



# *Statewide Truck Parking Study*

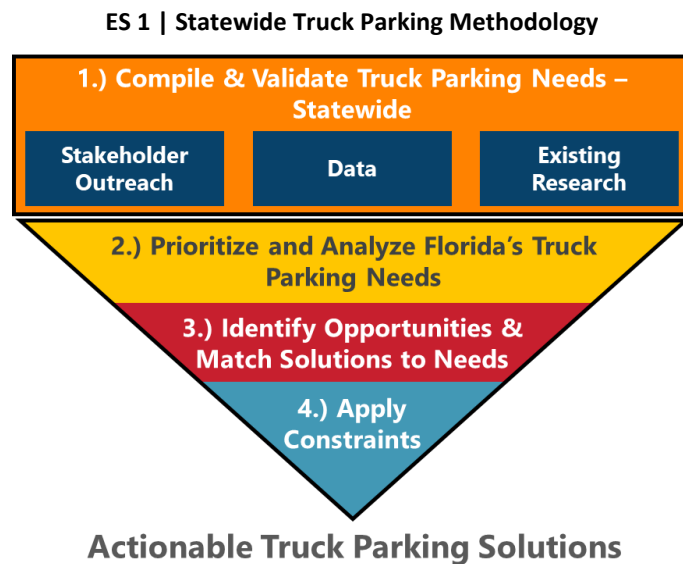
March 2020



## Executive Summary

Truck parking facilities provide truck drivers with a location to take required rest breaks and position themselves in advance of pick-ups and deliveries (i.e., staging to meet a pick-up or delivery window). Therefore, the availability of strategically-located truck parking is critical to roadway safety and to the efficient movement of freight via truck.

According to the American Transportation Research Institute (ATRI), truck parking is ranked as the most second critical issue in the trucking industry by truck drivers in 2018. Several national and state-level initiatives have been undertaken in recent years in order to understand the issue and identify potential solutions. The Florida Department of Transportation (FDOT) commissioned the Statewide Truck Parking Study to build upon existing truck parking studies by using new data and approaches to identify, prioritize, and recommend solutions to address the areas in Florida with the greatest truck parking needs. ES 1 provides a summary of the four-step approach to developing the Statewide Truck Parking Study and identifying actionable truck parking solutions.



The Statewide Truck Parking Study provides the recommendations, implementation plan, and supporting resources that consolidate potential solutions into a portfolio of actionable projects, policies, and partnerships to address truck parking problems throughout Florida.

## Understanding Florida’s Truck Parking Needs

A primary data source for this study was the identification of Florida’s public and private truck parking facilities, the utilization of the facilities, and the locations of unauthorized truck parking developed by FDOT in the “Statewide Truck GPS Data Analysis.” The “Statewide Truck GPS Data Analysis” identified 10,093 truck parking spaces in Florida, with 30 percent provided by the public sector and 70 percent provided by private sector truck stops.

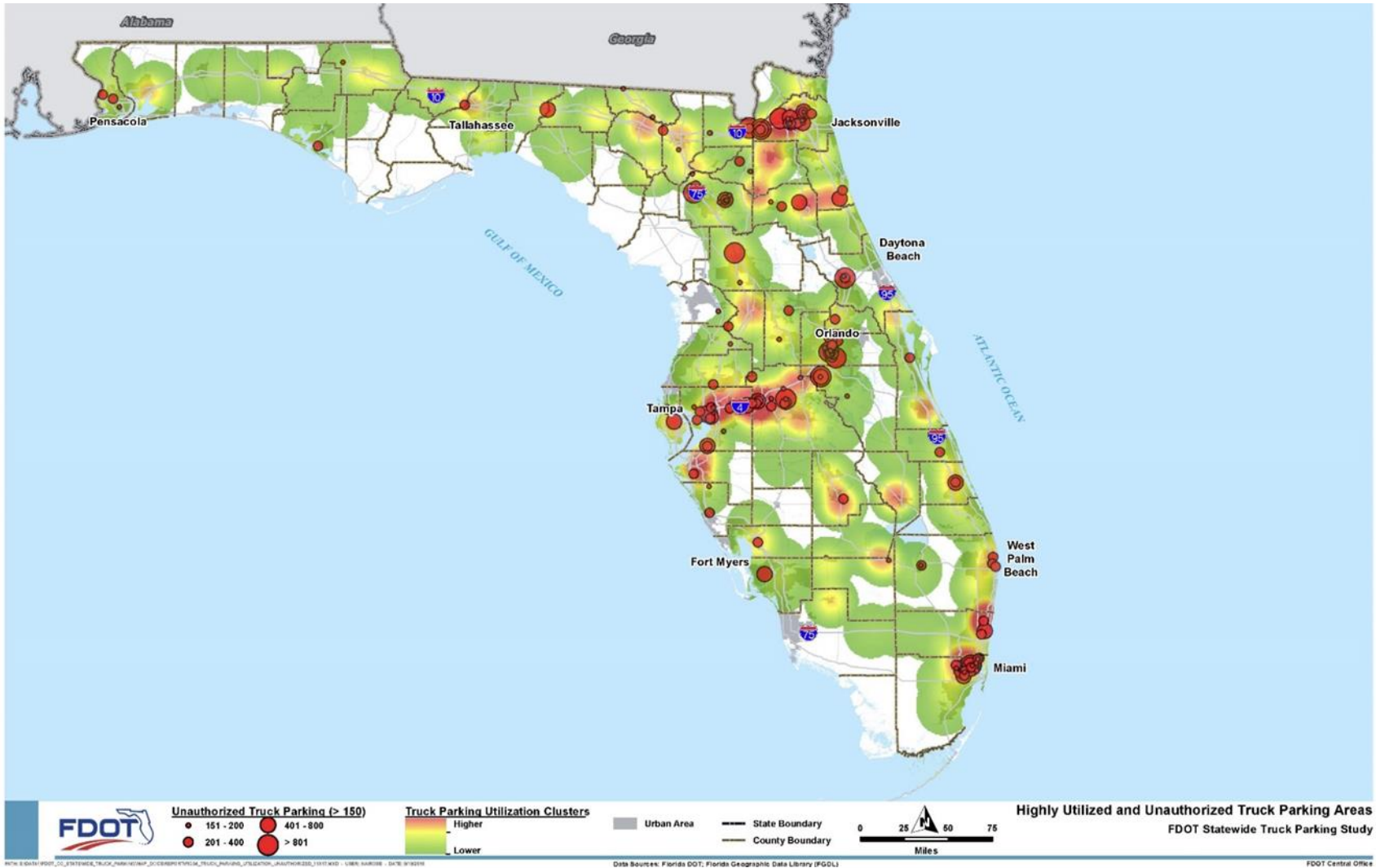
This study builds upon the “Statewide Truck GPS Data Analysis” by further validating the data, developing additional visualizations, prioritizing the most acute truck parking issues in the state, and conducting an inferential analysis to determine the root cause of unauthorized truck parking and over-utilization of truck parking locations. The compilation of Florida’s truck parking needs first identified clusters of unauthorized and over-utilized truck parking (ES 2). Areas with unauthorized truck parking stops and over-utilized truck parking spaces were overlaid and then an 80 percent weight was applied to unauthorized truck density to combine the layers. The combination of unauthorized and over-utilized truck parking was then clustered into the 20 areas of concern displayed in ES 3.



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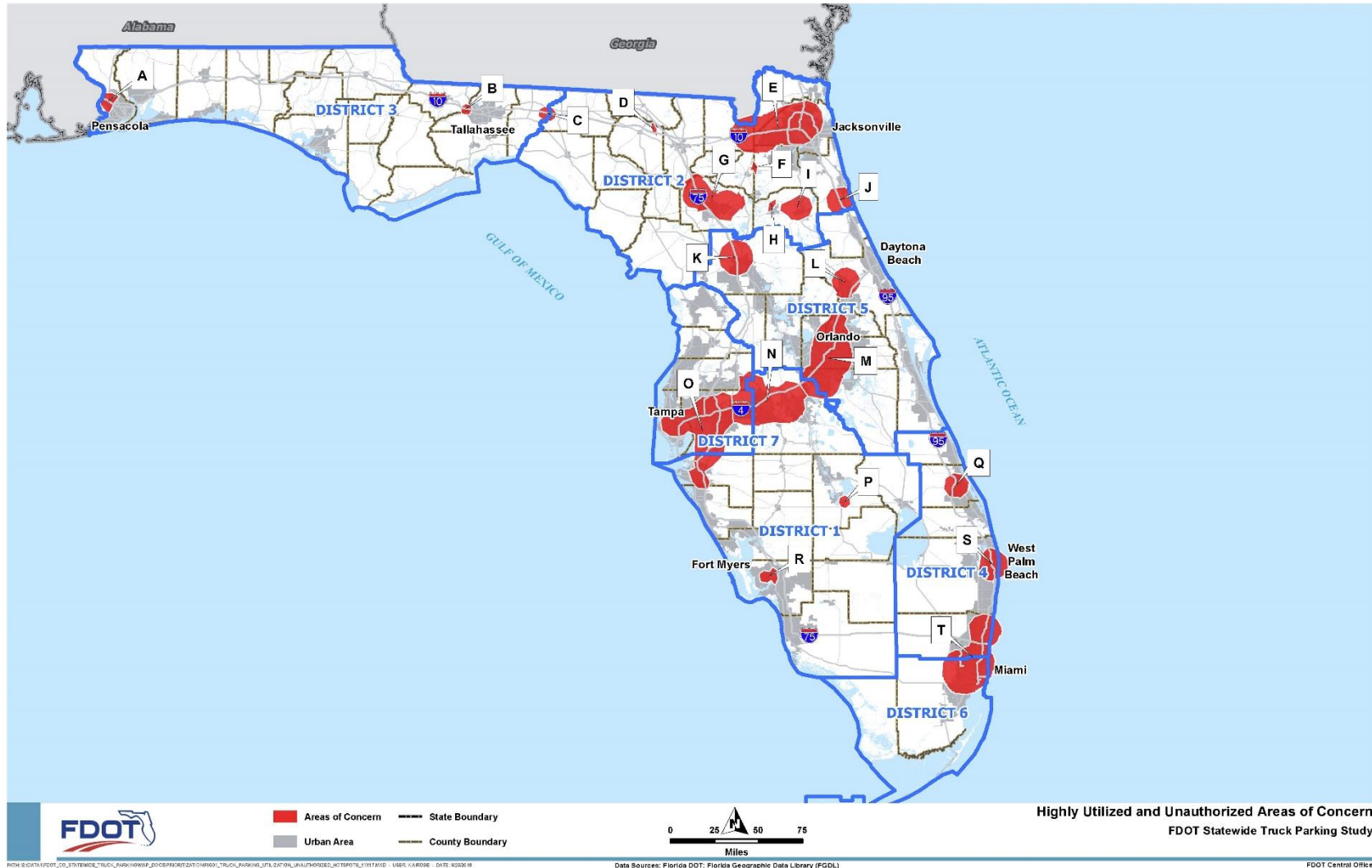
ES 2 | Unauthorized Truck Parking and Utilization of Public and Private Truck Parking



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### ES 3 | Top 20 Truck Parking Areas of Concern Statewide



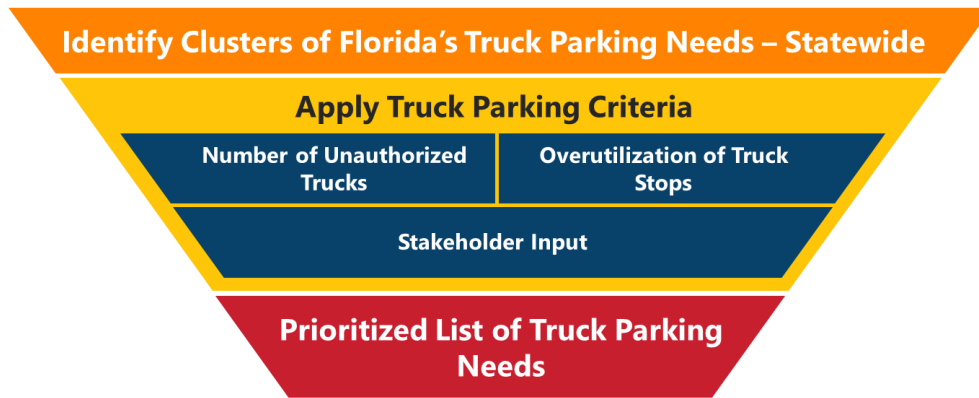




## Identifying Critical Areas of Concern

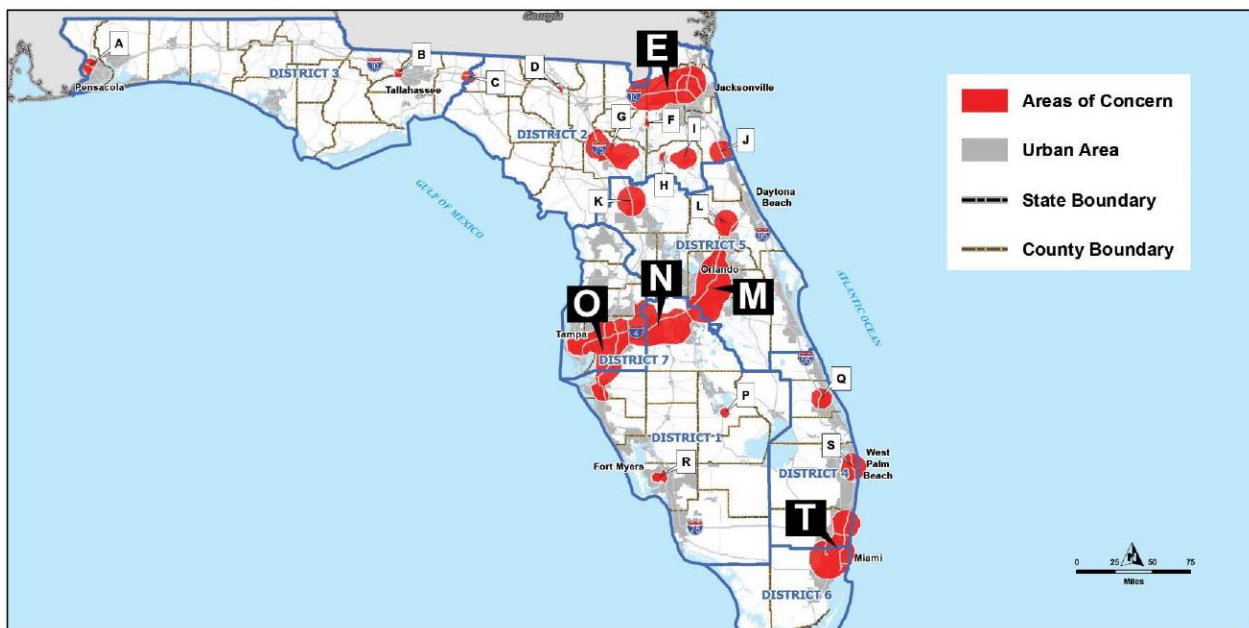
The cost of projects and limited resources necessitates a prioritization of the top 20 areas of concern identified in the study. As shown in ES 4, the prioritization process started with the calculation of the number of unauthorized and over-utilized trucks in each priority area of concern, which were combined to calculate a volume to capacity index (V/C) for each area of concern. The V/C index expresses excess truck parking demand (V) by the number of truck parking spaces (C) in each area of concern.

ES 4 | Truck Parking Prioritization Process



In order to focus on areas of concern that have both a high V/C index and high excess truck parking demand, a threshold of 25,000 was established for excess truck parking demand. The areas of concern with an excess truck parking demand over 25,000 were ranked according to their V/C index. The output of the prioritization process is shown in ES 5, with the top five Priority Areas of Concern (areas M, O, N, E, and T) shown in black boxes, along with the remaining 15 locations shown in white boxes.

ES 5 | Priority Areas of Concern



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The output of the prioritization process is used to focus the analysis and enable the identification of needs, opportunities, and recommendations in critical areas of the state.

## Stakeholder Input on Priority Areas of Concern

Stakeholder Input was solicited from internal and external stakeholders to validate the truck parking Priority Areas of Concern. The project team presented the areas of concern and the prioritization process to FDOT Central Office Staff and the District Freight Coordinators (DFC) in August 2019 and conducted follow-up conversations with each District in the Fall of 2019.

Additionally, FDOT conducted an online survey from September 30<sup>th</sup> to October 25<sup>th</sup> aimed at soliciting input from shippers, receivers, carriers, and truck stop operators. The survey received 136 responses, with the majority of respondents coming from the trucking industry. Respondents highlighted a general lack of truck parking inside the metropolitan areas associated with many of the clusters. Additionally, respondents noted that development is pushing truck stops out of urban areas, warehousing is being added in many areas, and truck drivers are often not permitted to park on-site at their pickup and delivery locations. These three factors together make it harder for truck drivers to find truck parking near their pickup or delivery location, costing them time and money. Respondents also noted problems with drivers storing their trucks at rest areas, as well as RVs taking up truck parking spaces. Lastly, many respondents noted that they won't deliver to some of the priority areas because it is so difficult to find safe truck parking. In general, the survey of truck parking stakeholders supports the findings of the analysis of truck parking utilization and unauthorized truck parking, as well as the results of the prioritization process used to identify the most critical truck parking locations.

## Analyzing Priority Areas of Concern

In order to match the appropriate solution to the Priority Areas of Concern, each area was broken down into smaller hotspots based on the location of unauthorized truck parking or over-utilized truck parking facilities. An inferential assessment was then conducted on each hotspot to identify the root cause of the issue and potential opportunities and solutions that could be applied to the hotspot.

## Inferential Analysis of Truck Parking Priority Areas of Concern

Each of the hotspots within the Priority Areas of Concern was analyzed to develop inferences about why unauthorized truck parking was occurring or existing truck parking locations where over-utilized. The hotspots were analyzed using:

- **Unauthorized Truck Parking:** Locations with a minimum of 350 unauthorized trucks parked along a single roadway segment during the year of data are characterized as a chronic issue.
- **Safety Impacts of Unauthorized Truck Parking:** Whether or not the unauthorized truck parking impedes traffic and presents a potential safety hazard for other roadway users.
- **Utilization of Parking Facilities:** The average utilization of a truck parking facility was used to categorize a facility as over-utilized, nearing over-utilization, and under-utilized to identify if trucks parking in unauthorized areas could be directed to under-utilized truck parking facilities.
- **Parking for Destination vs HOS Compliance vs Staging:** The amount of time stopped (dwell times) indicates why a truck is parked in a given location. Providing additional truck parking spaces for HOS compliance and overnight staging are the primary focal points for FDOT.



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- **Correlation to Freight Activity Areas (FAA) & Land Suitability Analysis:** Correlation of unauthorized parking observations with previously conducted FAA statewide analysis.
- **Potential for Truck Parking Development:** The suitability of parcels for developing truck parking (FDOT-owned, or otherwise) and the parcel size, zoning, and accessibility/connectivity to state roads and/or other designated freight facilities.

## Using the Results of the Inferential Analysis

The inferential analysis and input from stakeholders provided a systematic review of the priority areas to understand the root cause of truck parking issues in each priority area. Additionally, the in-depth analysis of potential opportunities forms the list of potential solutions for the recommendations and implementation plan. Ultimately, the study sets the stage for FDOT to move beyond recommendations that target incremental improvements and instead position the state to proceed with a unified vision to guide future decision-making.

## Recommendations and Implementation Plan

The strategies and recommendations of the Statewide Truck Parking Study are geared toward FDOT transitioning truck parking from a project-by-project approach to a holistic statewide truck parking program. Ultimately, the development of a statewide truck parking program and most importantly, the allocation of funding to the program, has a cascading impact on the medium (3-5 years) and long-term (5+ years) recommendations.

## Short Term: Focusing on Immediate Needs and Low-Hanging Fruits (1-2 years)

ES 6 displays three strategies in red that denote the continued development of FDOT and District truck parking activities. These three strategies are key to maintaining and expanding FDOT’s role in addressing truck parking issues.

Similarly, the strategies displayed in blue are those that extend beyond current roles or activities and include developing and implementing the findings of this study, designating a truck parking champion, establishing a program devoted to truck parking, and developing modes for P3s in urban and rural areas.

The following section presents the strategies and actions that form the basis for developing an





institutional process that keeps incremental improvements moving forward while FDOT and its partners identify and pursue new, innovative, and ambitious projects.

## **Continue the Exploration and Development of Existing Truck Parking Projects, Policies, and Planning Initiatives**

Existing FDOT District and Central Office projects, policies, and planning initiatives are the shovel-ready projects and implementation actions that are available during the first years of the implementation plan. Additionally, as new resources are made available and new opportunities are pursued, the continuation of existing projects, policies, and planning efforts will bring continuity and insights that will inform future implementation actions. The following activities were highlighted during consultations with FDOT Districts during the course of this study:

- **Projects**
  - District 2 - I-75 and I-95 Rest Areas Expansion Concept
  - District 5 – I-4 Rest Area Expansion (Sanford)
  - District 6 – I-95 planned Golden Glades Travel Center
  - District 7 – I-75 Hillsborough Rest Area Redesign and Reconstruction
  - Florida Turnpike – Canoe Creek Service Plaza, West Palm Beach Service Plaza, and Tandem Staging Lot at Turkey Lake
- Continue FDOT involvement in District truck parking planning efforts
  - District 1 - Truck Parking Study (2020)
- Support innovative pilot projects and best practices
  - District 4 - Farmers Market Pilot
  - District 2 - WIM Pilot Project at Yulee WIM Station

## **Identify and Implement Opportunities to Expand Capacity and Increase Utilization at Existing State-Owned Truck Parking Locations**

Through the update to the Rest Area Master Plan, FDOT should identify opportunities to optimize and add truck parking at existing rest areas. Additionally, FDOT should undertake pilot projects and awareness campaigns to promote under-utilized rest areas and weigh stations. By first targeting existing state-owned truck parking locations, FDOT can address truck parking needs in the short-term, while pursuing projects that have long development timelines, such as using FDOT-owned parcels or ROW to develop new truck parking.

## **Provide Truck Parking Support to Local Communities**

The FDOT DFCs should conduct outreach with local communities to share the findings of the Statewide Truck Parking Study that are relevant to the jurisdiction. Additionally, FDOT should share the tools (land suitability analysis, truck parking locations, utilization, solutions toolbox, and funding toolbox) developed in this study with local communities to provide context to the truck parking problems they are observing.

Beyond initial knowledge transfer, the DFCs will serve as the connection point between local communities and Central Office. Local communities and the DFCs are critical to identifying opportunities and mitigating challenges that truck parking projects often encounter. Additionally, the DFCs and Central Office should support the development of policies that incorporate truck parking into planning and land use by identifying best practices and key issues to consider when incorporating truck parking into planning and land use.





## **Continue the Development of the Truck Parking Availability System (TPAS)**

TPAS implementation is underway and should continue on the existing path and begin to pursue the integration of other providers of truck parking information. This integration and interoperability of TPAS data will provide additional high-value information. For example, private truck parking facilities provide 2.3 spaces for every public space, making the integration of private truck parking availability an important next step for TPAS. Additionally, incorporating information from neighboring states and vice versa, increases the reach of TPAS and its ability to inform truck driver decision-making.

## **Designate a Truck Parking Champion**

FDOT should designate a truck parking champion who is tasked with monitoring, implementing, and serving as the FDOT Central Office point of contact for public and private truck parking stakeholders. Initially, the truck parking champion will be focused on developing a communication plan that includes a website, brochures, and resource documents to communicate the findings and resources developed in this and previous studies, as well as conveying the need for a defined truck parking program.

## **Establish a Truck Parking Improvement Program (TPIP)**

FDOT should establish a formal program that is supported by a defined funding apportionment of \$10 million per year for at least five years. The TPIP should be similar to the Rest Area Program and Park and Ride Program, in that it defines truck parking facilities from FDOT's perspective and establish FDOT's role in truck parking. The TPIP must provide clear guidance to the Districts on how to approach truck parking projects from procedural, technical, and funding perspective, including the process for local governments and private stakeholders to pursue partnership opportunities.

Apportioned funding for the TPIP could occur through either legislative request or by leveraging National Highway Freight Program (NHFP) funds. Additionally, FDOT's Strategic Intermodal System (SIS) program could be used to fund truck parking capital projects. In addition to the \$10 million for capital projects, additional operations and maintenance funding will be needed to cover ongoing costs. This operations and maintenance funding will likely require legislation to allocate consistent funding for the operation and maintenance of truck parking facilities.

Overall, the TPIP will provide the FDOT Districts with the certainty needed to pursue longer-term initiatives and build on early wins and incremental improvements. Additionally, the TPIP is a signal to the private sector (truck drivers, carriers, developers, and truck stop operators) that FDOT is committed to addressing truck parking needs.

## **Develop Public-Private Partnerships Models for Rural and Urban Areas**

FDOT should assess the barriers to the development of truck parking P3s using grants and other transportation funding as a precursor to soliciting private sector interest in developing or expanding truck parking facilities. Developing P3 models for rural and urban areas accounts for the high land acquisition cost in urban areas and the high levels of demand in urban areas which make them viable for a commercial truck parking facility with amenities, which is not the case in rural areas.

## **Short-Term Implementation Actions**

ES 7 displays the implementation steps outlined above in a single table. The short-term implementation actions include a number of new initiatives for FDOT, including pilot projects and the development of the TPIP. Therefore, FDOT should establish truck parking metrics to measure the progress and impact of the implementation actions of this study.

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## ES 7 | Short-Term Truck Parking Implementation Actions

Strategy	Organization	Activities
<b>Continue the Exploration and Development of Existing Truck Parking Projects, Policies, and Planning Initiatives</b>	FDOT District with support from FDOT Central Office	<ul style="list-style-type: none"> <li>• Support on-going truck parking projects                             <ul style="list-style-type: none"> <li>○ <b>D2</b> - I-75 and I-95 Rest Areas Expansion Concept</li> <li>○ <b>D5</b> – I-4 Rest Area Expansion at Sanford</li> <li>○ <b>D6</b> – I-95 planned Golden Glades Travel Center</li> <li>○ <b>D7</b> – I-75 Hillsborough Rest Area Redesign and Reconstruction</li> <li>○ <b>Turnpike</b> – Canoe Creek Service Plaza, West Palm Beach Service Plaza, and Tandem Staging Lot at Turkey Lake</li> </ul> </li> <li>• Continue FDOT involvement in District truck parking planning efforts                             <ul style="list-style-type: none"> <li>○ <b>D1</b> - Truck Parking Study (2020)</li> </ul> </li> <li>• Support innovative pilot projects and best practices                             <ul style="list-style-type: none"> <li>○ <b>D4</b> - Farmers Market Pilot</li> <li>○ <b>D2</b> - WIM Pilot Project at Yulee WIM Station</li> <li>○ Electrification and alternative fuel corridor application</li> </ul> </li> </ul>
<b>Identify and Implement Opportunities to Expand Capacity and Increase Utilization at Existing State-Owned Truck Parking Locations</b>	FDOT Central Office and Districts	<ul style="list-style-type: none"> <li>• Update to the FDOT Rest Area Master Plan</li> <li>• Develop projects based on Rest Area Master Plan findings</li> <li>• Transfer findings and best practices Farmers Market and WIM Pilot project to other locations, as warranted</li> <li>• Build on District Truck Parking studies to identify additional opportunities</li> </ul>
<b>Provide Support to Local Communities to Improve Truck Parking</b>	Districts	<ul style="list-style-type: none"> <li>• Conduct outreach with local communities to share the findings and tools developed by the Statewide Truck Parking Study that are relevant to their jurisdiction</li> <li>• Identify what support is needed to overcome the challenges that truck parking policies and projects encounter at a local level</li> </ul>
<b>Continue the Development of TPAS</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Promote the use of TPAS information in private sector applications</li> <li>• Discuss integration of private truck stop data into TPAS</li> <li>• Coordinate expansion into neighboring states and system interoperability</li> </ul>



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Strategy	Organization	Activities
<b>Designate a Truck Parking Champion</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Develop a communication plan that includes a website, brochures, and resource documents to communicate the findings and tools developed in this study                             <ul style="list-style-type: none"> <li>○ The communication plan should include an awareness campaign to promote under-utilized truck parking locations</li> </ul> </li> <li>• Advocate and advance policy recommendations within FDOT while the truck parking program is established</li> <li>• Formalize FDOT’s existing truck parking efforts into a defined program that is focused on truck parking with defined funding</li> </ul>
<b>Establish a Truck Parking Improvement Program (TPIP)</b>	FDOT Central Office with support from Districts	<ul style="list-style-type: none"> <li>• <b>Pre TPIP Development:</b> Establish the goals and objectives of the TPIP and identify metrics to assess the progress of the TPIP</li> <li>• <b>Pre TPIP Development:</b> Leverage the Statewide Truck Parking Study data, findings, final report, and brochure to request \$10 million in annual funding for truck parking and the formal establishment of the TPIP                             <ul style="list-style-type: none"> <li>○ Apportion dedicated funding for truck parking projects either through legislative request or by leveraging NHFP funds</li> <li>○ Identify Operations and maintenances funding source for truck parking</li> <li>○ Develop procedure similar to FDOT Rest Area Program and Park and Ride Program</li> </ul> </li> <li>• <b>Pre TPIP Development:</b> Truck parking activities should be documented on the TPIP website and continue their implementation and development while formal funding and TPIP is established</li> <li>• <b>Post-TPIP Development:</b> Inform stakeholders about the TPIP</li> <li>• <b>Post-TPIP Development:</b> Develop and implement an annual call for truck parking projects that establishes a formal process and selection criteria for the District and local governments to submit projects or planning studies for funding</li> </ul>
<b>Develop Public-Private Partnerships Models for Rural and Urban Areas</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Explore impediments to P3 agreements for truck parking and the opportunity to partner with DEO to enter into a P3</li> <li>• Develop P3 models for urban and rural areas</li> </ul>



## Medium-Term: Leveraging Opportunities (3-5 Years)

As previously noted, the progress towards implementing the strategies and actions identified in the short-term affects what is possible in the medium-term time horizon. That said, the implementation actions in the medium-term have greater variety in what is possible because of the groundwork developed in this study, actions in the short-term Implementation Plan, and the longer time horizon that exists for projects and policies to develop. Additionally, the specific actions undertaken in the medium-term should be informed by the success and challenges encountered during short-term implementation.

### Leverage the TPIP

The underlying strategy for the medium-term is to leverage the TPIP by implementing a call for projects. The TPIP approach acknowledges the role of the FDOT Central Office, DFCs, and other stakeholders, by providing a funding mechanism and data to inform the identification of projects, policies, and partnerships. The actual identification and submission of a project should come from the Districts and/or local jurisdiction so that the project accounts for local factors that could make or break a proposed TPIP project, policy, or partnership.

Therefore, the truck parking champion should continue to conduct outreach about the TPIP process and opportunities to ensure a robust set of submissions. The Districts should be working with local communities to identify truck parking opportunities using local knowledge and the data and findings of this study. The findings of the inferential analysis, funding and solutions toolbox, land suitability analysis, truck parking supply, and truck parking utilization/unauthorized truck parking tools should be key resources for identifying opportunities in areas with truck parking issues.

### Leverage Partnership

Using the responses from the identification of barriers to developing a truck parking P3 and the rural and urban models for truck parking P3s, FDOT should decide if P3s should be funded through the TPIP, other state/federal grant program, or through a separate RFP.

### Revisit Statewide Truck Parking Needs

After four years or three rounds of project solicitations under the TPIP, FDOT Central Office should reassess the state's truck parking needs and the outcomes from the short and medium-term implementation. The focus of revisiting the truck parking needs is to identify what has changed since this study, challenges, successes, and new or existing opportunities. The annual review of truck parking implementation and metrics will inform the reassessment of Florida's truck parking needs and define the future of the TPIP and what other implementation actions are needed to address truck parking challenges.

## Long-Term: Position for Possibilities (5+ Years)

The transportation and logistics industry is quickly changing through new technology that will affect the demand for truck parking and the amenities needed at truck parking facilities trends. For example, the demand for truck parking could be substantially reduced as connected and autonomous vehicles (CV/AV) become common on Florida's roads. Additionally, electrification of trucks has the potential to change the needs at truck parking facilities, as well as mitigate some of the negative impacts of trucks, such as noise and pollution. Therefore, FDOT should monitor the development of these and other technologies and trends impacting freight to position the Department for future possibilities.





## Final Thoughts

The Statewide Truck Parking Study recommendations and Implementation Plan provide a structure that sets the stage for FDOT Central Office, FDOT Districts, local jurisdictions, and private sector stakeholders to address the state's truck parking needs. The data and analysis provided by this study and the development of the TPIP form the basis for innovative solutions that take into account local needs, challenges, and realities. Lastly, the assessment of implementation progress, identification of lessons learned, and revisiting truck parking needs over time closes the feedback loop and pushes all truck parking stakeholders to innovate and remain accountable during implementation.

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# Statewide Truck Parking Study



# 01



## Chapter 1. Introduction

The availability of strategically-located truck parking is critical to the safe and efficient movement of freight via truck in Florida. Truck drivers use truck parking facilities to rest and position themselves in advance of pick-ups and deliveries (i.e., staging to meet a pick-up or delivery window). When the demand for truck parking spaces is in excess of supply, truck drivers may park in unauthorized areas such as the shoulders of highway interchange ramps or on local roadways. These areas were not designed to safely accommodate a parked truck and can negatively affect the safety of both the truck driver and the traveling public. Similarly, the pavement in these areas is not designed to handle the weight of a parked truck, which impacts the long-term state of good repair of interchange ramps and other areas.

Additionally, parking in unauthorized areas puts truck drivers at risk of being targeted for theft and assault, among other crimes. Ultimately, truck drivers and society incur the costs of insufficient truck parking. For example, the time and fuel spent searching for parking or the miles and revenue lost when deciding to stop early are an inefficiency in the system that affects the cost of moving freight and goods overall. A 2016 study from the American Transportation Research Institute (ATRI) found that truck drivers had 56 minutes of unused drive time left per day when they parked.<sup>1</sup> Using updated wage figures for 2018, the unused drive time translates to over \$5,500 in lost wages per year or about 13 percent of the median annual wage of a truck driver.<sup>2,3</sup> The infrastructure, safety, and economic impacts of unauthorized truck parking make this topic critical to the performance of the transportation system and the Florida economy.

### Purpose of the Statewide Truck Parking Study

Florida’s transportation agencies have been studying truck parking issues in Florida for over ten years. Table 1 displays a selection of recently completed truck parking studies in Florida and shows how truck parking has been studied at a city, county, corridor, district, and statewide level. Appendix A provides a summary of the methodology, data, and recommendations for each of the studies shown in Table 1.

**Table 1 | Recent Truck Parking Studies in Florida**

	Study Title	Year	Study Area
Statewide Studies	Commercial Motor Vehicle Parking Trends at Rest Areas and Weigh Stations	2012	Statewide
	Statewide Truck GPS Data Analysis	2019	Statewide

<sup>1</sup> Boris, C. and R. M. Brewster, 2016. “Managing Critical Truck Parking Case Study – Real World Insights from Truck Parking Diaries.” American Transportation Research Institute.

<sup>2</sup> Murray, D. and S. Glidewell, 2019. “An Analysis of the Operational Costs of Trucking: 2019 Update.” American Transportation Research Institute.

<sup>3</sup> Bureau of Labor Statistics, U.S. Department of Labor, 2019. “Occupational Outlook Handbook, Heavy and Tractor-trailer Truck Driver

# Statewide Truck Parking Study



City, County, and Corridor Studies	Comprehensive Parking Study for Freight Transport in Miami-Dade County	2010	Miami-Dade County
	Development of Truck Parking Facilities in Miami-Dade County, Phase II – Options for Implementation	2012	Miami-Dade County
	Regional Truck Parking and Service Issues	2014	Tampa Bay Region
	Truck Parking Utilization Study: Turnpike Service Plazas and Tandem Truck Staging Lots	2015	Florida Turnpike
	St. Augustine Truck Parking Management Plan	2015	St. Augustine
	North & Central Florida Truck Stop Market/Site Analysis	2017	Florida Turnpike
	Public Rest Area Truck Parking	2017	I-75 in District 7
	Orlando Tandem Truck Staging Lot – Update to Preliminary Study	2017	Orlando
	District Studies	South Florida Truck Stop Market Analysis	2016
District One Districtwide Freight Truck Parking Inventory		2017	District 1
District Four Truck Parking Supply & Demand Phase 1		2017	District 4
Central Florida Truck Parking Study		2017	District 5
District Two Truck Parking Study		2019	District 2

The scan of existing truck parking studies demonstrates the wide variation in the methodology and data used to identify the supply of and demand for truck parking. Therefore, the comparability between studies is limited, especially when considering the variety of data sets (truck GPS, field surveys, truck registrations, truck counts) and methodologies used to identify the demand for truck parking. Additionally, private sector truck stops had limited inclusion in existing truck parking studies, which misses a substantial portion of Florida’s truck parking capacity.

The purpose of the Statewide Truck Parking Study is to build upon existing state and district truck parking studies using new data and approaches to ultimately identify, prioritize, and propose solutions to address the areas in Florida with the greatest truck parking needs. The Statewide Truck Parking Study also provides an implementation plan, supporting documents, and tools that consolidate potential solutions into a portfolio of actionable projects, policies, and partnerships that address truck parking problems throughout Florida.

## Factors Affecting Truck Parking Demand

While there are many factors that affect the quantity and location of the demand for truck parking, Hours of Service (HOS), the Electronic Logging Device (ELD) mandate, and the location of freight activity have a disproportionately large impact. The remainder of this section provides a brief overview of how each of these factors affects the demand for truck parking.

### Hours of Service Compliance

HOS refers to the federal regulations established by the Federal Motor Carrier Safety Administration (FMCSA) and codified primarily in 49 CFR 395 that limit the amount of time a driver can be on-duty and operate a commercial motor vehicle. HOS regulations were developed to reduce the risk of crashes and health conditions associated with a lack of sleep. Truck parking is critical to providing truck drivers with a safe location where they are able to take their HOS required rest.





Truck drivers are often in a position where they have to choose between parking in a nearby available spot and stopping before their HOS would require or continuing to drive and risk not finding a spot. Drivers nearing the end of their HOS and encountering full truck parking must choose between parking in an unauthorized area or driving beyond their HOS. A driver's decision on where to park effectively weighs risk and safety against productivity.

The FMCSA published a notice of proposed rulemaking (NPRM) on August 22, 2019, to collect input on proposed changes to HOS rules to provide additional flexibility for truck drivers. Although FMCSA has proposed changes to five existing HOS rules, the final HOS rules may change based on the almost 8,200 comments received by FMCSA. The comment period for the NPRM closed on October 7, 2019, but the timing for the final rule is unknown. Future changes to HOS have the potential to change truck parking demand by altering where and when truck drivers rest.

## Electronic Logging Device Mandate

The Moving Ahead for Progress in the 21st Century Act (MAP-21) was passed in 2012 and required truck drivers to switch from recording their HOS using paper-logs to using an Electronic Logging Device (ELD). While ELDs reduce a driver's administrative burden, they also remove the flexibility that drivers had to round their time to the one-quarter hour. The ability to round time was used by drivers as a buffer that provided a little extra time for truck drivers to locate adequate parking. In contrast, ELDs record to the minute, so there is no buffer time for drivers. For additional information on this topic, visit:

<https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-devices>. ATRI's analysis of 2,035 days of truck parking activity from 148 drivers found that drivers spent 16-30 minutes finding truck parking 18 percent of the time and over 30 minutes 10 percent of the time.<sup>4</sup> Similar to remaining drive time, the time spent looking for truck parking reduces the miles a driver can operate and therefore their wages.

## Freight Activity Areas

Most truck trips begin and/or end in urban areas, notably along the urban fringe. However, these regions often have very little truck parking, even near large freight centers, due to the higher cost of land in urban areas. As a result, many drivers deliberately give up potential driving hours (and revenue) to stage an hour or two outside of an urban area to avoid parking in an unauthorized area due to insufficient parking opportunities. Additionally, a previously conducted FDOT study to identify the highest intensity Freight Activity Areas (FAA) statewide, showed a very strong correlation between the highest concentrations of unauthorized truck parking along associated roadway segments with FAAs.

Additionally, objections from communities or "Not in My Back Yard" (NIMBY) opposition often block or complicate the development of truck parking in urbanized areas. Common objections include truck exhaust/emissions, noise, and the view that truck parking is an eye-sore which will result in lower property values. Many local governments have ordinances that restrict trucks from parking in their jurisdiction.

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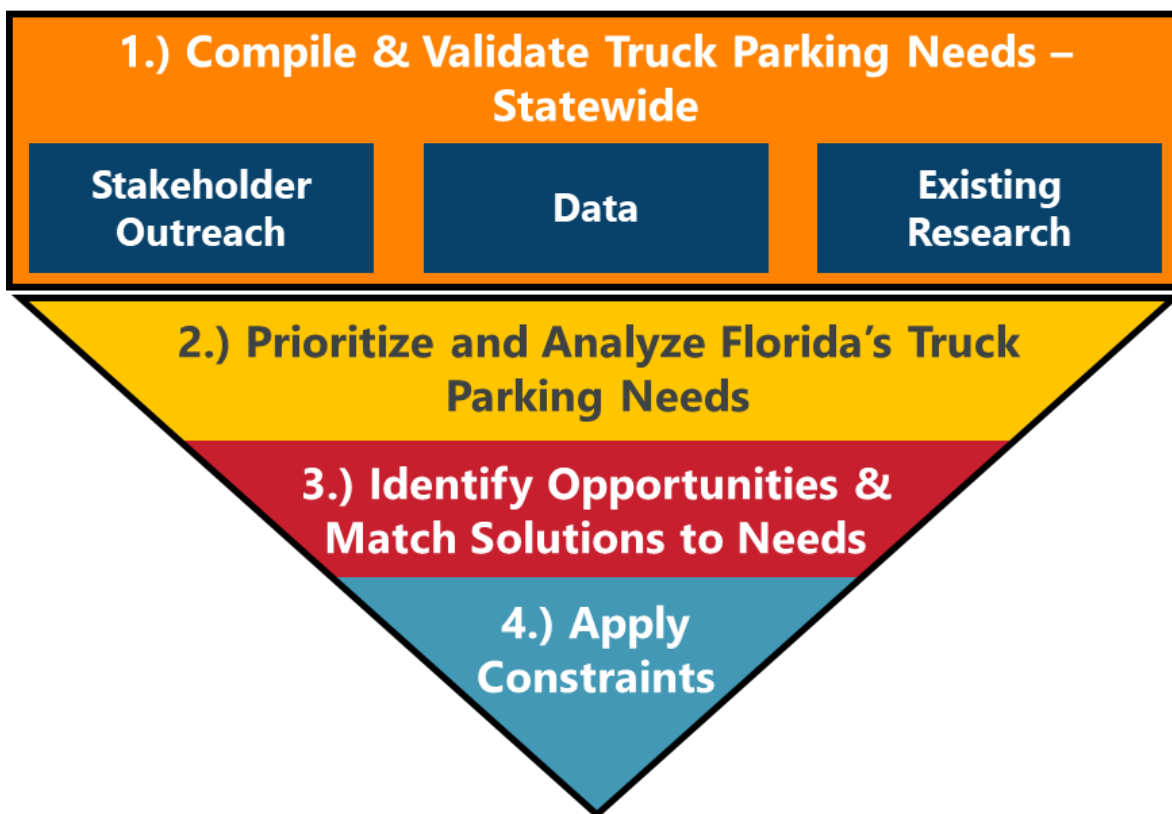
<sup>4</sup> Boris, C. and R. M. Brewster, 2016. "Managing Critical Truck Parking Case Study – Real World Insights from Truck Parking Diaries." American Transportation Research Institute.



## Methodology

As shown in Figure 1, the Statewide Truck Parking Study was developed in four steps, which culminate in the identification of actionable truck parking solutions. Step one compiled and validated truck parking needs, highlighting how the Statewide Truck Parking Study built upon existing research, new and existing data analysis, and stakeholder input to identify and validate a “long list” of Florida’s truck parking needs. Step one lays the groundwork for the prioritization developed in step two and matching truck parking solutions to the truck parking needs in step three. Finally, step 4 introduces constraints to the potential opportunities and solutions to ensure the recommendations and implementation plan is actionable.

Figure 1 | Statewide Truck Parking Methodology



## Actionable Truck Parking Solutions

Developing actionable recommendations and implementation plan relies heavily on stakeholder input. As shown in Figure 2, stakeholder input informed each step in the Statewide Truck Parking Study. Stakeholder input was collected from both internal and external stakeholders through webinars, presentations to FDOT District and Central Office Staff, and via an online survey.



Figure 2 | Incorporating Stakeholder Input

	<b>Stakeholders &amp; Outreach Approach</b>	<b>Input Received</b>
<b>Internal Stakeholders</b>	<ul style="list-style-type: none"> <li>▪ District &amp; Central Office freight staff</li> <li>▪ Group &amp; individual meetings, webinars, &amp; survey</li> </ul>	<ul style="list-style-type: none"> <li>▪ Identified existing truck parking activities (<b>Step 1</b>)</li> <li>▪ Validated locations of unauthorized truck parking (<b>Steps 1 &amp; 2</b>)</li> <li>▪ Identified &amp; validated solutions (<b>Steps 3 &amp; 4</b>)</li> </ul>
<b>External Stakeholders</b>	<ul style="list-style-type: none"> <li>▪ Truck drivers, fleet operators, MPOs, associations, shippers, receivers, etc.</li> <li>▪ Webinar &amp; survey</li> </ul>	<ul style="list-style-type: none"> <li>▪ Validated locations of unauthorized truck parking (<b>Steps 1 &amp; 2</b>)</li> <li>▪ Identified truck parking solutions (<b>Steps 3 &amp; 4</b>)</li> </ul>

The substantial existing truck parking studies completed in Florida, new and existing data analysis, and stakeholder input form the basis of the Statewide Truck Parking Study and will position FDOT Central Office and Districts with the data, recommendations, and tools to improve truck parking in Florida.





# 02



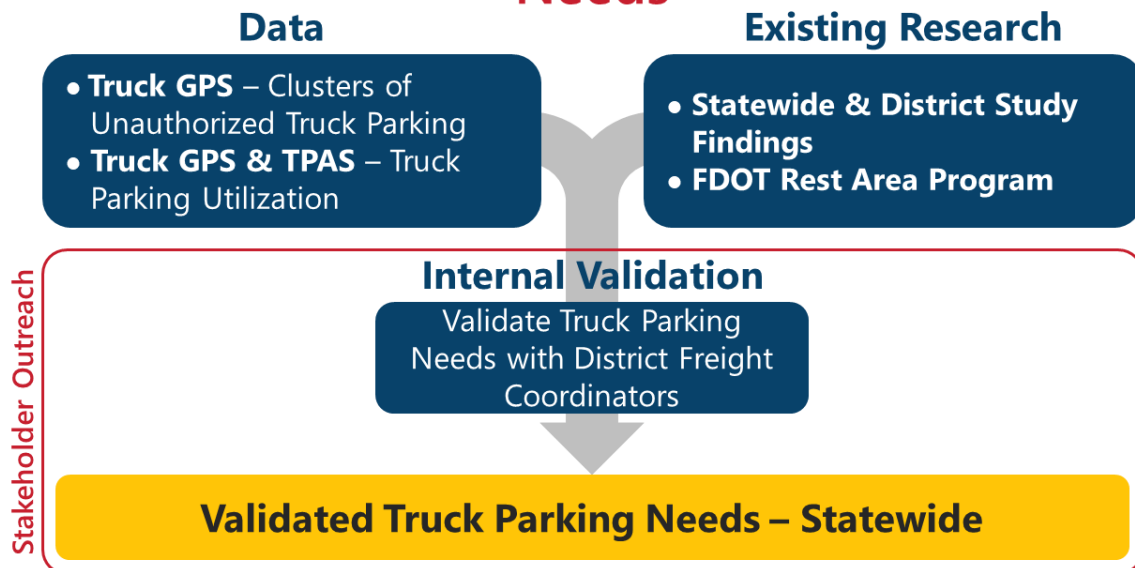
## Chapter 2. Building Upon Existing Truck Parking Studies in Florida

A review of existing truck parking studies in Florida revealed a variety of data sources and approaches used to study truck parking. While the findings of the existing truck parking studies are used to inform this study, a uniform data set and analytical approach was required to conduct a statewide assessment of truck parking in Florida. Therefore, FDOT’s Transportation Data and Analytics Office (TDA) and Freight and Multimodal Operations Office (FMO) conducted the “Statewide Truck GPS Data Analysis.” Finalized in 2019, the “Statewide Truck GPS Data Analysis” used a statewide truck GPS data set to evaluate the utilization of public and private truck parking facilities, as well as roadway segments used for parking in an unauthorized manner throughout the state.

