

National Electric Vehicle Infrastructure Formula Program

ANNUAL REPORT | Plan Year 2022–2023



Acknowledgments

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List of Acronyms

AFC	Alternative Fuel Corridor
AFDC	Alternative Fuels Data Center
BIL	Bipartisan Infrastructure Law
CCS	combined charging system
DCFC	direct-current fast charging
DOE	U.S. Department of Energy
DOT	department of transportation
EPA	U.S. Environmental Protection Agency
EV	electric vehicle
EVSE	electric vehicle supply equipment
FHWA	Federal Highway Administration
FY	fiscal year
Joint Office	Joint Office of Energy and Transportation
NEVI	National Electric Vehicle Infrastructure
NREL	National Renewable Energy Laboratory
O&M	operations and maintenance
RFI	request for information
USDOT	U.S. Department of Transportation

Executive Summary

The U.S. transportation sector accounts for one-third of the nation’s greenhouse gas emissions—the largest share of all primary sectors, including electricity production, industry, commercial and residential, and agriculture.¹ Electrified transportation has significant potential to reduce U.S. greenhouse gas emissions and help tackle the climate crisis.

Electrifying our transportation sector requires bold action to ensure the necessary infrastructure is in place for Americans to be able to ride and drive electric. According to a recent study from the National Renewable Energy Laboratory,² 1.2 million public charging stations will be needed to support 33 million light-duty vehicles by 2030. The Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law, invests \$7.5 billion to build out a national electric vehicle (EV) charging network for all Americans and also created the Joint Office of Energy and Transportation (Joint Office) to “study, plan, coordinate, and implement issues of joint concern between the two agencies.”

The National Electric Vehicle Infrastructure (NEVI) Formula Program was launched in February 2022, providing nearly \$5 billion over 5 years to help states, the District of Columbia, and Puerto Rico (hereafter referred to as “states”) create a network of EV charging stations beginning with designated Federal Highway Administration (FHWA) Alternative Fuel Corridors (AFCs), emphasizing the Interstate Highway System. All states submitted deployment plans which were reviewed by the Joint Office and FHWA and certified by FHWA in September 2022.

This document provides an individual and collective overview of the first-year deployment plans and summarizes the key activities of the Joint Office. Highlighted findings from the first round of NEVI plans, which are discussed in more detail in this document, include the following:

- **Everyone Is In.** All 52 plans were submitted to the Joint Office by Aug. 1, 2022, and approved by FHWA by Sept. 27, unlocking \$1.5 billion in funding for states to begin building charging stations through the NEVI Formula Program.
- **The Great American Road Trip Will Be Electrified.** Joint Office analysis shows that most states already have adequate funding to become “fully built out,” providing convenient, affordable, reliable, and equitable EV charging every 50 miles along 75,000 miles of designated highway corridors. Once fully built out, up to \$3.5 billion in funding could be available for EV charging beyond designated corridors.

¹ U.S. Environmental Protection Agency. 2023. “Sources of Greenhouse Gas Emissions.” Last updated April 28, 2023. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

² Eric Wood, Brennan Borlaug, Matt Moniot, Dong-Yeon (D-Y) Lee, Yanbo Ge, Fan Yang, and Zhaocai Liu. 2023. *The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5400-85654. <https://www.nrel.gov/docs/fy23osti/85654.pdf>

- **A Solid Start to Filling in the Network.** Currently designated EV corridors comprise 33% of the National Highway System and 92% of the Interstate Highway System. As of March 2023, 679 charging stations meet NEVI requirements for distance, port, and power, 228 of which are located within disadvantaged communities.
- **Room to Grow.** As a 5-year program, NEVI and its plans will evolve and continuously improve to reflect lessons learned, best practices, and innovation. Several areas that can generally be enhanced in future plans include procurement strategies, proposed station siting, cybersecurity, program evaluation, meaningful community engagement, and Justice40 implementation. These topics will be emphasized in technical assistance by the Joint Office.
- **Meeting States Where They Are.** The NEVI Formula Program allows for exceptions to the requirement that stations be placed every 50 miles within 1 mile of the highway when extenuating circumstances are presented. A total of 56 exception requests (to requirements for station spacing along highways or station locations from highways) were submitted; 18 were withdrawn after additional discussion with the requestor determined that they were not needed, 29 were approved, and 9 were denied.

Key Findings from the FY 2022 + FY 2023 State Plans

- All 52 plans were submitted by Aug. 1, 2022, and approved by Sept. 27, 2022—a tremendous accomplishment by all NEVI participants and a strong indicator of the importance of and interest in the NEVI Formula Program, releasing \$1.5 billion for fiscal year (FY) 2022 and FY 2023 to support implementation of those plans.
- All NEVI deployment strategies include designated portions of the National Highway Systems as AFCs, roughly 75,000 miles in total, and prioritize build-out along the Interstate Highway System.
- Many states anticipated they will achieve build-out of their AFCs in future years and have funding remaining for additional capacity or deploying stations in non-AFC locations. The Joint Office estimates up to \$3.5 billion of the \$5 billion could remain after build-out.
- General areas of plans that could be enhanced include procurement strategies, proposed station siting, cybersecurity, program evaluation, meaningful community engagement, and Justice40 implementation. These topics will be emphasized in technical assistance provided by the Joint Office.
- To allow implementation flexibility by state, a total of 56 exception requests (to requirements for station spacing along highways or station locations from highways) were submitted; 18 were withdrawn after additional discussion with the requestor determined that they were not needed, 29 were approved, and 9 were denied.

The vision presented in the first-year plans is encouraging and puts in place a strong foundation for an EV charging network that is convenient, affordable, reliable, and equitable. The Joint Office will utilize the summary of these plans to inform program improvement recommendations and future technical assistance activities to support states as they begin to implement their EV charging infrastructure.



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Introduction

This report provides an overview of the National Electric Vehicle Infrastructure (NEVI) Formula Program created through the Infrastructure Investments and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL). It highlights the key activities of the Joint Office of Energy and Transportation (Joint Office) in relation to the NEVI program and provides an individual and collective summary of the first-year NEVI deployment plans submitted by states, the District of Columbia, and Puerto Rico (hereafter referred to as “states”) and certified by the U.S. Department of Transportation (USDOT) Federal Highway Administration (FHWA) in September 2022.

The BIL, enacted in November 2021, authorized funding to states and other localities to strategically deploy electric vehicle (EV) charging infrastructure and establish an interconnected network to facilitate data collection, access, and reliability. The BIL also established the Joint Office, an interagency collaboration between the U.S. Department of Energy (DOE) and USDOT to support the successful implementation of BIL investments. The Joint Office was funded to study, plan, coordinate, and implement on these areas of joint concern between USDOT and DOE, including:

1. Technical assistance related to the deployment, operation, and maintenance of zero-emission vehicle charging and refueling infrastructure; renewable energy generation; vehicle-to-grid integration, including microgrids; and related programs and policies.
2. Data sharing of installation, maintenance, and utilization to continue to inform the network build-out of zero-emission vehicle charging and refueling infrastructure.
3. Performance of a national and regionalized study of zero-emission vehicle charging and refueling infrastructure needs and deployment factors to support grants for community resilience and EV integration.
4. Development and deployment of training and certification programs.
5. Establishment and implementation of a program to promote renewable energy generation, storage, and grid integration, including microgrids, in transportation rights-of-way.
6. Studying, planning, and funding for high-voltage distributed current infrastructure in the rights-of-way of the Interstate Highway System and for constructing high-voltage and/or medium-voltage transmission pilots in the rights-of-way of the Interstate Highway System.
7. Research, strategies, and actions under the departments’ statutory authorities to reduce transportation-related emissions and mitigate the effects of climate change.
8. Development of a streamlined utility accommodations policy for high-voltage and medium-voltage transmission in the transportation right-of-way.
9. Any other issues that the Secretary of Transportation and Secretary of Energy identify as issues of joint interest.

The Joint Office is initially focused on providing unifying guidance, technical assistance, and analysis to support the implementation of the following federal programs:

Program	Lead Agency	Funding
National Electric Vehicle Infrastructure Formula Program	USDOT (FHWA)	\$5 billion
Charging and Fueling Infrastructure Grants (Community Charging)	USDOT (FHWA)	\$1.25 billion
Charging and Fueling Infrastructure Grants (Corridor Charging) ³	USDOT (FHWA)	\$1.25 billion
Low or No Emission (Bus) Grants	USDOT (Federal Transit Administration)	\$5.6 billion
Clean School Bus Program	U.S. Environmental Protection Agency (EPA)	\$5 billion

Total: \$18.1 billion

Collectively, these programs account for \$18.1 billion in investment toward electrifying key components of our transportation system to envision a future where everyone can ride and drive electric.

³ The Charging and Fueling Infrastructure Grants program is open to EV as well as other alternative fueling infrastructure projects.

National Network of Electric Vehicle Charging Infrastructure

Vision for the National EV Charging Network

The Joint Office envisions a future where everyone can ride and drive electric. Realizing this vision will require a ubiquitous, nationwide EV charging network that increases coverage and capacity while instilling key values that improve the overall charging experience and enable a variety of mobility solutions. Critically, the national EV charging network should seek to present a compelling alternative to our current fueling infrastructure. If successful, electrified transportation has the potential to make notable progress toward imperatives such as tackling the climate crisis, creating good-paying jobs that align with emerging economic opportunities, and supporting American innovation and energy independence.

Building out, maintaining, and sustaining a national EV charging network will require both public and private sector innovation and investment, as well as tightly synchronized activities across a broad set of stakeholders including all levels of government, auto manufacturers, EV charger manufacturers, EV charging operator networks, electric utilities, site hosts, and workforce and labor organizations.

The Federal Role in the U.S. Electric Vehicle Charging Network

The U.S. transportation sector accounts for one-third of the nation's greenhouse gas emissions—the largest share of all primary sectors, including electricity production, industry, commercial and residential, and agriculture.⁴ Electrified transportation has great potential to reduce U.S. greenhouse gas emissions and help tackle the climate crisis.

As a concrete and bold step toward expanding the nation's EV charging network, the Biden administration set a goal of 500,000 public EV charging ports by 2030, which is a significant and necessary increase from the current network of roughly 140,000 ports.⁵ This growth, sparked by generational federal investments, will also require continued and expanded investment by the private sector.

The BIL invests up to \$7.5 billion in expanding the nation's EV charging network, and a multitude of additional federal programs and incentives include EV charging infrastructure in their scope. The actions in the BIL represent the single largest investment by the U.S. government in a public EV charging network.

⁴ EPA. 2023. "Sources of Greenhouse Gas Emissions."

⁵ The station/port numbers presented in this report are obtained from the U.S. Department of Energy Alternative Fuels Data Center Alternative Fueling Station Locator: <https://afdc.energy.gov/stations/#/find/nearest>. The Alternative Fueling Station Locator is updated once daily and only displays the stations/ports that are currently available at the time of update. Existing station/port totals will fluctuate on a daily basis as existing stations/ports may not show up for various reasons (e.g., down for regular maintenance, repairs). The station/port numbers presented in this report reflect the data on the specific date the Alternative Fueling Station Locator was queried.

Federal programs have been structured through corridor charging investments, which will enable long-distance travel of people and goods, and community charging investments, which will facilitate shorter day-to-day trips as well as greater overall mobility. Corridor charging is characterized by higher-power fast charging along major highways, whereas community charging will focus on lower-power, ubiquitous charging at home, as well as destinations such as retail locations and workplaces. It is expected that most EV charging will occur at private access sites such as single-family and multifamily homes, parking garages, and fleet depots, and that private charging ports will make up a significant majority of overall charging ports.



Figure 1. EV charging ecosystem

Federal investments in EV charging are intended to supplement, not supplant, private sector investment. Similar to other national infrastructure, federal investments will focus on filling gaps to facilitate access to all, with a particular focus on underserved and disadvantaged communities. These investments are guided by key performance standards and guidance to ensure consistency and instill the values of convenience, affordability, reliability, and equity into the charging network.

Key Values of the EV Charging Network: Convenience, Affordability, Reliability, and Equity

Through the collaboration facilitated by the Joint Office, federal program guidance and standards have been developed to promote a common, high-quality experience in our EV charging network. This whole-of-government approach is intended to increase effectiveness, simplify implementation, and drive critical outcomes.

Convenient

The U.S. EV charging network will need to successfully provide coverage and capacity to ensure that diverse needs are met. Geographic coverage is critical to ensuring that no matter where one is, there is charging available within a reasonable distance (e.g., within 1 mile of the highway). Charging capacity ensures that the number of available charging ports at a given location is proportional to current and projected future demand. To match the convenience of standard vehicle fueling, EV drivers need the

confidence of knowing they can charge their vehicles where and when they need. The United States has the potential to make charging more convenient than fueling stations by aligning the charging experience with places travelers are already traveling and dwelling, whether at home, work, commercial and retail establishments, or recreation locations.

A convenient charging experience is seamless and one that works for all vehicles, regardless of vehicle manufacturer or electric vehicle supply equipment (EVSE). Convenience means that charging is simple, with few steps required to locate, initiate, pay for, and complete the charge session with little to no wait time, efficient charging speed, a variety of payment methods, and no or low barriers to entry (e.g., no prerequisite memberships, proprietary connector types, or complicated pricing models).

Affordable

Estimates indicate that electric light-duty vehicles have substantially lower fuel costs than conventional light-duty vehicles, saving consumers thousands of dollars.⁶ In addition, long-term trends show that electricity has a substantially more stable price compared to gasoline and other alternative fuels.⁷ To complement these trends, the national charging network should be built in a way that fosters an open, competitive market. This can be accomplished with transparent requirements based on open standards. By employing chargers with standardized connectors and communication protocols, existing and new charging providers can more easily launch and maintain charging services and focus on providing a great customer experience. This provides EV charging customers and businesses wishing to host charging stations with more options.

Reliable

Just as Americans expect fueling stations to be operational when they arrive and for lights to turn on when flipping a switch, they expect EV chargers to work. Charging sessions should be easy and quick to start, regardless of the payment method used or vehicle being driven. It is critical for EV drivers to have a consistent charging experience, with their vehicles receiving the same amount of power regardless of how many other drivers are plugged in at the station. It is also important that EV charging is resilient to power outages and severe weather events. The national charging network will only be as reliable as the electric system that underpins it.

Equitable

The transition to electrified transportation provides an opportunity to address existing inequities and improve mobility for all. Emphasizing equity and avoiding exacerbating existing disparities is a cornerstone in the development and implementation of a

⁶ U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Vehicle Technologies Office. 2022. "FOTW #1251, August 15, 2022: Electric Vehicles Have the Lowest Annual Fuel Cost of All Light-Duty Vehicles." Aug. 15, 2022. <https://www.energy.gov/eere/vehicles/articles/fotw-1251-august-15-2022-electric-vehicles-have-lowest-annual-fuel-cost-all>

⁷ Alternative Fuels Data Center. 2023. "Fuel Prices." Accessed Jan. 12, 2023. <https://afdc.energy.gov/fuels/prices.html>

national EV charging network. As laid out in the NEVI program guidance, “many of the burdens from the transportation and energy systems have been historically and disproportionately borne by disadvantaged communities. Unequal distribution of benefits from the transportation and energy systems has prevented disadvantaged communities and minority-owned and women-owned businesses from realizing equitable benefits from these systems, while other historic barriers to transportation have made facilities inaccessible to individuals with disabilities.”^{8,9} Thus, the potential benefits of federal EV charging investments for disadvantaged communities could include, but are not limited to:

- Improving clean transportation access through the location of chargers.
- Decreasing the transportation energy cost burden by enabling reliable access to affordable charging.
- Reducing environmental exposures to transportation emissions.
- Increasing the clean energy job pipeline, job training, and enterprise creation in disadvantaged communities.
- Providing charging infrastructure for transit and shared-ride vehicles.

Additionally, ensuring the accessibility of EV charging infrastructure can take many forms, including ensuring that charging stations are physically accessible to persons with disabilities, signage offers options for individuals with limited English proficiency, accessible payment options are available to accommodate all consumers including the unbanked, and siting chargers with respect to underserved or disadvantaged communities.

Status of the Current Charging Network

The EV market and supporting EV charging network in the United States has been under development for over a decade, with the first mass-market plug-in EVs moving into production in 2010. Since that time, the market has continued to see rapid growth. According to Experian registration data, as of June 2022, a total of 2.3 million light-duty plug-in EVs are registered in the United States. Even more telling is that while overall vehicle sales declined in 2022, EV sales continued to grow in sheer numbers as well as market share. In addition, overall EV range has increased dramatically since 2011, when vehicles were only able to travel a little over 70 miles on a charge. Most current vehicles exceed 200 miles of range, with some higher-end models able to exceed 500 miles on a single charge.

⁸ Disadvantaged communities are those that have experienced disproportionately high and adverse human health, environmental, climate-related, and other cumulative impacts, including the economic challenges of such impacts.

⁹ U.S. Department of Transportation Federal Highway Administration. 2022. “The National Electric Vehicle Infrastructure (NEVI) Formula Program Guidance.” Memorandum, Feb. 10, 2022. Superseded on June 2, 2023 by https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/nominations/90d_nevi_formula_program_guidance.pdf.

As EVs have become more commonplace, the EV charging network has grown and evolved. As of March 2023, the U.S. public charging network had approximately 140,000 EV charging ports, according to DOE’s Alternative Fuels Data Center (AFDC), with more than 75% of the available ports being Level 2 chargers.¹⁰ The AFDC’s EV charging infrastructure trends reports provide snapshots and illustrate historical trends of the state of EV charging infrastructure in the United States.¹¹ The latest report from the third quarter of 2022 shows an overall increase of 5.5% in public EVSE ports and 6.9% in public DCFC ports since the previous quarter.¹²

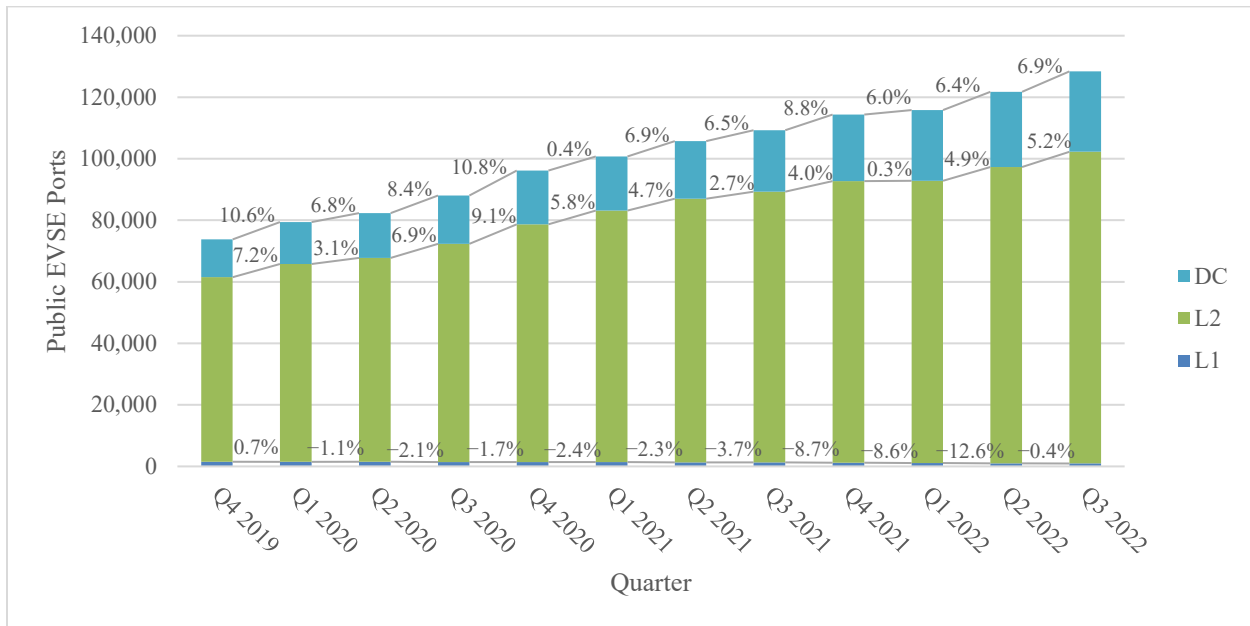


Figure 2. Quarterly growth of public EVSE ports by charging level.

Source: Brown et al. (2023)

Level 2 AC charging is often found at destinations such as shopping centers, recreation areas, workplaces, and other locations where vehicles may be parked for an extended amount of time. Significant research on consumer needs suggests that Level 2 charging is sufficient for a majority of travel.

DCFC ports often provide power output ≥ 50 kW, and current commercially deployed EVSE models provide up to 350 kW of charging, with greater power levels possible for certain charging standards. As DCFC power levels increase, faster charging is possible; however, potential impacts to the grid also require well-planned deployment of these

¹⁰ There are three common levels of EV charging—Level 1, Level 2, and DCFC—in addition to various common connector technologies that enable power transfer, communication, and safety in vehicle charging. The AFDC provides more information on charging levels and connector types: https://afdc.energy.gov/fuels/electricity_infrastructure.html.

¹¹ Alternative Fuels Data Center. 2023. “Electric Vehicle Charging Infrastructure Trends.” Accessed Jan. 12, 2023. https://afdc.energy.gov/fuels/electricity_infrastructure_trends.html

¹² Abby Brown, Jeff Cappellucci, Emily White, Alexia Heinrich, and Emma Cost. 2023. *Electric Vehicle Charging Infrastructure Trends from the Alternative Fueling Station Locator: Third Quarter 2022*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5400-84817. <https://www.nrel.gov/docs/fy23osti/84817.pdf>

chargers. Higher-power charging standards and technologies for medium- and heavy-duty vehicles, such as the Megawatt Charging Standard (MCS), can accommodate several megawatts of charging power and are in development. Figure 3 shows the current DCFC network along U.S. interstates; current coverage is limited in more rural areas, particularly for non-Tesla owners.

