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# Electric vehicle program designs and strategies to enhance equitable deployment

Jason Ball, Sydney Forrester, Alexandra Grayson, Andrew Satchwell

December 2023



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# **Electric Vehicle Program Designs and Strategies to Enhance Equitable Deployment**

Prepared for the  
Joint Office of Energy and Transportation  
U.S. Department of Energy and the U.S. Department of Transportation

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## Acronyms and Abbreviations

CBO	Community Based Organization
DAC	Disadvantaged community
DCFC	DC fast charger
DOE	Department of Energy
DOT	Department of Transportation
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
ICE	Internal combustion engine
JOET	Joint Office of Energy and Transportation
JUST	Joint Office United Support for Transportation
MFH	Multi-family home
MUD	Multi-unit dwelling
PUC	Public Utilities Commission

# 1. Executive Summary

A sharp increase in federal funding to support the deployment of electric vehicle supply equipment (EVSE) is now available, including a joint total of over \$7.5 billion from the Bipartisan Infrastructure Law and Inflation Reduction Act.<sup>1</sup> Most of this funding is subject to the federal Justice40 Initiative and local policies to promote the equitable distribution of program dollars and impacts.<sup>2</sup> As a result, there is an immediate need to center equity as a core objective for electric vehicle (EV) infrastructure deployment programs.

Policymakers, state officials, community leaders, and program managers are challenged to ensure equitable community-level outcomes while accelerating the deployment of EVSE at an unprecedented scale. As these decision-makers begin to implement equity-focused EVSE programs or revise existing ones, they may look for an understanding of common practices across the U.S. This report synthesizes and categorizes information from more than five dozen sources published between 2015 and 2023 – including national, regional, and state-level EVSE program summaries, as well as updates, policy briefs, proposals, whitepapers, and reports – and describes three Key Activities to support informed decision-making (see Table 1.1).

**Table 1.1 Key Activities Overview**

Key Activity	Description
<b>Cultivating Partnerships</b>	Cultivating effective partnerships allows for the integration of community perspectives and priorities in the planning and implementation of EVSE programs.
<b>Identifying a Community's Unique Needs</b>	Equity-focused EVSE programs should recognize existing barriers to EVSE deployment and create alignment between program goals and a community's needs and wants.
<b>Developing an Iterative Program Design</b>	Planning and implementation of equity-focused EVSE programs should include continuous measurement, evaluation, and improvement.

Each Key Activity is accompanied by three Supporting Processes, along with example strategies for implementing equity-focused EVSE deployment programs. These processes are intentionally broad and should be refined according to specific program and community needs. Decision-makers can develop detailed action plans by using this report's key activities and processes and then incorporating specific systemic and community factors.

Decision makers face a significant challenge to overcome institutional, organizational, and social barriers to equitable EVSE deployment. Consequently, this report underscores the extent to which meaningful community engagement, particularly in low-income and marginalized areas, is essential for developing and implementing effective, equity-focused EVSE programs.

<sup>1</sup> For more information about recent federal EV funding programs, see <https://www.transportation.gov/rural/ev/toolkit/ev-infrastructure-funding-and-financing/federal-funding-programs>.

<sup>2</sup> *Justice40: A Whole-Of-Government Initiative* <https://www.whitehouse.gov/environmentaljustice/justice40/>.



## 2. Introduction

U.S. electric vehicle (EV) adoption is rapidly increasing, with total EV sales nearly tripling from 2018 to 2022 (IEA, 2023). Federal, state, and local policies (including tax rebates, grants, and retail rate designs) aim to accelerate reductions in upfront and ongoing EV costs and support the widespread deployment of the charging infrastructure known collectively as electric vehicle supply equipment (EVSE). For example, the Bipartisan Infrastructure Law, which includes the National Electric Vehicle Infrastructure (NEVI) Formula Program, authorizes \$7.5 billion in grants to support the deployment of EV charging.

At the same time, there is growing recognition that EVSE investments should ensure an equitable sharing of benefits from transportation electrification. For instance, the Justice40 Initiative requires federal agencies to ensure that 40% of benefits from covered programs flow to disadvantaged communities (DACs).<sup>3</sup> This requirement will affect programs in any jurisdiction that receives federal dollars for EVSE deployments from a Justice40-covered program. To support equity in federally funded EV infrastructure deployment efforts, especially NEVI, the Joint Office of Energy and Transportation (JOET) has established several overarching principles and goals. These include improving clean transportation access through EVSE siting decisions; decreasing the burden of transportation energy costs by enabling reliable access to affordable charging; reducing environmental exposures to transportation emissions; and aiming to build a transportation electrification network that is affordable, equitable, accessible, reliable, and safe.<sup>4</sup>

In support of these goals, this report provides policymakers, state officials, community leaders, and program managers as well as Department of Energy (DOE) and Department of Transportation (DOT) staff (collectively, decision-makers) valuable insights on improving equity outcomes in the deployment of EVSE. Decision-makers can use this report's recommendations – which span design and implementation strategies, common practices, funding allocation and incentives models, community engagement approaches, and the tracking of benefits and outcomes – to create more equitable program outcomes.<sup>5</sup> Further, given the importance of customizing solutions to fit specific goals and objectives, decision-makers can help ensure program success by pursuing the three Key Activities described herein.

This report does not account for the unique policy, regulatory, and financial context that decision-makers operate in. For example, programs may face funding challenges at a planning and management level, which this report does not address (i.e., this report assumes funding is available for program managers to engage in these processes). Moreover, this report does not make any subjective prioritization of whether the cited programs may have been "successful" or not. Instead, the focus of this report is identifying common approaches to equity-focused outcomes within EVSE deployments and programs.

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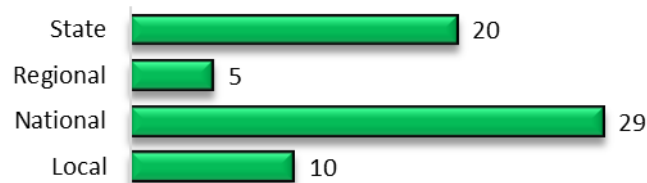
<sup>3</sup> *Executive Order 14008: Tackling the Climate Crisis at Home and Abroad* (January 27, 2021). For a list of DOE-covered programs, see <https://www.energy.gov/diversity/doe-justice40-covered-programs>.

<sup>4</sup> See generally: <https://driveelectric.gov>.

<sup>5</sup> This report primarily focuses on advancing equity and accessibility in single-passenger EVSE deployment programs. Other challenges exist (e.g., for public transportation, micro-mobility, EV supply chain, and other areas) that also require further research and support.

## 2.1 Analytical Approach

This report draws on 64 documents published between 2015 and 2023 – including national, regional, and state-level EVSE program summaries, updates, policy briefs, proposals, whitepapers, and reports – to create a representative sample of programs needed to summarize common design strategies, implementation practices, challenges, and considerations. Figure 2.1 disaggregates these references by geographic level.



**Figure 2.1 Geographical Breakdown of Research**

This report identified 588 unique quantitative and qualitative data points across four essential categories:

- Program design related to implementation, funding allocation, or eligibility
- Different user eligibility and usage models
- Community engagement, including considerations of different methods of community outreach, and how/if trusted community organizations are involved
- Practices for tracking benefits and impacts

These data points were then aggregated into a matrix of 20 themes and nine core areas. Data points were assigned themes based on their strongest characteristics; if a data point clearly applied to two themes (e.g., metrics and education/awareness), it was assigned to both. Core areas subdivide themes according to the JOET principles and goals referenced above. Consequently, the report’s final structure both reflects and summarizes the most important high-level takeaways observed across the nearly 600 discrete data points considered in this report. At a high level, those activities and processes are:

- **Key Activities.** Key activities are broad areas of effort decision-makers should engage in when implementing equity-focused EVSE programs. This report identifies three interrelated key activities:
  1. Cultivating Partnerships
  2. Identifying a Community’s Unique Needs
  3. Developing an Iterative Program Design
- **Supporting Processes.** Each Key Activity contains three Supporting Processes to assist decision-makers in establishing and achieving EVSE equity goals. These processes are generic and do not capture jurisdictional nuances; instead, they identify and organize common actions that decision-makers can use to improve a program’s equity outcomes.

The remainder of this report describes these activities and processes in more detail.

### 3. Key Activity #1: Cultivating Partnerships

Building equitable programs through transparent and inclusive partnerships with local communities is a common action across many equity-focused EVSE programs.<sup>6</sup> Cultivating effective partnerships allows for the integration of community perspectives and priorities in the planning and implementation of EVSE programs. This inclusion supports equity outcomes by generating robust community engagement to identify solutions in underserved communities (e.g., Slowik & Nicholas, 2017).

Decision-makers can leverage partnerships across many valuable assets – such as diverse expertise, novel funding mechanisms, and community-level decision-making – that enable equity in EVSE deployments and programs. Cultivating these partnerships consists of three processes:

- Stakeholder and inter-agency engagement
- Developing funding structures
- Conducting general outreach

Effective partnerships require proactive outreach, fair and culturally competent engagement, and collaboration across multipronged, iterative processes, along with clearly established organizational ownership of outcomes.<sup>7</sup> Clearly articulating goals and outcomes for community involvement forms the necessary foundation for identifying a community’s unique needs, as further discussed in Section 4. Therefore, equity-focused EVSE programs can benefit from actively mitigating barriers to community participation (e.g., by providing childcare and food services at local events) (Huether, 2021; Allen & Gibson, 2022).

#### 3.1 Stakeholder and Inter-Agency Engagement

The stakeholder and inter-agency engagement process introduces diverse perspectives and expertise to help ensure partnerships under EVSE programs effectively address community needs. The requisite engagement and relationship building that occurs at the outset of a program or project is key to developing trust and cooperation. Engagement may also be incorporated or elevated at any point throughout a program or project to beneficial effect. Ultimately, this process enables strong partnerships and helps EVSE programs consider a community’s unique needs.<sup>8</sup>

##### 3.1.1 Supporting Stakeholder Engagement

Laying the groundwork for EV and EVSE adoption requires collaboration among a wide range of entities including Community Based Organizations (CBOs), advocacy groups, local governments, planning agencies, electric service providers, EVSE providers, and others.<sup>9</sup> Engagement need not be limited to existing stakeholders or groups within a program’s operating framework (e.g., advocates within a

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<sup>6</sup> See generally: Huether, 2021; Huether et al., 2022; Dillon et al., 2022; NESCAUM, 2022; Rushlow et al., 2015; Guo & Kontou, 2021; Moriarty, 2023; PURA, 2021; Shared-Use Mobility Center, 2020; McAdams, 2022; Hardman et al., 2021; Slowik & Nicholas, 2017.

<sup>7</sup> See generally: Kelly & Singer, 2017; U.S. DOT, 2022; Moses & Brown, 2023; Huether et al., 2022.

<sup>8</sup> See generally: Shaw & Diaz, 2022; Shared-Use Mobility Center, 2020; Moses & Brown, 2023; Slowik & Nicholas, 2017;

<sup>9</sup> U.S. DOT, 2022; Moriarty, 2023; Carreon et al., 2022.

utility’s resource program). Engaging with groups promoting racial equity and environmental justice, for example, can ensure that innovative programs are implemented successfully (Shaw & Diaz, 2022).<sup>10</sup> Engagement should proceed in a holistic manner that considers the goals of the full program as opposed to planning one project at a time. For instance, a pilot with an objective of scalability could include developing vendor contracts with clear requirements and performance metrics (e.g., charger uptime) subject to stakeholder input (Lepre et al., 2022). Table 3.1.1 provides examples for increasing the scope of engagement by stakeholders.