As shown in Figure 3, this study leverages the data developed in the “Statewide Truck GPS Data Analysis” and applies additional cluster analysis, validation, and triangulation with existing research to compile a list of quantified and validated truck parking needs.

Figure 3 | Compiling and Validating Florida’s Truck Parking Needs

### 1.) Compile & Validate Florida’s Truck Parking Needs

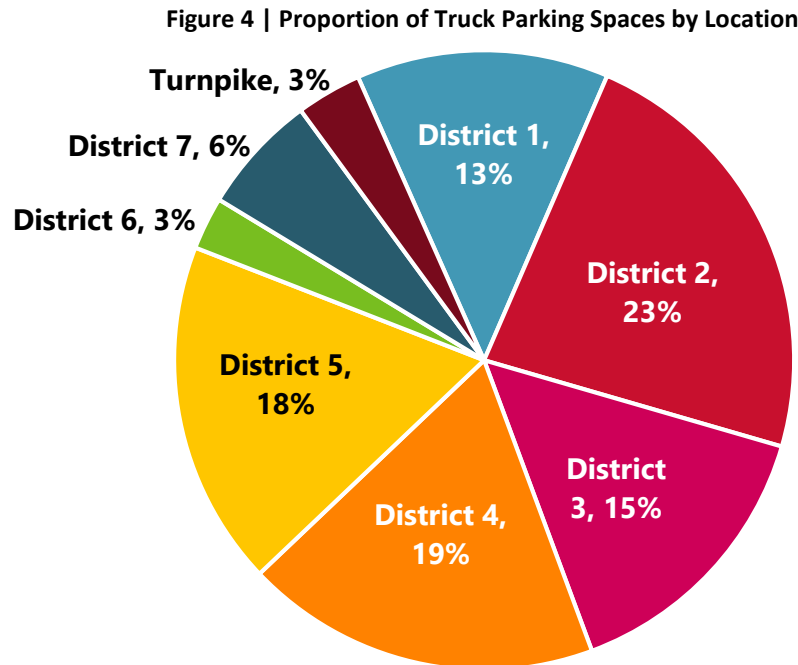


The remainder of this Chapter presents the truck parking activities underway in FDOT’s Districts, the findings of the “Statewide Truck GPS Data Analysis”, and validation that are prioritized and undergo additional analysis in Chapter 3 and Chapter 4, respectively.



## Identifying Truck Parking Supply

The “Statewide Truck GPS Data Analysis” identified 10,093 truck parking spaces in Florida, 30 percent of which are provided by the public sector and 70 percent are provided by private sector truck stops. Figure 4 displays the distribution of truck parking spaces by their location within an FDOT District or along the Florida Turnpike.



Source: Analysis of Data from the “Statewide Truck GPS Data Analysis”

Private truck stops provide about 2.3 truck parking spaces for each space at a public truck parking location. The ratio of private to public truck parking spaces highlights the importance of truck stops in providing truck parking. According to the 2015 Jason’s Law Survey, Florida had the fourth-lowest ratio of private to public truck parking spaces. Therefore, compared to the rest of the US, FDOT provides a disproportionately high number of public truck parking spaces relative to the private spaces in the state. The ratio of private to public truck parking spaces highlights the importance of both public and private sector solutions when addressing truck parking issues.

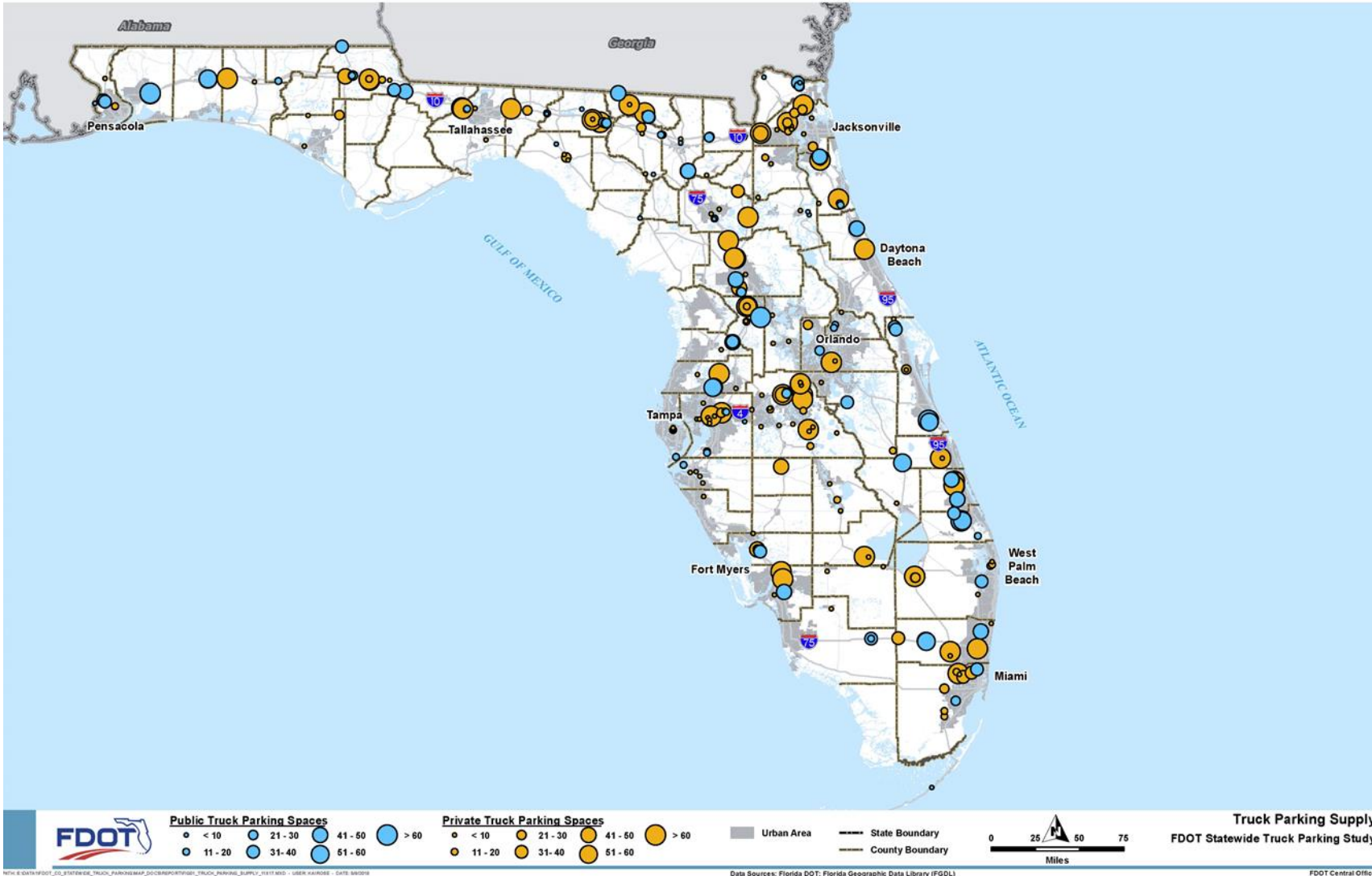
Figure 5 displays the location of truck parking facilities differentiated by the size and ownership (public or private) of the facility. Generally, truck parking spaces are concentrated near urban areas and along Florida’s Interstate Highways. As a factor affecting truck parking demand, the concentration of truck parking near urban areas and along major freight corridors matches the freight activity occurring in those areas.



# Statewide Truck Parking Study



Figure 5 | Supply of Public and Private Truck Parking



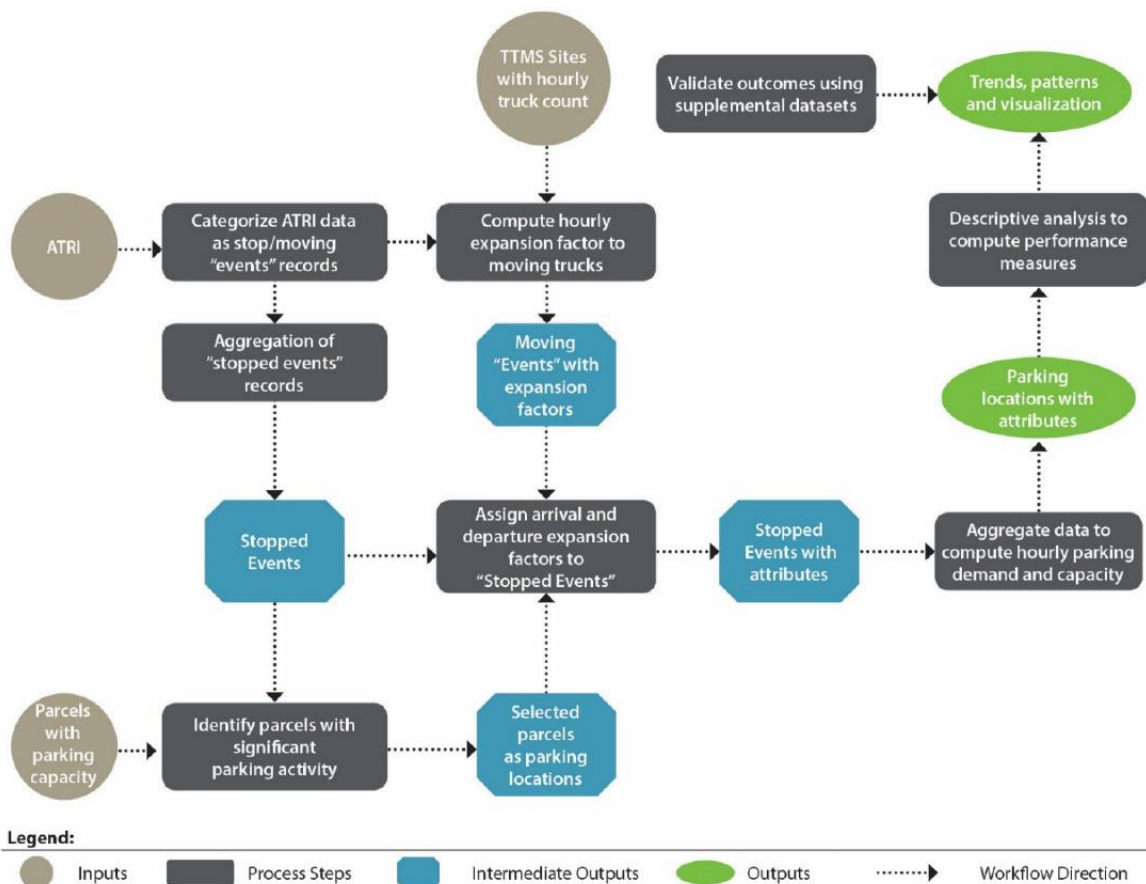




## Utilization of Truck Parking Spaces and Unauthorized Truck Parking

Adding the utilization (whether truck parking spaces are filled or empty) to the analysis of the number and location of truck parking spaces provides critical information about the locations where truck parking demand exceeds supply. Areas where truck parking demand exceeds supply often have unauthorized truck parking, such as trucks parked on the side of highways, on or off-ramps, vacant lots, or on local roadways. Unauthorized truck parking is often found near freight origins, destination, or truck parking locations that have high rates of utilization, which can be referred to as the spillover effect. Figure 6 displays the methodology used to identify truck parking utilization and unauthorized truck parking in the “Statewide Truck GPS Data Analysis.”

Figure 6 | Statewide Truck GPS Data Analysis Methodology



Source: Florida Department of Transportation, 2019

This study builds upon the data developed in the “Statewide Truck GPS Data Analysis” by further validating the data, developing additional visualizations, prioritizing the most acute truck parking issues in the state, and conducting an inferential analysis of the root cause of unauthorized truck parking and over-utilization of truck parking locations. This deep dive into unauthorized and over-utilized truck parking adds the local context and provides additional insight into why trucks are parked in a specific area. For example, analyzing the total time a truck is parked (dwell time) provides insight into whether the truck is staging for a pick-up/delivery or if they are stopped for HOS compliance. The insights added during the deep dive all influence the selection and implementation of the most appropriate solution.

## Statewide Truck Parking Study

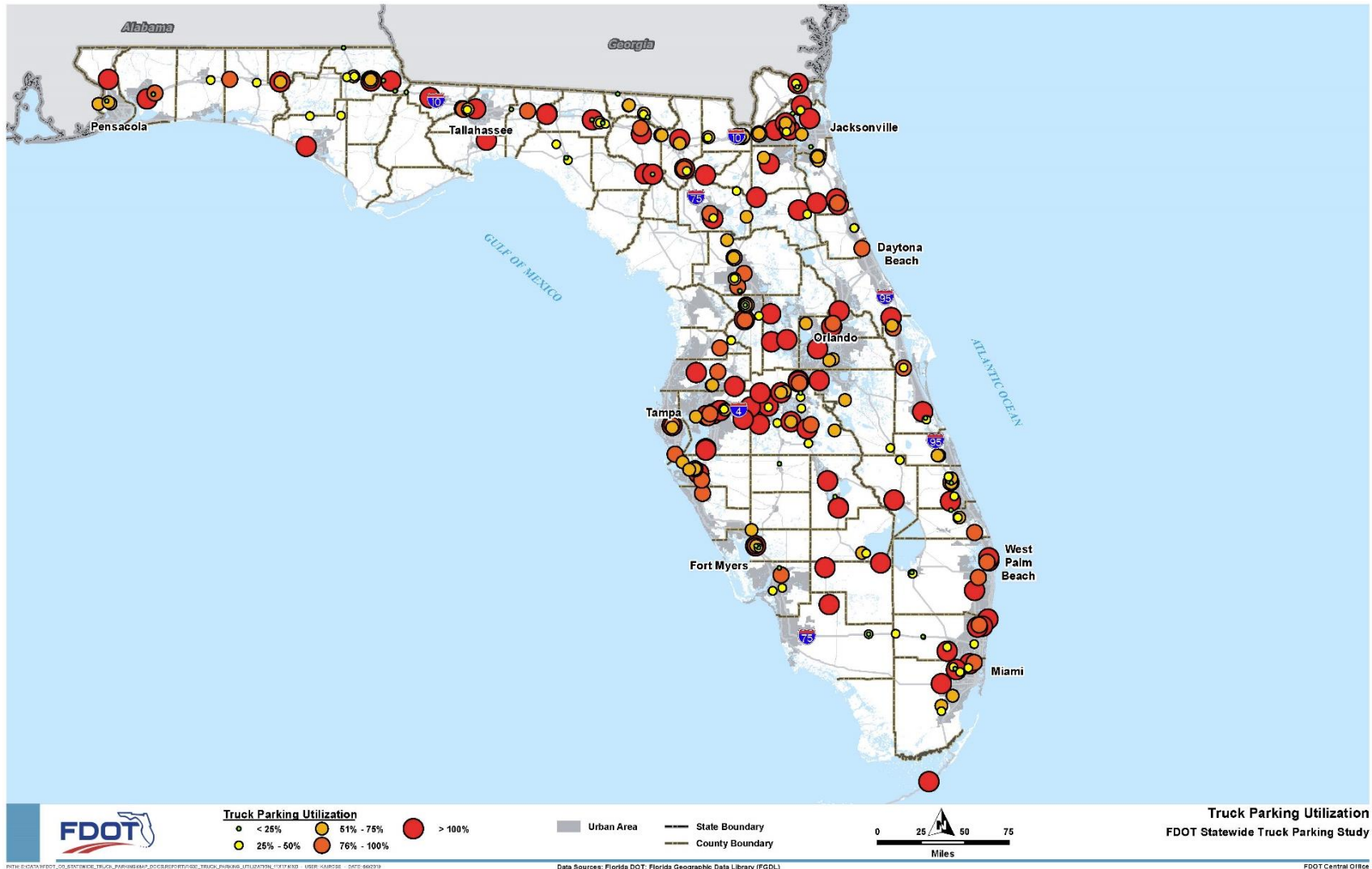


Figure 7 uses both size (larger markers denote higher utilization) and color (green is the lowest utilization and red is the highest) to denote the utilization of truck parking facilities. Figure 8 translates the utilization of individual truck parking facilities into a background layer and adds locations with at least 150 unauthorized trucks parked annually. Placing both the utilization and unauthorized truck parking on the same map allows for the comparison of where trucks are parking in unauthorized areas to the utilization of nearby truck parking locations. Comparing unauthorized truck parking to utilization provides insight into whether an information solution that directs trucks to available parking would solve trucks parking in unauthorized areas or if additional capacity is needed. The context of unauthorized truck parking shown in Figure 8 is critical to identifying the root cause of unauthorized truck parking and identifying potential solutions.

Additionally, Appendix B provides maps of unauthorized truck parking and the utilization of public and private truck parking locations for each FDOT District. The maps in Appendix B, along with other data and toolboxes, provide the background and analysis needed to identify truck parking issues, solutions, and opportunities in this study and in the future.



Figure 7 | Truck Parking Utilization

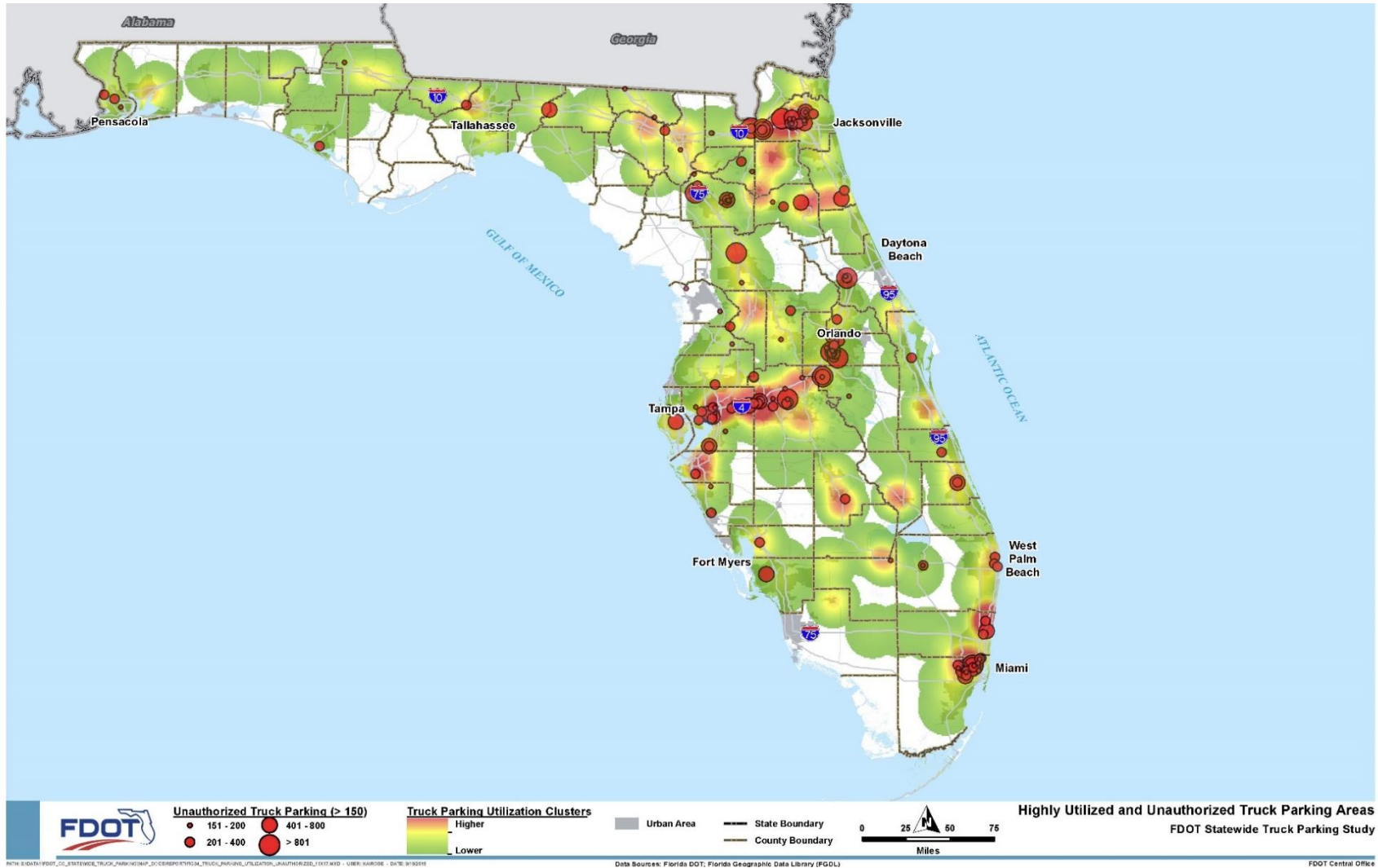




# Statewide Truck Parking Study



Figure 8 | Unauthorized Truck Parking and Utilization of Public and Private Truck Parking







## District Truck Parking Activity

Table 2 displays the truck parking projects, issues, and activities identified through consultation with FDOT Districts and Florida Turnpike. Substantial truck parking activity is underway throughout Florida, for example, many of the Districts highlighted recent or future truck parking studies, projects, and locations where truck parking is a problem. In addition to the activities presented in Table 2, FDOT is implementing the Truck Parking Availability System (TPAS) program. The TPAS program deploys vehicle detection technology at state-owned welcome centers, rest areas, and weigh stations to assess the availability of truck parking, which is then communicated to truck drivers via roadside signs and third-party applications.

The variety of truck parking activities underway in Florida displays a need and role for FDOT in coordinating a statewide approach to addressing truck parking issues. The findings presented in Table 2 are used as a starting point for the identification of potential projects and solutions to unauthorized truck parking in this study.

**Table 2 | District Truck Parking Projects**

District	Description of Ongoing Truck Parking Activities
<b>District 1</b>	<ul style="list-style-type: none"> <li>• Future plans to develop phase 2 of the District 1 Truck Parking Study</li> <li>• Searching for P3s with the commercial truck travel center and FDOT owned parcels</li> <li>• The District is performing community outreach and working with local government to identify safe havens without removing ordinances</li> <li>• Will use outcomes from this study to support outreach efforts with local economic development agencies</li> </ul>
<b>District 2</b>	<ul style="list-style-type: none"> <li>• Two task work orders to formalize truck parking south of I-75 (looking at green space) and addressing under-utilization at WIMs on state lines</li> <li>• Exploring options for making WIM stations more attractive to truck drivers                             <ul style="list-style-type: none"> <li>◦ Food options, landscaping, and lighting</li> </ul> </li> <li>• Specific areas with truck parking issues: Along I-295, St. Johns Rest Area on I-95, and last-mile issues in Baldwin and at the US 301/ I-10 interchange</li> </ul>
<b>District 3</b>	<ul style="list-style-type: none"> <li>• No ongoing projects but the district is identifying potential needs along I-10, particularly on the eastern end of the District boundary</li> </ul>
<b>District 4</b>	<ul style="list-style-type: none"> <li>• No ongoing projects but exploring solutions on I-75</li> <li>• Specific issue areas: Outside Port Everglades and Pompano Beach on Atlantic Boulevard</li> <li>• Coordination with Florida Department of Agriculture and Consumer Services’ (FL DACS) Pompano Beach State Farmers Market operations manager</li> </ul>
<b>District 5</b>	<ul style="list-style-type: none"> <li>• The District is currently assessing the development of additional truck parking spaces at the Sanford Rest Areas along the NE segment of I-4                             <ul style="list-style-type: none"> <li>◦ Public meetings/hearings about Sanford have been attended by the District Secretary</li> </ul> </li> <li>• Developers have also expressed interest in developing a truck stop</li> </ul>

# Statewide Truck Parking Study



District	Description of Ongoing Truck Parking Activities
<b>District 6</b>	<ul style="list-style-type: none"> <li>• More capacity needed along FL 836 in the northeast part of Miami-Dade County (MDC) and US 27 along the western edge of MDC</li> <li>• Projects are more viable if they are within the Urban Development Boundary (UDB)</li> <li>• Ongoing Projects:                             <ul style="list-style-type: none"> <li>○ Searching for land to develop a truck parking site along the Ronald Reagan Turnpike</li> <li>○ Golden Glades Truck Travel Center-Prelim-engineering in FY21 and building in FY23</li> <li>○ Several Sub-Area Freight Plans including assessments for developing potential truck parking facilities</li> </ul> </li> </ul>
<b>District 7</b>	<ul style="list-style-type: none"> <li>• Usability analysis found rest areas are over capacity along I-75</li> <li>• Projects: Two projects are in the design-build process that will add a total of 115 new truck parking spaces at Hillsborough County Rest Area northbound and southbound along I-75</li> <li>• Private sector interest in a site on Causeway Boulevard</li> </ul>
<b>Turnpike</b>	<ul style="list-style-type: none"> <li>• Projects: Recently expanded truck parking spaces at service plazas at Canoe Creek, West Palm Beach, and Turkey Lake</li> </ul>



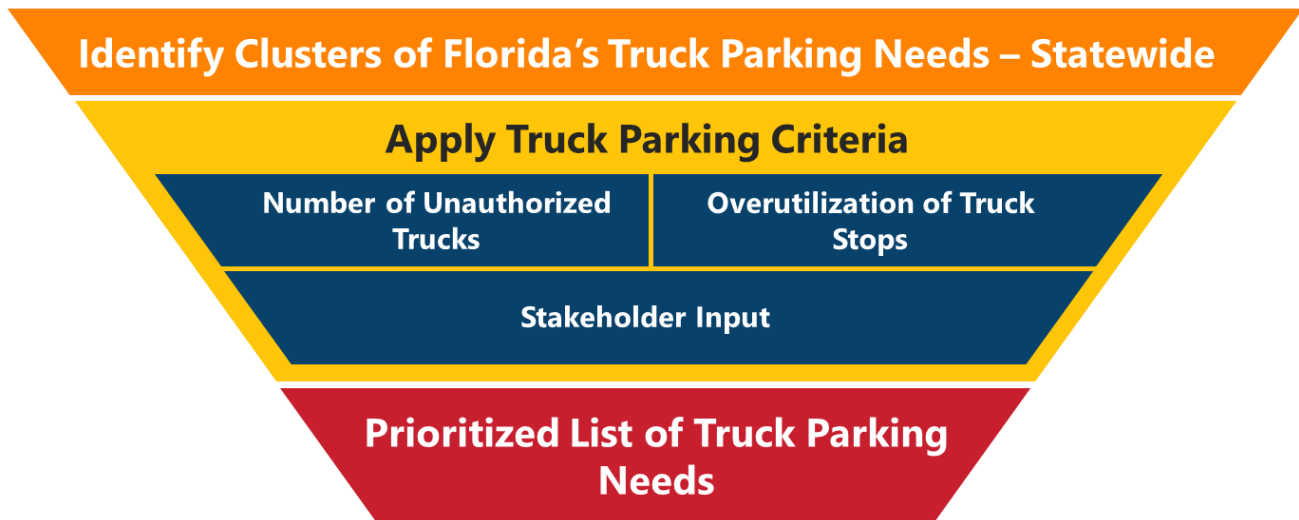
# 03



## Chapter 3. Prioritizing and Analyzing Florida’s Truck Parking Needs

The maps included in Chapter 2 displayed that unauthorized and over-utilized truck parking locations occur throughout Florida, but are often clustered around freight origins, destinations, and corridors. Figure 9 displays the process for analyzing and prioritizing clusters of truck parking needs in Florida, starting with identifying clusters of trucks parked in unauthorized locations and at over-utilized truck parking facilities. Truck parking clusters are then prioritized and the top priorities are analyzed to identify the root cause of the unauthorized truck parking occurring at each location.

Figure 9 | Truck Parking Prioritization Process



### Identifying Clusters of Unauthorized and Over-Utilized Truck Parking

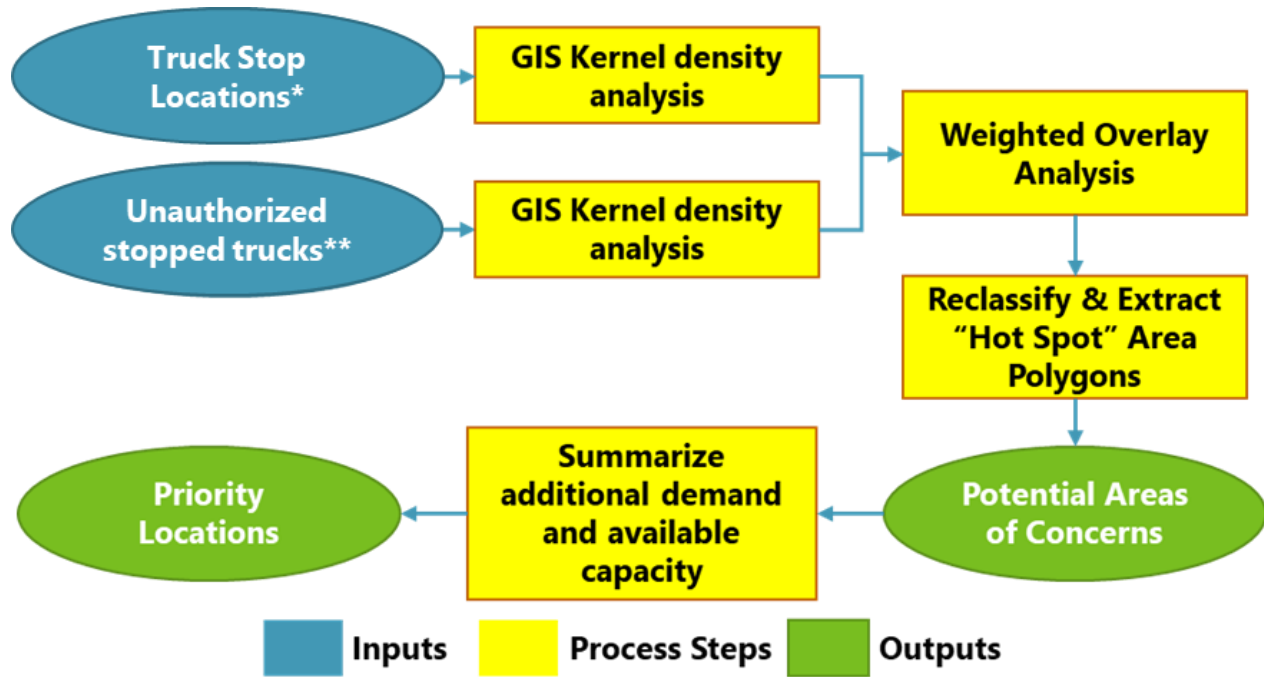
The first step in prioritizing truck parking needs is defining where truck parking needs are most concentrated. Figure 10 displays the process for identifying and prioritizing clusters of unauthorized truck parking and over-utilized truck parking. The cluster identification and initial prioritization process was conducted in the following steps:

1. Translate unauthorized truck parking stops and over-utilized truck parking spaces into kernel density layers
2. Run a weighted overlay analysis that assigns unauthorized truck density a higher weight (80 percent) to combine the kernel density outputs
3. Reclassify the final overlay analysis to produce areas of concern
4. Compute summary statistics for each area of concern
5. Determine criteria and potential priority locations
6. Compare clusters of unauthorized truck parking to findings of previous studies





Figure 10 | Cluster Identification and Prioritization Process



\*All truck parking locations with typical peak hour utilization of greater than 75%. \*\*Locations with more than 150 unauthorized truck stops. Data Source: Statewide Truck GPS Data Analysis

## Clusters of Unauthorized and Over-Utilized Truck Parking

Steps one through three described above resulted in 20 areas of concern displayed in Table 3 and mapped in Figure 11. Table 3 displays the summary statistics of the 20 areas of concern, including the FDOT district where each is located and the number of unauthorized, over-utilized, and total excess truck parking demand (sum of unauthorized and over-utilized trucks). Table 3 also provides the proportion of total excess truck parking demand that is due to trucks parking in unauthorized or over-utilized locations.

Table 3 | Top 20 Truck Parking Areas of Concern Statewide

Areas of Concern	District	Unauthorized Truck Count Annual		Over-Utilized Truck Count Annual		Total Excess Truck Parking Demand
		Count	Proportion of Total	Count	Proportion of Total	
A	3	2,829	100%	-	0%	2,829
B	3	381	100%	-	0%	381
C	3	559	13%	3,650	87%	4,209
D	2	34	100%	-	0%	34
E	2	28,395	46%	33,215	54%	61,610
F	2	3	100%	-	0%	3

# Statewide Truck Parking Study



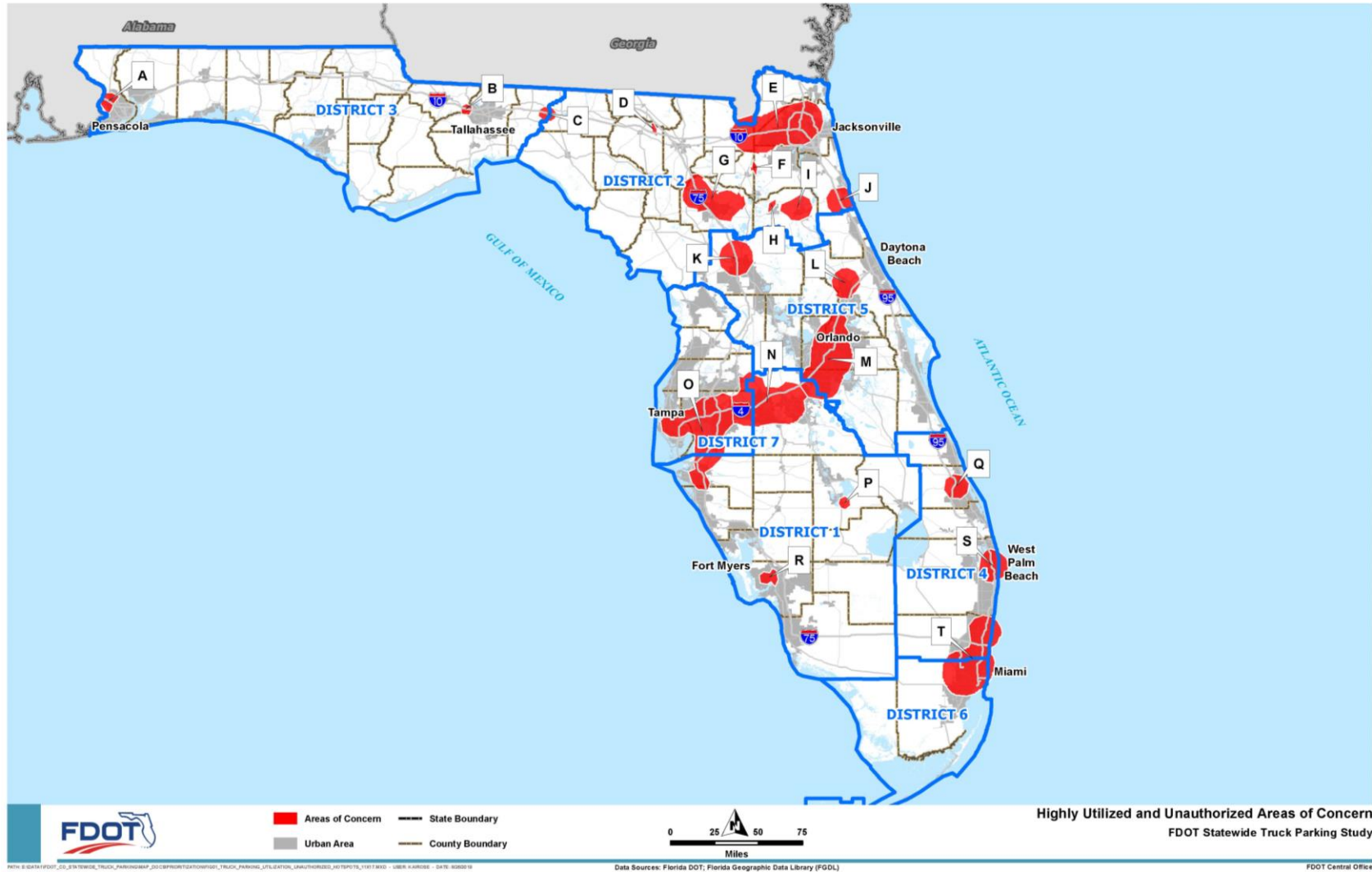
Areas of Concern	District	Unauthorized Truck Count Annual		Over-Utilized Truck Count Annual		Total Excess Truck Parking Demand
		Count	Proportion of Total	Count	Proportion of Total	
<b>G</b>	2	5,620	100%	-	0%	5,620
<b>H</b>	2	187	100%	-	0%	187
<b>I</b>	2	1,604	47%	1,825	53%	3,429
<b>J</b>	2	1,454	8%	17,885	92%	19,339
<b>K</b>	5	3,791	100%	-	0%	3,791
<b>L</b>	5	2,780	100%	-	0%	2,780
<b>M</b>	5	27,336	63%	16,060	37%	43,396
<b>N</b>	1	17,457	26%	48,545	74%	66,002
<b>O</b>	7	20,793	37%	35,040	63%	55,833
<b>P</b>	1	306	7%	4,015	93%	4,321
<b>Q</b>	4	2,464	100%	-	0%	2,464
<b>R</b>	1	1,421	100%	-	0%	1,421
<b>S</b>	4	4,887	51%	4,745	49%	9,632
<b>T</b>	6	37,554	62%	22,630	38%	60,184

Figure 11 displays the locations of the top 20 areas of concern in Florida. The top 20 areas of concern undergo additional analysis that further refines and prioritizes the list. The priority locations will be analyzed further to identify the specific locations where trucks are parking and potential opportunities to address truck parking within the priority location.

# Statewide Truck Parking Study



Figure 11 | Top 20 Truck Parking Areas of Concern Statewide





## Prioritizing Areas of Concern

The cost of projects and limited resources for truck parking projects necessitates a prioritization of the top 20 areas of concern identified in the study. The prioritization process started with the calculation of a volume to capacity ratio (V/C index) for each area of concern. The V/C index was calculated by dividing excess truck parking demand (V) by the number of truck parking spaces (C) in each area of concern as shown in Table 4. The V/C index adds context to the excess truck parking demand by putting it in terms of the supply of truck parking.

In order to focus on areas of concern that have both a high V/C index and high excess truck parking demand, a threshold of 25,000 was established for excess truck parking demand. The areas of concern with an excess truck parking demand over 25,000 were ranked according to their V/C index (displayed in red in Table 4).

**Table 4 | Prioritized Truck Parking Areas of Concern**

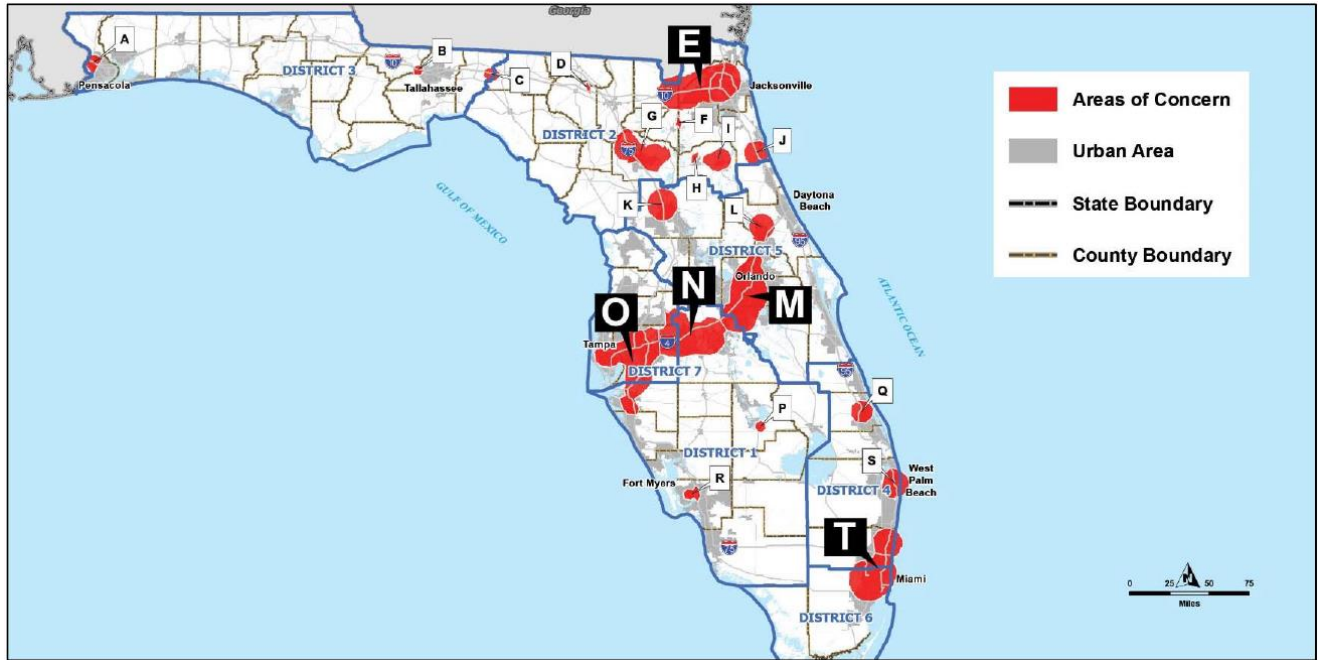
Area of Concern	District	Annual Excess Truck Parking Demand (V)	Supply Parking Spaces Total (C)	V/C index	Rank
<b>M</b>	<b>5</b>	<b>43,396</b>	<b>263</b>	<b>165</b>	<b>1</b>
<b>O</b>	<b>7</b>	<b>55,833</b>	<b>342</b>	<b>163</b>	<b>2</b>
<b>N</b>	<b>1</b>	<b>66,002</b>	<b>444</b>	<b>149</b>	<b>3</b>
<b>E</b>	<b>2</b>	<b>61,610</b>	<b>553</b>	<b>111</b>	<b>4</b>
<b>T</b>	<b>6</b>	<b>60,184</b>	<b>646</b>	<b>93</b>	<b>5</b>
J	2	19,339	141	137	
S	4	9,632	38	253	
G	2	5,620	6	937	
P	1	4,321	8	540	
C	3	4,209	21	200	
K	5	3,791	535	7	
I	2	3,429	6	572	
A	3	2,829	127	22	
L	5	2,780	0	N/A	
Q	4	2,464	773	3	
R	1	1,421	0	N/A	
B	3	381	278	1	
H	2	187	0	N/A	
D	2	34	0	N/A	
F	2	3	0	N/A	

The output of the prioritization process is shown in Figure 12, with the top five Priority Areas (areas M, O, N, E, and T) shown in black boxes, along with the remaining 15 locations shown in white boxes. The output of the prioritization process is used to focus the analysis and enable the identification of needs, opportunities, and recommendations in the study.





Figure 12 | Priority Areas of Concern



## Stakeholder Input on Priority Areas of Concern

Stakeholder Input was solicited from internal and external stakeholders to validate the truck parking Priority Areas of Concern. The project team presented the areas of concern and the prioritization process to FDOT Central Office Staff and the District Freight Coordinators (DFC) in August 2019 and conducted follow-up conversations with each District in the Fall of 2019.

Additionally, FDOT conducted an online survey from September 30<sup>th</sup> to October 25<sup>th</sup> aimed at soliciting input from shippers, receivers, carriers, and truck stop operators. The survey received 136 responses, with the majority of respondents coming from the trucking industry, Figure 13 provides a breakdown of the organization of respondents.



Figure 13 | Organization of Survey Respondents

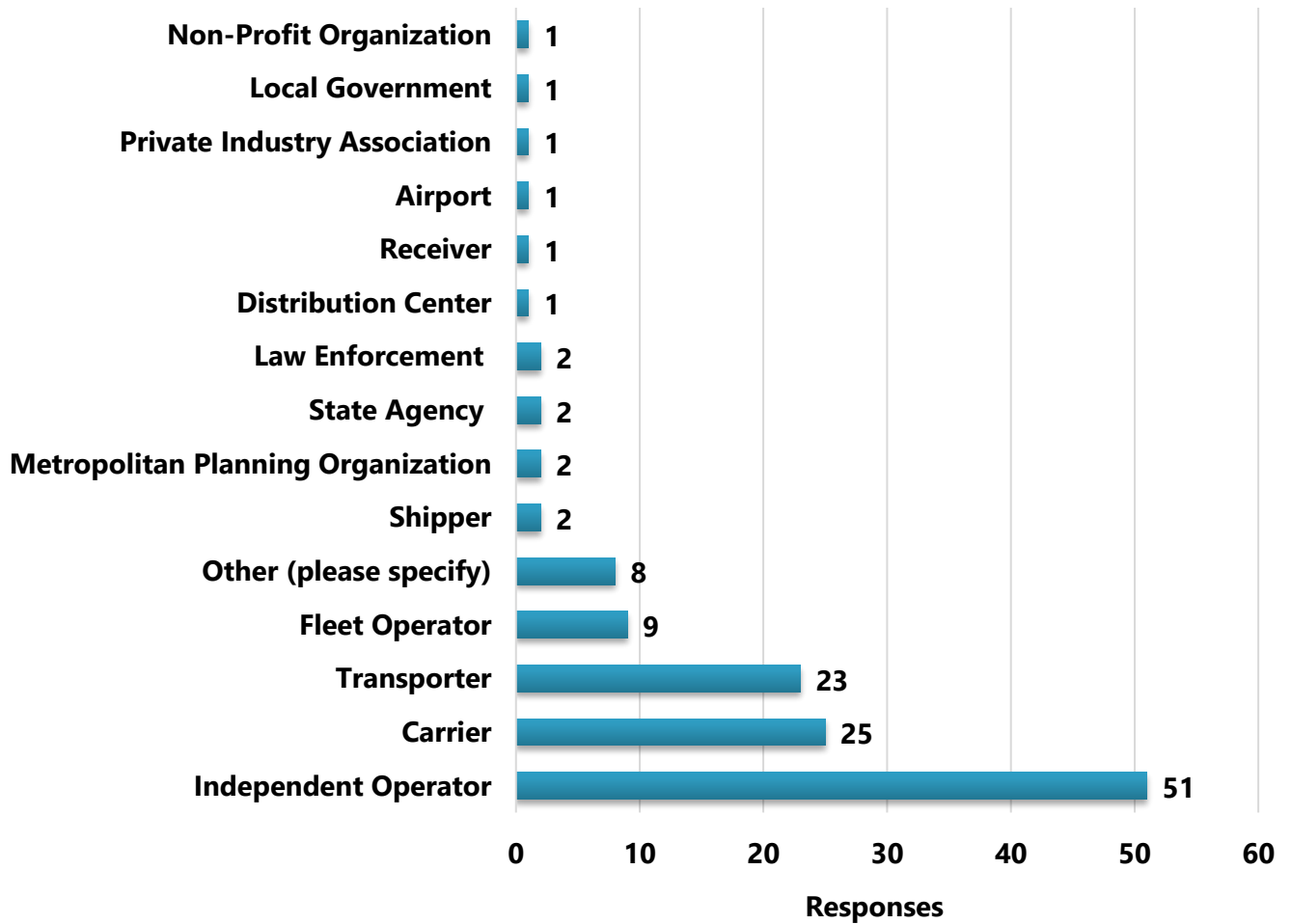


Figure 14 displays the frequency that survey respondents parked in Florida, based on the 78 respondents that filled out the question. Over half of the respondents park in Florida once a week or less, suggesting a mix of truck drivers that are occasionally in Florida and those that spend half or more of the workweek in the state.