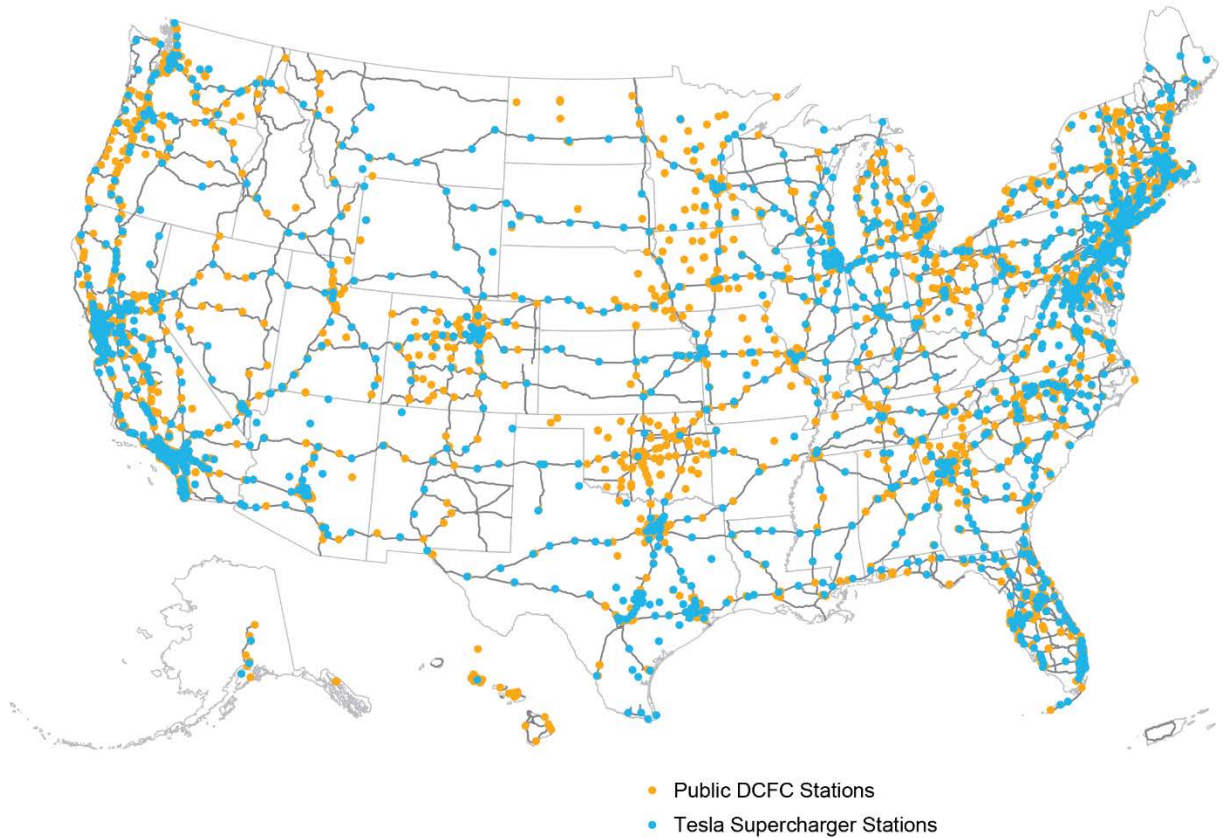


Figure 3. Public DCFC EV charging locations from DOE’s AFDC Alternative Fuel Station Locator. Detailed regional maps are provided in Appendix D.

According to the AFDC’s Third Quarter 2022 trends report, DCFC ports greater than 150 kW represent an increasing share of public DCFC ports (Figure 4). It is important to note that although power levels of charging infrastructure are important, actual charging speeds also depend on the capabilities of individual vehicle models.

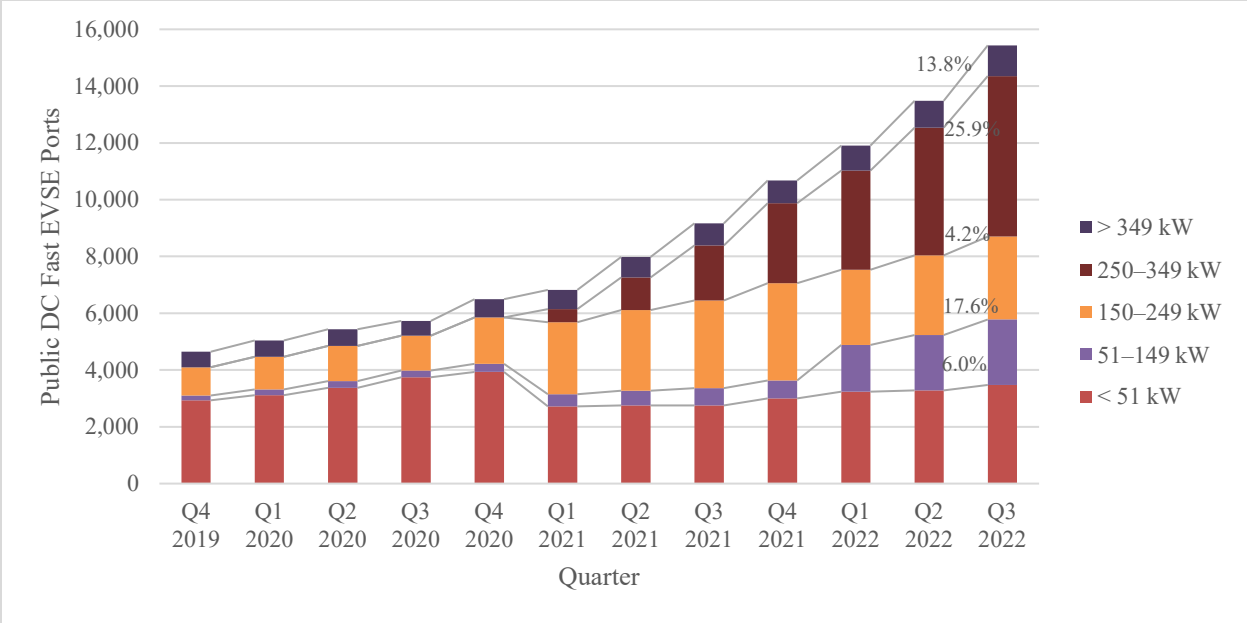


Figure 4. Quarterly growth of public DCFC ports by power output.

Source: Brown et al. (2023)

Despite growth in EV availability and increasing EV charging speeds and station numbers, challenges remain to achieve the required national network. Reliability, interoperability, open access for all, and standardization of key elements of the charging experience such as connectors, payment, and pricing (e.g., \$/kWh) are all currently lacking in most existing charging networks.^{13,14} There are still notable gaps in the collective charging network along major corridors; redundancy and future-proofing along these corridors will also be key as the EV market grows.¹⁵ In communities, entire new business and charging models must be pursued to ensure that drivers who do not have dedicated parking spots have consistent access to charging and that benefits of charging infrastructure can be accrued by all.¹⁶ Critically, community charging business models must also sustain all forms of electric mobility to enable solutions that do not require vehicle ownership.

¹³ Niraj Chokshi. 2022. "A Frustrating Hassle Holding Electric Cars Back: Broken Chargers." *The New York Times*, Aug. 16, 2022. <https://www.nytimes.com/2022/08/16/business/energy-environment/electric-vehicles-broken-chargers.html>

¹⁴ D. Rempel, C. Cullen, M. Bryan, and G. Cezar. 2022. "Reliability of Open Public Electric Vehicle Direct Current Fast Chargers." SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4077554

¹⁵ J.D. Power. 2022. "Growing Electric Vehicle Market Threatens to Short-Circuit Public Charging Experience, J.D. Power Finds." Aug. 17, 2022. <https://www.jdpower.com/business/press-releases/2022-us-electric-vehicle-experience-evx-public-charging-study>

¹⁶ A. Bassett. 2022. "Electric vehicles have a charging access problem. These companies are working to solve it." *Fortune*, Oct. 17, 2022. <https://fortune.com/2022/10/17/electric-vehicles-have-a-charging-access-problem-these-companies-are-working-to-solve-it/>

National EV Charging Network Needs Estimate

The BIL enables significant and necessary steps to realize the full opportunity of a national EV charging network. Many of the key performance needs identified in the previous section are addressed in 23 CFR Part 680: National Electric Vehicle Infrastructure Standards and Requirements published by FHWA (FHWA Docket No. FHWA–2022-0008) on Feb. 28, 2023. Actual construction, maintenance, and operation of charging stations are supported by a variety of formula and competitive federal funding programs (discussed later in this report). Ongoing technical assistance and analysis by the Joint Office will be critical to ensuring that programs and policies lead to effective implementation, as reflected in the legislation that established the Joint Office. Notably, the BIL charges the Joint Office with “performance of a national and regionalized study of zero emission vehicle charging and refueling infrastructure needs and deployment factors, to support grants for community resilience and electric vehicle integration.”

To support this mandate and inform critical federal investments, the Joint Office and DOE’s Vehicle Technologies Office partnered to support the development and recent publication of the report *The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure* by the National Renewable Energy Laboratory (NREL).¹⁷ The needs estimate builds upon numerous previous assessments and leverages NREL’s suite of EV infrastructure analysis tools (EVI-X) to identify where, how many, and what type of charging infrastructure the United States needs to support its transportation electrification targets.

The needs estimate arrives at several key conclusions that help frame the coevolution and expansion of EVs and charging infrastructure:

- Supporting a total of 33 million light-duty EVs, a mid-level adoption estimate, by 2030 will require over 28 million charging ports (both public and private) and cumulative investment between \$53 and \$127 billion. Approximately 1.2 million of the 28 million charging ports are publicly available in this analysis.
- Lower-power AC charging accounts for the majority of needed charging ports (approximately 26.8 million), while the estimated 182,000 needed DCFC stations could make up as much as 39% of the \$53–\$127-billion investment.
- The composition of the national public network is uncertain and will vary regionally, depending ultimately on vehicle adoption, access to residential charging, and individual charging preferences.

NREL’s needs estimate describes the charging network as a conceptual model akin to a tree, with the private charging network represented by the roots that anchor the overall network but are generally out of public sight (Figure 5). The trunk represents the role of the public fast charging network as the backbone and structure of the system, and the

¹⁷ Wood et al. 2023. *The 2030 National Charging Network*.

branches represent a variety of destinations with EV chargers that are enabled by corridor and community charging networks.

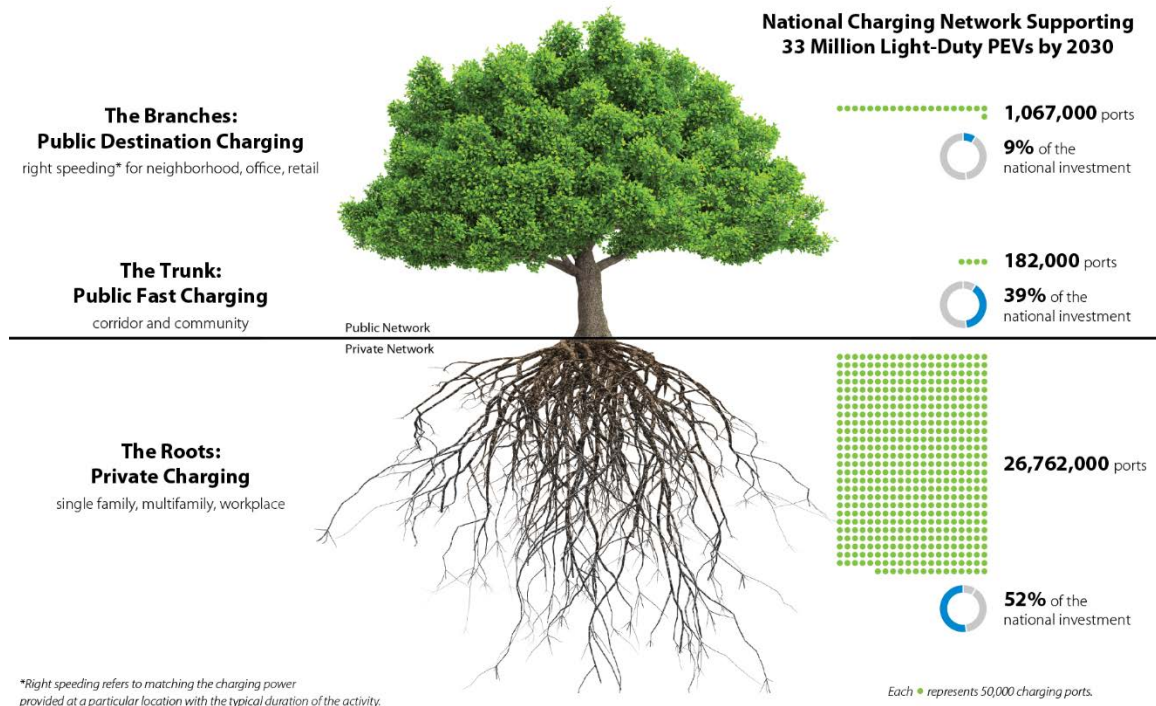


Figure 5. A new conceptual illustration of national charging infrastructure needs.

Source: Wood et al. (2023)

Additionally, the needs estimate suggests that many drivers will need to see charging stations at destinations and along routes they already travel, and that the stations need to be functional and available with no or little wait time to build consumer confidence in purchasing an EV.

While the previous investments and continued growth in the EV market are encouraging, the pace of EV charging infrastructure must increase substantially to meet the needs of 33 million EVs. Additionally, improvements in the reliability, interoperability, and convenience of public infrastructure are critical to realizing an electrified transportation system for all.

Federal Support for the National EV Charging Network

The BIL represents a historic whole-of-government approach and investment toward transportation electrification. The Joint Office is initially providing unifying support and technical assistance for a collective \$18.1 billion in programs across multiple agencies. Collectively, these programs are an important step toward making EV charging—and, more broadly, electric mobility—available to all Americans.



National Electric Vehicle Infrastructure (NEVI) Formula Program
Administered by USDOT and provides \$5 billion for states to build a national EV charging network along highway corridors.



Charging & Fueling Infrastructure Discretionary Grant Program

Administered by USDOT and provides \$2.5 billion in corridor and community grants for EV charging, as well as hydrogen, natural gas, and propane fueling infrastructure.



Low-No Emissions Grants Program for Transit

Administered by USDOT and provides \$5.6 billion in support of low- and no-emission transit bus deployments.



Clean School Bus Program

Administered by the EPA and provides \$5 billion in support of electric school bus deployments.

While these programs are key cornerstones to transportation electrification, there are additional significant programs supporting key efforts to bolster and decarbonize transportation and the electric power grid. Information on programs in the BIL and resources related to the Inflation Reduction Act are available online.^{18,19} Another key resource released by FHWA details over \$50 billion in programs that have eligibilities for EV charging.

Stakeholder and Private Sector Role and Engagement

To deliver on promises of the BIL, the Joint Office recognizes the importance of engagement with stakeholders and the private sector to leverage opportunities and expertise and build upon previous experiences. The Joint Office has engaged extensively with stakeholders in local, state, and federal government; equity-focused organizations; industry trade associations; nonprofits and nongovernmental organizations; and private industry, including automakers, charging equipment manufacturers and networks, property owners, and utilities. The Joint Office aims to be responsive, helpful, and open to meet the needs of these stakeholders while also collecting valuable feedback that supports successful and impactful work by the team and colleagues at DOE and USDOT. The Joint Office leverages multiple channels to connect with stakeholders, including:

- **DriveElectric.gov:** This website hosts content about the Joint Office, such as relevant news, upcoming and recorded webinars, technical assistance opportunities, career opportunities, data and tools, email news alert sign-up, and a “contact us” form. DriveElectric.gov had more than 280,000 page views between launch in February 2022 and the end of April 2023.
- **Joint Office email distribution list:** The Joint Office regularly connects with stakeholders via a monthly email news alert, as well as periodic email updates.

¹⁸ The White House. 2022. “Building a Better America.” Last updated Sept. 2022.

<https://www.whitehouse.gov/build/>

¹⁹ The White House. 2023. *Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act’s Investments in Clean Energy and Climate Action*. Version 2 (Jan. 2023). Washington, D.C.: The White House. <https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf>

From February to end of April 2022, the Joint Office sent 36 email alerts to a growing list of nearly 2,500 email subscribers.

- **Joint Office-hosted webinars:** Since late February 2022, the Joint Office has hosted 15 webinars that engaged more than 4,200 total attendees.
- **Stakeholder events, meetings, and webinars:** Since early 2022, the Joint Office has participated in nearly 215 speaking engagements at in-person and virtual meetings, as well as on webinars. In addition to these broad-reaching events, the Joint Office has conducted more than 180 one-on-one meetings with private sector stakeholders interested in learning about Joint Office priorities and sharing insights, products, services, and ideas that may support Joint Office activities.

Through these outreach channels, the Joint Office has fielded over 3,400 technical assistance inquiries as of April 2023.

Complementary to direct outreach conducted by the Joint Office, the office has a formal partnership with the National Association of State Energy Officials (NASEO) and the American Association of State Highway and Transportation Officials (AASHTO). These organizations have strong relationships with and provide a valuable connection to the parties responsible for implementing many of the programs supported by the Joint Office. The Joint Office also collaborates with organizations like the American Public Power Association, Edison Electric Institute, and National Rural Electric Cooperative Association, who provide unique insight into the challenges and opportunities facing utilities.

In its short tenure, the Joint Office has quickly established itself as a valuable and responsive partner, eager to engage with diverse audiences to accelerate an electrified transportation system that is convenient, affordable, reliable, and equitable. Together with the dedicated experts who have preceded it, the Joint Office is fostering a future where everyone can ride and drive electric.

National Electric Vehicle Infrastructure Formula Program

The NEVI Formula Program is a key component of the BIL, providing nearly \$5 billion over 5 years to help states create a network of EV charging stations along designated Alternative Fuel Corridors (AFCs), with emphasis on the Interstate Highway System. This funding will serve as a catalyst for the deployment of such infrastructure and help ensure the infrastructure results in a connected network to facilitate data collection, access, and reliability. Generally, the funds provided are to be used for²⁰:

1. The acquisition and installation of EV charging infrastructure.
2. Operations and maintenance (O&M) costs of EV charging infrastructure.

²⁰ This is a summary of the key eligibilities for the NEVI Formula Program funds. A complete list of program eligibilities and requirements can be found in FHWA's NEVI Formula Program Guidance and FHWA's National Electric Vehicle Infrastructure Standards and Requirements regulation (Docket No. FHWA-202200008).

3. Data sharing about EV charging infrastructure.
4. Development phase activities related to acquisition and installation of stations.
5. On-premises signage to provide information about EV charging infrastructure acquired and installed or operated.
6. Traffic control devices in rights-of-way to provide directional information about EV charging infrastructure acquired and installed or operated.
7. Mapping and analytics activities to support the acquisition, installation, and operation of EV charging infrastructure under this program.

The \$5 billion in NEVI Formula Program funds are apportioned to all states by Congress for each fiscal year (FY). The apportionments are determined by an established formula, set by Congress. The maximum federal share payable for the cost of a project funded under the NEVI Formula Program is 80%.

With the goal of establishing a national network of EV charging, key parameters of the NEVI Formula Program include:

- EV charging stations must be installed every 50 miles on the AFCs and within 1 travel mile of the highway or interstate, until deemed fully built out.
- DCFC charging stations must have at least four 150-kW Combined Charging System (CCS) ports capable of simultaneous charging for four EVs (600-kW total power) along all designated electric vehicle AFCs.
- Meeting these targets along all designated electric vehicle AFCs allows for states to be declared “fully built out” along corridors and to invest in public charging stations in additional locations.

Minimum standards and requirements for projects funded under the NEVI Formula Program²¹ are detailed in FHWA’s National Electric Vehicle Infrastructure Standards and Requirements published on Feb. 28, 2023 (Docket No. FHWA-2022-0008). These minimum standards and requirements, effective March 30, 2023, regulate the installation, operation, or maintenance of EV charging infrastructure; the interoperability of EV charging infrastructure; traffic control device or on-premises signage acquired, installed, or operated in concert with EV charging infrastructure; data, including the format and schedule for the submission of such data; network connectivity of EV charging infrastructure; and information on publicly available EV charging infrastructure locations, pricing, real-time availability, and accessibility through mapping applications.²²

²¹ FHWA’s National Electric Vehicle Infrastructure Standards and Requirements regulation applies to NEVI-funded projects as well as projects for the construction of publicly accessible EV chargers that are funded with funds made available under Title 23, United States Code, including any federally funded EV charging infrastructure project that is treated as a project on a Federal-aid highway.

²² U.S. Department of Transportation Federal Highway Administration. 2022. “National Electric Vehicle Infrastructure Standards and Requirements.” 23 CFR 680.

<https://www.federalregister.gov/documents/2023/02/28/2023-03500/national-electric-vehicle-infrastructure-standards-and-requirements>

On Feb. 21, 2023, FHWA also published a temporary “Waiver of Buy America Requirements for Electric Vehicle Chargers” (Docket No. FHWA-2022-0023) under its Buy America waiver authorities to modify its existing general applicability waiver for manufactured products related to EV chargers.²³ The short-term, temporary waiver, effective March 23, 2023, enables EV charger acquisition and installation to immediately proceed while also ensuring the application of Buy America to EV chargers by phasing out the waiver over time.

For each state to access its fiscal year NEVI Formula Program apportioned funds, it is required to submit an EV infrastructure deployment plan describing how it intends to use the funds. The state plans must provide information on state agency coordination, vision and goals, contracting strategies, existing and future conditions analysis, deployment approach, implementation strategies, civil rights considerations, equity and Justice40 considerations, labor and workforce considerations, cybersecurity, and program evaluation.

To support states in this effort, FHWA developed several guidance documents in coordination and consultation with the Joint Office,²⁴ including:

- **NEVI Formula Program Guidance**, issued by FHWA on Feb. 10, 2022.
- **State NEVI Infrastructure Deployment Plan Template**: A standardized template that states may elect to use to organize their plans to meet the guidance requirements.
- **Discretionary Exception Template**: A standardized template for states requesting an exception to the distance (50-mile and 1-mile) requirements in specific locations where extraordinary circumstances exist.
- **FAQs**: Additional information provided to states to address questions that arise during plan development.
- **[Combined DOE-DOT Justice40 map](#)**: Consistent with the Justice40 Interim Guidance, USDOT and DOE developed a joint interim definition of disadvantaged communities for the NEVI Formula Program.²⁵

In addition to playing a key role in the development of these guidance documents, the Joint Office directly supported the states in the development of their first EV infrastructure deployment plans. Through myriad opportunities initiated in February 2022, Joint Office staff engaged with states to help answer questions, discuss challenges, provide technical resources, and encourage collaboration between the

²³ U.S. Department of Transportation Federal Highway Administration. 2022. “Notice of Proposed Waiver of Buy America Requirements for Electric Vehicle Chargers.” *Federal Register* 87 (168): 53539–53547. <https://www.federalregister.gov/documents/2023/02/21/2023-03498/waiver-of-buy-america-requirements-for-electric-vehicle-chargers>

²⁴ On June 2, 2023, FHWA published updated guidance documents that supersede the February 2022 guidance documents referenced here. The state plans and analysis contained in this report reflect the February 2022 guidance.

