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Clean Cities: A Model for Clean Transportation Deployment Spanning Three Decades

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Executive Summary

Spanning three decades, the U.S. Department of Energy's (DOE's) Clean Cities network has grown from one Coalition in Atlanta, Georgia, with seven stakeholders, to a network of more than 75 Clean Cities Coalitions, representing more than 20,000 stakeholders and covering 84% of the U.S. population. Celebrating its 30-year history in 2023, the Clean Cities network began with a provision in the Energy Policy Act of 1992 calling for DOE to build voluntary markets for alternative fuel vehicles. The Clean Cities network now encompasses city-wide, regional, and state-wide programs to develop projects and educate end users (fleets), decision makers, and now, consumers, as electric vehicles have entered the market. DOE and its national laboratories are the backbone of the network, providing peer-sharing opportunities, analysis, tools, training, and educational materials. The importance of building coalitions and peer exchange, together with supporting technical analysis and outcomes, will be discussed. Clean Cities may serve as a model for other clean vehicle deployment efforts throughout the world.

1 Introduction

An approach to advancing clean transportation markets is to build local coalitions of public- and private-sector stakeholders supportive of and invested in clean vehicle technologies. While serving as the deployment arm of the U.S. Department of Energy's (DOE) Vehicle Technologies Office (VTO), the Clean Cities network is based on a unique voluntary, community-based approach to electric vehicle (EV) and other alternative fuel vehicle[1] (AFV) deployment.

The program began in 1993 with just one Coalition, representing Atlanta, Georgia, and its seven stakeholders; the program is now a network of nearly 20,000 stakeholders.[2] Today, there are more than 75 Clean Cities Coalitions (city-wide, regional, and state-wide) designated by DOE, with about 84% of the U.S. population living within the boundaries of Clean Cities territories, and despite its name, the network

[1] DOE defines alternative fuels as: biodiesel, hydrogen, electricity, liquefied petroleum gas (LPG, propane, or autogas), ethanol, methanol, and natural gas, based on the Energy Policy Act of 1992. Local efforts determine priorities on which fuels to focus.
[2] About Clean Cities, https:// https://cleancities.energy.gov/about/, accessed on 2023-4-16

includes much of rural America (Figure 1).[3] Clean Cities Coalitions foster the nation's economic, environmental, and energy security by working locally to advance affordable, domestic transportation fuels and other fuel-saving technologies and practices.[2] Each Coalition is led by an on-the-ground Clean Cities Coalition director who tailors projects and activities to capitalize on the unique opportunities within their areas and to educate others to see the advantages of EVs and AFVs. The director serves as a critical point of contact for not only DOE but also for industry, local end-users, and other decision-makers.

DOE's Clean Cities Coalition network provides a framework for a community's or region's businesses (fleet users, manufacturers and suppliers of equipment and vehicles), government, and other advocates to work as a coalition to build local EV and alternative fuel markets. DOE coordinates Clean Cities Coalitions' activities by providing a forum to develop strategies and initiatives to increase the number of clean vehicles and corresponding infrastructure, and educational events, while funding its national energy laboratories to provide technical expertise in the form of analysis, tools, training, and communication products that can be used locally to educate fleets, decision-makers, and the public. DOE also facilitates peer-share learning across the network through monthly conversations at a regional level, training, and an annual national peer exchange workshop. By encouraging EV and AFV use, Clean Cities helps to achieve environmental quality goals and energy security on local, national, and international levels.

Figure 1. About 84% of the U.S. population, including much of rural America, lives within the boundaries of Clean Cities Coalition territories. Source: U.S. Department of Energy Clean Cities Program.

