CARBON REDUCTION QUICK GUIDE:

Incorporating Carbon Reduction in the MPO Long Range Transportation Plan

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INTRODUCTION

CARBON REDUCTION

The Infrastructure Investment and Jobs Act (IIJA) requires FDOT, in consultation with Florida's 27 metropolitan planning organizations (MPOs), to develop a Carbon Reduction Strategy (Strategy) to reduce transportation emissions from surface transportation.

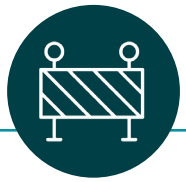
The Strategy shall:

- Support the reduction of transportation emissions in the state.
- Identify safe, reliable, and cost-effective options and strategies for projects.
- Consider the population density and context of the state, including MPO areas.

The state's Strategy should support the Federal goals to:

Reduce single-occupant vehicle trips

Facilitate the use of vehicles or modes of travel that result in lower emissions



Facilitate approaches to construction that result in lower emissions

All of Florida's MPO planning areas are affected by transportation emissions, and the specific contributors to transportation emissions may vary among MPO areas. For example, highly urbanized MPOs may consider congestion to be a significant cause of transportation emissions, while other areas might experience higher emissions from freight movement and truck idling/parking.

Transportation emissions are correlated with environmental changes, including rising temperatures, heavy rainfall, and extreme weather events. Additionally, transportation emissions may also affect the health of communities due to reduced air quality.

Florida has a strong foundation of carbon reduction activities. Several objectives within the Florida Transportation Plan (FTP) currently support statewide carbon reduction goals. The development and implementation of the Carbon Reduction Strategy will provide FDOT and its partners with a targeted approach to further reduce transportation emissions while delivering solutions to make our roadways safer, more efficient, and resilient.

The FDOT Office of Policy Planning has developed this Long Range Transportation Plan (LRTP) Quick Guide to assist MPOs in developing goals and objectives to support the reduction of transportation emissions and to identify projects that align with those goals and objectives.

At the end of this Quick Guide, a list of resources is provided so MPOs can easily access answers to questions regarding the implementation of the IIJA program.

CARBON REDUCTION IN THE LRTP

MPOs are responsible for identifying investment strategies that focus on developing projects and programs to best meet the transportation needs of the communities they serve. The long-range transportation plan, or LRTP, is a key tool used to set policy and guide planning processes for project identification and prioritization.

In this Quick Guide you will find:

Section 1: Understanding the importance of carbon reduction

Section 2: Reviewing trends and conditions related to transportation emissions

Section 3: Including goals and objectives specific to the MPO

Section 4: Measuring progress for carbon reduction goals and objectives

Section 5: Considering eligible projects

Section 6: Additional resources

SECTION 1: WHY CARBON REDUCTION?

Transportation emissions account for 27% of all carbon emissions, making the transportation industry the largest source of emissions (United States Environmental Protection Agency, August 2022). Carbon emissions affect air quality and the environment by trapping excess heat and causing the climate to warm. Therefore, reducing carbon and transportation emissions improves air quality and benefits human health.

All benefits of a project, including effects on transportation emissions, are important to consider when prioritizing projects. In many cases, transportation projects to improve mobility, accessibility, connectivity, or safety can also reduce carbon emissions. Some examples are shown below.

	 **Roundabout**	 **Additional truck parking and truck parking availability systems**	 **Electric transit buses**
Primary Purpose or Benefit	• Improve traffic flow • Decrease delay • Reduce crashes and crash severity • Decrease operational costs	• Improve safety and compliance with rest requirements • Reduce congestion	• Reduce operational costs • Increase service options • Increase transit ridership
Effect on Transportation Emissions	• Less idling • Lower emissions	• Less driving time in search of parking • Less congestion • Lower emissions	• Fewer Single Occupancy Vehicle (SOV) trips • Lower SOV and bus emissions

SECTION 2: TRENDS AND CONDITIONS

Understanding and monitoring current trends and conditions can assist in future planning, funding decisions, and policymaking for transportation projects. By better understanding both present and anticipated changes, MPOs are better equipped to meet the needs of their communities.

