CAMBRIDGE SYSTEMATICS

Transportation and Economic Impacts of the Freight Industry in Miami-Dade County

final

report

prepared for

Miami-Dade Metropolitan Planning Organization

prepared by

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with

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December 2011

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Table of Contents

Executive Summary **1**

1.0 Introduction **1-1**
1.1 Study Background 1-1
1.2 Study Purpose 1-3
1.3 Methodology 1-3

2.0 Current Transportation Impacts of Freight Activity in Miami-Dade County (2010) **2-1**
2.1 Major Elements of Freight Infrastructure in Miami-Dade County 2-1
2.2 Current Freight Activity in the County (2010) 2-15
2.3 Major Developments in Freight Infrastructure 2-18

3.0 Economic Impacts of Freight Activity in Miami-Dade County (2008) **3-1**
3.1 Industry Definition and Methodology 3-1
3.2 Existing Economic Impact Analyses 3-3
3.3 Direct impacts of Freight Activity in Miami-Dade County (2008) 3-5
3.4 Multiplier impacts of Freight Transportation in Miami-Dade County (2008) 3-14
3.5 Summary of Impacts and Perspective 3-17

4.0 Future Economic Impacts of Freight Activity in Miami-Dade County (2035) **4-1**
4.1 Freight flows forecast 4-1
4.2 Future economic impacts (direct/indirect/induced) 4-5

List of Tables

Table 2.1 Breakdown of International Cargo at the Port of Miami, 2010 2-3

Table 2.2 Top Commodities Handled at the Port of Miami, 2010 2-3

Table 2.3 Major Commodities of the Port of Miami River, 2009 2-4

Table 2.4 Major Commodities of Miami International Airport, 2010 2-6

Table 2.5 SIS Roadway Facilities within Miami-Dade County 2-8

Table 2.6 Corridors of Regional Significance within Miami-Dade County 2-8

Table 2.7 Warehousing Industry Sectors within Miami-Dade County by NAICS Code, with Square Footage of 10,000+ 2-10

Table 2.8 Warehousing Establishments with $10M+ in Sales in Miami-Dade 2-11

Table 2.9 Top 5 Wholesale Trade Establishments in Miami-Dade by Employees 2-13

Table 3.1 Economic Impacts Measured 3-2

Table 3.2 Economic Impact of the Port of Miami Cargo Activity, FY 2007 3-4

Table 3.3 Jobs Generated by MIA's Cargo Operation 3-5

Table 3.4 Direct Economic Impacts of Freight Industry in Miami-Dade, 2008 3-6

Table 3.5 Distribution of Freight Transportation Impacts by Industry Sector, 2008 3-7

Table 3.6 In-House Freight Transportation Impact 3-8

Table 3.7 Tax Revenue from Freight Activity in County, 2008 3-9

Table 3.8 Negative Impacts from Freight in Miami-Dade, 2008 3-11

Table 3.9 Traffic Delay from Rail Crossing, 2008 3-13

Table 3.10 Air Quality Impacts from Truck Traffic in Miami-Dade 3-13

Table 3.11 Combined Economic Impacts from Freight Activity in Miami-Dade County, 2008 3-14

Table 3.12 Construction Investment for Freight Projects in Miami-Dade, Fiscal Years 2011-16 (in millions) 3-17

Table 3.13 Economic Impacts of Freight Transportation in Miami-Dade County (in millions of dollars), 2008 3-18

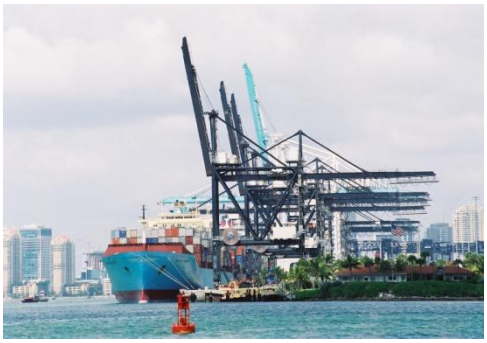
Table 3.14 Net Economic Impact of Freight Activity in Miami-Dade County 3-18
Table 3.15 Freight Industry Contribution to Miami-Dade Economy 3-19
Table 3.16 Top Industry Sectors by Jobs in Miami-Dade, 2008 3-19
Table 4.1 Container Traffic Forecasts at Port of Miami (in TEUs) 4-2
Table 4.2 Miami International Airport Cargo Forecast 4-3
Table 4.3 Miami-Dade Freight Flow Forecast 4-4
Table 4.4 Growth of Freight Transportation Jobs by Industry Sector 4-7
Table 4.5 Economic Impacts of Freight Transportation in Miami-Dade County (in millions of dollars), 2008 and 2035 4-8
Table 4.6 Net Economic Impact of Freight Activity in Miami-Dade County 4-8