Figure 14 | Frequency Survey Respondents Park in Florida

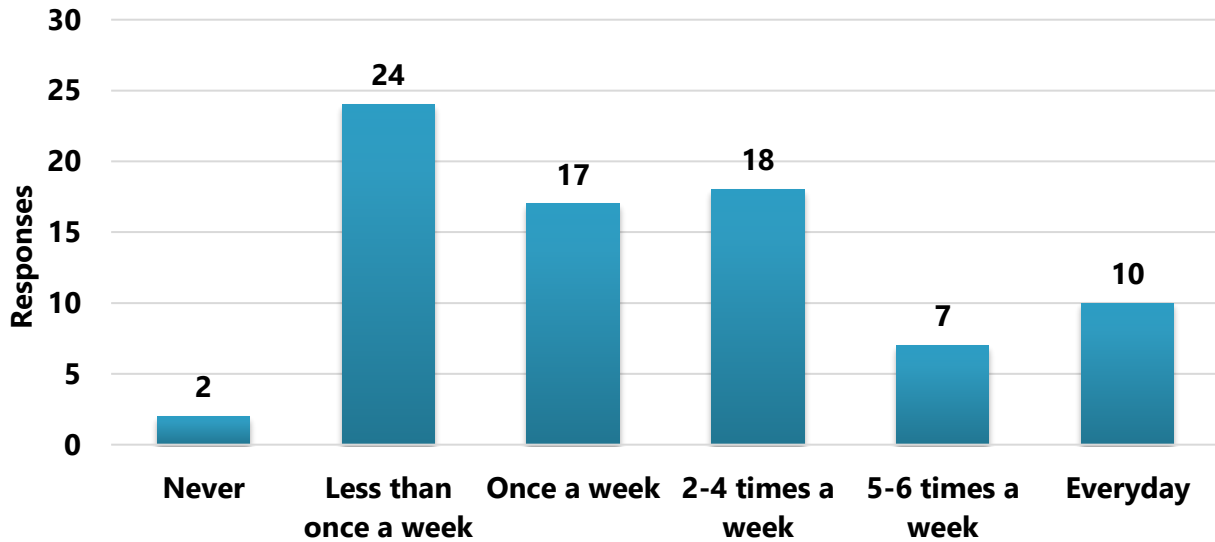
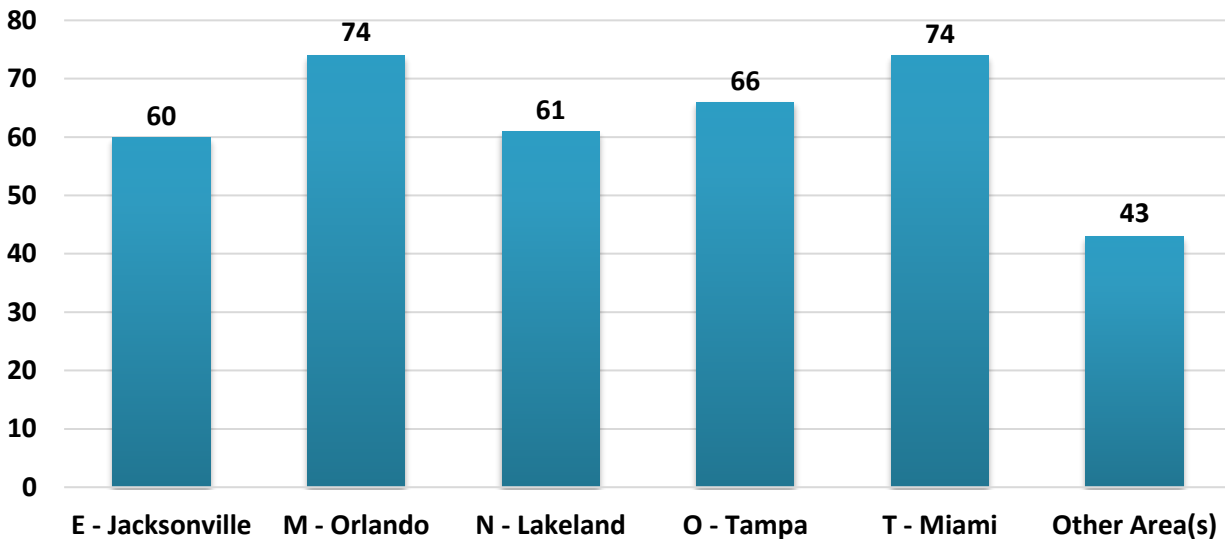


Figure 15 displays the results of the survey question asking respondents to select whether they had experienced overcapacity or had to park in an unauthorized area at any of the top 5 priority areas (areas E, M, N, O, and T in Figure 12) or “other” location in Florida. Priority areas M and T have slightly higher than average response rates compared to the other priority areas, suggesting that truck parking is a bigger issue in these areas or the respondents are more familiar with these areas.

Figure 15 | Priority Areas where Survey Respondents have Experienced Overcapacity or Unauthorized Truck Parking





Survey respondents were asked to provide their experience in each of the Priority Areas. Analyzing the comments on the survey responses yielded the following observations:

- **Priority Area M Orlando:** Respondents highlighted that truck parking was limited to one location in Orlando that has paid parking and other respondents noted that parking fills up early in the day. The limited parking and high demand result in truck drivers parking in unauthorized areas or parking between 30-75 miles outside of Orlando. Respondents also highlighted the limited parking on corridors that connect to Orlando.
- **Priority Area O Tampa:** Respondents highlighted the limited parking in Tampa and that they park in unauthorized locations as a result or stop early. Multiple comments highlighted the distance truck drivers have to park outside of Tampa to find truck parking, specifically noting that they stop near New Port Richey or at the Pasco County Rest Area to the North, Plant City to the East, and Bradenton to the South. The locations noted by respondents are between 25 to 45 miles from the city center, highlighting how far outside Tampa truck drivers will park, as well as the spillover effects of a lack of truck parking capacity and the resulting impact on the surrounding areas.
- **Priority Area N Lakeland:** Similar to the other priority areas, respondents noted that the area needs capacity and that parking fills early in the day, resulting in trucks parking between 20 and 30 miles away.
- **Priority Area E Jacksonville:** Respondents said that they had to park between 30 and 70 miles outside of Jacksonville in order to find truck parking. Respondents also said that truck parking capacity is low and what little parking is available fills up by 4 pm and 6 pm. Finally, respondents note that they often parking in Georgia or use unauthorized truck parking because of the limited availability of truck parking in Jacksonville.
- **Priority Area T Miami:** Respondents highlighted the lack of parking in Miami and that if parking was available, a fee was required. Many respondents noted parking locations two or more hours from the city center as locations where they park. Safety was brought up more in Priority are T than the other priority areas.
- **Other Critical Areas:** Multiple respondents noted I-75, I-95, and the Florida Turnpike as corridors that need truck parking. Other areas highlighted by multiple respondents were Naples, Fort Myers, Ocala, and West Palm Beach.

Respondents highlighted a general lack of truck parking inside the metropolitan areas associated with many of the clusters. Additionally, respondents noted that development is pushing truck stops out of urban areas, warehousing is being added in many areas, and truck drivers are often not permitted to park on-site at their pickup and delivery locations. These three factors together make it harder for truck drivers to find truck parking near their pickup or delivery location, costing them time and money. Respondents also noted problems with drivers storing their trucks at rest areas, as well as RVs taking up truck parking spaces. Lastly, many respondents noted that they won't deliver to some of the priority areas because it is so difficult to find safe truck parking

In general, the survey of truck parking stakeholders supports the findings of the analysis of truck parking utilization and unauthorized truck parking, as well as the results of the prioritization process used to identify the most critical truck parking locations.





# 04



## Chapter 4. Truck Parking Solutions

Truck parking involves many stakeholders including truck drivers, shippers/receivers, truck stop operators, and private citizens, as well as public sector stakeholders. The variety of stakeholders necessitates different types of solutions to address truck parking needs. Additionally, addressing truck parking needs throughout Florida will require a variety of solutions because there is no silver bullet or one size fits all solution that will work in every location. Rather, a toolbox of solutions empowers transportation agencies at all levels of government to select a solution that accounts for the unique factors causing trucks to park in unauthorized areas.

The purpose of this chapter is to highlight the types of solutions that make up the “Tool Box” of solutions transportation agencies can use to address truck parking needs.

### Solution Classification

Generally, truck parking solutions can be organized by type and timeline to differentiate the focus of the solution (type) and how quickly a project could be implemented (timeline). Additionally, the study differentiates truck parking solutions by the role of FDOT in implementation. The role of FDOT is presented in the toolbox because a critical outcome of this study is identifying truck parking solutions and the specific actions FDOT should undertake to address truck parking issues in Florida.

### Types of Truck Parking Solutions

The project team identified truck parking solutions through a literature review and discussions with stakeholders during the study. Although the following categories are used to classify the type of truck parking solution, specific solutions could be assigned to different solution types:

- **Capacity Projects:** Solutions classified as a capacity project involve physical investments such as the addition of truck parking spaces to a rest area, or restriping a rest area to optimize the use of space.
- **Technology/Communication Projects:** Solutions classified as a technology/communication project involve improving the availability of information through the use of technology or an alternative communication method. An example of a technology/communication project is the deployment of an information system to notify truck drivers of available truck parking. Additionally, technology/communication encompasses incorporating new and emerging technology into projects and planning, such as preparing for Automated, Connected, Electric and Shared (ACES) technologies.
- **Partnership:** Solutions classified as partnership require FDOT to enter into an agreement or coordinate with another public or private entity. Partnership projects could fit within another project type but are differentiated by the requirement to involve a non-FDOT entity to advance the project.
- **Policy:** Solutions classified as policies involve institutional changes to regulations, programs, or policies to improve truck parking. Policy solutions include developing a dedicated source of truck parking funding, assisting local governments in the development of truck parking policies, or leveraging grants to advance truck parking projects.



## Truck Parking Solution Implementation Timeline

While truck parking is an immediate issue in Florida, not all solutions can be implemented in a short-term timeline. Therefore the solutions are classified according to whether they can be implemented in the short-term (1-2 years), medium-term (3-5 years), and long-term (5+ years). The implementation timeline of a truck parking solution will be used to sequence truck parking solutions into the actions FDOT can implement to advance truck parking in the short, medium, and long-term.

## Role of FDOT in Truck Parking Solutions

Truck parking solutions may be implemented individually by the public or private sector, but many solutions require involvement from both groups. Truck parking solutions are organized into three categories:

- **Low FDOT involvement:** Solutions in this category denote a small FDOT role, where FDOT can influence a solution, such as a recommendation to another state agency.
- **Medium FDOT involvement:** Solutions in this category denote a medium FDOT role, such as a public-private partnership where FDOT has a critical role, but may not be the primary decision-maker or implementer.
- **High FDOT involvement:** Solutions in this category denote a high FDOT role, where FDOT is the primary decision-maker and implementer, such as updating a policy and/or program to include truck parking.

## Truck Parking Solutions Toolbox

Figure 16 displays the truck parking solutions toolbox that will be used to identify opportunities and match solutions to the Priority Areas of Concern. Solutions are organized by type and display FDOT's role in the project and the implementation timeline for the project.





Figure 16 | Truck Parking Solutions Toolbox

Type	No.	Potential Solutions	1-2 Years	3-5 Years	5+ Years	FDOT's Role in Project
Capacity	C-1	Optimize existing pavement at rest areas and other public truck parking facilities (revise rest area formula, site redesign, update Statewide Rest Area Long Range Plan)	✓			★★★
	C-2	Develop new truck parking capacity at existing rest areas and other public truck parking facilities, especially near areas with unauthorized parking (additional ROW and new pavement)	✓			★★★
	C-3	Encourage the use of under-utilized truck parking spaces at weigh stations, including designating "Safe Zones" with FHP, site beautification strategies, and additional amenities	✓			★★★
	C-4	Develop new public truck parking facilities near high demand private truck parking facilities.		✓		★★★
	C-5	Collocate overnight truck parking with commuter park-and-ride lots in high demand areas (site redesign, pavement upgrade, and additional maintenance may be necessary)		✓		★★★
	C-6	Convert existing FDOT right-of-way near interchanges in high demand areas to truck parking		✓		★★
	C-7	Leverage existing Florida P3 legislation to develop new truck parking facilities.		✓		★★
	C-8	Partner with local governments to develop municipal truck-only parking facilities in critical areas.			✓	★
Technology / Communications	T-1	Develop, initiate and maintain awareness campaigns to inform truck drivers, and freight generating facility managers, of under-utilized truck parking facilities	✓			★★★
	T-2	Ensure the joint exchange of Truck Parking Availability System (TPAS) data with private truck parking information providers and interoperability with other public entities; e.g., via an application programming interface (API).	✓			★★
	T-3	Monitor Automated, Connected, Electric and Shared (ACES) technology adoption and impacts on truck parking.	✓			★★
	T-4	Provide truck electrification (on-board power infrastructure) at public truck parking facilities.			✓	★★
Partnership	PA-1	Leverage existing state-agency grant programs to provide private sector resources to build new parking facilities in high-demand areas. A new FDOT truck parking grant may also be considered (annual call for project ideas).	✓			★★
	PA-2	Establish a collaborative program with freight generating facilities to promote partnerships and help provide additional on-site truck parking; i.e., a "Friendly Truck Parking Network."		✓		★★
	PA-3	Collaborate with the local governments and the private sector to leverage large venue (stadiums, arenas, regional malls, etc.) parking lots for overnight truck parking.		✓		★
Policy	PO-1	Include truck parking as eligible project type under FDOT Strategic Intermodal System (SIS) and other capacity improvement programs (establish criteria).	✓			★★★
	PO-2	Apportion dedicated funding for truck parking projects either through a legislative request or by leverage NHFP funds (consider both capital and O&M costs).	✓			★★★
	PO-3	Advocate with other states to USDOT to allow greater flexibility for third-party vendor operations at public rest areas; e.g., leveraging AASHTO.		✓		★★★
	PO-4	Leverage federal and state grants/funding opportunities to implement truck parking solutions.	✓			★★
	PO-5	Provide guidance to Metropolitan Planning Organizations (MPOs) and local municipalities to improve ROW and curbside management strategies and offer greater flexibility for freight parking options.	✓			★
	PO-6	Work with MPOs and local municipalities to incorporate secure truck parking requirements at new freight generating facilities (i.e., land use ordinances).	✓			★

★★★ = High (FDOT-led)  
 ★★ = Medium (P3 and/or FDOT collaboration with other public agencies)  
 ★ = Low (Implemented by another public agency or private entity)





## Capacity Solutions

As shown in Figure 17, capacity solutions fall into the short and medium-term timelines and generally have a strong role for FDOT. Capacity solutions are most fitting for locations where both public and private truck parking locations are full or over-utilized and trucks are parking in unauthorized areas.

Figure 17 | Truck Parking Capacity Solutions

Type	No.	Potential Solutions	1-2 Years	3-5 Years	5+ Years	FDOT's Role in Project
Capacity	C-1	Optimize existing pavement at rest areas and other public truck parking facilities (revise rest area formula, site redesign, update Statewide Rest Area Long Range Plan)	✓			★★★
	C-2	Develop new truck parking capacity at existing rest areas and other public truck parking facilities, especially near areas with unauthorized parking (additional ROW and new pavement)	✓			★★★
	C-3	Encourage the use of underutilized truck parking spaces at weigh stations, including designating "Safe Zones" with FHP, site beautification strategies and additional amenities	✓			★★★
	C-4	Develop new public truck parking facilities near high demand private truck parking facilities.		✓		★★★
	C-5	Collocate overnight truck parking with commuter park-and-ride lots in high demand areas (site redesign, pavement upgrade and additional maintenance may be necessary)		✓		★★★
	C-6	Convert existing FDOT right-of-way near interchanges in high demand areas to truck parking		✓		★★
	C-7	Leverage existing Florida P3 legislation to develop new truck parking facilities.		✓		★★
	C-8	Partner with local governments to develop municipal truck-only parking facilities in critical areas.			✓	★

★★★ = High (FDOT-led)  
 ★★ = Medium (P3 and/or FDOT collaboration with other public agencies)  
 ★ = Low (Implemented by another public agency or private entity)

The capacity solutions shown in Figure 17 are underpinned by the following strategies:

- Leverage existing truck parking facilities:** Solutions C-1, C-2, C-3, and C-5 highlight the opportunity to use existing FDOT facilities to address truck parking needs. Specifically, looking for opportunities to redesign rest areas and public truck parking facilities to add spaces through a more efficient use of paved space, encourage the use of under-utilized truck parking facilities by providing additional amenities, develop additional truck parking at existing facilities, and allowing trucks to use park and rides at night.
- Develop new truck parking spaces:** C-4 and C-6 denote developing truck parking spaces that are new and not located near an existing truck parking facility or leverage existing Right-of-Way (ROW) that could be used for truck parking.
- Partner to develop new truck parking spaces:** C-7 and C-8 present the opportunity for FDOT to partner with the private sector to develop new truck parking spaces using a public-private partnership or working with local municipalities to develop truck additional truck parking.



The selection of a specific strategy and solution will depend on the design of existing facilities, land surrounding existing facilities, ROW, and utilization of truck parking facilities. The many solutions and variables for selecting a specific truck parking solution demonstrate that there is no “one size fits all” approach to addressing truck parking issues and that each location needs to individually assess truck parking opportunities in each of the Priority Areas (Chapter 5).

## Land Suitability Analysis

In order to aid in the identification of opportunities and the development of new truck parking facilities, the Statewide Truck Parking Study developed a land suitability analysis that uses a GIS-based multi-criteria decision-making model to locate land parcels suitable for developing truck parking facilities. The suitability analysis is a resource that can be used by all levels of government to identify locations where truck parking could be added. Aside from some minor pre- and post-processing steps, the land suitability analysis followed the two-tier process presented below. Additional detail on the land suitability analysis is provided in Appendix C

### Tier 1: Identify High-Suitability Areas for Truck Parking

The Tier 1 land suitability analysis combined seven different criteria with a weighted overlay into a single, overall land suitability layer. Each criterion classified areas according to its desirability for providing a truck parking facility defined from the perspective of a truck driver looking for a suitable place to park. The following criteria were used to assess the suitability of an area for truck parking.

- **Road Proximity** – Identify desirable locations using a drive time analysis from the interchange locations on all Interstate and limited-access roadways. The output drive time polygons were rated on a suitability scale of 1 to 5 (Table 5).

Table 5 | Drive Time Suitability Scores

Drive Time (Minutes)	Suitability Rank	Suitability Score
0 – 5	Very High Suitability	1
5 – 10	High Suitability	2
10 – 15	Moderate Suitability	3
15 – 20	Low Suitability	4
20 - 30	Very Low Suitability	5

- **Destination Proximity** – Identify parking sites located FAAs using a drive time analysis and assign a suitability score based on drive time (Table 5).
- **Over-Utilized Truck Parking Lot Proximity** – Identify proximity to over-utilized truck parking lots (facilities with at least 75% capacity for any hour over a 24 hour period) and assign a suitability score based on drive time (Table 5).

**Adjacent Land Use Suitability** – Identify the proximity of each raster pixel to unsuitable land uses (Table 11 in Appendix C) such as schools, churches, or residential areas. Each pixel scored based on the distance to unsuitable adjacent land uses (

# Statewide Truck Parking Study



Table 6).



**Table 6 | Unsuitable Adjacent Land Use Suitability Scores**

Distance (Meters)	Suitability Rank	Suitability Score
> 1,200	Very High Suitability	1
800 – 1,200	High Suitability	2
400 - 800	Moderate Suitability	3
200 - 400	Low Suitability	4
< 200	Very Low Suitability	5

- **Land Use Parcel Suitability** – Identify existing compatible land uses for developing a truck parking lot. Each land use type (Table 13 in Appendix C) was assigned a suitability score from 1 (very high suitability) to 5 (very low suitability).
- **Crime Potential** – Identify a total crime index that is benchmarked to the national average crime rate to assign each census block group with a crime score ranging from 1 (Very High Suitability) indicating a crime index at or below the national average, up to 5 (Very Low Suitability) for block groups with more than ten times the national average crime rate. Table 7 shows the relationship between crime index values and truck parking suitability scores.

**Table 7 | Crime Index Suitability Scores**

Crime Index Value	Suitability Rank	Suitability Score
≤ 100	Very High Suitability	1
100 - 250	High Suitability	2
250 - 500	Moderate Suitability	3
500 - 1000	Low Suitability	4
≥ 1,000	Very Low Suitability	5

- **Unauthorized Parking Proximity** – Identify areas with high demand for legitimate truck parking facilities by using truck stops over 3 hours to develop a raster density surface weighted by the parking duration was developed. The point density output was classified using a quintile (5-class) classifier, and those classes were reclassified to the 1 to 5 truck suitability scale.

### Weighting Land Use Criteria

The final step in the Tier 1 analysis involved combining each of the seven input criteria layers using a weighted average of all the input pixels at each location. Several different weighting schemes for the input layers labeled A through D were evaluated, starting with the Tier 1A model that weighted each layer the same. The weights for each of the models appear in Table 8.

The output raster from each alternative model was examined visually in ArcGIS to determine whether known parcels suitable as potential truck parking facilities were flagged as very high or high suitability. The Tier 1C and 1D models rated very little of the District as highly suitable and missed most of the potential truck parking locations. The equally weighted Tier 1A model performed better but still missed some parcels even when they were immediately adjacent to another high suitability parcel. The Tier 1B model was best at locating known truck parking candidates but was also not excessive in rating areas as High Suitability for truck parking. Consequently, the Tier 1B model was used to develop the land suitability layer.





**Table 8 | Alternative Weighted Overlay Model Weights**

Factor Description	Tier 1A	Tier 1B	Tier 1C	Tier 1D
Road Proximity	15%	19%	20%	5%
Destination Proximity	15%	19%	20%	5%
Over-Utilized Truck Parking Lot Proximity	14%	14%	10%	5%
Crime Potential	14%	14%	5%	5%
Unauthorized Parking Proximity	14%	14%	5%	40%
Adjacent Land Use Suitability	14%	10%	20%	35%
Land Use Parcel Suitability	14%	10%	20%	5%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## Tier 2: Identify Land-Ownership Parcels of the High-Suitability Areas Identified in

The Tier 1 land suitability model described above identified the broad spatial areas that were most suitable for a truck parking facility. The purpose of Tier 2 is to locate specific parcels within those areas of high suitability that would meet the minimum requirements for truck parking sites.

Tier 2 began with selecting out the polygon areas that had been identified as very high or high suitability for truck parking in Tier 1. Parcels with appropriate existing land use were then selected from areas of high suitability for truck parking sites. From that point, the subsequent Tier 2 modeling steps took a different path depending on which of the following three parcel candidate types were identified:

- Shared Use Parcel Candidates** – This group included existing developed commercial or industrial parcels with large parking areas that might be available as part of a shared-use agreement for truck parking. Commercial and industrial parcels from the parcel candidates within the Tier 1 High Score Zones were identified and adjacent parcels were merged into a single “footprint.” This step ensured that no feasible sites were rejected because their individual parcels fell below the minimum size requirement (five acres), even though two or more adjacent parcels would collectively meet or exceed that size limit. For the shared use candidates the important size criterion was not the overall size of the combined parcels, but the availability of at least five acres of parking. The size of the parking was estimated by subtracting the total size of buildings on each parcel from the overall parcel size.
- Land Swap Opportunity Candidates** – These are vacant, government-owned parcels that could provide an opportunity for the FDOT to negotiate a land swap or shared-use agreement. Vacant government parcels were selected and merged into unique footprints at least five acres in size. Because many of the government-owned parcels were conservation lands, National Wetlands Inventory data were used to erase the wetlands and water features on each government parcel to leave only the upland areas that might be suitable for establishing a truck parking facility.
- Fee Simple Purchase Candidates** – These are vacant commercial or industrial zoned parcels that could be purchased outright for development into truck parking sites. Parcels at least 5 acres in size, in high suitability areas, were vacant, and zoned Commercial or Industrial were selected.

## Identification of Final Truck Parking Candidates

The three Tier 2 models generated hundreds of initial truck parking candidate locations which were evaluated by inspecting recent aerial imagery and rated as good, fair, or poor on the following criteria:



- **Shape** – A footprint was rated poor if it was so narrow or oddly shaped that truck trailers could not be easily parked, and Fair if most of the footprint could accommodate trucks. The footprint was rated good if the site had a rectangular shape that could be easily configured for parking.
- **Location\Access** – The footprint was rated poor if the access was not adjacent to an arterial or major collector suitable for trucks, or if the access required the use of a road with difficult access (e.g., tight turns) or through undesirable land use (e.g., residential). The footprint was rated fair if access was through a side street off of an arterial or major collector, and good if there was direct access from an arterial or major collector.
- **Land Use Compatibility** – The footprint was rated poor if the on-site land use appeared to be incompatible (e.g., fully developed with no shared parking opportunity or an obvious wetland). Footprints were rated fair if the on-site land use was acceptable (e.g., a vacant lot), but adjacent land uses were extremely incompatible (e.g., adjacent to a school or cemetery, or completely surrounded by dense residential use). A footprint was rated good if both on-site and adjacent land uses were compatible.

Those footprints rated good by the aerial imagery evaluation were extracted to create the Final Truck Parking Candidates.

### ArcGIS Online Web Maps

To make the results of this analysis more widely available to the FDOT, the final truck parking candidate footprint and parcel layers were published to ArcGIS Online web maps, one for each District. The links to each District web map are available below:

- [District 1](#)
- [District 2](#)
- [District 3](#)
- [District 4](#)
- [District 5](#)
- [District 6](#)
- [District 7](#)

The output of the Land Suitability Analysis is used to identify potential expansion opportunities in each priority area and serves as a tool that FDOT Central Office and the Districts can use during future implementation actions.

## Technology / Communication Solutions

As shown in Figure 18, technology/communication solutions are implementable in the short-term and have a strong role for FDOT. Technology/communication solutions are most fitting for locations where truck parking is not fully utilized, but trucks are parking in unauthorized areas. Less than full utilization and unauthorized truck parking could suggest truck drivers are unaware of available truck parking, making a technology/communication solution providing availability information viable. Additionally, trends in technology such as connected and autonomous vehicles (CV/AV), electrified trucks, and electrification of truck parking spaces have the potential to change the demand for truck parking spaces and the required amenities at truck parking facilities.



Figure 18 | Truck Parking Technology / Communication Solutions

Type	No.	Potential Solutions	1-2 Years	3-5 Years	5+ Years	FDOT's Role in Project
Technology / Communications	T-1	Develop, initiate and maintain awareness campaigns to inform truck drivers, and freight generating facility managers, of under-utilized truck parking facilities	✓			★★★
	T-2	Ensure joint exchange of Truck Parking Availability System (TPAS) data with private truck parking information providers and interoperability with other public entities; e.g., via an application programming interface (API).	✓			★★
	T-3	Monitor Automated, Connected, Electric and Shared (ACES) technology adoption and impacts on truck parking.	✓			★★
	T-4	Provide truck electrification (on-board power infrastructure) at public truck parking facilities.			✓	★★
<p>★★★ = High (FDOT-led)                      ★★ = Medium (P3 and/or FDOT collaboration with other public agencies)                      ★ = Low (Implemented by another public agency or private entity)</p>						

As shown in Figure 73, T-1 and T-2 involve the communication of truck parking availability to truck drivers. Specifically, T-1 seeks to inform truck drivers about locations that are chronically under-utilized. For example, informing truck drivers about safe zones at MCSAW weigh stations. Similarly, T-2 continues the development of FDOT’s TPAS by incorporating truck parking availability information from private truck parking facilities and public facilities in neighboring states into TPAS. T-2 would expand the information TPAS is able to provide beyond public facilities in Florida to provide truck drivers with more information about where truck parking spaces are available

Solutions T-3 and T-4 involve the impact of technology on truck parking demand and amenities. Specifically, T-3 involves FDOT monitoring the adoption of ACES technologies and identifying the impact of these technologies on truck parking. For example, CV/AV could reduce the demand for truck parking when fully autonomous trucks become more common on Florida’s roadways. T-3 requires FDOT to monitor the fast-changing technology landscape to inform future truck parking projects and policies. T-4 provides electrification of truck parking spaces to limit the need for idling and to reduce the local impacts of truck parking.

## Partnership Solutions

As shown in Figure 19, FDOT has less of a role in partnership solutions than capacity and technology/communication solutions, in part because they involve additional stakeholders that may lead the implementation of a specific solution. For example, solution PA-1 would likely be led by an economic development organization, such as Florida’s Department of Economic Opportunity (DEO). While the grant program may be administered by another agency, FDOT is critical to making the case for including a truck parking in an existing program’s eligibility, promoting the opportunity for truck parking providers to take advantage of the grants, and using the data and knowledge gathered during FDOT’s truck parking studies to help inform program development and project selection.



Figure 19 | Truck Parking Partnership Solutions

Type	No.	Potential Solutions	1-2 Years	3-5 Years	5+ Years	FDOT's Role in Project
Partnership	PA-1	Leverage existing state-agency grant programs to provide private sector resources to build new parking facilities in high-demand areas. A new FDOT truck parking grant may also be considered (annual call for project ideas).	✓			★★
	PA-2	Establish collaborative program with freight generating facilities to promote partnerships and help provide additional on-site truck parking; i.e., a "Friendly Truck Parking Network."		✓		★★
	PA-3	Collaborate with the local governments and private sector to leverage large venue (stadiums, arenas, regional malls, etc.) parking lots for overnight truck parking.		✓		★
<p>★★★ = High (FDOT-led)                      ★★ = Medium (P3 and/or FDOT collaboration with other public agencies)                      ★ = Low (Implemented by another public agency or private entity)</p>						

Similarly, FDOT has a medium role in PA-2, which establishes a program that works with freight generators to provide truck parking on site. The decision to allow trucks to park on-site at a freight generating facility will be made by the entities outside of FDOT. That said, FDOT does have a strong role and control over establishing the requirements for a site to be included on a “Friendly Truck Parking Network” and promoting the program to potential sites.

Finally, FDOT’s role in PA-3 is low, primarily because FDOT is not administering the site or a program to incentivize the use of large venues for overnight truck parking. That said, FDOT can promote this approach to local governments and the private sector using the land suitability analysis to identify potential locations where these venues could be used. Lastly, FDOT could assist local governments and the private sector in the development of these facilities into an overnight truck parking location by developing resources that outline the steps and potential approaches to converting an existing facility into a truck parking lot. Additionally, FDOT has a role in providing truck drivers with information about new truck parking facilities, so that these facilities are considered by truck drivers when they make truck parking decisions.

## Policy Solutions

The policy solutions displayed in Figure 20 show that FDOT’s role in implementing any of the potential policy solutions varies from high to low depending on the specific solution. The truck parking policy solutions identified in this study fit into three strategies: 1.) Formalize truck parking funding, 2) Increase flexibility for rest area operations, and 3.) Work with MPOs and municipalities to improve truck parking.





Figure 20 | Truck Parking Policy Solutions

Type	No.	Potential Solutions	1-2 Years	3-5 Years	5+ Years	FDOT's Role in Project
Policy	PO-1	Include truck parking as eligible project type under FDOT Strategic Intermodal System (SIS) and other capacity improvement programs (establish criteria).	✓			★★★
	PO-2	Apportion dedicated funding for truck parking projects either through legislative request or by leverage NHFP funds (consider both capital and O&M costs).	✓			★★★
	PO-3	Advocate with other states to USDOT to allow greater flexibility for third-party vendor operations at public rest areas; e.g., leveraging AASHTO.		✓		★★★
	PO-4	Leverage federal and state grants/funding opportunities to implement truck parking solutions.	✓			★★
	PO-5	Provide guidance to Metropolitan Planning Organizations (MPOs) and local municipalities to improve ROW and curbside management strategies and offer greater flexibility for freight parking options.	✓			★
	PO-6	Work with MPOs and local municipalities to incorporate secure truck parking requirements at new freight generating facilities (i.e., land use ordinances).	✓			★

★★★ = High (FDOT-led)  
 ★★ = Medium (P3 and/or FDOT collaboration with other public agencies)  
 ★ = Low (Implemented by another public agency or private entity)

## Formalize Truck Parking Funding

Policy solutions PO-1, PO-2, and PO-4 entail different funding approaches, but they are similar in that FDOT is taking a lead role in establishing the criteria and process for identifying, assessing, prioritizing, and/or applying for funding for capital projects and operation and maintenance (O&M) costs. Critical to the success of PO-1, PO-2, and PO-4 is establishing a framework and identifying available funding to provide the certainty that is needed to promote the exploration of innovative solutions to truck parking challenges. For PO-1 and PO-2, FDOT needs to establish eligibility, define the process for soliciting project ideas, and define the criteria that will be used to assess truck parking projects under the Strategic Intermodal Systems (SIS) or another program.

In contrast to PO-1 and PO-2, the federal and state grants that PO-4 is targeting are not decided by FDOT. FDOT does have an active role in soliciting ideas and supporting the development of grant applications. Figure 21 displays the truck parking funding toolbox developed for this study. The toolbox provides a starting point for formalizing the funding of truck parking solutions by classifying the potential state and federal funding programs into two categories: 1.) Primary - programs that can be used for truck parking and 2.) Secondary – programs that may fund truck parking projects. The classification of a program as primary or secondary was based on whether a program has funded a truck parking project in the past. Additionally, the truck parking funding toolbox displays whether a program is state or federally funded and displays the funding agency in parenthesis.



Figure 21 | Truck Parking Funding Toolbox

# TRUCK PARKING

## Funding Toolbox



Primary Programs ( <i>can fund projects</i> )		State Funding
<ul style="list-style-type: none"> <li>• Strategic Intermodal System, SIS (FDOT)</li> <li>• Economic Development Transportation Fund (Enterprise FL)</li> <li>• National Highway Freight Program, NHFP (USDOT/FHWA)</li> <li>• Surface Transportation Block Grant, STBG (USDOT/FHWA)</li> </ul>	<ul style="list-style-type: none"> <li>• Nationally Significant Freight and Highway Projects, INFRA (USDOT/FHWA)</li> <li>• Advanced Transportation &amp; Congestion Management Technology Deployment, ATCMTD (USDOT/FHWA)</li> <li>• FY 2019 National Infrastructure Investments, BUILD (USDOT/OST)</li> </ul>	
Secondary Programs ( <i>may fund projects</i> )		State Funding
<ul style="list-style-type: none"> <li>• Intermodal Development Program (FDOT)</li> <li>• Transportation Regional Incentive Program (FDOT)</li> <li>• State Infrastructure Bank (FDOT)</li> <li>• Strategic Port Initiative Investment Program (FDOT)</li> <li>• Public-Private Partnerships (FDOT)</li> <li>• Florida Seaport Transportation &amp; Economic Development Funding Program (FDOT)</li> <li>• Intermodal Logistics Center Infrastructure Support Program (FDOT)</li> <li>• Port Security Grant Program (DHS/FEMA)</li> <li>• Clean Diesel National Grants (EPA)</li> <li>• Commercial Trucks and Off-Road Applications FOA: Natural Gas, Hydrogen, Biopower, and Electrification Technologies (USDOE)</li> </ul>	<ul style="list-style-type: none"> <li>• Congestion Mitigation &amp; Air Quality Improvement Program (USDOT/FHWA)</li> <li>• National Highway Performance Program (USDOT/FHWA)</li> <li>• Emergency Relief Program (USDOT/FHWA)</li> <li>• Highway Safety Improvement Program (USDOT/FHWA)</li> <li>• Accelerated Innovation Deployment Demonstration (USDOT/FHWA)</li> <li>• Innovative Technology Deployment, formerly CVISN (USDOT/FMCSA)</li> <li>• Grant Anticipation Revenue Vehicles (USDOT/OIDP)</li> <li>• Railroad Rehabilitation &amp; Improvement Financing (USDOT/FRA)</li> <li>• Port Infrastructure Development Program (USDOT/MARAD)</li> <li>• Motor Carrier Safety Assistance Program (USDOT/FMCSA)</li> <li>• Transportation Infrastructure Finance and Innovation Act Credit Assistance (USDOT/OIDP)</li> <li>• Private Activity Bonds (USDOT/OIDP)</li> <li>• Value Capture (USDOT/OIDP)</li> <li>• Section 129 Loans (USDOT/OIDP)</li> </ul>	



# Statewide Truck Parking Study



## Increase Flexibility for Rest Area Operations

Solution PO-3 puts FDOT in an advocacy role that would allow the state greater flexibility in what is offered at public rest areas. FDOT would advocate their position via existing channels, such as the American Association of State Highway and Transportation Officials (AASHTO). Beyond advocating, FDOT would have the lead role in implementing any additional flexibility into the rest areas program.

## Work with MPOs and Municipalities to Improve Truck Parking

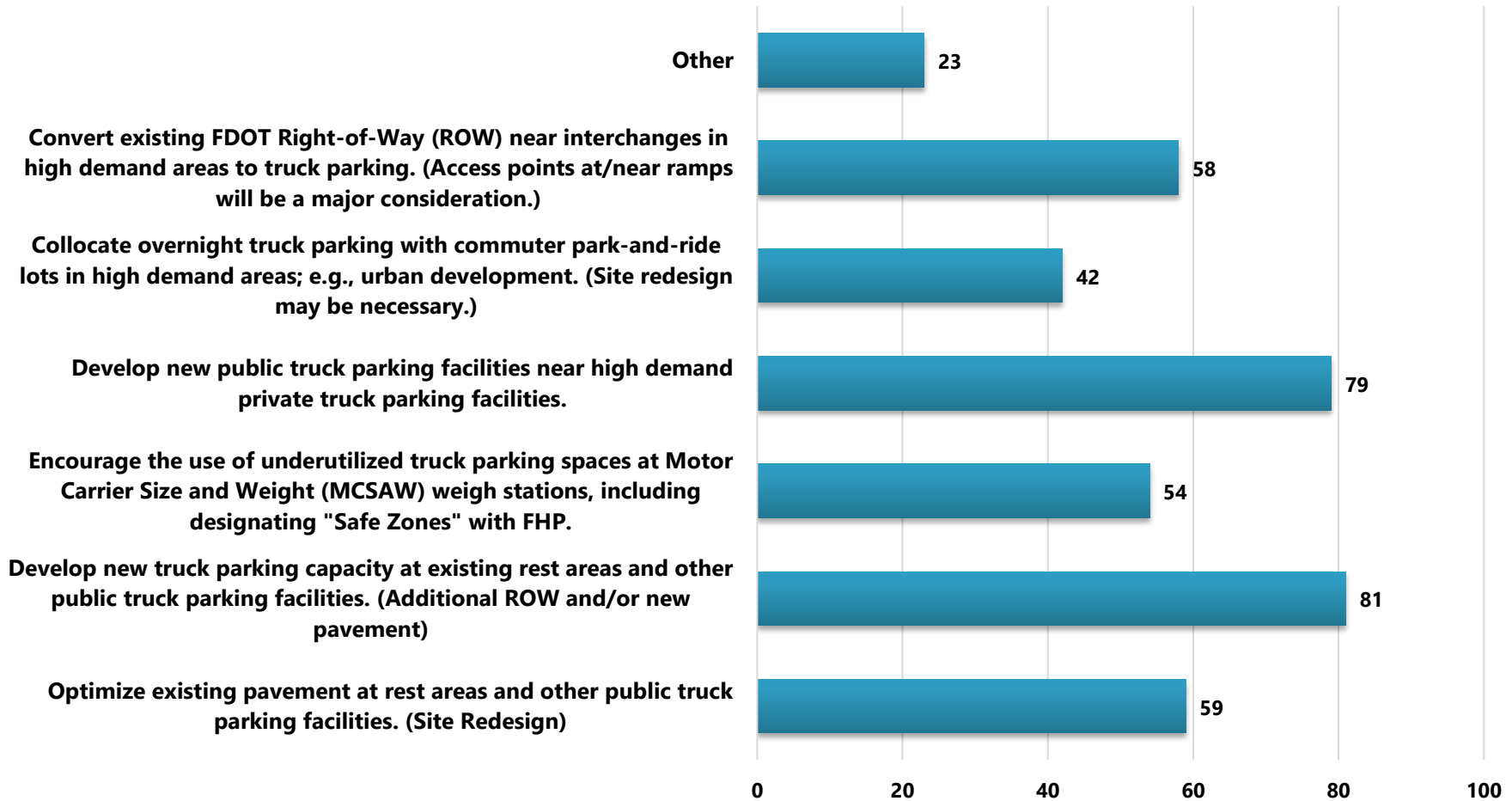
Truck parking solutions PO-5 and PO-6 have a low role for FDOT. In both cases, FDOT is supporting MPOs and municipalities to address truck parking needs by identifying and providing guidance on ROW, curbside management, and land use. PO-5 and PO-6 seek to align the curbside infrastructure and building requirements with the needs of truck drivers, especially within freight intensive industrial clusters. For example, providing a wide shoulder and the requisite build requirements that would allow trucks to safely park on the side of roadways that connect to freight origins and destinations. Similarly, adding truck parking to zoning codes would promote the inclusion of truck parking at industrial locations, with the goal of removing these vehicles from unauthorized areas. Overall, FDOT has an advisory role working with MPOs and municipalities to help leverage the data and resources developed in this and other studies, as well as a role in promoting best practices.

## Stakeholder Input on Truck Parking Solutions

The survey of truck parking stakeholders asked respondents to identify the truck parking solutions that would alleviate truck. As shown in Figure 22, capacity solutions presented in the survey received significant support, with developing new capacity at existing rest areas and new public capacity near high demand private truck parking facilities receiving support from over 80 percent of those that responded to the question.



Figure 22 | Survey Responses to the Question: Which of the following Capacity Strategies to Alleviate Truck Parking Issues make Sense to You?



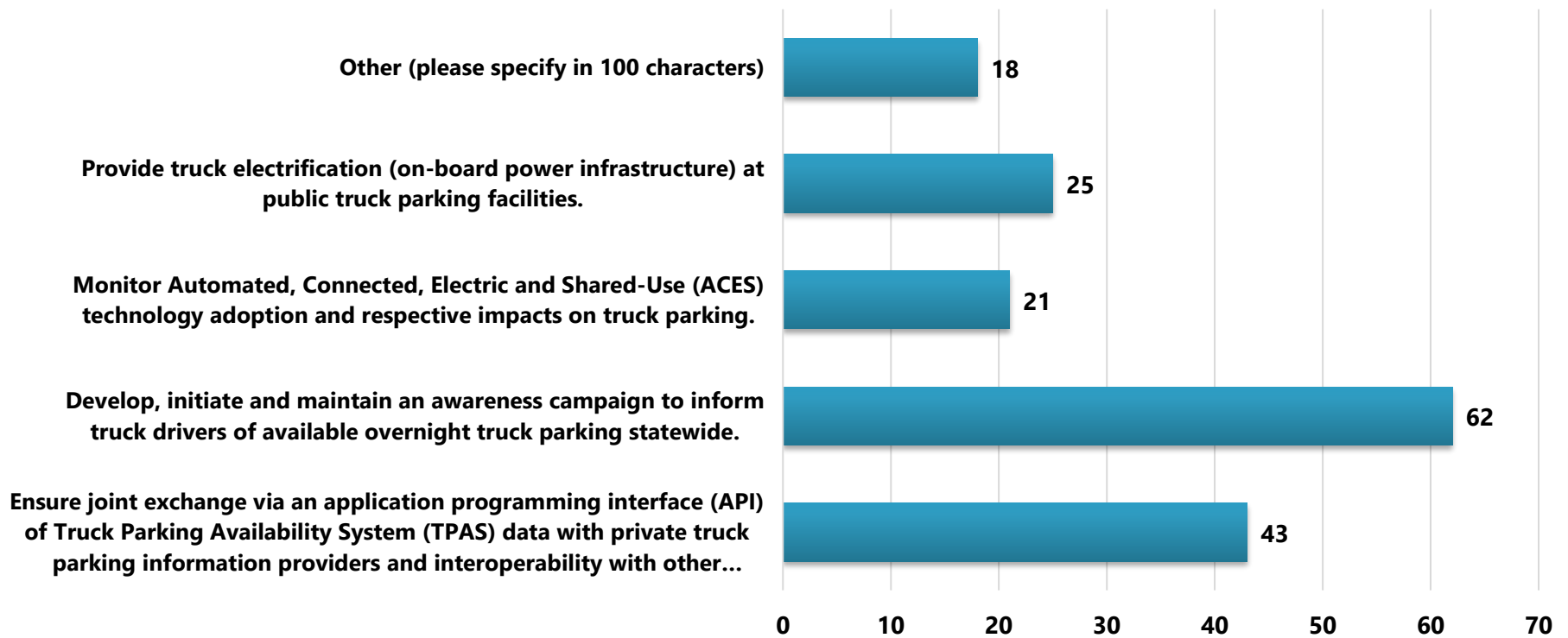


# Statewide Truck Parking Study



While all technology/communication solutions received support from survey respondents, developing an awareness campaign about available overnight truck parking and developing a joint data exchange between TPAS and private sources of truck parking information and neighboring states received the highest level of support (Figure 23). Providing truck electrification at public truck parking and monitoring the advancement of ACES received less than half the level of support compared to developing an awareness campaign about available overnight truck parking.

Figure 23 | Survey Responses to the Question: Which of the following Technology/Communication Strategies to Alleviate Truck Parking Issues make Sense to You?

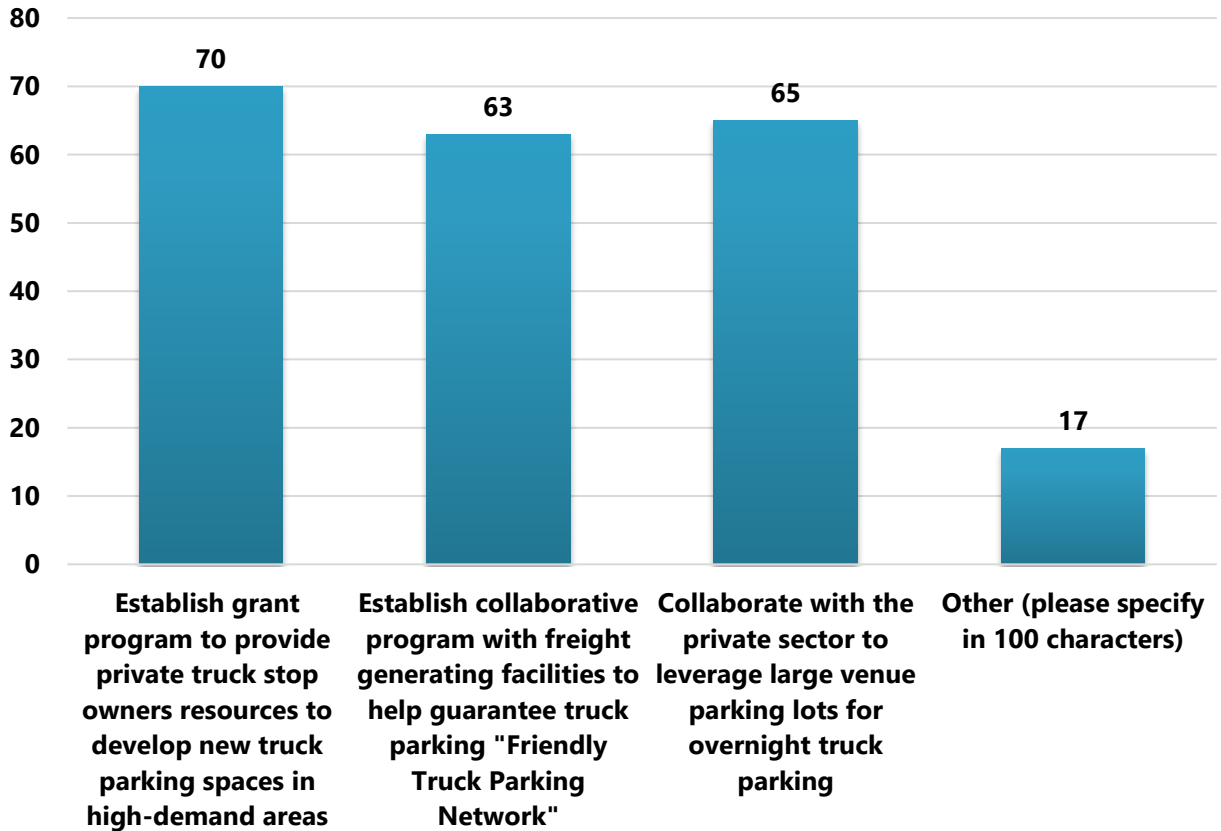


# Statewide Truck Parking Study



Figure 24 displays high levels of support for all three partnership strategies.

