EV INFRASTRUCTURE MASTER PLAN

July 2021

FDOT

CONTENTS

EXECUTIVE SUMMARY 1

INTRODUCTION 3

Types of EVs 3

ICE vs. EV 3

EV Infrastructure 4

Existing EVSE Types and Use Cases 4

BENEFITS OF ELECTRIFIED MOBILITY 5

BARRIERS TO ADOPTION AND INDUSTRY TRENDS 7

EV Adoption Barriers 7

EVSE Adoption Barriers 7

Perceived Barriers 7

EV Market Trends in the United States and Abroad 8

Cumulative BEV Offerings by Vehicle Type 8

INSTALLATION CONSIDERATIONS 9

Existing Statutes Regarding EV and EVSE 9

EV Technology Trends Currently Being Monitored 10

Plan Over Time to Expand EVSE Network 10

EVSE Pre-Deployment Planning 12

FLEET CONSIDERATIONS AND FUTURE ADVANCEMENTS 13

Private Light-Duty Fleets 13

Private Heavy-Duty Fleets 13

Transit Fleets 14

Wireless Power Transfer (WPT) 14

UTILITY REGULATORY CONSIDERATIONS 15

Regulatory Considerations 17

Current Utility Participation 19

STRATEGIES TO DEVELOP CHARGING SUPPLY 23

Other States' Examples 23

EV MARKET ADOPTION 25

BEV Ownership by County 25

Statewide EV Market Adoption by Vehicle Type 25

Current EV Adoption 26

Adoption Scenarios 26

IMPACTS TO TRANSPORTATION FUNDING 27
Total Net Revenue Differential 27
2021-2040 STTF Total Net Revenue Loss (Moderate Growth Scenario) 28
RESILIENCY AND EMERGENCY EVACUATIONS 29
EVSE Infrastructure Resiliency 29
Emergency Preparedness 30
Emergency Response 30
IDENTIFICATION OF POTENTIAL NEW EVSE LOCATIONS 31
Gap Analysis for Long-Range Travel (DCFC) 31
Gap Analysis for Short-Range Travel (Level 2) 31
Existing Publicly Accessible EVSE Locations 32
EV INFRASTRUCTURE ON THE STATE HIGHWAY SYSTEM 33
Gap Analysis Results - Potential DCFC Locations 33
Potential Community Charging (Level 2) Footprints 34
OTHER STATES' POSITION ON EV POLICIES 35
REGIONAL COLLABORATION 36
RECOMMENDATIONS 37
Process 37
Goals 37
Initiatives 37
Framework 38
INITIATIVE 1: ADAPT 39
INITIATIVE 2: FACILITATE 41
INITIATIVE 3: EDUCATE 43
INITIATIVE 4: COORDINATE 45
LOOKING AHEAD 47
LIST OF ABBREVIATIONS 48

EXECUTIVE SUMMARY

Electric Vehicle Infrastructure Master Plan (EVMP)

Florida Statute 339.287 titled "Electric vehicle charging stations; infrastructure plan development" requires the Florida Department of Transportation (FDOT) to coordinate, develop and recommend a Master Plan for the development of electric vehicle (EV) charging station infrastructure along the State Highway System (SHS). The FDOT, in consultation with the Florida Department of Environmental Protection (FDEP), the Florida Public Service Commission (PSC) and other state agencies, developed the EVMP with extensive public engagement.

The EVMP delivers a comprehensive course of action to efficiently and effectively provide for EV charging infrastructure to support the goals of F.S. 339.287. This document serves as a starting point for both public and private entities to become familiar with the challenges and opportunities associated with EV charging infrastructure. It also serves as a guide for future legislative, agency-level and public engagement efforts.

The EVMP supports the Florida Transportation Plan (FTP), a single overarching plan for Florida's transportation future, by advancing the use of EVs to improve air quality, and fosters economic development by encouraging the expansion of the labor force to support EV infrastructure. The EVMP supports opportunities to lower the total cost of vehicle ownership per household and enhances transportation equity. The primary objectives of the EVMP include:

SUPPORT
short-range and long-range electric vehicle travel as well as emergency evacuation in the state

ADAPT
state highway infrastructure consistent with market demand

ENSURE
availability of adequate and reliable EV charging stations

Emerging Needs and Opportunities

Florida is the third most populated state in the nation with a current population of over 21 million and is rapidly growing with approximately 800 people moving to the state every day. Florida also hosted more than 130 million visitors in 2019 and is anticipated to host 180 million visitors by 2029. Transformational initiatives are needed in order to enhance transportation infrastructure and meet the growing demand for safely moving people and goods, while enhancing economic prosperity and preserving the quality of our environment and communities.

Many automakers have recently announced their commitment to EVs by diversifying their offerings and making pledges towards electrifying their fleets over the next few years. Automakers are driving the need for electric vehicle supply equipment (EVSE) to charge the vehicles they are offering. Private sector EV infrastructure service providers deploy in areas where utilization is high, which leaves gaps in the network. Florida has an opportunity to adapt to these emerging technologies by closing the EVSE gaps along the state's multimodal transportation infrastructure.

These technologies also have implications for transportation funding both at the statewide and local levels. Careful consideration must be given to balance the desire to move toward electrified mobility and sustaining resources for the state's long-term success.

FDOT's role is to adapt state transportation infrastructure to enable the future of electrified mobility.

Recommendations

The process for the development of the EVMP included coordination with state, regional and local agencies and stakeholders as well as members of the public. A total of seven stakeholder meetings were conducted in addition to two public webinars and a 30-day public comment period. The collaborative process was informed by technical analysis, which led to the development of recommendations.

The recommendations provide a framework and strategic actions that Florida should consider to help achieve the goals and objectives of the EVMP. These foundational concepts are steps toward expanding EVSE networks along multimodal transportation infrastructure and enhancing both public and private investment in EVSE.

ADAPT

Adapt transportation infrastructure to advance electrified mobility.

FACILITATE

Facilitate the transition of next generation infrastructure through strategic investments and partnerships.

EDUCATE

Provide resources to share information and knowledge that enhance educational and outreach efforts to support the state's electrification goals.

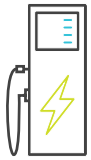
COORDINATE

Engage other states, communities, agencies and stakeholders to coordinate best practices on EV infrastructure deployment.

Utility Regulatory Considerations

A key aspect of providing a reliable EVSE network involves participation from electric utility providers and the regulations set forth by the PSC. Two main areas of consideration include:

1. Utility interaction with third party EVSE service providers (EVSPs).

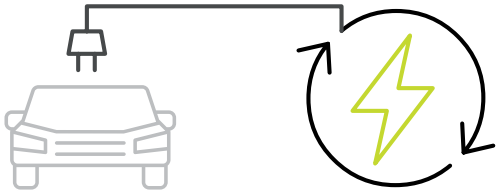


2. Utility-owned and operated EVSE.

INTRODUCTION

Types of EVs

Electric vehicles are a rapidly evolving technology. They are fueled and propelled differently from Internal Combustion Engine (ICE) vehicles. This section provides an overview of EV types and associated infrastructure.



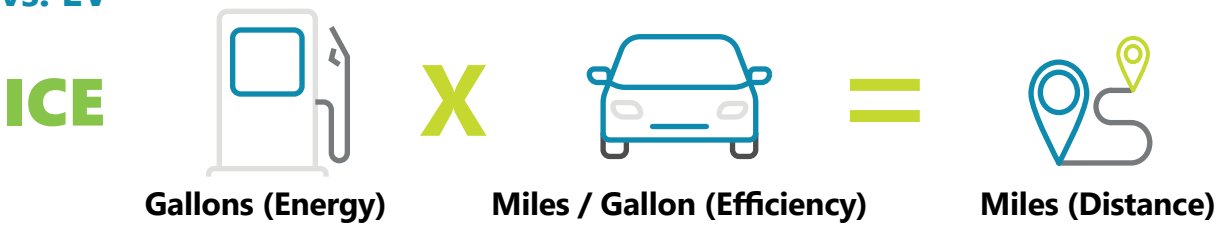
1 Battery Electric Vehicle (BEV)

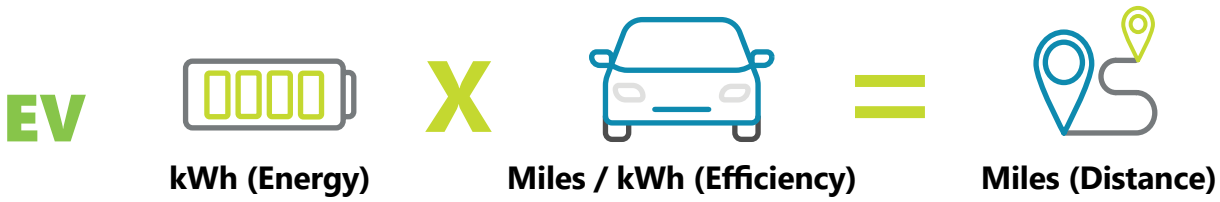
- Battery-only propulsion, no ICE backup
- Up to 400 mile range, depending on make and model
- Primary user considerations are long-range travel and evacuations

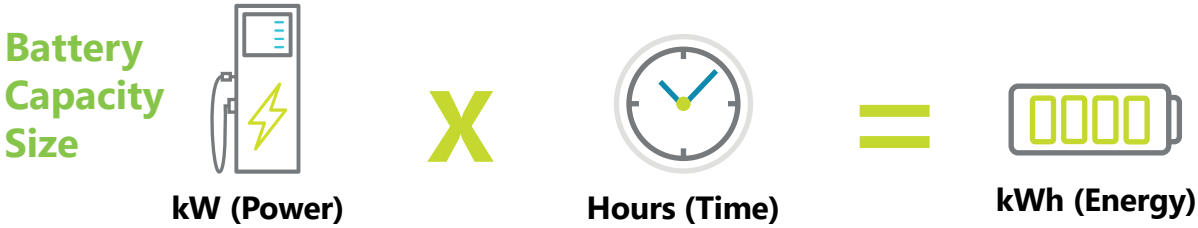
2 Plug-In Hybrid Electric Vehicle (PHEV)

- Relatively short range on full battery (~40 miles), then the ICE automatically starts
- Not limited in range by electricity

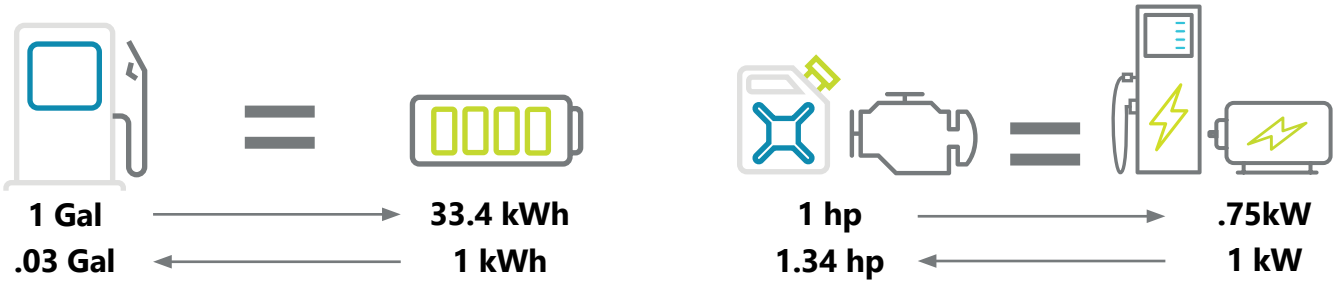
ICE vs. EV







Conversions



EV Infrastructure

EV Infrastructure is also referred to as EVSE and charging stations. There are three types of EV technologies currently available in the market for passenger vehicles.

Level 1 Charger

- Standard equipment for most electric vehicles
- Slower charging speed >eight hours - (full charge)
- Foundational technology that is aging out

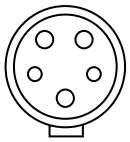
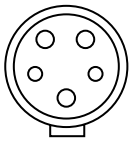
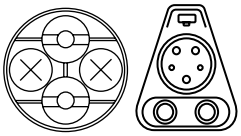
Level 2 Charger

- Slower charging speed >two hours - (full charge)
- Short-range travel (commuting, intra-regional)
- Currently accounts for ~80% of all charging demand

Direct Current Fast Charger (DCFC)

- Fast charging speed ~30 minutes - (full charge)
- Long-range travel (evacuation, inter-regional)
- Future-oriented

Existing EVSE Types and Use Cases

EVSE Type	Supply Voltage	Charger Examples	Power Level	Charge Rate (miles / hr)	Install Cost	Charging Use Cases	KEY POINTS
Level 1	120V (Toaster)	 J1772 Connector	1 - 1.8 kW	3 - 7	$	Home / Overnight	Obsolete for commercial purposes
Level 2	208-240V (Clothes Dryer)	 J1772 Connector	3.3 - 19.2 kW	10 - 60	$$	Home-work / Destination / Community	Currently dominant for commercial purposes
			7.7 kW typical	26			
DCFC	480V (Small office building)	 CHAdeMO / SAE Combo (CCS)	50 kW	175	$$$	Travel along State Highways	Most applicable for long-range travel and evacuations
			150 kW	**500**			
			350 kW	1,200			

THE RIGHT CHARGER → FOR THE RIGHT SPACE

Long-Range Travel VS Community Charging

BENEFITS OF ELECTRIFIED MOBILITY

Transportation electrification provides opportunities to transform mobility by providing environmentally friendly and cost effective travel options while promoting energy independence.

Transportation sector (automobiles) has been identified as one of the largest contributor of Green House Gases (GHGs).

Emissions are often disproportionately **concentrated in under-served and low-income communities within congested urban areas.**

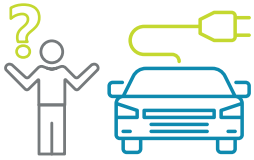
Lack of transportation energy diversity can lead to over reliance on specific energy sources.

This makes Florida susceptible to changes (price fluctuations / availability) in the global energy market. **EVs can be fueled by any power source.**

Energy sector fuel source (for electricity generation) is primarily natural gas.

Natural gas is becoming more popular and is a cleaner fuel source compared with coal-based electricity production. At the same time, **Florida utilities are rapidly investing in solar farms, which could further reduce EV's carbon footprint.**

General lack of awareness / education.



Higher price points for new EVs lead to confusion about overall total cost of ownership. Significantly **less maintenance and zero gasoline pumped** helps drive costs down over time.

Electric mobility provides several benefits to both transportation and energy sectors.

