effective approach to integrate the technologies for multiple modes with reduced grid costs. The reviewer noted that the project has a portfolio of five focus areas incorporating multiple modes and community use types, and generally has a modeling/planning/design phase followed by implementation and operation followed by outreach and education. The reviewer stated that the approach seems to miss a need for outreach and education earlier in the cycle, as part of planning and before deployment.

Question 3: Please comment on the project’s progress and significant accomplishments to date.

Reviewer 1:

The reviewer found that the effort has delivered on the stated goals, and the only barriers to success were outside of the scope of control of the team: supply chain and labor shortages. The reviewer noted that the project leveraged a cost share that created a fusion of corporate sponsorship and governmental funds through the match and has a demonstrated positive return on the investment.

Reviewer 2:

The reviewer commented that it seems like most of the project activity is still in the design and planning phase, and this makes it hard to assess any actual impacts. The reviewer noted that it would help to understand how DACs were provided access to the planning and design process. The reviewer found the EV car share to be a good start but was unsure what the usage means or the proximity of the service with respect to where the users

live, and whether the “intermodal hub” is the “e-mobility hub” and that the hub is the proposed Union Station location. The reviewer questioned what the outcome in this project for the port electrification element is, and how the national parks and recreation electrification element different or aligned with the National Park Service Electric Vehicle Transition plan from February 2023. The reviewer noted the supply chain challenge and the challenge of finding qualified staff for such a large area. The reviewer expressed an eagerness for the roll-out of the mobile unit and believes this can be a near-term impact for good.

Reviewer 3:

The reviewer noted that the project is 33% complete, which is behind schedule based on the October 2020 to December 2024 period of performance. The reviewer commented that the team is currently designing infrastructure the National Park in Moab and noted that they required a no-cost extension prior to the National Electric Vehicle Infrastructure (NEVI) Formula Program due to long lead times for procuring DCFC supplies, and they are not sure how much longer the lead times might become post-NEVI. The reviewer observed that the EV workforce training for rural communities has created and is using a mobile education unit, and the principal investigator reported that the EV car share with Nissan Leaf and Chevrolet Bolt models has been utilized by affordable housing residents, mostly new residents and refugees.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented that this effort created a fusion of thought leaders from industry, non-profits, academics, and others to work in a unified manner to achieve the project goals. The reviewer added that the management structure appears to have created a unified and successful initiative and potentially sets a foundation for future collaboration to meet environmental goals.

Reviewer 2:

The reviewer stated that the deployment of infrastructure and services of this kind is only available and possible as a result of collaborative partnerships—project team, CBOs, multi-sectoral, local agency, and other community groups; however, as there is limited implementation activity, it is difficult to assess this question. The reviewer found the partnerships for the mobile unit, and along the corridors to be good and necessary. The reviewer added that it would be great to understand how local community engagement efforts led to new local organizations participating in this project and how they will continue to be involved in supporting when the project ends. The reviewer observed that delays in the supply chain may have an impact on implementation.

Reviewer 3:

The reviewer noted that the level of collaboration seems high on the project, based on the multiple Clean Cities Coalitions committed as partners, and that it is a very large team of academia, national laboratories, utilities, Clean Cities, cities, non-governmental organizations (NGOs), port/airports, and the private sector. The reviewer stated that it is a little unclear how the partner roles are allotted, including among the five focus areas, with a portfolio of projects including urban and rural mobility components, electric bus and car share, freight and port applications.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that the project profiles an EV car sharing deployment in an affordable housing community called Giv Community and gives transparent findings on the obstacles and opportunities that the nonprofit arm of a leading MFH development organization faced in its effort to create urban mobility solutions with EV car

share for residents living in low-income areas. The reviewer added that, similarly, training through the Crater Lakes Training Center has the potential to improve economic futures for rural Electricians Pre-Apprenticeship Program through rural community and school connections.

Reviewer 2:

The reviewer noted that there are good elements in this project to provide project benefits to underserved and overburdened communities, but added that, given the reliance on the highway network and the scale, it is hard to see where DACs are located in relation to existing infrastructure, and how they are selected to participate in the planning process and serve as potential site host. The reviewer found EV car share to be a great start and noted that it would help to see more information about that implementation—trip types, distance, peak usage times, etc. The reviewer did not see information about how the overall project objectives/outcomes align with other community/city initiatives (General Plan, Transportation Plan, other kinds of plans, etc.) as a way of supporting sustainability and aligning EV benefits to other community priorities that identify transportation as a barrier—like access to healthcare, food deserts, air pollution, etc. Overall, the reviewer found it to be a good approach for such a large region.

Reviewer 3:

The reviewer found that the project brings a good contribution to EEEJ, based on three of the 12 sub-projects categorized as being for underserved regions, which is one of the five focus areas. The reviewer noted that these subprojects include e-buses, EV car share, and affordable housing, and stated that four of the five focus areas may have equity benefits, but that is less clear. Additionally, the reviewer noted that the EV training pre-apprenticeship program is intended to benefit tribal and coal communities.

Presentation Number: TI129
Presentation Title: Helping America's Rural Counties Transition to Cleaner Fuels and Vehicles
Principal Investigator: Ken Brown (AKB Strategies)

Presenter

Ken Brown, AKB Strategies

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer observed that the project tackles a variety of tough barriers in rural areas across a diversity of states, which is both a strength, and a potential weakness of the work. The reviewer commented that as the project comes to a conclusion and develops its 'playbook' it will be important to pull common lessons and recommendations out of this diverse set of projects and tasks.

Reviewer 2:

The reviewer commented that this project directly supports the TI program's objective of improving fuel diversity through the use of alternative fuels, specifically in this project focusing on rural communities. The reviewer noted that the objective of the project is to work with rural communities to understand their challenges in implementing alternative fuel vehicles (AFVs) and then distribute a playbook of lessons learned so that successes can be replicated across the country. The reviewer found that this project would provide Clean Cities coalitions with important information on how to work with rural communities in their area.

Reviewer 3:

The reviewer found that this project's objectives outline a specific and effective solution for helping rural counties understand clean fuel alternatives, assess their needs, and plan for incorporating clean fuel vehicles into their fleets. The reviewer noted that the project objectives also include the important step of making the results available for other communities to follow suit in the future.

Reviewer 4:

The reviewer determined that this project meets three of the four TI objectives, the missing objective being transportation efficiency, and found that the technical assistance provided to the fleets was critical to the success of these projects. The reviewer stated that it is great that this was able to be provided to communities.

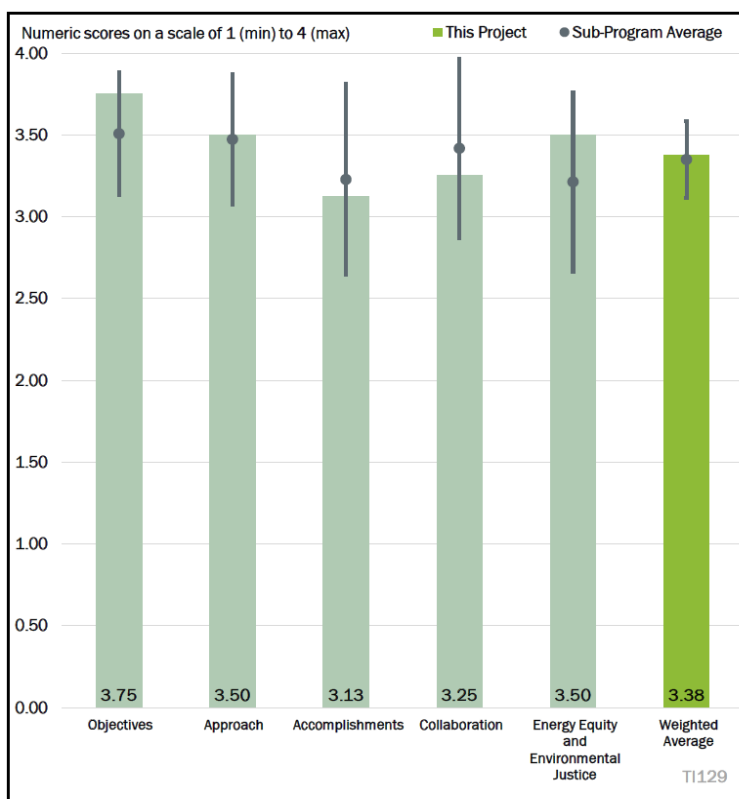


Figure 6-5 - Presentation Number: TI129 Presentation Title: Helping America's Rural Counties Transition to Cleaner Fuels and Vehicles Principal Investigator: Ken Brown (AKB Strategies)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer appreciated the focus on rural counties within diverse states, and on a variety of vehicles and use cases, but noted that this also makes the project a lot more complex.

Reviewer 2:

The reviewer commented that the project approach seems to mirror the successful strategies of Clean Cities coalitions working with stakeholders to implement projects and noted that one of the key factors often cited in successful projects is having a “champion” within the organization that is deploying vehicles and noted that the ultimate goal is to find local leaders that could be used as national spokespersons. The reviewer observed that the project obtained a range of industry partners to cover a wide variety fuel and powertrain types, which will help with the success of the effort by allowing communities to have the options to choose what vehicles make sense for them. The reviewer noted that the approach involves connecting these communities with subject matter experts, and that one challenge of this approach is that it seems the project is relying on industry partners representing a specific fuel to be the experts; the project team will need to make sure that the Clean Cities coalitions act as the neutral party to provide unbiased information.

Reviewer 3:

The reviewer observed that the project is being implemented in numerous counties across several states, and that a replication handbook and resources will be made available once the project is complete. The reviewer stated that providing demonstration vehicles, fleet assessments, workshops and access to experts is a comprehensive approach to help fleet managers and officials come up with the correct solution for their unique situations but indicated that information on how the project approach addresses the barrier of “limited resources to provide the upfront financing often needed to purchase clean fuels and vehicles,” as stated in the project objectives, was missing. The reviewer questions what other purchasing assistance or information has been offered, aside from the virtual U.S. Department of Agriculture (USDA) Community Facilities Grant Workshop, which discussed grant funding for AFVs for rural areas.

Reviewer 4:

The reviewer found that outreach and education paired with technical assistance and demonstration events is a perfect way to introduce technology to those who may not be familiar with it in an easy to understand, non-threatening way. The reviewer indicated that this shows that the project team thought about more than just providing technical assistance and took the extra steps to really make people more comfortable first before changing things. The reviewer commented that this is a great example of the phrase “go slow to go fast.”

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted good progress on specific tasks and stated that developing and disseminating the broader common lessons learned and recommendations will be critical.

Reviewer 2:

The reviewer commented that the major accomplishment of the project so far was able to identify fifteen “champions” in the eight states that are part of the project; in addition, eight demonstration vehicles were contracted with project partners. The reviewer noted that supply chain issues have impacted the availability of vehicles for this project, which has significantly delayed the project and could limit the success of the engagement with the community leaders. The reviewer observed that the project was able to complete its national outreach webinars and coalitions have completed their stated goal of twenty-four outreach events with at least three performed in each state as of the presentation; budget period (BP) 2 milestones were still in

progress, with the key efforts being in-depth technical assistance for 24 target counties in eight states, provided by Clean Cities coalitions, along with more than 40 total vehicle demonstrations. The reviewer noted that demonstration vehicles have been hard to get into the fleets' hands, and this has been the key issue in extending the project; showing vehicles in nearby communities has been way to try to deal with this.

Reviewer 3:

The reviewer observed that with 15 days left in BP 2, none of the stated objectives for the period were listed as accomplished; all were still in progress. The reviewer noted that the presenter did discuss what those ongoing efforts were, and a good amount of progress has been made, but indicated that it would have been more reassuring to know that some tasks had been fully completed.

Reviewer 4:

The reviewer stated that the project has provided outreach, education technical assistance and demonstration events to numerous fleets, thereby expanding the possibilities of these fleets. The reviewer found that the project has accomplished a great deal.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer observed that there seems to be great collaboration within and across states, and reasonable industry participation, but having more dissemination partners involved from an earlier point in the project to ensure that the lessons being learned will have a broader impact would have been helpful.

Reviewer 2:

The reviewer noted that the Clean Cities coalitions have a strong history of working well together and have selected industry partners that have done significant work to support the Clean Cities mission; the presentation stated that the coalitions are having monthly calls, while also doing quarterly all team meetings. The reviewer stated that it was unclear how the project is managing the collaboration and coordination of the project as it is reaching the fleet analysis stage, and they are collecting lessons learned. The reviewer added that it seems that some of the industry partners have not been able to deliver vehicles that were crucial in the success of the project.

Reviewer 3:

The reviewer observed that the project is made up of a strong team of industry and Clean Cities coalition partners. The reviewer found the accomplishments from Virginia, given as an example, are comprehensive and wide-ranging, and noted that the approach of making personal connections with local officials through in-person visits shows that coalition partners will be actively involved.

Reviewer 4:

The reviewer commented that the project team seemed to work well together and bring varying expertise to the table.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that rural communities face unique barriers and challenges. The reviewer observed that the project did not explicitly address race and income issues and how they intersect with rural communities and commented that there is a big difference between a rural county in eastern Oregon and a rural county in Alabama.

Reviewer 2:

The reviewer stated that the project is focused on supporting rural communities with resources to effectively analyze the use of alternative fuel vehicles in their areas and noted that the project includes rural areas in eight different states (with the goal of working in 24 counties), which will provide geographic variety. The reviewer found that this variety will be beneficial as different communities have different priorities and being able to work through those issues should provide significant lessons learned for others trying to implement projects in their rural communities. The reviewer noted that it was stated that cost savings have typically been a key focus, as well as downtime, for rural communities looking at alternative fuel vehicles and commented that this project offers the chance to demonstrate vehicles to new communities and may provide those benefits as well as others benefits including lower emissions and fuel diversity.

Reviewer 3:

The reviewer noted that the project specifically targets traditionally under-served rural areas of the country that often face unique challenges in acquiring the information and expertise, staff capacity, and funding needed to explore and utilize new technologies.

Reviewer 4:

The reviewer observed that rural communities often get overlooked when people think about underserved communities and appreciated that the project specifically targeted rural communities.

Presentation Number: TI130
Presentation Title: VoICE-MR:
 Vocation Integrated Cost Estimation
 for Maintenance and Repair of
 Alternative Fuel Vehicles (AFV)
Principal Investigator: Arvind
 Thiruvengadam (West Virginia
 University)

Presenter

Gregory Thompson, West Virginia
 University

Reviewer Sample Size

A total of four reviewers evaluated this
 project.

Question 1: Please provide comments
 on this project's degree of support for
 the overall Technology Integration (TI)
 objectives of improving fuel diversity,
 increasing local resiliency, and
 reducing greenhouse gas emissions
 through increasing alternative fuel
 use and transportation efficiency.

Reviewer 1:

The reviewer stated that this effort
 addresses a key data gap when
 performing cost of ownership analysis
 of heavy-duty (HD) alternative fuel vehicles versus their diesel counterparts by examining the potential
 maintenance savings that AFVs may provide based on fuel type, vocation, and geographic region. The
 reviewer noted that public maintenance data is very limited for both diesel with new aftertreatment
 technologies (selective catalytic reduction and particulate filters) and AFVs, and if the data shows that there
 are clear maintenance savings for certain AFVs this would help in the deployment of these technologies, which
 would improve fuel diversity and potentially improve resiliency. The reviewer added that this may also lead to
 GHG benefits, but not necessarily as fossil natural gas and propane vehicles may not provide much if any
 benefits, even though they have lower maintenance costs.

Reviewer 2:

The reviewer noted that the project conducts an in-depth survey of HD fleets operating in various vocations to
 collect maintenance records for diesel and alternative fuel vehicles and analyzes vehicle telemetry data to
 discern the effects of duty on maintenance cost of AFVs in different vehicle vocations. The reviewer indicated
 that the project will examine the impact of extreme seasonal temperature changes on the maintenance cost of
 AFVs, and develop the Vocation Integrated Cost Estimation for Maintenance and Repair (VoICE-MR) of
 AFVs.

Reviewer 3:

The reviewer commented that the project is focused on furthering knowledge in the area of Heavy-Duty AFV
 maintenance to compare it to conventionally fueled vehicles and added that this has been difficult information
 to obtain but is critical to support fleet decision-making to allow for greater penetrations of cleaner vehicles.

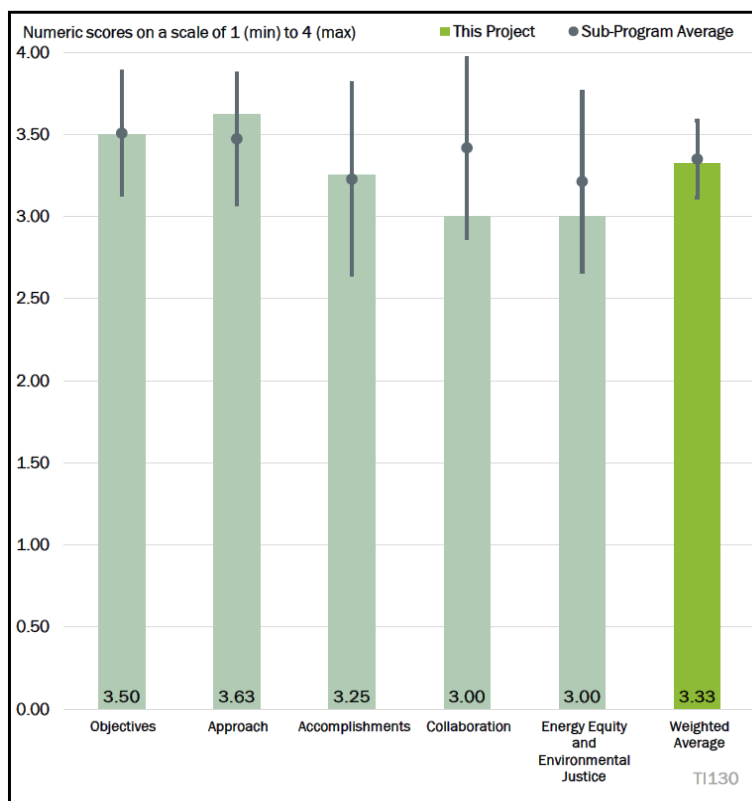


Figure 6-6 - Presentation Number: TI130 Presentation Title: VoICE-MR:
 Vocation Integrated Cost Estimation for Maintenance and Repair of
 Alternative Fuel Vehicles (AFV) Principal Investigator: Arvind
 Thiruvengadam (West Virginia University)

Reviewer 4:

The reviewer stated that collecting this data and providing the analysis is key to informing decision making of businesses evaluating alternative fuels and added that the lack of good data is a major barrier, so this is a very worthwhile project.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer indicated that the key to success of this project is being able to collect significant amounts of maintenance and repair data from a variety of fleets and vehicles efficiently, and that the project benefits from being able to leverage data collection from one of its partner's projects at the South Coast Air Quality Management District (SCAQMD). The reviewer added that the challenge of this type of effort is that while it is beneficial to collect as much data as possible from a wide variety of fleets, this can lead to significant data cleaning efforts by the project team due to the variability in record-keeping of different fleets. The reviewer noted that another part of the project is the effort to tie maintenance cost data to the vehicle's duty cycle through the use of telemetry data and other factors such as ambient temperatures and vehicle age, which is an important factor to understand as anecdotal discussions of maintenance of diesel vehicles with the most recent aftertreatment technologies have suggested that low speed and low load conditions were problematic. The reviewer noted that it is necessary to differentiate duty cycles when doing comparisons with alternative fuel vehicles. The reviewer added that another major component of the project is creating a machine learning model to estimate maintenance costs based on duty cycle but found that, from the presentation, it is not clear how the machine learning aspects of the project will be implemented and how the project team will mitigate biases in training this model.

Reviewer 2:

The reviewer found the project took a solid approach to a difficult data set to make accurate assessments and noted that data sanitization was the first step before converting paper records to electronic format. The reviewer observed that the converted data fleet maintenance records categories are defined by project scope, data is classified to include duty cycle and seasonal temperatures, and all data is put into a database using Microsoft PowerBi to analyze maintenance cost for diesel and alternative fuel vehicles. The reviewer added that PowerBi is a powerful tool that simplifies the data categorization process through relational database and provides flexibility in categorizing the data with multiple filters based on unique identifiers such as vocation, truck sub-system, and types of maintenance.

Reviewer 3:

The reviewer stated that the approach is complex, but that it is necessary to address the issues associated with collection and analysis of this type of information. In particular, the reviewer noted that the approach emphasizes the fleet operators who have agreed to share data, a critical element, and the project variables evaluated include weather, age of vehicle, etc.—the types of analysis that will really help fleets in their decision-making.

Reviewer 4:

The reviewer noted a very detailed approach with lots of steps and lots of parties involved. The reviewer pointed out that the one issue however is that technology is a moving target as newer, better engines and vehicles are produced each year and, in some cases, newer systems might be more efficient but also more complex and more expensive to maintain. The reviewer noted that it was unclear how the project team can address that in this project.

Question 3: Please comment on the project's progress and significant accomplishments to date.**Reviewer 1:**

The reviewer commented that the project looks to be behind schedule as key tasks in BP 2 have not been finished yet, including combining duty-cycle telemetry data with maintenance data and their correlation analysis between maintenance and seasons, and posited that the loss of the original principal investigator to another position has impacted the project. The reviewer cited as good news that data collection was completed with 285 vehicles providing more than 20,000 maintenance cost records, and for most fleets they have 4 to 5 years of vehicle history, which helps in understanding cost trends. The reviewer noted that, with the data breaking out corrective actions from periodic and preventative maintenance, it makes the comparison of data between powertrains more likely to be based on technology; however, it will be quite important to understand how high-cost corrective actions impact these comparisons. The reviewer surmised that the public would want to know the expected frequency of high-cost corrective actions and stated that it would be useful to know if the data shows any trends specific to duty-cycles, engine/vehicle manufacturers, or engine size based on duty-cycle. The reviewer noted the higher failure rates for natural gas (NG) goods movement vehicles primarily operating as port drayage trucks and stated that it would be useful to know if those trucks were running engines too small for the loads (e.g., using 8.9 L when a 11.9 L should have been used).

Reviewer 2:

The reviewer noted that Data Classification and Analysis collected by the project was from a total of 72 diesel, 86 propane, 102 natural gas and 25 electric HD vehicles and the project has collected a total of 7,000 maintenance cost records for diesel, 13,000 records for natural gas vehicles (NGV) and 1,800 records for propane. Data is being processed for EVs from a large transit fleet, and geographical regions covered include the Mid-Atlantic, Midwest, East Coast, Southwest and Central regions of the country. The reviewer added that vehicle model years range from 2008-2018 with historical maintenance records spanning from 2015–2021, new telemetry data from vehicle operation in the East Coast of the U.S. has been collected, and model development for predicting maintenance cost based on vocation characteristics has begun.

Reviewer 3:

The reviewer observed that the team is currently evaluating the data, particularly seasonal and temperature variables, and that this includes as much as the past decade of data on some of the diesel, compressed natural gas (CNG), and liquefied petroleum gas (LPG or propane) vehicles. The reviewer noted that the LPG data was for school buses, so there are some variations by vocation, and the project team has already identified some key differences between diesel and alternative fuel vehicles, with additional variation by vocation. The reviewer commented that there does seem to be a significant portion of work left (by the team's own admission, 30%), with only about six months left in the project.

Reviewer 4:

The reviewer commented that the fact that they are on track and are able to draw some conclusions about problems exhibited with different technologies is very positive.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.**Reviewer 1:**

The reviewer mentioned that Clean Cities coalition directors have helped with initial conversations to introduce fleets to West Virginia University (WVU), but that delays in subaward agreements with Clean Cities coalitions has slowed participation. The reviewer commented that it was stated that funding partners help target which fleets to go after, but the process was not explained very well. The reviewer observed that WVU is doing most of the work for BP 2 and BP 3.

Reviewer 2:

The reviewer found the project team to be very strong, including the South Coast Air Quality Management District, Southern California Gas Company, Michael Lee Project Partners, Wale and Associates Corp., Western Riverside Council of Governments, Pittsburg Region Clean Cities, West Virginia Clean Cities and Propane Education and Research Council. The reviewer opined that this group has an industry respected acumen to perform an accurate assessment for the project.

Reviewer 3:

The reviewer observed that the project team includes a number of Clean Cities coalitions, several fleets, and one alternative fuel association, but indicated that it would have been expected that more alternative fuel organizations might have been involved to help expand the opportunity for outreach. The reviewer noted that in addition both fleets lined up to provide data were in California and indicated that it probably would have been better to have included some more geographic spread. The reviewer noted that there are regular team meetings.

