Alabama Electric Vehicle Infrastructure Plan

WHEREVER YOU'RE GOING, ELECTRIC GETS YOU THERE

DRIVE ELECTRIC ALABAMA

January 2022

ACKNOWLEDGEMENTS

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Alabama Transportation Institute (ATI)	Volta Charging
Governor Kay Ivey's Office	Alabama Governor's Office of Minority Affairs
Alabama Department of Commerce	Alabama Department of Finance
Alabama Department of Transportation	Alabama Department of Conservation and Natural Resources
Alabama Tourism Department	Alabama Emergency Management Agency
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)
Automobile Dealers Association of Alabama	Alabama Automotive Manufacturers Association (AAMA)
Energy Institute of Alabama	Petroleum & Convenience Marketers of Alabama
Resident EV Owner	Direct Communications
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1. Executive Summary

A. The Issue

It is projected that by 2030 some 20% of vehicles sold annually in the U.S. will be Electric Vehicles (EVs). Transitioning to EVs will create challenges and opportunities. These challenges and opportunities will impact the nation, and they will impact the state of Alabama.

The Infrastructure Investment and Jobs Act (IIJA) includes $5 billion for EV charging infrastructure to states and another $2.5 billion in competitive grants for alternative fuel infrastructure.

B. The Need

One of the most significant challenges facing the adoption of EVs is the availability of vehicle charging stations to overcome consumer "range anxiety" associated with EVs, including the policies and infrastructure to support them. Indeed, expanding EV charging infrastructure, also known as Electric Vehicle Supply Equipment (EVSE), is critical to achieving increased EV adoption. In 2021, Alabama ranked 47th out of 50 states in charging points per 100,000 vehicles with 8.4 charging points per 100,000 vehicles.

Alabama needs a plan to prioritize additional public and private investments that will support the EV infrastructure needs of citizens, visitors, and its thriving automobile manufacturing sector into the future.

The Alabama Department of Economic and Community Affairs (ADECA) has developed this statewide Electric Vehicle Infrastructure Plan (EVIP) to guide the strategic deployment of state resources for EV charging infrastructure along the path to transportation electrification. The EVIP will also serve as a resource for state agencies, local agencies, and businesses in Alabama looking towards a future where EVs play a major role in the economic development of the state.

C. The Background

Electric vehicles are increasing in availability and affordability, and Alabama leaders are actively engaged in efforts to close EV charging infrastructure and awareness gaps. Currently in Alabama, there are 17 DC fast-charging sites with 38 charging ports and 9 Tesla only DC fast-charging sites with 76 charging ports.

In 2020, the Alabama legislature created programs at ADECA to coordinate statewide EV infrastructure planning and EV consumer awareness efforts.

Alabama Electric Vehicle Infrastructure Plan – Executive Summary

VOLKSWAGEN SETTLEMENT: A consent decree issued by the U.S. Department of Justice in 2016 settled allegations of emissions cheating brought by the United States Environmental Protection Agency and the Federal Trade Commission against Volkswagen AG. Out of the $14.7 billion total settlement amount, Alabama was allocated $25,480,968 to develop a program to fund certain types of projects to reduce nitrogen oxide emissions. States were allowed to dedicate up to 15% of their individual allocation for EV charger projects, referred to in the consent decree as "light duty zero emission vehicle supply equipment (EVSE)". Some states opted against using any eligible funds on EVSE and others dedicated some percentages up to the maximum allowed. Alabama reserved the maximum amount, 15% or $3,248,000, and combined it with $1 million provided by the state legislature through its FY2021 General Fund budget.

In June 2021, the state of Alabama combined funds appropriated by the legislature with Volkswagen settlement funds, and ADECA awarded 18 grants totaling more than $4.1 million to finance the installation of EVSE. To be consistent with the requirements of the Volkswagen settlement, projects were prioritized based on expected nitrogen oxide emissions reductions that would result from each project. These chargers are all expected to be installed in 2022 and will more than double the number of publicly accessible fast charger locations statewide. Locations are predominantly along the I-20/I-59/I-459 corridor between Tuscaloosa and the Georgia State line and include one outlet mall, two hotels, two sporting goods stores, eight convenience stores/gasoline stations, two grocery stores, two electric utility providers, and one public university. ADECA will be monitoring each awarded grant for compliance during construction and throughout the longer-term maintenance agreements between each specific site owner and the state of Alabama.

The initial round of grants made in 2020 followed the recommendations of the 2020 Alabama Electric Vehicle Infrastructure plan and was a great start. But to increase EV adoption, Alabama will require more charging stations serving more strategic corridors, more communities, and more travel destinations. For FY2022 the Alabama legislature has provided $2 million for EV infrastructure and $1 million for consumer EV Education.

This January 2022 *Alabama Electric Vehicle Infrastructure Plan* (EVIP*)* is comprehensive and provides a source of information to guide decisions related to future EVSE deployment. This plan offers an assessment of the current market and recommendations for funds available immediately. Additionally, this plan lays out a vision for future deployments based on a data-driven approach that supports consumer and commercial transportation system users.

D. The Potential

Alabama is the 4th ranked state in automotive exporting in the U.S. In 2020, despite the global COVID-19 pandemic, exports of Alabama-made vehicles and parts totaled $8.2 billion with Canada, China, Germany, and Mexico being the primary export markets.

Alabama already has a robust automotive industry with vehicle and parts manufacturers. EV manufacturing in Alabama is new and on the rise; and well-paying jobs for Alabamians are one major result.

In 2020, graphite was not produced in the U.S. Imports came from China (33%), Mexico (23%), Canada (17%), India (9%), and other countries (18%).

In 2021, Westwater Resources announced that it will be investing $202 million in Coosa County to employ at least 100 people and become the first U.S. company producing graphite—a key anode material used in EV batteries—by the end of 2022. Li-Cycle also announced it will create 78 jobs at a new EV battery recycling facility in Tuscaloosa County with plans to begin operations in 2022.

Other signs of Alabama's economy shifting towards EVs include:

- Mercedes-Benz will begin to assemble electric SUVs at its Tuscaloosa plant in 2022 and is investing $1 billion to construct an EV battery plant in Bibb County.
- In May 2021, 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.
- In 2021, The University of Alabama, Alabama Power and Mercedes announced they were collaborating to form the Alabama Mobility and Power (AMP) Center – to create 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 electric vehicles.
- New Flyer of America manufactures electric transit buses in Anniston.
- Autocar Trucks has a special electric fleet vehicle development team designing medium and heavy-duty electric vehicles in Birmingham.

The potential EV-related impact on the Alabama economy is not limited to vehicle manufacturers and their suppliers. Alabama enjoys a thriving tourist industry and is strategically located along important vacation routes (e.g., beach traffic). As EV adoption continues across the country, Alabama is well placed to generate commercial activity at businesses that offer charging. By 2030,

if the infrastructure exists and adoption trends continue as expected, users of a comprehensive statewide network of publicly accessible EVSE are forecast to spend approximately $36 million annually on goods and services while charging their vehicles in Alabama. Also, by 2030, annual Alabama EV registration fees will provide between $22 million and $85 million per year to maintain roads and bridges under medium and high adoption scenarios.

EVs will be good for the Alabama economy, and they will also reduce pollution in Alabama. Reduced pollution will be good for both the environment and public health. Additionally, EVs will reduce Alabama's dependence on conventional fuels – meaning greater economic and energy security and resilience for its residents and businesses.

E. The Path

This plan is intended to serve as the state's principal guidance to support publicly accessible EVSE deployment in a manner that enhances EV adoption throughout the state and leads to further automotive related economic development opportunities. Confusion and frustration have been reported in other states where governments have implemented multiple overlapping programs and incentives operated independently of each other. The best path forward is for the state to attract private investment by continuing support for its established EV infrastructure planning and EV consumer awareness programs. The state should also take full advantage of federal funding that will be available as the result of a recently enacted five-year infrastructure bill.

The Infrastructure Investment and Jobs Act (IIJA), signed into law on November 15, 2021, authorized and appropriated $5 billion for a National Electric Vehicle Formula Program through which Alabama will receive approximately $79 million over the next five years. These funds will either be spent by Alabama on EVSE infrastructure along federally designated corridors or, if not used by Alabama, may be reallocated by the federal government for use in other states. Jurisdictions within the state will have additional IIJA-related opportunities to compete for federal grants to install electric charging or hydrogen, natural gas, or propane fueling infrastructure through a separate $2.5 billion program. While additional sections of the new law will create EVSE funding opportunities for private entities, the focus of this plan is limited to publicly accessible electric vehicle charging infrastructure.

The Alabama Legislature has created three state-based programs related to EVs in recent years. In 2019, the state established an annual registration fee on EVs to replace gas tax revenue not paid by EV owners. The first 75% of the fee revenue is intended for state, local, and county governments for road and bridge projects and the second 25% for EVSE projects. The state has also established an Electric Vehicle Infrastructure Grant Program and an EV Technology Education Program, both administered by ADECA.

This plan 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 DC Fast Charging) and expected EV adoption in a particular geography. PredictEV™ also analyzes the economic, health, environmental and societal impacts 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.

Section 8 of this plan describes how state and federal funding programs can be complementary to each other and support a data-driven approach to guide future EVSE deployment decisions. Private investors are more likely to target investments in Alabama if the state commits to follow one clear and easily understood strategy to deploy EVSE.

F. The Recommendations

The following is a list of recommendations made with hyperlinked references to the specific section of the plan that provides a more complete discussion of the associated topic.

1. Due to the dynamic nature of the EV market, and to protect its investments, the state should establish an ongoing EVSE data-driven planning process to update the Alabama EVIP on at least an annual basis (*Section 1.G*). The state should leverage National Electric Vehicle Formula Program funds with state dollars to maintain an up-to-date data-driven mapping and analysis capacity that allows a city, county, or other political subdivision, or a local agency, to compare and evaluate different adoption and use scenarios for electric vehicles and electric vehicle charging stations (*Section 8.A.1*).

2. The state should establish the following priority ranking for projects supported by state dollars:

    - Tier 1 priority for a DCFC project along an interstate corridor if one is needed to achieve or maintain a Federal Highway Administration (FHWA) electric vehicle charging corridor designation.
    - Tier 2 priority for DCFC projects along non-interstate corridors to fill critical charging gaps and further catalyze EV adoption.
    - Determine appropriate set-asides during each future round of grants to encourage applications from the following categories (Section 6.C):

- Equity Set-asides – 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 Set-asides – 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. (*Section 4.B and Section 8.C*).

3. Deployment of hydrogen fueling infrastructure for fuel cell EVs in Alabama is not recommended at this time (*Section 5.B*).

4. Before nominating any non-interstate EV charging corridors through the FHWA alternative fuel corridor program, the state should assess the impact of adding that corridor on the cost of building out FHWA-designated corridors, and the remaining amounts of expected and available federal funding should be considered. (*Section 6.A*).

5. FHWA is expected to release new corridor designation criteria as a result of the federal infrastructure bill signed into law on November 15, 2021. Once the new criteria are released, the state should evaluate whether to nominate any new corridors. Specifically, the state should evaluate whether to nominate I-165, I-359, and I-759 and/or hurricane evacuation routes (*Section 6.A*).