ENERGY SECTOR

REDUCTION IN GHG EMISSIONS

- Positive impact for the environment
- Net fuel efficiency improvements
- Potential for future vehicle-to-grid applications

ENERGY DIVERSITY AND INDEPENDENCE

- Mobility is no longer tied to petroleum
- Renewable energy sources are advancing
- Resiliency during natural disasters

TRANSPORTATION SECTOR

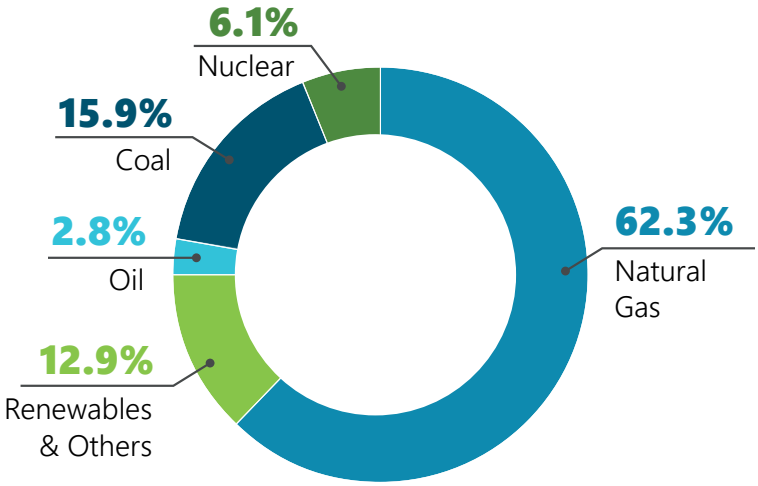
ZERO TAILPIPE EMISSIONS

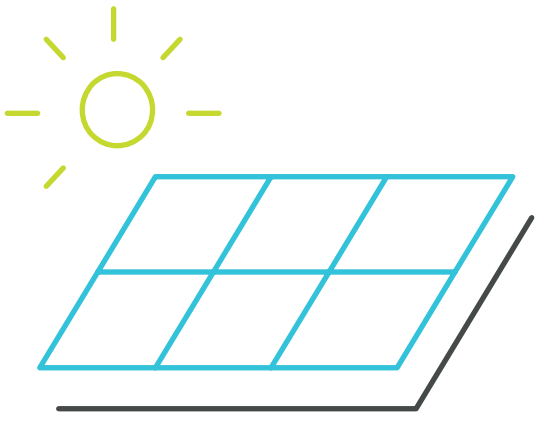
- Improvement in local air quality
- Reduction in noise pollution
- Significantly improved vehicle efficiency

LOWER TOTAL COST OF OWNERSHIP FOR HOUSEHOLDS

- Less moving parts = less maintenance
- Lower fuel costs
- Responsible stewardship of tax payer money by public agency fleets

Florida's Energy Sources for Electricity Generation





Solar is projected to increase

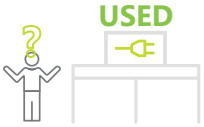
600% ***over the next ten years.***

BARRIERS TO ADOPTION AND INDUSTRY TRENDS

Emerging technologies often face barriers to market acceptance. Some barriers are easily overcome through innovation and market forces while other barriers are persistent. Some major barriers are highlighted below.

EV Adoption Barriers

EV cost parity with ICE vehicles – expected to occur short-term (2025 - 2030)



No secondary market (limited amount of used EV inventory)

Lack of charging stations; long-distance travel; and multi-family housing

Lack of dealership knowledge / willingness to suggest EVs; lack of EVs available at Florida dealerships

EVSE Adoption Barriers

Low EV customer base

Lack of public awareness regarding EVSE locations

EVSE charging speed – function of power delivery of EVSE and how much power an EV can accept

Service providers locate EVSE where EV adoption is highest; EVSE gaps exist in low-utilization, rural and under-represented communities

Utility demand charges

Lack of site-specific back-end utility infrastructure for DCFC stations, especially in rural and critical emergency evacuation areas

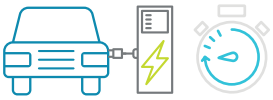
Additional costs when providing back-up power at EVSE locations for emergency evacuation

Limited public funding

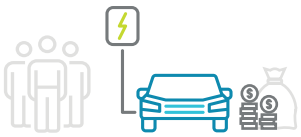
Perceived Barriers

Range anxiety during longer trips

Lack of truck, SUV/ crossover EV models available on the market



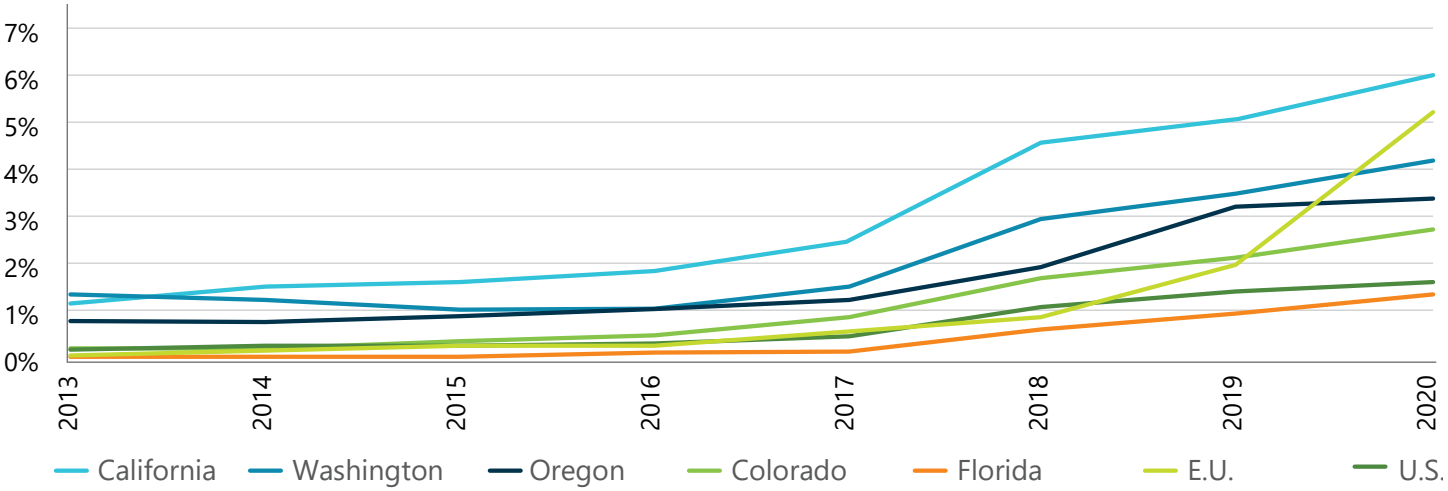
Long recharging times



Perception that gasoline is inexpensive

EV Market Trends in the United States and Abroad

The global market for EVs has been growing with significant increase in sales starting in 2017. California has the largest annual sales percentage with EVs accounting for over six percent of all vehicles sold in 2020. Several other states have reached annual EV sales percentages of three to four percent. The United States national average has increased slowly and is now just under two percent of annual vehicle sales.



Automobile Manufacturers are Going Electric

VOLVO
has pledged that 50% of its vehicle offerings will be EV by 2025.

GENERAL MOTORS
has pledged that all light-duty cars and SUVs will be EV by 2035.

FORD
expects that 40% of global sales will be EV by 2030.

VOLKSWAGEN
expects that 50% of US sales will be EV by 2030.

Cumulative BEV Offerings by Vehicle Type

2021	2022	2023	2024	2025
20	38	44	46	50
3	10	13	15	18
1	9	11	13	13
24 MODELS	57 MODELS	68 MODELS	74 MODELS	81 MODELS

By the end of 2020, there were 17 BEV models on the market.
Cumulatively, by 2025, there will be at least 81 additional BEV models available to consumers.

INSTALLATION CONSIDERATIONS

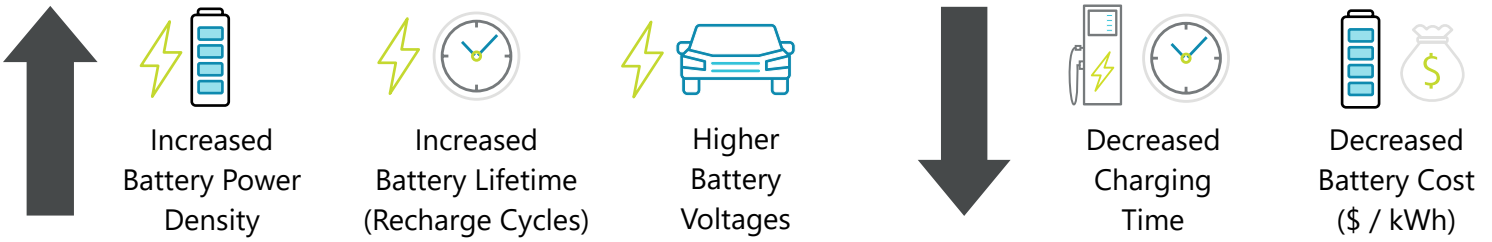
EVSE installations require coordinating with local building permit office(s) for EVSE related codes and local electricity utility provider(s) to determine load demand, especially when considering DCFCs. Existing Statutes and Rules regarding EVs and EVSE are highlighted below.

Existing Statutes Regarding EV and EVSE

EV Insurance Regulation	Insurance companies may not impose surcharges, or any additional fees based on the vehicle being electrified, unless justified and approved by the Florida Office of Insurance Regulation.	*Florida Statutes Title XXXVII. Insurance § 627.06535. Electric vehicles; restrictions on imposing surcharges.*
EVSE Financing Authorization	Local governments within Florida may offer funding for EVSE projects to private landowners.	*Florida Statutes Title XI. Intergovernmental Programs § 627.06535. Supplemental authority for improvements to real property.*
Authorization for Alternative Fuel Infrastructure Incentives	Local governments may use income from the infrastructure surtax to offer incentives to private property owners to install EVSE equipment. A local government ordinance must be in place.	*Florida Statutes Title XIV. Taxation and Finance § 212.055. Discretionary sales surtaxes; legislative intent; authorization and use of proceeds.*
EVSE Supply Equipment Utility Regulation Exemption	Electricity sold from publicly available non-utility EVSE infrastructure is not subject to regulation of rate, terms, or conditions.	*Florida Statutes Title XXVII. Railroads and Other Regulated Utilities § 366.94. Electric vehicle charging stations.*
EVSE Rules	Prohibits non-EV vehicles from using or blocking space allocated for plug-in vehicle charging. Also requires the state to provide definitions, methods of sale, labeling requirements, and price posting requirements for EVSE.	*Florida Statutes Title XXVII. Railroads and Other Regulated Utilities § 366.94. Electric vehicle charging stations.*
EVSE Policies for Condominiums	Requires a condominium association to allow a resident to install, at their own cost, EVSE infrastructure for the purpose of charging a vehicle.	*Florida Statutes Title XL. Real and Personal Property § 718.113. Maintenance; limitation upon improvement; display of flag; hurricane shutters and protection; display of religious decorations.*
Rest Areas	Florida administrative rule prohibits the physical connection of any vehicle to an electrical or water outlet at rest areas.	*Florida Rule 14-28.002 - Public Use of Rest Areas, Welcome Centers, Truck Comfort Stations, and Wayside Parks.*
Agreements Relating to the Use of and Access to the Interstate System Rights-of-Way	**Effectively prohibits commercial activities relating to the sale of electricity and other commodities at interstate rest areas. If a state DOT installs EVSE at interstate rest areas, the use of the charging station must be free to the traveling public.**	***Federal Regulation 23 U.S. Code § 111***

EV Technology Trends Currently Being Monitored

In order to assess infrastructure readiness, various technologies and market indicators need to be monitored.



BEVs HISTORICAL BATTERY COST & RANGE

BEVs FORECASTED BATTERY COST & RANGE

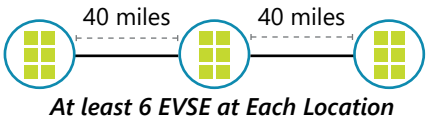
2010 COST	2015 COST	2020 COST	2025 COST
~$1,175 per kWh	~$375 per kWh	~$160 per kWh	~$100 per kWh
2010 RANGE	**2015 RANGE**	**2020 RANGE**	**2025 RANGE**
~75 miles	~160 miles	~250 miles	~450 miles

Plan Over Time to Expand EVSE Network

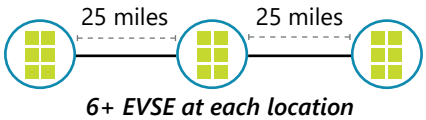
Ultimately, the deployment of EVSE infrastructure in the state of Florida will occur in several phases. The optimum methodology for choosing EVSE sites and determining the number of chargers will evolve as the EV adoption rate increases.

2020	2% - 8% Annual EV Sales	2025	8% - 30% Annual EV Sales	2030	30% - 50% Annual EV Sales	2035
PHASE	EARLY PHASE		MIDDLE PHASE		LATER PHASE	
OBJECTIVE	Build Out the Network		Grow and Densify		Densify and Maintain	
ACTION	Fill in the Gaps Between Locations (New Locations)		Increase Number of Chargers at Each Location		Decrease Intervals Between Stations	
METRIC	40 Mile Spacing Between EVSE Locations Along the SHS		Approximately 1MW of Peak Charging Demand at Each Location (6 DCFC Stations per Location)		25 Mile Spacing Between EVSE Locations Along the SHS	

At least 2 EVSE at each location



At least 6 EVSE at Each Location



6+ EVSE at each location

INSTALLATION CONSIDERATIONS

Installation of EVSE requires special considerations for how, where and why EV operators charge their vehicles. Locations along travel corridors are ideal for DCFC while Level 2 is best suited at locations with longer dwell times. Once the right charger has been identified for the location, the following are some pre-deployment considerations.

DCFC Installation Site - *Long-Range Travel*

Level 2 Installation Site - *Community Charging*

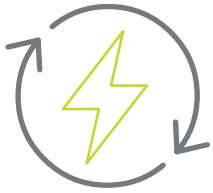
D DCFC STATIONS
2 LEVEL 2 CHARGERS

EVSE Pre-Deployment Planning

Considerations for Every Location Prior to Developing EVSE.

1. Power Supply

Early and consistent communication with the electrical utilities is critical so they can evaluate impacts to the grid, design and construct the necessary infrastructure equipment, and determine rate structure.

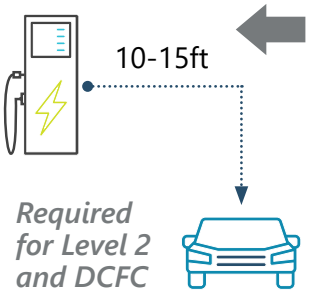


Utilities should understand the electrical requirements including:

PEAK LOAD	CHARGER VOLTAGE	SITE CONSTRAINTS	SCHEDULE
(both at start up and at future build out)	*(typically 480V for DCFC chargers)*		

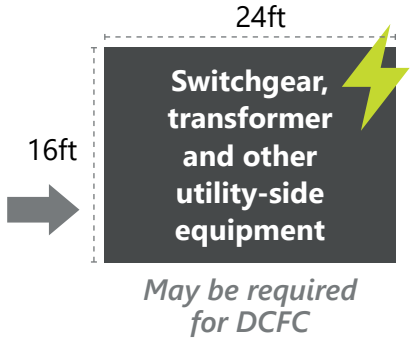
2. Space Requirements

Electrical utilities will typically require an easement for the overhead or underground power supply and for the equipment. Distribution transformers typically have three feet of space available to the sides and rear for fire safety and up to ten feet of clearance at the front for operational safety. ***Larger load sites (typically greater than 1 MW) may have additional utility requirements.***



Charging stations are located near the parking stalls and must be located within approximately 10 to 15 feet of the vehicle.