1.1 The Clean Cities Roadmap: Six Steps to a Sustainable Alternative Fuel Transportation Market

DOE provides a framework for Clean Cities Coalitions to develop a strategic program plan and develop public and private partnerships to expand the local EV and AFV market, by encouraging each stakeholder to commit to activities that strengthen clean transportation markets. The framework includes forming a Clean Cities Coalition, developing EV/AFV markets, and sustaining the Coalition. The six steps are:

[3]Clean Cities Coalition Network, *Clean Cities Coalition Network: A National Network of Local Coalitions (energy.gov)*, accessed 4-16-2023.

Step 1. Form a Coalition and hold stakeholder meetings.
Step 2. Appoint a director.
Step 3. Establish stakeholder commitments.
Step 4. Develop a program plan.
Step 5. Officially launch Coalition.
Step 6. Implement the program plan.

A coalition is simply a group of public and private sector stakeholders working together to build the EV and AFV market with the opportunity for all participants to share expertise and their challenges and opportunities. Usually, a few stakeholders hold an initial coalition meeting to identify other potential stakeholders. Early stakeholder meetings are held to understand the stakeholders' perspectives and gather support, identify a coalition director, identify the coalition's goals, form committees, identify specific stakeholder assignments, and develop a program plan. Stakeholder participation early in the process is essential to developing the local EV/AFV market and ensuring that the coalition becomes sustainable.

The benefits to forming a Clean Cities Coalition network include: (1) *credibility*, by having a diverse group of stakeholders striving for the same goal as well as being able to tap into unbiased analysis and resources from the DOE's national laboratory complex and federal funding opportunities by matchmaking needs locally with multiple partners to carry-out the work; (2) *viability*, by not being subject to changes in government leadership (DOE is only one funding source, and coalitions diversify revenue streams); (3) *ability*, to educate elected officials and other decision makers; and (4) *reliability*, by providing manufacturers and equipment suppliers a commitment that a market will be built. Ultimately, strength in numbers is the key; the more diverse the stakeholder group, the broader the public outreach and support, the greater the market penetration, and the greater chance for long-term sustainability.

The roadmap process is the heart of becoming a designated DOE Clean Cities Coalition. Coalitions also undergo a redesignation process every three years and discuss achievements and challenges. If a coalition is underperforming, DOE may implement a provisional re-designation or choose not to renew it into the network.

2 A Successful Model of Collaborative Technical Assistance

The Clean Cities Coalition network has effectively facilitated collaborative governance across sectors and levels of government within the U.S. transportation sector. Over 30 years, Clean Cities has developed a series of institutional attributes that explain its long-term success (Romero-Lankao et al., 2023) as a collaborative platform (section 2.1). These attributes have created and been enhanced by the interplay of four positive feedback areas that will be analyzed in section 2.2 (For more details see Romero-Lankao et al., (2023).

2.1 Attributes of Clean Cities

Clean Cities has a stable, flexible, and nimble **institutional structure** that has allowed members to be **semi-autonomous** while benefiting from and contributing to Clean Cities' success. Clean Cities has developed an **interdependent modularity**, a reciprocal form of interdependencies between its members that allows for interorganizational coordination while lessening the need for overt managerial control. Finally, it has a high level of **adaptability**, or the ability to adjust itself to and take advantage of a complex array of interlocking challenges (Ansell and Gash 2008).

Institutional Structure: Clean Cities provides a relatively stable institutional structure, upon which and through which, more dynamic and distributed processes and activities are organized. Within this framework, DOE and the national laboratories require that coalitions are held to standards and requirements to ensure minimum levels of engagement, such as the formal designation and redesignation process, cooperative agreements with DOE, and annual reports, along with other expectations guiding their participation in Clean Cities activities (DOE 2023).

This institutional structure is relatively stable through time because these standards ensure high levels of engagement, help coalitions plan for success, encourage consistency, and maintain the network's reputation. The structure also enables coalitions to address unique local needs while concurrently meeting national goals and objectives as they evolve and change across federal administrations. The reporting requirements confirm that coalitions execute the work for which they receive funding and help the national laboratories compile and communicate the national results and impacts of the Clean Cities Coalition Network.