List of Figures

Figure 2.1 Freight Infrastructure within Miami-Dade County 2-2
Figure 2.2 Truck AADT of Major Roadways within Miami-Dade County, 2010 2-9
Figure 2.3 Warehousing Establishments within Miami-Dade County, with Square Footage over 10,000, by Annual Sales Volume, 2010 2-12
Figure 2.4 Wholesale Establishments within Miami-Dade County, with over 25 employees, 2010 2-14
Figure 2.5 Freight Traffic by Direction (millions of tons) 2-16
Figure 2.6 Freight Traffic by Mode (millions of tons) 2-17
Figure 2.7 Planned Rail Improvements 2-20
Figure 3.1 Definition of Miami-Dade County's Freight Industry 3-2
Figure 3.2 Base Year Economic Impacts Methodology 3-3
Figure 3.3 Distribution of Freight Jobs by Industry Sector, 2008 3-7
Figure 3.4 Breakdown of Indirect Jobs by Industry Sector, 2008 3-15
Figure 3.5 Breakdown of Induced Jobs by Industry Sector, 2008 3-16
Figure 4.1 Miami-Dade Population Forecast 4-5
Figure 4.2 Forecast Methodology 4-6

Executive Summary

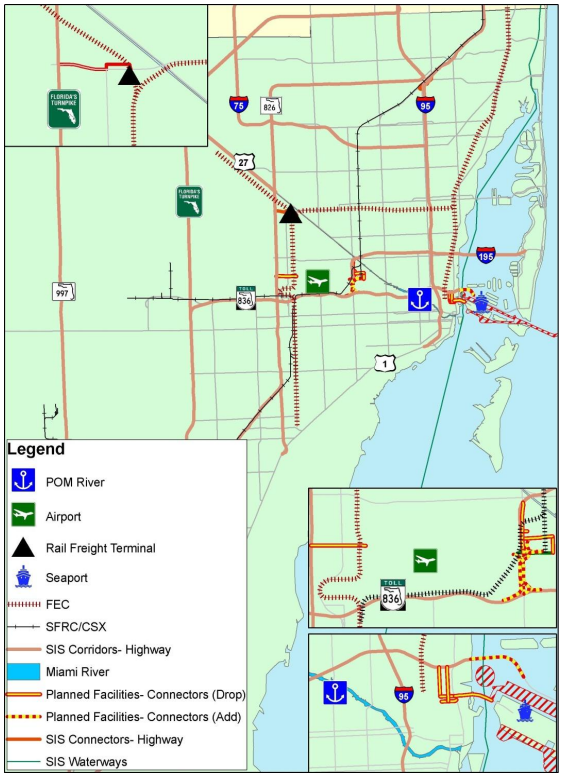
Miami-Dade County is an international marketplace driven by a well-established freight transportation system that serves as the cornerstone of the region's economy, providing goods and services to Florida's largest consumption market as well as connecting the region to the global economy through major sea and air gat gateways. This robust system helps lower the costs of moving goods and doing business in the region, thereby allowing the County to be more competitive in the attraction and retention of businesses – and well-paying jobs. Businesses directly involved in moving freight generate 275,000 jobs in Miami-Dade, representing over $42 billion in economic output, and a gross regional product of $25 billion. In fact, the freight industry is the third largest sector in Miami-Dade's economy behind finance, insurance and real estate (FIRE) and retail industry sectors.