The utility-side charging equipment for DCFCs will likely require a 16 feet by 24 feet enclosed area for the equipment.



ADA requirements should be taken into consideration at all sites.

Queue management considerations should be made for EVs waiting to charge.

3. Future Growth Considerations

If installations occur at a later time, **additional conduit should be installed** at the site to avoid costly demolition or downtime.

The electric utility industry should plan to accommodate **future upgrades**.

When improving existing or developing new multimodal transportation infrastructure, especially managed lanes, consider potential future technologies such as in-lane vehicle charging.

FLEET CONSIDERATIONS AND FUTURE ADVANCEMENTS

Due to economies of scale, public and private fleets (including transit agencies), are realizing cost savings by switching to EVs. Fleet managers need to evaluate where and how to charge their vehicles. The following provides considerations when making these decisions.

Private Light-Duty Fleets

Rental Cars, Delivery Vans, etc.

- Majority of vehicles will be light-duty (LD), but some may be medium-duty (MD) vehicles, charging infrastructure is the same
- Primary charging demands will be met with on-premise (i.e., depot, yard) using Level 2 chargers
- Secondary charging demands may be met using off-site publicly accessible DCFC as needed

2 LEVEL 2 CHARGERS D DCFC STATIONS

X XFC CHARGERS

Private Heavy-Duty Fleets

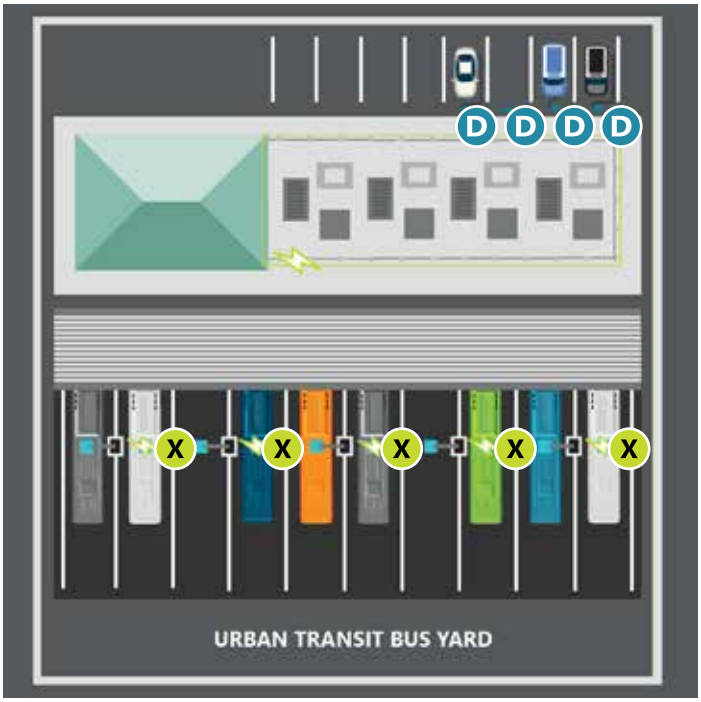
Long-Haul Trucks, Construction Vehicles, etc.

- Heavy-Duty (HD) fleet vehicles currently use HD EVSE which operates at >150kW
- HD vehicles will have their own dedicated EVSE charging network and may use Extreme Fast Charging (XFC) in the near future (1 MW+)
- LD and MD chargers will not be compatible with HD EVSE
- HD EVSE network will be primarily located along the SHS, likely at truck stops, rest areas, intermodal hubs and distribution centers

Transit Fleets

School Buses, Transit, etc.

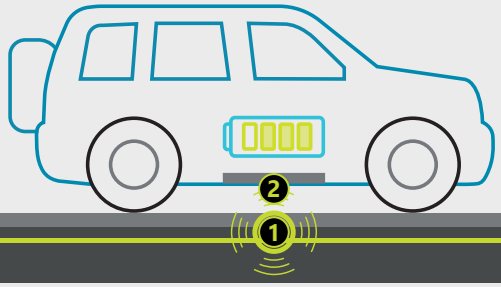
- HD EVSE for transit bus charging typically ranges between 150kW – 350kW
- A 100 bus depot pulls around 5MW of power to support 30-35 150kW chargers
- Charging is primarily conducted within the bus depot, but en-route charging can extend daily operations
- When en-route charging is not feasible, multiple buses may be needed to cover longer routes traditionally served by one diesel bus
- Battery size and charging strategy are critical to ensure maximum en-route time
- Transit fleet fuel sources have evolved from petroleum (diesel) to natural gas and now electricity, requiring substantial investment to deliver fuel to their vehicles



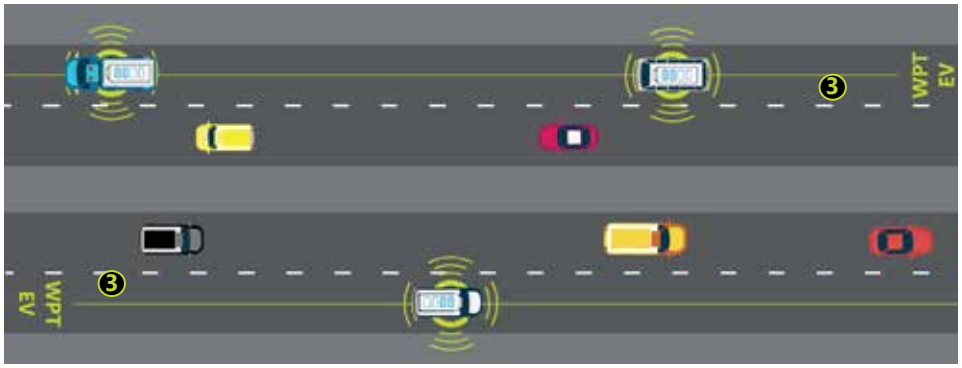
X XFC CHARGERS
D DCFC STATIONS

In-Road (Highway) or En-Route (Transit) Wireless Power Transfer (WPT)

WPT technology is currently in Research and Development phase, but is being closely monitored for future implementation.



Charging While Driving Could Enhance the State Highway System

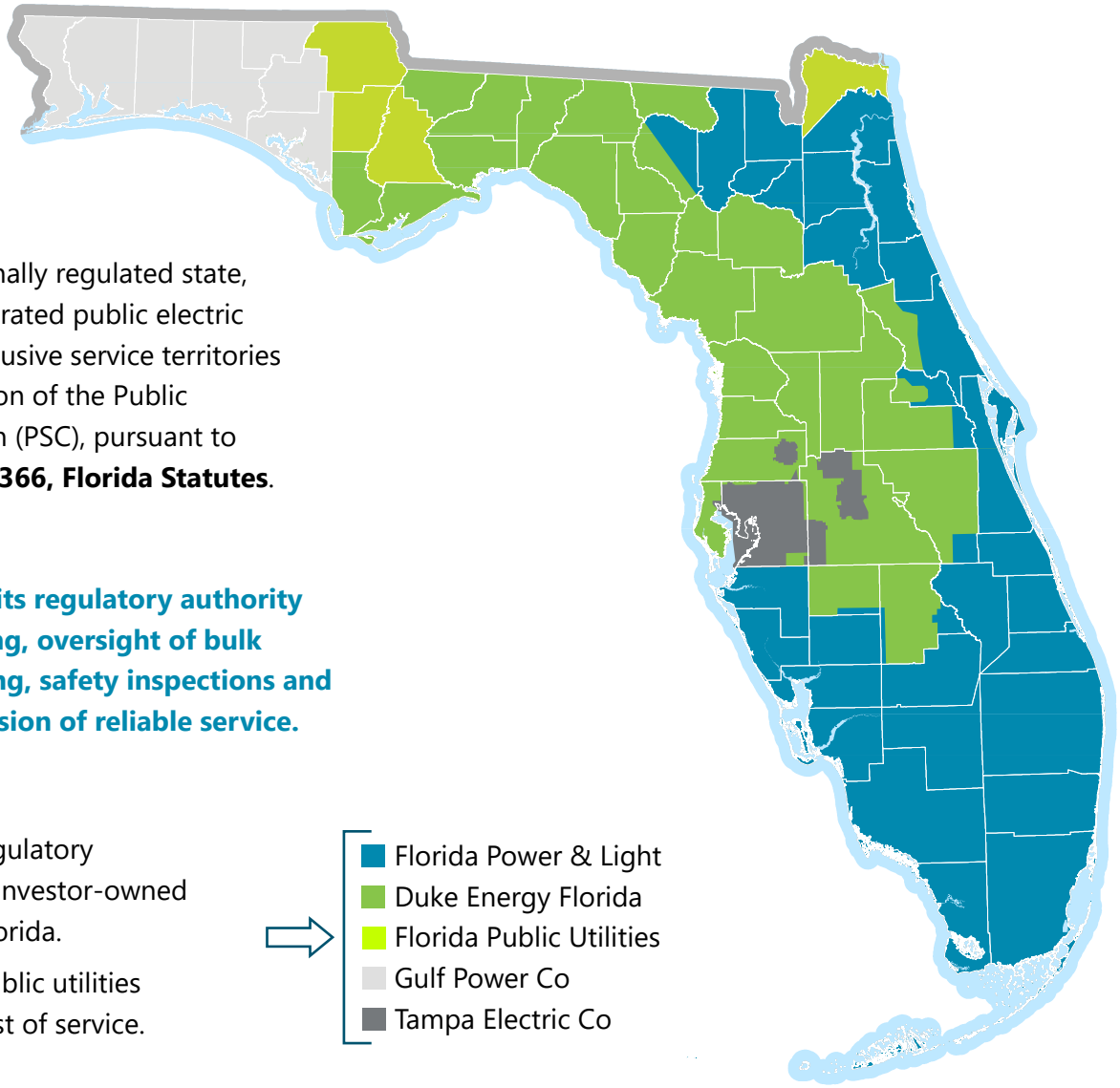


LEGEND

1. In-road wireless charging using inductive loop technology.
2. EVs must have on-board equipment to facilitate charging.
3. WPT on SHS to support long-range travel and emergency evacuations.

Florida's managed lanes provide an excellent opportunity to facilitate in-lane charging.

UTILITY REGULATORY CONSIDERATIONS



Florida is a traditionally regulated state, with vertically integrated public electric utilities serving exclusive service territories under the jurisdiction of the Public Service Commission (PSC), pursuant to **Chapters 350 and 366, Florida Statutes**.

The PSC exercises its regulatory authority through rate setting, oversight of bulk power grid planning, safety inspections and ensuring the provision of reliable service.

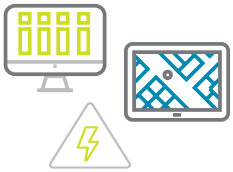
The PSC has full regulatory authority over five investor-owned public utilities in Florida.

Rates are set for public utilities based upon the cost of service.

Public utilities are permitted to recover in rates the capital invested in assets used to provide electric service, along with the opportunity to earn a reasonable return on that investment, and operating costs.

THE PSC

does not regulate the rates and service quality of municipal or rural cooperative electric utilities,



but does have jurisdiction regarding rate structure, safety, territorial boundaries, and bulk power supply planning.

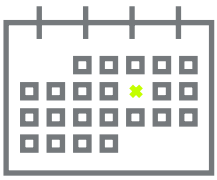
Since the current regulatory structure of electric utilities in Florida includes exclusive service territories, the sale of electricity to retail, or end-use customers by a third party is not permitted.

However, in 2012 the Florida Legislature created an exemption for electric vehicle charging. Section 366.94(4), Florida Statutes, states that "The provision of electric vehicle charging to the public by a non-utility is not the retail sale of electricity for the purposes of this chapter. The rates, terms and conditions of electric vehicle charging services by a non-utility are not subject to regulation under this chapter."

As such, the current process for the installation and provision of electric vehicle charging by a non-utility is not subject to regulation by the PSC.

On September 2, 2020 the PSC issued a request for comment identifying the type of regulatory structure necessary for the delivery of electricity to electric vehicle charging infrastructure and the participation of public utilities in the marketplace. In response, the PSC received 15 sets of comments from various stakeholders.

These contributors included the generating investor-owned utilities, three of the larger municipal utilities, several electric vehicle charging companies and stakeholders, and two environmental organizations.



On October 21, 2020 the PSC conducted a workshop to discuss the comments received.

Initial observations are that among stakeholders there is a general consensus that Florida's current regulatory structure is appropriate for the delivery of electricity to charging station infrastructure.

Participation by public utilities in the electric vehicle charging marketplace involves two areas of consideration.

1  **Interaction with 3rd party EVSPs**

2  **Utility-owned / operated EVSE**

A focus on flexibility should be maintained in order to adopt different models of utility and third-party ownership / operation based upon site-specific circumstances. In addition, prematurely and narrowly defining the role of public utilities should be discouraged given the nascence of the market and the urgent need to address gaps in charging infrastructure.

UTILITY REGULATORY CONSIDERATIONS

Regulatory Considerations

How Utilities Interact with Third-Party Charging Station Owners

Make-Ready utility installations involve both entities preparing the location for EV charging infrastructure. The utility facilitates installations or upgrades to distribution facilities including distribution lines, pad mounted transformers and the electrical meter. The third party is responsible for the panel that connects to the meter and the EV charger.

Traditional Cost of Service

Traditional cost of service regulation includes the idea that the party causing costs to be incurred should be responsible for bearing those costs, not the general body of ratepayers. With Make-Ready installations, under this approach, costs of installing the facilities connected by third-party chargers should be recovered by the utility from that third-party company.

If the charging station fails to function or the utility is otherwise unable to recover costs from the third party, the Make-Ready installation could result in stranded costs passed on to or subsidized by the general body of ratepayers. Any regulatory allowance of proposed Make-Ready projects should consider the risk of potential cross-subsidization. However, it should be noted that the Florida Legislature has encouraged utility investment in certain projects in the past by creating or allowing special cost recovery mechanisms for such investment.

Rate Structure

The rate structure applied to electric service for third-party charging stations is another consideration. For example, EV charging station companies are concerned that through the rate structure, demand charges by utilities are an impediment to DC Fast Charging infrastructure. Fast charging stations are commercial customers billed under rate schedules that include an energy charge (based on the amount of energy consumed, or kWh) and a demand charge (dollar per kW). The demand charge is based on the highest usage, or demand, over a specified time interval (15 or 30 minutes). This peak usage determines the demand charge for the billing month.

Demand charges recover the utility's fixed cost of facilities (power plant, distribution facilities) built to meet a customer's highest electricity demand, regardless of use. This challenges the economics of public fast charging stations that experience a high peak demand, but low levels of kWh energy sales, or utilization. Peak demand at an infrequently used site could be determined by the single customer of that site with the highest demand, rather than an aggregate from multiple users charging at the sites busiest time. At low levels of utilization, the bill incurred by the charging stations result in demand charges being spread over a low volume of energy sales. Stations with higher kWh sales spread the demand charge over more energy sales and are more likely to recover costs. In addition to evaluating whether demand charges are appropriate for EV charging, utilities may consider how rate structure can help manage the additional demand created by vehicle charging. Time-of-use rates, based upon the cost of producing energy during different segments of the day, can be a mechanism for encouraging EV charging during off-peak hours.