Semiautonomous Coalitions: Although supported by national institutions and resources, each Clean Cities Coalition is semi-autonomous and makes independent strategic and programmatic decisions. Coalition directors are not representatives of the federal government. Instead, they are independently hired, local, entrepreneurial leaders that dedicate themselves to the Clean Cities mission. This independence has multiple benefits that allow coalitions to build networks, design creative funding streams, and tailor messaging to local contexts in a manner that national laboratories or other federal entities cannot. However, forming a coalition necessitates significant support from the local host organization (i.e., local government, planning organization, university, non-profit). This "buy-in" at the local level contributes to the success of this model by grounding these independent efforts in an existing support structure.

Because coalitions are semi-autonomous and manage their own staffing and hiring plans, coalition staff are frequently hired by and from the community. Coalition directors and employees (full time, permanent, and interns) have existing knowledge of local context and experience with the factors that affect the local transportation system. This can expedite familiarization and trust-building with stakeholders and build bridges between DOE, national laboratories, and transportation stakeholders at national, state, and local levels.

Interdependent modularity: Modularity is an organizational property that allows network participants to adapt to complex environments. In a platform context, modularity is organized around a network structure that allows interorganizational coordination while lessening the need for overt managerial control (Furlan, Cabigiosu, and Camuffo 2014). Modularity entails partnerships with broader and less focused goals—such as advancing cost-effective, domestic transportation fuels and energy-efficient mobility systems—which tend to expand and change over time, incorporating multiple coalition stakeholders and elaborating new projects and activities.

This network structure operates in a way that leverages both national laboratory resources and expertise, while remaining rooted in communities and stakeholder networks across the United States. On the local level are individual coalitions, led by coalition directors, that work to advance transportation projects in their communities. For example, they provide support to local partners and fleets as they work to reduce their transportation impacts, and they cultivate teams for technology deployment projects.

Some of the interdependencies facilitated by the laboratories' orchestration efforts are *vertical* (e.g., between DOE, VTO, national laboratories, and coalitions). The Clean Cities Coalition network has facilitated cooperation among the national laboratories (National Renewable Energy Laboratory (NREL), Argonne, and Oak Ridge) and between these and coalitions at a scale that is atypical in the federal government space. Clean Cities is predicated on cooperation and effective use of resources, and the goals of the network umbrella transcend across all participating parties. Other interdependencies are *horizontal*—between the constituents and the coalitions themselves. There are several good examples of horizontal partnerships and collaborations that highlight the potential benefits of coalitions working together. For example, the Kansas City and Dallas-Fort Worth directors realized that collaboration between their two groups could help facilitate corridor and signage build-out on I-35, which runs within both their states. Coalitions and state Departments of Transportation (DOT), from New Jersey to Nebraska, also collaborated on planning efforts to fill the gaps for EV charging and alternative fueling charging, with a DOE national laboratory leading the effort with the Illinois DOT for the U.S. Federal Highway Administration's Alternative Fuel Corridor program.

Adaptability: Over three decades, Clean Cities has been able to adaptively facilitate and manage an array of collaborative networks and projects to evolve and adapt to changing circumstances, e.g. price fluctuations of petroleum. Adaptability, or the ability to adjust itself to a complex array of interlocking challenges, is a crucial feature because collaborative platforms such as Clean Cities must frequently identify and/or rediscover their value-added role nimbly and flexibly.

Adaptability has been achieved in many ways. By being fuel-neutral, the network has been able to pivot with changing DOE and community priorities, resulting in a high level of adaptability. To maximize inclusion and impact, coalition options are designed to be flexible, and coalitions are offered a variety of ways to engage so they can create the projects and structures that fit their local needs. DOE and the national laboratories have decided to remain nimble to use and adapt their tools and knowledge to these needs and priorities of Clean Cities coalitions.

