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Alabama Transportation Policy Research Center

An Assessment of Alabama's Electric Vehicle Charging Infrastructure and Policies: Identifying Gaps and Needs

POLICY REPORT ATPRC-2020-001

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An Assessment of Alabama's Electric Vehicle Charging Infrastructure and Policies: Identifying Gaps and Needs

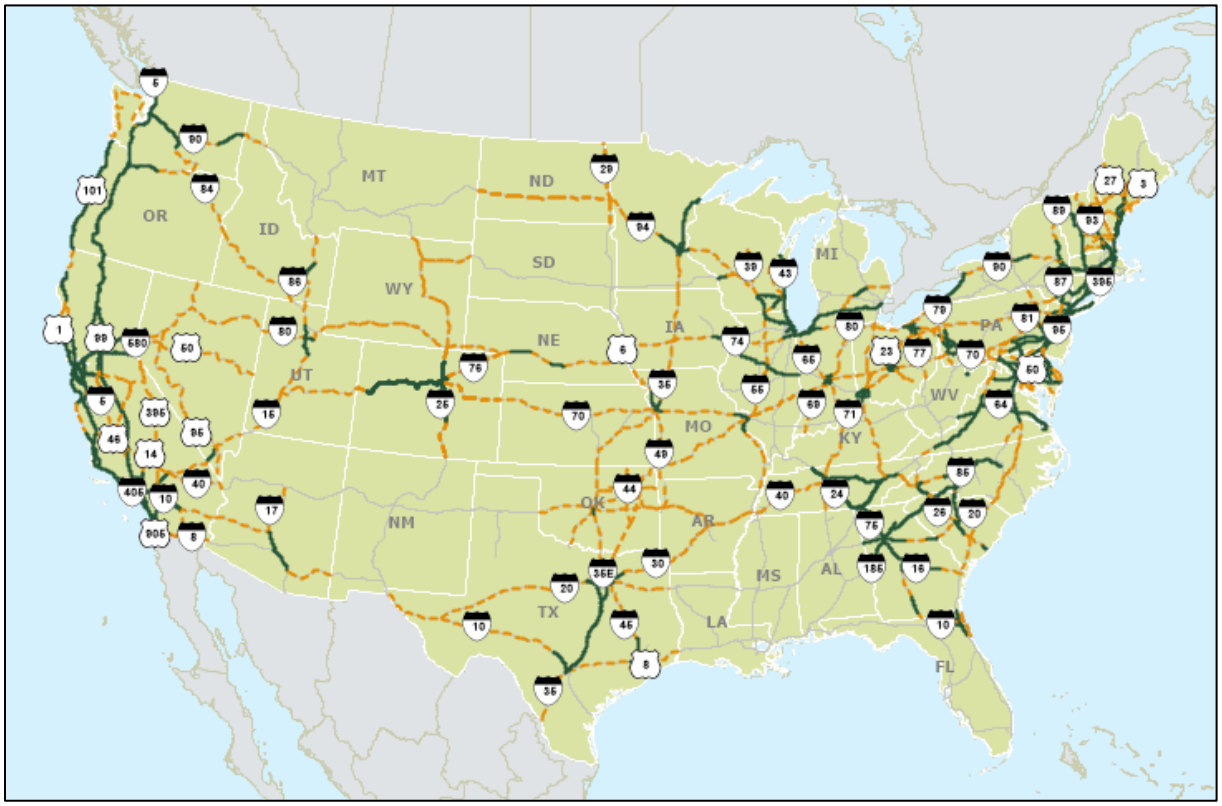
EXECUTIVE SUMMARY

Electric vehicles (EV) are increasingly being adopted worldwide as the EV industry rapidly evolves. There are more than 1.18 million EVs on the road in the U.S. with sales growing rapidly. EVs provide economic and environmental benefits but public concerns such as range anxiety and high upfront purchase costs impede sales. Potential purchasers consistently cite a lack of access to efficient charging as a significant concern. Forecasts suggest that the average range of fully electric cars available in the U.S. by 2022 will be around 275 miles and may reach 400 miles by 2028.

In Alabama, Jefferson County has the most EVs (624) followed by Madison (615), Shelby (254), Baldwin (230), Mobile (209), and Montgomery (189). Alabama has 2,487 EVs and 268 charging outlets in 115 locations for a ratio of 9.28 EVs per outlet (not counting home charging outlets).

The Federal Highway Administration offers an Alternative Fuel Corridor designation for national highway system corridors that are Corridor Ready or Corridor Pending. Alabama is not currently eligible for this designation but could be if charging stations were placed at 50 mile intervals.

Figure ES1: Alternative Fuel Corridors Across the U.S. Interstate Highway System

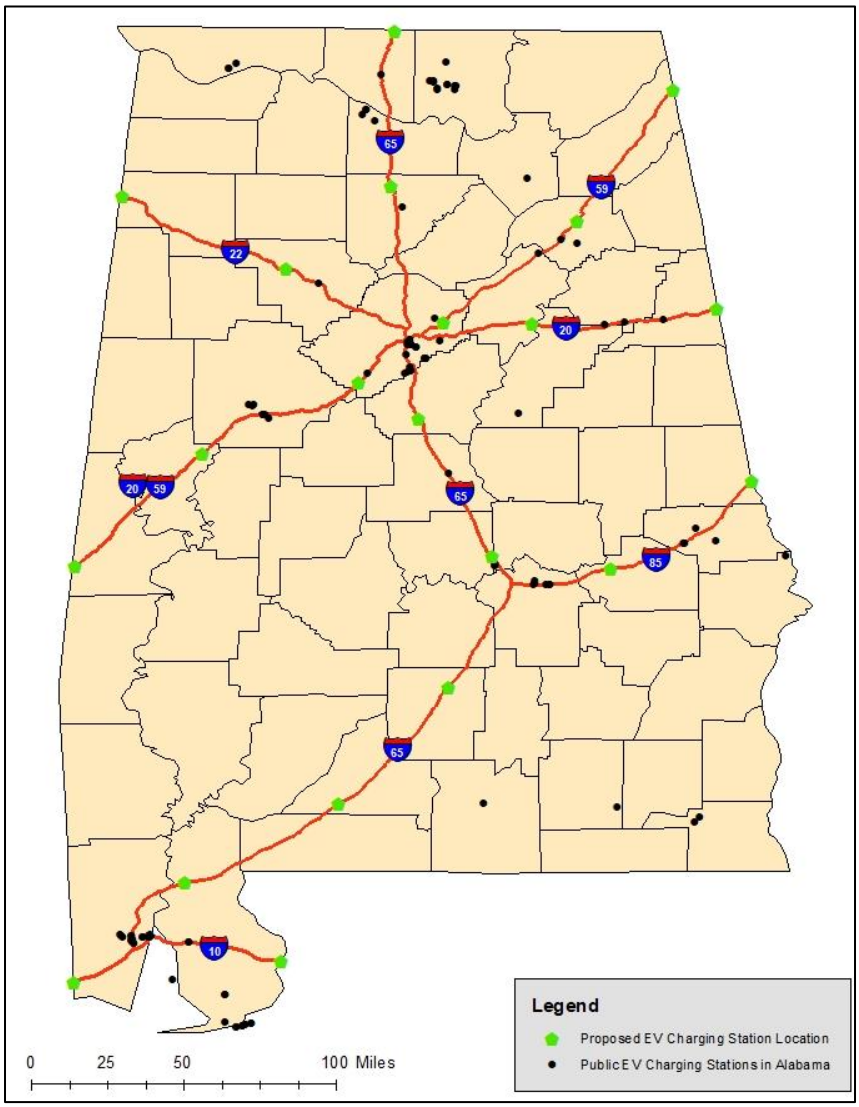


Source: https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/resources/afc_handout/afchandout.pdf

Six states offer statewide rebate incentives for the purchase of electric vehicles or electric vehicle supply equipment. Eight states and the District of Columbia offer various types of tax incentives for the purchase of electric vehicles or charging infrastructure, including vehicle license tax reductions, income tax credits, excise tax exemptions, sales tax exemptions, battery manufacturing tax incentives, and prohibitions on local taxes. Other funding sources include the Volkswagen settlement and rebates by utilities and private companies.