THE IMPACT OF FLORIDA'S GROWTH ON TRANSPORTATION EMISSIONS

Florida is the third most populous state in the nation and is expected to grow by an additional 6.3 million residents by 2050. On top of our steady population growth, Florida continues to welcome record-setting numbers of visitors each quarter, more than 60% of whom arrive by automobile. This is a sign of Florida's booming economy and also means more people and freight movement on our roadways.

Florida's population is projected to grow from **21.5 Million** in **2020** to **27.8 Million** in **2050.**

In **2019,** there were **122 Million** visitors to Florida, with almost **64%** arriving by automobile.

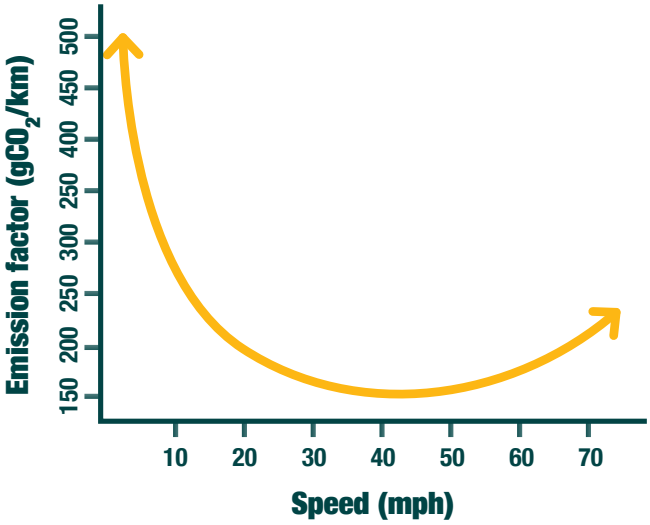
In **2019**, **682 Million** annual truck tons were transported in Florida.

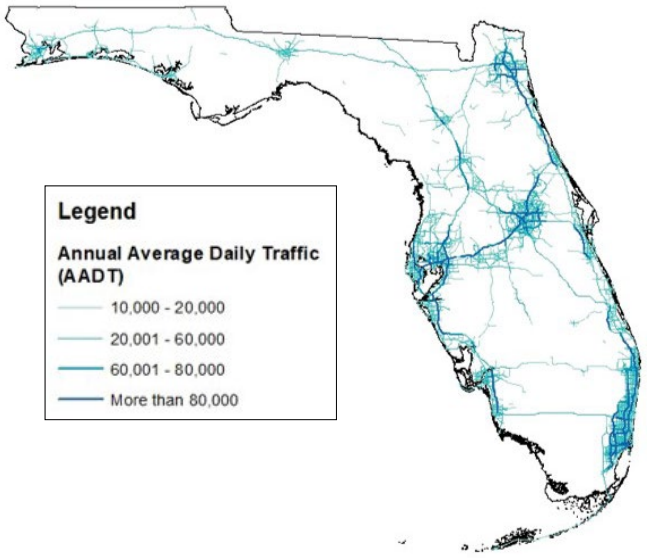
On average, **7,712,758,078** Gasoline Gallon Equivalents (GGEs) of gasoline fuel are **consumed each year** in Florida, and **2,180,465,519** GGEs of diesel are consumed.

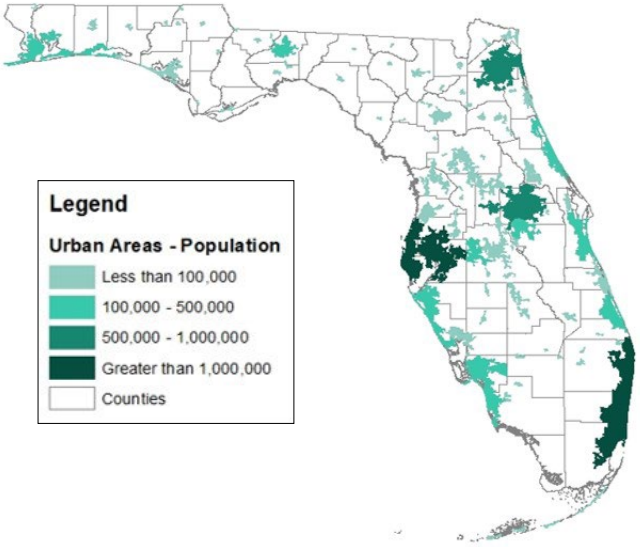
9 out of **10** Floridians live in urban areas.

