Alabama Electric Vehicle Infrastructure Plan

Wherever you're going, electric gets you there

Drive Electric Alabama

Summer 2022

ACKNOWLEDGEMENTS

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Alabama Governor Kay Ivey	Alabama Governor's Office of Minority Affairs
Alabama Department of Commerce	Alabama Department of Finance
Alabama Department of Transportation	Alabama Department of Labor
Alabama Department of Conservation and Natural Resources	Alabama Tourism Department
Alabama Department of Environmental Management	Alabama Technology Network
Alabama Emergency Management Agency	Alabama Association of Emergency Managers
Alabama Power Company	Tennessee Valley Authority (TVA)
Alabama Municipal Electric Authority	PowerSouth Energy Co-Op
Alabama Rural Electric Association	Electric Cities of Alabama
Center for Transportation and the Environment (CTE)	Electric Power Research Institute (EPRI)
Energy Institute of Alabama	Association of County Commissions of Alabama
Alabama League of Municipalities	City of Birmingham
Alabama Automotive Manufacturers Association (AAMA)	Automobile Dealers Association of Alabama
Honda Development & Manufacturing of America	Hyundai Motor Manufacturing Alabama
Mercedes-Benz U.S. International, Inc.	Toyota Motor North America
Creek Indian Enterprises Development Authority	Petroleum & Convenience Marketers of Alabama
Alabama State Electrical Workers Association	Economic Development Partnership of Alabama
Conservation Alabama Foundation	Burr & Forman, LLP
Resident EV Owners	Direct Communications
Alabama Transportation Institute (ATI)	Volta Charging
Alabama Clean Fuels Coalition	

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1. Executive Summary

It is projected that by 2030 some 20% of vehicles sold annually in the U.S. will be Electric Vehicles (EVs). In 2021, Alabama experienced a 61% increase in the number of unique battery electric vehicles (EVs) registered in the State. The number of plug-in hybrid electric vehicles (PHEVs) has also been on the rise. Transitioning to EVs creates challenges and opportunities. These challenges and opportunities impact the nation, and they impact Alabama.

This version of Alabama's Electric Vehicle Infrastructure Plan (EVIP) offers a current market assessment and recommendations for FY2023 state funds allocated by the Alabama legislature and FY2022 and FY2023 federal National Electric Vehicle Infrastructure (NEVI) Formula Program funds expected to become available for obligation once this plan is approved by the federal government.

Alabama is no stranger to transportation electrification. Montgomery was home to the first city-wide Electric Trolley system in the country. The "Lightning Route" by the Capital City Railway Company was developed in 1886 and operated until 1936.

Today, Alabama automobile manufacturers and their partners are leading the charge designing and delivering modern EVs to serve light-, medium-, and heavy-duty markets. Alabama's automotive manufacturers, their partners, and the Alabamians they employ are leaders in the nation and world, playing a significant role in taking electric transportation to the next level.

The Southeast United States is a leader in EV manufacturing investment and job creation, accounting for at least 14% of the passenger EV manufacturing jobs while representing 18% of the U.S. population.

The Southeast accounts for 28% of nationwide EV manufacturing investment.

Alabama Electric Vehicle Infrastructure Plan

In April, Mercedes-Benz gave the world a first glimpse of the 2023 EQS sport utility vehicle, an all-electric luxury ride that will be built at the automaker's Alabama plant later this year.

EV manufacturing in Alabama is new and on the rise; and well-paying jobs for Alabamians are a result. Since Mercedes-Benz opened its U.S. assembly plant in Alabama in 1993, Alabama has embraced its new role as an auto manufacturing state, and world-class vehicles are now the state's top export. In fact, Alabama ranks 4th among all states in automotive exporting.

Despite the global COVID-19 pandemic, exports of Alabama-made vehicles and parts totaled $8.5 billion in 2021 with Canada, China, Germany, and Mexico being the primary export markets. More than 150 Tier 1 and 2 automotive suppliers currently support production from Hyundai, Honda, Toyota, Mercedes-Benz, Autocar, and New Flyer.

There are many areas in which Alabama is leading the electrification of transportation. Below are some examples.

- Mercedes-Benz has invested over $1 billion to assemble electric SUVs at its Tuscaloosa plant and to construct an EV battery plant in Bibb County.

- Hyundai, which has a manufacturing plant in Montgomery, unveiled a plan to invest $7.4 billion in the U.S. by 2025. This investment includes commitments to produce future EVs, enhance production facilities, and further invest in smart mobility solutions.

- Westwater Resources and Alabama Graphite Products announced that it will be investing $202 million in Coosa County and is expected to employ at least 100 people and become the first-of-its kind U.S. company producing anode grade graphite—a key material used in EV batteries—by the end of 2022.

In Coosa County, Alabama Graphite Products will be producing Coated Spherical Purified Graphite (CSPG) for use in lithium-ion batteries. CSPG is not currently produced in the US and 100% is imported from Asia (China/Korea/Japan).

- Li-Cycle announced it will create 78 jobs at a new EV battery recycling facility in Tuscaloosa County with plans to begin operations in 2022.

- DURA Automotive Systems and the Shoals Economic Development Authority announced the creation of 279 direct jobs and a $59 million investment to open a manufacturing facility to produce battery trays for EVs.

Alabama Electric Vehicle Infrastructure Plan

"Mercedes is leading the way in globally cutting-edge research and development of electric vehicles, and Alabama's auto workers are playing a key role in this important effort." Secretary Greg Canfield, Alabama Department of Commerce.

- In 2021, The University of Alabama, Alabama Power and Mercedes announced their collaboration to form the Alabama Mobility and Power (AMP) Center. The center serves as a research and development hub for electric vehicles by creating and sustaining modern mobility and power technologies, developing charging infrastructure, and managing power delivery to support large-scale growth in EVs.

- New Flyer of America manufactures electric transit buses in Anniston and has invested over $25 million to upgrade its battery-electric bus facility.

New Flyer
Fuel Cell-Electric Transit Buses
Innovation Center in Anniston, AL

- Autocar Trucks has a special electric fleet vehicle development team designing medium and heavy-duty EVs in Birmingham.

E-ACTT
Autocar's All-Electric
Terminal Tractor

- The Gee's Bend Ferry is the first all-electric ferry boat in the US. The ferry makes five round trips across the Alabama River daily.

Gee's Bend Ferry

- The eWolf is the first all-electric tugboat built in Coden, Alabama.

The eWolf

Alabama's EV Advisory Group has been expanded three times since it was created in 2020. It now involves 66 individuals including citizen EV owners and representatives of 41 different stakeholder organizations.

This is the third version of Alabama's (EVIP). All three versions have been developed by the Alabama Department of Economic and Community Affairs (ADECA) to guide strategic deployment of EVSE funding along Alabama's path to transportation electrification. Alabama's EVIP is intended as a resource for state agencies, local agencies, businesses and interested individuals preparing for a future with many more EVs on the road. Alabama's EV Advisory Group has been expanded and now includes 66 individuals representing 41 organizations and citizen EV drivers serving without regard to their profession.

EV charging technology is collectively referred to as Electric Vehicle Supply Equipment (EVSE).

2. The Current Status of EV Charging in Alabama

In 2021, Alabama was ranked 47th out of 50 states in charging points per 100,000 vehicles with 8.4 charging points per 100,000 vehicles. According to the Alternative Fuels Data Center, a resource of the U.S. Department of Energy, there are currently 23 unique Level 3 Direct Current Fast Charger (DCFC) sites with 50 charging ports across Alabama. There are also 183 Level 2 charging stations with a total of 336 EV ports accessible to the public. Fourteen proprietary Tesla only DC fast-charging sites with 140 charging ports are also in Alabama. Tesla charging stations are currently only accessible for Tesla owners, but Tesla owners can charge at most DC fast-charging stations, too. To see a detailed breakdown of Alabama's publicly-accessible charging infrastructure, please refer to Section 15 of this plan.

Alabama needs more charging stations serving more strategic corridors, more communities, and more travel destinations to help fully realize all the benefits of transportation electrification.

3. EV Range Anxiety and Charging Technology

RANGE ANXIETY

Most EV owners charge their car at home. However, one of the biggest barriers to more widespread EV adoption is a lack of publicly accessible charging stations that serve consumer and commercial travelers and local EV owners who are unable to charge at home or work. Fear that an EV lacks enough battery capacity to make it to a destination is commonly referred to as "range anxiety." Most battery electric vehicles (EVs) introduced to the market in recent years have battery ranges similar to their gasoline-burning ancestors.

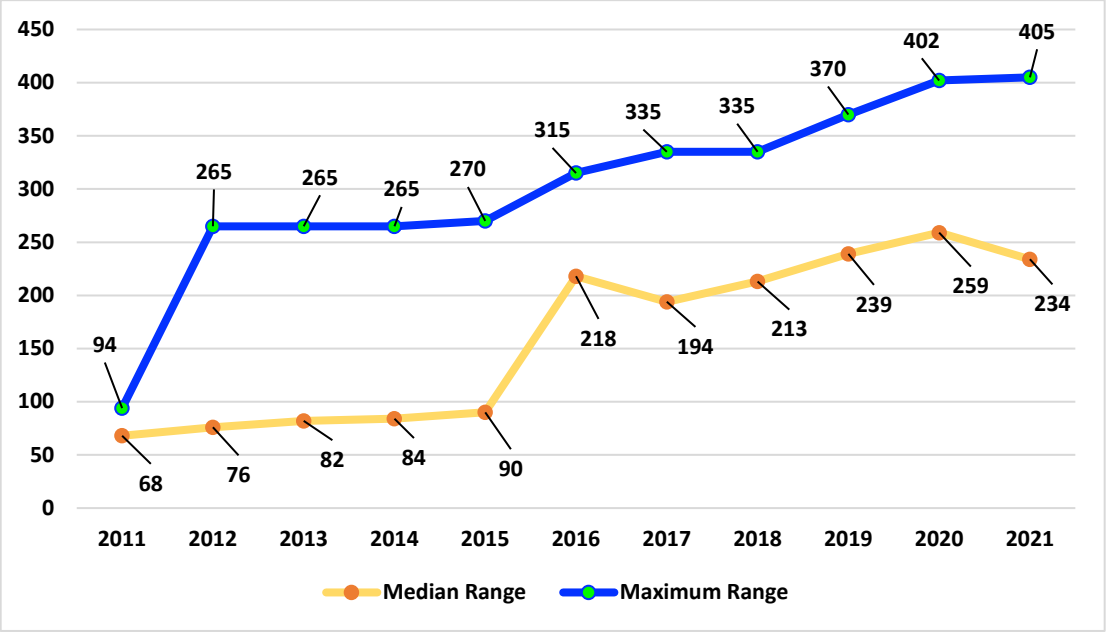


Figure 1. Median and Maximum Range of EVs Offered for Sale in the US (Miles per Charge) (From *EPA Find Median Range of EVs Dropped in 2021*)

EV range, the number of miles the EV can travel before needing to recharge, has steadily increased since 2011. As shown in Figure 1, the median range of EVs sold in the US increased from 68 miles in 2011 to 234 miles in 2021 . Similarly, the maximum range for EVs sold in the US also increased from 94 miles in 2011 to 405 miles in 2021.

CHARGING TECHNOLOGY

There are three main levels of EV charging technology and several different types of connectors for charging.

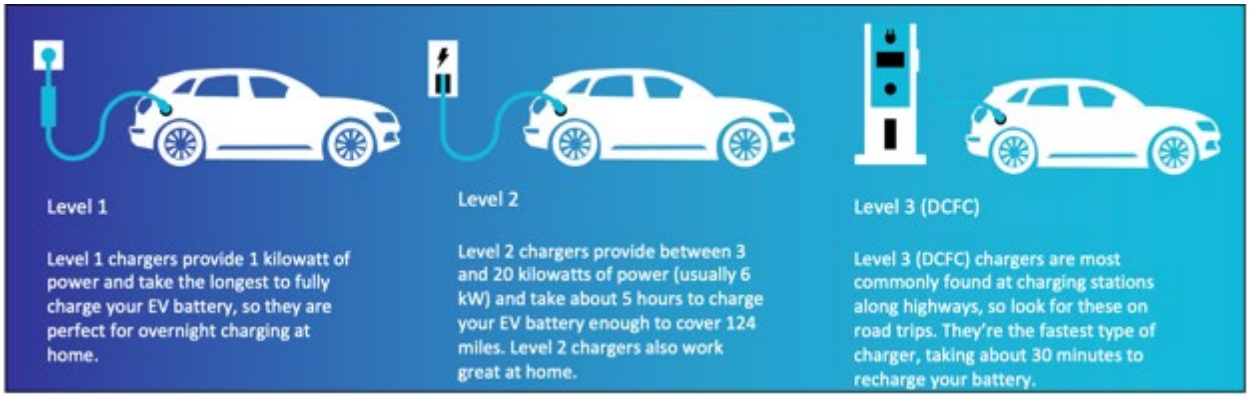


Figure 2. Charging Technology

Level	Source Voltage	Range from one-hour charge	Applications
1	120V	2-5 miles	Residential
2	240V	10-20 miles	Residential/Commercial
DCFC	480V	180-240 miles	Commercial

Table 1. EV Charging Levels

EV chargers interface with EVs through one of three primary types of connectors: CCS (also referred to as Combo or J1772), CHAdeMO, and Tesla. Some EVs require a CHAdeMO connector, but this type is not utilized on new EVs. Currently, Tesla chargers are proprietary and do not charge other brands of EVs. Because of this, Tesla charging stations are not eligible for support or expansion under state or federal funding programs. Tesla owners can use an adapter to charge at non-Tesla stations.

EV charging technologies are advancing. Technologies employed at today's most powerful DCFC stations are capable of delivering more power than most EVs can accept. EV adoption will accelerate with each new battery that can charge faster and go longer.

4. Alabama EV Market

Decreasing EV battery prices, increasing driving ranges, and skyrocketing gas prices all are contributing to rapid growth in the EV market. The EV market in the U.S. is trending very positively. Major investments from the public and private sector are driving the adoption curve even higher. According to Atlas Public Policy's EV Hub, more than 2.2 million EVs were sold in the United States from 2011 to 2021.

According to the Pew Research Center, 39% of U.S. adults indicated they were very or somewhat likely to seriously consider an EV for their next vehicle purchase.

In 2021, Alabama experienced a 61% increase in the number of unique battery electric vehicles (EVs) registered in the State.

After their introduction in 2010, EV and PHEV sales in Alabama first started to increase in 2011. From 2011 to 2019, however, PHEV vehicles dominated the market share. In 2019, EV registrations in Alabama surpassed PHEVs and continue to increase at a rate faster than PHEVs.