In Alabama, statutory and regulatory provisions may affect the expansion of electric vehicle sales and usage. These include the definition of Public Utility as it relates to electric vehicle charging stations, the prohibition on reselling and/or sharing electricity, the authority to regulate electric vehicle charging stations, and possible federal action regarding the definition of electric utility.

Figure ES2: Example EV Charging Station Placement in Alabama Along Interstate Highways



Source: ATI and https://afdc.energy.gov/stations/#/analyze?region=US-AL&show_map=true

SECTION I: Addressing Alabama's Electric Vehicle Charging Infrastructure Needs

An Overview of the Electric Vehicle Industry in the United States

Electric vehicles (EV) are increasingly being adopted worldwide as the EV industry rapidly evolves.[1] Under one growth trajectory forecast, EV producers may be expected to supply around 5% of the overall global light-vehicle market in 2020.[2] Some reported advantages of electric vehicles over vehicles powered by internal combustion engines include energy security, potential for diversification of the nation's transportation fleet, reduced impact of international energy supply disruptions on the national economy, lower fuel costs, and reduced carbon emissions.[3] For the purpose of this report, EVs include plug-in hybrid vehicles (PHEVs) and battery-operated electric vehicles (BEVs).

The EV market in the United States is currently the third largest in the world.[4] As of March 2019, there are more than 1.18 million electric vehicles on the road nationwide.[5] The volume of EV sales in the U.S. is growing rapidly (Table 1).

Table 1: U.S. Plug-In Electric Vehicle Sales by Year

Year	*Sales Volume*	*% Change in Sales from the Previous Year*
2010	345	(mass market introduction)
2011	17,735	5,041.57%
2012	52,835	197.91%
2013	96,702	83.03%
2014	118,773	22.82%
2015	114,022	-4.00%
2016	157,112	27.43%
2017	194,479	23.78%
2018	361,307	85.78%
2019 (as of July)	175,099	--

Source: Electric Drive Transportation Association. Retrieved on September 6, 2019 from https://electricdrive.org/index.php?ht=d/sp/i/20952/pid/20952

Over the next decade, the U.S. EV market is expected to grow significantly and at a higher rate than recorded over the last two decades. According to a recent EV sales forecast, 57% of all passenger vehicles sold will be electric by 2040.[6] A more conservative forecast with a shorter time horizon projects the total EV sales in the U.S. to be 4% of the fleet or 3 million EVs by 2025.[7]

Significant deterrents for people considering EVs are range and price. In one poll 62% of drivers expressed fear that an EV might run out of power before reaching its destination (range anxiety) and 60% cited high upfront purchase cost as key concerns. Other concerns include lack of model options, recharging duration, and environmental issues related to battery components.[8]

A McKinsey & Company report found that "…a lack of charging-infrastructure investment (public or private)…" is one of many persistent challenges in ensuring continuous electric-vehicle uptake in the U.S.[9] Another reports echoes the same theme -- lack of access to efficient charging could become a roadblock to the expansion of the electric vehicle market.[10] A path to ensuring sustainable market growth and accelerating the EV industry further therefore involves addressing range anxiety by ensuring a basic level of EV charging infrastructure.

Examples of effective EV promotion are found in other countries. The countries that currently lead in electric mobility support a variety of measures such as fuel economy standards along with local and national-level fiscal incentives for zero and low-emission vehicles. Additionally, leading EV markets like China and Europe promote economic tools to support the battery technology value chain, bridge the cost gap between electric and conventional vehicles and support the development of charging infrastructure.[11]

Electric Vehicles in the U.S. Market: Models and Features

Electric vehicles can typically be divided into two main types: plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). While PHEVs use two types of energy sources and run on both an internal combustion engine and an electric motor, BEVs only use an electric propulsion system. The distance that BEVs travel depends on the battery capacity.[12]

The driving range of a BEVs is defined as the distance that one full battery charge allows. Different models of electric vehicles report different driving ranges. Between 2011 and 2019, on average, automakers have increased the battery range of their BEV models by 15% per year.[13] Forecasts suggest that the average range of fully electric cars (BEVs) available in the U.S. by 2022 will be around 275 miles and may reach 400 miles by 2028.[14] Such an increase is equivalent to the average range growth rate of 25 to 40 miles every two to three years. The estimates are based on the range of EVs that are currently present in the U.S. market.[15]

At the same time, the average driving range in the U.S. may change in the upcoming years as new models produced by foreign companies enter the market. For example, some of the major Chinese electric car producers such as GAC Motor, Byton and NIO plan to launch their production in the United States in the upcoming years. Some of the latest models (such as GAC Motor's Aion LX and Byton's M Byte 95) will offer driving ranges between 250-373 miles, depending on the model.

The average driving range of EVs grows from year to year. Therefore, latest EV models may have significantly higher driving ranges than EV models issued a few years ago. The driving range values for some of the most popular EV options currently available in the U.S. are provided in Table 2.[16]

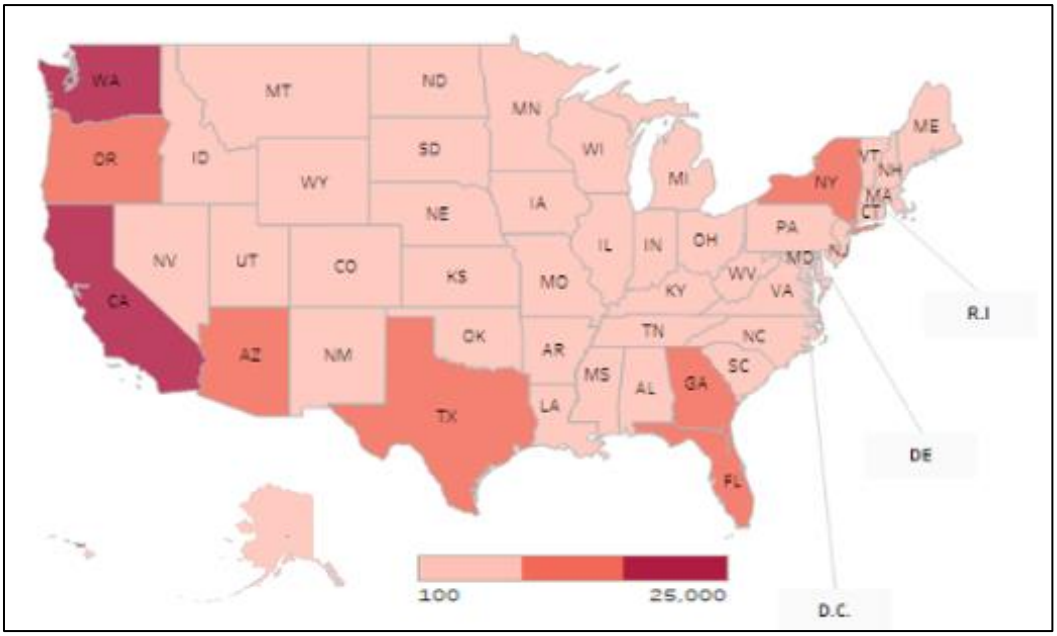
Table 2: Models and Ranges of EV Vehicles in the U.S. Automobile Market