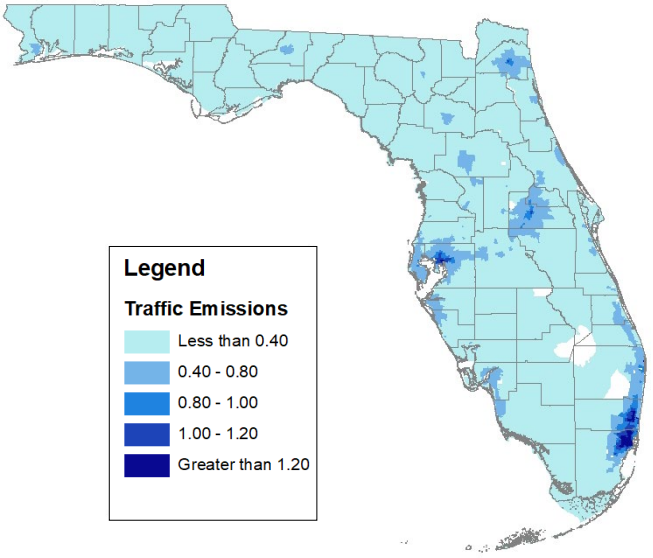
Data sources include FDOT Source Book (2020), Florida Transportation Plan Emerging Trends, Alternative Fuels Data Center, and American Trucking Association.

As shown in the maps, Florida's population is currently concentrated in urban areas, and this trend is expected to continue as almost two-thirds of the state's growth is projected to occur in just 10 counties. Congestion is highest in densely populated, urban areas. As a result, an increase in congestion causes increased hours of delay due to changes in demand and travel pattern. Transportation emissions are also concentrated in these areas. While the number and type of vehicles influences the amount of transportation emissions, so does the speed of the vehicles, as they produce more emission at lower speeds when they idle in high traffic.









Data sources include FDOT Source Book (2019), Barth & Boriboonsomsin (2009), FDOT TDA (2022), US Census (2019), and EPA (2022)

OPPORTUNITIES TO REDUCE TRANSPORTATION EMISSIONS

Florida's population relies heavily on the single occupancy vehicle (SOV) for work, school, recreation, and other activities. FDOT's Complete Streets and Context Classification Guide stress the importance of considering all users of a roadway, including bicyclists and pedestrians. The provision of safe and convenient walking and biking infrastructure which connects job centers, services, transit, and housing is critical to reducing SOV use.

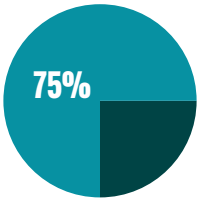
While transit ridership has plateaued, local agencies continue to look for ways to expand services and increase ridership, particularly in highly urbanized areas. Many transit agencies use modernization as a tool to reduce operating costs and offer new connections, such as the use of electric or other alternative fuel buses, apps and convenient payment systems, and partnerships with ride sharing companies.

Approximately 0.5% of Florida's total motor vehicle registrations are for electric vehicles (EV). As Florida implements its Electric Vehicle Deployment Plan, it expects to see a significant increase in EV charging infrastructure in order to support greater adoption rates and longer trips.

In addition, the installation of roundabouts is a priority for the State Highway System, as roundabouts offer lower speeds and fewer conflicts at intersections, increasing safety. Roundabouts also reduce idling, as vehicles move continuously through an intersection instead of waiting at a traffic light.