²⁵ The White House. 2021. “Interim Implementation Guidance for the Justice40 Initiative.” Memorandum, July 20, 2021. <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>

states while developing their plans. As the NEVI Formula Program advances, the technical assistance activities will continue to evolve as well, with a transition to a focus on implementation as opposed to plan development. Appendix A provides a more comprehensive description of the technical assistance activities.



Overview of State EV Infrastructure Deployment Plans

All states submitted their FY 2022/FY 2023 EV infrastructure deployment plans by the deadline of Aug. 1, 2022. Those plans were reviewed and evaluated by the Joint Office and FHWA. FHWA certified all 52 plans by Sept. 27, 2022, ahead of schedule. The approval of these plans unlocked \$1.5 billion of the total \$5-billion funding for the NEVI Formula Program and enabled the states to begin implementation.

Each of the plans is publicly available. Links to the plans and FHWA certification memos may be found on the [FHWA website](#) and [Joint Office website](#). Most states have also established their own NEVI Formula Program websites. Links to those state websites are also provided on the Joint Office website.

Funding

The BIL committed approximately \$5 billion over 5 years for the NEVI Formula Program. These funds are distributed to the states each fiscal year, as described in Appendix B.

FY 2022 and FY 2023 funds have been distributed to the states. Apportionment memos detailing the actual funding amounts can be found on the FHWA website:

- [FY 2022 Apportionment](#)
- [FY 2023 Apportionment](#).

All funds associated with the NEVI Formula Program are to be administered by state departments of transportation (DOTs) as apportioned under U.S. Code Title 23, Chapter 1, which encompasses requirements for states to receive federal transportation funding. All applicable requirements under this code and 2 CFR Part 200 apply to the use of these funds.

Progress toward a National Network

The state EV infrastructure deployment plans outline each state's strategy for implementing NEVI funds within their state borders, with a focus on deployment in FY 2022 and FY 2023. Collectively, those plans roll up to present a picture of the national network of EV charging infrastructure. While this is the first year of the program, and therefore states are in the early planning stages and have not yet begun implementation, the plans collectively demonstrate a commitment to creating a national network.

Alternative Fuel Corridor Coverage

In accordance with the requirements of the BIL, states are required to deploy NEVI Formula Program funds on their designated AFCs until they receive certification from FHWA that they have fully built out their AFCs, at which time they may use remaining NEVI Formula Program funds in other locations. AFCs are highways designated by FHWA as corridors that provide charging and fueling for alternative fuel vehicles including electricity, hydrogen, propane, and natural gas. Prior to the NEVI Formula Program, EV charging corridors were designated as either "ready," indicating charging station availability every 50 miles and up to 5 miles from the corridor, or "pending,"

indicating that stations have insufficient coverage to meet the criteria of 50-mile distance between charging stations. The NEVI program requires that stations be no more than 1 mile from the corridor and does not distinguish between ready and pending.

FHWA reviews and designates the AFCs nominated by the states. There have been six complete rounds of AFC designation since the program inception in 2016. The most recently completed round, Round 6, opened in February 2022, and FHWA designated Round 6 AFCs in July 2022. The state deployment plans include the AFCs through Round 6. To date, all states have designated one or more AFCs within their borders (Figure 7). In May 2023 FHWA opened Round 7 for nominations, and therefore FY 2024 state deployment plans will be updated accordingly to reflect any changes from that process. All information about the AFCs included in this report is based on the status of the designations at the time when the FY 2022/FY 2023 state deployment plans were submitted and is subject to change.

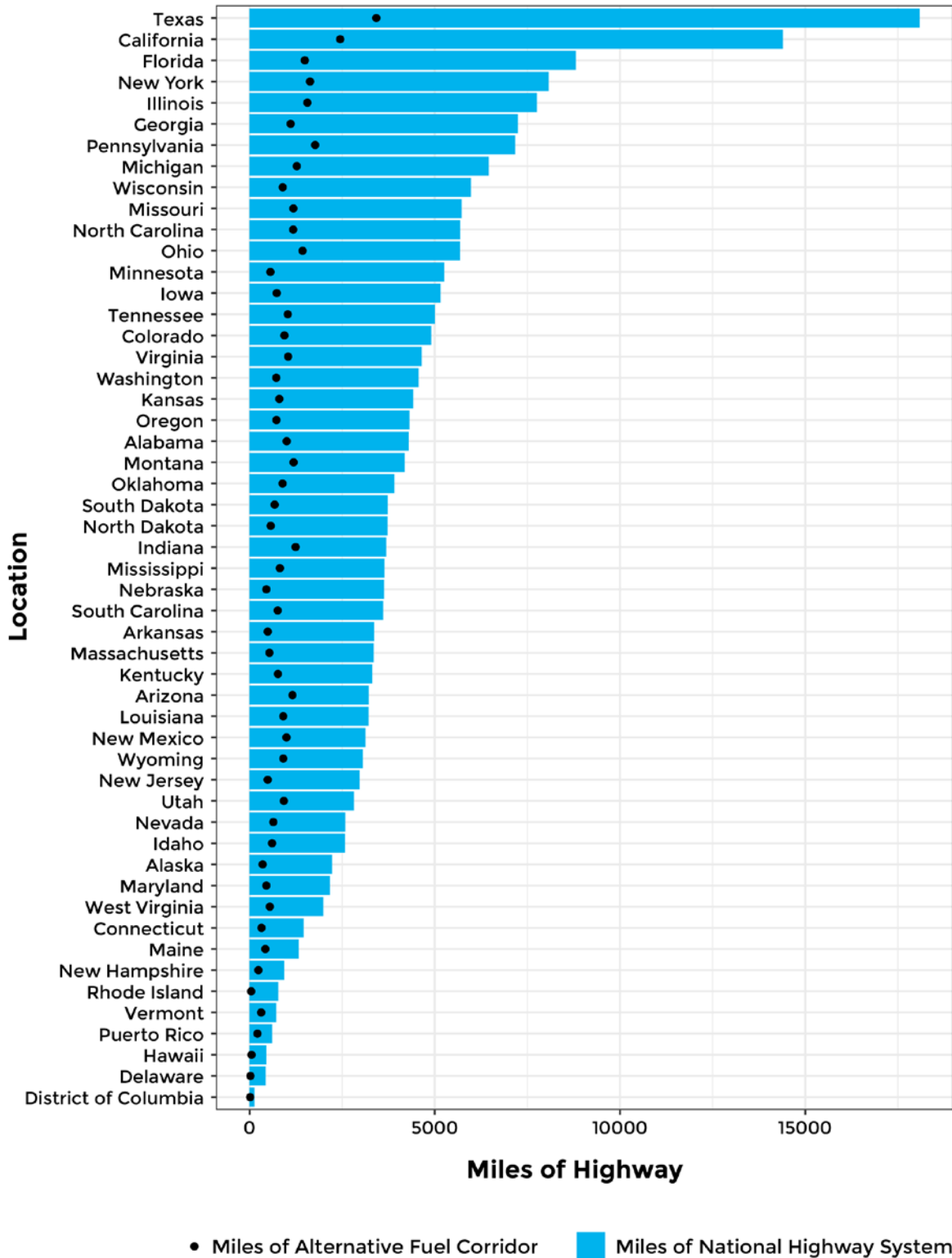


Figure 6. Comparison of total miles of National Highway System highway versus total miles designated as AFCs

At the writing of this report, the Joint Office estimates that the AFC designations total roughly 75,000 miles of EV corridors across the United States. These miles comprise roughly 33% of the National Highway System and 92% of the Interstate Highway System²⁶; 26,874 miles designated on the National Highway System are located within disadvantaged communities²⁷. According to the AFDC Station Locator, as of March 2023, there were 679 charging stations that meet NEVI requirements for distance, port, and power, 228 of which are located within disadvantaged communities (Figure 7).

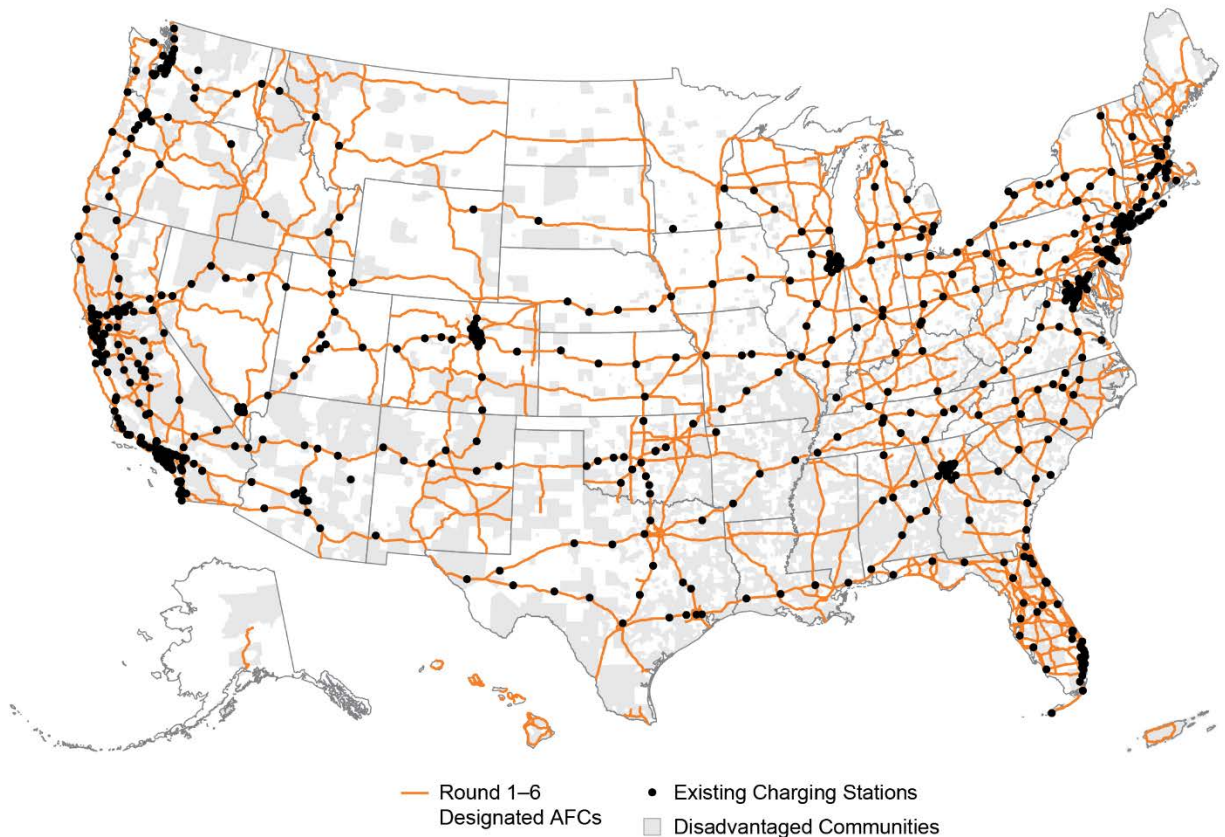


Figure 7. Round 1–6 designated AFCs with existing DCFC stations that meet NEVI distance, port, and power requirements are shown as single black points, and disadvantaged communities are shaded in gray. Detailed regional maps are provided in Appendix E.

State Plans for Charging Station Deployment

The state plans present a variety of approaches for how they intend to deploy their NEVI-funded EV charging stations. Most state plans discussed a focus on build-out of their respective AFCs within the first few years of the program. Some states are prioritizing the upgrade of existing AFC stations to meet the new NEVI requirements. Some states are prioritizing implementation of new NEVI-compliant stations along the

²⁶ The total AFC mileage is estimated based on Rounds 1–6 of the AFC designation process. This number is a rough estimate that reflects a snapshot in time and is subject to change.

²⁷ The US DOT- DOE joint interim definition of disadvantaged communities for the NEVI Formula Program is used for the purposes of this analysis. <https://www.anl.gov/esia/electric-vehicle-charging-equity-considerations>

AFCs before making upgrades to existing stations. Some states are proposing a combined approach, allowing for flexibility. Given that the states are in the early planning stages of their programs, the total number of proposed stations at the national level is not yet known. In nearly all plans, states proposed general station locations by exit, city/town, or a grouping of exits within a geographic zone. However, some states provided multiple candidate station locations within an identified gap in the network but did not explicitly state how many total stations would be required. Others listed several existing stations along AFCs that could potentially be upgraded to meet NEVI requirements but did not indicate the total number of stations that would need to be upgraded. Some states did not define station locations or numbers at all, leaving station siting up to future contract/grant awardees during implementation. Fewer details were provided for station deployment beyond AFC build-out. It is anticipated that annual plan updates, required for the NEVI Formula Program, will provide more detail for total number and location of planned stations as the program progresses and stations are installed.

As a baseline, Figure 8 highlights the current gaps in the existing AFC national network.²⁸ A gap is defined as a segment of an existing AFC that exceeds NEVI’s 50-mile and/or 1-mile distance requirements or does not meet the requirements for four CCS ports and 150-kW power for stations. The aim of the NEVI Formula Program is for states to complete these gaps, as well as nominate and complete any incomplete AFC segments that cross state borders to establish the backbone of a national network of publicly available fast charging infrastructure.

Updated NEVI Formula Program Guidance

On June 2, 2023, FHWA released updated guidance for the NEVI program. In this updated guidance, a number of additional requirements for an existing station to be counted toward build-out of an AFC (beyond the number of ports, power levels, and distance requirements) were outlined. These additional requirements include several elements from 23 CFR 680. The representation of “existing stations” in this report and the following gap analysis does not consider those additional requirements and is only representative of gaps between existing stations that meet the port, power, and distance requirements. Therefore, this gap analysis is subject to change as states review and determine which of their existing stations meet all of the requirements identified in the updated guidance and whether additional stations or upgrade of the existing attributed stations will be required.

²⁸ This analysis was done using GIS information on the AFCs from FHWA’s HEPGIS website and existing station location information from the AFDC in March 2023.

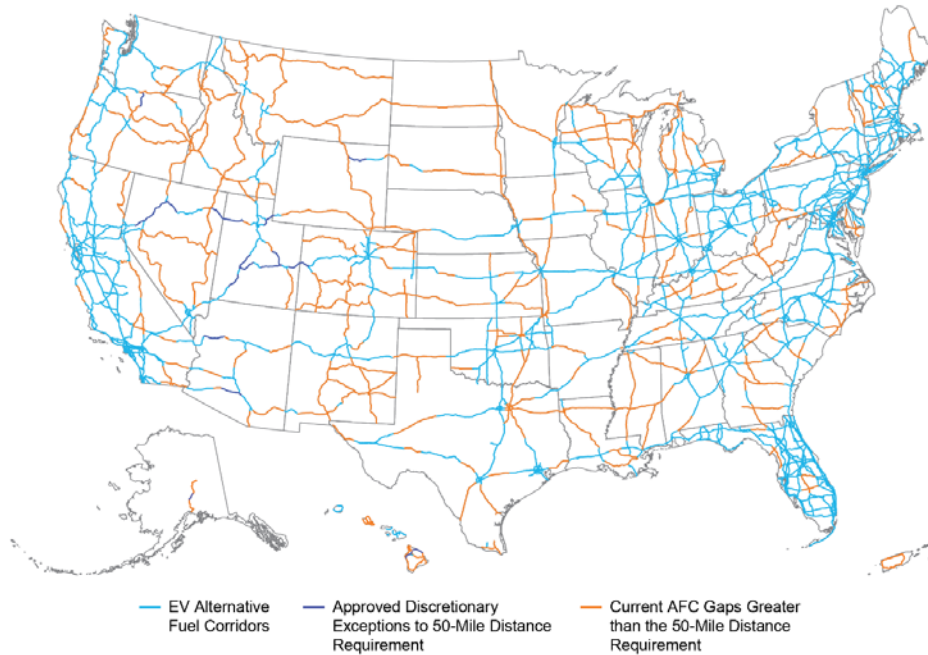


Figure 8. Map of AFCs depicting gaps in the network where stations are greater than 50 miles apart and/or more than 1 mile from the corridor, and/or existing stations do not meet the four-port and 150-kW power requirements. Note that this map also reflects approved exceptions to the distance requirements (see Discretionary Exceptions for more information).

To illustrate how states are addressing those preliminarily identified gaps, Figure 9 provides a snapshot of proposed station deployments based on information presented in the FY 2022/FY 2023 plans. Black dots represent existing stations that have four CCS ports capable of providing 150 kW (600 kW total) of simultaneous power and are located within 1 mile of the AFC. Wherever proposed general station locations were clearly presented in the plans, they are shown on the figure as orange triangles (new stations) and green squares (stations proposed to be upgraded with additional ports or increases in power to meet NEVI requirements).

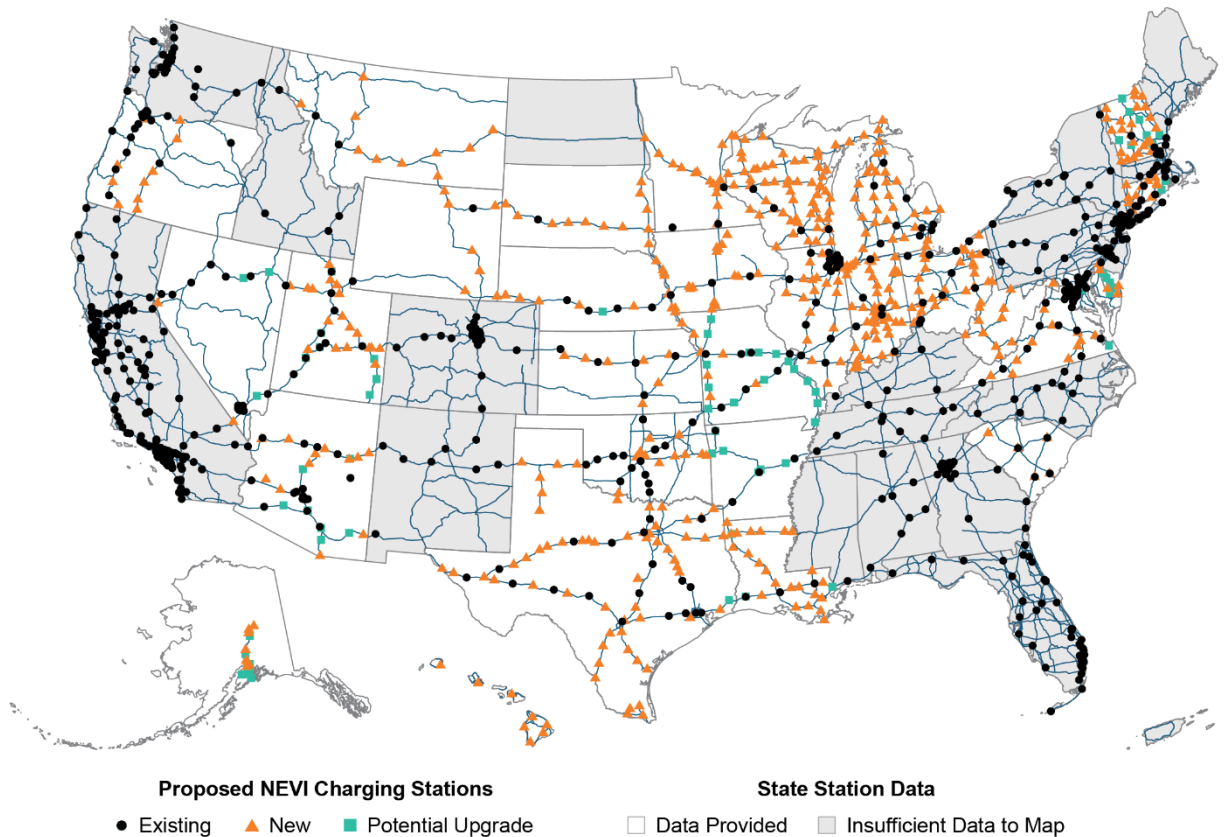


Figure 9. Map of AFCs and existing DCFC stations that meet NEVI distance, port, and power requirements, as well as proposed stations. Stations are divided into three categories: existing (black dots), potential new stations (orange triangles), and potential upgrades of existing stations (green squares). States that did not provide sufficient data for mapping purposes are shaded gray. Detailed regional maps are provided in Appendix F.

States shown in gray in Figure 9 did not explicitly state the number of proposed stations and/or did not provide general locations for proposed stations. Nearly all states indicated that the proposed station locations, where provided, were approximate and subject to change during implementation. Additionally, it is important to note that some states identified existing gaps in AFCs and proposed station counts and approximate locations they propose to achieve fully built-out status,²⁹ whereas other states only provided proposed station counts and locations specifically for use of FY 2022 and FY 2023 funds. Lastly, several states noted that they may nominate additional AFCs in future years as the program advances.

²⁹ The requirements for full build-out certification were not published by FHWA until the release of the updated NEVI Formula Program guidance on June 2, 2023. All discussion of numbers of stations required for reaching full build-out in this report are based on what was known by states in their FY 2022/FY 2023 state deployment plans, before the full build-out requirements were identified. The total number of stations required for build-out may change and will ultimately depend on the outcome after states analyze the impact of these additional requirements on their plans and adjust accordingly.

Funding Outlook

Average EVSE installation cost data are not readily available. Installation costs also vary substantially depending on location. Given that the requirements for full build-out were not known at the time states wrote their FY 2022/FY 2023 deployment plans, not all the state plans explicitly indicated a total number of proposed (new and upgraded) stations and/or ports to achieve build-out of their AFCs, nor did many plans specifically discuss average cost estimates per station they are using to estimate their build-out costs. Therefore, it is difficult to assess the extent of progress planned toward a national network with NEVI Formula Program funds. Nearly all states indicated plans to deploy NEVI Formula Program funds beyond their designated AFCs once build-out was achieved, but very little detail was provided for how much or proposed use of those remaining funds beyond describing the general approach to prioritize dispersal of those funds. However, it is useful from a programmatic perspective to conceptually consider how far those funds could extend.