6. The state should explore federal funding opportunities for charging infrastructure projects located along designated interstate and non-interstate Hurricane Evacuation routes and coordinate with relevant state and federal agencies to determine EV-related best practices for evacuations, emergency response, and restoration phase activities (*Section 6.A*).

7. Individual projects proposed to the state for funding under the Electric Vehicle Infrastructure Grant Program at ADECA should be evaluated for individual site features and characteristics using the criteria recommended in *Section 6.C*. All projects should follow the charging station requirements outlined in *Section 6.I*.

8. 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 electric vehicles (*Section 7.A*).

9. Each year, the Alabama Green Fleets Review Committee should assess EV models available on the market and provide guidance to agency fleet managers detailing which EVs could assist them in meeting their Green Fleets Policy goals (*Section 7.B*).

10. The U.S. Department of Transportation will issue guidance for highway exit signage for facilities that offer EV charging. The state should incorporate EV charging signage into its highway signage program in a manner that raises public awareness about the availability of charging stations and helps drivers locate EV charging stations (*Section 7.C*).

11. The state should deploy National Electric Vehicle Formula Program funds, of which the state is expected to receive about $79 million over the next five years, to build out DCFC charging capacity along Interstates 65, 565, 59, 459, 20, 85, 10, and 22 (*Section 8.A.1*).

12. Federal agencies that manage public lands within the state will have funding to install EVSE as part of the National Electric Vehicle Formula Program. Alabama-based entities that work to protect, promote, and support Alabama's federally managed public lands should inquire with the appropriate federal agencies to request chargers in Alabama (*Section 8.A.2*).

13. The state should continue to provide funding to Drive Electric Alabama, a public private partnership that supports consumer EV-related education and awareness, at $2 million per year through the Electric Vehicle Technology Education Program at ADECA, including up to $500,000 for Alabama auto/truck/bus EV dealership training grants (*Section 8.C*).

14. The state should continue to fund ADECA's Alabama Electric Vehicle Infrastructure and Planning Grant program at $5 million per year to enable support for EVSE projects in a manner that ensures no area of the state is left behind because it doesn't meet federal eligibility criteria (*Section 8.C*).

15. The state should prioritize the 25% portion of annual EV registration fees reserved for EVSE according to the priority ranking for state-funded projects recommended in this plan (*Section 8.C*).

G. The Need for Updates

The recommendations from this Plan will guide the development of advanced technology mobility solutions, reflecting the diverse needs of our state. EVSE is integral to the transformation of the state's multimodal transportation infrastructure. Even as technology associated with EVs and related EVSE may evolve, anticipated technologies – including faster battery charging, wireless battery charging, and even hydrogen compression for fuel cells – will depend on a supply of electricity being available at the fueling location. The continuous array of new vehicles available for purchase and the quickly expanding network of EVSE in Alabama will change not only who buys EVs and where they travel to and from, but also how and where vehicles will need to be charged.

Continuously examining the status of the region's EV market, convening stakeholders regularly, and being flexible to adapt to technological advancements will benefit and protect significant public and private investments while aiding Alabama's consumers and thriving automotive sector. In addition, the state can benefit from the property management oversight associated with its previous and ongoing investments in EVSE to generate lessons learned on how, where, and what EVSE to place to meet differing needs. The continuous examinations can also be impacted by funding availability from outside the state that may have guidelines and processes to consider. Again, the goal is to make this EVIP a living document that can adjust to benefit the state of Alabama's citizens and businesses. ***Due to the dynamic nature of the EV market, an ongoing EVSE data-driven planning process should be established to update the Alabama EVIP on at least an annual basis.***

2. Electric Vehicle Technology

A. EV Anatomy

Different from conventional internal combustion engine (ICE) vehicles (i.e., those that run on gasoline or diesel fuel), EVs are powered by electric motors. Today's hybrid electric vehicles (HEVs) are powered by an internal combustion engine in combination with one or more electric motors that use energy stored in batteries. In an HEV, the extra power provided by the electric motor may allow for a smaller combustion engine. The battery can also power auxiliary loads and reduce engine idling when the vehicle is stopped. An HEV cannot plug in to off-board sources of electricity to charge the battery. Instead, the vehicle uses regenerative braking and the internal combustion engine to charge.

Battery Electric Vehicles (BEVs) are completely powered by electricity from on-board battery systems that are charged from off-board sources of electricity. Other electric vehicles use battery systems together with another engine for power – plug-in Hybrid Electric Vehicles (PHEVs) and Fuel Cell Electric Vehicles (FCEVs). PHEVs are powered by a battery system, which is charged from off-board sources of electricity, working with an ICE. A FCEV works similarly but instead of an ICE, the battery system works with a fuel cell that uses hydrogen to produce electricity to power the vehicle.

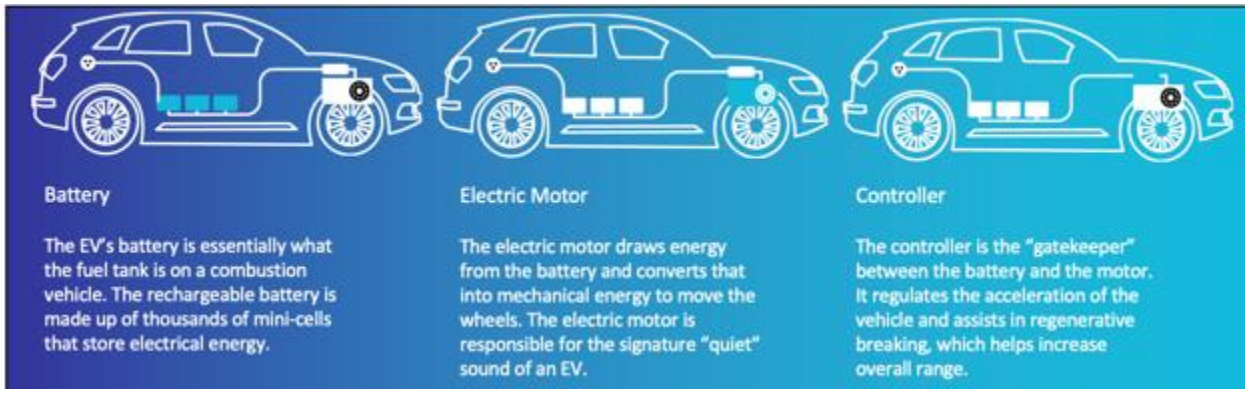


Figure 1. EV technology

EV range, which is the number of miles the EV can travel before needing to recharge, has steadily increased since 2011. As shown in Figure 2, the median range of EVs sold in the US has increased from 68 miles per charge in 2011 to 259 miles per charge in 2020. Similarly, the maximum range for EVs sold in the US also increased from 94 miles per charge in 2011 to 402 miles per charge in 2020.

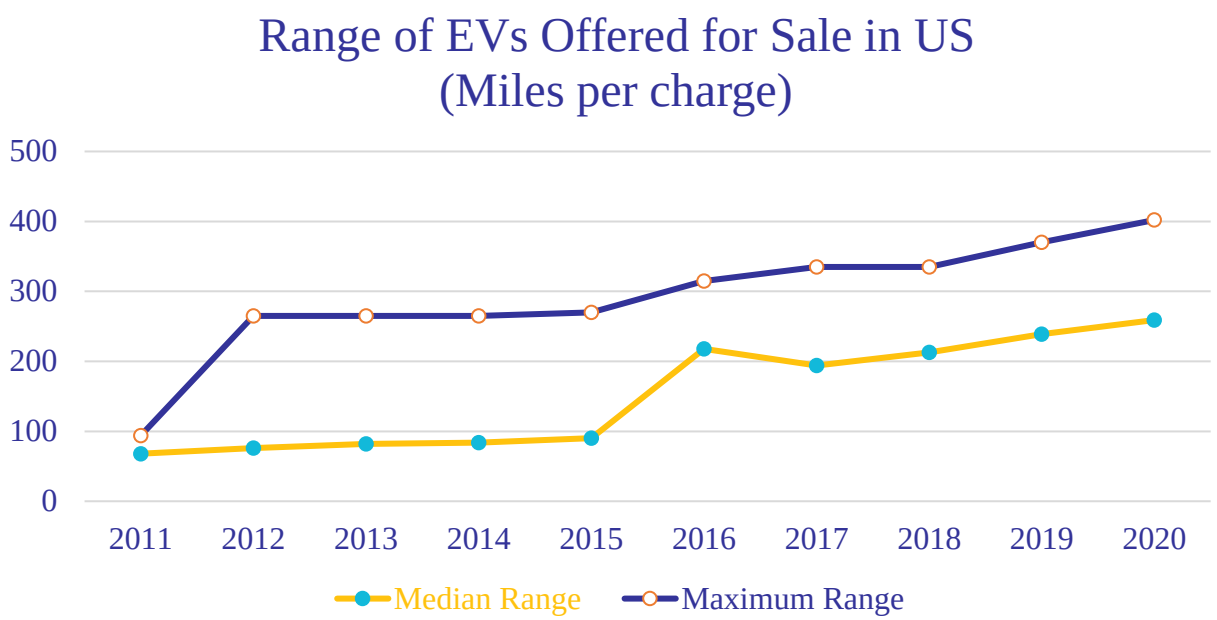


Figure 2. Median EV Ranges
Source: U.S. Department of Energy

B. Charging

Most EV owners charge their car at home. One of the biggest barriers to EV adoption has been a lack of publicly accessible charging stations to serve travelers and local EV owners who are unable to charge at home or work. Increasingly, businesses are installing chargers for employee and customer use and some even offer it free to employees as a benefit. Like the vehicles, there are different types of EV charging technology. The most important distinction is what is referred to as the charging level, as detailed in Table 1 and Figure 3.

Table 1. Explanation of EV Charging Levels

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

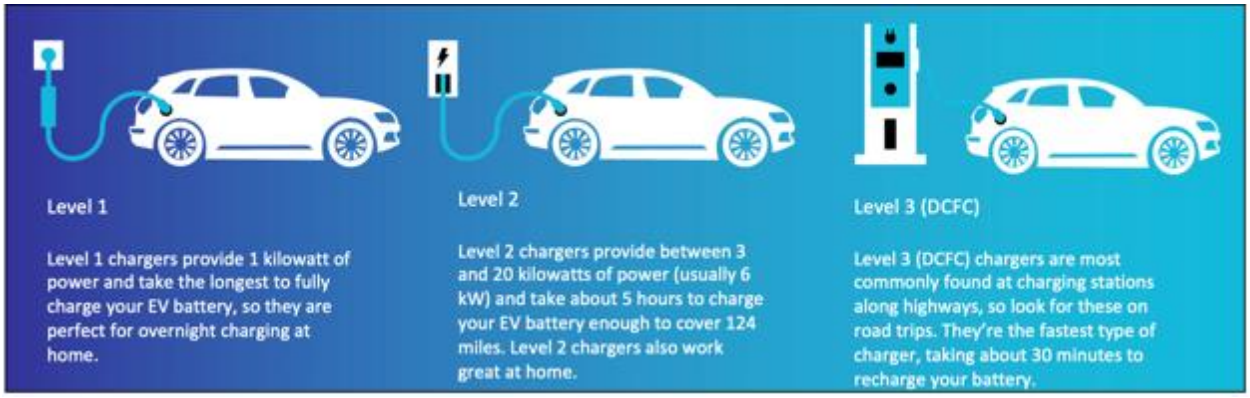


Figure 3. Charging Technology

EV chargers interface with EVs through one of three primary types of connectors: CCS (also referred to as Combo or J1772), CHAdeMO, and Tesla. Currently Tesla chargers are proprietary and do not charge other brands of EVs. Adapters are available for Tesla vehicles that allow use of other connecters for Tesla charging. Indications are that the CHAdeMO connector will not be utilized on new EVs in the future.