**Figure 24 | Survey Responses to the Question: Which of the following Partnership Strategies to Alleviate Truck Parking Issues make Sense to You?**

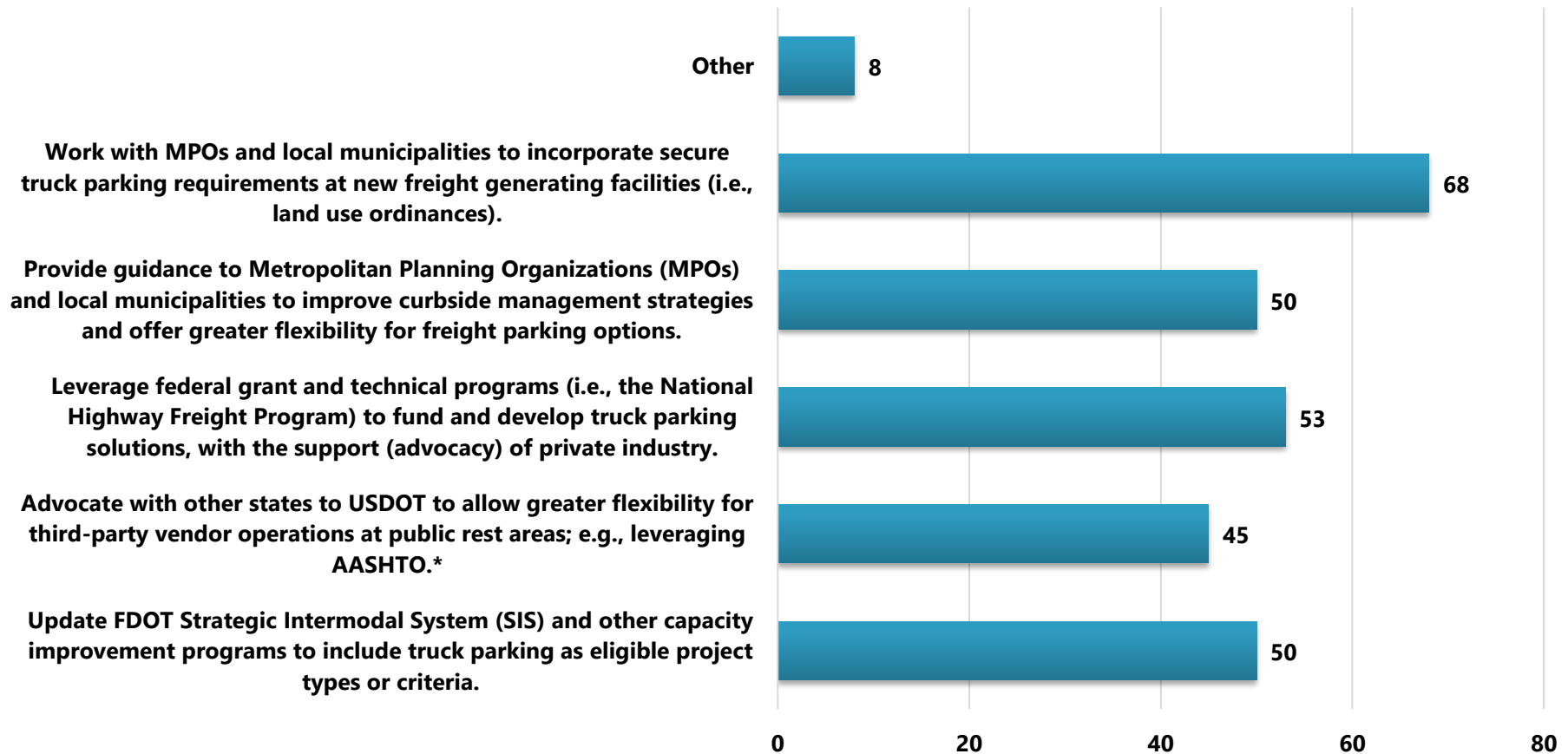


# Statewide Truck Parking Study



With the exception of working with MPOs and local municipalities, which received more support than any of the other policy strategies, (Figure 25) displays the uniform support for policy strategies to alleviate truck parking issues.

Figure 25 | Survey Responses to the Question: Which of the following Policy strategies to alleviate truck parking issues make sense to you?





# 05





## Chapter 5. Identifying Truck Parking Opportunities

In order to match the appropriate solution to the Priority Areas of Concern, each area was broken down into smaller hotspots based on the location of unauthorized truck parking or over-utilized truck parking facilities. An inferential assessment was then conducted on each hotspot to identify the root cause of the issue and potential opportunities and solutions that could be applied to the hotspot. This chapter presents the findings of the inferential analysis for each of the Priority Areas of Concern.

### Inferential Analysis of Truck Parking Priority Areas of Concern

The following criteria were used to identify and define the root cause of truck parking problems in each of the Priority Areas of Concern:

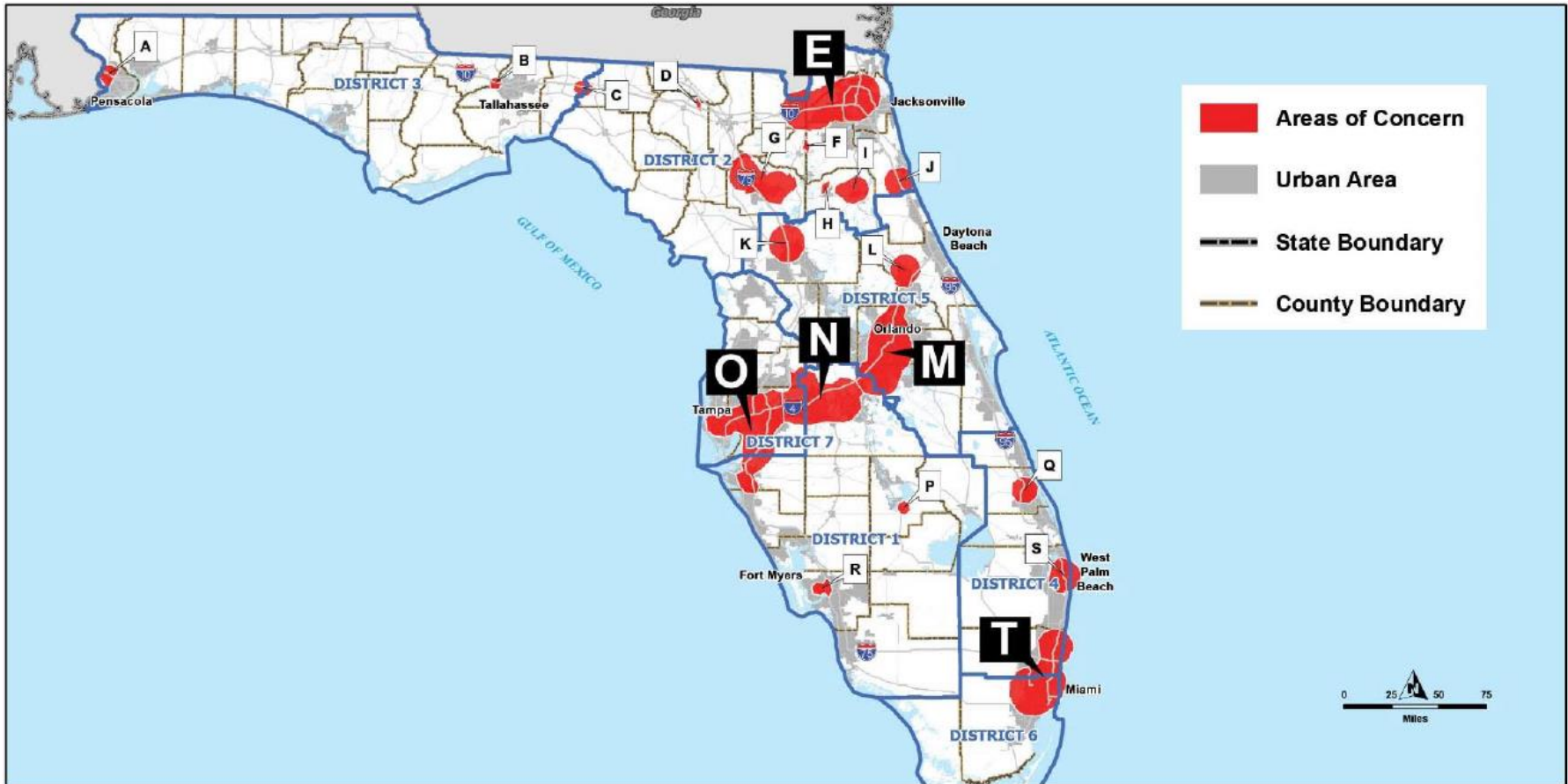
- **Unauthorized Truck Parking:** Locations with a minimum of 350 unauthorized trucks parked along a single roadway segment during the one year of data. At least 350 observations within one year can be characterized as a chronic issue as the location experiences at least one truck parked in the unauthorized location per day.
- **Safety Impacts of Unauthorized Truck Parking:** Whether or not the unauthorized truck parking impedes traffic and presents a potential safety hazard for other roadway users.
- **Utilization of Parking Facilities:** Truck parking facilities with an average utilization of over 100 indicates over-utilization. The average utilization of a truck parking facility was used to categorize a truck parking facility into the following types:
  - Over-utilized: Average utilization over 100 at a designated truck parking facility correlates with trucks parking along ramps, shoulders, and/or on adjacent roadways (spillover effect).
  - Nearing over-utilization: Average utilization over 75 at a designated truck parking facility, suggesting that the facility is nearing capacity and may become over-utilized in the near future.
  - Under-utilized: Average utilization of less than 50 at a designated truck parking facility suggests that the facility is under-utilized and solutions such as an awareness campaign or improved amenities could be used to attract truck drivers to these facilities and reduce demand at other over-utilized locations.
- **Parking for Destination vs HOS Compliance vs Staging:** The amount of time stopped (dwell times) indicates why a truck is parked in a given location. Providing additional truck parking spaces for HOS compliance and overnight staging are the primary focal points for FDOT.
  - 1-2 hours = refueling, meal, etc. (could be short-term staging)
  - 3-5 hours = staging to meet a delivery window
  - 6-7 hours = unacceptable staging imposed on the driver by shipper/receiver
  - 8-11 hours = HOS compliance/ overnight staging
  - 12+ hours = extended parking, temporary storage (homestay)
- **Correlation to Freight Activity Areas & Land Suitability Analysis:** Correlation of unauthorized parking observations with previously conducted FAA statewide analysis.
- **Potential for Truck Parking Development:** The suitability of parcels for developing truck parking (FDOT-owned, or otherwise) and the parcel size, zoning, and accessibility/connectivity to state roads and/or other designated freight facilities.

# Statewide Truck Parking Study



The findings of the inferential analysis of each of the Priority Areas of Concern displayed in black in Figure 26 is presented below, along with a stakeholder input received from a presentation of the priority areas to the DFCs and District Executives.

Figure 26 | Priority Areas of Concern





## Priority Area M

Figure 27 displays Priority Area M, located primarily in and around Orlando metropolitan and extending north along I-4 from Priority Area N. Additionally, cluster L is North of Priority Area M but was not one of the top priority areas identified in this study.

As context for the analysis of Priority Area M, Figure 28 and Figure 29 display the results of the analysis of the truck GPS data that identified the location a truck parked before and after it parked in an unauthorized area in Priority Area M. Figure 28 shows that trucks stopped throughout Florida before parking in an unauthorized location in Priority Area M, with the highest density in Orlando and along I-4, as well as other locations clustered primarily along Interstates. Figure 29 displays a greater number and geographic diversity of locations with a high density of stops compared to Figure 28. In general, after parking in unauthorized truck parking location in Priority Area M, trucks often stopped in Miami, Tampa, Orlando, and Jacksonville, as well as, along I-4 and I-75.

Figure 27 | Priority Area M

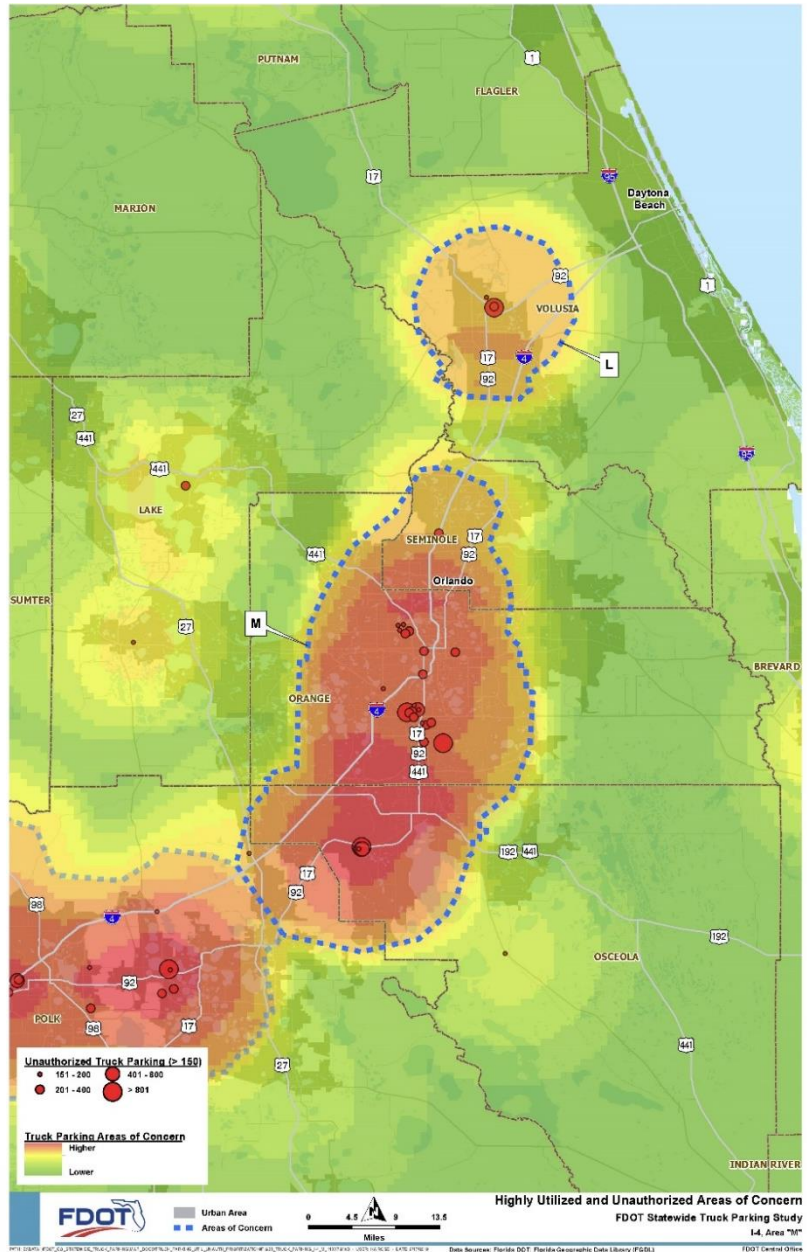






Figure 28 | Location of Truck Stop Events before Unauthorized Truck Parking in Priority Area M

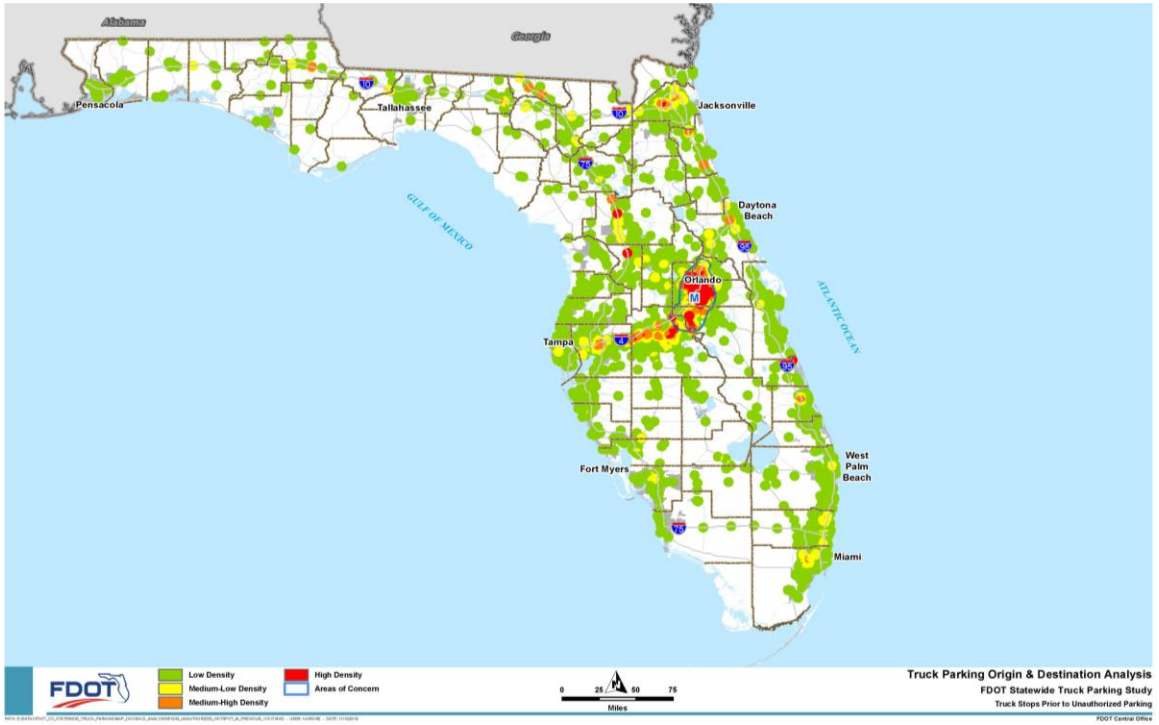
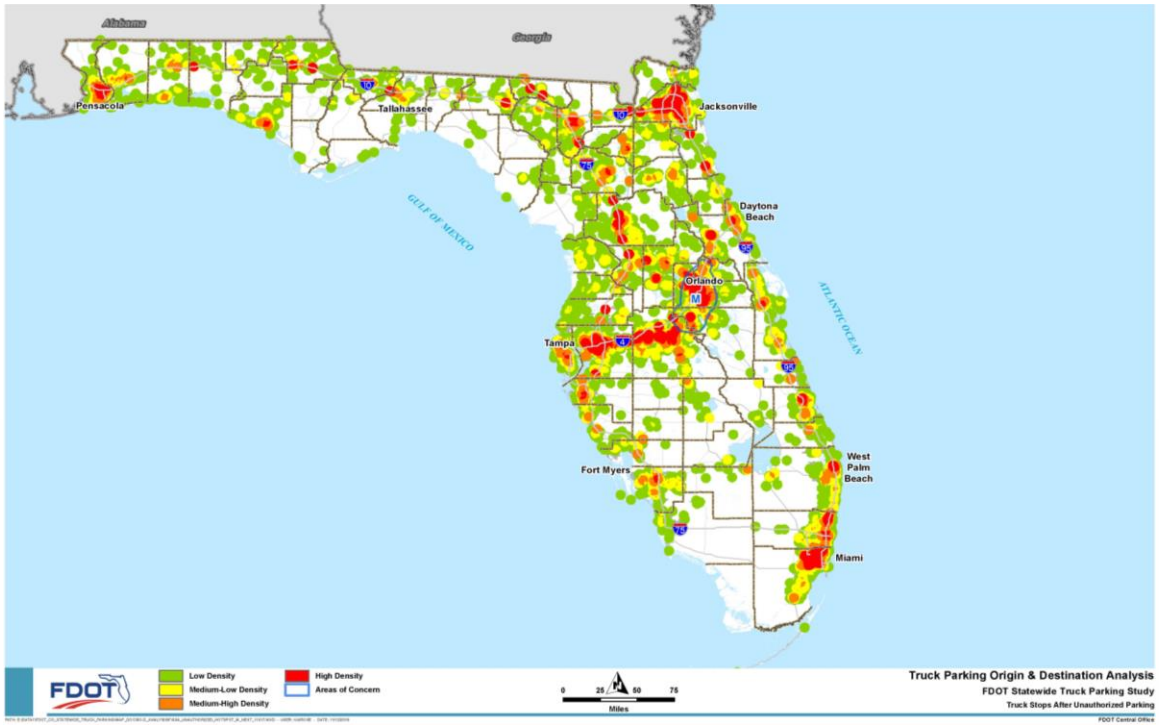


Figure 29 | Location of Truck Stop Events after Unauthorized Truck Parking in Priority Area M







The difference in where truck stop before and after parking in an unauthorized location in Priority Area M could be due to trucks coming from outside of Florida and thus not having a stop in Florida prior to the unauthorized parking event in Priority Area M. Figure 30 displays the travel time shed for a truck traveling eight hours from Priority Area M, highlighting the potential for a truck to travel to or from neighboring states within an eight-hour timeframe

**Figure 30 | Eight hour Travel Time Shed from Priority Area M**

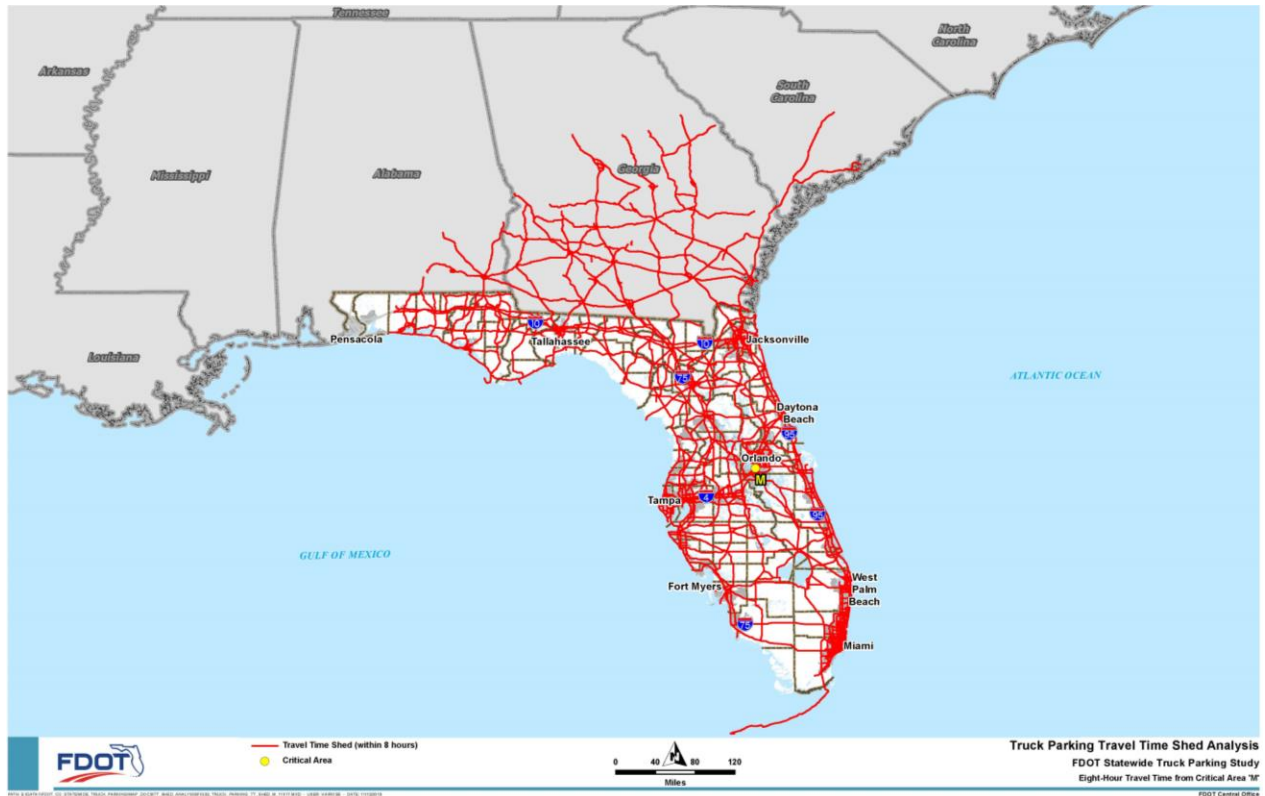
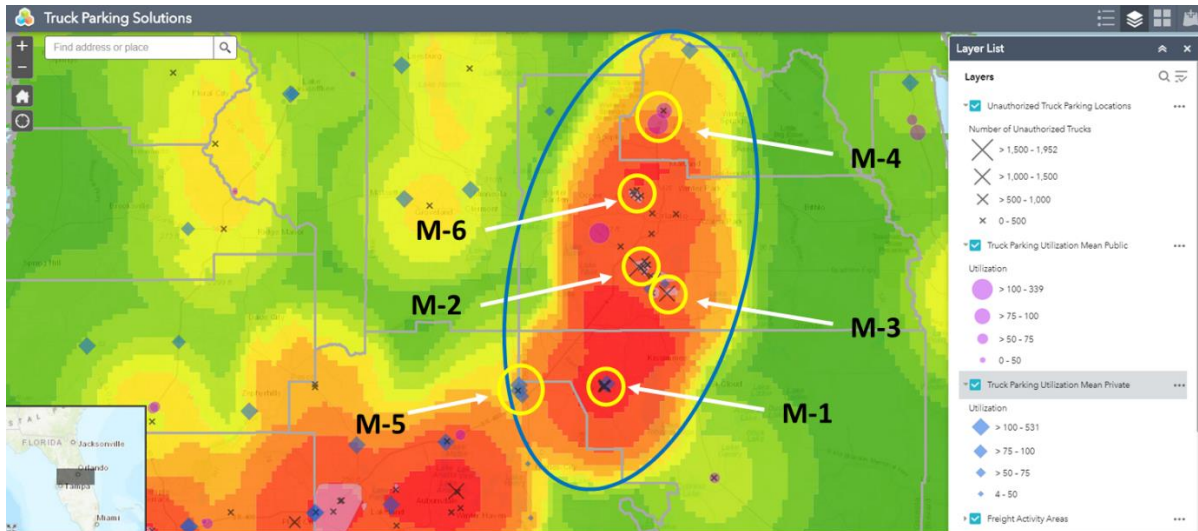


Figure 31 displays Priority Area M, along with the utilization of public truck parking locations (purple circle), utilization of private truck parking locations (blue diamonds), and number of unauthorized trucks parked (X marker) overlaid on a gradation of priority ranging from low priority (green) to high priority (red). Overall, Figure 31 provides insight into whether over-utilization of truck parking locations and/or unauthorized truck parking are causing an area to be assigned a specific level of priority.

Figure 31 displays the priority hotspots within Priority Area M, numbered one through six according to the highest number of unauthorized truck parking observations. The inferential analysis of Priority Area M focuses on the cause and opportunities in each hotspot.



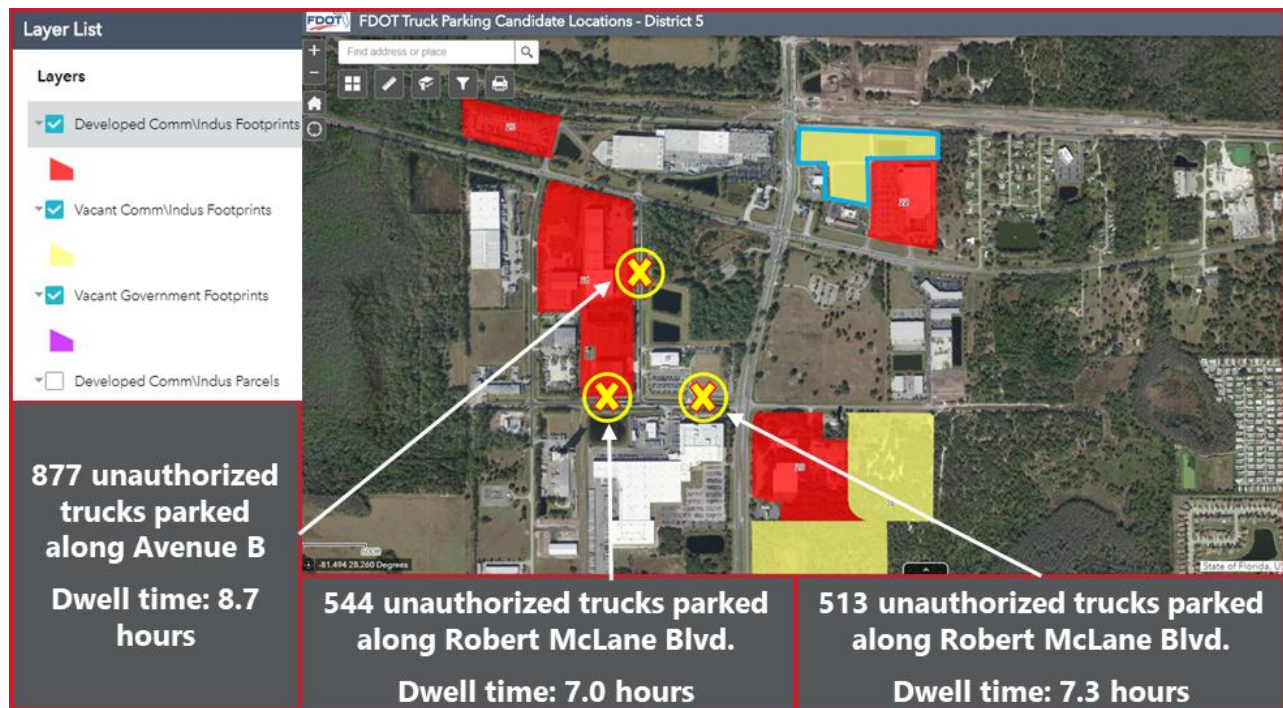
Figure 31 | Priority Area M Hotspots



## Hotspot M-1

As shown in Figure 32, M-1 contains three clusters of unauthorized truck parking where a total of 1,934 trucks parked along local roadways near commercial/industrial developments (red parcels). Additionally, there is only one truck parking location in the surrounding area and the location is over-utilized and only has two truck parking spaces.

Figure 32 | Suitable Parcels in Hotspot M-1





# Statewide Truck Parking Study



Figure 32 also displays vacant commercial / industrial parcels as potential locations for public, private, or P3 development of truck parking. The northernmost yellow parcel outlined in blue is adjacent to a truck stop, convenience stores, and other amenities that could make the location more attractive to truck drivers if the parcel was developed as a parking-only location.

## Hotspot M-2 and M-3

Hotspots M-2 and M-3 are in close proximity and encounter similar challenges and opportunities. The unauthorized truck parking occurring within M-2 and M-3 is located near commercial/industrial developments and together their largest clusters of unauthorized trucks totaled over 3,600. The majority of trucks parked in hotspot M-2 are located on Titan Row, but on-street parking does not seem to be prohibited (no signs), therefore the use of the side of the road may not require immediate action, as long as the trucks do not present a safety hazard or a problem for the local community.

Figure 33 also shows the two private truck parking locations (160 total spaces) and one public service plaza (24 spaces) near hotspots M-2 and M-3. Both private locations are under-utilized, presenting an opportunity for trucks parking in unauthorized areas to use available spaces at these facilities. Conversely, the Turkey Lake Service Plaza to the northwest of M-2 is over-utilized and would, therefore, require an expansion to address unauthorized truck parking in the area.

Figure 33 | Clusters of Unauthorized Parking in Hotspots M-2 and M-3

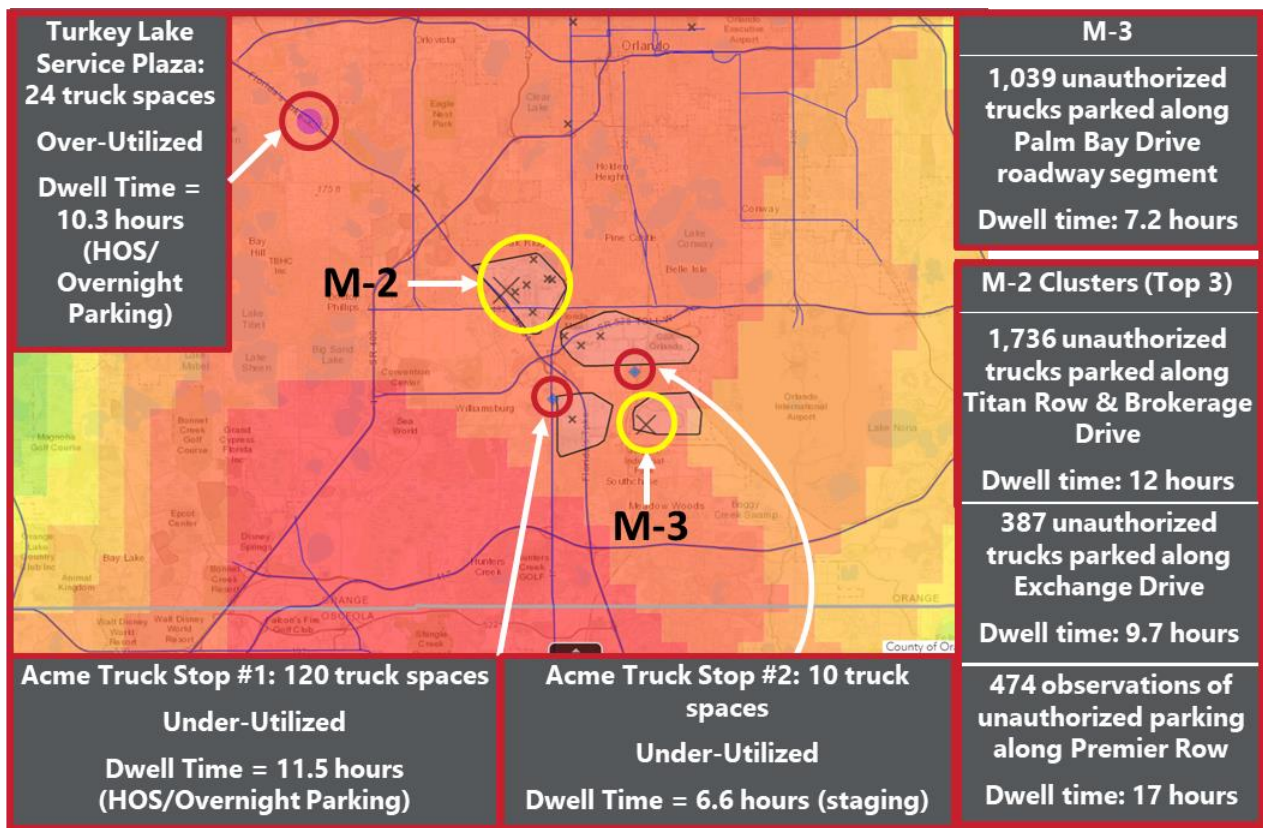


Figure 34 displays a parcel of land that is owned by FDOT in blue. The FDOT owned parcel is near the unauthorized truck parking on Titan Row and Brokerage Drive and is in close proximity to many clusters



of unauthorized truck parking. Therefore, a new rest area located at the interchange of SR 91, Sand Lake Road, and John Young Parkway could address multiple clusters of unauthorized truck parking and supplement truck parking at the Turkey Law Service Plaza.

**Figure 34 | Suitable Parcel for Truck Parking Development**







## Hotspot M-4

Figure 35 displays hotspot M-4, which is located at the Sanford Rest Area. Both the eastbound and westbound sides of the Sanford Rest Area are over-utilized and the eastbound side also has 400 trucks parked in unauthorized areas along the ramps and other areas.

Figure 35 | Clusters of Unauthorized Parking in Hotspots M-4

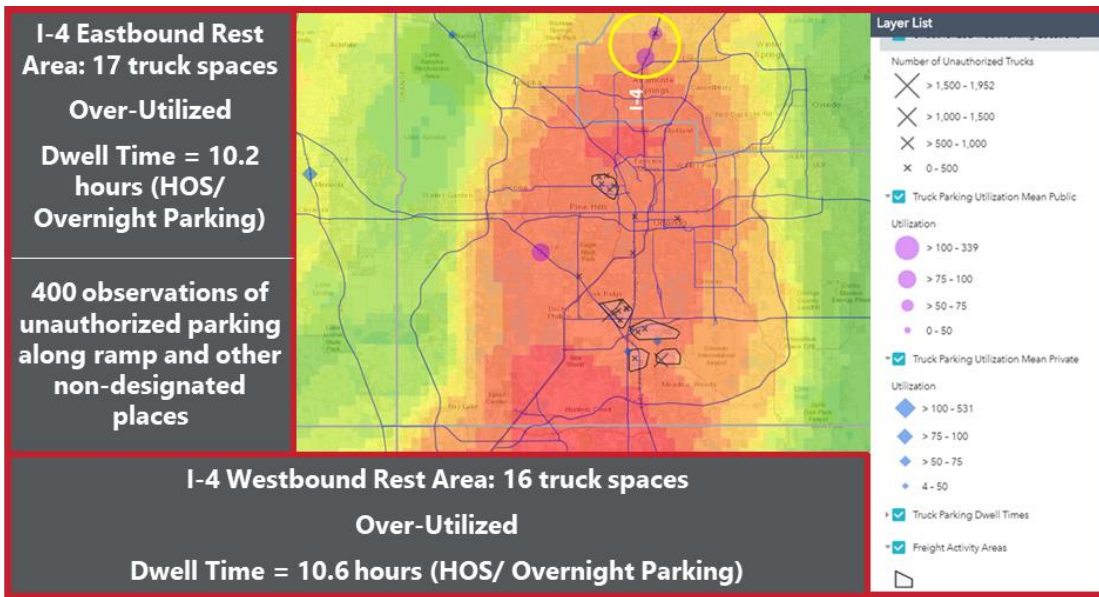


Figure 36 displays the eastbound and westbound rest areas, as well as areas in blue that could be used to expand truck parking on-site to accommodate the unauthorized truck parking at hotspot M-4. Consultation and validation with District 5 highlighted that the district has already initiated discussions to redevelop the rest area and add new truck parking spaces at both the eastbound and westbound locations.

Figure 36 | Suitable Parcels for Truck Parking Development at Sanford Rest Area



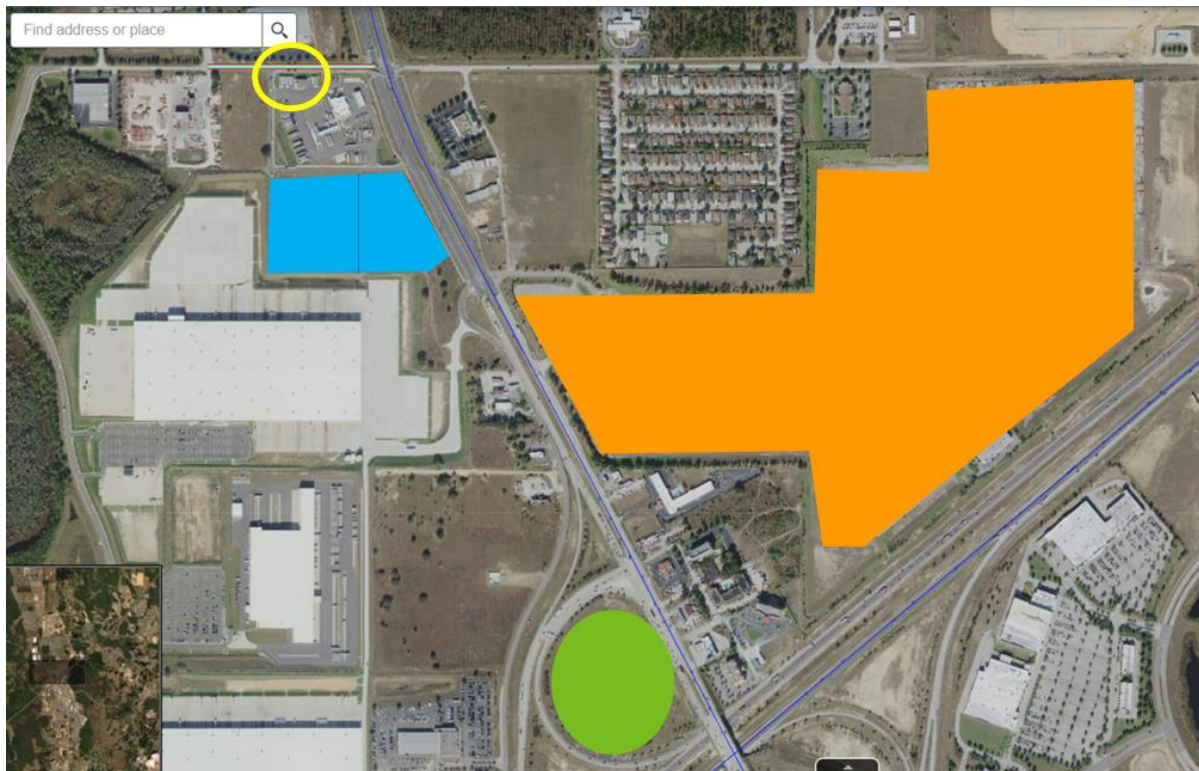


## Hotspot M-5

Hotspot M-5 has 153 unauthorized trucks that are using the nearby road as spillover from a Loves Travel Stop. There are three private truck parking locations, with the Loves accounting for 67 of the 74 spaces near Hotspot M-5. Additionally, all the truck parking locations near M-5 are over-utilized.

Figure 37 displays the roadway where the unauthorized truck parking is occurring, along with parcels that have the potential for development into additional truck parking. The parcels in the blue are vacant and are right next to the Loves Travel Stop, but the parcels are privately owned. The blue parcels present a potential P3 opportunity with Loves. The green circle is a large footprint interchange that is open in the middle, presenting an opportunity to develop truck parking on the open space. Lastly, the orange parcel presents an opportunity to amend the lease agreement with Ritchie Bros. Auctioneers to allocate some of the parcel nearest to US 27 for truck parking as FDOT owns the parcel.

Figure 37 | Suitable Parcels near Hotspot M-5



## Hotspot M-6

Located within a Freight Activity Area, Hotspot M-6 is between Hotspots M-2/M-3 to the South and M-4 to North. M-6 is a combination of five roadway segments where 1,061 trucks parked at multiple unauthorized locations during the study period for an average of 8.2 to 14.7 hours. The location and dwell times suggest that trucks are using Hotspot M-6 for staging and overnight parking before or after their pick-up or delivery time.

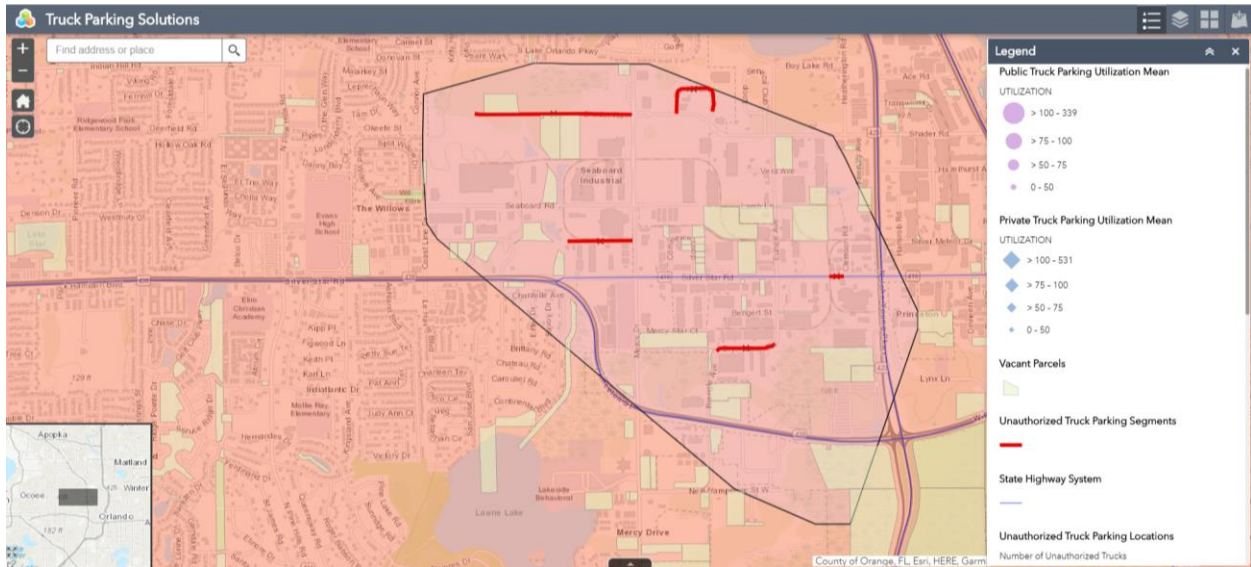


# Statewide Truck Parking Study



Figure 38 displays the substantial number of privately-owned vacant parcels in and around Hotspot M-6 (yellow parcels), but there are limited amenities in the area and no state-owned parcels in Hotspot M-6. The lack of state-owned parcels and amenities suggests that if a capacity solution was pursued, a new truck stop would need to be developed to provide the necessary amenities.

Figure 38 | Land Suitability Analysis in Hotspot M-6







## Priority Area O

Figure 39 displays Priority Area O, located primarily in and around the Tampa metropolitan area and connecting corridors. Priority Area O is the westernmost cluster along I-4, extending from Priority Area O east along I-4 to Priority Area N.

Figure 40 and Figure 41 display the location where a truck parked before and after it parked in an unauthorized area in Priority Area O. In general, trucks were largely stopped in Priority Area O and in areas along I-4 and I-75 in advance of parking in an unauthorized location in Priority Area O.

After parking in an unauthorized location in Priority Area O, trucks often stopped in Priority Area O, along I-4, and I-75 as well as, other urban areas, such as Miami, Orlando, Jacksonville, and Pensacola.