NEVI Formula Program funds may not be sufficient to build out the existing AFC network in a handful of states depending on the installation costs and total number of new versus upgraded stations and ports installed. However, in many cases, it is likely that states will complete build-out of their AFCs and have NEVI Formula Program funds remaining to use in off-AFC locations, including other non-designated highway corridors and in communities.

Using high-level cost estimates and conservative assumptions (see methodology in Appendix G), the Joint Office estimates that the full cost of build-out of the existing AFCs is roughly \$1.1 billion, potentially leaving states as much as \$3.47 billion for infrastructure deployment to add capacity or deploy stations consistent with the NEVI Formula Program in off-AFC locations such as in rural areas and communities. Based on the apportionment schedule, it is estimated that full build-out can mostly be achieved with funding from FY 2022 (\$615 million) and FY 2023 (\$885 million). Figure 10 depicts this analysis.

As states begin implementation, additional details will surface enabling analysis that will illuminate where and how much funding will actually extend beyond the implementation of the network on AFCs, or where there may be remaining gaps to fill. It is also important to keep in mind that the NEVI Formula Program funds are but one source of federal funding for deploying EV charging infrastructure in the states. As the community and corridor grants are implemented by state, regional, and local entities, a larger ecosystem of EV charging infrastructure will also emerge, complementing the NEVI-funded highway network.

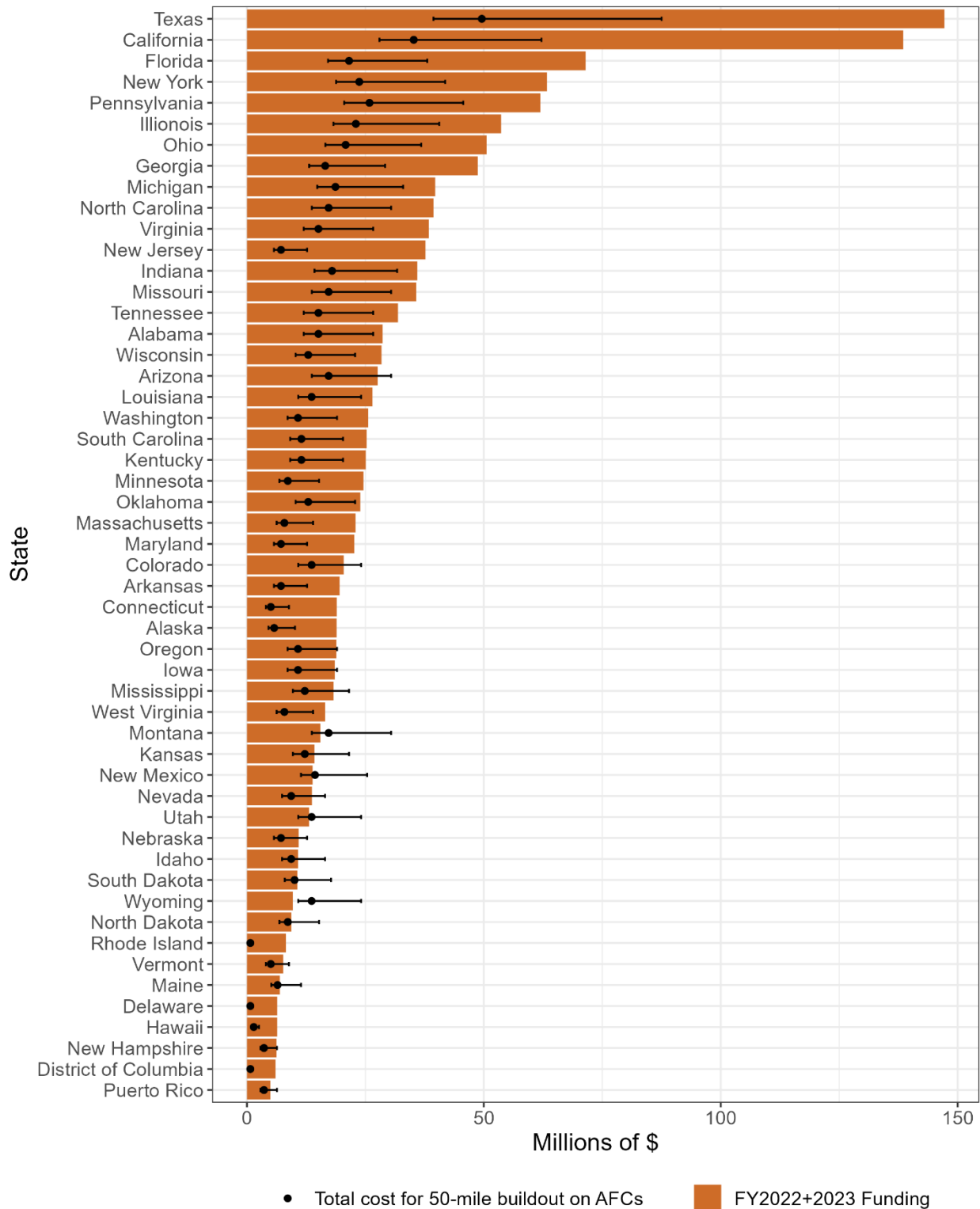


Figure 10. National comparison of FY 2022 and FY 2023 NEVI Formula Program apportionments to the total estimated build-out costs of AFCs in each state, highlighting potential that some states will have substantial remaining funds after build-out of their AFCs to deploy on other roadways and locations within the state.

Discretionary Exceptions

The NEVI Formula Program distance requirements for siting stations along AFCs present substantial challenges in some specific locations. To address those site-specific extraordinary circumstances, FHWA created a discretionary exception process. As part of the development and approval of state plans, states were permitted to submit a request for discretionary exceptions from the requirement that charging infrastructure is installed every 50 miles along designated AFC highways or within 1 travel mile of the designated AFC highway. The exception process permitted states to apply for an exception to the 50-mile (distance) criteria, the 1-mile (proximity) criteria, or both at specific locations where the following extraordinary circumstances exist:

- Grid capacity:** Delivering sufficient power to the charging site requires major upgrades to existing infrastructure.
- Geography:** Lack of necessary services or access to the site significantly compromises accessibility and/or functionality (e.g., roadway exits, necessary amenities).
- Equity:** An alternate location that would still service travelers on the interstate or AFC would better support providing benefits to a disadvantaged community.
- Extraordinary cost:** Costs to locate and operate a station at a given site prevent its economic viability, even with federal funding through NEVI or other sources.

States were required to submit their requests and provide justification to demonstrate the extraordinary circumstances. Approved exceptions to the 50-mile criteria are valid for the year of the plan being certified; approved exceptions to the 1-mile criteria are permanent upon commissioning of the charging site. The 50-mile exceptions will be revisited annually as conditions change and state plans are updated.

A total of 56 exception requests were submitted from 14 state plans (Table 1). The Joint Office first evaluated all the submissions and provided analysis and recommendations to FHWA for consideration. During plan review, the Joint Office and FHWA worked together to engage with states where clarification or additional information was needed, and to reach consensus on each exception approval. Final determination of each discretionary exception was included in the FHWA plan certification memos.

Table 1. Summary of Discretionary Exceptions Requested by State³⁰

State	Exceptions Requested	Withdrawn	Approved	Denied
Alabama	1	0	1	0
Alaska	1	0	1	0
Arizona	3	1	2	0
Georgia	2	0	2	0
Hawaii	5	3	2	0
Missouri	6	3	3	0
Nevada	4	0	4	0
New Jersey	7	7	0	0
Oregon	1	0	1	0
Utah	8	0	8	0
Vermont	1	1	0	0
Virginia	4	1	2	1
West Virginia	2	2	0	0
Wyoming	11	0	3	8
Total	56	18	29	9

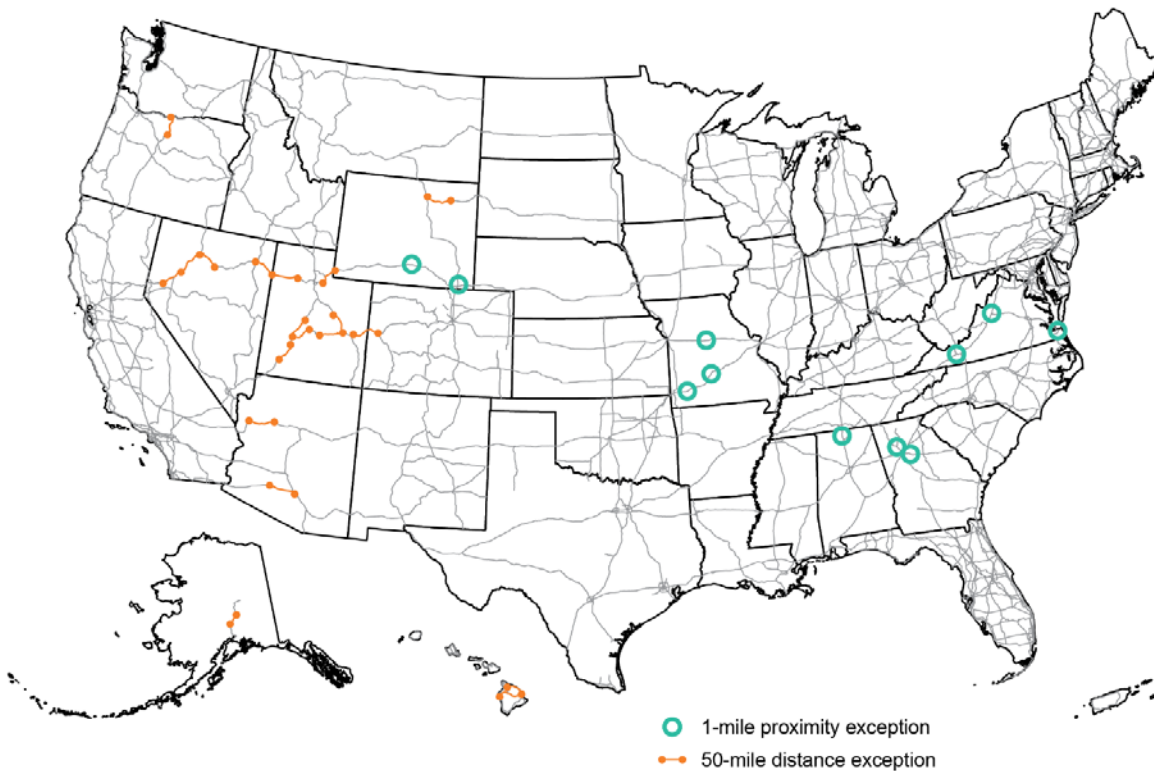


Figure 11. Map depicting the location of approved discretionary exceptions by state

³⁰ Numbers in this table represent the outcome of the discretionary exception process. This may not be consistent with what is shown in the plans, as some states did not resubmit their plans to reflect changes made during the review period.

Among all the exceptions requested from states, 32 requested exceptions to the 50-mile distance criteria, 22 requested exceptions to the 1-mile proximity criteria, and 2 others did not align with either exception criteria (Figure 12). A total of 18 exception requests were withdrawn by states after submission during plan review, including requests that did not align with distance or proximity exception criteria or where further study and information were needed for the state to evaluate the necessity of a discretionary exception. Twenty-nine requests were approved for a discretionary exception (Figure 12 and Appendix C), 19 of which requested an exception for the 50-mile distance criteria, with deviations of 3–36 miles from the guidance. Ten requests were approved for the 1-mile proximity criteria, with 0.1–1.8-mile deviation from the guidance. A total of nine requests were denied approval due to insufficient evidence to support the necessity of a discretionary exception from the requirements or no alignment with exception criteria.

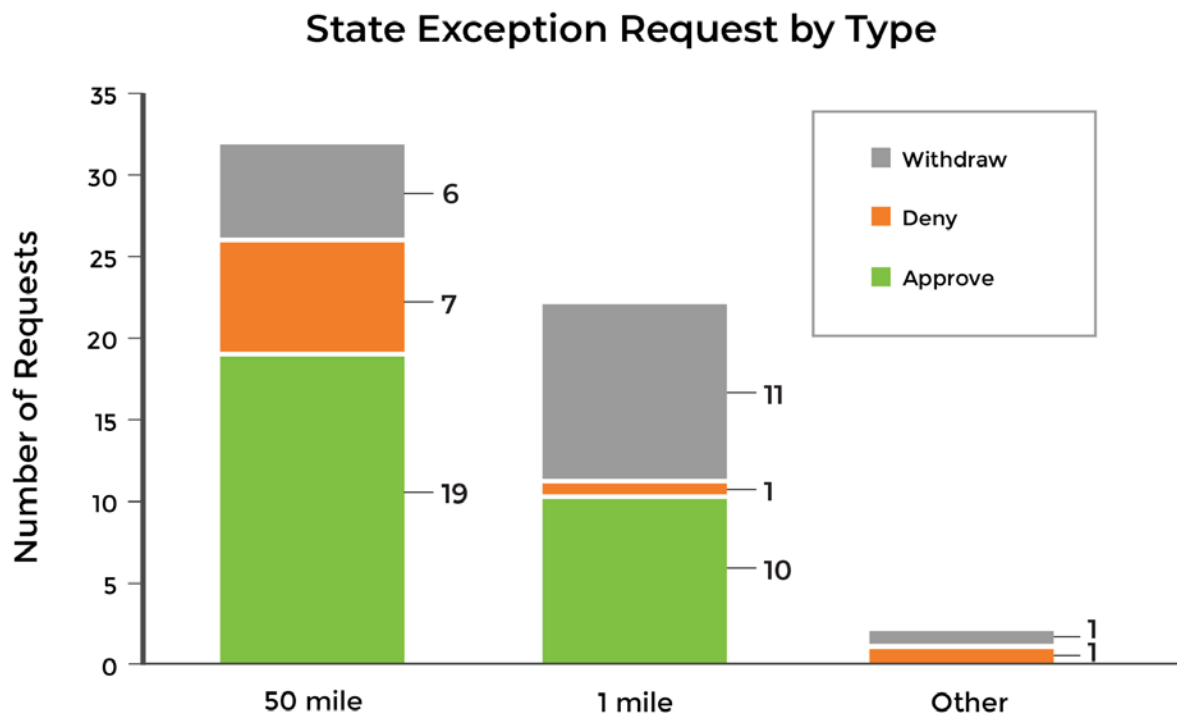


Figure 12. A breakdown of the exception requests submitted by type and the resulting approval determination

Most of the exception requests listed multiple reasons to justify the need for a discretionary exception; 75% of exceptions included extraordinary cost as a reason, 61% cited challenging geography, 52% cited equity, and 46% cited grid capacity (Figure 13).

State Exception Request Reasons

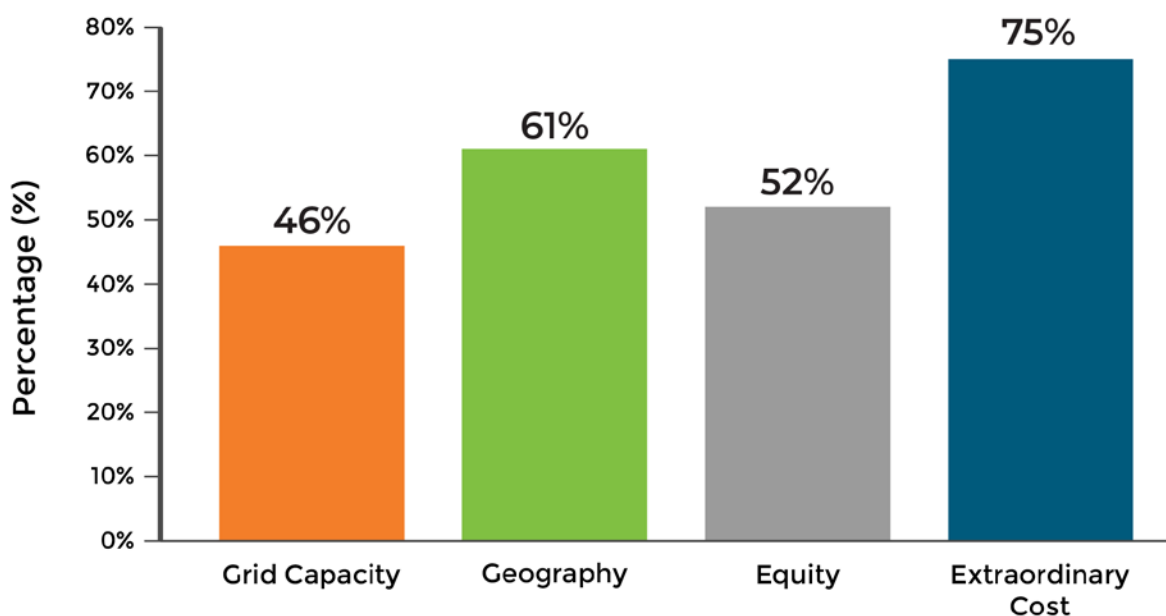


Figure 13. Percentage of exception requests submitted by reason. States were permitted to select more than one reason for the exception when submitting each request.

A majority of the claims for grid capacity provided in the state exception requests were not well articulated, with little to no information from the utility to justify the challenge of delivering sufficient power to the location. Likewise, all exception requests that stated equity as one of the reasons also failed to demonstrate how a proposed alternative location would directly benefit the disadvantaged community. However, in all cases where grid capacity or equity was selected as a reason for the exception request, additional reasons were also selected for that request, and therefore requests did not rely solely on grid capacity or equity for rationale.

It is important to note that most states were in the early stage of planning when the plans were submitted, with a lot of uncertainty on specific individual station siting. As states begin to implement their plans, it is anticipated that additional exceptions will be requested within the next year.

Initial RFIs Issued with Development of State Plans

States used a variety of methods for gathering information in developing their state plans. Some states issued formal requests for information (RFIs). RFI topics ranged from soliciting insights into the EV industry, workforce requirements, perspectives from EVSE providers and original equipment manufacturers, and utility needs. Some states worked in partnership in the RFI process via state working groups, state energy office working alongside the state DOT, or state DOTs collaborating on a regional basis. The Regional Electric Vehicle West states—including Arizona, Colorado, Idaho, Montana,

Nevada, New Mexico, Utah, and Wyoming—issued an RFI in partnership to inform plan development.

Table 2 includes a non-exhaustive list of states that solicited feedback utilizing formal RFIs to proactively reach out to stakeholder groups in developing their first-year NEVI plans.

Table 2. RFI Summary in State EV Infrastructure Deployment Plans

State	Summary
Alaska	In May 2022, the Alaska Energy Authority released an RFI to gather public feedback on the NEVI program and to solicit information from potential site hosts.
Florida	Florida’s DOT solicited information using a formal RFI that provided insight into the EV industry, workforce requirements, utility needs, and the range of types of organizations interested in providing EV infrastructure services.
Indiana	Indiana’s DOT and Office of Energy Development issued an RFI on April 4, 2022, giving interested parties an opportunity to provide comments and data for consideration in the <i>Indiana Electric Vehicle Infrastructure Deployment Plan</i> .
Massachusetts	An RFI was publicly issued to providers of EVSE infrastructure in April 2022 to request information on existing DCFC sites and sites under construction or with a construction contract. The information requested included site location, number of ports with a power level of at least 150 kW, and whether the site was an expansion of an existing site. Three providers responded to the RFI.
Montana	Input was gathered through an RFI for electric utilities and an RFI for charging station providers and original equipment manufacturers.
Oregon	In May 2022, Oregon’s DOT issued an RFI to all utilities in Oregon, requesting details on the availability of three-phase power, electrical capacity in their service territories (and specifically along current or nominated electric AFCs), interconnection timelines and staffing plans, and the availability of funding programs to potentially count toward the 20% nonfederal match.
Tennessee	Tennessee Valley Authority released an RFI on April 7, 2021, to establish minimum technical specifications for equipment and operations under forthcoming EV fast charging funding solicitations.
Utah	Utah’s DOT posted an RFI regarding the NEVI Formula Program and EVSE. They reached out to industry groups (e.g., contractors, consultants, vendors, experts) to obtain information regarding the delivery of this program. Utah DOT initiated an RFI process in partnership with Regional Electric Vehicle (REV) West participants.
Wyoming	To provide additional information to inform strategy development, Wyoming’s Zero Emission Vehicle Working Group issued RFI No. 22-011CS, <i>Zero Emissions Vehicle Infrastructure Strategic Plan</i> . The RFI opened for comment on Oct. 20, 2021, and closed on Dec. 1, 2021. In total, the RFI received nine responses and incorporated select recommendations into the zero-emission vehicle strategy and NEVI plan.

Topical Summaries from State Plans

FHWA's NEVI Formula Program Guidance provides background, funding eligibility, and program guidance for implementation of the NEVI Formula Program. It also provides an overview of elements states were required to include in the plan narrative, as well as technical assistance tools relevant for plan development.

The following sections summarize findings from each of the topical areas that states were required to discuss in the plans in accordance with the guidance. A few specific examples are provided in callout boxes or shown in figures to illustrate examples of how states approached each of these topical areas.

Planning

Each plan sets forth a state's vision and goals to create a convenient, affordable, reliable, and equitable statewide and national EV network. States drew from both existing and NEVI-specific planning efforts to lay out a clear vision for building out an EV charging network in their states. EV mandates set forth by state legislatures were factored into plan visions and goals. Many of the states present a broad goal and vision for the next 5 years of program administration. Some states have determined that further consideration and planning will be needed to achieve these goals. However, administration changes, an evolving EV market, and changes in state needs and goals may require further goal refinement in the future.

The importance of collaboration, especially across state agencies, is a consistent theme in states' visions and goals. Many state DOTs have not historically been involved in EV infrastructure development, particularly in providing direct public funding for EV infrastructure. State energy and environmental offices do not typically have experience deploying projects subject to U.S. Code Title 23 Chapter 1 and 2 CFR Part 200, which have specific requirements related to the transportation planning process.³¹ The NEVI Formula Program requiring funding to flow through state DOTs prompted unprecedented state interagency collaboration. State approaches to collaborating across agencies varied, including leveraging existing partnerships from previous EV charging deployment efforts, establishing new memoranda of understanding between



Figure 14. Arkansas Electric Vehicle Infrastructure Deployment Plan

³¹ Title 23 U.S.C. Chapter 1 and 2 CFR Part 200 include but are not limited to requirements related to the transportation planning process.

state agencies, and creating EV working groups that included relevant state agencies to guide planning processes.