**Table 3.1.1 Stakeholder Engagement: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
Partner with CBOs	<ul style="list-style-type: none"> <li>Allocate funding for marketing programs and provide education about participation.</li> </ul>	Gahlaut et al., 2022
	<ul style="list-style-type: none"> <li>Provide seed grants to enable participation, with clear expectations around policy objectives and priorities.</li> </ul>	Shaw & Diaz, 2022
Increase Participation of Historically Underrepresented Stakeholders	<ul style="list-style-type: none"> <li>Dedicate funding and up-front incentives for group participation.</li> </ul>	Carreon et al., 2022
	<ul style="list-style-type: none"> <li>Build networks that facilitate outreach to encourage participation (e.g., the Colorado ReCharge coaching program).</li> </ul>	Gaillard, 2022

While broadening the scope of participation is essential, decision-makers should also consider the tradeoffs between forming smaller, fast-moving teams and broader, more inclusive groups (Kelly & Singer, 2017). These trade-offs are most relevant to the development phase of projects, when unique expertise and leadership can be critical (Dillon et al., 2022). The Clean Cities American Recovery and Reinvestment Act Projects illustrates the challenge here - projects with more than 10 partners could support the cost-share requirements of smaller stakeholder groups, allowing them to continue to participate despite limited resources. But this led to a corresponding rise in the project’s intricacies and some program managers became overwhelmed by the organizational complexity (Kelly & Singer, 2017). Flexible, balanced stakeholder engagement can manage such complexities in EVSE deployments while helping to identify a community’s needs (see Key Activity #2).

### 3.1.2 Addressing Challenges to Stakeholder Engagement

Challenges to stakeholder participation include accessibility and engagement barriers.<sup>11</sup> Power dynamics within an existing participation framework can also be complex for new or smaller groups to navigate (Shaw & Diaz, 2022). From an administrative perspective, simply coordinating higher-level staff

<sup>10</sup> For more information on Energy Justice see: [Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All](#) (April 21, 2023).

<sup>11</sup> Language is an example of an accessibility barrier and is discussed in Section 3.3.1.

schedules can be time-consuming and delay project milestones and stakeholder engagement opportunities (Shared-Use Mobility Center, 2020). Addressing barriers like these helps ensure that stakeholders remain engaged throughout a program’s implementation. Some helpful strategies to overcome engagement barriers include:

- **Prioritize relationship building.** Institutional decision-makers should prioritize relationship building through frequent communication among existing and new stakeholders and institutions. This increases the likelihood of equitable outcomes in an EVSE program (U.S. DOT, 2022). For example, Puget Sound Energy (PSE) hosted workshops with local community stakeholders to better understand the needs of low-income customers; a year later, PSE’s relationships with local organizations and the feedback it obtained were instrumental in developing EV pilots based on mutually beneficial objectives (Huether, 2021).
- **Gather support from policymakers.** Involving policymakers – specifically, leaders with sufficient authority to establish policy guidance for a program, such as agency leaders or members of a law-making body – creates legitimacy among stakeholders and facilitates coordination (Rushlow et al., 2015; U.S. DOT, 2022). For example, the BlueLA Carshare program noted that the participation of mayors and council members supported early collaboration among critical stakeholders and facilitated inter-departmental efforts to deploy the program around the city (Gahlaut et al., 2022).
- **Formalize and adopt primary goals, principles, and commitments.** Establishing goals and principles early on can help smaller groups overcome challenges, especially when paired with additional resources to navigate procedures.<sup>12</sup> Larger groups can especially benefit from adhering to an agreed-upon scope and boundaries. For example, the multi-state Towards Equitable Electric Mobility Community of Practice utilized community agreements, a standing facilitation group, and ongoing peer-learning sessions and coaching to demystify participation procedures and support partners with limited resources (Shaw & Diaz, 2022). Collectively, these tactics successfully built state-level capacity for institutions and organizations to work together.

Developing trust between partners at the institutional and stakeholder levels facilitates the permitting, installation, and operation of EVSE. This helps align the deployment of EVSE with other goals and mandates, like broader electrification efforts or the reduction of emissions. In addition, coordination and planning among public, non-profit, and private entities can improve grid and community resilience, which is an increasingly common consideration for many programs (Dollen & Brickhouse, 2022).

### 3.2 Developing Funding Structures

Equitable funding structures can address EVSE access barriers, particularly for DACs, by enabling public funding for EVSE that may need a stronger business case to justify private sector investment, such as chargers in low EV adoption areas (Hsu & Fingerman, 2021). Generally, EVSE programs will design and implement funding structures early on. However, for multi-phase deployments, partner feedback may

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<sup>12</sup> For example, principles could include “Take into account the barriers specific communities might face in participating in the EV charging planning and implementation process.” See Zhou, 2022 for a comprehensive list.

prompt revisions to the funding structure later in the program (Shared-Use Mobility Center, 2020). Regardless of timing, equitable funding directly impacts the outcomes of an EVSE deployment while also providing resources for partners participating in a program. These resources are important to enabling Key Activity #2, Identifying a Community’s Unique Needs (see Section 4).

### 3.2.1 Supporting Equitable Funding Structures

Decision-makers can partner with community-level entities to directly target specific populations, particularly within DACs, to ensure that programs equitably distribute available funding across demographic indicators (Slowik & Nicholas, 2017). For example, expanding funding opportunities to include projects at multi-unit dwellings (MUDs) can address a need for ongoing resource allocations targeting DACs. However, efforts beyond simply expanding the eligibility pool for EVSE funding may be required to ensure equitable program outcomes (Dillon et al., 2022). Because strong positive relationships persist between income and EV ownership (i.e., EV owners are more likely to have higher incomes) and are evident in both MUDs and DACs, complementary programs to encourage or enable EV ownership in these communities could improve the likelihood of equitable EVSE program outcomes.<sup>13</sup> Table 3.2.1 provides examples for building program funding structures to improve equitable outcomes, along with implementation examples.

**Table 3.2.1 Equitable Funding Structures: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
Include Funding Partners that Focus Specifically on DACs	<ul style="list-style-type: none"> <li>Partner with green banks.</li> <li>Identify local micro-transit and car-sharing programs that work directly with targeted populations, such as low-income members of DACs or MUDs.</li> <li>Work with CBOs to conduct outreach and deliver incentives directly to members of DACs and MUDs based on relevant equity factors (e.g., pollution burden).</li> </ul>	Gahlaut et al., 2022
	<ul style="list-style-type: none"> <li>Allow utility funding, such as margin allowances, to cover infrastructure costs or be reimbursable.<sup>14</sup></li> <li>Use funding to cover operational expenses and provide alternative sources of capital for targeted programs (e.g., Los Angeles Metro and Via Partnership, DIVVY and Capital bike share programs).</li> </ul>	Klein, 2022
Increase Equitable Funding Opportunities		McAdams, 2022
		Gahlaut et al., 2022

<sup>13</sup> See generally: Gaillard, 2022; Moses & Brown, 2023; Guo & Kontou, 2021; Pierce, et al., 2020; Borenstein & Davis, 2015; Liu et al., 2020; Linn, 2022; Pierce, et al., 2019; Ju et al., 2020; Buchanan et al., 2021; Hardmant et al., 2021; Rubin & St-Louis, 2016; NESCAUM, 2022; Jamieson et al., 2022; Ge et al., 2021; Nguyen, 2020; Rushlow, et al., 2015; Kevin et al., 2022; Allen & Gibson, 2022; Hsu & Fingerma, 2021.

<sup>14</sup> In some jurisdictions, margin allowances are provided by utilities to cover some or all costs associated with new electrical or natural gas service.

### 3.2.2 Addressing Barriers to Equitable Funding Structures

Access restrictions, such as requirements to match awarded funding, can impede equitable participation by program partners (Shared-Use Mobility Center, 2020). Below are some mitigation strategies for addressing such access restrictions to generate more equitable funding structures.

- **Stage financial commitments.** It may be difficult for capital-constrained organizations to participate in cost-sharing programs that require up-front or lump-sum payments, as it can reduce their capacity for other projects (Shared-Use Mobility Center, 2020). Staging payments or pushing financial commitments closer to project execution timelines can reduce this gap (Kelly & Singer, 2017).
- **Coordinate funding logistics.** Public funding programs often include matching obligations. Using multisource funds is a standard solution for partners, but each source can possess differing requirements (e.g., timelines, allowable expenses, and administrative rules). These requirements strain partner and program resources, especially when funding announcements overlap with other project deadlines. Allowing partners to use program funding to track and monitor these requirements can help reduce this burden (Shared-Use Mobility Center, 2020).
- **Reduce restrictions on funding uses.** Programs that allow funds to offset energy rates as well as install EVSE in multiple locations can be impactful, particularly for DACs (McAdams, 2022).<sup>15</sup> Restrictive programs that fund only physical EVSE installations and not ongoing costs for using this infrastructure may exacerbate inequalities or create problems for other programs. For example, public charging costs can be 2-4x higher than home charging (McAdams, 2022, Hardman et al., 2021). Allowing funding to reduce these costs while also installing EVSE can encourage EVSE utilization, particularly in DACs (Hardman et al., 2021).

Program partners should have opportunities to provide feedback to decision-makers about improvements in the access and use of program funds. Incorporating such feedback is also essential to continuously improving program designs, as discussed in Key Activity #3, Developing an Iterative Program Design (see Section 5).

### 3.3 Conducting General Outreach

General outreach is the dissemination of information within a community directly affected by a program. This process is distinct from engagement because it is a form of one-way communication.<sup>16</sup> This process is focused on promoting education, awareness, and training and thus general outreach relies on partnerships with local decision-makers and community-based institutions. Without sufficient outreach, Key Activity #2 (Identifying a Community's Unique Needs) may be unable to generate

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<sup>15</sup> Additionally, program funding can be used to reduce ongoing operations and maintenance expenses (e.g., repair broken chargers), increasing the likelihood that the EVSE installation will remain in use by the local community.

<sup>16</sup> Outreach represents a part of procedural justice, which requires both the disclosure of information (i.e., outreach), and actively encouraging participation in decision-making (i.e., engagement). See Heffron et al., 2015; Sovacool & Dworkin, 2015.



participation sufficient to yield meaningful outcomes that are aligned with a community’s needs.

### 3.3.1 Supporting General Outreach

CBOs are invaluable partners for delivering outreach projects and enhancing existing relationships with other organizations. Overall, including CBOs in EVSE program development generally improves the likelihood of equitable outcomes (Slowik & Nicholas, 2017). For example, CBOs are particularly well suited to informing the creation, branding, and distribution of user-friendly written materials like straightforward signage that identifies charging locations and provides transparent prices.<sup>17</sup> Table 3.3.1 provides sample outreach objectives of potential interest to decision-makers and ways to support each goal.

**Table 3.3.1 General Outreach: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
Increase Demand for EVSE	<ul style="list-style-type: none"> <li>● Raise awareness of used and secondary markets for EVs.</li> </ul>	Rushlow et al., 2015
	<ul style="list-style-type: none"> <li>● Raise awareness of incentives available to reduce upfront costs as well as lower-than-expected operating costs.</li> </ul>	Nguyen, 2020
Engage Directly with Community Members	<ul style="list-style-type: none"> <li>● Set up vehicle showcases or “Ride and Drive” events to boost customer knowledge and access to experts.</li> </ul>	FORTH, 2019
	<ul style="list-style-type: none"> <li>● Partner with food vendors and high-profile speakers to increase participation.</li> </ul>	Moriarty, 2023
	<ul style="list-style-type: none"> <li>● Host multiple events across different locations.</li> </ul>	Shared-Use Mobility Center, 2020
	<ul style="list-style-type: none"> <li>● Speak at homeowner meetings and events.</li> </ul>	Jamieson et al., 2022

<sup>17</sup> See generally: Kevin et al., 2022; Shared-Use Mobility Center, 2020; Slowik & Nicholas, 2017; Allen & Gibson, 2022; Rushlow et al., 2015.