2019 EV Model	*Range (Miles per Charge)*
Tesla Model S	335 miles
Tesla Model 3	310 miles
Tesla Model X	295 miles
Hyundai Kona Electric	258 miles
Audi E-Tron	248 miles
Kia Niro EV	239 miles
Chevrolet Bolt EV	238 miles
Jaguar I-Pace	234 miles
Nissan Leaf E+	226 miles
Volkswagen e-Golf	125 miles
Kia Soul EV	111 miles

The Electric Vehicle Market in Alabama

In Alabama, as of April 22, 2019, there were an estimated 2,300 registered EVs which represents roughly 0.05% of the 5 million vehicles currently registered in the state.[17] Figure 1 and Figure 2 illustrate the number of light-duty EV registration counts by state (*as of December 31, 2017*) and by Alabama county (*Note: This registration count only captures registrations of EVs in fiscal year 2017 [10/01/2016 to 09/30/2017*]).

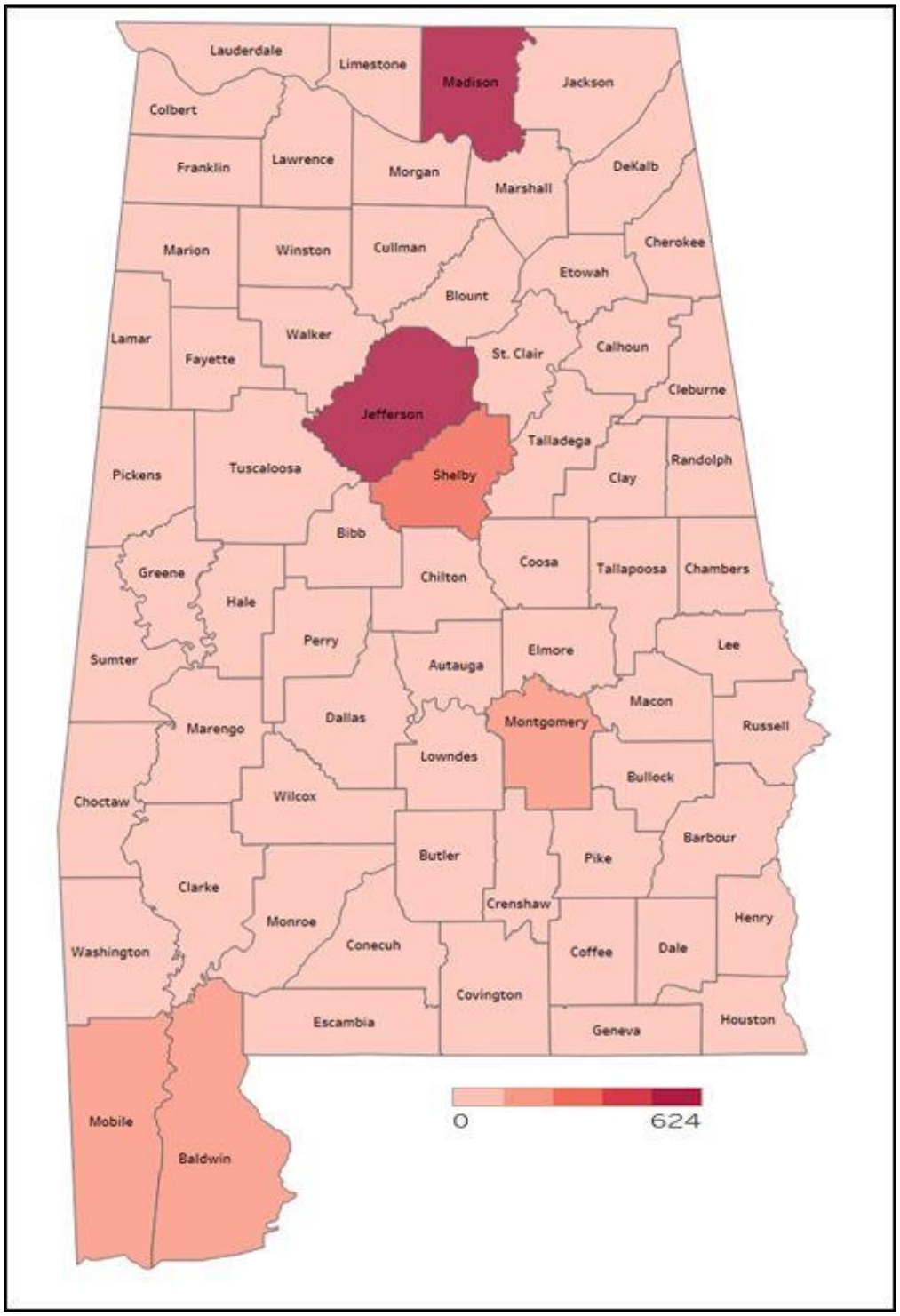
Figure 1: Number of EV Registrations by State as of 12/31/17



Source: U.S. Department of Energy. Electric Vehicle Registration Counts by State. Alternative Fuel Data Center. Retrieved on 9 September 2019 from https://afdc.energy.gov/data/10962

Per Figure 2, Alabama counties with the most registered EVs in fiscal year 2017 were Jefferson (624), Madison (615), Shelby (254), Baldwin (230), Mobile (209), and Montgomery (189).

Figure 2: Number of EV Registrations by Alabama County, FY 2017



Source: ATI analysis of Alabama Department of Revenue data

EV Charging Infrastructure: Placement Strategy

The rapid development of EVs creates a demand for EV charging facilities.[18] Although the majority of EV owners charge their vehicles at home, the process is time-consuming and usually takes about 6-8 hours which is at least 12 times longer than the charging time at charging stations with high voltage.[19] The alternating-current charging available at home (also known as Level 1 and Level 2 charging) is currently available for most homes. Distribution of EV charging stations outside the home may determine EV drivers' accessibility to energy and therefore affects the EV flow and even traffic conditions in the road network.[20] Without efficient planning of EV charging infrastructure and related roadways, the introduction of EVs can result in traffic congestion issues with the queuing time of EVs having a negative impact on traffic.[21]