How to Address Utility Participation Directly in the Charging Service Marketplace

There are multiple participants in the charging marketplace that face private capitalization and competition for high-usage locations. Potentially, a utility with lower capital risk provided by rate base regulation could have an advantage in the marketplace. However, public policy priorities may determine that the advantages of rapid deployment and the ability of utilities to serve high-cost, low-usage locations may outweigh the competitive concerns. Absent direction from the Legislature to adopt rules, the PSC will address utility involvement in the EV charging marketplace on a case-by-case basis as utilities propose programs for approval. Through comments, stakeholders have suggested competitively neutral policies that should be considered as utilities enter the market, such as the ability of site hosts to choose the products, services, and pricing that best suit their goals for providing charging services, as well as the use of equipment and software that promotes interoperability among charging locations. Regulated utilities offering EV charging services directly to the public would need to petition the Commission for approval of an EV charging tariff. Under traditional regulation, rates are set based upon the cost of service. Current conditions of this emerging market may not offer sufficient data available to determine a cost-based rate for charging services. In the early stages of participation, utilities may rely on some form of market-based rate derived by comparing rates charged by similarly situated charging stations. With this approach, utilities run the risk of charging rates that do not recover the cost of installation, creating subsidization by other users. On the other hand, there is a similar risk of utilities recovering more than the cost of providing service.

UTILITY REGULATORY CONSIDERATIONS

Current Utility Participation

Duke Energy Florida

Duke Energy Florida (DEF) has a five-year, EVSE pilot program "Park & Plug" as part of a negotiated rate case settlement agreement. DEF was authorized by the PSC to purchase, install, own and support EVSE at DEF customer locations. DEF may incur up to $8 million plus reasonable operating expenses, with a minimum deployment of 530 EVSE ports.

EVSE PILOT DETAILS

- At least 10 percent of EVSE ports must be installed in low-income communities.
- Deployment of Level 2 chargers and DCFC.
- Provision of equipment, installation, warranty and network connection services free of charge to the site hosts through 2022.
- Funding of consumer education up to $400,000.
- Ownership and operation of the charging station network with access (easement).
- Site hosts responsible for the cost of electricity used by the charging station; and
- Site hosts provide stations either as an amenity to drivers or by charging a fee to the driver, enabled by a smartphone or radio-frequency identification card.

The 2017 Settlement required a separate proceeding for approval of a permanent EV charging station offering within four years of the effective date or make a filing with the PSC to explain why a permanent offering is not warranted. On January 14, 2021, DEF filed a new Settlement Agreement, which requests the approval of a permanent EV charging station offering. The parties of the 2021 Settlement agree that DEF's 2017 EV Pilot should not be continued in its current form, although DEF will continue operation and recovery of costs of the charging stations that were installed pursuant to the 2017 EV Pilot. In its place, the 2021 Settlement presents three new EV programs forecasted to cost $62.9 million over a four-year term of 2022-2025.

NEW DUKE EV PROGRAMS

Residential EV Non-Time of Use (TOU) Credit Program

Residential customers that are not on a whole home TOU rate and who have EV charging stations located at their residence will be eligible for a $10 per month credit as a proxy for being on a TOU rate. The credit will be paid monthly to participating residential customers who observe off-peak charging. Customers will be allowed to "opt out" and charge during on-peak hours no more than twice in one month; customers who charge on-peak more than twice in one month will not receive that month's credit.

Rebate Program for Commercial & Industrial (C&I) Customers

All C&I customers that install an eligible EV charging station are eligible for the rebate. In exchange for the rebate, the C&I customer must install all EV chargers behind a separate meter and take service on schedule GST-1, a non-demand TOU rate schedule. The rebate amount will vary depending on the type of charging station being installed. Under the terms of the 2021 Settlement, DEF will be authorized to defer the recovery of its C&I rebate costs to a regulatory asset that will be amortized over five years.

Company-Owned DC Fast Charging Stations

DEF will be allowed to offer a new tariff for a Fast Charge Fee (FCF-1) to be collected from EV drivers using company-owned DC Fast Charging stations. The FCF-1 is based on the average cost for Fast Charging provided by other operators across Florida. DEF will include the Fast Charging station investments in rate base. All associated costs related to the DC Fast Charge EV program will be included in the cost of service. The 2021 Settlement was approved by the PSC on May 4, 2021.

UTILITY REGULATORY CONSIDERATIONS

Florida Power & Light Company

In 2019, Florida Power & Light Company (FPL) began a three-year pilot program, known as EVolution, which targets the installation of **1,000** charging ports of various technologies and all market segments.

EVolution PILOT DETAILS

- Facilitates gathering information such as EV use, adoption, and power quality data.
- Provides insights into potential new rate structures.
- Aims to increase public charging stations for EVs in Florida by 50 percent.
- Conducted in partnership with interested host customers over an approximate three-year period; and
- Installations will encompass workplace, destination, public fast charging, and residential.

OPTIONAL EV CHARGING PILOT TARIFFS

Utility-Owned Public Charging for Electric Vehicles (UEV)

Establishes a charging rate for utility-owned direct current fast charging stations. The UEV tariff sets a price of $0.30 per kWh for electricity sold to motorists at charging stations operated by FPL. FPL chose this rate based on a comparison of automotive fuel alternatives. FPL compared the average mileage efficiency of electric vehicles to gasoline-powered vehicles and, as a result, the electricity price that equates to the same cost per mile is $0.31 per kWh. FPL also considered EV pricing options offered by non-utility providers, such as Tesla, EVgo, and Electrify America. FPL also noted that the proposed $0.30 per kWh rate is not cost-based and that they do not have data regarding actual sales volumes and operating costs of utility-owned public charging stations and, therefore, the development of cost-based rates is conjectural at this time.

Electric Vehicle Charging Infrastructure Riders for General Service Demand (GSD-1EV) and General Service Large Demand (GSLD-1EV)

These new tariffs establish a rate for competitive market charging stations operating in FPL's service area. The GSD-1EV and GSLD-1EV tariffs help mitigate the impact of demand charges for charging stations that have low use. The GSD-1EV and GSLD-1EV rate schedules are comprised of an energy charge (based on the amount of energy, or kWh, consumed) and a dollar per kilowatt demand charge. The demand charge is billed on the highest usage, or demand, over a specified time interval (30 minutes). This peak usage determines the demand charge for the billing month. Current rate design results in scenarios where at low levels of utilization, the electric bills incurred by the charging stations result in demand charges spread over a relatively low volume of energy sales (low load factor customer). Charging stations with higher kWh sales (high load factor customers) are able to spread the billed demand cost over more energy sales and are, therefore, more likely to recover their electricity costs.

FPL proposed tariffs that include a demand limiter mechanism. Under the tariffs, the amount of demand billed to the customer would be the lesser of the measured demand or the limited demand as calculated by dividing the kWh sales by a fixed constant of 75 hours. Mathematically, applying the 75 hours constant to the kWh sales results in a reduction in the demand billed to a customer with a load factor of less than ten percent. Customers with a load factor above ten percent would pay the standard demand charges contained in the GSD-1EV and GSLD-1EV rate schedules and would not receive a reduction in the electric bill. The PSC ordered FPL to file, no later than Sept. 1, 2025, a petition to extend, modify, or terminate the tariffs, and required the utility to file annual reports with the results of the pilot program.

Tampa Electric Company

On September 25, 2020, Tampa Electric Company (TECO) filed a petition with the Commission for approval of a four-year, $2 million EV charging pilot program.

PROPOSED PILOT DETAILS

- TECO will own, operate, and maintain approximately **200 Level 2 charging ports** and four DC Fast Chargers within the company's service area.
- Will engage a turn-key vendor for installation of the charging ports, provision of networking, operation, maintenance and 24/7 customer support.
- Will fund the full cost of installation for income qualified and government site hosts.
- Charging ports will be located in five different market segments: workplaces, public/retail, multi-unit dwellings, income qualified, and government, with Site Hosts selected through an application process.
- Will contribute up to $5,000 towards installation costs for ports in the workplace, public/retail and multi-unit dwelling segments. The cap will encourage site hosts to minimize installation costs.

During the Pilot, TECO will retain full ownership of the charging equipment and provide full operation and maintenance service. The Site Host will be charged for electricity consumed by the charging equipment at standard tariff rates. The Site Host may choose to charge drivers for charging or may provide charging at no cost to EV drivers as an amenity. If the Site Host chooses to charge EV drivers, the charge will be limited to TECO's then-current GS tariff rate, plus any telecom or administrative fees assessed by the billing vendor. Tampa Electric Company will produce a final report on the key findings of the Pilot and provide the report to the PSC no later than the third year of the Pilot. The TECO pilot was approved by the PSC on April 1, 2021.

Municipal and Cooperative Utility EV Charging Programs

There have been two Municipal and Cooperative EV utility tariffs filed with the PSC for rate structure review in 2020.

ORLANDO UTILITIES COMMISSION (OUC)

OUC has been offering commercial Level 2 and DCFC EV charging services that include ownership options. OUC offers two models to choose from:

- **"Charge-It"** - OUC owns, installs and maintains the station. The commercial partner obtains EV charging services from OUC for a fixed monthly fee over a contracted period of time. The fee is based on specific characteristics of the site and the equipment type.
- **"Own-It,"** - OUC designs, procures and installs the station. The commercial partner pays for the equipment and installation that OUC provides and then takes immediate ownership of the station.

SUMTER ELECTRIC COOPERATIVE (SECO)

On January 1, 2021, SECO implemented a 50 kW or greater fast charging tariff that directly bills the user of the EV charger. The user must register an account with SECO's mobile application or network provider, including payment information, prior to charging the EV. The tariff is available to EV fast charging stations with output power of 50 kW or greater where SECO provides the charging service and direct billing to the user. The energy charge is $0.31 per kWh for charging at levels 1-129 kW and $0.44 per kWh for charging at levels 130kW and above.

STRATEGIES TO DEVELOP CHARGING SUPPLY

Other States' Examples

To increase EV charging station development, Florida can pursue a singular model or multiple models to enable ample opportunity for involvement from many parties. Multiple options to EVSE deployment allow the market to develop, embrace different business models and maintain flexibility. Following are examples and strategies of how they were implemented in other states.

MAKE-READY INFRASTRUCTURE: NEW YORK

The utility installs infrastructure for charging station and Electric Vehicle Service Provider (EVSP) is installed/owned by third party.

The EVSE New York Public Service Commission (NYPSC) approved a $701 million Make-Ready infrastructure program, involving the state's six investor-owned utilities to spur the installation of chargers. The NYPSC treats all utility-owned infrastructure as capitalized plant in service with cost allocation and recovery via traditional utility rate making methods. Since the assets are not reflected in current rate plans, utilities can recover the associated revenue requirement through an existing surcharge until base rates are adjusted to include the new program's investments.

53,000
Level 2 Chargers to be Installed

1,500
DCFCs Installed

REBATES: MICHIGAN

Rebates to third parties help with the initial costs of installing chargers. The rebate costs can be capitalized and put in rate base.

The Michigan Public Service Commission (MPSC) has authorized Consumers Energy to launch a charging infrastructure pilot program that includes rebates and a time-of-use rate plan. The PowerMIDrive program includes rebates for commercial public Level 2 chargers (up to $5,000) and for DC Fast Charging stations (up to $70,000). Applicants must be a business customer, submit an application, install at least one commercial charger from PowerMIDrive's approved list and complete installation of the charger.

~$5K
for Level 2 Chargers Rebates

~$70K
for DCFC Rebates

UTILITY OWN/OPERATE: NORTH CAROLINA

Fully owned and operated by the electric utility. Good for deployment in high-cost, low usage areas needing improved return on investment to support deployment by third-party charging.

The North Carolina Utilities Commission (NCUC) approved a $25 million EV pilot program allowing Duke Energy to install and own 280 charging stations. Duke Energy can install, own and operate 160 Level 2 charging stations at public destinations, 40 public DC Fast Charging stations throughout North Carolina, and 80 Level 2 charging stations at multi-family housing.

160
Level 2 Public Chargers

80
Level 2 Multi-family Chargers

40
DCFCs

SUBSCRIPTION SERVICES: MASSACHUSETTS

Utility owns and leases EVSE to third parties at flat subscription service charge for useful life of asset.

In Massachusetts, Eversource, offers an EV Make-Ready program that provides installation and funding support for non-residential customers to install approved Level 2 or DC fast charging EVSE at businesses, multi-unit dwellings, workplaces and fleet facilities. To qualify, customers must own, lease, or operate a site where vehicles are typically parked for at least two hours.

Level 2 & DCFCs Installed at Locations Where Residents Typically Park for at least

2 HRS

UTILITY/THIRD-PARTY PARTNERSHIP: ARIZONA

Utility partnerships for third-party turnkey services or bulk purchases under an own and operate model allowing utilities to work with an operator for maximum in-service time.

Arizona's Salt River Project (SRP) is partnering with EVgo to provide five new DC Fast-Charging stations in SRP's service territory. This business model, where EVgo owns, operates, and maintains the charging equipment, allows for a consistent customer experience and aligns the network operator and the consumer.

5

New DCFCs to be Installed

PUBLIC-PRIVATE PARTNERSHIPS: NEW YORK

Negotiated state contracts with multiple EVSE vendors deploying infrastructure along state highways and evacuation routes. Municipalities can work with EVSE owners to expedite deployment by streamlining permitting for installations.

REV Connect is a partnership that brings together companies and electric utilities to accelerate innovation, develop new business models and deliver value. The program engages partners through online platforms, in-person events and webinars. REV Connect is funded by the New York State Energy Research and Development Authority.

8

Partnerships Being Developed

5

Partnerships are Operational

REGIONAL/STATE PLANNING ORGANIZATIONS: MARYLAND

Planning organizations can be developed to advance charging infrastructure regionally and statewide through planning, implementation, and completion.

Maryland has a statutorily created entity, the Maryland Zero Emission Electric Vehicle Infrastructure Council (ZEEVIC), responsible for developing recommendations for a charging infrastructure plan. ZEEVIC develops targeted policies to support fleet purchases of electric vehicles, develops charging solutions for existing and future multi-unit dwellings, and pursues other goals and objectives that promote utilization of zero emission vehicles.

