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MIAMI-DADE COUNTY

MIAMI – DADE TRANSPORTATION PLANNING ORGANIZATION

FREIGHT PLAN UPDATE 2024

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Miami-Dade County Freight Plan Update 2024

prepared for

Miami-Dade Transportation Planning Organization

prepared by

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1.0 Background

The Miami-Dade Transportation Planning Organization (TPO) updates the Miami-Dade County Freight Plan on a regular basis in alignment with the TPO's Long-Range Transportation Plan (LRTP) update. In addition to developing a list of projects for funding consideration within the LRTP, this report highlights the importance of freight mobility in Miami-Dade County, documents how the county's freight industry has changed since the 2018 Freight Plan and involves coordination with freight stakeholders to inform them of the plan and the county's freight transportation needs.

Miami-Dade County is home to over 2.7 million people, making it the most populous county in the state and the seventh most populous in the country.[1] This does not include the 19.2 million overnight visitors and 7.3 million day visitors who also rely upon the freight system to supply goods and services to tourist destinations such as key attractions, hotels, restaurants, and cruise ships.[2] This diverse, multi-cultural community supports a strong economy dominated by international trade, tourism, agriculture, mining, and natural resources. The County's well-established and expanding freight transportation system is the cornerstone of the regional and statewide economy, providing goods and services to Florida's largest consumer market, and, through major sea and air gateway connections, to the global economy.

Major cargo hubs form the foundation of the County's freight system and support the transport of goods into, out of, and within the region. PortMiami is one of the largest container ports in Florida and is known as the Cruise Capital of the World. Miami International Airport (MIA) is the fifth largest cargo airport in the United States by landed weight, accounts for 70% of air cargo in Florida,[3] and is the World's largest gateway to Latin America and the Caribbean. The Miami River provides key niche waterborne cargo services to smaller ports in the Caribbean Basin and supports an active industrial core along the river corridor. The Florida East Coast (FEC) Railway and CSX provide freight rail service to Miami-Dade County, including intermodal and carload services that connect the county to the North American rail network. Miami-Dade County has a robust network of roadways providing regional mobility as well as gateways to other Florida counties and more distant state and nationwide markets. These transportation facilities complement the largest warehouse/distribution center cluster in the state of Florida as well as the international banking and brokerage infrastructure that facilitates international trade activities for the region. These facilities handle a range of products that drive the region's economic prosperity and quality of life, ranging from consumer goods to perishables to pharmaceutical products. Further information on these transportation facilities is included in Chapter 3.

Today, freight activity in the county is largely concentrated in the northwest quadrant, which is home to an increasing number of warehouses and distribution centers, representing hundreds of millions of dollars in investment by industrial developers. These facilities serve freight moving through key

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[1] *County Population Totals and Components of Change: 2020 – 2022.* U.S. Census Bureau. https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html

[2] *Greater Miami & Miami Beach 2022 Visitor Industry Overview.* Greater Miami Convention & Visitors Bureau. https://www.miamiandbeaches.com/press-and-media/miami-press-releases/growth-and-economic-impact

[3] *Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports.* Federal Aviation Administration. https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger

transportation hubs, including PortMiami, the Miami River Waterway, MIA, the FEC rail yard. The goods moving into and out of the region by rail (FEC and CSX railroads), and truck via key east/west and north/south roadways also include active rock quarries in western Miami-Dade County. Since the last freight plan update, the county also has seen a growing interest in industrial development to the south in the Homestead area, as investors look for additional opportunities to expand capacity in the region. Maps showing more detailed locations of these industrial centers and their key characteristics are included in Chapter 4.

Examples of Major Freight Investments in the Last Decade

- PortMiami Harbor Deepening (complete)
- PortMiami Tunnel (complete)
- Rehabilitation of On-Port ICTF and Rail Service to PortMiami (complete)
- 25th Street Viaduct (complete)
- SR 826/SR 836 Interchange Reconstruction (complete)
- I-395/SR 836/I-95 Project (ongoing)
- Krome Avenue Projects (ongoing)
- SR 25/US 27/Okeechobee Road Reconstruction Projects (ongoing)
- Golden Glades Interchange (ongoing)

Miami-Dade's freight transportation infrastructure has continued to undergo significant investment to position the region for future growth opportunities. For example, PortMiami, building on its harbor deepening, new gantry cranes, port tunnel, and on-port Intermodal Container Transfer Facility (ICTF), is now pursuing a *NetZero: Cargo Mobility Optimization and Resiliency Project*, which includes a range of waterside, terminal, and land-side investments. The port's investments have led to the port welcoming the *CMA-CGM Osiris* in November 2022 which is a neo-panamax vessel with a capacity over 15,000 twenty-foot equivalent units (TEUs), and the largest container ship to dock at PortMiami to date. [4] MIA continues to expand its air cargo operation through innovations like its planned vertical cargo facility. As the demand at these hubs increases, so too does the demand on the surrounding transportation and industrial infrastructure as goods are moved to their final destinations. In April 2024, the Florida Department of Transportation (FDOT) initiated a $633 million project to improve the Golden Glades Interchange, which has a project area consisting of four key transportation facilities: I-95, State Road (SR) 826/Palmetto Expressway, the Florida's Turnpike, and SR 7. This is a major bottleneck in South Florida. In addition, industrial developers have constructed millions of square feet of warehouse and distribution center capacity – largely fully leased before construction is complete – in northwest Miami-Dade County.

Miami-Dade County and its stakeholders have worked to secure funding to facilitate transportation access and mobility as goods and services leave the major cargo hubs. The safe and efficient movement of goods on connecting infrastructure is vitally important as each of the major modal partners must balance increasing freight traffic with passenger demand, including cruise ships and increased passenger rail service.

[4] *PortMiami welcomes the CMA-CGM Osiris, the largest container ship to call Miami.* Miami-Dade County. https://www.miamidade.gov/global/release.page?Mduid_release=rel1668783773555476

With many improvements complete and underway, the Miami-Dade County Freight Plan update will help to identify additional freight transportation needs in order to develop a list of freight-focused and freight-related projects for consideration in the development of the TPO's 2050 LRTP. The 2050 LRTP is a cost-constrained plan and the county's project needs far exceed available funding. The consideration of inclusion of priority freight projects within the LRTP process will increase the likelihood of funding allocations. Most importantly, the plan update will be stakeholder informed. These freight needs and priorities are included in Chapter 8. This update was informed by a comprehensive literature review. A summary of all material reviewed is provided in Appendix A.

Stakeholder Informed Plan

A Project Working Group was formed to guide the Plan Update, consisting of:

- CSX Transportation
- Florida Department of Transportation District 6
- Florida East Coast Railway
- Florida's Turnpike Enterprise
- Miami-Dade County Aviation Department
- Miami-Dade County Department of Transportation and Public Works
- Greater Miami Expressway Agency/GMX
- PortMiami

The remainder of the 2024 Miami-Dade Freight Plan Update is organized as follows:

- Chapter 2: Alignment with Federal, State, and County Initiatives
- Chapter 3: Miami-Dade Freight Transportation System and Cargo Flows
- Chapter 4: Miami-Dade Logistics Infrastructure
- Chapter 5: Role of Truck Parking
- Chapter 6: Future Technologies and Resilience
- Chapter 7: Freight Plan Compliance with Federal and State Performance Management
- Chapter 8: Freight System Needs and Priorities
- Chapter 9: Recommendations and Next Steps

2.0 Alignment with Federal, State, and County Initiatives

Planning and funding Miami-Dade County's freight transportation network is not just influenced by county efforts. Rather, this includes joint efforts across the nation, state, and county. This chapter describes some of these efforts which can have the greatest potential impact on the county's freight system. This is not an exhaustive list but represents many of the major initiatives complete or underway.

2.1 Federal Freight Initiatives

At the federal level, some of the greatest influences on Miami-Dade County's freight system are related to transportation spending bills. In the recent past this includes the Moving Ahead for Progress in the 21st Century (MAP-21) Act (2012), the Fixing America's Surface Transportation (FAST) Act (2015), and the current Infrastructure Investment and Jobs Act (IIJA) (2021). These legislative actions have included freight in transportation funding decisions, most notably with the creation of the National Highway Freight Network.

2.1.1 National Highway Freight Network

The National Highway Freight Network (NHFN) was established as part of the FAST Act in an effort to strategically direct Federal resources and policies towards improved performance of highway portions of the U.S. freight transportation system. The NHFN consists of the following subsystems which include a combined total of 60,110 centerline miles:

- **Primary Highway Freight System (PHFS):** Managed by the Office of Freight Management and Operations, these highways are identified as the most critical portions of the U.S. highway freight transportation system determined by measurable and objective national data. As of the 2022 Congressional re-designation, this network consists of 41,799 centerline miles, including 38,014 centerline miles of Interstate and 3,785 centerline miles of non-Interstate roads. *Florida accounts for 1,644.71 centerline miles of the PHFS.*
- **Other Interstate portions not on the PHFS (non-PHFS):** This consists of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities. These portions amount to 10,265 centerline miles of Interstate nationwide and fluctuate with additions and deletions to the Interstate Highway System. The mileage for Non-PHFS Interstate is based on the Interstate Mileage reported in the National Highway System (NHS) as of October 17, 2019. *Florida accounts for 36.19 centerline miles of non-PHFS roads.*

- **Critical Rural Freight Corridors (CRFCs):** CRFCs are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities. As of January 2023, there are 5,390 centerline miles designated as CRFCs. *There are 309.89 miles of CRFCs in Florida.*

FDOT, in partnership with the Broward Metropolitan Planning Organization (MPO) and Miami-Dade TPO is pursuing a change to the CRFC and CUFC designations in South Florida; the result will be the inclusion of a missing segment of US 27 south from the Broward County line to SR 821 (CRFC) and from SR 821 to SR 826 (CUFC), which is a critical freight route providing access to western Miami-Dade County.

- **Critical Urban Freight Corridors (CUFCs):** CUFCs are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities. As of January 2023, there are 2,656 centerline miles designated as CUFCs. *There are 159.86 miles of CUFCs in Florida.*

States and in certain cases, MPOs, are responsible for designating the CRFCs and CUFCs in accordance with Section 1116 of the FAST Act and the Bipartisan Infrastructure Law Section 11114. State designation of the CRFCs is limited to a maximum of 300 miles of highway or 20 percent of the PHFS mileage in the State, whichever is greater. State and MPO designation of the CUFC is limited to a maximum of 150 miles of highway or 10 percent of the PHFS mileage in the State, whichever is greater. In the case of rural states, as defined in the Bipartisan Infrastructure Law Section 11114 [5], the mileage maximum increases to 600 miles for CRFCs or 20 percent of the PHFS mileage in the State, whichever is greater. [6] Further information on how this network aligns with other freight infrastructure in Miami-Dade County is included in Chapter 3.

2.1.2 Infrastructure Investment and Jobs Act (IIJA)

Signed into law in November 2021, the Infrastructure Investment and Jobs Act, or IIJA, builds upon the FAST Act and provides $550 billion over fiscal years 2022 through 2026 in new Federal investment in infrastructure, including in roads, bridges, passenger rail, water infrastructure, resilience, and broadband. This includes $350 billion specifically for roadways. Of this amount, Florida is anticipated to receive $13.1 billion over the next five years.

Miami-Dade County has been successful in competing for federal grants. Recent wins from the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant program include:

- $5 million for PortMiami to plan and design studies for carbon neutralization of on-port operations and the development of an inland cargo center (2023)
- $16 million for PortMiami NetZero: Cargo Mobility Optimization and Resiliency Project (2022)

[5] Rural states are defined as those "with a population per square mile of area that is less than the national average, based on the 2010 census".

[6] *National Highway Freight Network.* Federal Highway Administration. https://ops.fhwa.dot.gov/Freight/infrastructure/nfn/index.htm

Additional funding is available through competitive grant programs and other formula funding such as the National Electric Vehicle Infrastructure Formula Program ($42.2 million for Florida) and the Bridge Formula funds ($52.7 million).[7]

2.2 State Freight Initiatives

At the state level, Florida must determine how to best use available federal funding allocations and other state dollars. Florida has developed its own top priority highway designation, known as the Strategic Intermodal System (SIS), to direct funding for the state's highest priority roadways and facilities. Planning for this system and other modal options is informed by the Freight Mobility and Trade Plan, the Florida Transportation Plan, and the Freight Priorities Program developed by the Florida Metropolitan Planning Organization Advisory Council.

2.2.1 Strategic Intermodal System (SIS)

The SIS is Florida's high priority network of transportation facilities important to the state's economy and mobility. Governor Bush and the State Legislature established the SIS in 2003 to focus the state's limited transportation resources on the facilities most significant for interregional, interstate, and international travel. The SIS is the state's highest priority for transportation capacity investments and a primary focus for implementing the Florida Transportation Plan, the state's long-range transportation vision and policy plan. Figure 2-1 shows the FDOT map of all SIS facilities in the county. The portions of the SIS in Miami-Dade County relative to other freight networks are discussed in Chapter 3.

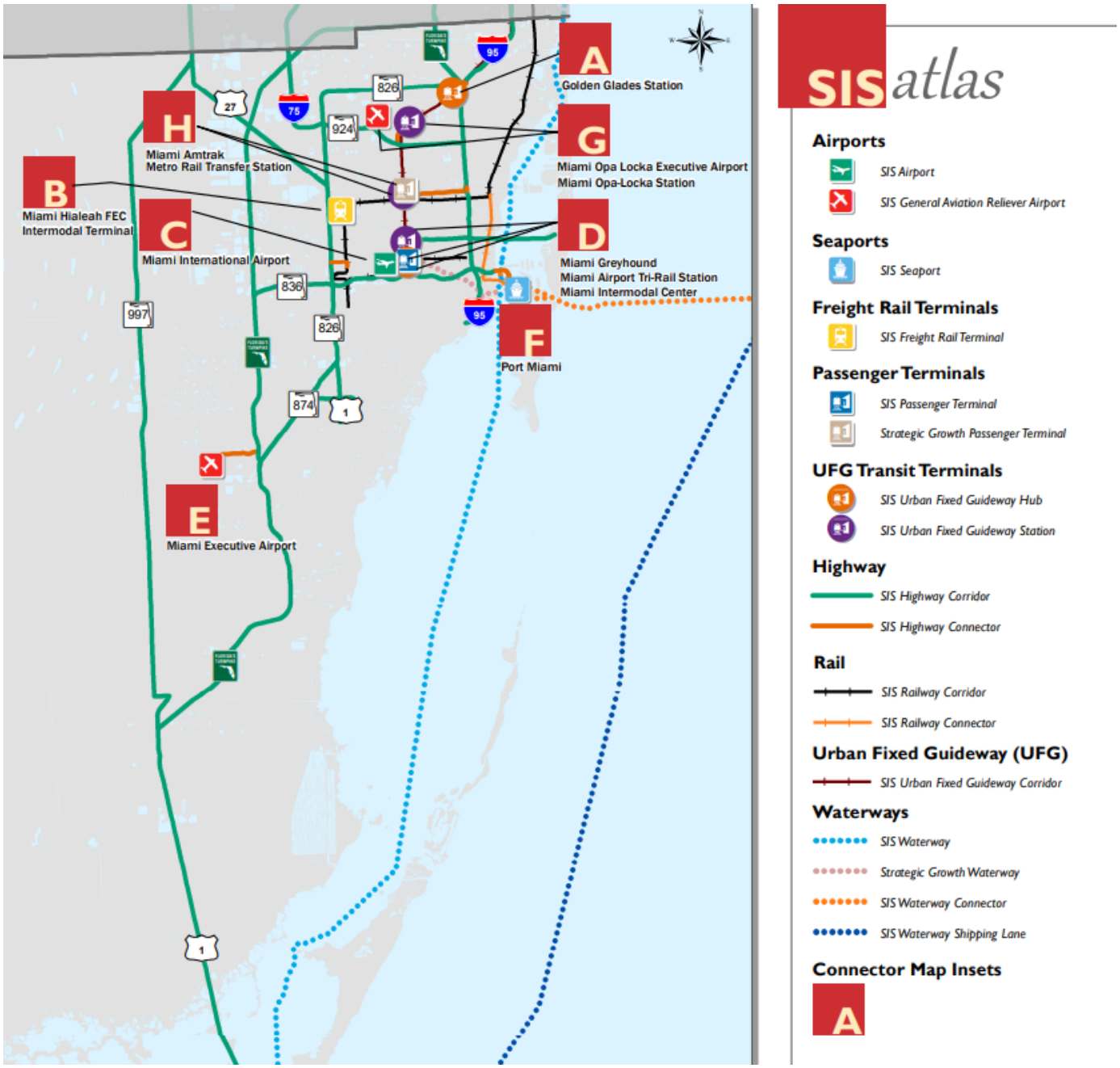
2.2.2 Freight Mobility and Trade Plan (FMTP)

The FMTP is a comprehensive plan that identifies freight transportation facilities critical to the state's economic growth and guides multimodal freight investments in the state. The ongoing update to this plan will be completed in 2024.

To receive funding under the National Highway Freight Program (23 U.S.C. 167), the FAST Act requires the development of a state freight plan which must comprehensively address the state's freight planning activities and investments both immediate and long-range. The IIJA included several new requirements for State Freight Plans and changed the update frequency from five years to four years.[8] Further guidance on the development of State Freight Plans can be found on the Federal Highway Administration (FHWA) website at https://www.transportation.gov/mission/office-secretary/office-policy/guidance-state-freight-plans-and-state-freight-advisory.

[7] *Bipartisan Infrastructure Law.* Federal Highway Administration. https://www.fhwa.dot.gov/bipartisan-infrastructure-law/

[8] *Freight Mobility and Trade Plan.* Florida Department of Transportation. https://www.fdot.gov/rail/plandevel/freight-mobility-and-trade-plan



Source: Florida Department of Transportation. [9]

Figure 2-1 Strategic Intermodal System Facilities in Miami-Dade County

[9] Additional maps, including smaller inset maps for the connectors are available on FDOT"s website: https://www.fdot.gov/planning/systems/sis/maps

2.2.3 Florida Transportation Plan (FTP)

The Florida Transportation Plan is the single overarching plan guiding Florida's transportation future. Updated every five years, the Florida Transportation Plan is a collaborative effort of state, regional, and local transportation partners in the public and private sectors. This plan is comprised of the following four elements:

- Vision Element defines Florida's long-range transportation vision and goals for the next 25 years and beyond.
- Policy Element describes how Florida will accomplish the vision and goals set by the Florida Transportation Plan. This includes the objectives and strategies to guide transportation partners over the next 25 years.
- Performance Element reports how our transportation system performs on key measures, with a current focus on safety, asset condition, and mobility.
- Implementation Element details how Florida will work towards implementation over the next five years. This includes specific short-term actions and describes the roles and processes for implementing the Florida Transportation Plan and tracking progress.

2.2.4 Freight Priorities Program

The Florida Metropolitan Planning Organization Advisory Council (MPOAC) is a statewide planning and policy organization created by the Florida Legislature pursuant Section 339.175(11), Florida Statutes. The organization is made up of a Governing Board consisting of local elected officials from each of the State's 27 MPOs, and a Staff Director's Advisory Committee consisting of the staff directors from each of the MPOs. A separate Freight and Rail Committee is also part of the MPOAC and is charged each year with developing a list of projects for the Freight Priorities Program. [10]

The Freight Priorities Program is an annual call for projects from each MPO/TPO to identify priority freight projects in their planning areas. Each MPO/TPO may submit up to six projects: up to three projects on the State Highway System (SHS); and up to three non-SHS projects which may include non-SHS roadways, intermodal logistic center (ILC) access, truck parking, or rail projects. This list is transmitted to FDOT for consideration in the annual Work Program update.

The following projects were submitted by the Miami-Dade TPO/FDOT District Six as of the most recent Work Program update (2023):

- US 27/SR 25/Okeechobee Road and SR 826 Interchange Improvements
- US 27/SR 25/Okeechobee Road from East of NW 87 Avenue to NW 79 Avenue
- US 27/SR 25/Okeechobee Road from East of NW 116 Way to East of NW 87 Avenue

[10] *About the MPOAC.* Florida Metropolitan Planning Organization Advisory Council. https://www.fdot.gov/MPOAC/about

2.3 County Initiatives

Additional planning efforts are focused at the county level, namely the Countywide Transportation Master Plan and the LRTP. The Freight Plan informs these and other county initiatives.

2.3.1 Countywide Transportation Master Plan (CTMP)

The Miami-Dade County Department of Transportation and Public Works (DTPW) is developing the first-ever CTMP as per a directive from the Board of County Commissioners (Resolution R-138-22). The CTMP will identify capital investment projects and improvement initiatives for transit, pedestrian, bicycle, roadways, and freight to be completed throughout Miami-Dade County in the next 20 years.

To develop the CTMP, the county was divided into six planning areas and the goals of this plan are as follows:

- Identify multimodal investments for the next 20 years
- Harmonize DTPW multimodal project investments with future municipal transportation and transit projects
- Engage stakeholders to develop scenarios that outline choices in transportation
- Establish processes to prioritize investments across modes
- Inform the public of planned transportation infrastructure improvements
- Achieve infrastructure improvement goals of Miami-Dade County
- Prioritize the needs of the public based on input gathered

The CTMP is anticipated to be complete in Spring 2024 and is intended to help inform the LRTP and the Transportation Improvement Plan (TIP) on DTPW's planned projects. [11]

2.3.2 Long Range Transportation Plan (LRTP)

The Miami-Dade TPO 2050 LRTP represents a 25-year long-range planning horizon to provide for the integrated development, management, and operations of a safe, equitable, and effective multi-modal transportation network for Miami-Dade County. As mentioned in Chapter 1, the Miami Dade Freight Plan Update serves to inform the freight element of the 2050 LRTP. Information provided by the Freight Plan is critical to ensure the LRTP includes the county's multimodal freight projects, and that the identified priorities are considered as part of the freight funding set aside established withing the LRTP to ensure some level of dedicated funding for freight projects. The 2050 LRTP is scheduled for adoption by the TPO Governing Board in Summer 2024. [12]

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[11] *Countywide Transportation Master Plan.* Miami-Dade County. https://www.miamidade.gov/global/transportation/countywide-transportation-master-plan.page

[12] Miami-Dade 2050 LRTP. https://miamidadetpolrtp2050.com/

3.0 Miami-Dade Freight Transportation System and Cargo Flows

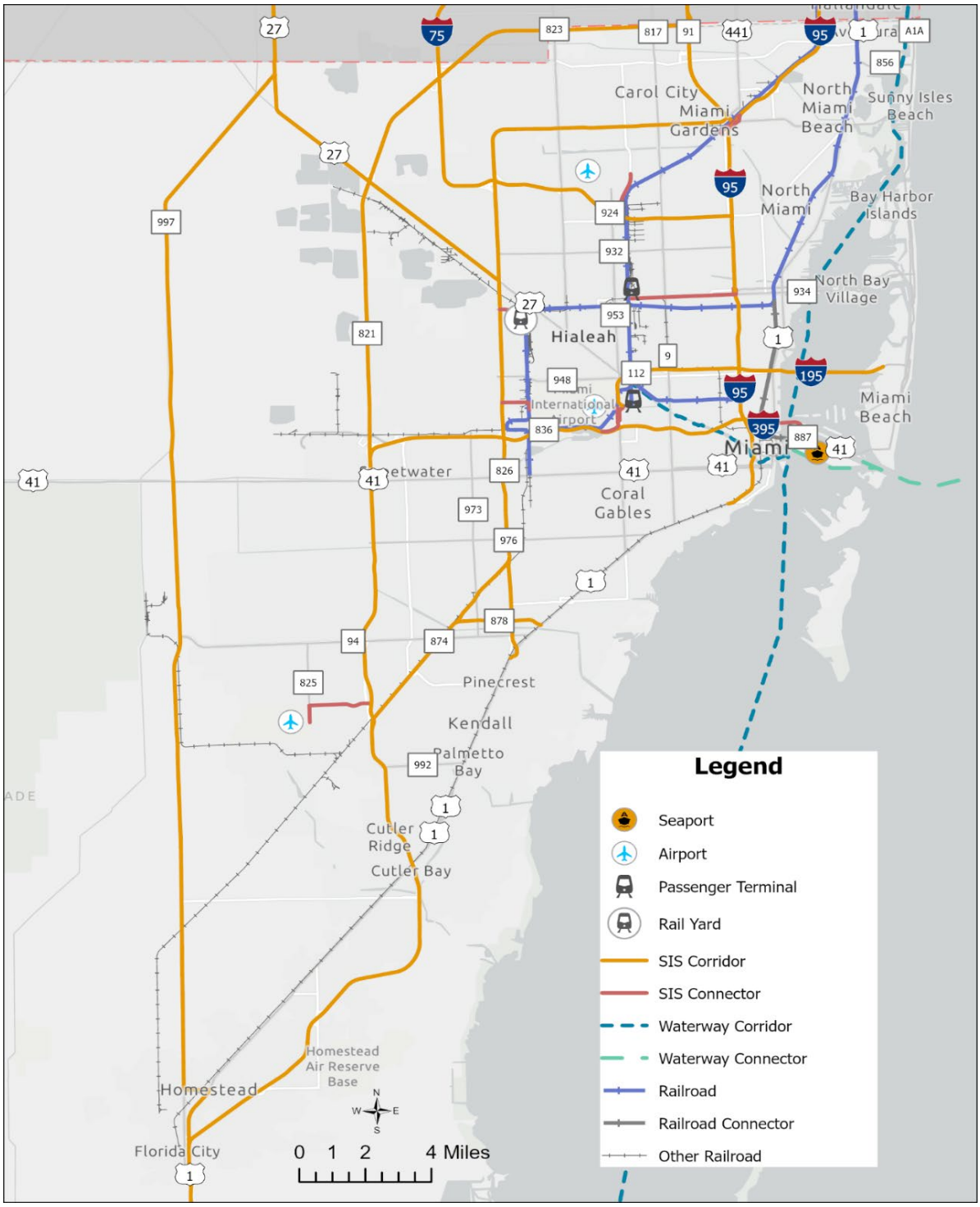
3.1 System Overview

The freight system in Miami-Dade County is vast and covers all major modes of transportation. These modes work together to ensure a seamless flow of goods within the county and beyond, including regional, national and international destinations. The network includes roads, railways, waterways, seaports, airports, and pipelines. Many of these facilities have been designated as Florida SIS or Emerging SIS facilities as corridors, hubs and connectors. The SIS network was created in 2003 as the State's top-priority network of transportation facilities essential for the seamless flow and highest degree of mobility of people and goods throughout Florida. The Miami-Dade County freight network is shown in Figure 3-1.

SIS designated facilities receive top priority for transportation investments and are essential in implementing the Florida Transportation Plan. The SIS network incorporates all aspects of freight needs, including commercial airports, deep-water seaports, rail terminals, waterways, and highways. The following facilities within Miami-Dade County have been designated as part of the SIS:

- **Airport:** Miami International Airport (SIS Airport), Miami Opa-locka Executive Airport (SIS General Aviation Reliever Airport), and Miami Executive Airport (added in 2014 as a SIS General Aviation Reliever Airport).
- **Railyard:** Miami Hialeah FEC Intermodal Terminal
- **Seaport:** PortMiami
- **Waterway:** Intracoastal Waterway (SIS Waterway), PortMiami (SIS Waterway Connector), Miami River SIS Waterway (Strategic Growth Waterway)
- **Roadways:** Designated highways consist of Interstates, toll roads/expressways, and other key State highways.
- **Connectors:** Each of the freight hubs have roadway, waterway and/or railway connectors designated to provide access to the SIS corridors. [13]

[13] *SIS Maps.* Florida Department of Transportation. https://www.fdot.gov/planning/systems/sis/maps



Source: FDOT and Cambridge Systematics, 2023.

Figure 3-1 Miami-Dade County Freight System

In 2015, the Fixing America's Surface Transportation Act (FAST Act) repealed both the Primary Freight Network and National Freight Network from Moving Ahead for Progress in the 21st Century Act (MAP-21) and directed the FHWA Administrator to establish a National Highway Freight Network (NHFN) to strategically direct Federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system. The NHFN consists of the following four subsystems: (1) the Primary Highway Freight System (PHFS); (2) those portions of the Interstate System not part of the PHFS; (3) Critical Rural Freight Corridors (CRFCs); and (4) Critical Urban Freight Corridors (CUFCs). The network was recently updated and is shown in Figure 3-2. Miami-Dade County, with 64 miles of PHFS routes, 11 miles of non-PHFS Interstates, and no CUFCs or CRFCs. Also included on this map are National Highway System (NHS) intermodal connectors which connect major intermodal terminals to the highway network. In Miami, this includes two connectors to the Miami International Airport, and one for each of the following areas: Miami's Doral Off-Airport Cargo Area, Miami's Off-Airport West Cargo Area, Parsec Miami Automobile Terminal, Parsec North, and PortMiami. [14]

The CRFC and CUFC designated roadways support movement of freight at the local level and are important to overall connectivity between freight activity centers and the PHFS and overall Interstate system. The draft network for the State of Florida included all of Krome Avenue and US 27 from SR 826 to I-75 in Broward County as Critical Freight Corridors (with designations of "Urban" or "Rural" depending on its location inside or outside of the Urban Development Boundary). The final Florida network did not include Krome Avenue or US 27 as statewide mileage caps limits the number of miles of freight corridors. Through the FHWA's process of developing the NHFN, the mileage caps for Florida were identified as 160.07 miles of CUFCs and 360.14 miles of CRFCs. Local freight stakeholders strongly believe that these corridors belong on the network and are supporting revisions to the Florida network to add the segment of US 27 from SR 826 to the Broward County Line to the NHFN. Based on the TPO's Resolution #18-18, [15] on April 26, 2018, an official request from Miami-Dade County Office of the Mayor was submitted to FDOT requesting US 27 between I-75 and the Hialeah Rail Yard be added to the Florida NHFN. Currently, US 27 remains designated for 5.01 miles from SR 826 to SR 112. [16] However, the TPO continues to pursue NHFN designation for this corridor. TPO Resolution #54-2023, approved in December 2023, calls for US 27 to be designated from SR 826/Palmetto Expressway to the Florida's Turnpike as a CUFC and from the Florida's Turnpike to the Miami-Dade and Broward County line as a CRFC. [17]

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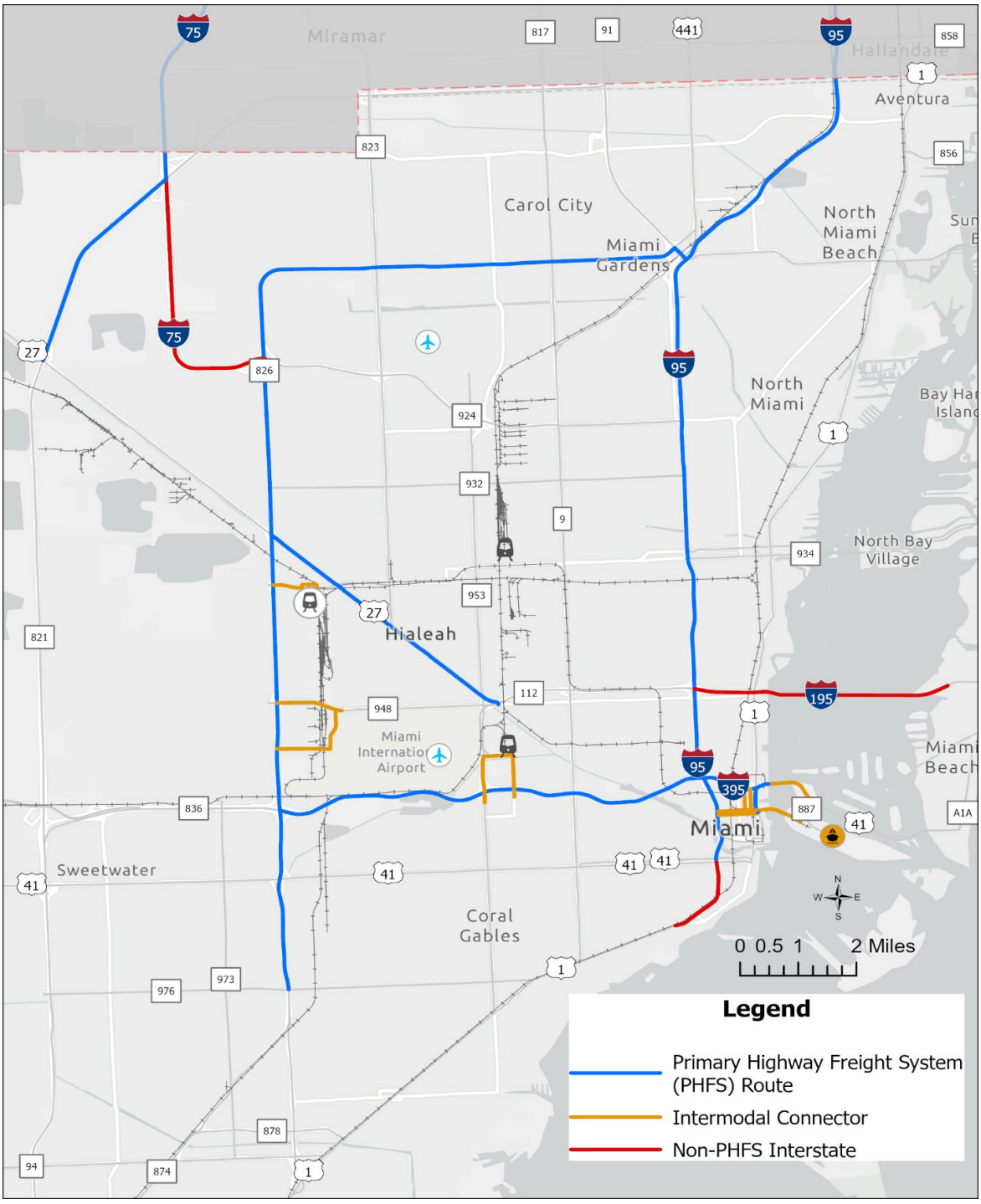
[14] *Intermodal Connectors – Florida.* Federal Highway Administration. https://www.fhwa.dot.gov/planning/national_highway_system/intermodal_connectors/florida.cfm

[15] TPO Resolution #18-18. https://www.miamidadetpo.org/library/boards/TPO-Governing-Board/Resolutions/2018-018-tpo-board.pdf

[16] *National Highway Freight System (PHFS): Florida.* Federal Highway Administration. https://ops.fhwa.dot.gov/Freight/infrastructure/ismt/state_maps/states/florida.htm

[17] TPO Resolution #54-2023. https://www.miamidadetpo.org/library/boards/TPO-Governing-Board/Resolutions/2023-054-tpo-board.pdf



Source: Freight Management and Operations, FHWA and Cambridge Systematics, 2023.

Figure 3-2 National Highway Freight Network Designation in Miami-Dade County

3.2 Regional Context

Understanding the connection of the county freight network to the larger freight systems in South Florida and the state is crucial. Municipal boundaries are not important to freight operators, as they focus on overall mobility and market access Figure 3-3 illustrates how Miami-Dade County serves and connects to the South Florida region through major roadways like I-75, I-95, and the Florida's Turnpike, which provide high-volume access between Miami-Dade County, Broward County, Palm Beach County, Monroe County, and the rest of the country. The US 27 corridor allows access to the industrial hub of Miami-Dade County and connects to Palm Beach County, as well as Hendry and Glades Counties, where private ILCs are in various stages of development. The Airglades International Airport is working to open a "state-of-the-art perishable cargo airport and full- service logistics center" [18], and the Americas Gateway Logistics Center is actively marketing its property for industrial development. [19] Both of these properties are located on the US 27 corridor. Additionally, the CSX Railroad and FEC Railway are important regional components, providing connections to the North American rail network.

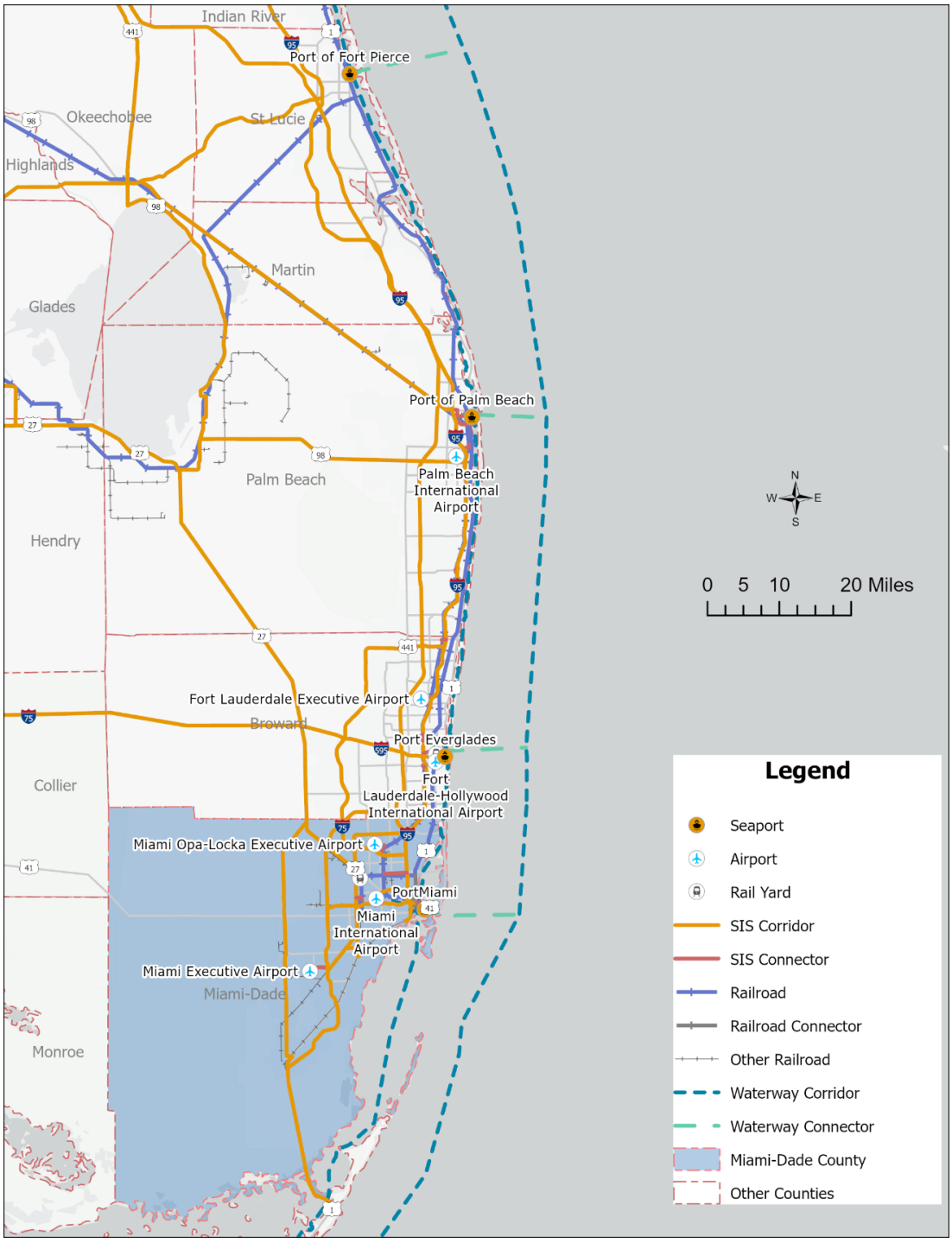
3.3 Highways

Miami-Dade County has a comprehensive highway system that offers access throughout the County and to the wider region and state. The primary interregional corridors include I-75, I-95, the Florida's Turnpike Enterprise (FTE) facilities, US 27, and US 1/South Dixie Highway that provides access to Monroe County to the south. Other roadways, such as expressways and state highways, provide internal movements and access to important freight hubs. Tolls are charged on many of the county's key expressways, as noted below:

- I-195/Julia Tuttle Causeway
- SR 112/Airport Expressway – Toll
- SR 836/Dolphin Expressway – Toll
- SR 874/Don Shula Expressway – Toll
- SR 924/Gratigny Parkway – Toll
- SR 934/Hialeah Expressway
- SR 826/Palmetto Expressway
- SR 878/Snapper Creek Expressway – Toll
- I-395/MacArthur Causeway

[18] https://www.airglades.com/2022/02/10/airglades-international-airport-to-open-state-of-the-art-perishable-cargo-and-full-service-logistics-center/

[19] https://gladescountyedc.com/wp-content/uploads/2023/07/Americas_Gateway-3-11-2021.pdf



Source: FDOT and Cambridge Systematics, 2024.

Figure 3-3 Regional Context of Miami-Dade Freight Network

GMX maintains five expressways, including SR 112, SR 836, SR 874, SR 878, and SR 924, while FDOT and FTE are responsible for other state roads. For funding purposes, the Miami-Dade County freight highway network includes 213 miles of SIS roadways and 75 miles on the NHFN, with overlapping designations for these two categories. The Road, Bridge, and Canal Maintenance Division of the Miami-Dade County Department of Transportation and Public Works (DTPW), and local jurisdictions maintain the remaining 5,500 miles of roadways in the County.

Figure 3-4 shows the 2022 Average Annual Daily Traffic (AADT) on the roadways in Miami-Dade County, with the major expressways registering the highest traffic volumes. Other roadways like NW 36th Street, US 1, the MacArthur Causeway, and Okeechobee Road also have significant traffic volumes. The maps highlight the NHFN and SIS roadways as high-volume roadways, illustrating their importance for the movement of both freight and people within the County.

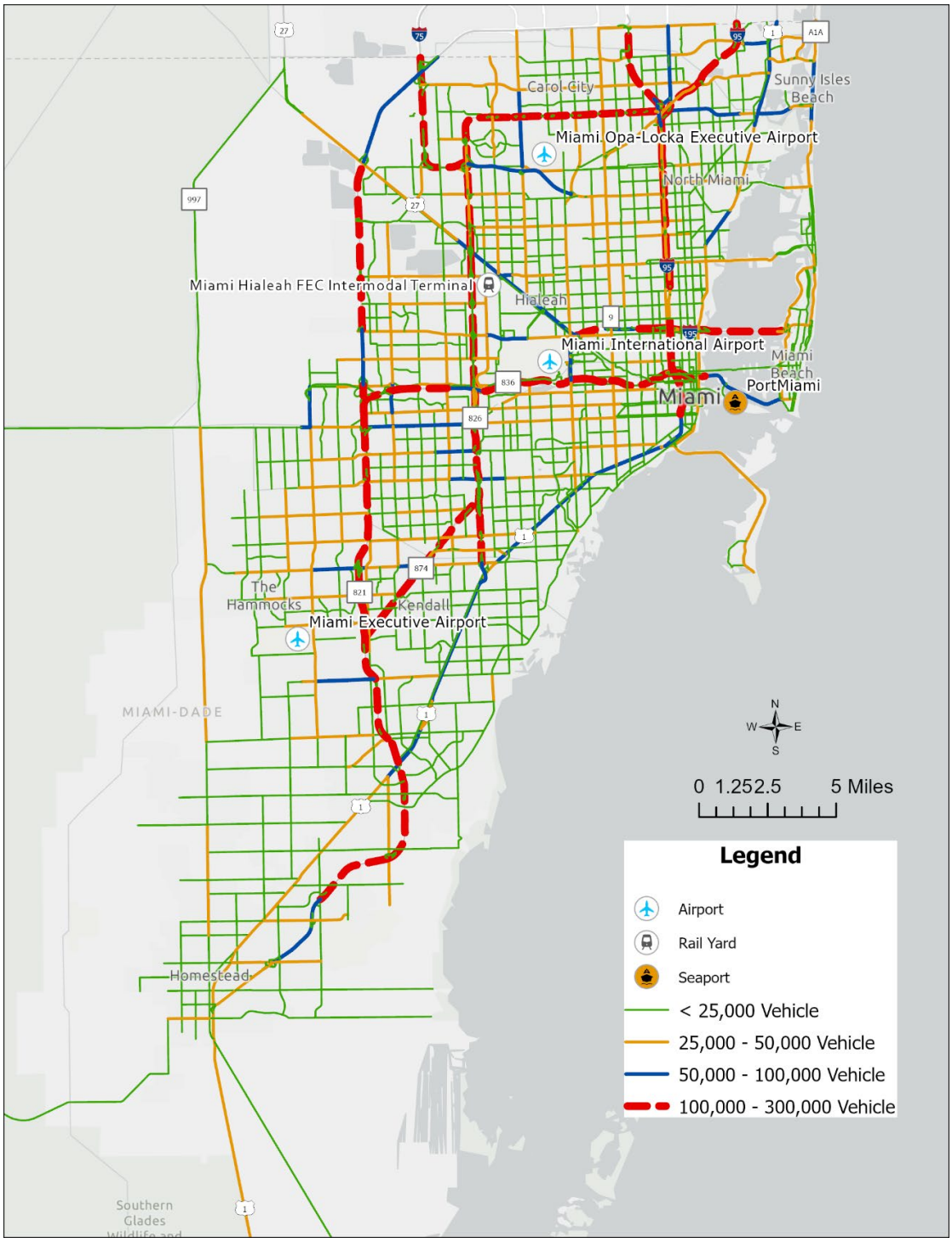
The number of trucks using these same roadways highlights which corridors are most important for the movement freight. Figure 3-5, created by FHWA, defines vehicle classifications for traffic counting purposes, with all vehicles in classes 4 through 13 being classified as "trucks," which includes any truck or bus with six or more tires.

These truck volumes are measured as Average Annual Daily Truck Traffic (AADTT). While trucks use the same busy highways as automobiles, the pattern of key roadways is slightly different. Figure 3-6 presents the 2022 AADTT counts for Miami-Dade County. The highest AADTT volumes are on the key expressways; however, concentrations of trucks getting on and off these roadways to access key freight activity centers can be seen, especially west of Miami International Airport. The highest daily volume of trucks in the county, with more than 20,000 trucks per day, is on SR 826 between NW 74th Street to US 27/SR 25/Okeechobee Road.

In addition to understanding the total volume of traffic represented as AADT and AADTT, it is important to understand the highway links where trucks represent a more significant percentage of traffic. This helps identify those roadways that are predominantly used by the freight industry to move cargo to and from the higher volume corridors. Figure 3-7 shows the percent of total traffic represented by trucks. The patterns show trucks make up the greatest present of traffic on the arterial grid providing access to industrial and agricultural properties.