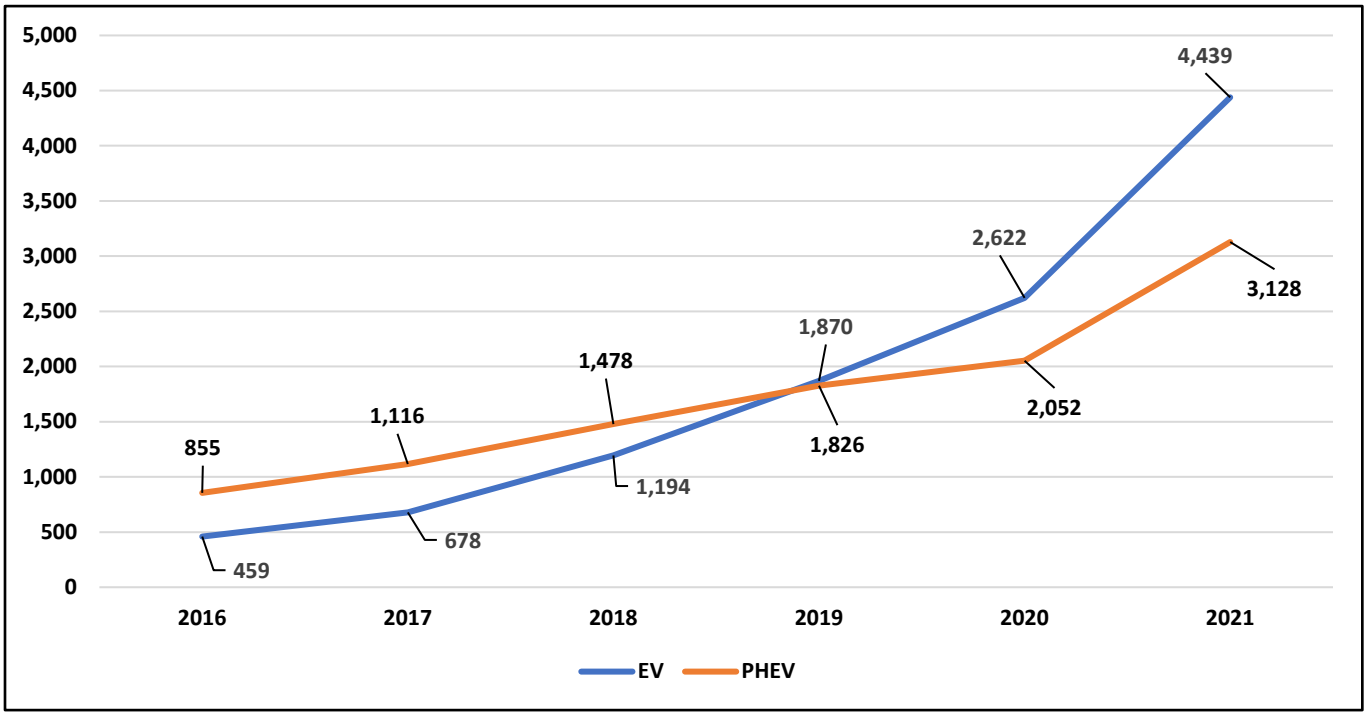


Figure 3. Unique EVs and PHEVs Registered in Alabama per Year

Year	Low Adoption	Medium Adoption	High Adoption
2022	2,587	2,893	3,005
2023	3,153	3,818	4,404
2024	3,961	5,168	7,152
2025	5,045	7,019	12,085
2026	6,444	9,456	20,043
2027	8,201	12,574	32,220
2028	10,360	16,479	49,543
2029	12,975	21,282	71,644
2030	16,099	27,102	96,392

Table 2. Projected PHEV Cumulative Registrations

Year	Low Adoption	Medium Adoption	High Adoption
2022	3,482	6,271	6,771
2023	4,411	10,415	13,070
2024	5,741	16,523	25,615
2025	7,531	24,967	48,474
2026	9,846	36,165	85,916
2027	12,756	50,582	144,108
2028	16,342	68,728	227,932
2029	20,688	91,143	335,134
2030	25,889	118,391	453,427

Table 3. Projected BEV Cumulative Registrations

Year	Low Adoption	Medium Adoption	High Adoption
2022	6,069	9,164	9,776
2023	7,564	14,233	17,474
2024	9,702	21,691	32,767
2025	12,576	31,986	60,559
2026	16,290	45,621	105,959
2027	20,957	63,156	176,328
2028	26,702	85,207	277,475
2029	33,663	112,425	406,778
2030	41,988	145,493	549,819

Table 4. Total Projected PHEV and BEV Cumulative Registrations

5. The Potential

CREATING A ROBUST CHARGING NETWORK

The federal government's NEVI program is expected to deliver $79.3 million to Alabama over the next five years supporting DCFC projects along Interstate corridors where high-powered chargers are needed. ADECA's state-funded Electric Vehicle Infrastructure and Planning Grant Program has already delivered multiple opportunities for grants to support DCFC and Level 2 charging infrastructure projects at locations accessible to the public. Additional federal programs are expected, and many private investments are kickstarting the development of a robust charging network in Alabama. Alabama's effective leveraging of all these opportunities together will lead to a convenient and reliable statewide network of charging infrastructure.

COMMUNITIES AND CONSUMERS BENEFIT FROM TRANSPORTATION ELECTRIFICATION

EVS ARE BETTER FOR PUBLIC HEALTH

Regardless of the source of electricity production, EVs are cleaner than their gasoline counterparts from an environmental standpoint. Reducing vehicle emissions is no doubt good for public health and the environment.

According to the U.S. Department of Energy, America spends about $1 billion per day on foreign oil. Electric transportation reduces Alabama's dependence on conventional fuels –meaning greater economic and energy security.

EV OWNERS SPEND MONEY IN COMMUNITIES AND ALABAMA EV REGISTRATION FEES SUPPORT TRANSPORTATION INFRASTRUCTURE NEEDS

People stopped at Alabama's EV charging locations will spend money on goods and services while they are also paying to charge their EVs. By 2030, if Alabama has a well-developed EVSE network, communities and businesses will benefit from an estimated $36 million per year spent by EV occupants on goods and services while their vehicle is charging. Alabama has also established an annual EV registration fee to help replace lost gas taxes not paid by EV owners. These fees are expected to generate between $22 million and $85 million per year by 2030, depending on actual EV adoption.

By 2030, EV owners are expected to spend an additional $36 million per year on goods and services while stopped to charge and annual EV registration fees will generate up to $85 million per year to support road infrastructure.

EVS ARE LESS EXPENSIVE TO OPERATE

EVs save drivers money and Consumer Reports analysts are finding that new long-range EVs are holding their value as well as, or better, than their traditional gasoline-powered counterparts. On fuel costs alone, a Consumer Reports Study shows that EV drivers can expect to save up to $1,000 per year and $9,000 over the lifetime of an electric car. Additionally, electric pickup truck drivers can expect to save up to $15,000 over the lifetime of an electric pickup truck. Exact savings depend on where and how an EV driver charges and on the cost of gasoline.

EVs are simpler and have fewer moving parts than conventional Internal Combustion Engine (ICE) vehicles. As such, Consumer Reports finds that EV owners can expect to spend half as much on vehicle maintenance costs as compared to ICE vehicle owners.

A Consumer Reports Study found that EV drivers can save up to $9,000 over the lifetime of their EV on fuel costs alone.

EV-RELATED WORKFORCE OPPORTUNITIES CREATE JOBS AND ENHANCE PUBLIC SAFETY

Transportation electrification is positively impacting Alabama's economy already. Recently, five EV-related economic development announcements involved the creation of 998 new jobs and $1.52 billion invested.

Alabama has an opportunity to continue its success as a top automotive manufacturing state through the development of upskilling and worker training programs.

Expanding EV-related workforce development efforts will prepare more workers to accept well-paying jobs. This will grow the state's economy and help Alabama remain competitive as a top automotive manufacturing state into the future.

PRIVATE EVSE INVESTMENT CATALYZES FURTHER ADOPTION

Private sector participation has been strong in Alabama's developing EV charging infrastructure network. Alabama's competitive EVSE grant programs are expected to continue to attract private investments in EV charging infrastructure projects. More EV support infrastructure will accelerate EV adoption by consumers and commercial transportation systems. Below are examples of private EVSE investments in Alabama.

Electrify America has installed 7 stations at Walmart and Sam's Club locations across the state of Alabama.

ELECTRIFY AMERICA (7 DCFC Stations)

- Athens, AL (Walmart)
- Alabaster, AL (Walmart)
- Oxford, AL (Walmart)
- Auburn, AL (Walmart)
- Montgomery, AL (Sam's Club)
- Greenville, AL (Walmart)
- Saraland, AL (Walmart)

Individual investments at vehicle dealerships throughout the state also resulted in some of the first DCFC in Alabama. This role is only expected to increase as more manufacturers roll out more EV models.

DEALERSHIPS (6 DCFC Stations)

- Greenway Nissan of Florence, AL
- Lynn Layton Cadillac Nissan of Decatur, AL
- Benton Nissan of Hoover, AL
- Jack Ingram Motors of Montgomery, AL
- Mercedes Benz of Birmingham - Birmingham, AL
- Redstone Harley Davidson - Madison, AL

GM to Expand Access to EV Charging throughout the U.S. with More than 40,000 Community-Based Charging Stations and New Smart EV Supply Equipment.

Electric utilities are also playing a role in the development of Alabama's EVSE.

UTILITY EVSE INVESTMENT

- Dothan Utilities (Dothan, AL) installed publicly accessible DCFC.
- Alabama Power Company contributed $737,000 to 10 ADECA awarded DCFC sites to assist their installation cost.
- Fort Payne Improvement Authority partnered with ADECA and TVA to install two DCFC along I-59 in Fort Payne, which opened in January 2022.

Utility	Incentives
Alabama Power Company	• Residential Plug-In Electric Vehicle Rate (PEV Rate Rider) – Whole House 9PM-5AM Year-Round Discount. • Business Electric Vehicle Time of Use Rate (BEVT) – EVSE must be separately metered from all other loads and requires a 5-year contract. • Economic Development Incentive Rate (EDI) – If qualified after APC economic evaluations, new/expanding sites installing a minimum of 250kW EV charging infrastructure may be eligible.
PowerSouth Energy Cooperative	• Residential EV Rebate Program – Residential EV owners and lessees can register their EV with their local distribution cooperative for a financial incentive. • Residential EV Time of Use rate – Some local distribution cooperatives are implementing residential EV Time of Use rates.
Alabama Municipal Electric Authority (AMEA)	• $1 million EV Charging Initiative Fund for AMEA members to install EV chargers in Member Electric Territories. • Additional $1 million EV Charging Initiative Fund to be used as matching funds for Member grant applications to install EV charging infrastructure in Member Electric Territories. • Future rebate program for Member residential customers to install EV chargers in their homes.
Tennessee Valley Authority and Local Power Companies of Alabama	• TVA is partnering with Local Power Companies of Alabama to deploy DCFC stations across interstates and major U.S. and state highways in northern Alabama. • TVA will reimburse Local Power Companies across its seven-state region 80% of the costs to install, own and operate DCFC stations at local businesses (service stations, restaurants, shopping centers, etc.) along major highways in their territory to ensure fast chargers are located at least every 50 miles.

Table 5. Utility Incentives Available in Alabama

6. Electric Vehicle Technology Education Program at ADECA

Recognizing the impending shift to electric transportation, Alabama is supporting efforts to raise public awareness about the benefits of EVs. Launched on November 29, 2021, Drive Electric Alabama is a public private partnership bringing together multiple stakeholders working to promote electric transportation in Alabama.

Many collaborations have formed around Drive Electric Alabama. The Alabama Clean Fuels Coalition is working under a three-year Drive Electric USA federal grant to further develop programs geared towards consumers, utilities, utility regulators, government officials, auto dealers, EV owners, fleet leaders and others. Drive Electric Alabama generated approximately 150 earned media stories through June 2022 that reached a Nielsen audience of 985,749 with a calculated publicity value of $483,195. Electrify America provided a grant that enabled a three-state partnership between the Alabama Clean Fuels Coalition and the Alabama Broadcasters Association to promote Drive Electric Alabama. Working with counterparts in Georgia and Tennessee, resulted in 8,526 television commercials, 37,275 radio ads, and digital advertising that generated 45.27 million impressions in one three-month period. Numerous Drive Electric Alabama outreach events are held throughout the state and an EV Summit is being planned for September 21-22, 2022. More information is available at www.driveelectricalabama.com.

Figure 4: Drive Electric Alabama and Drive Electric USA Awareness Campaigns

7. EV Infrastructure Programs Already Underway in Alabama

ADECA EV INFRASTRUCTURE PLANNING AND GRANT PROGRAM

Alabama EV Charging Infrastructure Program

FY 2021: 76 applicants requested $18 million with $4.2 million available to be awarded. Approximately 2/3 of the awarded DCFC projects are expected to be fully operational by the end of 2022.

FY 2022: 126 applicants requested $11.9 million with $2 million available to be awarded. ADECA is currently reviewing applications and funding decisions are expected in September. The FY 2022 ADECA grant program created eligibility for both DCFC and Level 2 projects.

FY2023: The Alabama Legislature appropriated $2 million which will be available for award beginning in October 2022. These funds can fill critical charging infrastructure gaps in communities not served by Interstate corridors which are the primary focus of current federal charging infrastructure programs.

Alabama has been conducting its own comprehensive planning to support a grant program designed to fill critical EV charging infrastructure needs. Specifically, the state legislature has funded the State EV Infrastructure and Planning Grant Program at ADECA with $5 million since 2020.

This program was launched in 2021 when the state combined $1 million appropriated by the legislature with $3.2 million in Volkswagen settlement funds. Grants were awarded on a competitive basis. Consistent with the Volkswagen settlement agreement, 2021 projects were prioritized based on projected nitrogen oxide emissions reductions. The State required a minimum of 20% of the costs be paid by the awardee and up to 80% of the project cost to be grant dollars. In June 2021, ADECA awarded 18 grants for DCFC at sites including one outlet mall, two hotels, two sporting goods stores, eight convenience stores, two grocery stores, two electric utility providers, and one public university. More than seventy percent of the 2021 projects are expected to be fully operational by December 2022.

ADECA is monitoring each project for compliance during construction and throughout a five-year maintenance period established between each site owner and the State of Alabama. Five years after a site is fully operational, the State of Alabama will have no further obligations and infrastructure ownership and maintenance will be at the discretion of the site owner.

In 2022, ADECA received a total of 126 applications during a second round of funding under its competitive grant program. Again, the funds granted will provide up to 80% of the cost of each project as a grant. The program provides eligibility for both DC fast chargers and Level 2 projects. ADECA is currently reviewing the applications to make funding decisions.

ALABAMA DEPARTMENT OF TRANSPORTATION AND FEDERAL HIGHWAY ADMINISTRATION (FHWA) ALTERNATIVE FUELS CORRIDOR PROGRAM

Most federal EV charging infrastructure funding is tied to EV charging corridors that have received FHWA designations. The Alabama Department of Transportation has proactively nominated electric vehicle charging corridors through six rounds of corridor designations completed between 2016 and 2022 as defined in 23 U.S.C 151. States have been strongly encouraged to primarily nominate interstate corridors. Alabama is now expected to receive $79.3 million to support statewide efforts to transition designated corridors from their initial status called "EV Corridor Pending" to a completed status called "EV Corridor Ready."

" EV Corridor-Pending"
A designation used by FHWA to describe corridors where public DCFC stations are more than 50 miles apart on a corridor.

"EV Corridor-Ready"
A designation used by FHWA to describe corridors covered by public DCFC stations that are no greater than 50 miles apart and no greater than 1 mile off the highway.

Interactive GIS Maps of Round 6 designated alternative fuel corridors can be accessed on the FHWA website.

On July 6, 2022, it was announced that FHWA has accepted Alabama's nominations of I-22, I-165, I-359, and I-759. All Alabama interstates are now designated as EV Corridor Pending. Alabama interstates include I-65, I-165, I-565, I-20, I-59, I-359, I-459, I-759, I-85, I-10, and I-22. Figure 5 depicts all FHWA EV Corridor Pending Corridors in Alabama with interstates added in Round 6 highlighted in red.