2.2 Positive Feedback

The Clean Cities Coalition network is unique as a technology deployment and technical response initiative in that it has been funded continuously by DOE or congressional appropriations for 30 years and has lasted through six federal administrations. While funding has been more consistent in recent years, funding and mission are both an outcome of the network's demonstrated impact and a key determinant of success, as this funding in more recent times has allowed coalitions to flourish. In periods of reduced funding due to changing DOE priorities, coalitions themselves maintained solvency by diversifying funding streams and leveraging each other as well as maintaining commitment to the mission. They are given the time and resources to build trust, lasting relationships, and successful coalition teams and projects in their region due to national level support and constant presence. Four positive feedback areas are at the heart of Clean Cities' success in widening and deepening innovation: attractor effect, learning, leverage, and synergies.

Attractor effect: Success begets success. Reputation, trust, and collaboration are some of the key components of Clean Cities' attractor effect. DOE and the national laboratories have allowed coalitions to build and maintain reputations as local, trusted, and knowledgeable sources of support and information. As opposed to traditional national laboratory technology deployment or technical support projects, where the laboratory joins partners with a community on a limited-term basis to execute a limited scope, Clean Cities coalitions operate within communities over years or decades. They remain embedded in local contexts and can be uniquely successful at developing trust and a positive reputation among local transportation stakeholders. This trust—a harbinger of success—can increase communities' willingness to partner and minimize the introductory period for technical response or deployment projects because there is already familiarity among collaborators, and the coalition is already familiar with local circumstances.

Learning: By working collaboratively, all parties in the Clean Cities Coalition network have been able to learn something about the nature of the issue that leads them to expand or adapt their collaborative effort. For instance, Clean Cities directors are provided training and educational opportunities from the time they join their coalitions, but they are not specialists on every vehicle, fuel, or transportation technology. There is a network of technical experts at national laboratories that are poised and ready to provide support, information, and resources as necessary to help bridge knowledge and experience gaps.

Leverage: Leverage is the "process of generating an impact that is disproportionately larger than the input" or "exercising an influence disproportionate to one's size" (Newig et al. 2014). Clean Cities has successfully utilized through strategies, such as developing shared information resources, online training, data, and analysis tools that can be recombined, thereby facilitating coordination and adaptive innovation. For instance, national laboratories communicate trends in cutting-edge research through new informational resources including brochures, fact sheets, trainings, webinars, and podcasts, ensuring coalitions have the breath of resources they need to continue to be knowledgeable, trusted assets to their state and local decision makers, stakeholders, and end-users (fleets, consumers). Coalitions can be on alert for future funding opportunities that might align with these new trends, identify local projects, and establish project teams.

Synergies: The Clean Cities Coalitions have created synergies by bringing members together with interactive knowledge, information, skills, tools, resources, and perspectives. Unlike many technical support and deployment programs in which information and technology are delivered to a stakeholder unidirectionally, the Clean Cities network is built on omnidirectional flow of knowledge and information that creates synergies by enhancing national understandings of local problems, while providing technically sound solutions that fit local needs. Resources, data, and insights flow from DOE to coalitions and national laboratories, from national laboratories to DOE and coalitions, from coalitions to national laboratories and DOE, and among/between coalitions. National laboratories are often in the middle of this flow of knowledge and information, acting as an orchestrator, conduit, and translator between communities, coalitions, industry partners, stakeholders, and DOE. DOE will have direct feedback loops with coalitions, with monthly regional calls held by DOE regional managers, and after a coalition has received direct funding for a project from DOE through funding opportunities.

Synergies are (re)created through constant communication between Clean Cities, national laboratories, and DOE that takes place through many different avenues: monthly regional calls, webinars, trainings, working groups, listening sessions, one-on-one discussions, regional meetings, a technical response service and tiger teams for direct technical assistance, conferences, and the annual network-wide, peer sharing meeting.