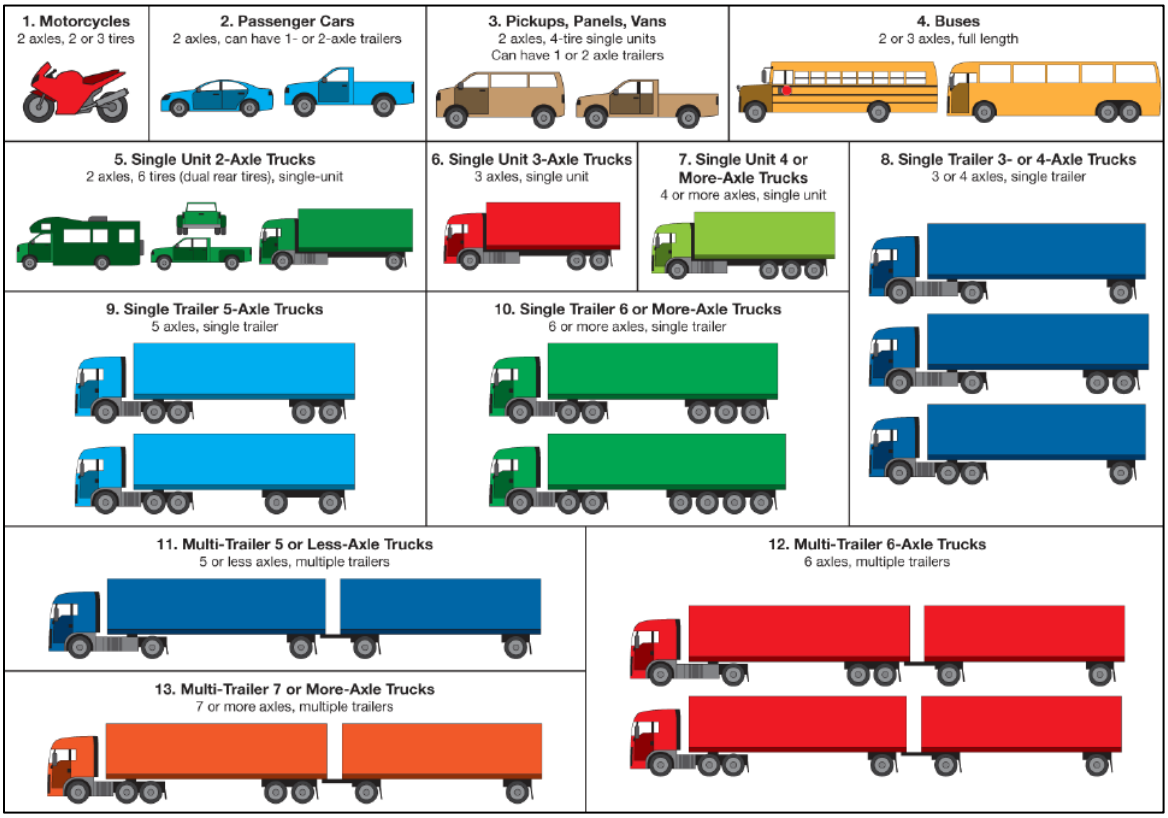
Aside from truck volume and truck percent characteristics, roadways also serve as gateways to the region's freight hubs and logistics infrastructure, such as PortMiami, FEC Intermodal Terminal, MIA, the Miami River industrial corridor, and western Miami-Dade County warehouse districts. Investments like PortMiami tunnel and the NW 25th Street Viaduct enable trucks to quickly and directly access essential freight hubs.

To determine the equivalent tonnage of freight moving into, out of, and within Miami-Dade County, the Freight Analysis Framework (FAF) developed by the Federal Highway Administration was utilized. The FAF, currently on version 5.5.1, provides annual estimates of freight traffic by origin/destination, commodity, and mode for base and future years. Estimates are developed for states and major metropolitan areas. Due to the proximity of other large population centers, the Miami Metropolitan Area used in FAF also includes Broward and Palm Beach counties.



Source: FDOT Open Data Hub, 2022.

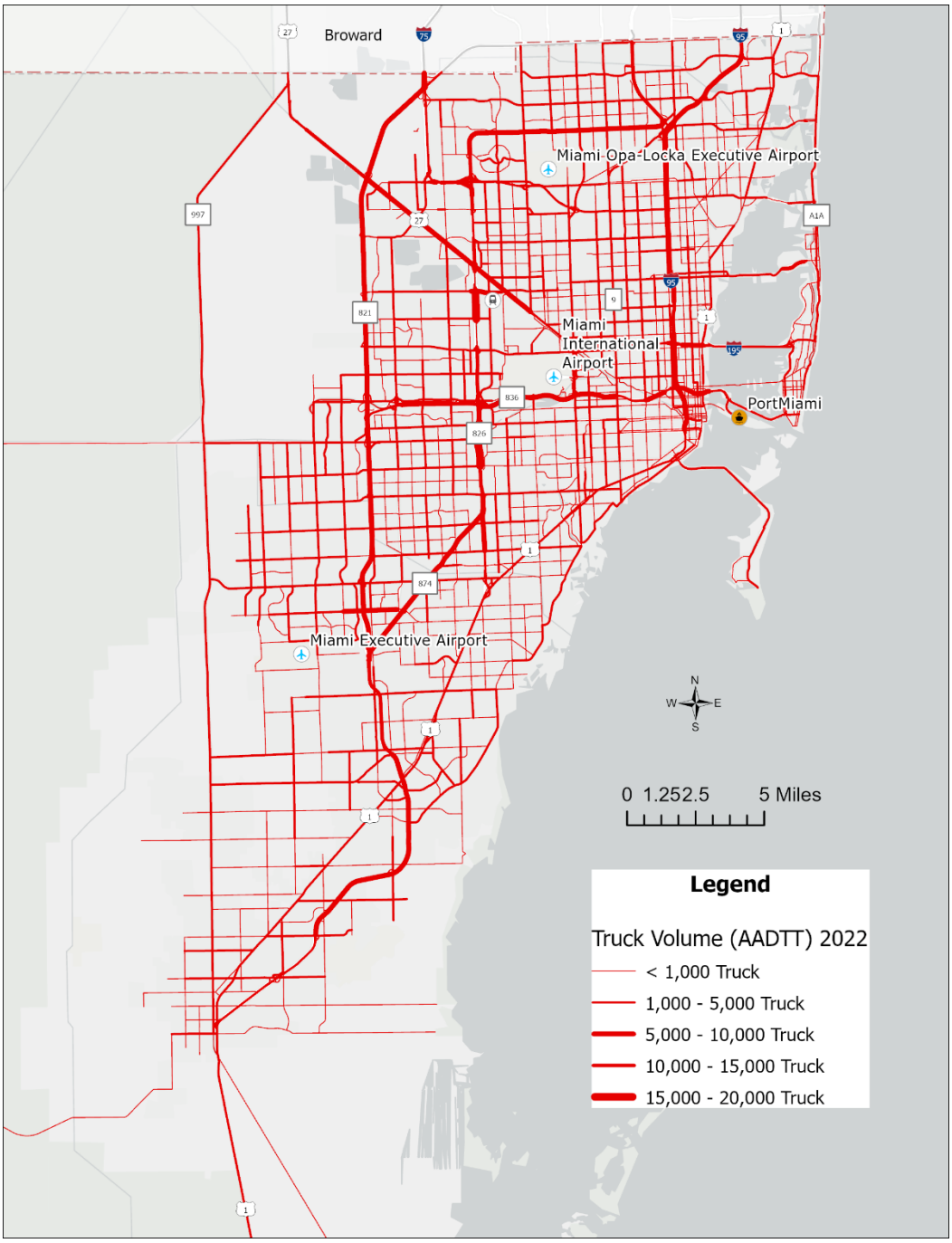
Figure 3-4 2022 AADT on Miami-Dade Highway System



Source: FHWA, 2018.

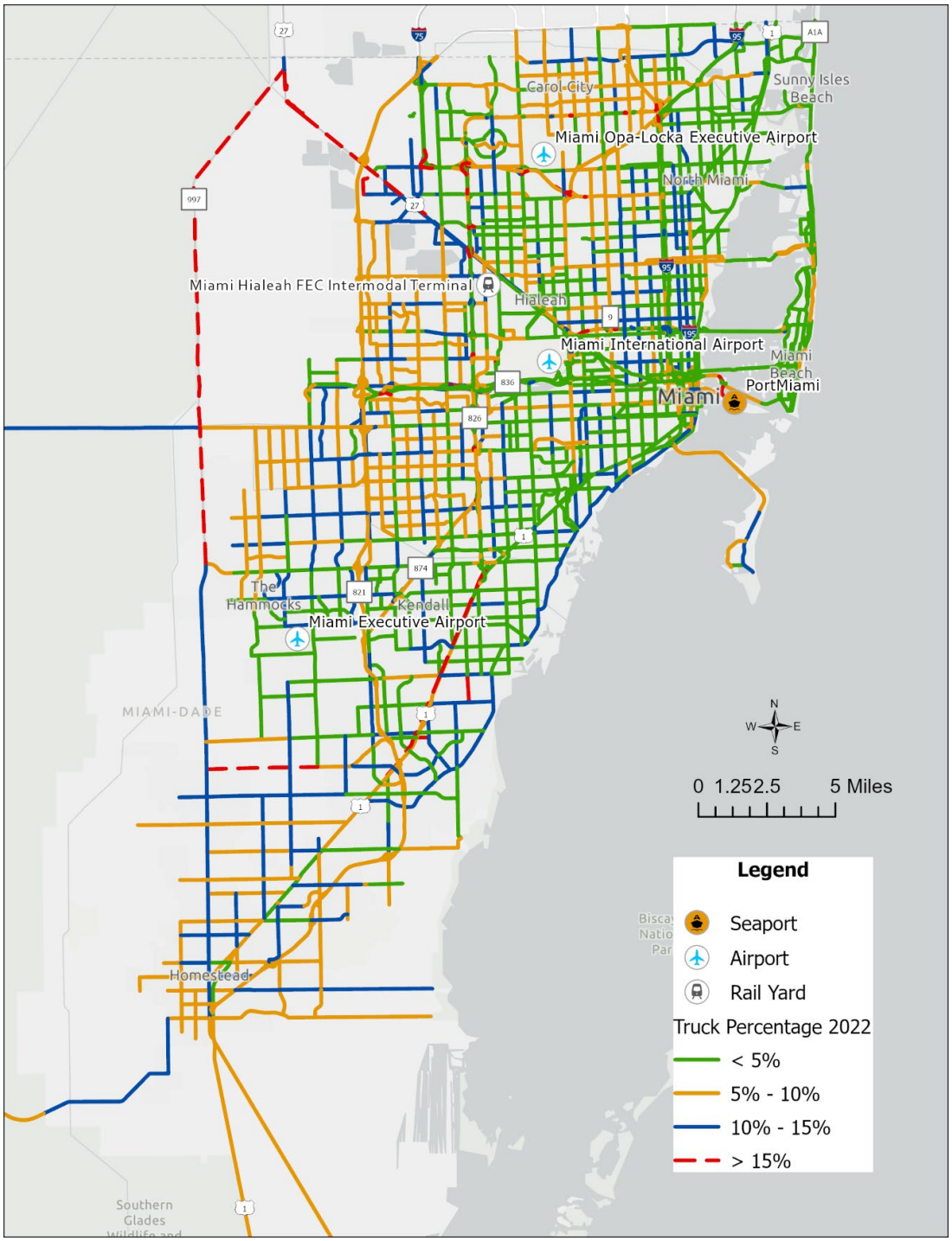
Figure 3-5 FHWA Vehicle Classification

Truck movements were estimated at nearly 250,000 thousand tons for 2021, the most recently available estimates, as shown in Figure 3-8. Internal movements accounted for the greatest volume of traffic at 62 percent of the total. This is expected as a significant amount of the cargo brought in through PortMiami and Miami International Airport serves the local resident and tourism markets. Inbound or destination movements are the next highest category representing 22 percent of the total with outbound or origin movements accounting for the remaining 16 percent. Florida is known for being a consuming state, versus a production state; and therefore, more goods come into the state than leave it. Miami-Dade County is no exception to this trend. Based on the FAF estimates, there is roughly a 60/40 split between inbound and outbound movements, respectively. This results in an empty backhaul movement for approximately one-third of the trucks delivering goods to the Miami region, with this trend expected to continue in the future. FAF provides forecasts for 2050, which includes a low, most-likely, and high estimate. Each scenario maintains this 60/40 split. Overall volumes are anticipated to increase by 40 to 55 percent as Miami's population and attraction as a vacation destination continue to grow. With roadways in Miami already experiencing severe congestion and unreliable travel times, further investments in operations and capacity will be needed to ensure that truck deliveries can continue to operate efficiently.



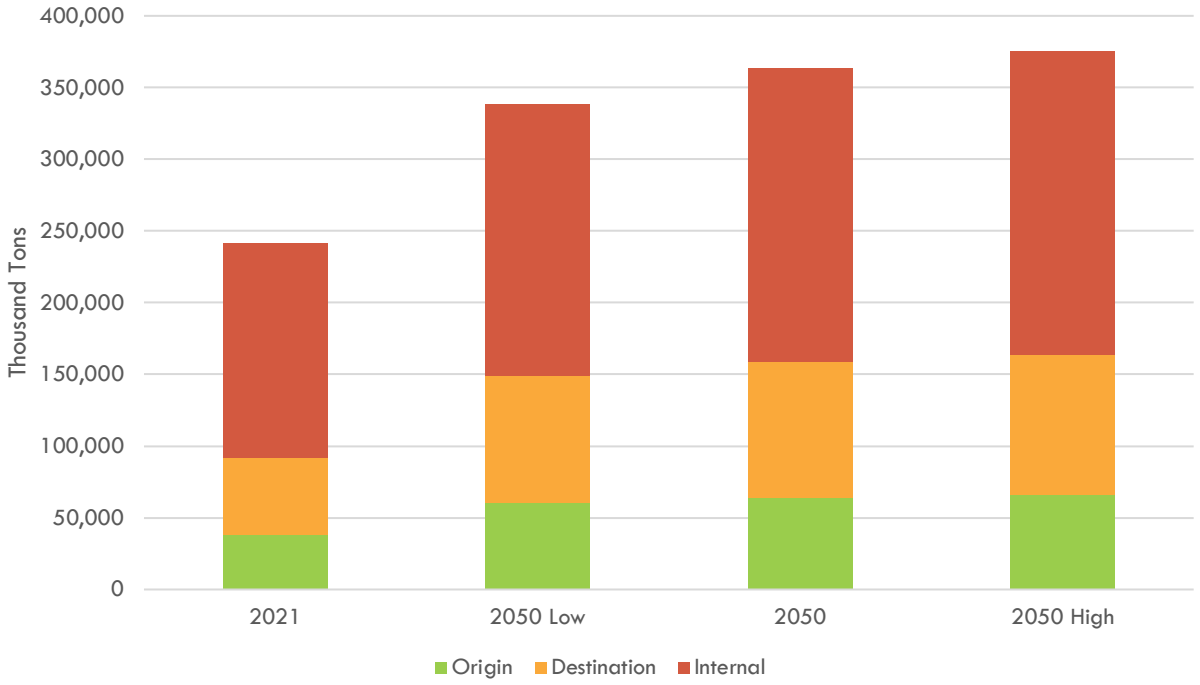
Source: FDOT Open Data Hub, 2022.

Figure 3-6 2022 Truck Volume (AADTT) on Miami-Dade Highway System



Source: FDOT Open Data Hub, 2022.

Figure 3-7 2022 Truck Percentage on Miami-Dade Highway System



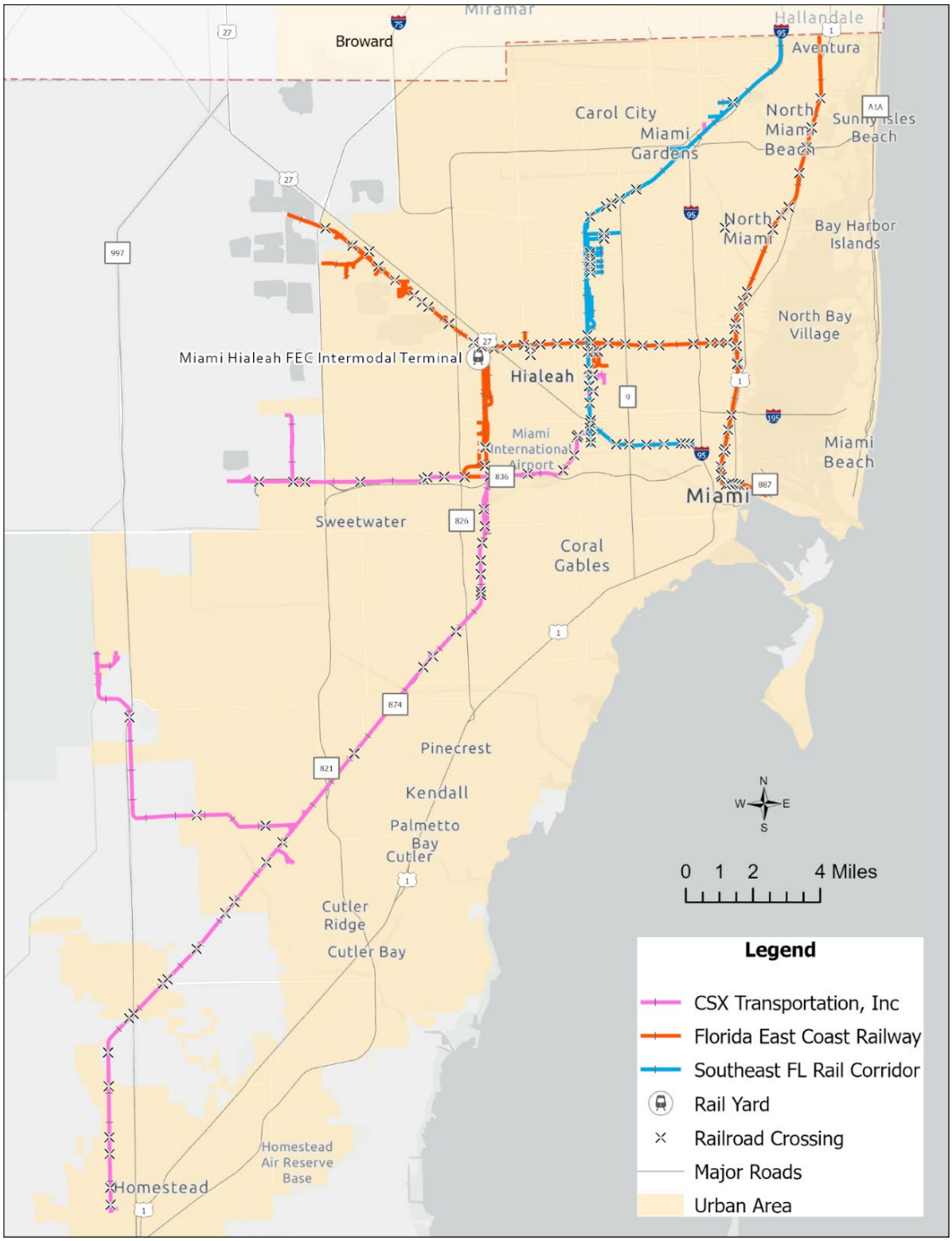
Source: Freight Analysis Framework 5.5.1.

Figure 3-8 Forecasted Truck Tonnage in the Miami Metropolitan Area, 2021 and 2050

3.4 Railroads

Miami-Dade County's freight rail network is served by two freight railroads, namely the FEC and CSX. FEC is a Class II railroad headquartered in Jacksonville, Florida, and operates 351 miles of mainline track along Florida's eastern coastline from Jacksonville to Miami. FEC interchanges with two Class I railroads in Jacksonville (CSX and Norfolk Southern) which provide connections to the North American Class I rail network. CSX, also based in Jacksonville, operates over 20,000 route miles across 23 states, the District of Columbia, and the Canadian provinces of Ontario and Quebec. CSX's southern terminus is located in Miami-Dade County.

FEC provides all of South Florida's intermodal service, with an intermodal ramp in Hialeah and at PortMiami. It also provides carload and general merchandise service. CSX provides carload and general merchandise service to South Florida. Both railroads serve the aggregate mines in the Lake Belt Area in western Miami-Dade County. Figure 3-9 illustrates the freight rail network in Miami-Dade County. Each of these freight rail operators shares right of way with passenger rail service. Brightline operates a higher speed intercity passenger service from Miami to Orlando along the FEC track. Tri-Rail operates a regional commuter service from Miami to West Palm Beach along the South Florida Rail Corridor (SFRC), which is former CSX track purchased by the state.

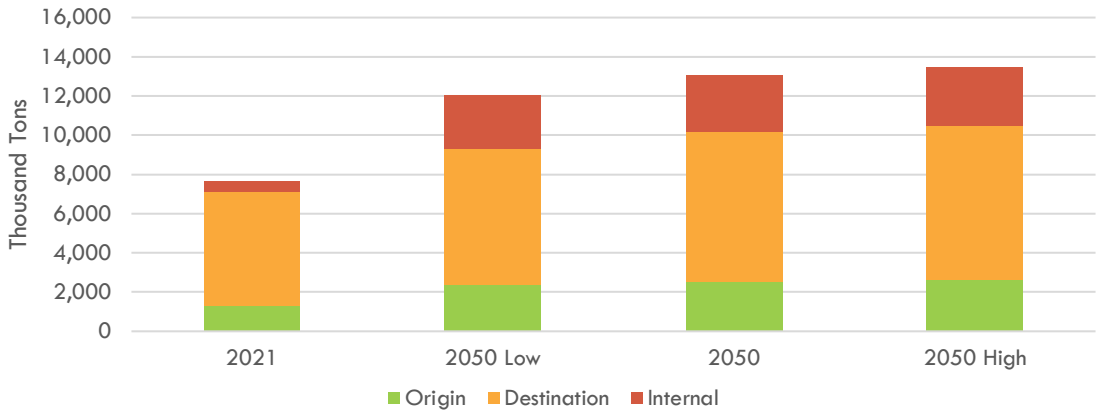


Source: Federal Railway Administration.

Figure 3-9 Miami-Dade County Freight Rail Network

Amtrak also provides service along the SFRC. Commuter service is anticipated to operate on the FEC corridor in the future as part of the Northeast Corridor, a component of the SMART Program and the Miami-Dade portion of the Coastal Link. The Northeast Corridor would extend from Downtown Miami to Aventura for approximately 13.5 miles.[20] This corridor is partially funded in the amount of $263.7 million as part of President Biden's FY 2025 Budget Request to Congress.[21]

To determine the tonnage of freight moving into, out of, and within Miami-Dade County by rail, the FAF was again utilized. Rail movements were estimated at nearly 8,000 thousand tons for 2021, as shown in Figure 3-10. Internal movements accounted for the lowest volume, which is expected as rail movements are typically least competitive for short haul movements. Inbound movements accounted for the greatest volume of traffic, representing 76 percent of the total. Florida is known for being a consuming state, versus a production state; and therefore, more goods come into the state than leave it. Based on the FAF estimates, there is roughly an 80/20 split between inbound and outbound movements, respectively. This results in an empty backhaul movement for approximately three-fourths of the railcars delivering goods to the Miami region, with this trend expected to improve slightly in the future. FAF provides forecasts for 2050, which includes a low, most-likely, and high estimate. Each scenario maintains a 75/25 split which means two-thirds of rail cars would still make an empty backhaul. Overall volumes are anticipated to grow by 57 to 75 percent, with the greatest increase seen in internal movements, perhaps in anticipation of increased use of proposed inland ports. With existing questions surrounding rail capacity and grade crossing safety, there is a need for increased rail investment in South Florida.



Source: Freight Analysis Framework 5.5.1.

Figure 3-10 Forecasted Rail Tonnage in the Miami Metropolitan Area, 2021 and 2050

[20] *Northeast Corridor.* Miami-Dade County. https://www.miamidade.gov/global/transportation/smart-plan-northeast-corridor.page

[21] *Biden-Harris Administration Announces Nearly $4 Billion in Support for 14 Major Transit Construction Projects Across the U.S.* U.S. Department of Transportation. March 11, 2024. https://www.transportation.gov/briefing-room/biden-harris-administration-announces-nearly-4-billion-support-14-major-transit

There are a significant number of at grade crossings along the FEC and CSX corridors. Each crossing is a conflict point between the rail and highway networks. Understanding and mitigating these conflicts is a critical component of the county's and TPO's transportation planning function.

Table 3-1 and Figure 3-11 present the top 20 crossings in Miami-Dade County by predicted accident rank. The data is an element of the Accident Prediction System (APS) from the Federal Railroad Administrations (FRA), which predicts the number of accidents that are anticipated at public crossings based on historical data. The Accident Prediction System (APS) ranks public highway-rail intersections by predicted accidents per year.[22] This includes accidents over the last five years. Of the 229 total public crossings in the county, only one has average predicted number of accidents exceeding 1 accident annually (indicated with the number 1 in Figure 3-11). Additionally, the top 20 locations congregate into three major clusters in the county: the CSX track south of Miami International Airport (which has 7 of the top 20 locations); the FEC track near North Miami; and the Southeast Florida Rail track near Golden Glades. Generally, tracks have one high-density area where most of their high crash crossings are located. These clusters are located where high-volume vehicle thoroughfares meet high speed, through passing trains. This suggests that the through movement conflict between the two modes is an indicator for predicting accidents.

The US 27 corridor represents a possible expansion of South Florida's rail network and has been studied for more than a decade. The possible new rail line would allow freight trains serving Miami-Dade County to bypass most of the Miami Urbanized Area and reconnect to the rail network to the north. The original impetus for such a service emerged from a larger discussion about the possibility of developing intermodal logistic centers (ILCs) in Palm Beach, Hendry, and Glades counties. A rail feasibility study, completed by FDOT, suggested a new rail link may be feasible. The feasibility study was followed by a Planning and Conceptual Engineering (PACE) Study in 2012. The potential corridor would connect existing rail termini in western Miami-Dade County to railroad connections in Palm Beach County, as illustrated in Figure 3-12.

Since the completion of this study, South Florida has seen the introduction of Brightline passenger rail service along the FEC corridor. With efforts by PortMiami and Port Everglades to double their containerized operations over the next twenty years, expansion of Tri-Rail service and Brightline Florida service, and growth in development along the SFRC and FEC rail corridors, traffic along existing rail lines will increase significantly. Current volumes of passenger service include:

- **Tri-Rail**
  - Train Volume: 50 trains per weekday and 30 trains per weekend or holidays
  - Ridership: 3.7 million passengers in FY 2023[23]
  - Miami Stations: 6 (MiamiCentral, Golden Glades, Opa-locka, Metrorail Transfer, Hialeah, Miami Airport)

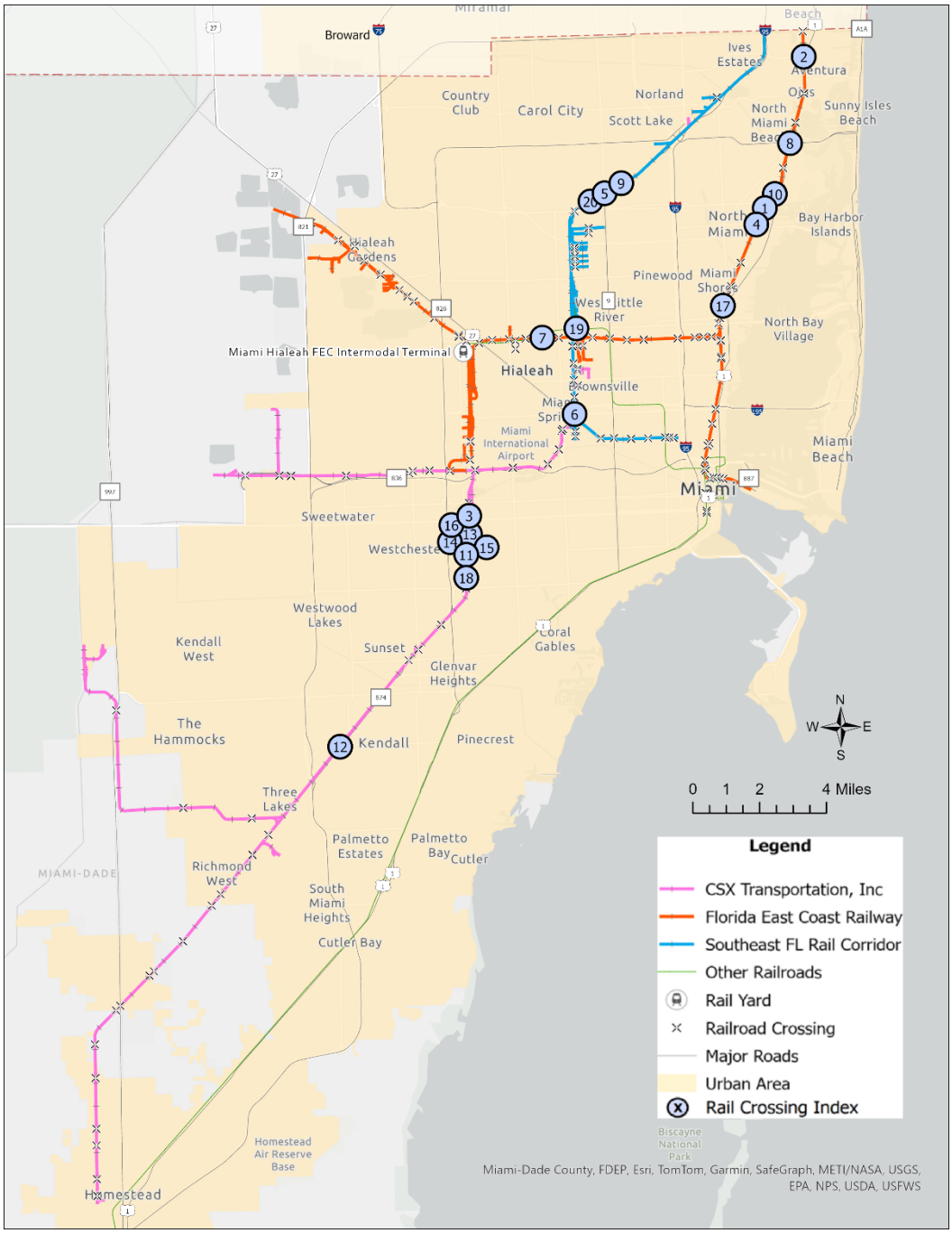
[22] *Accident Prediction System (APS) v2.0.0.84.* Federal Railroad Administration. https://safetydata.fra.dot.gov/gxaps-app/#/

[23] *Tri-Rail Facts.* Tri-Rail. https://www.tri-rail.com/pages/view/tri-rail-facts

Table 3-1 Public at-Grade Highway-Rail Crossings Accident Prediction, 2023

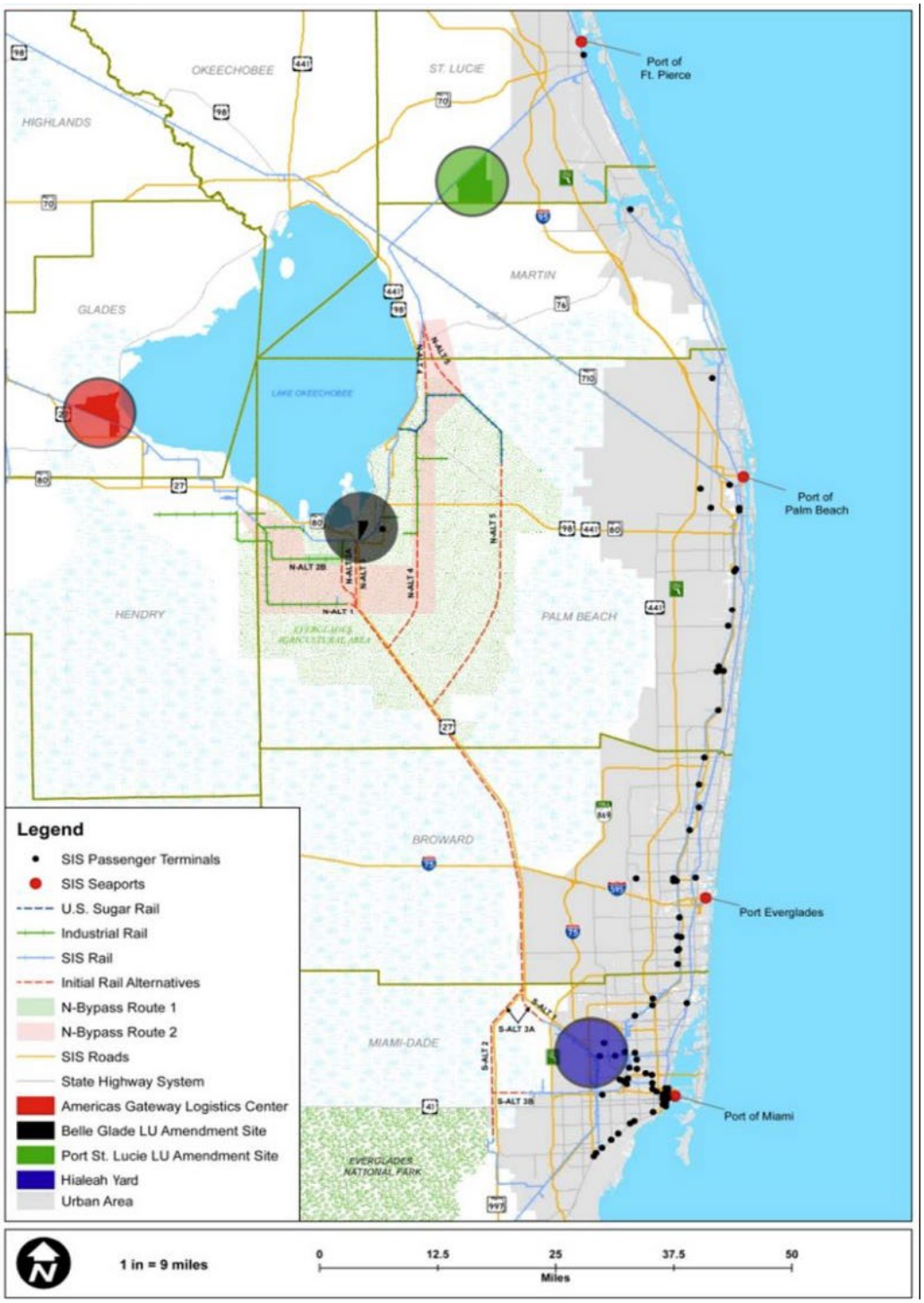
Map Index	RR Street Crossing	Crossing Number	Primary Operating Railroad	Number of Collisions (2019-2023)	Accident Prediction Value	Number of Daily Trains	Maximum Allowable Speed	AADT	Conflicts (Daily Trains × AADT)
1	NE 141ST ST	272609N	FEC	9	131%	50	79	4,551	227,550
2	NE 203RD ST	272596P	FEC	3	46%	50	79	17,500	875,000
3	SW 8TH ST	631057T	CSX	2	35%	1	25	52,500	52,500
4	NE 125TH ST	272612W	FEC	2	33%	52	79	30,500	1,586,000
5	NW 27TH AVE	628321V	SFRV	2	32%	61	45	40,000	2,440,000
6	NW 36TH ST	628377P	SFRV	2	31%	74	45	26,500	1,961,000
7	E 4TH AVE	272738D	FEC	2	31%	52	35	27,000	1,404,000
8	NE 163RD ST	272604E	FEC	1	19%	50	79	49,000	2,450,000
9	NW 22ND AVE	628320N	SFRV	1	19%	61	79	18,200	1,110,200
10	NE 135TH ST	272610H	FEC	1	18%	50	79	24,500	1,225,000
11	SW 23RD ST	631065K	CSX	1	17%	1	25	971	971
12	KILLIAN DR	631084P	CSX	1	17%	1	25	14,500	14,500
13	SW 9TH ST	631058A	CSX	1	17%	1	25	604	604
14	SW 13TH ST	631060B	CSX	1	17%	1	25	605	605
15	SW 21ST ST	631063W	CSX	1	17%	1	25	1,217	1,217
16	SW 13TH TER	631061H	CSX	1	17%	1	25	361	361
17	NE 6TH AVE	272618M	FEC	1	17%	50	79	10,600	530,000
18	SW 39TH ST	627901H	CSX	1	17%	1	25	3,975	3,975
19	NW 79TH ST	628339F	SFRV	1	17%	74	40	26,000	1,924,000
20	NW 135TH ST	628334W	SFRV	1	17%	61	45	21,000	1,281,000

Source: Federal Railway Administration.



Source: Federal Railway Administration.

Figure 3-11 Miami-Dade County Rail Network Strategic Railroad Crossing Index Map



Source: FDOT US 27 PACE Study.

Figure 3-12 US 27 Corridor

- **Brightline**
  - Train Volume: 32 trains per day (16 daily departures from Miami and Orlando)[24]
  - Ridership: 2.1 million passengers in 2023[25]
  - Miami Stations: 2 (MiamiCentral, Aventura)
- **Amtrak**
  - Train Volume: 2 trains per day (Silver Meteor and Silver Star)
  - Ridership: 50,992 in 2022 (at Miami station)[26]
  - Miami Stations: 1 (8303 NW 37th Avenue)

Existing right-of-way can accommodate an expansion through double or triple tracking, but the effects of increased passenger and rail operations will have a significant impact on the region. In addition, while ILCs have been slow to develop, there are active projects in Hendry and Glades counties, that, if successful would directly serve South Florida and rely on connections to South Florida's freight generators (e.g., PortMiami, MIA). As such, a new rail corridor in the rural western part of South Florida remains an attractive option. This corridor will be discussed in further detail in Chapter 8 regarding freight system needs and priorities.

3.5 Waterways

Miami-Dade County has three main waterways that serve the region's freight industry: the Miami River, the Atlantic Intracoastal Waterway and the Atlantic Shipping Lane. All three of these waterways are designated as part of the SIS.

The Miami River, overseen by the Miami River Commission, is a 5.5-mile-long waterway running from Biscayne Bay to just east of the SFRC drawbridge by NW 38th Avenue where it turns into the Miami Canal. An estimated 1,200 vessels move through this waterway each year. Use of the waterway for freight has been reduced in more recent years but approximately 300,000 short tons still move on this river each year to and from private terminals. As shown in Figure 3-13, the majority of movements on the Miami River consist of just five commodities which account for 71 percent of total traffic. In 2021, there was a significant increase in vehicles and parts, increasing from an average of 36,000 short tons in the prior four years to 137,663 short tons in 2021. In prior years, the largest cargo category was "Unknown or Not Elsewhere Classified" which has since declined from more than 50,000 short tons annually to just 5,000 in 2021.

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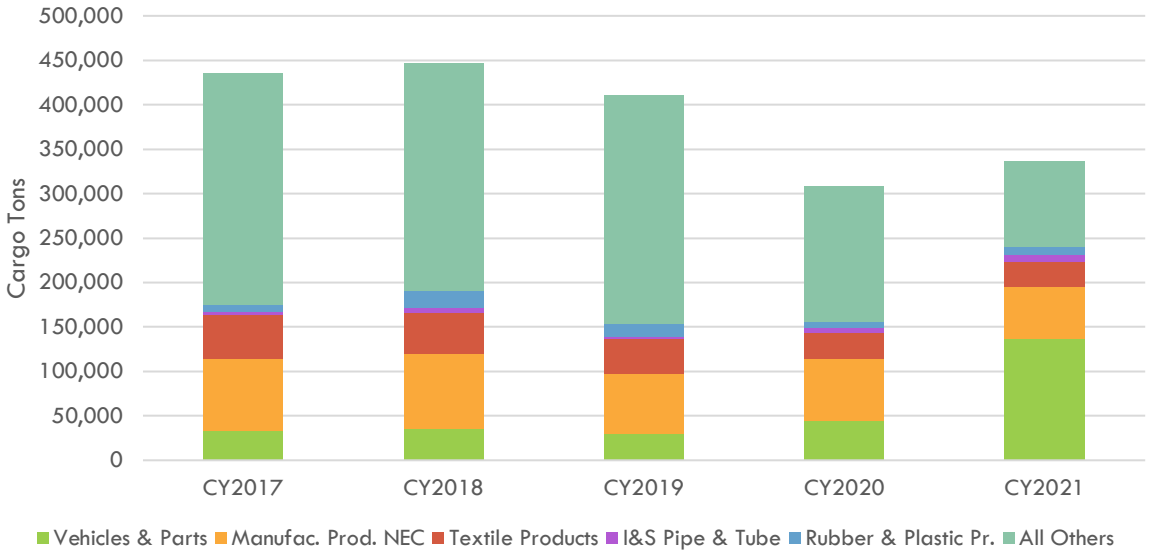
[24] *Brightline Now Running 32 Trains Between Orlando and Miami.* Go Brightline. December 4, 2023. https://www.tri-rail.com/pages/view/tri-rail-facts

[25] *Brightline, Florida's High Speed Railroad, Slashes 2024 Ridership Forecast.* Bloomberg. January 26, 2024. https://www.bloomberg.com/news/articles/2024-01-26/brightline-florida-s-high-speed-railroad-slashes-2024-ridership-forecast?embedded-checkout=true

[26] *Amtrak Ridership*. Bureau of Transportation Statistics. https://www.bts.dot.gov/browse-statistical-products-and-data/state-transportation-statistics/amtrak-ridership



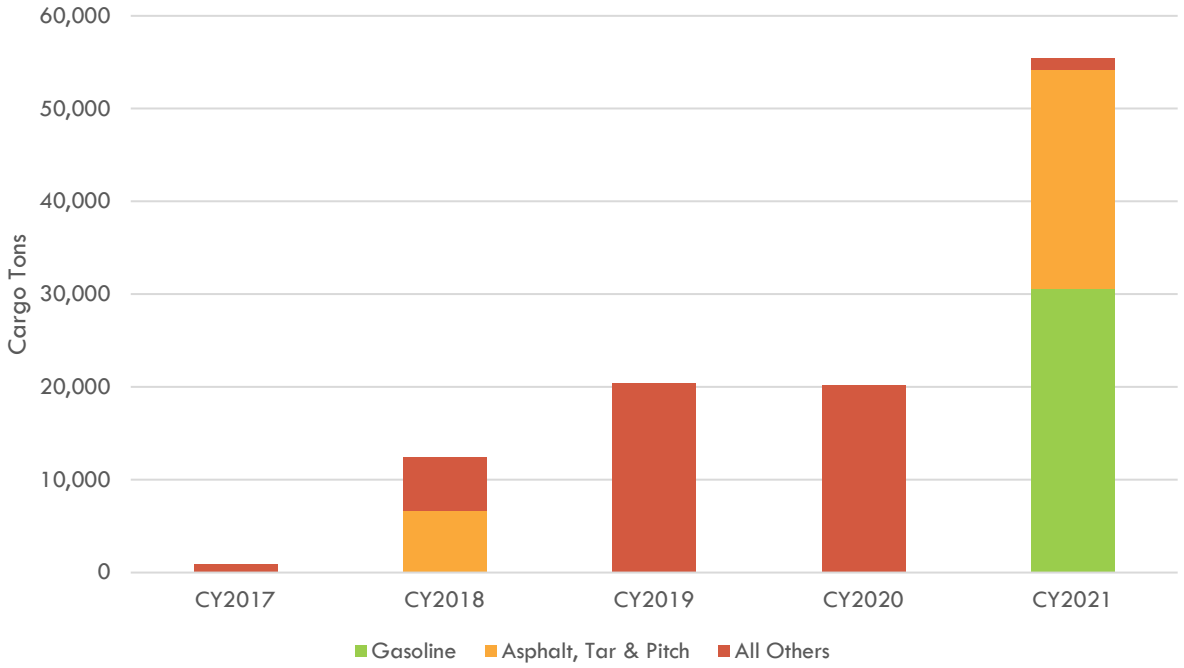
Source: US Army Corps of Engineers, Waterborne Commerce Statistics.

Figure 3-13 Cargo Activity on the Miami River

Based on historic trends, and ongoing redevelopment along the river's landside corridor, cargo volumes on the Miami River are expected to remain low.

The Atlantic Intracoastal Waterway (ICWW) stretches from Norfolk, Virginia to Key West, Florida as a 1,200-mile portion of the 3,000-mile Intracoastal Waterway. This system was originally designed to reduce the amount of open-ocean travel required as part of coastal shipping activity. Depths are maintained at 12 feet from Norfolk through Fort Pierce, Florida, and at 10 feet from Fort Pierce to Miami. The ICWW also has a significant number of bridges spanning the waterway. Many of these bridges were designed to accommodate much smaller barges and vessels. Most barges in use today are too large to pass under some of these bridges, limiting opportunity for commerce. Over the last decade, vessel traffic along the ICWW has continued to shift to primarily recreational in nature. For example, barge shipments of fuel to power plants along the ICWW historically represented a significant type of activity that has largely gone away as these facilities have converted to natural gas.

Cargo volumes between Jacksonville and Miami fluctuate but remain relatively low. As with the Miami River, the top types of commodities moved each year vary significantly, most likely due to the needs of a specific shipper for a finite period of time. For example, the largest commodity in 2020 was iron and steel plates and sheets, which accounted for 85 percent of the total volume. This commodity type was not reported in previous years or in 2021. Figure 3-14 shows the most recent cargo activity was related to gasoline and asphalt, tar, and pitch, which accounted for 98 percent of all cargo moved on the ICWW in 2021.



Source: US Army Corps of Engineers, Waterborne Commerce Statistics.

Figure 3-14 Cargo Activity on the Atlantic Intracoastal Waterway, Jacksonville to Miami

Future cargo moving on the ICWW will likely be associated with waterside operations requiring direct barge service for bulk, break bulk, or specialized project cargo. New facilities may need additional dredging to provide access from property/berth to the Federal channel. In Miami-Dade County, the use of the ICWW will likely remain largely recreational, other than for access to PortMiami and the Miami River.