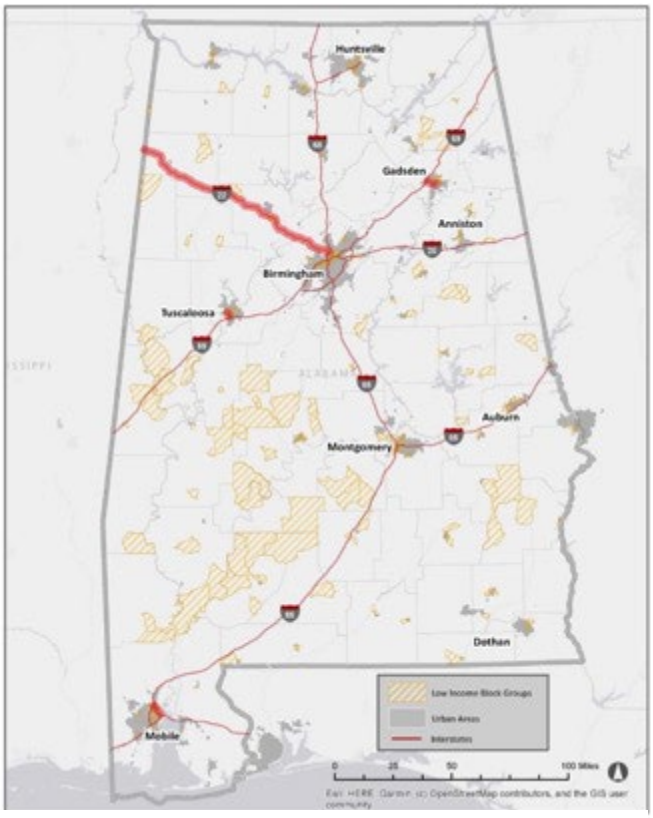


Figure 5. Alabama's Round 6 FHWA EV Charging Corridor Pending Nominations

EVSE INSTALLATION COSTS

EVSE installation costs vary widely based on many factors including: EVSE power levels, make/model of EVSE, site construction needs (new construction sites or addition to existing facilities), electric service required, local permitting requirements, equipment warranties, network fees, maintenance agreements, etc. Using data from real-world applications for funding projects to install DCFC and AC Level 2 EVSE in Alabama, the following cost estimations are provided for planning purposes:

- **DCFC** – $1,128 - $1,484 per kW or $127,400 - $203,130 per charging station (ranging from 62.5kW up to 350kW per charging station or "dispenser").
    - In a 2021 Request for Application (RFA) for DCFC projects , ADECA received 76 site DCFC site applications totaling $24,715,478 for all projects. Based on the total 16,660kW of proposed capacity to serve 194 charging stations (or "dispensers") outlined in the applications, the total all-inclusive cost for a DCFC installation would be approximately $1,484 per kW or $127,400 per dispenser (proposals ranged from 62.5kW up to 200kW dedicated per dispenser).
    - ADECA received one site application for four (4) DCFC dispensers capable of delivering 150kW each with the stated ability to supply up to 350kW to a single EV (managing the charging levels to other connected dispensers on site to stay below electrical capacity limits). This site applied for 720kW capacity with a total project cost of $812,514. Therefore, the total all-inclusive cost for this DCFC site design was calculated to be $1,128 per kW (or $203,130 per 150kW dispenser with the ability to supply 350kW to a single vehicle).
- **AC Level 2** - $3,000 - $5,000 per port/connector for new construction sites and $7,000 - $10,000 per port/connector to retrofit existing sites (based on Alabama utilities' experience installing AC Level 2 chargers through programs from 2014 – 2019).

2021 ADECA Electric Vehicle Infrastructure and Planning Grant Program Station Examples:

Fort Payne, AL
(Fort Payne Improvement Authority)

Boligee, AL
(Chevron Station)

Leeds, AL
(The Outlet Shops at Grand River)

Tuscaloosa County, AL
(Alberta Community Convenience Store)

8. Alabama's EV Advisory Group and Its Recommendations

In 2020, Alabama formed its first EV Advisory Group to develop the State's first EVIP which established state priorities for deployment of VW settlement funds and $1 million that had been provided by the Alabama legislature. The EV Advisory Group included representatives from the Alabama Governor's office, State agencies, and the electric utilities in Alabama and national experts on EV Infrastructure planning and deployment.

The EV Advisory Group was expanded in late 2021 to develop the January 2022 version of the EVIP. Added to the EV Advisory Group at that time were representatives of additional State Agencies, The Alabama Automotive Manufacturers Association, the Automobile Dealers Association of Alabama, the Petroleum and Convenience Marketers of Alabama, the Alabama Transportation Institute, and EV owners.

The Infrastructure Investment and Jobs Act led to another expansion of Alabama's EV Advisory Group around four specific and critical areas, and the following subcommittees have been created:

- Utility Subcommittee,
- Equity Considerations Subcommittee
- Labor and Workforce Considerations Subcommittee
- Public Engagement and Collaborative Funding Opportunities Subcommittee

Newly added Advisory Group members include a representative from the Creek Indian Enterprises Development Authority, the Alabama League of Municipalities, Chamber of Commerce Association of Alabama, the Alabama Transportation Planners Association, the Association of County Commissions of Alabama, the Economic Development Partnership of Alabama, representatives from Alabama automotive manufacturers, and additional citizen EV owners.

Below is a list of recommendations made by Alabama's EV Advisory Group for the state. Some may be implemented immediately while others may remain under consideration until such time as they are ready for implementation.

CONTINUOUS PLANNING PROCESS

Due to the dynamic nature of the EV market and requirements of the National Electric Vehicle Infrastructure (NEVI) Formula Program, Alabama should maintain an ongoing EVSE planning process. The state should look for opportunities to assist jurisdictions within the state to prepare their own transition to electric transportation and update the Alabama EVIP on at least an annual basis.

ADECA ELECTRIC VEHICLE INFRASTRUCTURE GRANT PROGRAM

The state should continue funding ADECA's Electric Vehicle Infrastructure Grant Program, established in 2020, and the funding level should be increased to $5 million per year to enable support for projects less likely to benefit from federal programs.

The state should establish the following priority ranking within ADECA's Electric Vehicle Infrastructure Grant Program:

- **Tier 1:** priority for state-funded DC fast-charging and Level 2 projects in rural and underserved areas not eligible under the National Electric Vehicle Infrastructure (NEVI) Formula Program.
- **Set-asides:** ADECA should assess the type of applications it is receiving to determine whether specific set-asides are needed to generate applications of the following types:
  - **Equity-related Needs –** a special category to encourage applications for projects that will serve low and moderate-income, rural, and/or areas with a high ratio of multi-unit dwellings to single-family homes.
  - **Destination-related Needs –** a special category to encourage applications for projects that will serve major destinations where people frequently gather for long periods of time, including hospitals, schools, shopping centers, places for leisure and outdoor recreation, entertainment, and sporting venues, etc.

Individual projects proposed to the state for funding under ADECA's Electric Vehicle Infrastructure and Planning Grant Program should be evaluated for individual site features and characteristics using the criteria recommended in Section 18.

ADECA should help educate and request information from other state agencies about their current and future expected charging infrastructure needs. ADECA should seek to connect interested agencies with information and resources to enable those agencies to support the electric transportation needs of their employees and visitors.

NATIONAL ELECTRIC VEHICLE INFRASTRUCTURE (NEVI) PROGRAM

The state should administer apportioned NEVI Formula Program dollars as a competitive grant program, requiring applicants to provide non-federal matching dollars.

Grantees should ultimately own and be fully responsible for maintaining NEVI supported infrastructure after the NEVI program's period of support has ended.

- The state should leverage NEVI funds to develop a mapping and analysis tool that could assist cities, counties, and local planning entities wishing to compare and evaluate different adoption and use scenarios for EVs and EV charging stations.

- Federal agencies that manage federal public lands within the state have access to some NEVI funding above and beyond the state's apportionment. Organizations in Alabama that work to protect, promote, and support Alabama's federally managed public lands and parks should inquire with appropriate federal officials to request projects in Alabama. Federal public lands that could benefit include locations such as Birmingham's Civil Rights National Monument, Talladega National Forest, Conecuh National Forest, Little River Canyon National Preserve, and The Cahaba River National Wildlife Preserve.

FHWA ELECTRIC VEHICLE CHARGING CORRIDOR NOMINATIONS

- Before nominating non-interstate EV charging corridors through the FHWA alternative fuel corridor program, the estimated cost of transitioning that corridor from FHWA's "EV Corridor Pending" to "EV Corridor Ready" status should be considered.

TRAINING REQUIREMENTS FOR ELECTRICAL WORKERS WHO INSTALL AND/OR MAINTAIN EVSE SUPPORTED BY STATE AND/OR FEDERAL FUNDING

- To ensure safety and high-quality delivery, for all future rounds of funding under EVSE programs administered by the state to deploy federal or state funds, the individuals who are installing or maintaining the EVSE should be required to meet minimum training standards in accordance with a federal requirement currently under development. Alabama should incorporate the requirements of a federal rulemaking currently underway into future projects supported by state and/or federal funding.

HURRICANE EVACUATION NEEDS

- The state should seek to identify ways to support charging infrastructure needs along hurricane evacuation routes and consider multi-state collaborative opportunities.

- Charging stations that serve hurricane evacuation routes need capacity to simultaneously charge a greater number of vehicles as quickly as possible. If higher capacity stations are supported along hurricane evacuation route locations, these locations should also be evaluated for their ability to support local public or private fleets that may utilize the infrastructure during non-emergency times.

- State and local emergency management agencies should work with utilities and other involved stakeholders to plan appropriate post-disaster protocol related to power restoration at EV charging sites, especially along designated evacuation routes.

ELECTRIC VEHICLE TECHNOLOGY EDUCATION PROGRAM AT ADECA

The state should continue the Electric Vehicle Technology Education Program at ADECA and provide $2 million in the near-term to continue support for the Drive Electric Alabama public-private partnership that is promoting consumer EV-related education and awareness.

EV-RELATED WORKFORCE DEVELOPMENT AND UPSKILLING

Up to $1 million of the $2 million from the Electric Vehicle Technology Education Program at ADECA should be leveraged to develop comprehensive EV upskilling programs for the existing workforce to prepare for Alabama's anticipated industry needs related to EV manufacturing, EV maintenance, EVSE installation and maintenance, and EV-related emergency first responder training. Federal and private sector partnerships should be leveraged, if possible, to provide additional support to these efforts.

ELECTRIC VEHICLE REGISTRATION FEES

The 25% portion of annual EV registration fees intended for EVSE projects should be implemented as envisioned to eventually replace the need for any additional state funding to ADECA's Electric Vehicle Infrastructure Planning and Grant Program.

Year	Low Adoption	Medium Adoption	High Adoption
2022	$238,775	$385,875	$413,675
2023	$322,067	$658,899	$816,022
2024	$415,181	$1,020,423	$1,557,851
2025	$540,403	$1,519,783	$2,907,502
2026	$702,270	$2,181,513	$5,114,752
2027	$968,567	$3,222,386	$9,068,868
2028	$1,236,312	$4,359,617	$14,300,025
2029	$1,560,753	$5,763,750	$20,988,468
2030	$1,948,853	$7,470,058	$28,380,064

Table 6. Projected Annual EV Registration Fees (25% of total) intended for EV charging infrastructure projects (Cumulative Figures)

Note: under the high adoption scenario, funds to the infrastructure grant may be $0 in the later years (2028-2030), if EVs surpass 4% of vehicles registered in the state.

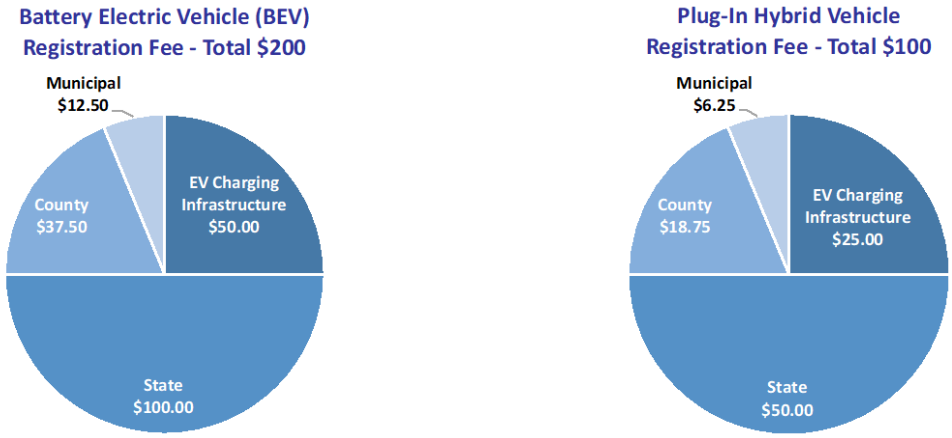


Figure 6: Breakdown of BEV and PHEV Registration Fees

BUILDING CODES

Homebuilders and owners and operators of multi-unit dwelling establishments and commercial locations are increasingly incentivized to consider electric vehicle charging infrastructure needs if they want to maintain access to the growing segment of the market represented by EV owners.

Prewiring a residential or commercial location for EVSE during the construction phase adds value to the property at a relatively low cost. On the other hand, retrofitting an existing structure for electric vehicle charging can be cost-prohibitive.

The Alabama Energy and Residential Codes Board should consider adopting EV-ready and EV-capable codes for newly permitted structures to significantly reduce the costs of future charger installations, striking a reasonable balance between the added costs of construction and the growing need to accommodate EVs.

ADECA's Electric Vehicle Infrastructure and Planning Grant Program creates eligibility for charging projects that serve multi-unit residential dwellings (MUDs). Additional federal programs are expected to serve these specific needs in the future. Alabama should consider how best to leverage funding to maximize opportunities for owners and managers of MUDs to meet the needs of their residents and parking tenants.

FLEET CONVERSIONS

Alabama owns and operates just over 9,000 motor vehicles and is one of the only statewide government fleet management programs consistently recognized by the National Association of Fleet Administrators on their annual list of the "100 Best Fleets in the Americas."

In 2009, the Alabama Legislature created a Green Fleets Review Committee and Green Fleets Policy requiring state-owned motor vehicles to achieve annual increases in average fleet fuel economy. The law also requires life cycle cost to be factored into purchasing decisions, which should be adjusted for EV proficiency. Individual state agency fleet managers are required to submit annual plans for procuring fuel-efficient vehicles.
State agencies register an estimated 1,500-2,000 new vehicles per year. Transitioning some of these vehicles to EVs could help agencies achieve their emissions reduction goals while also achieving fuel and maintenance cost savings.

Each year, the Alabama Green Fleets Review Committee, in conjunction with ALDOT Fleet Management, should assess EV models available on the market that match the duty cycle of agency fleets and would be a good option. These identified EVs and the related charging infrastructure should be added to statewide purchasing contracts. Subsequently, the Green Fleets Review Committee should provide guidance to agency fleet managers detailing which EVs and related charging infrastructure are available on statewide purchasing contracts to assist them in meeting their Green Fleets Policy goals.

HIGHWAY SIGNAGE

U.S. Department of Transportation (USDOT) guidance currently prohibits EV charging station on roadside signs that inform drivers about services available as they approach exits. Corridor signage helps travelers locate fueling stations and other essential services like food and lodging. Awareness of EV charging station locations will lead more consumers to consider an EV purchase. State transportation planners base signage decisions on guidance and standards issued through FHWA's Manual on Uniform Traffic Control Devices (MUTCD). Figure 7 provides examples of General Service Signs, Specific Service Signs, and Supplemental Messages.

Figure 7. Examples of General Service Signs, Specific Service Signs, and Supplemental Messages

If federal guidance ever permits, Alabama should incorporate EV charging station signage into its highway signage program to raise public awareness of EV charging corridors, help drivers locate charging stations, and assist with equitable access for stations serving electricity as a transportation fuel.

WORKPLACE CHARGING

The Alabama Clean Fuels Coalition is participating in a federal grant aimed at helping employers identify and satisfy needs related to workplace charging. Employers interested in workplace charging should contact the Alabama Clean Fuels Coalition if they would like to participate in this opportunity.

AIRPORT CHARGING

Alabama should consider adding Level 1 charging project eligibility under the Alabama Electric Vehicle Infrastructure and Planning Grant Program for airports and other locations where vehicles may be parked for longer periods of time. Entities interested in this type of charging infrastructure should also explore other federal funding programs that may help satisfy this need.

MEDIUM/HEAVY DUTY CHARGING

An increasing number of Alabama fleets that operate medium- and heavy-duty vehicles are expected to become interested in reducing their emissions and increasing their fleet fuel economy through deployment of zero emission vehicles. Additional federal

guidance on this topic is also expected, and Alabama should explore opportunities to develop programs to support these efforts.

ELECTRIC UTILITY INVOLVEMENT

It is vital that any business or government organization considering large scale EV charging infrastructure contact their local utility as they begin the planning process to ensure optimal outcomes and continued safe, reliable, and affordable electric service.

9. The Path Forward (2022-2023)

Alabama has designated ADECA as the agency to manage deployment of EVSE funding from both federal and state sources. ADECA will continue to administer its EV Infrastructure and Planning Grant Program subject to availability of funding. ADECA will also manage the NEVI program as outlined below.

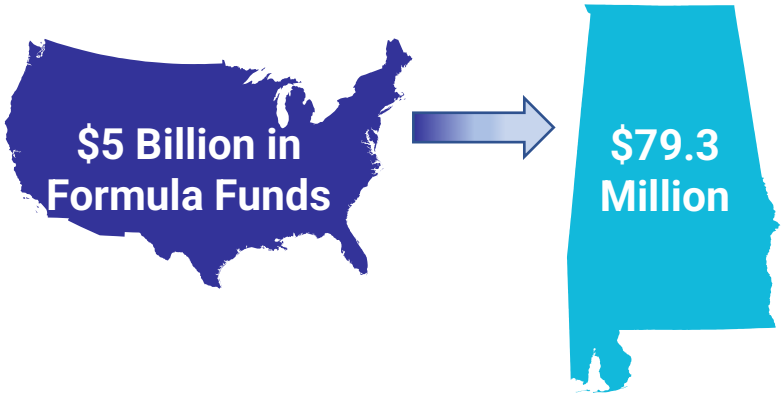
It is important to note that ADECA will utilize this plan as the basis for developing specific funding criteria and application rating guides issued for each future round of funding under both the state-funded program and the federal NEVI formula program.