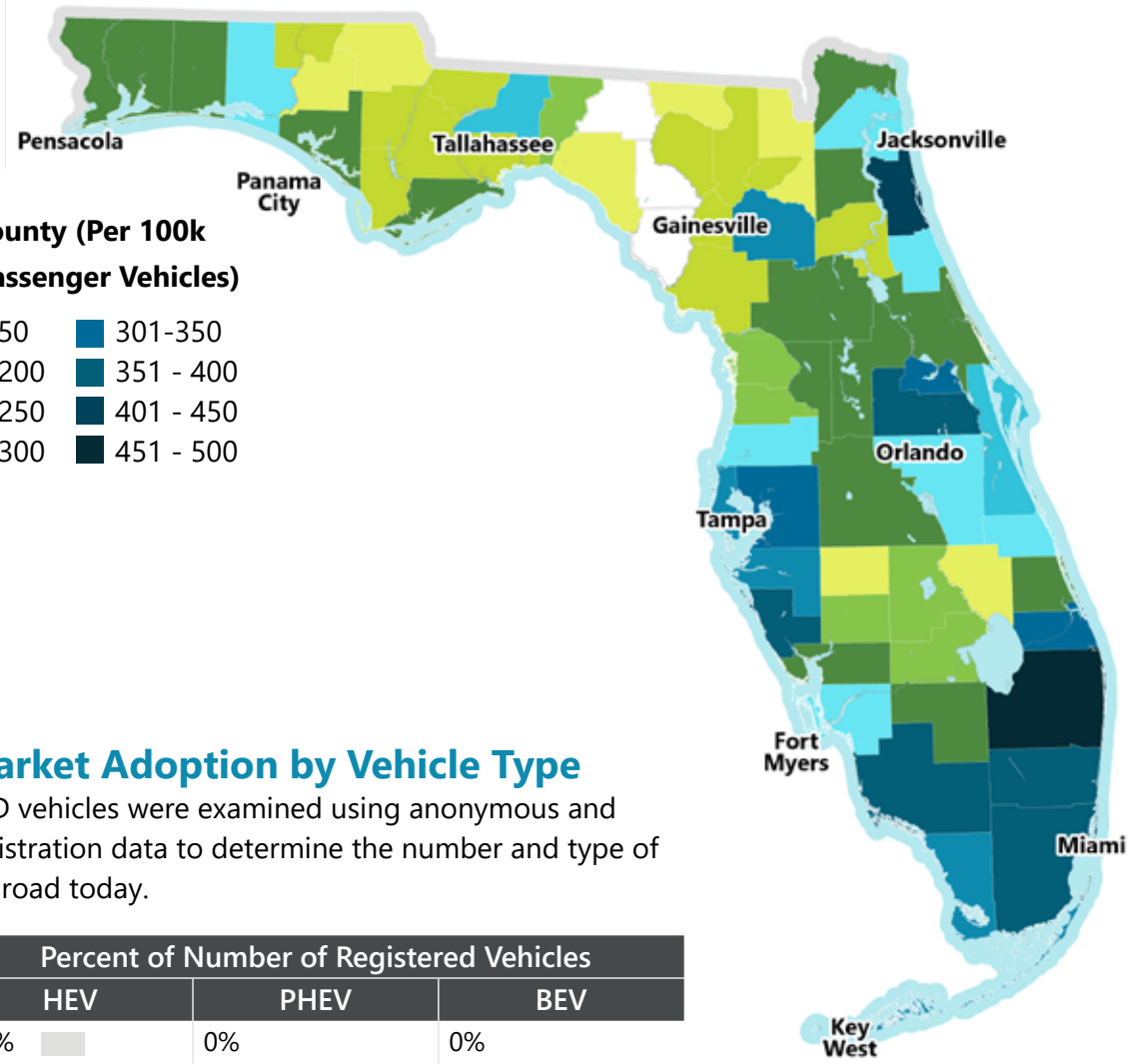
ZEEVIC

(Maryland's) Zero Emission Electric Vehicle Infrastructure Council

EV MARKET ADOPTION

Increasing EV sales is a precursor to actual EV market adoption. In Florida, annual EV sales have remained below two percent of overall vehicle sales and are projected to grow.

BEV Ownership by County



Registered BEVs by County (Per 100k Total Registered LD Passenger Vehicles)

0	101-150	301-350
1 - 25	151 - 200	351 - 400
25 - 50	201 - 250	401 - 450
51 - 100	251 - 300	451 - 500

Statewide EV Market Adoption by Vehicle Type

All registered Florida LD vehicles were examined using anonymous and aggregated vehicle registration data to determine the number and type of electric vehicles on the road today.

First Year of Registration	Percent of Number of Registered Vehicles		
	HEV	PHEV	BEV
Before 2010	.77%	0%	0%
2010	1.58%	0%	0%
2011	1.72%	.03%	.02%
2012	2.37%	.11%	.04%
2013	2.51%	.11%	.11%
2014	2.22%	.14%	.12%
2015	1.94%	.11%	.14%
2016	1.66%	.15%	.22%
2017	1.66%	.21%	.26%
2018	1.56%	.26%	.54%
2019	1.50%	.29%	.62%
2020	1.57%	.20%	.72%
All Years	**1.48%**	**.14%**	**.27%**

Map Source: *Florida Highway Safety and Motor Vehicles (2021);*
Date of Production: *3/19/2021*

Current EV Adoption

	All Registered LD Vehicles	Other Fuel Types	HEV	PHEV	BEV
Vehicles	16,529,219	16,218,211	244,323	**22,617**	**44,068**
% Total	100%	98.12%	1.48%	0.14% +	0.27%

.41% all LD vehicles registered in Florida

Source: FLHSMV VIN Registrations as of July 28, 2020

Adoption Scenarios

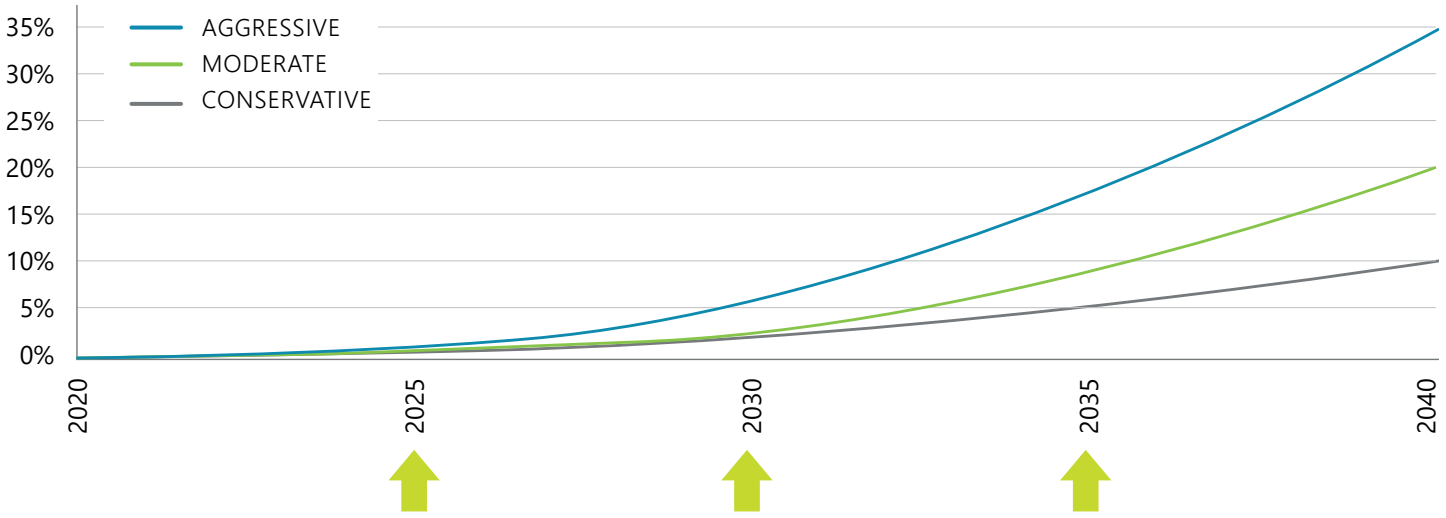
Industry trends are shifting toward offering increasingly more EVs. Three growth scenarios have been developed as indicators for understanding how aggressively transportation infrastructure needs to adapt. The EV adoption market projections, shown in the graph below, may shift and evolve with certain industry milestones.

AGGRESSIVE
Growth accelerates and continues for some time at a high rate due to reductions in cost, rapid technological improvements, and bold policy or funding incentives.

MODERATE
Growth occurs at an even pace with continued price decreases, technology improvements and modest policy or funding incentives.

CONSERVATIVE
Growth is limited due to factors such as cost, technological innovation pace and existing policy.

EV Market Adoption Projections of LD Vehicles by Scenario



VOLVO
50% of its vehicle offerings will be EV.

FORD
40% of global sales will be EV.

GENERAL MOTORS
all light-duty cars and SUVs will be EV.

IMPACTS TO TRANSPORTATION FUNDING

All motor fuel consumption based revenue streams will be reduced with EV market penetration, which will have national, statewide as well as regional and local impacts. Rising market shares of EVs are expected to adversely impact revenues collected from highway fuel taxes into resources like the State Transportation Trust Fund (STTF) over the next 20 years. Local option fuel taxes will also be adversely affected, which could have implications for operations and maintenance of local roadways, as well as public transportation.

Transportation funding impacts have been forecasted based on revenue projections issued by the Revenue Estimating Conference (REC). Impacts of reduced gasoline and diesel fuel consumption on Highway Fuel Sales (HFS) Tax, the State Comprehensive Enhanced Transportation System (SCETS) Tax, and the Local Option Distribution were estimated.

Total Net Revenue Differential

Impacts to REC Projections by Scenario - Includes All Revenue Streams.

The revenue impacts could range between 5.6 percent and 20 percent by the year 2040 depending on the adoption scenario. This represents cumulative revenue impacts up to seven percent under the aggressive scenario.

2040 Net Revenue Loss Projections

Conservative Growth Scenario
-5.6%

Moderate Growth Scenario
-11.1%

Aggressive Growth Scenario
-20.0%

20-Year Cumulative Total Projections

Conservative Growth Scenario
-2.2%

Moderate Growth Scenario
-3.8%

Aggressive Growth Scenario
-7.0%

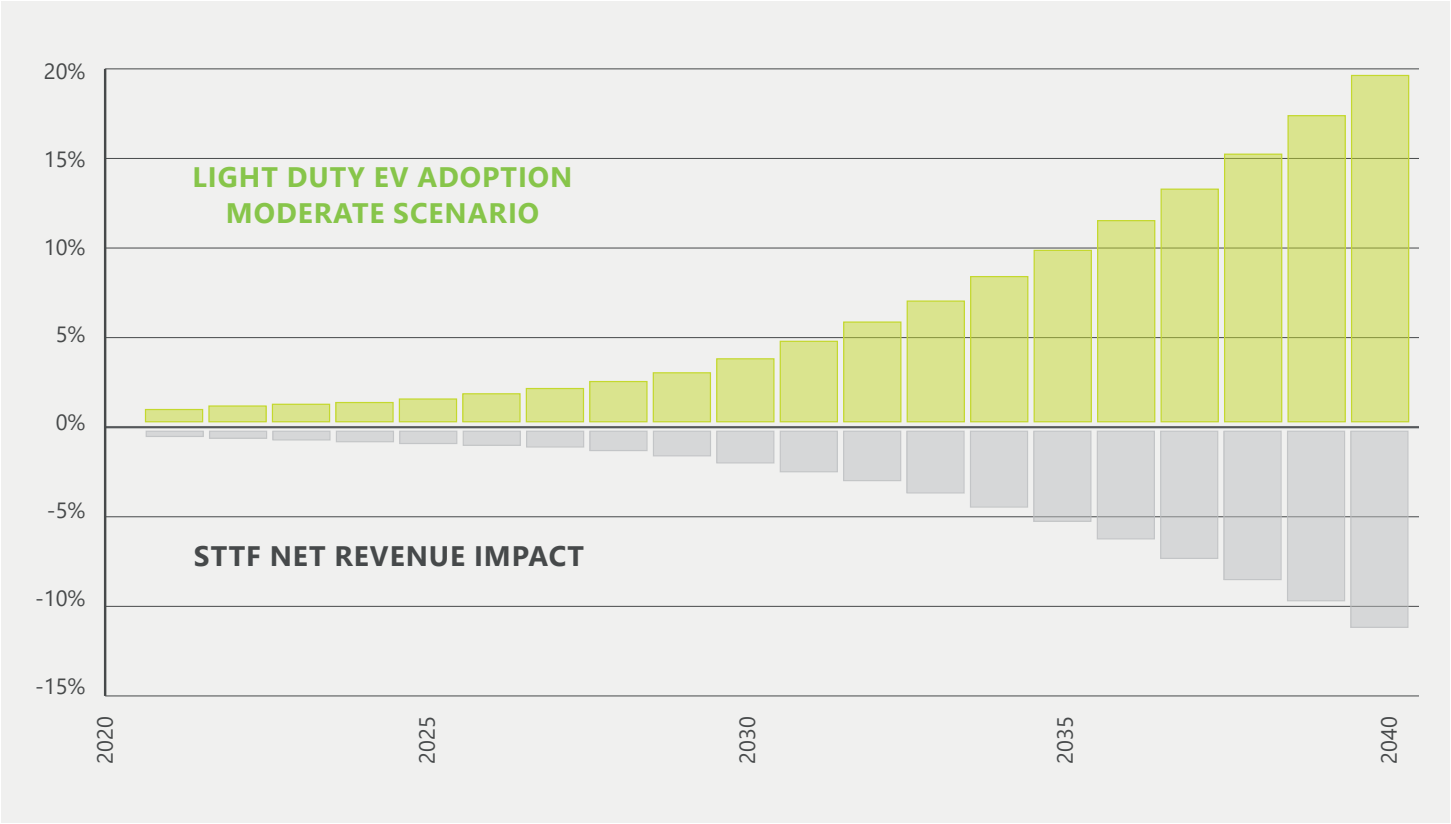
IMPROVED FUEL EFFICIENCY

To date, hybrids and improved fuel efficiency of ICE vehicles may have had a more significant impact on overall motor fuel consumption as compared to EVs. However, as BEVs proliferate, their impacts will become prominent.

2021-2040 STTF Total Net Revenue Loss (Moderate Growth Scenario)

Includes All Revenue Streams.

When factoring all transportation revenue streams, for every one percent increase in EV market adoption, there could be 0.5 percent reduction in STTF revenue.



RESILIENCY AND EMERGENCY EVACUATIONS

EVSE Infrastructure Resiliency

Resiliency during natural disasters is a critical requirement for EVSE infrastructure in Florida. The ability to travel after a hurricane is important for everyone including EV owners. Redundant power feeds to EVSE locations improve the resiliency of the charging network. Where redundant feeds are not available on-site, back-up power generation is another option. Emergency charging locations should also have multiple chargers and charging plugs so that a failure of a single charger does not render the charging site inoperable.

1. Two power feeds help maintain electrical connection if one line goes down.
2. Multiple charger types ensure interoperability with older EVs.
3. Permanent on-site back-up power generation is recommended, either diesel or a battery energy storage system.
4. Roll-on back-up power generation is an option if permanent on-site generators are not feasible.
5. On-site solar panels can be sufficient to power facilities, but will require adequate battery energy storage systems to supply power to EVs.
6. When on-site EVSEs are down or demand is excessive during emergencies, mobile (trailered) DCFC stations can be strategically deployed. Opportunity for multi-state collaboration exists.

EVACUATION PREPARATION

Evacuate 10s of miles and not 100s of miles.
Fully charge your vehicle.
Use ICE vehicle, if you have the option.

Emergency Preparedness

Items put in place before the disaster occurs, including physical infrastructure and plans.