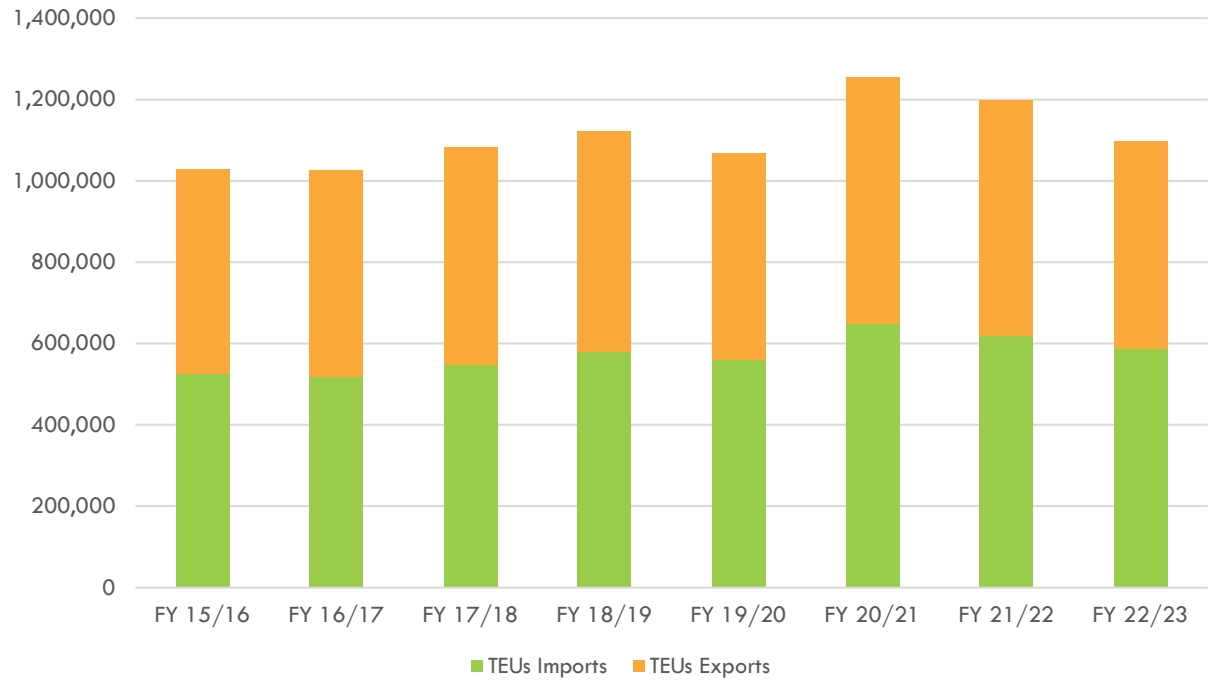
3.6 PortMiami

PortMiami is the "Global Gateway of the Americas" sitting at the crossroads of north-south and east-west trade lanes. The port consists of 520 acres located on Dodge Island in Biscayne Bay. The port is linked to the mainland via the PortMiami Tunnel, which provides direct access to the interstate highway system, and Port Boulevard via a bridge to the arterial network in Downtown Miami. FEC also provides direct rail service to the port via a rail bascule bridge and an on-port intermodal yard. PortMiami's primary cargo business is focused on container movements, but cruise operations represent the other major activity. The port's nine existing cruise terminals generate a significant demand for provisioning goods – all delivered by truck. Major capital improvement projects have been completed in recent years to position PortMiami to handle the modern fleet of neo-Panamax vessels as well as the World's largest cruise ships. Key investments have included the PortMiami

Tunnel that opened in 2014, deepening the channel to 50 feet, and the modernization of equipment such as container cranes. [27]

3.6.1 PortMiami Cargo Volumes

Container traffic is measured in twenty-foot equivalent units, or TEUs. At PortMiami, nearly all cargo movements are containerized goods, with some smaller number of bulk products occasionally moved. As shown in Figure 3-15, PortMiami has handled more than one million TEUs annually for the last eight years, or an average of 1.1 million. Container volumes reached a peak in FY 2021 at nearly 1.3 million TEUs. Most likely this is due to shifting supply chain movements during the COVID-19 pandemic. In the two most recent years, volumes have dropped from this high but still demonstrate growth over FY 2016 values. Between FY 2016 and 2023, annual growth at the port has been 1 percent. The ratio of import to export TEUs is relatively even at PortMiami, signifying a trade balance which has been constant over this time period.



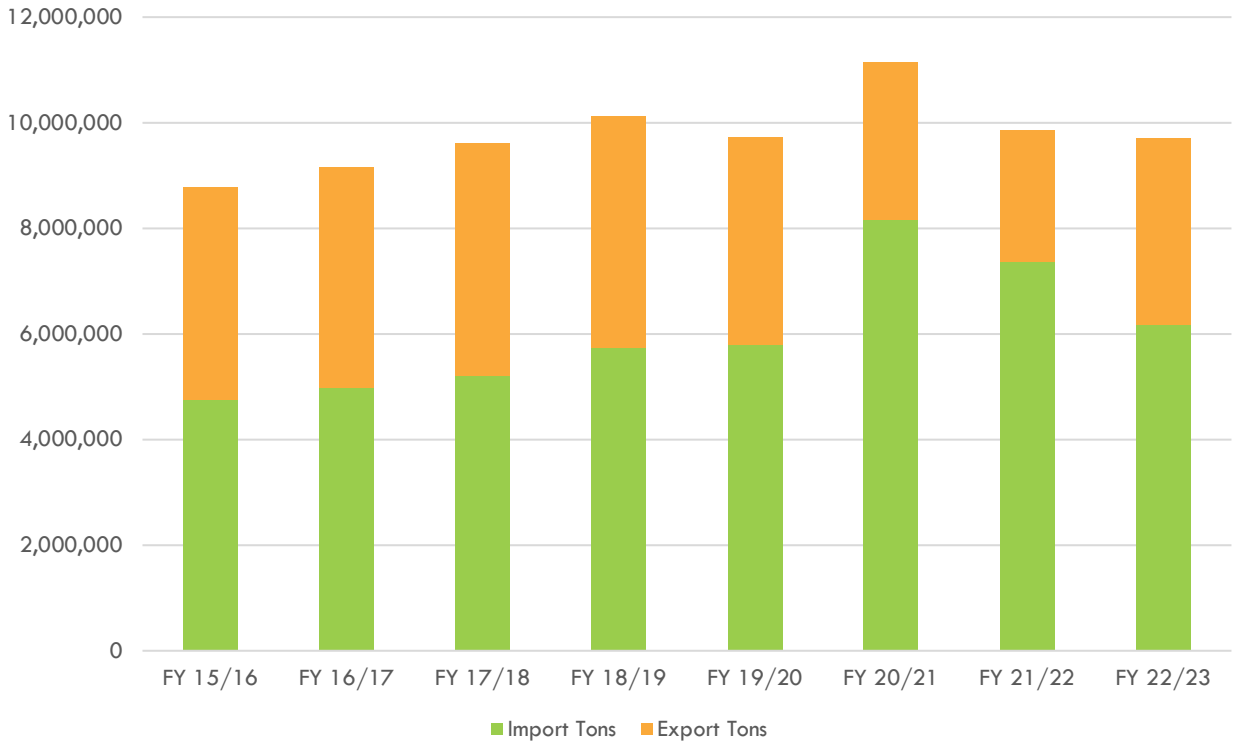
Source: FDOT, PortMiami.

Figure 3-15 PortMiami TEU Volumes by Year, FY 2016 – FY 2023

[27] *Seaport Business Plan.* Miami-Dade County. https://www.miamidade.gov/performance/library/business-plans/FY-2023-24-seaport.pdf

Figure 3-16 illustrates cargo trends by tonnage. Similar to the TEU volumes, tonnage reached a peak in FY 2021. Cargo tonnage has grown faster than the number of TEUs, with an average annual growth of 1.5 percent, increasing tonnage from 8.8 million tons in FY 2016 to 9.7 million tons in FY 2023.

Over the last few years, import tonnage has become significantly larger than export tonnage, even while the actual number of import and export containers remains fairly balanced. This is a shift from earlier years when both tonnage and TEUs were balanced. From FY 2016 through FY 2019, import and export tonnages were relatively equal with a 55/45 split, respectively. This reached a peak imbalance in FY 2022 when import tonnage accounted for 75 percent of the total container tonnage.



Source: FDOT, PortMiami.

Figure 3-16 PortMiami Tonnage Volumes by Year, FY 2016 – FY 2023

Looking forward, PortMiami's potential for cargo growth is bright. Significant investments, to be discussed in Chapter 8, are underway, the full impact of which remains to be seen. The most recent forecasts published by PortMiami were completed as part of the *2035 Master Plan* completed in 2012.[28] These forecasts were developed prior to the completion of several key capital projects mentioned above. In the high scenario, PortMiami expected to handle 2.5 million TEUs by 2024. Actual growth experienced by the port more closely followed the "Base-No Market Share

[28] *PortMiami 2035 Master Plan.* PortMiami. https://www.miamidade.gov/portmiami/master-plan.asp

Growth/Penetration" scenario, which expected 1.2 million TEUs in 2024. This suggests that the investments made to date have helped the port maintain its traffic but fail to grow its market share. Under this scenario, volumes are expected to continue to grow and reach 1.7 million TEUs by 2035.

PortMiami's Freight Export Profile

A closer examination of PortMiami's major commodities and trading partners can shed some light on the challenges and opportunities available. USA Trade Online,[29] developed by the US Census Bureau, provides access to current and cumulative export and import data by weight and by value. This dataset was used to identify top import and export commodities and countries for PortMiami traffic and later, similarly for Miami International Airport traffic.

PortMiami's top export commodities by weight are shown in Table 3-2. These top five commodities account for 42 percent of all exports by weight. From 2017 to 2023, the port's top three export commodities declined in volume. The most significant decline was experienced in Wood Pulp, which declined by 518 million kilograms (kg) in 2017 to 224 million kg in 2023, or a total decline of 57 percent. Given PortMiami's top three export commodities all declined during this period, total exports by weight are down 18 percent. Beverage exports grew 60 percent over the same period, moving it from the 11th highest commodity in 2017 to fifth in 2023.

Table 3-2 PortMiami Top Export Commodities, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Iron And Steel	306,868,973	-7%	14%	2	1
Wood Pulp Etc.; Recovered (waste & Scrap) paper & paperboard	224,107,173	-57%	11%	1	2
Cotton, Including Yarn and Woven Fabric Thereof	125,858,673	-3%	6%	3	3
Vehicles, Except Railway or Tramway, And Parts Etc.	123,983,575	4%	6%	4	4
Beverages, Spirits and Vinegar	99,438,981	60%	5%	11	5

Source: USA Trade Online

Only two of the five top export commodities by weight (Cotton and Vehicles) are in the top five when ranked by value, as shown in Table 3-3. The top five commodities represent 50 percent of total exports by value, or $5.4 billion of the $10.8 billion exported in 2023. Despite the drop in overall export weight, the value of these goods has increased by 14 percent. Each of these commodities grew at an above average rate, thus maintaining their 2017 ranking into 2023. In fact, of the top 10 commodities by weight, only one has changed over this time period. Dairy products have increased from a rank of 22nd to 10th whereas manmade staple fibers dropped out of the top 10 down to 17th.

[29] USA Trade Online. US Census Bureau. https://usatrade.census.gov/

Table 3-3 PortMiami Top Export Commodities, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Nuclear Reactors, Boilers, Machinery Etc.; Parts	$2,344,099,550	25%	22%	1	1
Electric Machinery Etc.; Sound Equipment; TV Equipment; Parts	$1,179,396,317	21%	11%	2	2
Vehicles, Except Railway or Tramway, And Parts Etc.	$990,867,175	38%	9%	3	3
Plastics And Articles Thereof	$472,568,329	15%	4%	4	4
Cotton, Including Yarn and Woven Fabric Thereof	$436,275,767	16%	4%	5	5

Source: USA Trade Online

Exported goods are going to five main countries which account for 45 percent of all exports, as shown in Table 3-4. China used to be the port's top export partner by weight but has since dropped to 21st. Exported volumes to China dropped from nearly 500 million kg of goods to approximately 23 million kg. For the most recent top list, nearly all of the countries are in the Americas. The exception to this is India, which ranks 2nd. While overall export volumes are down, attributed to reduced trade with China, the majority of these countries have increased their trade with PortMiami since 2017. Columbia has experienced a decline by 27 percent, most significantly due to a decrease in inorganic chemicals (reduction from 12.5 million kg to 2.3 million kg) and wood (10.1 million kg to 0.6 million kg). Exports to Jamaica have seen the highest rate of growth with an increase of 53 percent, bringing it from the 10th highest trading partner to fourth.

Table 3-4 PortMiami Top Export Countries, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Dominican Republic	332,157,479	16%	16%	2	1
India	226,008,418	48%	11%	4	2
Honduras	192,868,892	6%	9%	3	3
Jamaica	128,664,873	53%	6%	10	4
Colombia	84,031,223	-27%	4%	5	5

Source: USA Trade Online

By value, India is no longer included in the top five export countries as seen in Table 3-5, signifying that the goods exported there are lower value. These top five countries represent 50 percent of the value of goods exported from PortMiami for a total of $5.4 billion. High growth by some of these countries, in particular a 500 percent growth in trade with Peru, has shifted the top countries seen in 2017. Previously Costa Rica was ranked third and has fallen to 10th whereas Panama was ranked fifth and is now sixth.

Table 3-5 PortMiami Top Export Countries, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Dominican Republic	$1,930,253,521	52%	18%	1	1
Peru	$1,064,752,978	500%	10%	14	2
Honduras	$920,219,457	16%	9%	2	3
Colombia	$845,946,145	19%	8%	4	4
Jamaica	$601,515,522	46%	6%	8	5

Source: USA Trade Online.

PortMiami's Freight Import Profile

For imported goods, the types of commodities and trading partners vary significantly from exports. The top five commodities by weight, which account for 38 percent of the total, are shown in Table 3-6 and focus more on consumable goods. Overall import weight is up 37 percent, driven by significant growth in the major commodities of mineral fuel and edible fruit and nuts, each up over 100 percent. Products that dropped out of the top five since 2017 due to below average growth are apparel articles (3 percent growth, now ranked ninth) and furniture (17 percent growth, now ranked eighth).

Table 3-6 PortMiami Top Import Commodities, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Beverages, Spirits and Vinegar	477,334,101	23%	10%	1	1
Mineral Fuel, Oil Etc.; Bituminous Substances; Mineral Wax	420,493,236	165%	9%	6	2
Ceramic Products	328,783,662	-13%	7%	2	3
Edible Fruit & Nuts; Citrus Fruit or Melon Peel	324,278,794	132%	7%	11	4
Art Of Stone, Plaster, Cement, Asbestos, Mica Etc.	300,143,695	34%	6%	3	5

Source: USA Trade Online

The only product appearing on both the top weight and top value lists is beverages. Table 3-7 shows the top five commodities by value, which represent 45 percent of the total import value or $9 billion. Since 2017, the overall value of imported goods at PortMiami has grown 39 percent. Generally speaking, the top commodities by value have not changed significantly and none of these products has seen well-above average growth.

Table 3-7 PortMiami Top Import Commodities, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Electric Machinery Etc.; Sound Equipment; TV Equipment; Parts	$2,709,193,044	47%	14%	2	1
Apparel Articles and Accessories, Knit Or Crochet	$2,583,697,241	23%	13%	1	2
Nuclear Reactors, Boilers, Machinery Etc.; Parts	$1,594,062,555	42%	8%	3	3
Beverages, Spirits and Vinegar	$1,116,485,320	30%	6%	4	4
Tobacco & Subs; Products for Inhalation Without Combustion; nicotine Products	$1,011,634,579	41%	5%	6	5

Source: USA Trade Online

Unlike exports, nearly all of the top countries that PortMiami imports from are outside of the Americas. As seen in Table 3-8, the top five countries represent 39 percent of total imports by weight. Despite a decrease of 39 percent in weight, China still remains the top trading partner. The most significant shift has been the increase in trade with Peru, growing 660 percent since 2017 and rising from a rank of 25th to third. With the exception of China, all of the countries in the top five have more than doubled in this timeframe.

Table 3-8 PortMiami Top Import Countries, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
China	675,699,398	-39%	14%	1	1
Italy	448,851,446	242%	9%	5	2
Peru	283,811,296	660%	6%	25	3
Spain	266,419,019	98%	5%	4	4
Vietnam	255,914,981	202%	5%	11	5

Source: USA Trade Online

For the value of goods, the focus is back in the Americas with the exception of first ranked China and fourth ranked Italy. The top countries shown in Table 3-9 represent 49 percent of the total value of imports or $9.7 billion in trade. With Italy moving into the top five, France slid from its ranking of fifth in 2017 to seventh in 2023.

Table 3-9 PortMiami Top Import Countries, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
China	$3,269,357,783	-15%	16%	1	1
Dominican Republic	$2,244,621,539	102%	11%	2	2
Honduras	$1,693,004,264	60%	8%	3	3
Italy	$1,679,383,214	344%	8%	9	4
Nicaragua	$827,990,798	-9%	4%	4	5

Source: USA Trade Online

PortMiami's Competitive Position – Cargo

Nationally, PortMiami ranked as the 12th busiest container port in 2021 which is an improvement over 2017 when the port ranked 14th. Table 3-10 shows how PortMiami ranks as compared with the top five container ports in the country, as well as with JAXPORT, which is the only Florida seaport which handles more TEUs than PortMiami, and Port Everglades, which is the next closest Florida seaport to PortMiami's volumes. The least busy of these five, Port of Virigina, handles nearly three times the volume of cargo as PortMiami. Each of these ports has maintained its position relative to 2017, with each exceeding PortMiami's 20 percent growth except the Port of Los Angeles. The Port of Los Angeles experienced the slowest growth at 12 percent, while the Port of Savannah grew the fastest at 34 percent. PortMiami has a better balance of trade than any of the other ports listed, with 63 percent of loaded foreign containers being imported and 37 percent exported. The West Coast ports of Los Angeles and Long Beach are the least balanced with an 82 percent inbound rate. Closer to home, PortMiami only trails JAXPORT by less than 38,000 TEUs. In addition, JAXPORT has a strong domestic cargo base through trade with Puerto Rico which accounts for 66 percent of its loaded TEUs. As such, PortMiami is the top port in Florida for international container movements. Nearby Port Everglades used to handle similar volumes as PortMiami but has seen a 6 percent decrease since 2017.

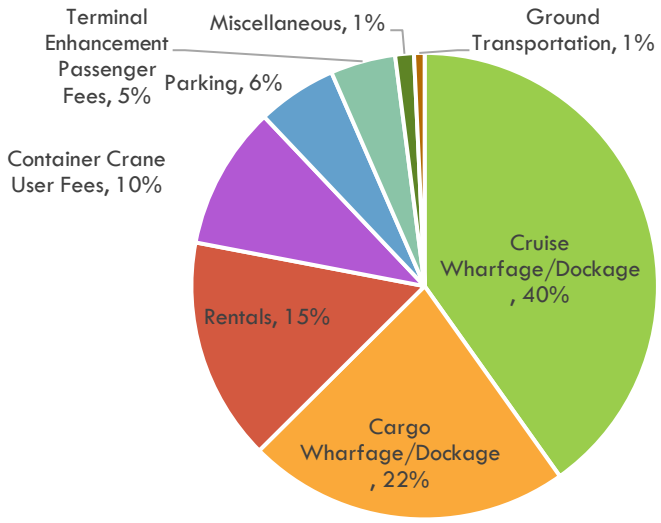
Table 3-10 Top Container Ports in the United States, 2021

Rank	Port	Loaded TEUs	Percent Growth 2017 – 2021	Percent Inbound
1	Port of Los Angeles, CA	7,037,986	12%	82%
2	Port of Long Beach, CA	6,398,905	22%	82%
3	Port Authority of New York and New Jersey, NY & NJ	6,304,078	30%	79%
4	Port of Savannah, GA	4,235,900	34%	68%
5	Port of Virginia, VA	2,769,965	25%	64%
11	Jacksonville, FL	958,123	19%	65%
12	PortMiami, FL	920,374	20%	63%
16	Port Everglades, FL	726,871	-6%	52%

Source: US Army Corps of Engineers, Waterborne Commerce Statistics.

3.6.2 PortMiami's Cruise Passenger Volumes

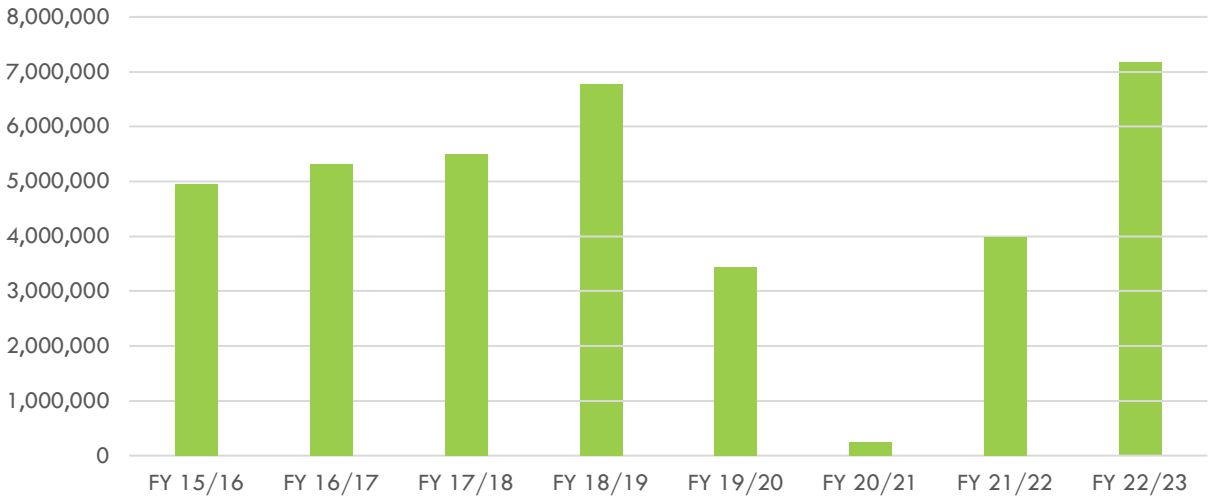
While this report focuses on the freight activity in Miami-Dade County, the impact of passenger traffic at the major freight hubs should be considered. These activities have an impact on travel patterns in and around the port, as well as berth availability, pilot availability, and investment focus. The cruise passenger traffic at PortMiami also requires significant provisioning activities which require food and other goods to be delivered by truck for each sailing. As illustrated in Figure 3-17 this cruise activity accounts for the largest share of revenue at the port, which helps to ensure the financial stability of the port. In total, cruise passenger traffic makes up more than 50 percent of revenue when considering wharfage/dockage fees, fees collected for terminal enhancement projects, and parking.



Source: PortMiami 2022 Annual Comprehensive Financial Report.

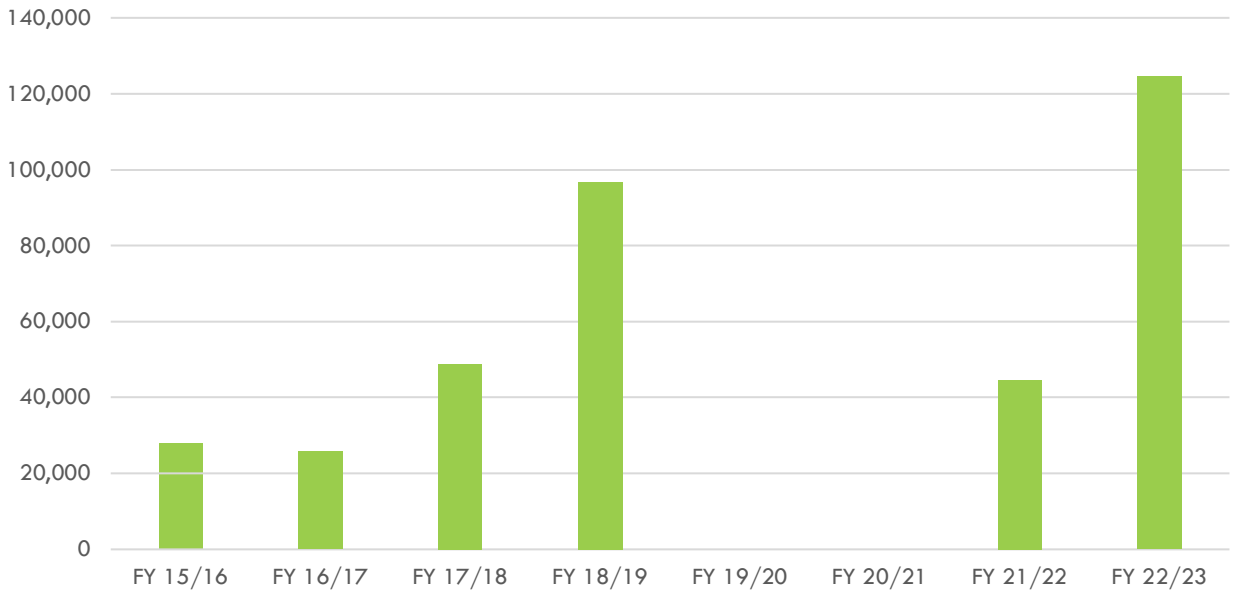
Figure 3-17 Revenue Sources at PortMiami, 2022

PortMiami is known as the "Cruise Capital of the World" with good reason. Typically ranked as one of the top three cruise ports in the World by passenger embarkments, PortMiami continues to hit record high volumes of passengers. As shown in Figure 3-18 and Figure 3-19, PortMiami saw a record 7.3 million revenue passengers in FY 2023. Although this industry was hit hard by the COVID-19 pandemic, the industry's strong commitment to Florida and the proximity of the Bahamas ensured that PortMiami quickly regained its market share. Since FY 2016, PortMiami's investment in its cruise terminals has paid off and passenger traffic has grown by 47 percent.



Source: FDOT, PortMiami.

Figure 3-18 PortMiami Multi-Day Cruise Passenger Volumes by Year, FY 2016 – FY 2023



Source: FDOT, PortMiami.

Figure 3-19 PortMiami Single Day Cruise Passenger Volumes by Year, FY 2016 – FY 2023

PortMiami's Competitive Position – Cruise

Florida is the center of the global cruise industry, with seven seaports serving cruise passengers: PortMiami, Port Canaveral, Port Everglades, JAXPORT, Port of Palm Beach, Port Tampa Bay, and Port of Key West (port-of-call only). Due to the availability of cruise terminals, berths, and nearby populations, cruise lines have a choice of locations to sail from. Large investments and multi-year commitments by cruise lines help to ensure continued business at each of Florida's seaports. Each of Florida's ports were hard-hit by the COVID-19 pandemic but have recovered to record breaking levels at a state level. For PortMiami, the current largest competitor for cruise traffic is Port Canaveral. Port Canaveral has invested a tremendous amount into its cruise infrastructure and has been successful in attracting new cruise operators and ships to its port. Since FY 2016, Port Canaveral has grown its cruise passenger volume by 63 percent to 6.9 million revenue passengers, as compared with PortMiami's 47 percent growth to a record 7.3 million. While PortMiami still ranks as the top cruise port, the port must be proactive in maintaining its attractiveness for cruisers. The impacts of less aggressive investment can be seen at nearby Port Everglades who has yet to meet pre-COVID cruise numbers. In fact, overall cruise volumes at Port Everglades have decreased by 21 percent since FY 2016 from a consistent 3.8 million revenue passengers in FYs 2016 through 2019 to 3 million revenue passengers in FY 2023.

3.7 Miami International Airport

The Miami International Airport (MIA) is the leading economic engine in Miami-Dade County due to its large volume of freight and passenger traffic. Located on 3,230 acres of land, MIA is operated by

the Miami-Dade Aviation Department and is the property of Miami-Dade County. Four runways are in operation ranging from 8,600 feet to 13,016 feet.[30] Cargo facilities at MIA include 24 cargo buildings encompassing 2.8 million square feet of warehouse space accompanied by 5.4 million square feet of apron space with parking for 74 aircraft. Support facilities also include the MIA Cargo Clearance Center to centralize Customs & Border Patrol (CBP) activities and the MIA Animal & Plant Health Inspection Service (APHIS) Facility to house the import and export operations of Veterinary Services.

Additional components of MIA's cargo infrastructure support their competitive position such as:

- Designated as the first International Air Transport Association (IATA) "Pharma Hub Airport" in North America to develop a Center of Excellence for Independent Validators (CEIV)[31] community of companies. This promotes MIA's leading position in high-value, temperature-sensitive pharmaceuticals. So far nine companies have obtained their IATA CEIV pharma certification.
- The MIA Foreign Trade Zone (FTZ) magnet site is an extension of FTZ 281 granted to PortMiami. LATAM Group was the first approved operator affiliated with MIA. Further information on FTZs will be discussed in Chapter 4.
- MIA's Cargo Flight Tracker allows businesses to see in real time where their flight and associated cargo is located.[32]

While MIA is the largest and serves the vast majority of air traffic in the county, five other airports are located in Miami-Dade, as shown in Figure 3-20:

- Miami-Opa-locka Executive Airport (OPF)
- Miami Executive Airport (TMB)
- Miami Homestead General Aviation Airport (X51)
- Dade-Collier Training and Transition Airport (TNT)
- Miami Seaplane Base (X44)

Together, these airports have an annual economic impact of $31.9 billion and provide 275,708 direct and indirect jobs to the local economy.

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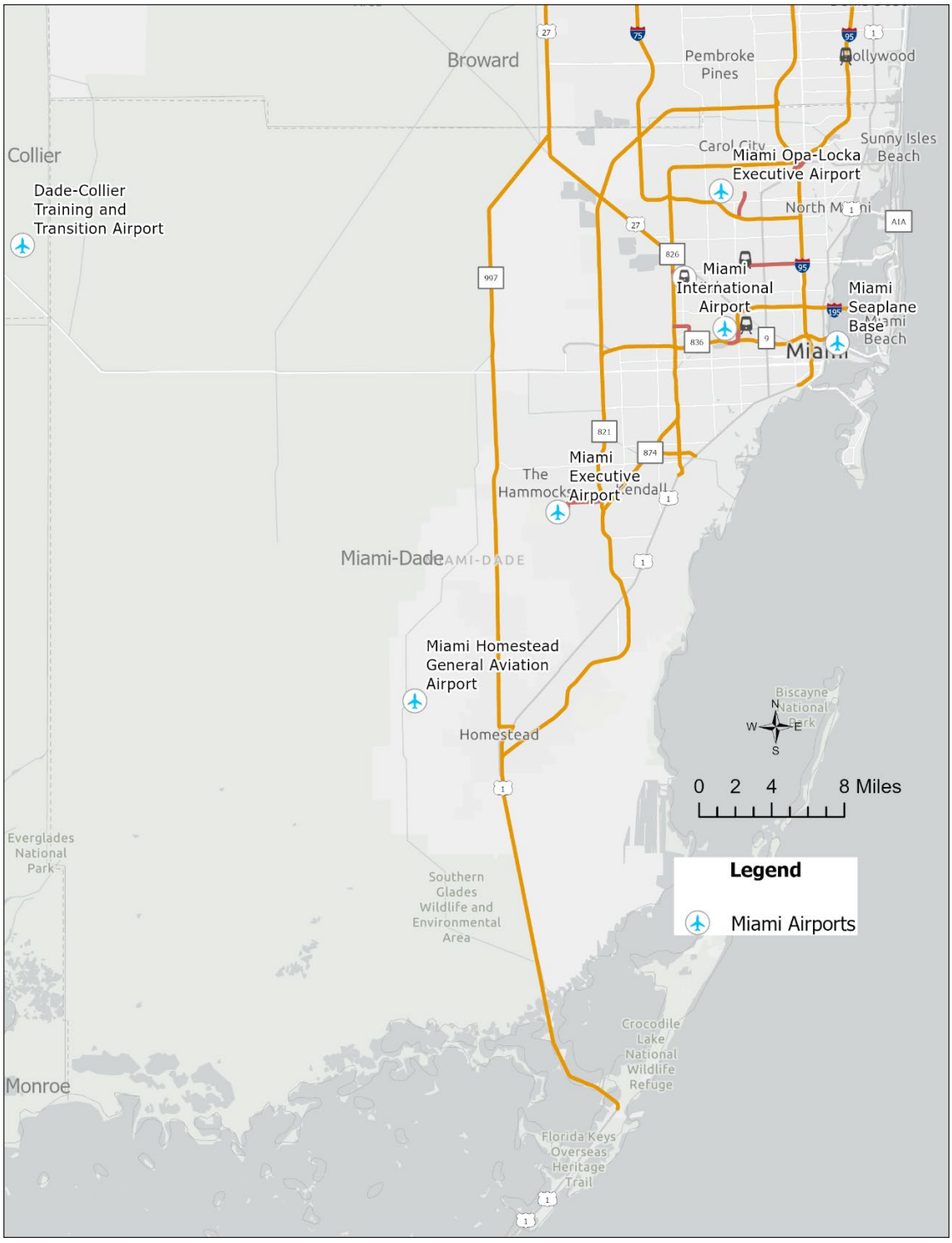
[30] *About Us.* Miami International Airport. https://www.miami-airport.com/about_us.asp

[31] *CEIV Pharma.* IATA. https://www.iata.org/en/services/certification/special-cargo/ceiv-pharma/

[32] *Miami-Dade Aviation Department Facts At-A-Glance.* Miami-Dade County. https://www.miami-airport.com/library/pdfdoc/Facts%20at%20a%20Glance/facts_at_a_glance.pdf

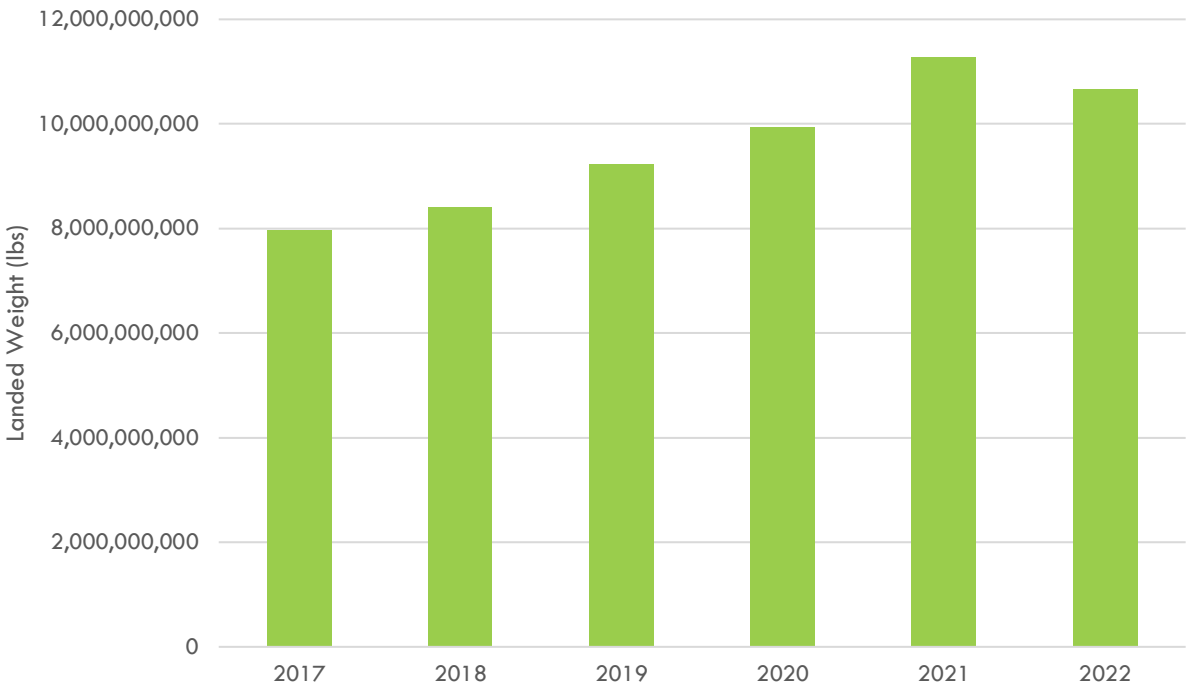


Source: Cambridge Systematics, 2024.

Figure 3-20 Airports in Miami-Dade County

3.7.1 Miami International Airport's Air Freight Volumes

MIA is ranked fifth in the United States by landed weight of air cargo, behind only Anchorage, Memphis, Louisville, and Los Angeles. Figure 3-21 shows the landed weight of cargo at MIA for 2017 through 2022. The total volume of 10.7 billion pounds passing through MIA in 2022 is a 34 percent increase over 2017 volumes. This does not match the peak of 11.3 billion pounds handled in 2021 as companies looked to alternative solutions to mitigate supply chain disruptions.



Source: Federal Aviation Administration.

Figure 3-21 Air Cargo Landed Weight (lbs.) At Miami International Airport, 2017 – 2022

MIA's ability to grow its cargo operation is challenged by the lack of available land. Current cargo capacity is estimated to be 2.5 to 2.8 million metric tons per year. Given the lack of land, MIA plans to grow its cargo operation by increasing the density of its available footprint by going vertical. Specifically, as will be discussed further in Section 8, MIA is working to develop a Vertically Integrated Cargo Community, or VICC. This facility will allow MIA to increase capacity by nearly double its current estimate to 5.5 million metric tons. This increased capacity will create the ability to pursue new opportunities while also streamlining existing operations.

Miami International Airport's Air Freight Export Profile

Consistent with PortMiami, the following sections provide an overview of the major commodities and trading partners MIA is importing from and exporting to, based on data from USA Trade Online. Table 3-11 shows the top five commodities by export weight, which account for 58 percent of total exports. This list of five remains unchanged from 2017 with the exception of the switching of the fourth and fifth commodities. Overall, exports by weight grew 12 percent, driven by significant growth in nuclear reactors and boilers, and vehicles.

Table 3-11 Miami International Airport Top Export Commodities, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Nuclear Reactors, Boilers, Machinery Etc.; Parts	101,454,375	34%	30%	1	1
Electric Machinery Etc.; Sound Equipment; TV Equipment; Parts	48,667,755	3%	14%	2	2
Optic, Photo Etc., Medic or Surgical Instruments Etc.	18,410,351	6%	5%	3	3
Vehicles, Except Railway or Tramway, And Parts Etc.	16,714,868	57%	5%	5	4
Plastics And Articles Thereof	12,817,171	6%	4%	4	5

Source: USA Trade Online

By value, the types of goods are much more consolidated as the top five commodities shown in Table 3-12 account for 83 percent of the total exports by value. Overall export value increased 24 percent since 2017. The commodities included here, in particular pharmaceuticals and optic or surgical instruments, are indicative of the typical products transported by air. Air cargo is normally used for high-value, time sensitive goods. The lighter-weight, higher value nature of goods such as pharmaceuticals aligns with this practice.

Table 3-12 Miami International Airport Top Export Commodities, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Electric Machinery Etc.; Sound Equipment; Tv Equipment; Parts	$10,723,717,628	25%	25%	1	1
Aircraft, Spacecraft, And Parts Thereof	$8,230,859,102	32%	19%	3	2
Nuclear Reactors, Boilers, Machinery Etc.; Parts	$8,197,031,907	31%	19%	2	3
Pharmaceutical Products	$4,459,217,431	91%	11%	6	4
Optic, Photo Etc., Medic or Surgical Instruments Etc.	$3,666,975,777	10%	9%	4	5

Source: USA Trade Online

Similar to PortMiami, exports are concentrated in the Americas. Again, there has not been much of a change since 2017, as shown in Table 3-13. These top five countries represent 62 percent of total exports by weight. Chile has been the most significant driver of growth at 158 percent since 2017, resulting in it taking the top spot.

Table 3-13 Miami International Airport Top Export Countries, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Chile	70,414,842	158%	21%	3	1
Brazil	67,578,331	5%	20%	1	2
Colombia	36,383,971	-13%	11%	2	3
Argentina	18,871,755	-5%	6%	4	4
Costa Rica	17,557,614	29%	5%	6	5

Source: USA Trade Online

Similarly, Table 3-14 shows the top export countries by value which also are largely unchanged. These countries represent 51 percent of the total value of exports. While not shown, the United Kingdom would rank sixth by value of export. This is a large move from the 19th largest export partner in 2017 going from approximately $439 million in exported goods to over $2 billion for a growth rate of 357 percent.

Table 3-14 Miami International Airport Top Export Countries, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Brazil	$10,733,578,556	20%	25%	1	1
Chile	$3,312,669,616	44%	8%	3	2
Colombia	$3,082,561,643	22%	7%	2	3
Argentina	$2,567,601,615	18%	6%	4	4
Paraguay	$2,239,895,135	17%	5%	5	5

Source: USA Trade Online

Miami International Airport's Air Freight Import Profile

For imports, there is a greater emphasis on consumer and/or perishable products. Table 3-15 shows the top five commodities, all of which fall into that classification with the exception of electric machinery. These top commodities represent 82 percent of imports by weight, which grew 36 percent overall for this time period. While the rank did not change, edible vegetables has seen a dramatic decrease in throughput at MIA. This commodity is down 45 percent since 2017, falling from 85 million kg in 2017 to 47 million kg in 2023. Growth was driven by significant increases in live trees, plants, bulbs and cut flowers, and fish.

Table 3-15 Miami International Airport Top Import Commodities, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Live Trees, Plants, Bulbs Etc.; Cut Flowers Etc.	343,059,625	68%	40%	1	1
Fish, Crustaceans & Aquatic Invertebrates	251,378,139	62%	30%	2	2
Edible Vegetables & Certain Roots & Tubers	46,812,153	-45%	6%	3	3
Edible Fruit & Nuts; Citrus Fruit or Melon Peel	32,168,137	-8%	4%	4	4
Electric Machinery Etc.; Sound Equipment; Tv Equipment; Parts	27,944,175	37%	3%	5	5

Source: USA Trade Online

By value, there is less of a focus on perishables, with the exception of fish. Table 3-16 shows the top commodities by value imported at MIA. These top five commodities account for 68 percent of the total value of imports. The overall value of imports has increased by 23 percent since 2017. Electric machinery, nuclear reactors and boilers, and fish have driven this increase with each category growing a minimum of 64 percent in this period, or nearly triple the average.

Table 3-16 Miami International Airport Top Import Commodities, Value, 2023

Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Electric Machinery Etc.; Sound Equipment; TV Equipment; Parts	$6,074,792,153	78%	20%	3	1
Special Classification Provisions, not elsewhere specified	$5,208,015,396	6%	17%	1	2
Natural Pearls, Precious Stones, Precious Metal Etc.; Coin	$4,388,677,721	11%	14%	2	3
Nuclear Reactors, Boilers, Machinery Etc.; Parts	$2,902,554,559	64%	9%	5	4
Fish, Crustaceans & Aquatic Invertebrates	$2,424,171,980	76%	8%	7	5

Source: USA Trade Online

Import countries continue to be focused in the Americas and the top five countries by weight, shown in Table 3-18, account for 72 percent of the total weight of imports. Again, import weight has increased 36 percent overall since 2017, driven by each of these countries with the exception of Peru. In fact, Peru is the only country in the top 10 by import weight that has witnessed a decline since 2017.

Table 3-17 Miami International Airport Top Import Countries, Weight, 2023

Commodity	2023 Weight (KG)	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Colombia	274,020,167	65%	32%	1	1
Chile	184,535,847	72%	22%	2	2
Ecuador	98,960,691	113%	12%	4	3
Costa Rica	26,990,425	48%	3%	7	4
Peru	26,269,624	-63%	3%	3	5

Source: USA Trade Online

By import value there has been more of a shift, with two of the previous top five countries falling out. These are Switzerland, now ranked 17th, and Singapore, now ranked 19th. The current top five countries by import value, shown in Table 3-18, make up 44 percent of the total value of goods and $13.5 billion in trade. Each of these countries had above average growth with the exception of Brazil which has declined by 12 percent.

Table 3-18 Miami International Airport Top Import Countries, Value, 2023

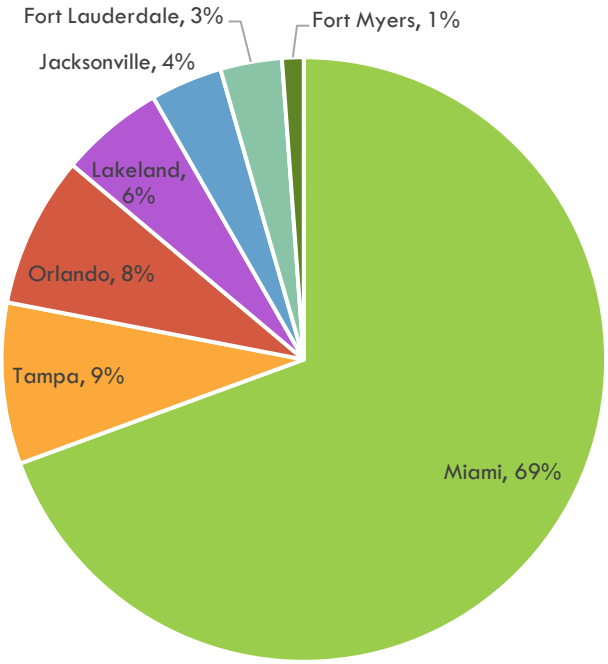
Commodity	2023 Value	% Growth 2017 – 2023	Percent of Total	2017 Rank	2023 Rank
Colombia	$3,350,597,244	58%	11%	2	1
China	$3,049,810,215	44%	10%	3	2
Brazil	$2,865,350,269	-12%	9%	1	3
Chile	$2,241,647,767	77%	7%	6	4
Costa Rica	$1,966,106,631	114%	6%	11	5

Source: USA Trade Online

Miami International Airport's Competitive Position – Cargo

MIA is a significant economic engine not just for Miami-Dade County, but also the entire state of Florida. MIA accounts for 69 percent of all landed cargo weight within Florida as shown in Figure 3-22. This dominance has declined slightly in recent years. In 2017, MIA's share of cargo was 73 percent. This small loss in market share is due to significant growth at other cargo airports. Between 2017 and 2023, Florida's airports grew cargo volumes by an average of 41 percent, whereas MIA grew by 34 percent. The airports with the highest rate of growth which have increased the state average are Tampa International Airport (55 percent growth) and Jacksonville International Airport (43 percent growth). Another new contender for cargo traffic is the Lakeland Linder International Airport (LAL). Despite reporting no cargo traffic in 2019 or prior, LAL now ranks fourth in the state with a landed cargo weight of 857 million pounds in 2022. In the past 10 years, over $300 million has been invested at LAL as it makes itself a major contender for air cargo in the Central Florida region. [33]

[33] FlyLakeland. https://www.flylakeland.com/airport-projects



Source: Federal Aviation Administration.

Figure 3-22 Share of Florida's Air Cargo by Airport, 2022

On the national level, MIA continues to rank fifth in the country by landed cargo weight; it was previously ranked fourth until being surpassed by Los Angeles International Airport (LAX) in 2020. LAX had the highest rate of growth at 59 percent out of the top five cargo airports in the United States ranked in Table 3-19. Average growth at these airports over the 2017 to 2022 time period was 26 percent, dampened by the lack of growth in cargo at Memphis International Airport. MIA ranked fourth among these by percent growth. With the exception of Louisville, all of the top airports saw a peak in cargo traffic in 2021 followed by a decrease in 2022, again likely due to changes in supply chain patterns due to COVID-19.