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

EV charging technologies are expected to continue advancing in coming years. Advancements have centered on reducing the time required for charging an EV so that an EV's charging time is similar to the time required to refuel a petroleum fueled vehicle.

3. Alabama EV Market

The EV market in the U.S. is on a positive trajectory. According to Atlas Public Policy's EV Hub more than 2.2 million EVs were sold in the United States from 2011 to 2021. Figure 4 shows the current trend of Alabama EV sales from 1997 through 2021. Hybrid vehicle (HEV) sales were initially slow as they entered the market in the early 2000s, but rapidly began increasing to the current 2021 levels.

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.

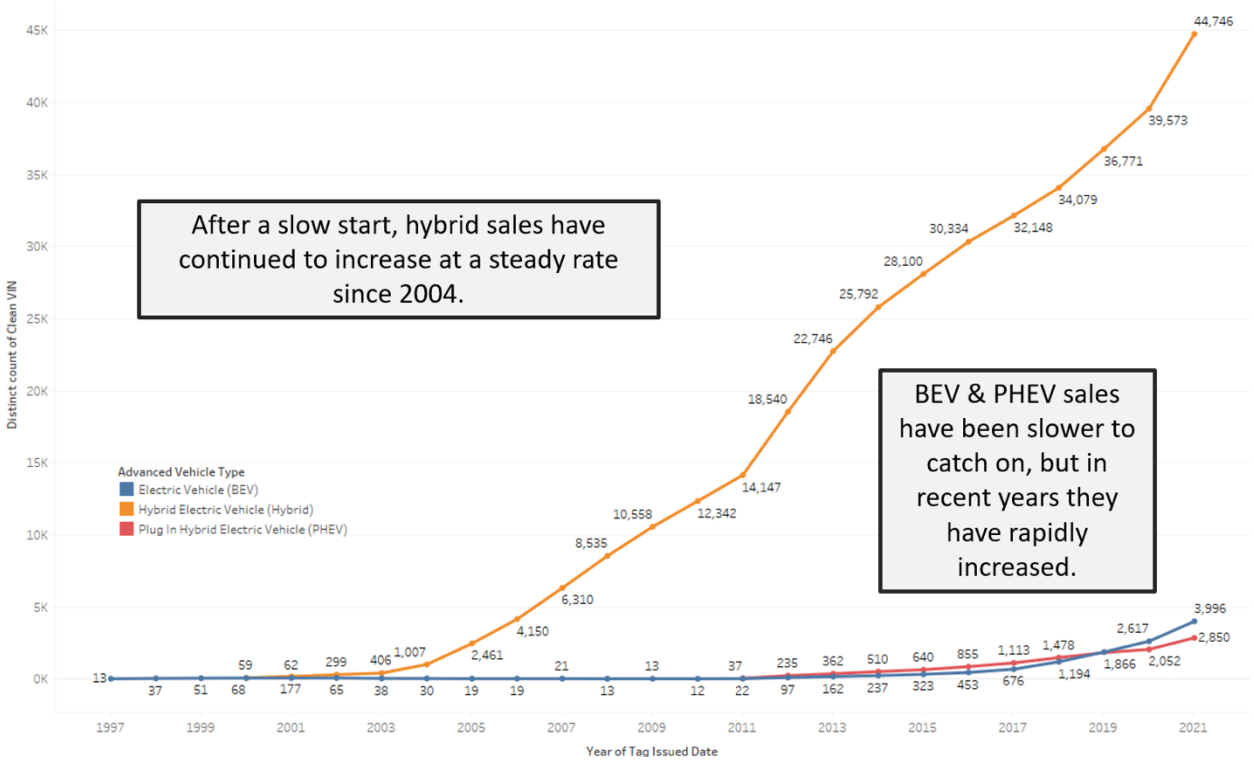


Figure 4. Alabama EV sales from 1997 through 2021

Figure 5 illustrates that, as the clean fuel vehicle market shifts from HEV to EV technology, the current trend in Alabama indicates that BEV and PHEV sales are on course to increase rapidly just as HEVs did when they hit the market. After their market introduction in 2010, BEV and PHEV sales in Alabama first started to increase in 2011. From 2011 to 2019, however, PHEV vehicles dominated the market share. In 2019, BEV registrations in Alabama surpassed PHEVs and continue to increase at a rate faster than PHEVs. Tables 2 and 3 show predicted cumulative PHEV and BEV registrations in Alabama through 2030. Table 4 summarizes the total projected cumulative PHEV and BEV registrations through 2030.

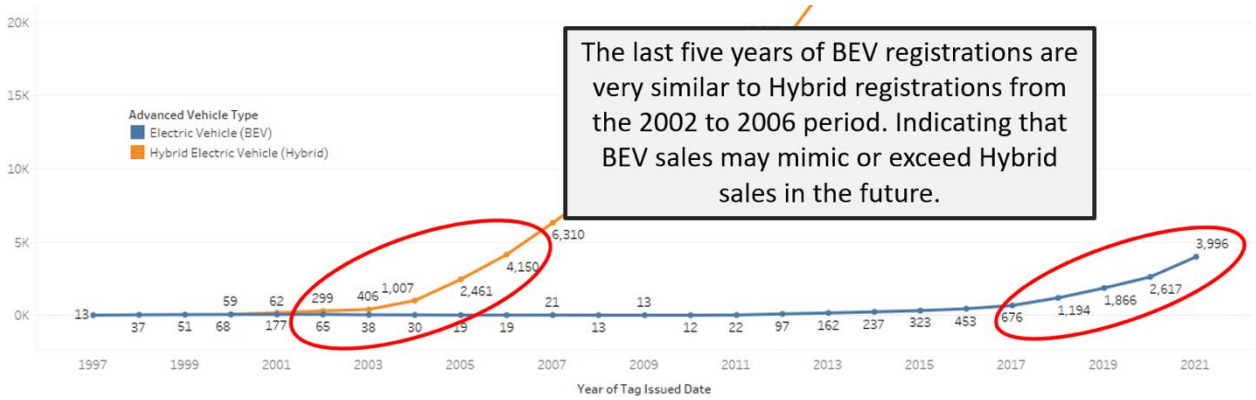


Figure 5. Comparison of hybrid and EV early sales trends

Table 2. Projected PHEV Cumulative Registrations

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 3. Projected BEV 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 4. Total Projected PHEV and 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

Beyond the Alabama data, national (and global) trends and strong support from the U.S. government and private sector entities point towards an increasingly robust EV market. These trends include decreasing EV battery prices, increasing driving ranges, rising conventional fuels costs and price volatility.

Bottom line – EVs are the future and Alabama needs to make the most of the opportunities at hand and become a leader in this economic and industrial revolution.

4. Opportunities

A. Economic Development

The future growth of the Alabama economy is, to a great extent, tied to the future of EVs. Indeed, the Southeast (Alabama, Florida, Georgia, North Carolina, South Carolina, and Tennessee) 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.

Additional investment in EV charging infrastructure in the state will reduce consumer "range anxiety" and lead to greater EV adoption. This will directly benefit Alabama's economy and its automotive manufacturing industry by creating more demand for their EV products. Increased demand for EVs will benefit the state from an economic development standpoint through EV manufacturing expansion and/or location of new EV manufacturing facilities to meet increased global market demand.

Charging stations that serve hurricane evacuation routes need high-powered chargers and may be initially equipped with the capacity to simultaneously charge a greater number of vehicles than stations not located on evacuation routes. Higher capacity stations, whether or not they are along evacuation routes, could be used as an economic development tool to attract new companies with electric fleets and encourage existing companies to incorporate electric vehicles into their fleets.

The reduced fueling and maintenance costs associated with EVs will provide consumers with more disposable income that can be utilized to purchase other goods and services, thereby enhancing economic activity in local communities.

Tourism, outdoor recreation, and retail destinations will benefit from having EV charging infrastructure convenient to their locations, thereby increasing business. EV charging infrastructure use at these locations may also increase destination dwell time for additional transactions with local businesses.

B. Impacting Communities

EV drivers who are traveling will stop and spend money on goods and services to charge wherever publicly accessible charging infrastructure is available. As the number of EVs on the road increases along with the number of EVs registered to Alabama citizens, localities will need charging infrastructure or EV drivers will bypass their communities, resulting in a loss of revenue over time. Alabama has established an annual EV registration fee intended to help support charging infrastructure grant projects and road and bridge maintenance projects.

By 2030, if Alabama fully embraces the establishment of its own strategic EVSE network, communities and businesses will benefit from an estimated $36 million per year that EV owners will spend on goods and services while stopped at locations to charge their vehicles. Also, by 2030, annual Alabama EV registration fees will provide between $22 million and $85 million per year to maintain roads and bridges under medium and high adoption scenarios. This future revenue is discussed in more detail in Section 8.

Federal programs will emphasize the need for charging infrastructure that expands access in rural areas, low and moderate-income neighborhoods, and communities with a low ratio of private parking spaces to households or a high ratio of multi-unit dwelling to single-family homes. **This federal priority should also be considered in state-level funding decisions so that no area of the state is left behind.**

Figure 6 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.