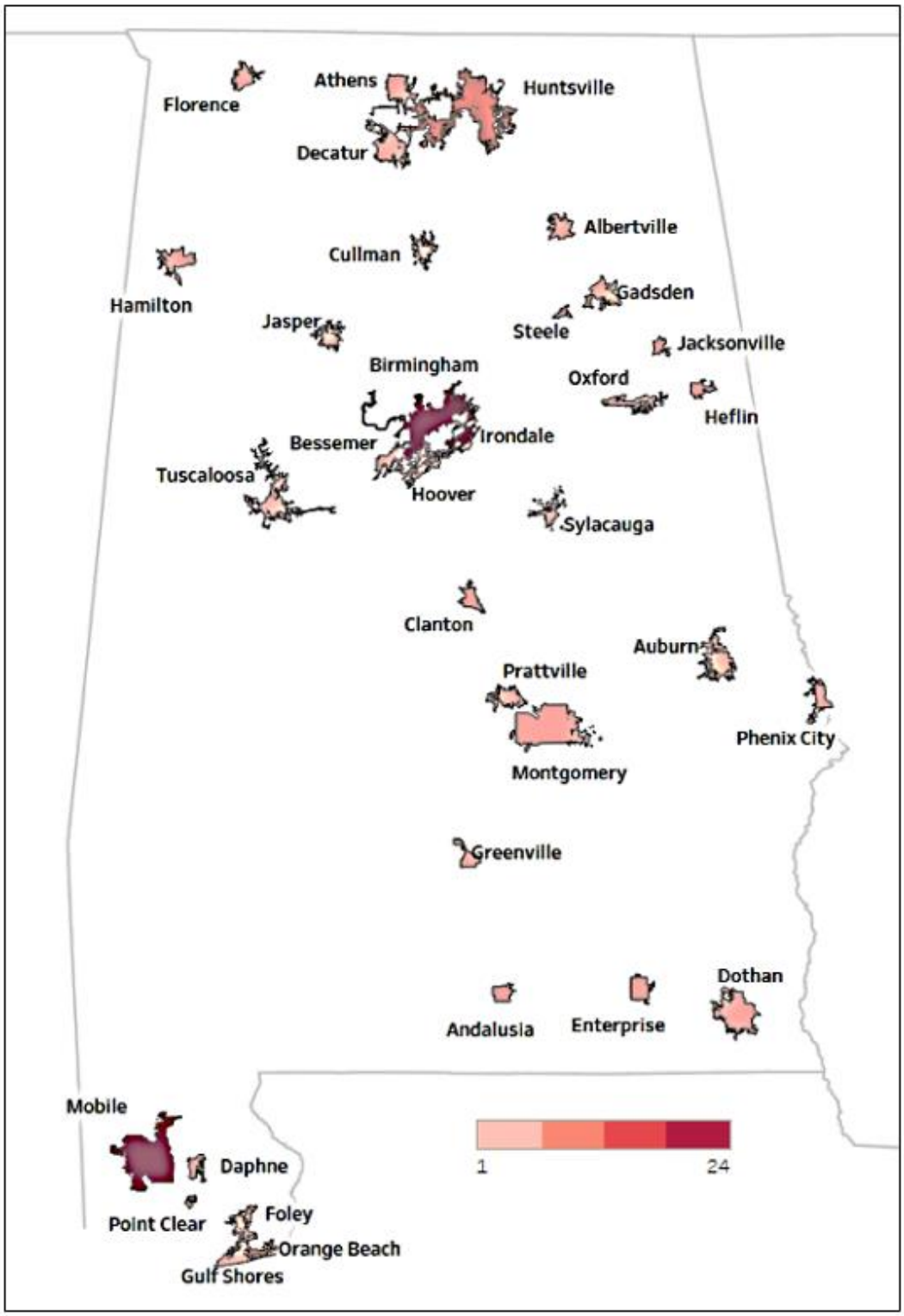
To ensure the sustainable operation of the EV infrastructure system, a thorough charging facilities placement strategy may require conducting geospatial and economic analyses and accounting for the distribution of electricity network, EV drivers' charging behaviors, traffic congestion patterns, queuing time at charging stations, and other factors.[22] A number of academic studies describe mathematical models that may help investigate effective placement strategies for charging stations. Most suggested approaches consider (a) socio-demographic factors such as population density, parking location, and expected demand for charging stations, and (b) the technical features of the electricity grid.[23]

Regional differences should also be taken into account. For example, low-rise residential homes with parking garages may have building structure and electricity demands and infrastructure that would be very different compared to high-rise multi-apartment buildings.[24]

Besides an area's socio-demographic characteristics and infrastructure features, an effective placement strategy for charging stations should account for behavioral factors. For example, an understanding of EV drivers' preferences regarding queuing time or waiting for an open charging slot and an acceptable length of time to charge the vehicle would be beneficial to optimize queuing time at charging stations. Long queuing times cause frustration among drivers and discourage the use of EVs.[25]

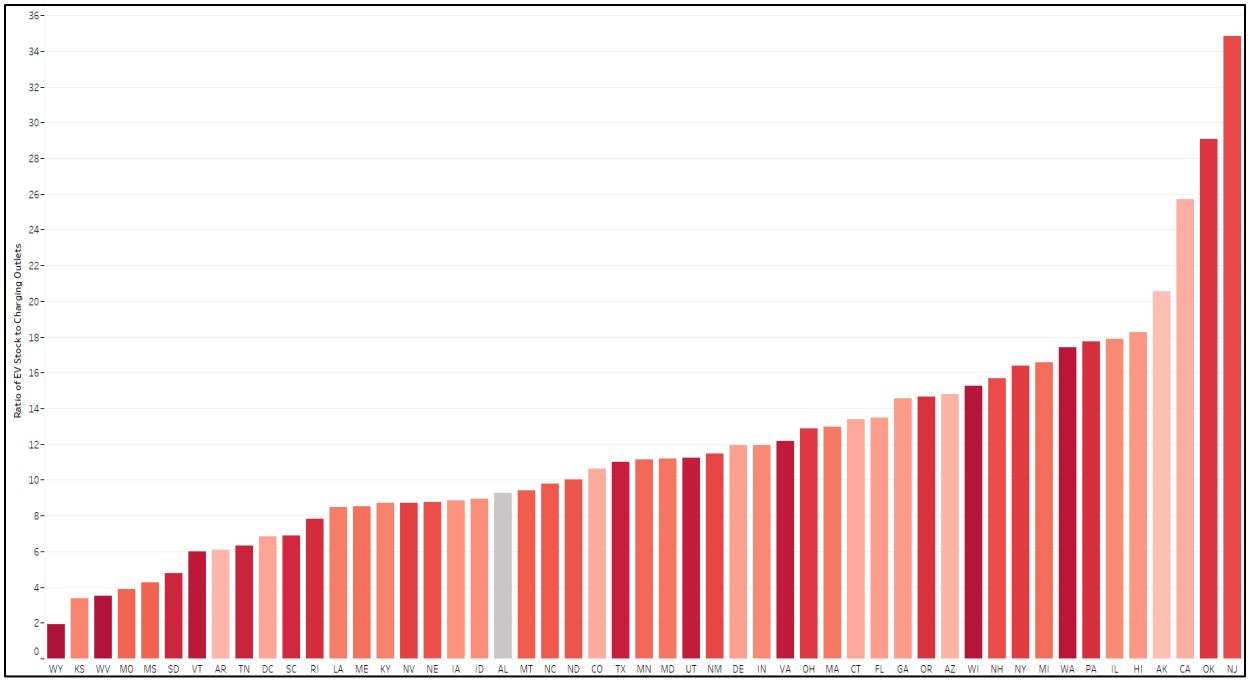
The following figures illustrate different measures of charging station availability. Figure 3 demonstrates charging station availability in Alabama cities. Figure 4 compares the ratio of EVs to charging outlets in each state. For example, according to EVAdoption.com, as of December 31, 2018 Alabama had 2,487 EVs, and 268 charging outlets in 115 locations for a ratio of 9.28 EVs per outlet.