Reviewer 4:

The reviewer noted that this project involves a significant number of participants and a lot of data that must be reviewed and added that others have had difficulty getting similar data, so it is excellent that they are on track.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer commented that it is difficult to grade this project on EEEJ, as the focus is on collecting data to support fleet decision-making; ultimately, the data from this project can lead to increased AFV adoption, which may provide emissions benefits to communities in both rural and underserved areas. The reviewer added that the project is trying to get data in rural regions and help fleets in those areas to understand their experience, though it is not clear how successful it has been so far at this.

Reviewer 2:

The reviewer noted that the project will address the gaps in knowledge related to wide-scale adoption of alternative fuel vehicles in rural regions of the country as well as increasing the use of domestic and cleaner fuels in HD vocations not restricted to urban locations.

Reviewer 3:

The reviewer concluded that the project would provide some benefit to overburdened communities by improving the prospects of alternative fuel vehicles, particularly MD and HD urban-based vehicles; however, the project has not really drawn a strong connection on this issue.

Reviewer 4:

The reviewer stated that a project like this will only have benefit to affected communities down the road as results and data are used to influence purchase decisions, so a good ranking is probably as high as you could get for a project like this.

Presentation Number: TI131
Presentation Title: DRIVE (Developing Replicable, Innovative Variants for Engagement) for EVs in the USA
Principal Investigator: Jonathan Overly (East Tennessee Clean Fuels Coalition)

Presenter

Jonathan Overly, East Tennessee Clean Fuels Coalition

Reviewer Sample Size

A total of three reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented that this is a massive and sprawling project including seven major activity areas across 14 states and many, many activities.

Reviewer 2:

The reviewer stated that the project promotes, educates, and works to remove other barriers to the adoption of electric transportation, directly supporting TI's fuel diversity objectives and goal to increase alternative fuel use and transportation efficiency. The reviewer added that the project is designed to address barriers on every level: consumers/fleets, infrastructure/government, dealerships/utilities. The reviewer noted that the project was created with the goal of supporting electric transportation in an impressive seven key areas.

Reviewer 3:

The reviewer commented that this project is laying the groundwork to meet these objectives in each state they work in.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer stated that this project is large, sprawling, and diverse and expressed the view that to maximize its value, and ensure it is not just "random acts of EV kindness," it will be critically important that this project extract key lessons learned, most promising strategies, etc.

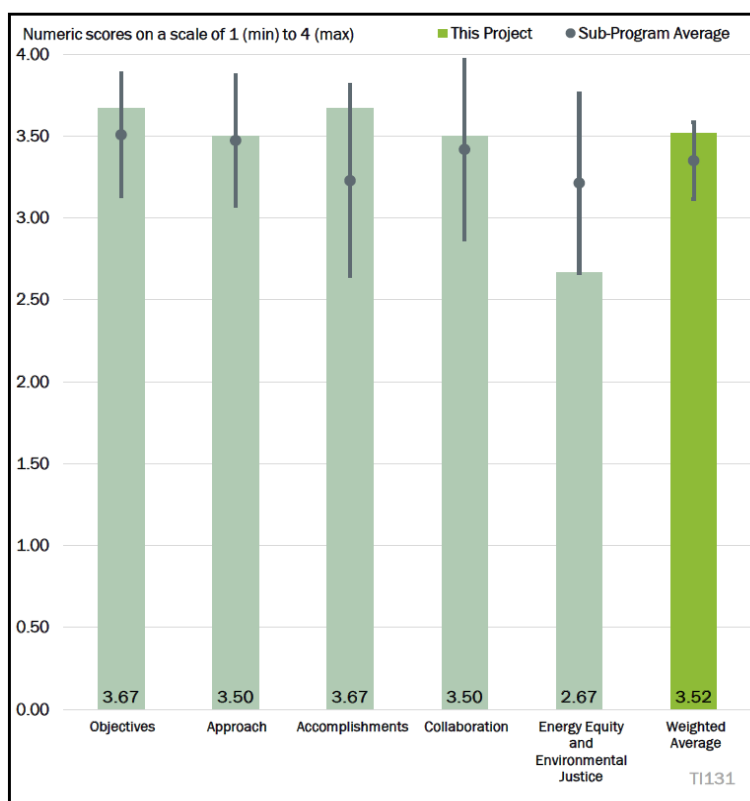


Figure 6-7 - Presentation Number: TI131 Presentation Title: DRIVE (Developing Replicable, Innovative Variants for Engagement) for EVs in the USA Principal Investigator: Jonathan Overly (East Tennessee Clean Fuels Coalition)

Reviewer 2:

The reviewer noted that the Project lead looked to Clean Cities coalitions (supporters of alternative transportation fuels) for partnership, and that these partners were already promoting clean transportation and this project, and its scope gave them a chance to formalize promotion of EVs; in effect, this project became a program. The reviewer stated that goals are organized, and websites established, and the seven priority areas are created to address nearly all players in EV adoption (minus original equipment manufacturers [OEMs], upfitters) allowing partners a template from which to design their chapter, with the team providing support through meetings, retreats.

Reviewer 3:

The reviewer commented that offering a charging gap analysis and a policy play book to these communities reduces a lot of the stress and work that decision makers have and enables a smooth transition to EVs.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that lots of good work has been done but suggested that the key question is whether and how this work continues, evolves, and can be replicated. The reviewer noted an aspiration to build a long-term program or campaign but stated that it is not clear that there is a viable funding/business model. The reviewer opined that this work seems like core operations for Clean Cities coalitions, and either DOE needs to fund this work indefinitely or it is unlikely to continue.

Reviewer 2:

The reviewer noted that the project lead successfully accomplished the establishment of Drive Electric USA, and in the remaining months of this project, the focus will be on utility, government, and dealership engagement, and on creating a replication playbook. The reviewer stated that a replication playbook made available to all Clean Cities coalitions and other relevant organizations will provide the direction needed to establish more chapters and beyond the end date, some chapters will continue Drive Electric USA, providing support for EV adoption well beyond this project. The reviewer suggested that providing funding for Drive Electric USA as an established program would help chapters to grow and remain strong and up to date.

Reviewer 3:

The reviewer commented that this project has progressed well in its 2 years.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that there seems to be good coordination among states, but it is less clear how well this effort is coordinating with industry, utilities, and other stakeholders. The reviewer noted that this will be increasingly important if the work continues, e.g. coordination with VTO-funded outreach projects, Plugstar, OEM marketing, etc.

Reviewer 2:

The reviewer commented that Clean Cities coalition directors are a dynamic group, and while thirteen partners is a lot to manage, most are likely enthusiastic and highly motivated. The reviewer noted that retreats, monthly meetings, and posting success stories are effective ways to keep the effort level up, and the creation of a steering committee was a good idea.

Reviewer 3:

The reviewer stated that this project team brought together a lot of partners.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer commented that this project was launched under a different set of guidelines and expectations but given the project breadth there could have been more emphasis on equity and issues related to the Justice40 Initiative in project execution.

Reviewer 2:

The reviewer noted that the presenter stated that at the time the project was created EEEJ was not a focus; however, one of the project objectives is to build EV awareness and adoption in rural communities.

Reviewer 3:

The reviewer stated that the project could have carved out specific space for Black, Indigenous, People of Color (BIPOC) and limited income community outreach. The reviewer commented that the rural outreach was great and appreciated the project lead acknowledging that they could have been stronger in this area and are taking steps to be better.

Presentation Number: TI132
Presentation Title: NFPA Spurs the Safe Adoption of Electric Vehicles through Education and Outreach
Principal Investigator: Andrew Klock (National Fire Protection Association)

Presenter

Andrew Klock, National Fire Protection Association

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented that issues of safety for first responders, etc., are critical as EVs scale, and there is a ton of misinformation and fearmongering in this space so having credible, objective information and training like this is crucial.

Reviewer 2:

The reviewer stated that this project addresses one of the obstacles to EV adoption—knowledge gaps for stakeholders about the electric vehicle (EV) ecosystem. The reviewer noted that the team had built products such as the EV Community Preparedness Assessment Workshop curriculum and toolkit for Clean Cities coalitions and had successfully delivered 30 virtual EV Community Preparedness Assessment Workshops nationwide in major cities to kickstart planning and preparedness for EV adoption.

Reviewer 3:

The reviewer found that the project objectives offer a great deal of support for the overall TI objectives of increasing alternative fuel use and transportation efficiency and noted that education is a key component of fostering the adoption of EVs, and this program has an all-encompassing approach.

Reviewer 4:

The reviewer expressed the view that this project increases local resiliency and tamps fears about EVs, and these trainings should be taken and given in every community; however, the project does not achieve the other three project objectives.

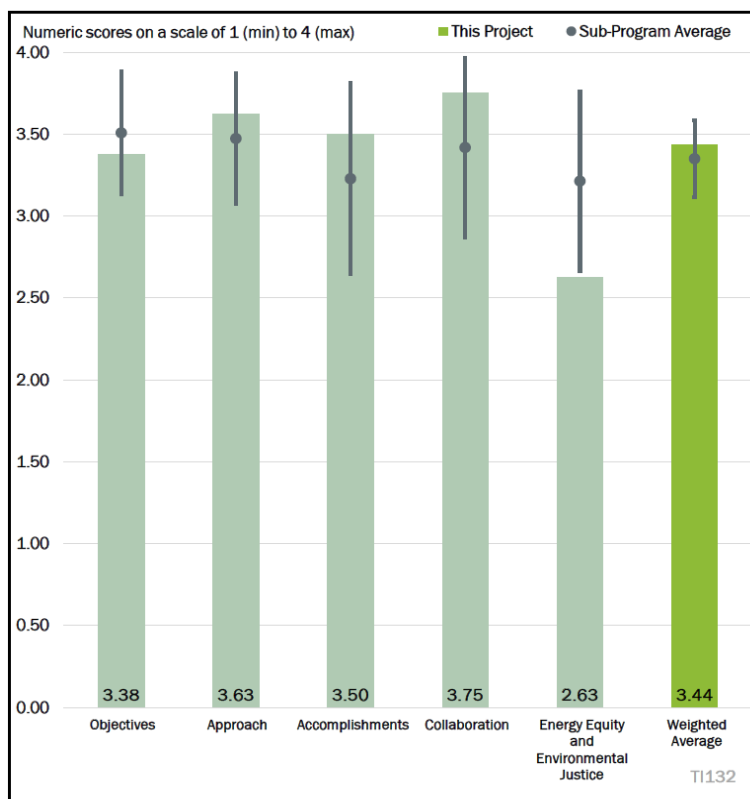


Figure 6-8 - Presentation Number: TI132 Presentation Title: NFPA Spurs the Safe Adoption of Electric Vehicles through Education and Outreach Principal Investigator: Andrew Klock (National Fire Protection Association)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer stated that developing online training, modules for different audiences and face-to-face workshops seems a solid approach, but expressed skepticism that Clean Cities coalitions are the best or only delivery system for this kind of training; the reviewer favored an approach that works more through appropriate intermediaries for each market (e.g., dealer associations, police associations, etc.). The reviewer speculated that this was a byproduct of DOE funding constraints that require large investments and partnerships with Clean Cities coalitions but commented that this likely made the project less impactful.

Reviewer 2:

The reviewer noted that the team took on a challenge to create content to bridge knowledge gaps and described the use of webinars and in-person events, but the presentation and documentation was lacking information to measure and/or understand the impact of this effort on communities. The reviewer noted that content creation for this training takes time and speculated that this is why communities where training will take place have been identified, but actual training is pending.

Reviewer 3:

The reviewer commented that developing online/virtual training courses was a great approach during the pandemic when this project was being planned, and pivoting to include in-person training for the same curriculum after the pandemic was even better. The reviewer added that targeting the entire “EV Ecosystem” of consumers, fleets, towing, dealers, insurance, first responders, etc., with the curriculum/training shows good thinking and showcases why National Fire Protection Association (NFPA) is a strong lead for this project. The reviewer noted that creation of the “Ready for EVs” website is a great addition to the project, helping to ensure that the project accomplishments and resources will live beyond the project’s end date.

Reviewer 4:

The reviewer noted that this project was able to pivot from in person to virtual at a time where that was critical to the success of these trainings and added that if this pivot had not been made the project would have had to be on hold indefinitely. The reviewer noted that this project also uses in person workshops for tangible interaction with these technologies.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that it seems that a lot of modules have been developed and workshops delivered but it was not possible to evaluate the quality of the products because metrics on the number of people and key audiences reached were not presented.

Reviewer 2:

The reviewer commented that the team has identified training partners within the Clean Cities coalitions and provided documentation that indicates “scheduled” or “on-target” for these efforts; however, additional clarity on what these terms mean would be helpful. The reviewer noted that content creation must have taken a lot of effort and time, and the opportunity still exists to meet the targets.

Reviewer 3:

The reviewer stated that for BP 2, of the 15 planned EV Community Preparedness Assessment Workshops, 10 had been hosted, with five scheduled to be done, and indicated that this shows adequate and consistent progress and gives every indication that the project is on track to meet its objectives in a timely manner.

Reviewer 4:

The reviewer found that this project has more than achieved its goals.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that collaboration seems solid; however, there does not seem to be any intention to ensure a long-term business model to provide this training/these workshops in an ongoing way. The reviewer noted that the presenter basically said, “it will be there if Clean Cities want to use it,” but the reviewer found that this approach seems to ensure it will slowly become less relevant and useful.

Reviewer 2:

The reviewer commented that leveraging Clean Cities coalitions is a smart way to reach intended audiences and noted that the team identified the need to leverage expertise from a diverse number of stakeholders, ranging from first responders to utilities, insurance companies, tow truck operators and others. The reviewer noted that the knowledge gaps that stakeholders have will be a barrier to EV adoption and this project provided an innovative approach to bringing key actors to the table and creating training/knowledge to inform communities.

Reviewer 3:

The reviewer stated that the structure of having three Clean Cities coalitions partnering with the NFPA as main collaborators will make the partnership nimbler and will facilitate better communication within the project leadership group. The reviewer added that recruiting 30 coalitions to deliver the workshops is also smart and allows those coalitions to leverage local knowledge, strengthen ties in their communities and foster greater stakeholder engagement. The reviewer noted one critical assumption made that, “beyond the grant period, we believe these workshops will begin a cascading effect, so that every Clean Cities Coalition around the U.S. will be able to implement such workshops in their own communities.” The reviewer found that this statement articulates a nice hope for future effect and expressed hope that the training materials will be available through the “Ready for EVs” website, to help achieve this.

Reviewer 4:

The reviewer commented that this project drew upon the strengths of many different members of the project team.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer commented that there were no attempts to focus this training or outreach on communities defined by the Justice40 Initiative/historically underserved communities, or to ensure the content centers those communities and their needs.

Reviewer 2:

The reviewer stated that perhaps the benefit to underserved communities is implied, but in reviewing documentation, this element is not fully discussed.

Reviewer 3:

The reviewer noted that the project plans to hold workshops nationwide, with 34 workshops in communities under 100,000 population and 41 in cities above 100,000 population. The reviewer added that the presentation did not specifically mention targeting disadvantaged or under-served areas, but the project approach did state

that NFPA is: “developing EV educational offerings that increase community preparedness planning and collaboration among EV ecosystem stakeholders regardless of the community’s socio-economic status,” and “to ensure these materials are accessible to all and do not create undue burden.”

Reviewer 4:

The reviewer observed that this training is provided for free, and they have a very successful marketing strategy, meaning that this is available to anyone, as long as they know it exists. The reviewer suggested that more targeted marketing to emergency responders in overburdened communities would be something to consider going forward.

Presentation Number: TI134
Presentation Title: Delivering Clean Air in Denver: Propane Truck and Infrastructure in Mail Delivery Application
Principal Investigator: Bonnie Trowbridge (Drive Clean Colorado)

Presenter

Bonnie Trowbridge, Drive Clean Colorado

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer noted that the project objectives are straightforward and clearly presented, detailing a proof-of-concept for the use of propane-powered fleet vehicles. The reviewer added that the project aims to demonstrate a real-world example that can shed light on the costs, operational issues, and performance of propane vehicles so that they can be more easily adopted in other contexts.

Reviewer 2:

The reviewer observed that while many Clean Cities coalitions are aggressively promoting EVs, Denver's Drive Clean Colorado has kept an "all of the above" focus of fuel diversity by creating a project designed for the promotion of propane fueled transportation. The reviewer noted that the data gathered from this project will educate fleet managers on the ins and outs of transitioning to this fuel, (hopefully dispelling fears about the fuel). The reviewer commented that propane vehicles are the smart option for many fleets looking for gas and diesel alternatives, (depending on the fleet's location and resources). The reviewer suggested extending this project's timeline, as the data acquired has the potential to make a significant impact in the promotion of this fuel.

Reviewer 3:

The reviewer noted that this effort examines the viability of propane vehicles for mail delivery, and if successful, this would provide a basis for the U.S. Postal Service (USPS) to adopt these vehicles into its fleet. The reviewer stated that, if successful, the project could improve local fuel diversity and resiliency. The reviewer added that propane vehicles do have air pollutant emissions benefits, but their benefit in reducing GHG emissions is reliant on using renewable propane.

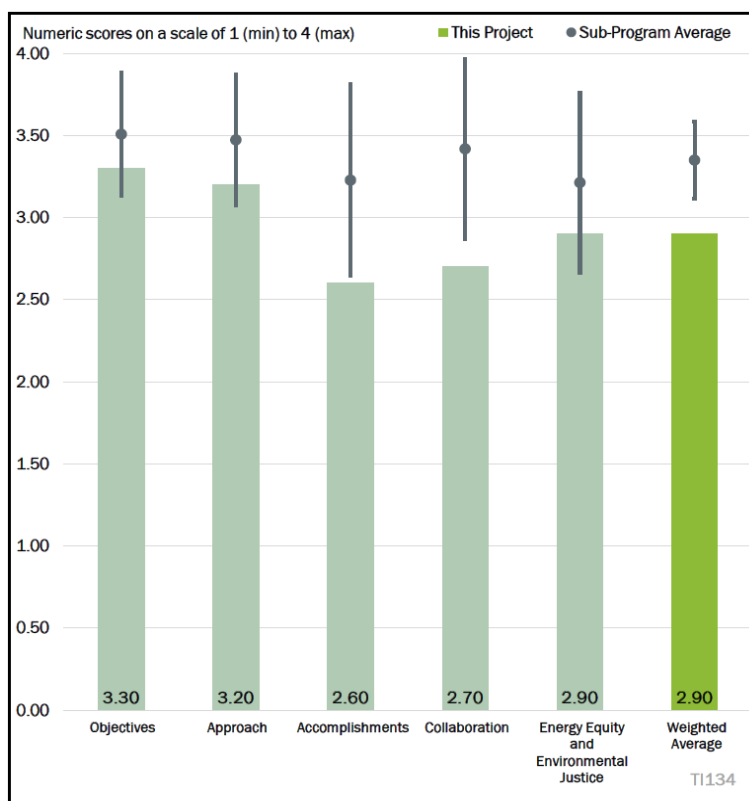


Figure 6-9 - Presentation Number: TI134 Presentation Title: Delivering Clean Air in Denver: Propane Truck and Infrastructure in Mail Delivery Application Principal Investigator: Bonnie Trowbridge (Drive Clean Colorado)

Reviewer 4:

The reviewer stated that the project seems well-aligned with VTO priorities, demonstrating clean transportation options in an important application/sector, and added that it was also focused on a recent technology with little in-use data.

Reviewer 5:

The reviewer stated that the objective of collecting real-world operational cost data is critical to providing fleets and consumers with information they need to make decisions regarding purchase of alternative fuel vehicles, and for that reason, the reviewer rated this project very highly.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that the project approach is clear, stating that fleet support, data collection, and education and outreach are the three main prongs of the effort.

Reviewer 2:

The reviewer found the approach to be straightforward: create a project with strong, fully dedicated partners; deploy vehicles; gather data; and share the success through targeted outreach. The reviewer noted that propane use has proven to reduce particulates compared to diesel, and that promotion of this fuel in fleets, particularly high use fleets like USPS, will improve air quality and promote energy independence. The reviewer added that conversion to a propane fleet is considerably less costly than converting to EVs.

Reviewer 3:

The reviewer noted that the project involved the purchase and installation of propane trucks and refueling infrastructure; in addition, data is to be collected on the performance, while education and outreach were also provided. The reviewer applauded the approach of having webinars and participating in the Work Truck Show. The reviewer commented that, while it is useful to present the results to the postal contractor association, a major weakness in the project is the lack of support from USPS or the postal contractor association as a project partner.

Reviewer 4:

The reviewer noted that a key element of the approach was working with the high-daily-use postal contractor fleets to lead to market transformation, and the project included specific elements addressing environmental benefits. The reviewer commented that it was a straightforward approach—buy vehicles, put them into the fleets, collect data, and do outreach and education.

Reviewer 5:

The reviewer commented that putting vehicles in actual use and collecting data is critical to providing realistic information, so the approach is excellent for that reason. The reviewer would have rated the project higher if the emissions data was based on actual in-use monitoring and provided comparison to conventional fuels. The reviewer recognized, however, that in-use emissions testing is expensive.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that, given that this is a three-year project in its final year, the team has successfully completed a large proportion of the scope, at this point, and added that the team plans to have discussions with the postal contractor association to present their findings and spur discussions of feasibility for incorporating this technology into the postal fleet.

Reviewer 2:

The reviewer noted that, at 85% complete, the project is on track, and pandemic related delays—including staff shortages and infrastructure permitting issues—could not have been anticipated when the proposal was submitted. The reviewer added that, with months to go, the project is up and running and data is coming in; hats off to the project team for hanging in there with the delays and working to complete the tasks that could be completed given the circumstances. The reviewer stated that the delays and staff shortages are understandable due to COVID; however, that all vehicles could not get up and running until November—after being delivered in August—indicates more needs to be done to work the kinks out of propane vehicles, and added that the drained batteries and the service parties not committed to being responsible for the fix are big issues that need to be resolved. The reviewer stated that all service parties—dealerships, upfitters, fuel distributors—must adhere to clear areas of responsibility when a problem arises; fleet managers will not tolerate the back and forth and will not consider adding more vehicles if it is problematic.

Reviewer 3:

The reviewer observed that the project has faced major setbacks along the way including a delay in delivery of trucks, and permitting delays for the refueling infrastructure, which have delayed the webinars and outreach. The reviewer noted that, once the trucks entered operation, they faced frequent downtime due to service and repairs and the lack of service staff to address them. In addition, the reviewer noted that project partners were blaming each other for the issues with vehicle downtime, rather than working together to get them solved.

Reviewer 4:

The reviewer noted that all five vehicles are up and running in the fleets—a definite accomplishment given supply chain delay impacts on other projects; it took 1-1/2 years to get the vehicles. The reviewer added that the project team seems to have overcome delay issues along the way, all equipment has been in operation since late 2022, and the project team has been in communication with a number of fleets who have shown interest in the technology. The reviewer commented that they continue to deal with issues with maintenance in particular, but that is not unusual, and that has impacted the schedule for data collection. As a result, the project has insufficient results to review at this time.

Reviewer 5:

The reviewer observed that the presenter revealed that the project has experienced setbacks related to data collection because of problems with the vehicles; these problems appear unrelated to the alternative fuel but related to implementation of the projects and within the control of project sponsors and participants.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted that there are regular meetings with project partners but more information on partners could have been provided.

Reviewer 2:

The reviewer commented that the lead did an excellent job of choosing the right partners for this project, including NREL for top notch data collating. Everyone was committed and hung in there when delays and problems popped up.

Reviewer 3:

The reviewer observed that once the trucks entered operation, they faced frequent downtime due to service and repairs and the lack of service staff to address them. In addition, project partners were blaming each other for the issues with these vehicles' downtime, rather than working together to get them solved.

Reviewer 4:

The reviewer commented that it seems like they assembled a team with all the necessary parties and have seen a high degree of interaction among the partners.

Reviewer 5:

The reviewer stated that the presenter acknowledged that problems with the vehicles have not been satisfactorily addressed because project participants have not taken responsibility for the issues and added that it is noteworthy that the issues are not related to the alternative fuel components.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer commented that more details on impacts/benefits to DACs would be helpful.

Reviewer 2:

The reviewer noted that operating propane fueled vehicles will reduce particulates in the areas used. The reviewer observed that Denver is facing a “demotion” in air quality status, and the vehicles will be operating in areas that include “disproportionately impacted communities.”

Reviewer 3:

The reviewer observed that these trucks will have lower air pollutant emissions than their diesel counterparts, and as these vehicles are operating in an area with poor air quality, this will provide some benefits to overburdened communities in the area.