Objectives	Implementation Practices	Sources
Improve Partnerships and Engagement in Rural Areas	<ul style="list-style-type: none"> <li>● Open dialogue with local service agencies to improve enrollment.</li> </ul>	Slowik & Nicholas, 2017
	<ul style="list-style-type: none"> <li>● Disclose and advertise principles, commitments, and community agreements as models for implementation.</li> </ul>	Shaw & Diaz, 2022
	<ul style="list-style-type: none"> <li>● Encourage local government to lead by example with charging sites at public facilities or near clusters of MUDs.</li> </ul>	
	<ul style="list-style-type: none"> <li>● Establish procedures and guidance on administering charging programs that coordinate usage among residents.</li> </ul>	DeShazo et al., 2017

### 3.3.2 Addressing Barriers to General Outreach

Overall, the lack of access and resources devoted to education, awareness, and training are significant barriers to the overall adoption of EVs and utilization of EVSE.<sup>18</sup> To overcome these barriers, general outreach should be a consistent part of program implementation. Consistency can be achieved if decision-makers:

- **Create specific outreach plans.** A common outreach challenge for plans is they can be light on specifics or fail to identify the target audience (Huether et al., 2022). To address this challenge, smaller-scale and more targeted communication can occur in parallel with high-level and generalized outreach programs.
- **Provide technology support.** Rural communities and DACs may have significant access barriers to certain technologies like computers, smartphones, or the Internet (Hardman et al., 2021; Hsu & Fingerman, 2021). Creating alternative participation pathways, like outdoor, all-weather computer kiosks, is one solution to this problem. A central location also allows organizations to refine the sign-up process, walk users through each step, educate residents and staff on using the program, and administer user surveys throughout the program (Shared-Use Mobility Center, 2020).
- **Improve connections among state-level partners.** These partners may already have experience facilitating consistent communication among specific communities and institutions. Task forces can leverage this existing expertise to generate localized and comprehensive EV-ready planning, zoning, and local code requirements (Klein, 2022).

Community partners may have direct knowledge of unique outreach challenges facing specific communities. Centering their expertise is vital to developing successful strategies for gathering feedback on a program’s equity implications and ultimately improving its outcomes.

<sup>18</sup> See generally: Slowik & Nicholas, 2017; Kelly & Singer, 2017; NESCAUM, 2022.

## 4. Key Activity #2: Identifying a Community's Unique Needs

Equity-focused EVSE programs should recognize existing barriers to EVSE deployment and create alignment between program goals and a community's needs and wants. This alignment occurs through three processes:

- Identifying preferences and desired outcomes
- Defining equity
- Designing incentive structures

These three processes build on the partnerships discussed in Key Activity #1 to surface the needs of underrepresented groups and proactively seek community involvement.

Key Activity #2 goes beyond identifying and engaging partners and requires several important activities, including fair and culturally competent engagement and collaboration throughout a program's development and implementation (Huether, 2021). For example, Oregon's 2021 Transportation Electrification Infrastructure Needs Assessment relied on local partners to conduct listening sessions in local communities about EVSE deployment needs (FORTH, 2022). This type of needs assessment can also support program design efforts and iterative program evaluations to ensure consistency with program objectives (see Section 5).

### 4.1 Identifying Preferences and Desired Outcomes

Gathering information about a community's preferences and desired outcomes can lead to more viable equity-focused EVSE deployments (Moses & Brown, 2023; Lin, 2022). Conducting needs assessments is a critical step in attaining equitable program outcomes, according to multiple sources.<sup>19</sup> By assessing a community's preferences and desired outcomes, concise and achievable goals can be established and the effectiveness of other processes can be enhanced.

#### 4.1.1 Supporting the Identification of Preferences and Desired Outcomes

Achieving equitable outcomes in EVSE deployment is primarily a function of directly meeting the needs of the communities being served by a project. However, preferences and desired outcomes can differ significantly from one community to another. For example, one survey found that 60% of low-income families would keep their personal vehicle even if alternative transportation were as convenient and inexpensive as operating their vehicle (Pierce et al., 2020). Decision-makers may consider other benefits of electric public transport options; school bus electrification, for example, can improve local air quality, which may be especially important to Black and Latino households (McAdams, 2022).

Identifying preferences and desired outcomes requires direct community engagement and can involve many factors. One resource described this engagement as a spectrum where different communities or elements within a community can choose to participate at different levels (Huether, 2021). The

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<sup>19</sup> Allen & Gibson, 2022; U.S. DOT, 2022; Lepre et al., 2022; Moses & Brown, 2023; Gaillard, 2022; Carreon et al., 2022; Huether, 2021; Curtis, 2021; Rillera & Houston, 2022; .

community partners involved in Key Activity #1 are well-equipped to understand where a community stands on this spectrum and how much involvement they may desire. However, specific program objectives or regulations, such as statutes limiting program oversight to a specific state agency, may restrict community engagement. In such a case, local leaders who desire full community ownership may be unable to participate in the program.<sup>20</sup> Consequently, there is no definitive approach to identifying community preferences and desired outcomes. Table 4.1.1 provides two sample objectives of potential interest to decision-makers and practices for identifying preferences or desired outcomes.

**Table 4.1.1 Identifying Preferences & Outcomes: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
<b>Understand Gaps in EVSE Access</b>	<ul style="list-style-type: none"> <li>Evaluate infrastructure available at common locations where drivers dwell (e.g., airport waiting areas and mobility hubs).</li> </ul>	Moriarty, 2023
	<ul style="list-style-type: none"> <li>Quantify EVSE density using data methods consistent with program objectives and goals (e.g., assess public EVSE ports within 15 minutes of walking for urban focused programs with an expectation of walking to public EVSE chargers).</li> </ul>	Zhou et al., 2022
	<ul style="list-style-type: none"> <li>Assess the desire for electric shuttles or EV ride-hailing vehicles and sharing programs, and the required EVSE to support an influx of such vehicles.</li> </ul>	Dillon et al., 2022
	<ul style="list-style-type: none"> <li>Examine the availability of specific financial tools, devices (e.g., text to voice), and/or language proficiency necessary to utilize services, such as EV ride-hailing or public EVSE.</li> </ul>	
<b>Assess Preferences for Particular Types of EVSE Deployments</b>	<ul style="list-style-type: none"> <li>Pilot an advantageous charging rate for EV ride-hail drivers or a private fleet incentive program in overburdened communities.</li> </ul>	Dillon et al., 2022
	<ul style="list-style-type: none"> <li>Expand rebate programs to include EVSE with the purchase of used vehicles.</li> </ul>	Rubin & St-Louis, 2016
	<ul style="list-style-type: none"> <li>Lead by example: State and local governments can serve as demonstration projects for fleet owners, workplaces, and parking managers.</li> </ul>	Rushlow et al., 2015

As programs move from the planning to implementation stage, the benefits of engaging communities become even more apparent. For example, several factors – including parking data, streetlight

<sup>20</sup> Community-ownership here refers to jurisdictional oversight of a program and not local “buy-in” for an EVSE deployment programs stated goals or outcomes.

locations, charger orientation, local traffic levels and safety, and wireless signal strength – are essential to site selection (Moriarty, 2023). Integrating community experience with these factors, such as whether a proposed site lacks essential amenities, safety, or 24-hour access, can eliminate unsuitable sites early on and conserve program resources. However, adding equity considerations like these to site selection criteria becomes increasingly difficult as a project progresses. Early consideration of community needs can therefore help decision-makers avoid costly missteps later (Moriarty, 2023).

#### 4.1.2 Addressing Barriers to Identifying Preferences and Desired Outcomes

Identifying preferences and desired outcomes starts with recognizing existing EVSE deployment barriers and their impacts on communities. These barriers are often intertwined with other factors, making identification challenging. For example, the limited availability of contractors familiar with updated EVSE installation processes, especially in poorer rural areas, can lead to delays or cause projects to compete for the same resources (Shared-Use Mobility Center, 2020). In such communities, community-level planning and need identification can improve EVSE deployments by tapping into regional coalitions to resolve challenges (U.S. DOT, 2022).<sup>21</sup> Other strategies to overcome barriers in this process include:

- **Identify sites early.** Finding locations to site EVSE is an important first step as it often dictates the electrical capacity available, the existing meter and electric access/panel to be used, potential locations for EVSE and charging areas, and the population for which it may be convenient (Plug-in NC, 2019). If any electrical upgrades are needed, early location identification may be particularly critical to support EVSE, especially for MUDs. Several resources cited in this report found that locating MUD sites was one of the biggest challenges. Successful installations can still be achieved through early buy-in from homeowner associations, building owners, property managers, and residents.<sup>22</sup>
- **Connect with the local utility early.** Electrical capacity, required upgrades, reliability information, cost-sharing, and supporting infrastructure are all necessary components of EVSE deployments.<sup>23</sup> Incorporating these design requirements early can avoid costly retrofits later (Fujimoto, 2020). Engaging with the local utility may also help ensure electric reliability and minimal EVSE downtime (Klein, 2022). Further, programs can allow for negotiating favorable rates to make charging more feasible (e.g., time-sensitive rates that avoid or reduce demand charges) (FORTH, 2019).
- **Engage in transparent contract negotiations.** Contract negotiations between program administrators and support teams should include opportunities for feedback from community-level leaders. Transparency in these actions can reduce ambiguity in project expectations or outcomes (Kelly & Singer, 2017). This transparency can also be extended to subcontracts, ensuring consistency in applying equity goals (Moses & Brown, 2023).

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<sup>21</sup> This is especially helpful with less developed electric and telecom infrastructure (U.S. DOT, 2022).

<sup>22</sup> Jamieson et al., 2022; Moriarty, 2023; Slowik & Nicholas, 2017.

<sup>23</sup> Lepre et al., 2022; Jamieson et al., 2022; Moriarty, 2023.

- **Maintain program flexibility when developing policy objectives.** Decision-makers should ensure that programs find the best solutions for communities rather than being overly prescriptive. For example, addressing physical barriers, such as the relative absence of electric vehicles in low-income and black households, will require a different solution set than resolving local financial barriers, such as increasing access to low-cost EVSE in low-income areas (McAdams, 2022; Hardman et al., 2021).

Throughout this process, engaging with partners from Key Activity #1 can provide valuable insight into each community’s specific challenges and needs. Decision-makers can leverage stakeholder relationships to surface critical information for establishing program goals based on community preferences while identifying specific, tangible outcomes that meaningfully and equitably meet a community’s needs.

## 4.2 Defining Equity

Clear and agreed-upon definitions of equity-guided decision-making can enable consistent evaluations of program outcomes across time and between programs. Using such definitions generally increases the likelihood of implementing an equitable EVSE program (Guo & Kontou, 2021; FORTH, 2022). Clear definitions are also essential if the program implementation sets goals or outcomes based on the people it aims to reach (e.g., specific demographic groups). Establishing these definitions early on supports consistency for the processes identified in Key Activity #3. Updating definitions by gathering additional information and feedback is also an effective practice (PURA, 2021).

### 4.2.1 Establishing Equity Definitions

To develop equity definitions, it’s important to establish a shared understanding of what “fair” and “just” mean, as well as a consistent syntax for equity. Establishing with precision what “equity” means and whom the program targets is essential for avoiding inequitable outcomes and ensuring coherent expectations around program results (Moses & Brown, 2022). A variety of definitions for key terms have been identified in academic literature such as: “Energy equity is the fair distribution of benefits and burdens of energy production, distribution, and consumption, and fair engagement in this system’s decision-making processes” (Barlow, 2022) and “energy justice [is] the pursuit of equity and minimalization of disparities across individuals and groups in all aspects of energy systems, markets, and operations (Baker et al., 2023).” Program managers developing equity-focused EVSE deployment programs should also look to sources in the Federal Government, such as:

*The term “equity” means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality. (Exec. Order No. 13985, 2021)*

Many academic and government sources for definitions focus on the application of these terms towards developing metrics.<sup>24</sup> Setting clear definitions ensures coherent expectations of how to measure results, a key element of many programs that fund EV initiatives (Moses & Brown, 2022, Rillera & Houston, 2022). For instance, the Justice40 Initiative relies on a single tool, the Climate and Economic Justice Screening Tool (CEJST), for federal agencies to use when defining and identifying disadvantaged communities (Executive Office of the President, 2023). The CEJST was constructed using specific definitions and indicators of disadvantaged communities’ such as high and/or persistent poverty, high unemployment and underemployment, racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities, and linguistic isolation (Executive Office of the President, 2021). This tool can also be used by non-federal decision-makers to identify disadvantaged communities across a broad array of EVSE focused programs, thus creating consistency in program qualifications, outreach, and engagement.<sup>25</sup>

Decision-makers may find different equity definitions necessary in different program contexts. Table 4.2.1 provides several ways to build distinct categories of equity and methods for developing equitable definitions. Depending on the specific program design, some categories may be more helpful in establishing and assessing outcomes than others. Decision-makers should keep in mind that using different definitions may create difficulties later when comparing outcomes across deployments or different programs. Such comparisons are a key component of program evaluation, as discussed in Key Activity #3.