3 Program Outcomes and Outputs

3.1 Metrics

Each coalition evaluates its area's transportation needs and energy choices to determine the most impactful and cost-effective vehicle options, fuels, and fuel efficiency strategies and best practices (e.g., safety training). Annual reporting data is submitted to NREL and summarized in an annual activity report. Clean Cities Coalition directors submit a range of data that characterize the membership, funding, projects, and outreach and training activities of their coalitions. Equally important, within their coalitions' boundaries, they include data about use of AFVs (including EVs and hybrid electric vehicles [HEVs]), sales of alternative fuels, idle reduction initiatives, fuel economy improvement activities, and programs to reduce vehicle miles travelled. An annual energy use impact score in gallon gasoline equivalents, which is a metric that measures combined progress in energy savings from efficiency projects and increased fuel diversity through use of alternative fuels, is used to track impact[4]. Figure 2 depicts the historical energy use impact of electric vehicles and other alternative fuel vehicles from 2004 to 2021.

[4]Clean Cities accomplishments, https://cleancities.energy.gov/accomplishments/, accessed 4-12-2023.

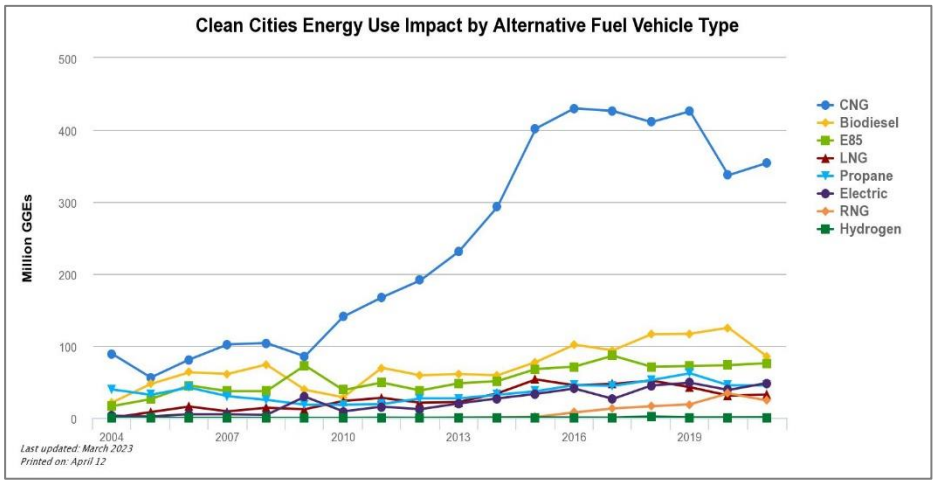

Figure 2. The historical energy use impact of electric vehicle and other alternative fuel vehicles from 2004 to 2021. Source: Alternative Fuels Data Center. [5]

During the program's 30-year history, Clean Cities Coalitions have collectively saved the equivalent of 13 billion gallons of gasoline[4] and eliminating more than 67 million tons of emissions through projects using alternative fuels, fuel efficiency technologies and public awareness strategies (Singer, Johnson, 2021). And with this reduction in gasoline came with putting 1.3 million alternative fuel vehicles on the road[4]. And today there are more than 52,000 public charging stations across the nation some of which can be attributed to local Clean Cities efforts6.

3.2 EV Analysis and Tools for Decision Makers

The Clean Cities network has the support of the DOE's national laboratory system with its analysis-generating tools, communication products, and training. As mentioned previously, the Clean Cities network is often the source of data that is collected and then used in this analysis, as well as providing user feedback and needs for additional support.

Table 1 lists the many tools that support the work of the Clean Cities program. EV-related tools highlighted include the suite of AFLEET (Alternative Fuel Life-Cycle Environmental and Economic Transportation) tools, such as the utility rate charging and infrastructure emissions calculators; EVolution: Education on E-Drive Vehicles; HEVISAM (Heavy-duty Electric Vehicle Infrastructure Scenario Analysis Model); and JOBS EVSE (Electric Vehicle Supply Equipment). Also, the Alternative Fuels Data Center has numerous tools to assist those who are considering purchasing an EV, EV drivers and fleet managers, including the Station Locator, Laws and Incentives Database, EVI-Pro Lite, and Electricity Sources and Emissions tools.