Reviewer 4:

The reviewer commented that the project team and approach specifically targeted operation in disadvantaged and environmentally compromised communities.

Reviewer 5:

The reviewer expressed the view that good is probably as high as you can rate these demonstration projects because the direct benefits to affected communities will come later when more fleets and business deploy the technologies based on lessons learned and analysis provided by the demonstration.

Presentation Number: TI135

Presentation Title: Advancing Climate and Innovation Goals of Memphis and Shelby County: Electrification of Key Fleet Vehicles to Capture Cost Savings and Climate Benefits
Principal Investigator: Leigh Huffman (Shelby County)

Presenter

Leigh Huffman, Shelby County

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer noted that the County seeks to electrify its fleet as much as possible, with this pilot program being the first step, and though the impact is small here, this project supports all the TI objectives listed above.

Reviewer 2:

The reviewer commented that this is a great example of support for TI; a pilot at the local level where next-generation technology can be difficult to introduce.

Reviewer 3:

The reviewer stated that while the overall objective is appropriate for VTO (initial EVs in a fleet to provide data for future decision-making and adoption), the scope is relatively small regarding potential influence and thus overall impact. The reviewer added that the project is primarily focused on just the Shelby County fleet, and no external outreach is planned, such as to other fleets in the region.

Reviewer 4:

The reviewer noted that there was a good set of objectives for a small-scale deployment project.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that the project approach is simple and effective: procure vehicles, install charging stations, deploy vehicles while increasing number of EVSE installations, and execute a robust outreach and education campaign. The reviewer noted that Shelby is one of thousands of counties working on increasing

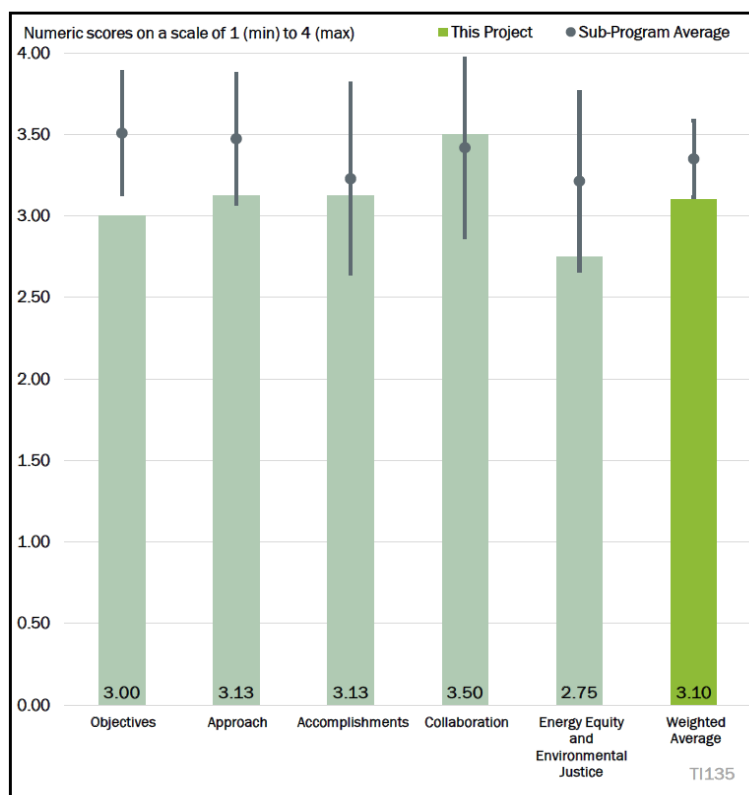


Figure 6-10 - Presentation Number: TI135 Presentation Title: Advancing Climate and Innovation Goals of Memphis and Shelby County: Electrification of Key Fleet Vehicles to Capture Cost Savings and Climate Benefits Principal Investigator: Leigh Huffman (Shelby County)

transportation efficiency in their fleets and added that if all areas of government—cities, counties, states—did the same it would make a significant impact on transportation efficiency and air quality.

Reviewer 2:

The reviewer stated that a medium-duty (MD) all-electric truck is a good application focus for this area and will be helpful for local stakeholders to better understand the technology.

Reviewer 3:

The reviewer opined that the approach seems fine as far as the fleet demonstration and training is concerned, although it would have been good to include some element of outreach and education beyond the Shelby County fleet to increase the project's impact.

Reviewer 4:

The reviewer found the plan for testing vehicles and sharing results to be a solid one.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer observed that there have been issues with procurement and so far, just one vehicle has been delivered and is in operation, although this was not the vehicle the project originally sought to acquire (which was to be a Ford F650 dump truck). A Class 6 truck was received and put in use but has a design issue (not enough clearance). The reviewer commented that the lead has done an excellent job rolling with the punches and modifying the plan and the project has received a no cost extension to 2025. The reviewer observed that they are currently awaiting four more vehicles to deploy and to be ready for this, the lead is actively planning more charging station installations. The county also delivered an emergency plan to first responders.

Reviewer 2:

The reviewer stated that while more work will be done for procurement and installs, it is good to see a truck procured and infrastructure moving to deployment.

Reviewer 3:

The reviewer noted that the first vehicle has arrived and begun operation, which is a real accomplishment; that even included a procurement change from a converted vehicle to an OEM EV, though they did find out that the replacement truck had lower ground clearance than required. The reviewer stated that they do appear behind on EVSE installation, though they did research additional sites for L2 charging, and added that the other four vehicles have been ordered. The reviewer observed that they were trying to get on the list for Ford Lightnings but may go back to Ford Mustang Mach-E vehicles or go out for bid.

Reviewer 4:

The reviewer commented that there is still work to do to deploy infrastructure and take delivery of vehicles, adding that global supply chain issues have affected vehicle cost and delivery timelines.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted that the project has included the following partners: local utility, government, a dealership, an OEM and a Clean Cities coalition, and that all appear to work well together. The reviewer observed that although the Ford dealership cannot promise what vehicles will arrive and when that will happen, that appears to be a nationwide availability issue with Ford Lightnings and Mustang Mach-Es.

Reviewer 2:

The reviewer stated that this is a complex partnership project, and the county has done well working with a broad gathering of supporting partners.

Reviewer 3:

The reviewer noted that the team includes the partners needed for the fleet demonstration—the fleet, utility, OEMs, and the local Clean Cities coalition, and added that it would have been good to have someone tasked with spreading the word to expand the impacts beyond the fleet. The reviewer observed that the agency representatives within the county have been participating in monthly meetings, and the agencies involved have grown.

Reviewer 4:

The reviewer commented on the great set of team members to help advise deployment and share lessons learned with other fleets in the region.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that this project’s focus is to work to electrify the county government’s fleet, which shows a commitment to the improvement of air quality in the region.

Reviewer 2:

The reviewer stated that while the analysis proposed is helpful, the future impact on EEEJ would be good to have.

Reviewer 3:

The reviewer observed that the project only addresses general air quality and emissions reductions, with no particular indication that DACs would see benefits.

Reviewer 4:

The reviewer stated that there are many EJ identified communities in the project area and expressed the view that the project could do more to target vehicle operations in these areas.

Presentation Number: TI136
Presentation Title: Zero Emission Freight Future
Principal Investigator: Tim Cho (Clean Fuels Ohio)

Presenter

Tim Cho, Clean Fuels Ohio

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented that although the project is designed around the deployment of just three Class 4-8 vehicles, the analyses from data gathered on vehicle operations

throughout Ohio will assist fleet decision-making. The reviewer further observed that these vehicles are now part of highly visible companies (PITT OHIO, Bimbo Bakery and hopefully City of Columbus), operating in key areas—which will further promote awareness of EVs. The reviewer found that this project supports all of the TI objectives above.

Reviewer 2:

The reviewer found the plan to be very good and commented that it was unfortunate that the original supplier of the waste hauling truck did not supply it in time.

Reviewer 3:

The reviewer noted that the objectives are to deploy MD/HD EVs by highly visible fleets in key vehicle platforms, improve MD/HD EV datalogging and reporting capabilities, prove the operational and financial case for EVs, leading to Class 4–8 adoption in various applications, and address critical gaps in MD/HD vehicle data and analysis to enhance fleet decision-making and EV adoption. By reducing GHG emissions and promoting transportation electrification for further GHG reduction, the reviewer found that the project meets the DOE goals.

Reviewer 4:

The reviewer observed that the project is focused on several applications that have seen lower EV adoption rates and that these are also several high-visibility applications. The reviewer commented that, overall, this project has been designed to move zero emission vehicles forward, a key goal for VTO efforts.

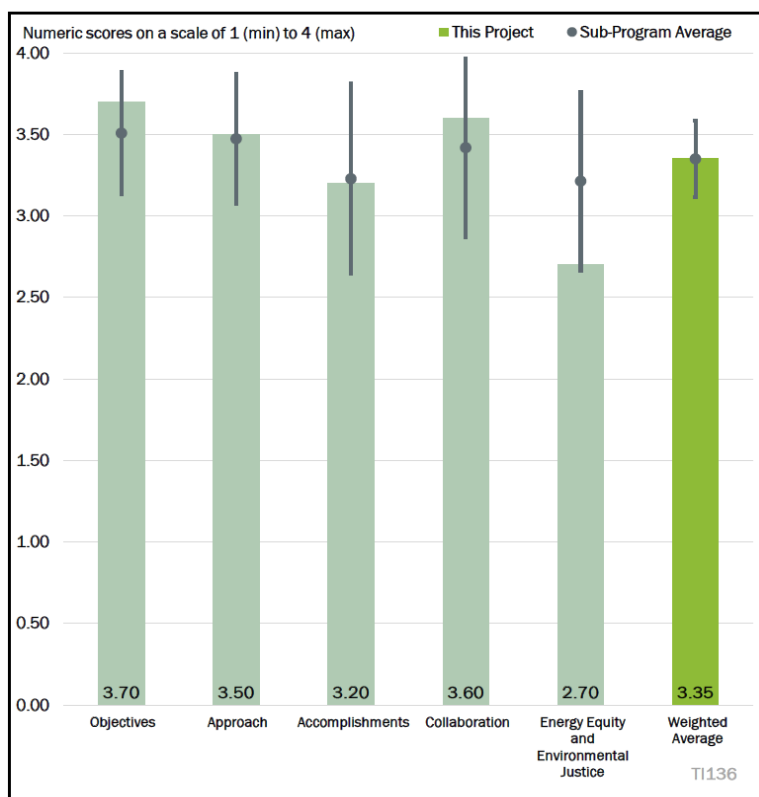


Figure 6-11 - Presentation Number: TI136 Presentation Title: Zero Emission Freight Future Principal Investigator: Tim Cho (Clean Fuels Ohio)

Reviewer 5:

The reviewer stated that telematic data retrieval and analysis is the key to answering this question and based on the PowerPoint slides and the oral presentation the project team is on track to accomplish its milestones.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer observed that the project approach is to install EVSE, acquire three vehicles and deploy them to gather data during operation, and added that the project will identify areas of improvement in telematics and develop an MD/HD EV analysis model with the assistance of Sawatch Labs. The reviewer noted that in the remaining months the team plans to continue with data gathering and assemble documentation and findings for replication. The reviewer recommended a no cost time extension to gather enough data to support analyses.

Reviewer 2:

The reviewer stated that truck data information appears on track but added that an explanation of the analysis tool would have been helpful. The reviewer expressed surprised that there was no discussion of the truck charging process and any challenges.

Reviewer 3:

The reviewer found the approach to be solid, with three phases, and summarized the approach as follows: overall program development; demonstration, analysis, and tool creation; and presentation of findings and dissemination. The reviewer detailed the overall program development as developing a data collection and analysis plan, convening a project advisory committee, developing a fleet demonstration deployment plan, creating design and engineering plans, creating specifications for EV and EVSE, and purchasing and deploying EVs and EVSE. The reviewer indicated that the demonstration, analysis, and tool creation is designed to identify data gaps for MD/HD telematics improvements and stated that the OEMs will gather and analyze data on EV deployments to date, gather analysis model data and begin developing models. The presentation of findings and dissemination will include a completion plan for replication resources. The team will seek feedback on replication resources and disseminate final replication resources and tools.

Reviewer 4:

The reviewer indicated that the project approach was solid, focusing on several key applications for EVs and then developing models and collecting data to show how they performed.

Reviewer 5:

The reviewer indicated that the team appears to have the right approach to integrating advanced transportation technology and practices. The reviewer added that the final answer will not be known until the project is over and the data is evaluated.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer observed that even though lack of MD/HD EV availability is an issue for many similar projects, this project was able to acquire two of the three trucks and use data from PITTS' other electric truck. The reviewer indicated that the team needs more time than is left to gather data on the step van and figure out if the refuse truck purchase can happen. As such, the reviewer suggested requesting a time extension.

Reviewer 2:

The reviewer indicated that progress appears satisfactory and suggested that a timeline plan of the milestones would be helpful.

Reviewer 3:

The reviewer stated that project accomplishments include progress on data collection and analysis, such as collecting one year of vehicle telemetry, operations, and fuel usage data from a Class 7 EV Straight Truck (May 2022–April 2023). The reviewer noted that approximately 25% of the energy being used is being offset by regenerative energy captured throughout the course of the driver’s day-to-day routes and stops, and the truck is averaging 1.12 kWh/mile with a 28-mpg efficiency using a 264 kWh battery pack (approximately a 200-mile range). The reviewer noted that the project team has designed engineering plans for fleet deployment, completed specifications, and purchased and deployed EVs and EVSE. The reviewer stated that it does not look like the refuse truck deployment will be in the scope of the project.

Reviewer 4:

The reviewer noted that two of the three vehicles are now in operation, including one very recently that had been delayed, but the third vehicle is a significant issue: the OEM cancelled the order, and the team is now having to request and evaluate bids from other refuse truck manufacturers. The reviewer observed that this is not unusual among the deployment projects, as supply chain issues continue. The reviewer stated that the team collected the data that they could, and right now, it is unclear if they will be able to get a refuse truck by the end of the year; if they can, then they might try to get 60–90 days of data, possibly through an extension.

Reviewer 5:

The reviewer observed that many of the projects seem to be behind schedule due to certain vehicles like the EV refuse trucks not being available, and late delivery of the Bimbo Bakery EV truck, and added that this is to be expected due to the availability of specialized EVs; the rest of the project appears to be on schedule.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commended the team lead on making outstanding choices in partners for this project, including OEMs, a software analytics firm and highly visible, enthusiastic fleets. The reviewer noted that it is unfortunate that the OEM rescinded the purchase order on the refuse truck and expressed optimism that this project is able to acquire another (or acceptable replacement) to gather data on the Class 8 refuse truck.

Reviewer 2:

The reviewer commended the team on doing a good job.

Reviewer 3:

The reviewer commented that the team is strong with the exception of Lion Electric, which withdrew from the project. The reviewer noted that the main problem that has affected the project up to this point has been the long lead/delivery times of specific MD/HD vehicle models (specifically the refuse truck). The third fleet partner had to discontinue their vendor-client relationship with the original OEM and is going through another bidding process to supply a Class 8 EV Refuse Truck for this project. The reviewer stated that the rest of the team is strong with project lead Clean Fuels Ohio; fleet deployment partners, PITT OHIO, City of Columbus, and Bimbo Bakeries; technical partner, Sawatch Labs; and OEM partners, Volvo and Motiv Power Systems, all industry professionals.

Reviewer 4:

The reviewer observed that the project included all the key types of partners on the team, which was very well organized and included the fleets and the OEMs from the beginning. The reviewer stated that one OEM turned out to be a problem for delivery, but the team has worked to pull in other OEMs to try to fill the hole for the refuse truck, and the fleets seem highly engaged.

Reviewer 5:

The reviewer stated that collaboration and coordination appear to be within the grant requirements, but late delivery of two of three of the vehicles has meant not all the expected performance data at this point in the project is available.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer observed that the project plans to use the Greenlink Equity Map (GEM) tool to identify areas of disparities in pollution in the three demonstration cities and noted that reduction of carbon emissions in the operations of MD and HD EVs will have a significant impact once more of these vehicles are acquired by fleets.

Reviewer 2:

The reviewer noted some discussion on EJ issues but no real partner or planned activity for outreach.

Reviewer 3:

The reviewer noted that the goal was to utilize the GEM tool to identify disparities in energy burden, climate risks, and pollution impacts for these three MD/HD EV pilot demonstration cities. The reviewer stated that the project reduces carbon emissions in communities overburdened with environmental pollution and showcases the financial feasibility of electrifying fleets for both private and public sector benefiting community members. The reviewer commented that the PITT OHIO project is improving air quality from freight ground services and supply chain solutions around northeast Ohio, while the Bimbo Bakery project is reducing direct tailpipe emissions in communities around the Dayton area. The reviewer observed that the City of Columbus did not deploy the planned refuse truck, although deployment would align with Columbus Climate Action Plan's Environmental Justice and sustainability goals.

Reviewer 4:

The reviewer stated that use of the vehicles is anticipated to provide benefits to overburdened communities, and the project's emphasis on exploring the financial feasibility of zero emission freight technology should lead to greater penetration in this sector.

Reviewer 5:

The reviewer commented that, based on the type of vehicles deployed and to be deployed, it appears EEEJ justice requirements of the grant will be met; however, not much is said about this area in the slides or presentation.

Presentation Number: TI137
Presentation Title: Cold-Weather Operation, Observation and Learning Electric Vehicles
Principal Investigator: Lisa Thurstin
 (American Lung Association)

Presenter

Lisa Thurstin, American Lung Association

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that understanding how ambient temperature affects batteries is imperative to the promotion of EVs, and this project's location—

Minnesota—allows for data to be collected in both very cold and very warm temperature situations. The reviewer observed that information gathered may help R&D improve battery performance and longevity, particularly in extreme cold and warm climates. The reviewer suggests the project end date be extended so the team can collect enough useful data on all vehicles.

Reviewer 2:

The reviewer commented that this effort examines the viability of HD EVs in a cold climate, and, if successful, the project could improve local fuel diversity and resiliency through the use of EVs. The reviewer noted that other locations with cold-weather operations would benefit from the lessons learned from this project, adding that EVs can have significant GHG emissions benefits, but quantity depends on the grid mix serving these vehicles.

Reviewer 3:

The reviewer noted that the project is focused on a key area of need—cold (and hot) weather performance data for EVs, which is important to ensure EV technology readiness in difficult operating environments, expanding use of a technology of great interest to VTO.

Reviewer 4:

The reviewer stated that cold weather operations are a noted barrier to vehicle electrification, and data collected as part of this project will be useful.

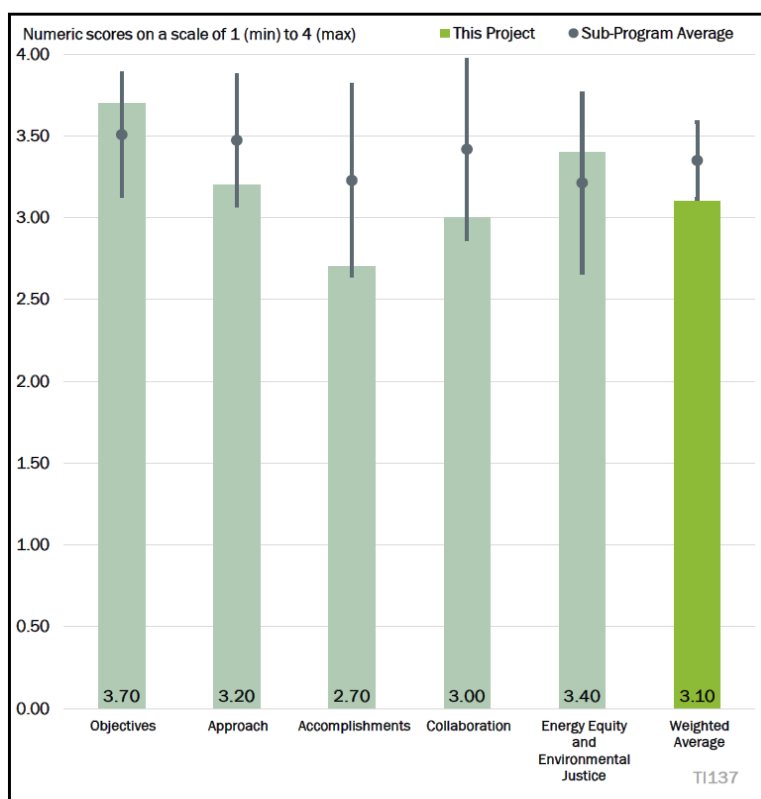


Figure 6-12 - Presentation Number: TI137 Presentation Title: Cold-Weather Operation, Observation and Learning Electric Vehicles Principal Investigator: Lisa Thurstin (American Lung Association)

Reviewer 5:

The reviewer observed that there is only one fuel (electricity) in the project and stated that fuel diversity is a moot point. The reviewer added that, as far as GHG and transportation efficiency, there is more vehicle usage data to be collected; key data that should be collected and analyzed once the project is completed should lead to resiliency improvement in EV cold weather operations.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer found the project to have clear steps to initiate—gather support partners and fleet participants, install EVSE, deploy and operate vehicles, gather data and share successes, and lessons learned—and noted that the project has a significant training and outreach component. The reviewer stated that the keys to increased EV deployment in northern and southern regions include eliminating the high cost of the vehicles and reducing any doubt about battery performance. The reviewer added that vehicles sit in very cold garages during the winter in northern regions; when driven, the heaters are blasting. In southern regions vehicles sit out in parking lots exacerbating the 110° heat in summer, and when driven the AC is on non-stop, and observing how batteries react to these stressors will be very helpful in understanding the next steps to battery improvement. The reviewer noted that the overview indicates one of the barriers to be addressed is “cost of medium and heavy-duty EVs” and it was not clear how that would be integrated in this project. The reviewer surmised that it would be accomplished through data that would support lower total cost of ownership (TCO) and that would be shared in outreach and promotion of EVs.

Reviewer 2:

The reviewer noted that the project's goal is to deploy four HD EVs and charging infrastructure in three community fleets in the Minneapolis/St. Paul metro area and analyze cold weather impacts to their functionality and provide lessons learned, and one of the key parts of this project is having the local utility work on the make-ready issues related to charging infrastructure. The reviewer stated that it is unclear what the project approach is to data collection and how they will analyze different vehicle types; it was stated that miles traveled, electricity consumption and maintenance data were being collected at a high level but due to challenges with the telematics data they have not collected detailed information yet. The reviewer commented that it would be useful for the project to spend some time working on the data collection plan and what they can or cannot collect based on what the fleets' telematics/data collection efforts can provide.

Reviewer 3:

The reviewer found that the approach is solid and makes sense—deploy HD EVs and charging systems in the Minnesota climate and analyze the performance. The reviewer added that the approach was solid enough that when a fleet backed out, they were able adjust to evaluate 12 fleets for a possible replacement.

Reviewer 4:

The reviewer observed that the project team had to re-run the request for proposals for fleets as one original partner on the project dropped out.

Reviewer 5:

The reviewer noted that the project uses real world diverse fleets to demonstrate and evaluate unique cold weather operational requirements and added that it is understandable that vehicle availability would be an issue, especially in the EV arena.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer observed that the school bus has been in operation for approximately 18 months and demonstrations and outreach have occurred. The reviewer added that the project lead could not have anticipated the pandemic related issues that have caused delays in the deployment of the vehicles (no vehicles, no data), or the problems interpreting the school bus's data. The reviewer noted that at this time only one of the four vehicles are operating; one fleet participant withdrew, and the data on the school bus came through garbled. The reviewer commented that according to the presenter there is poor communication between Battle Motors and the OEM on the refuse truck that was ordered, and they may have to scrap that plan, but the Peterbilts are receiving the boxes and will be operating and collecting data soon. The reviewer suggests that the lead request a significant time extension on this project so enough data will be gathered to complete the objectives.

Reviewer 2:

The reviewer observed that the project has had significant delays; in addition, one of the fleets that was planning to participate dropped out and no other fleet has replaced it (presenter said it would be unlikely they will find anyone). The reviewer noted that one of the fleets received its vehicle (a school bus) and installed L2 charging, and that vehicle has been on the road for 1.5 years, but the data collection effort has had significant problems. The reviewer noted that it was mentioned that project partner CTE for data analysis was just seeing garbled data from the telematics, and they plan to go straight to the telematics company, Geotab, to get the data. The reviewer observed that the University of Minnesota's two vehicles were being upfitted, while the Eureka Recycling refuse truck has been on order for 2 years and they are not sure when it will be delivered. The reviewer noted that the presenter stated that there has been poor communication between Battle Motors and the OEM on this refuse truck. As a main goal is to examine cold-weather operation of these HD EVs, the reviewer commented that these major delays have seriously impacted this project's ability to do so.