Planning

Plan Vision and Goals

Kentucky's NEVI goals align with the Commonwealth's 2022–2045 *Long-Range Statewide Transportation Plan* goals and guiding principles, aligning both goals and metrics to match.

New Mexico developed goals through a goal-setting workshop with its steering committee. Their facilitated, consensus-building process developed a list of nine overarching goals for public review and inclusion.

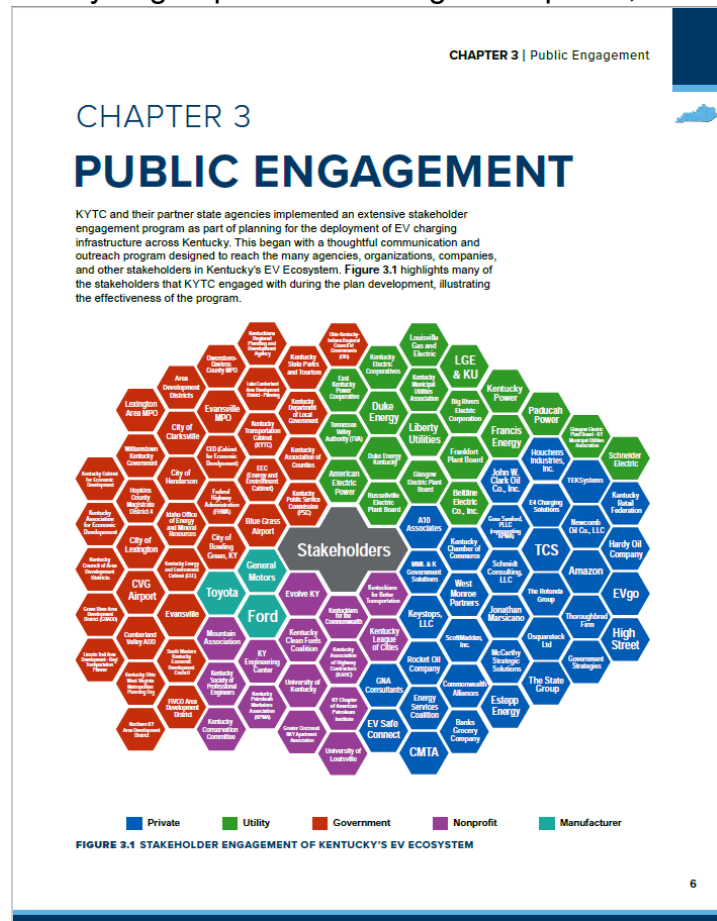
Interagency Coordination

The **Arkansas** Governor's Infrastructure Planning Advisory Committee was created to have 14 state departments coordinate to recommend the best uses of federal funds under the BIL. The Arkansas DOT convened weekly NEVI Project Management Team meetings to regularly coordinate with its peer agency partners.

The **Washington** State Legislature's Senate Bill 5974, Section 428, directed the creation of an Interagency EV Coordinating Council (IEVCC), jointly led by the Department of Commerce and WSDOT to implement the Washington State Plan for Electric Vehicle Infrastructure Deployment and oversee the strategy for meeting the state's Clean Cars 2030 target. The IEVCC, which comprises 11 state departments, will meet regularly to provide coordination and consultation and will assist with oversight and priority setting for NEVI implementation.

Stakeholder Engagement

State NEVI public engagement is tailored by and for each state, but typically involves a variety of groups such as the general public, tribal communities, labor organizations,



private sector/industry representatives, the Clean Cities Coalition Network, representatives of the transportation and freight logistics industries, public transportation agencies, and urban, rural, and underserved communities. Outreach to these groups focused on soliciting feedback to ensure plans prioritized an equitable and fair distribution of EV charging stations throughout the states. Some conversations led to larger EV planning discussions for underserved communities to increase EV ownership and ensure stations do not become stranded assets without users. Engagement methodologies include public and virtual meetings, surveys, focus groups, feedback forms, interviews, and participation in community events. States distributed educational materials through social media channels, dedicated EV infrastructure websites, and email lists targeting key stakeholder groups. Some states are prioritizing

Figure 15. Stakeholder engagement ecosystem from Kentucky's NEVI deployment plan

working with neighboring states to prevent large gaps and abrupt operational changes between charging stations during interstate travel.

Engagement

Public Engagement

The **Ohio** DOT partnered with several metropolitan planning organizations, regional transportation planning organizations, and Clean Fuels Ohio to host in-person listening sessions across the state. Virtual public meetings were also held to target specific equity communities across the state to inform them on planning efforts and provide a forum to give feedback.

Kansas' NEVI planning team conducted a telephone town hall, which drew more than 1,100 participants from across the state. The telephone town hall allowed the planning team to educate participants about EVs and infrastructure needs, answer questions about EV infrastructure deployment, and gather input via polling questions.

Partner and Utility Engagement

Wisconsin established the Freight Advisory Committee to provide guidance to the DOT on freight-specific electrification policies and procedures. Freight Advisory Committee members include a broad range of representatives from the industrial, agriculture, logistics, warehousing, economic development, and transportation sectors. Wisconsin DOT hopes the committee will continue to provide an active forum for ongoing engagement of the freight sectors on electrification.

Through robust early outreach with utility partners, the **Indiana** DOT has developed a set of guidelines for communication with utilities. Utility guidance indicated early and frequent communication about expected load, timeline, usage estimates, and proposed locations would be ideal for utility planning.

Utility engagement and planning are critical to EV charging station deployment success. State plans indicate that they are at various stages of working with their utilities, and all plans indicate they will continue to work with the utilities to understand grid capacity and necessary upgrades, determine the most advantageous electricity rate design for projects, and track station metrics such as utilization, payback periods, financial incentives, rebate programs, and more. Many plans note that utilities are interested in deploying NEVI stations themselves, providing cost share on projects, or fitting NEVI projects into existing EV charging make-ready programs. Unique state utility coordination includes:

- A utility pilot to reduce demand charges at less-utilized EV charging sites.
- A NEVI-funded pilot program for utility coordination to prequalify sites along nominated AFCs based on projected grid capacity.
- Several RFIs to all utilities within certain states to capture details on the availability of three-phase power, electrical capacity in their service territories (and specifically along current or nominated electric AFCs), interconnection timelines and staffing plans, and the availability of funding programs to potentially count toward the 20% nonfederal match.

Deployment Strategies

States have largely indicated a disinterest in directly owning and operating infrastructure, and instead are engaging with third parties to own and operate NEVI-funded infrastructure via public-private partnerships and design-build agreements. The plan procurement and contracting sections detail how third parties will deliver EV charging infrastructure in a manner that achieves state goals efficiently and effectively, highlighting approaches to both engage small businesses and ensure contracted entities will engage communities where EV charging is installed.

State planning included both the initial purchase of charging infrastructure and strategies for efficient O&M, as strategies for achieving efficient delivery, deployment, and ongoing O&M are crucial for program success. Plans show states are considering a variety of approaches for ensuring efficient O&M through both contract structuring and funding mechanisms. While NEVI guidelines require O&M for a 5-year period, some states expressed plans to request that prospective O&M providers detail strategies to ensure infrastructure is maintained beyond this time frame. Numerous states clearly outline expectations for timeliness of repairs, with some states indicating they plan to request historical data for response time and charger uptime from applicants.

Several states reference lessons learned from previous third-party EV charging projects and how those experiences influenced their planned contracting approach to install NEVI infrastructure. In particular, many states note experience funding EV charging infrastructure through their Volkswagen Settlement funds, although these funds were not administered by FHWA and were not required to follow Title 23 requirements. Plans

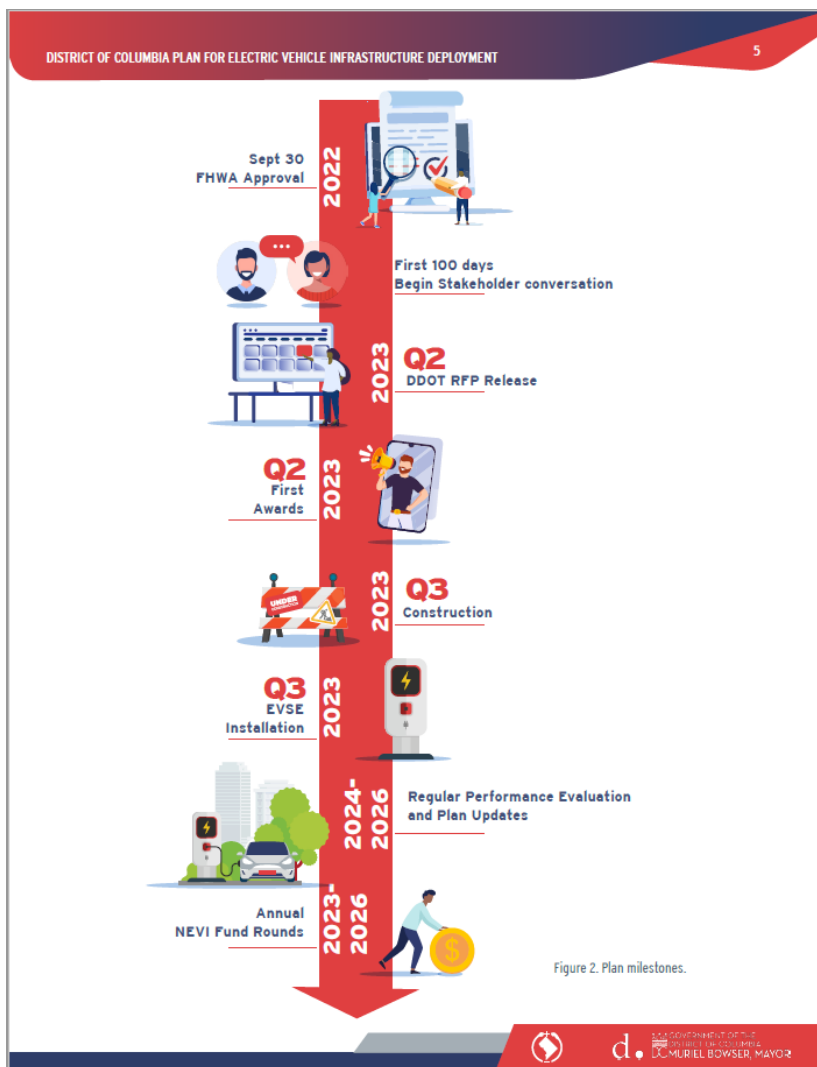


Figure 16. Deployment strategy from D.C.'s NEVI deployment plan

also include a variety of approaches to how states may fund the 20% local match requirement. Many states expect the third-party owner-operators to provide matching funds, but some indicate that state funding has been allocated for this purpose. Others note that they may fund match requirements only for stations located in areas that may initially experience low utilization. A few states specifically reference their intent to use VW funds as local match.

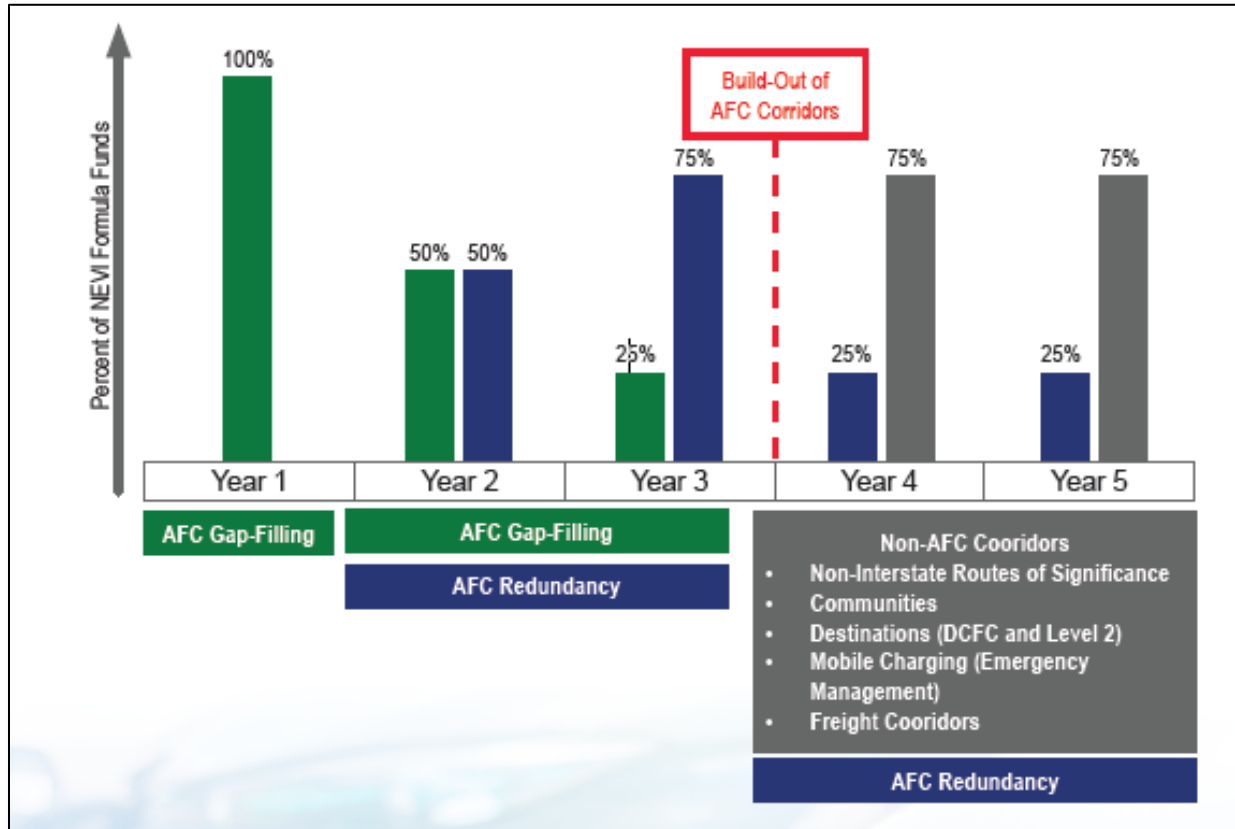


Figure 17. Example of a deployment phasing approach by funding cycle from Pennsylvania's NEVI deployment plan

All NEVI deployment strategies prioritize build-out along the Interstate Highway System on designated AFCs. Plans were not required to list exact charging infrastructure locations, but many did highlight gaps in existing EV charging infrastructure locations, along with plans for infrastructure upgrades or expansions. States with more advanced planning to date overlaid utility territories on the AFCs to allow for advanced utility upgrade planning for those priority locations. States note that they will be flexible in updating their plan goals based on the outcomes of initial projects.

Deployment Strategy

Pennsylvania's deployment framework aims to achieve fully built-out status in the first 3 years of the NEVI Formula Program. In the first year, Pennsylvania intends to focus on filling gaps along AFCs and continuing to fill gaps and building redundancy until its corridors are fully built out. After fully built-out status, Pennsylvania will focus NEVI Formula Program funding on building out off-AFC locations.

Fully Built Out

Much like other states, **New Jersey's** plan outlines a phased approach for EV infrastructure development. Phase 1 focuses on developing EVSE along AFCs toward achieving fully built-out status, but once the first phase is complete, New Jersey will focus on developing charging infrastructure every 25 miles, as established by state law, and implementing community-based charging station development.

Operations and Maintenance

Mississippi outlines a robust vendor and subcontractor service-level agreement approach for station performance. Mississippi will monitor station uptime and user satisfaction through third-party websites and will work to ensure NEVI O&M requirements are followed by the subcontractor.

Labor and Workforce Development

The deployment of NEVI charging infrastructure will create new workforce opportunities, and states are proactively seeking opportunities to grow and diversify their local workforce. Many plans discuss completing or planning comprehensive workforce capacity assessments to better understand local workforce development needs. The majority of plans highlight the [Electric Vehicle Infrastructure Training Program \(EVITP\)](#), which is now identified in FHWA's minimum standards and requirements, providing training and certification for electricians installing EV charging infrastructure. In addition to this training program, states discuss leveraging existing apprenticeship programs, community college programs, public-private partnerships, and state initiatives to provide new workforce development options. Numerous plans also identify local labor unions as key stakeholders with whom states have engaged or would engage. The NEVI Formula Program presents a unique opportunity to expand diversity among the electrical and other construction trades for installation of EV infrastructure. There was a wide range of workforce training and development approaches described in the state plans. Some states include specific preferences for contractors that hire from pre-apprenticeship programs that target historically marginalized and underserved populations. Some made general commitments to diversify the workforce, and others provided detailed workforce development plans.

Labor and Workforce Development

Michigan launched the [EV Jobs Academy](#) prior to the establishment of the NEVI Formula Program. The EV Jobs Academy is a cooperative of over 100 public and private partners collaborating to identify mobility and EV skill needs and to develop postsecondary training programs to support EV deployment.

The **Illinois Highway Construction Careers Training Program** boosts participation of diverse individuals in the industry and on Illinois highway construction projects. The program will develop an EV curriculum that aligns with federal NEVI Formula Program Guidance and serve as a workforce development pipeline for NEVI projects. Currently, 10 Illinois community college partners offer the program training, and the program is rapidly expanding throughout the state.

Equity Considerations

The equitable deployment of charging infrastructure is a key priority of the NEVI Formula Program, to avoid exacerbating existing disparities in the transportation system and to develop a convenient, affordable, reliable, and equitable charging experience for all users. A high-quality plan would:

- Describe how the plan was developed based on engagement with underserved and disadvantaged communities and a longer-term meaningful community engagement process with disadvantaged communities.
- Discuss how state planning and implementation will ensure compliance with state and federal civil rights laws, including Title VI of the Civil Rights Act³² and accompanying USDOT regulations, the American with Disabilities Act,³³ and Section 504 of the Rehabilitation Act.³⁴
- Explain how the state will deliver projects under the NEVI Formula Program that, consistent with Executive Order 14008 and the Interim Justice40 Guidance, include information on:
 - How NEVI chargers increase access to charging for disadvantaged communities.
 - How the state used the EV Charging Justice40 Mapping Tool and/or other tools to identify disadvantaged communities in their state for community engagement, station siting, and broader program design.

³² *Civil Rights Act of 1964*. Public Law 88-352; 78 Stat. 241.

<https://www.govinfo.gov/content/pkg/COMPS-342/pdf/COMPS-342.pdf>

³³ *Americans With Disabilities Act of 1990*. Public Law 101-336; 101st Congress.

<https://www.govinfo.gov/content/pkg/STATUTE-104/pdf/STATUTE-104-Pg327.pdf>

³⁴ *Rehabilitation Act of 1973*. Public Law 93-112; 87 Stat. 355.

<https://www.govinfo.gov/content/pkg/COMPS-799/pdf/COMPS-799.pdf>

- Plans to design and implement a Justice40 benefits framework, including monitoring and measuring performance toward Justice40 goals with specific metrics and methodologies.
- How they plan to contract with disadvantaged business enterprises or small and disadvantaged businesses (women-, veteran-, minority-owned, and economically disadvantaged).
- How they will diversify the workforce, including measures to foster hiring from economically disadvantaged communities and efforts to increase the participation of women, people of color, other underrepresented groups, and residents of disadvantaged communities in the EVSE workforce programs.

States have taken a variety of approaches to incorporating equity into their NEVI plans, which have been identified throughout this report.

Identifying Disadvantaged Communities

Almost all states referenced their use of the EV Charging Justice40 Map in their plans, and in some cases supplemented the map with either definitions of disadvantaged communities developed for the state (e.g., CalEnviroScreen 3.0) or other indicators (e.g., low-income households). For example, California included a map comparing CalEnviroScreen with the EV Charging Justice40 Map and showed the areas of overlap between the two approaches.

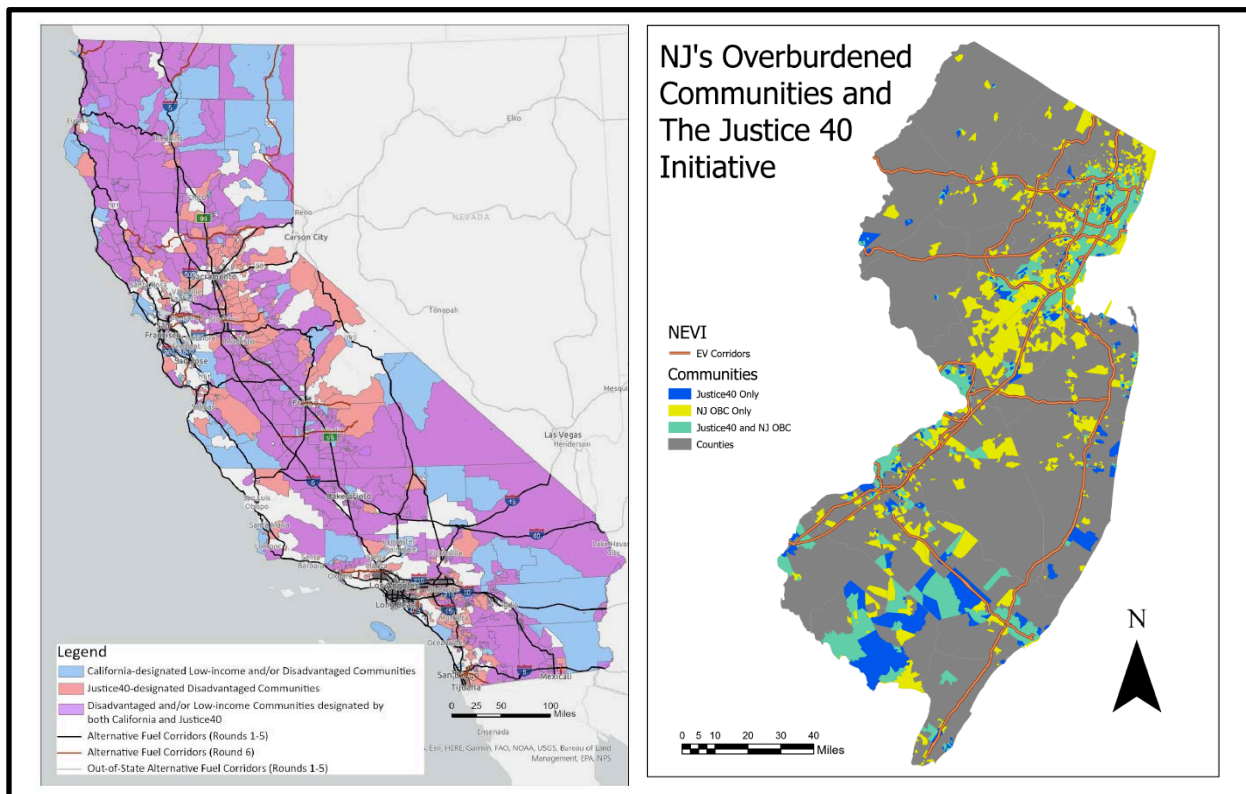


Figure 18. A few states supplemented the EV Charging Justice40 Map with state definitions or local indicators, including California and New Jersey's NEVI deployment plans

New Jersey also included additional indicators based on a state environmental justice law for overburdened communities,³⁵ which is based on thresholds for census blocks with low-income, minority, and limited English proficiency households. This definition expands the locations in the state beyond those identified by the EV Charging Justice40 Map.