Table 3-19 Top US Air Cargo Airports by Landed Weight, 2022

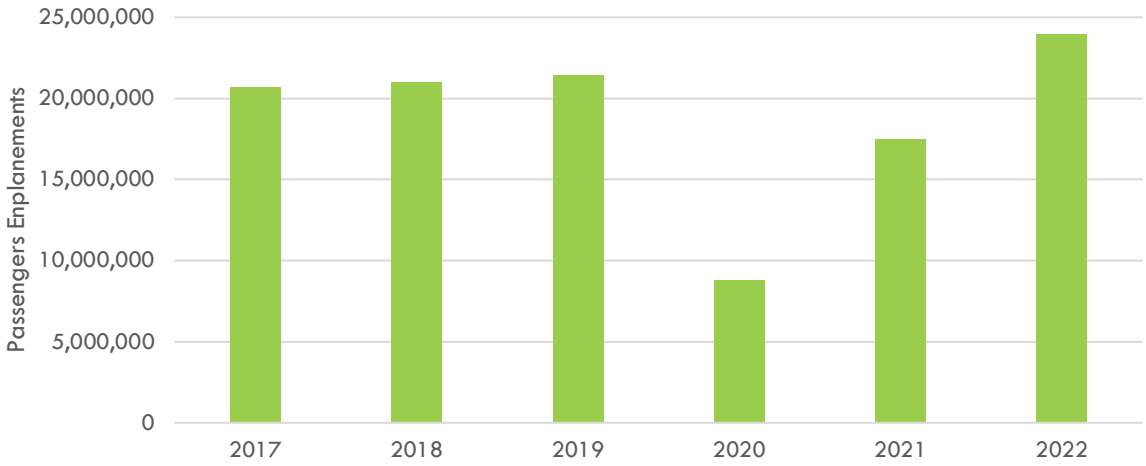
Airport	2022 Landed Weight (lbs.)	Growth Percent (2017 – 2022)
Ted Stevens Anchorage International	24,265,396,895	40%
Memphis International	23,402,185,775	-2%
Louisville Muhammad Ali International	18,168,215,285	36%
Los Angeles International	11,461,211,039	59%
Miami International	10,667,545,448	34%

Source: Federal Aviation Administration.

3.7.2 Miami International Airport Passenger Traffic

Passenger enplanements, while not directly cargo related, have an impact on cargo operations at MIA. As such, passenger volumes are included in this freight plan as they impact freight movement. While MIA has many direct cargo flights, much air freight is also transported as "belly cargo" in passenger planes. Therefore, the volume of passenger flights impacts overall cargo volumes. In addition, as MIA reaches capacity on its existing footprint, an increase in passenger traffic could impact the future growth potential of cargo flights.

Since 2017, passenger traffic has grown 16 percent from 20.7 million to 23.9 million enplanements, as shown in Figure 3-23. Volumes were significantly impacted in 2020 and 2021 as people traveled less due to the COVID-19 pandemic, a trend seen throughout the country.

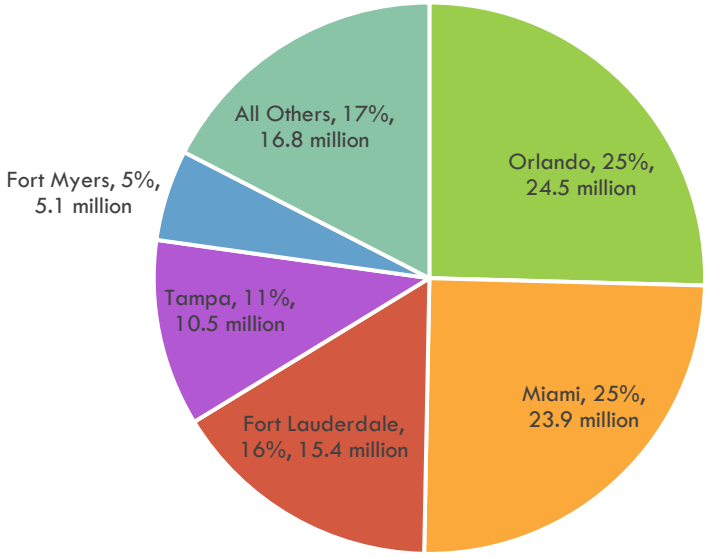


Source: Federal Aviation Administration.

Figure 3-23 Passenger Enplanements at Miami International Airport, 2017 – 2022

Miami International Airport's Competitive Position – Passenger Traffic

Within Florida, Miami places a close second behind Orlando International Airport for passenger traffic. In 2022, this difference was only 520,000 enplaned passengers. The top five passenger airports in Florida are shown in Figure 3-22. These five represented 83 percent of total passenger enplanements in 2022. Of them, Fort Lauderdale is the closest competitor for South Florida traffic but lags behind MIA by more than 8.5 million enplanements. Each airport saw a similar drop in COVID-19 patterns with 2020 volumes being 45 percent of 2019 volumes (MIA was 41 percent). With regard to general growth patterns, Florida's airports have grown 13 percent since 2017. MIA had the second highest growth rate of 16 percent of the top five, surpassed only by 18 percent growth by Southwest Florida International Airport (Fort Myers). In this same time period, the fastest growing airport in the state by passenger traffic has been Sarasota/Bradenton International Airport whose passenger enplanements have grown by 224 percent since 2017 from not even 600,000 passengers to over 1.9 million.



Source: Federal Aviation Administration.

Figure 3-24 Florida Passenger Traffic Split by Enplanements, 2022

Nationally, Miami is the ninth business passenger airport. The top five airports for passenger traffic are Atlanta, Dallas-Fort Worth, Denver, Chicago O'Hare, and Los Angeles. During COVID-19, these airports on average fared about the same as MIA's 41 percent passenger retention, with Los Angeles and O'Hare fairing the worst, maintaining only 33 percent and 36% of their 2019 traffic, respectfully. These top airports have also struggled to maintain their market share and reach pre-COVID-19 volumes. Overall, they decreased by an average of 6 percent since 2017. The largest declines are again seen at Los Angeles (-22 percent since 2017) and O'Hare (-14 percent since 2017). This is in stark contrast to MIA's growth of 16 percent.

4.0 Miami-Dade Logistics Infrastructure

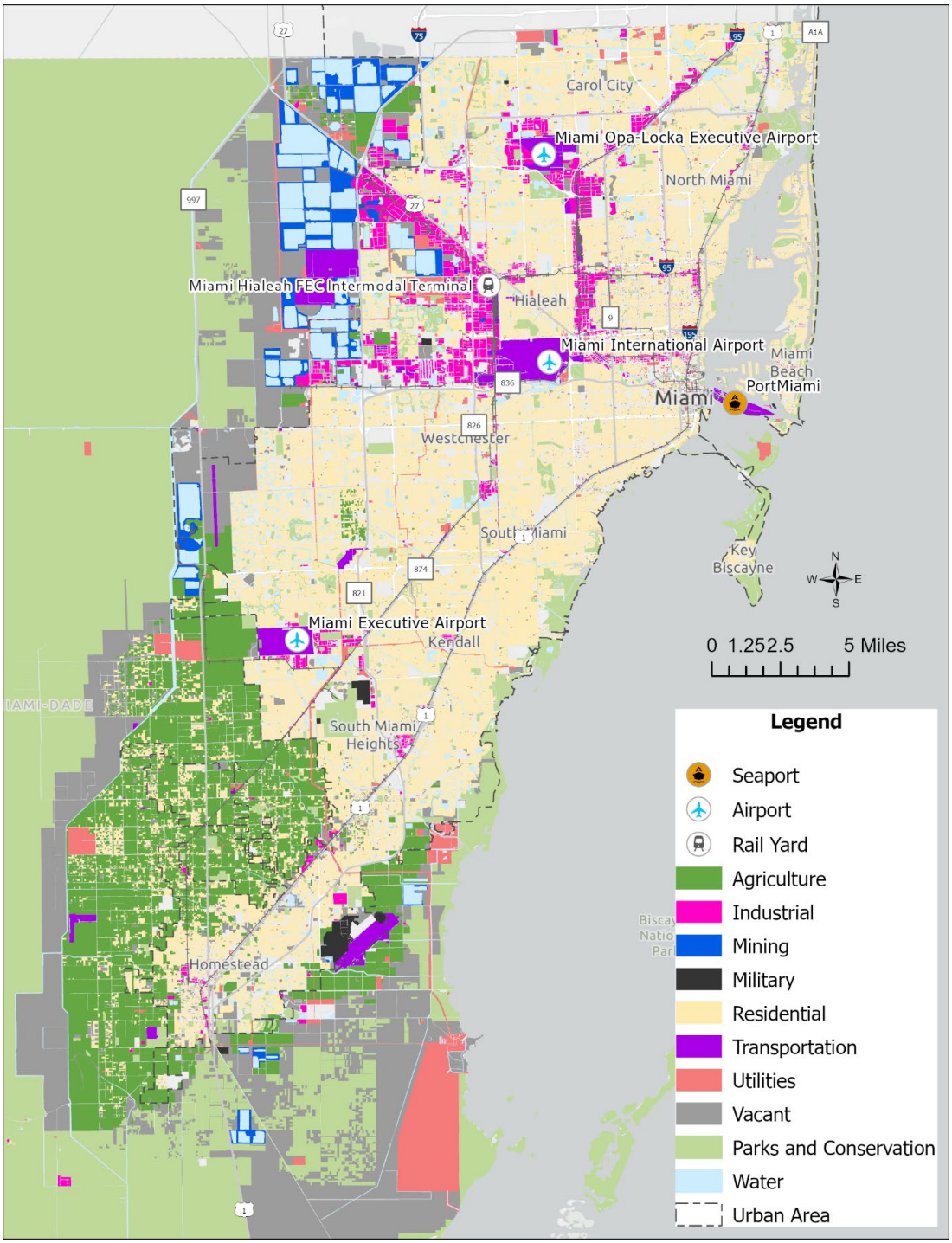
Miami-Dade County's logistics infrastructure expands beyond the modes of transportation responsible for the physical movement of goods. This infrastructure includes freight supportive land uses, warehouse and distribution center capacity, foreign trade zones, and inland ports or intermodal logistics centers. This section provides a description of each of these components.

4.1 Freight and Industrial Property Trends and Developments

Available land use data was examined and used to help illustrate the geographic location of freight and industrial operations in Miami-Dade County. The land use data was categorized, using four classifications to represent freight intensive uses. These are as follows:

- **Transportation land uses** (e.g., airports, seaports, railroads/rail terminals, roadways). Transportation land uses encompass the major freight transportation hubs as well as critical road and rail corridors. In some cases, these facilities are serving and/or are being proposed as inland ports or intermodal logistics centers. Figure 4-1 shows these hubs in dark purple and the major roadway corridors in orange (SIS roadways) and grey (other U.S. and State roads).
- **Industrial land uses** (e.g., warehousing/distribution centers). The industrial land uses comprise warehouses, distribution centers, foreign trade zones, light manufacturing, and other types of light and heavy industrial operations. Based on the operation, several of these facilities also represent intermodal logistics centers. Figure 4-1 shows the location of these facilities in light purple.
- **Agricultural land uses** (e.g., farms, packing facilities). The agricultural community in Miami-Dade County, mostly situated to the south and west, has a rich history and is well-established. These operations, which vary by season, contribute significantly to freight activity. Figure 4-1 shows the location of agricultural operations in dark green.
- **Mining land uses** (e.g., aggregate mining). Miami-Dade County has a long-standing history of aggregate mining, which produces substantial truck and rail traffic in the area. These operations are mainly located in the Lake Belt region in the northwestern part of Miami-Dade County. Figure 4-1 shows the location of mining activity in dark blue.

The bulk of the industrial property in Miami-Dade County is found in the northern central and northwestern regions, including Doral, Medley, Hialeah, and Opa-locka. These areas help facilitate various industries, including warehouses, distribution centers, and manufacturing plants. These locations are strategically placed near major transportation routes and hubs for easy access. Agricultural activities are mainly found in the southern parts of the county, with distribution centers scattered throughout the region.



Source: Miami-Dade County Open Data Hub, 2023.

Figure 4-1 Miami-Dade County Land Use

The northwest of the county is home to mining operations, specifically aggregate mining, which has direct rail access to quarries. The rest of the county is either zoned for residential use or preserved for environmental reasons, such as the Everglades National Park.

Freight related land use is 7.4 percent of the total land in Miami-Dade County, which increases to 21.8 percent if major conservation areas like the Florida Everglades are removed (Table 4-1). Among the 7.4 percent freight related land use, only 1 percent is transportation which includes highways, railroads, seaports, airports, and bus/truck/freight forwarding terminals. The rest of the freight related land uses include agriculture, industrial, and mining facilities.

Table 4-1 Miami-Dade Freight Related Land Use

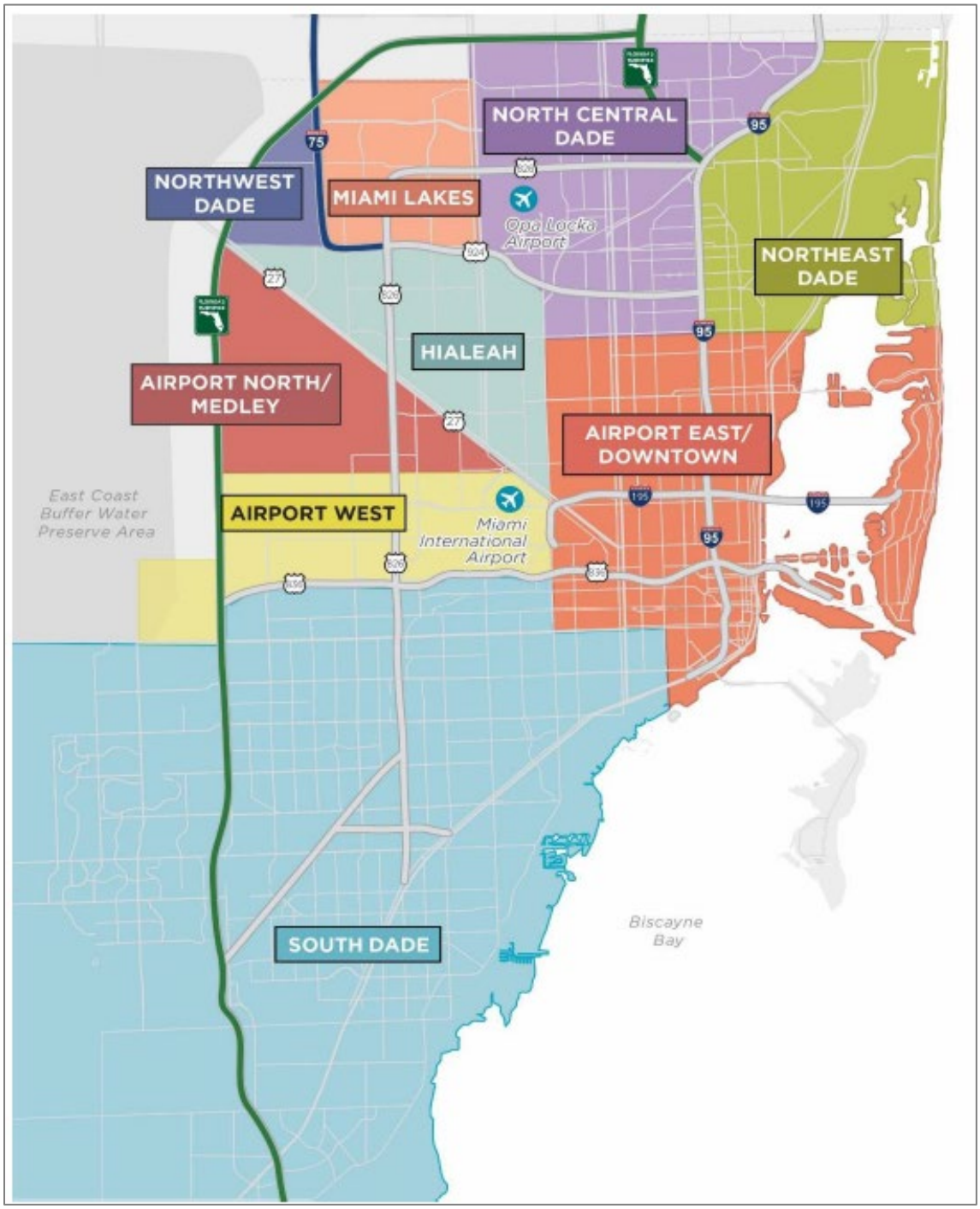
Land Use Type	Total by Percent	Total by Percent (Excluding Major Conservation Areas)
Agriculture	4.7%	13.8%
Industrial	1.1%	3.3%
Mining	0.5%	1.6%
Transportation	1.0%	3.1%
Total Freight-Related	7.4%	21.8%

Source: Miami-Dade County Open Data Hub and Cambridge Systematics, 2023.

4.2 Trends in Warehouse Affordability and Pricing

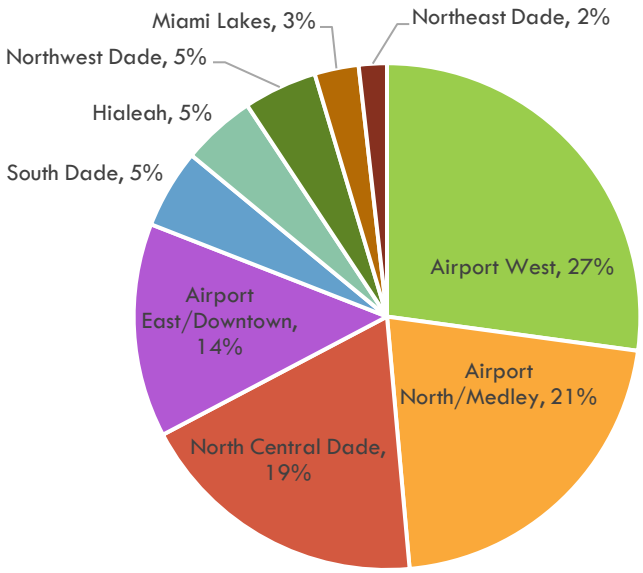
Growth in Miami-Dade's population and tourism markets has increased the competition for developable land, limiting the opportunity to develop additional warehouse and distribution space. As the population grows, so does the demand for new housing developments, new commercial businesses, new schools, and the like. To serve this population, warehouse and distribution space is a necessity, especially with the increased demand for fulfillment facilities required to serve the e-commerce market. This competition for space has resulted in significant increases in rental rates and historically low vacancy rates. The industrial real estate trends for Miami-Dade County are organized by the nine industrial submarkets as defined by Cushman & Wakefield and shown in Figure 4-2.

Of the more than 170 million square feet of industrial inventory in Miami, the largest portions are found in the Airport West submarket, accounting for more than 46 million square feet or 27 percent of total inventory. Combined with the 21 percent market share of Airport North/Medley, these two submarkets account for nearly 50 percent of the total industrial inventory in Miami-Dade County. This industrial core is well positioned to serve international cargo arriving at Miami-International Airport as well as the nearby residents and visitors who ultimately receive these goods.



Source: Cushman & Wakefield, Miami-Dade Marketbeat.

Figure 4-2 Miami-Dade Industrial Submarkets



Source: Cushman & Wakefield, Miami-Dade Marketbeat.

Figure 4-3 Industrial Inventory by Miami Submarket

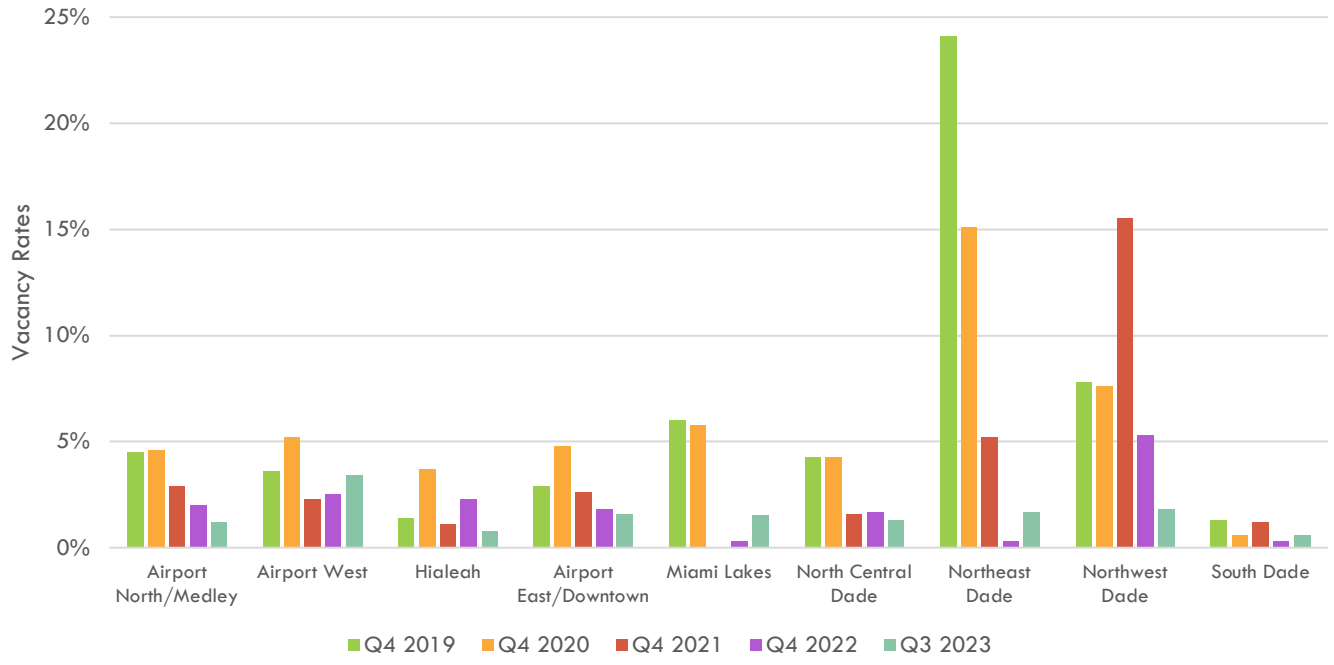
Growth in inventory for each of these submarkets is varied, as shown in Table 4-2, likely due to the availability of suitable land as determined by acreage, zoning, and cost. The largest net change in growth, as well as the largest percent growth since 2019 is found in the Northwest Miami-Dade submarket. This area has more than doubled its industrial square footage from about 3 million square feet in 2019 to almost 8 million square feet in 2023, with another 2 million under construction. While previously seen as far from major cargo hubs and the population center of the county, the continued push of development towards the urban development boundary has made land in this submarket more attractive. Other high growth areas include Airport North/Medley and North Central Miami-Dade, each with a total of about 2 million square feet in growth. Some submarkets have seen a contraction in inventory over this time period, namely Airport East/Downtown, Hialeah, and Miami Lakes. Most likely this contraction is due to the redevelopment of old warehousing space into other uses, such as residential, which are also necessary as Miami's population continues to grow.

With little affordable land available to develop, the existing warehouse space in Miami-Dade County is in high demand. Generally speaking, full occupancy is considered to be at 5 percent vacancy or less. As Figure 4-4 shows, every area of Miami-Dade County is well below this 5 percent threshold. The highest vacancy rate as of the 2023 Quarter 3 preliminary numbers is 3.4 percent in Airport West. The remaining submarkets are all below 2 percent with a countywide average of 1.8 percent. These vacancy rates have continued to decrease since before the global pandemic, even with significant new capacity coming online.

Table 4-2 Change in Industrial Submarkets, Q4 2019 to Q3 2023

Submarket	Q4 2019 (sq ft)	Q3 2023 (sq ft)	Net Change (sq ft)	Percent Change	Q3 2023 Under Construction (sq ft)
Airport West	45,670,117	46,235,150	565,033	1%	1,566,312
Airport North/Medley	33,951,839	36,455,168	2,503,329	7%	724,958
North Central Miami-Dade	29,924,347	31,844,119	1,919,772	6%	1,587,924
Airport East/Downtown	25,851,648	23,240,823	-2,610,825	-10%	85,376
South Dade	7,752,725	8,595,837	843,112	11%	0
Hialeah	8,890,435	8,022,854	-867,581	-10%	363,907
Northwest Miami-Dade	3,092,815	7,997,703	4,904,888	159%	2,048,646
Miami Lakes	5,184,718	4,791,921	-392,797	-8%	0
Northeast Miami-Dade	2,847,465	3,050,778	203,313	7%	0
Total	163,166,109	170,234,353	7,068,244	4%	6,377,123

Source: Cushman & Wakefield, Miami-Dade Marketbeat.

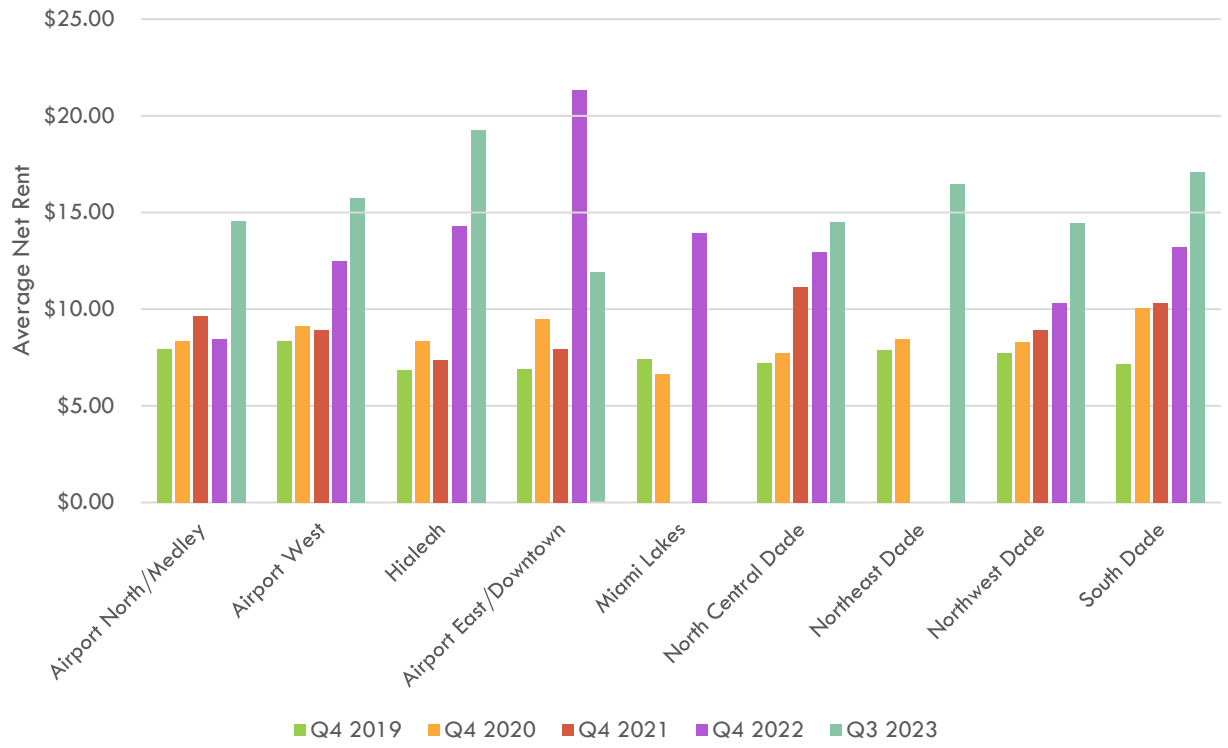


Source: Cushman & Wakefield Industrial Marketbeat Reports.

Figure 4-4 Miami-Dade Industrial Submarkets Vacancy Rates

The low vacancy rates caused by the competition for the available warehouse and distribution center space has also resulted in increased rental rates. As the available supply decreases, the cost to rent rises as shown in Figure 4-5. Since Quarter 4 of 2019, the average warehouse and distribution rental rate went from $7.80 per square foot to $15.24 in Quarter 3 of 2023. This reflects a 95 percent increase. Rental rates increased significantly in all submarkets.

The low vacancy rates combined with the high rental rates creates an environment In South Florida that complicates supply chain decisions, decisions that must balance a variety of cost and service factors. At the same time, these trends serve as an indicator of the strong desire of industry to have a presence in Miami-Dade County.

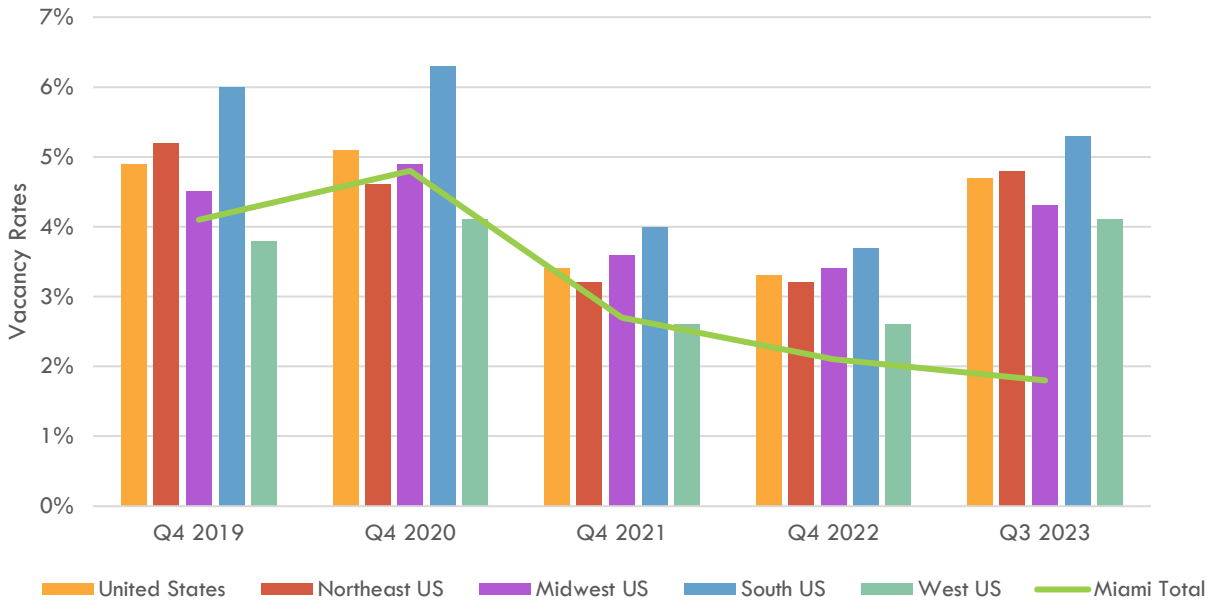


Source: Cushman & Wakefield Industrial Marketbeat Reports.

Figure 4-5 Miami-Dade Industrial Submarkets Warehouse and Distribution Weighted Average Net Rent

4.2.1 Miami-Dade's Competitive Position – Warehouse and Industrial Space

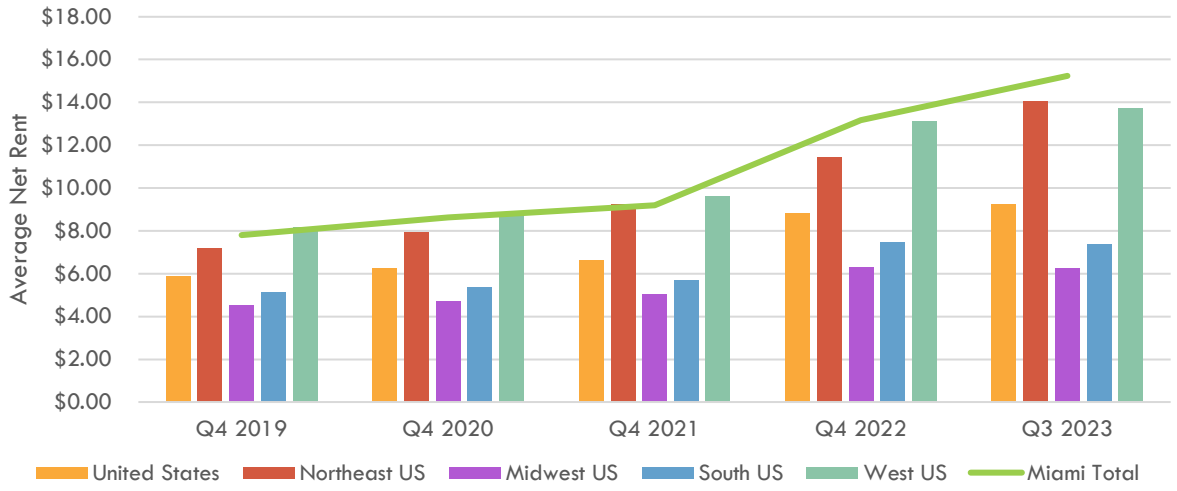
The decrease in vacancy rates with an increase in overall rental rates is not a trend unique to Miami. Across the country, the demand for warehouse and industrial space has increased over the last several years. However, the demand in Miami-Dade County, relative to the available capacity, far exceeds that of the rest of the country. As stated previously, the vacancy rate for industrial space in Miami is below 2 percent. The average across the United States, as shown in Figure 4-6, is 4.7 percent. This is in line with the typical threshold of 5 percent for "full occupancy". The highest vacancy is currently found in the South at 5.3 percent. Significant investments in capacity have taken place in this region, largely associated with the growth of the Port of Savannah. The lowest vacancy is found in the West at 4.1 percent. This region is home to largest trade gateways at the Ports of Los Angeles and Long Beach and the "inland empire", which is home to a huge complex of warehouse and distribution centers. Aside from having the lowest vacancy rates, Miami differs from national trends in that vacancy rates have continued to decline. In the rest of the country, vacancy rates hit a low point during 2021 and 2022 and have increased in 2023 as supply chains normalized from COVID-19 irregularities. That has not been the case in Miami-Dade County.



Source: Cushman & Wakefield Industrial Marketbeat Reports.

Figure 4-6 Industrial Vacancy Rates, United States

The cost of industrial space continues to rise nationally, even where there have been increases in vacancy rates. As shown in Figure 4-7, the nationwide average has increased from $5.88 in Q4 2019 to $9.24 in Q3 2023, a 57 percent increase. A significant portion of this increase can be attributed to the Northeast where prices have nearly doubled over this time period from $7.17 to $14.04. The lowest rate of increase is seen in the Midwest with only a 39 percent increase. Miami for its part continues to outpace the market with a 95 percent increase for the same time period. Miami prices are now 65 percent above the national average. The high cost and low vacancy indicate that that market has been able to bear this cost to date, with industry continuing to invest in and serve the South Florida community.



Source: Cushman & Wakefield Industrial Marketbeat Reports.

Figure 4-7 Industrial Warehouse and Distribution Weighted Average Net Rent, U.S.

4.3 Evolving Warehouse Needs & New Developments

With new technologies and optimization strategies being implemented in supply chain operations, the physical characteristics of warehouses and distribution centers have also changed. Many of Miami's oldest warehousing inventory are comprised of small warehouses with low ceiling heights, minimal or no parking, and inadequate truck access. New developments are focused on the construction of larger spaces which can be modified to better serve tenant requirements. A few recent projects in the county include:

- 14000 NW 37th Avenue: Amazon Mega Warehouse completed in 2019 with 850,000 square feet and over 1,500 full time employees. [34]
- 8315 NW 27th Street: 32-foot clear, rear-loaded building with 32 dock doors and 110 auto parks. This building can accommodate tenants from 30,000 to 118,000 square feet. [35]
- 3925 Northwest 26th Street: 296,637 square foot building developed by Prologis and occupied by Amazon. [36]
- NW 107th Avenue and NW 41st Street: Located in Doral, the Bridge Point Doral development will offer 2.6 million square feet of industrial space on 175 acres. This site will offer both cross-dock and rear-load warehouse configurations with 36-foot clear height. [37]

There has been significant investment in industrial capacity in Miami-Dade County. The majority of new development has been concentrated along the US 27/SR 25/Okeechobee Road corridor with some infill opportunities near the Opa-locka Executive Airport and Miami International Airport. As available land becomes scarce, new developments are pushing up against the Urban Development Boundary in places previously deemed unsuitable to serve the industrial market. Figure 4-8 illustrates the impacts of these investments in northeastern Miami-Dade County in just the last 5 years (2018 to 2023). The parcel of land outlined in red represents a 620-acre master planned industrial campus developed by Florida East Coast Industries. While some pieces have been sold to other investors such as Terreno Reality Corp and Ares Management, this development represents hundreds of millions of dollars in investments. The portion purchased by Terreno Realty Corp. encompasses 121 acres of this development, purchased for $173.6 million with expected development costs of $491.1 million. [38] The project is expected to be completed by 2027, with initial phases already fully occupied. Investments like this, and the rapid absorption of vacant space, indicates that the industrial market is extremely strong in Miami-Dade County and investors are willing to develop available lands, even at significant cost.

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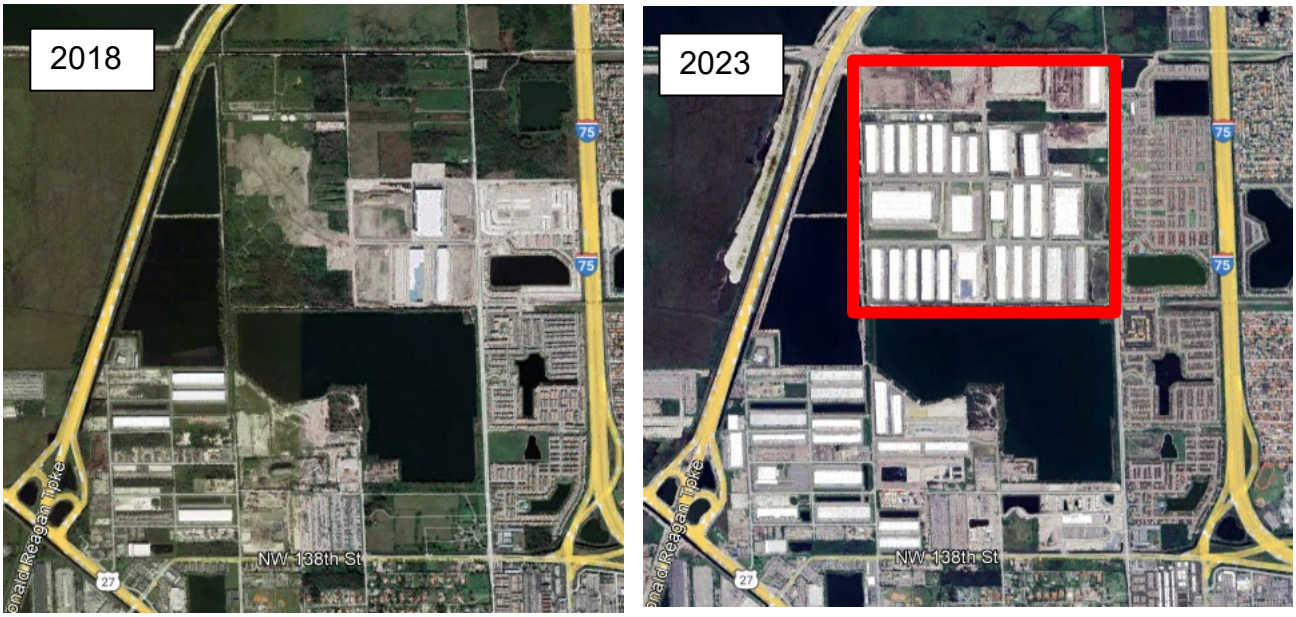
[34] *Deco gets an inside look at Amazon's new fulfillment center in Opa-locka."* News 7 Miami. June 27, 2019. https://wsvn.com/entertainment/deco-gets-an-inside-look-at-amazons-new-fulfillment-center-in-opa-locka/

[35] *New 118,000 SF Warehouse in Doral Nearing Completion.* DiGiacomo Group. https://miamiairportwarehouses.com/new-118000-sf-warehouse-in-doral-nearing-completion/

[36] Cushman & Wakefield Industrial Marketbeat Reports.

[37] Bridge Point Doral. https://www.bridgepointdoral.com/

[38] *Terreno to Develop $491 Miami Industrial Project.* Commercial Property Executive. https://www.commercialsearch.com/news/terreno-to-develop-491m-miami-project/



Source: Google Earth.

Figure 4-8 Change in the Industrial Landscape of Miami-Dade County, 2018-2023, Northwest Miami-Dade County

The availability of industrial land is further complicated by the Live Local Act (SB 102) passed in 2023 and amended in 2024 (SB 328). This Act states that "a county must authorize multifamily and mixed-use residential as allowable uses in any area zoned for commercial, industrial, or mixed use if at least 40 percent of the residential units in a proposed multifamily development are rental units that, for a period of at least 30 years, are affordable as defined by s. 420.0004". [39] This Act can allow for the state law to override local zoning and limits on building height and density. For spaces previously designated as industrial, this calls into question if they will remain as such, thus further limiting the amount of available warehousing space to serve Miami's population.

4.4 Foreign Trade Zones

In the United States, foreign trade zones (FTZ) are areas located near ports of entry where goods receive the same U.S. Customs treatment as if they were still outside the United States. These goods may be reconfigured or manufactured on US soil, and duties are only paid when goods are transferred to the US consumer market. This lowers the tariffs and taxes paid by companies engaging in international trade by eliminating and/or delaying payment. Effective use of FTZs creates economic opportunities and competitive advantages for a region. At present, there are three FTZs in Miami-Dade County. The defined zones are as follows:

[39] *CS for CS for SB 328, 1st Engrossed.* https://www.flsenate.gov/Session/Bill/2024/328/BillText/er/PDF

- **FTZ No. 32:** Greater Miami Foreign-Trade Zone, Inc.[40] consists of approximately 102 "activated" acres with the largest sites encompassing Sysco Food Services of South Florida, Inc. (49 acres), Island Gardens Deep Harbour, LLC (doing business as Yacht Haven Grand Miami at Island Gardens) (13 acres), and Mobis Parts Miami, LLC (9.19 acres).
- **FTZ No. 166**: Vision Foreign-Trade Zone, Inc. (Homestead)[41] consists of a 1,000-acre site roughly 30 miles from both the Airport and Seaport. At present, this FTZ only has 1.46 "activated acres" for Homestead Properties.
- **FTZ No. 281**: Miami-Dade County[42] extends from SW 8th Street to the Broward County line and from Miami Beach to the east of the Urban Development Boundary in the west. This FTZ encompasses some of the most critical logistics infrastructure in the county including Miami International Airport, Opa-locka Airport, PortMiami, and rail yards. This FTZ has 341.91 "activated" acres with the largest sites including Athena Brands, LLC (264 acres), Flagler Station (13.89 acres), and DSV Air & Sea, Inc. (4.5 acres).

Previously FTZ No. 180 in Wynwood was designated as a foreign trade zone but was never fully established and remains inactive. At this time, it is no longer listed on the U.S. Department of Commerce's International Trade Administration website.[43]

4.5 Inland Port Development

With a limited supply of available land for industrial development, developers and major cargo hubs like PortMiami, have begun to look at underutilized land outside of their preferred geography. Commonly, the larger proposed developments have been referred to as "inland ports" or ILCs. Per Florida Statute 311.101, an ILC has been defined as a "facility or group of facilities serving as a point of intermodal transfer of freight in a specific area physically separated from a seaport where activities relating to transport, logistics, goods distribution, consolidation, or value-added activities are carried out, and whose activities and services are designed to support or be supported by conveyance or shipping through one or more seaports."[44]

Recently, PortMiami led the charge to develop an inland port and export consolidation center in support of its cargo development activities. The island geography of the port and mix of uses (i.e.,

[40] *Greater Miami Foreign Trade Zone.* Greater Miami Chamber of Commerce. https://www.miamichamber.com/gmftz

[41] Vision FTZ 166. https://visionftz166.com/

[42] *Foreign Trade Zone 281.* Port Miami. http://www.miamidade.gov/portmiami/foreign-trade-zone-281.asp

[43] *Zone Information.* International Trade Administration. https://ofis.trade.gov/Zones

[44] *Chapter 311 Seaport Programs and Facilities.* Florida Legislature. http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0300-0399/0311/0311.html

cruise passenger traffic) limits the potential growth of cargo operations. To identify a suitable location, PortMiami conducted an *Inland Port Site & Feasibility* study[45]. Core uses for the site include:

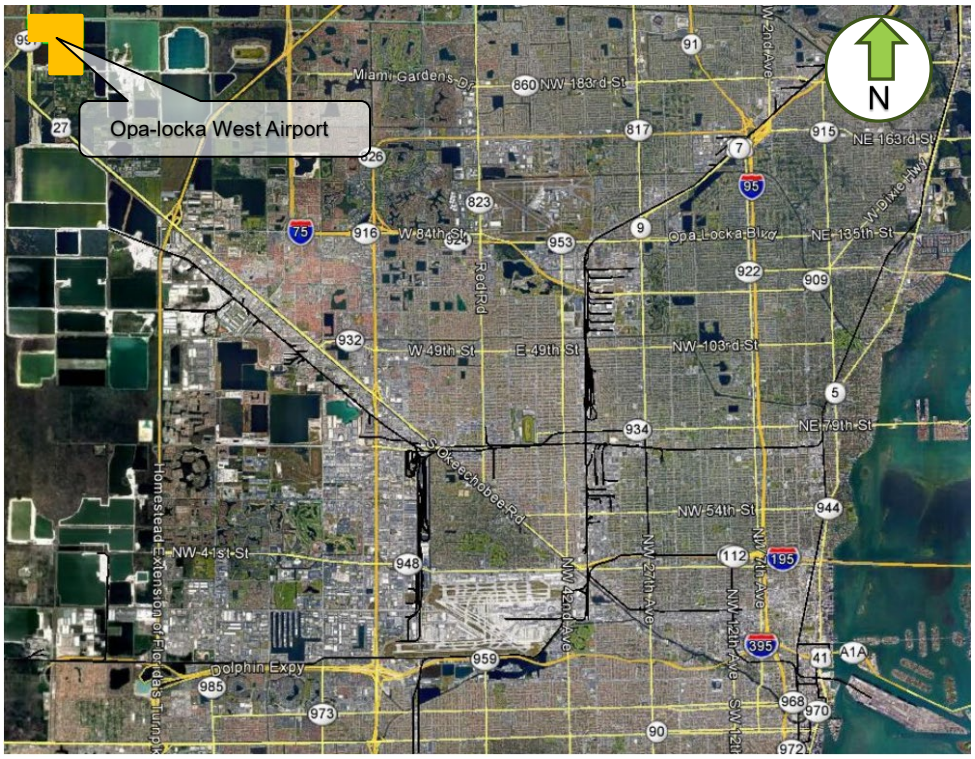
- Empty container storage, eliminating truck trips to and from the port to return an empty or pick up an empty to load export cargo.
- Storage and staging of import or export cargo until it is needed at the Port, which reduces container dwell time, freeing up port capacity.
- Truck parking to help drivers meet their mandatory breaks.