Reviewer 3:

The reviewer commented that there have been issues obtaining several of the vehicles as well as with the data collection systems, and only one vehicle is in operation at this time. The reviewer noted that the project team claims to be about 50% complete, although the project is scheduled to be completed in only 6 months (by the end of December 2023). The reviewer observed that there have been problems with a vehicle supplier for the recycling truck, and that the team may have to take an alternative path. The reviewer stated that, to the team's credit, they have done a lot of outreach and education.

Reviewer 4:

The reviewer noted that global supply chain challenges have affected deployment of vehicles, and this is outside the hands of the project team.

Reviewer 5:

The reviewer stated that it appears the project is proceeding in line with the proposed timetable, regardless of vehicle availability.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer observed that team dynamics are lead—support partners—participating fleets, giving the feel of a top-down team model (vs. a lateral team model). During the presentation, the reviewer got the impression that the three participating fleets are enthusiastic.

Reviewer 2:

The reviewer commented that it looks like the project had good support from Xcel Energy for installing one of the chargers; however, one of the project partners dropped out and it does not seem as if there will be a replacement. The reviewer added that there have been significant delays in obtaining the vehicles, which can be attributed to the supply chain. The reviewer noted that the Eureka Recycling refuse truck has been on order for 2 years and there has been poor communication between Battle Motors and the OEM on this refuse truck about when this vehicle will be delivered. The reviewer added that the project partners have had significant issues working together on data collection from the telematics systems.

Reviewer 3:

The reviewer commented that the original roster of partners made a lot of sense, although some have dropped out along the way. The reviewer noted that the project team has worked to interact with the remaining partners and interviewed 12 potential replacement fleets, and there has also been a lot of technical support provided.

Reviewer 4:

The reviewer noted that the team includes a Clean Cities Coalition, fleets, utilities, and vehicle manufacturers.

Reviewer 5:

The reviewer stated that, according to the presentation, the project team was working together with a high degree of collaboration and coordination and added that it also appeared that the project team selection has led to a coordinated, properly leveraged team effort.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that, according to the presentation, vehicles will be deployed in “two of three communities of low income.”

Reviewer 2:

The reviewer commented that the project highlights that two out of the three fleets operate in communities of low income. The reviewer stated that the zero emission tailpipe capabilities of EVs will reduce the air pollution emissions of vehicles in these areas. In addition, the reviewer noted that the project plans to develop case studies and demonstrations for underserved communities based on the output of their project.

Reviewer 3:

The reviewer stated that the project has a particular focus on low income/disadvantaged areas, with several of the fleets located in those areas; thus, zero emission technology demonstration in these areas appears to have been a focal point of the approach from the beginning.

Reviewer 4:

The reviewer observed that some vehicles will be deployed in EJ identified communities in the project area and case studies will be created.

Reviewer 5:

The reviewer stated that the project percentage involving EEEJ about equals the percentage allowed for this question.

Presentation Number: TI138
Presentation Title: Demonstrating Electric Shuttles for the New Orleans Region
Principal Investigator: Jordan Stewart (Tulane University)

Presenter

Jordan Stewart, Tulane University

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that this project is a great effort that helps increase visibility and potentially adoption of battery-electric vehicles (BEVs) in an area with high marketability and opportunity for application.

Reviewer 2:

The reviewer commented that the two false starts of this project have only served to reinforce how difficult it will be to meet the TI objectives; after two years of work, one fast charger has been installed. The reviewer questioned whether this will be enough for nine vehicles. The reviewer noted that they are replacing large city buses with small Ford E-Transit vehicles, and speculated that this will significantly impact the route planning, etc.

Reviewer 3:

The reviewer commented that the project is focused on providing a double-bang for the buck—showing EVs in an application sector with fewer EVs adopted to date, and in a sector that reduces vehicle miles traveled (mass transit—local shuttles). The reviewer found the tie to overall VTO goals to be strong.

Reviewer 4:

The reviewer stated that it is a good objective to demonstrate shuttles.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer found the approach to be solid and building up local qualifications and introducing a cost analysis for EV shuttle applications in this region to be important.

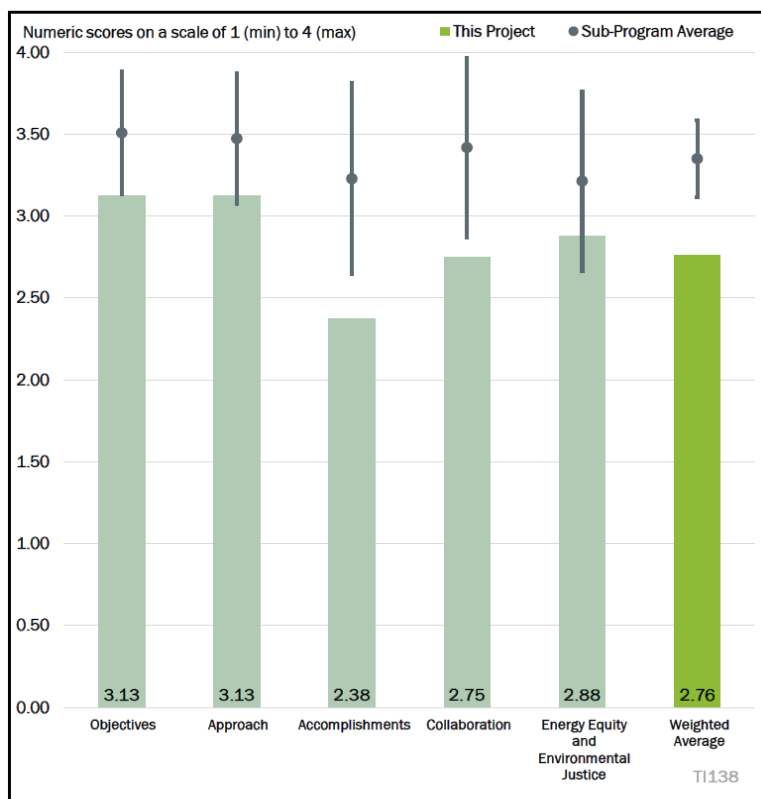


Figure 6-13 - Presentation Number: TI138 Presentation Title: Demonstrating Electric Shuttles for the New Orleans Region Principal Investigator: Jordan Stewart (Tulane University)

Reviewer 2:

The reviewer indicated that the initial approach was good, but the compromises that have been made may negatively impact the results. The reviewer opined that while they have been waiting for their vehicles to arrive, they should have spent more time in analyzing the metrics and how to improve them. The reviewer stated that real world test results are vitally important.

Reviewer 3:

The reviewer stated that the approach was logically laid out, although they had to make significant changes when they ran into procurement issues on the shuttles. The reviewer noted that they are now in the third version of the procurement process and have increased the order from five to nine shuttles. The reviewer stated that, while the shuttles are smaller than originally planned, this will allow the operator to use them on any of their routes. The reviewer stated that EVSE is in place, though additional EVSE may be installed later.

Reviewer 4:

The reviewer stated that the project plan is reasonable, but vehicle suppliers have been unable to deliver.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer stated that once the shuttles arrive, this project will have further impact.

Reviewer 2:

The reviewer noted that this project is significantly behind schedule and questioned whether enough research was conducted initially regarding vehicle availability, etc. The reviewer gave the example of Amazon, which has been using BEV cargo vans for several years and asked where they purchased their vehicles.

Reviewer 3:

The reviewer observed that delivery of the buses has not yet occurred, so the principal investigator has requested a no-cost extension to provide the time for operation of the buses and for data collection. The reviewer noted that the project team had to change suppliers twice and is now on their third procurement, and the vehicles are expected to start arriving this summer, with required modifications to the vehicles to take place after initial operation (due to delays in modification equipment). The reviewer noted that installation of the EVSE was delayed somewhat, but that was largely due to a major weather event (Hurricane Ida).

Reviewer 4:

The reviewer stated that manufacturer and supply chain challenges have delayed vehicle delivery, making achieving other goals difficult.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented that this is a nice collaboration between a university, the Federal government, industry, and a Clean Cities coalition.

Reviewer 2:

The reviewer stated that if there were good collaboration within the various teams, they probably would have known much sooner about the lack of vehicle availability. The reviewer added that it seems that they knew very little about the local utility “clean” energy, and this detail should have been top of mind for the presentation.

Reviewer 3:

The reviewer commented that the small team seems solid and works together well, under less than terrific circumstances and speculated that it may have helped to have the OEM on the team at the beginning, particularly given that bus suppliers have been the real problem for this project.

Reviewer 4:

The reviewer noted lots of outreach and collaboration even though vehicles have not been deployed yet.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that while the location of this project will be helpful to the community, it would be good to see more details and efforts for equitable engagement.

Reviewer 2:

The reviewer stated that running BEVs for university transportation will likely benefit the surrounding community; however, it seems that not much thought has gone into the actual metrics of reduced GHG, reduced noise, which underserved communities, etc.

Reviewer 3:

The reviewer noted that the project is focused not only on EVs, but also on EVs for transit, which also addresses vehicle miles traveled reductions. The reviewer noted that they propose that emissions and noise reductions will provide significant benefits for New Orleans' DACs.

Reviewer 4:

The reviewer commented that the project will benefit the local community when deployed, but deployment has been delayed.

Presentation Number: TI139
Presentation Title: Pilot Heavy-Duty Electric Vehicle (EV) Deployment for Municipal Solid Waste Collection
Principal Investigator: Kelli Toth (Municipality of Anchorage)

Presenter

Kelli Toth, Municipality of Anchorage

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the project has an effective goal and a worthy plan for supporting the TI program goals. The reviewer commented that, from the presentation, it was difficult to understand what the plan is for the refuse vehicles and what expectations the project has for carbon reduction, given the baseline duty cycles of the operations. The reviewer noted that fuel cost and efficiencies appear well documented for the Class 6 truck and should greatly benefit future EV customers in the geographic region.

Reviewer 2:

The reviewer noted that this effort examines the viability of HD EVs in a cold climate, as well as the use of a battery tied EVSE system to help with grid peak shaving. If successful, the reviewer found that the project could improve local fuel diversity and resiliency through the use of EVs, and other locations with cold-weather operations would benefit from the lessons learned of this project. The reviewer stated that EVs can have significant GHG emissions benefits, but quantity depends on the grid mix serving these vehicles.

Reviewer 3:

The reviewer commented that the project is focused on cold weather operation and deployment of HD EV, which is important to VTO to ensure that EVs are applicable to cold climates.

Reviewer 4:

The reviewer stated that deploying EVs in very challenging duty cycles, with data collection and lessons learned, can help further deployment.

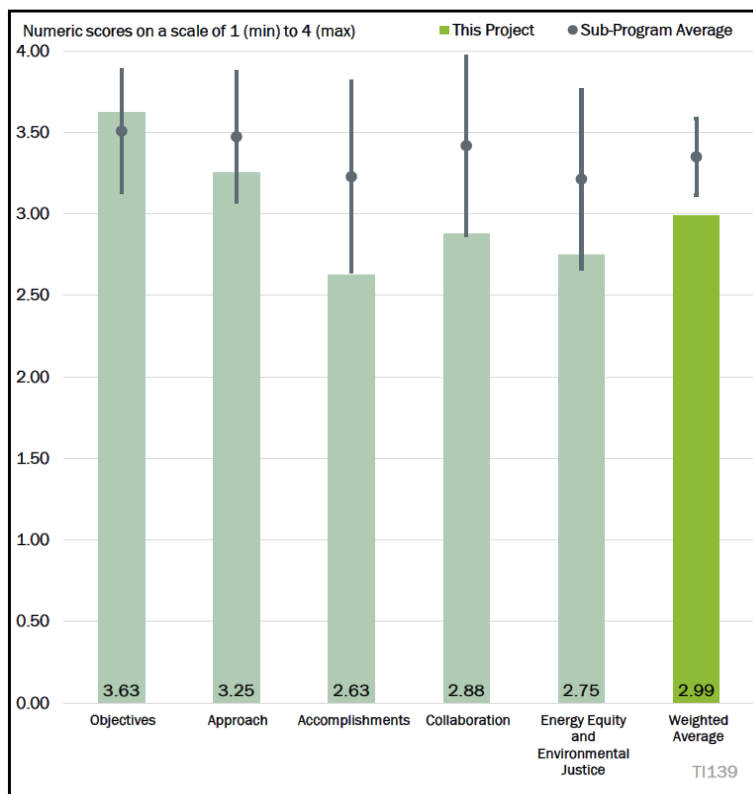


Figure 6-14 - Presentation Number: TI139 Presentation Title: Pilot Heavy-Duty Electric Vehicle (EV) Deployment for Municipal Solid Waste Collection Principal Investigator: Kelli Toth (Municipality of Anchorage)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer observed that all of the components are in place to provide an effective and successful project but expressed concern about the degree of data analysis shown so far. The reviewer expressed the hope that when the EVSE is functioning, data for cost and energy is collected.

Reviewer 2:

The reviewer stated that the project approach to screening vendors that could provide vehicles and equipment suitable for remote locations, cold climates, and the operational needs of the fleet are crucial to the long-term success of the project. The reviewer commented that in the technical notes, the project is demonstrating that the data collection and lessons learned highlight important factors for EVs in snowy/cold climate operations; in addition, they show preliminary information on energy consumption based on local temperatures, showing the impact of cold weather operation. The reviewer observed that monitoring these operational issues through data collection will be a crucial part of the output of this project.

Reviewer 3:

The reviewer commented that the approach seems solid—operate the vehicles, monitor operation, and perform continued maintenance, and the approach also calls for conducting outreach and education to other fleets/locations in the region.

Reviewer 4:

The reviewer found the approach to deploying and testing vehicles to be well-designed, although deployment of heavy refuse vehicles has been delayed.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted good progress, given the situation with equipment reliability and weather challenges, but expressed concern that the amount of DOE funds spent to date does not match what is required for this stage of the project; however, the spending plan was not discussed.

Reviewer 2:

The reviewer observed that the project has had significant delays, and the presenter is the third principal investigator on this project. The reviewer noted that the EVSE and the 220e box truck have been installed and delivered, with some preliminary data being collected; however, this vehicle has had inconsistent usage due to heavy snow events and battery issues causing the vehicle not to be able to charge to 100%. The reviewer added that the stationary battery has yet to be integrated and the two 520 electric garbage trucks have yet to be delivered, with anticipated delivery in fall, due to delays in the supply chain. The reviewer noted that the data from the telematics has been difficult to analyze but stated that the team has worked on improving communications/data sharing between the operator, foreman, and principal investigator, although the system requires that each of the parties manually share data, which could lead to issues with data accuracy. The reviewer highly recommended working on the telematics system to make sure the project is collecting accurate data.

Reviewer 3:

The reviewer commented that one vehicle is up and running and the team is anticipating another two in the fall, and the delays with vehicle delivery are delaying data collection. The reviewer noted that they have initiated the pilot demonstration with the one vehicle received, and that the principal investigator realized that

improved communication was required, as were revised data collection procedures, which were both addressed. The reviewer observed that, overall, the project is somewhat behind the planned schedule.

Reviewer 4:

The reviewer commented that good data has been collected from the medium duty box truck deployment, while the deployment of the HD collection vehicles has been delayed.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that it appears the team is functioning well since no concerns were mentioned during the presentation. The reviewer would have liked to have seen more on how the project is being shared and communicated to the public, and to whom, and whether that matches the original plan.

Reviewer 2:

The reviewer commented that the project has faced major delays in obtaining the vehicles and has had issues with the vehicle that has arrived, and it is unclear how well project partners are working together to address the issues delaying the project. The reviewer noted that delivery of vehicles is a tough challenge, but the concern is that the vehicle in hand is not being used as fully as it could due to service issues. The reviewer found it concerning that the project was on its third principal investigator so far and remarked on a lack of leadership to make this effort successful.

Reviewer 3:

The reviewer remarked that it seems like the project had a very committed, though small, team that appears to be working together well, and noted that they were able to pull in Peterbilt to provide additional assistance.

Reviewer 4:

The reviewer noted that team members include other public agencies, an energy authority, and a university, and that the vehicle manufacturer has been involved in various maintenance issues.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer would have liked to see more of the impacts listed.

Reviewer 2:

The reviewer observed that the project vehicles will operate in an area with very high asthma rates and health insurance stress and that the EVs will provide zero emissions from the vehicle. The reviewer noted that if the project is successful, the use of EVs in rural, cold locations could be increased.

Reviewer 3:

The reviewer indicated that the project included specific elements to address environmentally sensitive areas, though none appear to be focused on DACs.

Reviewer 4:

The reviewer stated that the vehicle is operated in an EJ community.

Presentation Number: TI140

Presentation Title: St. Louis Vehicle Electrification Rides for Seniors (SiLVERS)

Principal Investigator: Connor Herman (Forth Mobility)

Presenter

Connor Herman, Forth Mobility

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer observed that the project is a pilot where EVs are used in CBOs, in this case, primarily to provide rides to lower income residents and seniors, and to provide meals delivery. The

reviewer found that the project supports all goals above, and its success will likely be replicated throughout the U.S.

Reviewer 2:

The reviewer commented that the project aligns well with the TI goals related to deployment, fuel sources, and resilience.

Reviewer 3:

The reviewer noted that this effort examines the viability of EVs for smaller nonprofits, specifically CBOs that do not have the capacity to analyze the TCO of installing charging and using EVs. The reviewer commented that, if successful, this would provide a model for small fleets that do not have a fleet manager to utilize EVs. The reviewer added that as community-based organizations (CBOs) work with local community members, the successful use of EVs could lead to further EV deployment through word-of-mouth, and in that case, the project could improve local fuel diversity and resiliency, as well as reduce GHG emissions due to the low emission profile of EVs.

Reviewer 4:

The reviewer stated that the project shows a new model for deploying EVs in high impact community services.

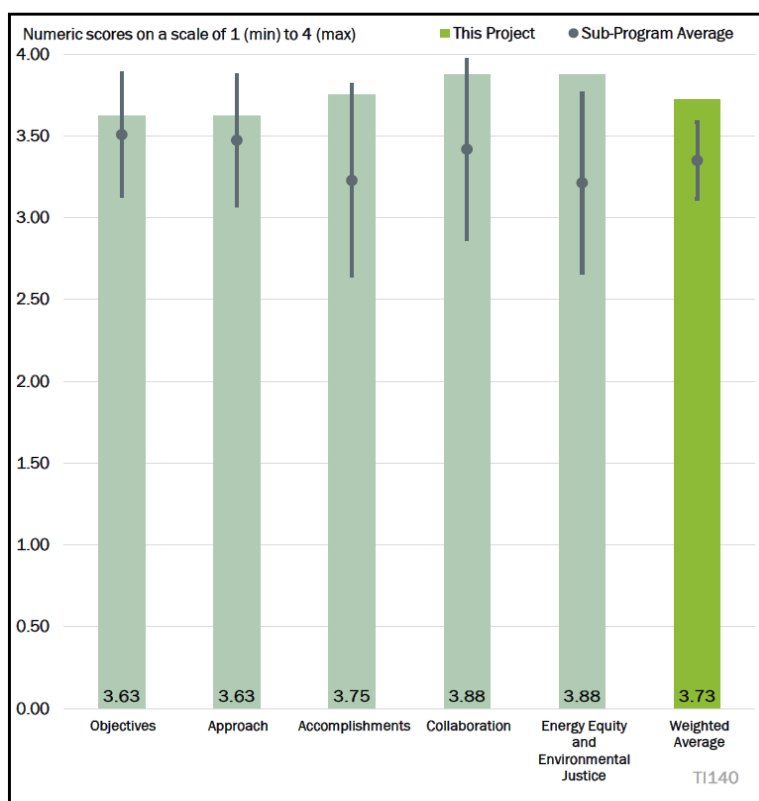


Figure 6-15 - Presentation Number: TI140 Presentation Title: St. Louis Vehicle Electrification Rides for Seniors (SiLVERS) Principal Investigator: Connor Herman (Forth Mobility)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer found that the project approach is solid, with additional steps over and above the “plan, install EVSE, procure, deploy, and report,” approach. The reviewer stated that the team had to consider requirements specific to the CBOs with regards to services provided (rides, meal delivery), that staff needed to be trained, CBOs were provided support, and the project included “implementation of public use of chargers.” The reviewer indicated that if this model proves financially sustainable after the project ends, social service agencies throughout the U.S., many of which are urban or rural DACs, will adopt this model to provide clean, efficient transportation in areas with air quality issues.

Reviewer 2:

The reviewer indicated that this project utilizes technology and the right partners to impact not only environmental challenges, but social challenges as well.

Reviewer 3:

The reviewer stated that the project consists of three major phases, phase 1 including initiation and launch, phase 2 collecting/analyzing data and refining the project, and phase 3 disseminating lessons learned locally and nationally. The reviewer added that a key part of the project approach was to procure the EVs and install the chargers for the two CBOs participating in the project and then train the staff to use them and noted that the project set aside CBO personnel time for both training and promotion to the community. The reviewer found it to be a good approach to make sure that training for the CBO workers and general technical assistance is a prominent part of the project and added that the project has a detailed plan for disseminating results to several Clean Cities coalitions directly (via hands-on technical assistance), as well as providing presentations of the results at both local and national venues. The reviewer suggested that a case study will be valuable to understand lessons learned.

Reviewer 4:

The reviewer commented that the project successfully demonstrated vehicles and is now sharing lessons learned.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer found that the accomplishments are impressive: five vehicles deployed at two CBOs focused on seniors; five charging stations installed, over 16,000 meals delivered, and over 1,600 rides given. The reviewer observed that data is being gathered, outreach conducted, a working group developed, and toolkit resources created, and the project team will use the remaining months to refine the model, produce a case study, and share the results.

Reviewer 2:

The reviewer stated that the project has impacts on EV adoption, service to the underserved, and provides a model to follow and complimented the team on its excellent work.

Reviewer 3:

The reviewer commented that the project had tremendous success in procuring the EVs and installing the chargers without significant delays, which was especially impressive due to the pandemic and resulting supply chain issues. The reviewer added that, as that is such a crucial part of the project, it allowed additional project tasks to be completed, and the project has already demonstrated vehicle utilization as well as charging data for

more than one year. The reviewer stated that this has put the project on a very good path to being completed and meeting its goals.

Reviewer 4:

The reviewer noted that the vehicles are getting good use and exposing more individuals to EV technology.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented that the project team consists of dedicated and enthusiastic community and industry partners and stated that, given the success of this project, it is likely that overall, there was a high level of collaboration. The reviewer observed that Forth Mobility and the team have taken care of the financial burden of insurances, and presumably also maintenance and repairs of EVs and EVSE, cost of electricity to fuel vehicles and any monthly charger network fees. The reviewer suggested that, if not already done, the project team sit down with the agencies using these vehicles and discuss if and how they plan to assume these expenses after the project end date.

Reviewer 2:

The reviewer found the partnership structure to be excellent, including service organizations and a Clean Cities coalition.

Reviewer 3:

The reviewer observed that the project demonstrated significant coordination with project partners in its ability to quickly obtain the EVs, install the chargers, and work with the two CBOs to initiate the project. The reviewer noted that the presentation highlighted the project team is in frequent communication about the status of the project and is trying to engage the team to get feedback on how to improve the project as it proceeds.

Reviewer 4:

The reviewer noted that team members included CBOs, a utility, infrastructure, and vehicle providers, all working together to deliver a successful project.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that this project's focus is on CBOs, the pilot is operating for the benefit of the population aged 65–74 years old, and the vehicles are serving those in need in an urban community and added that the presenter provided details of demographics in Slide 9.

Reviewer 2:

The reviewer observed that the heart of this project serves an underrepresented group while raising the profile in a metropolitan area that will further benefit underserved populations through the various project benefits.

Reviewer 3:

The reviewer commented that, of the two CBOs participating in the project, one is in a location with a significant percentage of the clientele population being low income and/or a minority, while the other is not in an underserved community, but both are supporting elderly populations. In addition to the direct impact on the communities that the project is involved with, the reviewer stated that the overall lessons learned from the project could lead to other nonprofit groups supporting DACs implementing EVs. The use of EVs offers zero tailpipe emissions in the communities where the vehicles are driven. The reviewer stated that the goal of the project is to demonstrate whether these vehicles are cost-effective and meet the operational requirements of

these organizations, and while data was not presented, it was suggested the EVs will have a lower TCO. The reviewer expressed concern that the current upfront costs of EVs will be a challenge for CBOs in the future.