**Table 4.2.1 Defining Equity: Example Categories & Development Methods**

Definition Categories	Methods for Developing Equitable Definitions	Sources
Income-Based Definition	<ul style="list-style-type: none"> <li>Develop criteria based on federal poverty guidelines, state median income, area median income, and/or categorical eligibility based on participation in other benefit programs.</li> </ul>	Huether, 2021
Place-Based Definitions	<ul style="list-style-type: none"> <li>Collect, aggregate, and anonymize information at the census block, individual block, or household level to avoid socio-demographic heterogeneity that occurs at larger spatial scales.<sup>26</sup></li> <li>Address inclusion of unincorporated communities.</li> </ul>	Hsu & Fingerman, 2021  Seattle City Light, 2022

<sup>24</sup> See generally: Barlow et al., 2023; Baker et al., 2023; Heffron et al., 2015; Sovacool & Dworkin, 2015.

<sup>25</sup> This is a key finding underlying the Justice40 Initiative: “Greater uniformity in the identification of communities that are disadvantaged, marginalized, overburdened, and underserved will reduce confusion and tension between programs, and promote consistency in outreach and engagement across the Federal family. In addition, communities will better understand if they are prioritized for benefits across a wide swath of programs” (Executive Office of the President, 2023).

<sup>26</sup> When funding is allocated according to an overly broad definition of place-based equity, disparities may arise within the area. For example, in the case of a program that designates funding to disadvantaged areas at the census tract level, the most disadvantaged census block group may not be served by a private EVSE company that receives public funding.

Definition Categories	Methods for Developing Equitable Definitions	Sources
Home Occupancy-Based Definitions	<ul style="list-style-type: none"> <li>● Include historic homeownership inequities by specifically focusing on residents of MUDs or multi-family homes.</li> </ul>	Lepre, 2021
	<ul style="list-style-type: none"> <li>● Specifically identify MUDs with below-market rent.</li> </ul>	FORTH, 2019
Comprehensive Definitions	<ul style="list-style-type: none"> <li>● Include climate vulnerability, pollution burden, disparate financial burden (e.g., share of transit, energy, and/or housing costs, etc.), and race and ethnicity demographics that underlie many comprehensive variables for inequity.<sup>27</sup></li> </ul>	Tee Lewis et al., 2023
	<ul style="list-style-type: none"> <li>● Distinguish between ability and accessibility. For example, micromobility is less accessible to those with physical limitations.</li> </ul>	Gahlaut et al., 2022

#### 4.2.2 Addressing Challenges to Defining Equity

Establishing equity definitions is essential to measuring distributional impacts (PURA, 2021). However, decision-makers and leaders should recognize that communities are not demographically homogenous, even at the census tract level (Hsu & Fingerman, 2021). Due to these differences, effective definitions may require additional specificity or complexity. For example, income-based criteria often do not address race, tribal status, pollution burden, credit, or community economic conditions (Huether, 2021). Unfortunately, information about all these factors may not be available when a program establishes its definitions. In such a situation, decision-makers can start with generic definitions and iteratively develop more specificity as policy evolves and information is gathered (PURA, 2021). Below are some suggested methods for decision-makers to identify and utilize this additional context.

- **Establish equity principles first.** Focusing on general equity principles is a good way to start the definition process since it can identify historical and structural injustices, build trust, increase transparency, and improve accountability.<sup>28</sup> Engaging with stakeholders and community members from the start, and agreeing on the principles underlying equity, can also lead to more specific and useful definitions later (Shaw & Diaz, 2022).
- **Use similar definitions across similar programs and projects.** Equity definitions can vary widely even among similarly structured entities (e.g., utilities) (Huether et al., 2022). Differences in equity definitions can undermine the comparability of relevant data within and among EVSE projects. Using consistent definitions therefore makes it easier for organizations and institutions to track progress and measure the impact of initiatives that promote EVSE deployments (Huether et al., 2022).

<sup>27</sup> Programs aiming to address historic racial and ethnic disparities should consider specific comprehensive criteria that represent racial and ethnic inequities in their context.

<sup>28</sup> U.S. DOT, 2021; Moses & Brown, 2023; Moriarty, 2023.



- **Use EJ screening tools.** Environmental justice (EJ) tools, such as the federal Climate and Economic Justice Screening Tool (CEJST), California’s CalEnviroScreen tool, or Argonne National Laboratory’s EV Charging Justice40 Map Tool, can provide valuable insight on the history and context of inequality in a program’s jurisdiction.<sup>29</sup> These tools can display detailed statistical disadvantages at the county or census tract level, which are useful for understanding disparities within a community (Hsu & Fingerma, 2021).

### 4.3 Designing Incentive Structures

Equitable incentive structures encourage EVSE deployments by targeting disadvantaged communities and other relevant populations with appropriate financial and non-financial motivations and is critical to overall program design (see Section 5).

#### 4.3.1 Supporting Equitable Incentive Structures

Consciously designing community-focused incentive structures can help decision-makers ensure more equitable outcomes from transportation electrification. Building community-oriented targeting into marketing and management structures can significantly improve the accessibility and effectiveness of EVSE deployments.<sup>30</sup> The MassEVIP program, for instance, has public access considerations for determining award funding, including whether the projects has an impact on communities with environmental justice concerns or if it creates a more equitable distribution of EVSE across the entire state (Slowik & Nicholas, 2017). This allows the MassEVIP program to focus on specific, community-based factors, such as geographic access and spatial equity, when awarding funds (Moses & Brown, 2023). Table 4.3.1 provides community-focused objectives and approaches to tailoring incentive structures for equitable outcomes.

**Table 4.3.1 Designing Incentive Structures: Example Objectives & Design Practices**

Objectives	Design Practices	Sources
<b>Expand Eligibility</b>	● Fund low-interest financing programs.	Allen & Gibson, 2022
	● Develop subscription programs around charging times and amounts.	
	● Reduce the complexity of tax deductions or credit applications.	Liu et al., 2020
	● Utilize incentive stacking to target specific overlapping groups.	Gaillard, 2022
	● Use geographic tools (e.g., CEJST) to develop more targeted incentives.	McAdams, 2022

<sup>29</sup> California’s CalEnviroScreen tool is available at <https://oehha.ca.gov/calenviroscreen>. The federal Climate and Economic Justice Screening Tool is available at <https://screeningtool.geoplatform.gov/en/>. The EV Charging Justice40 Map Tool is available at: <https://www.anl.gov/esia/electric-vehicle-charging-equity-considerations>.

<sup>30</sup> Ju et al., 2020; Linn, 2022; Rubin & St-Louis, 2016.



Objectives	Design Practices	Sources
Address MUD Barriers	<ul style="list-style-type: none"> <li>● Inform building managers about benefits of EVSE infrastructure (e.g., improved property values, increased tenant demand).</li> </ul>	Lepre, 2021
	<ul style="list-style-type: none"> <li>● Address space limitations.</li> </ul>	Allen & Gibson, 2022
	<ul style="list-style-type: none"> <li>● Create mechanisms that don't rely on access to traditional banks or smartphones.</li> </ul>	
	<ul style="list-style-type: none"> <li>● Develop programs to encourage neighborhood charging.</li> </ul>	Dillon et al., 2022

### 4.3.2 Addressing Challenges to Developing Equitable Incentive Structures

Incentive structures, if not carefully designed, can impede equitable EVSE deployment. For example, EVSE is almost twice as dense in urban areas as compared to rural ones, where electric infrastructure also tends to be underinvested (Curtis, 2021; McAdams, 2022). If an incentive structure focused exclusively on purchasing EVs but doesn't address grid upgrades, the likely outcome would be low uptake and EVSE utilization in rural areas. Decision-makers can avoid such unintended outcomes through strategies like:

- **Create custom energy rates for EVSE.** Retail electricity rate considerations are essential for both EV and non-EV owners (Cappers & Satchwell, 2022). Partnerships with state regulators and other decision-makers can prioritize the equitable allocation of utility costs and program benefits in the design of EV-specific retail electricity rates while minimizing cross-subsidization (McAdams, 2022; Klein, 2022).<sup>31</sup>
- **Use broad distribution channels.** Low-income customers are much more likely to purchase used vehicles, pay with cash, participate in a car scrapping program, and rely on upfront incentives rather than guaranteed financing programs (Pierce et al., 2019). Decision-makers should therefore create programs and build development goals around alternative supply channels and consider leasing options, point-of-sale rebates, and/or short-term rentals.<sup>32</sup>
- **Create separate incentive structures for different targeted populations.** For example, renters and owners of MUDs face distinct challenges regarding equitable access to EVSE.<sup>33</sup> Engaging directly with each group can help determine how best to deploy incentives such as income, property, or sales tax exemptions that reduce EVSE installation costs (e.g., panel upgrades) (DeShazo et al., 2017; Pierce et al, 2020).

<sup>31</sup> For example, demand charges create considerable barriers to accessing EVSE, especially in disadvantaged communities which typically have higher concentrations of MUDs (Harper et al., 2019). Employing alternative pricing schemes and/or managed charging (where the utility operates an EV charging network like a demand response program) can reduce costly spikes on customer bills.

<sup>32</sup> Hardman et al., 2021; Gaillard, 2022; Moriarty, 2023.

<sup>33</sup> Curtis, 2021; Buchanan et al., 2021; PURA, 2021.

Decision-makers may want or need to include cost-effectiveness tests in the implementation of various incentive structures. For utilities in particular, traditional cost-effectiveness tests may exclude important indirect benefits (e.g., improved air quality, improved health outcomes, and lower emissions) that would offset increased system costs from EV charging. This can present a challenge to decision-makers seeking to encourage EVSE adoption (Rushlow et al., 2015). Table 4.3.2 provides sample approaches to evaluating the cost-effectiveness of EVSE incentives that can overcome this hurdle.

**Table 4.3.2 Evaluating Cost-Effectiveness of EVSE Incentives: Example Implementation Practices**

Implementation Practices	Sources
<ul style="list-style-type: none"> <li>• Coordinate charging with periods of high renewable energy generation.</li> </ul>	FORTH, 2019
<ul style="list-style-type: none"> <li>• Utilize both an income-progressive rebate and an income cap.</li> </ul>	Rubin & St-Louis, 2016
<ul style="list-style-type: none"> <li>• Consider different charging prices based on average MPG, license type, or driver’s residence.</li> </ul>	FHWA, 2021
<ul style="list-style-type: none"> <li>• Include benefits from reduced oil consumption, cleaner air, better health, and lower greenhouse gas emissions.</li> </ul>	Rushlow et al., 2015

Overall, using both supply- and demand-side incentives as well as improving cost-effectiveness evaluations can help overcome EVSE deployment challenges (Hardman et al., 2021).

## 5. Key Activity #3: Developing an Iterative Program Design

Planning and implementation of equity-focused EVSE programs should include continuous measurement, evaluation, and improvement. This process includes using a needs assessment at the onset of a program to influence its design, as well as continued assessments to facilitate achievement of equity goals. The three processes primarily responsible for this Key Activity are:

- Program planning
- Project planning
- Metrics collection and evaluation

Each process enables programs to follow through on the goals that decision-makers establish while integrating the work of the two previous Key Activities into program outcomes. For example, working directly with developers to quickly deploy EVSE often targets areas with considerable numbers of existing Evs, significant commercial activity, or heavy traffic areas, all of which are typically found in higher-income, urban locations (Hsu & Fingerman, 2021). This targeting can perpetuate or enhance existing inequities within the community.

Setting a baseline can yield substantial dividends and support programs in fostering trust, addressing historical and structural injustices, encouraging accountability, and achieving meaningful solutions to the community's needs (Jamieson et al., 2022). These baselines are particularly useful in improving planning, measurement tools, and using program evaluations. In general, proper metrics and data collection should support a program's objectives while tracking costs related to evaluation and iterative improvement.

### 5.1 Program Planning

Program planning, as one of the first steps in a program's lifecycle, represents an early opportunity to consider equity objectives (Dillon et al., 2022). Planning includes a needs assessment to identify changing needs or opportunities for improvement. Such assessments can incorporate improvements into planning iteratively, continuously accounting for progress toward goals, new challenges, opportunities, and/or community feedback. This iteration is an excellent way to quantify and proactively improve a program's outcomes on individuals and communities.