Community Engagement

Given the very accelerated timeline with which states had to design their plans, conducting meaningful community engagement was challenging for some states, including a few states who had not started their stakeholder engagement efforts more broadly. Many states committed to conducting meaningful stakeholder engagement with disadvantaged communities, but most did not provide much detail on how they would create these processes.

Community and Tribal Engagement

Rhode Island's plan includes a list of 19 Justice40 considerations using Rhode Island-specific needs as they relate to DOE, USDOT and EPA Equity Action Plans. Corresponding with the Justice40 considerations, Rhode Island identified relevant stakeholder groups and engagement tactics needed to reach disadvantaged communities (see the [Rhode Island NEVI Deployment Plan](#)).

Arizona categorized the challenges facing underserved communities and provided a comprehensive set of benefits and affiliated measurements to understand impacts. The plan includes qualitative descriptions of the type of benefit to the underserved community, as well as how to measure it, how often to measure it, and potential sources for the data.

Nevada's plan considers a variety of areas where benefits to underserved communities could be realized through the NEVI plan. Nevada provides evaluation metrics that explicitly call out the promotion of equity, and initial metric tracking includes percentage of EV charging infrastructure in underserved communities, income characteristics of users, and air quality outcomes.

South Dakota's plan demonstrates meaningful engagement with the nine tribal nations in the state. For decades, South Dakota's DOT has held an annual meeting with tribes to coordinate on the development of the Statewide Transportation Improvement Program, and has leveraged this forum to incorporate feedback from tribal nations on the NEVI plan as well. Further, South Dakota DOT distributed social media and direct email correspondence to tribal representatives inviting their feedback, and conducted two online webinars exclusively for the tribal nations to obtain feedback regarding its NEVI plan, address questions, and provide information regarding its development.

³⁵ N.J.S.A. 13:1D-157. <https://dep.nj.gov/ej/>

Several states, such as Pennsylvania and Oregon, were able to meet with organizations representing disadvantaged communities or members of such communities in their work. These states provided details of who they met with and how they conducted their community engagement. A few states described what was asked or discussed, but very few were able to demonstrate how this feedback was used to inform program design decisions.

Justice40

States were asked to describe how they will deliver projects under the NEVI Formula Program that, consistent with Executive Order 14008 and the Interim Justice40 Guidance issued by the White House and USDOT, will provide at least 40% of the benefits toward disadvantaged communities. Though Justice40 is a new concept for many states, almost all the plans included statements regarding Justice40 and tracking benefits for disadvantaged communities.

While a majority of the state plans lacked detail, many did describe potential categories of benefits that would be relevant for disadvantaged communities in their state, such as reduced greenhouse gas emissions, improved air quality, improved community involvement and engagement, petroleum displacement, improved transportation access, jobs and job training, and opportunities for minority-owned businesses. Several plans also acknowledged the potential for negative impacts such as displacement related to gentrification, safety concerns, and increased right-of-way acquisition. A few states—Arizona, California, Ohio, Oregon, and Nevada—included specific metrics, methods, and potential data sets for measuring these benefits. Many states are planning to engage with disadvantaged communities to understand community priorities on the build-out of the EV charging network. States also noted in their plans that they are seeking additional guidance on how to track benefits from the federal government.

Characterizing Access to Charging Infrastructure for Disadvantaged Communities

Many states described, either conceptually or with measurable metrics, how chargers deployed will increase access to charging for disadvantaged communities. Some states were proposing to track how many chargers might be deployed directly in disadvantaged communities, and others were planning to identify segments of AFCs where they might deploy chargers that were either located in or near disadvantaged communities. Access to chargers was also characterized by the drive time to chargers from locations where communities live and work.

Commitments to Adhere to Nondiscrimination and Accessibility

NEVI grant recipients are required to comply with state and federal civil rights laws, including Title VI of the Civil Rights Act and accompanying USDOT regulations, Title III of the Americans with Disabilities Act (ADA), and Section 504 of the Rehabilitation Act. Almost all the plans expressed a commitment to comply with state and federal civil rights laws, especially Title VI, and ADA and Section 504 accessibility requirements. Though many states did not describe in detail how they would comply with Title VI, key considerations on conducting meaningful public participation and engagement,

evaluating the impacts and benefits of programs considering the demographics of communities, avoiding disparate impacts, and providing equitable access to benefits were described in other parts of the plan. Some of the plans described in detail how they would design and install chargers to be accessible. The U.S. Access Board released new design recommendations for EV charging stations in July 2022.³⁶ Some states referenced previous recommendations from the Access Board but were not able to include these new recommendations.

Ongoing Activities

Cybersecurity

EV infrastructure cybersecurity presents a challenge that spans multiple industries, including automotive, charging equipment manufacturers, telecom, payment cards, Wi-Fi networks, and utilities. Cybersecurity concerns involve both station hardware and software. States identified software update requirements to ensure the station or vehicle is not compromised by malicious code and to prevent EVs from spreading malicious code to other stations during future charges. Many state DOTs are partnering with other state agencies to develop cybersecurity plans and leverage cybersecurity best practices, with some states already having applicable cybersecurity requirements for charging infrastructure. Some states propose requiring their funding applicants to submit cybersecurity plans during the request for proposal process, while others will only require plans to be submitted after vendor selection. Many plans mention that regular cybersecurity audits or reviews will be required.

Cybersecurity

Connecticut's Electric Distribution Companies Cybersecurity and Privacy Framework is the base for their plan's cybersecurity policy to provide a consistent approach to establishing cybersecurity and privacy objectives, managing risks, and implementing relevant cybersecurity capabilities and controls. The framework incorporates cybersecurity best practices and industry standards to address new and emerging threats.

Iowa's DOT and Office of the Chief Information Officer (OCIO) developed a Cybersecurity Strategic Plan, which will encompass the NEVI program as it is implemented in Iowa. Iowa DOT and OCIO will work together to appropriately identify resources to mitigate exposure and risk to EV charging site users.

Oklahoma DOT and state agency partners, including the Oklahoma Turnpike Authority and Office of Management and Enterprise Services, are developing an Information Technology Office that will assist in the creation of cybersecurity and privacy requirements for their NEVI Formula Program. Third parties responding to procurement opportunities must submit a cybersecurity plan and agree to participate in a privacy impact assessment.

³⁶ U.S. Access Board. 2022. "U.S. Access Board Issues Design Recommendations for Accessible Electric Vehicle Charging Stations." July 21, 2022. <https://www.access-board.gov/news/2022/07/21/u-s-access-board-issues-design-recommendations-for-accessible-electric-vehicle-charging-stations/>

Program Evaluation

The NEVI Formula Program requires each state to develop and implement a robust, data-driven program evaluation plan to ensure accountability and program success. The evaluation should, at a minimum, assess performance in achieving the state's interim and 5-year goals.

Evaluation of each plan's effectiveness includes monitoring performance metrics such as EV charging infrastructure usage, EV charging infrastructure reliability, customer satisfaction, equitable distribution and access to EV charging infrastructure within the state, greenhouse gas emissions, or other metrics that support creating a national network. An efficiency assessment of a state's use of federal funding, measured by the amount of charging developed per funding amount, was also to be included.

States are at different stages in their program evaluation planning. Some plans have already identified performance indicators and metrics, while others have not started formal program evaluation work and have indicated a need to hire independent program evaluation consultants. Performance metrics that states have identified to date include, but are not limited to:

- Number of NEVI charging stations installed.
- Completion percentages against state goals.
- Population demographics within 50 miles of a station.
- Average consumer charging cost per kilowatt-hour.
- Number of stations serving underserved communities.

While some states have indicated they will build upon existing performance monitoring programs and tools to evaluate NEVI Formula Program outcomes, others are planning to develop new public-facing dashboards to share ongoing progress.

Ongoing Activities Strategies

Program Evaluation

Alaska, Maryland, and Washington, D.C., are a few of the states that have indicated they are developing a dashboard to display data collected from NEVI-funded infrastructure, such as the number and locations of active stations, their uptime, and their usage.

The **Pennsylvania** DOT is developing a formal Program Evaluation Plan to evaluate the success of Pennsylvania's program by quantifying and assessing the benefits and impacts of investments. The evaluation plan will include definitions of the performance measures, as well as plans for collecting data and reporting on the performance and evaluation process. Information obtained through program evaluation will be shared with the Joint Office and the public through future updates of the NEVI state plan, Pennsylvania DOT's EV website, and dashboards.

Known Risks and Challenges: Themes Identified by States

States were encouraged to describe their known risks and challenges in implementing the NEVI Formula Program funds. This section provides a summary of themes that emerged from plans. The Joint Office is using this information to help prioritize where states may need additional support and to guide future technical assistance efforts.

Risks

1. EV use rates aren't high enough to support stations in some areas/business models; low return on investment due in part to high peak demand charges.
2. Chargers will be abandoned beyond the required term of the agreement if utilization is not high enough. These risks are higher in areas with lower population density and travel demand.
3. Anticipated supply chain issues will cause implementation delays, which could lead to increased costs.
4. Lack of information about infrastructure and utility costs and potential revenue generation may discourage potential site hosts from applying because they are unable to calculate their risks.
5. Lack of network power/grid capacity to reach minimum standards at some station locations.

Challenges

1. Delay in finalizing FHWA minimum standards and requirements and related administrative schedules will impact NEVI deployment. Many states noted potential difficulty or inability to move forward with procurement until the final rule was published and the proposed FHWA Buy America waiver was resolved.
2. Given the relatively short period of time to prepare the plans (6 months), states indicated that proper outreach to all other stakeholders, including disadvantaged communities, will take more time. Some specifically noted from experience that outreach, education, and identification of specific site hosts requires substantial time and effort.
3. Overall lack of public awareness about public chargers, including where they are and how to use them.
4. States expressed that figuring out the National Environmental Policy Act (NEPA) process, coordinating with all the different stakeholders, and permitting and zoning updates that may be required will all take time to address.
5. Several states noted that the amount of time needed for utility interconnections, which can average many months (in some cases as many as 9–12 months) will impact deployment.

6. Some states expressed concerns about the time and effort needed to coordinate with state departments of labor and unions to define training needs and opportunities.
7. Many states noted that power supply and communication stability in remote areas and across difficult terrain/extreme weather zones will be a challenge.
8. Some states expressed concerns with extreme weather events impacting power supply, including forced power outages to protect against wildfires and regular disruptions to utility service from natural events (e.g., earthquakes, wildfires, flooding, extreme cold, winter storms).
9. Other challenges included ensuring Justice40 requirements are met, Buy America compliance, complete road closures during winter months impacting construction (e.g., Alaska), technology adoption by low-income households, source of 20% match, and state statutes limiting how fees can be assessed for EV charging (e.g., Montana is prohibited from charging by dollars per kilowatt-hour), among others.

Sample State Proposed Mitigations to Known Risks and Challenges

Arizona

The Arizona NEVI plan includes staffing for implementation as a challenge. They also note that extreme heat can cause lithium-ion battery fires that are difficult to extinguish; their mitigation plan is to include adequate fire suppression facilities at key locations.

District of Columbia

D.C.'s NEVI plan provides a concise table of 10 challenges with descriptions and possible mitigations. The inclusion of mitigation opportunities helps to clarify the level of effort needed to overcome the challenges.

Massachusetts

Massachusetts's plan documents nine challenges and their potential solutions. They range from managing constantly evolving technology to reliable O&M and security for the physical infrastructure.

Areas for Additional Technical Assistance

The Joint Office technical assistance staff are currently meeting with each state to review Joint Office plan feedback and identify immediate next steps and areas for additional assistance. This information will complement Joint Office detailed analyses of the certified state plans to identify shared needs across plans and tap Joint Office resources to fill those needs with technical assistance, information resources, and access to peer-to-peer exchange through office hours and webinars.

The Joint Office will continue to provide direct technical assistance and support to states as they transition from plan development to implementation. The support includes regular one-on-one calls between the Joint Office and each of the states to coordinate direct technical assistance based on their certified EV infrastructure deployment plan. These calls will be held bimonthly during the implementation phase to support progress, share best practices, and address challenges. Additional support will be provided during regional office hours and topical webinars, as needed.

Based on initial review of the state plans and ongoing conversations with the states, cybersecurity; contracting; identifying, implementing, and tracking Justice40 benefits; providing ongoing and meaningful community engagement; utility engagement and coordination; and labor and workforce development are topics that have been noted for additional technical assistance.

Through the Joint Office's partnership with the National Association of State Energy Officials (NASEO) and the American Association of State Highway and Transportation Officials (AASHTO), additional technical assistance will also be provided through monthly regional calls with state DOTs and energy offices to discuss multi-state collaboration activities regarding EV infrastructure planning and deployment; activities to enhance coordination and collaboration between states, the federal government, and the private sector on EV infrastructure build-out; and state topics of interest such as utility coordination.

Conclusion

This report provides an overview of common themes, strategies, and risks/challenges in the first-year plans of the National Electric Vehicle Infrastructure Formula Program. Each plan was unique, representing varied perspectives, approaches, and levels of capacity and experience in administering EV charging programs and plans. Ultimately, this quilt of 52 different patterns will be bound together in a network that represents unique needs and consideration of each state while incorporating the vision and requirements outlined in the NEVI Formula Program Guidance and rulemaking.

Overall, it was clear that each state is invested in providing EV infrastructure to ensure a convenient, affordable, reliable, and equitable national network. The commitment by state DOTs to develop their first NEVI charging plans over a period of less than 6 months—in what was a new topic for some—speaks volumes of their interest and commitment. It is to be expected that there will be challenges ahead and a great deal to learn in the coming years, and maintaining a strong sense of community and continuous improvement in future years will be mission critical to our collective success.

Key Findings from the FY 2022 + FY 2023 State Plans

- All 52 plans were submitted by Aug. 1, 2022, and approved by Sept. 27, 2022—a tremendous accomplishment by all NEVI participants and a strong indicator of the importance of and interest in the NEVI program releasing \$1.5 billion for FY 2022 and FY 2023 to support implementation of those plans.
- All NEVI deployment strategies include designated portions of the National Highway Systems as AFCs, roughly 75,000 miles in total, and prioritize build-out along the Interstate Highway System.
- Many states anticipated they will achieve build-out of their AFCs in future years and have funding remaining for additional capacity or deploying stations in non-AFC locations. The Joint Office estimates up to \$3.5 billion of the \$5 billion could remain after build-out.
- General areas of plans that could be enhanced include procurement strategies, proposed station siting, cybersecurity, program evaluation, meaningful community engagement, and Justice40 implementation. These topics will be emphasized in technical assistance provided by the Joint Office.
- To allow implementation flexibility by state, a total of 56 exception requests (to requirements for station spacing along highways or station locations from highways) were submitted; 18 were withdrawn after additional discussion with the requestor determined that they were not needed, 29 were approved, and 9 were denied.

Opportunities for Future Emphasis

- State plans lacked detail in specific sections, suggesting opportunities for additional technical assistance and capacity. The topics of workforce development, community engagement and meeting Justice40 requirements, cybersecurity, and grid capacity and utility engagement are all areas that could benefit from additional support and detail in future years. Interstate and regional coordination will be key in future planning and implementation, and it will be important to ensure that corridors connect and work seamlessly across state lines. The current NEVI plans cover designated corridors along roughly 75,000 miles of the 230,000 miles in the National Highway System; future plans and corridor nominations should seek to close that gap.
- State DOTs will need to continue to build internal capacity and expand their interaction with external stakeholders to successfully administer the NEVI program. We would encourage DOTs to leverage their peer network in fellow DOTs, as well as existing expertise in other state government offices and programs.

What to Expect Next Year

This is the first year of a 5-year program, and states are just getting started with their implementation. In future-year reports, as the states begin implementation, the Joint Office anticipates that there will be additional information to include on the progress toward a national, convenient, affordable, reliable, and equitable EV charging network. This information will be gleaned from a variety of sources including state deployment plan updates, as well as data resulting from the reporting requirements from FHWA's minimum standards.

The Joint Office is pursuing the development of a data collection and analytics platform and database to aid the states in efficiently providing program data as defined in 23 CFR 680, Section 112, FHWA's minimum standards and requirements. The intent is for the platform to enable states and the Joint Office to perform programmatic analysis and gain insights through data downloading, dashboards, and visualizations. The objectives are to:

- Standardize the data collection, storage, sharing, and analysis of EV installation, maintenance, and utilization data across a wide ecosystem of actors.
- Facilitate and ease the reporting process for funding recipients.
- Leverage data to inform program modifications at the state and national level.
- Make high-level, non-sensitive data publicly available via a dashboard.

The Joint Office is seeking input from a variety of stakeholders to inform the development of the platform and will aim to integrate with existing systems and processes to the extent practicable to minimize the burdens of the data collection requirements.

This report presents a snapshot in time and is based on information and NEVI guidance that was available when NEVI plans were submitted in August 2022. Subsequent to this date, FHWA regulations (23 CFR 680) for stations installed under this program has been finalized and updated NEVI Formula Program guidance including requirements for achieving fully built out status has been published. Outside of federal program requirements, many external announcements and partnerships have also been formed that may affect state plans. It is anticipated that updated plans submitted on Aug. 1, 2023, will discuss and reflect this new information.



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Appendix A. Overview of Joint Office Technical Assistance Efforts

One of the cornerstones of the Joint Office is technical assistance: The Joint Office provides technical assistance to states and others to smooth and accelerate the rollout of a national EV charging network. Since its launch in February 2022, the Joint Office has focused on supporting all states in submitting state EV infrastructure deployment plans. Plan submissions are required under the NEVI Formula Program established and funded by President Biden's BIL. The timely submission of every plan in year one demonstrated the widespread commitment from states to build out EV charging infrastructure to help accelerate the adoption of EVs, create good jobs, and combat the climate crisis.

The Joint Office serves as a focal point for collaboration, bringing the collective expertise of DOE and USDOT together with individual states to build a national EV charging network. The Joint Office offers robust technical assistance tools and resources on [DriveElectric.gov](https://www.driveelectric.gov). The public, states, and stakeholders can access guidance documents on the website, including the NEVI Formula Program Guidance, a template for state plan development, equity resources, charging infrastructure tools, frequently asked questions, and more.

States also have direct access to the Joint Office technical assistance team through the concierge service, which serves as a way for states to receive answers to questions related to plan development, programmatic requirements, and implementation. Since its inception in February 2022, the concierge service has answered over 1,100 inquiries from state DOTs and stakeholders regarding the NEVI Formula Program.

The Joint Office has developed a robust outreach strategy for state engagement, which has grown over time from initially providing broad resources through national webinars to being able to provide nuanced, customized, state-specific engagement opportunities. Conducting outreach at both the state and national levels allows the Joint Office to identify evolving trends and gaps in resources, which informs all types of technical assistance. The national webinars initially presented an introduction to the Joint Office, Joint Office technical assistance capabilities and ways for states to get assistance, an overview of the NEVI Formula Program, common themes and questions from states, and equity considerations for state plans.

The Joint Office then provided more tailored engagement opportunities for states during the plan development process. The Joint Office staff administered five regional office hour calls in 10 regions to encourage state-to-state collaboration and interaction between the state DOTs and FHWA division offices. The collaborative forum of regional office hours offered by the Joint Office provided an opportunity for states to share best practices and resources and plan for multi-state charging station network planning. As a result of directly and proactively supporting state electrification efforts, the Joint Office was able to identify additional topics for office hours, including sessions on equity, workforce development, and the notice of proposed rulemaking. Focusing on these

topics provided states with information necessary to provide greater levels of detail on those specific sections of state plans.

Throughout the plan development timeline, state DOTs met individually with members of the Joint Office technical assistance team to discuss challenges and strategies for EV charging station deployment. Overall, the Joint Office staff participated in 112 state meetings with all 50 states, Washington, D.C., and Puerto Rico. State one-on-one meetings were critical opportunities for the Joint Office to address unique state challenges and differences, which all have to be addressed under a single unified programmatic direction. The states were also invited to share preliminary drafts of their plans for Joint Office feedback in advance of the submittal deadline; 24 states accepted the opportunity for this detailed engagement. While supporting the states, the Joint Office was able to gain valuable feedback from the states that included public input on how to shape the final program.