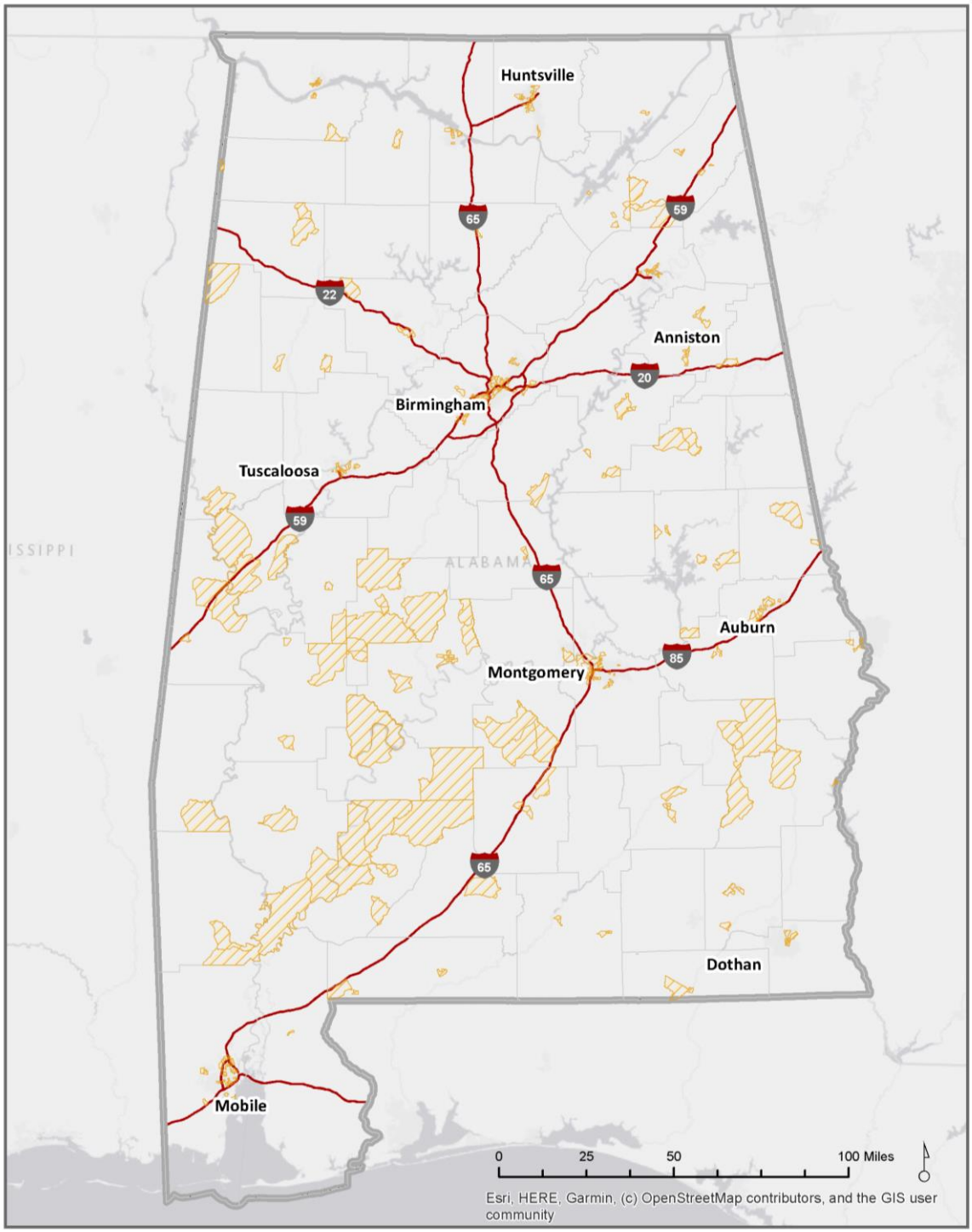


Figure 6. Low-income areas of Alabama

The federal government is expected to create funding opportunities for EVSE projects in urban areas and near multi-family dwelling units. Figure 7 shows the areas of Alabama designated as urban by the U.S Census Bureau. Once specific federal guidance is released, additional analysis should be conducted to determine which areas of the state qualify.

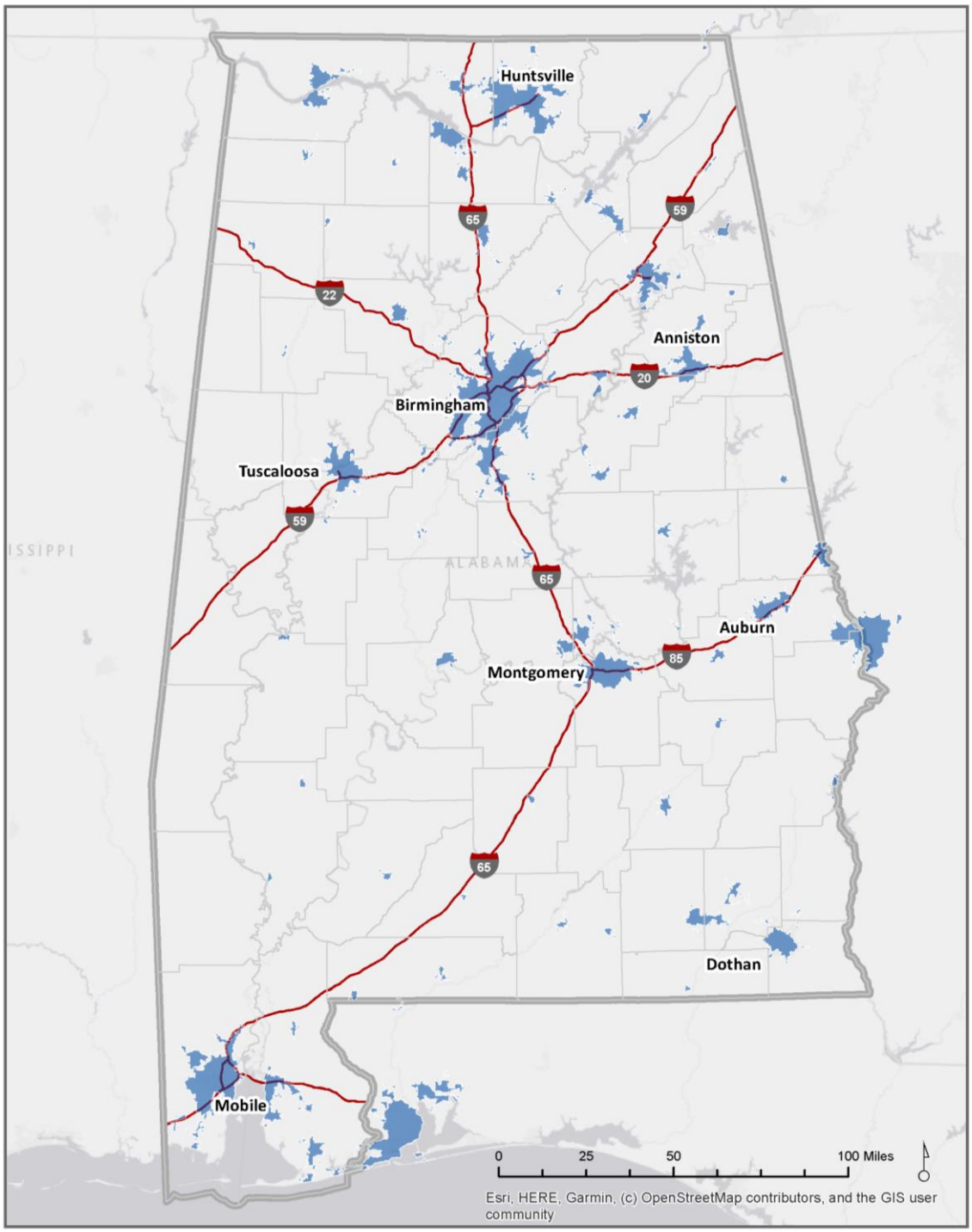


Figure 7. Urban areas of Alabama

C. Impacting Individuals

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

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 the 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 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.

5. 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".

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. Additionally, there was some initial concern over EV performance. Recent news coverage and marketing campaigns around EVs have made it very clear that they are capable of providing driving performance (e.g., speed and acceleration) on par with conventional ICE-powered vehicles.

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

Alabama's automobile manufacturers are not alone in producing more EVs. The increasing global supply of EVs will mean that more of the vehicles will be available at dealerships in Alabama.

While most EV charging will occur at home, the biggest unmet challenge is the lack of availability of fast chargers in Alabama for EV travelers and local EV owners who cannot charge at home or work. Alabama can play a role in overcoming this challenge by continuing its EV infrastructure and EV consumer awareness efforts. Doing so will lead to more future EV travelers stopping to spend money in Alabama communities.

A. 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 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. These systems could also be deployed to determine the charging utilization potential, prior to an investment in a permanent installation.

Another measure of resilience 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. State and local emergency management agencies should work with utilities to prioritize power restoration of EV charging sites, especially along evacuation routes.

B. 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.

Deployment of hydrogen fueling infrastructure in Alabama is not recommended at this time as there is currently no hydrogen fuel cell vehicle market in Alabama.

6. Framework

A. Federal Highway Administration (FHWA) Corridors

Most of the federal funding that will be available through the IIJA is tied to EV charging corridors that have received federal designations. Federal designations are expected to remain largely focused on interstate corridors. This plan suggests the continuation of state funding so there will be opportunities for charging infrastructure in all areas of the state, not just where the federal funds are eligible to be spent.

FEDERAL HIGHWAY ADMINISTRATION ALTERNATIVE FUEL CORRIDOR PROGRAM

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

Five previous rounds of corridor designations were carried out between 2016 and 2020 under the law as defined in 23 U.S.C 151. Interactive GIS Maps of designated alternative fuel corridors can be accessed on the FHWA website. Section 11401 of the IIJA extends the corridor designation program and creates a $2.5 billion competitive grant program for fueling infrastructure that is discussed in greater detail in Section 8.A.3.

"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 5 miles off the highway.

Criteria for future corridor designations and redesignations may be altered by FHWA. For example, during previous rounds of designations, FHWA required charger power levels to be 50kW or greater. In subsequent rounds, this requirement was changed to 100kW or higher. In the past, states have been encouraged to limit nominations to interstates barring some very compelling reason to nominate non-interstate highways. ***Once FHWA releases IIJA-related corridor designation criteria, the state should evaluate which corridors, if any, to nominate. Specifically, the state should determine whether to nominate hurricane evacuation routes as well as I-165, I-359, and I-759.*** Since each of these auxiliary interstates are less than 5 miles long, specific locations along each corridor may already have eligibility for National Electric Vehicle Formula Program funding since they are connected to Interstates 65, 20/59, and 59, respectively.

Before nominating any non-interstate corridors through the FHWA alternative fuel corridor program, the state should assess the impact of adding that corridor on the building out of FHWA designated corridors and consider the remaining amounts of expected and available federal funding.

ALABAMA'S FHWA-DESIGNATED ELECTRIC VEHICLE CHARGING CORRIDORS

In February 2020, the Alabama Department of Transportation (ALDOT), with support from the Alabama Clean Fuels Coalition, submitted nominations to FHWA for designation of the main interstates in Alabama. These nominations were enabled by nine DCFC stations (non-Tesla) that were either existing or under development. I-22 was not eligible because no DCFC was installed or planned. The nominations were accepted, and the corridors were designated in June 2020. These corridor designations will soon pay off, as discussed in the funding section (Section 8) of this plan, when the IIJA delivers an estimated $79 million to support a full buildout of EVSE along these corridors.

B. Identification of Charging Infrastructure Needs

The figures in this section were developed based on data driven analysis of future charging infrastructure needs in Alabama. Charging station icons may represent census block groups and are not suggested as exact locations.

Figure 8 shows projected statewide charging stations along Alabama's interstates. As previously noted, the federal government may change corridor designation criteria in the future. The map in Figure 8 shows approximate locations for EV charging needed to satisfy the current FHWA EV "Corridor Ready" requirement that chargers are spaced no more than 50 miles apart along the interstate corridors. The recommended locations are based on forecasted demand and utilization in 2030 and, where available, provide location options to allow the state to meet the necessary criteria.