Figure 39 | Priority Area O

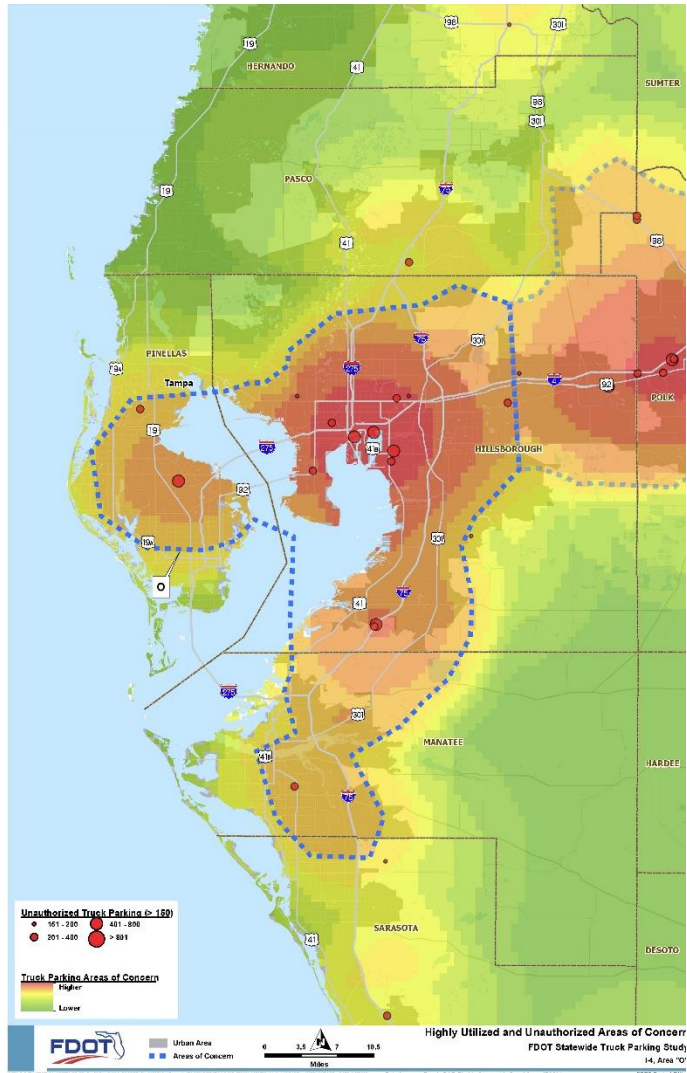




Figure 40 | Location of Truck Stop Events before Unauthorized Truck Parking in Priority Area O

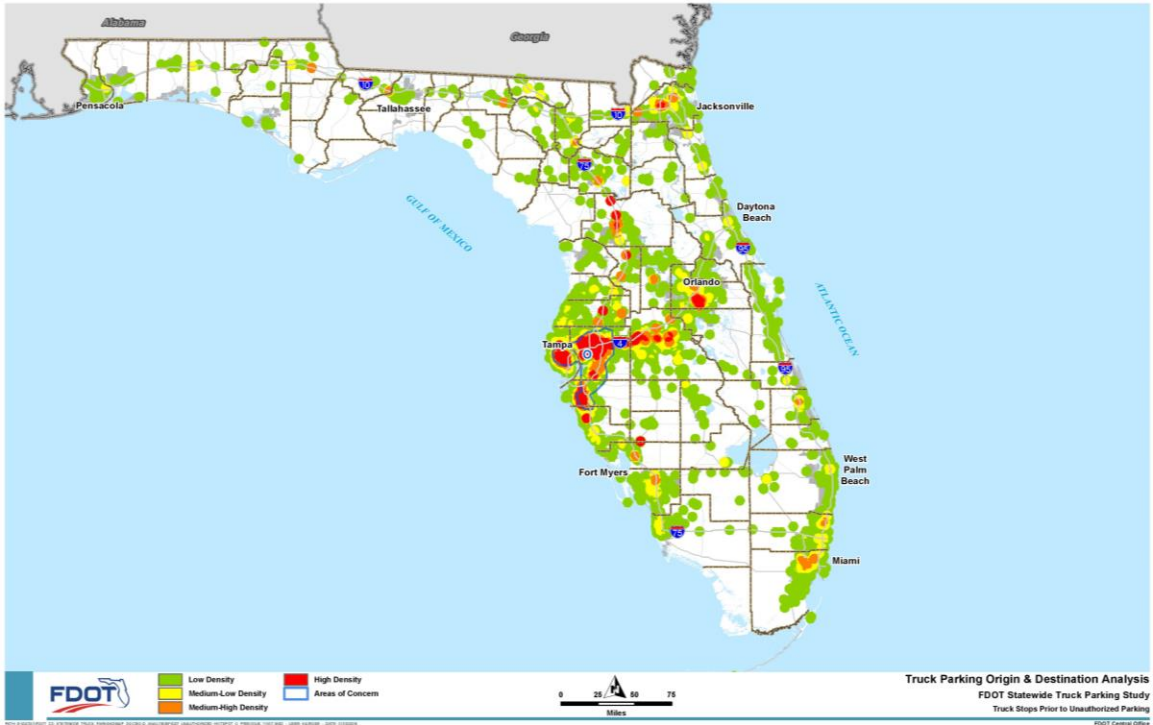
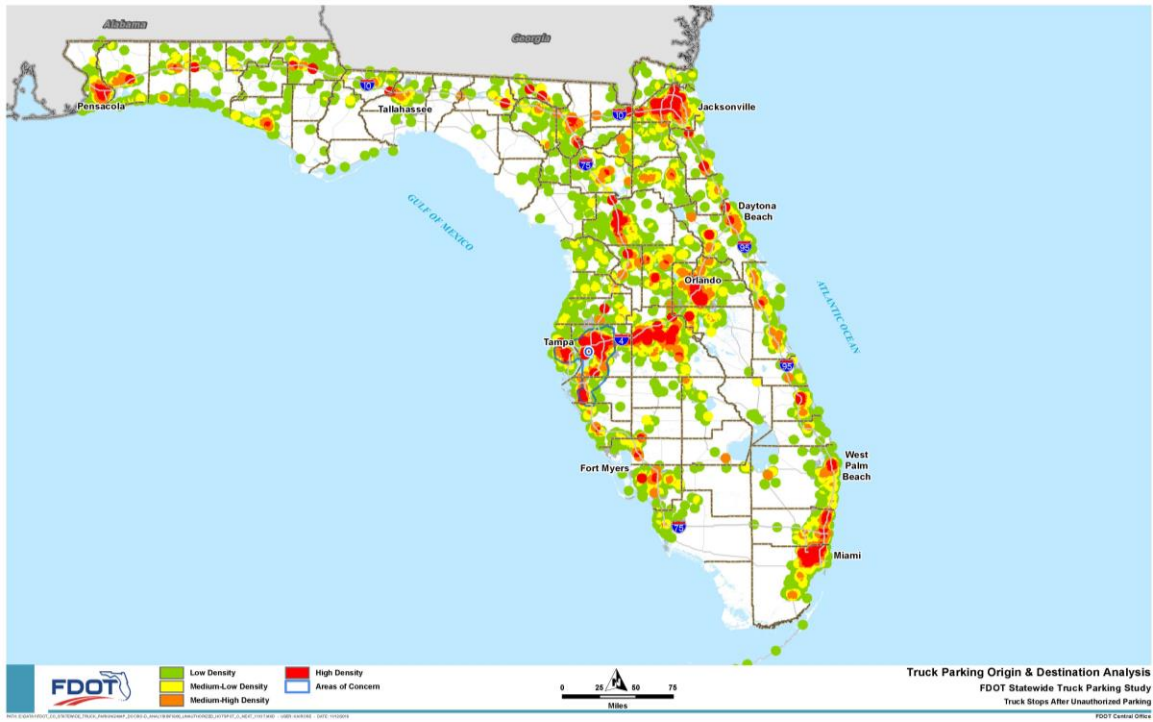


Figure 41 | Location of Truck Stop Events after Unauthorized Truck Parking in Priority Area O





Due to their proximity, the travel time shed shown in Figure 42 is very similar to Priority Area M, which also explains the greater density of stops in Florida after unauthorized parking in Priority Area O than before.

Figure 42 | Eight hour Travel Time Shed from Priority Area O

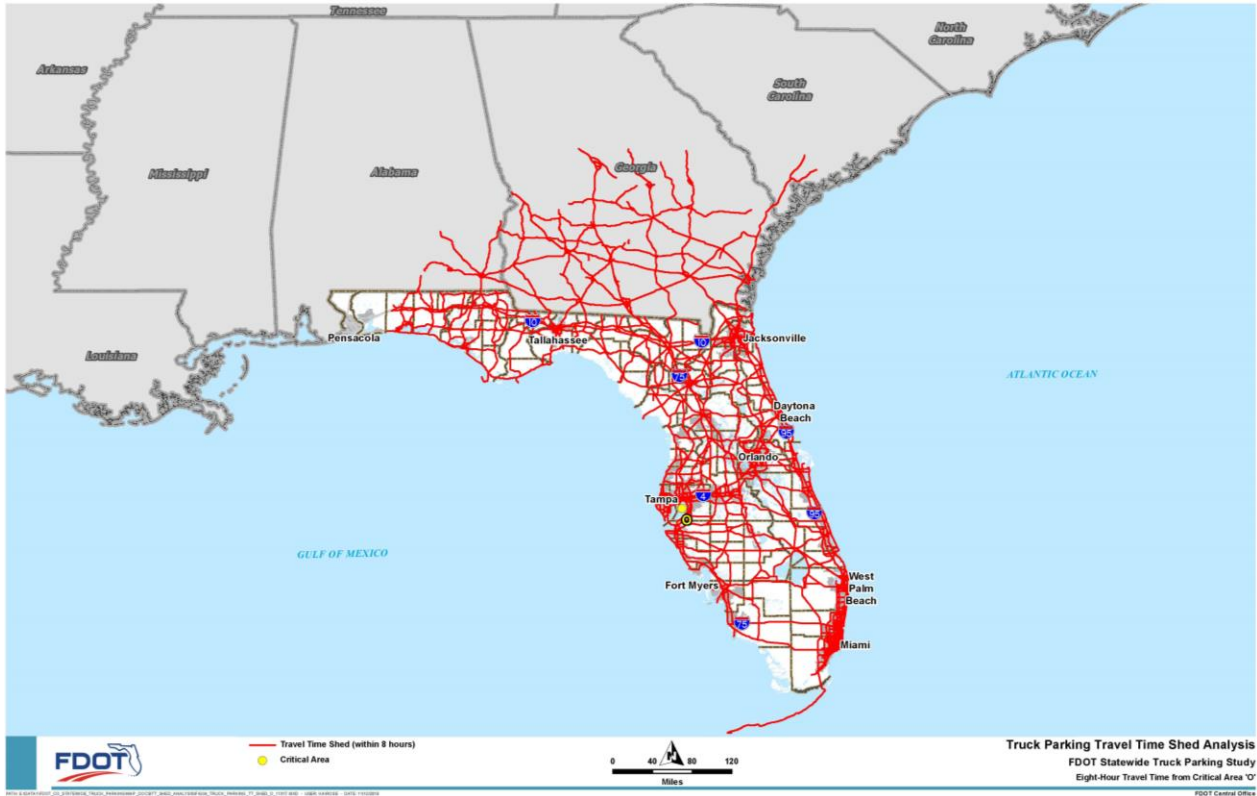
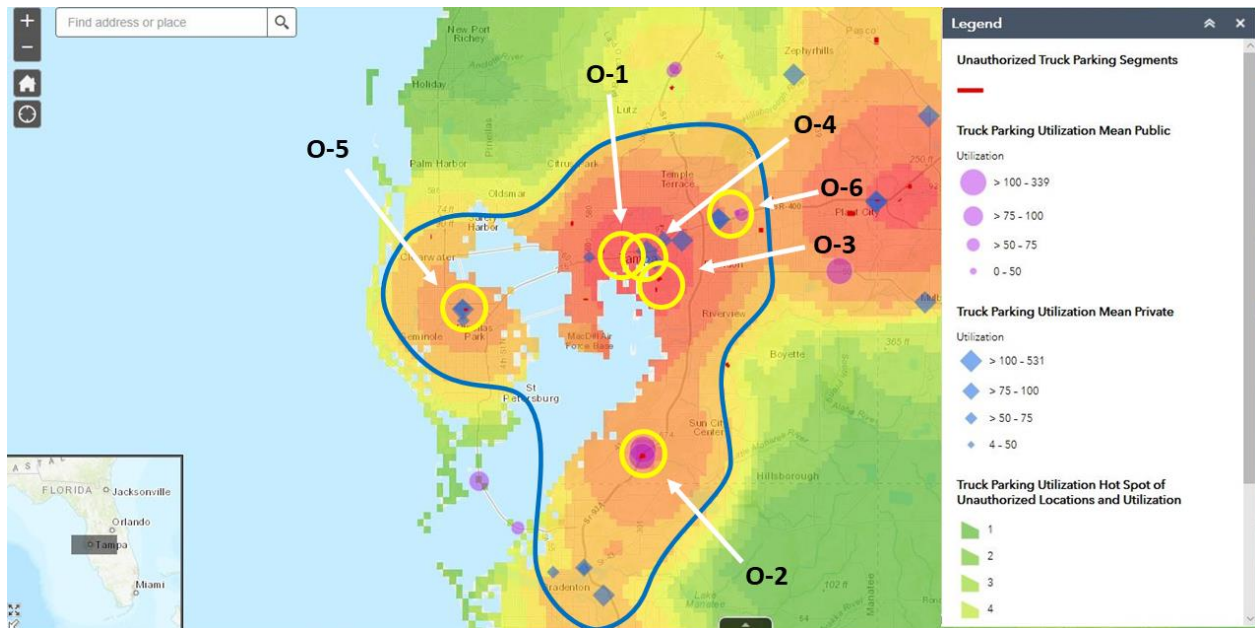


Figure 43 displays the hotspots within Priority Area O. Further analysis and consultation with District 7 resulted in a focused analysis of Hotspot O-2. Hotspot O-2 was particularly important due to it occurring at a state-owned facility and the potential negative impact on safety caused by trucks using the on and off-ramps of the rest area for truck parking. Additionally, District input on the findings, existing projects and studies, and the opportunities identified in Priority Area O are highlighted for their potential to address other hotspots in Priority Area O.





Figure 43 | Priority Area O Hotspots



## Hotspot O-2

Hotspot O-2 occurs at the northbound and southbound Hillsborough County Rest Area, where both facilities are over-utilized and 981 trucks parked along the northbound rest area on and off-ramps. The trucks parking at the rest area and those using the on and off-ramps were stopped for about 10 hours, making their stop for HOS compliance. The unauthorized on and off-ramp parking, as well as both facilities being over-utilized, suggests the need for additional truck parking spaces. Of note, both the northbound and southbound sides of the rest area have projects starting late 2019 / early 2020 that will add a total of 115 truck parking spaces and result in a total of 191 spaces.

## Other Opportunities in Priority Area O

Other locations of unauthorized truck parking include areas around the port and are located in industrial areas. Additionally, there are a limited number of truck parking spaces and high utilization of most truck parking spaces within Priority Area O, especially as truck drivers approach Hotspots O-1, O-3, and O-4. One exception is the truck parking availability at the I-4 weigh station at Seffner shown in Figure 44 (Hotspot O-6).

The eastbound and westbound facilities at the weigh stations at Seffner both have 15 truck parking spaces and have an average utilization rate of about half of the spaces. Nearby truck parking facilities are over-utilized and the number of unauthorized trucks increases as drivers enter Tampa. Truck drivers have indicated a general apprehension towards parking at weigh stations due to the perception that they may be subject to inspection while on-site, as well as, the general lack of amenities at weigh stations. Improvements to the weigh station could make it more attractive to truck drivers and address some of the unauthorized truck parking in Priority Area O.

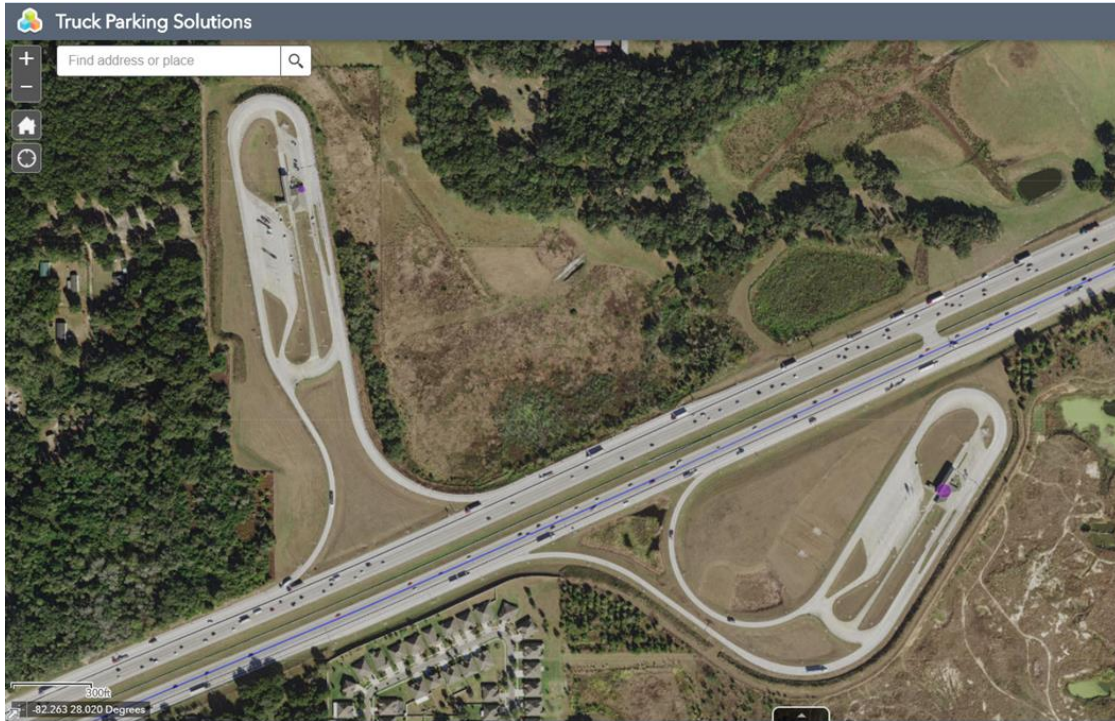
Additionally, District 7 highlighted private sector interest for the development of a truck parking site on Causeway Boulevard, which could address some of the authorized truck parking at Hotspots O-1, O-3, and O-4. Lastly, many of the rest areas in Priority Area O are at or near capacity and have the potential

# Statewide Truck Parking Study



to reach capacity in the coming years, suggesting the need to monitor the trends in truck parking utilization in the future. Lastly, further analysis may be needed for identifying the Port Tampa Bay staging area(s).

Figure 44 | Hotspot O-6 - I-4 Weigh Station at Seffner, Florida







## Priority Area N

Priority Area N is located along I-4 between Priority Areas O to the west and Priority Area M to the east (Figure 45).

Figure 46 and Figure 47 display the location that trucks parked before and after they parked in an unauthorized location in Priority Area N. In general, trucks were largely stopped in Priority Area N, along I-4, and around Orlando in advance of parking in an unauthorized location in Priority Area N. There were a greater number of trucks parked in Florida following an unauthorized stop in Priority Area N than before an unauthorized stop. High-density clusters occur along I-4, I-75, and I-95, as well as in and around Miami, Tampa, Orlando, and Jacksonville, among other locations.

Figure 45 | Priority Area N

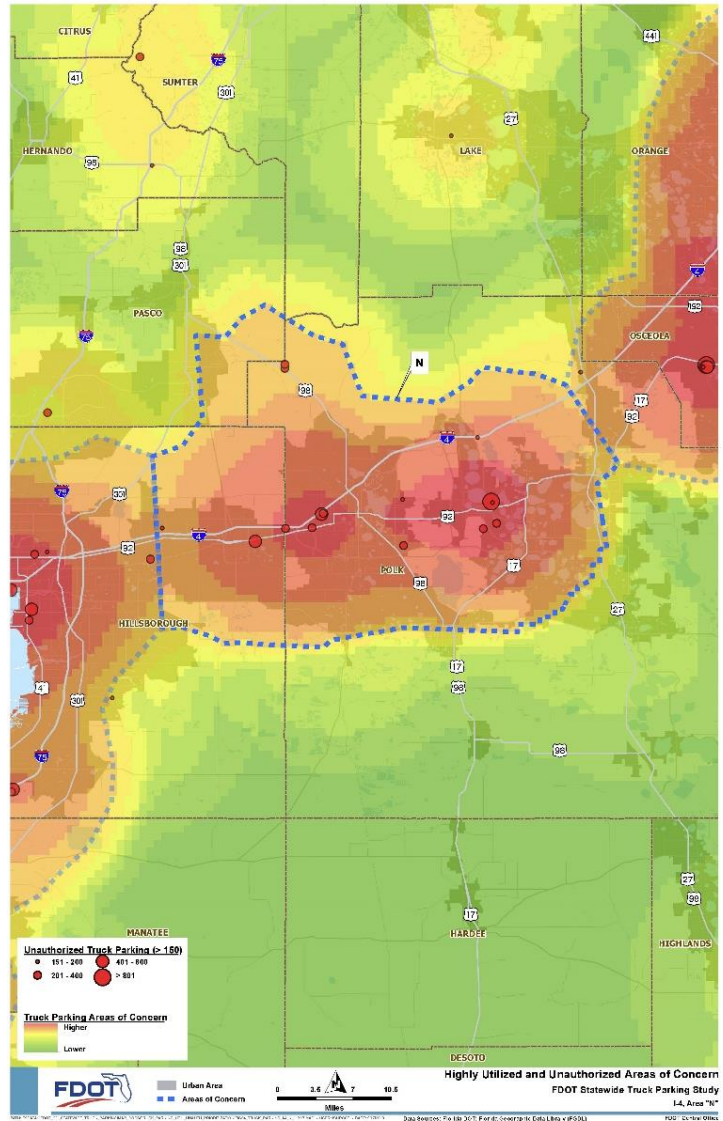






Figure 46 | Location of Truck Stop Events before Unauthorized Truck Parking in Priority Area N

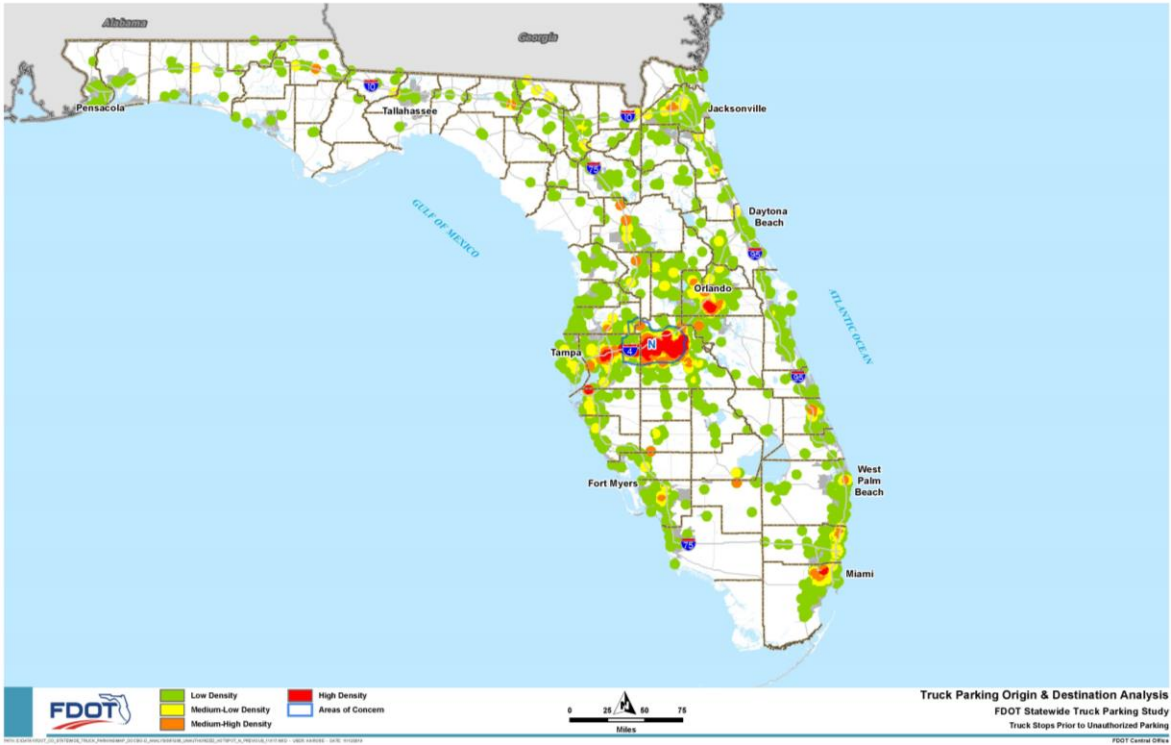
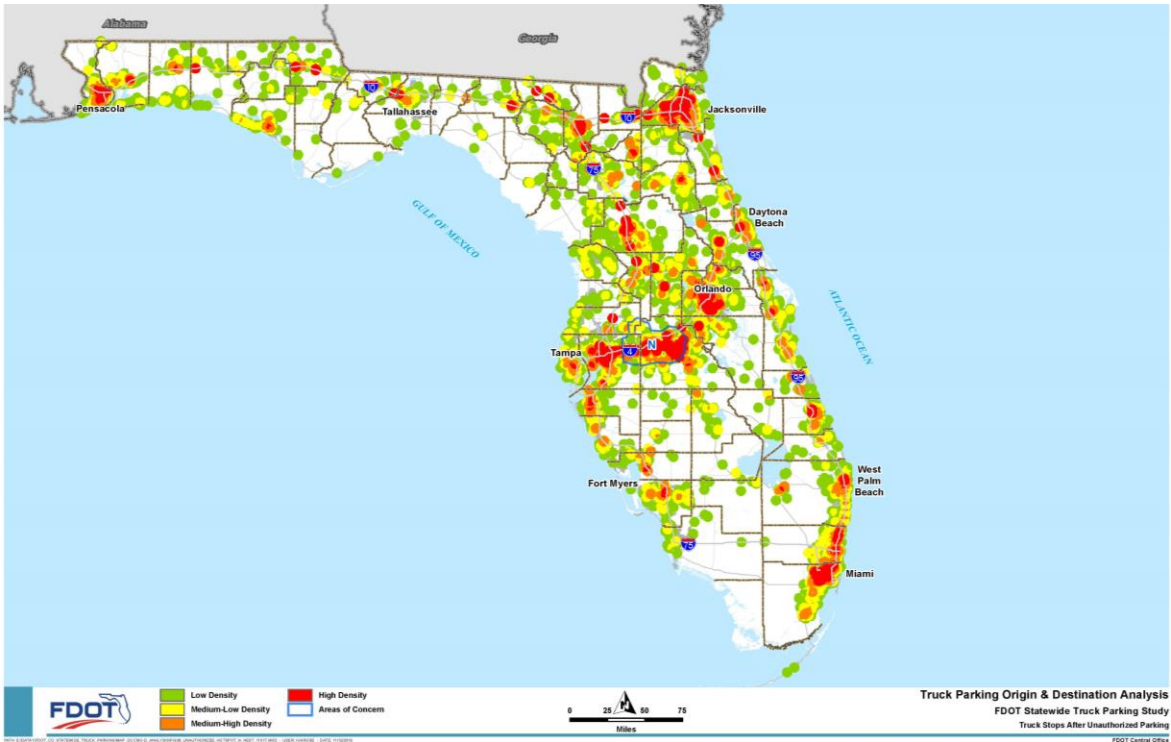


Figure 47 | Location of Truck Stop Events after Unauthorized Truck Parking in Priority Area N



# Statewide Truck Parking Study



Similar to Priority Areas O and M, Priority Area N has an eight hour travel time shed that extends throughout all but the westernmost part of Florida and into Alabama, Georgia, and South Carolina.

Figure 48 | Eight hour Travel Time Shed from Priority Area N

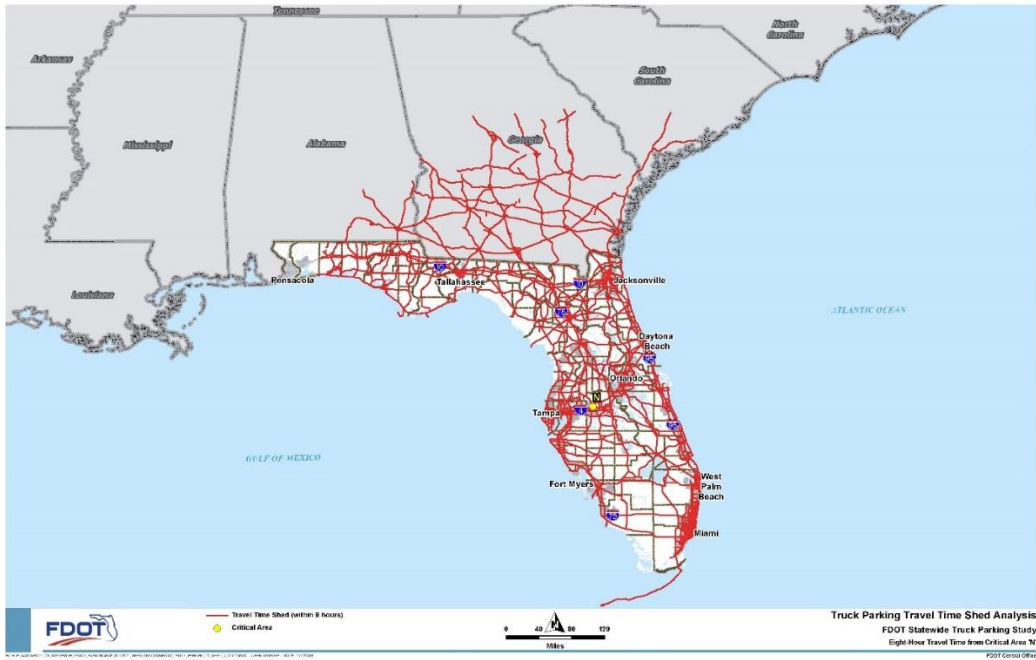
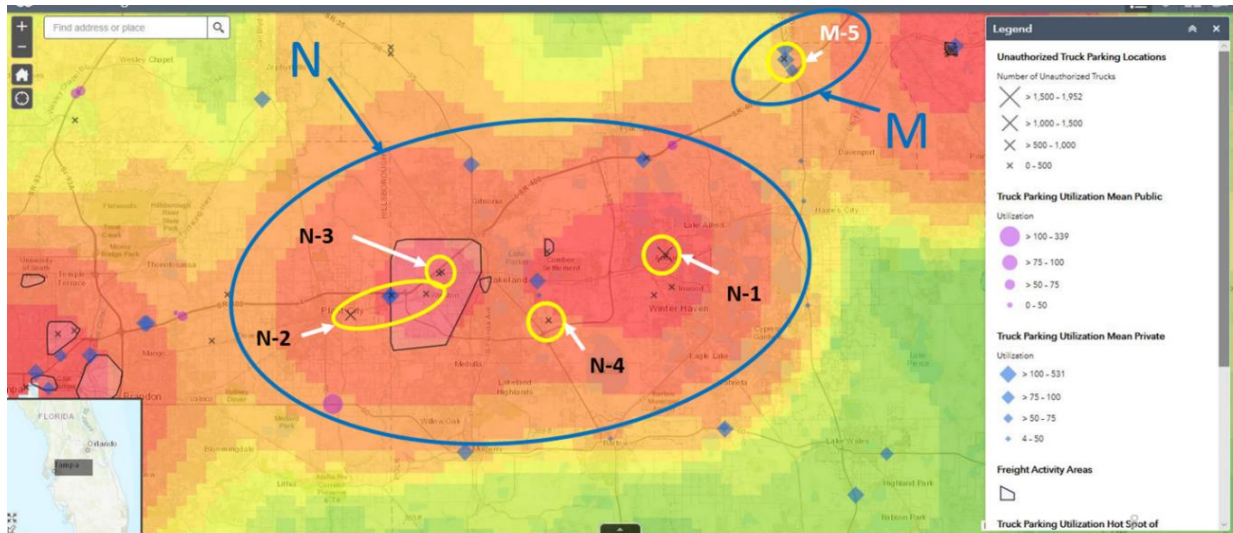


Figure 49 displays the four individual hotspots that were identified for further exploration within Priority Area N.

Figure 49 | Priority Area N Hotspots







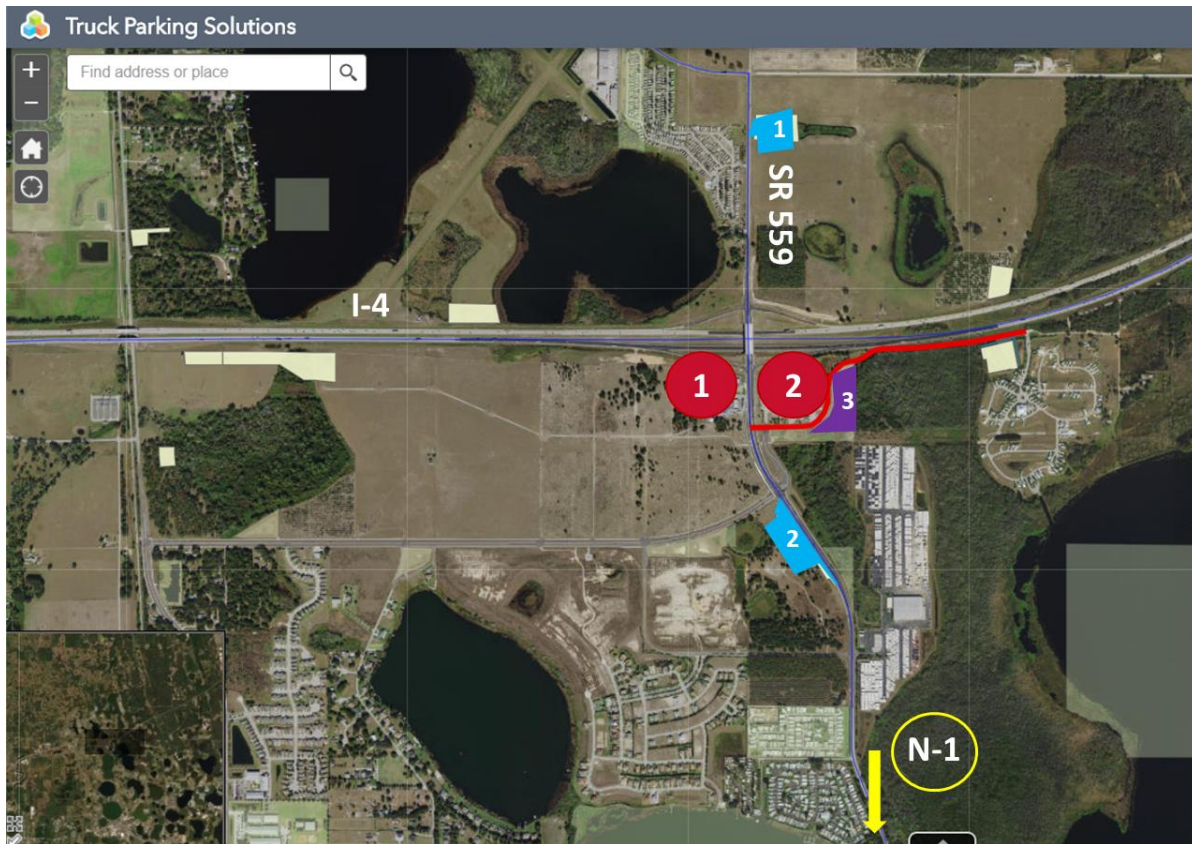
## Hotspot N-1

Hotspot N-1 had 1,243 unauthorized trucks parked along Progress Road in Auburndale near industrial land uses, such as warehousing and wholesalers. N-1 has the highest number of unauthorized trucks for all of Priority Area N. There are four truck parking facilities, two private truck stops (Loves 110 spaces and Polk City Travel Center 42 spaces) and two public rest areas (I-4 Eastbound 23 spaces and Westbound Rest Areas 24 spaces) near Hotspot N-1.

Figure 50 displays the Polk City Truck Stop (number one) and Loves Travel Stop (number two) in red, FDOT owned parcels and another roadway segment where unauthorized truck parking occurs are marked in red. The truck stops displayed in Figure 50 are about seven miles from Hotspot N-1. Although the Polk City Truck Stop and Loves Travel Stop are across from each other, the analysis of the GPS data identified that the Polk City Truck Stop was under-utilized, with about half of the spaces available and the Loves Travel stop was over-utilized by about 70 percent. Similarly, the I-4 Eastbound Rest Area was also under-utilized by about 25 percent. Anecdotal and first-hand observations suggest that the I-4 Eastbound Rest Area is over-utilized.

Validation with District 1 removed parcels two and three because of a pond and the proximity of the location to a neighborhood respectively. Parcel 1 is about three acres of land but is described as a stormwater management facility by the Florida Department of Revenue and there are no amenities near the parcel.

Figure 50 | Parcel Suitability Analysis







## Hotspot N-2 and N-3

Figure 51 displays the three segments that comprise Hotspots N-2 and N-3. Hotspot N-2 has a total of 1,142 unauthorized trucks parked near industrial parcels and spilling over from private truck parking facilities. Similarly, Hotspot N-3 has 860 unauthorized trucks parked near a cluster of industrial parcels. Additionally, state-owned parcels are displayed in tan to inform the identification of potential solutions. Hotspot N-2 and N-3 have 11 truck parking spaces between three locations, one of which is the Hopewell Static Station on US-60. The two remaining private truck parking facilities around N-2 and N-3 are over-utilized.

Figure 51 | Hotspots N-2 and N-3

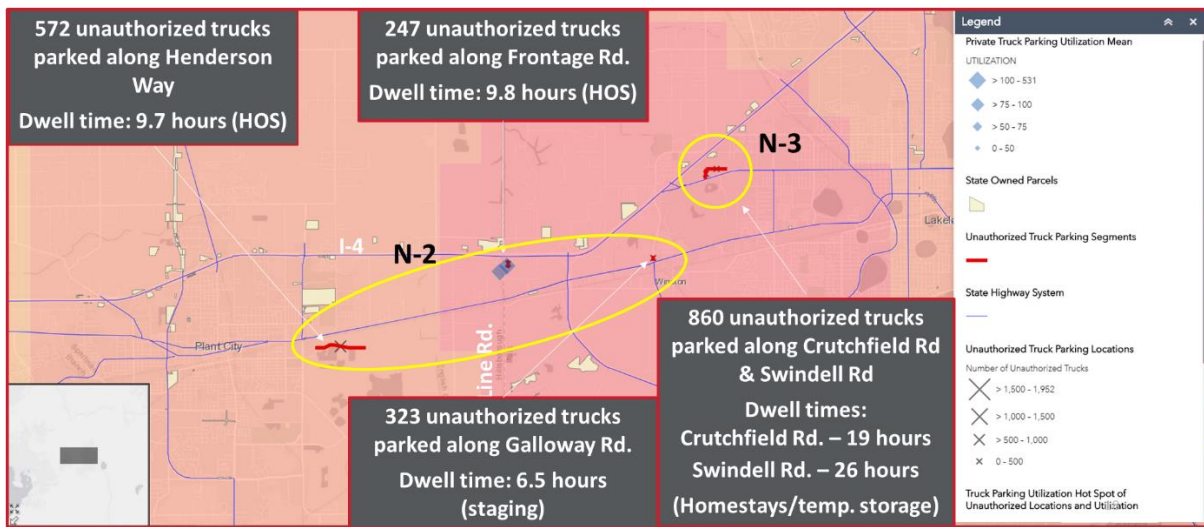
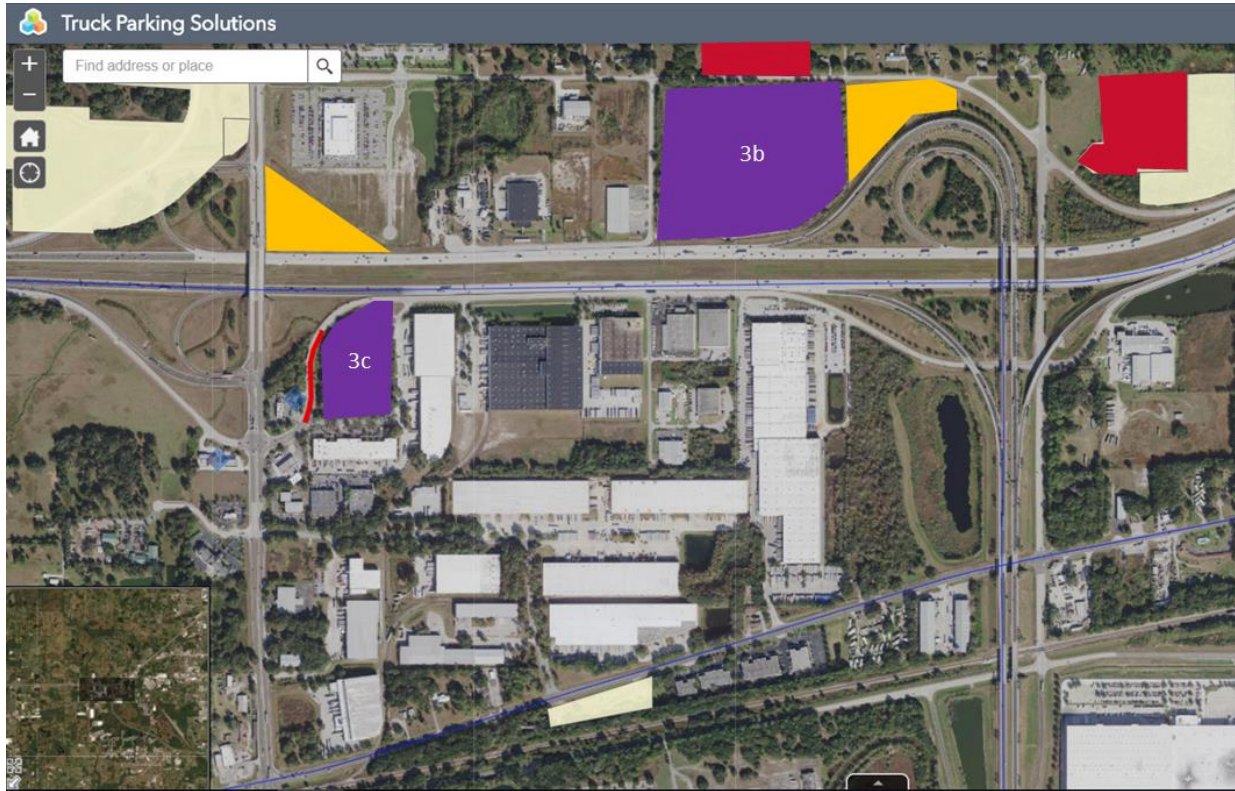


Figure 52 displays the suitable parcels identified around the unauthorized truck parking on Frontage Road South. The area shown in Figure 52 is in close proximity to I-4, freight generators, and is centrally located to benefit many of the trucks that park in unauthorized locations. Consultations with District 7 and District 1 noted that FDOT owned parcels have established drainage ponds that would have to be mitigated if used for truck parking. Similarly, at least one of the identified parcels will be used when US-92 is widened. Therefore, the orange and purple polygons were identified as potential locations that aggregate could be compacted to develop an area for staging trucks (orange) and a location for a new private truck parking facility (purple), possibly using a P3 and/or a grant program in partnership with the Florida DEO. Additionally, a developer has expressed interest in building a truck stop on Galloway road (eastern side of Hotspot N-2).



Figure 52 | Suitable Parcels around Hotspot N-2



District 7 also highlighted that the Florida Department of Agriculture and Consumer Services (FDACS) has a location that is used for a farmers market in Plant City. The site of the farmers market has five truck parking spaces that can be reserved or filled on a first come first serve basis. Similarly, District 7 recently kicked off a project to identify the location for a truck parking facility in the Plant City and I-4 area.

Figure 53 displays FDOT owned parcels, near Hotspot N-3. The polygon displayed in blue has the potential for a new public truck parking facility on the approximately 25-acre parcel. A new facility would require amenities on-site and may need stormwater management. The development of truck parking spaces at N-2 or N-3 would help address unauthorized truck parking for other hotspots in Priority N.





Figure 53 | Suitable Parcels near Hotspot N-3



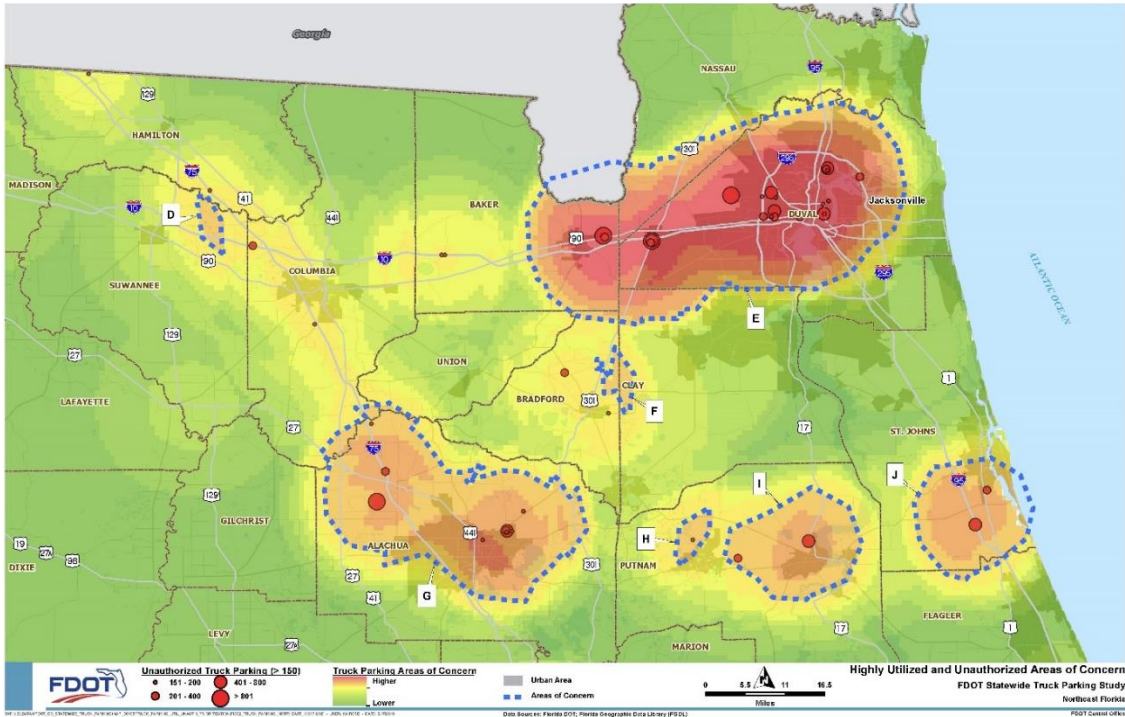




## Priority Area E

Figure 54 displays Priority Area E, located in and around the Jacksonville metropolitan area and along US 90 and I-10 corridors connecting to Jacksonville. Although they were not ranked as high in the prioritization, Figure 54 also displays clusters D, F, G, H, I, and J near Priority Area E, displaying the clustering of truck parking issues in Northeast Florida.

Figure 54 | Priority Area E



As context for the analysis of Priority Area E, Figure 55 and Figure 56 display the results of the truck GPS analysis that identified where trucks parked prior to parking in an unauthorized area in Priority Area E. Figure 55 shows that trucks came from throughout Florida with the only location displaying a high density in Jacksonville. Conversely, Figure 56 displays a greater number and geographic diversity of locations. The difference in where truck stop before and after parking in an unauthorized location in Priority Area E could be Priority Area E's location along the Georgia border and many trucks are coming from outside of Florida. Figure 57, displays the travel time shed for a truck traveling eight hours from Priority Area E and displays the potential for a truck to travel to or from four different states within an eight-hour timeframe.