#### 5.1.1 Supporting Program Planning

Equitable program planning should concentrate on addressing local issues, such as accessibility and affordability, as wide-reaching market transformations appear to do a poor job of delivering equity outcomes (Gaillard, 2022). For example, in rural communities, where the distance between charging stations is generally greater than in urban areas, EVSE deployments tend to be concentrated near highways or tourist areas (Allen & Gibson, 2022). Community-level planning could improve EVSE siting in these areas by combining the economic benefits of EVSE charging locations with local activities that are useful to both residents and travelers (e.g., community attractions and parks) (U.S. DOT, 2022). A program based on this plan could increase overall access to EVSE by selecting projects that would

otherwise not receive funding, generating revenue and opportunities for the local community (Allen & Gibson, 2022). This outcome would still be consistent with wide-reaching policy goals (e.g., deploying a broadly accessible EVSE network) while allowing for incremental equity improvements, building on unique community needs. Table 5.1.1 provides sample EVSE program objectives, along with practices to support these objectives at different points during a program’s implementation.

**Table 5.1.1 Program Planning: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
<b>Utilize Pilot Programs</b>	<ul style="list-style-type: none"> <li>● Use pilots to identify and test solutions for streamlining deployments and permitting.</li> <li>● After initial pilots, focus on low-hanging fruit (i.e., projects requiring the fewest modifications to be scalable).</li> </ul>	<p>Moriarty, 2023</p>
	<ul style="list-style-type: none"> <li>● Use pilots to test different metrics and evaluation strategies for scaling the program (e.g., use 5-10 buses to test infrastructure and processes, learn about project needs, locate EJ or high-visibility routes, and identify low-hanging fruit such as depots suitable for a larger program).</li> </ul>	<p>Lepre et al., 2022</p>
<b>Generate Deployment Guidance</b>	<ul style="list-style-type: none"> <li>● Establish program or installation startup conditions such as:               <ul style="list-style-type: none"> <li>○ Cost-sharing for categories like asset ownership, insurance, and O&amp;M</li> <li>○ Implementing specific community outreach plans</li> <li>○ Improving general site conditions within jurisdictional boundaries (e.g., light poles owned by the city but operated by a utility)</li> <li>○ Providing equitable payment processing access.</li> </ul> </li> </ul>	<p>Moriarty, 2023</p>
	<ul style="list-style-type: none"> <li>● Set aside funds for training and establish specific goals for learning and engagement.</li> </ul>	<p>Kelly &amp; Singer, 2017</p>
	<ul style="list-style-type: none"> <li>● Adopt comprehensive policies that support affordability modeled on other basic service sector programs at state or federal levels.</li> </ul>	<p>Pierce et al., 2020</p>
<b>Broaden Program Offerings</b>	<ul style="list-style-type: none"> <li>● Fund publicly available hosting capacity maps to increase EVSE deployment on underutilized circuits.</li> </ul>	<p>PURA, 2021</p>
	<ul style="list-style-type: none"> <li>● Prioritize ride-sharing or bus routes in vulnerable communities.</li> </ul>	<p>Huether, 2021</p>
	<ul style="list-style-type: none"> <li>● Site DC fast chargers (DCFC) in overburdened communities.</li> </ul>	<p>Dillon et al., 2022</p>

### 5.1.2 Addressing Challenges to Program Planning

Decision-makers may face requirements to establish broad, universal goals. However, equity-focused programs generally benefit from more targeted efforts, and planning should therefore be concentrated at local levels (Hsu & Fingerma, 2021). Decision-makers can balance these priorities by iteratively evaluating plans and weighing community needs against more universal goals (Lepre et al., 2022; Klein, 2022).<sup>34</sup> Strategies that support this hybrid approach include:

- **Develop plans in parallel with other processes.** Planning is an iterative process and can be revised at any stage of a program’s implementation. One way to start is by creating partner-informed action plans that provide specific details on how to reduce, mitigate, or eliminate known community-level barriers (Moses & Brown, 2023). Sometimes, clear solutions – such as partnering with local utilities to improve interconnection processes before project construction starts – may already exist. Other times, solutions may take more time to identify and implement (Gahlaut et al., 2022).
- **Synchronize plans with municipal policy and local action plans.** EVSE deployment, especially in public or MUD settings, must comply with local zoning, permitting, and other codes and statutes that may impact the siting, installation, and operation of EVSE (Klein, 2022). Decision-makers can gain valuable experience by working through zoning and permitting issues in order to align EVSE deployment practicalities with various programmatic goals (Klein, 2022; Puentes, 2019). This experience, as well as existing knowledge and lessons learned about EVSE deployments, can be incorporated into program planning to overcome challenges to achieving specific goals.
- **Create both short- and long-term versions of the same goal.** For example, electrical panel or utility upgrades are a significant challenge to EVSE deployment, especially for MUDs, because of their long lead times and high cost.<sup>35</sup> Using building codes to increase EVSE deployments addresses this challenge. Even so, it would likely take years for a substantial number of panels to be EVSE-ready (DeShazo et al., 2017). Pairing such a plan with shorter-term objectives, like deploying DCFC equipment with low access charges in targeted areas, can provide more immediate benefits.<sup>36</sup>

## 5.2 Project Planning

Project planning ensures that feedback from partners and community members is directly integrated into a program’s outcomes. The partnerships established in Key Activity #1 and the community needs identified in Key Activity #2 are critical inputs into this process as they provide the mechanisms for receiving relevant and valuable feedback.

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<sup>34</sup> “Targeted universalism” is an example framework that hybridizes the need to achieve universal goals with the individualized, targeted actions that are more likely to generate equitable outcomes. This creates directed, contextualized outcomes within the structure of a community’s culture, location and needs while remaining consistent with universal goals. See Powell et al. (2019) and Allen & Gibson (2022) for more examples of how to apply and utilize this framework.

<sup>35</sup> See generally: Klein, 2022; Jamieson et al., 2022; Puentes, 2019; DeShazo et al., 2017; Pierce et al., 2020.

<sup>36</sup> See generally: McAdams, 2022; Hardman et al., 2021; Huether, et al., 2022.

## 5.2.1 Supporting Project Planning

Developing a partner-driven, adaptable approach to project planning that is both iterative and accountable creates a strong foundation for project success (Moses & Brown, 2023). For example, while EVSE facilities typically need only 4-8 weeks for construction, the full timeline for deploying EVSE is often measured in years. Streamlining regulatory and utility processes while cultivating trust and relationships with institutional staff can significantly reduce this timeline (Klein, 2022). This can be further enhanced by incorporating partnerships from Key Activity #1 to ensure that EVSE deployments are accessible and relevant to targeted populations (Powel et al., 2019; Allen & Gibson, 2022). Feedback from early projects or previous programs may lead decision-makers to establish specific project planning objectives. Table 5.2.1 provides examples of such objectives and how decision-makers can achieve them.

**Table 5.2.1 Project Planning: Example Objectives & Implementation Practices**

Objectives	Implementation Practices	Sources
<b>Reduce the Risk of Delays</b>	<ul style="list-style-type: none"> <li>Engage utilities in equity-focused transportation electrification plans to identify potential project chokepoints.</li> </ul>	Huether, 2021
	<ul style="list-style-type: none"> <li>Understand staffing needs and responsibilities; engage with unions early and identify limitations (e.g., who can handle high voltage equipment).</li> </ul>	Lepre et al., 2022
	<ul style="list-style-type: none"> <li>Develop strong vendor contracts with precise requirements and/or performance metrics.</li> </ul>	
	<ul style="list-style-type: none"> <li>Create charging plans first, as utility upgrades may have longer lead times.</li> </ul>	
<b>Ensure Outcomes Meet Community Needs</b>	<ul style="list-style-type: none"> <li>Provide targeted support for typical EVSE deployment barriers in a way that supports residents' needs without increasing building rents (e.g., address space limitations, parking layouts, etc.)</li> </ul>	Allen & Gibson, 2022 DeShazo et al., 2017
	<ul style="list-style-type: none"> <li>Address utility reluctance to upgrade local infrastructure without guaranteeing long-term occupancy and demand.</li> </ul>	Lepre et al., 2022
	<ul style="list-style-type: none"> <li>Strike a balance between networked (e.g., utility-controlled) charging requiring less customer attention and cheaper, non-networked equipment.</li> </ul>	Harper et al., 2019

## 5.2.2 Addressing Challenges to Project Planning

Significant delays or infrastructure requirements, such as those related to interconnection rules, can change project outcomes and threaten program goals. In addition, other factors like the effects of administrative tasks (e.g., coordinating meeting logistics) and direct implementation decisions (e.g., site selection and grid interconnection) can significantly affect program costs (DeShazo et al., 2017). Project deployment breakdowns can be particularly frustrating for decision-makers in cases where program goals are harmed. Strategies for decision-makers to proactively address deployment problems before they arise include:

- **Connect with local utilities early.** Local utilities can present significant barriers to project realization and consequently should be engaged at multiple levels of a program and as early in a program's development as possible (Dillon et al., 2022). State regulators can be strong partners in this area, as they often oversee interconnection requirements and processes and have existing relationships with local utilities (Gahlaut et al., 2022).
- **Understand building codes and permitting constraints.** Decision-makers should anticipate long lead times for permits and should ensure sufficient resources are available for navigating local code requirements (Klein, 2022). Comprehensive transition plans that use multiple individualized sub-plans aligned with broader goals (such as phased approaches or tracts focused on specific topics) can help projects navigate this process (Huether et al., 2022).<sup>37</sup>
- **Develop mechanisms for continuous improvement.** The network of partners established in Key Activity #1 can help project plans identify local best practices that support positive project outcomes. Through this network, decision-makers should design a project planning process to improve future planning activities. Local partners can be particularly helpful in co-developing broader strategies and policies that reduce barriers to project deployment (Shaw & Diaz, 2022).

Continuous program improvement requires iterative evaluation of outcomes, identification of potential impacts, and implementation of accountability mechanisms. This process, discussed in the next section, can be used at a project planning level to improve individual outcomes and at a program planning level to understand progress toward overall policy goals.

## 5.3 Evaluating and Collecting Metrics

Metrics collection and evaluation enable accountability between communities and decision-makers through actionable information about the progress of a program or the suitability of expanding a pilot. Overall, metrics provide information about progress toward program goals, including measuring progress toward equitable outcomes (ACEEE, 2023).

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<sup>37</sup> Where possible, decision-makers should examine ways to streamline permitting and code requirements for EVSE. *EV Ready Codes Research Summary* is a particularly good resource for how to start this work (Fujimoto, 2020).

### 5.3.1 Supporting Equitable Data Evaluation and Collection

This process starts with clear and precise definitions for metrics. Broad generalizations when tracking results can be problematic, as they can lead to conclusions that are not necessarily grounded in actual implementation (e.g. FHWA, 2021 & Huether, 2021). For example, a statewide rebate program could establish a percentage of funding available to disadvantaged communities using metrics like housing type and annual income as a qualification threshold. However, housing type does not necessarily equate to a disadvantaged community classification (e.g., luxury condominiums may be classified as multi-family housing) (Jamieson, 2022; Hardman, 2021). In addition, annual income is a poor proxy for measuring lifetime income or wealth, which are better indicators of whether a household may benefit from a rebate (Guo & Kontou, 2021). Overall, an income-based definition could result in median-income households receiving fewer overall rebates than higher-income households that technically meet program eligibility thresholds.<sup>38</sup> Clearly defined and precise metrics could avoid this situation and lead to more equitable investment structures overall (Guo & Kontou, 2021). In the above example, a better understanding of what constitutes disadvantaged households and their unique characteristics would help generate more equitable program outcomes.

Once a program establishes clear definitions for metrics, data collection and evaluation should occur continuously throughout its implementation. Effective and robust metric collection allows new information to incorporate community feedback and adjust collective expectations (U.S. DOT, 2022). Where appropriate, metrics should be tied to specific targets to promote accountability for meeting program goals. For example, assigning performance targets for subcontractors saves time and reduces ambiguity for program managers and developers (Kelly & Singer, 2017). Consequences should also be established for failing to report on progress or meet targets (Huether et al., 2022). Table 5.3.1 provides examples for how decision-makers can incorporate metrics collection directly into a program's objectives, as well as practices for better data collection.