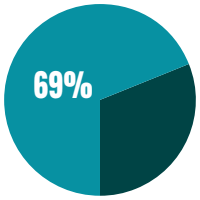
75%

of non-freeway State Highway System (SHS) have **bicycle facilities.**



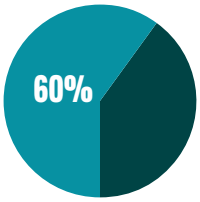
69%

of non-freeway SHS in **urban areas** have **pedestrian facilities.**



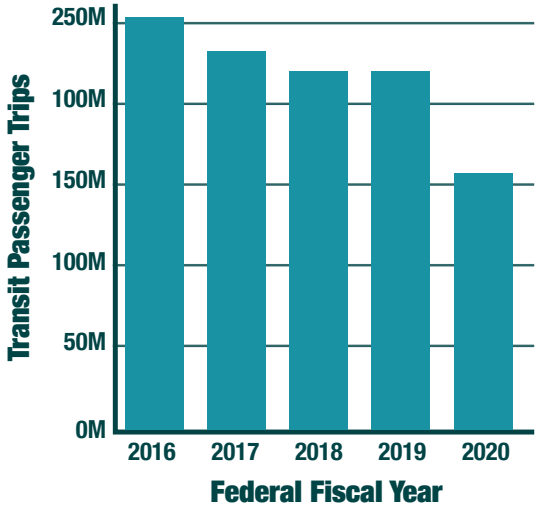
60%

of **Florida's population** lives within one mile of **bicycle facilities.**



155.6 Million

Transit Passenger Trips in **2020**



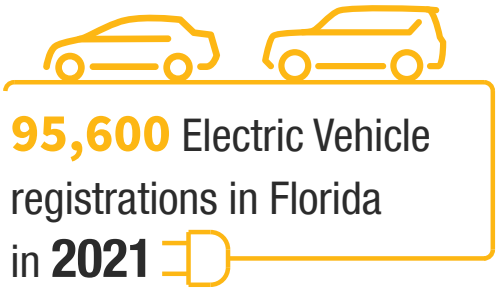
Approximately **20** **roundabouts operating on the state highway system**

More than **300** **roundabouts on local roads throughout the State**

Data sources include US EIA, Alternative Fuels Data Center, FDOT Source Book (2021), and FDOT Florida Roundabouts

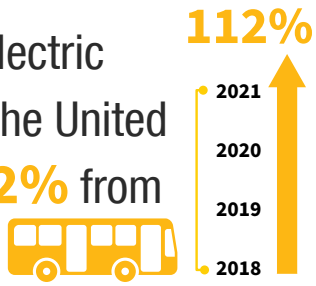
With increasing freight movement comes an increase in truck traffic. For SOVs to comply with safety regulations, truckers must rest periodically. Truck parking needs exceed capacity throughout the state with truckers driving further and longer specifically in search of safe parking. Increasing truck parking availability, using notification systems to assist truckers with finding safe parking, and providing electrification, shade, or other amenities can help reduce transportation emissions.

98% of truck drivers report **problems finding safe parking, causing drivers more than 56 minutes of additional drive time** to find parking.