Figure 55 | Location of Truck Stop Events before Unauthorized Truck Parking in Priority Area E

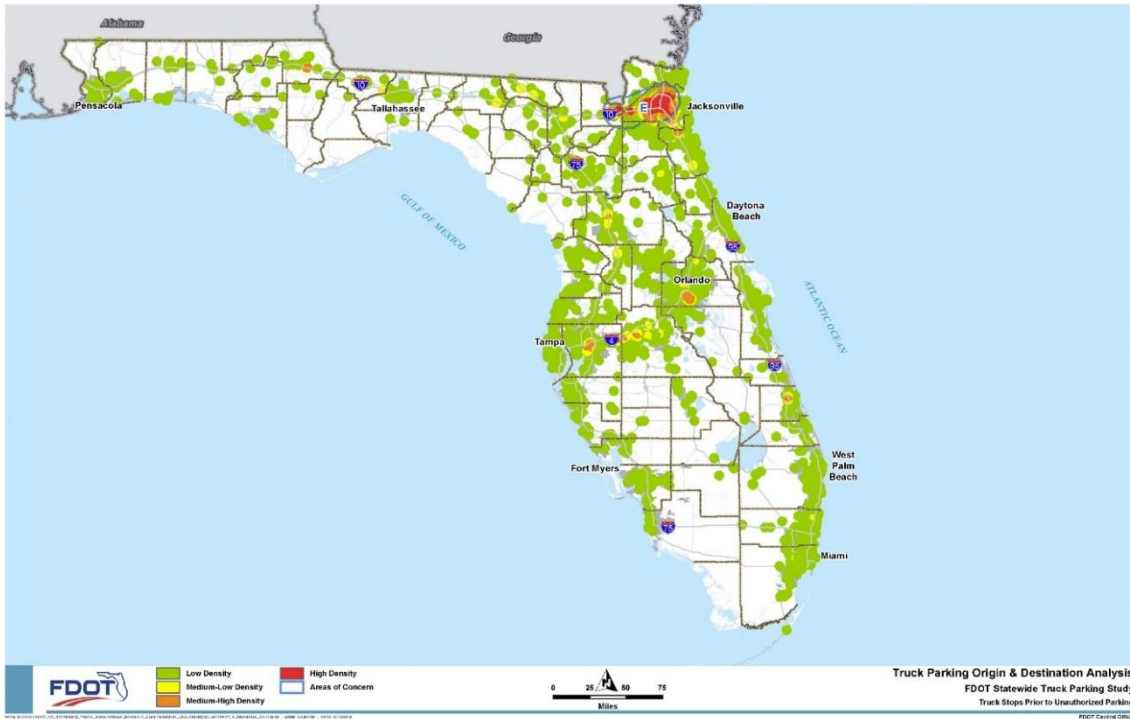


Figure 56 | Location of Truck Stop Events after Unauthorized Truck Parking in Priority Area E

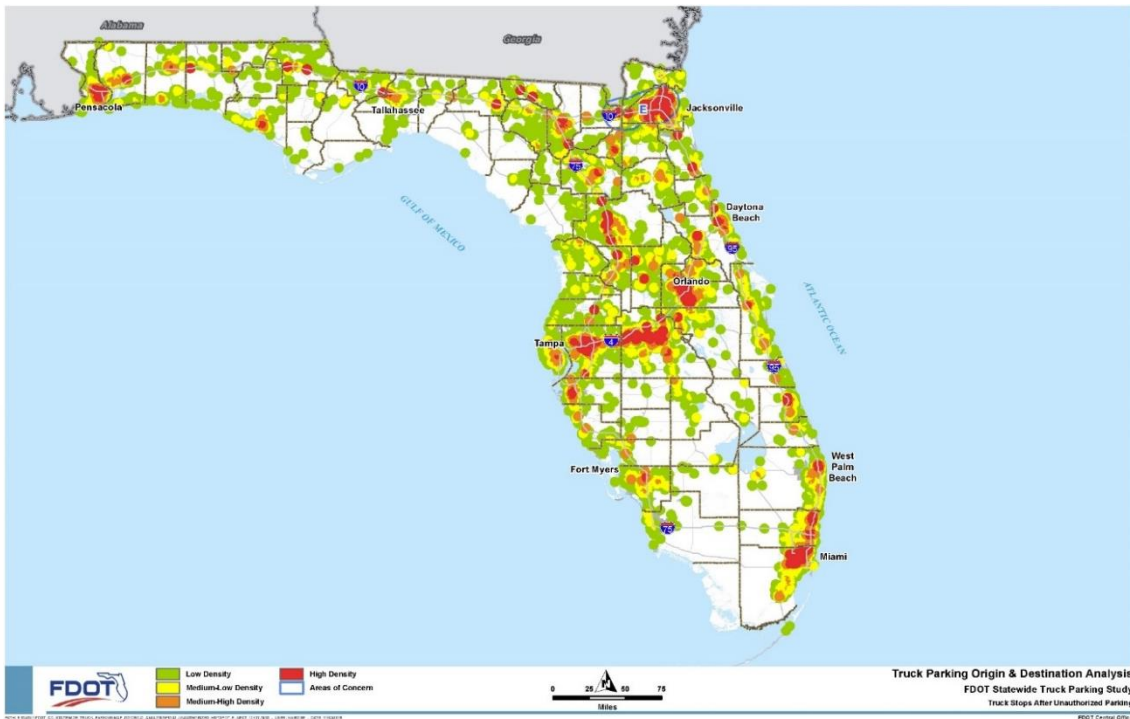




Figure 57 | Eight Hour Travel Time Shed from Priority Area E

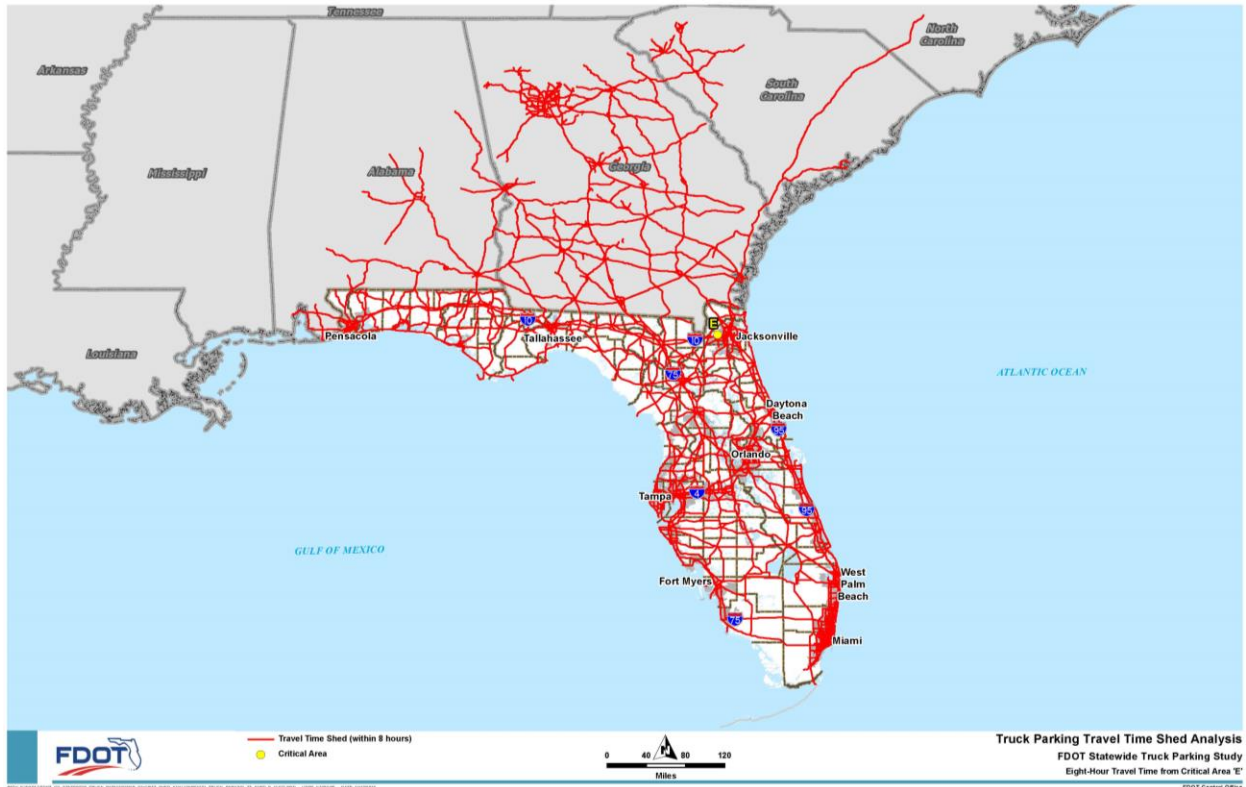
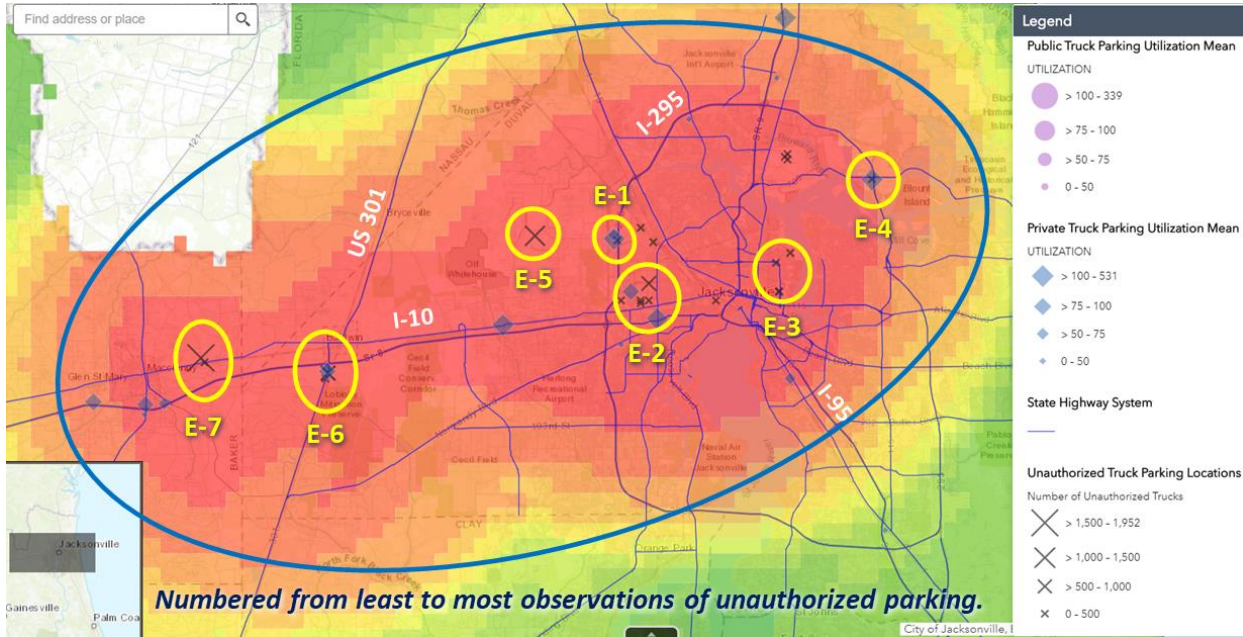


Figure 58 displays the individual locations of over-utilized truck parking locations (blue diamonds) and unauthorized truck parking locations (X marker). The hotspots within Priority Area E are numbered one through seven according to the highest unauthorized truck parking observations. Analysis of the hotspots revealed that hotspots E-2 through E-5 are a lower priority within Priority Area E due to the unauthorized parking locations being less likely to impede traffic, they are not a chronic issue, and/or have available truck parking nearby. Therefore, the remainder of the discussion of Priority Area E focuses on hotspots E-1, E-6, and E-7.





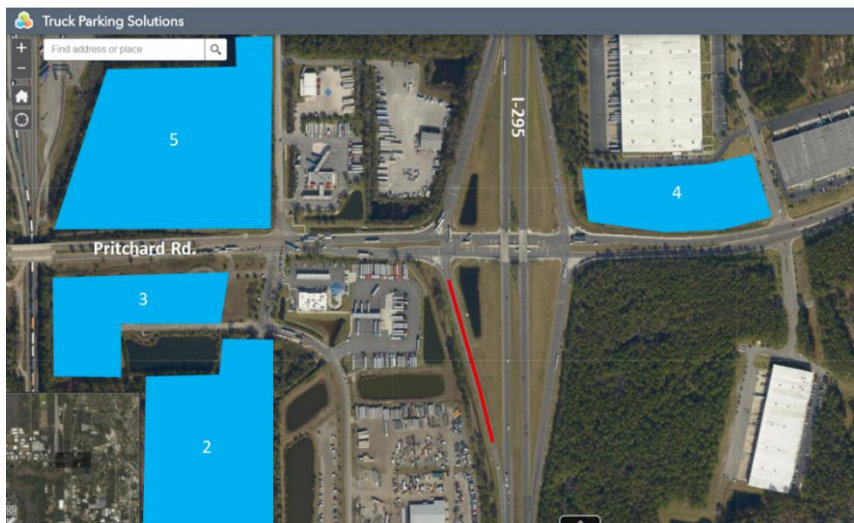
Figure 58 | Priority Area E Hotspots



### Hotspot E-1

Figure 59 displays the unauthorized location where 172 trucks are parking (red) and potential parcels (all privately owned) for additional truck parking (blue). The dwell time for trucks parking on the I-295 on-ramp was 9.4 hours, denoting parking for HOS compliance. Additionally, the on-ramp is adjacent to a Pilot Travel Center (80 spaces) and Circle K (25 spaces). The Pilot Travel Center is over-utilized, but the Circle K was under-utilized during the study period. One potential opportunity at hotspot E-1 is further analysis to develop a public or private truck parking location on one of the parcels identified in Figure 59.

Figure 59 | Suitable Parcels in Hotspot E-1

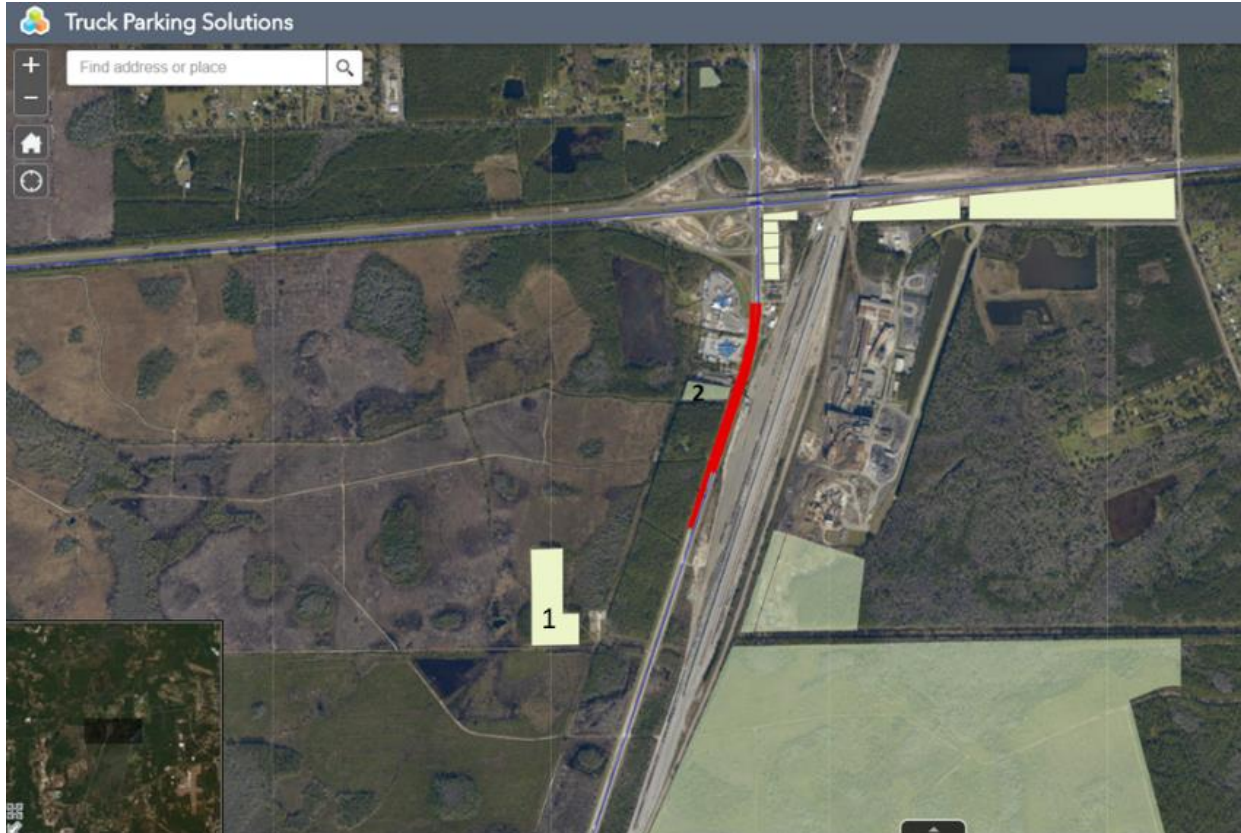




## Hotspot E-6

Figure 60 displays the location where almost 1,620 trucks are parking in red and potential parcels (state-owned parcels in yellow and privately-owned in green) for additional truck parking. The dwell time for trucks parking along US 301 was 9.7 hours, denoting parking for HOS compliance. Hotspot E-6 is adjacent to a TA/Petro (150 spaces) and Pilot Travel Center (50 spaces). The TA/Petro is nearly at capacity and the Pilot Travel Center is over-utilized.

Figure 60 | Suitable Parcels in Hotspot E-6





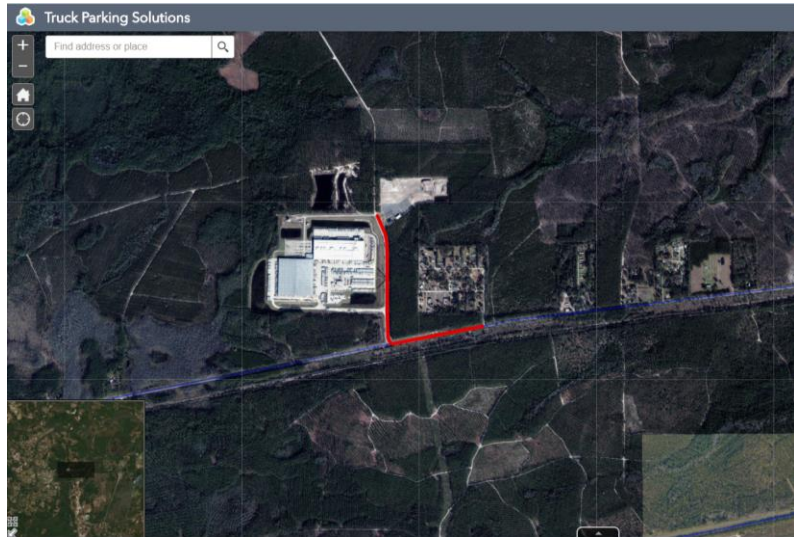


## Hotspot E-7

Figure 61 displays the location where over 1,950 trucks are parking along Enterprise East Boulevard and almost 230 trucks parking along US 90 in red. The trucks are parked adjacent to a Wal-Mart distribution center and the dwell time for all unauthorized truck parking (7.5 hours) denotes staging in advance of pick-up or delivery.

Hotspot E-7 is between five and ten miles from four locations with truck parking. Three out of the four locations are at or near capacity and one location is about 38 percent full.

Figure 61 | Location of Unauthorized Truck Parking in E-7



The land suitability analysis did not find state-owned facilities located near Hotspot E-7, but the owner of the Journeys Food Store, which already provides truck parking, owns additional undeveloped land adjacent to their existing truck stop. The potential solutions for E-7 should take advantage of the unique case where an existing truck stop has vacant land adjacent to their existing truck stop. Additionally, the concentration of trucks near the Walmart distribution center provides an opportunity to explore the development of a truck parking facility near the distribution center or on the existing parcel.





## Priority Area T

Figure 62 displays Priority Area T, located in the Miami metropolitan area. Priority Area T is also located near areas of concern S and Q, but those areas were not prioritized in the top five Priority Areas of Concern.

Figure 63 and Figure 64 display the locations that trucks parked before and after they parking in an unauthorized location in Priority Area T. In general, trucks were largely stopped in Priority Area T and Orlando in advance of parking in an unauthorized location in Priority Area T. After parking in an unauthorized location in Priority Area T, trucks often stopped at locations in Miami, Tampa, Orlando, Jacksonville, and along I-4 and I-75.

Figure 65 displays the travel time shed for a truck traveling eight hours from Priority Area T. In contrast to other priority areas, trucks cannot reach most of the Florida panhandle and barely reach Georgia after eight hours of travel.

Figure 62 | Priority Area T

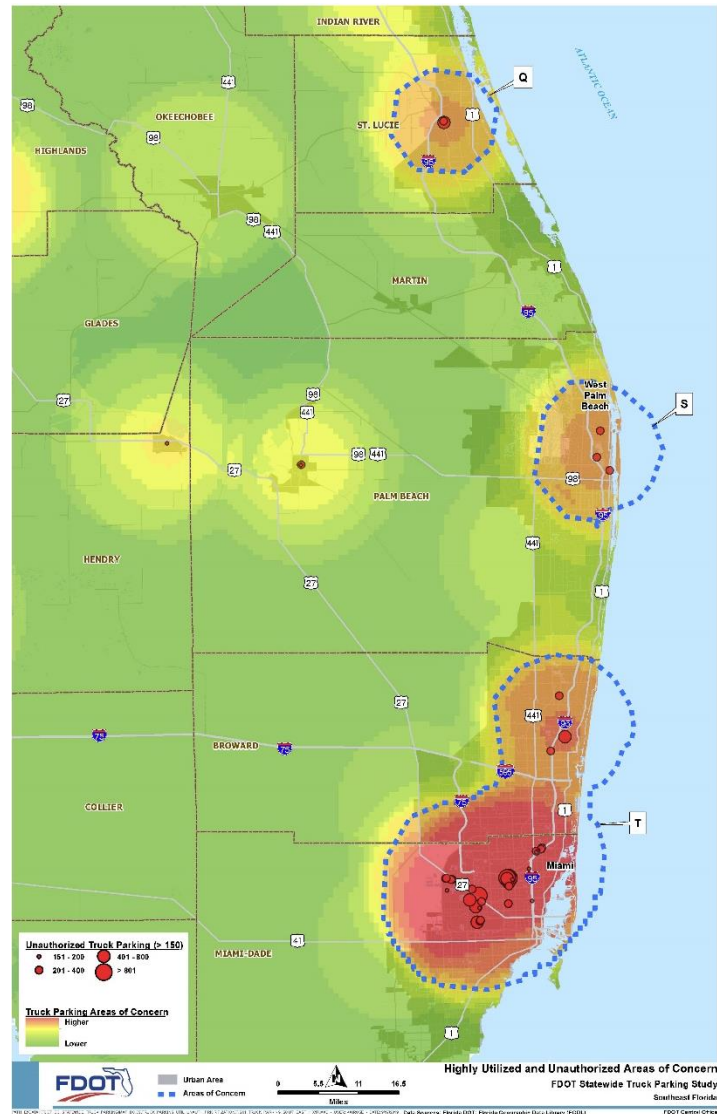




Figure 63 | Location of Truck Stop Events before Unauthorized Truck Parking in Priority Area T

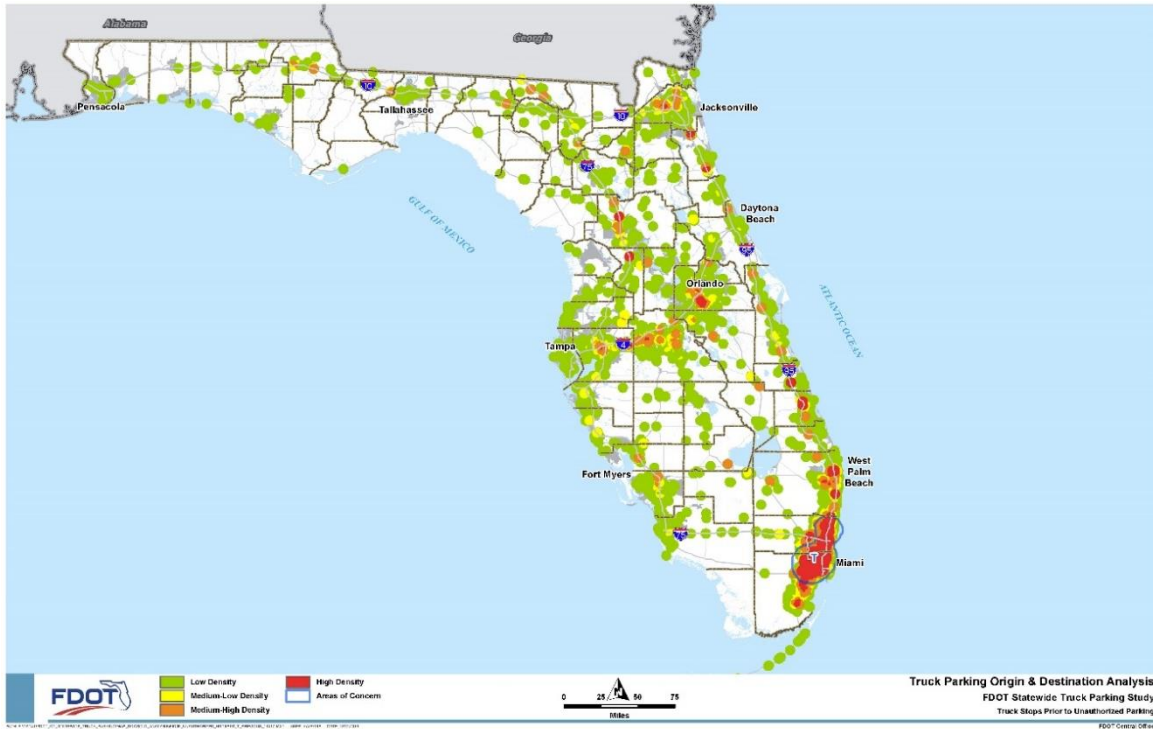


Figure 64 | Location of Truck Stop Events after Unauthorized Truck Parking in Priority Area T

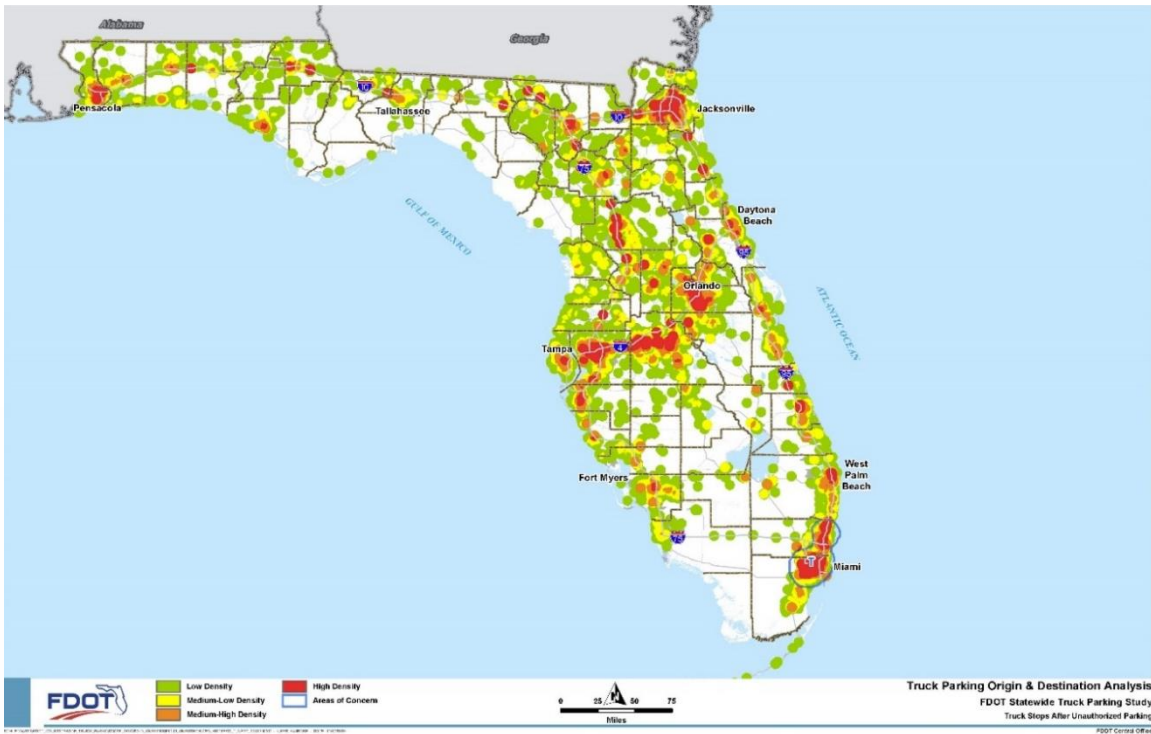




Figure 65 | Eight hour Travel Time Shed from Priority Area T

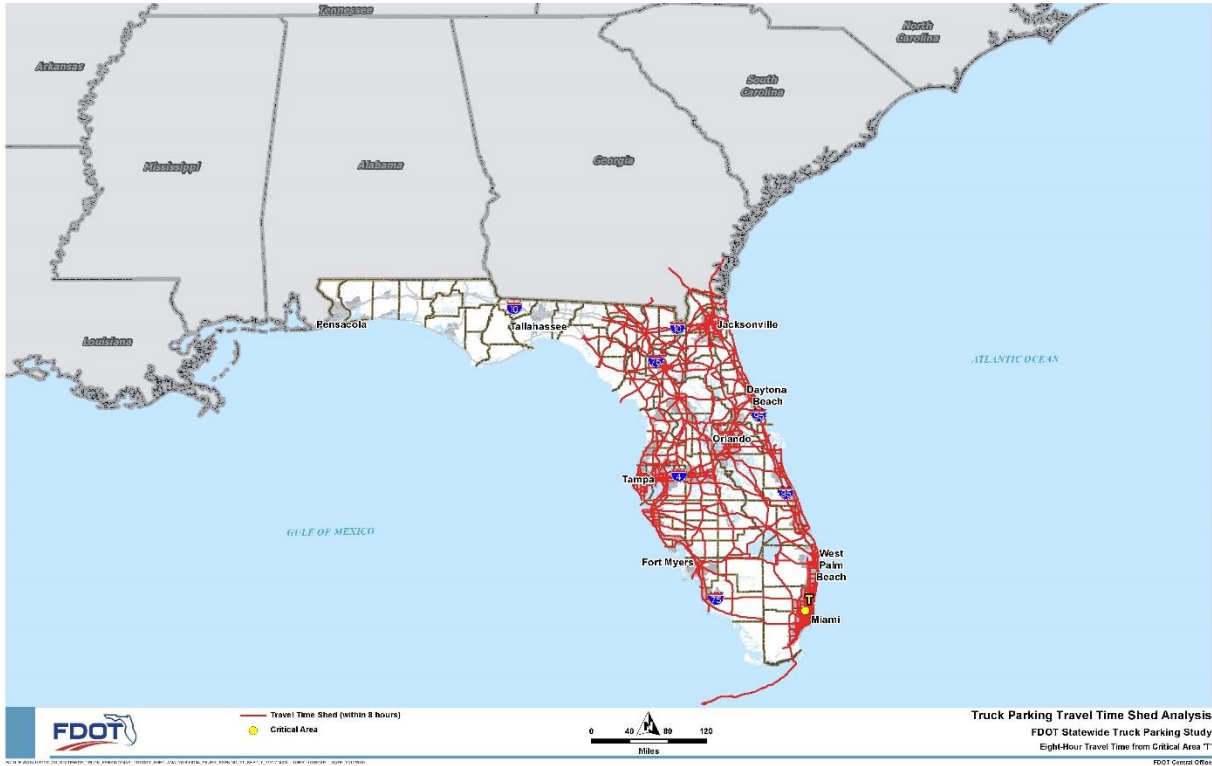
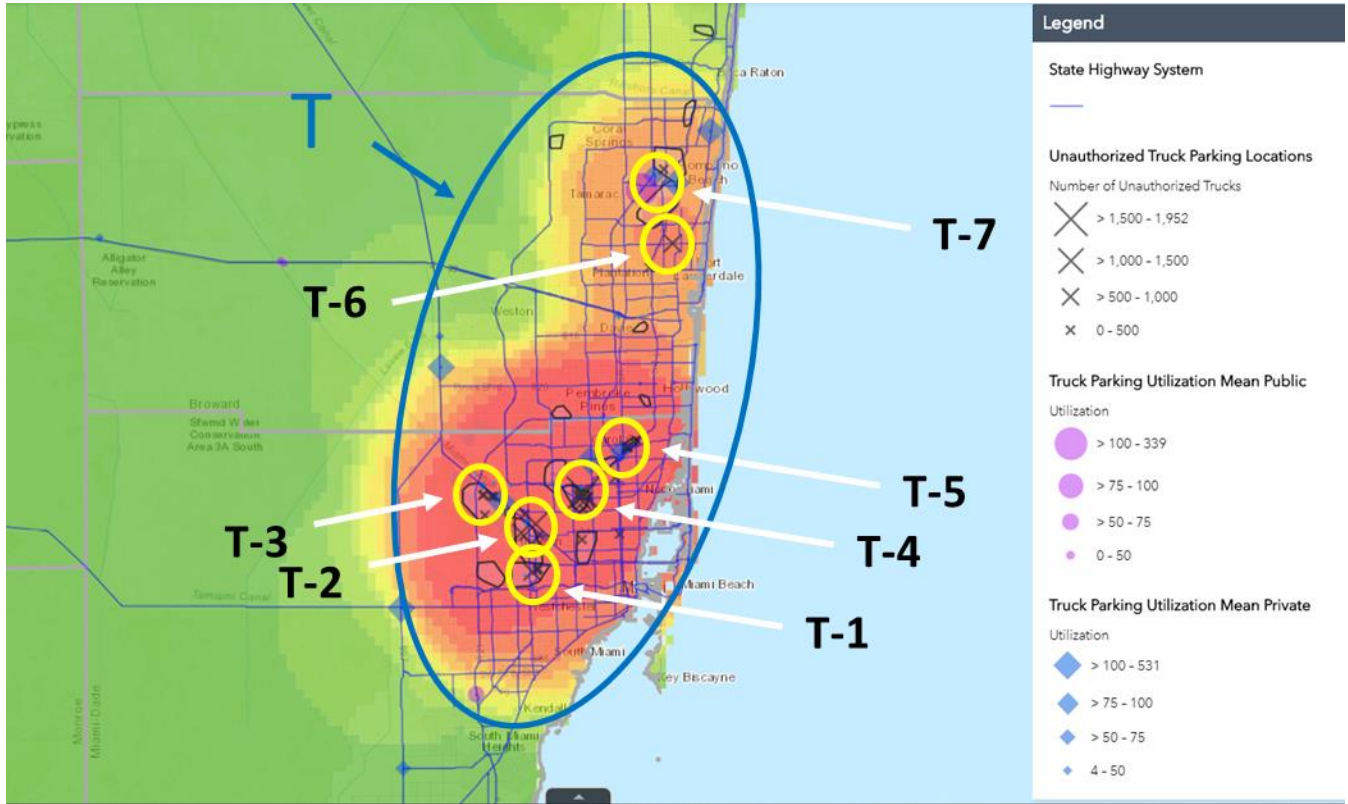


Figure 66 displays the hotspots within Priority Area T, numbered one through seven. Additional analysis of T-2 and T-6 concluded that the hotspots could be due to temporary storage, the location has limited through traffic, and some of the unauthorized trucks could have been miss-assigned due to overlap between the parcels and state ROW files. Therefore, the remainder of the discussion of Priority Area T focuses on the findings of the inferential analysis and the opportunities at hotspot T-1, T-3, T-4, T-5, and T-7.





Figure 66 | Priority Area T Hotspots





## Hotspot T-1

Hotspot T-1 had 1,485 unauthorized trucks parking on four different roadway segments that were located near industrial land uses. Hotspot T-1 lacks truck parking near the segments with unauthorized truck parking. Figure 67 displays the area around Hotspot T-1 and a parcel owned by Miami-Dade County that could be developed into a county-owned truck parking facility that provides truck parking inside Miami.

Figure 67 | Suitable Parcels near Hotspot T-1



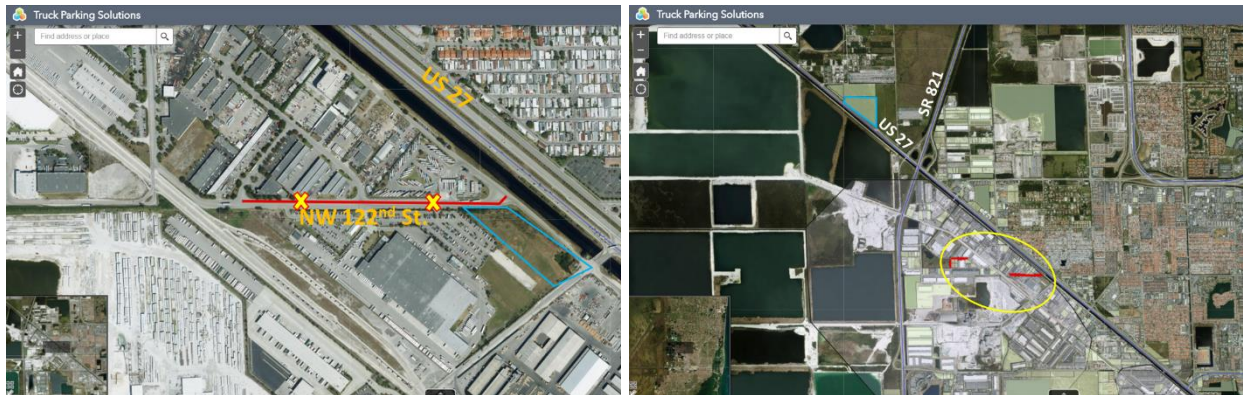




## Hotspot T-3

Hotspot T-3 had 883 unauthorized trucks parking along the three segments with the most concentrated unauthorized truck parking. The left-hand side of Figure 68 displays the location of unauthorized truck parking associated with a Pilot Travel Center, suggesting trucks are parking outside the facility because the location is overcapacity. Additionally, a vacant parcel of land (blue polygon) is across from the Pilot Travel Center, presenting an opportunity for a partnership with the local government or private sector to add truck parking spaces. Similarly, the map on the right-hand side of Figure 68 shows Hotspot T-3 circled in yellow and a blue polygon outlining a vacant parcel to the northwest that is owned by the Florida Department of Environmental Protection. The parcel could be developed into a new truck parking facility with basic amenities on-site to address some of the unauthorized truck parking in Hotspot T-3.

Figure 68 | Location of Unauthorized Truck Parking in Hotspot T-3



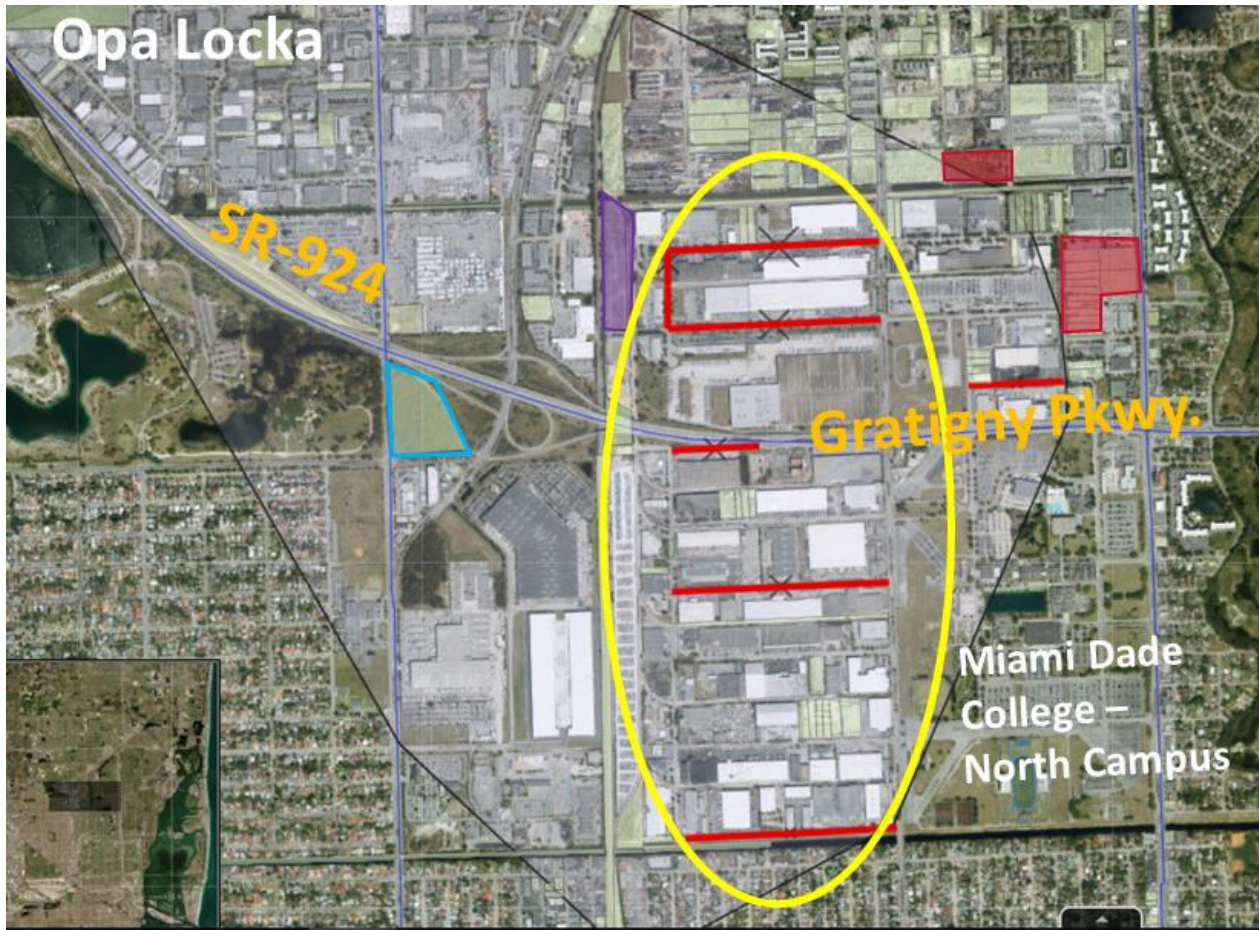




## Hotspot T-4

As shown in Figure 69, there are multiple roadway segments that have unauthorized truck parking. In total, the segments with the most unauthorized truck parking in Hotspot T-4 had a total of 5,386 unauthorized trucks. The unauthorized truck parking occurs near industrial parcels and is using unauthorized locations for staging and HOS compliance. There are no truck parking spaces near Hotspot T-4, therefore the parcels highlighted in blue (owned by Miami-Dade County), purple (privately owned), and red (owned by Miami-Dade County) were identified as potential locations for truck parking spaces.

Figure 69 | Hotspot T-4



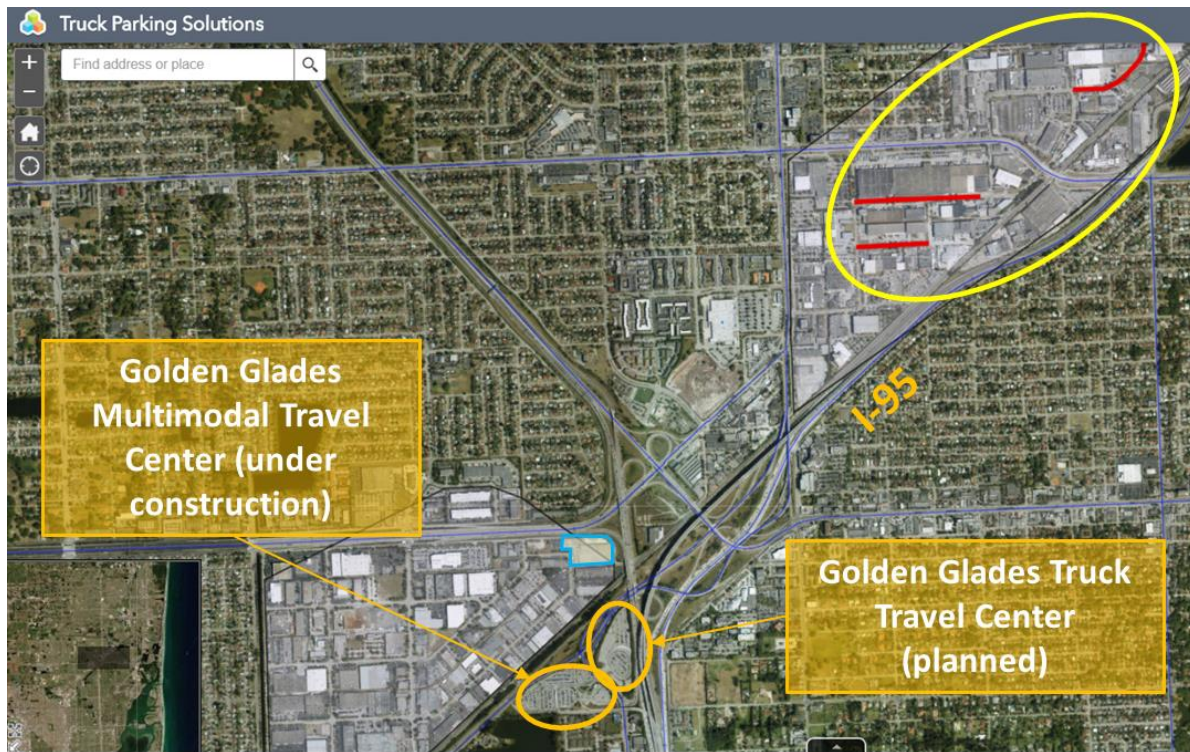




## Hotspot T-5

Hotspot T-5 is composed of three unauthorized truck parking locations near industrial land uses. Figure 70 shows the segments with unauthorized truck parking and the location of a planned project and project that is under construction at the Golden Glades Truck Travel Center. The planned project at the Golden Glades Truck Travel Center will help address unauthorized parking in Hotspot T-5. Additionally, the parcel in blue is vacant and owned by the State of Florida and could be developed to add truck parking near Hotspot T-5.

Figure 70 | Hotspot T-5



## Hotspot T-7

Hotspot T-7 does not have any roadway segments over 350 unauthorized trucks parked during the study period. There are two truck parking facilities with a total of 23 spaces, one public service plaza with 46 spaces, and one Wal-Mart that allows truck parking near Hotspot T-7. The private truck parking facilities near Hotspot T-7 are over-utilized.

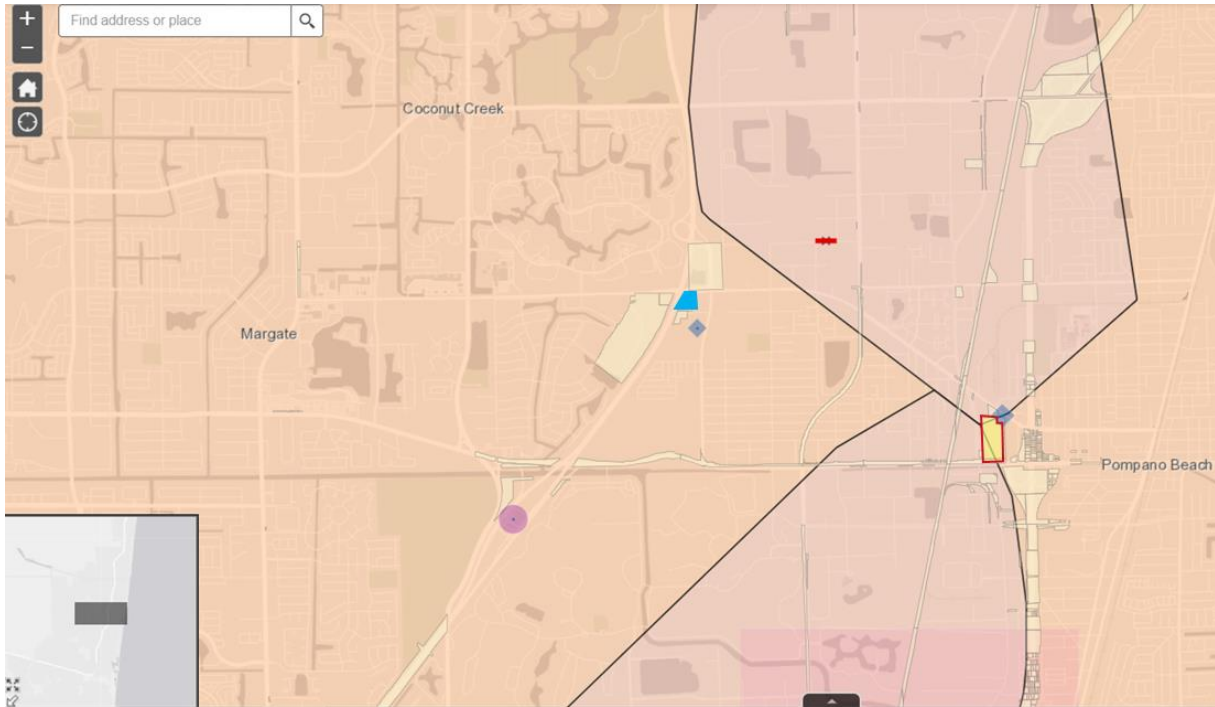
In addition to the truck parking locations, the FDACS provides 75 truck parking spaces at State Farmers Market (yellow and red polygon shown in Figure 71). State Farmers Markets present an opportunity for FDOT to partner with FDACS to both inform truck drivers about available parking at the facilities, as well as, identify any of 12 State Farmers Markets that could allow overnight truck parking.