EVSE Funding Source	Funding Provided	Funds Deployed	Funds Remaining
Volkswagen Settlement	$3,248,000	$3,248,000	$0
Federal National Electric Vehicle Infrastructure (NEVI) Formula Program	$79,300,000 anticipated	Funds will be made available over 5-year period	No funds have been deployed to date
State EV Infrastructure and Planning Grant Program at ADECA	$5,000,000	$1,000,000	$4,000,000
State EV Technology Education Program at ADECA	$3,000,000	$2,000,000	$1,000,000

Table 7. Primary State and Federal Funding Sources

ALABAMA NEVI FORMULA PROGRAM MANAGEMENT

According to the U.S. Department of Transportation, Alabama is expecting a total of $79,308,285 through the 5-year National Electric Vehicle Infrastructure Formula Program with $11,738,801 already apportioned on February 10, 2022. The goal of this program is to create a convenient, affordable, reliable, and equitable network of chargers in Alabama.



NEVI FORMULA PROGRAM WILL SUPPORT PROJECTS ALONG ALABAMA INTERSTATES UNTIL THEY ARE TRANSITIONED TO EV CORRIDOR READY

Every interstate in Alabama has been designated or nominated as EV corridor-pending under the FHWA Alternative Fuel Corridor Program. With up to 80% NEVI funds and at least 20% non-federal matching dollars, it is anticipated that all Alabama interstates should become eligible to transition to EV corridor-ready status over the next 5-7 years. These benchmarks will be further developed, and the status of this buildout will be reflected in greater specificity in future versions of this plan.

INTERAGENCY AGREEMENT BETWEEN ALDOT AND ADECA

The Alabama Department of Transportation (ALDOT) and the Alabama Department of Economic and Community Affairs (ADECA) worked with the Federal Highway Administration (FHWA) to execute an agreement enabling ADECA to administer Alabama's National Electric Vehicle Infrastructure (NEVI) Formula Program.

ALABAMA'S COMPETITIVE EV CHARGING INFRASTRUCTURE GRANT PROGRAM HAS BEEN VERY POPULAR WITH APPLICANTS AND ATTRACTS HIGHER THAN MINIMUM LEVELS OF PRIVATE INVESTMENT

Alabama businesses and communities have established a clear desire to be eligible to apply for competitive grants to install EVSE. In ADECA's recent rounds of state-funded EVSE grants, the amount of funds requested has far exceeded the amount of funds available. At this time, ADECA intends to administer the NEVI program as a competitive grant program. Individual projects proposed to the state for funding under the NEVI formula program must be evaluated and administered in a manner that meets all requirements of relevant federal law and regulations.

The State can leverage NEVI funds to develop a mapping and analysis tool it can use to assist cities, counties, and local planning entities as they compare and evaluate different adoption and use scenarios for EVs and EV charging stations.

CHARGER TYPE	PERCENTAGE OF APPLICATIONS	AVERAGE CHARGING PORTS PER PROJECT	AVERAGE PROJECT COST	PERCENTAGE OF PROJECT COST REQUESTED AS GRANT
Level 2 (L2) ONLY	52%	4	$35,000	55%
DC Fast ONLY	39%	2.5	$248,000	65%
L2 + DCFC	9%	7.2	$270,000	77%

Table 8. Tier 2 (Non-Interstate) Applications Received through ADECA's 2022 Electric Vehicle Infrastructure Grant Program

ASSET OWNERSHIP WILL REVERT TO PROJECT HOST

NEVI projects in Alabama will be structured so that applicants ultimately assume total ownership of the infrastructure. This means applicants will also be responsible for all aspects of the charging infrastructure beyond the period of time supported by the NEVI program. This arrangement will limit the state's long-term risk exposure associated with these projects.

GRANT APPLICATION GUIDES AND RATING CRITERIA WILL BE RELEASED FOR EACH ROUND OF FUNDING

ADECA will soon begin to develop its NEVI Grant Application and Rating Guide in order to be prepared to issue those documents as soon as possible after FHWA authorizes Alabama to begin deploying NEVI funds. It is ADECA's intention to work closely with FHWA as these documents are developed to ensure compliance with NEVI program law and regulations. This program will be announced and advertised in similar fashion to Grant Applications and Rating Guides developed for both state-funded and VW settlement-funded programs in recent years. It is the State's goal to make a first round of awards within two months of the closing of the first application period. It is also a goal to have at least 2/3 of projects become fully operational within 12-18 months of their award.

DATA DRIVEN APPROACH TO FUTURE PLANNING

Alabama's January 2022 EVIP was developed utilizing Volta Charging's proprietary PredictEV® SaaS Solution. PredictEV® is a machine-learning technology designed to help utilities, municipalities, and organizations predict electric vehicle adoption and EVSE demand. PredictEV® analyzes EV adoption trends and local mobility, demographic, business, and site-specific data, at scale, to identify key planning drivers, such as suitable vehicle charging locations, the right mix of charging infrastructure (AC Level 2 or DCFC) and expected EV adoption in a particular geography. PredictEV® also analyzes the economic, health, environmental, and societal impacts the projected EV adoption and associated EVSE infrastructure would have on the community. The tool enables the state to achieve smart and efficient deployment of infrastructure, be prepared for the forecasted growth of EVs, and to plan for the highest possible utilization of its electrification infrastructure investment.

ALL ELIGIBLE NEVI ACTIVITES WILL BE CONSIDERED FOR IMPLEMENTATION

In addition to supporting NEVI-compliant charging infrastructure projects, additional activities are eligible uses for NEVI funds. These additional activities can enhance efforts to protect investments of public dollars, encourage additional private participation in project financing, and ultimately lead to closure of more critical charging infrastructure gaps. These activities may include but not be limited to the following:

- To evaluate the locations of current and future electric vehicle owners.
- To forecast commuting and travel patterns of EVs and the quantity of electricity required to serve electric vehicle charging stations.
- To estimate the concentrations of electric vehicle charging stations to meet the needs of current and future electric vehicle drivers.
- To estimate future needs for EV charging stations to support the adoption and use of EVs in shared mobility solutions, such as micro-transit and transportation network companies.
- To develop a model to allow a city, county, or other political subdivision of a state or a local agency to compare and evaluate different adoption and use scenarios for EVs and electric vehicle charging stations.

10. Equitable Implementation

CIVIL RIGHTS

In the previous rounds of Requests for Proposals, the State makes clear that compliance with all State and Federal civil rights laws, including Title VI of the Civil Rights Act and accompanying USDOT regulations, the Americans with Disabilities Act, and Section 504 of the Rehabilitation Act are adhered to. These compliance requirements will remain in place for future Requests for Proposal so that each EVSE project will adhere to State and Federal civil rights laws.

EQUITY CONSIDERATIONS

The January 2022 version of Alabama's EVIP established a framework for equitable distribution of resources and benefits to ensure no area or subpopulation of the state is left without access to EV-related opportunities. A critical relationship exists between the federal NEVI program and Alabama's own Electric Vehicle Infrastructure Grant Program. The federal NEVI program will deliver its most significant benefit in the form of high-capacity DCFC located within one mile of interstate corridors. EV operators and businesses located within range of interstate charging corridors will receive the most direct benefit from the NEVI program.

Many areas of the state are between 50-100 miles from the nearest interstate corridor, so a critical need exists for charging infrastructure grant opportunities in those areas much less impacted by the NEVI program. Alabama is prioritizing projects funded through its state-based program to support DCFC and Level 2 projects outside NEVI's strict eligibility criteria.

Alabama's EV Advisory Group has also been expanded and an Equity Considerations Subcommittee has been formed. This Subcommittee will continuously help assess how Alabama's programs are performing against the goals of the federal Justice40 Initiative. Members of this subcommittee currently include a representative from our state's federally recognized tribe, the

Poarch Band of Creek Indians; a community and faith leader from The Worship Center Christian Church, who is leading many efforts in disadvantaged communities; a representative from the Economic Development Partnership of Alabama already focused on delivering education and workforce opportunities to individuals representing traditionally underserved communities; and EV owners representing minority subsets of the population.

Figure 8 shows a map of all areas in the state designated as low-income. The map is built on data from Argonne National Laboratory, which developed environmental justice metrics based on statistics from the 2018 American Community Survey (5-Year). Census block groups are identified as low income if the percentage of the population below poverty level is greater than the percentage below the poverty level block group statewide average, plus an additional 20%. For Alabama, the percentage below poverty block group statewide average is approximately 19%, so any block group where greater than 39% (19+20) of the population is living below the poverty level would be classified as low income. As the price of new EVs reaches parity with ICE vehicles, there will be more opportunity for low-income individuals to participate in the EV market. Therefore, it is important for EVSE deployment planning to consider charging needs in these areas.

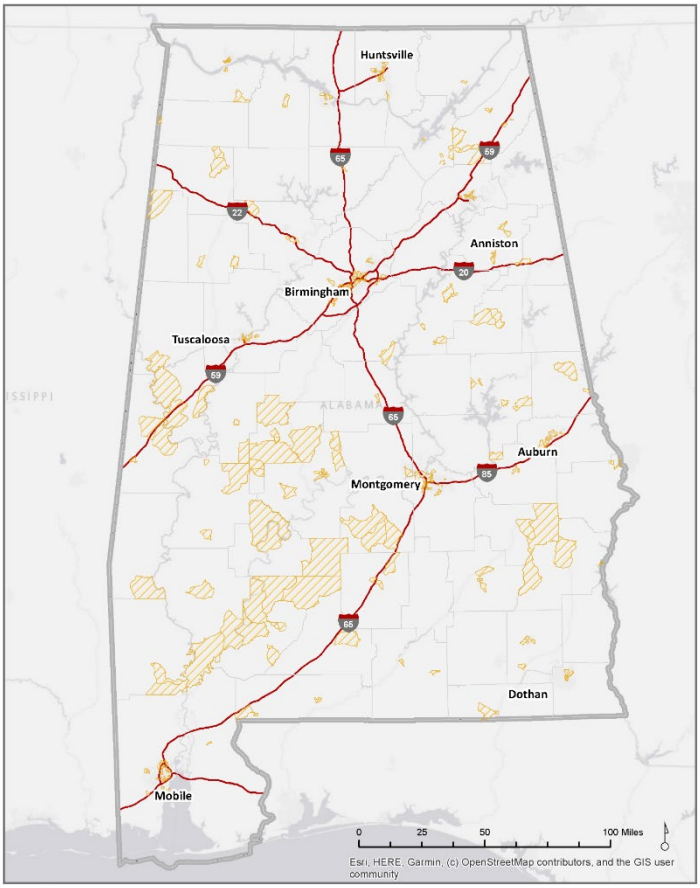


Figure 8. Low-income Areas of Alabama

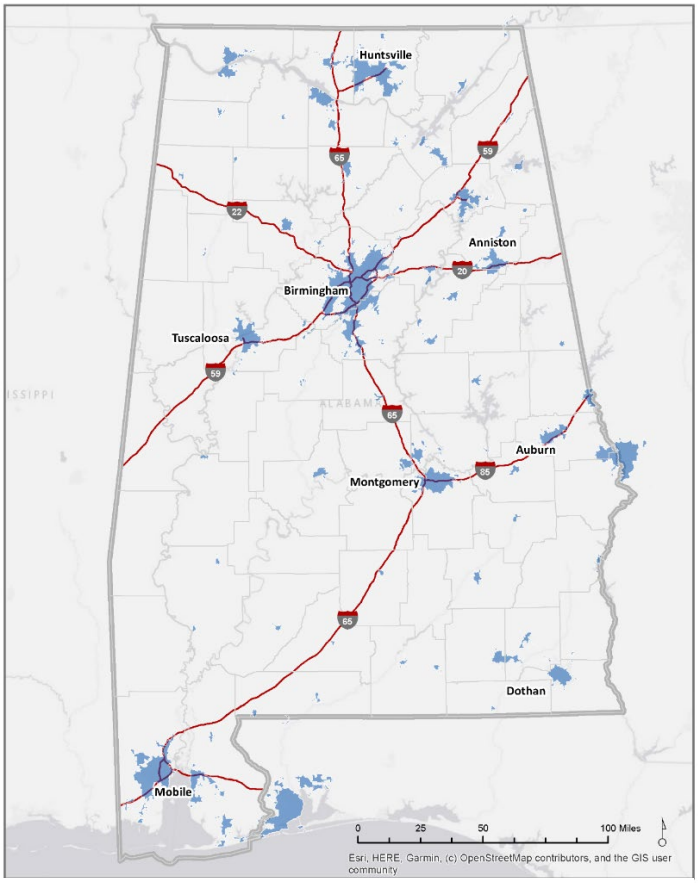


Figure 9. Urban Areas of Alabama

IDENTIFICATION AND OUTREACH TO DISADVANTAGED COMMUNITIES (DACS) IN THE STATE

Alabama's Equity Considerations subcommittee will help assess and guide outreach regarding EVs and EVSE conducted throughout the entire state with a special focus on delivering benefits to disadvantaged communities. Figure 10 is from the Argonne National Laboratory Justice40 tool. As is evidenced by the map, Alabama has a large portion of communities recognized under the federal Justice40 Initiative as disadvantaged communities.

Figure 10. Disadvantaged Communities in Alabama According to the Justice40 Mapping Tool

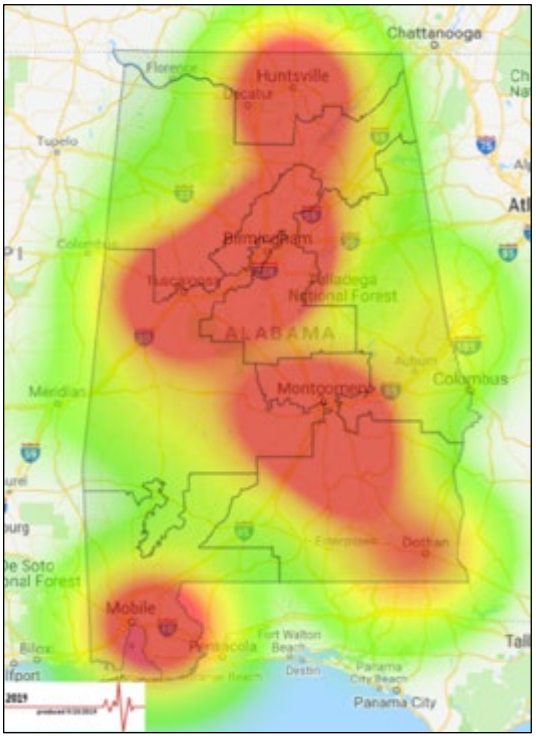


Figure 11. Heat Map of the Reach of the PEP Program

The State-supported Drive Electric Alabama initiative is actively conducting educational outreach to consumers through television commercials, radio spots, digital advertisements, and social media posts. All spots are designed to educate consumers about electric transportation, debunk myths, and highlight the benefits of owning an EV. This significant public engagement campaign has driven traffic to the Drive Electric Alabama website and social media pages leading many consumers to directly interact with the state's Electric Vehicle Charging Infrastructure Program staff. The heat map in Figure 11 shows the reach of a specific and ongoing Public Education Partnership (PEP) collaboration between the Alabama Broadcasters Association, the Alabama Clean Fuels Coalition, and broadcast radio and television stations throughout the state.

PROCESS TO IDENTIFY, QUANTIFY, AND MEASURE BENEFITS TO DACS

The Equity Considerations Subcommittee and the Public Engagement and Collaborative Funding Opportunities Subcommittee both recommend additional outreach efforts targeting disadvantaged communities. Specific activities that are under active consideration include the following:

- The Economic Development Partnership of Alabama (EDPA) and the Economic Development Association of Alabama (EDAA) have offered to host lunch and learn meetings targeting disadvantaged communities.
- ADECA should consider a partnership with the Alabama Association of Regional Councils (AARC) to enhance EV-related outreach. AARC is a public non-profit organization made up of twelve individual Regional Councils serving sub-state districts, which consist of a group of neighboring counties and municipal governments whose residents are joined by common political, economic, social, geographic, and public service interests. Such a partnership could be valuable to conduct coordinated statewide outreach designed to foster collaborative EV-related opportunities across all areas of the state.
- ADECA should continue public outreach efforts through Drive Electric Alabama and hold additional informational briefings, in-person focus groups, and undertake specific outreach efforts to the greatest possible benefit to Alabama's disadvantaged communities.