Site criteria, including a minimum size of 75 acres with the ability to expand to 150+ acres, include:

- Proximity to the industrial areas where concentrations of imported containerized cargo are destined, export cargo is loaded, and containers become empty.
- Limited impact on adjacent and nearby parcels. Sites surrounded by industrial or vacant areas not designated for residential use are preferred.
- Nearby access to one or more principal interstates or major arteries that limits truck travel on local roads.
- Short distance to rail access, with direct rail service preferred.
- Vacant land is preferred, reducing costs associated with demolition and brownfield development.
- Government owned property, especially Miami Dade County owned, is preferred over privately owned parcels.
- Access to utilities.
- Lower number of parcel owners would make acquisition less complicated.
- Land use and zoning that support industrial uses (i.e., inside the urban development boundary (UDB), transportation or industrial land use).

From this study, the Opa-locka Airport West was determined to be the most feasible location. As shown in Figure 4-9, this 416-acre parcel owned by the Miami-Dade County Aviation Department is ideally situated along US 27 at the intersection of Krome Avenue. This development will support PortMiami's NetZero: Cargo Mobilization Optimization and Resiliency Project while increasing capacity of the port and allowing it to better serve the county's residents and beyond. PortMiami has an extensive capital improvement plan in place to realize this vision, which is discussed in further detail as part of the freight needs presented in Chapter 8.

[45] *Inland Port Site & Feasibility*. Miami-Dade County Board of County Commissioners. https://www.miamidadetpo.org/library/presentations/Freight-Transportation-Advisory-Committee/portmiami-inland-port-site-and-feasibility-2018-09-12.pdf



Source: Inland Port Site & Feasibility Study.

Figure 4-9 Opa-locka West Airport – PortMiami's Preferred Inland Port Site

At the state level, consideration of ILCs has been an ongoing discussion for more than a decade. In 2023, FDOT revisited the potential role of ILCs to help support the capacity, resilience, and competitiveness of the state's freight transportation system. The *Feasibility Assessment of Intermodal Logistics Centers Serving Florida's Seaports*[46] summarized existing and proposed ILCs in Florida and the southeast, explored the economic conditions and market interest necessary to create the demand for ILCs, and presented recommendations for further consideration by state leaders. The role of ILCs received additional attention in Florida's 2024 legislative session; specifically, ILCs were called out as key considerations in the text of two bills introduced in the Senate and House to drive state transportation investment decisions [SB 1506: Strategic Infrastructure Investment Plan and HB 1275: Strategic Transportation Infrastructure Investment]. As Miami-Dade County advances its inland port, it will be critical to monitor state initiatives and programs that may be available to support the development of ILCs as part of Florida's freight system.

[46] *Intermodal Logistics Centers Serving Florida Seaport.* Florida Department of Transportation. https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/seaport/pdfs/intermodal_logistics_centers_serving_florida_final.pdf?sfvrsn=c09ac2ca_1

5.0 Role of Truck Parking

Truck parking facilities fulfill an important role in the freight community by providing a space for drivers to stop for fuel, food, restroom breaks, sleeping, and more. Most importantly, truck parking facilities help ensure truck drivers have a place to rest and the ability to meet federal requirements. These facilities can provide a range of services depending on driver needs. Some drivers work locally and only need a space to park overnight. Facilities aimed toward these drivers will typically only offer the bare minimum of a space to park, along with a fence and security. However, drivers making long-haul movements in need of a place to sleep overnight would be looking for more amenities such as showers, a restaurant, and restrooms, etc.

5.1 Background

Truck parking is an important component of the freight network that is often overlooked in terms of public knowledge and investment. The passage of the Moving Ahead for Progress In the 2[1st]t Century (MAP-21) Act in 2012, Section 1401 Jason's Law made the construction of safety rest areas, commercial motor vehicle parking facilities, and electric vehicle and natural gas vehicle infrastructure eligible for federal funding. In addition, U.S. DOT was required to survey states within 18 months of enactment regarding commercial vehicle traffic and the ability to provide parking for such vehicles. The passage of the FAST Act in 2015, expanded truck parking eligibility under certain formula funding programs. This continued evolution in federal guidance[47] has expanded current eligible funding programs to include:

- Surface Transportation Block Grant Program (STBG).
- National Highway Freight Program (NHFP).
- Highway Safety Improvement Program (HSIP).
- National Highway Performance Program (NHPP).
- Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT).
- Carbon Reduction Program (CRP); and
- Congestion Mitigation and Air Quality Improvement Program (CMAQ).

[47] *Eligibility of Title 23 and Title 49 Federal Funds for Commercial Motor Vehicle Parking (Updated)*. Federal Highway Administration. September 20, 2022. https://ops.fhwa.dot.gov/Freight/infrastructure/truck_parking/title23fundscmv/title23_49_funds_cmv.pdf

Truck parking is also eligible for the following discretionary grant opportunities:

- Infrastructure for Rebuilding America (INFRA) Grants
- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grants
- Rural Surface Transportation Grants
- National Infrastructure Project Assistance (Mega) Grants
- Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT)
- Advanced Transportation Technologies and Innovative Mobility Deployment (ATTIMD) Grants
- Reduction of Truck Emissions at Port Facilities Grants
- High Priority Innovative Technology Deployment (HP-ITD) Grants

Despite the availability of federal funding for truck parking, hours of service regulations, electronic logging requirements, increasing demand for goods, availability of suitable land in urbanized areas, and cost of development have continued to exasperate the issue. The Jason's Law 2019 Truck Survey and Assessment completed by FHWA in 2019 confirmed these conditions. All 50 state DOTs responded to the survey, along with 18 port authorities and nearly 12,000 drivers. Shortages are similar to those found in the 2015 survey results. Florida in particular was reported as having one of the highest numbers of unofficial or unauthorized truck parking locations. Most commonly this occurs on ramps (58 percent) and roadway shoulders (34 percent). Identified challenges by State DOTs include planning, funding, and accommodating truck parking; need for research of business models and impacts; and local government involvement and education. [48]

5.2 Hours of Service

Hours of Service regulations impact how long a driver may drive in a given day or over a period of seven or eight days. The Hours of Service of Drivers Final Rule was originally published in the Federal Register in December 2011, with an effective date of February 2012 and a compliance date of July 2013 for the remaining provisions. Since then, several revisions have been made to these regulations. The most significant change went into effect in September 2020 which updated guidance on short-haul exceptions, adverse driving conditions exceptions, 30-minute rest break requirements, and sleeper berth provisions. The current full guidance was published in April 2022 [49] and a summary of the current regulations are shown in Table 5-1.

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[48] *Jason's Law Commercial Motor Vehicle Parking Survey and Comparative Assessment.* Federal Highway Administration. December 1, 2020. https://ops.fhwa.dot.gov/Freight/infrastructure/truck_parking/coalition/2020/mtg/jasons_law_results.pdf

[49] *Interstate Truck Driver's Guide to Hours of Service.* Federal Motor Carrier Safety Administration. https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2022-04/FMCSA-HOS-395-DRIVERS-GUIDE-TO-HOS%282022-04-28%29_0.pdf

Table 5-1 Hours of Service Regulations – Interstate

Regulation	Description
11-Hour Driving Limit	May drive a maximum of 11 hours after 10 consecutive hours off duty.
14-Hour Limit	May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.
30-Minute Driving Break	Drivers must take a 30-minute break when they have driven for a period of 8 cumulative hours without at least a 30-minute interruption. The break may be satisfied by any non-driving period of 30 consecutive minutes (i.e., on-duty not driving, off-duty, sleeper berth, or any combination of these taken consecutively).
60/70 Hour Limit	May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty.
Sleeper Berth Provision	Drivers may split their required 10-hour off-duty period, as long as one off-duty period (whether in or out of the sleeper berth) is at least 2 hours long and the other involves at least 7 consecutive hours spent in the sleeper berth. All sleeper berth pairings MUST add up to at least 10 hours. When used together, neither time period counts against the maximum 14- hour driving window.
Adverse Driving Conditions	Drivers are allowed to extend the 11-hour maximum driving limit and 14-hour driving window by up to 2 hours when adverse driving conditions are encountered.
Short Haul Exception	A driver is exempt from the requirements of §395.8 and §395.11 if: the driver operates within a 150 air-mile radius of the normal work reporting location, and the driver does not exceed a maximum duty period of 14 hours. Drivers using the short-haul exception in §395.I)(1) must report and return to the normal work reporting location within 14 consecutive hours, and stay within a 150 air-mile radius of the work reporting location.

Source: Federal Motor Carrier Safety Administration. [50]

This summary does not include the additional mandates established under the Electronic Logging Device (ELD) Rule published in the Federal Register in December 2015. [51] The ELD Rule states that a motor carrier operating commercial motor vehicles must install and require each of its drivers to use an ELD to record the driver's duty status no later than December 18, 2017. The Electronic Logging Devices website of FMCSA maintains a current list of eligible devices. [52] Drivers and motor carriers currently using Automatic Onboard Recorders (OABRDs) could continue to use them for an additional two years beyond that date. Exceptions to this rule include drivers who use paper logs no more than eight days during any 30-day period; driveaway-towaway drivers; and drivers of vehicles

[50] *Summary of Hours of Service Regulations.* Federal Motor Carrier Safety Administration. https://www.fmcsa.dot.gov/regulations/hours-service/summary-hours-service-regulations

[51] *Electronic Logging Devices and Hours of Service Supporting Documents.* Federal Register. https://www.govinfo.gov/content/pkg/FR-2015-12-16/pdf/2015-31336.pdf

[52] *Electronic Logging Devices.* Federal Motor Carrier Safety Administration. https://eld.fmcsa.dot.gov/

manufactured before model year 2000. Other exemptions have previously been granted to the United Parcel Service (UPS) and the Motion Picture Association of America (MPAA). [53]

An understanding of Hours of Service and ELD mandates is an important component of understanding truck parking shortages, and the corresponding efforts to expand existing facilities or build new ones. To maximize their working hours, drivers would ideally stop just short of their maximum hours of service. However, a parking facility may not be located at that exact moment in time, or it may already be full. As a result, drivers must risk exceeding hours of service, or stop short of their hours of service to guarantee parking. Time wasted can be significant as some areas have very limited truck parking and over the road/long-haul drivers may not be familiar with a local facility.

Hours of service regulations differ slightly for local, intrastate-only drivers. Table 5-2 shows these hours of service regulations for Florida. For the most part, these regulations are slightly more relaxed than the regulations for interstate commerce. For example, truckers may drive for 12 hours after 10 hours off duty for intrastate commerce whereas they can only drive for 11 hours for interstate commerce. However, parking challenges exist for local drivers as well. Most residential communities have restrictions that require a driver to park his/her truck somewhere other than at their residence. In Miami-Dade County this has created a significant demand for overnight truck parking lots.

Table 5-2 Hours of Service Regulations – Intrastate

Regulation	Description
12-Hour Driving Limit	Driver may drive 12 hours after 10 consecutive hours off duty.
16-Hour Limit	Driver may not drive after 16th hour after coming on duty following 10 consecutive hours off duty.
70/80-Hour Limit	Driver may not drive after 70/80 hours on duty in 7/8 consecutive days. 34 consecutive hours off constitutes end of 7/8 day period.
150-Air Mile Radius	Drivers who do not exceed 150 air mile radius and no placarded hazmat are exempt from maintaining a log book. Drivers not released from duty within 14 hours must document driving time.
Agricultural products	Weekly limit does not apply to a person who operates a commercial motor vehicle solely within this state while transporting, during harvest periods, any unprocessed agricultural products or unprocessed food or fiber that is subject to seasonal harvesting from place of harvest to the first place of processing or storage or from place of harvest directly to market or while transporting livestock, livestock feed, or farm supplies directly related to growing or harvesting agricultural products.

Source: Florida Statute Chapter 316. [54]

[53] *Electronic Logging Device (ELD) Exemptions, Waivers, and Vendor Malfunction Extensions.* Federal Motor Carrier Safety Administration. https://www.fmcsa.dot.gov/hours-service/elds/electronic-logging-device-eld-exemptions-and-waivers

[54] *State Uniform Traffic Control.* Florida Statute. http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0300-0399/0316/0316.html

5.3 Miami-Dade and FDOT District 6 Trucking Parking Studies

Miami-Dade has realized and documented truck parking shortages in South Florida over the last decade. The Miami-Dade TPO conducted two truck parking studies that were completed in September 2010 and November 2012. These studies sought to determine the availability of truck parking, the demand for truck parking, and potential locations for additional facilities to be developed. It was estimated that there were only 293 legal truck parking spots for both local drivers and long-haul drivers. The demand was determined to be in excess of 12,000 spots, which would require the development of over 1,100 acres of land. In a county with limited undeveloped land, a wide mix of land uses, and high land values, finding appropriate locations to build such facilities has proven to be a challenge, despite efforts by the TPO, the Miami-Dade Freight Transportation Advisory Committee (FTAC), and FDOT District 6 to encourage the development of new truck parking locations.

In 2016, FDOT District 6 performed market and economic analyses regarding the feasibility of building and operating truck stop facilities at two sites owned by the State of Florida within the Greater Miami area. The proposed site at the Golden Glades Interchange had some positive attributes, including being surrounded by several major highways including I-95 and the Florida's Turnpike. The site has significant traffic, and there are some access constraints for trucks. In addition, the current and projected number of cars parked each day in the lot across from SR 7 is significant. Given these conditions, a gas station and convenience store were identified as possibilities for this location. The Golden Glades Multimodal Transportation Facility (GGMTF) opened in 2021 and in 2023 FDOT developed a lease agreement project for the truck parking facility. The current schedule has the Golden Glades Truck Travel Center (GGTTC) opened in 2036. [55]

FDOT completed an updated assessment of potential truck parking locations in August 2018. This study took a tiered approach in looking at potential truck parking locations: Preliminary Screening (Tier 1), Detailed Screening (Tier 2), and an Engineering Feasibility and Stakeholder Support Screening (Tier 3). Of the examined sites, only "Site X" was determined to be feasible. This site is located on NW 7th Street in the southeast quadrant of the SR 826/Palmetto Expressway and the SR 836 Dolphin Expressway interchange – a site previously used as construction staging for the SR 826/SR 836 interchange reconstruction project. The preliminary engineering concept for this site includes 113 truck parking space, three diesel pumps and a security building, as shown in Figure 5-1. [56]

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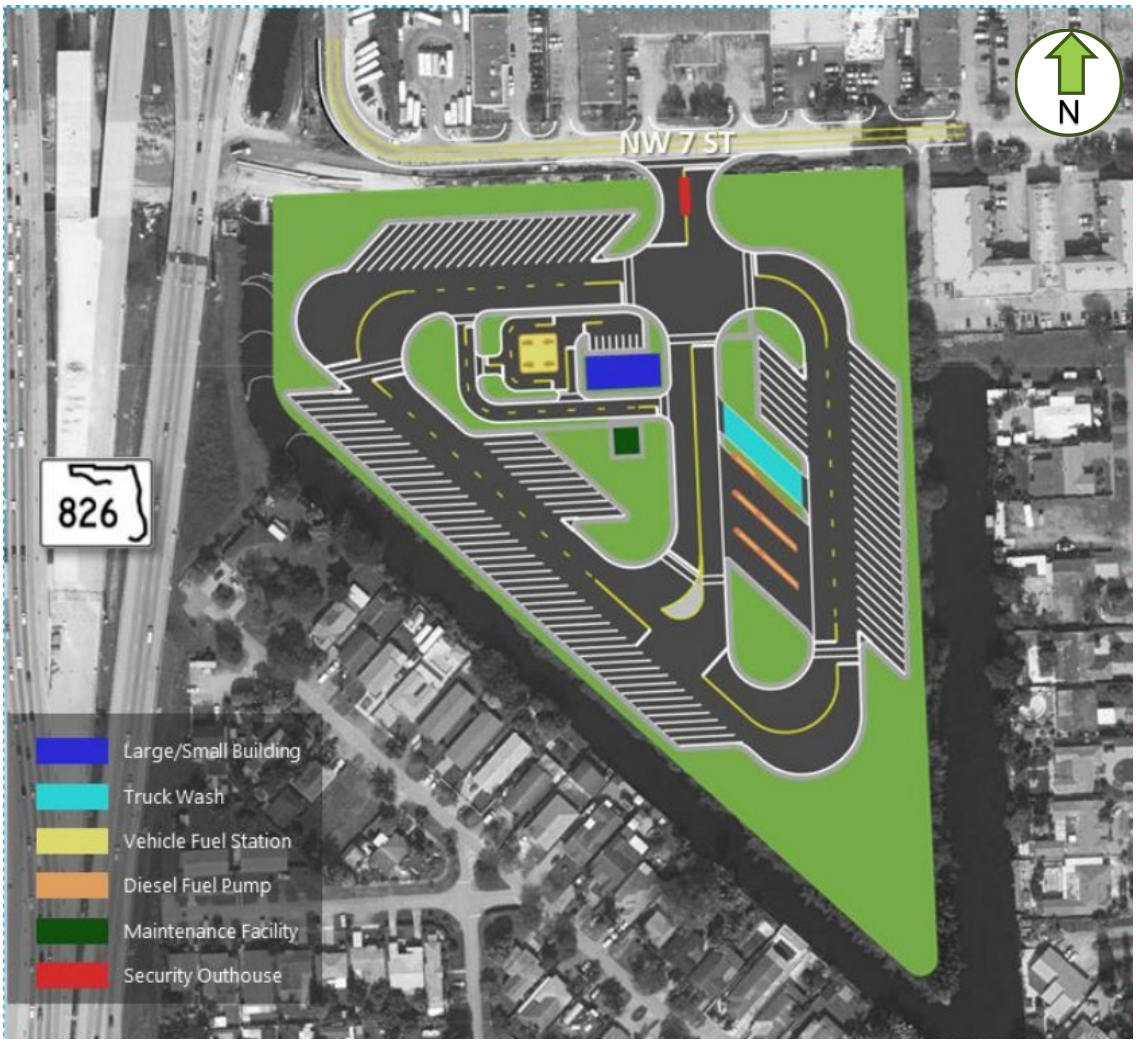
[55] *Golden Glades Truck Travel Center (GGTTC) Lease Request for Proposal (RFP) Development.* Florida Department of Transportation. https://www.fdotmiamidade.com/design-projects/pdf_download/25200-Fact_Sheet_-_GGTTC_-_08-22-2023.pdf

[56] *Assessment for Potential Truck Parking Location within Miami-Dade County.* Florida Department of Transportation. August 2018. https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/assessmentpotentialtruckparking_aug2018.pdf?sfvrsn=2196e313_2



Source: Assessment for Potential Truck Parking Location within Miami-Dade County.

Figure 5-1 Truck Parking Site X Preliminary Engineering Concept

Building on this analysis, a secondary assessment was conducted on five parcels in 2019. Of the five Miami-Dade County owned parcels, two were determined to be suitable for truck parking usage, both within the Homestead Base census designated area. While demand is lower in this area relative to the rest of the county, these two locations could provide a minimum of 303 (Parcel 2) and 466 (Parcel 3) truck parking spaces, assuming 10 spaces per acre. Development risks also exist for these locations as they are near residential areas. [57]

[57] *Miami-Dade County Preliminary Truck Parking Assessment.* Florida Department of Transportation. https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/truck_parking_assessment_tech_memo_mdc-owned-land_march2019.pdf?sfvrsn=8291e350_2

An updated supply and demand study was conducted by FDOT in June 2022, and a further study is underway that is evaluating 16 sites and is expected to be complete in 2024, including the "Site X" previously mentioned.[58] These sixteen sites are shown in Figure 5-2 and range in size from 4.81 acres to 165.1 acres. Key characteristics for each site are summarized in Table 5-3 Truck Parking Selected Sites, 2024. The majority are owned by public entities (State of Florida, Miami-Dade County, and the Florida Department of Transportation), also some are privately held. These sites were screened based on site characteristics (zoning, future land use, acreage, etc.), driving distance from intermodal points of interest (freeways, SIS, NHFN, etc.), demand components, and the cost of land per acre. The top ranked sites are sites 1, 15, and 9 which would be capable of developing 2,789 truck parking spots, enough to nearly accommodate the estimated shortage of 3,390. The addition of the fourth ranked site, number 7, would add an additional 2,718 spots and allow for the estimated demand to be met. Implementation of FDOT District 6's truck parking program will be accomplished in three phases:

- **Phase 1:** Exploration and Initial Steps: Includes site identification (as determined by this analysis), securing public-private partnerships, and implementing policies to improve funding availability.
- **Phase 2:** Full Implementation: Move forward with site plan approval and permitting, securing funding, and construction of facilities.
- **Phase 3:** Future Actions. Using the information, performance measures, and opportunities from the prior phases, explore opportunities to address undesignated truck parking by tracking performance and implementing technology.[59]

In addition to the sixteen sites discussed above, the development of an inland port by PortMiami at the Opa-locka Airport West property also is anticipated to include some number of truck parking spaces.

5.4 FDOT's Truck Parking Availability System (TPAS)

Truck parking is also an issue at the state level. In an effort to aid truck drivers in finding available spots, FDOT developed a real time Truck Parking Availability System (TPAS). The goal of TPAS is to install an Intelligent Transportation System (ITS) to detect available truck parking spaces at public facilities across Florida's Interstate System. This includes I-4, I-10, I-75, and I-95, welcome centers, weigh stations, and rest areas.

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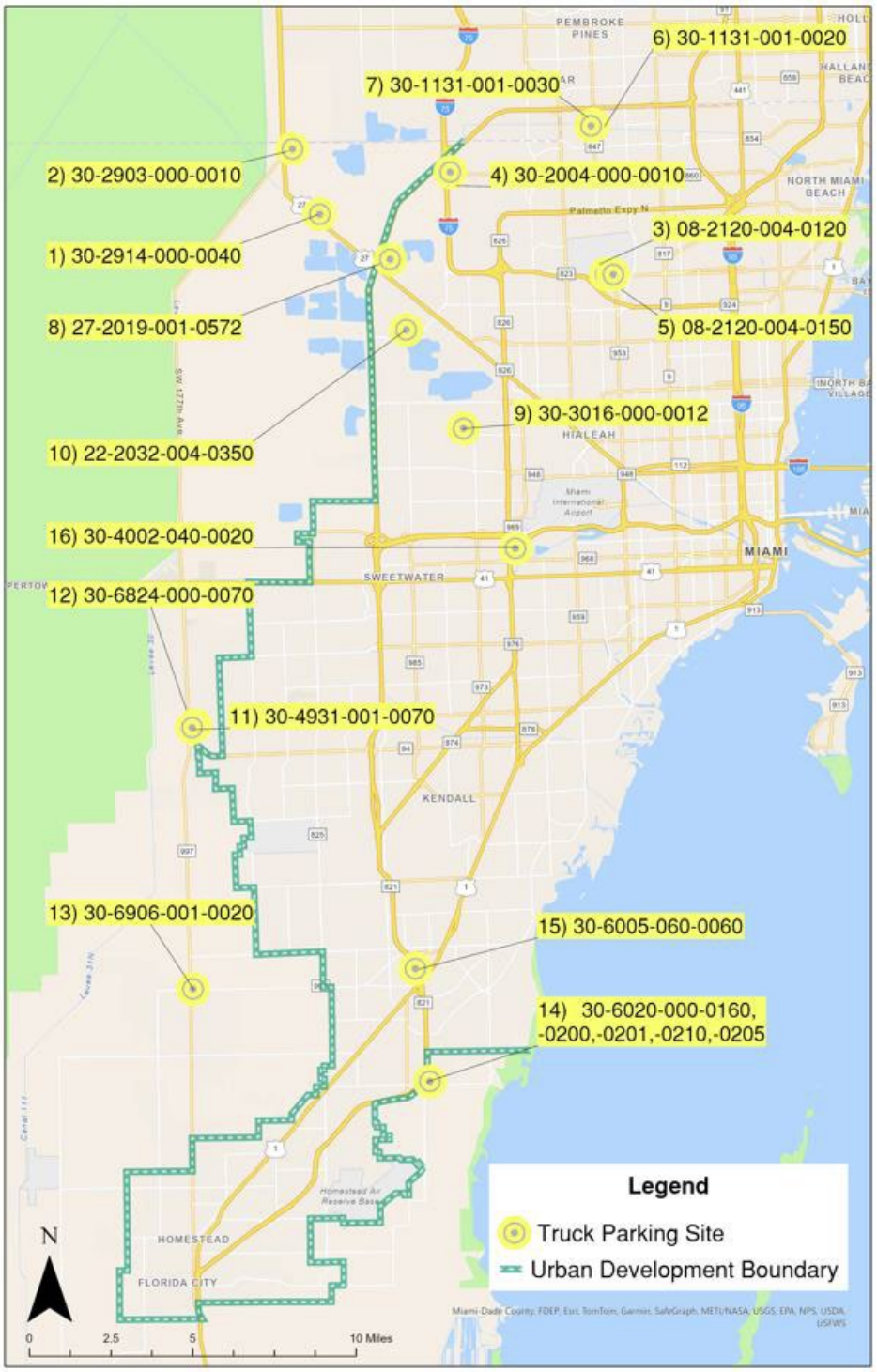
[58] *State probes 16 county sites for freight truck parking lots.* MiamiToday. December 26, 2023. https://www.miamitodaynews.com/2023/12/26/state-probes-16-county-sites-for-freight-truck-parking-lots/

[59] *Miami-Dade County Truck Parking Implementation Master Plan. March FTAC Meeting.* Miami-Dade TPO. March 6, 2024. https://miamidadetpo.org/library/boards/Freight-Transportation-Advisory-Committee/Agendas/2024-03-06-ftac.pdf



Source: Florida Department of Transportation.

Figure 5-2 Truck Parking Selected Sites, 2024

Table 5-3 Truck Parking Selected Sites, 2024

Site	Owner	Acreage	Zoning	Existing Use	Total Truck Parking Capacity
1	State of Florida	130.93	AU-Agricultural / Residential 5 Acres gross	Vacant	1,907
2	Miami-Dade County	102.98	GU- Interim District	Vacant	1,308
3	Miami-Dade County	10.15	Vacant Land- Industrial	Vacant	70
4	State of Florida	64.80	N/A	N/A	N/A
5	Miami-Dade County	8.33	Vacant Land- Industrial	Vacant	65
6	TITTF	31.12	Agricultural / Residential 5 Acres gross	Vacant	409
7	Miami-Dade County	165.10	Agricultural / Residential 5 Acres gross	Vacant	2,718
8	F & C Trucking Inc	8.35	Vacant Land- Industrial	Vacant	85
9	Miami-Dade County	47.6	GU- Interim District	Vacant	655
10	Tarmac Roadstone Inc	12.92	Vacant Land- Industrial	Vacant & Adjacent To GSA	115
11	FDOT	19.01	GU- Interim District	Vacant & Adjacent To GSA	279
12	Miami-Dade County	4.81	GU- Interim District	Interchange Drainage Pond	48
13	Florida Acquisitions Group LLC	5.24	AU-Agricultural / Residential 5 Acres gross	Vacant	38
14	0160, 0205, 0210: Coconut Palm TH LLC, 0200: Mofongo Holdings LLC, 0201: Wilber T. Vick,	38.62	AU-Agricultural / Residential 5 Acres gross	Vacant	586
15	Miami-Dade County	11.89	IU-1 Industrial Districts, light manufacturing	Vacant	137
16	FDOT	15.1	Industrial – Restricted	Staging Area for the I-395 Construction Project	316

Source: Florida Department of Transportation.

This technology uses in-pavement sensors to detect vehicle presence in a parking space at participating facilities, which can be manually verified with closed-circuit televisions (CCTV) cameras. Weigh stations will have sensors to monitor when trucks enter or exit a weigh station as well as CCTV cameras. The information collected by these sensors is shared via smartphone applications so that truck drivers and dispatchers can search for available parking. This type of technology is important as it gives truck drivers knowledge of the road ahead of them. By knowing whether or not there is parking available at the next facility, truck drivers can make an informed decision to either keep driving or modify their route or anticipated driving hours to park at a different facility. FDOT was successful in competing for a $10.8 million Infrastructure for Rebuilding America (INFRA) Grant for the initial implementation of the TPAS. As of March 2024, TPAS has been implemented at 68

locations across the state, although none are located in Miami-Dade County.[60] Further information on concept plans, estimates, and grant information is available on the FDOT website.[61]

5.5 Current Parking Availability

With a demand of 12,190 truck parking spaces, as documented by FDOT District 6 *Truck Parking Supply and Demand Study*, the supply of parking spaces is critical.[62] As part of the Jason's Law Truck Parking Survey conducted in 2015, FHWA collected information on existing truck parking locations, both private and public, across the nation. Public facility data for this survey was sourced from FHWA while private facility data was sourced from Trucker's Friend. Table 5-3 provides a list of these locations. In 2019, an additional dataset was released which only included public truck parking facilities. In Miami, this only includes the Snapper Creek location located on Florida's Turnpike.[63] Expansion of these existing facilities is difficult due to most of the surrounding land already being developed and the high cost to purchase land and develop additional spots. Note that this dataset does not include locations outside of the urban development boundary.

Table 5-4 Truck Parking Locations in Miami-Dade County

Business	Intersection	Total Spaces
Snapper Creek	Homestead Extension of Florida's Turnpike (HEFT) North of Don Shula Expressway	30
Exxon	SW 200th Street & Krome Avenue	15
Mobile	Coconut Palm Drive & Krome Avenue	12
Shell	US 41 & Krome Avenue	30
USA Truck Service Plaza	Okeechobee Rd/Frontage Rd & NW 77th Avenue	90
FX	NW South River Drive & Beacon Station Road	2
Pilot Travel Center	NW South River Drive & NW 122nd Street	65
Citgo	Okeechobee Road & NW 138th Street	10
Mobil	NW 167th Street & NW 27th Avenue	8

Source: Federal Highway Administration.

5.6 Future Developments

Meeting the demand for truck parking will continue to be a challenge in Miami-Dade County. While additional truck parking locations are available in other counties, such as Broward and Palm Beach, which can serve some of the Miami-Dade market, those counties also face shortages. For most developers, the construction of a truck parking facility will not yield the highest profits when compared to other opportunities, as evidenced by the lack of availability. As an example, recent land and

[60] *Truck Parking Availability.* Florida 511. https://fl511.com/list/pois/parking?start=0&length=25&order%5Bi%5D=1&order%5Bdir%5D=asc

[61] *Florida Trucking Information.* Florida Department of Transportation. http://www.floridatruckinginfo.com/Docspubs.htm

[62] *Truck Parking Supply and Demand Study.* Florida Department of Transportation. June 2022. https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/d6_-2022-truck-parking-supply-demand-study.pdf?sfvrsn=61630210_1

[63] *Jason's Law 2019 Truck Parking Survey and Assessment.* Federal Highway Administration. https://ops.fhwa.dot.gov/Freight/infrastructure/truck_parking/index.htm

property sales indicate that land is over $1 million per acre in Miami. The sale of 175 acres to Bridge Industrial in 2022 for an estimated $400 million put the value of more premium locations above $2 million per acre.[64] The land purchase cost for 100 truck parking spots (10 spots/acre) alone could cost more than $20 million dollars, without including the cost of development. If companies are unwilling to develop standalone truck parking locations, then new industrial development should consider including truck parking in their site design.

In some cases, landowners are taking development into their own hands, albeit without proper changes to land use and zoning designations. Located primarily on former agricultural land, these truck parking locations are outside of the urban development boundary and as such offer limited services. They primarily serve as a place to park overnight for the local trucking community versus being able to serve the long-haul truck drivers. An example of these locations is shown Figure 5-3 with the red boxes indicating the locations. These here are located in the northwest corner of Florida's Turnpike and US 27/SR 25/Okeechobee Road. The success of these locations confirms the estimated demand for truck parking spaces and reinforces the need for the construction of more facilities. In recognition of the demand for parking and the difficulty in finding appropriate sites for development, Miami-Dade County has endorsed some of these truck parking locations outside of the urban development boundary (UDB). The revised Terra application provides additional truck parking on land designated as Terminal without needing to move the UDB. This provides greater assurance that it will be used as truck parking as moving the UDB would increase the value of the land and make it more likely to be considered for other uses.[65]

Specific direction for this type of truck parking is provided by the Land Use Element of the Comprehensive Development Master Plan (CDMP) as follows:

> "The parking and storage of operable, non-disabled commercial motor vehicles may be considered for approval on properties ten acres or greater in the area east of the Urban Development Boundary, south of the theoretical extension of SW 236 Street, and north of SW 248 Street subject to the following requirements:
>
> (a) commercial vehicle storage facilities shall obtain an annual operating permit from the Division of Environmental Resources Management in the Department of Regulatory and Economic Resources and be subject to required quarterly groundwater quality monitoring;
>
> (b) all vehicles and equipment shall be stored or parked only on paved impervious surfaces with county-approved drainage systems;
>
> (c) truck washing, mechanical repair, or maintenance of any kind shall be prohibited;

[64] *Commercial Real Estate Booms Near Miami International Airport.* Miami Today. July 25, 2023. https://www.miamitodaynews.com/2023/07/25/commercial-real-estate-booms-near-miami-international-airport/

[65] *Application No. CDMP20210006, Terra137, LLC, and Blue Heron 6137, LLC.* Miami-Dade County. March 10, 2023. https://documents.miamidade.gov/mayor/memos/03.10.23-Application-No-CDMP20210006-Terra137-LLC-and-Blue-Heron-6137-LLC.pdf

(d) the storage, handling, use, discharge and disposal of liquid wastes or hazardous wastes shall be prohibited; and

(e) a vegetative buffer shall be provided along the perimeter of the property to provide visual screening."[66]

Source: Google Earth.

Figure 5-3 Truck Parking Locations Outside the Urban Development Boundary Along US 27

[66] *Land Use Element.* Miami-Dade. https://www.miamidade.gov/planning/library/reports/planning-documents/cdmp/land-use.pdf

6.0 Future Technologies and Resilience

6.1 Introduction

In June 2018, the Miami-Dade TPO identified similar goals and objectives with the FDOT State Freight Plan to continue to invest in maintaining an agile, resilient, and quality infrastructure to meet the needs of future vehicles, technology, and innovation. With the capability to evaluate and implement transportation technologies, customers and companies have the ability to transport their goods and services at a faster pace. These enhanced speeds of delivery systems will lead to time and cost savings for both the company and the consumer. These enhancements include the development of government initiatives such as the Electronic Freight Management Program will allow for the improvement of the implementation of future shipment visibility throughout existing freight supply chains. The primary objective of this document is to identify the current and future freight technologies, recognize environmental obstacles with the deployment of various transportation technologies, and discover innovative methods to mitigate specific impacts with the possible adoption of these pioneering freight solutions.

6.2 Identification of Current and Future Technologies

Freight industries and governmental agencies such as the Miami-Dade TPO are constantly examining current and future technologies to improve the movement of goods across the globe. The deployment of technological solutions within the freight environment will allow shipping companies, ports, and end users to benefit from a more accurate, efficient, and secure transfer of commodities. One of the best tools to accomplish these shipping benefits is to implement automation within the shipping process. Injecting automation or even Artificial Intelligence (AI) into the process allows for the reduction of the inspection of cargo while in transport.

6.2.1 Truck Parking Availability System

One example of the use of current freight technology within the trucking industry is the use of automated technology to identify and report the availability of truck parking. According to the American Transportation Research Institute, in 2022, the availability of proper truck parking rose to be ranked the third industry concern behind driver shortages and fuel prices.[67] Figure 6-1 demonstrates areas with high projected demand for additional truck parking spaces now and into the future. By not having immediate parking available for commercial drivers poses an immediate safety risk to all

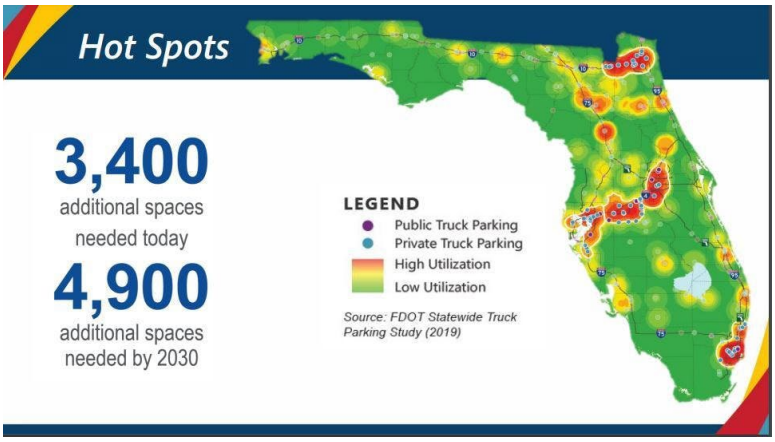


Figure 6-1 Truck Parking Demand

[67] https://truckingresearch.org/wp-content/uploads/2022/10/ATRI-Top-Industry-Issues-2022.pdf

users of the roadway. Tired drivers or drivers whose driving time is about to expire may elect to park their trucks in unsafe conditions, such as exit ramps or shoulders, which can also be a safety hazard to everyday drivers. To combat this overarching issue, the FDOT has decided to develop and implement a statewide initiative technology to improve efficiency at parking facilities known as the Truck Parking Availability System (TPAS), as mentioned in Section 5.4. The TPAS System electronically measures parking availability while alerting commercial vehicle operators via Cellular Applications, Dynamic Truck Parking Signs (DTPS), and the Florida 511 Traveler Information System. The benefits of the TPAS system are to enhance safety along Florida Interstates while providing reliable truck parking information and increase driver acceptance of the system when faced with vital truck parking decisions at private parking lots, FDOT Public Rest Areas, or State Weigh Stations[68]

6.2.2 Mainline Weigh-in-Motion Solution

Keeping freight moving at all times is another example of how the logistics industry is using AI and automation to increase the efficiency of transporting goods. In conjunction with the deployment of the TPAS system at weight stations, the FHWA has partnered with numerous state agencies to deploy a Mainline Weigh-in-Motion (WIM) Solution pictured in Figure 6-2 to achieve this goal of keeping freight in continuous motion. WIM systems are deployed on mainline streets and interstates to provide weight compliance at weigh station locations. The WIM equipment has the ability to determine traffic volumes by weight and vehicle classification. Additional items the equipment can receive are the date/time of read, axle spacing, speed, and each axle weight of the vehicle and trailer. To ensure the trucks and trailers do not have to stop on a static scale, the weigh sensor is uniquely embedded in the pavement of the interstate or the weight station off-ramp to give the WIM operator an estimate of the vehicle weight. If the commercial operator is within the predefined weight threshold, they are informed via their in-cab alerting device to re-enter or remain on the roadway. If the truck is identified to be outside the predetermined weight threshold, they are sorted into the weigh station for additional screening on precision scales, where the commercial driver will be issued a citation. All vehicles are subject to having their license plate read via a digital device known as a non-invasive license plate reader (LPR) and cross-referenced against both the Florida Department of Highway Safety and Motor Vehicles (FLHSMV) and the U.S. DOT Databases. These databases will verify if the vehicle registration is still valid, identify if any previous safety violations were issued, and if a vehicle is permitted to operate within the State of Florida. The development of the WIM solution has decreased the timeframe for a commercial vehicle to clear the weight station but also to verify the vehicle's credentials while improving the overall efficiency of freight logistics.

Figure 6-2 Weigh-in-Motion System

[68] https://www.fdot.gov/traffic/traf-incident/tpas

6.2.3 Dolphin Station Park-and-Ride Transit Terminal Facility

Moving freight via truck, train, and cargo ship is important, but also is the transportation of individuals as well. Making it easier for commuters to transfer quickly and easily between modes of transportation is paramount to the adoption of public transportation, reducing rider stress while reducing congestion on the surrounding roads. One innovative technique currently deployed within the State of Florida is the development of the multi-modal park-and-ride transit terminal facility. This pioneering mobility concept was developed between a partnership of the GMX, DTPW, and FDOT. The transit terminal facility concept is located in Doral, Florida, and is known as the Dolphin Station or the Dolphin Station Park and Ride Transit Terminal Facility (shown in Figure 6-3). The Dolphin Station opened in March of 2020, is located on 15 acres of land and is the central transit hub for the local transit community who need another transportation option within Doral, Sweetwater, West Miami-Dade, the Miami International Airport, Brickell, Downtown Miami, Florida International University, and also the Dolphin Mall. Riders of multimodal transportation will have the ability to use the existing GO Miami-Dade Transit Mobile phone application to quickly identify the arrival times of the buses, trains, and mover cards to plan their transition between each mobility solution quickly. In addition, contactless payments can also be processed while in transit for efficient movement across the County. This facility allows riders to transition between transit, commuter rail service, and automobile transportation without leaving the secure mobility complex.

Figure 6-3 Dolphin Station Park-and-Ride

6.2.4 Digital Freight Matching

Another technology that has revolutionized the shipping industry is the use of Digital Freight Matching (DFM). DFM or also known as Digital Load Matching (DLM), is an online platform that uses AI to match shippers and carriers to maximize the utilization of their vehicles on the road. Using an online platform and integrated messaging service helps drivers plan out routes and communicate with drivers in near real-time and have the ability to eliminate a commercial vehicle on the road that is not fully loaded. This digital platform is not only used to increase load capacity but can also be used when a shipper is seeking competition within the logistics industry. The shipper will input all of their freight information, and this information is then posted to the DFM system so that freight companies have the ability to obtain the best price to transport their goods to the end user. This specific technology is not limited to the trucking industry but is also utilized within the ocean shipping industry as well. A 2018 study by Flexport International LLC revealed that Full Container Load (FCL) containers were, on average, only 65 percent utilized, meaning that more than one-third of U.S.-

bound container space moves across the ocean without cargo[69]. FCLs are containers that a single shipper owns, and the shipper is not obligated to share the remaining space not occupied by their cargo. By allowing a platform that allows both the shipper and end user to maximize the container, container ships to be utilized more efficiently while reducing the impact on the environment.

6.2.5 Gig Economy

Figure 6-4 Gig Economy Statistics

The advancements in freight technology have exploded over the last decades, specifically within the gig economy with last-mile delivery. A Gig Economy, now employing 15.8M workers (See Figure 6-4) is a similar concept to digital freight matching as they utilize digital platforms as a communications medium, but instead of freight, this technology is used to recruit labor for specific short-term tasks. It is estimated that roughly 36 percent of the population in the United States is working in the gig economy[70], with approximately 1.6 million individuals earning their primary income from the gig economy[71]. Many of the popular careers within the gig economy include virtual customer service agents, graphic designers, digital marketers, web developers, virtual assistants, personal shoppers but also last-mile delivery drivers. This specific type of employment allows workers to dictate their own working schedule while working from anywhere in the World with a reliable internet connection, or in the circumstances of the delivery driver where they would only need a mode of transportation and a cellular phone. One popular gig economy occupation is being a last-mile delivery driver. Last-mile delivery driving in the gig economy is popular among the short-term workers but also among the companies who employ them. Many tech companies such as Uber, Door Dash, Grub Hub, Instacart, and the online retail giant Amazon utilizes giga economy drivers known as Amazon Flex to allow individuals to deliver their goods from their distribution. These last-mile delivery drivers do benefit from a sense of independence, and working as a contractor has the ability to obtain higher hourly rates than traditional delivery jobs, which have the potential for the customer to pay more for a product or service due to the on-demand nature. The industry saw a surge of growth due to the COVID-19 pandemic.

[69] https://www.dcvelocity.com/articles/30582-flexport-platform-matches-freight-to-wasted-space-in-ocean-containers

[70] https://lauriemccabe.com/2020/10/06/statistics-on-the-game-changing-gig-economy/

[71] https://corporatefinanceinstitute.com/resources/economics/gig-economy/

6.2.6 Commercial Grade Unmanned Aerial Vehicles

With the invention of various modes of electrified vehicles, the gig economy has looked toward autonomous technology to be the answer to increasing the efficiency of the freight industry and finding innovative ways to reduce operating costs while increasing reliability by providing on-time deliveries as promised. One of these solutions is to take to the sky using commercial-grade unmanned aerial vehicles (UAVs) or drones to perform many last-mile deliveries. The use of UAVs is not the overarching solution to this in-demanding service but has shown to have the potential for solving the last-mile delivery solution concerns. One of the most attractive items companies are drawn to is the potential reduction in operating costs. One way to potentially save costs for both the company and the customer would be to reduce the delivery labor force and make the switch from using fossil fuels to electricity as the organization's primary fuel source. Drones can have up to 94% lower energy consumption per package than other vehicles.[72] One UAV company known as DroneUp (see Figure 6-5) has partnered with Walmart to expand its drone delivery service to approximately four million additional households, which includes Florida. These DroneUp Commercial drones can deliver up to more than ten thousand (10,000) eligible products up to a maximum weight of 10 pounds[73]. The UAV does not require the capability to stop the delivery process. Once the package is loaded into the UAV and is piloted via an FAA-certified pilot, the UAV reaches the final destination; the carriage is dropped via an 80-foot tether with selected products; the drone then turns around, going back to the origin or other central delivery hub to repeat the process again.

Figure 6-5 Drone Up Delivery Service

6.2.7 Heavy-Duty Autonomous Trucks

The latest generation of advanced assistance driver safety systems, such as lane keep assist, adaptive cruise control, and automatic emergency braking developed for both passenger and commercial vehicles, are quickly establishing technological standards for the development and deployment of autonomous and driverless trucks. Freight companies are faced with challenges, and to be competitive within the logistics industry, these companies, regardless of size, need to find new and innovative alternatives to rising costs and driver shortages. One of the biggest expenses for trucking companies is the cost of paying their drivers. This includes a combination of compensation, benefits, and payroll taxes which can range from 28 to 50 percent of revenue depending on factors such as location, type of operation, and distance traveled. These expenses encompass various

[72] https://engineering.cmu.edu/news-events/news/2022/09/16-last-mile-drones.html

[73] https://www.businesswire.com/news/home/20221215005622/en/Walmart%E2%80%99s-Drone-Delivery-Takes-Flight-in-Florida-with-DroneUp

forms of compensation such as base wages, incentive pay, per diem, accessorial pay, and benefits like workers' compensation, health insurance, and retirement benefits.[74] Many companies are looking at eliminating this cost and replacing drivers with autonomous driving systems. The technology is still in its infancy but is gaining popularity with shipping companies but also customers as they have the ability to stabilize or even lower the cost of their products.