Reviewer 4:

The reviewer noted that the project provides direct services to seniors in need and demonstrated the cleanest transportation technologies in historically DACs.

Presentation Number: TI141
Presentation Title: Integrated Fuel Cell Electric Powertrain Demonstration
Principal Investigator: Patrick Kaufman (Cummins)

Presenter

Patrick Kaufman, Cummins

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the deployment of hydrogen (H₂) fuel cell trucks and buses is clearly one of the options for reducing GHG in this sector, if the H₂ is renewable, and added that the focus on reducing the TCO of fuel cell powertrains is good. The reviewer commented that the project focus on modular systems to increase component commonality is valid, but is not unique or original, and suggested showing a comparison to other options of net-zero carbon fuel-powertrains.

Reviewer 2:

The reviewer noted that the objective is to develop and demonstrate a modular and scalable integrated fuel cell electric powertrain for use in HD trucks and buses. The reviewer added that the expected outcome of the project is a market-ready fuel cell electric powertrain whose operational performance and TCO will support near-term, rapid, and substantial penetration of the truck and bus markets. The reviewer stated that if the project is successful, it will help reduce costs of hydrogen fuel cell commercial vehicles. The reviewer added that DOE funding will bring to market a unique and cost-competitive zero-emission powertrain solution that can be scaled to other HD vehicle markets like marine and industrial applications; these are sound obtainable objectives.

Reviewer 3:

The reviewer observed that the project is focused on developing a modular, market ready H₂ fuel cell drive train for use in HD vehicles (trucks and buses). The reviewer commented that this is the key market sector for fuel cells for transportation to add another zero-emission option, the expectation being that the drivetrain can also be scaled to other applications (marine, industrial, etc.). The reviewer noted that, with the bus OEM pulling out, it has reduced the scope of the project, but the project will still be important for the truck market.

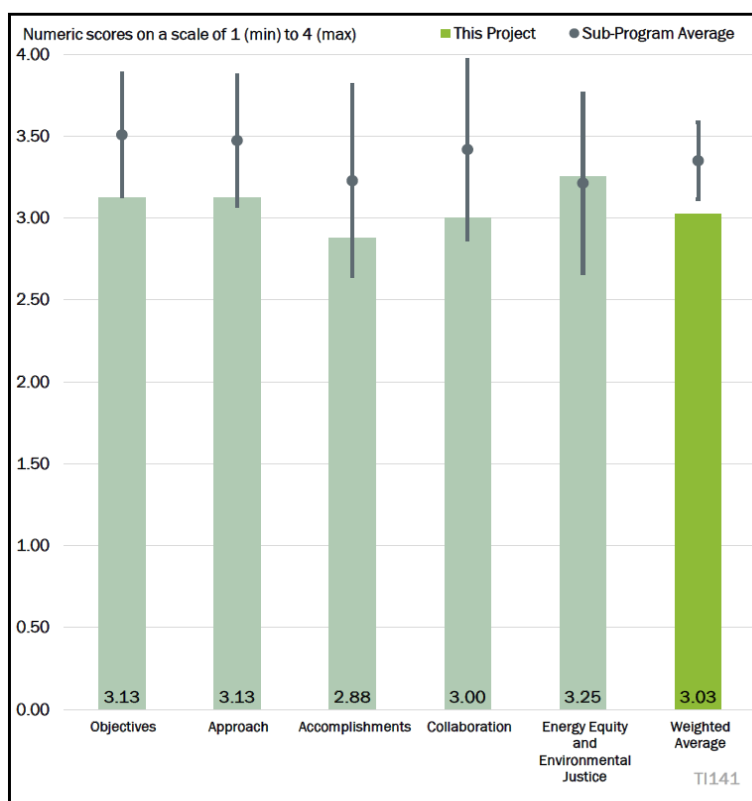


Figure 6-16 - Presentation Number: TI141 Presentation Title: Integrated Fuel Cell Electric Powertrain Demonstration Principal Investigator: Patrick Kaufman (Cummins)

Reviewer 4:

The reviewer expressed the view that this is exactly the type of project DOE should be funding to help accelerate the development and deployment of new technologies that involve significant risk but provide large benefits if successful. The reviewer added that the project satisfies all the above criteria related to fuel diversity, etc.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that, in general, it is not shown that this project will greatly improve the market viability of fuel cell trucks and buses beyond what has been learned in many previous similar demonstrations and incentivized applications. The reviewer added that the project is in early phases and may have more information in the future, but the bus partner dropping out is a negative and the quantitative TCO analysis was not shown. The reviewer stated that the project needs comparison to a baseline and prior work to show how this project will “move the needle.” The reviewer added that there is not much/any attention to the H₂ fuel supply and questioned whether the H₂ infrastructure in the area has already been built and whether green H₂ is being used.

Reviewer 2:

The reviewer summarized that the approach is sound and has three phases for integrated fuel cell powertrain design/assembly, vehicle testing and technology commercialization. Phase 1, design of a modular and scalable integrated fuel cell electric powertrain by leveraging existing fuel cell powertrains. Phase 2, vehicle testing, demonstration and evaluation of the prototype vehicles will be tested for performance, safety, durability, and reliability in operation closely simulating the drive cycles typically taken by the end-user fleets, delivered to the end-user fleets, and operated in real-world conditions covering both hot and cold climate. Phase 3, technology commercialization public outreach activities will help establish strong relationships throughout the hydrogen ecosystem to support future commercialization efforts. The reviewer noted that an actionable technology deployment plan will be laid out to complete the introduction to market of the integrated fuel cell electric powertrain, achieve high production volumes at reduced costs, and identify a viable pathway for commercialization to achieve near term, rapid, and substantial penetration of the truck and bus market.

Reviewer 3:

The reviewer stated that the project approach is well-designed to achieve the overall goals of the project and includes specific performance metrics. The reviewer noted that the original approach focused on design, testing, and then commercialization (outreach/deployment/work with OEMs), but the team is proposing to move up commercialization from phase 3 to phases 1 and 2.

Reviewer 4:

The reviewer commented on the sound project approach with well thought out plan.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that the project appears to still be in early phases; definition of architecture is shown, but quantitative analysis results are lacking. The reviewer commented that an unfortunate situation exists with the bus partner.

Reviewer 2:

The reviewer observed that project accomplishments and progress include applied technology improvements with sub-systems/modules wherein improvements are being realized are as follows: next-generation higher

power fuel cell engine, new high-power battery packs better suited to fuel-cell applications, eAxle traction system for Class 8 application and direct drive traction improvement for transit bus application, and a 700bar H₂ storage system with more H₂ capacity for Class 8 applications. The reviewer noted that on the fuel cell truck the team worked with Navistar on an amendment to the Navistar agreement to clarify roles and responsibilities, partially based on the improvements listed above. On the fuel cell bus, the OEM has agreed in principle to partner with Cummins on this project. Both a memorandum of understanding and contract are in continued negotiations. The reviewer stated that OEM and fleet requirements were reviewed and finalized; they received 60% of vehicle information, including computer aided design models of stock bus; detailed architecture is frozen; major components were confirmed based on the simulation results to meet OEM preferred duty cycle (fleet requirements); 10% of component layout work is completed; and concept bill of materials defined. The reviewer noted that the project team engaged fleet partners to gather the voice of customers and better understand their requirements.

Reviewer 3:

The reviewer stated that the team seems to be completing most of its milestones as planned, though some have moved out in time, balanced against commercialization elements that have been moved up to earlier in the timeline. The reviewer added that the project team has also decided to adopt some newer technologies (next-gen fuel cell and e-axle) than originally planned, though this has called for some delay in specific design and testing deadlines; this was done to make sure that the latest and best technologies are incorporated. The reviewer commented that Cummins has looked carefully at the cost impacts of the newer technologies and does not expect any significant overall changes, with improved performance. Further, the fuel cell bus OEM dropped out in December 2022 so Cummins has asked to cut the bus portion of the project due to difficulties in finding a replacement OEM; this would cut the project in half. The reviewer noted that Cummins expects that the technology developed will be adoptable for buses.

Reviewer 4:

The reviewer commented that the truck project is on track and appears to be going well, but the bus project has been cancelled, resulting in a somewhat lower ranking here.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that the overall team looks solid and comprehensive, and the expectation is that Cummins will lead the effort to good results. The reviewer noted that the fuel supplier does not seem to be identified.

Reviewer 2:

The reviewer commented that a very strong team is assembled, and coordination is very good. The reviewer further summarized the project collaboration: Cummins Electrified Power NA Inc. (Cummins) is the recipient and will provide overall project management, task coordination, and administrative functions for the project. Cummins will also manage all the technical tasks, working with Navistar to design the integrated fuel cell electric powertrain. Cummins will build, commission, and test the prototype fuel cell vehicle, providing service and support during the field demonstration Werner Enterprises. CALSTART, with Cummins' guidance, will manage data collection and analysis, develop the product development and manufacturing plan, and the technology commercialization pathway. Long Beach Clean Cities will hold community outreach events. SoCalGas will provide additional funding to the project, and additional funding partners are being sought. Each of the partners listed will participate in regular project meetings and reviews and provide feedback to the Project Team on policies and legislation driving the hydrogen economy and the commercialization of fuel cell and hydrogen technologies.

Reviewer 3:

The reviewer stated that the project has an impressive team put together with representatives from key sectors and noted that the principal investigator has been working closely with the truck manufacturer to find out more about its specific technical needs. The bus manufacturer pulled out completely, resulting in a request to cut the bus portion of the project. The reviewer noted that, given the bus manufacturer pulling out, the regional bus operator and Clean Fuels Ohio will no longer be on the team and summarized by stating that the team has collaborated well on the truck side, but the bus side of the project did not go well.

Reviewer 4:

The reviewer noted that collaboration between Cummins and Navistar appears to have resulted in improvements and positive changes to development of the fuel cell system. The reviewer added that the project rating would have been higher if the bus project were still on track.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that, if successful, the improved viability of this zero-tailpipe-emission system will benefit everyone and noted that the restoration of a bus OEM and success in the bus transit area may have higher value to low-income communities.

Reviewer 2:

The reviewer observed that contributions to EEEJ include an estimated 38,900 gallons of diesel fuel that will be displaced annually. Each fuel cell transit bus will reduce 13,900 gallons, and each Class 8 truck will reduce 25,000 gallons. The reviewer stated that the vehicles will be operating in disadvantaged areas.

Reviewer 3:

The reviewer commented that the technology would result in significant fossil fuel and emission reductions; however, no specific mention was made on benefits to DACs.

Reviewer 4:

The reviewer stated that the benefits of projects like this will be realized at a later time when the vehicles and systems are deployed, so “Good” is probably the best rating the project could achieve now.

Presentation Number: TI142**Presentation Title: Field****Demonstration of a Near-Zero, Tier 5 Compliant, Natural Gas Hybrid Line-Haul Locomotive****Principal Investigator: Ted Barnes and Bart Sowa (Gas Technology Institute)****Presenter**

Ted Barnes, Gas Technology Institute

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented that the project can make a strong contribution to decarbonizing rail through deployment of renewable natural gas (RNG), augmented by a hybrid system to improve efficiency and extend the supply of renewable fuel. The reviewer observed that it appears to require no major infrastructure change and stated that the determination of hybrid benefits will be an excellent technical contribution.

Reviewer 2:

The reviewer stated that this project supports the TI objectives. The reviewer also stated that, if the final efficiency were only 20%, a reduced rating would be warranted, but a 40% efficiency gain is a substantial improvement.

Reviewer 3:

The reviewer noted that the project is aimed at reducing emissions and improving fuel diversity for a sector characterized by high emissions (GHGs and criteria pollutants) and conventional fuel use, and thus, this ties very well to VTO objectives.

Reviewer 4:

The reviewer stated that locomotives, while an efficient means of moving goods, produce large emissions and consume a significant amount of fuel, and demonstrating the ability to deploy a more efficient system powered by alternative fuel supports TI's overall objectives identified above.

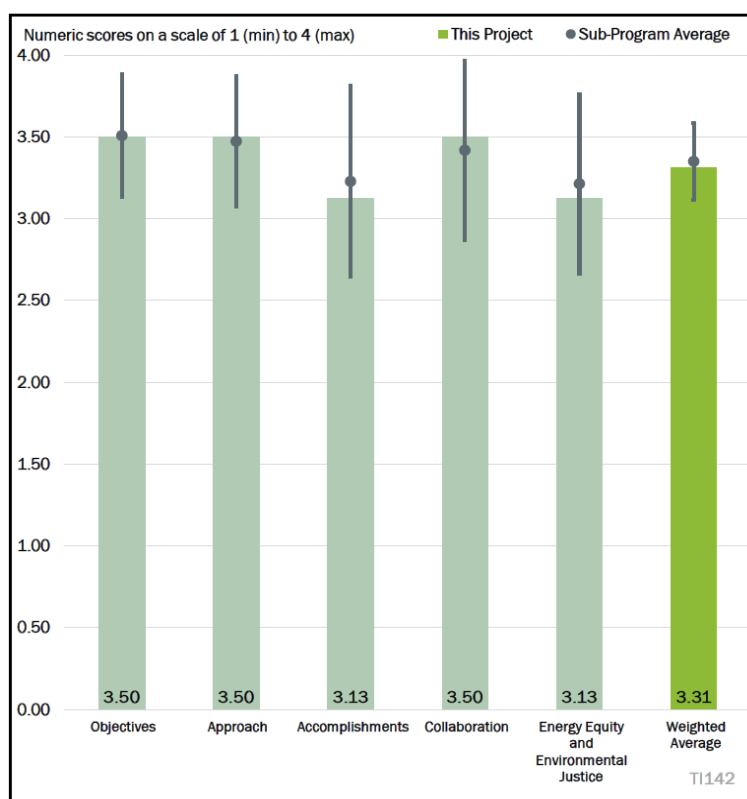


Figure 6-17 - Presentation Number: TI142 Presentation Title: Field Demonstration of a Near-Zero, Tier 5 Compliant, Natural Gas Hybrid Line-Haul Locomotive Principal Investigator: Ted Barnes and Bart Sowa (Gas Technology Institute)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that an excellent team has been assembled and the approach of retrofitting an existing locomotive is constructive for GHG reduction and cost effectiveness. The reviewer requested information on restrictions on moving compressed gases and Li-ion batteries through railroad tunnels.

Reviewer 2:

The reviewer indicated that the technologies chosen appear to be well suited to the task, but suggested that some up-front analysis could have been done to understand a baseline duty cycle and performance so that the hybrid system could be engineered in a smarter way, rather than waiting solely on final test result.

Reviewer 3:

The reviewer stated that the approach has been laid out in a logical manner, with clear elements for each BP and found it particularly beneficial that the team is looking at the potential for retrofitting existing locomotives, which stay in operation for a very long time. The reviewer added that the re-power market is large, with over 5000 of the models of locomotive being used in operation. The reviewer noted that safety reviews are also built into the approach.

Reviewer 4:

The reviewer commented that using existing systems and a module approach is outstanding because others could easily implement this concept.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that the team acknowledged some COVID delays but has made good progress on overall design and sourcing of key components.

Reviewer 2:

The reviewer stated that, even though the project endured delays due to COVID, it appears they are making up ground and may finish close to the original plan.

Reviewer 3:

The reviewer commented that all BP 1 milestones were completed, though there were some schedule impacts due to COVID, and the team received a no-cost extension for BP 1. The reviewer noted that, for BP 2, they have started all activities and believe they are on schedule to build by the end of the year so testing can be done in 2024.

Reviewer 4:

The reviewer observed that the project has been delayed due to COVID related issues and this has impacted accomplishments to date.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented that team roles are complementary and on path.

Reviewer 2:

The reviewer noted that collaboration and coordination appear successful due to the current status of the project.

Reviewer 3:

The reviewer observed that the project team includes participants from several of the key sectors to achieve project goals; in particular, testing will be conducted at the Federal Railroad Administration’s test facility, and the team is in conversation with rail operators to put the locomotive into operation. The reviewer noted that the team is working with gas utilities, including a collaborative of 20 gas utilities, that are cost-sharing some of the activities. The reviewer added that the team has been actively working with its industry members and participating with rail industry events and has plans to do more in the future, and they have also been interacting with regulatory agencies.

Reviewer 4:

The reviewer stated that most of the collaboration so far has been on the engineering side, and no problems have been indicated, and added that it will be important to see the degree of collaboration and coordination when production starts.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that the project is on path to benefit everyone; a good point is made that low-income communities are sometimes near rail yards that will get emission reduction with this technology, although rail traffic travels through almost all categories/demographic areas.

Reviewer 2:

The reviewer noted that air quality improvements with this technology are obvious, but suggested adding partners that would help monitor and judge the effort to ensure the technology is offered to railyards, so that it can positively impact the health of the surrounding population.

Reviewer 3:

The reviewer stated that the expectation by the project team is that the technology under development will ultimately provide significant energy and environmental benefits in overburdened communities, as rail operations tend to be centered in these communities and noted that the near-term impacts may be small from a single locomotive, but the ultimate impacts could be large.

Reviewer 4:

The reviewer commented that the benefits will come later, and if this project is successful, it could have a major very positive impact on affected communities in urban areas due to the high emissions trains operating in those areas normally produce, which add to the already high industrial emissions often found in urban areas.

Presentation Number: TI143
Presentation Title: Medium-Duty Electric Truck (Etruck): Pilot Electrified Fleets in Urban and Regional Applications
Principal Investigator: Junmin Wang (University of Texas-Austin)

Presenter

Junmin Wang, University of Texas-Austin

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer found the project plan and purpose to be well suited to the TI goals but questioned the rationale for choosing two geographic locations instead of one, which might have made the project more efficient in spending and activity.

Reviewer 2:

The reviewer stated that the objective of this project is to provide fleets in Texas and Tennessee with the opportunity to demonstrate medium duty electric trucks in urban and regional delivery applications and noted that by providing a significant number of fleets the opportunity to demonstrate these vehicles, they are increasing the likelihood that these fleets will purchase EVs in the future. The reviewer commented that, if successful, this could improve local fuel diversity and resiliency through the use of EVs. The reviewer added that EVs can have significant GHG emissions benefits, but the quantity of those benefits depends on the grid mix serving these vehicles.

Reviewer 3:

The reviewer noted that the project is focused on MD EV trucks, an area with relatively little data to date, and the project team will be deploying them in urban and regional fleet applications and collecting data. The reviewer observed that the vehicles targeted for replacement often operate in high emission areas and have duty cycles that can match well with EV truck capabilities.

Reviewer 4:

The reviewer found the project had solid objectives to deploy and demonstrate multiple vehicles and share lessons learned.

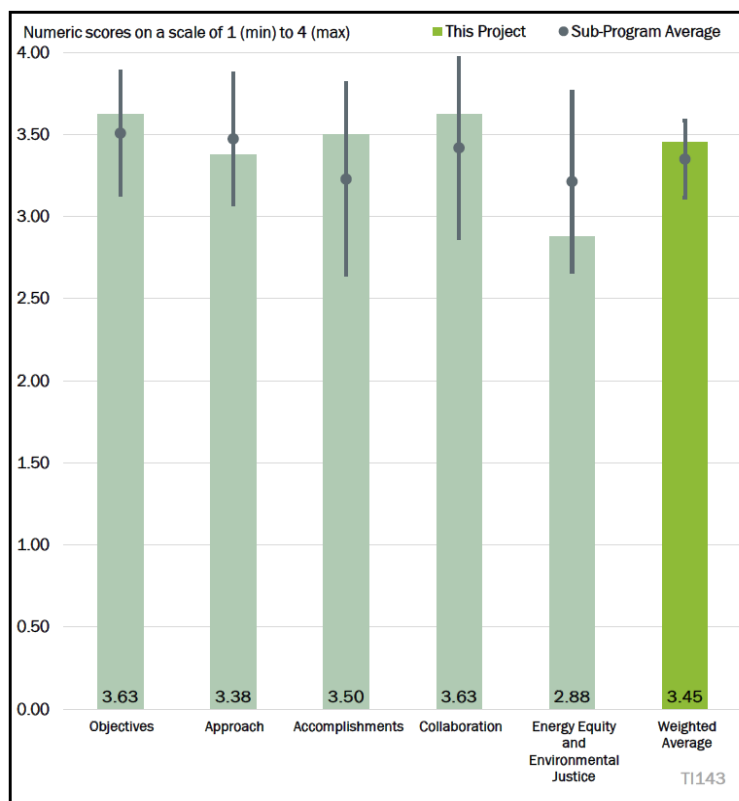


Figure 6-18 - Presentation Number: TI143 Presentation Title: Medium-Duty Electric Truck (Etruck): Pilot Electrified Fleets in Urban and Regional Applications Principal Investigator: Junmin Wang (University of Texas-Austin)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer stated that the approach described should lead to success but suggested that an understanding and discussion of exactly what data analysis reports are expected would be beneficial.

Reviewer 2:

The reviewer commented that the project has the goal of providing electric trucks to 40 fleets to demonstrate and found that the project has a robust data collection plan to analyze the usage of the vehicles in the various fleet duty cycles. The project will utilize this data to help develop simulation models for electric truck usage. The reviewer noted that each fleet in the project will be given a pre- and post-study survey, with versions for both the driver and fleet manager, and the survey will help understand the positives and negatives for both operation and management of these vehicles. In addition, the project will collect data to support which duty cycles work well with these vehicle types. The reviewer observed that the project has a number of outreach and education events to discuss the project; however, it is unclear what the final output of the study will be. The reviewer noted that the presenter mentioned information exchange and outreach activities, but strongly recommended the project team look to develop a final summary report and presentation that details all the information from the study. The reviewer added that case studies from fleets where things did not work and did work would be valuable to demonstrate the lessons learned from this project.

Reviewer 3:

The reviewer found that the project has a clear approach, with three trucks spread over two sites for demonstration; overall, the project team is looking at demonstrating the vehicles in 40 fleets. The reviewer noted that all BPs include specific elements focused on information exchange, outreach, and education, and the project includes post-use surveys. The reviewer commented that there are no plans to collect data on the baseline diesel vehicles but suggested that might be a useful addition at some point, if possible, under the budget and if fleets agree.

Reviewer 4:

The reviewer commented that the use of a driver survey and interviews in addition to telematics data collection will lead to a rich dataset.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer stated that the project appears to have been successful to date but did not recall hearing about the progress of charging station installations.

Reviewer 2:

The reviewer observed that the project was able to get the first two trucks in operation in 2020 and 2021 and found that to be very commendable considering the supply chain issues for EVs; in addition, the project was able to obtain the third truck in 2023. The reviewer noted that the project has already had six fleets demonstrate the vehicles, with a goal of a total of 40 demonstrations by the end of the project, each of the fleets had a Level 2 charger installed, and the project made a major effort to set up its telematics/data logger systems to be able to collect very detailed data from each vehicle in real time. The reviewer noted that the project has already used that data to develop a simulation-based vehicle model for these medium duty electric trucks and the project has developed a pre- and post-study survey to evaluate each fleet's awareness/acceptance of electric trucks. The reviewer added that the project has already participated in several outreach and education events in both Tennessee and Texas.

Reviewer 3:

The reviewer noted that the team received its trucks in BP 1, calling that a major accomplishment, and the trucks are up and running and have been moving through the demonstration fleets. The reviewer commented that they appear to have started all their BP 2 milestones. The reviewer observed that they did have to change the manufacturer for one of the trucks—the one for Tennessee, but all data acquisition systems have been set up, fleet recruitment is on-going, and the team has established a specific process for agreements with the fleets. The reviewer commended the team on having done an impressive amount of education and outreach, as well.

Reviewer 4:

The reviewer observed that, despite supply chain delays, the team has put vehicles from multiple manufacturers in service, initiated data collection, and made multiple presentations and publications.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that collaboration and communication to participants and external stakeholders about the project seems to be well planned. The reviewer was unsure of the extent of collaboration for the chargers, as very little was discussed on this topic.

Reviewer 2:

The reviewer noted that the project has managed to recruit a significant number of fleets to participate in both Texas and Tennessee, the team was able to obtain EVs at a time where their supply was very limited, and they have worked on a data collection plan to outfit these vehicles with data loggers and wirelessly collect the information. The reviewer commented that there were not a lot of additional details in the presentation on how the project team collaborates and coordinates, so it is difficult to rate the project on this question, but added that, with the significant accomplishments the project has shown already, it seems the project team is doing a good job.

Reviewer 3:

The reviewer commented that the project has an impressive roster of partners, including state, regional, and national organizations, and Texas and Tennessee trucking associations, to get the word out on the project's results. The reviewer stated that the project team appears to have been working together closely to ensure achievement of project goals and maximum impact through fleet involvement and outreach.