ELECTRICAL HARDWARE

- Infrastructure installed at designated emergency EVSE locations prior to an emergency occurring
- Redundant power feeds, on-site generators, connections for mobile generators

COMMUNICATION NETWORK

- Network connectivity and redundancy in contingency plans
- Hardwired communication lines can be backed-up by cellular networks or vice-versa
- If communication goes down but power does not, EVSE should still operate during an emergency

PAYMENT

- Communication is usually used for payments, there are multiple ways to address an outage
- Capture payment information locally and process payments later
- Florida could explore legislative framework for FEMA to reimburse electricity costs associated with EV charging during a declared emergency

Emergency Response

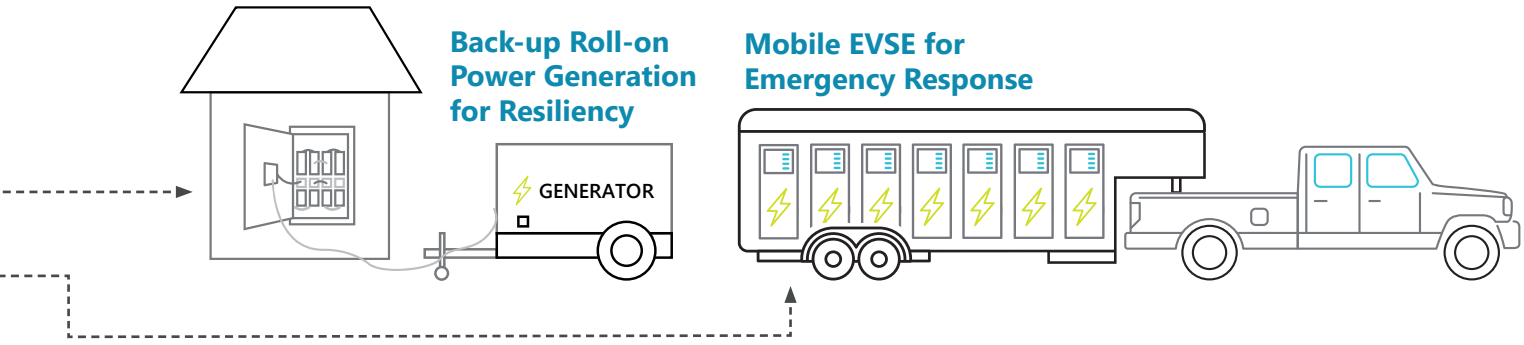
Items deployed after the disaster occurs.

POWER SUPPLIES

- Mobile EVSE deployments
- Trailer with EVSE that can be deployed to the exact areas impacted
- Attached to the grid at pre-planned locations for emergency charging
- Attached to or combined with a mobile generator
- Mobile backup generators
- Trailer with diesel generator that can power EVSE in an emergency
- Deploy to pre-planned locations that have infrastructure to accept a connection to a generator and pre-planned space to hold the generator

OTHER CONSIDERATIONS

- Level 2 chargers should be installed near evacuation shelters and/or hotels for coastal residents who travel inland for temporary shelter
- Access to Level 2 chargers in these locations will reduce demand on the DCFC infrastructure



F.S. 526.143 requires certain gas stations along evacuation routes to have backup power generation. Florida could amend this statute to include EVSE locations. Alternatively, locations without existing EVSE could be host sites (i.e., rest areas) for mobile DCFC EVSE stations.

IDENTIFICATION OF POTENTIAL NEW EVSE LOCATIONS

Gap Analysis for Long-Range Travel (DCFC)

A GIS computer mapping analysis was used to find gaps in the DCFC charging network along the SHS. Multiple factors were combined to find the areas around SHS roadway intersections that had high potential to fill the gaps in the DCFC EVSE network.

CONSIDERATION FACTORS:

- **Proximity to existing DCFC charging sites**
  - A. Areas within a 25-mile driving distance of an existing DCFC EVSE were considered to be adequate
  - B. Locations between 25 and 50 miles were potentially suitable
  - C. Areas more than 50 miles from a DCFC EVSE were rated as most in need of new charging stations. (Since the existing DCFC stations tend to be clustered in urban areas, this factor also helped address equity concerns by finding potential EVSE locations in more rural areas)
- **Daily traffic at intersections along the SHS**
  - A. Areas near high-traffic intersections rated higher than those with moderate or low traffic levels
- **Proximity to SHS intersections along evacuation-critical routes**
  - A. Located areas with easy access for motorists on the SHS
  - B. Identified areas within 1 minute, 5 minutes or 10 minutes drive from each SHS intersection
  - C. Areas within a short drive-time were rated higher than areas that took longer to reach
- **To ensure the greatest benefit to the most EV drivers, the proposed EVSE locations were prioritized by**
  - A. The amount of daily road traffic on the SHS roadways
  - B. Higher priority given to the most heavily traveled roads

Gap Analysis for Short-Range Travel (Level 2)

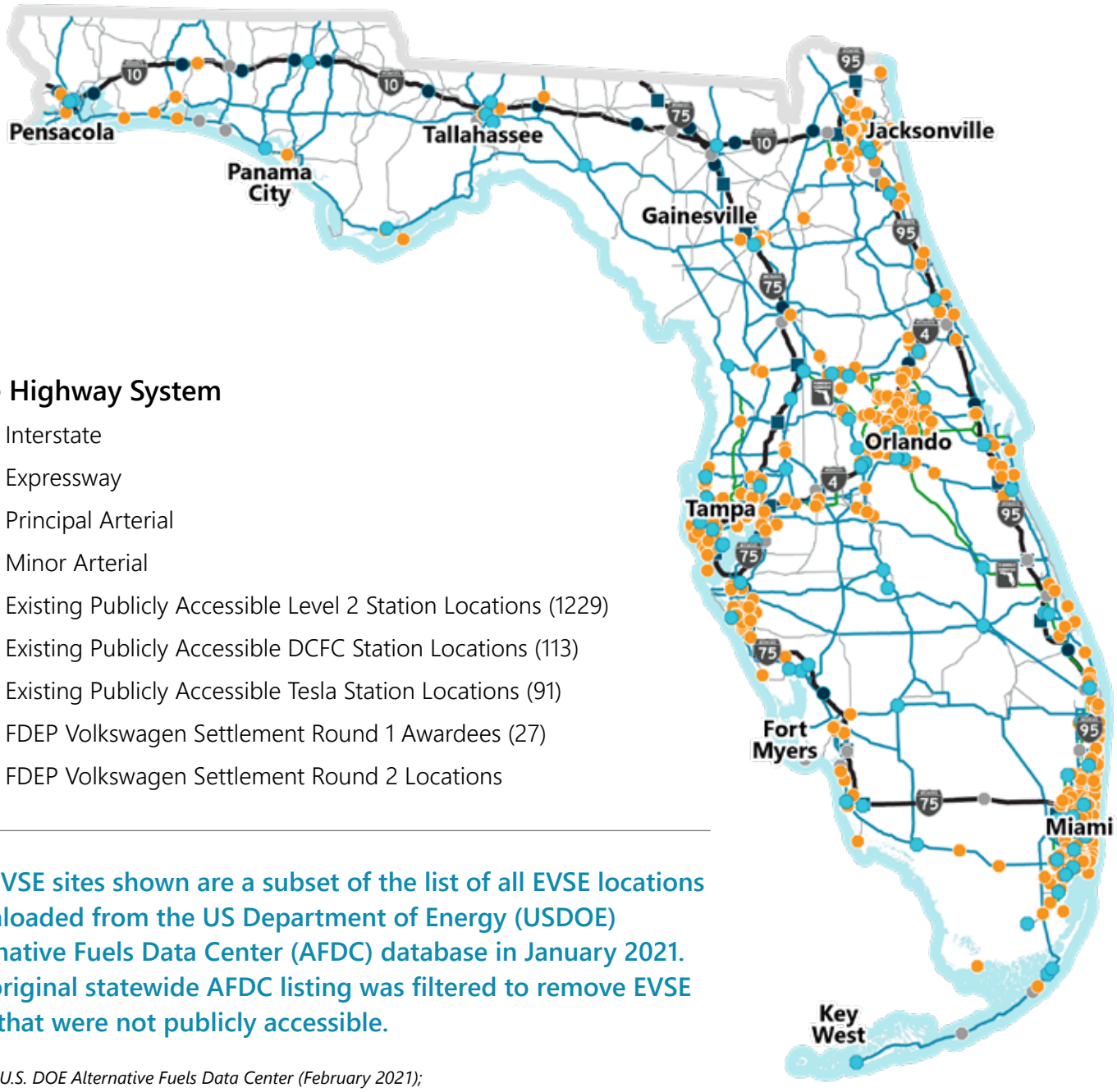
A GIS analysis was conducted to identify potential Level 2 EVSE charging sites within urban areas with consideration for low-income communities and multi-family residential buildings. Besides providing EV charging capability for EV owners unable to charge their vehicles at home, many of these sites would also provide destination charging opportunities for EV users going about routine daily activities.

CONSIDERATION FACTORS:

- **Within convenient walking distance of large multi-family residential buildings**
  - A. Highest priority for areas within a quarter mile
- **Median household income**
  - A. Greatest weight assigned to areas in the lowest 20 percent income group
- **Identify existing gaps in the Level 2 charging network**
  - A. Areas more than five miles from a Level 2 charger as the highest priority
  - B. Areas within a half mile of an existing Level 2 EVSE were rated as low priority
- **Land use types at which drivers might park for extended periods of time**
  - A. Movie theaters, restaurants, shopping centers, parks and government offices

Existing Publicly Accessible EVSE Locations

Prior to conducting the gap analyses, the existing publicly available EVSE locations were identified. The following page provides results from these gap analyses.



State Highway System

- Interstate
- Expressway
- Principal Arterial
- Minor Arterial
- Existing Publicly Accessible Level 2 Station Locations (1229)
- Existing Publicly Accessible DCFC Station Locations (113)
- Existing Publicly Accessible Tesla Station Locations (91)
- FDEP Volkswagen Settlement Round 1 Awardees (27)
- FDEP Volkswagen Settlement Round 2 Locations

The EVSE sites shown are a subset of the list of all EVSE locations downloaded from the US Department of Energy (USDOE) Alternative Fuels Data Center (AFDC) database in January 2021. The original statewide AFDC listing was filtered to remove EVSE sites that were not publicly accessible.

Source: *U.S. DOE Alternative Fuels Data Center (February 2021); Florida Department of Transportation (February 2021)*
Date of Production: *3/17/2021*

3 STATEWIDE CHARGING NETWORKS → **Level 2** *(community/local)*, **DCFC** *(long-range)*, **Proprietary**

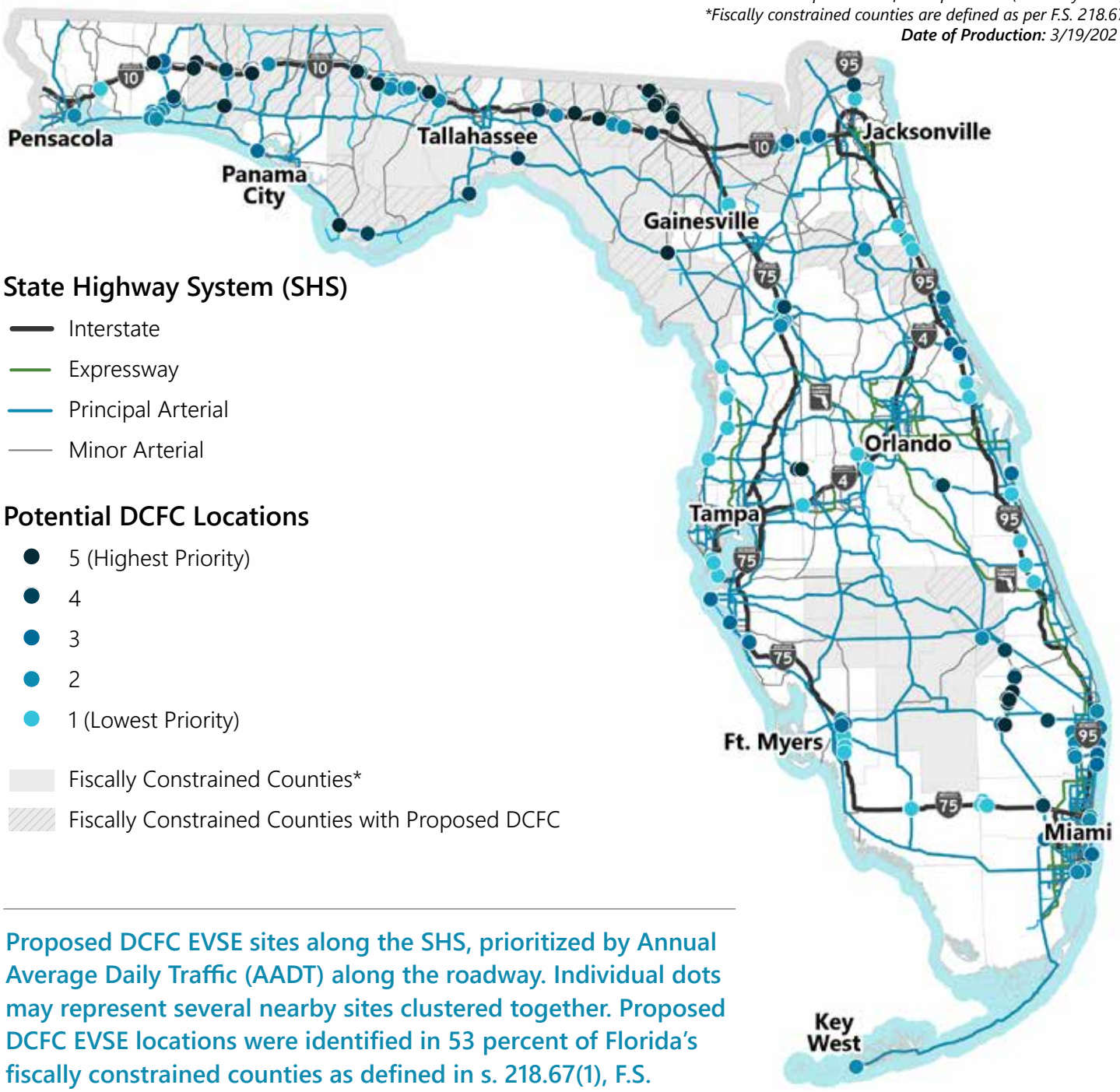
Each has unique characteristics that must be accounted for.