[5] Maps and Data, Alternative Fuels Data Center: Maps and Data - Clean Cities Energy Use Impact by Alternative Fuel Vehicle Type, accessed 4-12-2023.
[6] Station locator, Alternative Fuels Data Center: Alternative Fueling Station Locator (energy.gov) accessed 4-12-2023.

Table 1. EV Analysis and Tools for Decision Makers

Tool Name and URL	Purpose	Benefits	Primary Decision Makers Served
JOBS EVSE (JOBS Electric Vehicle Supply Equipment) https://www.anl.gov/esia/jobs-evse	Estimates economic impacts of installing electric vehicle (EV) charging infrastructure	JOBS EVSE 2.0 allows users to quickly estimate the economic impacts associated with the development, construction, and operation of electric vehicle charging stations. The impacts range from job creation to ripple-effect economic activity, such as local spending.	Planners, local governments
AFLEET Suite of Tools (Alternative Fuel Life-Cycle Environmental and Economic Transportation) https://afleet.es.anl.gov/home/	Estimates fuel usage, greenhouse gas (GHG) emissions, air pollutants, and cost of ownership of light-, medium-, and heavy-duty vehicles	AFLEET estimates and compares petroleum use, greenhouse gas emissions (GHGs), air pollutant emissions, and cost of ownership for conventional and alternative fuel vehicles (including EVs) and GHG emissions for alternative fuel infrastructure.	Planners, local governments
		AFLEET results serve as great resources to educate fleet operators and potential consumers on the energy and environmental benefits of EVs. The cost of ownership allows for the comparison between the cost of owning EVs and traditional internal combustion-engine vehicles (ICEVs) under user-defined scenarios, which demonstrates the economic savings of owning an EV and potentially promotes the adoption of EVs among fleet operators and individual consumers.	Fleet operators, individual consumers
	AFLEET Tool Highlights		
	EV Utility Rate Calculator	AFLEET's EV Utility Rate Calculator applies regional utility rates for EV residential, public, and fleet charging, accounting for rate type, charger rating, charging period/strategy, and vehicle requirements; and addressing energy, demand, and fixed charges for summer and winter and off-peak, mid-peak, and on-peak variability.	Fleet operators, individual consumers

Table 1. EV Analysis and Tools for Decision Makers, *continued*

Tool Name and URL	Purpose	Benefits	Primary Decision Makers Served
	AFLEET Tool Highlights, *cont.*		
	EV Charging Costs Calculator	AFLEET's EV Charging Cost Calculator assesses the levelized and net present value (NPV) costs of charging a fleet's electric vehicles, along with utilization, capital costs (charger and make-ready), annual operating costs (communications, warranty, maintenance), and electricity costs, to present a true, organization-centric cost of charging an EV fleet.	Fleet operators, individual consumers
CHECT (Charging Hub Economic and Costing Tool) https://www.anl.gov/esia/decision-support-for-ev-charging-cost-analysis	Estimates the levelized cost of charging ($/kWh) for various EV charging hub scenarios considering different charging technologies, ownership models, and local utility rates	Examining the levelized cost of EV charging in multi-unit dwellings provides very important equity implications for planners and local governments, guiding them toward effective planning and policies to increase access to EV charging facilities by residents living in multi-family housing.	Planners, local governments
		Using levelized charging costs based on user-defined scenarios, users can identify the most cost-efficient options for installing and operating charging facilities	Property owners, private companies, utilities, fleet operators
EVolution (Education on E-Drive Vehicles) https://evolution.es.anl.gov/	Allows users to compare the benefits and costs of specific EV models compared to specific conventionally fueled vehicles in their locations	EVolution offers a user-friendly interface to educate fleet operators and consumers on the basic concepts of EVs. It also enables users to conduct case-by-case comparisons of the costs and benefits of alternative fuel vehicles of various sizes, prices, and powertrains. Knowledge gained from EVolution can help guide informed choices to transition to EVs by consumers and fleet operators.	Fleet operators, individual consumers