Figure 3: Number of EV Charging Stations per Alabama City



Source: U.S. Department of Energy (n.d). Alternative Fuels Data Center. Alternative Fueling Station Locator. Retrieved on 3 September 2019 from https://afdc.energy.gov/fuels/electricity_stations.html

Figure 4: Ratio of EV Stock to Charging Outlets by State



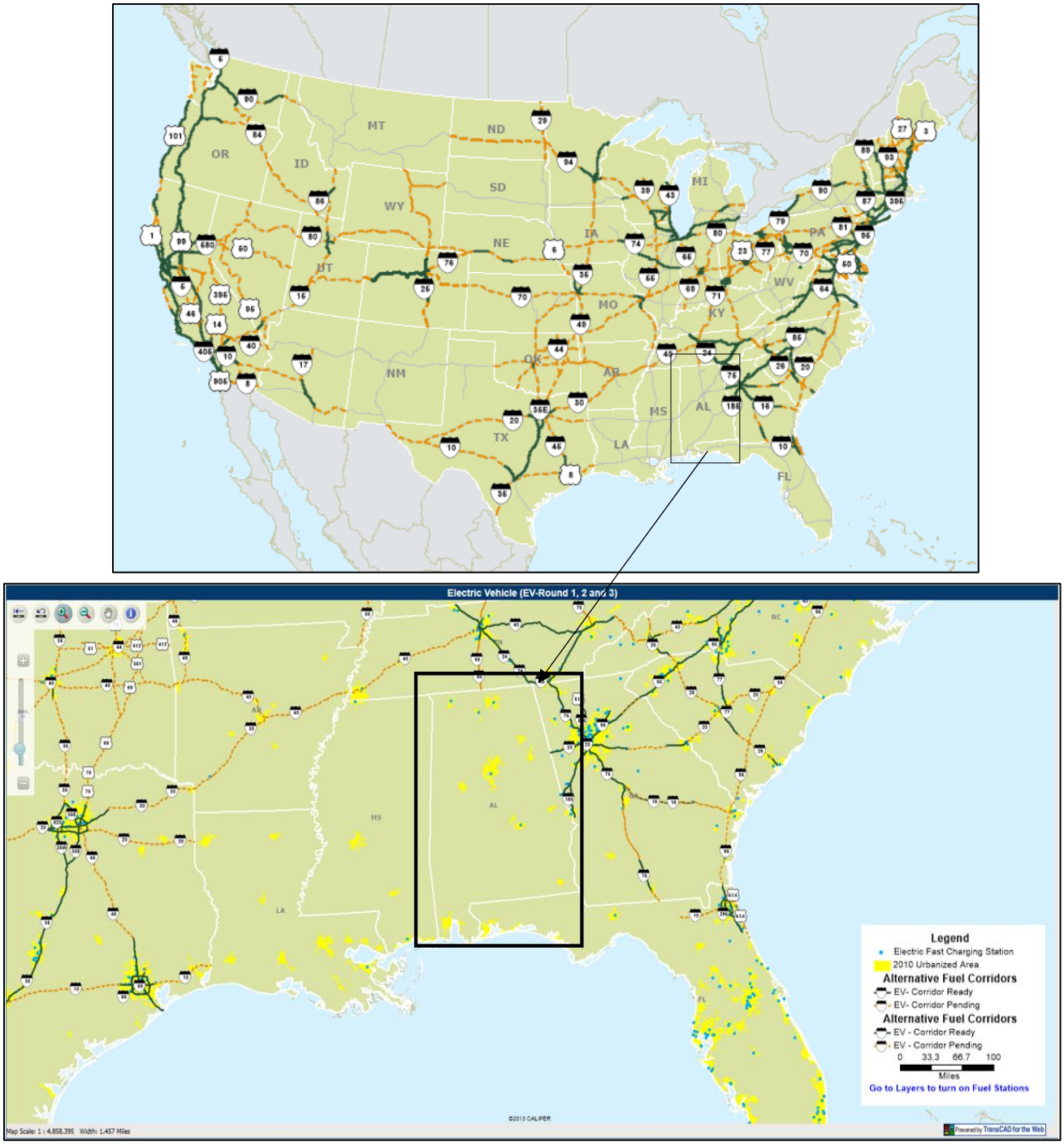
Note: The table only captures data for EV stock up to Dec. 31, 2018 and charging outlets through April 5, 2019.
Source: EVAdoption. Charging Stations By State. Retrieved on 10 September 2019 from https://evadoption.com/ev-charging-stations-statistics/charging-stations-by-state/

Alternative Fuel Corridors

Beginning in 2016, following the passage of Section 1413 of the Fixing America's Surface Transportation (FAST) Act, the Federal Highway Administration (FHWA) started designating electric vehicle (EV) charging, hydrogen, propane, and natural gas fueling corridors along the nation's interstate highways.[26] With the help of other entities including local and state governments, FHWA is designating a national network of alternative fueling and charging infrastructure along national highway system corridors.

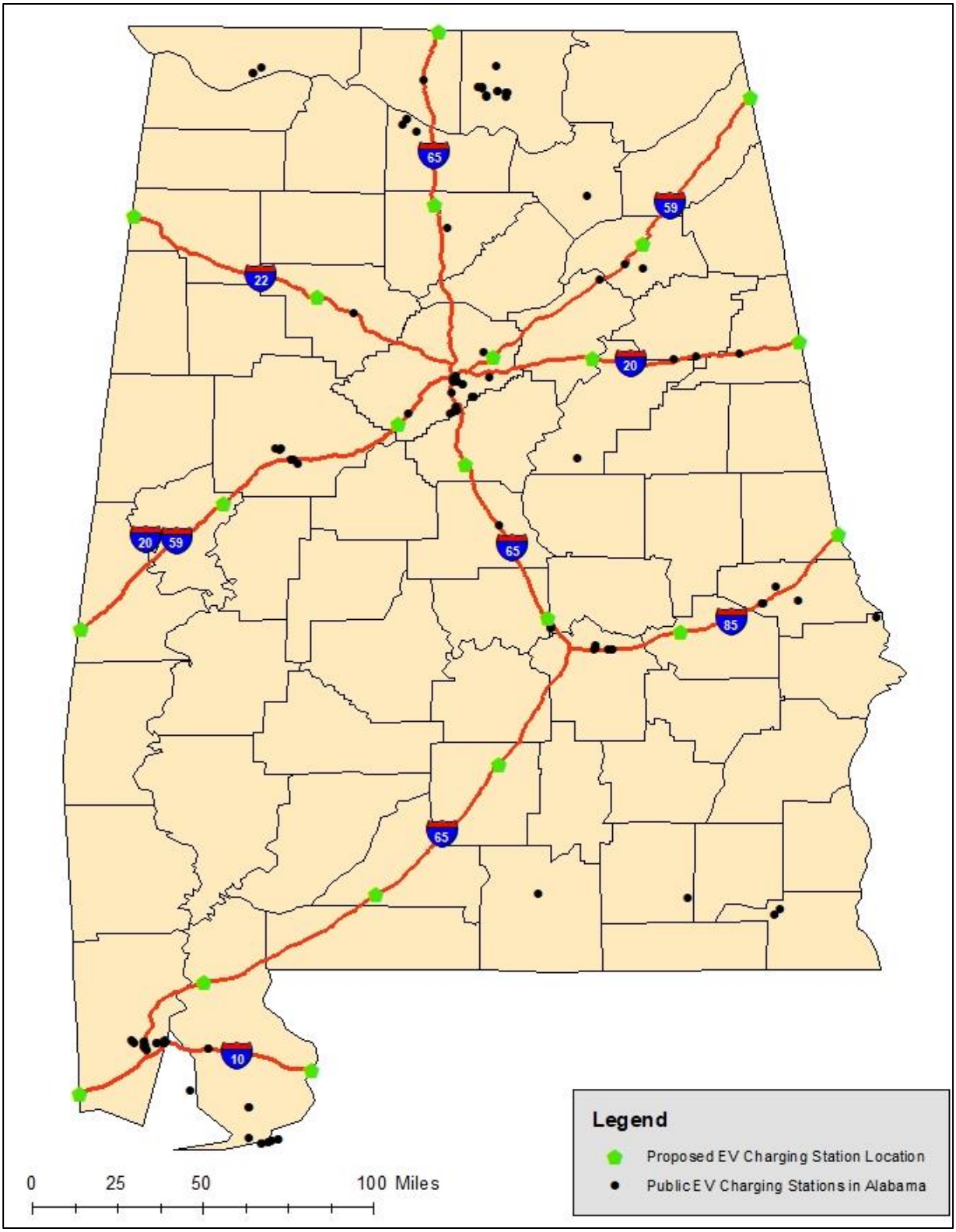
Since 2016, three rounds of designation (2016, 2017, and 2018) have been completed, with 79 nominations, including segments of 100 Interstates, along with 76 US highways/state roads, in 46 states in addition to the District of Columbia (D.C.)[27] FHWA designates highway segments as either "Corridor Ready" or "Corridor Pending." For EVs, a corridor-ready designation indicates the presence of certain EV charging facilities at 50-mile intervals. No Alabama highway segments are designated as EV corridor-ready or EV corridor-pending (Figure 5). In order to overcome this gap, Alabama would need EV charging infrastructure meeting federal criteria along at least one interstate highway. Figure 5 illustrates an example EV charging stations placement scheme that would allow Alabama to receive EV corridor-ready designations for multiple corridors.

