

# Clean Transportation **COLLABORATIVE**

## **SYNTHESIS OF STAKEHOLDER INPUT ON ELECTRIC VEHICLE CHARGING INFRASTRUCTURE**

Clean Transportation Collaborative  
Summer 2022 Meeting

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Center for Advancing Research in  
**Transportation Emissions, Energy, and Health**  
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## Introduction

The Clean Transportation Collaborative (CTC) is an initiative of the Texas A&M Transportation Institute's Center for Advancing Research in Transportation Energy, Emissions, and Health, which is a University Transportation Center funded by the U.S. Department of Transportation (USDOT). This member-driven collaborative consists of stakeholders with interests in transportation, energy, and emissions in both the private and public sectors.

On July 13, 2022, CTC met to:

- connect CTC members to each other through meaningful conversation on emerging issues related to topics of interest; and
- develop, record, and disseminate expert practitioners' experiences, ideas, and insights that can influence research areas and policy recommendations.

This meeting focused on transportation electrification, an important and timely element of clean transportation given the maturity of the technology and provision of federal funds to support electric vehicle (EV) charging. Momentum is building for transportation electrification due to its climate-health co-benefits and has resulted in strong interest in developing the infrastructure necessary to support electrification. The unique and emerging challenges presented by increased EV adoption result in the need for stakeholders from the public and private sectors to work together to understand and address the challenges ahead.

CTC members participating in the meeting came from a range of sectors and organizations, including local government councils, city metropolitan planning organizations, state departments of transportation (DOTs), research organizations, universities, federal agencies, and the energy sector. The diverse collection of participants allowed for a comprehensive discussion covering a variety of critical topics surrounding EV charging infrastructure.

The meeting began with a brief introduction of recent developments in federal regulations around EV charging, with a focus on the notice of proposed rulemaking from USDOT regarding formula funds for EV charging infrastructure in the National Electric Vehicle Charging Infrastructure (NEVI) program. Following the introductory session, CTC participants split into virtual breakout rooms. Participants chose from the following five breakout room topics:

- workforce development;
- charging infrastructure;
- signals and signs, and safety and security;
- data and networks; and
- public engagement.

Within the breakout rooms, a discussion facilitator and notetaker were assigned to introduce the discussion prompts, stimulate dialogue, and take notes on participant contributions from which this brief was assembled. Following the breakout room discussions, CTC members reconvened to report back and identify the key crosscutting themes. During this discussion, the following three themes emerged as priority focus areas:

- equity,
- partnerships, and
- technology.

The following sections of this brief provide an overview of the information gathered during breakout sessions and the subsequent group discussion related to the three themes. The brief concludes with suggestions for next steps for the CTC to continue to engage and support stakeholders in planning for and implementing EV charging infrastructure.

## Priority Areas from Participant Discussion

The following subsections provide an overview of each of the three themes.

### Equity

CTC participants noted that they would like to see public funds used to support charging infrastructure in a way that is justly distributed. Participants suggested that more equitably distributing access to charging should help increase EV adoption rates, thus supporting both environmental justice and environmental sustainability goals. Solutions such as placing public charging near services and locations visited by more diverse and currently underserved populations were frequently discussed. These locations might include grocery stores, laundromats, low- and medium-priced apartment buildings, offices, and places of worship. Meeting participants suggested that—in addition to increased access—ensuring that charging infrastructure is located in close proximity to these locations will provide the benefit of both increased perceived and actual safety. These benefits include elements such as well-lit areas due to existing lighting, more trafficked or populated areas due to multiple trip purposes, security cameras, and other features.

There are federal requirements for installing charging stations at regular intervals along highway corridors when using federal funds, and participants suggested that additional chargers in developed rural areas could provide economic benefits to local communities. The model would allow travelers to use charging stations when needed, provide an opportunity for travelers to spend time and money in local economies, and provide residents with local charging opportunities. The safety benefits of collocating chargers with existing businesses would also apply.

CTC members expressed concern about the current lack of a trained workforce to handle EV charger maintenance, such as electricians. Disparities in access to certain jobs relating to electrification currently exist, especially with respect to communities of color and places that have experienced historical underinvestment. Electricians, especially those with NEVI certifications, are needed, but locations to take the tests for NEVI certifications are minimal. To that end, participants suggested looking into alternatives for certification programs, such as those offered through community colleges. Participants also suggested conducting outreach to existing electricians or potential future workers from communities of color to help fill gaps while concurrently accelerating diversity in candidates for EV-related workforce training.

In addition to federal funds, participants indicated that funds collected through taxes related to charging and/or vehicle miles traveled could support new infrastructure and workforce training.

### Partnerships

In Partnerships with private businesses for charger siting, educational institutions for workforce training, and community organizations for public outreach were all suggested as means to increase equitable outcomes as EVs become more common. Independently owned or small businesses, residential locations including apartment

buildings, and shopping centers were identified as locations frequented by members of disadvantaged communities that are currently lagging in charger installation due to the need for capital investment and the lack of existing demand. CTC members suggested that an opportunity to accelerate confidence in charging availability—and EV adoption—would be to use public funds to build charging infrastructure in or near these private lots.