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<sup>38</sup> A similar situation occurred in 2018, when the California Clean Vehicle Rebate Project established an income limit as a qualification metric. Households with \$50,000 in annual income received the lowest rebates per capita, despite the program having established an upper-income limit. Although the program ultimately resulted in more disadvantaged communities receiving incentives over time, initial results showed that the top 12.5% of most advantaged census tracts received almost four times more rebates per capita than the lower 75%; see Guo & Kontou (2021) for more information.



**Table 5.3.1 Metrics and Data: Example Objectives and Collection & Evaluation Practices**

Objectives	Data Collection & Evaluation Practices	Sources
Expand Existing Metrics to Include Equity Components	<ul style="list-style-type: none"> <li>● Consider specific equity factors that can impact a program, such as:                             <ul style="list-style-type: none"> <li>○ Mobile Equity: Students with disabilities are more likely to ride buses to school and load/unload near the tailpipe while idling</li> <li>○ Racial Equity: Black students travel longer for school on average</li> <li>○ Environmental Equity: Communities of color are more impacted by poor air quality</li> <li>○ Geographic Equity: Rural communities generally have less access to transportation options</li> <li>○ Income Equity: Lower income communities may not have equal grid access or EV readiness.</li> </ul> </li> <li>● Track parking and electrical access for sub-populations to capture existing electrical access, need for upgrades, effects of behavior modification, etc.</li> </ul>	<p>Moses &amp; Brown, 2023</p> <p>Ge et al., 2021</p>
Improve Quality of Information Collected from Pilots, Demos and Deployments	<ul style="list-style-type: none"> <li>● Look for heterogeneity within targeted demographics, such as varying incomes levels in MUDs.</li> <li>● Collect granular data from behavior modification components such as idle fees, power-sharing solutions, and active load management.</li> <li>● Proactively recruit lower-wage workplaces for pilot participation if they provide chargers for everyone and not just specific employees.</li> <li>● Include post-implementation information such as second-life use and/or recycling of battery technologies.</li> </ul>	<p>Jamieson et al., 2022</p> <p>Allen &amp; Gibson, 2022</p> <p>Moses &amp; Brown, 2023</p>
Collect Specific Metrics for EVSE Deployments Within DACs	<ul style="list-style-type: none"> <li>● Identify the % of school districts in underserved communities with at least one electric school bus.</li> <li>● Identify the % of financially supported partners who are non-white.</li> <li>● Evaluate community-specific research activities that center or integrate equity.</li> <li>● Track participation rates by financial partners that specifically target underserved communities.</li> <li>● Survey environmental justice organizations, consultants, and BIPOC-led organizations on satisfaction with EVSE deployment process.</li> </ul>	<p>Moses &amp; Brown, 2023</p>
Use Metrics to Track Progress in Achieving Equitable Outcomes	<ul style="list-style-type: none"> <li>● Use metrics to establish interim goals in achieving specific benchmarks or objectives (e.g., reduce energy burden by X% by a certain date).</li> <li>● Establish program targets based on rank (e.g., schools in the top percentile of minority households).</li> <li>● Require utilities to use metrics in rationale supporting cost recovery of investments or programs.</li> </ul>	<p>Huether et al., 2022</p> <p>Moses &amp; Brown, 2023</p> <p>Rushlow et al., 2015</p>

### 5.3.2 Addressing Challenges to Equitable Metric Evaluation and Collection

Metrics should go beyond basic descriptive statistics (e.g., “loads” and “number of customers”) and instead quantify an EVSE program’s impacts using factors relevant to equity such as fairness of risk or perceptions of program implementation (Dollen & Brickhouse, 2022; Moses & Brown, 2023). However, decision-makers may find it challenging to identify what to include in program evaluations or what to use for target setting since there is no standard set of metrics for EVSE implementations. Strategies decision-makers can use to identify appropriate metrics for general program evaluation include:

- **Engage with partners to identify priority metrics.** Measurable goals for EVSE should align with community preferences and desired outcomes as described under Key Activity #2. Community partners are particularly well situated to identify the highest-priority outcomes and appropriate metrics. Decision-makers can use this information to set specific program targets that align with community goals (PURA, 2021).
- **Disaggregate existing metrics.** Improving the specificity of metrics can reduce generalizations even within the census tract level and support more detailed spatial analysis (Rubin & St-Louis, 2016). This may help decision-makers craft highly specific metrics for evaluating program outcomes.
- **Utilize public engagement questionnaires.** Qualitative surveys can help identify significant, direct, and indirect metrics for generalized EVSE implementations.<sup>39</sup> Programs can build on questionnaire results to create both evaluation metrics and general program targets, such as reducing emissions from medium- and heavy-duty vehicles. For example, if a survey identified vehicle emissions as a critical metric to monitor for EVSE implementations, establishing targets for electrifying school buses could generate meaningful outcomes for a community (McAdams, 2022).

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<sup>39</sup> For example, U.S. DOT used a 25-question survey to measure equity and transportation workforce data (Request for Information on Transportation Equity Data, 2021).

## 6. Conclusion

This report summarizes and discusses common themes and strategies across 64 national, regional, and state-level reports on equity-focused EVSE deployment programs. Overall, three Key Activities and nine Supporting Processes serve as pathways to enhancing equity in deploying EVSE programs. These activities and processes reveal two nationwide practices common to equity-focused EVSE deployment programs: 1) customizing design and implementation strategies through community partnerships, and 2) prioritizing the participation and needs of those impacted directly by an EVSE project. Both practices underscore the significant effect policymakers can have on equity-focused EVSE deployment outcomes by cultivating trust and openness, aligning program goals with community needs, and continuously improving program effectiveness.

Decision-makers using this report as a resource to support the implementation of their programs should consider their own specific policy, social, economic, and historical contexts carefully. In general, the principles described herein can be applied by mapping barriers alongside relevant processes and possible solutions. Table 6.1 depicts how this mapping could be structured to address several prospective decision-maker priorities. These are only some of the real-world barriers that EVSE programs face, however. A decision-maker's specific policy, regulatory, and financial context will heavily influence how each process functions, how processes map to potential barriers, and what solutions are ultimately appropriate.

By adapting this report to their unique situations, decision-makers can identify useful techniques and build successful approaches to developing community partnerships, identifying needs, and improving programs. They can also prioritize arguably the most important activity in developing successful equity-focused EVSE programs: listening to local communities.

**Table 6.1 Sample Solutions for Various Decision-Maker Priorities**

<b>Sample Priority: Infrastructure Deployment</b>		
<b>Barriers</b>	<b>Processes</b>	<b>Solutions</b>
<b>Low Infrastructure Capacity to Support EVSE</b>	<i>3.2 Funding Structures</i>	Ensure funding is available to coordinate upgrades with the local utility.
	<i>4.1 Identify Preferences &amp; Outcomes</i>	Identify specific gaps in infrastructure access to ensure program resources target the most relevant needs.
	<i>4.3 Designing Incentive Structures</i>	Improve transparency in infrastructure investment decision-making.
	<i>5.1 Program Planning</i>	Work with regulators and utilities to improve hosting capacity.
<b>Lack of Expertise in Building/Maintaining EVSE</b>	<i>4.1 Identify Preferences &amp; Outcomes</i>	Identify specific gaps in decision-makers knowledge and resources to target program efforts on discrete needs relevant to program goals.
	<i>5.1 Program Planning</i>	Modify programs to support community-focused workforce development.
<b>Low Private-Sector Interest in Deploying EVSE</b>	<i>3.2 Funding Structures</i>	The profitability of public chargers can be greatly increased by public funding, but this must be balanced against low EV adoption areas (which may inhibit a broad roll-out).
	<i>5.2 Project Planning</i>	Evaluate opportunities to improve permitting, regulatory, or other processes that may discourage local investment.

<b>Sample Priority: Institutional Improvement</b>		
<b>Barriers</b>	<b>Processes</b>	<b>Solutions</b>
<b>Low Infrastructure Capacity to Support EVSE</b>	<i>4.1 Identify Preferences &amp; Outcomes</i>	Identify specific gaps in infrastructure access to ensure program resources target the most relevant needs.
	<i>4.3 Designing Incentive Structures</i>	Improve transparency in infrastructure investment decision-making.
	<i>5.1 Program Planning</i>	Work with regulators and utilities to improve hosting capacity.
<b>Lack of Expertise in Building/Maintaining EVSE</b>	<i>4.1 Identify Preferences &amp; Outcomes</i>	Identify specific gaps in knowledge and resources to target program efforts on discrete needs relevant to program goals.
	<i>5.1 Program Planning</i>	Modify programs to support community-focused workforce development.
<b>Low Private-Sector Interest in Deploying EVSE</b>	<i>3.2 Funding Structures</i>	The profitability of public chargers can be greatly increased by public funding, but this must be balanced against low EV adoption areas (which may inhibit a broad roll-out).
	<i>5.2 Project Planning</i>	Evaluate opportunities to improve permitting, regulatory, or other procedural processes that may discourage local investment.
<b>Community Skepticism</b>	<i>3.3 Conduct General Outreach</i>	Partner with local organizations and appoint allied individuals representing marginalized communities to positions of agency and organization leadership.
	<i>4.2 Defining Equity</i>	Demonstrate commitment to equity principles by incorporating community feedback into program principles and bind programs to meeting these commitments.
<b>Regulatory Challenges</b>	<i>5.1 Program Planning</i>	Coordinate changes with other local initiatives or trends in energy infrastructure (e.g., grid modernization programs, DER deployment, microgrid evaluations, etc.).
	<i>5.2 Project Planning</i>	Streamline regulatory processes to reduce deployment timelines.
<b>Rate Challenges (e.g., Demand Charges, Cost Recovery)</b>	<i>3.2 Funding Structures</i>	Implement cost-sharing programs.
	<i>4.3 Designing Incentive Structures</i>	Engage with state regulators to develop smart charging incentives.
<b>Delays from Permitting and Code Requirements</b>	<i>5.2 Project Planning</i>	Establish plug-in electric vehicle (PEV)-ready new construction codes and review project plan, zoning, and land use codes (e.g., curb cuts, disability access requirements, etc.) while streamlining utility interconnection procedures for EVSE deployments.
	<i>5.1 Program Planning</i>	Use pilots to identify projects requiring the fewest modifications to be scalable.

Sample Priority: Local Policy Coordination		
Barriers	Processes	Solutions
Need for Alternative Transportation Options	3.2 Funding Structures	Configure EVSE to support carshare, public transit, or other mobility programs and determine responsibility for ownership, insurance, cleaning, O&M, etc.
Lack of EVSE Readiness in MUDs	4.2 Defining Equity	Partner with community leaders from MUDs and consider implementing renters “right to charge” laws (e.g., such as those in CA or CO).
	5.3 Evaluating and Collecting Metrics	Establish program metrics focused on MUD targeting.
	5.2 Project Planning	Update building codes and ordinances for MUDs to include EVSE readiness.

Sample Priority: State Policy Coordination		
Barriers	Processes	Solutions
Utility Regulations Prohibit Electricity Resale	3.1 Stakeholder and Inter-agency Engagement	Exempt charging station owners/operators’ electricity sales from regulation as a public utility.
Balancing Subsidies vs. Taxes	4.3 Designing Incentive Structures	Employ a combination of incentives (e.g., taxes on gas-powered cars and subsidies for EVs)
Institutional Memory	3.3 Conduct General Outreach	Create task forces that generate EV-ready templates for use by agencies responsible for localized and comprehensive planning, zoning, and land use.