Another attractive benefit to the deployment of heavy-duty Autonomous Trucks is that they have the ability to increase the safety of the roadway while decreasing the number of vehicle crashes and increasing the efficiency of the commercial vehicle by maintaining constant driver behavior. Another benefit is that these driverless trucks can be operated for longer periods of time as there is no longer a concern that the driver will become fatigued. Autonomous driving technology utilizes several types of existing technologies (HD Cameras, LiDAR, and Radar, shown in Figure 6-6) to obtain the required detection information for the vehicle to make informed guidance decisions. This combination of technologies allows the commercial vehicle to operate in any driving conditions, such as day, night, rain, construction sites, and aggressive drivers. Human drivers must decide as well regarding operating the truck in non-visible or unsafe conditions, and Autonomous trucks are the same, so the operation of both human and autonomous operations are similar. The autonomous trucking industry is progressing quickly, and specifically, the State of Florida has embarrassed the advancement of technology with the signing of numerous bills to evaluate autonomous vehicles but also the construction of a connected and autonomous vehicle testing ground known as SunTrax. On June 16, 2019, the Florida's Turnpike Enterprise granted Starsky Robotics the ability to drive their fully autonomous driverless truck for a total of 9.4 miles while surrounded by live traffic with no issues. Not every organization has elected to adopt this specific type of driverless technology. Many people have concerns about removing millions of human drivers from behind the wheel of these commercial vehicles. Also, while autonomous trucking technology is progressing, shipping companies may employ truck drivers to be at the ready during an unexpected event. Since these truckers are not physically driving commercial vehicles, there is a possibility of a reduction in wages until the technology is formally adopted. There are also security and equipment failure concerns due to the vulnerability of the technology being hacked by unauthorized users. Finally, there would be an immense upfront cost to either completely replace the commercial vehicle or even retrofit an existing one with the required sensors, computers, and global positioning systems (GPS) to achieve full autonomous driving.

Figure 6-6 Autonomous Driving Technology

[74] https://www.freightwaves.com/news/understanding-total-operating-cost-per-mile#:~:text=Driving%20labor%20expense%20is%20the,%25%20to%2050%25%20of%20revenue.

6.2.8 Electric Commercial Vehicles

A secondary technological advancement within the transportation industry is the implementation of electric vehicles (EVs), specifically the acceptance and benefits of commercial freight companies owning and operating electric semi-trucks (Figure 6-7). Electric commercial vehicles have gained popularity due to the worldwide expansion of the electric vehicle charging network. Finding new and alternative technologies to improve the driver experience, reduce operating costs, and reduce carbon emissions are all primary benefits for the freight industry to migrate from traditional diesel semi-trucks to commercial electric vehicles. Another benefit to electric semi-trucks is that they contain few parts than traditional commercial vehicles. When the semi-truck is ready for preventative maintenance or repair, the truck contains fewer parts and components. Hence, the number of items to be repaired is fewer, reducing repair costs. Many larger trucking companies have in-house repair facilities with on-call mechanics. Since the truck contains fewer parts, the amount of parts warehouse space is reduced, the number of components to be purchased for on-demand repairs is reduced, but also the amount of required labor to repair the vehicle is decreased, as well as cutting operating costs of each truck on the road. One of the most popular electric semi-trucks to be adopted is the Tesla Semi Truck, which is one of the most recognizable electric commercial vehicles on the road today. The Tesla Electric Semi-Truck is equipped with a total of three independent drive motors with a capability of having a maximum range of 500 miles on a single charge, can charge up to 70 percent within 30 minutes, and has an estimated fuel savings of $200,000 over a three-year period while fully loaded with a gross combination weight of 82,000 pounds[75]. The adoption of electrified truck technology is impressive, but there are some disadvantages of the technology, which are not a concern with traditional semi-trucks. All electric vehicles, including semi-trucks, are suspectable to large temperature swings. These trucks are required to operate across the world, and many times in extreme weather conditions. Extreme temperatures can have a direct effect on how the batteries are charged/ discharged. High temperatures can hinder the time it takes an EV battery to charge and can lose up to 30% of its range in freezing temperatures[76]. Another disadvantage is the limited number of electrified semi-trucks on the market today but also the higher upfront cost compared to a standard commercial vehicle which can tend to have a higher cost to insure due to many truck insurance carriers willing to insure and repair these highly technical machines.

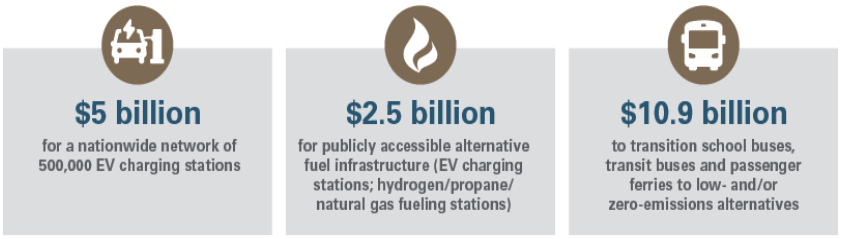
Figure 6-7 Electric vs. Traditional Semi-Trucks

[75] https://www.tesla.com/semi

[76] https://www.cbc.ca/news/canada/sudbury/electric-vehicle-cold-range-1.6738892#:~:text=Sudbury-,Electric%20vehicles%20lose%20up%20to%2030%25%20range%20when%20temperatures%20dip,range%20loss%20in%207%2C000%20cars.

6.2.9 Electric Vehicle Infrastructure Funding

The Infrastructure Investment and Jobs Act (IIJA) was signed into law in November 2021, which authorizes $1.2 trillion for transportation and infrastructure spending, with $550 billion allocated for modernistic investments and programs. The IIJA bill provides supplementary funding that allows for various improvements in infrastructure such as energy, power, access to broadband internet, water infrastructure, and other infrastructure essentials to the citizen of the United States (see Figure 6-8. One of these infrastructure funding mechanisms utilized is the National Electric Vehicle Infrastructure (NEVI) Program[77]. The NEVI Program is anticipated to offer the FDOT a budget of $198 million over five years to provide EV charging requirements for passenger vehicles and light-duty trucks. The funds will be utilized for purchasing and installing EV charging infrastructure, covering operational expenses, acquiring, and setting up traffic control devices, creating on-premises signage, and conducting mapping and analysis tasks. Another specific analysis task within the NEVI Program is an initial planning analysis of existing corridor charging and providing recommendations for increasing EV fast charging capacity. EV Fast Chargers that are being proposed are required to have open-access payment methods and will need to be available to the public or authorized commercial motor vehicle operators affiliated with more than one company. Additionally, they must be situated along designated U.S. DOT FHWA Alternative Fuel Corridors (AFCs). An AFC refers to a network of electric vehicle charging stations and fueling infrastructure for hydrogen, propane, and natural gas, strategically placed along national highway system corridors[78]. Figure 6-9 illustrates the AFC Corridors currently deployed as of July 2022.



Source: White House IIJA guidebook, May 2022 edition

Figure 6-8 Funding for EV Charging

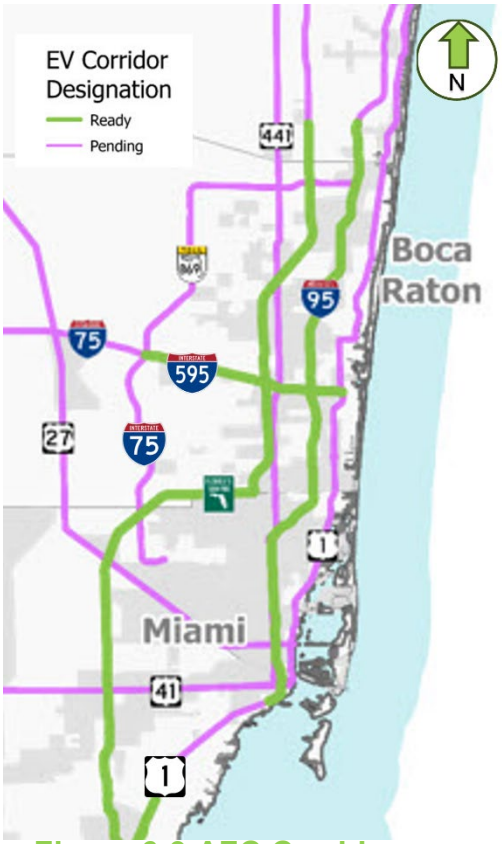


Figure 6-9 AFC Corridors

Source: FHWA Designation of AFC Corridors as of 7/5/22

[77] https://www.fdot.gov/planning/policy/ev/electric-vehicle-infrastructure-funding [fdot.gov]

[78] https://afdc.energy.gov/laws/11675

6.2.10 PortMiami NetZero Initiative

Similar to the NEVI initiatives for the construction of EV Charging Stations, the IIJA Bill allows for the ability to improvements to the PortMiami supply chain while working towards the development of the nation's first end-to-end net zero carbon emission supply chain known as the PortMiami NetZero initiative. The reduction of emissions from the supply chain will not be implemented overnight, but PortMiami was awarded $16 million in federal grants to support their NetZero initiative through their Rebuilding American Infrastructure with Sustainability and Equity (RAISE) program to optimize their existing cargo supply chain. PortMiami's intermodal rail expansion will receive supplementary funding to construct two rail tracks and three electric rubber-tired gantry cranes. The RAISE grant will also allow for the installation of Light Emitting Diode (LED) lights and the reconstruction of the stormwater drainage system to address increases in sea level rise. Additional improvements will include the reconstruction of cargo gates, such as roadway realignments, gate canopies, and technology upgrades, by enhancing truck access and staging and upgrading gate technology, where goods have the ability to be transported quickly while reducing truck dwell time.[79]

6.2.11 Dynamic Wireless Roadway Charging

Figure 6-10 Dynamic Wireless Charging

With the rapid adoption of EVs, the vehicle charging infrastructure has been plagued with hindered expansion, inadequate chargers, but also non-functioning units due to a lack of maintenance by both vehicle manufacturers and third-party vendors who operate Charging as a Service (CaaS). If a functioning charging station is found, the EV driver must wait for their vehicle to be charged before continuing their journey. One charging innovation that is quickly gaining popularity is Dynamic Wireless Charging (DWC) which electrifies the road by using in-pavement induction charging. The DWC concept centers around incorporating an inductive charging coil into a roadway pavement, stop, or designated EV parking spot. This enables a vehicle to be charged without having to be directly connected to the charging infrastructure or requiring a proprietary EV charging plug, and in some cases, without the need to stop at all. The vehicle would need to be outfitted with a receiver or kit, which would be the interface between the DWC system, and then charge the vehicle batteries while charging the vehicle in motion. This solution is focused on the daily commuter who does not have the luxury of waiting for their vehicle to be charged. Commercial applications would benefit from this type of charging technology as truck drivers are only allowed to be in the driver's seat for approximately nine hours per day. Installation of the system is designed for a large-scale deployment that can charge dozens of vehicles without putting a strain on the existing electrical grid. One system can install the roadway infrastructure up to a mile of roadway within one night. The DWC concepts identified that since there is not a need to house a large number of battery banks onboard due to the

[79] https://www.miamidade.gov/releases/2022-08-11-mayor-port-raise.asp

dynamic charging, the weight of the vehicle will be reduced and will have more space for cargo and passengers, all while reducing the amount of driver range anxiety while increasing the adoption of the EV technology[80].

6.2.12 Maritime Autonomous Surface Ships

The final evolution within technological advancement regarding the oceanic supply chain is the development and utilization of maritime autonomous surface ships (MASS) or also known as autonomous container ships. The advances in Artificial Intelligence (AI) and machine learning technologies have accelerated the development of maritime autonomy. This development of autonomous ship technology is in direct relation to a shortage of crew members to provide support assignments such as routine onboard maintenance activities and safely securing cargo onboard. There have been numerous discussions within the shipping industry related to the benefits of MASS deployments which could potentially impact global shipping companies. These advantages over manned cargo ships include improved safety measures, enhanced monitoring of cargo and machinery performance, less need for crew space, higher cargo capacity, and fewer human errors. By eliminating facilities and systems needed for crew accommodation and welfare, more space can be made for cargo, leading to a potential increase in freight income while reducing maritime accidents caused by human error[81]. This technology is already proving itself. In 2022, a 750 gross ton commercial autonomous container cargo ship Suzakyu, accomplished navigating through the heavily congested Tokyo Bay, covering almost 500 miles with human intervention for only 1% of the journey. These autonomous vessels, like Suzakyu, will have the ability to monitor their own health and make decisions in real time while reporting all activities back to their respective control center via satellite communications. Due to the high initial capital costs of autonomous vessels costs, there will be a transitional period that could potentially have an impact on how the shipping companies manage their resources. Due to the MASS developments having similar sensor fusion technology as MASS, both of these industries could benefit from advancements in LiDAR, thermal imaging, high-definition verification cameras, detection algorithms, and advancements in autonomous system software.

Figure 6-11 Maritime Autonomous Surface Ship Control Room

[80] https://electreon.com/technology

[81] https://www.researchgate.net/profile/Ismail-Kurt/publication/357770226_Operational_and_economic_advantages_of_autonomous_ships_and_their_perceived_impacts_on_port_operations/links/61f7a33611a1090a79c337a4/Operational-and-economic-advantages-of-autonomous-ships-and-their-perceived-impacts-on-port-operations.pdf

6.2.13 Potential Economic Impacts to the Miami-Dade Region

Many of the current and future freight technologies are focused on the automation of activities and efficiencies within the logical supply chain. Due to already congested roads, the adoption of automated UAVs for last-mile deliveries could make an immediate impact on the roadway infrastructure by reducing the number of delivery vehicles on the roadways. Mandating the use of automated vehicle technologies would impact the Miami-Dade region and would reduce the amount of road safety incidents. A mere one percent decrease in road safety incidents would lead to an annual cost reduction of over eight billion in the United States alone.[82]

There is also an economic impact. When many of these technologies are evolving and implemented within the area, the economic landscape will be changed forever. One of the many consistencies within implementing many of these current and future technologies is to improve safety. Port Miami serves as Miami-Dade County's second most significant economic driver, contributing a staggering $43 billion to the local economy every year and supporting over 334,500 jobs in South Florida, making it essential to the region's workforce and economic success of the area[83].

Another economic impact would be the influx of skilled labor and industry to the Miami-Dade area. It would be beneficial to the community for the industry to invest in the local workforce to make the transition from human interaction to full automation. A strategic partnership between the local government and the automation freight industry to ensure a percentage of the existing workforce will be trained on the new technologies.

6.2.14 Unmanned Aerial Vehicles Regulation

One of the other major impacts of the area would be regulation. The use of UAVs has the potential to decrease the congestion on local roadways and interstates, but the regulatory impact on the Miami-Dade area would need to be validated as well. The Miami-Dade area has numerous airspace challenges that they will need to contend with. First is the close proximity and the sheer number of airports located within the area. These airports include Miami International Airport (MIA) with its General Aviation Center, Homestead General Aviation Airport (X51), Miami Executive Airport (TMB), Miami-Opa-Locka Executive Airport (OPF), Dade-Collier Training, and Transition Airport (TNT), and the Miami Seaplane Base (MPB). Due to the congestion of residents within Miami-Dade County and the close proximity of the regulated airspace, the air traffic management regulations would need to be ratified to allow for these unmanned flights to be accomplished without diverting commercial and private aircraft to their final destinations. The large number of low-altitude aerial operations at such a scale and scope will pose a unique and untested challenge for regulatory agencies and will remain in a state of constant change for the foreseeable future[84]. The Federal Aviation Administration (FAA)

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[82] https://www.forbes.com/sites/forbestechcouncil/2022/02/14/autonomous-vehicles-and-their-impact-on-the-economy/?sh=1a0b859260de

[83] https://www.miamidade.gov/portmiami/

[84] https://dspace.mit.edu/bitstream/handle/1721.1/145726/MIT-CTL-Regulatory-Implications-Unmanned-Aerial-Vehicles-Drones-Last-Mile-Delivery.pdf?sequence=1&isAllowed=y

has launched an informational campaign such as the No Drone Zone Signage, similar to Figure 6-12 for the purpose of informing amateur pilots of areas of restricted airspace.

6.3 Environmental impacts of freight technologies

The transportation of goods across town or across the globe is a known offender when it relates to environmental impacts on a specific urban area such as Miami-Dade. Many individuals immediately think of releasing greenhouse gasses and pollution from semi-trucks, ships, and delivery vehicles. Various environmental factors can be impacted by transportation, including air pollution, climate change, noise pollution, water pollution, accidents, land use, and habitat destruction[85]. A specific impact on the local area would be the adoption of many of these technologies is the recycling of legacy technologies. To demonstrate their commitment to the environment, organizations must take action immediately, which necessitates the sharing of information, fostering alternative innovation, and adopting sustainable, affordable, and community-oriented approaches. Much of the older equipment and infrastructure have precious metals which could be recycled and reused in the manufacturing process of some of these new technologies. Preventing the release of environment-damaging gases such as sulfur dioxide, nitric oxide, and methane into the air and surrounding waterways is crucial to avoid adverse effects on the local ecosystem. Depleting the natural resources to develop these new processors, machines, and detection sensors should be minimized as much as possible. Items such as mining fossil fuels and minerals, overconsumption of resources, and aquifer depletion are all specific items the freight industry must be mindful of when adopting new freight technologies.

6.3.1 Adoption of Unmanned Aerial Vehicle Technology

Electing to adopt a new technology does not always have a negative impact on the environment. One environmental strategy to deploy is the development of additional renewable energy technology within the Miami-Dade Area. One technology which would be a benefit to the region would be the adoption of UAV technology for last-mile delivery by major shipping organizations. Having fewer vehicles on the roads within the Miami metropolitan area and using automation technologies to operate the remaining vehicles more effectively and with the increased adoption of electric vehicles will reduce the negative impact on the environment.

The last-mile and shipping company can also utilize electrified UAVs to reduce the number of carbon emissions, then if they obtain their power from the sun, wind, or tide to charge the primary energy source of the drone. To increase range or even to offset the non-sustainable energy power from the grid, the UAV could be equipped with an onboard solar panel to capture sunlight while flying on their predetermined flight path Figure 6-12 shows a comparison of energy consumption and carbon dioxide-equivalent (CO_2e) emissions for several modes of transportation, including both electric and traditional fossil fuel vehicles and demonstrates the fuel consumption savings that could be realized with the use of UAVs as compared to traditional last mile delivery vehicles.

[85] https://www.oecd.org/environment/envtrade/2386636.pdf

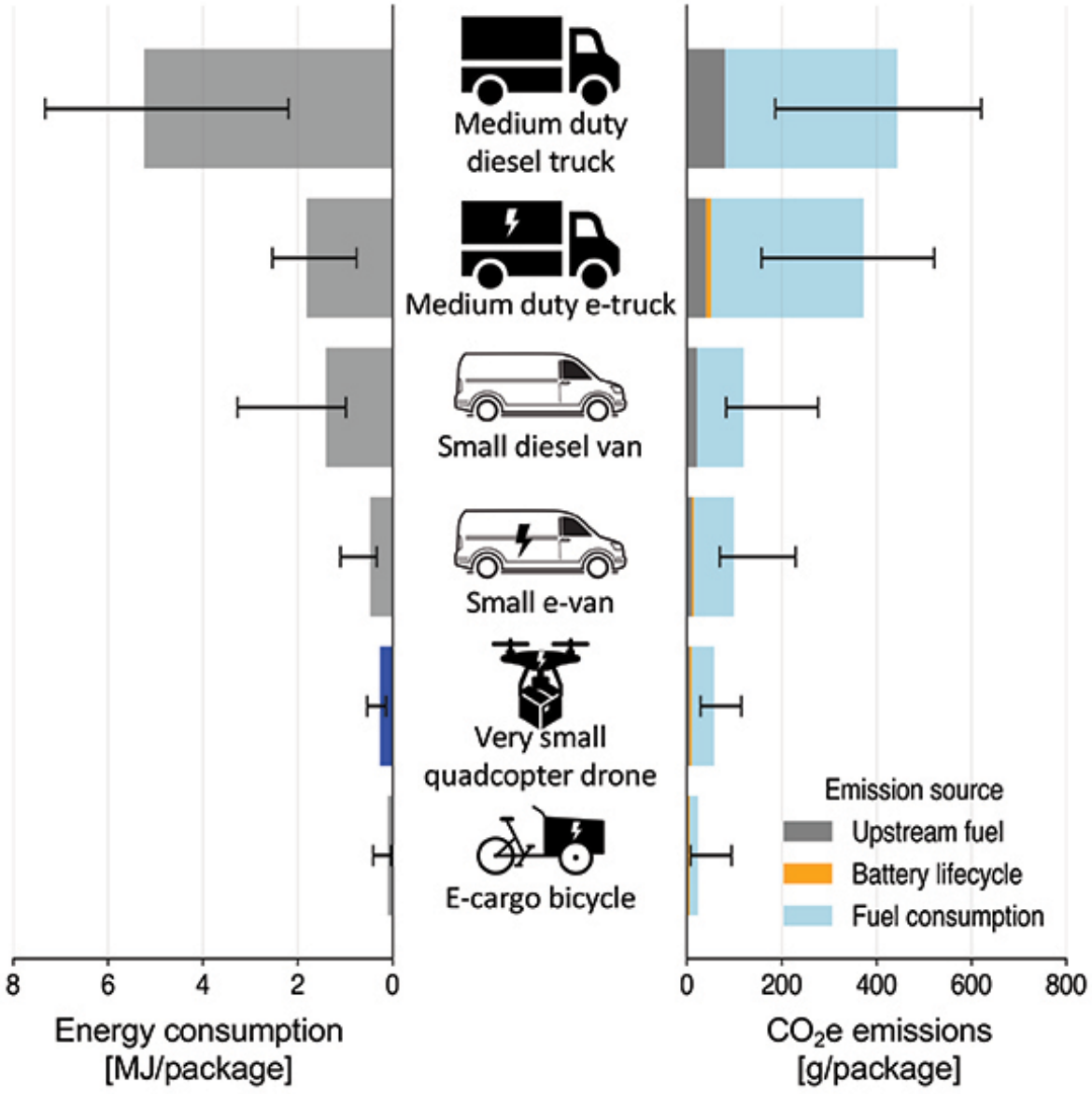


Figure 6-12 Comparison of Energy Consumption and CO_2e Emissions

6.3.2 Recommendations for Overcoming Environmental Impacts

Many freight innovators have the moral responsibility to develop their technology to improve the current state of the environment instead of contributing to potential pollution, climate change, and the overexploitation of the natural resources within the Miami-Dade area. One recommendation is to monitor trucks and other vehicles that would be parked at rest areas, truck stops, weigh stations, and TPAS areas. An idling vehicle can burn 0.8 gallons of fuel per hour, and typically, a long-haul truck idles about 1,800 hours per year using about 1,500 gallons of diesel while expelling about 11 million tons of carbon dioxide, 55,000 tons of nitrogen oxides, and 400 tons of particulate matter annually in the United States[86]. Having a dedicated team who would monitor these idling activities is crucial to have a compensation program for truck drivers and freight organizations to turn off their engines when not in use. Incentives could also be given to commercial drivers who use alternative energy such as solar or additional batteries which are charged while they are in transit.

Another way to overcome the environmental impact of deploying new technologies is to communicate to the public regarding the potential impact of transitioning to a new transportation or freight technology. The initial transition to the new technology could be seamless, but many individuals do not understand the consequences of their purchase. Education and information are paramount to the successful healing of the environment. An example of this is the adoption of EVs. Many EV drivers do not understand that the manufacturing of EVs can adversely impact the environment by contributing to air pollution because the minerals required to produce these EV batteries are energy-intensive to mine. Alternatively, the EV battery at some time will need to be recycled. The current EV battery recycling programs are in their infancy and are not specifically designed to be recovered or reconditioned into other products. Many potential EV drivers also do not understand that many of the EV charging stations, both commercial and private rely upon the burning of fossil fuels to generate electricity. Finding new and innovative alternatives to energy production is key to the successful sustainability of the EV. Programs similar to the Florida Power and Light Company's (FPL) Everglades Solar Center project (Figure 6-13). This innovative project will install and operate more than two hundred thousand (200,000) photovoltaic (PV) solar panels while generating approximately two hundred and fifty (250) jobs during the peak of construction, benefitting the local Miami-Dade area.

Figure 6-13 Everglades Solar Center Project

[86] https://gomotive.com/blog/cost-idle-time/#:~:text=Even%20without%20a%20load%2C%20idling,annually%20and%20costs%20%243%20billion.

The final recommendation to minimize and mitigate environmental impacts and reduce potential climate change is to review the current legislation and regulation on how EVs are manufactured, operated, and maintained. The United States has provided tax rebates to individuals who purchased an electric vehicle which helps with the transition to the new technology, but federally funded environmental assessments need to be conducted so that if a deficiency or environmental impact is discovered, it can be mitigated quickly. Within the United States, the Department of Energy (DOE) provides incentives to manufacturers in the form of grants. Specifically, the U.S. Department of Transportation (DOT) FHWA Charging and Fueling Infrastructure Discretionary Grant Program (CFI Program) offers funding to deploy publicly accessible electric vehicle charging and alternative fueling infrastructure in urban and rural communities and along Alternative Fuel Corridors (AFC) while prioritizing low-income, underserved, rural, and high-density communities[87].

6.4 Obstacles of Implementation and Resolution Recommendations

The implementation of new mobility technologies can be challenging at times, but these obstacles can easily be overcome. It is expected that not every citizen or utility user will adopt the technology immediately. Additional effort will be required to convey the importance, and taking the time to answer any questions or concerns will allow the user to become comfortable with the solution. Communication and public outreach are key to the overall adoption of a technological solution. Individuals known as the late majority and laggards tend to be older in age and are the last members of society to adopt innovative technologies. Younger individuals, known as Early Adopters, tend to be more discreet in the adoption of technology and can also be a resource to convince the late majority of the benefits of the adoption of freight technologies. Specifically, due to the diverse population of the Miami-Dade Area, these communication and outreach sessions will need to be conducted in numerous languages (English, Spanish, and Créole) to ensure that every member of the population understands the importance of the proposed technological solution.

Another obstacle to the implementation of a new freight technology is developing a proper execution plan and training on the technology. A significant amount of effort will be invested in promoting the adoption of new technology, but it is crucial that the implementation process is smooth and effortless, or the embracing of the solution will be rejected. Once the implementation of the technology is accepted and the traveling public is interacting with the solution, numerous training sessions will need to be conducted to ensure all members of the community fully understand the importance of the deployment of the technology and how it will impact or improve their quality of life. Miami-Dade will have a vested interest in the deployment of the technology and the assessment of a County Project Manager to monitor all activities and follow up on any potential issues, which will ensure successful deployment and adoption of the technology.

[87] https://afdc.energy.gov/fuels/laws/ELEC?state=US

6.5 Impacts of E-Commerce, On-Demand Deliveries, and the Internet Economy

The Internet economy and e-commerce are a part of our daily lives, and numerous individuals rely upon these goods and services to function on a daily basis. E-Commerce market value is approximately $13 billion through approximately 24 million e-commerce sites located on the internet.[88] If you want a specific product, many shoppers will immediately head to the internet before traveling to the local big box store. If the same individual is hungry, they will most likely reach for their phone or computer to open their favorite on-demand food delivery service to obtain their meal or groceries. In either scenario, the common theme is that the product requires a specific type of storage facility and transit mechanism to be received by the customer.

Popular online retailers rely upon distribution centers to receive, store, and ship their products to their patrons. Some retailers have millions of products on the shelves, having a centrally located disruption or e-commerce center as illustrated in Figure 6-14. For example, the online retailer Amazon utilizes planes, trains, vehicles, and ships to transport their products between manufacturers, distribution centers, and customers.

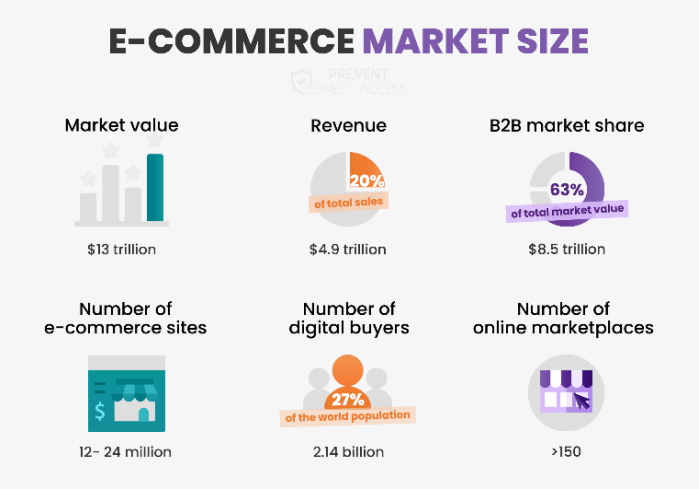


Figure 6-14 E-Commerce Statistics

Having access to and utilizing numerous modes of transportation, e-commerce, and on-demand deliveries can have immediate impacts in the Miami-Dade Area. The potential impacts to the Miami-Dade area would be at the PortMiami as additional shipping cargo vessels with the potential of hundreds of containers are expected in the future. Observing this trend, PortMiami has invested heavily in outfitting the port with 52 deep channels, installing Post-Panamax Cranes, national freight rail connections, and the construction of a port tunnel with direct access to highway facilities[89]. Next would be the additional rail traffic on the Florida East Coast rail system requiring additional trains or transferring these containers to secondary modes of transportation such as tilt bed trucks or shipping container trucks. A staging yard would be required for the transfer of these containers, but the cost of commercial real estate in the Miami-Dade area is expensive. The City of Miami is the most expensive city to buy commercial real estate, with the average asking price for a commercial property at roughly $12.5 million[90].

[88] https://preventdirectaccess.com/ecommerce-stats/

[89] https://www.miamidade.gov/portmiami/cargo.asp

[90] https://myelisting.com/commercial-real-estate-news/1222/five-most-expensive-cities-buy-commercial-real-estate-2022/#:~:text=Miami%20is%20the%20most%20expensive,property%20at%20roughly%20%2412.5%20million.

Due to the proximity of PortMiami, it is a prime spot for the construction and operation of fulfillment centers. E-commerce has impacted the area due to the ingress of heavy semi-trucks and the egress of packages from these fulfillment centers, which include last-mile deliveries.

6.5.1 Supplementary Robot Delivery

The on-demand delivery services have also been impacted by the congestion of the roadways within the Miami-Dade areas. As the popularity of on-demand delivery for food, drinks, and groceries is trending upward, one of the major challenges is transporting the products via traditional mobile solutions. A popular on-demand delivery service Uber East has partnered with Cartken (shown in Figure 6-15) and has launched a supplementary robot delivery service in the Dadeland area of Miami-Dade County. This autonomous sidewalk traveling robot will alert the customer when their food is at its outside near its destination. Customers will then use their phones to unlock the robot to obtain their products. Uber is exploring partnerships as a means to reduce its dependence on independent contractors who provide ride and delivery services, which has resulted in legal challenges for the company recently and will potentially reduce a small amount of congestion on the local roadways. Finally, a company known as Tiny Mile is utilizing about twenty (20) remotely human-piloted robots named Geoffery to deliver these on-demand food delivery orders. This delivery program is currently in a soft launch phase but could quickly expand to meet future demands if successful.

Figure 6-15 Cartken Robot Delivery Service

6.6 Matrix of Technologies and Impacts

Miami-Dade TPO is committed to maintaining a flexible, strong, and reliable infrastructure to cater to the requirements of future vehicles, technology, and innovation. As identified, the improvement in delivery reliability will result in cost and time savings for both the company and the consumer. Numerous mobility technologies, benefits, and impacts to the area were identified within this technical document. To provide quick reference and immediate identification of the proposed technology, changes required to implement the technology, the benefits of the solution, and impacts on the local environment, **Table 6-1** was developed.

Table 6-1 Matrix of Technologies and Impacts

Proposed Technology	Changes Introduced	Benefits	Impacts to Miami-Dade County
Truck Parking Availability System – (TPAS)	Electronically measures parking availability while alerting commercial vehicle operators	Enhances interstate and roadway safety by providing reliable truck parking by reducing driver fatigue	Reduces drivers from parking illegally on mainline, ramp shoulders, and vacant lots

Table 6-1 Matrix of Technologies and Impacts

Proposed Technology	Changes Introduced	Benefits	Impacts to Miami-Dade County
Mainline Weigh-in-Motion – (WIM)	Determines traffic volumes by weight and vehicle classification without stopping commercial vehicles	Decreases the timeframe for a commercial vehicle to remain compliant and clear the weight station without major human interaction	Allows immediate verifications of the vehicle's credentials while improving the overall efficiency of freight logistics
Dolphin Station Park and Ride Transit Terminal Facility	Construction of a 15-acre multi-modal park-and-ride transit terminal facility central transit hub for the local riders requiring alternative transportation options	Encourages commuters to transfer quickly and easily between modes of transportation while increasing public adoption	Reduces rider stress while reducing congestion on the surrounding roads
Digital Freight Matching	An online platform that uses AI to match shippers and carriers to maximize the utilization of their vehicles on the road	Freight companies have the ability to obtain the best price to transport their goods to the end use	Allows increases in load capacity but can also be used for shipper competition while reducing emissions
Gig Economy	Utilize digital platforms as a communications medium, but instead of freight, this technology is used to recruit labor for specific short-term tasks	Working as a contractor has the ability to obtain higher hourly rates than traditional delivery jobs	Unnecessary amounts of vehicles on roadways performing short distance deliveries
Commercial Grade Unmanned Aerial Vehicles (UAVs)	Increasing the efficiency of the freight industry and a reduction of operating costs while increasing reliability by providing on-time deliveries	Possibility of 94% lower energy consumption per package than other vehicles	Reduction in environmental emissions from switching from fossil fuels to electricity
Heavy Duty Autonomous Trucks	Introduction of driverless commercial vehicles	Trucks can be operated for longer periods of time due to there is no longer a concern that the driver will become fatigued	Increase the safety of roadways while decreasing the number of vehicle crashes
Electric Commercial Vehicles	Migration away from traditional diesel-powered to electrified commercial vehicles	Improved driver experience, reduce operating and maintaining costs than to traditional commercial vehicles	A reduction of carbon emissions
Dynamic Wireless Roadway Charging	Incorporating an inductive charging coil into a roadway pavement, stop, or designated EV parking spot	Ability to charge vehicle batteries while the vehicle in motion	Reducing the amount of local driver range anxiety while increasing the adoption of the EV technology
Maritime Autonomous Surface Ships	Transition from traditional ships to autonomous surface ships and increasing satellite communications	Improved safety measures, enhanced monitoring of cargo and machinery performance, less need for crew space, and higher cargo capacity	A reduction of human accidents at ports and at sea while increasing speed of mobility within the supply chain
Supplementary Robot Delivery	**Deployment of autonomous sidewalk-traveling robots**	**Reduction of dependence on independent contractors who provide ride and delivery services**	**A reduction of vehicle congestion and a decrease of vehicle emissions**

7.0 Freight Plan Compliance with Federal and State Performance Management

7.1 Background

As discussed in Chapter 2, federal laws guide the investment in and development of freight infrastructure across the country. Namely, the Infrastructure Investment and Jobs Act (IIJA) (2021) and the preceding act of Fixing America's Surface Transportation (FAST) Act (2015) have established various freight networks, funding sources, and requirements to access said funding. As part of this legislation, state DOTs are required to follow performance management guidelines. In relation to freight performance management, the National Highway Freight Program (NHFP) includes two provisions for state departments of transportation (DOTs) to follow:

- **Freight Performance Measure:** Freight performance measures established under 23 U.S.C. 150(c)(6) to assess the national freight movement on the Interstate system remain in effect. NHFP funds may be used for freight improvement projects to help States achieve performance measure targets. The performance measure identified to assess freight movement on the Interstate System is the Truck Travel Time Reliability (TTTR) Index established under 23 CFR 490.607.
- **Freight Highway Bottlenecks:** In accordance with 23 U.S.C. 150(e)(4), performance reports are required to describe ways in which the State is addressing congestion at freight bottlenecks. NHFP funds may be used for freight improvement projects to help States address freight highway bottlenecks.

7.2 Truck Travel Time Reliability (TTTR) Index

The TTTR index is related to the Combination Truck Planning Time Index (PTI) which is defined as the ratio of the 95th percent peak period or peak hour travel time to the free flow travel time. This measure represents the additional time that a shipper should budget to ensure on-time arrival 95% of the time. TTTR is calculated using 15-minute intervals of truck travel time data from the National Performance Management Research Data Set (NPMRDS). Average travel times are determined for each segment of the interstate for the following time periods:

- AM Peak – 6:00 AM – 10:00AM, Monday – Friday
- Mid-day – 10:00 AM – 4:00 PM, Monday – Friday
- PM Peak – 4:00 PM – 8:00 PM, Monday – Friday
- Weekend – 6:00 AM – 8:00 PM, Saturday – Sunday
- Overnight – 8:00 PM – 6:00 AM, daily

A TTTR ratio is calculated for each segment, for each time period, with the following equation:

$$TTTR = \frac{Travel\ Time_{95th\ Percentile}}{Travel\ Time_{free\ flow}}$$

The highest TTTR value for each segment is then weighted by the segment length and the sum of the weighted values is divided by the total interstate length to calculate the index.[91]

At the state level, FDOT established statewide two-year and four-year performance targets for the system performance measures. All 27 MPOs supported the statewide targets including the intent to plan and program projects that are anticipated to make progress toward achieving the statewide targets. Table 7-1 shows historic performance for the TTTR for Miami-Dade County Interstate Highways and the statewide Interstate System in comparison to the 2- and 4–year freight targets identified by FDOT. The Miami-Dade TTTR Index is much higher than the Statewide indices which is expected as the Florida Interstate System has long stretches of Interstate with very little traffic congestion. Note that while Miami is above the 2- and 4-year targets, any improvements to the TTTR in Miami-Dade County will improve the state's overall performance.

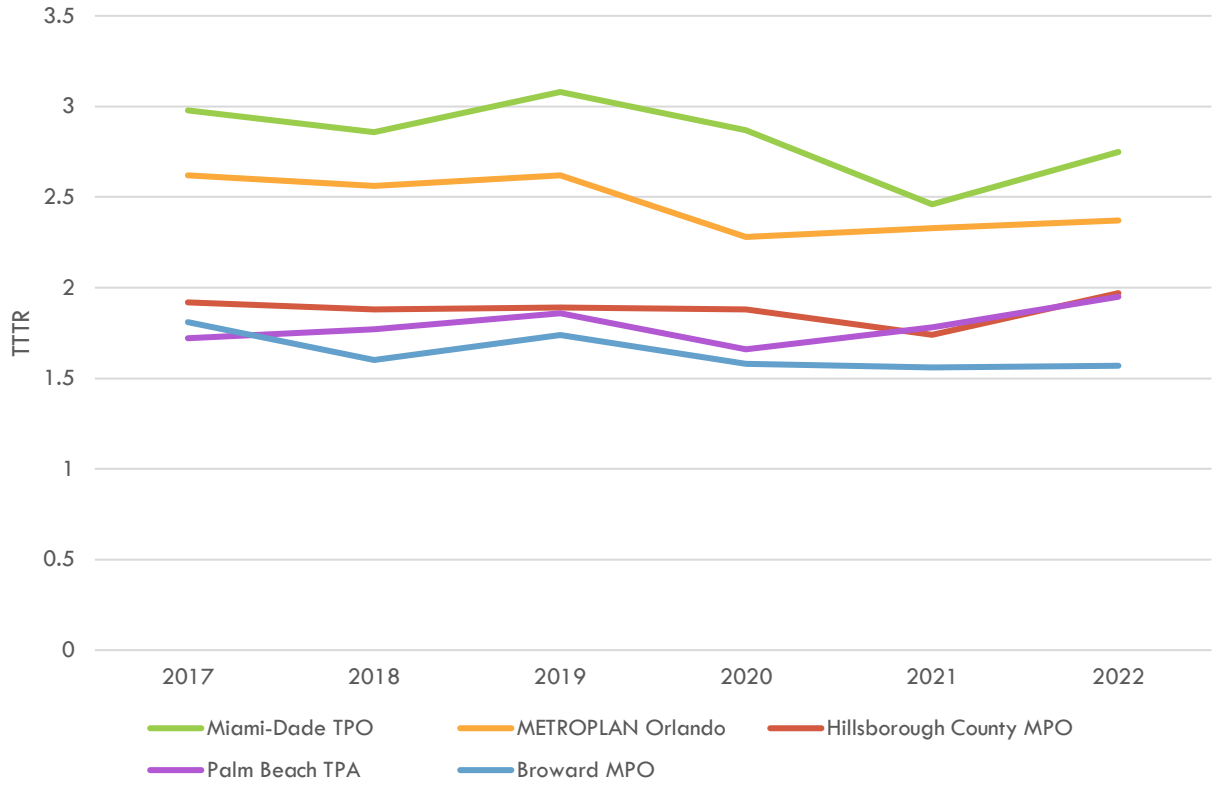
Table 7-1 TTTR for Statewide and Miami-Dade County Interstate Highways, 2017-2022

Region	2017	2018	2019	2020	2021	2022	2023 (2-Year Target)	2025 (4-Year Target)
Statewide	1.43	1.43	1.45	1.34	1.38	1.46	1.75	2
Miami-Dade TPO	2.98	2.86	3.08	2.87	2.46	2.75		

Source: FDOT Sourcebook, 2023.

In comparison to other nearby urban areas (Broward and Palm Beach Counties), Miami-Dade County experiences a higher degree of unreliability for truck travel time. Over the prior three years (2020 – 2022), the average TTTR for Miami-Dade County has been 2.69 compared with 1.57 in Broward County and 1.80 in Palm Beach County. For comparison, Figure 7-1 shows these three MPO areas as well as the next most unreliable MPO reporting areas in the state, which consist of MetroPlan Orlando (Orange, Osceola and Seminole Counties) and the Hillsborough MPO. The three-year averages for MetroPlan Orlando and Hillsborough MPO are 2.33 and 1.86, respectively. Each region showed a similar improvement in their respective TTTRs in 2020, most likely due to COVID travel restrictions resulting in fewer cars on the roadway system. However, nearly all of these metro areas have seen a decrease in reliability (increase in TTTR) as traffic volumes have resumed more regular patterns.

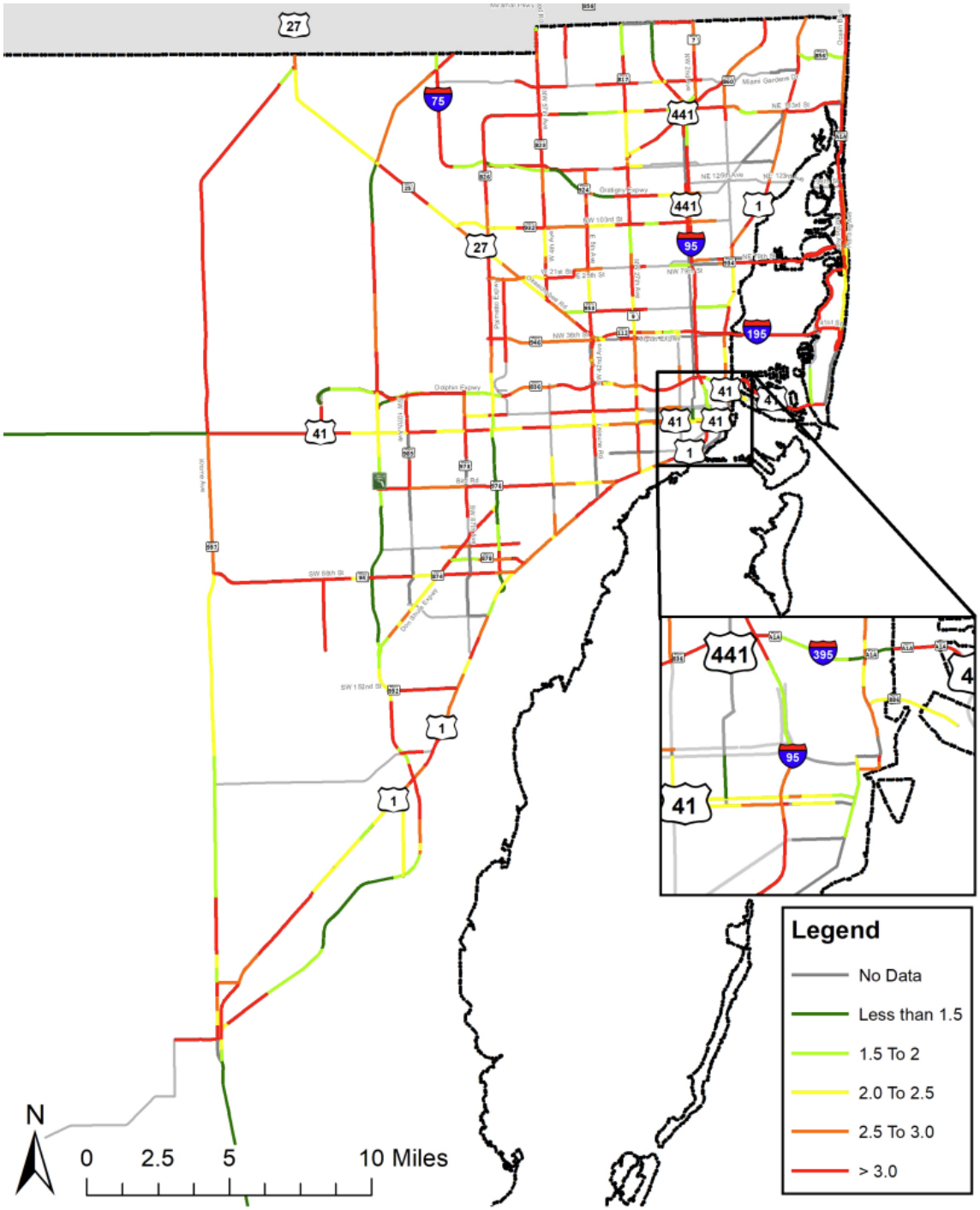
[91] FDOT Sourcebook. Methodology: PM3 – System Performance. http://fdotsourcebook.com/federal-measures/system-performance



Source: FDOT Sourcebook, 2023.

Figure 7-1 TTTR for Miami-Dade County and Other Large Metro Areas, 2017 - 2022

In 2022, the Miami-Dade TPO published the *Transportation Performance Trends in Miami-Dade County* report. While this report only includes data through 2019, it includes a map showing the reliability of each roadway segment as shown in Figure 7-2. Nearly every roadway has at least one segment with a high degree of unreliability, indicating that the problem persists throughout the county.



Source: 2022 Transportation Performance Trends in Miami-Dade County, Miami-Dade TPO.