95,600 Electric Vehicle registrations in Florida in **2021**

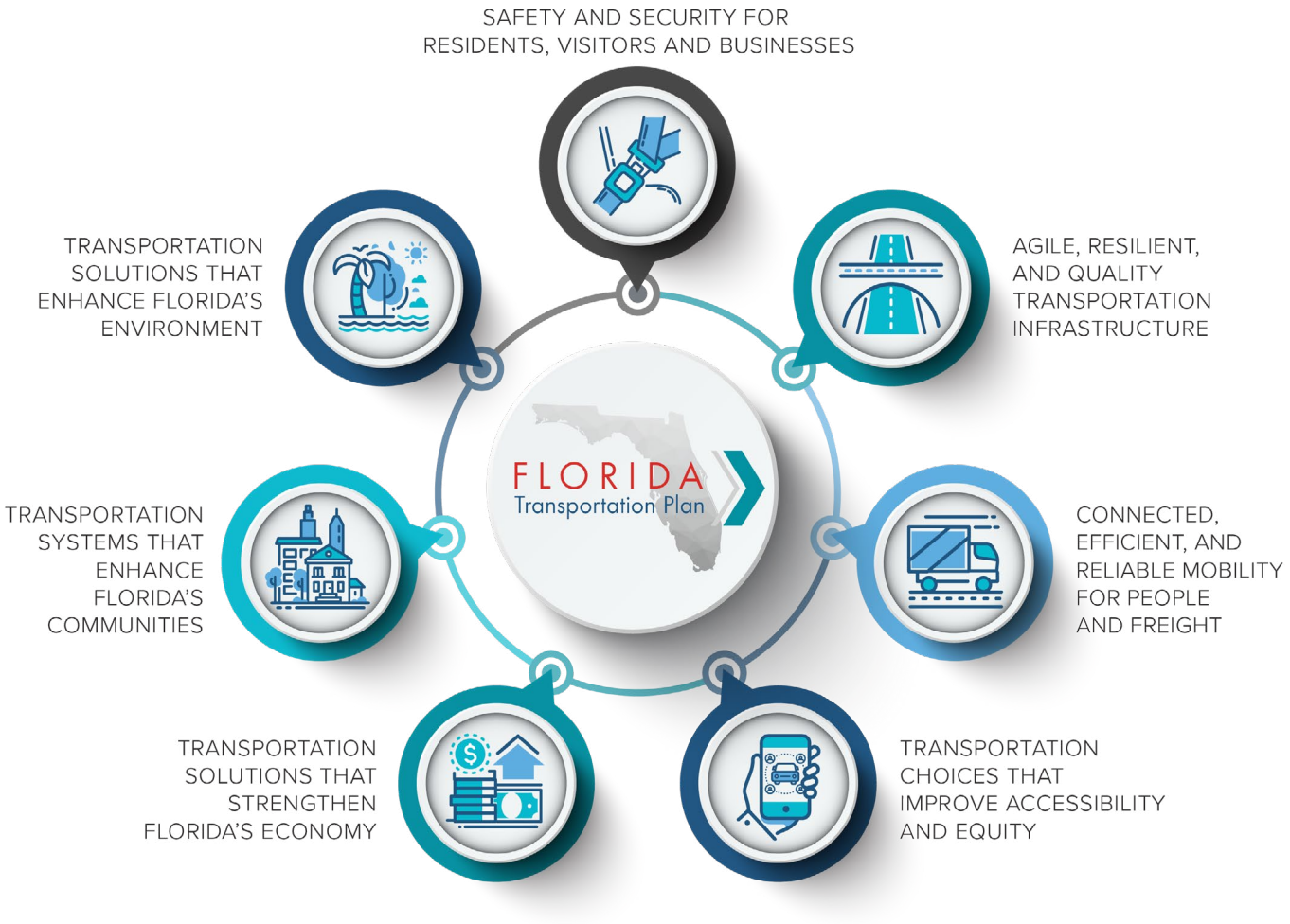
The number of electric transit buses in the United States grew **112%** from **2018** to **2021.**



Data sources include American Trucking Association, Alternative Fuels Data Center, and Florida Transportation Fast Facts.

SECTION 3: GOALS AND OBJECTIVES

The FTP is the single overarching plan guiding Florida's transportation future. It defines goals, objectives, and strategies to guide the FDOT and our partners as we develop and implement policies, plans, and programs.



Current objectives in the FTP that support carbon reduction include:

- Improve system connectivity.
- Increase the reliability and efficiency of people and freight trips.
- Increase alternatives to single occupancy vehicles.
- Decrease transportation-related air quality pollutants and greenhouse gas emissions.
- Increase the energy efficiency of transportation.

Addressing carbon reduction in the LRTP goals allows MPOs to:

- Prepare for current and future impacts of climate change.
- Prepare for shifting economic conditions and fluctuations.
- Anticipate operational challenges and impacts of new technologies.
- Manage life-cycle costs of the transportation system.