EV INFRASTRUCTURE ON THE STATE HIGHWAY SYSTEM

Gap Analysis Results - Potential DCFC Locations

To Support Long-Range Travel

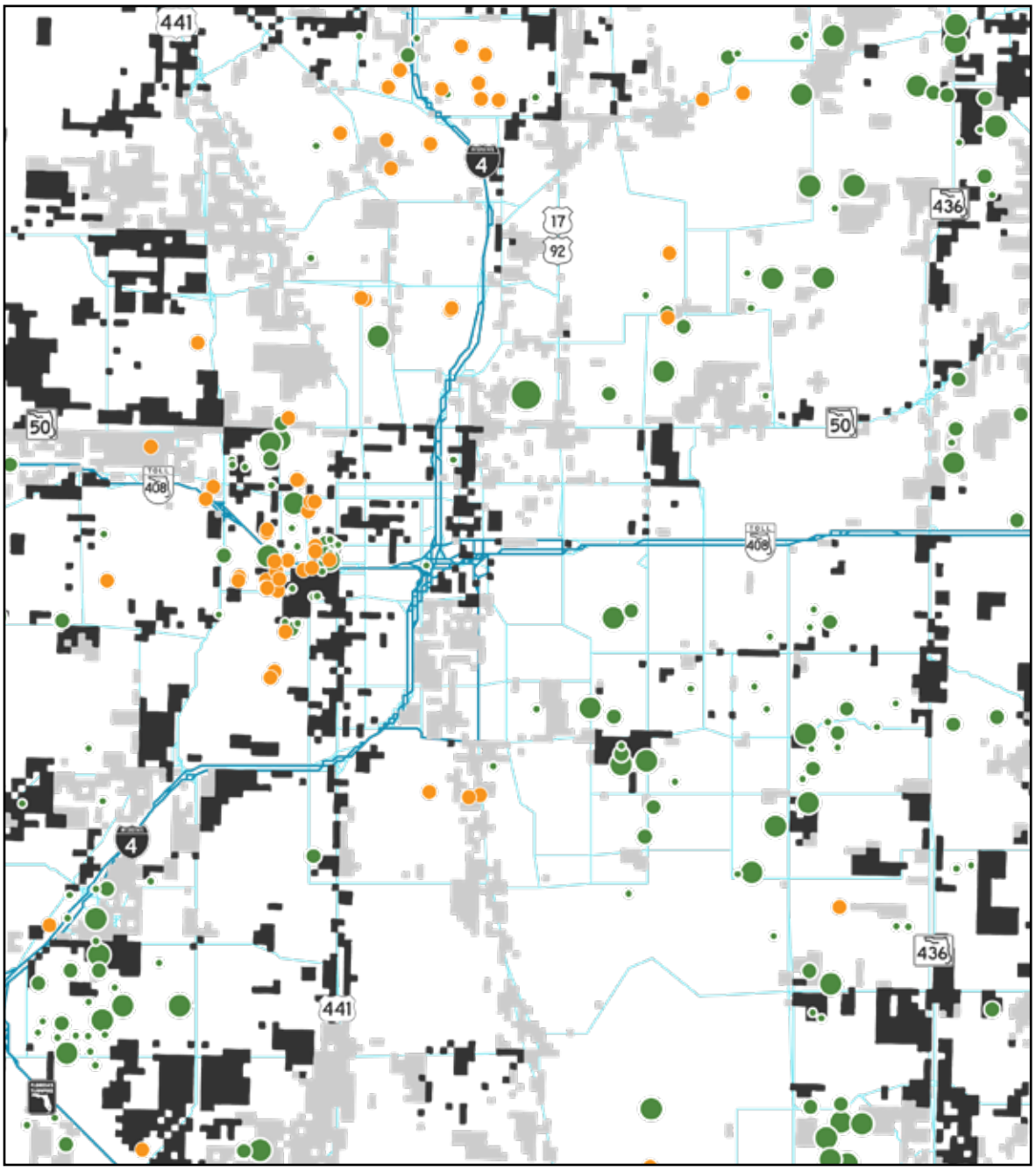
Source: *U.S. DOE Alternative Fuels Data Center (February 2021); Florida Department of Transportation (February 2021)*
**Fiscally constrained counties are defined as per F.S. 218.67*
Date of Production: *3/19/2021*



Proposed DCFC EVSE sites along the SHS, prioritized by Annual Average Daily Traffic (AADT) along the roadway. Individual dots may represent several nearby sites clustered together. Proposed DCFC EVSE locations were identified in 53 percent of Florida's fiscally constrained counties as defined in s. 218.67(1), F.S.

Potential Community Charging (Level 2) Footprints

To Support Short-Range Travel (Orlando Area Example)



Multi-Family Residential Units

- 0 - 200
- 201 - 300
- 301 - 600
- 601 - 1,000
- 1,001 - 8,736
- Existing Level 2 Locations
- Moderate Potential
- High Potential

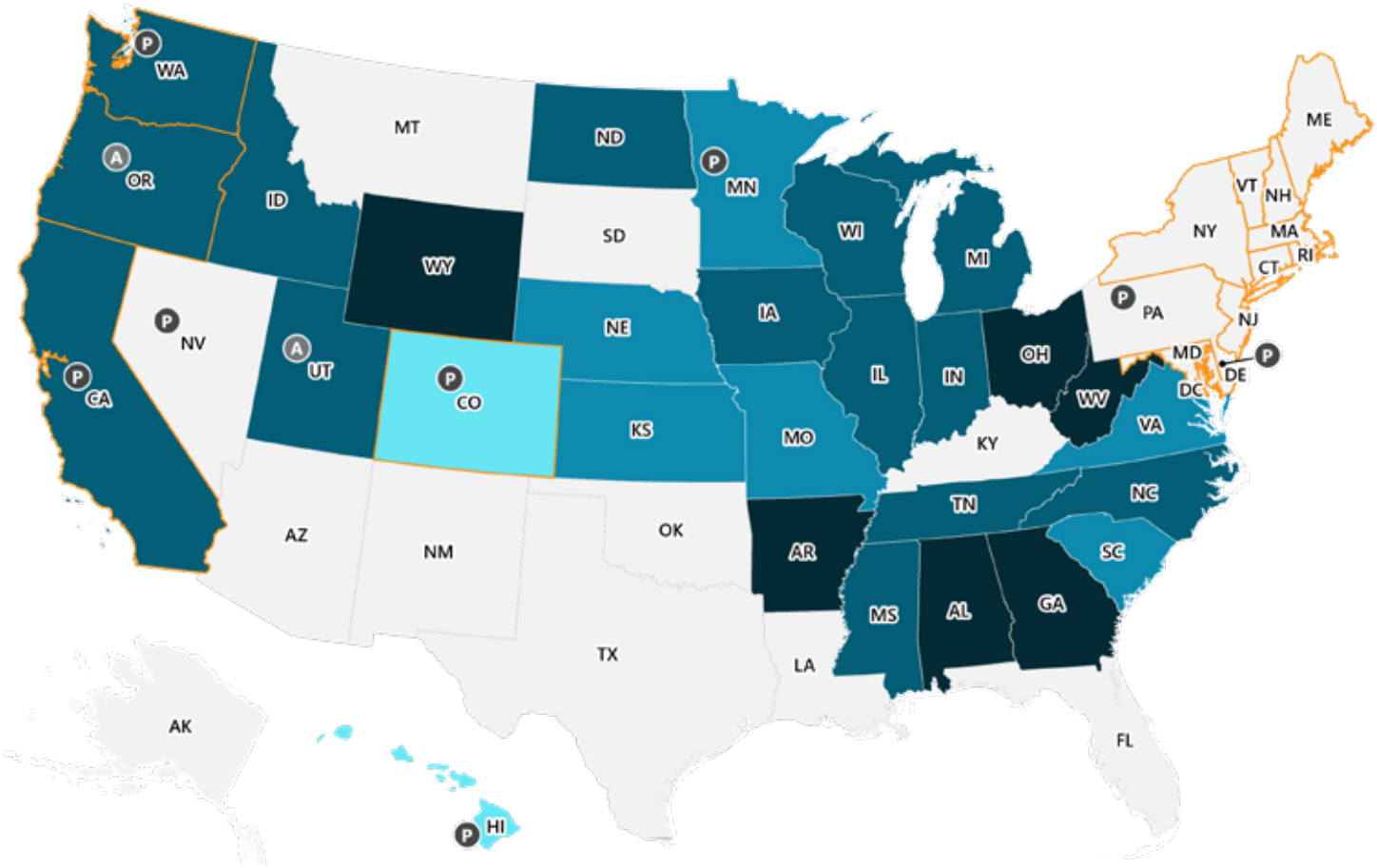
Sources:
Esri, HERE, Garmin, Intermap, increment P.Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, FDOR Parcels 2018, USDOE AFDC EVSE Database 2021,

Date of Production:
3/10/2021

Potential locations to serve low-income and multi-family residential populations in the vicinity of Downtown Orlando. The areas represent land uses conducive to longer-term parking, such as restaurants, movie theaters, shopping centers, parks or government offices, where slower Level 2 charging would be more feasible.

OTHER STATES' POSITION ON EV POLICIES

Various policies, fees and programs have been enacted by states to encourage the adoption of EVs and facilitate the installation of EVSE. Other state-level efforts may exist, but the following is an overview of the most common policy actions.



EV Registration Fees by State

- 0
- <=$50
- $51-$75
- $76-$150
- $151-$212

Road Usage Charge (RUC) Piloted Projects

- A Active Program
- P Pilot/Demo

Zero Emission Vehicle (ZEV) Regulated State

- Active Participant

REGISTRATION FEES

As of early 2021, 28 states have implemented a registration fee supplement for EVs, with a combined average fee of $121.

RUC PROGRAM

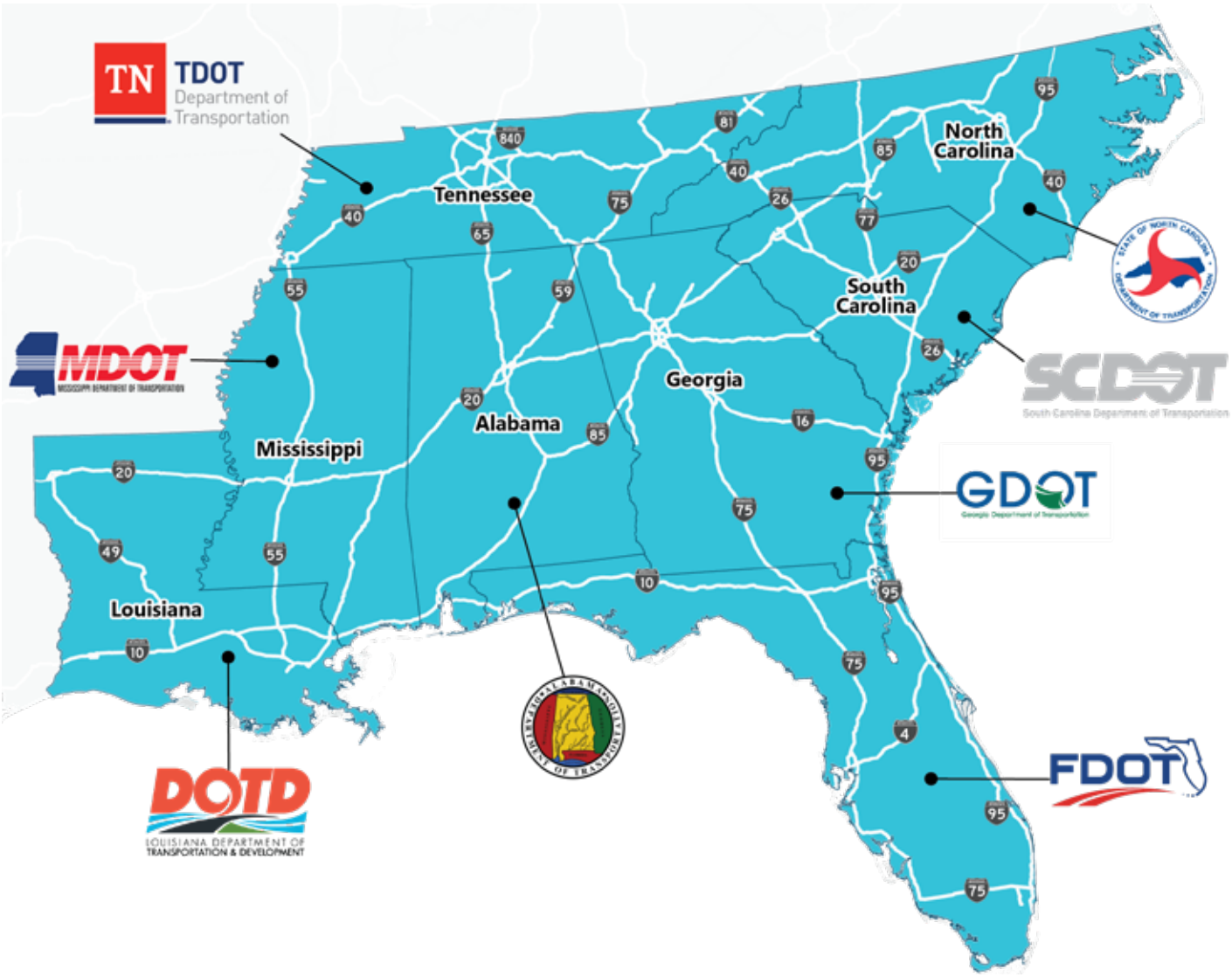
Two coalitions have emerged to guide and support the development and interoperability of regional RUC systems. A number of pilots have been conducted throughout the United States to explore different approaches to collecting road user fees.

REGULATED STATES

A state can adopt Section 177 of the Clean Air Act which permits a state to require automakers to sell a certain proportion of their vehicles as ZEV.

REGIONAL COLLABORATION

Florida actively participates in organizations such as the American Association of State Highway and Transportation Officials (AASHTO) and The Eastern Transportation Coalition (TETC) to advance inter-regional objectives that strive for well-connected transportation networks. These entities serve as sounding boards to share best practices and achieve common goals towards providing safe, reliable and equitable mobility options.



Regional Opportunities in the Southeast

Potential southeast regional opportunities may involve engaging existing regional organizations and partnerships. Activities and topics of discussion could include:

- ☑ Regional market forecast for LD, MD and HD EVs
- ☑ EVSE siting assessment for multi-state corridors
- ☑ Model policy, planning guidance, and EVSE-ready building codes for local agencies
- ☑ Regional evacuation considerations

RECOMMENDATIONS
INTRODUCTION

This section includes recommendations for actions and next steps towards facilitating the expansion of EVSE to support transportation mobility goals.

Process

To inform the EVMP framework, stakeholder and public engagement occurred during the development of the Plan. The collaborative process was also informed by technical analysis.

Goals

The following goals were developed based on the legislation and the FTP to establish the framework of this Plan.