Figure 5: Alternative Fuel Corridors Across the U.S. Interstate Highway System with Alabama Highlighted



Source: U.S. Department of Transportation Federal Highway Administration. (2018) Electric Vehicle (EV-Round 1, 2 and 3. Retrieved on September 10, 2019 from https://hepgis.fhwa.dot.gov/fhwagis/ViewMap.aspx?map=Highway+Information|Electric+Vehicle+(EV-Round+1,+2+and+3)#

Figure 6: Example EV Charging Station Placement in Alabama Along Interstate Highways



Source: ATI and https://afdc.energy.gov/stations/#/analyze?region=US-AL&show_map=true

SECTION II: Innovative Electric Vehicle Incentives Implemented by State Governments Across the Country

Effectiveness of Electric Vehicle Incentives

As states look to encourage the adoption of electric vehicles, they are offering various forms of incentives meant to encourage the adoption of electric vehicles or electric vehicle supply equipment. Currently, 45 states and the District of Columbia offer incentives for plug-in hybrid and/or electric vehicles. Incentives at the state level may be monetary incentives like tax credits or rebates, or they could be non-monetary such as permitting solo drivers of electric vehicles to use high-occupancy lanes or offering specialized parking spaces for electric vehicles. As states offer incentives, they may be interested in which incentives are most likely to increase EV adoption. Research shows that tax incentives and strategic placement of charging infrastructure located along highways significantly influence per capita PEV purchases. Within tax incentives, rebates are the most effective form of incentives because the value is clear to the buyer at the time of the transaction.[28] In addition to incentives from state or local governments, electric utility providers and private companies also offer incentives to increase the adoption of electric vehicles and electric vehicle supply equipment (EVSE).[29]

Statewide Rebate Incentives

Six states have statewide rebate programs for the purchase of electric vehicles or electric vehicle supply equipment, which research suggests are the most effective form of incentive to increase electric vehicle adoption. The states with rebate programs are California, Delaware, Massachusetts, New York, Oregon, and Pennsylvania (Table 3). Additionally, in California several municipalities have rebate programs for their residents.[30]

Table 3: Statewide Rebate Incentives

State	Incentives
California	**Statewide Rebates** • Clean Vehicle Rebate Project (CVRP) offers up to $2,500 for the purchase or lease of BEVs, and $1,500 for the purchase or lease of plug-in hybrid electric vehicles (PHEV). • Qualifying low-income households may receive an additional $2,000. **Local Rebates** • City of Riverside provides a $500 rebate for PEV purchases. • San Joaquin Valley's "Drive Clean!" rebate program offers qualifying residents up to $3,000 for the purchase or lease of a PEV. • The City of Anaheim provides a $400 rebate and a city permit fee waiver for a level 2 charger installation.
Delaware	**Statewide Rebates** • The Delaware Clean Vehicle Rebate Program offers a rebate of up to $3,500 for the purchase or lease of a BEV, and $1,500 for a PHEV and for the conversion of an ICE engine to an EV. BEV and PHEV with a MSRP of $60,000 or more receive a $1,000 rebate. The rebate applies to vehicles purchased or leased between November 1, 2016 and December 31, 2019. • The Delaware EV Charging Equipment Rebate Program offers a rebate for new Level 1 or Level 2 chargers up to $500 at a residential site, up to $2,500 at a commercial site and up to $5,000 for a workplace. The rebate applies to electric vehicle charging stations purchased between November 1, 2016 and June 30, 2018.
Massa-chusetts	**Statewide Rebates** • As of 1/1/19, the Massachusetts Offers Rebates for Electric Vehicles (MOR-EV) program offers rebates for the purchase or lease of BEVs with a $50,000 MSRP cap through 9/30/19. Vehicle must be registered in MA. Funding is available on a first come, first serve basis
New York	**Statewide Rebates** • The Drive Clean Rebate for Plug-In Electric Vehicles offers up to $2,000 for a BEV or PHEV.
Oregon	**Statewide Rebates** • The Clean Vehicle Rebate Project provides a $1,500 rebate for PEVs with <10kWh battery capacity, and $2,500 for PEVs with >10kWh battery capacity. For low and moderate-income drivers who replace their cars that are at least 20 years old with an electric vehicle, they will receive an additional $2,500.
Pennsyl-vania	**Statewide Rebates** • New program guidelines are in effect until 12/31/19 - the Alternative Fuels Incentive Grant Program offers rebates up to $1,500 for the purchase or lease of a new PEV (based on kWh battery capacity); one-time preowned vehicles may qualify for a $750 rebate, and low-income individuals may qualify for an additional $1,000 rebate. Used PEVs may qualify for a $1,000 rebate

Source: https://pluginamerica.org/why-go-plug-in/state-federal-incentives/

Statewide Tax Incentives

States offer various types of tax incentives for the purchase of electric vehicles or charging infrastructure. The tax incentives that states offer include vehicle license tax reductions, income tax credits, excise tax exemptions, sales tax exemptions, battery manufacturing tax incentives, and prohibitions on local taxes. Eight states and D.C. offer statewide tax incentives: Arizona, Colorado, Louisiana, Montana, New Jersey, South Carolina, Utah, and Washington (Table 4).[31]