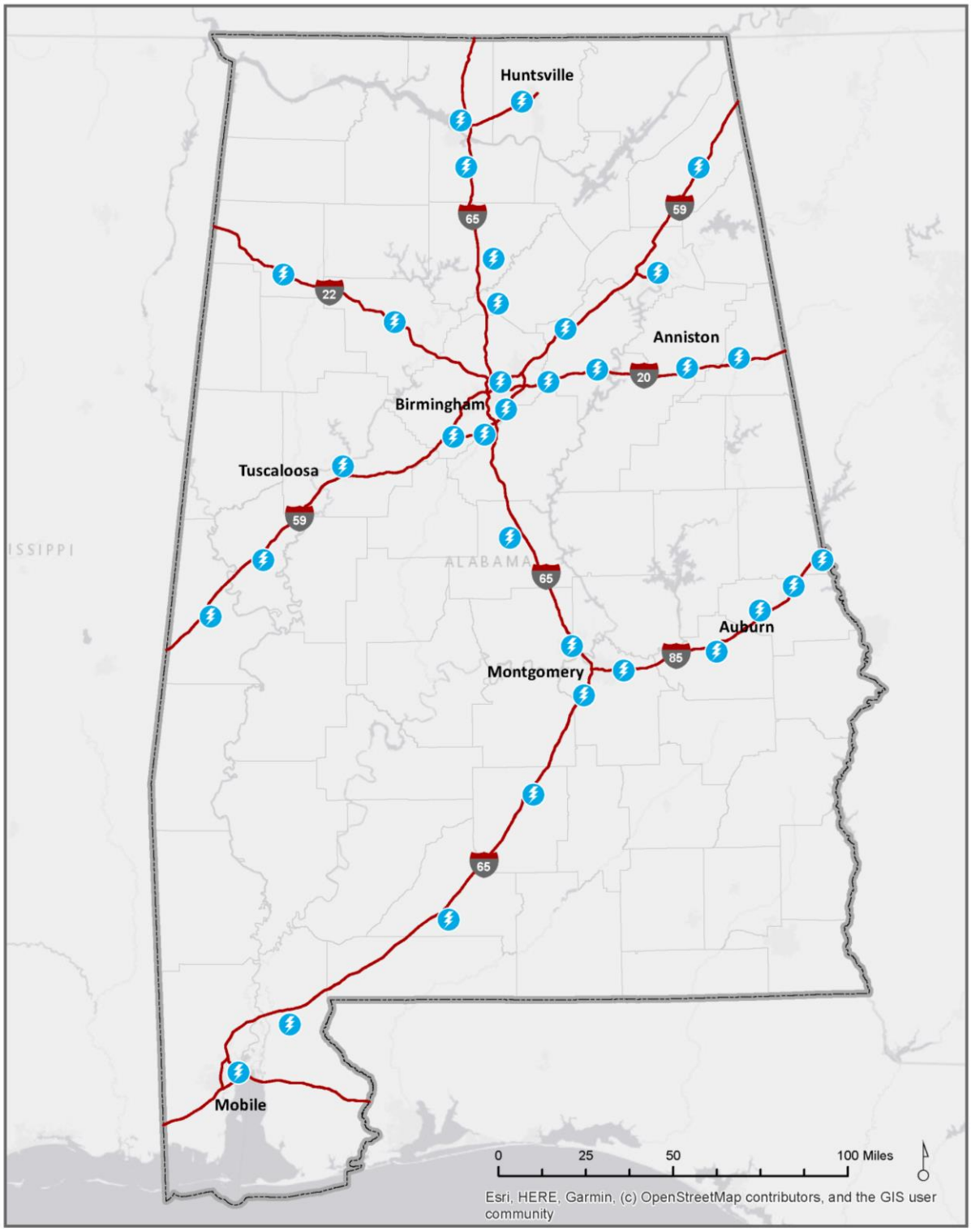


Figure 8. 2030 FHWA EV Charging Corridors

An assessment of Alabama's designated hurricane evacuation routes was conducted to ensure that EV charging locations are considered along these corridors. Figure 9 shows the general locations of these corridors. While sections of I-65 and I-59 are included, many of these routes are not interstates.

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 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.

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 electric vehicles into their fleets.

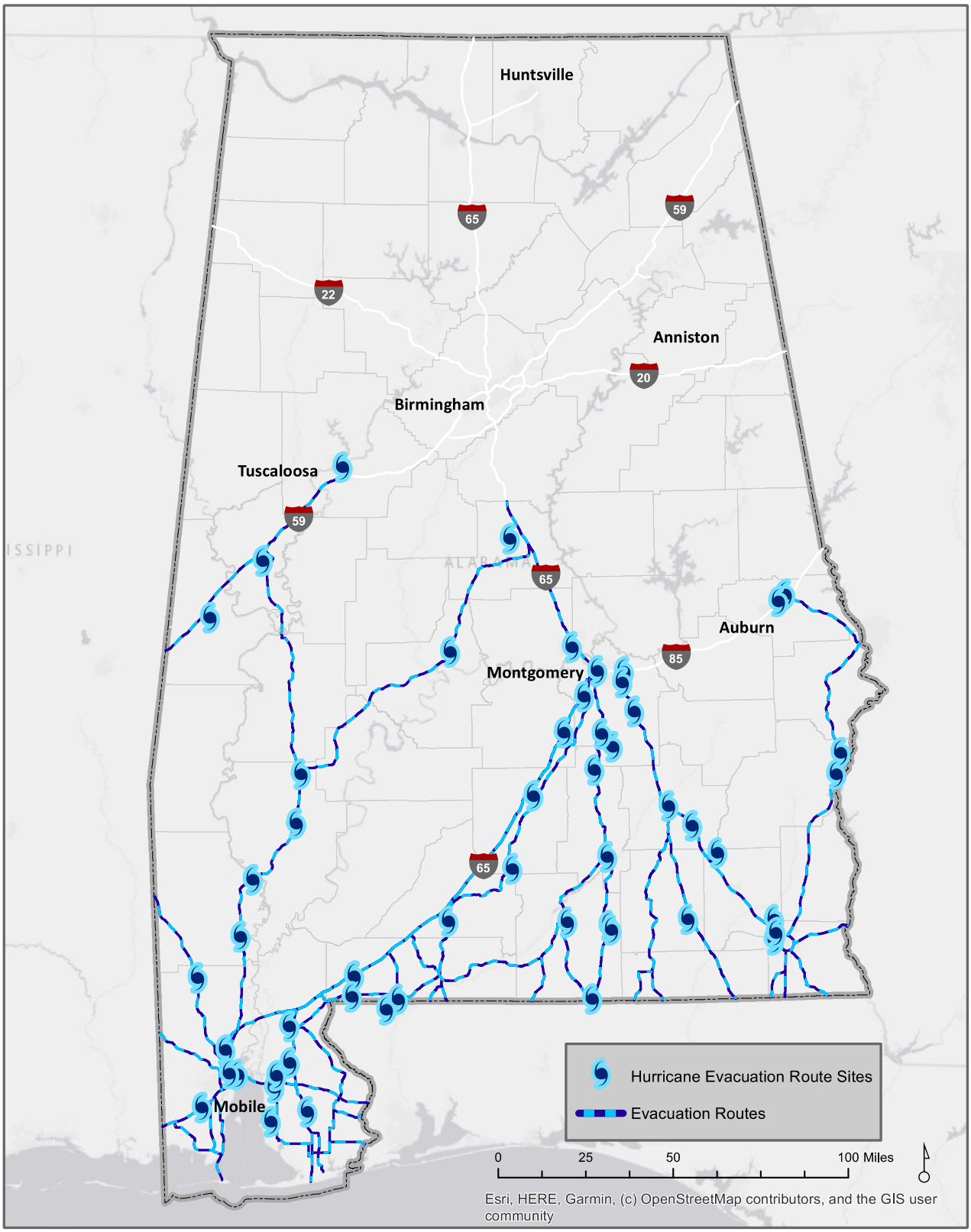


Figure 9. Projected hurricane evacuation route charging locations

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 10 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.

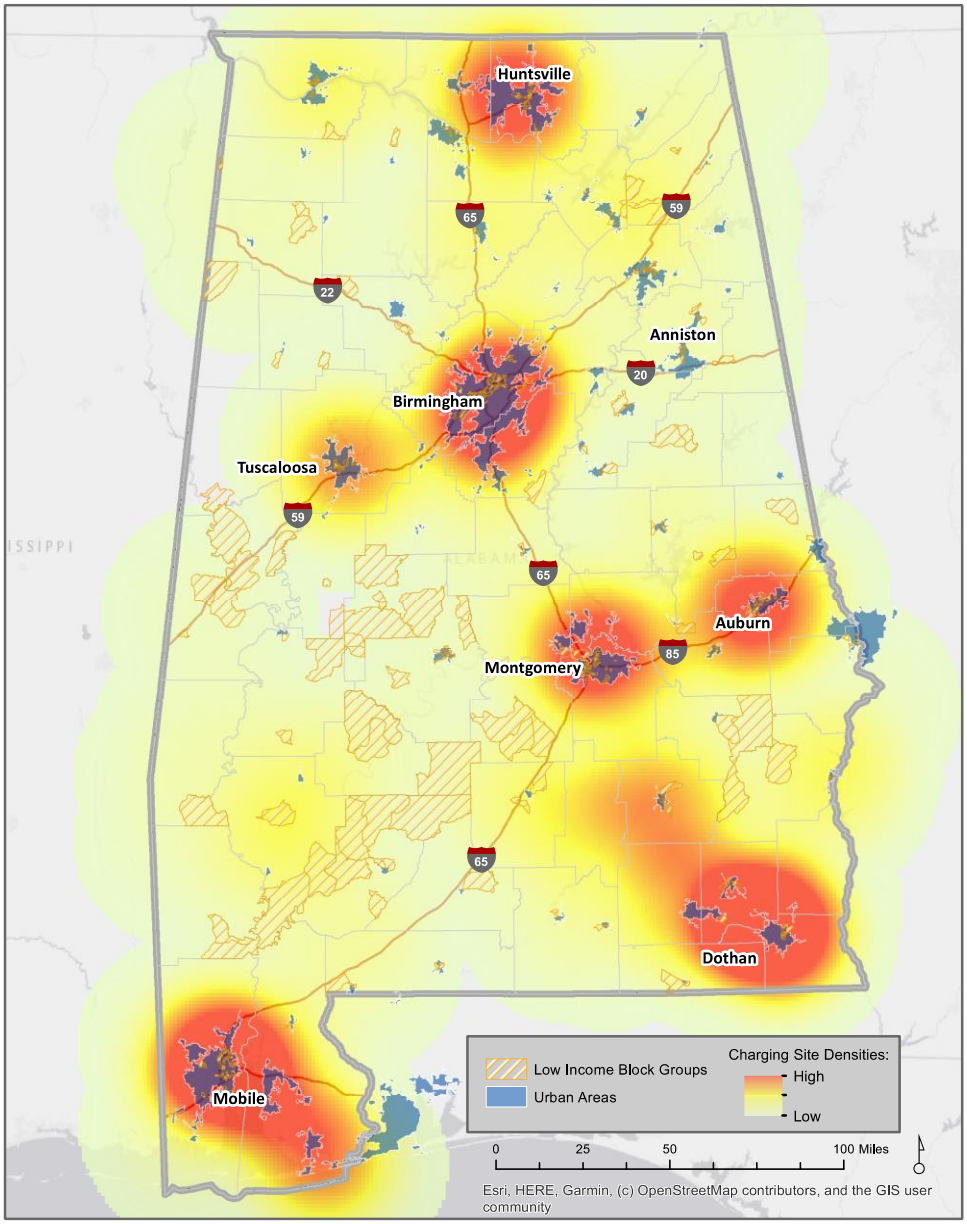


Figure 10. Projected heatmap of 2030 charging areas of demand

While the above figures show extensive coverage across the state, there are still areas of opportunity to ensure that public-access EV charging infrastructure is accessible to all citizens regardless of where they live or their income level. Section 4.B provides examples of low-income and high-density urban areas that may receive priority consideration for federal grants described in Section 8.A.3 or as a set-aside priority for the state established in Section 6.C.