Similarly, there is potential for the Pompano Service Plaza (purple marker) to add truck parking spaces if the available right of way allows for the expansion. The blue polygon also presents an opportunity for an



FDOT owned parcel to be used to develop a truck parking facility. There is a truck stop located close to the blue polygon that could provide fuel and amenities to truck drivers.

Figure 71 | Hotspot T-7



## Using the Results of the Inferential Analysis

The inferential analysis completed in Chapter 5 and supplemented by input from stakeholders, systematically reviewed the priority areas to understand the root cause of the truck parking issue for each priority area. The root cause of the priority areas and the in-depth analysis of potential opportunities form the list of truck parking issues and potential solutions that inform the truck parking recommendations and implementation plan.





# 06



## Chapter 6. Recommendations and Implementation Plan

The Statewide Truck Parking Study builds upon and refines the substantial truck parking work that has been completed throughout Florida by leveraging existing knowledge and applying a uniform data set and approach. This study sets the stage for FDOT to move beyond recommendations that target incremental improvements and instead position the state to proceed with a unified vision to guide future decision-making.

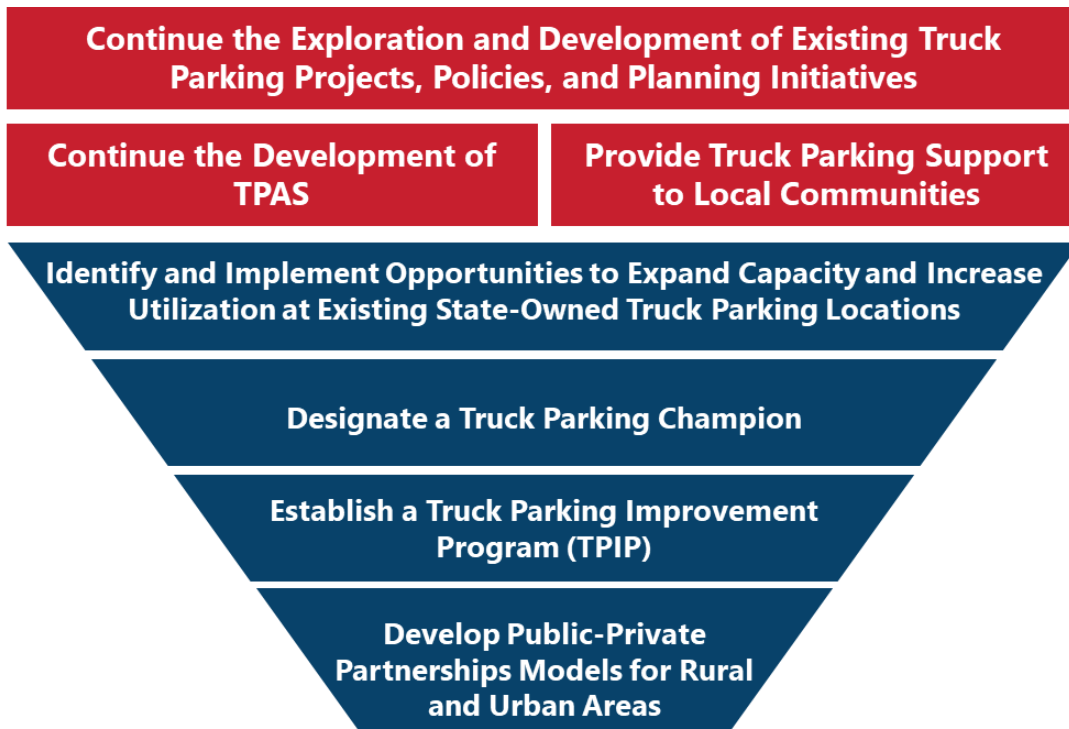
### Short Term: Focusing on Immediate Needs and Low-Hanging Fruits (1-2 years)

The strategies and recommendations presented below focus on the short-term (1-2 years) time horizon because the short-term recommendations are geared toward transitioning truck parking from a project-by-project approach to a holistic statewide truck parking program. Ultimately, the development of a statewide truck parking program and most importantly, the allocation of funding to the program, has a cascading impact on the medium (3-5 years) and long-term (5+ years) recommendations.

Figure 72 displays three strategies in red that denote the continued development of FDOT and District truck parking activities. These three strategies are key to maintaining and expanding FDOT's role in addressing truck parking issues. Similarly, the strategies displayed in blue are those that extend beyond current roles or activities and include developing and implementing the findings of this study, designating a truck parking champion, establishing a program devoted to truck parking, and developing modes for P3s in urban and rural areas.



Figure 72 | Short-Term Implementation Strategies



The following section describes the strategies and actions that form the basis for developing an institutional infrastructure that keeps incremental improvements moving forward while FDOT and its partners identify and pursue new, innovative, and ambitious projects.

## **Continue the Exploration and Development of Existing Truck Parking Projects, Policies, and Planning Initiatives**

Existing FDOT District and Central Office projects, policies, and planning initiatives form the shovel-ready projects and implementation actions that are available during the first years of the implementation plan. Additionally, as new resources are made available and new opportunities are pursued, the continuation of existing projects, policies, and planning efforts will bring continuity and insights that will inform future implementation actions. The following activities were highlighted during consultations with FDOT Districts during the course of this study:

- Projects
  - District 2 - I-75 and I-95 Rest Areas Expansion Concept
  - District 5 – I-4 Rest Area Expansion (Sanford)
  - District 6 – I-95 planned Golden Glades Travel Center
  - District 7 – I-75 Hillsborough Rest Area Redesign and Reconstruction
  - Florida Turnpike – Canoe Creek Service Plaza, West Palm Beach Service Plaza, and Tandem Staging Lot at Turkey Lake
- Continue FDOT involvement in District truck parking planning efforts
  - District 1 - Truck Parking Study (2020)
- Support innovative pilot projects and best practices





- District 4 - Farmers Market Pilot
- District 2 - WIM Pilot Project at Yulee WIM Station

## Identify and Implement Opportunities to Expand Capacity and Increase Utilization at Existing State-Owned Truck Parking Locations

Through the update to the Rest Area Master Plan, FDOT should identify opportunities to optimize and add truck parking at existing rest areas. Additionally, FDOT should undertake pilot projects and awareness campaigns to promote under-utilized rest areas and weigh stations. By first targeting existing state-owned truck parking location, FDOT can address truck parking needs in the short-term, while pursuing projects that have long development timelines, such as using FDOT-owned parcels or ROW to develop new truck parking projects.

## Provide Truck Parking Support to Local Communities

The FDOT DFCs should conduct outreach with local communities to share the findings of the Statewide Truck Parking Study that are relevant to the jurisdiction. Additionally, FDOT should share the tools (land suitability analysis, truck parking locations, utilization, solutions toolbox, and funding toolbox) developed in this study with local communities to provide context to the truck parking problems they are observing.

Beyond initial knowledge transfer, the DFCs will serve as the connection point between local communities and Central Office. Local communities and the DFCs are critical to identifying opportunities and mitigating challenges that truck parking projects often encounter. Additionally, the DFCs and Central Office should support the development of policies that incorporate truck parking into planning and land use by identifying best practices and key issues to consider when incorporating truck parking into planning and land use.

## Continue the Development of TPAS

TPAS implementation is underway and should continue on the existing path and begin to pursue the integration of other providers of truck parking information. This integration and interoperability of TPAS data will provide additional high-value information. For example, private truck parking facilities provide 2.3 spaces for every public space, making the integration of private truck parking availability an important next step for TPAS. Additionally, incorporating information from neighboring states and vice versa, increases the reach of TPAS and its ability to inform truck driver decision-making.

## Designate a Truck Parking Champion

FDOT should designate a truck parking champion who is tasked with monitoring, implementing, and serving as the FDOT Central Office point of contact for public and private truck parking stakeholders. Initially, the truck parking champion will be focused on developing a communication plan that includes a website, brochures, and resource documents to communicate the findings and resources developed in this and previous studies, as well as conveying the need for a defined truck parking program.

## Establish a Truck Parking Improvement Program (TPIP)

FDOT should establish a formal program that is supported by a defined funding apportionment of \$10 million per year for at least five years. The TPIP should be similar to the Rest Area Program and Park and



Ride Program, in that it defines truck parking facilities from FDOT's perspective and establish FDOT's role in truck parking. The TPIP must provide clear guidance to the Districts on how to approach truck parking projects from procedural, technical, and funding perspective, including the process for local governments and private stakeholders to pursue partnership opportunities.

Apportioned funding for the TPIP could occur through either legislative request or by leveraging National Highway Freight Program (NHFP) funds. Additionally, FDOT's Strategic Intermodal System (SIS) program could be used to fund truck parking capital projects. In addition to the \$10 million for capital projects, additional operations and maintenance funding will be needed to cover ongoing costs. This operations and maintenance funding will likely require legislation to allocate consistent funding for the operation and maintenance of truck parking facilities.

Overall, the TPIP will provide the FDOT Districts with the certainty needed to pursue longer-term initiatives and build on early wins and incremental improvements. Additionally, the TPIP is a signal to the private sector (truck drivers, carriers, developers, and truck stop operators) that FDOT is committed to addressing truck parking needs.

## **Develop Public-Private Partnerships Models for Rural and Urban Areas**

FDOT should assess the barriers to the development of truck parking P3s using grants and other transportation funding as a precursor to soliciting private sector interest in developing or expanding truck parking facilities. Developing P3 models for rural and urban areas accounts for the high land acquisition cost in urban areas and the high levels of demand in urban areas which make them viable for a commercial truck parking facility with amenities, which is not the case in rural areas.

## **Short-Term Implementation Actions**

Table 9 displays the implementation steps outlined above in a single table. The short-term implementation actions include a number of new initiatives for FDOT, including pilot projects and the development of the TPIP. Therefore, FDOT should establish truck parking metrics to measure the progress and impact of the implementation actions of this study.



**Table 9 | Short-Term Truck Parking Implementation Actions**

Strategy	Organization	Activities
<b>Continue the Exploration and Development of Existing Truck Parking Projects, Policies, and Planning Initiatives</b>	FDOT District with support from FDOT Central Office	<ul style="list-style-type: none"> <li>• Support on-going truck parking projects                             <ul style="list-style-type: none"> <li>○ <b>D2</b> - I-75 and I-95 Rest Areas Expansion Concept</li> <li>○ <b>D5</b> – I-4 Rest Area Expansion at Sanford</li> <li>○ <b>D6</b> – I-95 planned Golden Glades Travel Center</li> <li>○ <b>D7</b> – I-75 Hillsborough Rest Area Redesign and Reconstruction</li> <li>○ <b>Turnpike</b> – Canoe Creek Service Plaza, West Palm Beach Service Plaza, and Tandem Staging Lot at Turkey Lake</li> </ul> </li> <li>• Continue FDOT involvement in District truck parking planning efforts                             <ul style="list-style-type: none"> <li>○ <b>D1</b> - Truck Parking Study (2020)</li> </ul> </li> <li>• Support innovative pilot projects and best practices                             <ul style="list-style-type: none"> <li>○ <b>D4</b> - Farmers Market Pilot</li> <li>○ <b>D2</b> - WIM Pilot Project at Yulee WIM Station</li> <li>○ Electrification and alternative fuel corridor application</li> </ul> </li> </ul>
<b>Identify and Implement Opportunities to Expand Capacity and Increase Utilization at Existing State-Owned Truck Parking Locations</b>	FDOT Central Office and Districts	<ul style="list-style-type: none"> <li>• Update to the FDOT Rest Area Master Plan</li> <li>• Develop projects based on Rest Area Master Plan findings</li> <li>• Transfer findings and best practices Farmers Market and WIM Pilot project to other locations, as warranted</li> <li>• Build on District Truck Parking studies to identify additional opportunities</li> </ul>
<b>Provide Support to Local Communities to Improve Truck Parking</b>	Districts	<ul style="list-style-type: none"> <li>• Conduct outreach with local communities to share the findings and tools developed by the Statewide Truck Parking Study that are relevant to their jurisdiction</li> <li>• Identify what support is needed to overcome the challenges that truck parking policies and projects encounter at a local level</li> </ul>
<b>Continue the Development of TPAS</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Promote the use of TPAS information in private sector applications</li> <li>• Discuss integration of private truck stop data into TPAS</li> <li>• Coordinate expansion into neighboring states and system interoperability</li> </ul>



# Statewide Truck Parking Study



Strategy	Organization	Activities
<b>Designate a Truck Parking Champion</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Develop a communication plan that includes a website, brochures, and resource documents to communicate the findings and tools developed in this study                             <ul style="list-style-type: none"> <li>○ The communication plan should include an awareness campaign to promote under-utilized truck parking locations</li> </ul> </li> <li>• Advocate and advance policy recommendations within FDOT while the truck parking program is established</li> <li>• Formalize FDOT’s existing truck parking efforts into a defined program that is focused on truck parking with defined funding</li> </ul>
<b>Establish a Truck Parking Improvement Program (TPIP)</b>	FDOT Central Office with support from Districts	<ul style="list-style-type: none"> <li>• <b>Pre TPIP Development:</b> Establish the goals and objectives of the TPIP and identify metrics to assess the progress of the TPIP</li> <li>• <b>Pre TPIP Development:</b> Leverage the Statewide Truck Parking Study data, findings, final report, and brochure to request \$10 million in annual funding for truck parking and the formal establishment of the TPIP                             <ul style="list-style-type: none"> <li>○ Apportion dedicated funding for truck parking projects either through legislative request or by leveraging NHFP funds</li> <li>○ Identify Operations and maintenances funding source for truck parking</li> <li>○ Develop procedure similar to FDOT Rest Area Program and Park and Ride Program</li> </ul> </li> <li>• <b>Pre TPIP Development:</b> Truck parking activities should be documented on the TPIP website and continue their implementation and development while formal funding and TPIP is established</li> <li>• <b>Post-TPIP Development:</b> Inform stakeholders about the TPIP</li> <li>• <b>Post-TPIP Development:</b> Develop and implement an annual call for truck parking projects that establishes a formal process and selection criteria for the District and local governments to submit projects or planning studies for funding</li> </ul>
<b>Develop Public-Private Partnerships Models for Rural and Urban Areas</b>	FDOT Central Office	<ul style="list-style-type: none"> <li>• Explore impediments to P3 agreements for truck parking and the opportunity to partner with DEO to enter into a P3</li> <li>• Develop P3 models for urban and rural areas</li> </ul>



## Medium-Term: Leveraging Opportunities (3-5 Years)

As previously noted, the progress towards implementing the strategies and actions identified in the short-term affects what is possible in the medium-term time horizon. That said, the implementation actions in the medium-term have greater variety in what is possible because of the groundwork developed in this study, actions in the short-term Implementation Plan, and the longer time horizon that exists for projects and policies to develop. Additionally, the specific actions undertaken in the medium-term should be informed by the success and challenges encountered during short-term implementation.

### Leverage the TPIP

The underlying strategy for the medium-term is to leverage the TPIP by implementing a call for projects. The TPIP approach acknowledges the role of the FDOT Central Office, DFCs, and other stakeholders, by providing a funding mechanism and data to inform the identification of projects, policies, and partnerships. The actual identification and submission of a project should come from the Districts and/or local jurisdiction so that the project accounts for local factors that could make or break a proposed TPIP project, policy, or partnership.

Therefore, the truck parking champion should continue to conduct outreach about the TPIP process and opportunities to ensure a robust set of submissions. The Districts should be working with local communities to identify truck parking opportunities using local knowledge and the data and findings of this study. The findings of the inferential analysis, funding and solutions toolbox, land suitability analysis, truck parking supply, and truck parking utilization/unauthorized truck parking tools should be key resources for identifying opportunities in areas with truck parking issues.

### Leverage Partnership

Using the responses from the identification of barriers to developing a truck parking P3 and the rural and urban models for truck parking P3s, FDOT should decide if P3s should be funded through the TPIP, other state/federal grant program, or through a separate RFP.

### Revisit Statewide Truck Parking Needs

After four years or three rounds of project solicitations under the TPIP, FDOT Central Office should reassess the state's truck parking needs and the outcomes from the short and medium-term implementation. The focus of revisiting the truck parking needs is to identify what has changed since this study, challenges, successes, and new or existing opportunities. The annual review of truck parking implementation and metrics will inform the reassessment of Florida's truck parking needs and define the future of the TPIP and what other implementation actions are needed to address truck parking challenges.

## Long-Term: Position for Possibilities (5+ Years)

The transportation and logistics industry is quickly changing through new technology that will affect the demand for truck parking and the amenities needed at truck parking facilities trends. For example, the demand for truck parking could be substantially reduced as connected and autonomous vehicles (CV/AV) become common on Florida's roads. Additionally, electrification of trucks has the potential to change the needs at truck parking facilities, as well as mitigate some of the negative impacts of trucks,

# Statewide Truck Parking Study



such as noise and pollution. Therefore, FDOT should monitor the development of these and other technologies and trends impacting freight to position the Department for future possibilities.

## Final Thoughts

The Statewide Truck Parking Study recommendations and Implementation Plan provide a structure that sets the stage for FDOT Central office, FDOT Districts, local jurisdictions, and private sector stakeholders to address the state’s truck parking needs. The data and analysis provided by this study and the development of the TPIP form the basis for innovative solutions that take into account local needs, challenges, and realities. Lastly, the assessment of implementation progress, identification of lessons learned, and revisiting truck parking in the medium-term closes the feedback loop and pushes all truck parking stakeholders to innovate and remain accountable during implementation.





## Appendix A. Summary of Florida Truck Parking Studies

### Comprehensive Parking Study for Freight Transport in Miami-Dade County

The “Comprehensive Parking Study for Freight Transport in Miami-Dade County” was finalized in 2010. The study estimated the demand for truck parking based on truck registration data provided by the State. Specifically, the study used intrastate truck registrations and Interstate Registration Program (IRP) adjusted by the type of truck, fleet size, zip code, and length of haul based on the Florida Intermodal Statewide Highway Freight Mode to identify local and long-haul truck parking demand.

The study ultimately identified a severe shortage of truck parking in Miami-Dade County. Specifically, the study estimated an overall truck parking demand of over 12,000 spaces, but the county only has 293 truck parking spaces. The recommendations of the study are as follows:

- Develop a county policy for the development of a truck parking program
- Coordinate with law enforcement
- Develop outreach material and conduct community outreach
- Conduct market research
- Engage the private sector
- Validate and refine desired truck parking functionality
- Develop a strategic land acquisition and build-out plan
- Develop ownership and fee structure plan
- Conduct detailed site analyses

### Development of Truck Parking Facilities in Miami-Dade County, Phase II – Options for Implementation

Completed in 2012, the “Development of Truck Parking Facilities in Miami-Dade County, Phase II – Options for Implementation” is a continuation of the 2012 study of truck parking in Miami-Dade County. The 2012 study prototyped truck parking sites to assist developers and property owners in the development of truck parking facilities. The study also identified amenities, the order of magnitude costs, business models, and parcels that could be viable options for truck parking facilities.

### Regional Truck Parking and Service Issues

Completed in 2014 as part of the “Tampa Bay Regional Goods Movement Study,” the “Regional Truck Parking and Service Issues Overview” is a white paper that used the FDOT website and the “Truck Stop Guide” to identify the supply of public and private truck parking at rest areas, weigh stations, and truck stops. The study identified public and private truck parking within and surrounding the Tampa Bay Region. In total, the study identified 574 public truck parking spaces and 1,741 private truck parking spaces.

The study also identified opportunities to address truck parking needs, specifically identifying the following future considerations for freight planning in the Tampa Bay Region:



- Expedite the implementation of real-time information for truck parking availability and used historic data to develop truck occupancy rates
- Identify rest areas and weigh stations with insufficient capacity and add truck parking
- Continue to support security personnel at state rest areas and weigh stations
- Pursue public-private partnerships to acquire land or improve existing facilities (e.g. lighting, security)
- Develop and implement an FDOT/Bureau of Motor Carrier Compliance/Florida Highway Patrol truck stop security certification program based on the European Union SETPOS program

## Truck Parking Utilization Study: Turnpike Service Plazas and Tandem Truck Staging Lots

The 2015 “Truck Parking Utilization Study: Turnpike Service Plazas and Tandem Truck Staging Lots” studied truck parking availability and utilization along the Turnpike system and identified peak parking demand and parking deficiencies. The utilization of the eight service plazas along the turnpike was collected via a continuous video recording for one week in 2015. The counts were adjusted to reflect seasonality and undesigned truck parking occurring outside of the areas captured by cameras. The study serves as a resource to inform future freight decision-making.

### St. Augustine Truck Parking Management Plan

The “St. Augustine Truck Park Management Plan” was completed in 2015. The study included an inventory of truck parking, the collection of traffic data, analysis of truck parking occupancy, a user survey, and public workshops to develop a parking strategy.

The study identified truck parking accommodating two delivery vehicles, 23 medium trucks, and four heavy trucks in the study area. All truck parking was provided by the private sector. Observed occupancy and a delivery company survey were also used to collect information on the use of truck parking. The recommendations of the study are as follows:

- Time restrictions should be implemented in loading zones during peak hours
- Redesign of existing parking areas
- Smart parking management systems would help manage space availability
- Loading zone fees, permits, and fines should be updated to incentivize compliance
- Establishing truck routes within the city could help reduce impacts

### South Florida Truck Stop Market Analysis

The 2016 “South Florida Truck Stop Market Analysis” surveyed 65 truck stops within 150 miles of Miami, including the number of fuel pumps, available parking, square footage and condition of the property, fuel sales volume estimates, and convenience store/food sales estimates. The study also interviewed truck drivers, fleet operators, and other transportation stakeholders. The market analysis also identified the potential customer base, existing and projected traffic data, and developed sales projections to match with projected costs estimates of construction to ultimately assess the financial feasibility of a P3 to develop truck travel centers and other commercial truck services at two state-owned sites in District 6. Consultations with commercial property development and lending experts ultimately led to the recommendation that a ground lease would make the most sense for the projects considered.



## Orlando Tandem Truck Staging Lot – Update to Preliminary Study

The 2017 “Orlando Tandem Truck Staging Lot – Update to Preliminary Study” builds upon the 2008 preliminary study by analyzing the four sites identified in the 2008 study and identified other potential sites. The study conducted consultations with companies that operate tandem trucks, analyzed truck traffic, crash data, and drainage impact analysis. Ultimately, the prohibitions of left turns at the existing site led to the recommendation that the Turnpike proceed to replace the I-4 tandem truck staging lot with a site at Turley Lake Service Plaza. The Turley Lake Service Plaza received five good rankings and one adequate. Additionally, the final design should include TPAS to provide drivers with advanced notice.

## North & Central Florida Truck Stop Market/Site Analysis

The 2017 “North & Central Florida Truck Stop Market/Site Analysis” included a review of the market for commercial truck parking and related services, a survey of travel centers, truck stops and fuel stops, and a review of traffic and freight trends. In addition to the existing facilities and trends, the study also analyzed the characteristics of truck parking facilities and the options for sites. For example, the minimum requirements including available acreage, parking, retail operations, and other truck-related services

- Physical analysis of the proposed site including available acreage, access, and surrounding property
- Utility analysis including facility constraints assessment, including access to utilities, flood plain concerns, and environmental concerns
- Financial assessment of the proposed facility including a capital finance plan and operating finance plan

## Public Rest Area Truck Parking

The 2017 “Public Rest Area Truck Parking” Technical Memorandum focused on truck parking at public rest areas along the I-75 corridor within District 7. The study used Bluetooth, video, and tube counts to collect count data for trucks entering and exiting rest areas. The memo compared approaches to collecting truck count data to determine the pros and cons of each approach.

Using the count data, truck parking utilization was assessed to identify the availability and over-capacity of truck parking spaces. The results of the analysis showed truck parking was overcapacity during the late evening to early morning hours and a large number of spaces available during the daytime hours.

The memorandum made the following recommendations:

- FDOT should consider providing a “go-around” to allow trucks to access the additional large vehicle parking spaces in the RV area, when available, to reduce the illegal parking on-ramp areas and shoulders
- Consider adding hard shoulders within rest areas for legal overcapacity parking
- Add signage to truck-only areas that specify areas are for commercial trucks and will be enforced
- Add an advanced notification system to inform truck drivers about parking availability





## District One Districtwide Freight Truck Parking Inventory

The “District One Districtwide Freight Truck Parking Inventory” completed in 2017 focused on field inventories and observations to document existing or potential sites that could be used for overnight truck parking. The study recommended the following:

- Coordinate with adjacent districts, local communities, and agencies to analyze ongoing truck parking issues and plan for ways to mitigate the problem
- Identify ordinances that restrict overnight parking
- Identify other FDOT-owned sites that could be used for future truck parking

## District Four Truck Parking Supply and Demand Phase 1

The 2017 truck parking study for District Four included an inventory of truck parking facilities and used a methodology from the Federal Highway Administration (FHWA) to estimate the demand for truck parking. In-person and online truck driver surveys were conducted, as well as surveys of truck parking facility operators. In total, the study found truck parking demand ranges from about 2,000 to 2,600 and available truck parking is 1,600. As a result, District Four’s unmet truck parking demand is about 500 to 1,000 spaces.

The recommendations of the study are as follows:

- Identify possible land available for truck stop development by county
- Identify state-owned lands available for truck stop development
- Identify needed improvements at existing FDOT truck parking facilities
- Identify access improvement needs at existing private truck parking facilities
- Identify non-capacity opportunities to increase utilization at existing facilities
- Define the best role for FDOT in partnering with private developers and truck stop operators
- Estimate impact of seasonal peaks on truck parking demand

## District Five: Central Florida Truck Parking Study

Completed in 2017, the “Central Florida Truck Parking Study” developed and validated an inventory of truck parking using the Jason’s Law dataset, stakeholder input, online resources, and aerial imagery. The study developed an estimate of demand for truck parking using the methodology from the FHWA. The study also included information about truck parking using in-person and online truck driver surveys, as well as field observations and truck counts using video capture. Interactive public stakeholder meetings were held and included participation from local residents, government agencies, truck drivers, and industrial real estate professionals.

The study identified the following strategies and projects:

- Identify public-private partnerships that could help increase truck parking
- Work with local governments to develop infrastructure and communication strategies and policies for truck parking
- Improve existing rest areas through redesign and the implementation of ITS technology.
- Improved information for parking availability will help truckers locate parking spots
- Develop truck-only facilities for additional capacity
- Private-public partnering to create new facilities
- Mitigate community impacts and negative connotations in urban/suburban areas using noise walls, improved lighting, increased LEO patrol, and vehicle electrification



- Identified public funding sources and discretionary grants for truck parking funding.
- Leverage existing weight stations
- Repurpose existing ROW
- Joint use park and ride lots
- Truck turnout areas
- Freight Advanced Traveler Information System (FRATIS)
- Mobile device apps
- Autonomous and connected commercial vehicles
- Coordination and partnerships
- Data and research
- Federal Funding (Discretionary)
- Rest area formula
- Grants and tax incentives
- Generating revenue to pay for parking
- Parking at existing industrial sites
- Retrofit partnership
- Off Interstate/P3 Truck Parking Areas

## District Two Truck Parking Study

The truck parking study covering District Two assessed truck trips to, from, and within the district, considered truck counts, used the FHWA methodology to assess truck parking demand, surveyed stakeholders online and in-person, considered unauthorized parking, and identified on-typical sources of truck parking funding.

The study identified the following near-term recommendations:

- Re-design older rest areas to improve circulation, safety, and capacity for various sized commercial trucks
- Formalize informal parking at existing rest areas and evaluate opportunities to reconfigure green space
- Leverage current public ROW to safely add to available parking
- Identify opportunities to add new amenities to existing facilities (public rest areas and weigh stations) to incentivize utilization
- Target key corridor segments with over-utilized parking, such as the I-295 (East) and I-95 corridors near Jacksonville to immediately address the lack of parking
- Work with Central Office to revise rest area formula and identify new funding opportunities
- Consider the impacts of new HOS regulations
- Utilize new federal transportation funding programs based on new published criteria and priorities

The study identified the following mid-term recommendations:

- Foster Opportunities to develop municipal truck-only parking facilities in critical areas such as along I-75, I-95 in and north of Jacksonville, and along I-295 East
- Leverage and expand the TPAS program for greater coverage such as private truck parking facilities.
- Consider the impacts of Connected Automated Vehicle (CAV) and alternative fuel technology on both short and long-haul commercial truck trips.



The study identified the following long-term recommendations:

- Foster Opportunities to develop municipal truck-only parking facilities in critical areas such as along I-75, I-95 in and north of Jacksonville, and along I-295 East.
- Leverage and expand the TPAS program for greater coverage such as private truck parking facilities.
- Consider the impacts of Connected Automated Vehicle (CAV) and alternative fuel technology on both short and long-haul commercial truck trips.

## Commercial Motor Vehicle Parking Trends at Rest Areas and Weigh Stations

The “Commercial Motor Vehicle Parking Trends at Rest Areas and Weigh Stations” was completed in 2012. The project used overnight field visits of all public rest areas on I-10, I-75, and I-95 corridors to collect information about the supply and demand for truck parking. This information was supplemented with consultations of security officers, state troopers, county sheriffs, and FDOT staff. The field survey and consultations enabled a measurement of the capacity problems at each rest area. Additionally, the study assessed technology that could be used to improve the management of truck parking in rest areas.

The study ultimately recommended:

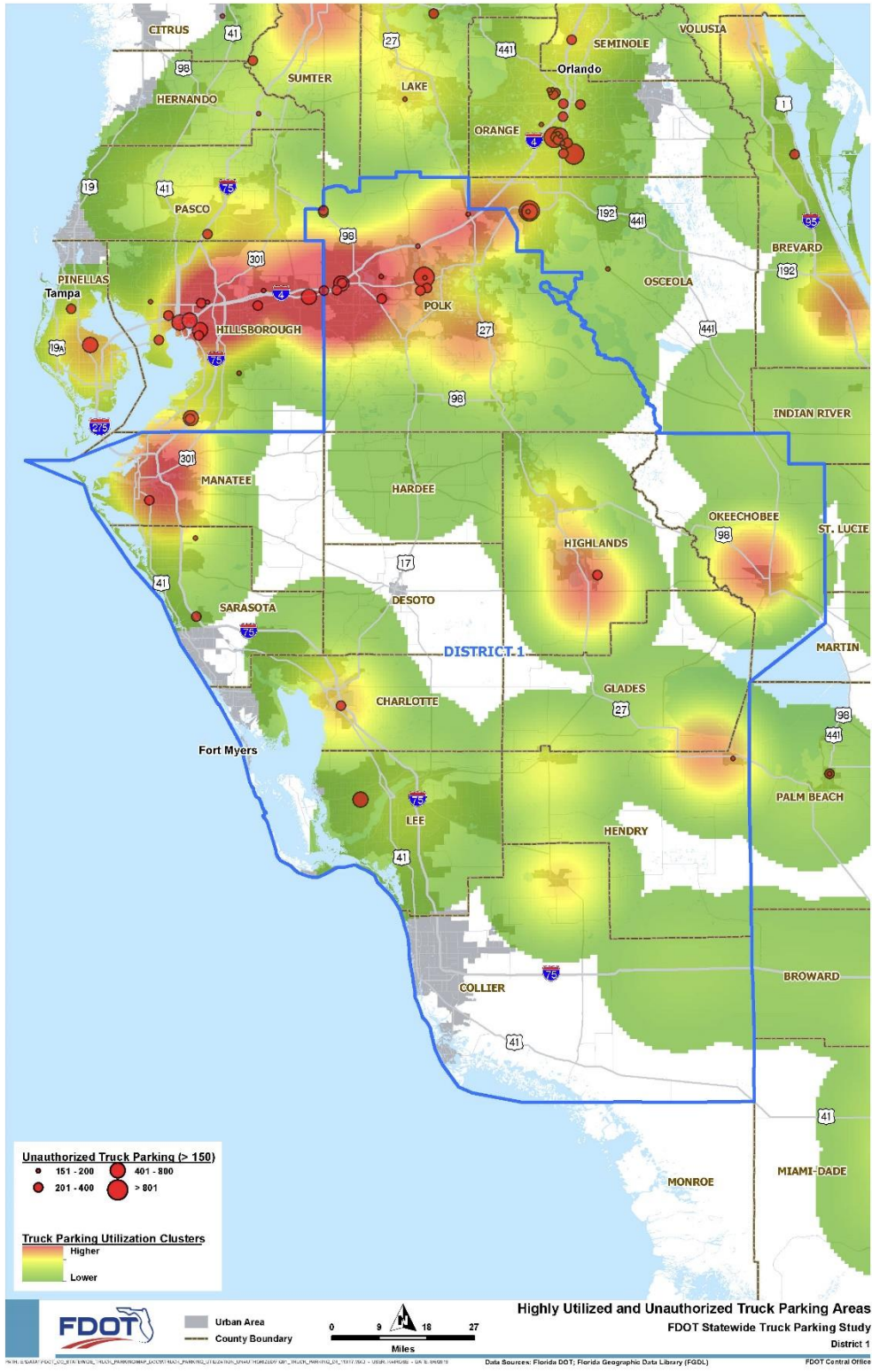
- Achieve better utilization of weigh stations by determining why drivers do not use weigh stations for truck parking and develop recommendations that address driver concerns
- Develop a comprehensive truck stop database in Florida that provides truck drivers with information about public and private truck parking facilities
- Evaluate of P3 opportunities for Florida’s rest areas and truck stops





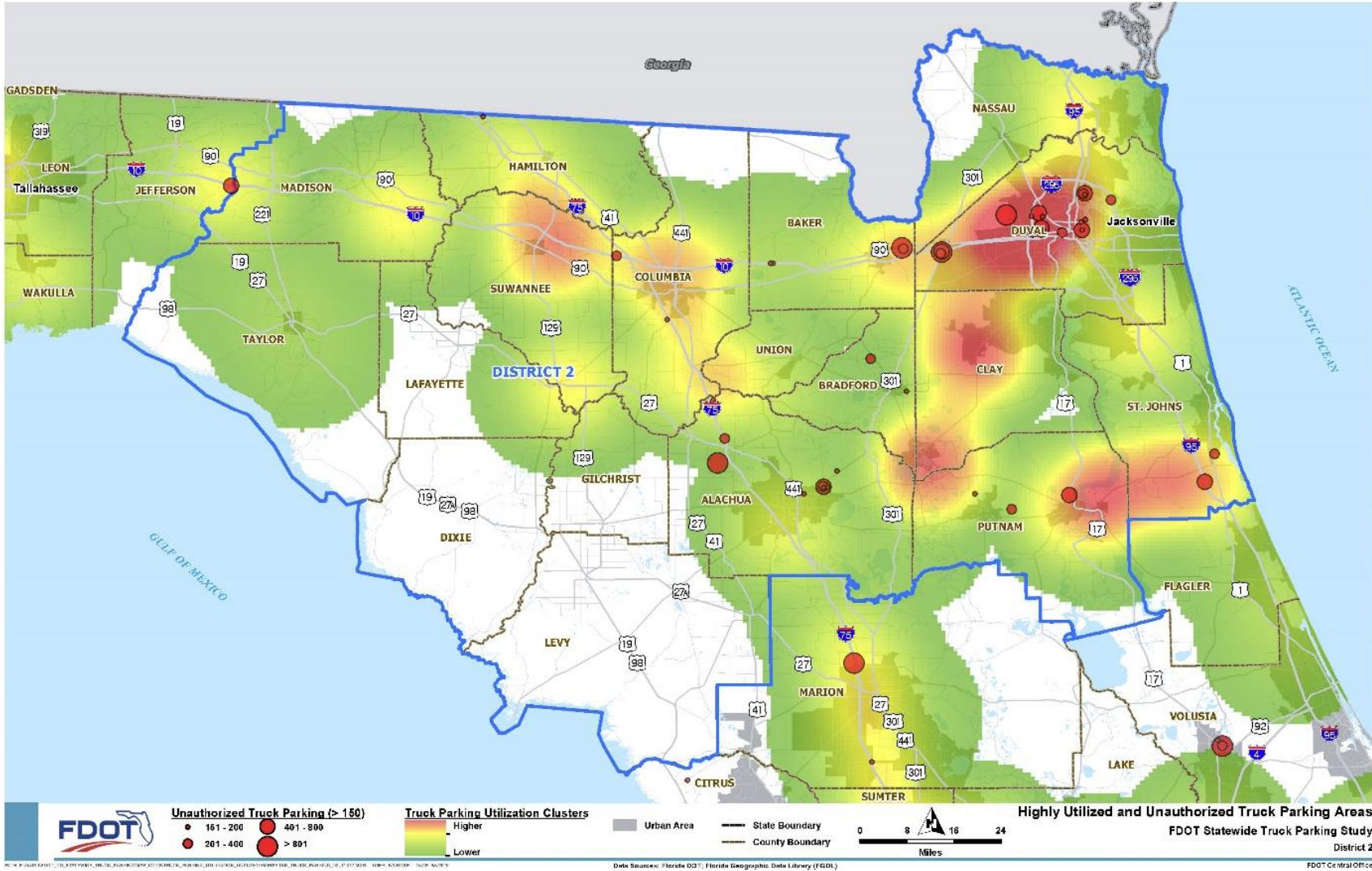
## **Appendix B. District Public and Private Truck Parking Utilization**