Table 1. EV Analysis and Tools for Decision Makers, *continued*

Tool Name and URL	Purpose	Benefits	Primary Decision Makers Served
	AFLEET Tool Highlights, *cont.*		
HEVISAM (Heavy-duty Electric Vehicle Infrastructure Scenario Analysis Model) https://www.anl.gov/esia/decision-support-for-ev-charging-cost-analysis	Estimates levelized charging costs ($/kWh) from direct current fast charging (DCFC) stations for medium- and heavy-duty electric fleets	Based on user-defined scenarios regarding fleet types, hourly demand, and charging rates, HEVISAM provides a comprehensive picture of the charging costs for a specific electric fleet, including capital costs, O&M costs, charging stations' energy costs, and charging stations' cash flows.	Fleet operators
AFDC (Alternative Fuels Data Center) https://afdc.energy.gov/	Features multiple tools, capabilities, and datasets related to alternative fuels and advanced vehicles	Tools and datasets accessible through AFDC provide state-level comprehensive summaries on the development of alternative fuel technologies. The AFDC allows governments to monitor the local adoption of alternative fuel vehicles and identify regions and areas with limited access to transportation options.	Planners, local governments
		Fleet operators can access very detailed information through AFDC regarding their fleet application types and pathways to electrification. Consumers can use AFDC learn which EV charging stations are nearby and on their routes to other locations.	Fleet operators, individual consumers

3.3 Peer Exchange

Clean Cities peer-to-peer mentorship leverages the deep expertise of the network to facilitate collaboration among coalitions and foster opportunities for coalition directors to bolster their leadership abilities. Peer-to-peer mentorship provides support for coalitions looking to tackle a challenge or wanting to build capacity in a certain area. Coalition directors are paired with peer mentors, who provide guidance and support to develop solutions based on a coalition's unique needs. Peer-to-peer collaborations can occur one-on-one or in small group formats, at national or regional conferences, allowing for opportunities to build relationships with like-minded peers working toward common goals and operating under similar constraints. DOE supports this effort by having a mentoring program and having regional federal staff who interact with Coalition directors, serving as a coach, liaison between DOE, national laboratories, and coalitions themselves to provide direction, lessons learned, information and resources. Regional virtual calls take place monthly, as well as annual regional meetings for more in-depth exchanges.

3.4 Outreach Efforts to Fleets, Consumers and Disadvantage Communities

Local tactics for impactful outreach include organizing ride and drives at local events for consumers or fleets; organizing auto show experiences for EVs; speaking to diverse audiences in communities and conferences; providing related content for schools (e.g., trade, STEM programs); and partnering with other place-based organizations interested in EVs. According to the 2021 Annual Activity Report, Clean Cities Coalition directors logged more than 3,756 outreach, education, and training activities in 2021, which reached an estimated 25 million people (Singer and Johnson 2021).

At the advent of the Biden Administration, Executive Order (EO) 14008, Sec.223 was signed, making equity a key focus with 40 percent of overall benefits of certain federal investments focused on clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and development of clean water infrastructure flow to disadvantaged and over-burdened communities (The White House 2021). This Executive Order called on Director of the Office of Management and Budget (OMB), the Chair of the Council on Environmental Quality (CEQ), and the National Climate Advisor, in consultation with the White House Environmental Justice Advisory Council (WHEJAC), to jointly publish guidance on how certain federal investments could be directed to this goal for its Justice40 Initiative. In July 2021 this interim guidance provided implementation direction to an initial set of covered programs under the Justice40 Initiative; VTO's Clean Cities initiative was one of these pilots (The White House 2021). With the design of this network, Clean Cities Coalitions are poised to improve equitable access to clean transportation mobility options in disadvantage communities by engaging locally, listening to needs, and co-developing projects to meet those needs.