C. Prioritization

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 estimated date of project completion should be no greater than one year after funds are awarded.
- 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
    - Total EVs
    - EV adoption impacts from the project
    - Site serves multiple EV charging site categories (corridor, destination, rural, underserved community, multi-family dwelling, etc.).

Evacuation Routes Recommendations:

1. ***Explore federal funding opportunities for EVSE projects located along designated interstate and non-interstate Hurricane Evacuation routes, coordinating with neighboring states to the extent possible.***
2. ***Once FHWA releases criteria for its next round of electric vehicle charging corridor designations, the state should consider nominating any individual evacuation route corridors that may be eligible.***
3. ***Coordinate with relevant state (ALDOT, AEMA) and federal (FEMA) agencies to determine EV-related best practices for evacuations, emergency response, and restoration phase activities. Consider the following:***
    a. ***Needs of any EV fleets operated by utilities and other entities working to support infrastructure restoration.***
    b. ***Long-term resiliency and reliability with distributed generation.***
    c. ***Locating charging stations on evacuation routes.***
        i. ***Consider using these as economic development tools, for instance, with business fleets.***
        ii. ***Consider alternative uses to boost station utilization.***
    d. ***Prioritization of charging station use during emergency situations.***

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 under the Volkswagen Settlement, 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).

PRIORITIZATION OF PROJECTS FUNDED WITH STATE DOLLARS: Unlike federal funds, which are controlled by Washington, and Volkswagen settlement funds, which were subject to the specific terms of a settlement agreement, the state has absolute authority over how to prioritize its own funds to support EVSE projects. The state should prioritize projects funded with state dollars according to the following order of priority.

THE STATE SHOULD ESTABLISH THE FOLLOWING PRIORITY RANKING FOR PROJECTS FUNDED WITH STATE DOLLARS:

1) ***TIER 1 PRIORITY FOR A DCFC PROJECT NEEDED TO ACHIEVE OR MAINTAIN AN FHWA ELECTRIC VEHICLE CHARGING "CORRIDOR PENDING" DESIGNATION:*** State funds should not be deployed to build out EVSE along Alabama's major interstates (Interstates 65, 565, 59, 459, 20, 85, 10, and 22) unless there is an interstate that needs one DCFC installed to become eligible for federal funds to support the build out. Currently, I-22 is the only Alabama interstate lacking federal designation because there is currently no DCFC along the corridor. Dedicating state funds to install the first DCFC along this corridor would enable a build out using federal funds. A new round of FHWA designations is imminently expected. The state should require that any project it funds along I-22 uses equipment that meets or exceeds the minimum FHWA criteria.

2) ***TIER 2 PRIORITY FOR PROJECTS ALONG NON-INTERSTATE CORRIDORS TO FILL CRITICAL CHARGING GAPS AND CATALYZE FURTHER EV ADOPTION*:** The top priority for state funds should be to support EVSE projects at strategic locations along non-interstate corridors that fill critical charging gaps and catalyze further EV adoption. Applications for projects to fund both AC Level 2 and DC fast chargers should be eligible under this category. These projects may also serve FHWA-interstate corridors but doing so should not be a requirement for funding.

3) ***SET-ASIDES:*** Out of funds available, during each future state-funded round of grants, a special category of eligibility should be established for certain set-aside categories. Applications submitted under set-aside categories should only be evaluated for funding against other project applications in the same set-aside category. During each future grant

application period, the state should determine whether to dedicate a certain percentage of funds or to fund a certain number of projects under each category.

a. ***EQUITY SET-ASIDE:*** This category should be reserved for projects that will serve low- and moderate-income areas, rural areas, and/or areas with a high ratio of multi-unit dwellings to single-family homes. Eligible projects should include both DC fast charger projects and AC Level 2 projects.

b. ***DESTINATION SET-ASIDE:*** This category should be reserved for projects that will serve destinations where people frequently gather for long periods of time. Location categories should include, but not be limited to, hospitals, schools, shopping centers, places of leisure and outdoor recreation, entertainment, and sporting venues. Eligible projects should include both DC fast charger projects and AC Level 2 projects.

D. Residential Charging

Most EV drivers charge their vehicles at home using Level 1 or Level 2 charging equipment. Many EV owners will be able to meet their daily driving range requirements (40 miles or less) by charging overnight (8-10 hours) with Level 1 equipment. For drivers with less regular schedules, or longer commutes, Level 2 charging equipment can be installed.

Every new EV is sold with a Level 1 charging station. It can be plugged into a standard household 110-volt grounded wall outlet and usually requires no upgrade to utility panels. A Level 1 charging station will deliver about 5 miles per hour of charge. This ready-to-go option might be right if you have a short commute, drive a plug-in hybrid such as the Kia Niro Plug-in Hybrid, are offered workplace charging, or if you're able to charge your vehicle for 8 or more hours each night. Level 2 charging stations are four times faster than Level 1 and can provide about 25 miles per hour of charge. Level 2 stations require a professionally installed 240-volt outlet on a dedicated circuit, just like the circuits in homes for ovens or clothes dryers. If you'd like one installed in your home, contact a licensed electrician to get an estimate and to determine if a permit is required. Level 2 might be the right choice if you drive a battery EV such as a Tesla Model 3, as these cars have larger batteries that require longer charging times. Drivers with longer commutes, or those who want a faster charge or longer electric driving range, should also consider choosing a Level 2 charging station.

EV charging for multi-unit dwelling residents is a greater challenge than for single-family residents, as they do not usually have access to charging at their apartment or condo facility. It is also more difficult for owners or managers of these properties to incorporate EV charging on-site. One solution that can be effective is to locate public access charging stations near these properties that also serve other users at nearby points of interest. It will be impactful, and much more cost-

effective, to incorporate EV charging in the building specifications for the construction of new multi-family developments.

E. Workplace Charging

Workplace charging can be an important employee retention tool for employers and demonstrates the organization's leadership in supporting advanced technologies. Workplace charging can enable plug-in hybrid electric vehicle (PHEV) drivers to cover both legs of their commute in clean all-electric mode. Workplace charging is also extremely useful for drivers of battery electric vehicles (BEVs) with shorter ranges and EV owners who cannot charge at their place of residence.

Employers can help increase the convenience and affordability of driving electric for their employees by implementing workplace charging programs that make Level 1, Level 2, or DC Fast Charging stations available for employee use.

Plug In America found in their 2020 driver survey that, when it is offered, EV drivers make frequent use of workplace charging. Workplace charging is inexpensive compared to other employee benefits. Offering workplace charging to employees can be as little as $1.50/day with Level 2 charging and as little as $0.60 a day with Level 1 charging—less than a cup of coffee!

Depending on the parking layout at the workplace, employers could install commercial-grade 20A dedicated 120V circuit outdoor outlets for Level 1 charging along a building exterior. Some employers may also install some combination of Level 2 chargers and commercial grade 20A dedicated 120V circuit outdoor outlets to serve Level 1 chargers.

F. Airport Charging

With the increased number of EVs, some airports are finding that demand for charging stations is exceeding supply, and airport sponsors are challenged to determine how and where to expand the number of charging stations. In cases where demand is exceeding supply, airport sponsors have installed additional stations according to need; increased the number of EV-dedicated parking spaces adjacent to existing EV charging stations; considered solutions such as valet management of EV chargers; and/or considered requiring EVs to be plugged in if they are parked near EV charging stations. When additional charging stations are required, the optimal number and location for the equipment has been determined by customer demand, funding availability, and/or average length of stay for customers. Airports may also want to consider providing access to Level 1 -120V outlets for EVs (best option is commercial grade outlets with 20A dedicated 120V circuits), especially for visitors who will have EVs parked for 72 hours or more. EV owners usually have their own charging connection for these Level 1 outlets.

G. Medium/Heavy-Duty Charging

Medium and Heavy-Duty vehicle electrification is an emerging technology. According to Atlas Public Policy's EV Hub current deployment in the United States includes:

- 2,790 Electric Transit Buses
- 350 Electric School Buses
- 315 Electric Trucks

Alabama manufacturers of these vehicle classes include New Flyer in Anniston (Electric Transit Buses) and Autocar in Birmingham. Electric buses are currently in service in Birmingham (Birmingham-Jefferson County Transit Authority – public transit buses), Huntsville (Alabama A&M University – student transit buses) and Fort Payne (Fort Payne City School District – school buses).

Many technical and financial challenges must be overcome to increase the market for these vehicles, i.e., cab cooling/heating in very hot and cold temperatures can reduce vehicle driving range by 50%. At this time, there is not a need for public charging infrastructure for these vehicles, as unlike passenger vehicles, most of the charging would take place at the fleet's depot. Other options for charging these vehicles could include shared card lock locations for multiple fleets or opportunity charging at stores, ports, or warehouses where the vehicles would be for extended periods. In some areas of the country traditional fueling companies (Loves, BP, Shell) are investing in EV charging and may be positioned to best support commercial vehicles that need public charging. Line haul trucks may have a greater need for publicly accessible EVSE. However, that will be a longer-term development. Also, technology developments with hydrogen can change things for the heavy-duty market.

H. EVSE Grid Impacts

Utilities are constantly evaluating load growth and shifts to proactively meet customers' needs. EV related load considerations of on-peak, off-peak, seasonal, use of hurricane evacuation routes, and differences of residential/commercial/industrial charging are all part of normal utility planning. Currently utility adjustments to EV related loads are within the normal management and planning criteria to provide customers confidence with meeting their electrical needs over the long term. Each business specific site can be unique with utility service capacity/access and other factors. ***It is vital that any business or government organization considering EV infrastructure contact their local utility as they begin planning.***

I. Requirements for Charging Locations

Generally, Alabama corridor charging sites should be required to be able to charge a minimum of two EVs simultaneously to reduce wait times for consumers. In addition, the charging connectors on EVs vary among EV manufacturers, with three different types of connectors: CCS (Combo), CHAdeMO, and Tesla.

Charging units at Alabama corridor sites should be equipped with both the CCS and CHAdeMO connectors to enable charging of all EV models. The power levels or configurations of charging units at Alabama corridor sites should provide a minimum of 100 kW to maximize the ability for various EV models to be able to charge at these stations. Alabama charging site installations should include future proofing on available charging spaces with conduit and an electrical service box of adequate size and disconnect capacity that will allow the additional electrical cable to be run to the site for future installation. This will ensure the site will meet EV charging demand growth and anticipated technology developments in EVs and DCFC infrastructure.

Charging sites should consider layouts and configurations that provide adequate space for vehicles to queue while waiting to charge, like features at conventional petroleum fueling stations. This would be especially important for evacuation route sites.

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.

The following are more specific recommended requirements for Alabama charging sites:

Table 5. Charging Site Requirements

Charging Site Requirements	DC Fast Chargers	Level 2 Chargers
1. 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.	X	
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.		X
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).	X	X
4. Charging stations must be connected to an operating network and must have the ability to switch to OCPP networks.	X	X
5. 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).	X	X
6. 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. Charging station equipment shall allow for flexible pricing including, but not limited to per kWh/kW, per minute or per hour, by space, or by time of day. ADA type access to initiate charging should be considered.	X	X
7. Sites must be equipped with both Society of Automotive Engineers Combined Charging System (SAE CCS) and CHAdeMO protocol connectors.	X	
8. 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.	X	
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.		X

Charging Site Requirements (continued)	DC Fast Chargers	Level 2 Chargers
10. Each interstate charging site should, at a minimum, meet current FHWA requirements. At this time DC fast chargers should 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.	X	
11. All charging ports/connectors must be capable of supplying a minimum of 6.6kW to any vehicle connected.		X
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%.	X	X
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.	X	X
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.	X	X
15. Sites should include a customer service support telephone number that is available 24 hours per day, seven (7) days a week, and clearly posted to assist customers with difficulties accessing or operating the charging station.	X	X
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.	X	X
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.	X	X
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.	X	X
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).	X	X
20. Site utilization data shall be made available upon request for a period of five (5) years after initial operation.	X	X

7. Policies

A. Building Codes

Electric vehicle sales are already approaching 5% of new car sales in North America, and industry analysts project this number could reach 20% by the year 2030. 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 electric vehicles.