Figure 7-2 Truck Travel Time Reliability (TTTR) on SHS, 2019

7.3 Freight Highway Bottlenecks

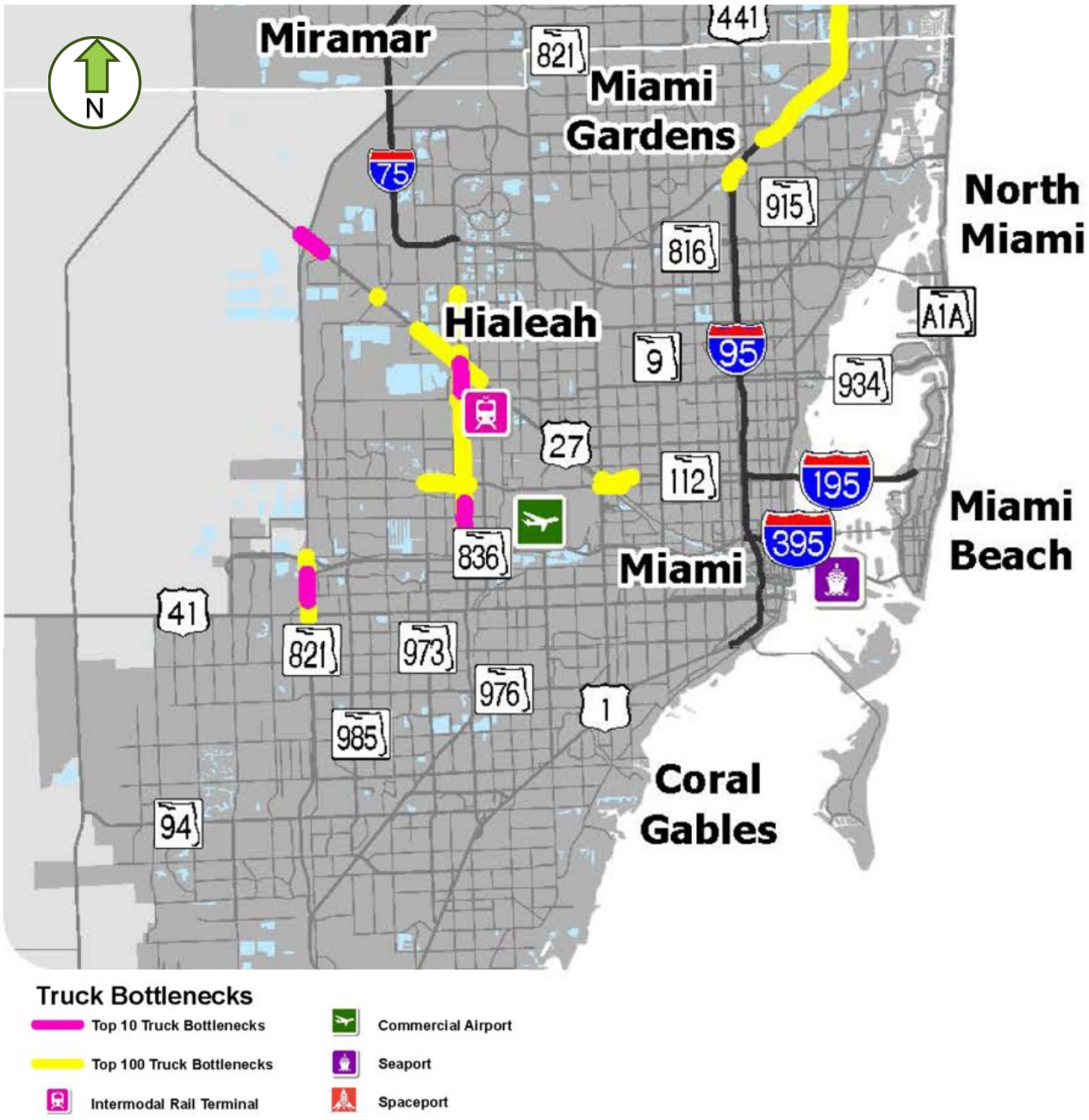
In 23 U.S.C. 150(e), Congress specified that State performance reports must also describe the ways in which they are addressing congestion at freight bottlenecks. A set of regulations (23 CFR part 490) published by the FHWA in 2016 and 2017 defined a truck freight bottleneck as "a segment of roadway identified by the State DOT as having constraints that cause a significant impact on freight mobility and reliability. Bottlenecks may include highway sections that do not meet thresholds for freight reliability identified in 23 CFR 490.613, or other locations identified by the State DOT."

According to FDOT's Freight Mobility and Trade Plan, Miami-Dade County has six out of the top 10 recurring bottlenecks in the state as shown in Table 7-2 and illustrated in Figure 7-3. The Plan showed a majority of the top bottlenecks were located in Florida's heavily urbanized areas especially in Miami-Dade County where fifteen of the top twenty were located, all of which fell on the following facilities: the Florida's Turnpike (SR 91), SR 826 – Palmetto Expressway, US-27, I-95, and SR 112 – Airport Expressway.

Table 7-2 Top Recurring and Non-Recurring Congestion Locations in Florida

Rank	Recurring Congestion Road	County	Non-Recurring Congestion Road	County
1	FL-414 eastbound between Seminole/Orange County border and I-4	Orange	FL-414 eastbound between Seminole/Orange County border and I-4	Orange
2	I-4 westbound close to Lee Roy Selmon Expressway	Hillsborough	I-4 westbound close to Lee Roy Selmon Expressway	Hillsborough
3	I-4 westbound approaching I-275	Hillsborough	I-4 eastbound approaching US 27	Polk
4	Palmetto Expressway Northbound corridor between the ramps entering and exiting NW 25th Street	Miami-Dade	US-27 Northbound approaching FL Turnpike	Miami-Dade
5	I-4 Westbound between Daniel Webster Western Beltway and SR 417-Toll	Osceola	US-27 Northbound between West 12th Avenue and close to Hialeah Expressway	Miami-Dade
6	Florida Turnpike Southbound between Dolphin Expressway and US 41	Miami-Dade	Palmetto Expressway Northbound close to Miami Airport approaching Dolphin Expressway	Miami-Dade
7	Palmetto Expressway Northbound and south of Okeechobee Road	Miami-Dade	US-27 Northbound between West 12th Avenue and south of Hialeah Expressway	Miami-Dade
8	Palmetto Expressway Northbound close to NW 74th Street	Miami-Dade	US-27 Northbound between the ramps entering and exiting FL Turnpike	Miami-Dade
9	Palmetto Expressway Northbound and north of Okeechobee Road	Miami-Dade	Palmetto Expressway Northbound corridor between the ramps entering and exiting NW 25th Street	Miami-Dade
10	US-27 Northbound approaching FL Turnpike	Miami-Dade	Palmetto Expressway Southbound and south of Okeechobee Road	Miami-Dade

Source: Freight Mobility and Trade Plan, 2020 utilizing FHWA NPMRDS, 2018.



Source: FDOT Freight Mobility and Trade Plan, 2020.

Figure 7-3 Major Truck Bottlenecks in Miami-Dade County

7.4 FDOT Statewide Initiatives

Beyond the Federal requirements, the Miami-Dade TPO could seek to monitor additional performance measures. At the state level, some of this work has already been completed. On an annual basis, FDOT publishes a Source Book, which contains current and historical data and analysis describing the performance of Florida transportation system. Table 7-3 lists the measures in the Source Book, including multiple provisions for freight trucks, airports, rail, and seaports. While many of these statistics are reported within the Source Book at a composite level (State, District, etc.), they could also be determined for an individual MPO by FDOT. Most are not relevant to freight but could be relevant at a project level. For example, bicycle counts are not freight related but could be indicative of travel modes for workers at manufacturing or distribution facilities.

Table 7-3 Multimodal Performance Measures

Mobility				
Auto	Vehicle Miles Traveled	Person Miles Traveled	Average Travel Speed	Vehicle Hours of Delay
	Person Hours of Delay	Planning Time Index	%Miles by Congestion Level	Duration of Congestion
	Average Speed versus Posted Speed Limit	Vehicles per Lane Mile	Level of Travel Time Reliability	
Aviation	Aviation Passenger Boardings	Aviation Departure Reliability	Aviation Tonnage	
Bicycle	% Bicycle Facility Coverage	Non-Motorized Counts		
Pedestrian	% Pedestrian Facility Coverage	Non-Motorized Counts		
Rail	Rail Passengers	Passenger Rail On-Time Arrival		
Seaport	Seaport Passenger Movements	Seaport Tonnage	Twenty-Foot Equivalent Units	
Spaceport	Space Launches and Sites	Space Payloads		
Transit	Transit Passenger Trips	Transit Revenue Miles	Passenger Trips per Revenue Mile	Transit Revenue Miles Between Failures
	Transit Weekday Span of Service			
Truck	Combination Truck Miles Traveled	Combination Truck Average Speed	Combination Truck Hours of Delay	Combination Truck Cost of Delay
	Combination Truck Planning Time Index	Combination Truck Tonnage		
Accountability				
Construction Contracts Completed On-Time				
Construction Contracts Completed Within Budget				
Infrastructure				
Pavement Condition				
Bridge Condition				
Maintenance Condition				
Safety				
Number and Rate of Fatalities		Pedestrian Fatalities and Serious Injuries		
Number and Rate of Serious Injuries		Bicyclist Fatalities and Serious Injuries		
Motorcyclist Fatalities and Serious Injuries		Safety Belt Use		

Source: FDOT Sourcebook, 2023.

8.0 Freight System Needs and Priorities

Miami-Dade County has invested heavily in its freight infrastructure. This has included public and private investments driven by ownership of infrastructure. These projects preserve and expand freight system capacity, and in some cases, help transform the way freight moves throughout the region. As the county looks back on the progress made with the completion of key projects like the PortMiami Tunnel, the NW 25th Street Viaduct, deep dredging of PortMiami, and the ongoing reconstruction of I-395, and the Golden Glades Interchange, this freight plan will continue to identify and highlight the next generation of freight projects that will continue to drive the growth and economic prosperity of the region.

For the non-highway freight hubs of PortMiami, MIA, and the county's rail network, needs were identified through stakeholder interviews, the review of past and current plans, such as Capital Improvement Programs (CIPs) and Master Plans, and consultation with modal partners. These projects primarily fall in the short-term as these cargo handlers respond to changing market conditions. Some funding in outer years is identified which aligns with mid-term goals.

For highway freight, needs were identified through stakeholder interviews, the review of past and current plans, and the on-going 2050 LRTP process. This plan carries forward the projects identified in the *2018 Miami-Dade Freight Plan Update* for the freight set-aside, incorporates those projects identified as priorities through the MPOAC's Freight Priorities Program, and identifies which of the 2050 LRTP projects qualify as freight projects.

8.1 Seaport Projects

PortMiami continues to invest significant funds in its infrastructure to serve both cargo and cruise markets. The markets themselves have influenced investment priorities over the years. For example, cargo related investments were the priority several years ago, as the port worked to align critical investments with the opening of an expanded Panama Canal. This included the port's deep dredge project that brought them to minus 50 feet. Additionally, other projects include the PortMiami tunnel that provided direct interstate access, the re-introduction of an on-port intermodal container transfer facility (ICTF) to support a growth in intermodal rail traffic, and the purchase of additional gantry cranes to serve the ever larger container ships. With these game changing investments complete, the current CIP is focused much more on cruise infrastructure.

Table 8-1 shows the breakdown of projects by type planned at PortMiami over the next six fiscal years and beyond. Nearly $3 billion in capital improvement projects have been identified, with $510 million in work already complete (through FY 2023) and $1.8 billion anticipated for FY 2024 – 2029. Of this total, 78 percent, or $2.3 billion is anticipated to be spent on cruise projects. This includes new and/or enhanced terminals, a campus for cruise line operators, roadway improvements, and shore power. The remainder is earmarked for cargo improvements (11 percent) or port-wide improvements (10 percent) which can benefit both cargo and cruise traffic.

Table 8-1 PortMiami Capital Improvement Program (in millions)

Project	Description	Spent to Date	FY 2024-FY 2029	Future Expenditures	Total
	Cargo Projects				
Gantry Cranes	Purchase five additional Post Panamax gantry cranes for increased cargo traffic to bring the total number of cranes to 17	$0.3	$99.7	$19.1	$119.0
South Florida Container Terminal	Provide drainage improvements and various cargo yard projects in the South Florida Container Terminal, Electric Rubber Tire Gantry (ERTG) Phase 2	$4.7	$84.1	$26.8	$115.7
Net Zero Cargo Program	Construct additional rail capacity and increase cargo gate optimization to reduce traffic congestion at the Port and lower carbon emissions	-	$32	-	$32
Inspection & Fumigation Facilities	Develop a fumigation and cold chain processing center	$0.4	$55.6	-	$56.0
Southside Dredge	Dredging on southside of PortMiami	-	-	$6.7	$6.7
Cargo Totals		**$5.8**	**$271.4**	**$52.6**	**$329.4**
	Cruise Projects				
Cruise Terminal V	Construction of cruise terminal for Virgin Voyages	$142.7	$15.9	-	$158.6
Cruise Terminal F	Expand Terminal F to accommodate additional Carnival Cruise Lines ships	$126.5	$15.9	-	$142.3
Cruise Terminal AA/AAA	Design and construct new cruise terminals to support expanded operations of MSC Cruise Line	$67.4	$69.2	$31.8	$168.3
Shore Power	Provide Shore Power to all cruise terminals which will allow ships to turn off their primary engines while docked resulting in reduced air emissions	$47.3	$112.0	$14.7	$173.9
Cruise Terminal Roadway Flyover	Construct a new road to handle increased Port traffic for new terminals A and AA	$18.5	$19.5	-	$38.0
Berth 10	Prepare Berth 10 for a new future terminal	$0.8	$163.1	$26.1	$190.0
Passenger Boarding Bridges	Purchase passenger boarding bridges for various terminals throughout the port	$11.8	$9.6	-	$21.5
North Bulkhead	Provide repairs and improvements to the north bulkhead terminal	$2.3	$85.0	$371.7	$459.0
Cruise Terminal G	Design and construct a new cruise terminal to support expanding operations	$2.0	$323.0	-	$325.0
RCG Campus	Infrastructure improvements including but not limited to road work and relocations for future buildings constructed by Royal Caribbean Cruise	-	$482.0	$118.0	$600.0

Table 8-1 PortMiami Capital Improvement Program (in millions)

Project	Description	Spent to Date	FY 2024-FY 2029	Future Expenditures	Total
	Line, Norwegian Cruise Line and Carnival Cruise Line				
Cruise Terminal J Seawall	Construction of seawall on Cruise Terminal J	$3.2	$18.9	-	$22.1
Cruise Totals		**$422.5**	**$1,314.2**	**$562.2**	**$2,298.9**
	Port Wide Projects				
Federal Inspection Facility	Build new Federal Inspection facility for Immigration and Customs Enforcement Operations	$0.5	$39.0	$0.9	$40.4
Miscellaneous & Port-Wide	Provide infrastructure improvements in various areas of the Port including drainage, wayfinding port beautification projects, dredging, Etc..	$49.5	$122.7	-	$172.3
Construction Supervision	Provide supervision of on-going construction projects at the Seaport	$32.5	$54.0	$7.7	$94.2
Port Wide Totals		**$82.5**	**$215.7**	**$8.7**	**$306.8**
Grand Total		**$510.3**	**$1,801.3**	**$623.4**	**$2,935.1**

Source: PortMiami.

Two of the most significant cargo initiatives at PortMiami currently underway fall under one program – the NetZero Cargo Program. This program will modernize and "green" the port equipment and operations, and develop an inland port. It aims to develop the nation's first end-to-end net zero carbon emission supply chain in line with the county's goal of reducing emissions by 25 percent by 2030. Components on this project include electric tugboats, shore power for cargo vessels (shore power for cruise ships is already in implementation), electric gantry cranes, rail expansion, and electric and hybrid electric cargo yard equipment.[92] Current efforts for this program are focused on an intermodal rail expansion, funded in part through a $16 million RAISE grant. This portion will add two rail tracks and three new electric rubber-tired gantry cranes. This will also support cargo gate improvements, improved access and staging for trucks, and reduced truck dwell time.[93]

The CIP shows an estimated $32 million in funding for this program, which represents only a fraction of the larger, visionary project proposed for PortMiami. Looking beyond the physical port property, the NetZero initiative expands to the proposed inland port development at the Opa-locka Airport West, previously discussed in Chapter 4. This inland port would allow PortMiami to increase its cargo capacity and volume. Preliminary estimates indicate container volumes could increase by as much as 50 percent with this investment. In addition to moving containers off port property much quicker to open up capacity, the inland port could also provide truck parking, a solar farm, export

[92] *Transportation Improvement Program Strategy.* PortMiami. Fiscal Years 2023/2024 – 2027/2028.

[93] *PortMiami receives $16M grant from U.S. Department of Transportation's RAISE program.* Miami-Dade County. August 11, 2022. https://www.miamidade.gov/releases/2022-08-11-mayor-port-raise.asp

consolidation, and rail service. A proposed rail extension to the site would encourage multi-modal use and reduce truck traffic on the already crowded roadways in Miami-Dade County. Initial cost estimates for development of this facility and its related components are well north of $300 million and represent the next transformation for the port's cargo future.

8.2 Airport Projects

Cargo volumes continue to grow and challenge MIA's ability to invest in new capacity. MIA's cargo partners have demonstrated interest in expanding their operations with a $72.2 million investment by FedEx and a $78 million investment by DHL in 2021 alone. Given the fixed cargo footprint available today, the ability to increase on-airport capacity requires consideration of a variety of concepts described below and illustrated in Figure 8-1:

- **Redevelopment of existing infrastructure.** This consists of demolishing older facilities and replacing them with state-of-the-art buildings as well as expanding aprons to accommodate a greater number of aircraft.
- **Development of Vertical Integrated Cargo Community (VICC).** Increase capacity through densification of terminal space by going vertical. This facility is poised to double the airport cargo capacity amidst prior concerns that the airport was reaching capacity for both passengers and cargo. Modeled off of a similar concept in Hong Kong, the VICC will make better use of limited space by densifying its footprint through five floors of activity. Four floors would be dedicated to cargo processing – two automated using robotic technology, and two handling more traditional processing methods. The fifth floor would serve as an amenity center for workers.[94]
- **Expansion through right of way acquisition.** MIA has identified and continues to pursue possible parcels of land to the west and south of the airport in proximity to cargo operation. While opportunities are limited, they do represent one component of a larger expansion plan. One recent example is the purchase of 11.5 acres of the Simkins Airport Property, expected to be finalized by November 2024. At a purchase price of $45 million, this puts acquisitions close to $4 million per acre.[95]
- **Consider rail relocation to expand air-side acreage.** Rail track run along the perimeter of the airport. Relocation of these tracks would be necessary to expand air-side acreage. Again, while this represents a complicated, longer-term strategy, it is one piece of a larger expansion plan.

MIA's ongoing expansion must balance passenger and cargo operations. In addition to the cargo concept plan discussed above, MIA's CIP provides a balanced view of all planned investments. Figure 8-2 provides a high-level illustration of key improvements included in the CIP and Table 8-2 lists the key cargo projects with anticipated completion dates.

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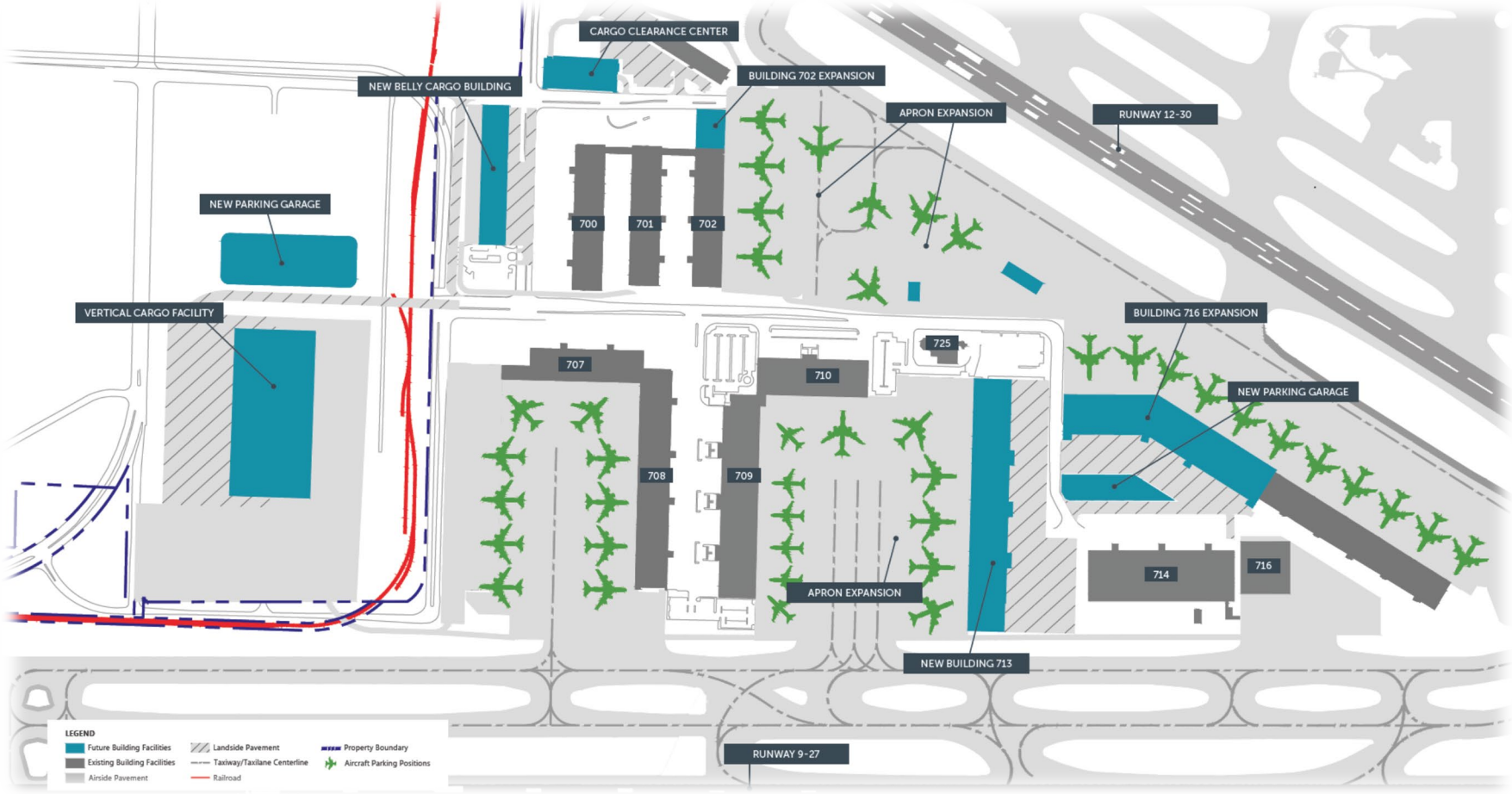
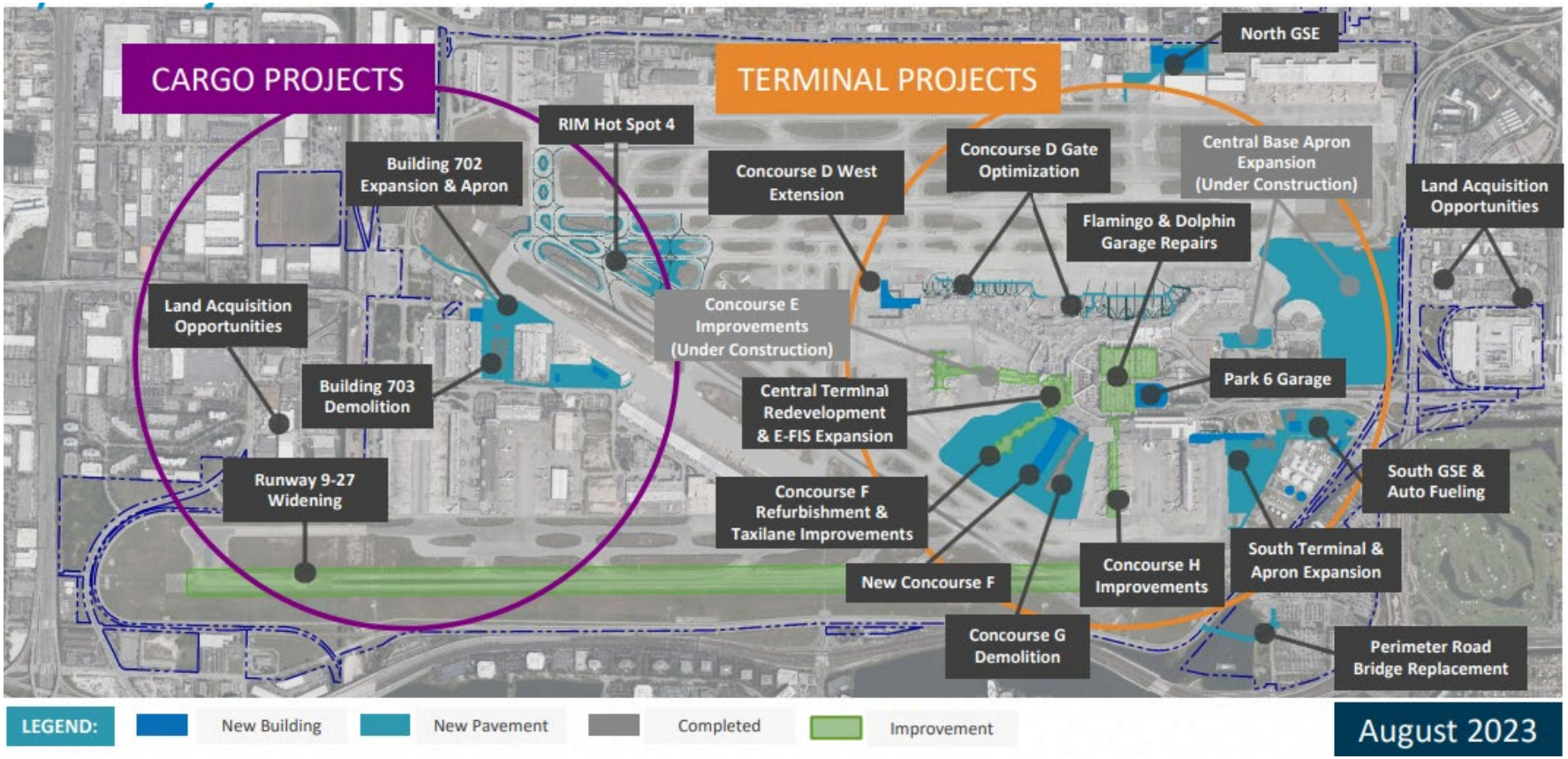
[94] *Going Vertical MIA's ambitious $2 billion plan to expand its cargo facilities.* Global Miami. https://globalmiamimagazine.com/going-vertical/

[95] *Miami-Dade County buys site near airport for $45 million.* South Florida Business Journal. January 12, 2024. https://www.bizjournals.com/southflorida/news/2024/01/12/miami-dade-county-buys-site-near-airport-for-45m.html



Source: Strategic Airport Master Plan Supplemental Analysis, 2017-2020.

Figure 8-1 Future Cargo Facilities Concept Plan



Source: Miami-Dade Aviation Department, August 2023.

Figure 8-2 Miami International Airport Capital Improvement Program

Table 8-2 Miami International Airport Cargo Projects

Project	Estimated Completion Date
MIA Building 702 Apron & Airside Improvements - ON HOLD	December 2029
MIA Building 3032 Replacement	October 2027
MIA West Cargo Truck Parking	September 2032
MIA Consolidated Office Complex (Finishes Cc D Landside)	August 2025
MIA Demolition Building 5A	September 2028
Finance and Administration Division Offices Relocation	August 2026
MIA Building 5A Tenants Relocation	October 2025
MIA Bldg. 3030 IPE Room Expansion	September 2026
MIA GSE Facility for North Terminal	July 2030
MIA Buildings 703 and 703A Demolition and Environmental Assessment and Remediation - ON HOLD	September 2025
MIA Demolition Building 704	August 2031

Source: MIA CIP Schedule, December 2023.

8.3 Railroad Projects

Miami-Dade County is served by two freight railroads, the FEC and CSX. FEC operates on privately owned track while CSX operates primarily on state-owned tracks, specifically the SFRC. While a detailed list of freight specific rail needs was not provided by FEC or CSX, both railroads participated in stakeholder interviews and provided the following input related to freight rail needs:

- Better communication is needed regarding planned projects among freight and passenger services to ensure operational conflicts are minimized and mitigated
- Plans for new waste management service will create a new demand for rail service
- Capacity should be added in key corridors where passenger/freight rail conflicts exist today
- Capacity should be added in Medley to provide direct rail service to warehouse properties
- Capacity should be added to the Miami to Homestead corridor to serve industrial growth
- Automate the gates at the Hialeah intermodal ramp to improve efficiencies
- Add a new direct access highway ramp into Hialeah intermodal ramp to improve access
- Add rail to the US 27 corridor to provide new rail capacity away from the congested coastal routes

Planned state investments in the rail network in Miami-Dade County are included in FDOT's 5-Year Work Program in two categories: Freight Logistics and Passenger Operations Program – Rail and Florida Rail Enterprise. Table 8-3 and Table 8-4 summarize the projects listed in the current work program. These projects largely focus on improvements to passenger services along the SFRC. Note that the NE 203rd Street project and the SRFC Double Tracking project appear in both tables.

Table 8-3 FDOT 5-Year Work Program – Freight Logistics and Passenger Operations Program – Rail

Project	Item	Type of Work	2024-2029 Funding (Tentative)
Contingency for Potential Rail Needs	250703-4	Funding Action	$632,983
NE 203 St Intersection Improvements between SR 5/US 1 & W Dixie Hwy	433511-2	Rail Capacity	$3,679,097
SRFC Double Tracking from Hialeah Market to MIC	429487-2	Rail Capacity	$8,639,742
SR 25/Okeechobee Rd FEC Bridge at Ramp 368.35 Xing #272752Y	424309-3 424309-4	Routine Maintenance	$45,000 $45,000

Source: Florida Department of Transportation.

Table 8-4 FDOT 5-Year Work Program – Florida Rail Enterprise

Project	Item	Type of Work	2024-2029 Funding (Tentative)
NE 203rd Street Intersection Improvements between SR 5/US 1 & W Dixie Hwy	433511-2	Rail Capacity	$3,679,097
SFRC - Crossing 628348E at NW 35th Avenue	449891-1	Rail Preservation	$144,045
SFRC - Crossing 628476M at NW South River Dr	449915-1	Rail Preservation	$819,925
SFRC – Downtown Lead - Crossing 628413H at NW 22nd Court	449913-1	Rail Preservation	$109,857
SFRC Double Tracking from Hialeah Market to MIC	429487-2	Rail Capacity	$8,639,742
SFRC Hialeah Yard Environmental Investigation of Sanitary Sys and Sses	453784-1	Rail Revenue/ Operational Improvement	$286,000
SFRC -Railroad Crossing Rehab at NW North River Drive /XING:628403C	453797-1	Rail Preservation	$1,028,000
SFRC - Railroad Crossing Rehab at NW 14th Avenue /XING:628425C	453798-1	Rail Preservation	$771,000
SFRC - Railroad Crossing Rehab at NW 18th Avenue /XING:628419Y	453794-1	Rail Preservation	$492,144
SFRC - Railroad Crossing Rehab at NW 21st Avenue	453795-1	Rail Preservation	$771,000
SFRC - Railroad Crossing Rehab at NW 22nd Avenue /XING:628414P	453800-1	Rail Preservation	$771,000
SFRC - Railroad Crossing Rehab at NW 23rd Avenue /XING:628412B	453796-1	Rail Preservation	$771,000
SFRC - Railroad Crossing Rehab at NW 25th Avenue /XING:628409T	453799-1	Rail Preservation	$771,000
SFRC - Railroad Crossing Rehab at NW 26th Avenue /XING:628408L	453801-1	Rail Preservation	$771,000
SFRC Rehab of Miami Downtown Spur & Runaround Track	453841-1	Rail Revenue/ Operational Improvement	$1,315,501

Source: Florida Department of Transportation.

In addition to the projects listed in FDOT's work program, two major rail needs warrant further discussion.

- **Municipal Waste Exports by Rail**. In 2023, the Miami-Dade County Resources Recovery Facility caught fire. The waste to energy plant was capable of processing more than 1 million tons of waste annually. This facility reduced the volume of waste destined for landfills while also generating enough power to operate itself as well as supply energy to 35,000 homes.[96] As a result, the county's landfills are expected to run out of space within five years. This has a secondary impact on new construction as counties must be able to show that they can dispose of their population's solid waste for at least five years in the future. This would halt the development of new industrial spaces as well as residences and businesses. A potential solution to this is to rail the waste out of the county to other locations with available space.[97] Depending on the type of rail car utilized, this has the potential to also backfill some of the empty rail backhaul movements.
- **US 27 Rail Corridor.** The volume of passenger service operating on the same rail lines as FEC and CSX freight trains has increased. With the introduction of Brightline service on the FEC network, the existing Tri-Rail and Amtrak services on trackage served by CSX, and proposed commuter service on the FEC, growth for both freight and passenger rail movements is limited. A new rail corridor along the US 27 corridor has long been discussed as a possible bypass route for freight rail service originating and terminating in Miami-Dade County. As discussed in Chapter 3, this rail line would serve proposed ILCs in Florida's hinterland as well as connect to PortMiami's proposed inland port at the Opa-locka West Airport. The anticipated benefits would be increased capacity on the eastern corridor for passenger traffic with new capacity for freight traffic on the US 27 corridor. Reduced delay at road/rail grade crossing along the existing eastern corridor located in the urban core would be an additional benefit.

8.4 Highway Projects

Identified highway needs fall into three categories: MPOAC Freight Priority Projects, 2045 Freight LRTP Set-Asides, and 2050 LRTP Projects. The following sections describe each of these project categories and the projects included.

[96] *Exclusive new photos show aftermath of massive fire at Doral waste-to-energy plant.* South Florida 6. July 6, 2023. https://www.nbcmiami.com/news/local/exclusive-new-photos-show-aftermath-of-massive-fire-at-doral-waste-to-energy-plant/3066764/

[97] *'Trash Trains' to Georgia could be Miami-Dade's garbage plan.* Miami Herald. January 18, 2024. https://www.miamiherald.com/news/local/community/miami-dade/article282752328.html

8.4.1 MPOAC Freight Priority Program Projects

The MPOAC is a statewide transportation planning and policy organization created under Florida Statutes to augment the role of individual MPOs in the cooperative transportation planning process.[98] As part of this cooperative effort, the Freight Priorities Program, was established in 2018 to provide the metropolitan planning agencies of Florida with the opportunity to identify their highest priority freight projects and use the MPOAC as a united voice to promote and position these projects for funding. This list is updated each year and transmitted to FDOT for funding consideration. Each year Florida's MPOs may submit up to three state highway system projects and three non-state highway system projects. The non-state highway system projects may include any combination of roadways, ILC access, trucking parking, or rail projects.

The Miami-Dade TPO has participated in this program since its inception. In fact, project priorities that the TPO has submitted in past years have received funding and advanced. The TPO's most recent submission represents the three projects submitted in 2023 shown in Table 8-5. All three projects here are located on the state highway system, National Highway Freight Network, and Strategic Intermodal System which allows them to qualify for a multitude of funding programs. At the time of this report, the 2024 Call for Projects is underway and will result in an updated list of project priorities for the TPO.

Table 8-5 Miami Freight Priority Program Projects, 2023[99]

Project Name	FM Number	Project Request (millions)	Priority Since
US 27/SR 25/Okeechobee Road and SR 826 Interchange Improvements	436565-1	$147.02	2021
US 27/SR 25/Okeechobee Road from East of NW 87 Ave to NW 79 Ave	423251-3	$46.91	2022
US 27/SR 25/Okeechobee Road from East of NW 116 Way to East of NW 87 Ave	423251-4	$311.72	2023

Source: MPOAC.

8.4.2 2045 LRTP Freight Set-Asides

As part of the 2045 LRTP process, a group of set asides was designated to help ensure specific project types were funded. Namely, this included: a Bike/Ped Set Aside, a Congestion Management Set Aside, and a Freight Set Aside. The Freight Set Aside included investments of $243.04 million over 21 years, with half of the projects designated as long-term priorities (2036-2045). County planning documents and past and current TIPs were reviewed to assess the current status of these projects. It was determined that these projects have yet to move forward. In particular, the most recent TIP (FY 2024 – 2028) summarizes "Planned Freight-Related Transportation Improvements" on page 213-3. Highlights include references to researching, testing, and implementing CAV technology on SR 821 and SR 826; and signal improvements at SR 969 and SR 934 and US 27 and

[98] Florida Metropolitan Organization Planning Council. https://www.mpoac.org/

[99] The prior 2020 submittal was the Golden Glades Truck Parking Center which is now not expected to be complete until 2036 and has moved off of this priority list.

SR 821. As these projects are yet to be completed, they are carried forward as priorities for completion in this freight plan update.[100] As the 2050 LRTP is completed, these projects should be reconsidered as the 2050 LRTP Freight Set Aside projects are identified. The short, medium, and long term freight projects from the 2045 LRTP Freight Set Aside List are included as Table 8-6, Table 8-7, and Table 8-8, respectively.

Table 8-6 Priority I (Short Term) Freight Projects

Facility	From	To	Description	Cost ($2024) - Millions
SR 821 (HEFT)	SR 836 (Dolphin Expressway)	NW 106 St & Beacon Station Blvd	CAV Technology	$0.44
SR 826 (Palmetto Expressway)	SR 836 (Dolphin Expressway)	US 27/Okeechobee Rd (SR 25)	CAV Technology	$0.15
SR 969 (NW 72 Avenue/ Milam Dairy Road)	SR 934 (SR 74 St/Hialeah Expressway)		Traffic Operation Improvements	$0.66
US 27/Okeechobee Road (SR 25)	SR 821 (HEFT)	NW 74 St & W 12 Ave	Traffic Adaptive Signal System	$2.06

Source: 2045 Miami-Dade LRTP.

Table 8-7 Priority II (Medium Term) Freight Projects

Facility	From	To	Description	Cost ($2024) - Millions
NW 12 Street	NW 87 Avenue		Traffic Operation and Geometric Improvements	$0.66
NW 25 Street	NW 67 Avenue		Traffic Operation Improvements	$0.25
NW 25 Street	NW 75 Avenue		Traffic Operation Improvements	$0.11
NW 106 Street / NW 106 Terrace	NW 116 Way & Beacon Station Blvd	NW South River Dr	Widen from 2 to 4 lanes divided arterial	$3.68
NW 116 Way & Beacon Station Blvd.	NW South River Drive	US 27/Okeechobee Road (SR 25)	Traffic Operation Improvements	$0.79
NW 41 Street	1 mile west of NW 122 Avenue	SR 821 (HEFT)	Widen from 2 to 4 lanes divided arterial	$10.91
NW North River Drive	SR 948 (NW 36 Street/Doral Blvd)	SR 9/NW 27 Avenue	RRR & Truck Parking	$0.66
SR 9 (I-95)/NW 27 Avenue	SR 916 (Opa-locka Blvd)/NW 135 St	SR 9 (I-95)	Widen from 6 to 8 lanes, divided arterial	$6.39

[100] *Transportation Improvement Program (TIP) Fiscal Years 2024-2028.* Miami-Dade Transportation Planning Organization. June 22, 2023. https://www.miamidadetpo.org/library/reports/tip/Final-Report/2024-transportation-improvement-program-final.pdf

Facility	From	To	Description	Cost ($2024) - Millions
SR 934 (SR 74 St / Hialeah Expressway)	NW 77 Ct		Traffic Operation Improvements	$3.26
SR 934 (SR 74 Street /Hialeah Expressway)	NW 87 Avenue	SR 826 (Palmetto Expressway)	TSM&O/ITS Improvements	$0.73
SR 934 (SR 74 Street /Hialeah Expressway)	SR 826 (Palmetto Expressway)	US 27/Okeechobee Rd (SR 25)	Widen from 2 to 8 lanes divided arterial	$14.19
SR 948 (NW 36 Street /Doral Blvd)	NW 79 Avenue		Traffic Operation Improvements	$0.14
SR 948 (NW 36 Street /Doral Blvd)	NW South River Dr		Traffic Operation Improvements	$1.09
SR 948 (NW 36 Street /Doral Blvd)	NW 79 Ave		Geometric Modifications	$0.14
SR 948 (NW 36 Street /Doral Blvd)	NW 67 Ave, NW 66 Ave & Perimeter Rd		Traffic Operation Improvements	$0.35
SR 969 (NW 72 Avenue /Milam Dairy Rd)	SR 934 (SR 74 Street /Hialeah Expressway)		Traffic Operation Improvements & Access Management	$2.80

Source: 2045 Miami-Dade LRTP.

Table 8-8 Priority III (Long Term) Freight Projects

Facility	From	To	Description	Cost ($2024) - Millions
SR 9 (I-95)/NW 27 Avenue	SR 9 (I-95)		Interchange Improvements	$46.88
SR 969 (NW 72 Avenue/Milam Dairy Rd)	SR 836 (Dolphin Expressway)	US 27/Okeechobee Road (SR 25)	Widen from 6 to 8 lanes, divided arterial and TSM&O improvements	$49.03
SR 817 (NW 27 Avenue)	North Corridor		Incorporate truck parking considerations to the SMART Plan North Corridor Rapid Transit project	$46.85

Source: 2045 Miami-Dade LRTP.

8.4.3 2050 LRTP Projects

As part of the 2050 LRTP Update process a list of projects was developed using information from FDOT, towns and cities within Miami-Dade, the county, modal partners, and more. To determine which of these projects would improve freight movement in the county, the following project types and locations were used for criteria: SIS designation, NHFN designation, and proximity to freight

intensive areas (as determined based on existing land use and locations of warehousing and distribution centers).[101]

The intent of this screening was to identify all projects that fall on critical, high volume corridors (SIS and NHFN), as well as those projects located within freight intensive areas. Figure 8-3 shows the freight intensive areas identified as part of the needs assessment. These locations supported the identification of freight roadway needs.

Figure 8-3 Freight Intensive Areas in Miami-Dade County

Source: Cambridge Systematics, Google Earth.

[101] Projects determined to benefit bike/pedestrian movements and not truck were not included, even if they did fall within a freight intensive area.

Based on the above defined criteria, 95 projects included in the 2050 LRTP needs database were flagged as freight needs (see Appendix B). These projects represent an investment need for the county in excess of $9.8 billion based on partial cost information.

9.0 Recommendations and Next Steps

As global shifts continue, and Florida advances its global logistics competitiveness, Miami-Dade County needs to continue to develop and implement strategies that ensure it remains competitive and positioned for growth. Maximizing freight and logistics opportunities will complement other investments designed to transition Miami into a World-class city. The following highlights key short-term and ongoing strategies that can be undertaken to help advance Miami-Dade County's freight program:

- **Monitor and support PortMiami's inland port development activities at the Opa-locka West site.** PortMiami is in the process of developing an off-site location to support intermodal, transload, laydown and other cargo activities. Growth at the port for both cruise and cargo operations must be rationalized and some cargo operations could be located away from the port with good highway and rail connections to help increase the capacity of the land-constrained port. Studies that promote efficient connections between the port and the inland port could be advanced.
- **Monitor and incorporate planned capital investments at PortMiami and Miami International Airport, at key master plan milestones, as well as private sector rail investments.** In addition to PortMiami's inland port development, planned investments by modal partners could be monitored. These investments would have the greatest influence on cargo movements into, out of, and within Miami-Dade County. Priorities for rail, port, and air investments often change based on market opportunities, making ongoing monitoring necessary.
- **Coordinate and partner with FDOT D6 on implementation of the countywide freight program.** FDOT District 6 has completed a series of subarea freight studies that were critical in the development of freight infrastructure and operations projects that directly enhance freight mobility in the county. FDOT is currently conducting a districtwide evaluation of freight needs which incorporates and updates these existing subarea studies. Ongoing coordination could be undertaken with FDOT to ensure that the findings, recommendations, and projects identified in the Miami-Dade County Freight Plan and the 2050 LRTP are incorporated into the districtwide freight plan, and that the results from the districtwide freight plan are considered and incorporate as appropriate into the next county freight plan update.
- **Coordinate with the Federal Railroad Administration to update the county's grade crossing inventory.** The FRA maintains an inventory of grade crossings and uses data for these crossings to update the Accident Prediction System, used to inform states and local agencies of which grade crossings may need modifications; however, the most recent FRA report for Miami-Dade County includes many crossings that no longer exist and have not for over a decade, and the inventory states that six trains per day use the line. The FRA could be asked to update its database to ensure that all current crossings are included in the inventory and APS analysis.

- **Actively participate in updates to the Florida Mobility and Trade Plan to effectively compete for NHFP resources and promote South Florida freight needs.** The Freight Mobility and Trade Plan (FMTP) is required to be updated every four years in order for the state of Florida to receive its allocated NHFP funding. The TPO will continue to participate in these updates to ensure that the needs of South Florida's freight community are represented and included in the required Freight Investment Plan.
- **Coordinate and engage with local stakeholders on the development of truck parking facilities.** This update has documented the continued lack of private incentive to develop a large, full service truck parking facility, primarily due to land costs and availability of an adequate parcel. The significant increase in truck parking with no amenities outside the urban district boundary largely in the northwest quadrant of the county has been documented, and ongoing work by FDOT has identified several possible sites for a range of truck parking facilities. The TPO will continue with Miami-Dade County, FDOT, and local municipalities to identify public property and/or funding to support the development of large, state of the practice full-service trucking facilities.
- **Promote preservation of industrial land for freight usage.** As available land becomes more constrained within the county, some redevelopment has occurred which has shifted traditional freight areas away from freight usage. This has been most obviously seen along the Miami River with some landowners fighting against eminent domain. Preserving land for freight usage could help ensure Miami-Dade County's residents and visitors continue to receive goods efficiently, and that there is landside capacity to support the projected growth at PortMiami and Miami International Airport.
- **Promote economic contributions of the freight and logistics industry.** Transportation and economic development investments take place within a competitive environment. The funding PortMiami has received to prepare it for the next generation of cargo vessels was hard fought for through demonstration of overall benefits. The ability to quantify the economic impacts associated with freight project investments could be critical in the successful solicitation of local, State, and Federal funds. Impact tools and marketing materials could be developed and used to educate key decision-makers about the contributions of this targeted industry.
- **Continue to fund the freight set aside program to help promote priority freight projects.** As part of the 2045 LRTP, financial revenues were set-aside to provide assurance that bicycle/pedestrian (non-motorized), congestion management, and freight projects are afforded a minimum level of investment in the Plan. Individual plans were developed for each of these programs to identify needs and prioritize projects. This freight set aside could continue to be funded in order to facilitate freight movement within Miami-Dade County.