To achieve the goals of the EO and subsequent guidance, the Clean Cities Energy and Environmental Justice initiative (CCEEJI) was born to provide coalitions with training and resources to engage with disadvantaged communities effectively and meaningfully. The initiative has had a deliberate, phased-in approach to building Coalitions' capacity in this area with DOE and national laboratories leading the effort. The first phase included a series of webinars for all Coalitions to participate and learn about community engagement best practices, historic transportation inequities, and metrics for evaluation. Deep-dive training workshops on community engagement followed on as the second phase of CCEEJI of a cohort of 29 coalitions. A competitive process was implemented in the third phase resulting in 17 coalitions selected to receive funding for the hire of community engagement liaisons (CELs) for up to two years, additional training and coaching for the coalition staff and CELs. While it is too early to gauge the impact of this training and the hiring of CELs, Coalition directors are intent with making it a success and are looking for other revenue streams to make the CELs permanent positions within their coalitions. This initiative is another example of the Clean Cities network's adaptability, understanding of the local landscape, and willingness to help meet a national goal with national laboratories supporting its growth.

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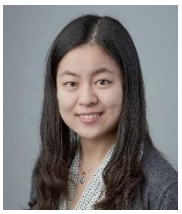
Presenter Biographies

Marcy Rood began her career in clean transportation deployment, building the Clean Cities program, at DOE from 1995 to 2008. She currently manages a team of experts at Argonne National Laboratory (Argonne) supporting DOE VTO's Technology Integration program and the Clean Cities network in areas such as the Energy and Environmental Justice Initiative; analysis of EV/AFV markets; and management of the development of emissions and economic impact tools, training, and information products. In partnership with Illinois DOT, she leads planning efforts for the I-80 Mid-America Clean Fuels Corridor to enable consumers and fleets to drive electric from New Jersey to the Nebraska border. She leads Argonne's work for the DOE-funded Mid-Atlantic Electrification Partnership to build community electric vehicle (EV) ecosystems and connection of these hubs through EV corridors in Virginia, West Virginia, Maryland, and the District of Columbia.

Dr. Paty Romero-Lankao is a distinguished research scientist at the National Renewable Energy Laboratory. Paty examines key interactions among people, cities, and climate, with a particular emphasis on equitable and sustainable energy transition as well as people's capacity to pursue their life goals and address sustainability challenges. Throughout her career, she has developed a considerable body of highly regarded interdisciplinary research, resulting in several research grants, and 145 peer-reviewed publications. Paty has extensive experience as a sociologist working across disciplines, and at the science-policy interface in the US and many other cities internationally. Paty was co-leading author to Working Group II of the Nobel prize-winning IPCC Fourth Assessment Report (AR4). Currently, she is leading the social and policy approaches to LA100 Equity Strategies.

Sandra Loi is a project manager in the Center for Mobility Integrated Sciences (CIMS) at NREL in Golden, Colorado. In her role, Sandra is NREL's point person providing technical assistance to the network of more than 75 local Clean Cities Coalitions throughout the United States. In supporting the DOE 's Technology Integration program, she is the lead for coordinating events, shaping training opportunities, and organizing outreach activities. Sandra also strengthens the network by cultivating partnerships with community organizations, industry partners, media, and other stakeholders.



Xinyi (Sydney) Wu is a postdoctoral researcher at Argonne National Laboratory. Her research focuses on sustainable transportation, alternative fuel corridors, as well as the energy and environmental impacts of vehicle electrification. She participated in multiple research projects that assess the influences of increasing market penetration of advanced and alternative fuel vehicles. She also maintains several analytical models of Argonne and tracks the adoption of plug-in electric vehicles in the United States.