## 7. References

- Allen, J., & Gibson, G. (2022, June 11). *Centering Equity in Charging Investments to Accelerate Electrification*. 35<sup>th</sup> International Electric Vehicle Symposium and Exhibition, Oslo, Norway.
- American Council for an Energy-Efficient Economy. (2023). *Leading with Equity: Recommendations for State Decision Makers to Advance Energy Equity*. <https://www.aceee.org/energy-equity-initiative>
- American Council for an Energy-Efficient Economy. *A Call to Action for Energy Efficiency*. (2020).
- Atlas Public Policy. (2018). *Smart Columbus Kickstarts EV Charging Deployments at Multi-Unit Dwellings Case Study on Multi-Unit Dwelling Charging Infrastructure*.
- Baker, E., Carley, S., Castellanos, S., Nock, D., Bozeman, J. F., Konisky, D., Monyei, C. G., et al. (2023). *Metrics for Decision-Making in Energy Justice*. Annual review of environment and resources, 48(1), 737–760.
- Barlow, J., Tapio, R., & Tarekegne, B. (2022). *Advancing the state of energy equity metrics*. The Electricity Journal, 35(10), 107208.
- Borenstein, S., & Davis, L. W. (2015). The Distributional Effects of U.S. Clean Energy Tax Credits. *BER Tax Policy and the Economy*, 30(1), 191–234.
- Buchanan, Maya, Elias, E., Reichers, J., Schultz, A., Smith, R., & Wallace, R. (2021). *Biennial Zero Emission Vehicle Report (2021 Biennial Zero-Emission Vehicle Report)*. Oregon Department of Energy.
- Cappers, P., & Satchwell, A. (2022). *EV Retail Rate Design 101*. <https://doi.org/10.2172/1878745>
- Carreon, A., Klock-McCook, E., Mohanty, S., Odom, C., Teplin, C., & Toth, S. (2022). *Increasing Equitable EV Access and Charging: A Path Forward for States*. RMI.
- Center for Sustainable Energy. (2022). *CHEAPR Annual Report: First Year June 2020 – July 2021* (CHEAPR Annual Report).
- Cirillo, C., & Bas, J. (2021). *Adoption and Diffusion of Electric Vehicles in Maryland*. Urban Mobility &

Equity Center.

Curtis, E. (2021). *An Initial Assessment of Vermont's Progress in Equitably Electrifying Transportation to Meet Climate Goals*.

DeShazo, J. R., Wong, & Karpman, J. (2017). *Overcoming Barriers to Electric Vehicle Charging in Multi-unit Dwellings: A Westside Cities Case Study*. Luskin Center for Innovation.

Dillon, K., Hornsby, M., Bevacqua, A., Morgan, S., Lewis, C., Griffith, L., & Davis, P. (2022). *New Jersey Overburdened Communities Electric Vehicle Affordability Program Study*. U.S. Department of Energy.

Dollen, D. V., & Brickhouse, B. (2022). *Equity and Resilience: Implications at the Intersection of Climate Change and Community*. EPRI.

Electric Vehicle Council. (2022). *EV Charger Deployment Optimization*.

EPRI. (2022). *Heat Maps Visualize EV Market Share Across the U.S.*

Exec. Order No. 13985, 86 FR 7009 (2021). <https://www.federalregister.gov/documents/2021/01/25/2021-01753/advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government>.

Exec. Order No. 14008, 86 F.R. 7619 (2021). <https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad>

Exec. Order No. 14096, 88 FR 2521 (2023). <https://www.federalregister.gov/documents/2023/04/26/2023-08955/revitalizing-our-nations-commitment-to-environmental-justice-for-all>

Executive Office of the President. (2021). *Memorandum for the Heads of Executive Departments and Agencies RE: Interim Implementation Guidance for the Justice40 Initiative*.

Executive Office of the President. (2023). *Memorandum for the Heads of Executive Departments and Agencies RE: Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool (CEJST)*.

Federal Highway Administration Office of Operations. (FHWA). (2021, August 7). *Chapter 7. Equity*



- and Public Perception. <https://ops.fhwa.dot.gov/publications/fhwahop19041/ch7.htm>
- FORTH. (2019). *Transportation Electrification January 2019 Strategies for Electric Utilities*.
- Frommer, M. (2018, October 23). *Cracking the Code on EV-Ready Building Codes—Southwest Energy Efficiency Project*. SWEEP: Southwest Energy Efficiency Project.  
<https://www.swenergy.org/cracking-the-code-on-ev-ready-building-codes/>
- Fujimoto, David. (2020). *Regional Code Collaboration: EV Ready Codes Research Summary*. King County.
- Gahlaut, A., Klock-McCook, E., & Shapiro, B. (2022). *Electric Mobility for All: A Feasibility Study of Electric Transportation Options for Low- to Moderate-Income Residents in Connecticut*. RMI.
- Gaillard, I. (2022). *Ingredients for Equitable Electrification*. The Greenlining Institute.
- Ge, Y., Simeone, C., Duvall, A., & Wood, E. (2021). *There's No Place Like Home: Residential Parking, Electrical Access, and Implications for the Future of Electric Vehicle Charging Infrastructure* (NREL/TP-5400-81065, 1825510, MainId:79841; p. NREL/TP-5400-81065, 1825510, MainId:79841). <https://doi.org/10.2172/1825510>
- Guo, S., & Kontou, E. (2021). Disparities and equity issues in electric vehicles rebate allocation. *Energy Policy*, 154, 112291. <https://doi.org/10.1016/j.enpol.2021.112291>
- Hardman, S., Fleming, K., Kare, E., & Ramadan, M. (2021). A perspective on equity in the transition to electric vehicles. *MIT Science Policy Review*, 46–54.  
<https://doi.org/10.38105/spr.e10rdoaup>
- Harper, C., McAndrews, G., & Byrnett, D. S. (2019). *Electric Vehicles: Key Trends, Issues, and Considerations for State Regulators*. National Association of Regulatory Utility Commissioners.
- Heffron, R. J., McCauley, D., & Sovacool, B. K. (2015). *Resolving society's energy trilemma through the Energy Justice Metric*. *Energy policy*, 87, 168–176.
- Hsu, C.-W., & Fingerman, K. (2021). Public electric vehicle charger access disparities across race and income in California. *Transport Policy*, 100, 59–67.

<https://doi.org/10.1016/j.tranpol.2020.10.003>

Huether, P. (2021). *Siting Electric Vehicle Supply Equipment (EVSE) With Equity in Mind*. ACEEE.

Huether, P., Cohn, C., & Jennings, B. (2022). *Utility Transportation Electrification Planning—*

*Emerging Practices to Support EV Deployment*. ACEEE. [www.aceee.org/research-report/t2201](http://www.aceee.org/research-report/t2201)

International Energy Agency. (2023). *Global EV Outlook 2023: Catching up with Climate Ambitions*.

OECD. <https://doi.org/10.1787/cbe724e8-en>

Jamieson, W., Gibson, G., Wood, K., & Owens, R. (2022, June 11). *Technological Barriers to Electric Vehicle Charging at Multi-Unit Dwellings in the U.S.* 35th Electric Vehicle Symposium (EVS35), Oslo, Norway.

Ju, Y., Cushing, L. J., & Morello-Frosch, R. (2020). An equity analysis of clean vehicle rebate programs in California. *Climatic Change*, 162(4), 2087–2105.

<https://doi.org/10.1007/s10584-020-02836-w>

Kelly, K. L., & Singer, M. R. (2017). *Designing a Successful Transportation Project: Lessons Learned from the Clean Cities American Recovery and Reinvestment Act Projects* (NREL/TP--5400-68140, DOE/GO--102017-4955, 1397158; p. NREL/TP--5400-68140, DOE/GO--102017-4955, 1397158). U.S. Department of Energy. <https://doi.org/10.2172/1397158>

Kelly, K., & Singer, M. (2016). *American Recovery and Reinvestment Act: Clean Cities Project Awards*. U.S. Department of Energy. [cleancities.energy.gov/publications](http://cleancities.energy.gov/publications).

Klein, T. (2022). *A Best Practices Guide for EVSE Regulations*. Transport Energy Strategies.

Lepre, N. (2021). *EV Charging at Multi-Family Dwellings: Drivers, Barriers, and Recommendations*. Atlas Public Policy.

Lepre, N., Burget, S., & McKenzie, L. (2022). *Deploying Charging Infrastructure for Electric Transit Buses*. Atlas Public Policy.

Less, B. D., Casquero-Modrego, N., & Walker, I. S. (2022). Home Energy Upgrades as a Pathway to Home Decarbonization in the U.S.: A Literature Review. *Energies*, 15(15), 5590.

<https://doi.org/10.3390/en15155590>

- Linn, J. (2022). *Balancing Equity and Effectiveness for Electric Vehicle Subsidies*. Resources for the Future.
- Liu, H., Guensler, R., & Rodgers, M. O. (2020). *Equity Assessment of Plug-in Electric Vehicle Purchase Incentives*. Center for Transportation, Equity, Decisions and Dollars.
- McAdams, J. (2022). *Models for Incorporating Equity in Transportation Electrification: Considerations for Public Utility Regulators (Electric Vehicles: Key Trends, Issues, and Considerations for State Regulators (2019))*. National Association of Regulatory Utility Commissioners.
- Metcalf, M. (2016). *EPIC Final Report*. Pacific Gas and Electric Company.
- Moriarty, K. (2023). Clean Cities Coalition Network. Retrieved from U.S. Department of Energy: <https://cleancities.energy.gov/project-lessons/>
- Moses, E., & Brown, C. (2023). Equity Framework to Guide the Electric School Bus Initiative. *World Resources Institute*. <https://doi.org/10.46830/wriwp.22.00047>
- Munoz, E. (2021). *Southern California Edison Company's: Charge Ready Pilot Quarterly Report (Charge Ready Pilot Quarterly Report)*. Southern California Edison Company.
- New Jersey Department of Environmental Protection (NJ DEP). (2022). *MUD Toolkit*. <https://dep.nj.gov/drivegreen/multi-unit-dwelling-toolkit/>
- Nguyen, J. (2020). *The Adoption of Zero-Emissions Vehicles by Low-Income Consumers in California: An Outcome Evaluation of the Clean Vehicle Rebate Project (947)* [Master's Projects, San Jose State University]. <https://doi.org/10.31979/etd.n6a2-y5cp>
- Nicholas, M. (2019). *Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas*. The International Council on Clean Transportation.
- Northeast States for Coordinated Air Use Management (NESCAUM). (2022). *Expanding Equitable Access to Electric Vehicle Mobility Examples of Innovative Policies and Programs*.

- Pena, S., Smith, C., Butsko, G., Gardner, R., & Armstrong, S. (2022). *Service Upgrades for Electrification Retrofits Study Draft Report*. Pacific Gas & Electric Company.
- Pennsylvania Department of Transportation (PennDOT). (2022). *Pennsylvania State Plan for Electric Vehicle Infrastructure Deployment (FFY 2022-2023; National Electric Vehicle Infrastructure (NEVI) Formula Program)*.
- Pennsylvania Department of Transportation. (2022). *Electric Vehicle (EV) Equity Guiding Principles*.
- Pierce, G., DeShazo, J. R., Sheldon, T., McOmber, B., & Blumenberg, E. (2019). *Designing Light-Duty Vehicle Incentives for Low- and Moderate-Income Households*. UCLA Luskin Center for Innovation.
- Pierce, G., McOmber, B., & DeShazo, J. R. (2020). *Supporting Lower-Income Households' Purchase of Clean Vehicles: Implications From California-Wide Survey Results*. UCLA Luskin Center for Innovation.
- Plug-in NC. (2019). *Multifamily Electric Vehicle Charging Guide*. <https://pluginncc.com/resource/multifamily-charging-quick-guide/>
- Public Utilities Regulatory Authority (PURA). (July 14, 2021). *Pura Investigation into Distribution System Planning of the Electric Distribution Companies – Zero Emission Vehicles: DECISION*. Author.
- Puentes, A. (2019). *On-Street Electric Vehicle Charging from Light Poles: Feasibility study identifying possibilities for light-pole charging in Vancouver*. City of Vancouver.
- Rillera, L., & Houston, S. (2022). *Electric Vehicle Charging in Communities Equity Workgroup Report*. Electric Vehicle Charging Infrastructure Strike Force.
- Rubin, D., & St-Louis, E. (2016). Evaluating the Economic and Social Implications of Participation in Clean Vehicle Rebate Programs: Who's In, Who's Out? *Transportation Research Record: Journal of the Transportation Research Board*, 2598(1), 67–74. [https://doi.org/10.3141/2598-](https://doi.org/10.3141/2598-08)