Table 4: Statewide Tax Incentives

State	Incentives
Arizona	**Vehicle License Tax Reduction** • BEVs qualify for a reduced vehicle license tax (VLT) and are exempt from emissions testing. The VLT is changed to a rate of $4 per $100 of assessed valuation, which is determined by 1% multiplied by the factory list price in the first year and 15% depreciation for subsequent years. The minimum VLT is $5.
Colorado	**Income Tax Credit** • Colorado offers an income tax credit of $5,000 for those that purchase an EV and $2,500 for those who lease an EV, with decreasing amounts until 1/1/22.
D.C.	**Excise Tax Exemption** • Qualified PEVs are exempt from the excise tax imposed on an original certificate of title. The original purchaser and subsequent purchasers of the same vehicle are eligible for the excise tax exemption. The District of Columbia Department of Motor Vehicles (DMV) has the authority to determine which PEVs qualify. • A tax credit is also available for 50% of the equipment and labor costs for the purchase and installation of alternative fuel infrastructure on qualified AFV fueling property. The maximum credit is $1,000 per residential electric vehicle charging station, and $10,000 per publicly accessible AFV fueling station
Louisiana	**Income Tax Credit** • PHEVs are eligible for a tax credit of 10% of the cost of the vehicle, up to $2,500. To qualify, the PHEVs must be registered in Louisiana. The tax credit goes until 1/1/22.
Montana	**Income Tax Credit** • A tax credit for the conversion of a vehicle to a BEV is available for 50% of the equipment and labor costs incurred, up to $500 for vehicles < 10,000 lbs and up to $1,000 for vehicles > than 10,000 lbs.
New Jersey	**Sales Tax Exemption** • A sales tax exemption is available for the purchase or lease of BEVs.
South Carolina	**Battery Manufacturing Tax Incentive** • Battery manufacturing tax incentive (the taxable market value of manufacturing machinery and equipment purchased for use at a renewable energy may be reduced by 20% of the original cost)
Utah	**State Fuel Tax Exemption** • Propane, natural gas, electricity, and hydrogen, also known as clean fuel or special fuel, used to operate motor vehicles are exempt from state fuel taxes, but subject to a special fuel tax at the rate of 3/19 of the conventional motor fuel tax. A reduction in special fuel tax is permissible if the fuel is already taxed by the Navajo Nation. Retailers, wholesalers, and suppliers of special fuel are eligible for a refund of the special fuel tax if dyed diesel fuel is mixed with special fuel and the mixed special fuel is returned to the refinery.
Washing-ton	**Sales Tax Exemption** • Effective 1/1/20, BEVs and qualifying PHEVs are eligible for a sales tax exemption for the purchase or lease of the vehicle. There is an MSRP cap of $45k for new vehicles, and $30k for used vehicles.

Source: https://pluginamerica.org/why-go-plug-in/state-federal-incentives/

Funding for Electric Vehicle Charging Infrastructure

Research shows charging infrastructure and their placement are important factors in the adoption of electric vehicles. States currently use a variety of methods to fund charging infrastructure. Alabama and Washington both use a portion of the electric vehicle annual registration fee revenues and reinvest those revenues into charging infrastructure. As of September 2019, Alabama and Washington are the only states that fund charging infrastructure with registration fees.

The Alabama Transportation Institute has created a tool that can project the revenues and registrations for BEVs and PHEVs through the year 2040. The projections calculate the estimated revenues from PHEV and BEV registration fees based on the projected percentage of EVs compared to non-truck vehicles in Alabama. The tool can be used to estimate the revenue that EV registrations will generate and can show how much of that revenue is projected to fund charging infrastructure. For example, if it is assumed that EVs will make up 2% of the non-truck vehicles in Alabama by the year 2040, funding for such infrastructure will total $74 million by 2040 (Table 5).

Table 5: Projected EV and PEV Registrations and Revenues from the Rebuild Alabama Act

Year	Total Vehicle Registrations	Non-truck Vehicles	Projected BEV Registrations	Projected PHEV Registrations	Projected Total EV Registrations	Projected EV % of Non-truck Vehicles	BEV Registration Fees	PHEV Registration Fees	Projected Revenues from BEV Registrations	Projected Revenues from PHEV Registrations	Total Projected Revenues from PHEV/BEV Registrations towards Roads & Bridges Fund	Projected Revenues towards Charging Infrastructure
2018	5,696,657	5,162,329	1,446	1,586	3,032	0.06						
2019	5,729,421	5,234,236	4,210	4,210	8,421	0.15	$200	$100	$842,068	$421,034	$947,326	$315,775
2020	5,799,871	5,301,995	6,821	6,821	13,642	0.24	$200	$100	$1,364,199	$682,100	$1,534,724	$511,575
2021	5,870,322	5,369,755	9,494	9,494	18,988	0.32	$200	$100	$1,898,764	$949,382	$2,136,109	$712,036
2022	5,940,773	5,437,515	12,229	12,229	24,458	0.41	$200	$100	$2,445,761	$1,222,881	$2,751,481	$917,160
2023	6,011,223	5,505,274	15,026	15,026	30,052	0.50	$203	$103	$3,050,270	$1,547,674	$3,380,841	$1,217,103
2024	6,081,674	5,573,034	17,885	17,885	35,771	0.59	$203	$103	$3,630,711	$1,842,184	$4,024,187	$1,448,707
2025	6,152,124	5,640,793	20,807	20,807	41,614	0.68	$203	$103	$4,223,772	$2,143,096	$4,681,521	$1,685,348
2026	6,222,575	5,708,553	23,790	23,790	47,581	0.76	$203	$103	$4,829,453	$2,450,412	$5,352,842	$1,927,023
2027	6,293,025	5,776,312	26,836	26,836	53,672	0.85	$206	$106	$5,528,262	$2,844,640	$6,038,150	$2,334,751
2028	6,363,476	5,844,072	29,944	29,944	59,888	0.94	$206	$106	$6,168,505	$3,174,085	$6,737,445	$2,605,145
2029	6,433,926	5,911,831	33,114	33,114	66,229	1.03	$206	$106	$6,821,555	$3,510,121	$7,450,728	$2,880,948
2030	6,504,377	5,979,591	36,347	36,347	72,693	1.12	$206	$106	$7,487,411	$3,852,745	$8,177,997	$3,162,159
2031	6,574,828	6,047,350	39,641	39,641	79,282	1.21	$209	$109	$8,284,996	$4,320,883	$8,919,254	$3,686,625
2032	6,645,278	6,115,110	42,998	42,998	85,996	1.29	$209	$109	$8,986,533	$4,686,757	$9,674,498	$3,998,792
2033	6,715,729	6,182,870	46,417	46,417	92,833	1.38	$209	$109	$9,701,063	$5,059,406	$10,443,729	$4,316,741
2034	6,786,179	6,250,629	49,898	49,898	99,795	1.47	$209	$109	$10,428,586	$5,438,832	$11,226,947	$4,640,471
2035	6,856,630	6,318,389	53,441	53,441	106,881	1.56	$212	$112	$11,329,423	$5,985,356	$12,024,152	$5,290,627
2036	6,927,080	6,386,148	57,046	57,046	114,092	1.65	$212	$112	$12,093,747	$6,389,149	$12,835,344	$5,647,552
2037	6,997,531	6,453,908	60,713	60,713	121,427	1.74	$212	$112	$12,871,249	$6,799,905	$13,660,524	$6,010,631
2038	7,067,982	6,521,667	64,443	64,443	128,886	1.82	$212	$112	$13,661,931	$7,217,624	$14,499,691	$6,379,864
2039	7,138,432	6,589,427	68,235	68,235	136,470	1.91	$215	$115	$14,670,496	$7,847,010	$15,352,845	$7,164,661
2040	7,208,883	6,657,186	72,089	72,089	144,178	2.00	$215	$115	$15,499,098	$8,290,215	$16,219,986	$7,569,327
	% EVs in 2040 of the total non-truck vehicles			2.0						TOTAL	$178,070,321	$74,423,022
	BEV % of non-truck vehicles			50								