The Equity Considerations subcommittee has been established to help assess how well Alabama's NEVI program is pairing up with the state's Electric Vehicle Infrastructure Grant Program to deliver program benefits to traditionally disadvantaged communities. Based on currently available NEVI guidance, the Equity Considerations Subcommittee recommends focusing on the following four metrics to measure the benefits to disadvantaged communities:

1. Improving clean transportation access through installation of charging stations.
2. Decreasing the transportation energy cost burden by enabling reliable access to affordable charging.
3. Reducing environmental exposures.
4. Increasing parity in clean energy access technology and adoption.
5. Increasing gallons of petroleum displaced by the availability of chargers

11. Outreach Plan

ADECA maintains an EV Information Mailing List and always responds to all questions about its grant funding programs promptly. ADECA regularly participates in public meetings where its programs are discussed and questions are raised and answered. ADECA has already been funding specific EV technology education outreach across the state and those efforts will continue. In the coming weeks and months, ADECA will be working to create additional opportunities for the public to provide input that will be considered in the states ongoing EVSE planning process. ADECA will also be working to implement suggestions of the Public Outreach and Collaborative Funding Opportunities Subcommittee of the Alabama EV Advisory Group to make its public outreach efforts even more robust. The state will also undertake specific efforts to conduct outreach to disadvantaged communities in collaboration with the members of the Equity Considerations Subcommittee of the Alabama EV Advisory Group. Anyone interested in EV charging infrastructure, sharing information, or commenting on the development of this plan are encouraged to submit comments to ev@adeca.alabama.gov.

12. Labor and Workforce Considerations

Alabama's leaders have long understood the need to collaborate with industry partners to identify and address workforce related needs to advance the state's competitiveness and create opportunities for well-paying jobs for citizens. The Labor and Workforce Considerations Subcommittee of the Alabama EV Advisory Group has identified four primary areas of immediate need:

(a) EV manufacturing workforce/ training needs & opportunities
(b) EV maintenance technician workforce / training needs & opportunities
(c) EV charger installation and maintenance training needs & opportunities
(d) first responder training needs related to EVs

To address these needs, the EV Advisory Group has recommended that ADECA's Electric Vehicle Technology Education Program coordinate efforts to support the development of comprehensive EV upskilling programs for the existing workforce. This will help prepare for Alabama's anticipated workforce needs related to EV manufacturing, EV maintenance, EVSE installation and maintenance, and EV-related emergency responder training. Federal and private sector partnerships will be leveraged, if possible, to provide additional support to these efforts.

TRAINING REQUIREMENTS FOR ELECTRICAL WORKERS WHO INSTALL AND/OR MAINTAIN EVSE SUPPORTED BY STATE AND/OR FEDERAL FUNDING

To ensure safety and high-quality delivery, for all future rounds of funding under EVSE programs administered by the state to deploy federal or state funds, the individuals who are installing or maintaining the EVSE will be required to meet minimum training standards in accordance with a federal requirement currently under development. As background, Section 680.106(j) of the Infrastructure Investment and Jobs Act requires States ensure that the installation and maintenance of EVSE is performed safely by a skilled workforce that has appropriate licenses, certifications, and training.

The federal government is currently undertaking a rulemaking process which is fully expected to result in a requirement that, with the exception of apprentices, all electricians installing, maintaining, and operating EVSE supported with federal funds be certified through the Electric Vehicle Infrastructure Training Program (EVITP). The EVITP refers to a comprehensive training program for the installation of EV supply equipment. To be eligible for EVITP, a participant must be a State licensed or certified electrician. Or, if the participant works in a state that does not license or certify electricians, the participant must provide documentation of a minimum of 8,000 hours of hands-on electrical construction experience. The EVITP was created by a collaboration of industry stakeholders from the private sector and educational institutions.

13. Challenges

Range Anxiety: Fear of having insufficient fuel/electricity to be able to reach your destination.

There are three primary barriers to widescale EV adoption in Alabama: a) EVs are currently more expensive than conventional vehicles; b) the low availability of EV inventory at Alabama dealerships; and c) the current lack of fast charging infrastructure in the state contributes to what is typically referred to as "range anxiety".

VEHICLE COST

As with any new technology, the prices of EVs and batteries will continue to decrease as more consumers purchase them and more manufacturers introduce different options into the market.

Prices of EV batteries decreased 89% between 2010 and 2020 and another 13% in 2020 alone.

EV CHARGING STATION RESILIENCY

Power outages caused by major weather events are problematic and likely. Weather is the largest cause of electric disturbance events in Alabama and in the United States. A hurricane, tornado, ice storm, or other disaster can produce widespread power outages that last for days. Without electrical supply at charging stations, EV drivers who evacuated have no means to make it back home, and those drivers may be stranded without transportation for days.

Several methods of temporary charging have been developed, including small self-contained portable battery systems, larger scale battery systems on heavy-duty trucks, and stand-alone, transportable, temporary charging installations. All these solutions have drawbacks and should be carefully considered when developing EV charging sites, but some offer capabilities beyond charging EVs. Portable, self-contained systems are now available that can be used to charge EVs and provide clean power for emergency installations such as field medical facilities and shelters. The systems can be tied to the electrical grid or installed as stand-alone systems that use solar photovoltaic (PV) and battery storage to provide power for vehicles and equipment.

Another measure of resiliency for EV charging sites is determining their post-storm power restoration priority. Generally, high priority is given to restoring power to public service and emergency service agencies like hospitals, police, fire, water pumping stations, and communication facilities. Additionally, high priority is given to critical service needs of small groups or individuals. Neighborhoods, businesses, and industrial and agricultural facilities are the next priority.

FUTURE PROOFING

Investments in electrical power supply infrastructure to serve electric vehicle charging stations also create future flexibility for these locations to enable fueling with other alternative fuels, like hydrogen, that also require large amounts of electricity at fueling locations.

There are currently no commercially available light-duty hydrogen fuel cell vehicles in Alabama and only very limited availability in certain parts of the United States. According to the U.S. Department of Energy Alternative Fuels Data Center (AFDC), as of mid-2021, there are 48 retail Hydrogen stations in the United States with one in Hawaii and the other 47 in California. In addition, the AFDC stated that 60 additional Hydrogen stations are in the planning stages, with the vast majority being added in California and 14 of them being built in the Northeastern United States.

SUPPLY CHAIN

Supply chain issues could delay the pace of project installations. Not only could the chargers themselves be delayed, but also components needed to prepare for the charger installation, such as conduit and transformers.

WORKFORCE CHALLENGES

Alabama is actively exploring opportunities to meet EV-related workforce needs. For more information, refer to Section 12.

14. Considerations for Charging Infrastructure Network

Alabama has multiple gaps in charging infrastructure that are discussed in more detail below.

UPGRADES OF CORRIDOR PENDING DESIGNATIONS TO CORRIDOR READY DESIGNATIONS

At this time there are no corridors in Alabama eligible to be considered for upgrade to Corridor Ready. NEVI funds will be administered as a competitive grant program in Alabama. Stations supported by NEVI funds will meet all federal requirements and consideration will be given to the need to locate projects approximately 50 miles apart along each of the State's FHWA EV Pending Corridors for the corridor to become eligible to transition from EV Corridor Pending to EV Corridor Ready.

INCREASES OF CAPACITY/REDUNDANCY ALONG EXISTING AFC

During each round of NEVI funding, project locations that create higher capacity and station redundancy will be considered in urban areas and sections of I-65, I-59, and I-10 that are designated hurricane evacuation routes.

PUBLIC TRANSPORTATION CONSIDERATIONS

There are currently two electric transit buses in use by the Birmingham Jefferson County Transit Authority (BJCTA). Alabama A&M University also owns and operates several campus buses through its transit agency. Fort Payne City Schools has two electric school buses in operation. The Gee's Bend Ferry is the first all-electric ferry in operation in the United States. Alabama leaders encourage eligible applicants to pursue opportunities to secure funding for these medium and heavy-duty vehicles and will adapt this approach as market circumstances dictate and as federal guidelines may require in the future.

MEDIUM AND HEAVY-DUTY VEHICLE CONSIDERATIONS

Medium and Heavy-Duty vehicle electrification is an emerging technology. According to Atlas Public Policy's EV Hub current U.S. deployment of battery electric and hydrogen fuel cell trucks classified as Class 2b through Class 8 includes:

- 3,533 Electric Transit Buses
- 1,738 Electric School Buses
- 1,253 Electric Trucks

EVSE GRID IMPACTS

Utilities are constantly evaluating load growth and shifting to proactively meet customers' needs to continue to deliver safe, reliable, and affordable electricity. EV related load considerations including on-peak vs. off-peak energy requirements, seasonal variations, peak usage events, use and differences between residential/commercial/industrial charging technologies, power levels, and vehicle energy requirements are all entering utility planning processes. It is vital to note large scale EV adoption will not occur overnight. The latest generation of EVs hit the market in

2010/2011 and EVs still make up a small, yet growing proportion of the transportation sector. Vehicles are major financial investments with long service lives (15+ years). It will take time and sustained effort to transition our transportation sector towards large scale electrification. Consumers should have confidence through coordinated planning criteria and management processes, that utilities are working today to meet the changing electrical needs over the long term for their customers. Locally, each customer and business specific site can be unique in regards to utility service capacity/access and other factors. ***It is vital that any business or government organization considering large scale EV charging infrastructure contact their local utility as they begin the planning process to ensure optimal outcomes and continued safe, reliable, and affordable electric service.***

REGULATORY CONSIDERATIONS

A significant barrier to attracting private investment in EVSE in Alabama involves whether, under Title 37 of the Alabama Code, a charging station owner who purchases electricity and then resells the electricity for EV charging would be regulated as a utility. Regulation as a utility under Title 37 entails significant responsibilities and restrictions on the part of the infrastructure owner, as well as substantial oversight by the Alabama Public Service Commission (APSC). In 2018 the APSC addressed this concern in Docket No. 32694 by requesting comments from interested parties across the state as to whether those charging stations would fall within the jurisdiction of the APSC. The overwhelming response from the Alabama Attorney General's Office, Alabama Power Company, the Business Council of Alabama, and many others was that a person who owns, operates, leases, or controls an EV charging station should not be considered a utility for purposes of Title 37 regulation. Commentors unanimously agreed that the inclusion of EV charging station owners and operators as "utilities" would considerably inhibit participation by the private sector in establishing EV charging infrastructure, and consequently, would greatly impede the development of the EV market as a whole in Alabama.

After thorough analysis and consideration of public comments received, the APSC issued an order decisively stating that a person who owns, operates, leases, or controls EV charging stations in Alabama is not a utility under Title 37. Accordingly, Alabama has made preemptive efforts to leave as much room as possible for open participation in the EV charging infrastructure market by specifically exempting EV charging station owners from utility regulations.

STATE GEOGRAPHY, TERRAIN, CLIMATE AND LAND USE PATTERNS

The climate for the entire State of Alabama is considered Humid Subtropical. Below are maps indicating Alabama experiences average annual temperatures considered warm to hot with average rainfall in the state between 50 and 64 inches annually. Most of the state is considered at low elevations with high mountains and low valleys to the north and coastal beaches to the south. Alabama can experience extreme weather events in the form of tornadoes and hurricanes each year. These climate factors were all considered when determining the overall framework for EVSE in Alabama as detailed in the pages below.

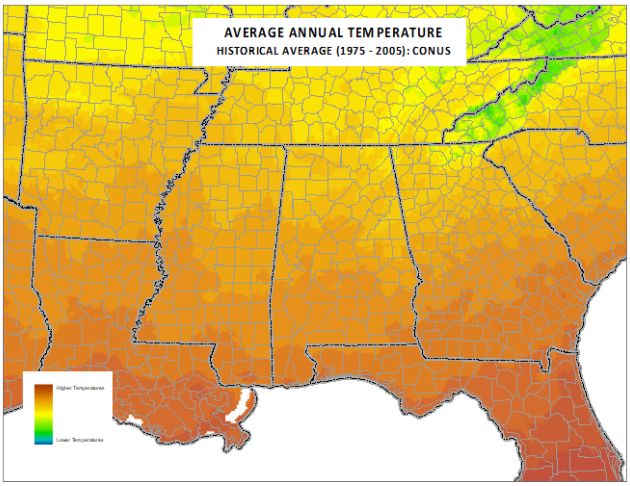


Figure 12. Average Annual Temperature

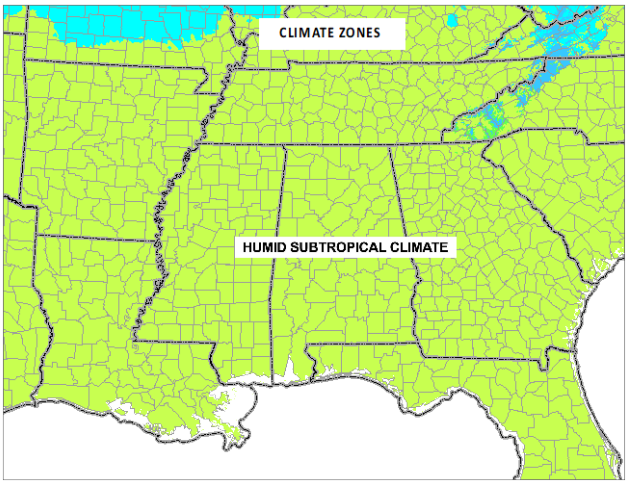


Figure 13. Alabama's Climate Zone

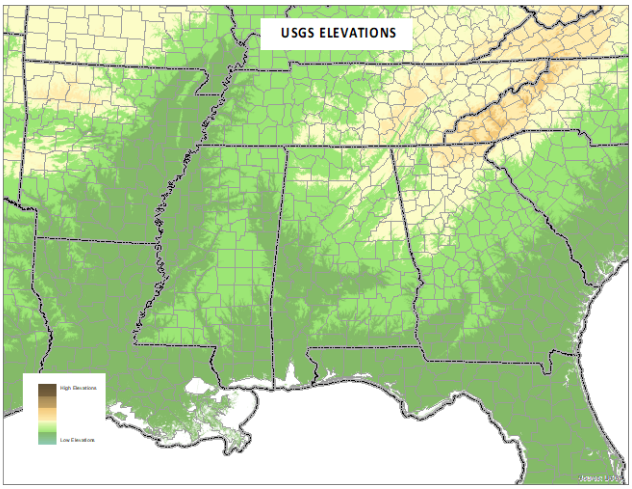


Figure 14. Alabama's Elevations

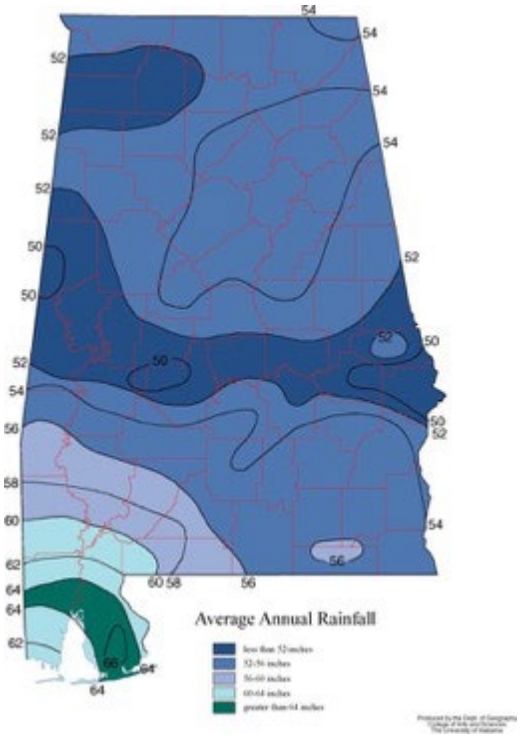


Figure 15. Average Annual Rainfall

STATE TRAVEL PATTERNS, PUBLIC TRANSPORTATION NEEDS, FREIGHT AND OTHER SUPPLY CHAIN NEEDS

Traffic counts along Alabama interstates during fiscal year 2020 are shown on the map below. The map also indicates the percentage of Alabama interstate traffic attributable to freight trucks. Alabama intends to address freight-specific EVSE needs in a future version of this plan as technology develops and relevant NEVI guidance is available.