There are three basic types of infrastructure requirements that can be implemented through residential and commercial building codes:

1) EV-Capable: install electrical panel capacity with a dedicated branch circuit and a continuous raceway from the panel to the future EV parking spot.
2) EVSE-Ready Outlet: Install electrical panel capacity and raceway with conduit to terminate in a junction box or 240-volt charging outlet (typical clothing dryer outlet).
3) EVSE-Installed: Install a minimum number of Level 2 EV charging stations.

B. State of Alabama 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.

C. Signage

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 are generally required to design their signage programs around federal standards and guidance issued through FHWA's Manual on Uniform Traffic Control Devices (MUTCD). Figure 11 provides examples of General Service Signs, Specific Service Signs, and Supplemental Messages, which are permitted on Specific Service sign logo panels.

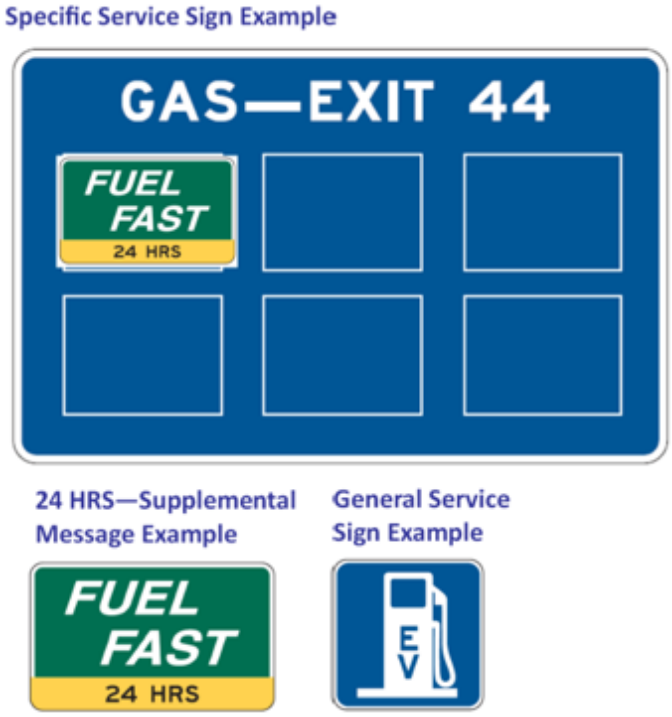


Figure 11. Examples of General Service Signs, Specific Service Signs, and Supplemental Messages

In December 2020, FHWA proposed changing the MUTCD to limit EV charging station signage to the General Service sign category and only allow supplemental messages for EV charging to be placed on gasoline station logos. Many stakeholders submitted letters through an associated public comment process urging FHWA to create parity between alternative fueling stations and gasoline station signage rules. FHWA was also urged by many commenters to grant states flexibility in deciding between General Service signs or Specific Service signs when incorporating alternative fuel station signage into existing signage programs.

The Alabama Clean Fuels Coalition (ACFC) co-leads a regional group called the Southeast Corridor Council (SCC) that organizes regular monthly stakeholder calls around various topics related to alternative fuel corridor development and planning. The Alabama Department of Transportation has participated, delivering valuable insights that have helped stakeholders better understand how states approach signage policy decisions.

The IIJA contains language instructing federal agencies to establish recommendations for EV charging station signage. ***Once federal guidance is finalized, the state of Alabama should incorporate EV charging signage into its highway signage program in a manner that raises public awareness about the availability of charging stations and helps drivers locate EV charging stations.***

8. Funding

Alabama is in an excellent position to make the most of recently committed federal funds by leveraging them to create opportunities for communities in all areas of the state to tie into the rapidly developing national electric vehicle charging network.

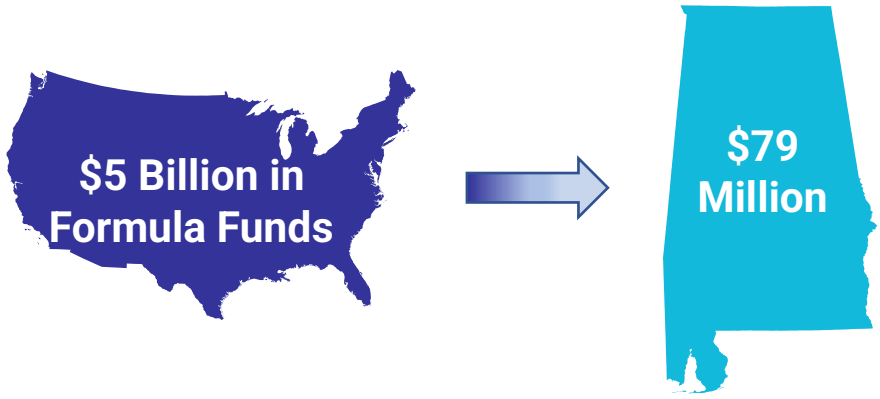
By 2030, EV owners are expected to spend an additional $36 million per year on goods and services while stopped to charge. Annual EV registration fees will generate an additional $22-85 million per year to maintain roads and bridges.

EV owners typically charge at home where they realize tremendous savings on transportation fuel. However, cross-state and cross-country travelers driving EVs follow charging corridors and spend money along the way. By 2030, if Alabama fully embraces the establishment of its own strategic EVSE network, communities and businesses will benefit from an estimated $36 million per year that EV owners will spend on goods and services while stopped at locations to charge their vehicles. Also, by 2030, annual Alabama EV registration fees will provide between $22 million and $85 million per year to maintain roads and bridges under medium and high adoption scenarios.

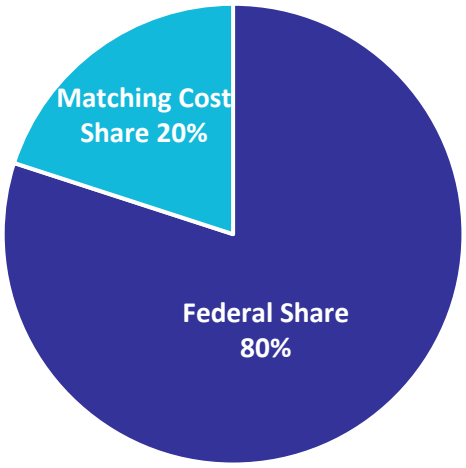
Alabama has an opportunity to set itself apart from other states when it comes to smart, multistakeholder EVSE deployment. Whether the state has one or multiple agencies administering various grant programs, an overall commitment to collaborate and avoid waste and confusion will benefit the state and its citizens. Confusion and frustration have been reported in other states where governments have implemented multiple overlapping programs and incentives operated independently of each other. Clear funding priorities will advance broad goals of catalyzing the market for consumer and commercial EV adoption and create opportunities for communities all over the state to attract electric vehicle travelers. Alabama's thriving automotive manufacturing industry will also benefit.

A. Federal Funding

1. Formula



The National Electric Vehicle Formula Program (NEVFP), established through the Infrastructure Investment and Jobs Act, will deliver Alabama an estimated $79 million over the next 5 years for EV charging stations on federally designated routes.



While Congress gave discretion to the Secretary of the U.S. Department of Transportation to develop program guidance, the law is very clear about major funding priorities and other elements of the program.

To receive these funds, the state must first submit a strategic deployment plan to the federal government. While this plan may need minor updates to serve that purpose, it is consistent with the objectives detailed in the law. The state will be required to show progress acting on its plan over time or the federal government could reclaim control of these funds and award them to projects in other states. Establishing an ongoing EV planning process for the state would prevent this from occurring.

There is no option to transfer these funds to other DOT priorities such as traditional road and bridge construction or maintenance. Also, the law clearly defines that building out FHWA-designated electric vehicle charging alternative fuel corridors will be the primary and initial goal of this program.

Once Alabama's federal charging corridor buildout is deemed to have been completed by the U.S. Department of Transportation, the state may be able to deploy NEVFP funds to support projects

in other public locations such as parking facilities at public buildings, public schools, and public parks, or in publicly accessible parking facilities owned or managed by private entities.

The state should deploy National Electric Vehicle Formula Program funds to build out DCFC charging capacity along Interstates 65, 565, 59, 459, 20, 85, 10, and 22.

The National Electric Vehicle Formula Program funds may be leveraged to maintain an up-to-date data driven mapping and analysis capacity that allows a city, county, or other political subdivision, or a local agency, to compare and evaluate different adoption and use scenarios for electric vehicles and electric vehicle charging stations. This will protect investments being made with public dollars, encourage private participation in project financing, and close critical public-access charging infrastructure gaps which are the most significant barrier curtailing or delaying EV adoption across the country. The following activities will be eligible uses of NEVFP funding (click here to read the relevant bill language):

- To evaluate the locations of current and future electric vehicle owners.
- To forecast commuting and travel patterns of electric vehicles 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 electric vehicle charging stations to support the adoption and use of electric vehicles 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 electric vehicles and electric vehicle charging stations.

2. Charging On Federal Public Lands

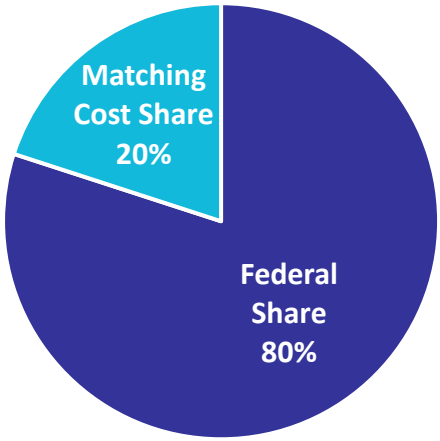
Out of the $5 billion appropriated for the NEVFP nationally, federal agencies with natural resource and land management responsibilities—like the Forest Service, Fish and Wildlife Service, and National Park Service—will each be allocated $7 million per year for projects to install EVSE on federal lands. Alabama's federal public lands, which could benefit from this set-aside of funds, includes 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.

Federal agencies that manage public lands within the state will have funding to install EVSE as part of the National Electric Vehicle Formula Program. Alabama-based entities that work to protect, promote, and support Alabama's federally managed public lands should inquire with the appropriate federal agencies to request chargers in Alabama.

3. Competitive Grants for Charging and Fueling Infrastructure

Section 11401 of the Infrastructure Investment and Jobs Act creates a new $2.5 billion federal grant program to deploy publicly accessible electric vehicle charging, and hydrogen, propane, and natural gas fueling infrastructure along FHWA designated corridors and certain other locations. To learn more about Alabama's FHWA-designated alternative fuel corridors, see Section 6.A of this plan.