- **Maximize use of available funding programs including identification of opportunities for grant funding for freight projects, and use of public/private partnerships.**Ways to maximize these programs are summarized below:
  - **Maximize use of available funding programs.** There are a significant number of programs available to help advance freight projects. The Infrastructure Investment and Jobs Act (IIJA) further expanded funding opportunities by increasing the funding levels for both formula and discretionary programs, as well as creating new programs. Miami-Dade County has had repeated success over the years competing for grant awards and this should continue. Programs like the Infrastructure For Rebuilding America (INFRA), State Infrastructure Banks (SIB), FDOT SIS, and FDOT District 6 Intermodal Funds have been used to advance critical projects in Miami-Dade County. Applications, as appropriate, could be routinely submitted to these and other identified programs to ensure Miami-Dade County and its partners are competing for all available funding.
  - **Identify a list of freight projects and complete a preliminary assessment to ensure preparedness for upcoming grant opportunities.** The Notices of Funding Opportunities (NOFOs) for grant funding often have short turn around periods. As part of the effort to maximize the use of available funds, freight related projects could preemptively be identified and evaluated for submittal, including the identification of data gaps to support benefit-cost analysis such as traffic impact studies and project cost estimates. Advanced preparedness could help to better position those projects to receive grant funding.
  - **Leverage investments through public/private partnerships.** Miami-Dade County is home to one of the largest public/private partnerships (P3s), and this partnership helped successfully deliver the PortMiami Tunnel. Regardless of the scale of the project, P3s can help accelerate critical investments through shared risk. Opportunities for additional P3s could be identified and pursued, as appropriate to help advance remaining freight system needs. In addition, these types of partnerships can help put together local funding matches when pursuing available funding grants from State and Federal partners.
- **Support the MPOAC's Freight Priorities Program.** On an annual basis, the Florida MPOAC requests freight priority projects from its partners. A list of projects is prepared and submitted to FDOT promoting the MPOs' collective freight priorities. The TPO has consistently participated since the program's inception in 2018 and should continue to do so. In addition, the TPO will continue to participate in the Freight and Rail Committee to help this program evolve to best meet MPO needs.
- **Monitor performance of the freight system.** As required by Federal law, performance monitoring of the freight system must be conducted, which can help track the effectiveness of the freight program. Currently, FHWA requires MPOs to establish 2- and 4-year targets for truck travel time reliability. It is critical that this continues in Miami-Dade County to ensure that freight can successfully compete for available funding. In addition, development of a freight

performance dashboard that goes beyond Federal requirements could be considered to help promote the county's competitiveness.

- **Engage the freight community in the identification of freight bottlenecks, including first/last mile connections.** In conjunction with documenting the performance of the freight system, the NPMRDS could be used to help identify bottlenecks on key freight corridors. In addition, the Miami-Dade TPO Freight Transportation Advisory Committee could continue to be used as a sounding board on the location of key bottlenecks. A process to solicit input from the freight industry could be developed to support a real-time list of ongoing bottlenecks.
- **Ensure trade and logistics remains a targeted industry.** Significant work has been undertaken over the last several years by the Florida Chamber Foundation and the Beacon Council, along with many others, to elevate trade and logistics to the list of targeted industries. As a result, different types of economic incentives are available to the industry to drive growth. It is critical that the industry remain designated and that economic development professionals use available incentives to attract and grow businesses in Miami-Dade County. Coordination with the Beacon Council could continue to promote the importance of this industry.
- **Support work force development programs.** The trade and logistics industries are aging and the availability of a trained workforce has become one of the most critical concerns for many companies. Combined with the rising cost of living in the county and the average wage of industry workers, filling available roles can be challenging. Entities such as Employ Florida, FDOT, and the Florida Chamber have focused on trade and logistics as a target area for workforce development. An active role in workforce development could be taken, partnering with industry, government, and academia.
- **Advance best practices by continuing to develop, test and expand pilot programs.** Miami-Dade County is home to several innovative and cutting edge pilot programs developed to address critical bottlenecks in our international trade regulations and operations. The Perishables Coalition, the Transshipment Committee, and CBP's Reimbursable Services Authority all represent exceptions to Federal trade regulations or new ways to manage the programs. Local leaders could continue to expand these pilots and identify new innovative ways to streamline operations to drive the competitiveness of the trade and logistics industry.
- **Monitor hinterland ILC developments and engage as appropriate.** The larger master planned ILC proposals in the heartland of South Florida have the potential to significantly expand the logistics capacity of the region and the State as they come online. These developments are taking longer than expected to break ground, but when they do it will be important for Miami-Dade County businesses and government leadership to engage with these developers to establish business relationships. In the longer term, this connection could be even more critical as the County's ability to expand warehouse capacity diminishes.

- **Evaluate the economic and operational feasibility of developing a rail line on US 27.** While the development of a rail line along US 27 has been tied to ILC development in the heartland, growing passenger and freight traffic on urban rail lines is limited by the rail capacity. Development of a rail line along US 27 could shift freight rail traffic away from the urban core, reducing the time at-grade crossings are closed and increasing capacity for passenger rail traffic such as Brightline, Amtrak, Tri-Rail, and the future Northeast Corridor. The benefits of this project could be evaluated to determine the financial viability of this option.
- **Promote regional freight mobility.** In a world of competing priorities, it is important that the importance of freight mobility is acknowledged and promoted. This Plan provides the material and data to support the development of dashboards, fact sheets, and other material to help demonstrate the significance of freight activity and the supporting infrastructure in Miami-Dade County. This could be done at a regional level in partnership with key planning agencies making up the Miami Urbanized Area. This integrated region is home to over six million residents and millions of annual tourists. The freight companies serving this market do not recognize County lines as they only care about overall access and mobility.
- **Monitor global supply chain and geopolitical trends to support effective competitive positioning.** The last five years have demonstrated the delicate balance between goods production and delivery. Shifts in global production and constraints on operations during the COVID-19 pandemic strained the ability of carriers to deliver goods on-time and at a reasonable cost. In some cases, such as with the congestion at West Coast seaports, this affords an opportunity for Miami to attract new business. Upcoming freight trends could continue to be monitored to determine how Miami can serve and retain existing businesses, attract new businesses, and provide a higher quality of life to South Florida residents and visitors.

Appendix A – Literature Review List

Document Title	Brief Description	Key Findings/ Summary	Task 2 - Data Analysis and Evaluation of the Magnitude of Freight Activity in Miami-Dade County	Task 3 - Freight Plan Compliance with Federal and State Performance Measures	Task 4 - Future Technologies and Resilience	Task 5 - Identify State & Regional Competitiveness for Freight	Task 6 - Identify Truck Parking; Inland Ports; and Truck Empty Back-Haul	Task 7 - Identify Planned and Programmed Freight Related Improvements and Provide Recommendations	Comment/ Notes	Hyperlink
TPO South Florida Truck Parking Workshop (October 2021)	Miami-Dade TPO organized a three day workshop on South Florida Truck Parking with 2.5 hour long sessions each day. Topics discussed included truck parking basics, parking solutions, and truck parking action plan development.	The workshop focused on truck parking shortages and potential capacity solutions separating them into short, medium and long term. Truck parking solutions were also discussed from technology, programmatic and cross-cutting considerations perspective. Key components of a future truck parking action plan were also discussed.	Truck parking trends and needs		Implementation of technology to inform availability of parking (parking app).		Truck parking solutions			**https://connectdot.connectsolutions.com/p7woocа863e5/ https://connectdot.connectsolutions.com/pbv583mwodk3/ https://connectdot.connectsolutions.com/plziepkuv88v/**
Miami-Dade TPO Covid-19 Travel Behavior Trend Analysis 2021	The Miami-Dade Transportation Planning Organization (TPO) undertook a COVID-19 Travel Behavior Trend Analysis to investigate the effects of the COVID-19 pandemic on travel behavior in Miami-Dade County. This was done by comparing pre-pandemic transportation related data sets to data collected during various phases of the pandemic and post lock down. Trend analysis for highway volumes, transit usage, airport/cruise port passengers and other transportation data were completed using 2019 (pre-pandemic), 2020 and available 2021 data.	The study found that unlike tourism, trip frequency etc. the freight transportation sector experienced growth during the COVID-19 pandemic. Although there was an overall reduction in economic activity, air cargo commerce in Southeast Florida showed growth during the pandemic. At Miami International Airport (MIA), air cargo increased by 3% year to year, 2019 to 2020. E-commerce and pharma shipments made in 2020 was the busiest year ever for MIA cargo.	Traffic, ridership, port and airport activity data etc.							https://miamidadetpo.org/library/studies/mdtpo-covid-19-travel-behavior-trend-analysis-final-report-2022-01.pdf
TPO COVID-19 Freight Impact Analysis Study 2022	This study compares pre- and post-COVID-19 freight travel patterns and freight industry data throughout Miami-Dade County. This data is used to develop insights and recommendations for the Miami- Dade Transportation Planning Organization (TPO) to assist in the development of the 2050 Long Range Transportation Plan (LRTP).	The study assesses the pre- and post-COVID-19 pandemic impacts on the Miami-Dade County freight/truck transportation network. The trucking industry and related infrastructure is directly impacted by all modes of transportation, including seaports, aviation, rail and highways. The study came up with 10 recommendations to highlight the main areas of attention for the Miami-Dade TPO to consider when evaluating future freight and trucking transportation decisions.	AADT, Truck travel time reliability etc. Data source used: REPLICA Data - an industry standard data source for transportation related data		Connected and Automated Vehicle Infrastructure		Truck parking, covid 19 impact on trucking network	The report identifies priority freight corridors for travel time assessment and alternative corridor assessment.		
TPO Southeast Florida Origin-Destination Travel Survey (September 2017)	The report contains a description of the data and data delivery formats, data reasonableness checks, and sample visualizations that portray key characteristics of Southeast Florida travel and the breath of information contained in these datasets.	This report describes a comprehensive dataset of personal and commercial trip origin-destination travel patterns for the three counties of Southeast Florida. The data portray average travel conditions for two broad data periods, which comprise all months in 2015 and all months in 2016. The report illustrates various travel patterns which can be constructed with the OD data.	Important information on trip origins - destination, duration, trip generation and distribution, time of day analysis, travel time analysis etc.			Covers three counties for the analysis.			Analysis based on 2015 and 2016 data.	https://www.miamidadetpo.org/library/studies/southeast-florida-origin-destination-travel-survey-final-report-2017-09.pdf
Miami-Dade County Freight Plan Update 2018	The plan highlights the importance of freight mobility in Miami-Dade County, develops and application for a Miami-Dade County designated Freight Logistics Zone (FLZ) and to coordinate with freight stakeholders to prepare an updated list of transportation needs. The list of projects developed in this update will be considered for funding in the development of the TPO's Year 2045 Long Range Transportation Plan (2045 TPO LRTP).	The Miami-Dade County Freight Plan 2018 identified several key findings related to the freight transportation network in the region: Miami-Dade County is a critical gateway for international trade, serving as a hub for the movement of goods between Latin America, the Caribbean, and the rest of the United States. The existing freight transportation network is facing significant challenges, including congestion, capacity constraints, and a lack of infrastructure investment. The region's roadways, railways, and seaports are operating at or near capacity, with limited opportunities for expansion. The growth of e-commerce and other emerging industries is expected to drive increased demand for freight transportation in the region in the coming years. Based on these findings, the Miami-Dade County Freight Plan 2018 proposes a range of strategies and initiatives to improve the efficiency, safety, and sustainability of the freight transportation network in the region.	Strategic rail crossing crash, train traffic, waterway cargo volumes, historic cargo movement, projected TEU growth, air cargo and projected growth etc.	Multimodal Mobility Performance Measures Matrix	Resilience included as a goal.	County freight network at a regional context	FDOT's Truck Parking Availability System (TPAS)	Seaport, airport, railroad, freight direct highway project needs.		https://www.miamidadetpo.org/library/studies/freight-plan-update-2018-06.pdf
Miami-Dade County Freight Plan Update 2014	Miami-Dade County Freight Plan Update of 2014 proposed a range of strategies and initiatives to improve the efficiency, safety, and sustainability of the freight transportation network in the region, including investments in new infrastructure, the development of new intermodal facilities, and the promotion of sustainable transportation practices. The plan also emphasized the importance of collaboration between public and private stakeholders and the need to engage with local communities to mitigate the impacts of freight transportation.	Miami-Dade freight plan promotes economic contributions of freight and logistics industry, maximizing use of available funding programs, support advancement of solutions for missing freight links, promote regional freight mobility.	Cargo movements through PortMiami, Miami International Airport, etc.				Potential new truck parking locations.	Seaport, airport, railroad, freight direct highway project needs. Locations for freight only projects.		https://www.miamidadetpo.org/library/studies/freight-plan-update-2014-08.pdf

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Miami-Dade County Preliminary Truck Parking Assessment	Miami-Dade County has identified five parcels for potential truck parking development considering the severe shortage of truck parking spaces. This memorandum aims to preliminary assess the viability of truck parking development at these locations.	The parking locations assessment looks at three tiers: (1) Legal, geometric, and geographical characteristics, (2) environmental characteristics, (3) freight transportation demand. Out of the five locations assessed, two sites were found suitable and both of them are located in the Homestead census-designated area.	Statistics on truck parking shortages.				Truck parking shortage, potential suitable new truck parking locations.			https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/d6/truck_parking_assessment_tech_memo_mdc-owned-land_march2019.pdf?sfvrsn=8291e350_2
Florida Department of Transportation (FDOT) Freight Mobility and Trade Plan	The FMTP is a comprehensive plan that identifies freight transportation facilities critical to the state's economic growth and guides multimodal freight investments in the state.	The plan identifies key freight issues and opportunities along with immediate and long-range freight needs of the state and establishes a prioritization process. The FMTP establishes a 5-year financially constrained Freight Investment Plan inclusive of all funded freight projects with the state. Five recommendations have been developed for each FMTP objective based on technical analysis results, capturing stakeholder input, and considering emerging market trends and opportunities.	System performance statistics.	Freight system performance measures (both qualitative and quantitative)	E-commerce, Gig economy, technology trends,	Economic trends	Truck bottlenecks, parking, empty backhaul	Tech memo 6 - freight related projects		https://www.fdot.gov/rail/plandevel/freight-mobility-and-trade-plan
FDOT Sub-Area Freight Improvement Studies:										https://www.fdot.gov/rail/publications.shtm/D6freight
Medley	The Town of Medley Freight Mobility Improvement Plan examines the existing and planned transportation infrastructure in and around the Town of Medley, Florida with respect to how effective it accommodates the existing and forecasted vehicular and truck traffic volumes.	Along with exploring existing condition, the study also performed network analysis for six scenario in order to provide a range of future truck trip demands. The study also came up with recommendations and list of future projects in the area.	Existing AADT, crash data, land use, socioeconomic condition of the area		Use of ITS and ETDM		List of proposed and existing truck parking locations	Long, mid and short term recommendations and proposed projects		
Opa-Locka	This Plan documents existing conditions, identifies key challenges and opportunities, defines and evaluates a range of growth scenarios, and provides a comprehensive list of improvements to support the efficient movement of freight into, out of, within and through the City of Opa-locka.	The study discusses existing condition, future alternative scenarios, and future points of failure.	Existing truck volume, LOS etc.	Performance measures were selected for trip assignment and distribution				Short, medium and long term projects are summarized		
Miami River	The Miami River Freight Improvement Plan is one of several subarea freight studies being conducted by the Florida Department of Transportation - District 6 with the aim to enhance freight mobility in key districts of Miami-Dade County where freight and logistics operations are clustered.	The study performs an alternative analysis for the Miami River Freight Improvement Plan which considers several future freight growth scenarios in the Miami River study area, while recognizing a continuing presence of marine-oriented freight operations along the west end of the corridor. Five alternatives were scored to see which may produce positive impact. The study also discusses potential funding sources.	Existing traffic data, system performance, safety statistics etc.	FDOT goals and performance measures				Includes a list of recommended improvements with project scores		
Doral	The study identifies and analyzes freight corridors in the City of Doral area for the specific purpose of advancing project proposals from a planning phase to environmental, design, and construction.	The study identifies six FDOT projects proposed for advancement to a condensed Project Development and Environment (PD&E) phase.	Context classification, LOS, truck traffic growth etc.		City of Doral has a IT department. The city utilizes trolley tracker, red light cameras, GIS portal, License Plate Reader cameras etc.		Truck turning assessment, freight bottleneck, and truck weight issues.	A list of FDOT projects recommended for advancement is provided. Freight only projects are also identified		
Miami Gardens	This study looks to implement the policies of the Florida Freight Mobility and Trade Plan in Miami-Dade County to achieve statewide goals through consistent application of freight strategies at the local level.	The study proposes short, medium and long term improvements projects based on number of different future scenarios evaluated.	Traffic data and system performance					Recommended improvement projects		
Homestead	The Homestead Freight Improvement Plan is one in a series of freight subarea studies being conducted by the Florida Depart of Transportation (FDOT) – District Six with the goal of enhancing freight mobility for the freight and logistics community across Miami-Dade County.	The agricultural-based economy of Homestead has diversified with eco-tourism, military, motor racing, and industrial. There has been a proposal of 793 acre expansion of urban development boundary in the plan and three freight planning scenarios has been compared.	Truck OD patterns, truck trip density, growth forecast				Truck parking feasibility analysis, priority truck parking sites.		The plan is still in progress. General information gathered from presentation documents on the Homestead Freight Improvement by the TPO.	
Hialeah Freight Mobility Implementation Plan Truck Parking Assessment	The focus of this study is to develop a plan of viable alternatives that enhance freight connectivity and minimize transportation conflicts within the City of Hialeah and surrounding areas. This study reviews existing and forecasted conditions, focusing on vehicular and truck volumes to identify bottlenecks and other key locations for improvement. The study also considers the effects of interaction between freight and other modes of transportation, including freight rail, Hialeah Transit, Tri-Rail, Amtrak, Metrorail, bicyclists and pedestrians.	The study recommends specific sites for potential development or expansion to ease the regional truck parking deficit. No existing sites were identified that address the long-haul driver need within Hialeah region. Most of the identified sites within the UDB that could accommodate truck parking are also attractive for other investments that would generally be considered a higher and better use of the land. Therefore, these sites will always present a challenge for truck parking development due to future compatibility with surrounding area and public perception that truck parking hurts the surrounding area land value.					Existing truck parking assessment			

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FDOT Statewide Truck Parking Study	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.	The study provides truck parking 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 short-term implementation actions include a number of new initiatives for FDOT, including pilot projects and the development of the Truck Improvement Program (TPIP). The underlying strategy for the medium-term is to leverage the TPIP by implementing a call for projects. FDOT should monitor the development of technologies and trends impacting freight to position the Department for future possibilities in the long term.	Truck parking supply, truck parking candidate locations (ArcGIS online),		Communication of truck parking availability to truck drivers, FDOT monitoring the adoption of ACES technologies and identifying the impact of these technologies on truck parking.		Truck parking shortage, truck parking solution	Truck parking expansion and new locations for parking.		https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/rail/publications/studies/trucking/florida-statewide-truck-parking-study_final_march-2020.pdf?sfvrsn=98bcb129_4
FDOT District 6 Freight Resources	FDOT District 6 freight resources is a online source of important information on airport, seaport, railway, truck parking and other freight activity. The weblink also allows downloading different freight related studies.								Relevant documents have been downloaded and reviewed from the source.	
FDOT Freight Moves Florida	FDOT Freight Moves Florida is an important freight related data source from where data can be downloaded and used for intended purposes.			Mobility Performance measure: http://fdotsourcebook.com/					Some relevant data sources are listed below on table 2.	http://freightmovesflorida.com/
FDOT Truck Empty Backhaul Analysis	The purpose of this study is to quantify truck empty backhaul in Florida using weigh in motion (WIM) data. The WIM dataset contains information on date, time, travel direction, travel lane, truck gross weight, vehicle class, vehicle length, axle spacing and axle weights for each truck passing through 30+ WIM stations across the state of Florida.	The percentage of empty trucks leaving the state ranges between 30% and 50% depending on the corridor. Approximately 15% to 20% trucks entering Florida are also empty. The percentage of empty trucks in the inbound direction is highest during the month of May, while the percentage of empty trucks in the outbound direction is the lowest during the same month. Less seasonal variation occurs in the inbound direction compared to the outbound direction. Also, the percentage of empty trucks increases during the middle of the day as compared to hours in the night.	WIM data		Internet Based Freight Efficiency Applications		Truck empty back haul.		WIM data from 2015 through 2017 was used for this analysis.	https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/statistics/docs/truck-empty-back-haul-final-report-2018.pdf?sfvrsn=8efaa9c_0
Infrastructure Investment and Jobs Act (IIJA) Freight Provisions	The Infrastructure Investment and Jobs Act (IIJA) is a reauthorization of the FAST Act and provides $973 billion in funding over five years from FFY 2022 through FFY 2026, including $550 billion for new investments for all modes of transportation, water, power and energy, environmental remediation, public lands, broadband, and resiliency.	The IIJA is estimated to bring $16.7 billion in transportation formula funds to Florida among FDOT, transit agencies, airports, and other partners. FDOT is estimated to receive $13.5 billion under the IIJA in formula funds. This is $3.5 billion and 35 percent more than provided by the FAST Act. Local agencies (cities, counties, MPOs, and transit agencies, for example) may be eligible for a myriad of competitive grant programs under the IIJA.								https://www.fdot.gov/planning/policy/legislation/Bipartisan-Infrastructure-Law-(BIL).shtm https://www.miamidade.gov/citt/library/2021/ffm_presentation_2021_11_15.pdf
Federal Highway Administration (FHWA) Freight Management and Operations: Florida	Federal Highway Administration (FHWA) Freight Management and Operations: Florida is a source of Freight Profiles and Maps		Commodity Flow Survey (CFS), FAF tabulation tool						Truck flow data can be downloaded from the link mentioned in table 2.	https://ops.fhwa.dot.gov/freight/freight_analysis/state_info/florida/fl.htm
PortMiami Master Plan	The 2035 Master Plan identifies strategies that will help increase both cargo and passenger throughput by adding services, upgrading infrastructure, enhancing efficiency and increasing berthing capacity. Projects presented in the 2035 Master Plan include a phased implementation plan allowing for development depending on additional changes in the global market.	The plan identifies some key cargo strategies for future improvement of the port. They are: Completing the harbor deepening project; Building the on-port intermodal rail facility to enhance the operational options and efficiencies of the Port for the users; Continuing with the tunnel implementation to provide interstate access for trucks; Building the new cargo road taking into consideration the future expansion of the North Channel cruise berths and potential realignment of the current yard gate structures.	Land use, channels, berth inventory, cargo inventory, TEUs handled		Climate change affecting PortMiami.			Projects presented in the 2035 Master Plan include a phased implementation plan		https://www.miamidade.gov/portmiami/master-plan.asp
Miami-Dade Aviation (MDAD) Master Plan Executive Summary	In 2017, the Miami-Dade Aviation Department (MDAD) initiated the Supplemental Airport Master Planning Study (Supplemental Study), which serves as an update to the 2009 Strategic Airport Master Planning Study (SMP). The SMP addressed the 20-year capacity and operational needs for Miami International Airport (MIA or the Airport) and Miami-Dade County's (the County's) four general aviation airports. The SMP also evaluated MIA's longer-range needs for a strategic planning horizon that extended to the 2050 timeframe.		Cargo tonnage forecast							https://www.miami-airport.com/library/pdfdoc/HB_915/MIA%20Supplemental%20Master%20Planning%20Executive%20Summary%20Book%20-%2010-27-21.pdf

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Additional relevant Resources:										
Addressing Truck Emissions and Noise at Truck Freight Bottlenecks	This report provides information on strategies to address truck emissions and noise at truck freight bottlenecks, including significant highway bottlenecks and truck access to intermodal connectors. The report includes case studies to demonstrate the potential benefits of various mitigation strategies at three locations.	The results for the three case studies show that truck volumes coupled with congested conditions and/or excessive idle drive total emissions. Correspondingly, mitigation strategies that substantially reduce truck volumes, replace more polluting trucks with cleaner trucks, significantly increase peak-period speeds, or reduce idling activity were found to have the largest emissions benefit. Noise-specific mitigation strategies do not reduce emissions. However, some noise mitigation strategies—including noise barriers, buffer zones, and vegetation—can lower air pollutant concentrations at near-road receptor locations.			Clean Vehicles and Fuels					https://www.fhwa.dot.gov/environment/air_quality/research/addressing_truck_bottlenecks/fhwahep22026_final.pdf
Statewide Truck GPS Data Analysis	The purpose of this study is to develop a methodology for systematic evaluation of truck parking supply and utilization using truck GPS data and other data sources.		Truck parking locations, daily utilization	Performance measures to quantify parking utilization and other analyses		Parking comparison between the districts	Truck parking utilization, Top Locations for Unauthorized Stopped Trucks		Truck parking location review: https://hdr.maps.arcgis.com/apps/webappviewer/index.html?id=2d1da560cbb643439dee8581120718aa	https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/statistics/multimodaldata/multimodal/fdotcoswtruckgpsparkingfinalreportb03efb1d092a4d23b31c29a5dd13d4d6.pdf
Miami-Dade 2045 Long Range Transportation Plan	The 2045 LRTP guides citizens, businesses, and elected officials in fostering an innovative vision for the future of the transportation system over the next 26 years. The plan serves as a mechanism for the implementation of improvements to the transportation network through the identification and prioritization of transportation projects to address current and future needs.	The existing transportation system was analyzed with the projected increased population in 2045 to identify deficiencies in the transportation system for the 26-year period from 2020 to 2045. Over 300 improvement projects were identified to meet the desired mobility conditions. These projects were reviewed and evaluated to develop the 2045 Cost Feasible Plan based on the projected available revenue of $19.3 billion YOE dollars for new capital and new Operating and Maintenance (O&M).		FDOT and TPO system & freight national performance measure targets	Development of Connected and Autonomous Vehicles (CAV)	Regional connectivity	Truck parking	List of prioritized projects which were used to develop a Cost Feasible Plan for the respective set-asides.		https://gfnet.sharefile.com/share/view/s758c69f961434337a6955ee7b3f07ab4

Table 2: Data Sources

Source	Data	Hyperlink
FDOT Open Data Hub	Current 5-Year Adopted Work Program	https://gis-fdot.opendata.arcgis.com/apps/current-5-year-adopte
	Freight Activity Data	https://gis-fdot.opendata.arcgis.com/documents/fdot::freight-acti
	Truck Volume TDA	https://gis-fdot.opendata.arcgis.com/datasets/fdot::truck-volume-
	Weigh In Motion TDA	https://gis-fdot.opendata.arcgis.com/datasets/fdot::weigh-in-mot
	Annual Average Daily Traffic Historical TDA	https://gis-fdot.opendata.arcgis.com/datasets/fdot::annual-averag
	Rail System Map	https://gis-fdot.opendata.arcgis.com/apps/5ed25c91f91740719d8
	Turnpike Adopted Work Program	https://gis-fdot.opendata.arcgis.com/apps/4fc71bb41ff540b88a05
	Active Construction Projects	https://gis-fdot.opendata.arcgis.com/apps/ce28840751504b0190f
FAF5	FAF5 Estimates of Truck Flow for Base Year 2017	https://ops.fhwa.dot.gov/freight/freight_analysis/faf/faf_highway

Appendix B - List of Freight Projects Identified as part of the 2024 Miami-Dade County Freight Plan Update

Project ID	PROJECT (Descriptive) Name	FACILITY	FROM	TO	PROJECT Description / Details	Specify Proposed Planning Period	Roadway ID
1	WIDEN NW 25 STREET FROM NW 117 AVENUE TO NW 87 AVENUE	NW 25 St	NW 117 Ave	NW 87 Ave	The proposed project consists of reconstructing and widening of the existing roadway from a four (4) lane road to a six (6) lane road with raised median, sidewalk on the south side, bicycle/pedestrian path on the north side of the roadway, curb and gutters, stormwater drainage system, pavement marking and signage, traffic signalization and improved roadway lighting / Roadway / Highway / Safety,Pavement,Bridge_(NHS),Systems_Performance	LOPP	
2	Widen NW 25 St. from NW 117 Ave. to NW 87 Ave.	NW 25 St	NW 117 Ave	NW 87 Ave	Road widening and addition of shared-use path / Roadway / Highway / Pavement,Systems_Performance	LOPP	
3	Using Technology to Support the Freight Network	Using Technology to Support the Freight Network	Countywide		Planning Study	UF (2051 and beyond)	
4	US 27/ Okeechobee Rd (SR 25)	US 27/ Okeechobee Rd (SR 25)	NW 42 Ave (LeJeune Rd)		Improve access at intersection; Iron Triangle	III (2036-2040)	
5	US 27 Multimodal Feasibility Study	US 27	Existing rail network in Miami-Dade County	Existing rail network near Lake Okeechobee	Study benefits of building a new rail line through Florida's interior to expand passenger rail capacity on existing coastal rail lines.		
6	Track Extension	Track Extension	-	-	Transit. Expand the railroad along US27 to connect to the Inland Port and Logistics Center	LOPP	
7	SW 127 Avenue	SW 127 Avenue	SW 244 Street	SW 184 Street	Capacity Improvement	UF (2051 and beyond)	
8	SW 107 Avenue	SW 107 Avenue	Quail Roost Drive	SW 160 Street	ROADWAY IMPROVEMENTS	UF (2051 and beyond)	
9	SW 107 Avenue	SW 107 Avenue	Quail Roost Drive	SW 160 Street	The project consists of roadway improvements which include, reconstructing and widening from a 2-lane to a 4-lane divided road, sidewalks, curb and gutters, continuous storm drainage system, pavement markings and signage, signalization, lighting, and landscaping.	LOPP	
10	SW 107 Ave (SR 985)	SW 107 Ave (SR 985)	SR 994 (Qual Roost Dr)	SW 160 St	Add 2 lanes and reconstruct	III (2036-2040)	
11	SR-934/NW 74 Street	SR-934/NW 74 Street	SR-821/HEFT	US-27/Okeechobee Road	Operational Improvements	I (2026-2030)	
12	SR-916/Douglas Road	SR-916/Douglas Road	South of NW 142 Street	North of NW 142 Street	Widening (Add one lane in each Direction)	I (2026-2030)	
13	SR-25 (Okeechobee Rd)	SR-25 (Okeechobee Rd)	East of NW 87 Ave	NW 79 Ave			
14	SR-25 (Okeechobee Rd)	SR-25 (Okeechobee Rd)	East of NW 116 Way	East of NW 87 Ave			
15	SR-25	SR-25	SR 25	SR 826	Interchange Improvements		
16	SR 9A/I-95 from US-1/S. Dixie Hwy to South of NW 62nd Street	SR 9A/I-95	US-1/SR 5/S. Dixie Hwy	South of NW 62nd Street	Capacity Improvements/Modify Interchanges	II (2031-2035)	87270000
17	SR 9A/I-95 from US-1/S. Dixie Hwy to South of NW 62nd Street	SR 9A/I-95	US-1/SR 5/S. Dixie Hwy	South of NW 62nd Street	Capacity Improvements/Modify Interchanges	IV (2041-2050)	87270000
18	SR 9A/I-95 from South of SR 860/Miami Gardens Dr to Broward County Line	SR 9A/I-95	South of SR 860/Miami Gardens Dr	Broward County Line	Capacity Improvements/Modify Interchanges	II (2031-2035)	86070000, 87000169, 87013000, 87026000, 87270000
19	SR 9A/I-95 From South of NW 62nd Street to North of NW 143rd Street	SR 9A/I-95	South of NW 62nd Street	North of NW 143rd Street	Capacity Improvements/Modify Interchanges	II (2031-2035)	87270000
20	SR 9A/I-95 From South of NW 62nd Street to North of NW 143rd Street	SR 9A/I-95	South of NW 62nd Street	North of NW 143rd Street	Capacity Improvements/Modify Interchanges	III (2036-2040)	87270000
21	SR 9A/I-95 From North of NW 143 Street to South of SR 860/Miami Gdns Dr	SR 9A/I-95	North of NW 143 Street	South of SR 860/Miami Gardens Dr	Capacity Improvements/Modify Interchanges	II (2031-2035)	87270000

Project ID	PROJECT (Descriptive) Name	FACILITY	FROM	TO	PROJECT Description / Details	Specify Proposed Planning Period	Roadway ID
22	SR 9A/I-95 From North of NW 143 Street to South of SR 860/Miami Gdns Dr	SR 9A/I-95	North of NW 143 Street	South of SR 860/Miami Gardens Dr	Capacity Improvements/Modify Interchanges	IV (2041-2050)	87270000
23	SR 9A/I-95 From N. of Biscayne Canal to SR 860/Miami Gardens Dr	SR 9A/I-95	N. of Biscayne Canal	SR 860/Miami Gardens Dr	Add Lanes and Reconstruction	II (2031-2035)	87270000
24	SR 953/NW 42nd Ave with SR 948/NW 36 St and SR 25/Okeechobee Rd - Iron Triangle	SR 953/NW 42nd Ave/SR 948/NW 36 St/SR 25/Okeechobee Rd	-	-	Intersection Improvements	II (2031-2035)	87000327, 87083500, 87090000, 87220000, 87281000, 87281001
25	SR 953/NW 42 Avenue with SR 948/NW 36 Street and SR 25/Okeechobee Rd	SR 953/NW 42 Avenue with SR 948/NW 36 Street and SR 25/Okeechobee Rd	-	-	Ultimate improvement for the "Iron Triangle"	LOPP	-
26	SR 826/Palmetto Expressway from N. of Canal C-8 Bridge (NW 162 St) to E. of NW 67 Ave	SR 826/Palmetto Expressway	North of Canal C-8 Bridge	E. of NW 67 Ave	Add Lanes and Reconstruction	III (2036-2040)	87260000
27	SR 826/Palmetto Expressway from I-75 to North of Canal C-8 Bridge	SR 826/Palmetto Expressway	I-75	North of Canal C-8 Bridge	Add Lanes and Reconstruction	III (2036-2040)	87260000
28	SR 826/Palmetto Expressway from E. of NW 67 Ave to E. of NW 57 Ave	SR 826/Palmetto Expressway	E. of NW 67 Ave	E. of NW 57 Ave	Add Lanes and Reconstruction	III (2036-2040)	87260000
29	SR 826/Palmetto Expressway from E. of NW 42 Ave to E. of NW 32 Ave	SR 826/Palmetto Expressway	E. of NW 57 Ave	E. of NW 42 Ave	Add Lanes and Reconstruction	III (2036-2040)	87260000
30	SR 826/Palmetto Expressway from E. of NW 42 Ave to E. of NW 32 Ave	SR 826/Palmetto Expressway	E. of NW 42 Ave	E. of NW 32 Ave	Add Lanes and Reconstruction	III (2036-2040)	87260000
31	SR 826 (Palmetto Expy) and US 1 (South Dixie Hwy/SR 5)	SR 826 (Palmetto Expy) and US 1 (South Dixie Hwy/SR 5)	Transitway	SR 826 (Palmetto Expy)	Direct access ramps	UF (2051 and beyond)	
32	SR 5 (US 1/Dixie Hwy) Grade Separation at NE 186 St/Miami Gardens Dr	SR 5 (US 1/Dixie Hwy)	at NE 186 St/ Miami Gardens Dr	at NE 186 St/ Miami Gardens Dr	East/West Grade Separated Overpass (GSO) over the FEC Rail Line	II (2031-2035)	87026000, 87030000
33	SR 5 (US 1/Dixie Hwy) Grade Separation at NE 163 St	SR 5 (US 1/Dixie Hwy)	at NE 163 St	at NE 163 St	East/West Grade Separated Overpass (GSO) over the FEC Rail Line	II (2031-2035)	87030000, 87170000
34	Shore Power	Shore Power	-	-	Transit. Provide Shore Power to all cruise terminals which will allow ship to turn off their primary engines while docked, resulting in reduced air emissions	LOPP	
35	realign NW 77ct to align with SB onboard ramp at 826	NW 77th Ct			Realign intersection to improve traffic flow	To be determined after completion of master plan and adjacent studies	
36	Rail Safety Analysis	Rail Safety Analysis	Countywide	Miami-Dade County Rail System	Planning Study	UF (2051 and beyond)	
37	Rail Land Use Analysis and Small Rail Yard Opportunities/Distribution Centers	Rail Land Use Analysis and Small Rail Yard Opportunities/Distribution Centers	Countywide		Planning Study	UF (2051 and beyond)	
38	Rail Connections/Freight Opportunities	Rail Connections/Freight Opportunities	Countywide	Freight Rail Corridors	Planning Study	UF (2051 and beyond)	
39	Port of Miami Tunnel Oversight Consultant	Port of Miami Tunnel	N/A	N/A	Inspect Construction Projects	II (2031-2035)	87059000
40	Port of Miami Tunnel Oversight Consultant	Port of Miami Tunnel	N/A	N/A	Inspect Construction Projects	III (2036-2040)	87059000
41	Port of Miami Tunnel Oversight Consultant	Port of Miami Tunnel	N/A	N/A	Inspect Construction Projects	IV (2041-2050)	87059000
42	Port of Miami Tunnel From Port of Miami to SR 836/I-395- Phase 52	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Repay Project Capital Cost	II (2031-2035)	87059000

Project ID	PROJECT (Descriptive) Name	FACILITY	FROM	TO	PROJECT Description / Details	Specify Proposed Planning Period	Roadway ID
43	Port of Miami Tunnel From Port of Miami to SR 836/I-395- Phase 52	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Repay Project Capital Cost	III (2036-2040)	87059000
44	Port of Miami Tunnel From Port of Miami to SR 836/I-395- Phase 52	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Repay Project Capital Cost	IV (2041-2050)	87059000
45	Port of Miami Tunnel From Port of Miami to SR 836/I-395 - Phase 82	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Operations Consultant	II (2031-2035)	87059000
46	Port of Miami Tunnel From Port of Miami to SR 836/I-395 - Phase 82	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Operations Consultant	III (2036-2040)	87059000
47	Port of Miami Tunnel From Port of Miami to SR 836/I-395 - Phase 82	Port of Miami Tunnel	Port of Miami	SR 836/I-395	Operations Consultant	IV (2041-2050)	87059000
48	Port Miami Tunnel Phase A8	Port of Miami Tunnel	Watson Island	MacArthur Bridge	Administration Other Agency	II (2031-2035)	87059000
49	Port Miami Tunnel Phase A8	Port of Miami Tunnel	Watson Island	MacArthur Bridge	Administration Other Agency	III (2036-2040)	87059000
50	Port Miami Tunnel Phase A8	Port of Miami Tunnel	Watson Island	MacArthur Bridge	Administration Other Agency	IV (2041-2050)	87059000
51	NW South River Drive	NW South River Drive	NW 107 Avenue	NW 74 Avenue	Traffic Study	UF (2051 and beyond)	
52	NW South River Dr	NW South River Dr	NW 107 Ave	NW 74 Ave	Roadway and operational improvements	II (2031-2035)	
53	NW South River Dr	NW South River Dr	NW 32 Av	NW 38 AV	ROADWAY IMPROVEMENTS	UF (2051 and beyond)	
54	NW S. River Drive over FEC Canal	NW S. River Drive over FEC Canal	East of NW 74th Street	-	BRIDGE REPAIR/REPLACEMENTS	UF (2051 and beyond)	
55	NW 97 Avenue	NW 97 Avenue	North of NW 74 Street	NW 106 Street	PD&E Study	II (2031-2035)	
56	NW 90 Street	NW 90 Street	NW 87 Avenue	NW 97 Avenue	PD&E Study	UF (2051 and beyond)	
57	NW 72 Ave (Milam Dairy)	NW 72 Ave (Milam Dairy)	Hialeah Expy		Operational improvements	III (2036-2040)	
58	NW 36 St/NW 41 St (SR 948/Doral Blvd)	NW 36 St/NW 41 St (SR 948/Doral Blvd)	SR 821 (HEFT)	NW 42 Ave (LeJeune Rd)	Redesign NW 36 St/NW 41 St as a super arterial express street	UF (2051 and beyond)	
59	NW 25th Street	NW 25th Street	NW 117th Ave	NW 87th Ave	ROADWAY IMPROVEMENTS	UF (2051 and beyond)	
60	NW 25 ST Bridge Replacement N Line Canal Culvert	NW 25 ST Bridge Replacement N Line Canal Culvert	SW 84 AVE	SW 82 AVE	BRIDGE REPAIR/REPLACEMENTS	UF (2051 and beyond)	
61	NW 25 St	NW 25 St	-	-	Viaduct Extension	UF (2051 and beyond)	
62	NW 22 Avenue	NW 22 Avenue	SR-916/NW 135 Street	NW 151 Street	Traffic Study	I (2026-2030)	
63	NW 122 Street	NW 122 Street	US-27/Okeechobee Road	SR-826/Palmetto Expressway	Use of Traffic Adaptive Signal System throughout the corridor	UF (2051 and beyond)	
64	NW 107 Ave	NW 107 Ave	NW 25 St	NW 41 St	Add 2 lanes and reconstruct	II (2031-2035)	
65	NW 106 Street/NW 116 Way/Hialeah Gardens Boulevard	NW 106 Street/NW 116 Way/Hialeah Gardens Boulevard	SR-821/HEFT	I-75/NW 138 Street	Operational Improvements	I (2026-2030)	
66	NW 106 Street/NW 116 Way/Hialeah Gardens Boulevard	NW 106 Street/NW 116 Way/Hialeah Gardens Boulevard	SR-821/HEFT	US-27/Okeechobee Road	TSMNO	I (2026-2030)	
67	Net Zero Cargo Supply Chain Program - Inland Port	Net Zero Cargo Supply Chain Program - Inland Port	-	-	Transit. Following the planning study, develop an inland port to expand cargo business opportunities and competitiveness	LOPP	
68	Net Zero - Inland Port Development	Net Zero - Inland Port Development	-	-	Transit. Continue Inland Port development of the container storage and transfer staging areas	LOPP	
69	NE 215 Street	NE 215 Street	NE 2 Avenue	NE 12 Avenue	Roadway Rehabilitation	UF (2051 and beyond)	
70	Microfreight Pilot Project Opportunities	Microfreight Pilot Project Opportunities	Countywide		Planning Study	UF (2051 and beyond)	
71	Miami-Dade County Rail Grade Separation Study (County Roads)	Miami-Dade County Rail Grade Separation Study (County Roads)	Countywide	County Owned At Grade Rail Crossings	Planning Study	II (2031-2035)	
72	Miami Dade County Rail Delay Study	Miami Dade County Rail Delay Study	Countywide	County Owned At Grade Rail Crossings	Planning Study	II (2031-2035)	

Project ID	PROJECT (Descriptive) Name	FACILITY	FROM	TO	PROJECT Description / Details	Specify Proposed Planning Period	Roadway ID
73	Infrastructure Improvements - Portwide	Infrastructure Improvements - Portwide	-	-	Transit. Portwide infrastructure improvements including beautification, drainage, dredging, road improvements, photovoltaics, generators, batteries, electric connectivity and charging stations, BMS upgrades, wayfinding, landscape, lighting, sidewalks, etc.	LOPP	
74	Infrastructure Improvements - Channel Modifications	Infrastructure Improvements - Channel Modifications	-	-	Transit. PortMiami channel modifications as per the Miami Harbor Improvements	LOPP	
75	I-75/SR 93/SR 826 (Palmetto Expy) Interchange	I-75/SR 93	I-75/SR 93	SR 826 (Palmetto Expy)	Modify Interchange	II (2031-2035)	87075000
76	I-75/SR 93/SR 826 (Palmetto Expy) Interchange	I-75/SR 93	I-75/SR 93	SR 826 (Palmetto Expy)	Modify Interchange	III (2036-2040)	87075000
77	I-75/SR 93/SR 821 (HEFT) Interchange	I-75/SR 93/SR 821 (HEFT) Interchange	CD Rd	Miami Gardens Dr	Modify Interchange	II (2031-2035)	87075000
78	I-75/SR 93/SR 821 (HEFT) Interchange	I-75/SR 93/SR 821 (HEFT) Interchange	CD Rd	Miami Gardens Dr	Modify Interchange	III (2036-2040)	87075000
79	I-75/SR 93/Miami Gardens Interchange	I-75/SR 93/Miami Gardens Interchange	SR 821 (HEFT)	NW 170 St	Modify Interchange	II (2031-2035)	87075000
80	I-75/SR 93/Miami Gardens Interchange	I-75/SR 93/Miami Gardens Interchange	SR 821 (HEFT)	NW 170 St	Modify Interchange	III (2036-2040)	87075000
81	I-75/SR 93 Corridor Improvements	I-75/SR 93	NW 138 St	SR 826 (Palmetto Expy)	Ultimate Plan	II (2031-2035)	87075000
82	I-75/SR 93 Corridor Improvements	I-75/SR 93	NW 138 St	SR 826 (Palmetto Expy)	Ultimate Plan	III (2036-2040)	87075000
83	I-75/SR 93 at NW 138 St	I-75/SR 93	at NW 138 St		Modify Interchange	II (2031-2035)	87075000
84	I-75/SR 93 at NW 138 St	I-75/SR 93	at NW 138 St		Modify Interchange	III (2036-2040)	87075000
85	I-75 CD System PD&E from SR 826/Palmetto Expwy to Broward County Line	I-75 / SR 93	SR 826/Palmetto Expy	Broward County Line	Collector-Distributor (CD) System Road	II (2031-2035)	87075000
86	I-75 CD System PD&E from SR 826/Palmetto Expwy to Broward County Line	I-75 / SR 93	SR 826/Palmetto Expy	Broward County Line	Collector-Distributor (CD) System Road	III (2036-2040)	87075000
87	Hard Rock Stadium/NW 199 Street	Hard Rock Stadium/NW 199 Street	NW 27 Avenue	NW 14 Court	Roadway Rehabilitation	UF (2051 and beyond)	
88	Federal Inspection Facility	Federal Inspection Facility	-	-	Transit. Build new facility for Immigration and US Customs Border Protection	LOPP	
89	Develop sustainable and Socially Concious Freight Policies and Regulations	Develop sustainable and Socially Concious Freight Policies and Regulations	Countywide		Planning Study	UF (2051 and beyond)	
90	Curb management Freight Analysis	Curb management Freight Analysis	Countywide		Planning Study	UF (2051 and beyond)	
91	Crossing Surface Condition Assessment	Crossing Surface Condition Assessment	Countywide	County Owned At Grade Rail Crossings	Planning Study	II (2031-2035)	
92	Miami Lakes NW 59th Avenue Roadway Extention and Redevelopment Project	NW 59th Ave	NW 158th St	NW 151st St	Extend NW 59th Ave via a new bridge across the canal and Opa Locka Airport air strip	under design	
93	FDOT SR826 Improvements - Reconfigure NW67th Avenue and Palmetto Intersection (FDOT)	NW 67th Ave			Realign interchange to improve traffic flow details of implementation to be determined	To be determined after completion of master plan and adjacent studies	
94	FDOT SR826 Improvements - Reconfigure NW57th Avenue and Palmetto Intersection (FDOT)	NW 57th Ave			Realign interchange to improve traffic flow details of implementation to be determined	To be determined after completion of master plan and adjacent studies	
95	Build I-75 Connection at NW87th Avenue	NW 87th Ave			Details of implementation to be determined	To be determined after completion of master plan and adjacent studies	

SMART 2045
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