Appendix B. Annual NEVI Formula Program Apportionment Schedule by State

	Actual FY 2022 Funding	Actual FY 2023 Funding	Estimated FY 2024 Funding	Estimated FY 2025 Funding	Estimated FY 2026 Funding	Estimated Total Funding
National	\$615,000,000	\$885,000,000	\$885,000,000	\$885,000,000	\$885,000,000	\$4,155,000,000
Alabama	\$11,738,801	\$16,892,267	\$16,892,384	\$16,892,399	\$16,892,434	\$79,308,285
Alaska	\$7,758,240	\$11,164,195	\$11,164,272	\$11,164,282	\$11,164,305	\$52,415,294
Arizona	\$11,320,762	\$16,290,704	\$16,290,816	\$16,290,830	\$16,290,864	\$76,483,976
Arkansas	\$8,010,850	\$11,527,704	\$11,527,783	\$11,527,793	\$11,527,817	\$54,121,947
California	\$56,789,406	\$81,720,595	\$81,721,161	\$81,721,230	\$81,721,400	\$383,673,792
Colorado	\$8,368,277	\$12,042,045	\$12,042,129	\$12,042,139	\$12,042,164	\$56,536,754
Connecticut	\$7,771,342	\$11,183,049	\$11,183,127	\$11,183,136	\$11,183,159	\$52,503,813
Delaware	\$2,617,339	\$3,766,380	\$3,766,406	\$3,766,409	\$3,766,417	\$17,682,951
D.C.	\$2,468,807	\$3,552,641	\$3,552,666	\$3,552,669	\$3,552,676	\$16,679,459
Florida	\$29,315,442	\$42,185,251	\$42,185,543	\$42,185,579	\$42,185,666	\$198,057,481
Georgia	\$19,978,342	\$28,749,059	\$28,749,258	\$28,749,282	\$28,749,342	\$134,975,283
Hawaii	\$2,616,956	\$3,765,829	\$3,765,855	\$3,765,858	\$3,765,866	\$17,680,364
Idaho	\$4,425,511	\$6,368,360	\$6,368,404	\$6,368,409	\$6,368,422	\$29,899,106
Illinois	\$21,998,178	\$31,655,626	\$31,655,845	\$31,655,872	\$31,655,938	\$148,621,459
Indiana	\$14,743,125	\$21,215,523	\$21,215,670	\$21,215,688	\$21,215,732	\$99,605,738
Iowa	\$7,604,168	\$10,942,483	\$10,942,559	\$10,942,568	\$10,942,591	\$51,374,369
Kansas	\$5,847,059	\$8,413,984	\$8,414,042	\$8,414,049	\$8,414,067	\$39,503,201
Kentucky	\$10,280,470	\$14,793,712	\$14,793,815	\$14,793,827	\$14,793,858	\$69,455,682
Louisiana	\$10,859,512	\$15,626,960	\$15,627,068	\$15,627,081	\$15,627,114	\$73,367,735
Maine	\$2,856,158	\$4,110,043	\$4,110,072	\$4,110,075	\$4,110,084	\$19,296,432
Maryland	\$9,298,080	\$13,380,042	\$13,380,134	\$13,380,146	\$13,380,174	\$62,818,576
Massachusetts	\$9,397,238	\$13,522,732	\$13,522,825	\$13,522,837	\$13,522,865	\$63,488,497
Michigan	\$16,290,764	\$23,442,593	\$23,442,756	\$23,442,775	\$23,442,824	\$110,061,712
Minnesota	\$10,089,418	\$14,518,786	\$14,518,886	\$14,518,899	\$14,518,929	\$68,164,918
Mississippi	\$7,483,268	\$10,768,508	\$10,768,582	\$10,768,591	\$10,768,614	\$50,557,563
Missouri	\$14,647,722	\$21,078,237	\$21,078,383	\$21,078,400	\$21,078,444	\$98,961,186
Montana	\$6,348,350	\$9,135,347	\$9,135,410	\$9,135,418	\$9,135,437	\$42,889,962
Nebraska	\$4,472,243	\$6,435,608	\$6,435,652	\$6,435,658	\$6,435,671	\$30,214,832
Nevada	\$5,618,414	\$8,084,961	\$8,085,017	\$8,085,024	\$8,085,041	\$37,958,457

	Actual FY 2022 Funding	Actual FY 2023 Funding	Estimated FY 2024 Funding	Estimated FY 2025 Funding	Estimated FY 2026 Funding	Estimated Total Funding
New Hampshire	\$2,556,450	\$3,678,760	\$3,678,786	\$3,678,789	\$3,678,796	\$17,271,581
New Jersey	\$15,448,790	\$22,230,983	\$22,231,137	\$22,231,156	\$22,231,202	\$104,373,268
New Mexico	\$5,681,977	\$8,176,429	\$8,176,486	\$8,176,493	\$8,176,510	\$38,387,895
New York	\$25,971,644	\$37,373,488	\$37,373,747	\$37,373,779	\$37,373,856	\$175,466,514
North Carolina	\$16,137,196	\$23,221,608	\$23,221,768	\$23,221,788	\$23,221,836	\$109,024,196
North Dakota	\$3,841,352	\$5,527,749	\$5,527,787	\$5,527,792	\$5,527,804	\$25,952,484
Ohio	\$20,739,853	\$29,844,883	\$29,845,089	\$29,845,114	\$29,845,177	\$140,120,116
Oklahoma	\$9,812,934	\$14,120,923	\$14,121,021	\$14,121,032	\$14,121,062	\$66,296,972
Oregon	\$7,733,679	\$11,128,851	\$11,128,928	\$11,128,937	\$11,128,961	\$52,249,356
Pennsylvania	\$25,386,631	\$36,531,648	\$36,531,901	\$36,531,932	\$36,532,008	\$171,514,120
Puerto Rico	\$2,020,490	\$2,915,577	\$2,909,472	\$2,908,724	\$2,906,890	\$13,661,153
Rhode Island	\$3,383,835	\$4,869,376	\$4,869,410	\$4,869,414	\$4,869,424	\$22,861,459
South Carolina	\$10,360,855	\$14,909,387	\$14,909,490	\$14,909,503	\$14,909,534	\$69,998,769
South Dakota	\$4,363,463	\$6,279,072	\$6,279,116	\$6,279,121	\$6,279,134	\$29,479,906
Tennessee	\$13,074,884	\$18,814,906	\$18,815,036	\$18,815,052	\$18,815,091	\$88,334,969
Texas	\$60,356,706	\$86,853,980	\$86,854,582	\$86,854,655	\$86,854,836	\$407,774,759
Utah	\$5,372,731	\$7,731,421	\$7,731,474	\$7,731,481	\$7,731,497	\$36,298,604
Vermont	\$3,140,247	\$4,518,851	\$4,518,882	\$4,518,886	\$4,518,895	\$21,215,761
Virginia	\$15,745,244	\$22,657,583	\$22,657,740	\$22,657,759	\$22,657,806	\$106,376,132
Washington	\$10,489,110	\$15,093,948	\$15,094,052	\$15,094,065	\$15,094,096	\$70,865,271
West Virginia	\$6,761,785	\$9,730,285	\$9,730,352	\$9,730,361	\$9,730,381	\$45,683,164
Wisconsin	\$11,642,061	\$16,753,057	\$16,753,173	\$16,753,188	\$16,753,222	\$78,654,701
Wyoming	\$3,963,841	\$5,704,011	\$5,704,051	\$5,704,056	\$5,704,067	\$26,780,026

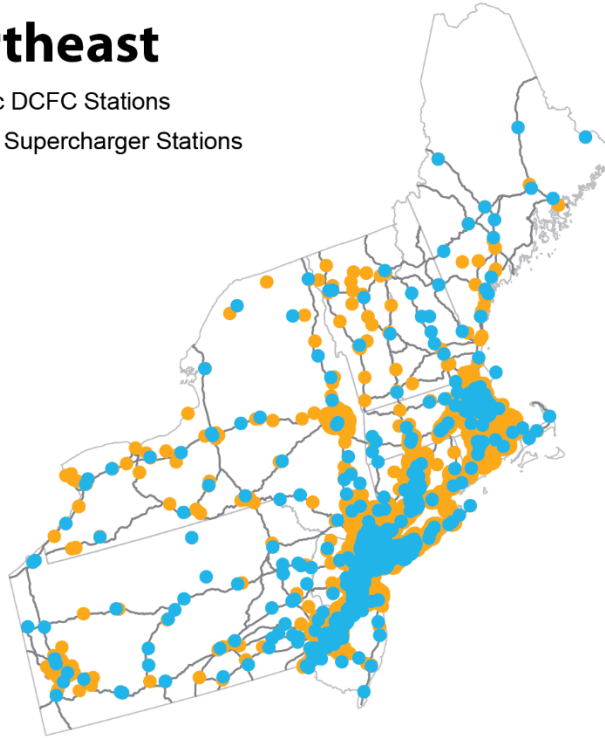
Appendix C. Approved Discretionary Exceptions by State

State	Location	Type	Deviation (miles)
Alabama	Walmart 661 (Athens)	1-mile	0.1
Alaska	Parks Highway mile 135 (north of Trapper Creek) to mile 210 (Cantwell)	50-mile	25
Arizona	Kingman to Seligman (I-40)	50-mile	7
Arizona	Gila Bend to Casa Grande/Eloy (I-8)	50-mile	17
Georgia	Conyers	1-mile	0.6
Georgia	Kennesaw	1-mile	0.1
Hawaii	Hawai'i Island Waimea	50-mile	5
Hawaii	Hawai'i Island Saddle Road	50-mile	27
Missouri	Mount Vernon	1-mile	0.4
Missouri	Lebanon	1-mile	0.2
Missouri	Booneville	1-mile	0.1
Nevada	Fernley to Lovelock	50-mile	5
Nevada	Winnemucca to Battle Mountain	50-mile	5
Nevada	Wells to West Wendover	50-mile	7
Nevada	Lovelock to Winnemucca	50-mile	21
Oregon	Biggs Junction to Shaniko	50-mile	6
Utah	Cedar City to Beaver	50-mile	5
Utah	US40 to Evanston	50-mile	5
Utah	Cove Fort to Scipio	50-mile	6
Utah	Cove Fort to Salina	50-mile	6
Utah	Price to Green River	50-mile	14
Utah	Delle to Wendover	50-mile	21
Utah	Thompson Springs to Grand Junction	50-mile	25
Utah	Ivie Creek to Green River	50-mile	36
Virginia	Station ID 167892 (Walmart #1344 at 1028 Richmond Ave C, Staunton)	1-mile	0.9
Virginia	Station ID 168007 (Sheetz 407 at 1340 North Fourth St., Wytheville)	1-mile	1.1
Wyoming	Cheyenne I-25	1-mile	1.8
Wyoming	Rawlins	1-mile	0.6
Wyoming	Gillette to Buffalo	50-mile	26

Appendix D. Public DCFC Stations by Region

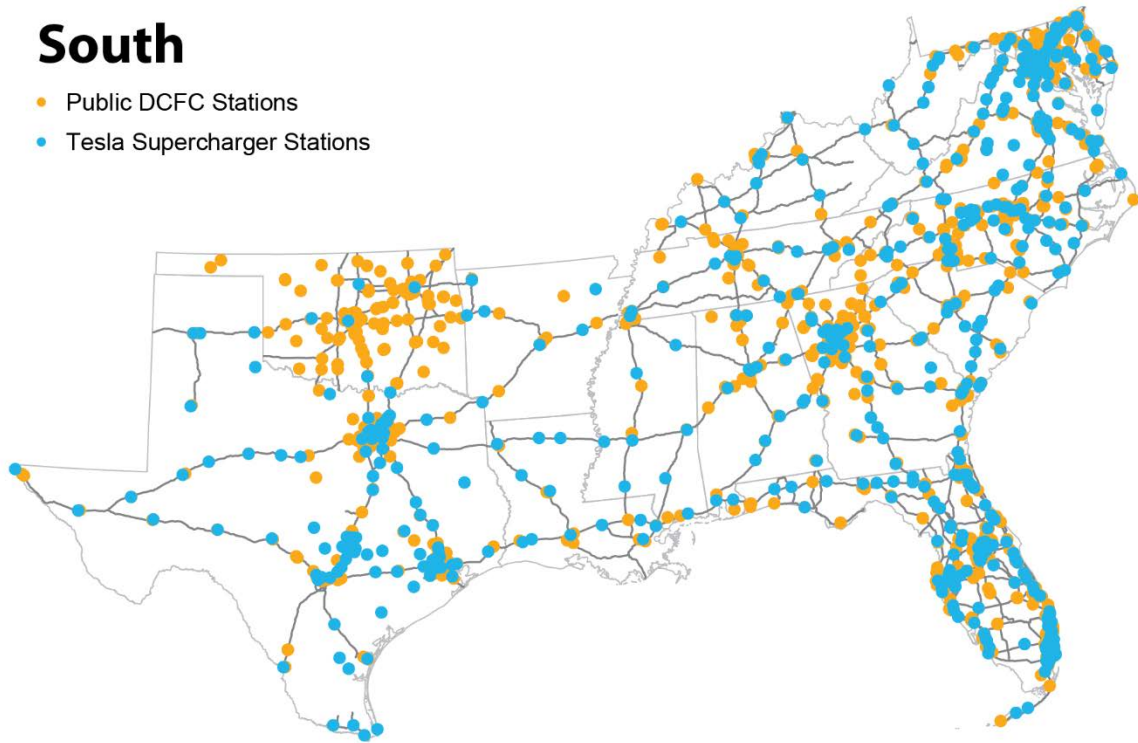
Northeast

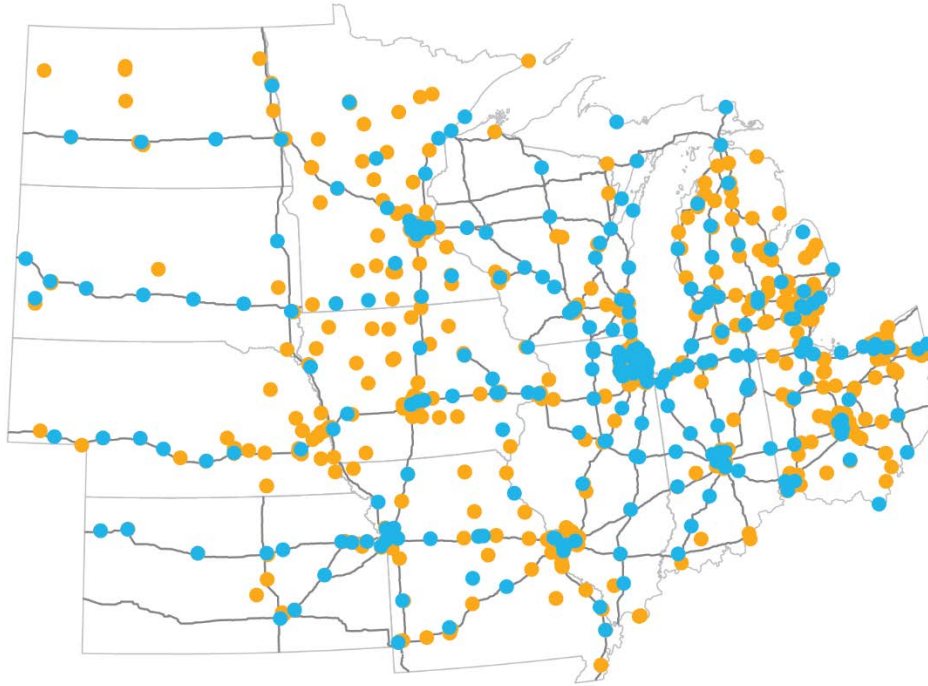
- Public DCFC Stations
- Tesla Supercharger Stations



South

- Public DCFC Stations
- Tesla Supercharger Stations

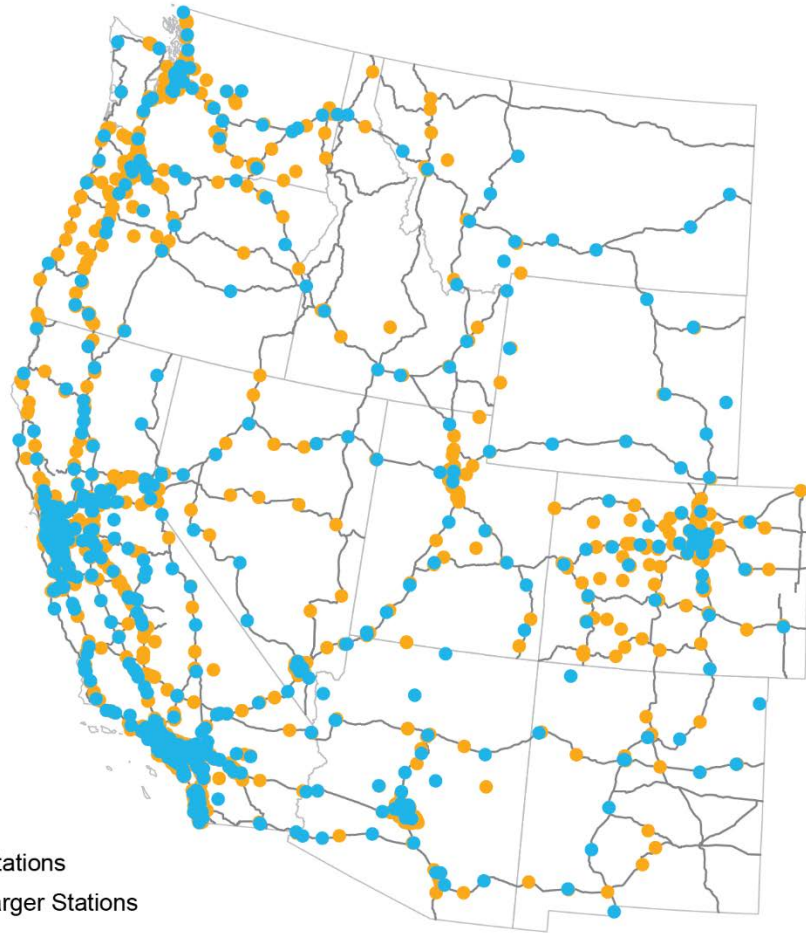




Midwest

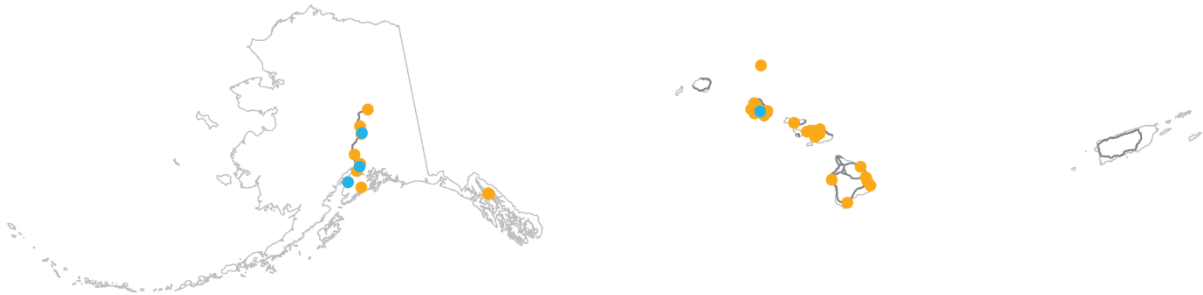
- Public DCFC Stations
- Tesla Supercharger Stations





West

- Public DCFC Stations
- Tesla Supercharger Stations



Alaska — Hawaii — Puerto Rico

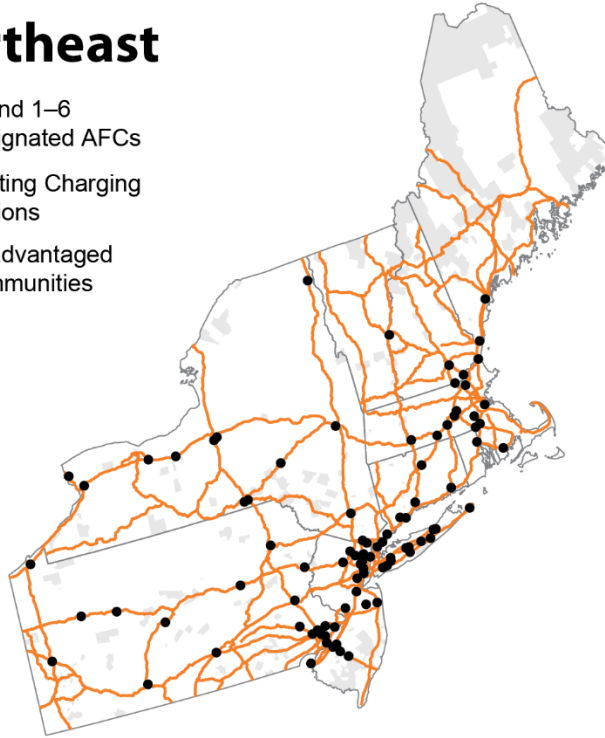
- Public DCFC Stations
- Tesla Supercharger Stations