# Statewide Truck Parking Study



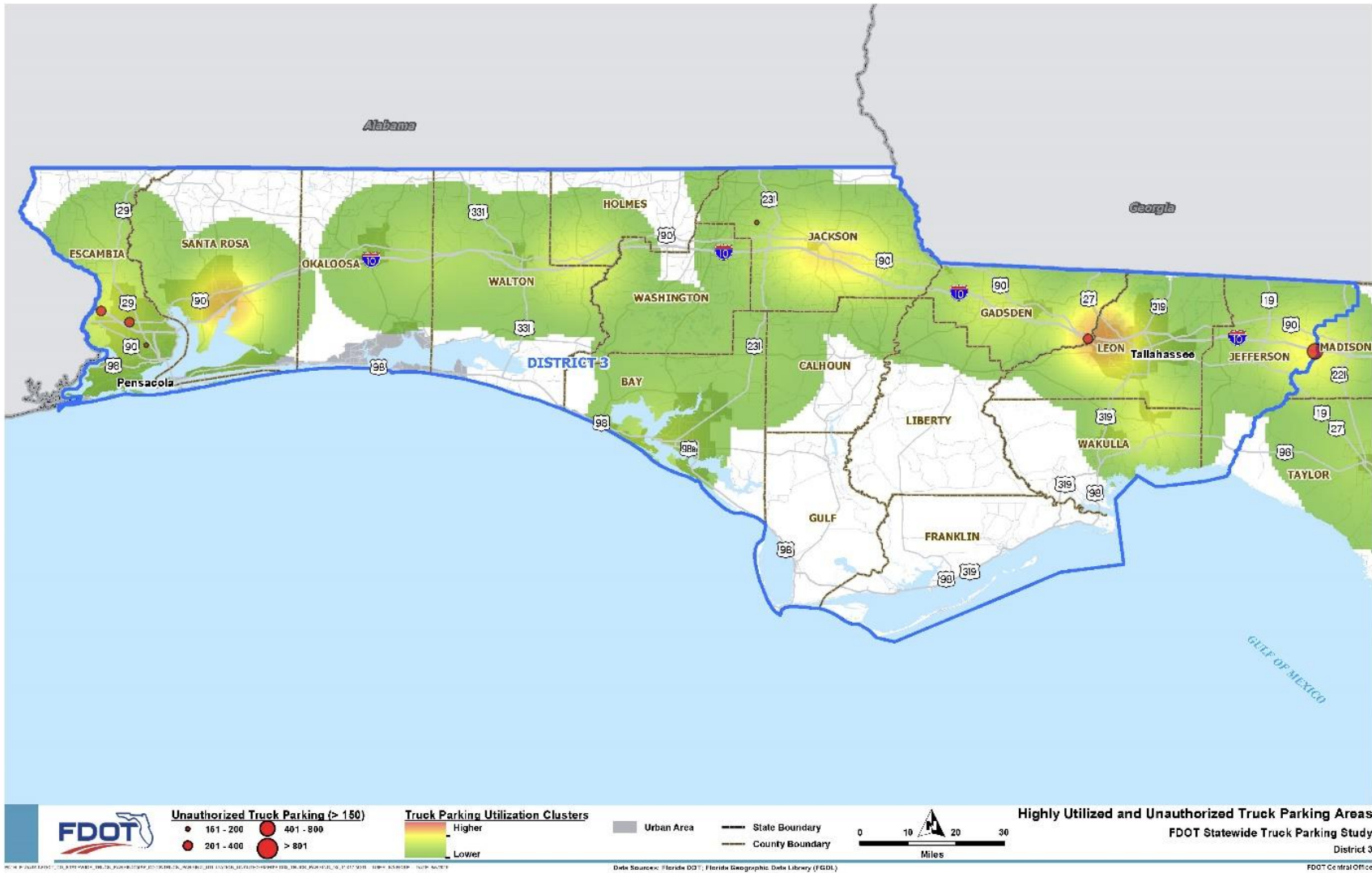


# Statewide Truck Parking Study

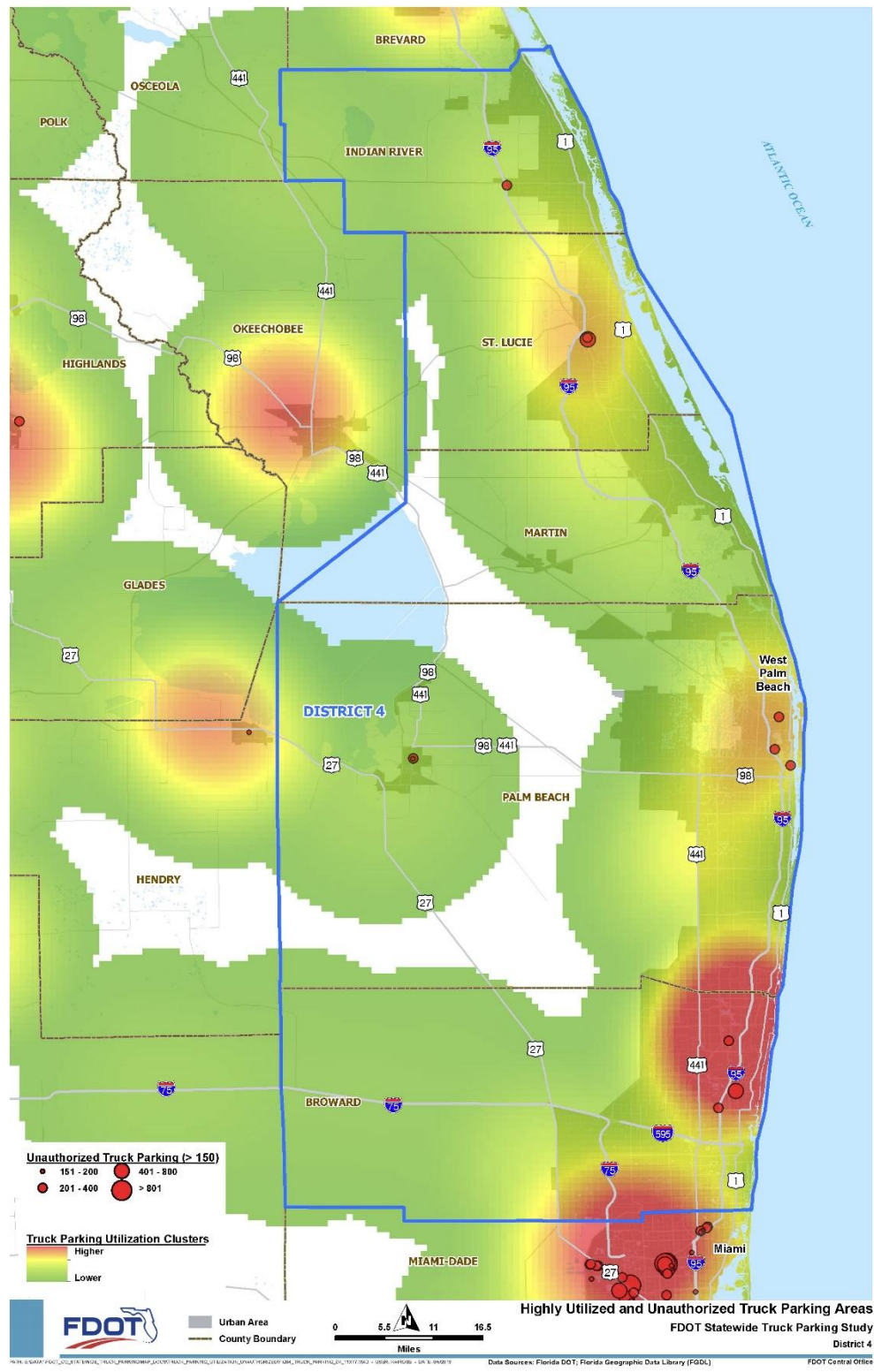




# Statewide Truck Parking Study

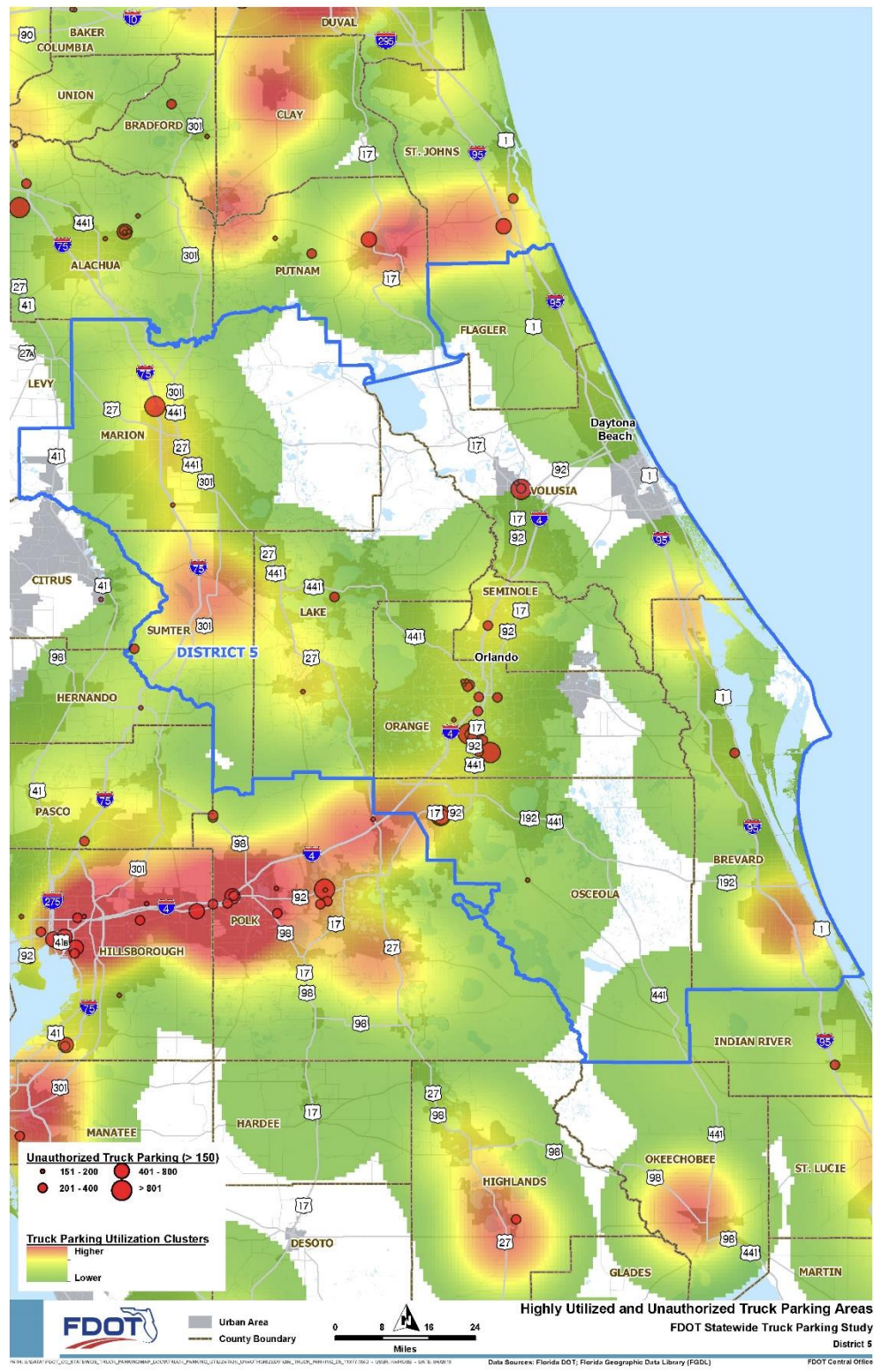


# Statewide Truck Parking Study



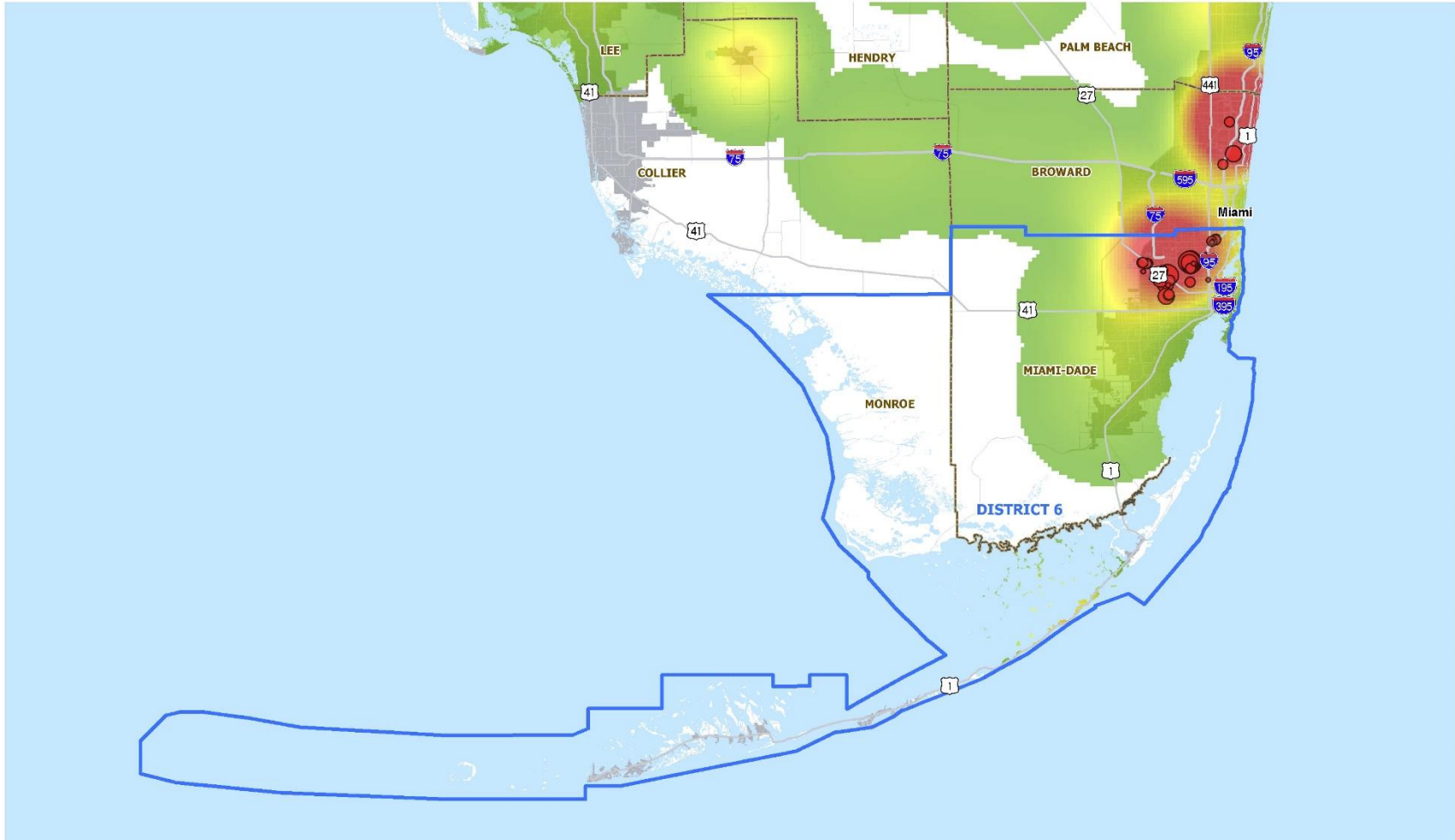


# Statewide Truck Parking Study





# Statewide Truck Parking Study



**Unauthorized Truck Parking (> 150)**

- 151 - 200      ● 401 - 800
- 201 - 400      ● > 801

**Truck Parking Utilization Clusters**

- Urban Area
- State Boundary
- County Boundary

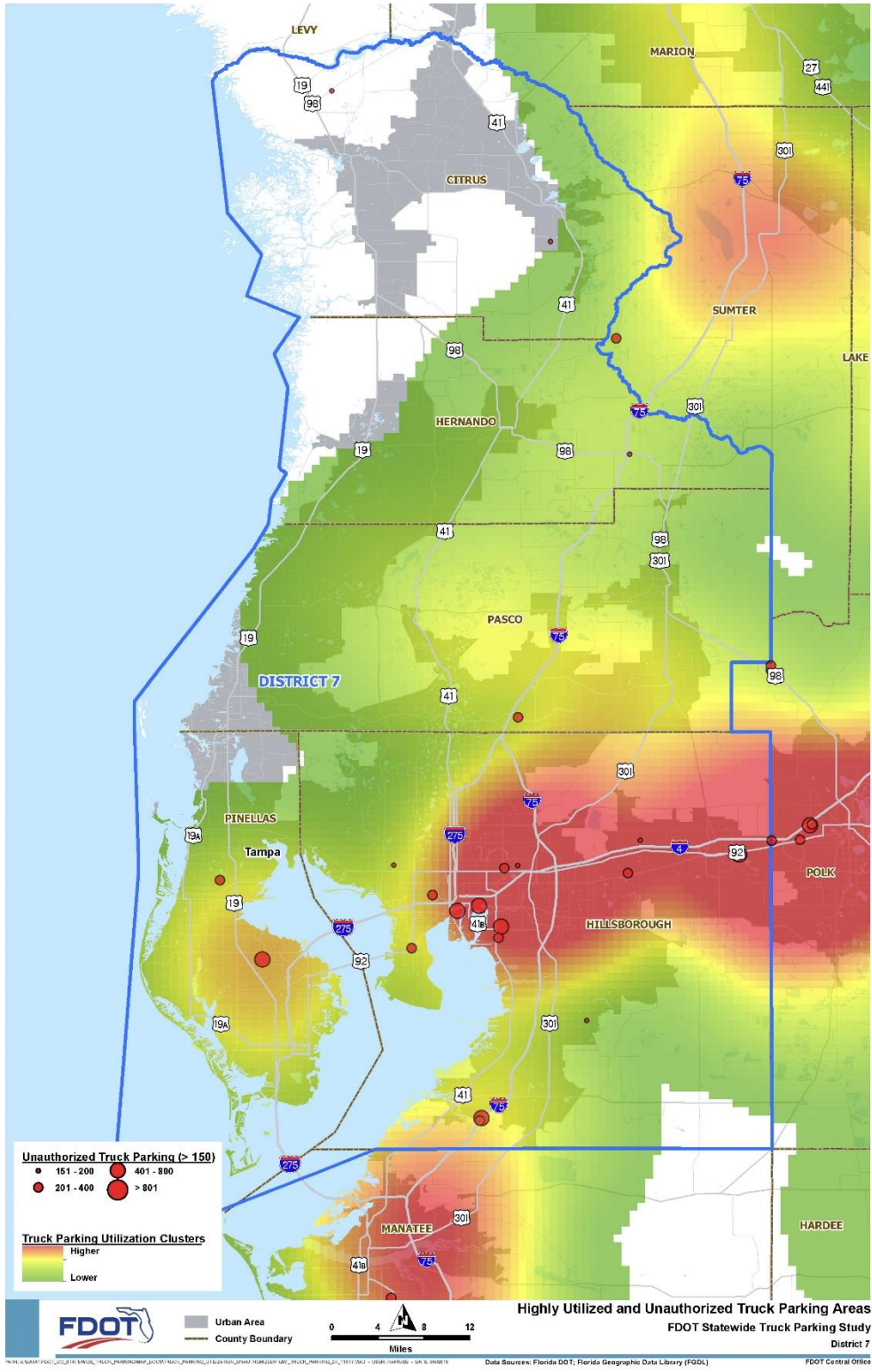
Miles

**Highly Utilized and Unauthorized Truck Parking Areas**

FDOT Statewide Truck Parking Study  
District 6

Data Sources: Florida DOT; Florida Geographic Data Library (FGDL)

# Statewide Truck Parking Study





## Appendix C. Land Suitability Analysis Framework

In order to aid in the identification of opportunities and the development of new truck parking facilities, the Statewide Truck Parking Study developed a land suitability analysis that uses a GIS-based multi-criteria decision-making model to locate land parcels suitable for developing truck parking facilities. The suitability analysis is a resource that can be used by all levels of government to identify locations where truck parking could be added.

The land suitability analysis was conducted using the Spatial Modelbuilder functionality within ArcGIS Desktop 10.6.1. Aside from some minor pre- and post-processing steps, the land suitability analysis followed a two-tier process:

- **Tier 1:** Implement a raster-overlay process focused on identifying the areas within each District suitable for truck parking based on a variety of spatial characteristics.
- **Tier 2:** Identify land-ownership parcels meeting specific criteria which fell within the high-suitability areas identified by Tier 1.

The details of Tier 1 and Tier 2 modeling processes follow.

### Tier 1 Land Suitability Model

The Tier 1 land suitability model combined seven different criteria with a weighted overlay into a single, overall land suitability layer (Figure 73). When developing the inputs of a multi-criteria decision-making model, it was useful to keep in mind the phrase “all else considered equal.” That is, each *individual* factor was evaluated as if it was the only one that would affect the desirability of an area for truck parking.





Figure 73 | Tier 1 Modeling Flowchart



FDOT Statewide Truck Parking  
Land Suitability Analysis – Tier 1

In Tier 1, each criterion defined an area of the landscape according to its desirability for providing a truck parking facility. Most of the criteria were defined from the perspective of a truck driver looking for a suitable place to park. The seven input criteria are described in detail below.

## Road Proximity

For road proximity, the most desirable locations would be those within a very short drive from an interchange exit, followed by those only a bit further away, and so on. To develop this input layer a drive time analysis was conducted in ArcGIS Online from the interchange locations on all Interstate and limited-access roadways within the District (Figure 73, Steps 1 – 3). Interchanges within 10 miles of the District boundary were included in the drive time analysis to account for any suitable areas within the District that might be near an interchange just outside the District’s jurisdiction. The drive time analysis was conducted using the option for actual average traffic for noon on Wednesday to provide more realistic conditions than the default “no traffic” option, while also avoiding excessively long drive-times that might be associated with peak-hour time periods. The output drive time polygons were rated on a suitability scale of 1 to 5 (Table 10) before being rasterized to create the road proximity raster layer (Figure 73, Steps 4 and 5).



**Table 10 | Drive Time Suitability Scores**

Drive Time (Minutes)	Suitability Rank	Suitability Score
<b>0 – 5</b>	Very High Suitability	1
<b>5 – 10</b>	High Suitability	2
<b>10 – 15</b>	Moderate Suitability	3
<b>15 – 20</b>	Low Suitability	4
<b>20 - 30</b>	Very Low Suitability	5

### Destination Proximity

Truck drivers may also prefer parking sites located near their origin or destination. To identify these areas, the Freight Clusters previously identified in a study of statewide freight activity areas were used as the “trucking destination” input to a drive time analysis (Figure 73, Step 6). Freight Clusters within 10 miles of the District boundary were included in each District drive time analysis to account for trucking destinations located outside, but near, to the District. The subsequent Drive Time analysis steps (Figure 73, Steps 7 – 10) and drive time suitability scores (Table 10) were the same as those used in Roadway Proximity.

### Over-utilized Truck Parking Lot Proximity

Existing truck parking lots that are over capacity indicate an unmet demand for truck parking. In this case, a new truck parking facility in the vicinity of an over-utilized parking lot would relieve that demand. Over-utilized truck parking facilities were identified as those with  $\geq 75\%$  capacity for any hour bin over a 24 hour period (Figure 73, Step 11). Over- utilized truck parking lots within 10 miles of the District boundary were included in each District drive time analysis to account for parking lots located outside, but near, the District. The subsequent drive time analysis steps (Figure 73), Steps 12 – 15) and drive time suitability scores (Table 10) were the same as those used in Roadway Proximity.

### Adjacent Land Use Suitability

New truck parking lots should be located in appropriately zoned commercial or industrial areas. However, some commercial and industrial parcels may not be suitable for supporting truck parking since they entail trucks driving through or near areas of unsuitable adjacent land use such as schools, churches or residential areas. To address this concern, land use parcels from the Florida Department of Revenue (FDOR) with unsuitable land use codes (Table 11) were extracted (Figure 73, Steps 16 – 18), converted to a raster format, and buffered using the Euclidean Distance tool (Figure 73, Step 19).

**Table 11 | List of Unsuitable Adjacent Land Uses for truck Parking**

FDOR Use Code	Land Use Description
<b>000</b>	Vacant Residential with/without extra features
<b>001</b>	Single Family
<b>002</b>	Mobile Homes
<b>003</b>	Multi-family - 10 units or more
<b>004</b>	Condominiums
<b>005</b>	Cooperatives



006	Retirement Homes not eligible for exemption
007	Miscellaneous Residential (migrant camps, boarding homes, etc.)
008	Multi-family - fewer than 10 units
009	Residential Common Elements/Areas
012	Mixed use - store and office or store and residential combination
017	Office buildings, non-professional service buildings, one story
018	Office buildings, non-professional service buildings, multi-story
019	Professional service buildings
021	Restaurants, cafeterias
022	Drive-in Restaurants
023	Financial institutions (banks, saving and loan companies, mortgage companies, credit services)
024	Insurance company offices
071	Churches
072	Private schools and colleges
073	Privately owned hospitals
074	Homes for the aged
075	Orphanages, other non-profit or charitable services
076	Mortuaries, cemeteries, crematoriums
077	Clubs, lodges, union halls
078	Sanitariums, convalescent and rest homes
079	Cultural organizations, facilities
082	Forest, parks, recreational areas
083	Public county schools - including all property of Board of Public Instruction
084	Colleges (non-private)
085	Hospitals (non-private)
097	Outdoor recreational or parkland, or high-water recharge subject to classified use assessment

The Euclidean distance tool determined the distance of each raster pixel from any of the unsuitable adjacent land uses. Those pixels were then assigned a truck parking suitability score based on their proximity to unsuitable land uses, with those closest receiving a poor score and those furthest away receiving a very high suitability score (Table 12).

**Table 12 | Unsuitable Adjacent Land Use Suitability Scores**

Distance (Meters)	Suitability Rank	Suitability Score
> 1,200	Very High Suitability	1
800 – 1,200	High Suitability	2
400 - 800	Moderate Suitability	3
200 - 400	Low Suitability	4
< 200	Very Low Suitability	5





## Land Use Parcel Suitability

This part of the Tier 1 model identified those parcels whose existing land use would be compatible with the development of a truck parking lot (Figure 73, Steps 22 – 25). Vacant commercial and industrial sites topped the list of 56 land-use types (Table 13). Each land use type was assigned a suitability score from 1 (very high suitability) to 5 (very low suitability) to reflect its potential for conversion to a truck parking facility. Any land-use type not listed in Table 13 was assigned a very low suitability score of 5.

**Table 13 | Parcel Truck Parking Suitability Scores**

FDOR Use Code	Land Use Description	Suitability Score
010	Vacant Commercial with/without extra features	1
040	Vacant Industrial -with/without extra features	1
041	Light manufacturing, small equipment manufacturing plants, small machine shops, instrument manufacturing, printing plants	1
042	Heavy industrial, heavy equipment manufacturing, large machine shops, foundries, steel fabricating plants, auto or aircraft plants	1
043	Lumber yards, sawmills, planing mills	1
044	Packing plants, fruit and vegetable packing plants, meat packing plants	1
045	Canneries, fruit and vegetable, bottlers and brewers, distilleries, wineries	1
046	Other food processing, candy factories, bakeries, potato chip factories	1
047	Mineral processing, phosphate processing, cement plants, refineries, clay plants, rock and gravel plants	1
048	Warehousing, distribution terminals, trucking terminals, van and storage warehousing	1
015	Regional Shopping Centers	2
020	Airports (private or commercial), bus terminals, marine terminals, piers, marinas	2
028	Parking lots (commercial or patron), mobile home parks	2
029	Wholesale outlets, produce houses, manufacturing outlets	2
031	Drive-in theaters, open stadiums	2
049	Open storage, new and used building supplies, junk yards, auto wrecking, fuel storage, equipment and material storage	2
070	Vacant Institutional, with or without extra features	2
080	Vacant Governmental - with/without extra features for municipal, counties, state, federal properties and water management district (including DOT/State of Florida retention and/or detention areas)	2
086	Counties (other than public schools, colleges, hospitals) including non-municipal government	2
087	State, other than military, forests, parks, recreational areas, colleges, hospitals	2
088	Federal, other than military, forests, parks, recreational areas, hospitals, colleges	2
089	Municipal, other than parks, recreational areas, colleges, hospitals	2



090	Leasehold interests (government-owned property leased by a non-governmental lessee)	2
092	Mining lands, petroleum lands, or gas lands	2
013	Department Stores	3
014	Supermarkets	3
016	Community Shopping Centers	3
026	Service stations	3
032	Enclosed theaters, enclosed auditoriums	3
035	Tourist attractions, permanent exhibits, other entertainment facilities, fairgrounds (privately owned)	3
036	Camps	3
050	Improved agricultural	3
051	Cropland soil capability Class I	3
052	Cropland soil capability Class II	3
053	Cropland soil capability Class III	3
054	Timberland - site index 90 and above	3
055	Timberland - site index 80 to 89	3
056	Timberland - site index 70 to 79	3
057	Timberland - site index 60 to 69	3
058	Timberland - site index 50 to 59	3
059	Timberland not classified by site index to Pines	3
060	Grazing land soil capability Class I	3
061	Grazing land soil capability Class II	3
062	Grazing land soil capability Class III	3
063	Grazing land soil capability Class IV	3
064	Grazing land soil capability Class V	3
065	Grazing land soil capability Class VI	3
066	Orchard Groves, citrus, etc.	3
068	Dairies, feed lots	3
069	Ornamentals, miscellaneous agricultural	3
011	Stores, one story	4
039	Hotels, motels	4
067	Poultry, bees, tropical fish, rabbits, etc.	4
099	Acreage not zoned agricultural - with/without extra features	4

## Crime Potential

All else being equal, truck parking facilities should be located in places where the vehicles and their drivers will not be at high risk of crimes against their persons or property. The [Esri Demographics Crime Index](#) layer for Florida was downloaded and incorporated into the Tier 1 model for this purpose. The total crime index was tied to the national average crime rate. A total crime index value of 100 for a census block group represented the national average crime rate, while a total crime index value of 200



indicated a block group with twice the amount of crime as the national average, and so on. Each census block group in the District was assigned a crime score ranging from 1 (Very High Suitability) indicating a crime index at or below the national average, up to 5 (Very Low Suitability) for block groups with more than ten times the national average crime rate. Table 14 shows the relationship between crime index values and truck parking suitability scores. The census block groups were rasterized by their crime score suitability values to prepare them for use in the weighted overlay analysis (Figure 73, Steps 26 – 28).

**Table 14 | Crime Index Suitability Scores**

Crime Index Value	Suitability Rank	Suitability Score
≤ 100	Very High Suitability	1
100 - 250	High Suitability	2
250 - 500	Moderate Suitability	3
500 - 1000	Low Suitability	4
≥ 1,000	Very Low Suitability	5

### Unauthorized Parking Proximity

Lastly, any place where a large number of unauthorized truck parking occurred was considered an indicator of high demand for legitimate truck parking facilities. To develop this layer, truck parking GPS location data was filtered to extract only those trucks that were stationary for 3+ hours for each District and the area 10 miles beyond the District boundary. The ArcGIS point density tool was used to develop a raster density surface weighted by the parking duration for each vehicle (Figure 73, Steps 29 – 31), under the presumption that longer-duration immobility represented actual long-term parking, and where many trucks engaged in long-term parking should represent a higher demand for new truck parking facilities. The point density output was classified using a quintile (5-class) classifier, and those classes were reclassified to the 1 to 5 truck suitability scale (Figure 73, Steps 32 – 34).

### Weighted Overlay Analysis

The final step in the Tier 1 analysis involved combining each of the seven input criteria layers described above using the ArcGIS weighted overlay tool (Figure 73, Steps 35 - 36). The weighted overlay tool performs a weighted average of all the input pixels at each location in the District. Several different weighting schemes for the input layers labeled A through D were evaluated, starting with the Tier 1A model that weighted each layer the same. The weights for each of the models appear in Table 15.

**Table 15 | Alternative Weighted Overlay Model Weights**

Factor Description	Tier 1A	Tier 1B	Tier 1C	Tier 1D
Road Proximity	15%	19%	20%	5%
Destination Proximity	15%	19%	20%	5%
Over-Utilized Truck Parking Lot Proximity	14%	14%	10%	5%
Crime Potential	14%	14%	5%	5%
Unauthorized Parking Proximity	14%	14%	5%	40%
Adjacent Land Use Suitability	14%	10%	20%	35%
Land Use Parcel Suitability	14%	10%	20%	5%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



## Statewide Truck Parking Study

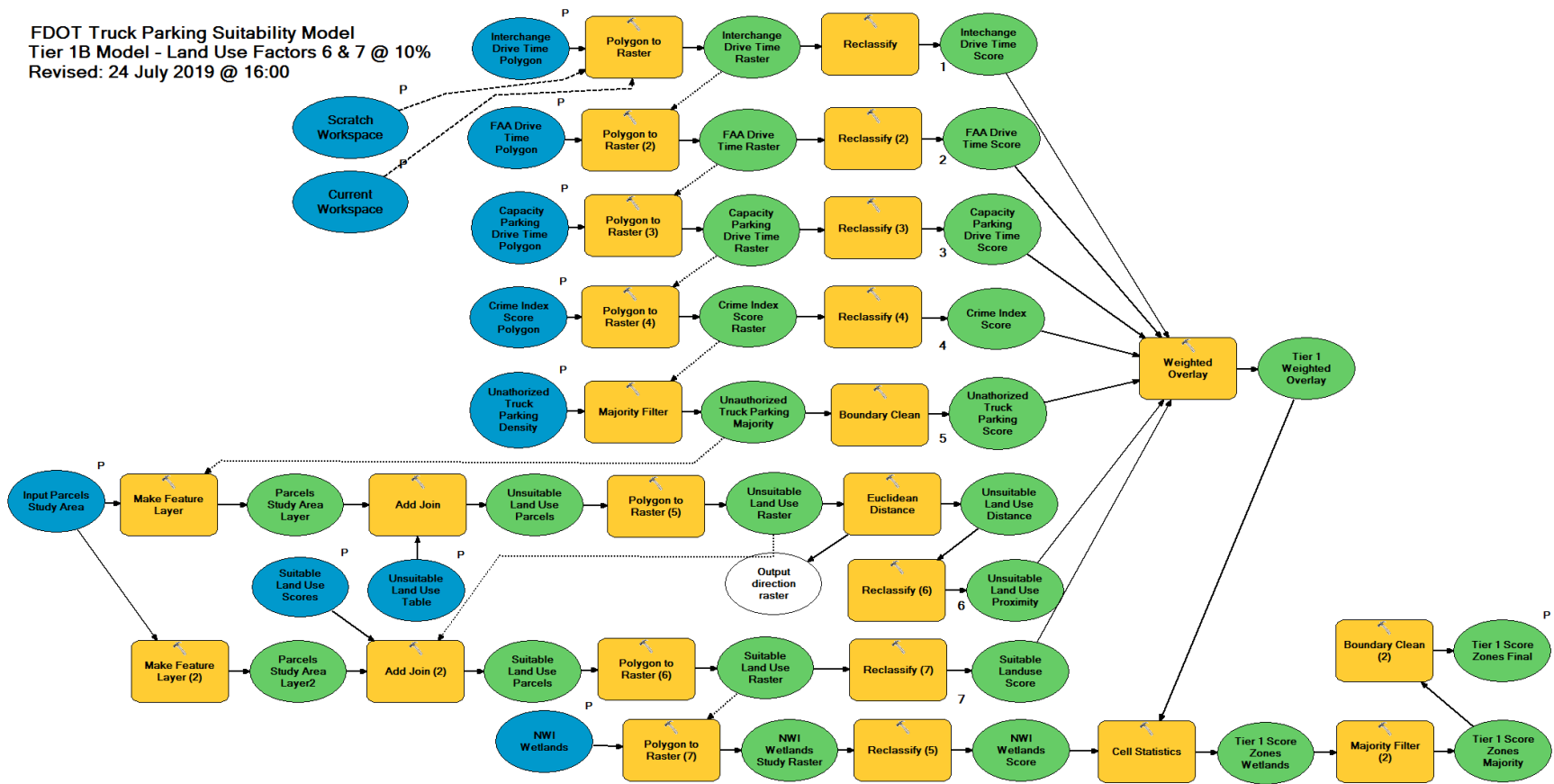


The output raster from each alternative model was examined visually in ArcGIS to determine whether known parcels suitable as potential truck parking facilities were flagged as very high or high suitability. The Tier 1C and 1D models rated very little of the District as highly suitable and missed most of the potential truck parking locations. The equally weighted Tier 1A model performed better but still missed some parcels even when they were immediately adjacent to another high suitability parcel. The Tier 1B model was best at locating known truck parking candidates but was also not excessive in rating areas as High Suitability for truck parking. Therefore, the Tier 1B model was used to develop the land suitability layer for all Districts (Figure 74).



Figure 74 | FDOT Truck Parking Suitability Model Tier 1B – Land Use Factors 6 & 7

FDOT Truck Parking Suitability Model  
Tier 1B Model - Land Use Factors 6 & 7 @ 10%  
Revised: 24 July 2019 @ 16:00





## Tier 2 Land Suitability Model

The Tier 1 land suitability model described above identified the broad spatial areas that were most suitable for siting a truck parking facility. The purpose of the Tier 2 models was to locate specific parcels within those areas of high suitability that would meet the minimum requirements for truck parking sites. There were three kinds of parcels identified by the Tier 2 process:

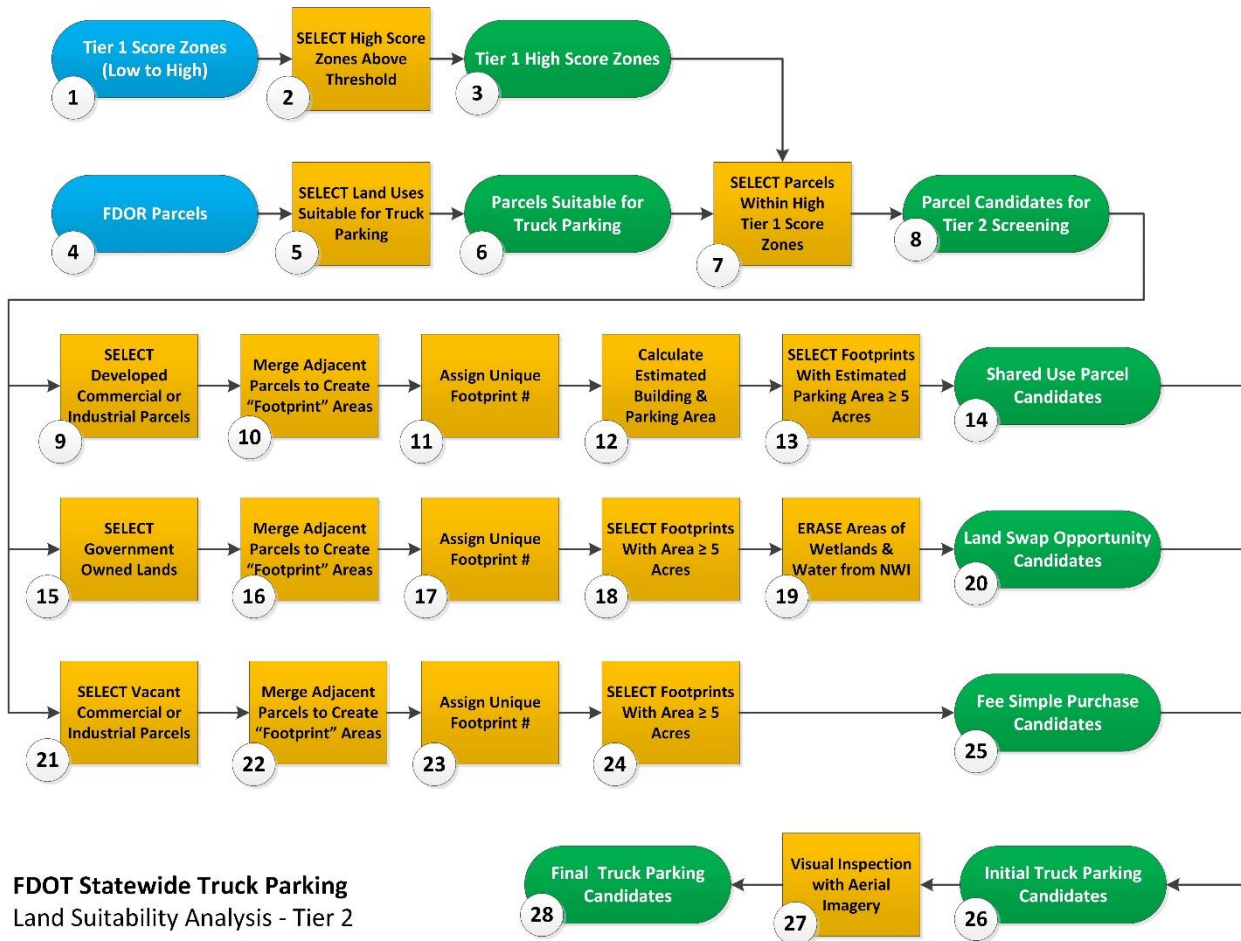
- **Shared Use Parcel Candidates** – This group included existing developed commercial or industrial parcels with large parking areas that might be available as part of a shared-use agreement for truck parking.
- **Land Swap Opportunity Candidates** – These are vacant, government-owned parcels that could provide an opportunity for the FDOT to negotiate a land swap or shared-use agreement.
- **Fee Simple Purchase Candidates** – These are vacant commercial or industrial zoned parcels that could be purchased outright for development into truck parking sites.

Figure 75 outlines the Tier 2 modeling process, which began with selecting out the polygon areas that had been identified as very high or high suitability for truck parking by the Tier 1 model (Steps 1 – 3). The Tier 1 high score zones were used to perform a spatial select on suitable FDOR parcels to extract only those parcels with appropriate existing land use that were located in areas of high suitability for truck parking sites (Figure 75, Steps 4 – 8). From that point, the subsequent Tier 2 modeling steps took a different path depending on which of the three parcel candidate types were identified.





Figure 75 | Tier 2 Modeling Flowchart



## Shared Use Parcel Candidates

The complete ArcGIS Spatial Modelbuilder Tier 2A model for this process appears in Figure 76 at the end of Appendix C, but its key steps are shown in Figure 75. This process began with selecting those already developed commercial and industrial parcels from the parcel candidates within the Tier 1 High Score Zones (Figure 75, Step 9). The ArcGIS Dissolve tool was used to merge together adjacent parcels into a single "footprint" polygon which was then assigned a unique ID number (Figure 75, Steps 10 - 11). This step ensured that no feasible sites were rejected because their individual parcels fell below the minimum size requirement (5 acres), even though two or more adjacent parcels would collectively meet or exceed that size limit.

For the shared use candidates the important size criterion was not the overall size of the combined parcels, but the availability of  $\geq 5$  acres of parking. The size of the parking was estimated by subtracting the total size of buildings on each parcel from the overall parcel size (Figure 75, Step 12). This calculation assumed that the buildings on the parcel were a single story so that the total living area of the buildings was the same as the building footprint. However, if any buildings were multi-story that would only have decreased the building footprint and increased the potential size of the estimated parking area by this method. Conversely, this calculation method could not account for other uses on each parcel such as



internal roads, landscaping, drainage, and water treatment ponds that reduced the total available parking area. Nonetheless, these steps help to filter out most of the commercial and industrial parcels whose potential parking areas were too small for further consideration (Figure 75, Steps 13 – 14).

## Land Swap Opportunity Parcel Candidates

The ArcGIS Spatial Modelbuilder Tier 2C model for identifying vacant government parcels (Figure 77 at the end of Appendix C) involved selecting out the appropriate parcels and merging them into unique footprints  $\geq 5$  acres in size (Figure 75, Steps 15 – 18). Because many of the government-owned parcels were conservation lands, National Wetlands Inventory data were used to erase the wetlands and water features on each government parcel to leave only the upland areas that might be suitable for establishing a truck parking facility (Figure 75, Steps 19 and 20).

## Fee Simple Purchase Parcel Candidates

Finally, the ArcGIS Spatial Modelbuilder Tier 2B model (Figure 78 at the end of Appendix C) identified those parcels  $\geq 5$  acres in size in high suitability areas that were vacant but zoned Commercial or Industrial, as outlined in (Figure 75, Steps 21 – 25).

## Identification of Final Truck Parking Candidates

The three Tier 2 models generated hundreds of initial truck parking candidate locations (Figure 75, Step 26). To winnow the number of candidate locations to a more manageable number, each footprint polygon was evaluated by inspecting recent aerial imagery in ArcGIS Online and rated as good, fair, or poor on the following criteria:

- **Shape** – A footprint was rated poor if it was so narrow or oddly shaped that truck trailers could not be easily parked, and Fair if most of the footprint could accommodate trucks. The footprint was rated good if the site had a rectangular shape that could be easily configured for parking.
- **Location\Access** – The footprint was rated poor if the access was not adjacent to an arterial or major collector suitable for trucks, or if the access required the use of a road with difficult access (e.g., tight turns) or through undesirable land use (e.g., residential). The footprint was rated fair if access was through a side street off of an arterial or major collector, and good if there was direct access from an arterial or major collector.
- **Land Use Compatibility** – The footprint was rated poor if the on-site land use appeared to be incompatible (e.g., fully developed with no shared parking opportunity or an obvious wetland). Footprints were rated fair if the on-site land use was acceptable (e.g., a vacant lot), but adjacent land uses were extremely incompatible (e.g., adjacent to a school or cemetery, or completely surrounded by dense residential use). A footprint was rated good if both on-site and adjacent land uses were compatible.

Those footprints rated good by the aerial imagery evaluation were extracted to create the Final Truck Parking Candidates (Figure 75, Steps 27 – 28).

## ArcGIS Online Web Maps

To make the results of this analysis more widely available to the FDOT, the final truck parking candidate footprint and parcel layers were published to ArcGIS Online web maps, one for each District. The links to each District web map are available below:

- [District 1](#)

# Statewide Truck Parking Study



- [District 2](#)
- [District 3](#)
- [District 4](#)
- [District 5](#)
- [District 6](#)
- [District 7](#)

The output of the Land Suitability Analysis is used to identify potential expansion opportunities in each priority area and serves as a tool that FDOT Central Office and the Districts can use during future implementation actions.





Figure 76 | Tier 2A Developed Commercial / Industrial Land Uses

FDOT Truck Parking Suitability Model  
 Model: Tier 2 A, Developed COM/IND Land Uses - District 1  
 Revised: 26 July 2019 @ 17:00

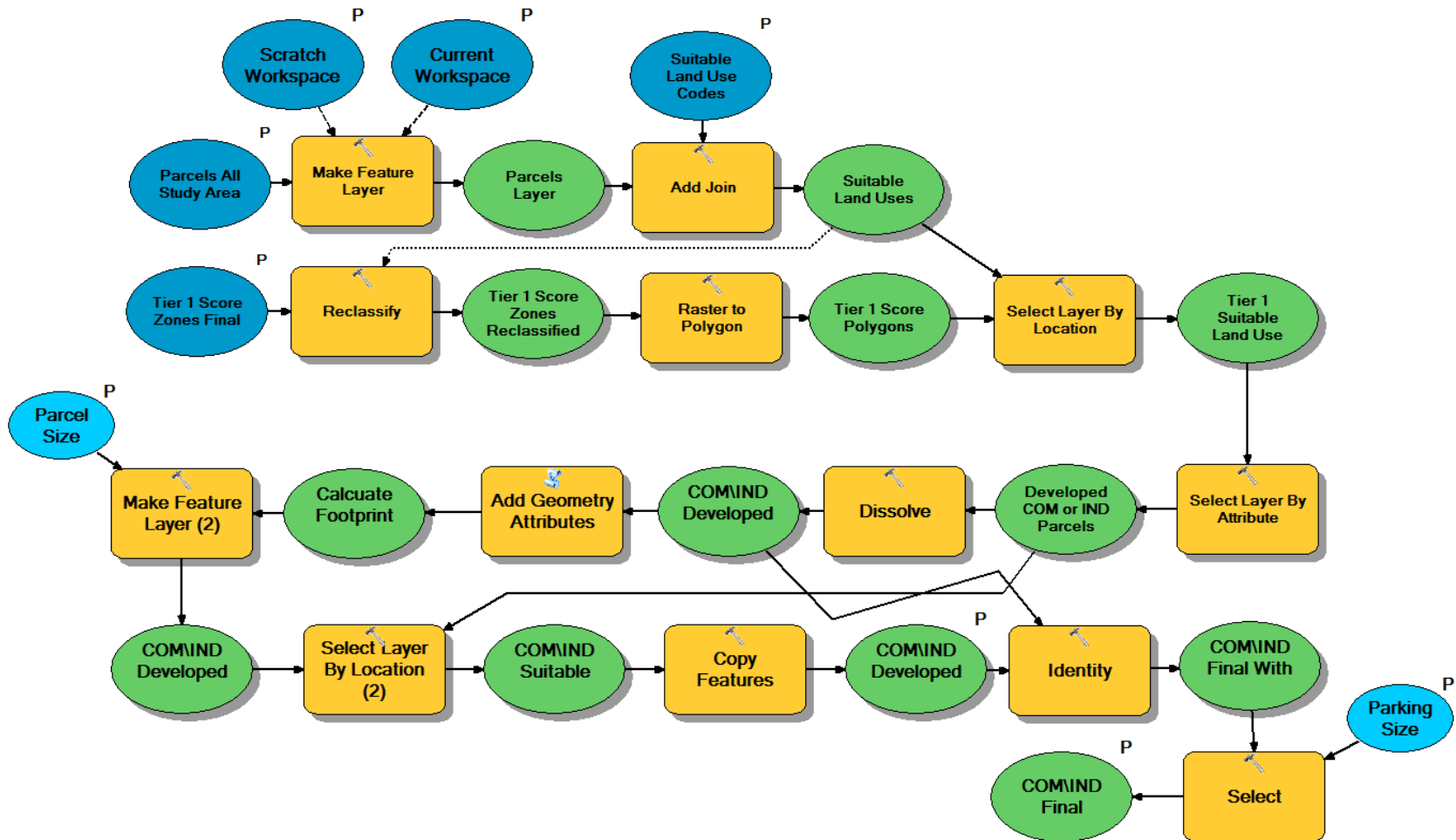




Figure 77 | FDOT Truck Parking Suitability Model: Tier 2C, Vacant Non-Wetland Government Land Uses

FDOT Truck Parking Suitability Model  
 Model: Tier 2 C, Vacant Non-Wetland GOV Land Uses - District 1  
 Revised: 25 July 2019 @ 15:15

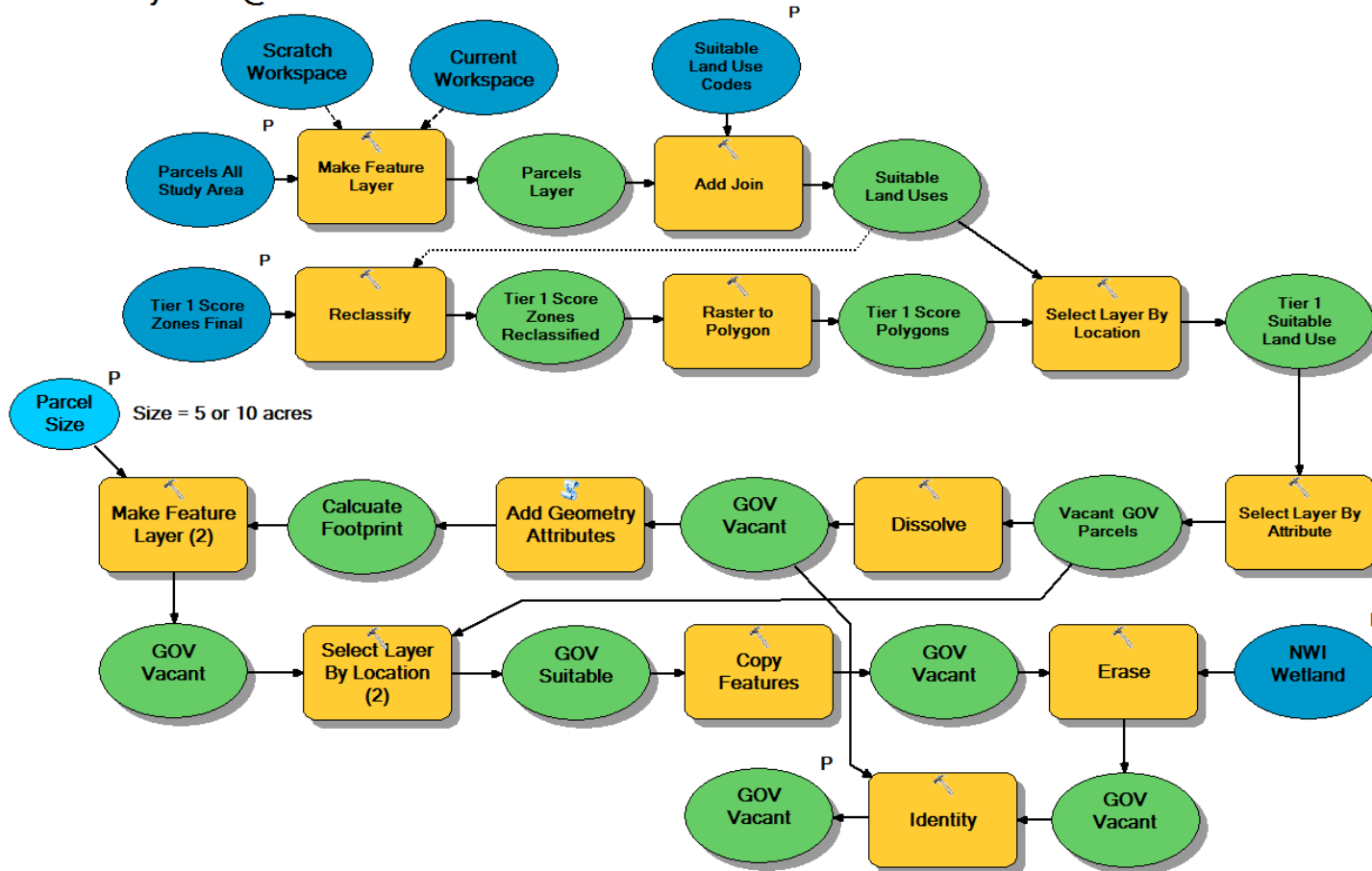
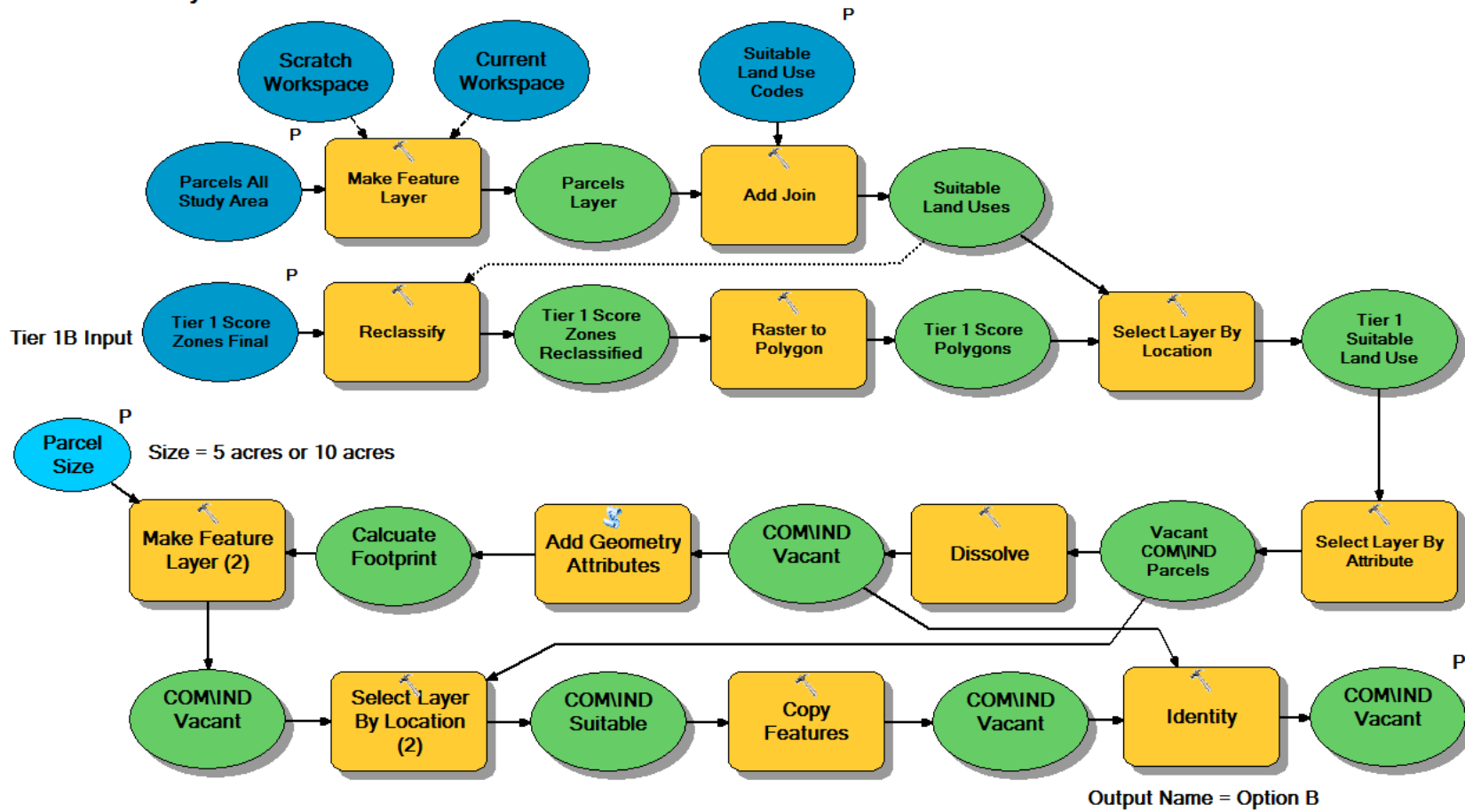




Figure 78 | Truck Parking Suitability Model: Tier 2B, Vacant Commercial/Industrial Land Uses

**FDOT Truck Parking Suitability Model**  
**Model: Tier 2 B, Vacant COM\IND Land Uses - District 1**  
 Revised: 25 July 2019 11:43







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