Notes:

1 Assumes equal distribution in number of PEV and EV registered
2 Assumes PEV and EV account for 2% of the non-truck vehicle fleet by 2040
3 $75 from EV and $25 from PEV will be allocated to the Electric Transportation Infrastructure Program; plus $3 increases effective in 2023 every four years therafter
4 From 2023, the EV registration fees increases by $3 every four years

Source: ATI

Another way that states are funding charging infrastructure is through funds resulting from the settlement of claims by the U.S. Environmental Protection Agency and the Federal Trade Commission against the automaker Volkswagen. Under the terms of the settlement, states are given an allocation of funds from the Environmental Mitigation Trust Fund. States are allowed to use up to fifteen percent of their award on electric vehicle charging infrastructure. The manner in which states plan to spend the funds from the settlement must be set forth in a Beneficiary Mitigation Plan, which must be submitted to a trustee of the Environmental Mitigation Trust Fund. According to the United States Public Interest Research Group, 38 states, including Alabama, plan to use 15 percent of their awards on charging infrastructure, while 13 states do not.[32] Information on Alabama's Volkswagen Settlement program can be found at the Alabama Department of Economic and Community Affairs website.

Rebates Offered by Utilities/Private Companies

In addition to electric vehicle incentives offered by governments, many utility companies and private entities offer incentives for the purchase of electric vehicles and/or charging infrastructure.[33] Utility companies have an opportunity as the primary providers of electricity to aid in integrating EVs into the grid. One example of how utilities are attempting to integrate EVs into the grid is by providing incentives to charge EVs during off-peak hours. Many utility companies also offer rebates for the purchase and/or installation of in-home charging stations.

An example of private entities offering incentives lies with the partnership of Audi, Amazon, and Electrify America. Audi's partnership with Amazon gives Audi owners the option to use Amazon Home Services to prepare their homes for an installation of a charging station within their home. As a part of the partnership, Audi will also offer 1,000 kilowatt-hours of power to vehicle owners over a four-year period when they use Electrify America's chargers.[34]

Another creative partnership exists between the University of Vermont, Nissan and the Vermont Clean Cities Coalition. Through this partnership, the three entities are able to offer a rebate of up to $5,000 to students and employees at the University of Vermont for the purchase of a new Nissan Leaf. The offer lasted from July 2019 through the end of September 2019.[35]

SECTION III: An Overview of the Legal and Regulatory Impediments to the Electric Vehicle Market in Alabama

Exemption from Definition of Public Utility

A key question for the future of Electric Vehicle Charging Stations (EVCS) is whether the operators of EVCS are subject to regulation as electric utilities or not. States have taken three main approaches:

- Some states have issued new guidelines or regulations that define the requirements for regulated utilities to operate charging stations. Examples of states that have chosen this path are Oregon, Texas, and Kansas.
- Some states have chosen to refrain from taking any action.
- Other states, including Alabama, have exempted charging station operators from public utility regulations. Since charging station operators would not be regulated as public utilities, a question remains as to which regulatory agency, if any is responsible for regulating charging station operators.[36]

In evaluating whether an operator of an EVCS is subject to the regulatory jurisdiction of the Alabama Public Service Commission (the Commission), the Commission issued an order concluding that an owner/operator of an EVCS is not a utility, and therefore is not subject to the jurisdiction of the Commission. Therefore, EVCS operators in Alabama are not subject to the regulatory jurisdiction of the Commission. In making its ruling, the Commission noted that several interested parties submitted comments during the initial comment phase including: the Alabama Office of the Attorney General (the Attorney General's Office), Alabama Power Company, the Business Council of Alabama, ChargePoint, the Edison Electric Institute, Greenlots, Honda Manufacturing of Alabama, the National Federation of Independent Business/Alabama, Plug In America, the Southern Alliance for Clean Energy (SACE), the Southern Environmental Law Center, along with Energy Alabama, and Gasp.[37]

Prohibition on Reselling and/or Sharing Electricity

Another key issue regarding EVCS is that many utility companies have a prohibition on the reselling and/or sharing of electricity. In fact, Alabama Power Rule 1.6 prohibits the sharing or supplying of electricity.[38] However, Alabama Power noted in its comments to the Commission that the prohibition on sharing/reselling electricity is not offended when the end-use customer does not actually engage in an attempt to mark-up the cost of electricity as part of any fees or charges assessed. Alabama Power goes on to state that an EVCS that recovers the cost of electricity as part of its electric vehicle charging service is no different than a commercial establishment recouping its cost of electricity through charges for its goods or services, so there is no attempt to mark-up the cost of electricity. However, the Commission states that its jurisdictional authority only extends

to Alabama Power Company, but there are many other electricity suppliers in Alabama that are overseen by municipalities, boards, or other forms of governance. Therefore, other utilities would have to make their own determination as to whether an EVCS operator is sharing/reselling electricity. Since the Commission does not have authority over every utility company in Alabama, a universal state policy for electric vehicles and EVCS cannot start with the Commission.[39] [40]

Regardless of the determination that charging stations are not regulated as utilities, some states have gone on to further clarify that in the utilities' rules and regulations, the prohibition against sharing/reselling electricity is not violated by the use of EVCS. For example, Hawaii's Public Utilities Commission approved a utility's request to amend their existing rule to clarify that the rule prohibiting an electric utility customer from reselling electricity to another person does not apply to the resale of electricity for use as a motor fuel for light duty plug-in electric vehicles. Also, Missouri's Public Utility Commission ordered a utility to revise its rules to clarify that EVCS are not reselling electricity.[41]

Authority to Regulate EVCS

Since EVCS are not regulated as utilities, the question remains – who does regulate EVCS? In comments submitted to the Commission, Plug In America and SACE note that matters relating to consumer protection, like safety and accuracy, are the responsibilities of other agencies and apply to EVCS Operators. For example, Plug In America and SACE recommend that the Commission work with the state Weights and Measures Division under the Alabama Department of Agriculture and Industries to adopt requirements for EVCS manufacturers on the accuracy and testing of the EVCS.[42]

Future Regulation and Questions

One-way Alabama could implement a universal state policy would be by statute through amending Code Section 37-4-1 to clarify what the definition of an electric utility should be in the state. Finally, there is a possibility that the Federal Energy Regulatory Commission (FERC) will determine that it has jurisdiction to regulate EVCS, which is an issue beyond Alabama's authority to take action since it is a federal matter, but that issue remains unanswered and is being debated by legal scholars. (Detsky & Stockmayer, 40 Wm. & Mary Envtl. L. & Policy Rev. 477).

SECTION IV: Acknowledgements

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