CTC members indicated that a shortage of trained workers is a significant barrier to widely implementing EV charging infrastructure. Participants specified that the installation and maintenance of charging infrastructure are a primary concern—one that may be exacerbated in rural areas. The skills that members indicated are most in need include engineers and electrical subcontractors to implement the design and development of EV infrastructure as well as electricians and diagnosticians for maintenance. Suggestions to accelerate workforce training include connecting public and private funding and financing opportunities from federal, state, regional, and local programs and private investment with charging infrastructure installation and maintenance companies and/or educational institutions. Participants also identified the need to determine the training and competencies that are needed for these roles as an essential step to develop workforce training and partnerships. However, participants also indicated that the industry suffers from inequity within workforce training due to inaccessibility in disadvantaged communities to the federally mandated NEVI certification process. Potential solutions suggested to address this included consideration of training in community colleges with options to transition to universities or paid internships. Participants identified this type of solution as a means of increasing equity in access to jobs and increasing potential sites for NEVI certifications. Participants also noted that the pipeline in K-12 education needs to facilitate these opportunities at the post-high-school level.

Beyond workforce partnerships, participants discussed community outreach and engagement programs to connect community members to opportunities related to EV infrastructure and provide reliable information. Participants suggested programs that address EV concerns and increase EV adoption by community members, which can then allow the expansion of the EV infrastructure workforce through an expansion of the sector. Potential partnerships identified that can aid in outreach and engagement efforts included state government agencies (state DOTs, environmental and energy agencies, and other initiatives), local transportation and urban planning agencies, and electric utility companies. Participants agreed that there would need to be some mechanism in place, such as oversight by a central authority (e.g., a DOT), to ensure that public engagement methods are consistent and do not provide contradictory information.

Discussions also noted the importance of being able to define the target audiences for outreach messaging as essential to ensure thoughtful and strategic communication about EV infrastructure planning and implementation. Some participants went further to suggest planning the sequencing of audience engagement because certain sectors or populations may need to be talked to before others to optimize information sharing and political feasibility. Additionally, participants noted that identifying what efforts have already been made to share information about EV infrastructure through existing public engagement efforts in forums can help identify possible outreach gaps and future opportunities.

Participants agreed that it is problematic to use a one-size-fits-all approach for outreach messages. For example, different channels could include websites, social media campaigns, and community events or meetings. Even so, participants noted common messaging themes regarding the implementation and expansion of EV infrastructure need to include basic knowledge of EVs, information on the society-wide benefits of EVs (e.g., vehicle emission reductions and improved air quality), and how to locate and access charging stations. However, the discussion did include the potential barriers to customized and wide-reaching community outreach efforts, such as concerns over cost, equity issues in ease and convenience of charging, and a lack of motivation of the general public to make lifestyle changes. The group did acknowledge that bringing different partners to the table provides different expertise for enhancing community outreach and engagement efforts and minimizing potential barriers.

## Technology

EV charging and infrastructure technology needs were discussed, especially in the context of adapting vehicle and grid technologies to ensure compatibility with new generations of EVs, as well as current and older hardware and software. Participants cited the urgency and importance of developing charger technologies to fit these changing needs as one of the most critical technological concerns identified at the meeting. In addition, participants focused on physical design characteristics at EV charging stations because these characteristics can play a significant role in the likelihood that drivers will want and be able to use the facilities. For example, participants discussed how the physical turnaround space and available amenities—such as restrooms, water, and food—at EV charging stations can impact the desire to stop and charge there.

Safety concerns at charging sites were brought up by multiple participants, citing location, lighting, and time of day as elements to consider. Crime data can be analyzed to figure out where to build charging stations; however, this must still be done in an equitable way that does not disproportionately impact certain communities or misclassify areas due to biased data. To address safety concerns at charging stations, installation of cameras and security systems was recommended to keep the areas safe.

In Texas as well as other areas of the United States, grid reliability is of great concern, so participants discussed the need to couple EV charging with advanced clean energy technologies, such as battery storage and localized photovoltaic systems. The conversation about battery storage related to how to prioritize vehicle-to-load (V2L) and vehicle-to-grid (V2G) technologies to support using an EV as a potential backup source of energy for the power grid during times of need. Few participants were aware of existing successful advancements in this area though most were interested and had high hopes for new developments. Some participants also noted that V2L and V2G technologies were unlikely to avoid all potential outages, so other solutions must in place to ensure reliability. The conversations about resiliency during rolling blackouts covered needs for those sheltering in place during weather events as well as the need for sufficient vehicle charging during an evacuation event. Participants also related this topic back to needing a maintenance workforce to ensure dependable charger uptime during emergencies and potential backup solutions such as mobile chargers.

Concerns arose about the potential for vehicle electrification causing more pollution, such as if the electricity is generated from coal, and how the full life cycle of the vehicle and battery is carried out. Participants discussed the benefits of vehicle–grid integration (creating a system where the consumer and the grid must agree to charge) to prevent the practice of charging during peak times from overwhelming the grid. Also, in consideration of potential added pollutants, CTC members discussed a lack of robust cradle-to-grave assessments to evaluate the impacts of the full life cycle of an EV on the environment and personal safety. This would include mining and refining for battery components, and battery production and disposal, among other considerations.

## Next Steps

The conversations between participants at the meeting enabled communication across industries and sectors about experiences, challenges, and opportunities related to EV charging. Conversations centered around the three themes of equity, partnerships, and technology. CTC will continue to convene members around identified challenges and opportunities to increase knowledge sharing and facilitate conversations between experts and potential partners across sectors and industries. CTC leadership is also examining topics identified as areas of need for more research and development for white papers and other means of information dissemination.