Eligible applicants for funding under the Grants for the Charging and Fueling Infrastructure program will include states, MPOs, Local Governments, special purpose districts and authorities, and Indian tribes. Applicants may partner with other entities and apply to the federal government for project funding. The federal government is required to issue guidance for the competitive federal grant program before November 15, 2022.



B. Private Sector Investment

1. Private EVSE Funding

Private and other Non-Federal investments in publicly accessible DCFC Stations enabled FHWA designations of all Alabama interstates except for I-22. A major investment from Electrify America installed 7 stations at Walmart and Sam's Club locations across the state of Alabama. Individual investments at vehicle dealerships throughout the state also played a significant role. More recently, Dothan Utilities has installed two DCFC stations in the southeast Alabama City of Dothan. Additionally, OEM Community Charging Programs will accelerate the deployment of charging in underserved, rural, and urban communities.

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)

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.

UTILITIES

- Dothan Utilities (Dothan, AL) installed publicly accessible DC Fast Chargers in Dothan, AL.
- 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 DC Fast Chargers along I-59 in Fort Payne, which are expected to open in Q1 2022.

2. Encouraging/Attracting Additional Private Investment

Establishing clear and consistent guidance across all state-administered EV-related grant and funding programs will lead to a better experience for applicants and a more efficient deployment of funds. All of this will lead to additional private EVSE investment in Alabama.

Entities that install EVSE in Alabama will benefit from some of the state-level decisions around the regulation of resellers of electricity for vehicle charging.

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. Commentators 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.

C. State Funding

Since 2019, Alabama has instituted three state-level funding programs that include support for electric vehicle charging infrastructure, electric vehicle infrastructure planning, and electric vehicle consumer education and awareness. First, in 2019, the state imposed annual registration fees on BEVs and PHEVs with the first 75% of the proceeds divided among state, county, and local governments and intended for road and bridge maintenance. The remaining 25% is reserved for EVSE projects. Second, Alabama established a state-funded EVSE grant program at the Alabama Department of Economic and Community Affairs (ADECA), providing direct funding in 2020 and 2021. Third, the state established an EV technology education program to raise consumer awareness about the benefits of EV adoption, also providing funding for this program in 2020 and 2021. State funding can supplement and complement federal funding and private funding and lead to better results for the state and its citizens.

Table 7. State Funding Towards EVSE and EV Education

EVSA Funding Source	Funding Provided	Funds Deployed	Funds Remaining
Volkswagen Settlement	$3,248,000	$3,248,000	$0
EV Infrastructure and Planning at ADECA	$3,000,000	$1,000,000	$2,000,000
EV Technology Education Program at ADECA	$2,000,000	$1,350,000	$650,000

ALABAMA ELECTRIC VEHICLE INFRASTRUCTURE AND PLANNING GRANT PROGRAM AT ADECA: The Legislature established the Electric Vehicle Infrastructure and Planning Grant Program in 2020 and has provided $3 million to the program since its inception. ***The state should continue to fund this program, but at a higher level. Funding this program at $5 million per year would enable the state to support EVSE projects under its own authority to ensure that no area of the state is left behind.***

REBUILD ALABAMA ACT

The state initiated a new annual EV registration fee for battery electric vehicles and plug-in hybrid electric vehicles through the Rebuild Alabama Act in 2019. Seventy-five percent of revenue from this new fee is divided among the state (67%), counties (25%), and municipalities (8%). The remaining 25% of the revenue from the EV registration fee is reserved for EVSE until registrations of EVs exceed 4% of the total annual non-trailer and semitrailer registrations within the state of Alabama. Based on low, medium, and high EV adoption scenarios, motor vehicle registration fees in Alabama are projected to generate between $5 million and $75 million annually by 2030 for local, county, and state government. To support EVSE needs in Alabama, these user fees are projected to generate between $1.9 million and $28 million annually by 2030 (see Table 8 below).

Table 8. Projected Annual EV Registration Fees (25% of total) intended for EV charging infrastructure projects (Cumulative Figures)

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

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.

The state should begin making EVSE grants using the portion of EV registration fees intended for this purpose using the same set of priorities established in Section 6.C of this plan.

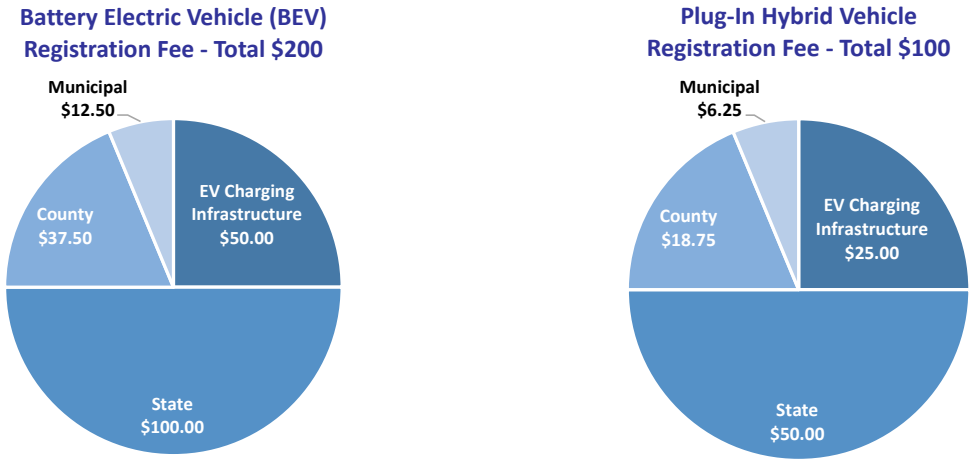


Figure 12: Breakdown of BEV and PHEV Registration Fees

ELECTRIC VEHICLE TECHNOLOGY EDUCATION PROGRAM AT ADECA

Recognizing the impending shift to electric transportation and its importance to the state's economy, Alabama has provided $2 million over a two-year period to initiate a marketing and promotions campaign raising public awareness about the benefits of EVs. Launched on November 29, 2021, this effort has been dubbed *Drive Electric Alabama. Electric Gets You There* and brings together multiple stakeholders working to promote electric transportation in Alabama. ***The state should continue to provide funding to Drive Electric Alabama, a public private partnership that supports consumer EV-related education and awareness with $2 million per year through the Electric Vehicle Technology Education Program at ADECA, including up to $500,000 for Alabama auto/truck/bus EV dealership training grants.***

Additional support for the *Drive Electric Alabama* campaign has been provided through a private Electrify America grant being leveraged by the Alabama Clean Fuels Coalition to support a smaller federal grant under which multiple state-based coalitions are collaborating on best practices. Goals of the federal grant include educating consumers, utilities, utility regulators, government officials, auto dealers, EV owners, fleet leaders and others. Activities being undertaken through Drive Electric Alabama include earned media placement, TV, radio, digital advertising, billboards, and educational events throughout the state. More information is available at www.driveelectricalabama.com.

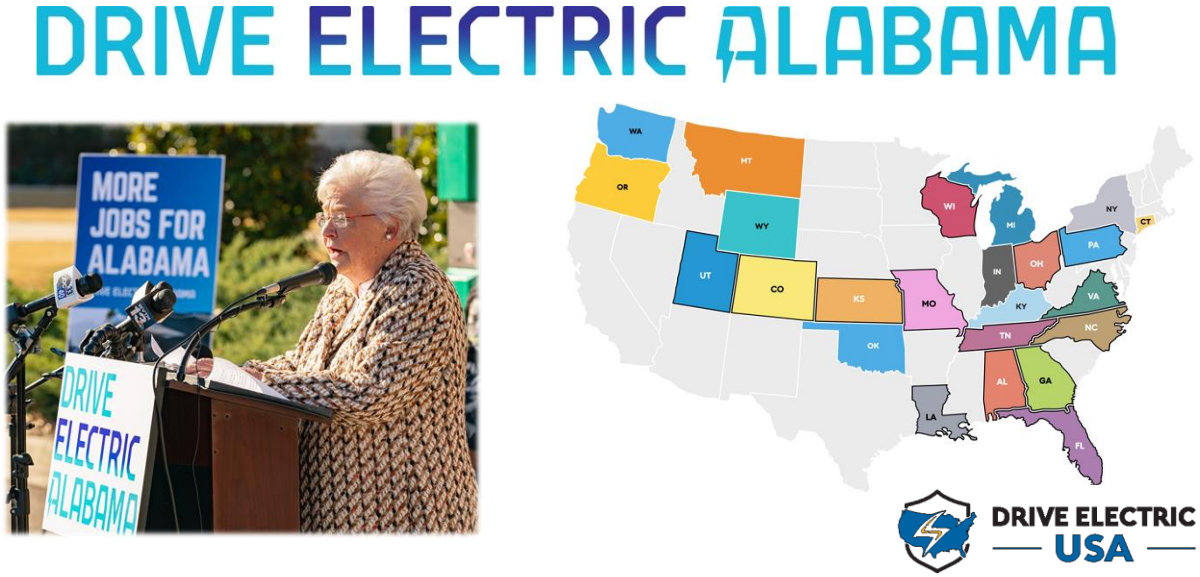


Figure 13: Drive Electric Alabama and Drive Electric USA Awareness Campaigns

ADDITIONAL EVSE FUNDING PROGRAMS

Additional EVSE funding opportunities that come to the attention of ADECA may be shared from time to time with individuals signed up through ADECA's EV and VW Information Mailing List.

D. EV/EVSE Incentive Programs

State Incentives

A number of states have adopted policies providing incentives to consumers to encourage EV adoption. Some policies provide non-financial incentives such as single-occupant vehicle access to HOV or HOT lanes, preferred parking, etc. Examples of financial incentives offered by other states include:

- Georgia offers a state tax credit for business enterprises that purchase and install publicly available EVSE for 10% of the cost up to $2,500. Georgia also offers a state tax credit for a business that manufactures alternative energy products for use in battery, biofuel, and electric vehicle enterprises. The amount of the tax credit is based on the number of new full-time employee jobs.

- Colorado offers a state tax credit for newly purchased or converted EVs. The tax credit is available for light, medium, and heavy-duty vehicles and varies in amount between $2,500 and $10,000, depending on the type of vehicle.

- Louisiana offers a state tax credit for new EVs for 10% of the purchase price, up to $2,500.

- Oklahoma offers a state tax credit for the purchase and installation of commercial EVSE for 45% of the installation cost.

Although the state of Alabama does not currently offer any incentives directly to consumers for EV adoption, it is assisting consumers and supporting the EV market through investments in EV infrastructure, planning, and consumer awareness programs.

Existing Alabama Utility Incentives

Several Alabama utilities offer incentive programs for EVs and/or EVSE. These incentives may come in the form of rate riders, rebates, or funds used to install EVSE. See Table 9 below.

Table 9. Utility Incentives Available in Alabama

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 DC Fast Chargers 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 DC Fast Chargers 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.

9. Leadership

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 and producing modern electric vehicles to serve light-, medium-, and heavy-duty vehicle markets. Alabama's automobile manufacturers, their partners, and the Alabamians who they employ are leaders in the nation and world, playing a significant role in taking electric transportation to the next level.

10. 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.
NEVFP	National Electric Vehicle Formula Program	Per the U.S. Department of Energy, as part of the IIJA, the NEVFP will provide funding to states to strategically deploy EVSE and to establish an interconnected network to facilitate data collection, access, and reliability.