Figure 16. 2020 Traffic Counts in Alabama

15. Existing Locations of Charging Infrastructure along EV Corridors

NEVI COMPLIANT AL DC FAST CHARGERS							
Location	STATUS	Station Name	Station ID	Corridor	POWER LEVEL	DCFC Ports	Network (if known)
Montgomery	ACTIVE	Sam's Club 8106 (Montgomery, AL)	170323	0.3 Mile from I-85	NEVI Compliant	4	Electrify America
Oxford	ACTIVE	Walmart 809 (Oxford, AL)	165316	0.4 Mile from I-20	NEVI Compliant	4	Electrify America
Saraland	ACTIVE	Walmart 1212 (Saraland, AL)	167355	0.5 Mile from I-65	NEVI Compliant	4	Electrify America
Greenville	ACTIVE	Walmart 1462 (Greenville, AL)	164539	0.6 Mile from I-65	NEVI Compliant	4	Electrify America
Alabaster	ACTIVE	Walmart 423 (Alabaster, AL)	170322	0.8 Mile from I-65	NEVI Compliant	4	Electrify America
Auburn	ACTIVE	Walmart 356 (Auburn, AL)	156169	1.0 Mile from I-85	NEVI Compliant	4	Electrify America

Table 9. NEVI Compliant DC Fast Chargers

NEVI DISTANCE EXCEPTION REQUESTED							
Location	STATUS	Station Name	Station ID	Corridor	POWER LEVEL	DCFC Ports	Network (if known)
Athens	ACTIVE	Walmart 661 (Athens, AL)	166908	1.1 Mile from I-65	NEVI Compliant	4	Electrify America

Table 10. NEVI Distance Exception Requested

PLANNED OR ACTIVE DCFC SITES LOCATED 1 MILE OR LESS FROM DESIGNATED FHWA CORRIDOR							
Location	STATUS	Station Name	Station ID	Corridor	POWER LEVEL	DCFC Ports	Network (if known)
Cullman	PLANNED	Cullman Electric Cooperative		179 feet from I-65	NTC		
Boligee	ACTIVE	Chevron		250 Feet From I-59	NTC		
Moody	ACTIVE	Brompton Valero Travel Center	219025	0.2 Mile from I-20	2 @ 120kW	2	CHARGELAB
Birmingham	PLANNED	UAB		0.2 MI from I-65	NTC		
Bessemer	PLANNED	EXXON		0.2 MI from I-459	NTC		
Leeds	PLANNED	Buc-ee's		0.3 Mile from I-20	NTC		
Birmingham	ACTIVE	MBBHM DELIVERY	194633	0.4 Mile from I-459	1 @ 62.5kW	1	ChargePoint Network
Bessemer	PLANNED	HAMILTON INN		0.5 MI from I-20/59	NTC		

Birmingham	ACTIVE	Benton Nissan - Hoover	39849	0.6 Mile from I-459	1 @ 50kW	1	Non-Networked
Oxford	PLANNED	IRA PHILLIPS, INC.		0.6 MI from I-20	NTC		
Hoover	PLANNED	SHELL		0.6 Mile from I-65	NTC		
Tuscaloosa	PLANNED	FAIRFIELD INN		0.7 MI from I/20/59	NTC		
Leeds	ACTIVE	CAT CARD GRAND RIVERS 1-4	221213	0.8 Mile from I-20		1	ChargePoint Network
Madison	ACTIVE	REDSTONE HD DCFAST HOG	144515	0.9 Mile from I-565	25kW	1	ChargePoint Network
Montgomery	ACTIVE	Jack Ingram Motors	39852	1.0 Mile from I-85	1 @ 50kW	1	Non-Networked

Table 11. Planned or Active DCFC Sites 1 Mile or Less from Designated FHWA Corridor

PLANNED OR ACTIVE DCFC SITES LOCATED 1-5 MI FROM FHWA CORRIDOR							
Location	STATUS	Station Name	Station ID	Corridor	POWER LEVEL	DCFC Ports	Network (if known)
Fort Payne	ACTIVE	FPIA RIGHT STATION AND LEFT STATION	205260	2.1 Mile from I-59	1 @ 125kW	2	ChargePoint Network
Tuscaloosa	ACTIVE	Midstates Petroleum		3.3 Mile from I-59	NTC		
Decatur	ACTIVE	Lynn Layton Nissan	39851	4.3 Mile from I-65	1 @ 44kW	1	Non-Networked

Table 12. Planned or Active DCFC Sites Located 1-5 Miles from FHWA Corridor

ACTIVE DCFC LOCATED 5 MILES OR FURTHER FROM FHWA CORRIDOR							
Location	STATUS	Station Name	Station ID	Corridor	POWER LEVEL	DCFC Ports	Network (if known)
Decatur	ACTIVE	Bramlett Buick GMC	205573	5.2 Mile from I-65	1 @ 50kW	1	EV Connect
Foley	ACTIVE	RIVIERA EV RIVIERAOFFICEDC	206110	16.6 Mile from I-10	1 @ 62.5kW	1	ChargePoint Network
Dothan	ACTIVE	DU ELECTRIC STATION 1 and 2	184907	34 Mile from I-10 (Florida)	2 @ 62.5kW	2	ChargePoint Network
Florence	ACTIVE	Greenway Nissan of Florence	165454	40.8 Mile from I-65	1 @ 44kW	1	Non-Networked

Table 13. Active DCFC Located 5 Miles or Further from FHWA Corridor

TESLA DCFC STATIONS				
Location	STATUS	Station Name	Station ID	DCFC Ports
Athens	ACTIVE	FAIRFIELD INN - Tesla Supercharger	101972	8
Auburn	ACTIVE	Auburn Mall - Tesla Supercharger	101973	6
Birmingham	ACTIVE	Uptown Entertainment District - Tesla Supercharger	101974	8
Greenville	ACTIVE	Hampton Inn Greenville - Tesla Supercharger	101975	6
Mobile	ACTIVE	The Bel Air Mall - Tesla Supercharger	101976	8
Oxford	ACTIVE	Oxford Exchange - Tesla Supercharger	101977	12
Steele	ACTIVE	Love's Travel Stop - Tesla Supercharger	101978	8
Montgomery	ACTIVE	Target - Tesla Supercharger	197422	12
Mountain Brook	ACTIVE	Publix - Tesla Supercharger	201927	8
Cottondale	ACTIVE	Hampton Inn Tuscaloosa - Tesla Supercharger	207273	8
Leeds	ACTIVE	Buc-ee's - Tesla Supercharger	212748	16
Robertsdale	ACTIVE	Buc-ee's - Tesla Supercharger	216368	16
Auburn	ACTIVE	Winn-Dixie - Tesla Supercharger	218655	12

Table 14. Tesla DCFC Stations

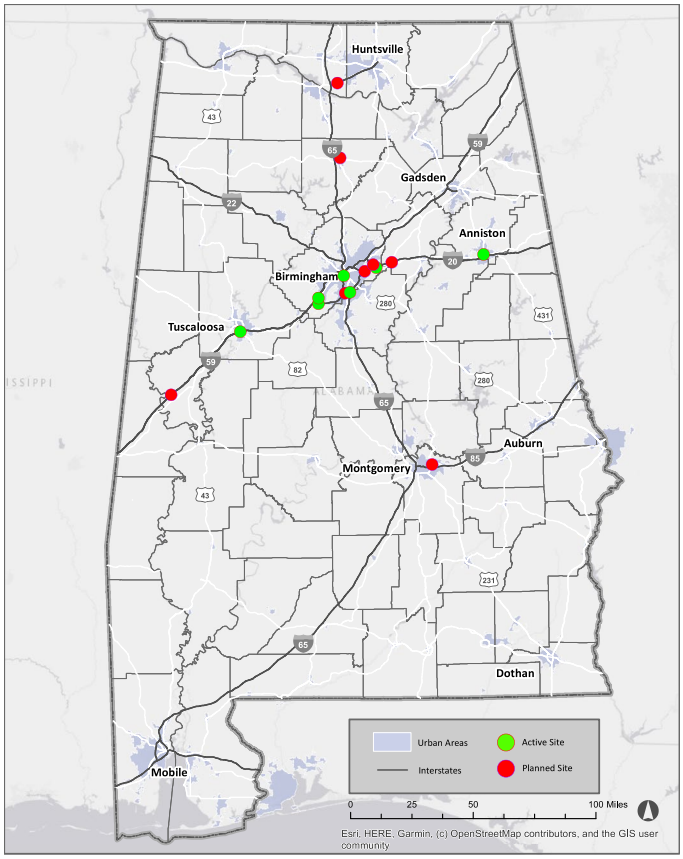


Figure 17. Planned/Active DCFC Sites Located 1 Mile or Less from Designated FHWA Corridors

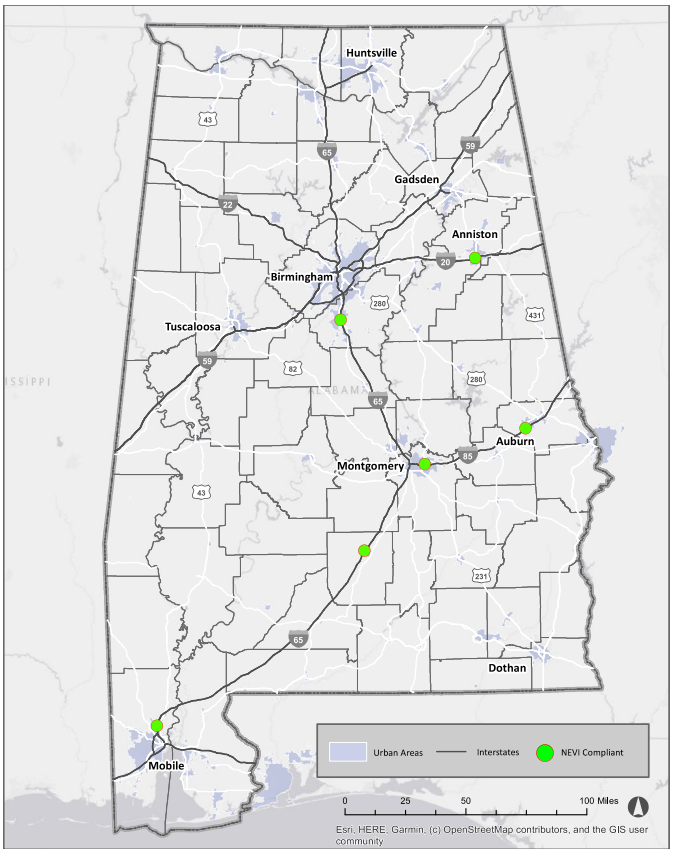


Figure 18. NEVI Compliant DCFCs in Alabama

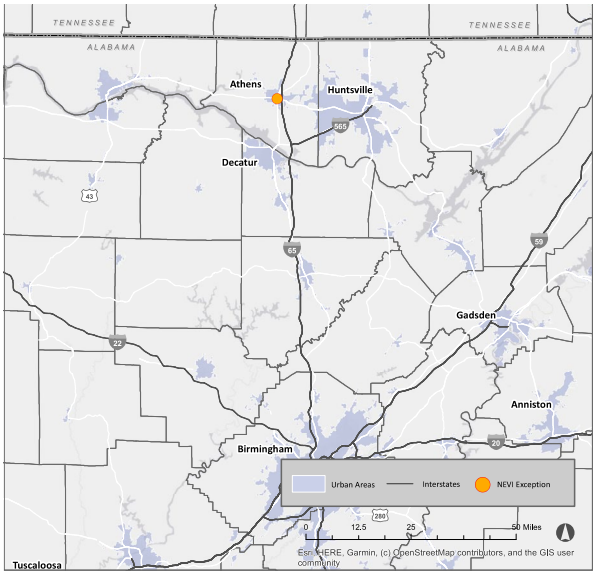


Figure 19. NEVI Distance Exception Requested

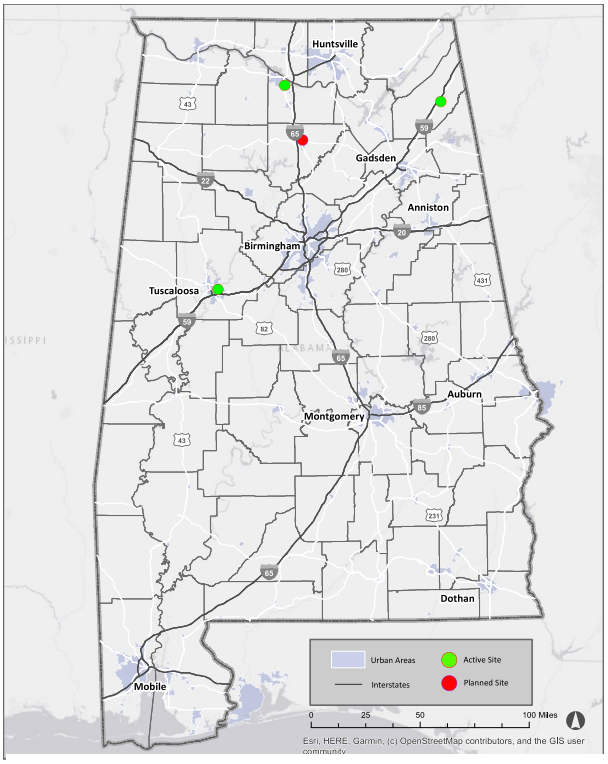


Figure 20. Planned/Active DCFC Sites Located 1-5 Miles from FHWA Corridor

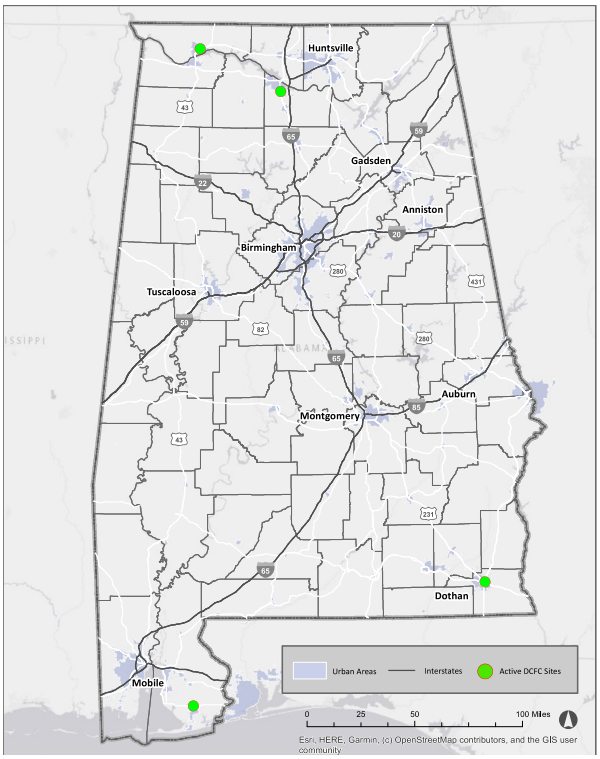


Figure 21. Active DCFC Located 5 Miles or more from FHWA Corridor

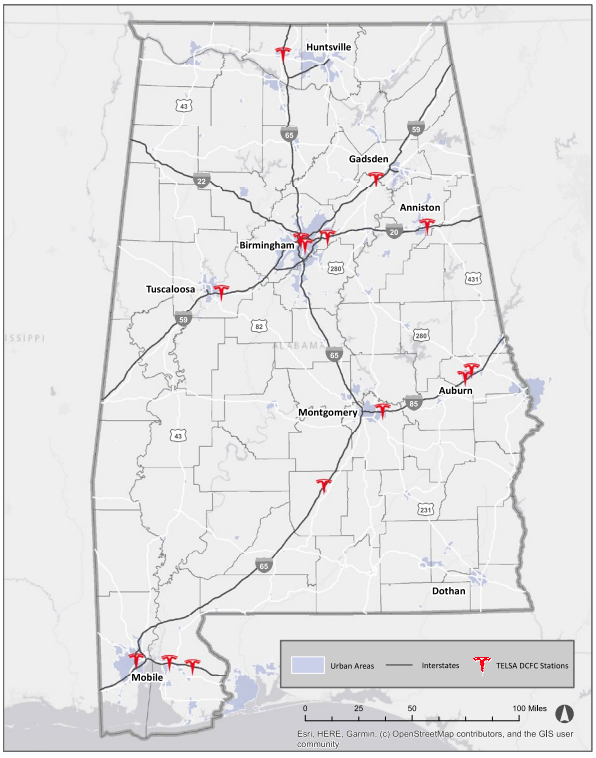


Figure 22. Active Tesla DCFC Stations

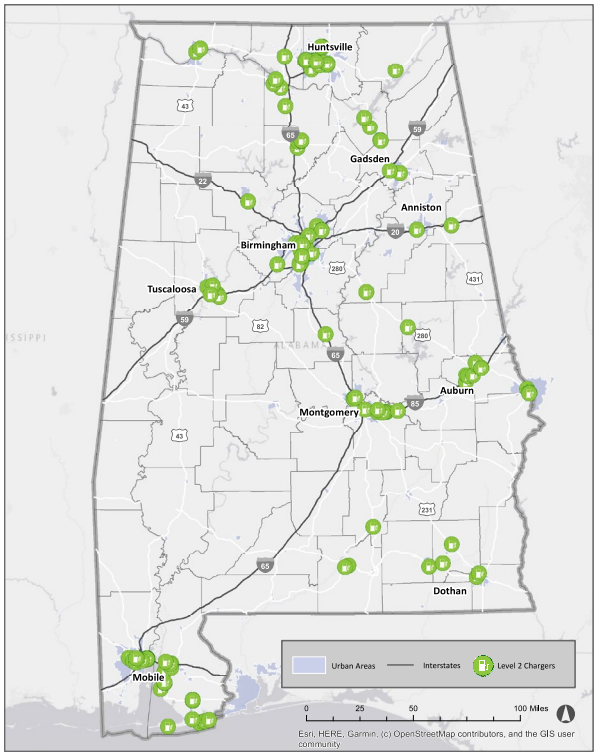


Figure 23. Alabama Public Level 2 Chargers

16. Federal FY 23-26 NEVI Formula Program Corridor Buildout

Alabama plans to expend the maximum NEVI funding each year with the goal of transitioning Alabama's FHWA EV Pending Corridors to EV Ready Corridors as quickly as possible. Annual assessments will be performed to identify remaining gaps that need to be filled.