Goals and objectives form the foundation of the LRTP that guide the selection and prioritization of projects and programs. During the creation of goals and objectives, MPOs can incorporate carbon reduction into their LRTPs in ways that address the unique needs and nature of their community.

A number of Florida's MPOs are already considering carbon reduction in their long-range planning process. Continuing to refine goals and objectives will help shape recommendations, inform policy decisions, and facilitate coordination between MPOs and state and federal agencies.

EXAMPLE LRTP CARBON REDUCTION GOALS:

- Improve air quality and reduce transportation emissions.
- Protect and preserve the environment.

EXAMPLE LRTP CARBON REDUCTION OBJECTIVES:

- Provide safe and convenient transportation options that appeal to consumers.
- Improve traffic flow and reduce congestion and idling.
- Improve energy efficiency of transportation projects.
- Reduce climate impacts of freight.

NOTEWORTHY PRACTICES

FLORIDA

R2CTPO Connect 2045 Metropolitan Transportation Plan

River to Sea Transportation Planning Organization (R2CTPO)'s Connect 2045 Plan identified six goals at the outset of the planning process including those pertaining to multimodal systems, economic development, connectivity, safety, livability, and involvement. A few of the objectives pertaining to the multimodal Connect 2045 Goals include the development of a multimodal transportation system that:

- Improves accessibility and mobility to economic centers for all users (including motor vehicle, bicycle, pedestrian, transit) as well as the movement of goods.
- Maintains or reduces vehicle greenhouse gas emissions and reduces or mitigates stormwater impacts.

R2CTPO also incorporates resilience criteria in their project prioritization for Traffic Operations & Safety and Bicycle & Pedestrian projects. Projects that address the resiliency of the transportation system in their proposals get extra points during their annual call for projects. *(R2CTPO 2045)*

Martin MPO 2045 Martin in Motion

Martin MPO's 2045 Martin in Motion includes a goal to "Preserve natural environment and promote equity and healthy communities." This goal is supported by the following objectives:

- Minimize adverse impacts to the natural environment.
- Reduce on-road mobile source emissions.
- Increase the bicycle facility coverage throughout the planning area.
- Increase the sidewalk coverage on roadways serving concentrations of population and employment in urban areas.
- Implement strategies that increase the miles of shared used path to support the trail network.
- Prioritize improvements that provide non-motorized access to recreational opportunities.

LOUISIANA

Louisiana Climate Action Plan and LCMPO 2045 Metropolitan Transportation Plan

Louisiana's Climate Action Plan recommends strategies and actions to reduce greenhouse gas emissions. Transportation goals include:

- Maximizing efficiency of energy-intensive freight transit.
- Researching and deploying solutions at scale to decarbonize freight.

To accomplish this goal, the state will target emissions reductions for freight transport along highways, at ports, and at airports such as those that optimize traffic, directly reduce emissions and idling such as shore power, reduce carbon intensity, and explore mode shifting.

Specific goals for roadway and freight are also outlined within the Lake Charles Urbanized Area (LCUA) MPO Metro Transportation Plan (MTP). Understanding that Calcasieu Parish has more than 400 miles of truck routes and 160 miles of railroad, the MTP prioritizes freight movement while balancing the needs of passenger vehicles with the hope of continuing distribution while ensuring roadway capacity. These goals include:

- Reduce or eliminate state-identified "bottleneck" locations by 2045.
- Reduce Truck Travel Time Reliability (TTTR) index along NHS corridors below statewide targets for 2022.

(Climate Action Plan, LCMPO 2045)

SECTION 4: MEASURING PROGRESS

MPOs use performance measures to track progress towards the achievement of the MPO's goals and objectives. Performance measures also drive investments in projects and help shape policy. Within their LRTPs, MPOs have an opportunity to determine what successful carbon reduction looks like and how to measure success for their planning area.