Reviewer 4:

The reviewer observed that multiple partners across Texas and Tennessee include universities, national laboratories, Clean Cities coalitions, vehicle providers, and fleets, and commended the team on strong outreach and engagement at regional events.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that there was some discussion about the impacts, but no actual plans or partners appear scheduled.

Reviewer 2:

The reviewer noted that the project goal is to provide a wide range of fleets, many financially constrained or relatively small, with the ability to demonstrate EVs and, while not directly relating to EEEJ, if the project is successful in increasing the deployment of MD EVs, there would be beneficial impacts to the communities in

which they operate. The reviewer commented that, from the presentation, it was not clear how many of the fleets were operating in DACs.

Reviewer 3:

The reviewer found that the project team has specifically considered the benefits for DACs as well as how to minimize the impact on sensitive areas/neighborhoods, and they have focused much of their outreach on both small business fleets and government decision-makers.

Reviewer 4:

The reviewer stated that providing electric truck opportunities to small or financially constrained trucking fleets will help amplify the general benefits that EVs bring to pollution burdened communities.

Presentation Number: TI144
Presentation Title: Creating the NFPA Distributed Energy Resources Safety Training (DERST) Program
Principal Investigator: Andrew Klock (National Fire Protection Association)

Presenter

Andrew Klock, National Fire Protection Association

Reviewer Sample Size

A total of three reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented on the unique focus to improve training practices for first responders and increase the reach of trainings.

Reviewer 2:

The reviewer stated that this project is important and should be required to be provided to communities when any type of distributed energy resources (DER) project gets built. The reviewer found that it definitely increases local resiliency but does not achieve the other objectives.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer found that the approach proceeds logically, starting with collection and testing data, analyzing findings, and then updating trainings based on these findings. The reviewer stated that this approach also combines trainings on different distributed energy resources (DER) technologies that were treated separately.

Reviewer 2:

The reviewer commented that vehicle to grid (V2G) technology is growing quickly, and it is important that emergency responders know what they are looking at when they see a vehicle battery being used as a grid asset. The reviewer added that in-person demonstrations are so important, too.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer really appreciated the gamification approach.

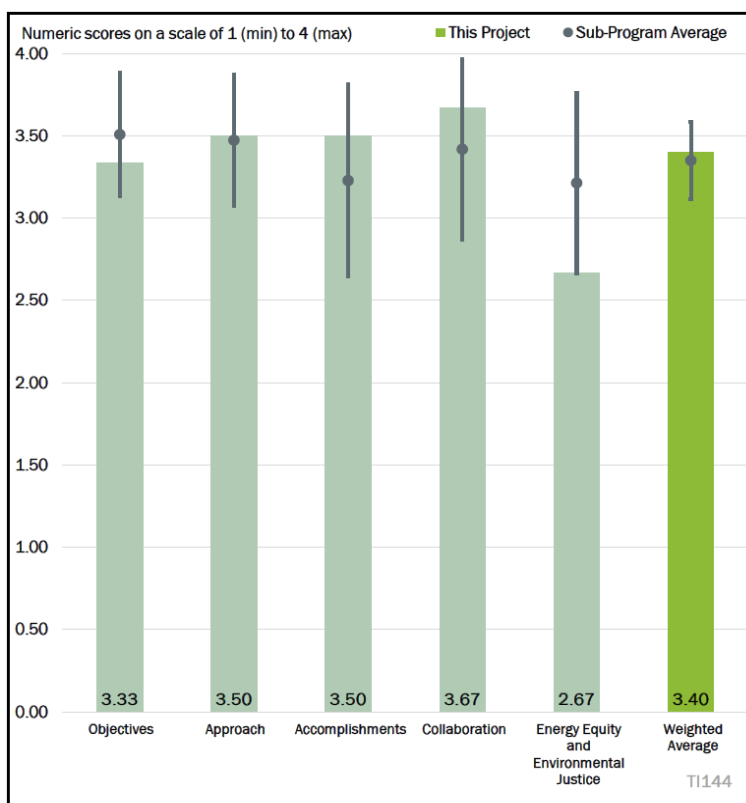


Figure 6-19 - Presentation Number: TI144 Presentation Title: Creating the NFPA Distributed Energy Resources Safety Training (DERST) Program Principal Investigator: Andrew Klock (National Fire Protection Association)

Reviewer 2:

The reviewer found that the project has achieved its early objectives, and contractors appear capable of building the simulation that is a key deliverable for later BPs.

Reviewer 3:

The reviewer stated that this project has achieved all of its goals to date.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer found the biweekly meetings between project team partners to be effective, and noted good collaboration between NFPA, the university and the national laboratories.

Reviewer 2:

The reviewer observed that this project brought together many different project partners that had to work together to make it successful.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted the training design to minimize barriers to access but suggested that the project do more to focus on the specific needs of historically underserved communities and fire departments in both content and marketing.

Reviewer 2:

The reviewer commented that training is needed in all communities, although DERs tend to be deployed more in wealthier communities. The reviewer stated that NFPA has a strategy to make sure materials are available across communities.

Reviewer 3:

The reviewer stated that targeted outreach to overburdened communities is something to consider moving forward.

Presentation Number: TI145
Presentation Title: Electric Vehicle Market Stimulation in Divested Economies
Principal Investigator: Miriam Bouallegue (Metropolitan Energy Center)

Presenter

Miriam Bouallegue, Metropolitan Energy Center

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer found that the project clearly achieves TI goals by increasing local fuel diversification and increasing affordability for consumers.

Reviewer 2:

The reviewer noted that the project team very clearly stated their relevance to the TI programmatic objectives, but they provided the project objectives at a higher level.

Reviewer 3:

The reviewer commented that this project is a “leading by example” project by employing EVs and EVSE in municipal settings.

Reviewer 4:

The reviewer stated that this is an ambitious opportunity to engage the community and provide exposure to EVs and commercial EVSE infrastructure, and, if successful, it will deploy HD EVs and charging infrastructure in DACs improving fuel diversity, increasing resiliency, and reducing GHGs. The reviewer questioned whether the project goals are attainable and how the team plans to find commercial entities that can meet cost-match requirements. The reviewer further questioned how the project will meet the objective of paying special attention to multifamily residents.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commended the project's focus on community engagement to ensure that this technology is implemented in a way that is responsive to the input of DACs.

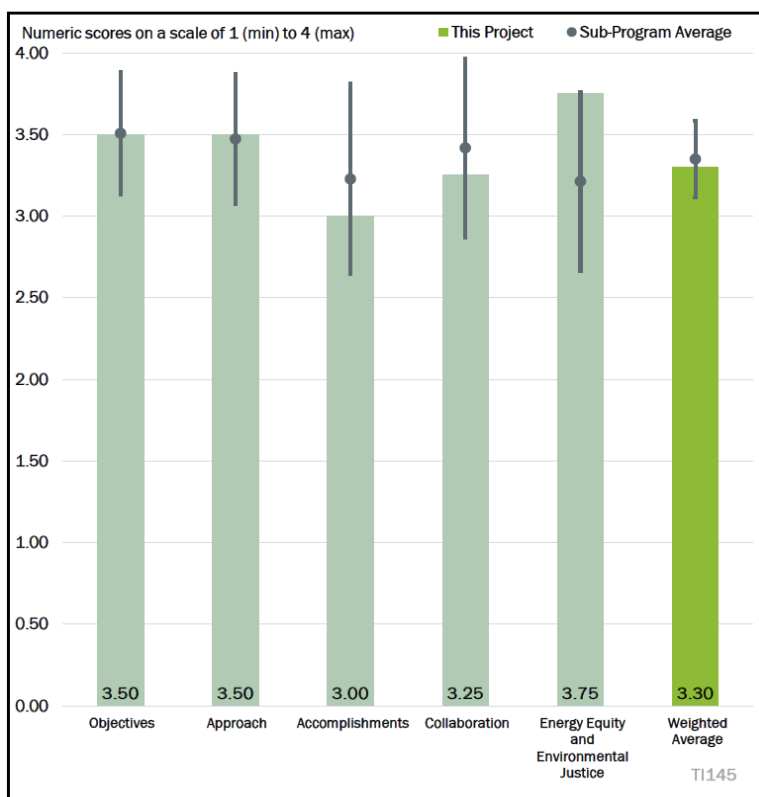


Figure 6-20 - Presentation Number: TI145 Presentation Title: Electric Vehicle Market Stimulation in Divested Economies Principal Investigator: Miriam Bouallegue (Metropolitan Energy Center)

Reviewer 2:

The reviewer stated that the project approach was described and includes a number of logical steps for each BP, but suggested the project team may need to consider how they would pivot their approach if supply chain issues persist and technology availability is limited. The reviewer added that the project team may also want to consider how to more specifically explore adjacent economic development opportunities and business models that might work in rural settings.

Reviewer 3:

The reviewer commented that getting EV terminal tractors in use is impressive.

Reviewer 4:

The reviewer observed that this project uses a two-pronged approach to meet the objectives that will involve dedicated project management and coordination. The reviewer commended the team on the dedicated community engagement plan early in the process to ensure EV charging stations are placed in the right locations for DACs and noted that a strategic plan for other cities will also expand the impact of this project. The reviewer stressed the importance of a cost share that will be feasible for local entities.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer found the amount of project funds spent thus far to be somewhat concerning, along with very few milestones achieved at this point but added that community engagement is rightfully a slow process and that can be a contributor to the limited progress so far.

Reviewer 2:

The reviewer stated that the project, like many projects, is experiencing supply chain delays and constraints in market availability of EVs and EVSE infrastructure. The reviewer noted that one of the CBOs has been identified and the other one is still in progress, and the EVSE contractors have been selected for more than a quarter of the planned sub recipient projects. The reviewer found that the project team provided some context and background on the progress of the milestones, describing the community engagement and outreach methods and events. The project team has held six events so far. The reviewer noted that they have been trying to deploy HD vehicles from manufacturers that have not had supply chain issues, including deployment of three EV terminal tractors.

Reviewer 3:

The reviewer noted that they have identified EJ communities that need a reduction of emissions and found this to be a positive step.

Reviewer 4:

The reviewer observed that only 2% of the budget has been spent so far. The reviewer appreciated that the community engagement process has been a priority, as it is important to include this in the early planning stages but noted that three vehicles have been purchased so far, and site selection for EVSE infrastructure has just begun. The reviewer questioned the feasibility of completing the project by the May 31, 2025, deadline.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer stated that the team has been successful with the standard players including municipalities, nonprofits, colleges, and industry but noted that a key missing group is local advocacy organizations and those representing DACs, and they should be part of the stakeholder set.

Reviewer 2:

The reviewer noted that the project team anticipates that the partner list will grow, and private sector organizations will provide cost share overmatch, and suggested that they consider engaging with local financial and economic development entities to determine how project efforts might also explore the connection with local wealth building from various aspects of the project.

Reviewer 3:

The reviewer commented that it looks like the team is getting things done.

Reviewer 4:

The reviewer noted that the project provided a list of partners and collaborations but suggested that more detail regarding their specific roles in the project would be helpful. The reviewer appreciated the inclusion of cities and underserved CBOs in the process.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that community engagement is a challenging but essential component for technology implementation and that this project relies heavily upon it. The reviewer found that there are clear air quality and EEEJ benefits of the project, though more limited direct benefits beyond that for DACs. The reviewer added that engagement ensures that the desires of DACs will be heard regarding potential benefits and avoidance of burdens from the project.

Reviewer 2:

The reviewer stated that the project team did outline a few energy and environmental justice benefit areas and there was some discussion of how they would track those benefits. The reviewer suggested that the project team consider how to more clearly track or explore how the project or similar efforts can build wealth in the communities where they are deployed.

Reviewer 3:

The reviewer commented that the involvement of the cities goes a long way to getting things moving in EJ communities.

Reviewer 4:

The reviewer appreciated the identification of underserved communities and engaging them in the process of deploying HD electric fleet vehicles and added that community collaboration in placing charging stations should contribute to EEEJ benefits. The reviewer found no estimate of the tangible impact, such as projected GHG and air pollutant reduction of these efforts, however, and suggested that quantifying these impacts will make the benefits clearer to reviewers as well as to the communities themselves.

Presentation Number: TI146

Presentation Title: Rural Reimagined: Building an EV Ecosystem and Green Economy for Transforming Lives in Economically Distressed Appalachia
Principal Investigator: Pinggen Chen (Tennessee Tech)

Presenter

Pinggen Chen, Tennessee Tech

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the objectives are clear and well-aligned with TI goals, particularly fuel diversity, economic growth, affordability, and resilience.

Reviewer 2:

The reviewer commented that this project can be a very positive example of how to deal with Rural America and EVs and found the hands-on approach to be a great idea and a way to help people understand what driving an EV is all about.

Reviewer 3:

The reviewer found that this project is doing an excellent job of meeting several TI objectives. It supports the objective of national security by increasing the diversity of transportation fuels available; the objective of economic growth by providing business opportunities and workforce training; and the objective of increasing affordability via the cost-savings associated with EV adoption.

Reviewer 4:

The reviewer stated that this project offers opportunities to address systemic issues related to EVs in Appalachia such as inequity, economic opportunity, and public perception. The reviewer added that it appears to provide EV operation and use data specific to rural communities that could be useful in similar applications across the country.

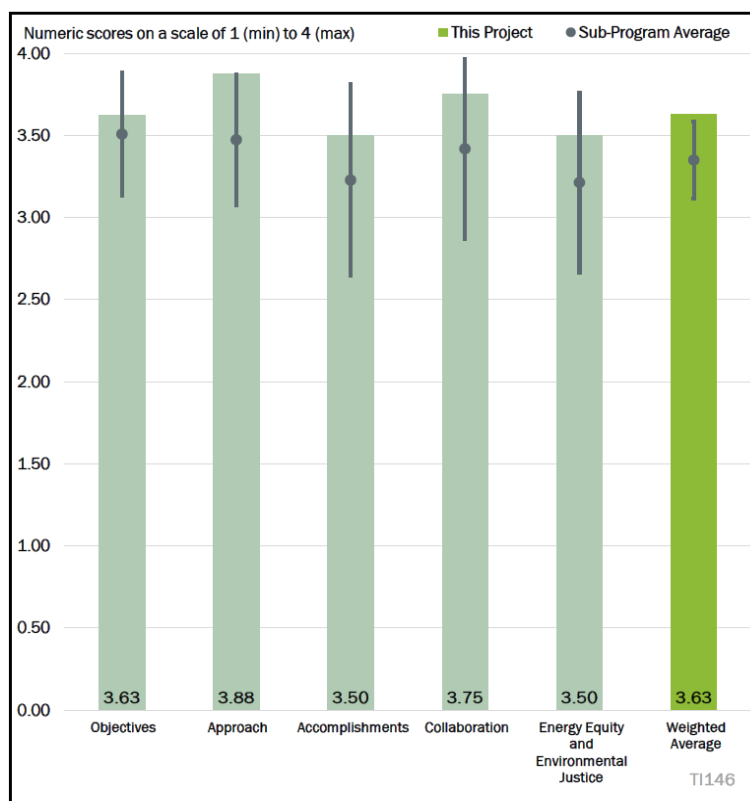


Figure 6-21 - Presentation Number: TI146 Presentation Title: Rural Reimagined: Building an EV Ecosystem and Green Economy for Transforming Lives in Economically Distressed Appalachia Principal Investigator: Pinggen Chen (Tennessee Tech)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer found the project approach to be wide-ranging and comprehensive, and if achieved, it would be an incredible undertaking. The reviewer's only concern was that the scope is immense and accomplishing it with the given budget will be quite ambitious.

Reviewer 2:

The reviewer stated that organizing BEV events in the region was a great idea because Rural America sometimes does not have the capacity to get the public involved.

Reviewer 3:

The reviewer commented that the approach touches many elements of EV adoption for both individual consumers and businesses and attempts to address many of the barriers that those groups encounter, including access to EV charging and awareness and exposure to EVs. The reviewer noted that the project endeavors to implement strategies to help rural communities lower the burden of EVSE investment by paying a portion of the installation costs. In addition, the project has established an EV infrastructure working group made up of a diverse group of partners.

Reviewer 4:

The reviewer stated that the approach of this project appears to be very broad and considers many of the possible concerns and expressed appreciation for the idea of a "comprehensive EV ecosystem and green economy" in an area that without this project would likely fall behind others in EV education and adoption. The reviewer commented that the focus on regional workforce development training is especially important. The reviewer expressed concern for the feasibility of the approach but stated that the list of collaborators and coordination of partners somewhat addresses these concerns. The reviewer added that the high level of research and partnerships discussed in the proposal makes its success more likely, and the regional approach involving five states spreads benefits over a large area. The reviewer commented on the realistic maintenance and installation forecast that was provided but questioned whether the project has an Operations and Maintenance plan for EV infrastructure, in an effort to reduce range anxiety.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer found that the project has already demonstrated tangible progress, specifically with the installation of hundreds of EV chargers, delivery of EVs, training of the local workforce, and by assembling the EV Infrastructure Working Group.

Reviewer 2:

The reviewer stated that the fact that this project was able to get BEVs in today's market is very impressive.

Reviewer 3:

The reviewer observed that, despite supply chain issues, the project team has deployed over 10 vehicles in a short period of time and has conducted an impressive number of engagement events already; on the charging infrastructure side, the project has made significant progress in identifying the appropriate technology and locations for their deployments. The reviewer noted that the workforce training group has been established to help ensure that these communities are able to not only have service and installation provided for vehicles/EVSE but that they are not left behind in the transition to EVs more broadly.

Reviewer 4:

The reviewer noted that, in less than a year, the project is 15% complete with over half of the EVs reserved and/or received. The reviewer added that the identification of EVSE sites provided by the EV infrastructure working group is an important step, and EV outreach, demonstrations, and information exchanges are ongoing to increase the public's interactions with EVs. The reviewer stated that this project is off to a good start and appears to have good momentum moving forward.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer found it to be very impressive that the project lists a huge group of leads and partners with great diversity in terms of geography, interest, and backgrounds.

Reviewer 2:

The reviewer commented on the very impressive team including a number of Clean Cities coalitions.

Reviewer 3:

The reviewer stated that the number of partners engaged in this project is wide-reaching in both geography and project scope. The reviewer added that this project touches the vehicle and charging side and will depend on a large group of stakeholders to be engaged throughout. Based on the accomplishments to date, the reviewer found the network and partnerships created in this project to be vast and seemingly quite invested in its success.

Reviewer 4:

The reviewer noted that the project provided good detail on partners and their involvement in the project organization chart and project accomplishments and added that established efforts such as the EV infrastructure working group and workforce training group are very important and point to high levels of collaboration and coordination.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that the project has great potential equity contributions on its face, and the team has done an excellent job of highlighting them in the presentation.

Reviewer 2:

The reviewer commented that the Appalachian Region Commission is certainly in need of help in the economic realm and this project addresses this on several fronts.

Reviewer 3:

The reviewer noted that the majority of funding is going to rural communities and transit agencies that serve them; the project is inherently serving underserved communities, but the project team is also providing funding to 34 organizations that represent underserved communities. The reviewer stated that the project is also prioritizing creating jobs in the clean energy sector, which is one that will be crucial in this part of the country that has historically served our fossil-fuel-powered society.

Reviewer 4:

The reviewer found that this project provides a comprehensive regional approach to increasing engagement with EVs at all levels, including public ownership, workforce development, and charging accessibility in

historically underserved areas. The reviewer appreciated that the project involves community outreach, education, and training and noted that project organizers have made efforts to engage communities at all levels of the project and aim to gather data to inform efforts in rural areas elsewhere.

Presentation Number: TI147

Presentation Title: Affordable Mobility Platform

Principal Investigator: Connor Herman (Forth Mobility)

Presenter

Connor Herman, Forth Mobility

Reviewer Sample Size

A total of three reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the project objectives are clearly defined and well aligned with the TI goals; specifically, the project will contribute to the TI goals of improving fuel diversity, increasing local resiliency, and reducing GHG emissions.

Reviewer 2:

The reviewer commented that this project has a unique and very relevant set of objectives which directly relate to the TI objectives of improving fuel diversity, increasing local resiliency, and reducing GHG emissions. The reviewer added that the project focuses on developing replicable models for deploying shared vehicles and car sharing technology which also benefit local community members.

Reviewer 3:

The reviewer noted that getting car share programs going in low-income communities is a big lift, and they seem to have a plan.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer indicated that a strength of this project is that it incorporates land-use in the implementation of transportation technology and incorporates clever and novel strategies for improving access to clean transportation.

Reviewer 2:

The reviewer stated that the project approach is very holistic, logical, and detailed, and describes the steps that would be needed to accomplish the project objectives. The reviewer added that the project team should definitely engage the U.S. Department of Housing and Urban Development (HUD) to determine how they

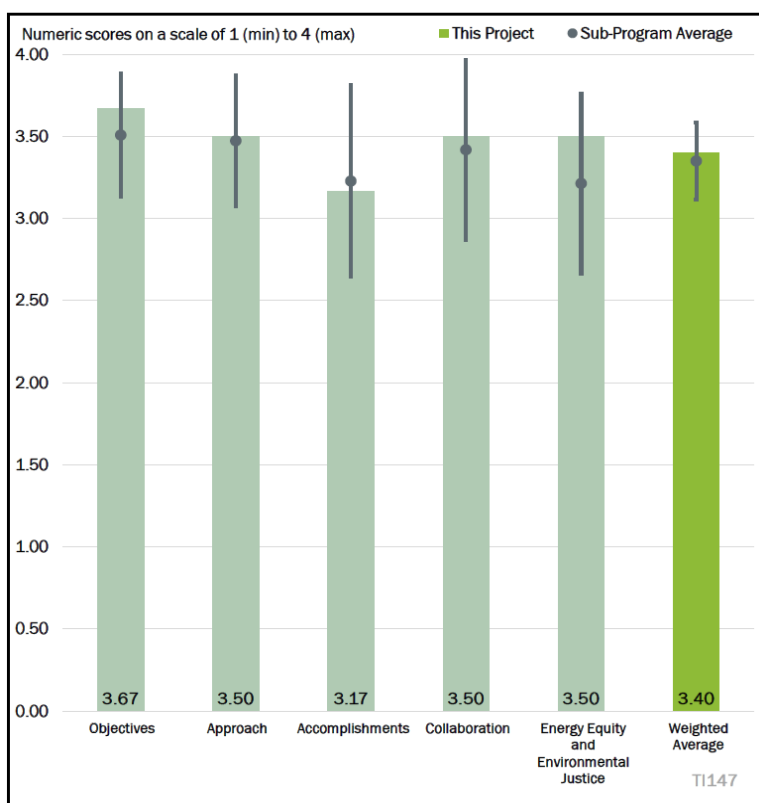


Figure 6-22 - Presentation Number: TI147 Presentation Title: Affordable Mobility Platform Principal Investigator: Connor Herman (Forth Mobility)

could leverage HUD efforts to support EV charging infrastructure and transportation needs at affordable housing sites.

Reviewer 3:

The reviewer noted that they seem to be a bit slow on the start and expressed hope that they can pick up the pace. The reviewer recommended that they get the housing authorities involved sooner rather than later.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer found that the presentation indicates good progress with some milestones complete and many in progress.

Reviewer 2:

The reviewer observed that many of the BP 1 milestones have either been completed or are estimated to be completed by July 2023, and this was the most active phase of the project.

Reviewer 3:

The reviewer stated that they need to identify locations for parking the vehicles because parking spaces in cities are at a premium and many folks do not want to give up spaces for dedicated EVs.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted very detailed information on collaboration and coordination with project partners and appreciated the table that describes the objectives of communication, the frequency, and the ownership.

Reviewer 2:

The reviewer observed that the project has a complex set of team members across 11 different locations and found that they described very structured and detailed points of collaboration, modes, and participation across various aspects of the project, e.g., budget, project management, etc. The reviewer suggested that the project team consider engaging public sector housing agencies (federal, state, and local) and local green banks to support their efforts.

Reviewer 3:

The reviewer observed that only one Clean Cities coalition is involved, but connections have been made in 11 cities so it would be important to reach out to any coalitions in those cities. The reviewer added that it looks like they will be working with coalitions yet to be identified.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer found that the project design is oriented around equity and does so in a novel way by coordinating transportation technology with land use. The reviewer added that the presentation comprehensively describes contributions to equity by outlining direct benefits to DACs.

Reviewer 2:

The reviewer stated that the project has outlined very clear energy and environmental justice benefit categories and suggested that the project team could consider also documenting how the car sharing models could help underserved communities build wealth.