- Rushlow, J., Coplon-Newfield, G., LeBel, M., & Norton, E. (2015). *CHARGING UP: The Role of States, Utilities, and the Auto Industry in Dramatically Accelerating Electric Vehicle Adoption in Northeast and Mid-Atlantic States*. CLF, Sierra Club, Acadia Center.
- Sacramento Municipal Utility District (SMUD). (July 27, 2021). Comments to California Energy Commission on Building Decarbonization and Energy Efficiency, 21-IEPR-06. <https://efiling.energyca.gov/getdocument.aspx?tn=239016>
- Seattle City Light. (2022). *Curbside Level 2 EV Charging: Minimum Requirements for Curbside EV Charger Locations*.
- Shared-Use Mobility Center. (2020). *Our Community CarShare Sacramento Case Study*.
- Shaw, J., & Diaz, A. (2022, June 11). *Towards Equitable Electric Mobility—Community of Practice*. 35th International Electric Vehicle Symposium and Exhibition, Oslo, Norway.
- Slowik, P., & Nicholas, M. (2017). *Expanding access to electric mobility in the United States*. The International Council on Clean Transportation.
- Sovacool, B. K., & Dworkin, M. H. (2015). *Energy justice: Conceptual insights and practical applications*. *Applied Energy*, 142, 435–444.
- Tee Lewis, P. G., Chiu, W. A., Nasser, E., Proville, J., Barone, A., Danforth, C., Kim, B., et al. (2023). Characterizing vulnerabilities to climate change across the United States. *Environment International*, 172, 107772.
- U.S. Department of Transportation (U.S. DOT). (2022). *Charging Forward: A Toolkit for Planning and Funding Rural Electric Mobility Infrastructure*. <https://www.transportation.gov/rural/ev/toolkit>
- Werthmann, E., & Kothari, V. (2021). *Pole-Mounted Electric Vehicle Charging: Preliminary Guidance for a Low-Cost and More Accessible Public Charging Solution for U.S. Cities*. World Resources Institute. <https://www.wri.org/research/pole-mounted-electric-vehicle-charging-preliminary-guidance>

Zhou, Y., Gohlke, D., Sansone, M., Kuiper, J., & Smith, M. (2022). *Using Mapping Tools to Prioritize Electric Vehicle Charger Benefits to Underserved Communities*. Request for Information on Transportation Equity Data; Department of Transportation, 86 Fed. Reg. 28189 (May 25, 2021).

## Appendix A. Analytical Methods

To support equity in federally funded EV infrastructure deployment efforts, especially NEVI, the Joint Office of Energy and Transportation (JOET) has established several principles and goals, including to improve clean transportation access through the location of EVSE, decrease the transportation energy cost burden by enabling reliable access to affordable charging, and reduce environmental exposures to transportation emissions.<sup>40</sup> This report used those principles to develop the following scope:

*A broad assessment describing key themes and principles for successful implementation that emerge from literature review with an emphasis on commonality (i.e., themes that are consistently discussed and/or found to be successful among publicly-available sources).*

The first step was a qualitative review of 64 national, regional, and state-level EVSE program summaries, updates, policy briefs, proposals, whitepapers, reports, and web materials published from 2015 to 2023. The bibliography focused heavily on non-academic resources to avoid duplication of current or recently completed research undertaken in support of the Bipartisan Infrastructure Law (BIL) and NEVI. Overall, the bibliography includes web content and published materials that discuss both EVSE programs and equity-related goals within the following categories:

- U.S. Department of Energy and U.S. Department of Transportation programs
- Multi-State Studies of EVSE programs
- State and local programs
- International programs
- Research, advocacy and trade associations
- Utility programs

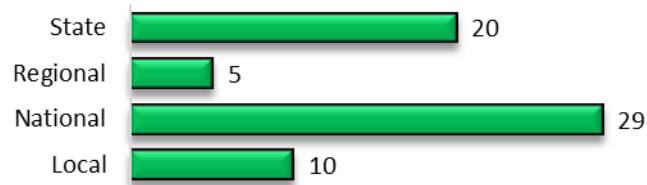
Information from these categories was included in the report if it appeared to contain at least two of the following kinds of information based on a preliminary evaluation:

1. Program design related to implementation, funding allocation, or eligibility
2. Different user eligibility and usage models
3. Community engagement that includes considering different community outreach methods and how/if trusted community organizations are involved
4. Practices for tracking benefits and impacts

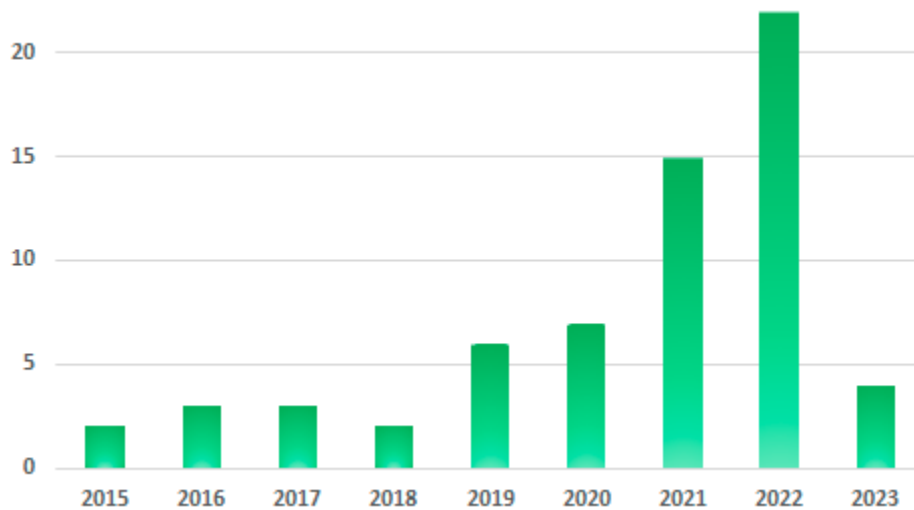
The report evaluated each resource for representation across both temporal and geographic dimensions to create a representative sample of programs. Figures A.1 and A.2 show that 60% of the information in the bibliography was either state-specific or more localized and was skewed towards recent data (i.e., from the last three years), another important goal.

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<sup>40</sup> See generally: <https://driveelectric.gov>.



**Figure A.1 Breakdown of Research by Geography**



**Figure A.2 Breakdown of Research by Year**

Each resource in the bibliography was evaluated for material relevant to the report’s scope including individual quotes, data, findings, themes, or principles. This material consisted of sentences or bullet points that were self-contained and fell into one of the following categories:

- Major and minor themes
- Data or methods
- Lessons learned or principles for implementation
- Equity topics
- Other topics
- Comments
- Interesting graphs
- Interesting references
- Important quotations

Overall, 588 unique, qualitative, unfiltered data points emerged from the bibliography. The next step was to look for patterns within the data and identify commonalities. Each data point was assigned one or more broad “themes” based on its strongest characteristics. Each theme also consisted of non-unique core areas, which tied directly to the report’s initial scope. This qualitative matrix is summarized in Table A.1 below, along with how many data points were assigned to each theme or core area. Importantly, each unique data point could be assigned to more than one theme. Finally, the data points



within the themes and core areas identified above were mapped into a structured report, with three Key Activities and nine Supporting Processes used to describe the relationship between the themes.

**Table A.1 Summary of Data Points Assigned to Themes and Core Areas**

<b>Theme</b>	<b>Core Areas</b>	<b>Data Points</b>
<b>Adopting Meaningful Metrics</b>	Best practices for tracking benefits	5
	Best practices for tracking impacts	4
	Examples	9
	Implementation	2
	Program design	5
<b>Adopting Meaningful Metrics Total</b>		<b>25</b>
<b>Community-Led Engagement</b>	Best practices for tracking impacts	1
	Community engagement	7
	Examples	6
	Organizational involvement	6
	Outreach models	7
<b>Community-Led Engagement Total</b>		<b>27</b>
<b>Data Collection</b>	Best practices for tracking benefits	5
	Community engagement	1
	Examples	8
	Implementation	2
	Organizational involvement	1
	Outreach models	1
	Program design	2
<b>Data Collection Total</b>		<b>20</b>
<b>Defining Equity</b>	Best practices for tracking benefits	6
	Best practices for tracking impacts	2
	Effectiveness	2
	Examples	10
	Organizational involvement	1
	Program design	2
	User eligibility	2
<b>Defining Equity Total</b>		<b>25</b>
<b>Education &amp; Awareness</b>	Community engagement	6
	Effectiveness	3
	Examples	15
	Organizational involvement	2
	Outreach models	6
<b>Education &amp; Awareness Total</b>		<b>32</b>
<b>Funding Structures</b>	Best practices for tracking benefits	1
	Examples	2
	Funding	3
	Funding allocation	7
	Implementation	1
	Program design	1
	Usage models	3
	User eligibility	2

Theme	Core Areas	Data Points
<b>Funding Structures Total</b>		<b>20</b>
<b>General Constraints</b>	Community engagement	1
	Effectiveness	2
	Examples	8
	Funding	1
	Funding allocation	1
	Implementation	6
	Program design	3
	User eligibility	4
<b>General Constraints Total</b>		<b>26</b>
<b>Identifying/Understanding Regulatory &amp; Institutional Barriers</b>	Best practices for tracking benefits	5
	Best practices for tracking impacts	2
	Community engagement	3
	Effectiveness	2
	Examples	7
	Funding	1
	Implementation	7
	Organizational involvement	4
	Outreach models	1
	Program design	16
	User eligibility	4
<b>Identifying/Understanding Regulatory &amp; Institutional Barriers Total</b>		<b>52</b>
<b>Improving Interagency/Inter-institutional Communication</b>	Examples	9
	Organizational involvement	7
	Outreach models	2
<b>Improving Interagency/Inter-institutional Communication Total</b>		<b>18</b>
<b>Innovative EVSE Options</b>	Funding	1
	Implementation	1
<b>Innovative EVSE Options Total</b>		<b>2</b>
<b>Jobs</b>	Best practices for tracking impacts	1
	Organizational involvement	3
	Usage models	1
<b>Jobs Total</b>		<b>5</b>
<b>Other Impacts</b>	Best practices for tracking benefits	1
	Best practices for tracking impacts	1
	Examples	1
	Funding allocation	1
	Implementation	1
<b>Other Impacts Total</b>		<b>5</b>
<b>Other Transportation Options</b>	Best practices for tracking benefits	1
	Community engagement	4
	Examples	5
	Implementation	6

Theme	Core Areas	Data Points
	Organizational involvement	1
	Outreach models	4
	Program design	4
	User eligibility	4
<b>Other Transportation Options Total</b>		<b>29</b>
<b>Project Planning</b>	Effectiveness	1
	Examples	4
	Funding allocation	2
	Implementation	9
	Usage model	1
	User eligibility	1
<b>Project Planning Total</b>		<b>18</b>
<b>Reviewing Incentive Structures</b>	Best practices for tracking impacts	1
	Examples	9
	Funding	4
	Implementation	2
	Program design	17
	Usage model	1
	User eligibility	37
<b>Reviewing Incentive Structures Total</b>		<b>71</b>
<b>Stakeholder Engagement</b>	Community engagement	2
	Examples	9
	Implementation	1
	Organizational involvement	7
	Outreach models	11
<b>Stakeholder Engagement Total</b>		<b>30</b>
<b>Strategic/Programmatic Planning</b>	Best practices for tracking benefits	2
	Best practices for tracking impacts	1
	Community engagement	7
	Effectiveness	3
	Examples	3
	Funding	2
	Implementation	17
	Organizational involvement	5
	Outreach models	10
	Program design	12
	User eligibility	1
<b>Strategic/Programmatic Planning Total</b>		<b>63</b>
<b>Understanding Community Needs</b>	Best practices for tracking benefits	2
	Best practices for tracking impacts	3
	Community engagement	38
	Effectiveness	1
	Examples	13
	Funding	7
	Implementation	9
	Metrics	2
	Organizational involvement	1
	Outreach models	5

Theme	Core Areas	Data Points
	Program design	6
	User eligibility	11
<b>Understanding Community Needs Total</b>		<b>98</b>
<b>Unsure</b>	Community engagement	1
	Examples	6
	Funding	2
	Program design	2
	Usage model	1
	User eligibility	1
<b>Unsure Total</b>		<b>13</b>