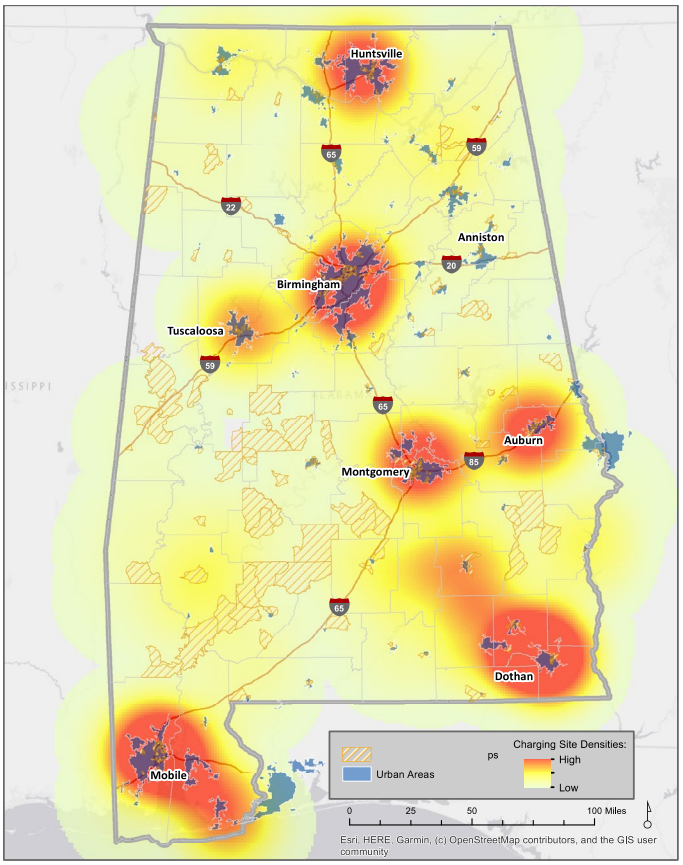


Figure 24. Projected heatmap of 2030 charging areas of demand

To support wider EV adoption within Alabama and to attract out-of-state EV owners to visit Alabama, an analysis was conducted using PredictEV® to identify areas where demand for EV charging would be expected to be the highest by 2030. Figure 24 depicts these areas as a heatmap with red indicating areas where a higher number of EV charging locations are needed. Areas where Alabamians and out-of-state travelers frequently visit and have longer dwell times represent a range of destination types, such as tourist destinations, State Parks, hotels, schools, universities, hospitals, shopping centers, areas of outdoor recreation, stadiums, and other venues. Successful build out of the interstate charging corridors, the hurricane evacuation route corridors, and areas where high demand is expected will provide excellent EV charging availability in Alabama.

The state has past experience that listing specific exits as possible locations for charging stations has caused applicant confusion. Alabama's 2020 EVIP listed specific "potential" exits for EVSE projects which led multiple potential applicants to ask ADECA if that depiction meant projects would only be funded at those specified exit locations.

Figure 25 is a map showing the potential areas where NEVI-compliant charging stations could be installed to meet minimum corridor buildout requirements. This figure does not depict areas that may need greater station capacity and/or frequency. The locations depicted are general areas and do not depict specific locations. In fact, zooming in on the map reveals markers are intentionally located in the middle of the corridor and not at certain exits or specific Points of Interest (POIs).

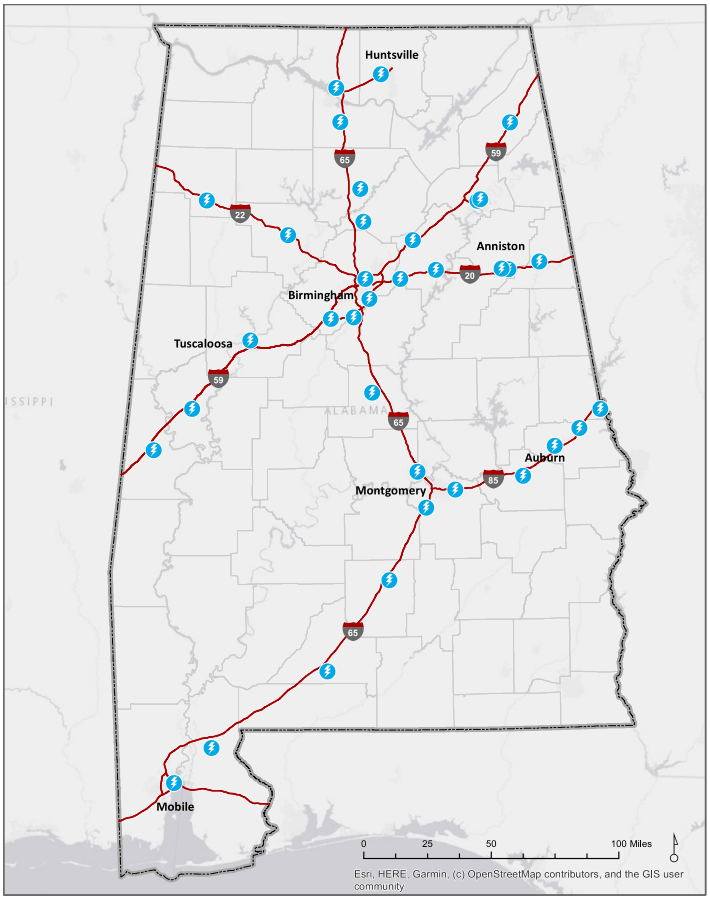


Figure 25. Potential Alabama NEVI Compliant DCFC Locations

17. Hurricane Evacuation Route Considerations

At the highest level, an evacuation is a mass exodus of people that will create more traffic than would be expected at any other time. Just as long lines often form at gasoline stations during mass evacuation events, it should be expected that EV owners would experience increased wait time during the middle of a mass evacuation event. An assessment of Alabama's designated hurricane evacuation routes was conducted to ensure that EV charging locations are considered along these corridors. An analysis of 2017 data indicated 969 gasoline stations were operating in a 24-county region of Alabama from the Gulf Coast north to Montgomery. To provide capacity for a similar level of support when 5% of vehicles on the road are EVs, 48 EV charging stations with multiple charging bays and high-powered chargers would be needed. Figure 26 shows possible general locations of charging stations on these corridors. While sections of I-65 and I-59 are included, many of these routes are not interstates.

EVSE installed for the purpose of supporting mass evacuations could also serve dual purposes. The existence of these charging stations could lead to reduced range anxiety for beachgoers, thereby increasing EV adoption. These stations could also help incentivize local businesses operating in evacuation route zones to adopt EVs into their fleets.

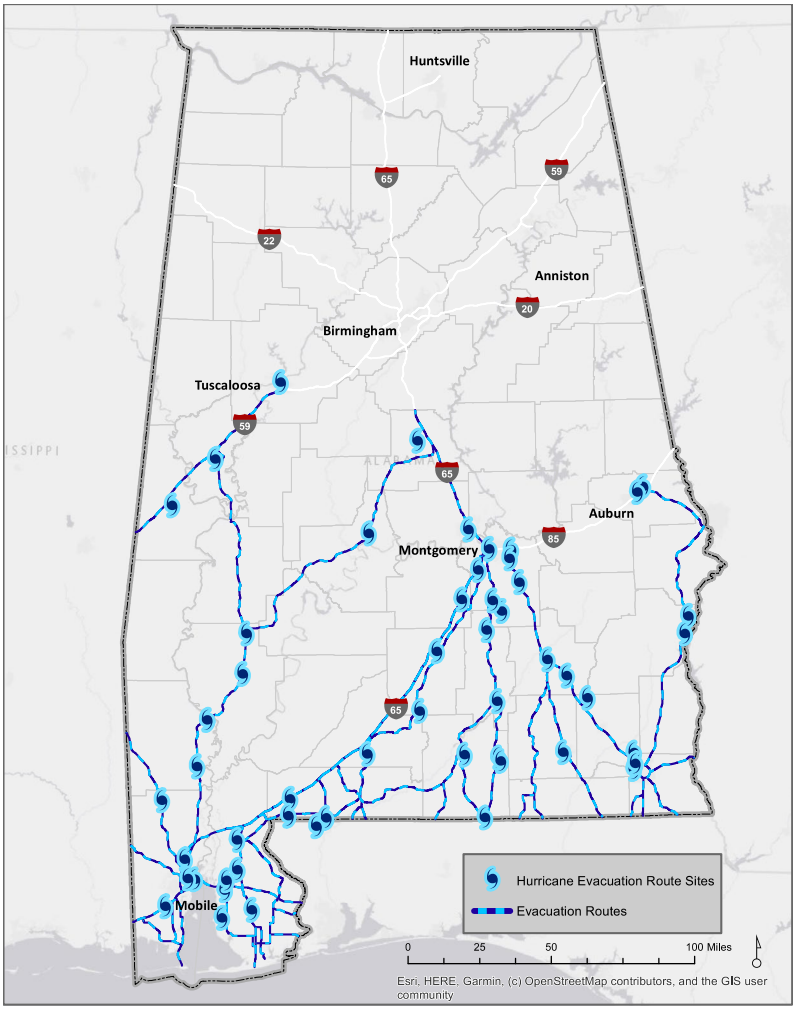


Figure 26. Possible hurricane evacuation route charging locations

As noted in Section 13, State and local emergency management agencies should work with utilities to plan appropriate post-disaster protocol related to power restoration at EV charging sites, especially along designated evacuation routes.

18. Prioritization of Projects Supported with State Funding Through ADECA's Electric Vehicle Infrastructure Grant Program

Individual projects proposed to the state for funding under the Electric Vehicle Infrastructure Grant Program at ADECA should be evaluated for the following individual site features and characteristics:

- Each applicant's project should include a completion timeline estimating when the project will become fully operational, based on current conditions, with an underlying goal of completion 12 to 18 months post-award.
- The amenities at retail and service establishments should be within a safe walking distance near the charging location (restrooms, restaurants, stores, tourism destinations, etc.).
- The proximity of a proposed project to existing publicly available electric vehicle charging infrastructure.
- Information on connections to the electrical grid (this should be assessed jointly by an applicant and their electric utility provider).
- The capacity of an applicant to ensure long-term operation and maintenance to avoid stranded assets and protect the investment of public funds.
- Utilization of a higher level of cost share or other existing electric vehicle charging infrastructure programs and incentives that reduce the need for state funds for the project.
- Project application considers current and anticipated market demands with higher power levels and/or faster charging speeds than the minimum requirements.
- Further criteria, such as the following metrics and indicators, should be utilized in application evaluation and decision-making:

    - Site Visitation / EV Visitation
    - Forecasted utilization of chargers
    - Travel corridors nearby
    - Points of Interest nearby
    - Category of the location
    - EV adoption impacts from the project
    - Site serves multiple EV charging site categories (corridor, destination, rural, underserved community, multi-family dwelling, etc.).

19. Requirements for NEVI/State-Funded Charging Locations

Based on the assumptions from the NEVI Notice of Proposed Rulemaking released on June 22, 2022, the EV Advisory Group's Utility Subcommittee, developed the listed requirements on the pages below to distinguish charging station requirements for NEVI funded chargers, State funded DCFC, and State funded Level 2 chargers. Requirements for charging sites should be revised during any EVIP reviews based on EV or EVSE technology advancements, changes to federal funding assistance requirements, or unique circumstances that would be beneficial to Alabama citizens and businesses. Specific site requirements listed in this plan are based on current conditions and subject to change during each future round of grant funding administered by the State of Alabama.

NEVI FUNDED DC FAST CHARGING SITE REQUIREMENTS

Each NEVI-supported project should meet current FHWA requirements for NEVI-funded projects and any additional requirements determined by the State. Whenever FHWA changes its requirements, Alabama will also.

1. All charging stations must be installed and maintained with the oversight of an electrical worker trained in accordance with a minimum federal requirement currently under development.
2. All charging sites shall be publicly accessible to the general public 24-hours per day, seven (7) days a week, year-round with the site accessible free of charge to EV drivers (may require payment to charge); adequately lit from dusk to dawn; and within a short and safe walking distance to retail and service establishments with amenities such as restrooms, convenience stores, restaurants, shopping centers, or tourism destinations.
3. Charging stations must be capable of utilizing Open Charge Point Protocol (OCPP) V1.6 or newer for communications to various network back-ends (i.e., the system must be able to "default" to OCPP for basic functionality).
4. Charging stations must be connected to an operating network and must have the ability to switch to OCPP networks.
5. Charging stations should ensure considerations for cybersecurity are addressed, especially concerning times of software updates and protecting EVs from being compromised by malicious code so that an EV does not infect other charging stations.
6. Charging stations must support continuous operations, even when network connectivity is not available or consumer cell phone service is not available (i.e., "default on" with loss of network).
7. Charging stations must be payment card industry compliant – must allow direct use of a credit card, debit card, and network card at the charging station, except when charging is free. Stations may also offer additional payment methods including subscription methods, smart cards, or smart phone applications. Real-time pricing and fee information shall be displayed on the device or payment screen. Multilingual and ADA type access to initiate charging should be considered.
8. Each charger must display and base the price for electricity to charge in $/kWh. Price of charging displayed on the chargers and communicated via the charging network must be the

real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session. Price structure including any other fees in addition to the price for electricity to charge must be clearly explained via an application or a website, with instructions for finding the information posted in an accessible manner at the charging station.

9. Each DCFC charging port must be equipped with Society of Automotive Engineers Combined Charging System (SAE CCS). Additionally, a minimum of one connecter at each charging site must be a CHAdeMO connector.

10. Each charging site must have at least four (4) charging network-connected DCFC ports and be capable of simultaneously charge at least four (4) EVs.

11. DC fast chargers should be capable of charging a single EV "at or above 150 kW per charging port simultaneously across all charging ports. DCFC must supply power according to an EV's power delivery request up to 150 kW. DCFC may participate in smart charge management programs so long as each charging port continues to meet an EV's request for power up to 150 kW."