PROMOTE
a variety of energy sources

POSITION
Florida as a national leader in EVSE infrastructure implementation

EXPAND
EVSE access in Florida

ANTICIPATE
changes in travel choice and transportation technologies toward EV adoption

ENHANCE
Florida's overall transportation system

SUPPORT
emergency evacuation

Initiatives

ADAPT

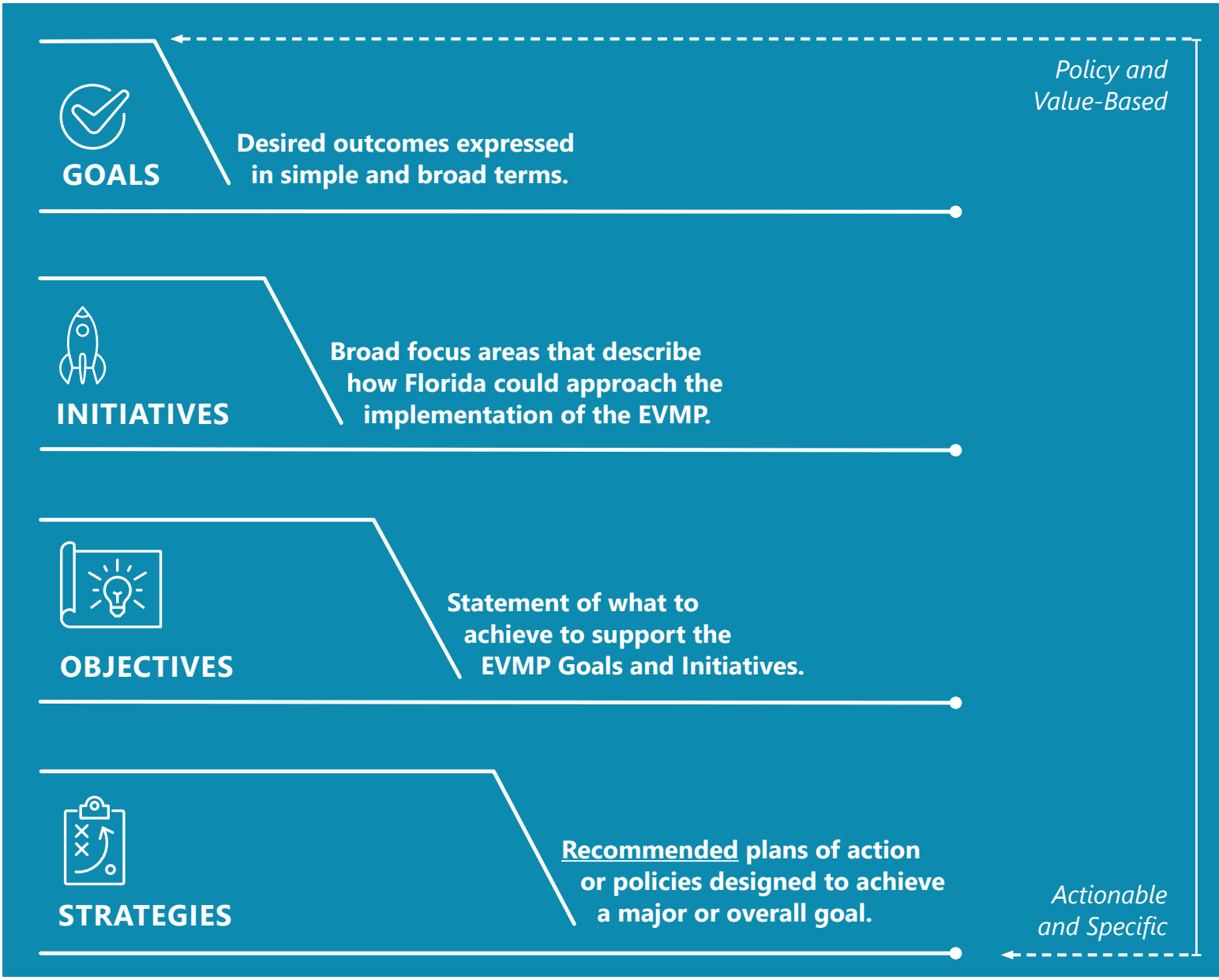
FACILITATE

EDUCATE

COORDINATE

Framework

The framework provides an overview of recommendations that should be considered for action to support the identified goals, initiatives, objectives, and strategies.



Equity, as defined for the EVMP, prioritizes fair and equal access, and incorporates criteria for mitigating potential social or economic status barriers to electric vehicles and charging stations.

EQUITY IN THE EVMP → **EVMP strategies supporting Equity will be highlighted throughout the recommendations.**

RECOMMENDATIONS
INITIATIVE 1: ADAPT

FDOT should take the lead to adapt existing transportation infrastructure to support the move towards electrified mobility.

1

OBJECTIVE

Anticipate Market and Industry Trends

STRATEGY

- **Monitor industry trends to inform decision making:**
  Understanding what is happening in the EV and EVSE market is critically important to adapting transportation infrastructure to meet changing customer needs.

2

OBJECTIVE

Adapt Transportation Policy Framework

STRATEGY

- **Remove legal and institutional barriers for installing EVSE at rest areas and other facilities within state owned right-of-way:**
  For example, 23 U.S. Code § 111 and Florida Administrative Rule 14-28.002 could be amended.
- **Identify alternative and innovative revenue sources:**
  Motor fuel consumption is going to decrease while the wear and tear on our roads is going to increase. It is critically important to identify sustainable revenue sources at the state and local levels.

3

OBJECTIVE

Expand EVSE Network along Transportation Infrastructure

STRATEGIES

- **Fill immediate EVSE gaps:**
  The private sector is leading the implementation. However, low return on investment creates infrastructure gaps in areas with low EVSE utilization. The state can play an important role in filling these gaps along the SHS. EVSE Infrastructure investments should be scaled with EV market adoption.
- **Develop and implement a phased approach to EVSE deployment:**
  Develop an EVSE deployment plan that prioritizes immediate needs while expanding the network over time to meet future needs.
- **Include EVSE in planning and project development:**
  Account for EVSE needs when existing infrastructure is enhanced or new infrastructure is developed.
- **Assess opportunities to provide sponsorships of EVSE at rest areas:**
  Similar to 'safe cell phone zones' at rest areas and FDOT Road Rangers, sponsorships could offset the cost of electricity.
- **Develop and deploy a mobile charging program to support evacuations:**
  Utilize existing state property to develop and deploy mobile charging stations at strategic locations along major evacuation routes.
- **Install EVSE at welcome centers:**
  EVSE at welcome centers provides the state an opportunity to showcase electrified mobility advancements. If these centers used electricity powered by solar, it could tie into the "Florida Sun" brand.

OBJECTIVE 4

Support Municipal and Local Agencies with Implementation of the EVMP

STRATEGY

- **Increase or raise awareness and provide guidance for early adopters of EVSE:**
  Develop guidance and standards for the entire life-cycle of EVSE.

OBJECTIVE 5

Support Research and Testing of Next Generation EVSE like WPT and HD EVSE

STRATEGY

- **Leverage SunTrax as a test bed for industry:**
  FDOT invested in a large-scale, cutting edge facility (SunTrax) dedicated to the research, development and testing of emerging technologies in a safe and controlled environment. EVSE vendors can lease test sectors, develop test scenarios, access specialized equipment, and realize testing performance at the facility.

FDOT can serve as a facilitator between public and private partners to strategically enhance EV infrastructure.

1

OBJECTIVE

Promote EVSE Infrastructure to Support Long-Range Corridor Travel and Emergency Evacuation

STRATEGIES

- **Create an EVSE competitive grant program:**
  Tap the private sector to lead the implementation of DCFC charging infrastructure in key areas throughout Florida.
- **Forge strategic partnerships to expand EVSE network:**
  Facilitate EVSE network expansion through public-private partnerships (P3).
- **Promote emergency EVSE accessibility:**
  Require publicly accessible EVSE to be open to all users during times of emergencies and require chargers to continue functioning if communications are disabled.
- **Encourage open source data:**
  Work with partners to encourage all DCFCs to adhere to latest Open Charge Point Protocol industry standards to ensure interoperability.

2

OBJECTIVE

Identify and Pursue a Variety of Funding Options with Partners to Support EVSE Implementation

STRATEGIES

- **Continuously monitor federal funding programs:**
  FDOT and other Florida agencies will continuously monitor funding options available through federal programs.

A. Low and Zero Emission Public Transportation Research, Demonstration, and Deployment Funding
B. Alternative Fuel Infrastructure Tax Credit
C. Improved Energy Technology Loans
D. Congestion Mitigation and Air Quality (CMAQ) Improvement Program
E. Diesel Emissions Reduction Act (DERA) Funding
F. Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD)
G. Rebuilding American Infrastructure with Sustainability and Equity (RAISE)
H. Department of Energy / Clean Cities Coalition Funding Opportunity Announcements (FOAs)
I. State Energy Program
J. Federal Lands Access Program (FLAP)
K. Voluntary Airport Low Emissions Program (VALE)
L. Department of Energy Loans Program
M. Surface Transportation Block Grant Program (STBG)
N. Surface Transportation System Funding Alternatives Grant Program (STSFA)

OBJECTIVE 3

Promote Installation of Community Charging Infrastructure

STRATEGIES

Develop an innovative and ongoing funding program:

Work with partners to develop a grant and/or loan program to expand access to EVSE in low-income and historically disadvantaged communities.

- **EVSE planning program:**
  Support regions, agencies, counties, and municipalities to develop their own EVSE readiness plans.

Develop model building and zoning codes:

Draft language that local and regional governments can adopt or modify for use in establishing requirements and guiding the implementation of EVSE.

Multi-family EVSE:

Expand language restricting condominium associations from banning EVSE to include multi-family rental developments.

- **Fast-track and streamline EVSE permitting:**
  Each permitting entity should allow fast-tracked permitting to EVSE infrastructure. This should also include standardizations by region to allow designers to quickly meet standards and requirements.
- **EVSE minimum functionality standards:**
  Provide guidance and minimum functionality, or operational, requirements for EVSE installed in public areas or using public resources. This should include the latest in universal high functionality payment standards, allowing travelers to seamlessly plug and charge. Additionally, the potential to integrate payment with SunPass transponders could provide another payment mechanism within an existing tolling account.
- **Develop minimum EV-ready parking requirements:**
  Work with state and local government partners to establish minimum EV-ready parking requirements for planning future EVSE or requirements for installing EVSE based on different land uses or building types. This needs to acknowledge the crossover between EV charging spaces and ADA required spaces.

Public awareness and education of electric transportation infrastructure and how it supports electrified mobility is important in achieving the goals of the EVMP.

1

OBJECTIVE

Support EVSE-Focused Education and Outreach

STRATEGIES

Develop and launch a consumer-oriented education and outreach program:
A program to educate the general public on the basics of EV ownership, such as how the charging works, the potential benefits and downfalls, the cost, the incentives available, and information relevant to purchasing or owning an EV. This program could inform the public on available EV infrastructure. This should be coordinated to provide education and outreach to the broader community with active engagement efforts in low-income and historically disadvantaged communities.

- **Develop a fleet and charging site-oriented education and outreach program:**
  Develop a fleet and charging-site oriented program to educate owners and operators on the cost, planning considerations, benefits, available incentives, etc. This should target the rental agencies, businesses, and property owners, and incorporate feedback on any barriers to adoption of this technology.

- **Attract, retain and train EVSE installation and maintenance professionals to support adapting our transportation infrastructure:**
  Collaborate with workforce development agencies to recruit talent.

Workforce development with active engagement efforts in disadvantaged communities:
Coordinate with education providers around the state to develop the knowledge and curriculum needed to train Florida's workforce to service EV vehicles and to install, service and maintain EVSE infrastructure.

2

OBJECTIVE

Support Local Jurisdictions and Agencies

STRATEGIES

- **Practical guidance:**
  Develop practical guidance for planning considerations, EVSE installation, prioritization, and any of the knowledge that community planners and engineers need to support their EV and EVSE implementation efforts.

- **Develop Long-Range Transportation Plan (LRTP) guidance:**
  Develop potential guidance for the MPOs on how to best consider EVSE and equity into the development of the LRTP.

Provide resources to share information and knowledge that enhance educational and outreach efforts to support the state's electrification goals.

3 OBJECTIVE

STRATEGIES

Increase awareness of publicly available EVSE locations

- **Include charging station locations on FL511 app:**
  Update Florida's traveler information app (FL511) to include publicly-available charging locations. This effort should be coordinated with charging network providers to provide up to date information and status of chargers.
- **Leverage Partner Resources:**
  Promote EVSE availability through signage, web sites and social media.

FDOT should continue coordinating with all stakeholders to ensure development of EV infrastructure supporting short-range and long-range EV travel options.

1

OBJECTIVE

Advance a Regionally and Comprehensive Approach to EV Infrastructure

STRATEGY

- **Interstate coordination:**
  Partner with other states in the Southeast to harmonize interstate corridor electrification efforts. This should include groups such as The Eastern Transportation Coalition, the American Association of State Highway and Transportation Officials, and the National Association of Regulatory Utility Commissioners in order to coordinate signage and EVSE infrastructure between southeastern states.

2

OBJECTIVE

Continuously Coordinate Stakeholders to Support EVSE Planning and Implementation Efforts

STRATEGIES

- **Florida EVSE stakeholder group:**
  Leverage existing inter-agency work groups that include federal, state, local, private, and research organizations.

  These groups should include diverse representation from low-income and historically disadvantaged communities throughout the state of Florida.

3

OBJECTIVE

Establish State, Regional and Local Agency Roles and Responsibilities

STRATEGIES

- **Program charter:**
  Initiate a program charter that identifies the roles and responsibilities of each stakeholder involved in statewide EVSE planning and implementation.
- **Planning continuum:**
  Develop structure to harmonize statewide EVSE planning and implementation with regional and local efforts.

4

OBJECTIVE

Coordinate the Utility Roles and Rates to Support the Goals of this Plan

STRATEGIES

- **Grid benefits and impacts:**
  Evaluate the benefits and impacts of incorporating EVSE into the electricity grid (such as vehicle-to-grid charging).
- **Coordinate with Florida utilities:**
  Facilitate EV infrastructure deployment best practices.

Engage other states, communities, agencies and stakeholders to coordinate best practices on EV infrastructure deployment.

LOOKING AHEAD

The Department is committed to advancing electrified mobility in the state through the implementation of the EVMP in close coordination with state, regional, local and industry partners. The recommendations from this Plan will guide the development of integrated mobility solutions, reflecting the diverse needs of our state. EVSE is integral to the transformation of our multimodal transportation infrastructure. The innovative electrified mobility solutions will serve Florida for years to come as the Department continues to deliver one of the best transportation systems in the nation.

LIST OF ABBREVIATIONS

AADT.
Annual Average Daily Traffic

ADA.
Americans with Disabilities Act

AFDC.
Alternative Fuels Data Center

API.
Application Programming Interface

BESS.
Battery Energy Storage System

BEV.
Battery Electric Vehicle

CCS.
Combined Charging System

DCFC.
Direct Current Fast Charger

EV.
Electric Vehicle

eVMT.
Electric Vehicle Miles Traveled

EVSE.
Electric Vehicle Supply Equipment (aka charging station and EV infrastructure)

EVSP.
Electric Vehicle Service Provider (aka EVSE operator)

GIS.
Geographic Information System

HEV.
Hybrid Electric Vehicle

ICE.
Internal Combustion Engine

MA3T.
Market Acceptance of Advanced Automotive Technologies Model

MPG.
Miles per gallon

NHTSA.
National Highway Traffic Safety Administration

PEV.
Plug-In Electric Vehicle (includes BEV and PHEV)

PHEV.
Plug-In Hybrid Electric Vehicle

REC.
Revenue Estimating Conference

SCETS.
State Comprehensive Enhanced Transportation System

STTF.
State Transportation Trust Fund

VIN.
Vehicle Identification Number

VMT.
Vehicle Miles Traveled

WPT.
Wireless Power Transfer

XFC.
Extreme Fast Charging

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