In order to maximize the effectiveness of any new performance measure, it is helpful for the MPO to consider available data to evaluate progress on both near-term and long-term timeframes. Additionally, conversations with agency partners such as FDOT and FHWA will help align the performance measure with best practices from other areas, such as safety, resilience, and congestion management. This approach leads to performance measures that can more easily translate between the LRTP and the Transportation Improvement Program (TIP).

NOTEWORTHY PRACTICES

FLORIDA

Indian River MPO 2045 LRTP

Five goals, coupled with twenty-two objectives, were developed at the outset of the planning process for Connecting IRC 2045, Indian River MPO's 2045 LRTP. Objectives pertaining to protecting the natural and social environment include:

- Limiting average increase in Carbon Monoxide (CO), Hydrocarbon (HC), and Nitrogen Oxide (NO) emissions to less than 15% from the previous five-year period for each five-year period from 2025 to 2045.

Performance Measures to determine if the MPO is meeting their objective include:

- Percent change in CO, HC, and NO emissions (in kilograms) for each five-year period from the base year for the period from 2025 to 2045.

GEORGIA

Gainesville-Hall MPO Regional Transportation Plan

Regional transportation plan goals incorporated multimodal connectivity, mobility and economic vitality, safety and security, system preservation and maintenance, and environment, among others. Performance measures recommended include:

- accessibility measures (such as % of population within a ½ mile to public transit)
- level of service (LOS)
- vehicles miles of travel (VMT)
- vehicle hours of delay
- greenhouse gas emission
- general measures (average commute time, % of commuters driving alone to work, % of commuters using public transit, etc.)

These measures aim to support Gainesville-Hall Metropolitan Planning Organization's (GHMPO) goal of developing a transportation system that will enhance social values, protect the natural environment, and minimize adverse effects. These measures meet the GHMPO's transportation needs while simultaneously incorporating sensitivity to the transportation efforts of the region's multiple planning partners. *(GHMPO)*

SECTION 5: ELIGIBLE PROJECTS

The new Carbon Reduction Program (Program) provides $320.4 million to Florida over the next five years to reduce transportation emissions from on-road highway sources. The Program allocates 65% of funding based on population. These funds will be distributed to their respective FDOT Districts, who will use the project priority lists provided by the local governments and MPOs to match appropriate funding sources to projects. The remaining 35% is available for statewide projects or initiatives.

The Carbon Reduction Strategy is intended to support the goals of FHWA's Carbon Reduction Program. As MPOs prioritize projects, they should consider potential carbon reduction benefits and indicate these benefits on their priority lists, where applicable. The FDOT District Offices will continue to coordinate with the MPOs as projects are developed and funds are programmed.

The Program provides numerous examples of eligible projects to meet the overall goal of reducing transportation emissions. The eligible projects have been organized into four project categories:

TRANSPORTATION CHOICES

These projects provide safe and convenient transportation options that appeal to consumers. Examples include public transportation, complete streets, trails and nonmotorized transportation, bicycle and pedestrian facilities, and the inclusion of other modes (besides single occupancy vehicles) within existing right of way.

CONGESTION MANAGEMENT

Projects in this category improve traffic flow and reduce congestion and idling. Examples include deployment of ITS; traffic monitoring, management, and control programs; roundabouts; truck parking projects; and traffic improvements without adding new general use lanes.

ENERGY EFFICIENCY AND DIVERSIFICATION

These projects improve energy efficiency and diversify energy sources used throughout the transportation network. Examples include port and truck stop electrification, efficiencies which reduce environmental and community impacts of freight, replacement of street lighting and traffic control devices with energy efficient alternatives, deployment of alternative fuel infrastructure, and renewable energy within existing right of way.

CONSTRUCTION PRACTICES

Activities in this category reduce climate impacts from construction of transportation facilities. Examples include purchase or lease of zero-emission construction equipment and use of sustainable pavements and construction materials.