12. Stations should be designed to allow for future upgrades and updates to power levels and number of chargers, to the extent possible and within reason. Alabama will require conduit and an electrical service box of adequate size and disconnect capacity that will allow additional electrical cable to be run to the site for future expansion to allow for two additional (6 total) charging stations and to upgrade at least one charger to 350kW to meet demand growth and anticipated technology developments in EVs and DCFC. The charging enclosure must be constructed for use outdoors with UL50, Standard for Enclosures for Electrical Equipment, National Electrical Manufacturers Association (NEMA), and Type 3R exterior enclosure or equivalent.

13. Charging equipment shall be capable of operating without any decrease in performance over an ambient temperature range of minus 22 to 122 degrees Fahrenheit with a relative humidity of up to 95%.

14. The equipment must have a minimum manufacturer's hardware warranty of five (5) years and continually be in full working order to the extent possible. Should repair be necessary, charging units shall be fully operating within 72 hours of equipment issue/breakdown to ensure a 97% annual uptime guarantee. A minimum of 5 years software network and scheduled maintenance agreements are preferred.

15. The charging stations must be Nationally Recognized Testing Laboratory (NRTL) certified to demonstrate compliance with appropriate product safety test standards. NRTLs are found online at: https://www.osha.gov/dts/otpca/nrtl/list_standards.html. Supporting evidence must be provided.

16. Sites should include a customer service support telephone number that is available 24 hours per day, seven (7) days a week, year-round and clearly posted to assist customers with difficulties accessing or operating the charging station. Site hosts must ensure that EV charging customers have mechanisms to report outages, malfunctions, and other issues with charging infrastructure. Site hosts must comply with the American Disabilities Act of 1990 requirements and multilingual access when creating reporting mechanisms.

17. Sites shall include paved parking spaces enabling the maximum number of vehicles capable of being charged simultaneously and shall include adequate space for future expansion.

Larger spaces and pull-through designed charging to enable larger vehicles, drivers with mobility limitations (ex. Wheelchairs), and vehicles towing trailers to charge are suggested for consideration due to expected near-term future vehicle developments and market availability.

18. Charging Stations shall be connected to a network by Wi-Fi, hardwired connection, or cellular connection. Furthermore, projects shall maintain appropriate EV charging network diagnostics, remote start of the equipment, and collecting and reporting usage data. Charging Station Operators must collect, process, and retain only that personal information strictly necessary to provide the charging service to a consumer, including information to complete the charging transaction and to provide the location of charging stations to the consumer. Charging Stations Operators must also take reasonable measures to safeguard consumer data.
19. "Electric vehicle charging only" signs are required on each side of each charging station along with "electric vehicle charging only" stenciled graphics on each striped parking stall.
20. Site design, development, installation, and maintenance shall be done in compliance with all applicable laws, ordinances, regulations, and standards, including but not limited to the Americans with Disabilities Act (ADA).
21. Site utilization data shall be made available upon request for a period of five (5) years after initial operation.

ALABAMA STATE FUNDED DC FAST CHARGING SITE REQUIREMENTS

1. All charging stations must be installed and maintained with the oversight of an electrical worker trained in accordance with a minimum federal requirement currently under development.
2. All charging sites shall be publicly accessible to the general public 24-hours per day, seven (7) days a week with the site accessible free of charge to EV drivers (may require payment to charge); adequately lit from dusk to dawn; and within a short and safe walking distance to retail and service establishments with amenities such as restrooms, convenience stores, restaurants, shopping centers, or tourism destinations.
3. Charging stations must be capable of utilizing Open Charge Point Protocol (OCPP) V1.6 or newer for communications to various network back-ends (i.e., the system must be able to "default" to OCPP for basic functionality).
4. Charging stations must be connected to an operating network and must have the ability to switch to OCPP networks.
5. Charging stations should ensure considerations for cybersecurity are addressed, especially concerning times of software updates and protecting EVs from being compromised by malicious code so that an EV does not infect other charging stations.
6. Charging stations must support continuous operations, even when network connectivity is not available or consumer cell phone service is not available (i.e., "default on" with loss of network).
7. Charging stations must be payment card industry compliant – must allow direct use of a credit card, debit card, and network card at the charging station, except when charging is free. Stations may also offer additional payment methods including subscription methods,

smart cards, or smart phone applications. Real-time pricing and fee information shall be displayed on the device or payment screen.

8. Each charger must display and base the price for electricity to charge in $/kWh. Price of charging displayed on the chargers and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session. Price structure including any other fees in addition to the price for electricity to charge must be clearly explained via an application or a website, with instructions for finding the information posted in an accessible manner at the charging station.
9. Sites must be equipped with both Society of Automotive Engineers Combined Charging System (SAE CCS) and CHAdeMO protocol connectors.
10. Each charging site must be capable of charging at least two (2) EVs simultaneously with provisions for future expansions to charge four (4) vehicles simultaneously.
11. Each interstate charging site should, at a minimum, be capable of charging a single EV at greater than 100kW with future provisions for expansion and power upgrades to include two additional (4 total) charging stations and/or upgrades to higher power (up to 350kW) to meet demand growth and anticipated technology developments in EVs and DCFC infrastructure. In the event FHWA changes these requirements, Alabama should adjust this minimum accordingly for projects supported with federal funding. Conduit and an electrical service box of adequate size and disconnect capacity that will allow additional electrical cable to be run to the site for future expansion must be included in the installation. The charging enclosure must be constructed for use outdoors with UL50, Standard for Enclosures for Electrical Equipment, National Electrical Manufacturers Association (NEMA), and Type 3R exterior enclosure or equivalent.
12. Charging equipment shall be capable of operating without any decrease in performance over an ambient temperature range of minus 22 to 122 degrees Fahrenheit with a relative humidity of up to 95%.
13. The equipment must have a minimum manufacturer's hardware warranty of five (5) years and continually be in full working order to the extent possible. Should repair be necessary, charging units shall be fully operating within 72 hours of equipment issue/breakdown to ensure a 95% annual uptime guarantee. A minimum of 5 years software network and scheduled maintenance agreements are preferred.
14. The charging stations must be Nationally Recognized Testing Laboratory (NRTL) certified to demonstrate compliance with appropriate product safety test standards. NRTLs are found online at: https://www.osha.gov/dts/otpca/nrtl/list_standards.html. Supporting evidence must be provided.
15. Sites should include a customer service support telephone number that is available 24 hours per day, seven (7) days a week, year round and clearly posted to assist customers with difficulties accessing or operating the charging station. Site hosts must ensure that EV charging customers have mechanisms to report outages, malfunctions, and other issues with charging infrastructure. Site hosts must comply with the American Disabilities Act of 1990 requirements and multilingual access when creating reporting mechanisms.
16. Sites shall include paved parking spaces enabling the maximum number of vehicles capable of being charged simultaneously and shall include adequate space for future expansion.

Larger spaces and pull-through designed charging to enable larger vehicles, drivers with mobility limitations (ex. Wheelchairs), and vehicles towing trailers to charge are suggested for consideration due to expected near-term future vehicle developments and market availability.

17. Charging Stations shall be connected to a network by Wi-Fi, hardwired connection, or cellular connection. Furthermore, projects shall maintain appropriate EV charging network diagnostics, remote start of the equipment, and collecting and reporting usage data. Charging Station Operators must collect, process, and retain only that personal information strictly necessary to provide the charging service to a consumer, including information to complete the charging transaction and to provide the location of charging stations to the consumer. Charging Stations Operators must also take reasonable measures to safeguard consumer data.
18. "Electric vehicle charging only" signs are required on each side of each charging station along with "electric vehicle charging only" stenciled graphics on each striped parking stall.
19. Site design, development, installation, and maintenance shall be done in compliance with all applicable laws, ordinances, regulations, and standards, including but not limited to the Americans with Disabilities Act (ADA).
20. Site utilization data shall be made available upon request for a period of five (5) years after initial operation.

LEVEL 2 CHARGING SITE REQUIREMENTS

1. All charging stations must be installed and maintained with the oversight of an electrical worker trained in accordance with a minimum federal requirement currently under development.
2. Preferred, but not limited to, publicly accessible to the general public 24-hours per day, seven (7) days a week; adequately lit from dusk to dawn; and within a short and safe walking distance to retail and service establishments with amenities such as restrooms, convenience stores, restaurants, shopping centers, or tourism destinations. If the charging is primarily for workplace and/or multi-unit dwelling locations, the proximity to retail, etc. may not be required.
3. Charging stations must be capable of utilizing Open Charge Point Protocol (OCPP) V1.6 or newer for communications to various network back-ends (i.e., the system must be able to "default" to OCPP for basic functionality).
4. Charging stations must be connected to an operating network and must have the ability to switch to OCPP networks.
5. Charging stations should ensure considerations for cybersecurity are addressed, especially concerning times of software updates and protecting EVs from being compromised by malicious code so that an EV does not infect other charging stations.
6. Charging stations must support continuous operations, even when network connectivity is not available or consumer cell phone service is not available (i.e., "default on" with loss of network).
7. Charging stations must be payment card industry compliant – must allow direct use of a credit card, debit card, and network card at the charging station, except when charging is

free. Stations may also offer additional payment methods including subscription methods, smart cards, or smart phone applications. Real-time pricing and fee information shall be displayed on the device or payment screen. ADA type access to initiate charging should be considered.

8. Each charger must display and base the price for electricity to charge in $/kWh. Price of charging displayed on the chargers and communicated via the charging network must be the real-time price (i.e., price at that moment in time). The price at the start of the session cannot change during the session. Price structure including any other fees in addition to the price for electricity to charge must be clearly explained via an application or a website, with instructions for finding the information posted in an accessible manner at the charging station.
9. Each charging site must be capable of charging at least four (4) EVs simultaneously with provisions for future expansions to charge a minimum of eight (8) vehicles simultaneously.
10. All charging ports/connectors must be capable of supplying a minimum of 6.6kW to any vehicle connected.
11. Charging equipment shall be capable of operating without any decrease in performance over an ambient temperature range of minus 22 to 122 degrees Fahrenheit with a relative humidity of up to 95%.
12. The equipment must have a minimum manufacturer's hardware warranty of five (5) years and continually be in full working order to the extent possible. Should repair be necessary, charging units shall be fully operating within 72 hours of equipment issue/breakdown to ensure a 95% annual uptime guarantee. A minimum of 5 years software network and scheduled maintenance agreements are preferred.
13. The charging stations must be Nationally Recognized Testing Laboratory (NRTL) certified to demonstrate compliance with appropriate product safety test standards. NRTLs are found online at: https://www.osha.gov/dts/otpca/nrtl/list_standards.html. Supporting evidence must be provided.
14. Sites should include a customer service support telephone number that is available 24 hours per day, seven (7) days a week, year round and clearly posted to assist customers with difficulties accessing or operating the charging station. Site hosts must ensure that EV charging customers have mechanisms to report outages, malfunctions, and other issues with charging infrastructure. Site hosts must comply with the American Disabilities Act of 1990 requirements and multilingual access when creating reporting mechanisms.
15. Sites shall include paved parking spaces enabling the maximum number of vehicles capable of being charged simultaneously and shall include adequate space for future expansion. Larger spaces and pull-through designed charging to enable larger vehicles, drivers with mobility limitations (ex. Wheelchairs), and vehicles towing trailers to charge are suggested for consideration due to expected near-term future vehicle developments and market availability.
16. Charging Stations shall be connected to a network by Wi-Fi, hardwired connection, or cellular connection. Furthermore, projects shall maintain appropriate EV charging network diagnostics, remote start of the equipment, and collecting and reporting usage data. Charging Station Operators must collect, process, and retain only that personal information strictly necessary to provide the charging service to a consumer, including information to complete

the charging transaction and to provide the location of charging stations to the consumer. Charging Stations Operators must also take reasonable measures to safeguard consumer data.

17. "Electric vehicle charging only" signs are required on each side of each charging station along with "electric vehicle charging only" stenciled graphics on each striped parking stall.

18. Site design, development, installation, and maintenance shall be done in compliance with all applicable laws, ordinances, regulations, and standards, including but not limited to the Americans with Disabilities Act (ADA).

19. Site utilization data shall be made available upon request for a period of five (5) years after initial operation.

20. Addendums

A. Addendum 1: Glossary

Term	Acronym Defined	Additional Information
AC	Alternating Current Electricity	Used in Level 1 and Level 2 Charging Stations
ADECA	Alabama Department of Economic and Community Affairs	ADECA is a state agency that partners with leaders at the local level to positively impact and enhance the quality of life in Alabama communities through dozens of federal and state grant programs, surplus property, and water resource management.
AEMA	Alabama Emergency Management Agency	The mission of the AEMA is to support our citizens, strengthen our communities, and build a culture of preparedness through a comprehensive Emergency Management (EM) program.
ALDOT	Alabama Department of Transportation	ALDOT is a state agency with the primary responsibility of statewide transportation through all modes of travel. ALDOT employs approximately 4,000 people and expends or disburses more than $600 million per year, including federal, state, and local funds.
BEV	Battery Electric Vehicle	BEVs are completely powered by electricity from on-board battery systems that are charged from off-board sources of electricity.
DC	Direct Current Electricity	Used in DC Fast Chargers
EV	Electric Vehicle	EVs encompass all electric vehicles, including Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), and Hybrid Electric Vehicles (HEVs).
EVIP	Electric Vehicle Infrastructure Plan	This plan is titled the Alabama Electric Vehicle Infrastructure Plan.
EVSE	Electric Vehicle Supply Equipment	All charging equipment falls under the umbrella of the EVSE category.

FCEV	Fuel Cell Electric Vehicle	Electric Vehicles that are powered by Hydrogen Fuel Cells.
FEMA	Federal Emergency Management Agency	FEMA's mission is helping people before, during and after disasters, and our core values and goals help us achieve it. FEMA works in coordination with AEMA when an emergency occurs in Alabama.
FHWA	Federal Highway Administration	FHWA is a division of the U.S. Department of Transportation and specializes in highway transportation. FHWA manages the alternative fuel corridor designations.
HEV	Hybrid Electric Vehicle	HEVs combine a conventional internal combustion engine with one or more electric motors that use energy stored in batteries.
ICE	Internal Combustion Engine	ICE vehicles are vehicles powered by traditional fuels, such as gas or diesel.
IIJA	Infrastructure Investment and Jobs Act	Commonly known as the "Infrastructure Bill," which was signed into law on November 15, 2021.
NEVI	National Electric Vehicle Infrastructure	The NEVI Formula Program provides funding to states to strategically deploy EVSE and to establish an interconnected network to facilitate data collection, access, and reliability.

B. Addendum 2: Further Guidance on NEVI Charger Requirements

Per NEVI guidance regarding payment:

(1) "Charging stations must provide for secure payment methods, accessible to persons with disabilities, which at a minimum shall include a contactless payment method that accepts major debit and credit cards, and Plug and Charge payment capabilities using the ISO 15118 standard (incorporated by reference, see § 680.120(b)(1));

(2) Charging station operators must not require a membership for use;

(3) Charging stations must not delay, limit, or curtail power flow to vehicles on the basis of payment method or membership; and

(4) Charging station payment instructions must provide multilingual access and accessibility for people with disabilities.

Per NEVI Guidance Regarding Network Communication:

(a) Charger-to-Charger-Network Communication.

(1) Chargers must communicate with a charging network via a secure communication method.

(2)Chargers must have the ability to receive and implement secure, remote software updates and conduct real-time protocol translation, encryption and decryption, authentication, and authorization in their communication with charging networks.

(3)Charging networks must perform and chargers must support remote charger monitoring, diagnostics, control, and smart charge management.

(4)Chargers and charging networks must securely measure, communicate, store, and report energy and power dispensed, real-time charging-port status, real-time price to the customer, and historical charging-port uptime.

(5)Chargers must be capable of using Open Charge Point Protocol (OCPP) (incorporated by reference, see § 680.120(c)(1)) to communicate with any Charging Network Provider.

(6)Chargers must be designed to securely switch Charging Network Providers without any changes to hardware.

(b) Charging-Network-to-Charging-Network Communication. A Charging Network must be capable of communicating with other Charging Networks to enable an EV driver to use a single credential to charge at Charging Stations that are a part of multiple Charging Networks.

(c) Charging-Network-to-Grid Communication. Charging Networks must be capable of secure communication with electric utilities, other energy providers, or local energy management systems.