Appendix E. Round 1–6 AFC Designations by Region

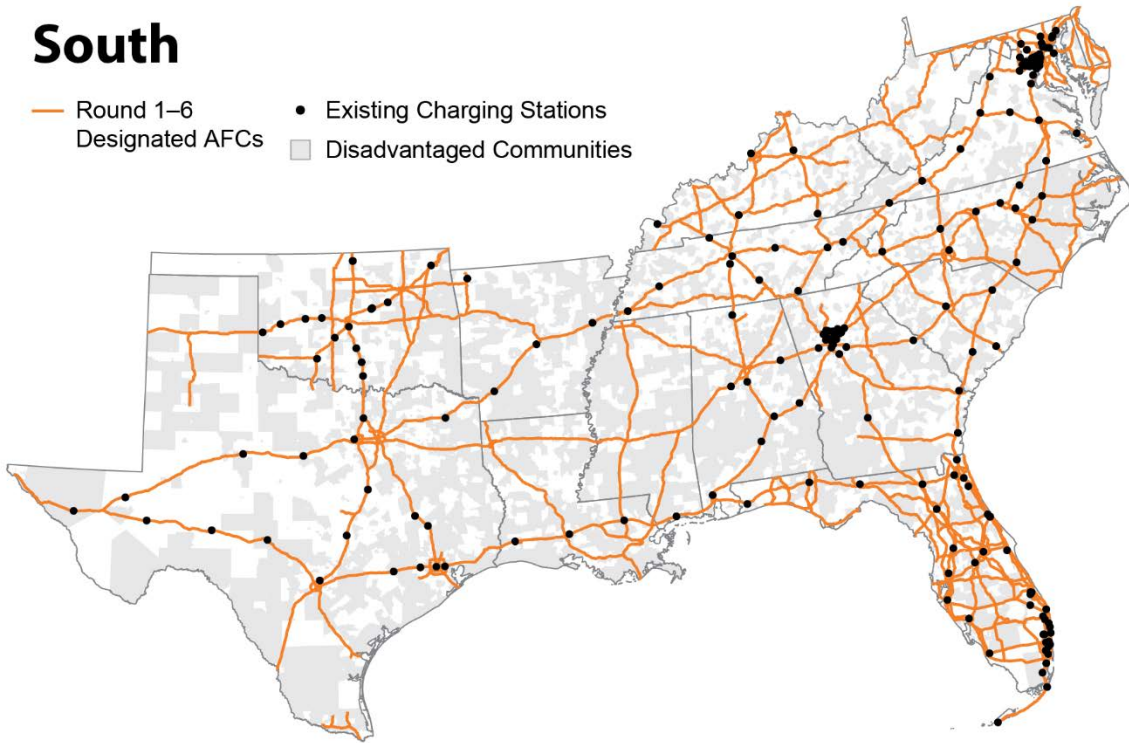
Northeast

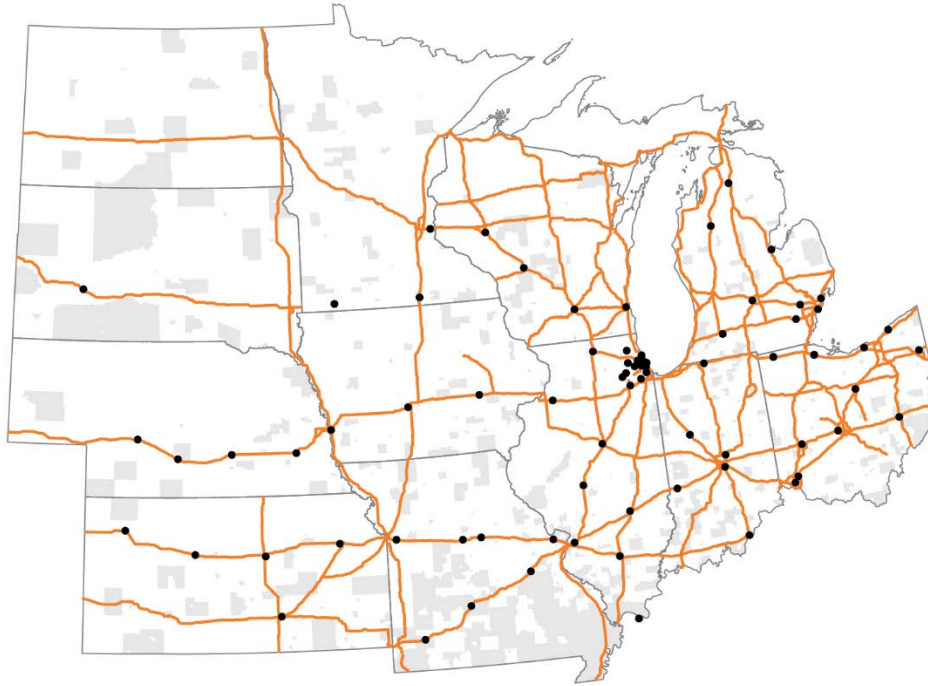
- Round 1–6 Designated AFCs
- Existing Charging Stations
- Disadvantaged Communities



South

- Round 1–6 Designated AFCs
- Existing Charging Stations
- Disadvantaged Communities



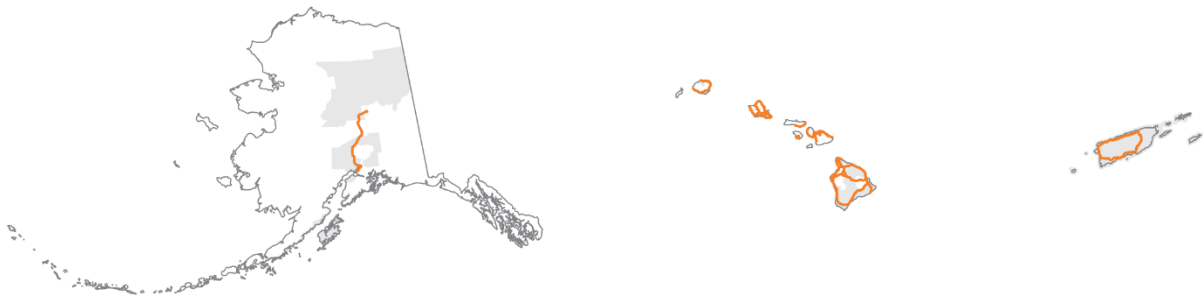
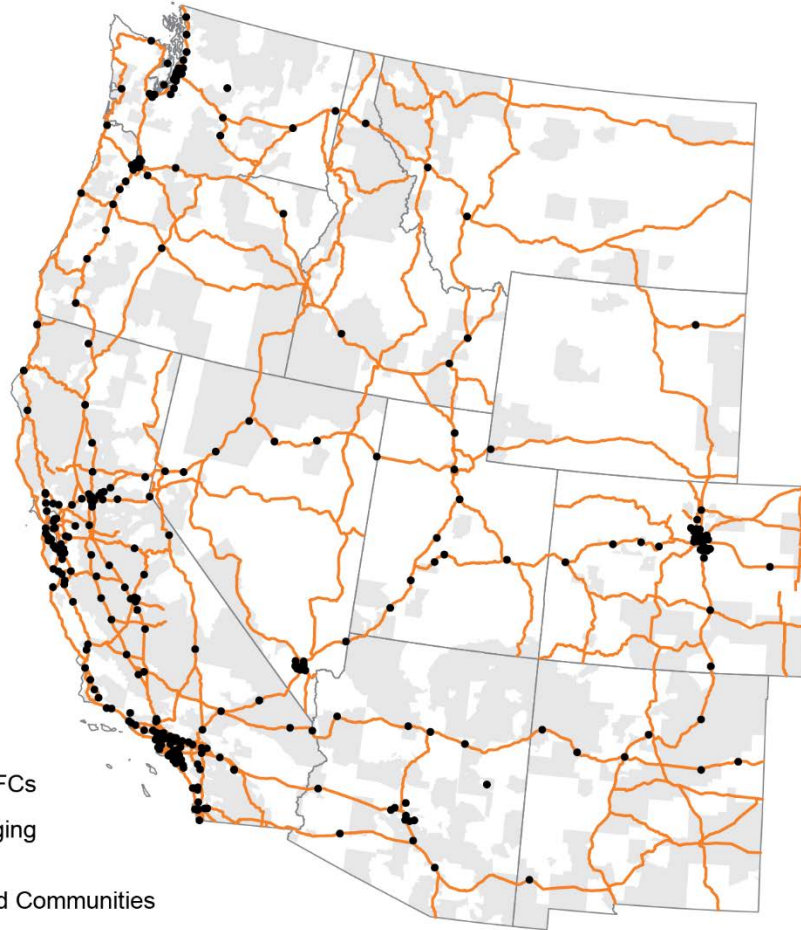


Midwest

- Round 1–6 Designated AFCs
- Existing Charging Stations
- Disadvantaged Communities

West

- Round 1–6 Designated AFCs
- Existing Charging Stations
- Disadvantaged Communities



Alaska — Hawaii — Puerto Rico

- Round 1–6 Designated AFCs
- Existing Charging Stations
- Disadvantaged Communities

Appendix F. Round 1–6 AFC Designations with Proposed NEVI Stations by Region

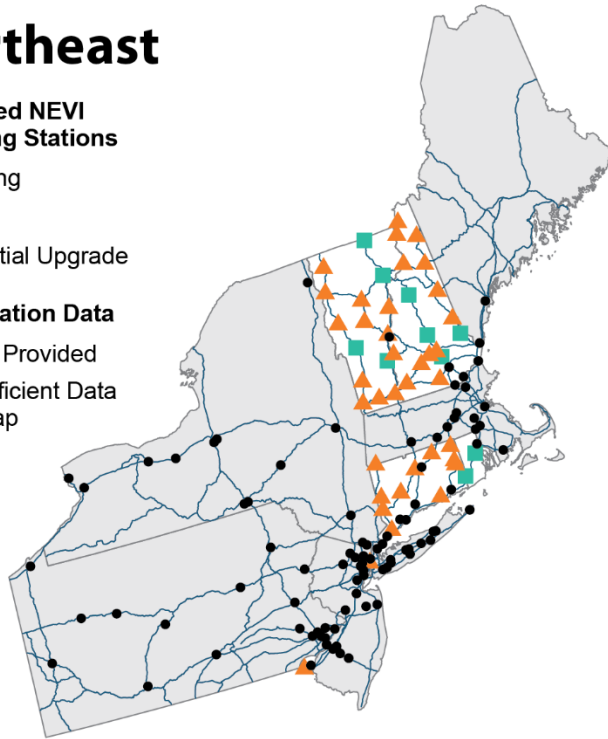
Northeast

Proposed NEVI Charging Stations

- Existing
- ▲ New
- Potential Upgrade

State Station Data

- Data Provided
- Insufficient Data to Map



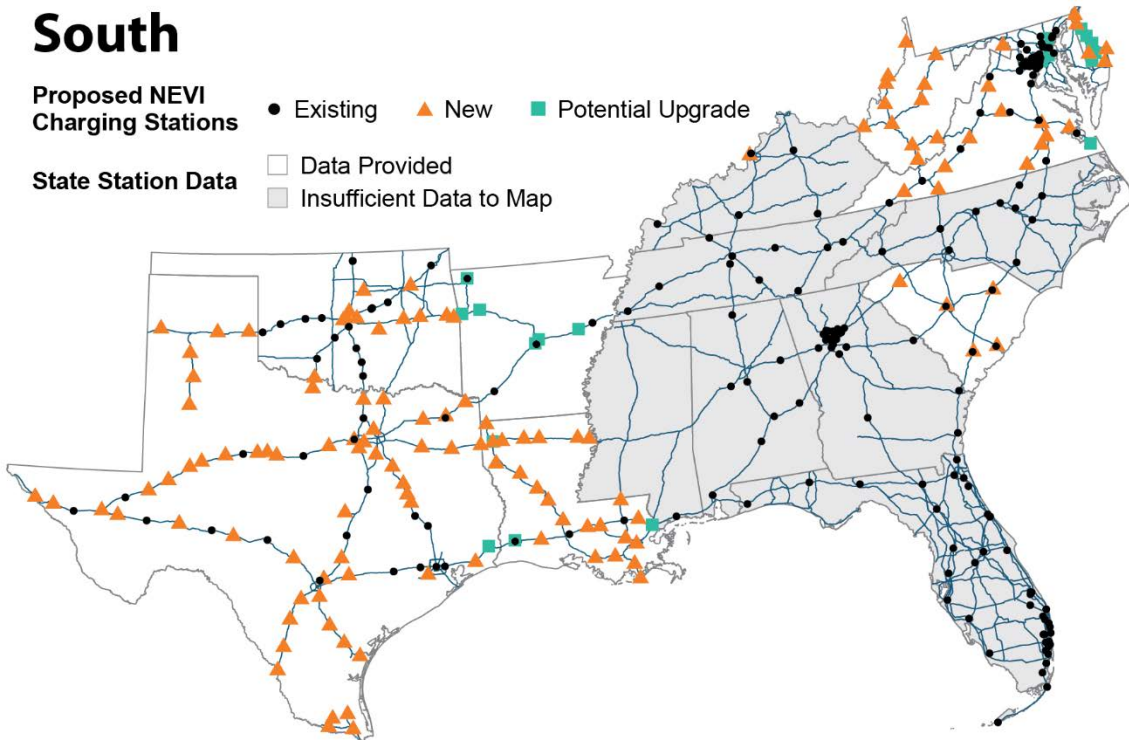
South

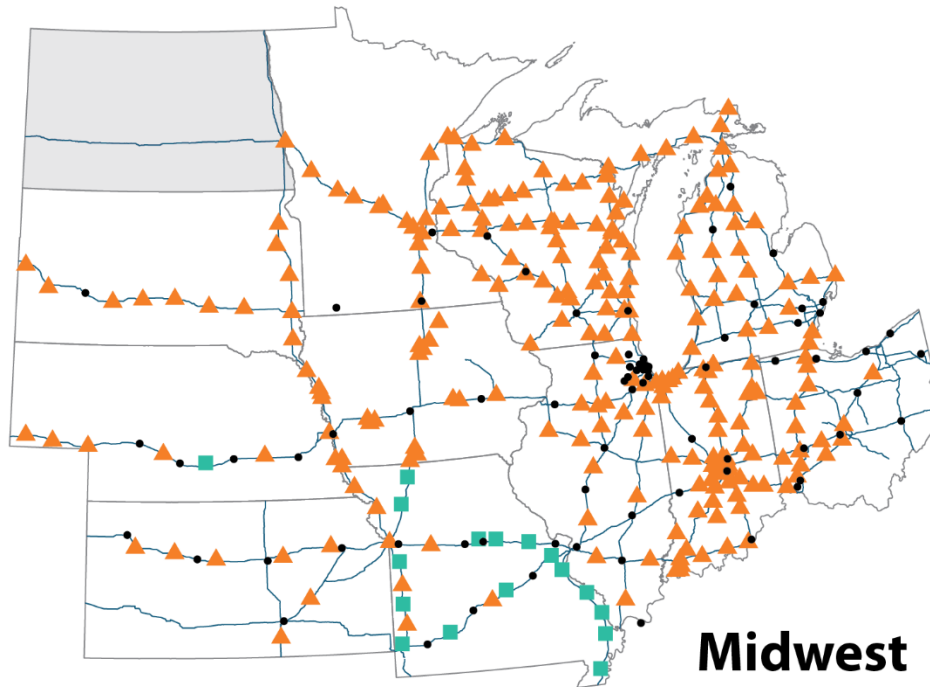
Proposed NEVI Charging Stations

- Existing
- ▲ New
- Potential Upgrade

State Station Data

- Data Provided
- Insufficient Data to Map

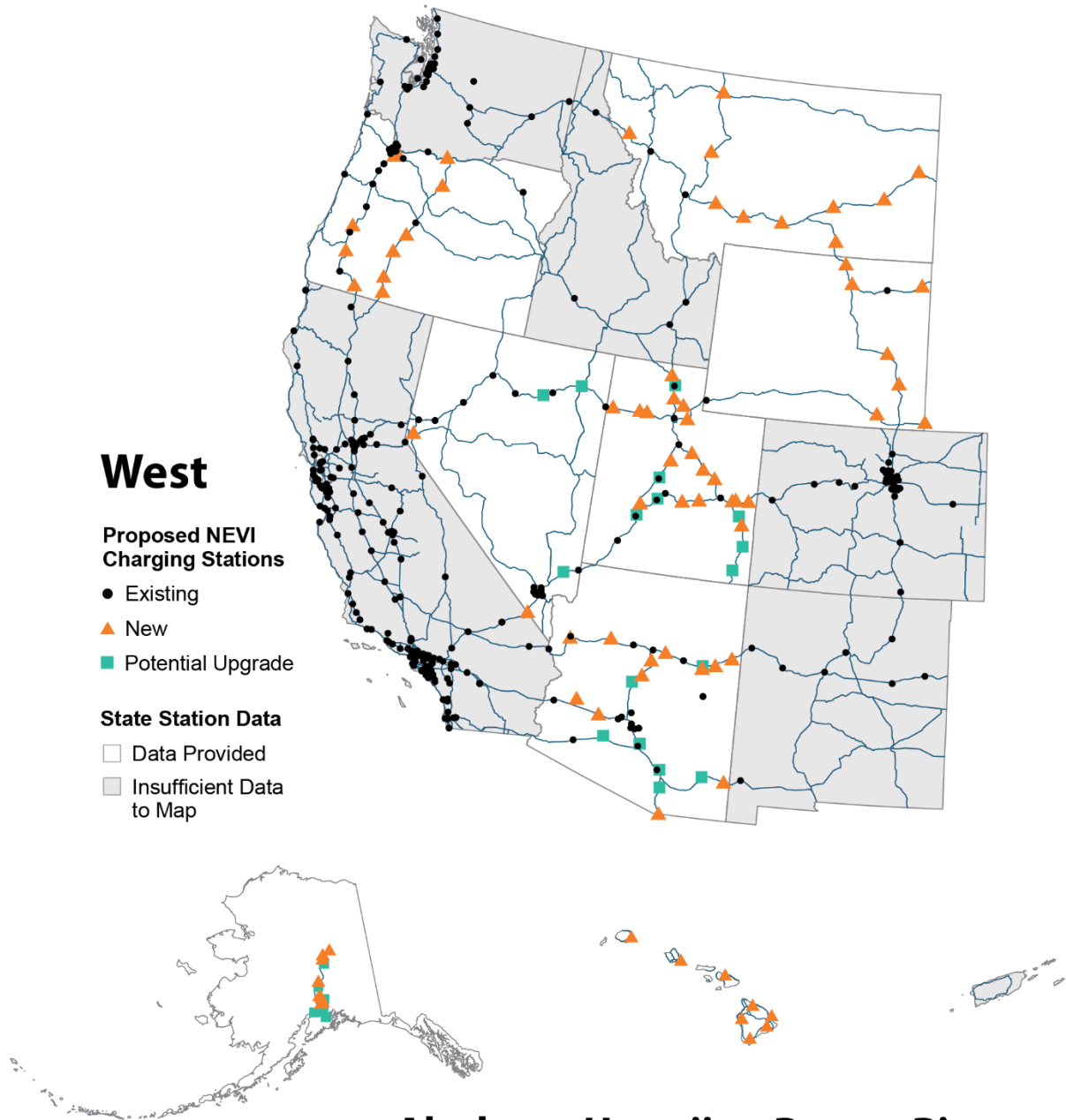




Proposed NEVI Charging Stations ● Existing ▲ New ■ Potential Upgrade

State Station Data □ Data Provided ■ Insufficient Data to Map





West

Proposed NEVI Charging Stations

- Existing
- ▲ New
- Potential Upgrade

State Station Data

- Data Provided
- Insufficient Data to Map

Alaska — Hawaii — Puerto Rico

- Proposed NEVI Charging Stations
- Existing ▲ New ■ Potential Upgrade
- State Station Data
- Data Provided ■ Insufficient Data to Map



Appendix G. Methodology for Estimating Number of Stations, Ports, and Costs for Full AFC Build-Out

G.1 Determining Total AFC Mileage

The spatial mapping of AFCs is conducted using GIS shapefiles provided by FHWA. The total mileage considers AFC Rounds 1 through 6 from the shapefile while removing any overlaps in the corridors and allocating corridors to each state and territory. The total length of the AFCs from this analysis is 75,306 miles.

G.2 Estimating Number of Stations and Ports for AFC Build-Out

The infrastructure needed for full build-out is a simplified estimation based on dividing the total mileage in each state into 50-mile segments. While this procedure does not account for many edge cases (e.g., road intersection distances, noncontinuous paths), any approach that spatially allocates station locations will inevitably make a set of assumptions.

Stations are assumed to have a total of six 150-kW ports—while this is greater than the minimum requirement of four chargers, it is assumed that many stakeholders taking advantage of NEVI funding will build out the infrastructure beyond the minimum requirement. Therefore, a total of 1,537 stations (with an assumed total of 9,222 ports) are required for full build-out of AFCs across all states and territories.

State	AFC Miles	State	AFC Miles
AK	364	MT	2,138
AL	1,005	NC	1,993
AR	514	ND	570
AZ	1,162	NE	483
CA	7,106	NH	682
CO	3,136	NJ	758
CT	416	NM	2,132
DC	28	NV	2,132
DE	258	NY	2,035
FL	6,141	OH	1,869
GA	1,521	OK	1,955
HI	800	OR	2,453
IA	742	PA	2,057
ID	1,975	PR	211
IL	1,562	RI	44
IN	1,436	SC	761
KS	1,352	SD	679
KY	1,471	TN	1,286

State	AFC Miles	State	AFC Miles
LA	1,124	TX	3,622
MA	850	UT	1,219
MD	1,109	VA	1,082
ME	1,109	VT	551
MI	2,126	WA	1,260
MN	562	WI	2,012
MO	1,184	WV	535
MS	818	WY	912

G.3 Estimating Total Cost of AFC Build-Out

The costs assumed per port are based on estimates from seven sources.³⁷ The costs are composed of four grouped elements:

- Equipment costs per port: \$87,000
- Installation costs per port: \$33,000
- 5-year maintenance costs per port: \$12,500
- Fixed station costs: \$103,000 (divided by 6 for costs per port).

The total cost per port would therefore be \$149,667, but the costs in the calculations for this report are focused only on the 80% federal cost share—thus amounting to a total of \$119,733. However, low- and high-cost scenarios are also used to bound the analysis (at \$95,072 and \$211,360 respectively). The base scenario has total costs (federal share) for a full build-out of about \$1.1 billion.

Considering the 10% set-aside, the total NEVI funding is roughly \$4.57 billion. With approximately \$1.1 billion of that total estimated for build-out, that leaves about \$3.47 billion in funding that would remain for states after build-out is completed.

³⁷ Jesse Bennett, Partha Mishra, Eric Miller, Brennan Borlaug, Andrew Meintz, and Alicia Birky. 2022. *Estimating the Breakeven Cost of Delivered Electricity to Charge Class 8 Electric Tractors*. Golden, CO: National Renewable Energy Laboratory. NREL/TP-5400-82092. <https://www.nrel.gov/docs/fy23osti/82092.pdf>; Bloomberg New Energy Finance. 2020. “2019 BNEF Commercial EV Charger Price Survey.”; Brennan Borlaug, Matteo Muratori, Madeline Gilleran, David Woody, William Muston, Thomas Canada, Andrew Ingram, Hal Gresham, and Charlie McQueen. 2021. “Heavy-duty truck electrification and the impacts of depot charging on electricity distribution systems.” *Nature Energy* 6: 673–682. <https://www.nature.com/articles/s41560-021-00855-0>; Brennan Borlaug, Shawn Salisbury, Mindy Gerdes, and Matteo Muratori. 2020. “Levelized Cost of Charging Electric Vehicles in the United States.” *Joule* 4 (7): 1470–1485. <https://doi.org/10.1016/j.joule.2020.05.013>; Gladstein, Neandross & Associates. 2021. *California Heavy-Duty Fleet Electrification Summary Report*. <https://blogs.edf.org/energyexchange/files/2021/03/EDF-GNA-Final-March-2021.pdf>; Chris Nelder and Emily Rogers. 2019. *Reducing EV Charging Infrastructure Costs*. Basalt, CO: Rocky Mountain Institute. <https://rmi.org/insight/reducing-ev-charging-infrastructure-costs/>; Michael Nicholas. 2019. “Estimating electric vehicle charging infrastructure costs across major U.S. metropolitan areas.” ICCT working paper 2019-14. <https://theicct.org/publication/estimating-electric-vehicle-charging-infrastructure-costs-across-major-u-s-metropolitan-areas/>



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