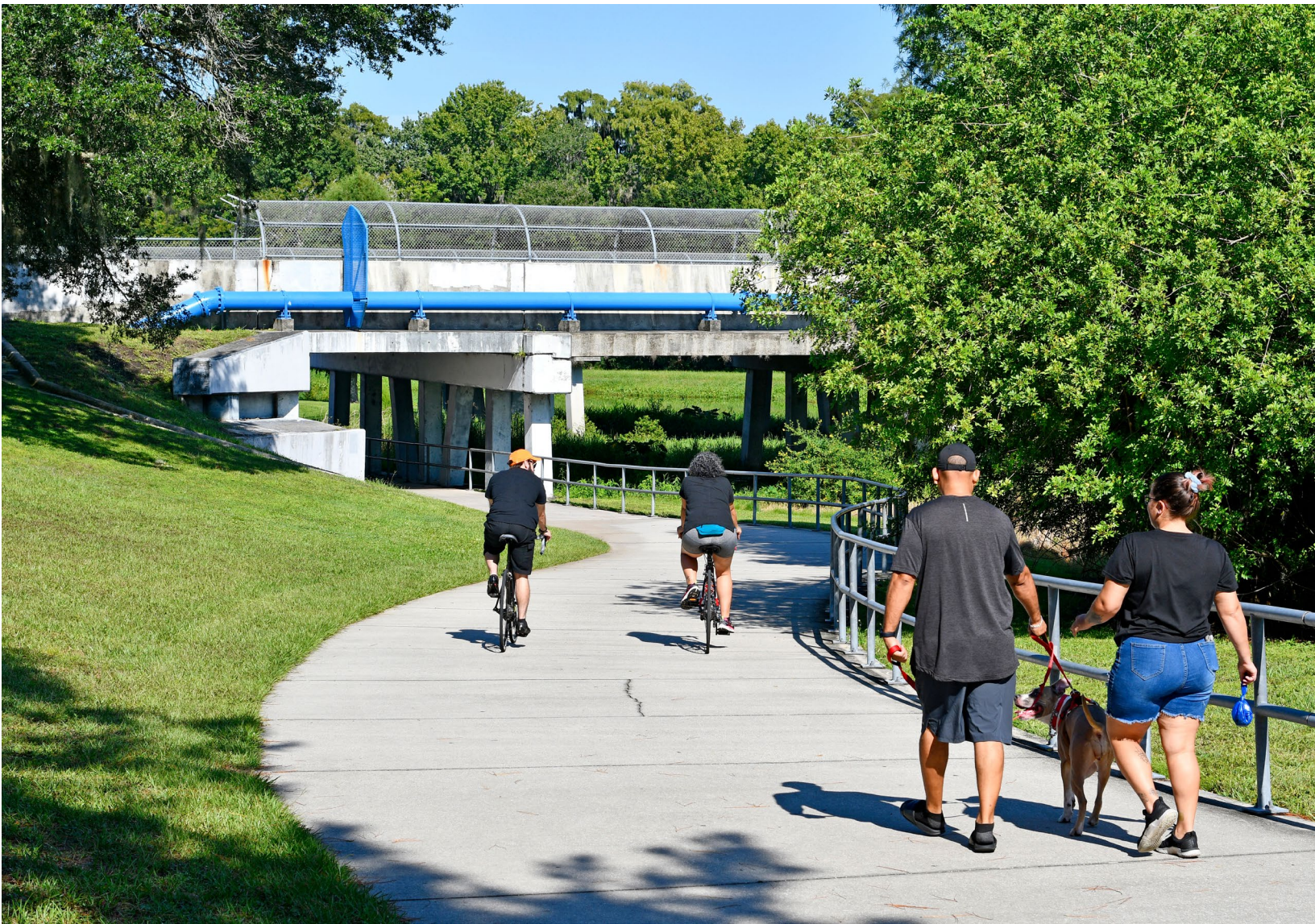
SECTION 6: ADDITIONAL RESOURCES

Additional resources from FDOT and FHWA are provided below.

FDOT Carbon Reduction Strategy Website

FHWA Carbon Reduction Program Guidance

FHWA Fact Sheet




REST AREA
TRUCK PARKING
21
SPACES
AVAILABLE