Reviewer 3:

The reviewer observed that the project team is planning to reach out to housing authorities with certain income criteria and noted that it will be important to educate the managers of the identified housing complexes on the benefits of EVs.

Presentation Number: TI148
Presentation Title: Upper Midwest Inter-Tribal Electric Vehicle (EV) Charging Community Network
Principal Investigator: Robert Blake (Native Sun Community Power Development)

Presenter

Robert Blake, Native Sun Community Power Development

Reviewer Sample Size

A total of four reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer commented that this is a fantastic project that aligns with TI goals through improving fuel diversity, local resiliency, and reducing GHG emissions within a novel context in northern tribal communities.

Reviewer 2:

The reviewer stated that the project team is pursuing TI objectives of improving fuel diversity, increasing local resiliency, and reducing GHGs, by leveraging real world data and lessons learned from Tribal communities. The reviewer noted that they are also developing, demonstrating, and deploying a replicable program for expanding clean and sustainable electrified transportation to underserved communities through EVs and EVSE deployment, data analysis, education, and outreach. The reviewer observed that they are testing out different types of EVs and chargers on tribal lands and sites in cold and harsh winter conditions, a very exciting and relevant project with high replicability potential.

Reviewer 3:

The reviewer commented that the introduction of EVs and infrastructure will go a long way to improve fuel diversity based on the fact that gasoline is very expensive on the reservation and many residents do not have resources to maintain internal combustion engine (ICE) vehicles.

Reviewer 4:

The reviewer stated that this project is wide-reaching in both geographic and project scope, and it will support the TI objectives of improving fuel diversity and increasing local resiliency by building systems from within communities to prepare for EV adoption in the future. The reviewer added that the project will directly lead to increased alternative fuel use via the deployment of EVs and EV charging stations for organizations that serve

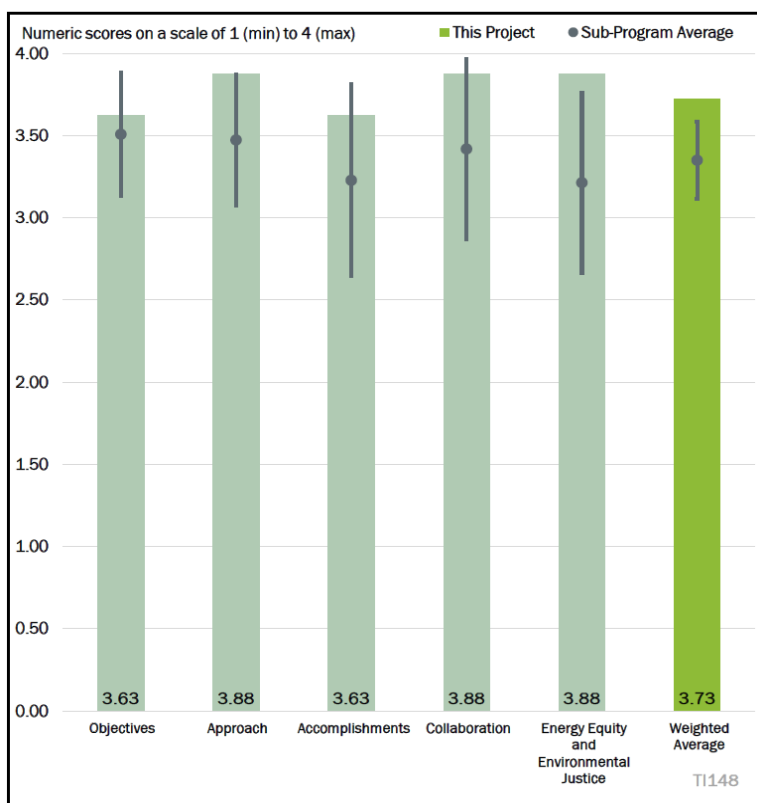


Figure 6-23 - Presentation Number: TI148 Presentation Title: Upper Midwest Inter-Tribal Electric Vehicle (EV) Charging Community Network Principal Investigator: Robert Blake (Native Sun Community Power Development)

the community and noted that it is also focused on providing solutions and reducing barriers to EVs that are suitable for remote cold-weather environments.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer stated that the project approach is wide-ranging and ambitious. The reviewer appreciated the fact that this project is demonstrating the viability of clean transportation technologies in two unique settings: cold climates, and Tribal communities.

Reviewer 2:

The reviewer observed that the project team seems to be on track to meet the BP 1 milestones; all their site locations have been determined, their fleets have confirmed participation in the transportation needs assessments, and more than 75% of the planned publicly available L2 EVSE on Red Lake and Standing Rock are expected to be installed and operational by the end of May 2023. The reviewer noted that the availability and scarcity of EVs, EVSE supply chain delays, and recent price increases pose challenges and barriers for project.

Reviewer 3:

The reviewer commented that the installation of DCFCs in critical locations will enable locals to go the long distances for services found on the reservation.

Reviewer 4:

The reviewer noted that this project relies on multiple partnerships that span the energy economy as well as those that will be most impactful to its success on the ground, and these partnerships will be pivotal for the project's success during the funded project period, while also creating opportunities for continued collaboration, learning, and development beyond the life of the grant. The reviewer stated that one of the project goals is to determine how much money can be saved by switching to EVs from combustion vehicles; also of note is that the project will be providing much-needed job training in these communities to ensure they are not left behind in this transition.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that the project is in its early stages with a few milestones completed and more expected in the near term.

Reviewer 2:

The reviewer observed that all of their site locations have been determined, their fleets have confirmed participation in the transportation needs assessments, and more than 75% of the planned publicly available L2 EVSE on Red Lake and Standing Rock are expected to be installed and operational by the end of May 2023.

Reviewer 3:

The reviewer stated that half of the BP 1 milestones have been completed and the rest are close. The reviewer commented that the fact that they have branded this project with a common logo has given this project a positive spin.

Reviewer 4:

The reviewer found that the project is on track to meet its deliverables and has made significant progress already in the first BP. The reviewer noted that the project is supported by a tremendous number of partners

that have buy-in to its success. Despite supply chain issues that might create delays outside of their control, the reviewer indicated that the project team seems well-equipped to stay on track in meeting its milestones.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted that the project team is collaborating with a very diverse (in terms of backgrounds, skillsets, and geography) set of partners including Tribal Nations, utilities, government agencies, and nonprofits.

Reviewer 2:

The reviewer commented that the project team described coordination and collaboration across three states, multiple tribes and reservations, public and private sector organizations, and added that the project team has a lot of support from Minnesota Department of Transportation (MnDOT) and the Minnesota governor and participated on the governor's workforce board of directors. The reviewer noted that there has also been an effort to sign virtual power purchase agreements with MnDOT to further the goal of reducing GHGs.

Reviewer 3:

The reviewer observed that it is important that Tribal leadership in the various nations are able to work together on this project and they have appeared to do this. The reviewer added that the utilities are on board, which is important when infrastructure involves DCFC units.

Reviewer 4:

The reviewer reiterated that the project's foundation is through partnerships and its teaming arrangements. The reviewer added that the project will leverage a number of funding sources to amplify its efforts and is coordinating effectively with other agencies with complementary programs (such as NEVI funding administered via State governments).

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that the equity benefits of the project largely go without saying, although the team comprehensively describes those benefits in the presentation. The team highlights equity benefits such as including Tribal communities in the energy transition, promoting workforce development in Tribal communities, improving resiliency in Tribal communities, and providing access to clean transportation options in Tribal communities.

Reviewer 2:

The reviewer observed that the project is actively integrating the programs and technology into efforts that will provide tangible benefits for communities, including fleets for Family and Children Services, agriculture, Tribal college, buses for culture and language immersion school, and community shuttle service, workforce training, and legal agreements that could be utilized by other tribes.

Reviewer 3:

The reviewer noted that this project serves tribes on various reservations which will provide energy security for folks on the reservations identified on this grant.

Reviewer 4:

The reviewer stated that this project's core focus is on serving under-resourced and underserved Tribal communities. The reviewer added that it also features collaboration across several of these communities to

create an “Electric Nation” so that these communities can pool their resources and work together toward shared goals and objectives. The reviewer observed that by creating partnerships early-on and securing buy-in on the plan, this project should avoid the increased burden that might otherwise be a threat or concern for this type of work.

Presentation Number: TI149

Presentation Title: Equitable Mobility Powering Opportunities for Workplace Electrification Readiness (EMPOWER)
Principal Investigator: Michael Graham (Western Washington Clean Cities)

Presenter

Michael Graham, Western Washington Clean Cities

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer expressed the view that the focus on increasing workplace charging will be essential for accelerating transportation

electrification and expanding access to individuals who do not have access to at home charging. The reviewer stated that if employees (and particularly lower- and middle-income individuals) see chargers at work, they may become more interested in EVs. Workplace charging is also essential to utilizing more renewable/photovoltaic generation during the day.

Reviewer 2:

The reviewer found that the project does attend to the TI goals related to fuel diversity and GHG reduction.

Reviewer 3:

The reviewer noted that the project seeks to accelerate interest and support for workplace charging to advance EV adoption that will reduce petroleum use and GHG emissions, supporting TI subprogram goals to improve fuel diversity, greater adoption of EVs and reduced use of petroleum transportation fuel. The reviewer added that the project will increase local resiliency by reducing peak time charging of EVs through daytime charging at the workplace and will reduce GHG emissions by increasing alternative fuel use in the consumer sector.

Reviewer 4:

The reviewer stated that this project directly addresses one of the major barriers to EV adoption, namely insufficient access to home charging. The reviewer noted that the workplace is the second-most used parking spot for most vehicles, in terms of time, and increasing access to charging at work will encourage more people to purchase and drive EVs for their daily commutes.

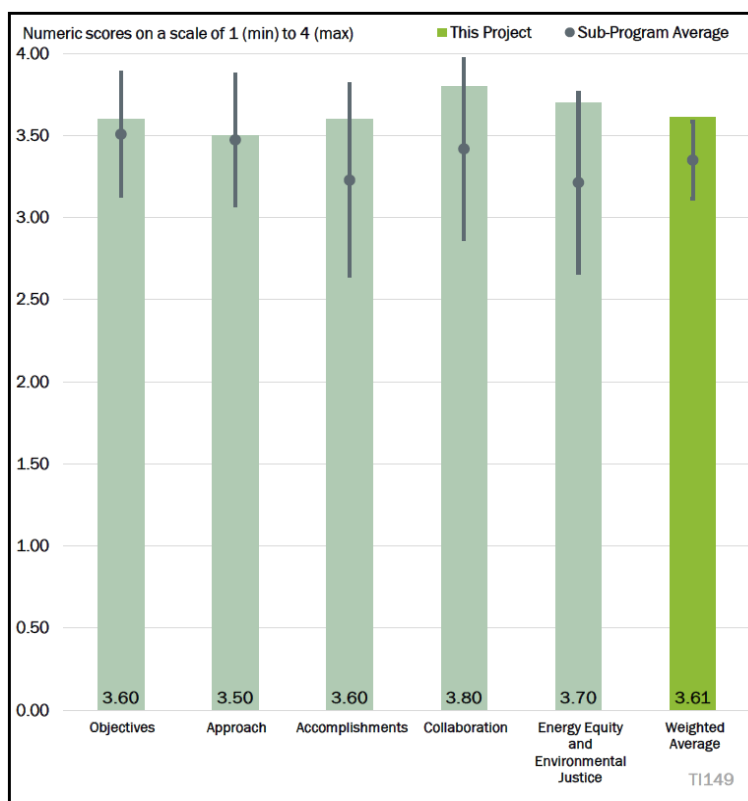


Figure 6-24 - Presentation Number: TI149 Presentation Title: Equitable Mobility Powering Opportunities for Workplace Electrification Readiness (EMPOWER) Principal Investigator: Michael Graham (Western Washington Clean Cities)

Reviewer 5:

The reviewer commented that the project appears to have met all of its milestones to date from what the presenter has indicated.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer noted that the project focuses on the very real challenge of access to chargers for individuals who do not have access to at-home chargers and added that promoting workplace charging is also essential for aligning charging with renewable generation and grid capacity available during the day.

Reviewer 2:

The reviewer stated that the approach is good for coordinating with workplaces to establish charging.

Reviewer 3:

The reviewer commented that the approach is strong and in three phases: planning and preparing for implementation by developing resources, launching resource site, and training Clean Cities for outreach. The reviewer added that implementation of outreach would occur by contacting employers to share information around workplace charging and collect workplace charging installation commitments. The approach also includes wrap-up of implementation, project reflection, lessons-learned dissemination, and succession planning.

Reviewer 4:

The reviewer noted that contacting employers to share information around workplace charging and collect workplace charging installation commitments, while also establishing an online resource center for employers and the public is a great approach. The reviewer stated that the presentation did not give a lot of specific information on how employers would be approached or recruited by the coalitions, or what resources would be available on the website, but found that the site itself is easy to navigate and provides answers to a lot of common questions, as well as a good bit of technical information relative to the benefits of workplace charging.

Reviewer 5:

The reviewer stated that this type of project lends itself to integrating advanced transportation technologies and allows straightforward activities to solve real-world challenges.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that the project is on track. It has completed or nearly completed all BP 1 milestones and has already received 13 commitments and completed two installations.

Reviewer 2:

The reviewer found the resource center and the Energy and Environmental Justice Action Plan (EEJ Action Plan) to be helpful documents but is looking forward to more actionable results in the near future.

Reviewer 3:

The reviewer noted that the first two workplace charger commitments have been secured by partner Virginia Clean Cities, and a bonus is that these meet Energy Environmental Justice metrics for the project. The reviewer observed that the project team completed a project wide EEJ Action Plan, launched a workplace charging resource center landing page (<https://www.workplacecharging.com>), and formally kicked off the outreach implementation phase. The reviewer noted that the team has trained 30 Clean Cities Coalition Implementation

Partners on engagement with workplaces, including providing technical assistance, and finalized a project-wide outreach flyer, market barriers report, and project evaluation plan. The reviewer added that all the project partners contracting is completed.

Reviewer 4:

The reviewer observed that the workplace charging website has already been launched and is available to the public to act as a resource center while the rest of the project is being implemented. With 2 years remaining in the timeline, 30% of the project objectives have been achieved.

Reviewer 5:

The reviewer commented that, from the oral presentation and the PowerPoint slides, it appears the project is meeting its milestones in accordance with the project plan.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer noted that there is a good group of project partners, and having East Tennessee Clean Fuels as a super prime is a good strategic decision because of the lack of EVs in the state (the project can bring awareness) and the rural communities/low income/underserved communities. The reviewer added that states further along the EV adoption path can serve as good peer learning/sharing for other partners.

Reviewer 2:

The reviewer commended the project team on a great partnership established to cover several different stakeholders in numerous locations.

Reviewer 3:

The reviewer stated that there is a very strong team assembled that includes Columbia-Willamette Clean Cities (prime), 30 Clean Cities coalitions across the country, East Tennessee Clean Fuels, Geaux Green, Shift2Electric, Smart Electric Power Alliance, Cerritos College, Center for Sustainable Energy (CSE) and The Cadeo Group. The reviewer noted that this team can cover all aspects of the project.

Reviewer 4:

The reviewer observed that this project includes 30 Clean Cities coalitions as partners, the largest assemblage of coalitions on a single VTO project. The reviewer stated that the project should be able to capitalize on existing coalition relationships with employers of all sizes, across the entire country and added that the project partners include a diverse array of industry and education stakeholders, making a strong core team.

Reviewer 5:

The reviewer noted that the communications plan that drives the collaboration and coordination effort is in place and appears to be working according to plan.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer stated that the broad definition of EEEJ is meant to ensure that important communities will not be left behind due to specific, narrow EJ criteria; offering communities the possibility to explain why they should be considered EJ is a valuable approach.

Reviewer 2:

The reviewer commented that the guide is a great first step; looking forward to next steps and rollout of this strategy.

Reviewer 3:

The reviewer summarized that the EEJ aspects of this project focus project work in communities subjected to historical disinvestment and overburdened with pollution in 30 Clean Cities coalition locations. The project outlines how it aligns with the Justice40 Initiative. The Clean Cities coalitions that are part of the EMPOWER project (listed from West Coast to East Coast) are: Long Beach Clean Cities, East Bay Clean Cities Coalition, San Diego Regional Clean Cities Coalition, Columbia-Willamette Clean Cities, Western Washington Clean Cities, Utah Clean Cities, Drive Clean Colorado, North Dakota Clean Cities, Minnesota Clean Cities, Wisconsin Clean Cities, Illinois Alliance for Clean Transportation, Drive Clean Indiana, Michigan Clean Cities, Central Oklahoma Clean Cities, Tulsa Clean Cities, Dallas-Fort Worth Clean Cities, Louisiana Clean Fuels, Central Florida Clean Cities Coalition, Clean Cities-Georgia, East Tennessee Clean Fuels Coalition, Kentucky Clean Fuels Coalition, Virginia Clean Cities, State of West Virginia Clean Cities, Greater Washington Region Clean Cities Coalition, State of Maryland Clean Cities, New Jersey Clean Cities, Empire Clean Cities, Connecticut Southwestern Area Clean Cities, Vermont Clean Cities, Granite State Clean Cities Coalition, and Maine Clean Communities.

Reviewer 4:

The reviewer noted that the project team has completed a project wide EEJ Action Plan, which focuses project work in communities subjected to historical disinvestment and overburdened with pollution, and outlines how the project defines equity for 40% goal, aligning with the Justice40 Initiative. The reviewer added that, of 13 workplace charging commitments so far, five meet EEJ metrics of the project, which shows a good mix and a determined effort to include EEJ considerations in the program.

Reviewer 5:

The reviewer commented that this project appears to have a well-organized EEJ Action Plan, and with the variety of project locations/partners, the EEJ Action Plan should have access to a variety of locations that are good areas to apply the plan.

Presentation Number: TI150
Presentation Title: Charge to Work USA
Principal Investigator: Jason Zimbler (CALSTART)

Presenter

Jason Zimbler, CALSTART

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the focus on workplace charging is important for utilizing available grid assets/resources without increasing costs by increasing daytime charging. Further, it will raise visibility of EVs and could spur greater adoptions providing access to those without at home charging options.

Reviewer 2:

The reviewer found that the goals of this project align with multiple TI goals.

Reviewer 3:

The reviewer stated that the project objectives are to gain greater EV adoption by enhancing driver confidence in charger availability, as well as to increase reliability and geographic coverage of charging infrastructure through the adoption of workplace charging solutions, thus reducing range anxiety, and increasing consumer confidence. Additionally, the objectives are to reduce GHG emissions; expand access to electric mobility in DACs and workplaces in DACs; adopt charging solutions for employees that do not have access to charging at home; increase local resiliency and reduce GHG emissions; and create a self-sustaining market for workplace charging.

Reviewer 4:

The reviewer commented that improved access to workplace charging is an excellent way of supporting TI goals of increasing alternative fuel use and transportation efficiency and added that this project has ambitious goals for the number and sizes of employers expected to make workplace charging commitments.

Reviewer 5:

The reviewer found that the TI tasks seem to be on track with the grant milestones.

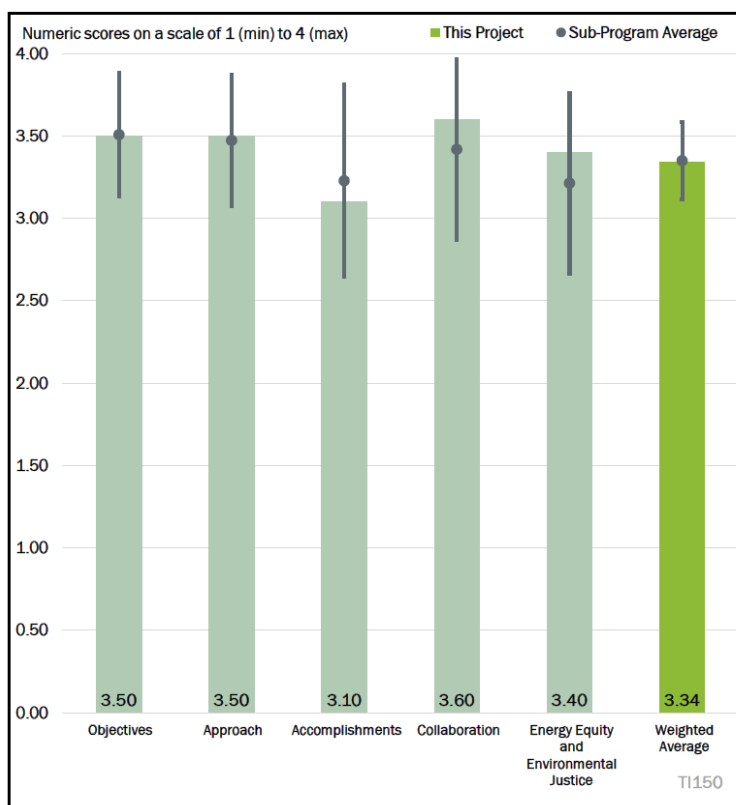


Figure 6-25 - Presentation Number: TI150 Presentation Title: Charge to Work USA Principal Investigator: Jason Zimbler (CALSTART)

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer commented that state segmentation with primes is good and commended the focus on the prime's strengths and aim to avoid duplication. The reviewer added that the interactive portal is a great option, and the scenario element will be very helpful as site hosts weigh and evaluate options. The reviewer further stated that the project approach, given its specific objectives, is good. The reviewer questioned whether the conversion rate would increase if there was implementation funding, and wondered how binding an employer commitment is.

Reviewer 2:

The reviewer stated that it is a solid approach with great partners with appropriate goals.

Reviewer 3:

The reviewer indicated that the approach is for CALSTART and Forth Mobility to collaborate to develop a brand and strategic vision; launch a Workplace Resource Center; develop an Implementation Portal; create strategic outreach and marketing plans; and obtain early commitments from employers and public officials to participate in the program.

Reviewer 4:

The reviewer noted that the project approach is multi-faceted, including direct outreach to employers, an online resource website, and a push to create a self-sustaining market for workplace charging. The reviewer found this to be an important key for long-term success of workplace charging initiatives. The reviewer noted that the project team includes relatively few Clean Cities coalitions, whereas other similar projects are including a large number of coalitions, across multiple geographic regions, to leverage their local knowledge in recruiting employers.

Reviewer 5:

The reviewer stated that the integration of advanced transportation technology involved in the grant appears to be in line with the goals of the grant. The reviewer added that the final results of the project will determine the success of this part of the grant; it is too early to tell how successful this part of the program will be.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that the project had some challenges getting started so they are behind in meeting milestones, but it appears they have laid the foundation to get back on track for remaining BPs.

Reviewer 2:

The reviewer stated that the project is set up for success but looking forward to additional progress.

Reviewer 3:

The reviewer commented that the accomplishments include public events and appearances at Forth Mobility's 2022 Roadmap Conference; coordinating and preparing materials for a remote webinar and two in-person events; a workplace charging educational webinar for National Grid NY's commercial customers in Spring 2023 as well as the Climate Group's US Climate Action Summit and Forth Mobility's Roadmap conference in April/May 2023; and collaborating on a unified message for Charge@Work, a single, public-facing workplace charging campaign and assistance program. The reviewer noted that CALSTART and Forth Mobility have chosen a final logo and have completed a full brand guide and are working collaboratively to effectively segment employers throughout the country. In addition, CALSTART is finalizing its strategy for employer

recruitment and has developed an introductory list of targets for the first round of outreach, and the Workplace Charging Resource Center and Implementation Portal have been completed.

Reviewer 4:

The reviewer noted that, with 15 days left in BP 1, the presentation listed all the milestones as being in-progress and overall project objectives as being 30% complete. The reviewer commented that the listed accomplishments outline a lot of strategizing, finalizing, and identifying of “warm” targets, but few concrete steps outside of one conference presentation and three webinars given, along with completion of a branding guide. The reviewer added that the Charge@Work website mentioned in the presentation is up and running and includes a good amount of resources, along with some well-crafted pitches to solicit employer commitments and the project has spent only a small portion of its total budget, which seems commensurate with the level of achievements accomplished to date.

Reviewer 5:

The reviewer indicated that, based on the project manager presentation and the PowerPoint presentation, it appears the accomplishments and progress are in line with the project goals, and seem to be in line with the milestones, but it is too early to tell for sure.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commended the project team, saying collaboration and partners are excellent and utility involvement is great.

Reviewer 2:

The reviewer stated that it is a great team with the right expertise to make this project successful.

Reviewer 3:

The reviewer noted a very strong team assembled to complete the project. The lead organization are CALSTART/Forth Mobility with partner organizations, EVNoire, Climate Group, NESCAUM, Empire Clean Cities, EP-ACT, Pittsburgh Region Clean Cities, Drive Clean Colorado, Northern Colorado Clean Cities, Qmerit, ZappyRide, National Grid, Edison Electric Institute and EVgo. The reviewer noted that this a very strong group and should be able to accomplish the project successfully and added that the meeting schedules and collaboration are working well.

Reviewer 4:

The reviewer indicated that project leadership has held alignment calls with Co-Prime Forth Mobility on a weekly basis, separate weekly calls with EVNoire, Climate Group, and ZappyRide, monthly calls with National Grid, and ad hoc meetings with other sub-recipients to work through contracting agreements. The reviewer noted that Forth Mobility and CALSTART are co-prime organizations in both TI150 and TI151, programs with very similar objectives and approaches, and are jointly developing Charge@Work, a unified, national campaign promoting workplace charging, to be used as pillars of both projects. The reviewer commented that it will be interesting to see how these two projects keep their efforts separate, and how they tally up their recruited companies, etc., to avoid the appearance of delivering the same results to fulfill two contracts.

Reviewer 5:

The reviewer stated that collaboration and coordination appear to be in line with the project’s milestones.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer remarked on the good partners for EEEJ work.

Reviewer 2:

The reviewer is anticipating additional implementation in the project to put the agreed-upon EEEJ principles to work.

Reviewer 3:

The reviewer stated that CALSTART, EVNoire, and partners are actively incorporating diversity, equity, and inclusion (DEI) into the project objectives with these targets: 30% of employer sites located in underserved areas, 25% of workplace charging stations in underserved areas, 40% of Ride and Drives in underserved areas, 30% of business certifications in DEI areas and 30% of budget to minority- and women-owned business enterprises. The reviewer added that the project is meeting the EEEJ requirements by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities, goals of the DOE/VTO.

Reviewer 4:

The reviewer cited the presentation as stating the following relative to EEEJ: CALSTART, EVNoire, and our partners are actively incorporating DEI into our project objectives with these targets: 30% of employer sites located in underserved areas, 25% of workplace charging stations in underserved areas, 40% of Ride and Drives in underserved area, 30% of business certifications in DEI areas, 30% of budget to minority- and women-owned business enterprises. The reviewer found these goals to be comprehensive and attainable but did not see specific language outlining collaboration with affected communities.

Reviewer 5:

The reviewer commented that the EEEJ section of the project appears to be doing well, based on the PowerPoint slides and the oral presentation. The reviewer added that a successful completion of this part of the grant will only be apparent once the project is finished and the report details are written.

Presentation Number: TI151
Presentation Title: Leadership of Employers for Electrification Program
Principal Investigator: Steffani Cuff
(Forth Mobility)

Presenter

Aleksandra Evert, Forth Mobility

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer found that the focus on workplace charging is good and meets TI objectives. The reviewer noted that it is unclear how the employer registrations increase local resilience, but the education, outreach and technical assistance are good objectives.

Reviewer 2:

The reviewer noted that the project aligns well with the TI goals.

Reviewer 3:

The reviewer indicated that the project objectives are to develop and execute a nationwide workplace charging program comprised of education, outreach and technical assistance activities; gain over 2,500 employer commitments with the end goal of catalyzing over 20,000 EVSE port installations; reach 5,000 employer registrations on the Electric Vehicle Adoption Leadership (EVAL) certification platform; meet VTO goals by empowering local communities with the technical expertise to influence charging solutions at their workplaces through a tailored, regional outreach; enable a large-scale increase in workplace charging to accelerate EV adoption; and increase organizational capacity and community leadership to pursue workplace charging solutions. The reviewer indicated that this will also increase local resiliency and reduce GHG emissions.

Reviewer 4:

The reviewer commented that this project aims to develop and execute a nationwide workplace charging program comprised of education, outreach, and technical assistance activities. In addition, the project hopes to gain more than 2,500 employer commitments with the end goal of catalyzing at least 20,000 electric vehicle support equipment (EVSE) port installations and reach at least 5,000 employer registrations on the EVAL certification platform. The reviewer found that the objectives are valid and, if successful, the project should make a positive impact on the adoption of EVs. The reviewer noted that workplace charging will be a key component of addressing current barriers to EV adoption, and the project supports TI objectives of improving

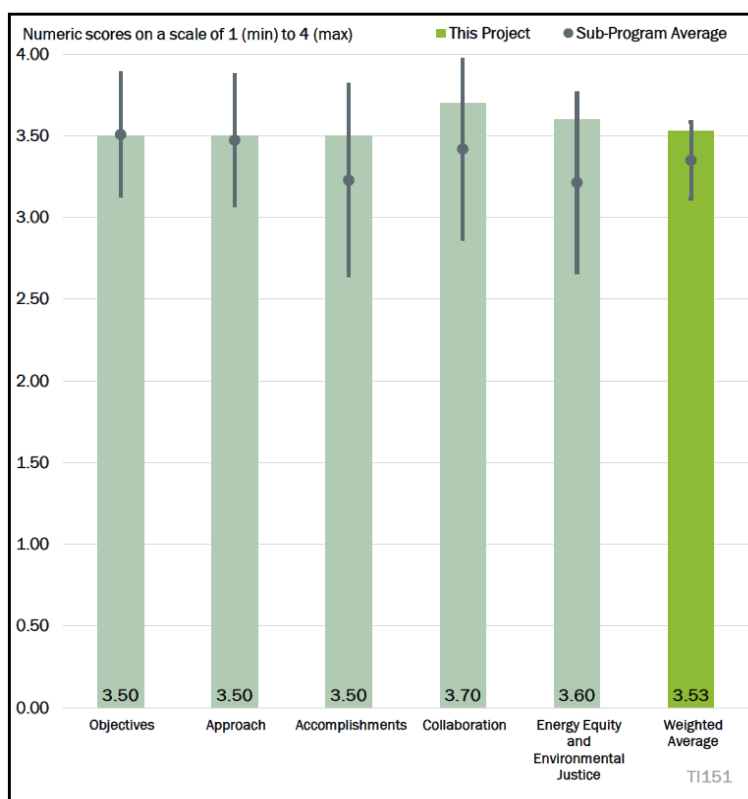


Figure 6-26 - Presentation Number: TI151 Presentation Title: Leadership of Employers for Electrification Program Principal Investigator: Steffani Cuff (Forth Mobility)

fuel diversity, increasing local resiliency, and reducing GHG emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 5:

The reviewer stated that the project plan and milestones appear to be on schedule and, based on the presentation and PowerPoint, the project is on track with projective objectives.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer stated that the project has ambitious goals and good partners to try to meet these goals. The reviewer questioned whether it will be feasible to reach the more than 2,500 commitments and more than 5,000 registrations. The reviewer noted that the regional aspect is good for reaching large numbers, however.

Reviewer 2:

The reviewer commented that it is an interesting approach to gain buy-in from a mass amount of stakeholders for workplace charging.

Reviewer 3:

The reviewer found the approach to be solid, starting with Initiation and Operations Planning. The project team will confirm participants for the Project Advisory Group and finalize program design; finalize implementation partners and issue contracts and plan localized outreach strategy; build out and launch the website; and lastly, host a full partner kickoff meeting and train implementation partners. According to the reviewer, this approach is a process for success.

Reviewer 4:

The reviewer stated that this project will encourage and incentivize workplaces to pursue a nationally recognized EVAL certification and found that this could be a valuable incentive for employer participation and a unique approach not shared with other similar VTO projects. Partners include Clean Cities Coalitions, non-governmental organizations (NGOs), electric utilities, nonprofits, and municipalities. The reviewer noted that, as entities that regularly interact with regional workplaces, implementation partners will work with lead sub-recipients and leverage their communication channels to recruit a wide sample size of businesses of all sizes, industry types, demographics, and geographies. The reviewer concluded that this is a solid plan that takes advantage of existing relationships of the project partners.

Reviewer 5:

The reviewer noted that it appears the integration of advanced transportation technology is on track, but the presentation does not really explain much in detail about the progress. The reviewer anticipates that next year's AMR will provide better definition of milestone completion.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer observed that many milestones are reaching completion and are scheduled to be completed several months ahead of the end of BP 1.

Reviewer 2:

The reviewer stated that this project is set up well for future successes.

Reviewer 3:

The reviewer outlined the accomplishments so far for the Leadership of Employers for Electrification Program (LEEP) Project. Forth Mobility consulting has finalized the implementation partners and currently has nine

partners on contract, and they anticipate the remaining partners to be on contract by end of Q3; the certification program design is complete and in review with lead sub-recipients; the project advisory group has identified 12 members for the group and created an advisory specific communications plan which outlines meeting frequency, duration and other administrative expectations; Forth Mobility and Green Light Labs finalized the statement of work. Green Light Labs will serve as the technical advisor for Forth Mobility and is currently in the process of building out visual specifications for the website. The reviewer noted that the Charge@Work accomplishments include the branding and marketing campaign. Forth Mobility and CALSTART are jointly developing Charge@Work, a unified, national campaign promoting workplace charging. The reviewer commented that CALSTART and Forth Mobility created and agreed upon a final logo, completed a full brand guide, created a web landing page and secured the chargeatwork.org domain name; they also finalized Charge@Work Pledge to collect employer commitments and hosted a Charge@Work partner gathering at the 2023 Roadmap Conference in Portland, Oregon; Forth Mobility and CALSTART are working collaboratively to effectively segment employers throughout the country; Forth Mobility is finalizing its strategy for employer recruitment and has developed an introductory list of targets for the program.

Reviewer 4:

The reviewer noted that the project is still in BP 1 and has accomplished 15% of its overall project goals. Most BP 1 and BP 2 goals are in progress and on schedule.

Reviewer 5:

The reviewer stated that the presentation and PowerPoint slides indicate the project accomplishments/milestones have been made in a timely manner.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer commented on the great project partners but noted that it is unclear how this partnership with CALSTART differs from the Forth project. While the collaboration is good, the reviewer suggested that it would be beneficial for future reviews to clearly explain the uniqueness and delineation between the projects.

Reviewer 2:

The reviewer stated that this is a great team that sets up this project for success.

Reviewer 3:

The reviewer commented on the great team assembled, with no weak links. The reviewer summarized the project organization as follows: Forth Mobility is sharing prime responsibility with two other organizations, CALSTART and Columbia-Willamette Clean Cities Coalition. Forth Mobility and CALSTART make up the Charge@Work team. Each prime leads a core group of lead-subrecipients. Forth Mobility is responsible for the communication of the project including developing marketing assets and conducting a Northwest regionally focused outreach campaign. The reviewer noted that Plug In America, EVNoire and The Electrification Coalition bring a broad depth of experience working on transportation electrification projects nationwide, with special emphasis on consumer adoption. Partners include Clean Cities Coalitions, NGOs, electric utilities, nonprofits, and municipalities. The reviewer noted that, as entities that regularly interact with regional workplaces, implementation partners will work with lead sub-recipients and leverage their communication channels to recruit a wide sample size of businesses of all sizes, industry types, demographics, and geographies.

Reviewer 4:

The reviewer stated that, despite setbacks due to staff changes and learning to coordinate and collaborate across a three-prime effort, the project is on track. Forth Mobility and CALSTART are co-prime organizations in both TI150 and TI151, programs with very similar objectives and approach, and are jointly developing Charge@Work, a unified, national campaign promoting workplace charging, to be used as pillars of both projects. The reviewer expressed interest in seeing how these two projects keep their efforts separate, and how they tally up their recruited companies, etc. to avoid the appearance of delivering the same results to fulfill two contracts.

Reviewer 5:

The reviewer stated that, based on the presentation and PowerPoint slides, it appears the collaboration and coordination among the project team is ongoing and successful to date.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer found that DEI has been integrated into the project's decision-making processes and the focus on community partners in the EJ communities is fantastic. The reviewer praised the focus group to assess effectiveness of resources.

Reviewer 2:

The reviewer commented that it is clear the project team has taken the EEEJ component of this project seriously and will certainly align to EEJ principles throughout.

Reviewer 3:

The reviewer noted that the overall goal of the LEEP is to bring outreach, education and resources on EVs and charging access to employers and workers of all demographics; to advance DEI in all the project's decision-making processes; and to understand the barriers to workplace charging that exist for low-income, BIPOC, rural and other underserved employers and employees. To increase access to clean commuting and create opportunities for historically underserved communities, the reviewer observed that Forth Mobility will develop community partnerships and listen and respond to expressed needs as LEEP is designed and implemented, to ensure that the program can scale while maintaining diverse, equitable and inclusive processes and outcomes.

Reviewer 4:

The reviewer found that the project has created a comprehensive EEEJ plan and has established several DEI Milestones to ensure the project is explicitly integrating DEI into its project management plan. The reviewer added that this project's EEEJ plan is spelled out in more detail than most projects and noted that adding a timetable for accomplishing certain verifiable milestones does more than just pay lip service to the requirement.

Reviewer 5:

The reviewer stated that, at this point in the project, there does not seem to be much information about EEEJ activities. The reviewer anticipates that there will be a lot more about this area in next year's AMR.

Presentation Number: TI152
Presentation Title: Project Sila: An Arctic CNG Pilot Test Program
Principal Investigator: Keith Patterson (ASRC Energy Services)

Presenter

Troy Tempel, ASRC Energy Services

Reviewer Sample Size

A total of five reviewers evaluated this project.

Question 1: Please provide comments on this project's degree of support for the overall Technology Integration (TI) objectives of improving fuel diversity, increasing local resiliency, and reducing greenhouse gas emissions through increasing alternative fuel use and transportation efficiency.

Reviewer 1:

The reviewer stated that the project objectives consist of a pilot test of CNG-upfitted HD trucks and noted that the project team will install an Arctic rated CNG fueling station and benchmark CNG vs. diesel performance while measuring reduction in emissions. The reviewer noted that this improves fuel diversity by using a readily available and underutilized fuel source. The reviewer observed that this pilot project will document the feasibility of CNG operations in the Arctic and address concerns with using a high CO₂ local fuel source. Further, it will provide training to both operator and maintenance personnel on CNG operation, with the potential to deploy this technology to other parts of the North Slope.

Reviewer 2:

The reviewer found that the project is properly aimed at improving fuel diversity, increasing local resilience, and reducing GHG emissions and noted that, while developed for the Alaska market, the results could be applicable to other cold weather regions. In addition, this project is focused particularly upon operation in what could be considered a sensitive environmental area.

Reviewer 3:

The reviewer found this project to be excellent because it addresses all the TI objectives. The reviewer noted that replacing trucked-in diesel with locally sourced natural gas provides efficiencies not typical with natural gas projects, so this is particularly interesting and could have application to other locations in the U.S. where stranded gas is located and diesel equipment such as mining or drilling equipment is used.

Reviewer 4:

The reviewer stated that this project is unique and demonstrates key aspects of TI, supporting improved fuel diversity and local resiliency, based on the technology demonstrated.

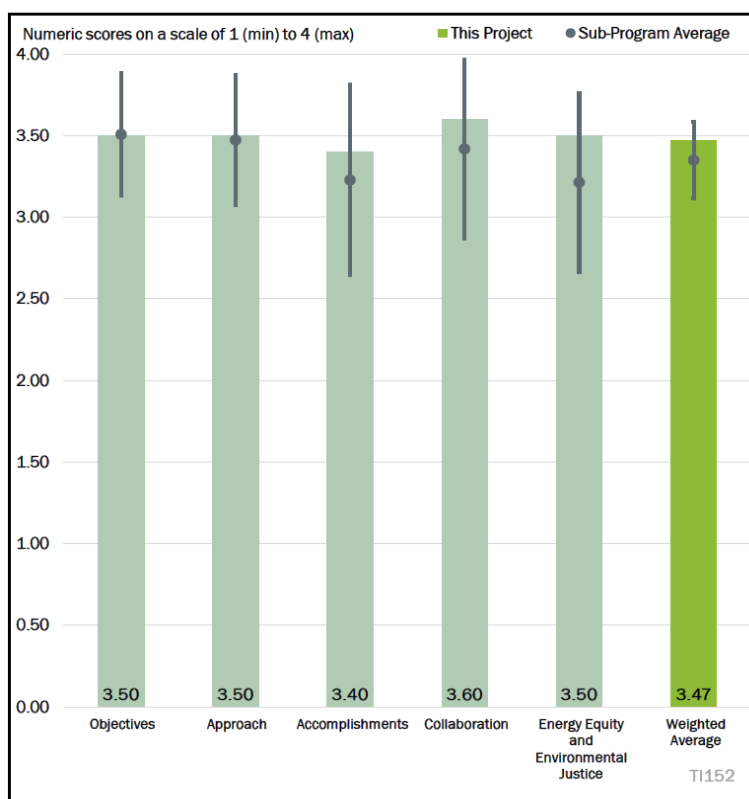


Figure 6-27 - Presentation Number: TI152 Presentation Title: Project Sila: An Arctic CNG Pilot Test Program Principal Investigator: Keith Patterson (ASRC Energy Services)

Reviewer 5:

The reviewer commented that this project clearly improves fuel diversity, reduces GHGs through increasing alternative fuel use, and increases local resiliency. The reviewer did not find an improvement in transportation efficiency.

Question 2: Please comment on this project's approach for integrating advanced transportation technologies and practices to solve real-world challenges.

Reviewer 1:

The reviewer noted that the approach is to use off-the-shelf designs to ensure compressor design meets Arctic and CO₂ barriers. The reviewer observed that the site plan was drafted and needed to finalize with tie-in locations, and truck procurement was submitted with PAPE Kenworth in March 2023. Compressors will be tested, and staff training will occur at Onboard Dynamic's facility compressor installation. The reviewer concluded that this is a solid approach to this difficult project.

Reviewer 2:

The reviewer indicated that the project approach seems solid, with all the expected steps plus additional ones specifically recognizing the need for ensuring proper equipment operation and troubleshooting issues. The reviewer noted that the plan is for two years of operation and found this to be a better choice than a single year in this very challenging environment. The reviewer recommended having more of an outreach and education program to attempt to reach additional potential users.

Reviewer 3:

The reviewer commented that it is a relatively uncomplicated project, but the approach looks to be sound. The reviewer found value in addressing a barrier (cold weather) that has not been tackled before, and evaluating high CO₂ gas which may not have been an issue before and may not be an issue in too many places.

Reviewer 4:

The reviewer stated that this project demonstrates advanced transportation technologies and provides this technology to northern climate operators around the world where oil and gas extraction occurs.

Reviewer 5:

The reviewer noted that the project demonstrated the technology, ordered the technology, and plans to provide training and education on operating the technology, a great approach. The reviewer added that it takes a step back and shows, instead of tells, how great the technology is, and supports it through the purchasing and integration of this technology.

Question 3: Please comment on the project's progress and significant accomplishments to date.

Reviewer 1:

The reviewer noted that all compressors, trucks, and equipment have been ordered, and the project team is actively working with Onboard Dynamics on compressor design and the Arctic and CO₂ barriers. The project is on plan and budget.

Reviewer 2:

The reviewer stated that the project appears to largely be proceeding as planned, but the project has only been in place about a year, with the first year focused on equipment procurement, compressor design and location, and ordering the trucks. The reviewer noted that there have been some supply chain delays, but they are working through those. The reviewer added that a particular focus of activities to date has been addressing the high CO₂ content of the fuel, which can be a major issue for compression vendors and noted that the utility might add a large-scale scrubber if the project takes off.

Reviewer 3:

The reviewer commented that the project is still really getting underway, with no major issues identified at this point. It is on track.

Reviewer 4:

The reviewer stated that, based on the verbal presentation and PowerPoint slides this project is on track and meeting its milestone schedule.

Reviewer 5:

The reviewer observed that the project is on track to meet its goals.

Question 4: Please comment on the level of collaboration within the project team and the degree to which the project team has identified and leveraged the proper connections to achieve its project goals.

Reviewer 1:

The reviewer observed that the team is strong and has the appropriate acumen to have a successful project. The lead organization is ASRC Consulting & Environmental Services with LLC partners of Onboard Dynamics (CNG compression equipment), PAPE Kenworth (CNG trucks), Agility Fuel Systems (CNG truck upfitting), Norgasco, Inc. (natural gas utility community partners), and the Arctic Slope Regional Corporation.

Reviewer 2:

The reviewer noted that partners include the manufacturer of a unique-design compressor for this environment, the truck manufacturer, and the CNG storage system manufacturer, and the prime is providing the project management/integration and many of the technical assistance services, including monitoring operation. The reviewer observed that the team lead seems to have been working closely with the equipment suppliers to resolve technical barriers and they are hoping to expand the team, already working with the natural gas utility and, in the future, operations contractors.

Reviewer 3:

The reviewer stated that the project team members are experienced, and it appears that collaboration and coordination are proceeding well. The reviewer noted that the trucks have not been deployed yet, so the real test is coming later.

Reviewer 4:

The reviewer observed that project collaboration and coordination appear to be on track in an area that has a hostile weather environment.

Reviewer 5:

The reviewer commented that the project brought together key partners to achieve their goals.

Question 5: Please provide comment on the contribution of this project to energy equity and environmental justice by ensuring the project benefits underserved and overburdened communities and does not cause increased burdens to these communities.

Reviewer 1:

The reviewer noted that the Arctic Slope Regional Corporation consists of seven communities—Barrow, Wainwright, Atkasuk, Nuiqsut, Kaktovik, Pt. Lay, and Pt. Hope—three of which have natural gas sources. The reviewer added that they are all utilizing a local fuel source that will drastically reduce vehicle fueling costs and emission output. Currently, diesel is barged up seasonally. The reviewer noted that air quality will be further improved as commercial fleets transition to a CNG source.

Reviewer 2:

The reviewer found that the project provides for improvements related to energy and environment and added that the operation area now is an active oil operation zone, so air quality could be a concern and thus the benefit from greater use of this technology would be appreciated.

Reviewer 3:

The reviewer commented that this is a really unique project that has the potential to provide direct benefit to affected identified communities if the trucks and demonstration are successful. The reviewer added that the fact that they are using lower emitting trucks and displacing trucked in fuel is very beneficial.

Reviewer 4:

The reviewer stated that, based on the location of this project, it appears this project supports EEEJ requirements better than most of the other projects. The reviewer added that this project area is an example of an area that is underserved.

Reviewer 5:

The reviewer stated that offering communities the emissions and reliability data of this technology is great and indicated that it would be great to know if the project team has considered doing targeted education and outreach in tandem with providing this information, as well as which communities the team is prioritizing to receive that data.

Acronyms and Abbreviations – TI

Abbreviation	Definition
ACP50	Areas of concentrated poverty where 50% or more of residents are people of color
AFV	Alternative fuel vehicle
BEV	Battery electric vehicle
BIPOC	Black, indigenous, people of color
BP	Budget period
CBO	Community-based organization
COVID	Coronavirus disease (COVID-19), infectious disease caused by the SARS-CoV-2 virus
CNG	Compressed natural gas
CSE	Center for Sustainable Energy
DAC	Disadvantaged communities
DCFC	Direct current fast charger
DEI	Diversity, equity, and inclusion
DER	Distributed energy resources
DOE	U.S. Department of Energy
EEJ	Energy equity and environmental justice
EEJ Action Plan	Energy Environmental Justice Action Plan
EERE	Energy Efficiency and Renewable Energy
EJ	Environmental Justice
EV	Electric vehicle(s)
EVAL	Electric Vehicle Adoption Leadership
EVSE	Electric vehicle supply equipment
GEM	Greenlink Equity Map
GHG	Greenhouse gas
H ₂	Hydrogen
HBCU	Historically black colleges and universities
HD	Heavy-duty
HUD	U.S. Department of Housing and Urban Development
ICE	Internal combustion engine
L2	Level 2

Abbreviation	Definition
LEEP	Leadership of Employers for Electrification Program
LPG	Liquified petroleum gas or propane
MD	Medium-duty
MFH	Multi-family housing
NEVI	National Electric Vehicle Infrastructure
NFPA	National Fire Protection Association
NGO	Non-government organization
NGV	Natural gas vehicle
NREL	National Renewable Energy Laboratory
OEM	Original equipment manufacturer
RDD&D	Research, development, deployment and demonstration
RNG	Renewable natural gas
SCAQMD	South Coast Air Quality Management District
TCO	Total cost of ownership
TI	VTO Technology Integration subprogram
USDA	U.S. Department of Agriculture
VoICE-MR	Vocation Integrated Cost Estimation for Maintenance and Repair
VTO	Vehicle Technologies Office
WVU	West Virginia University