The ***Transportation and Economic Impacts of the Freight Industry in Miami-Dade County Study*** provides the County with a critical tool to help understand the magnitude of the freight industry. The study describes the County's current infrastructure by mode, existing and future freight flows, and their corresponding economic impacts in 2008 and 2035. The economic impacts are summarized in terms of jobs, wages, economic output, gross regional product, tax revenue generated, and costs (road maintenance, congestion, and rail crossing delay).

What Are the Freight-Significant Features of Miami-Dade County?

Miami-Dade County has an extensive freight system consisting of the Port of Miami, Miami International Airport, the Port of Miami River, CSX and FEC rail corridors and terminals, and a dense infrastructure of private warehouse and distribution center facilities – all connected and served by a network of highway corridors. The major roadway corridors have been designated as part of either the Strategic Intermodal System (SIS) or the Southeast Florida Transportation Council's (SEFTC) Corridors of Regional Significance.



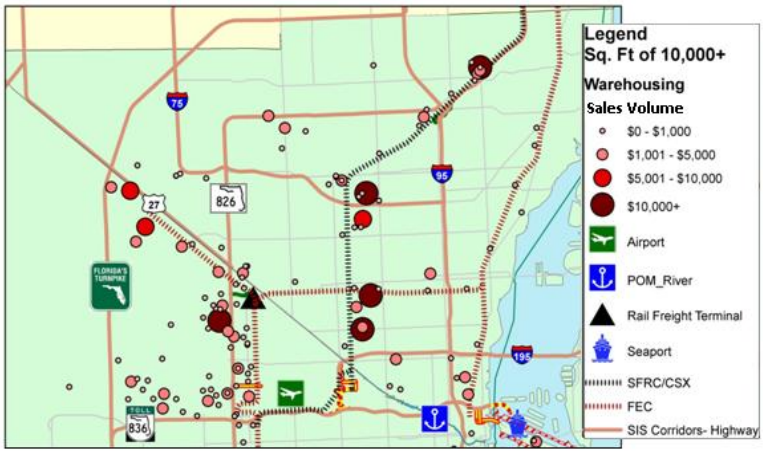
The Port of Miami (POM) is the largest container port in the state, handling over 850,000 TEUs (twenty-foot equivalent container units) of goods. Cargo destined for more than 100 countries and 250 ports around the world flow through the POM. Significant infrastructure improvements are underway to allow the port to nearly triple this volume by 2035 – and more importantly, be the

first and only port in Florida that will be "open for business" when the widening of the Panama Canal is completed in 2014. These improvements include deepening the main channel to 50 feet to serve the next generation of mega containerships, re-establishing on-port rail service with the Florida East Coast Railway to provide direct rail connections to U.S. hinterland markets, and building a tunnel to provide trucks with direct access to the interstate highway system.

Miami International Airport is the fourth largest cargo airport in the country with over 2 million tons of freight annually. More importantly, MIA is the dominant airport in the US for the import of perishables, including flowers, fruits and vegetables, and fish. These shipments come from all over the world, but the primary trading partner/region is South America and MIA handles over 80 percent of them. The final phase of the 25th Street Viaduct project will commence in 2012, representing a significant improvement in access to MIA's air cargo operation. Additional terminal side improvements are also underway to ensure MIA maintains its competitive position globally.

The County also is served by two freight operating railroads: CSX Transportation and the Florida East Coast Railway (FEC). The CSX freight network within Miami-Dade County consists of carload and bulk service, including aggregate and general merchandise. It has a yard in Hialeah that supports its carload operations. It operates on the South Florida Corridor (SFRC), which is owned by the state of Florida and used by Tri-Rail and Amtrak. The FEC is a Class II railroad that provides north-south service along the Atlantic Coast between Miami and Jacksonville. The FEC provides exclusive rail service to the Port of Miami, Port Everglades, and Port of Palm Beach. Both of these railroads provide Miami-Dade County with direct access to the rest of North America through the rail gateway in Jacksonville.

Miami-Dade County is also host to an extensive network of warehouses focusing on general merchandise, refrigerated goods, and farm products. The establishments are spread out across the County, but cluster around the major freight roadway and rail corridors – primarily SR-826, SR-836 and US-27 – and the major hubs – MIA, POM, FEC, CSX. There is a major concentration of Warehousing establishments within the Doral and Medley industrial areas.



How Significant Is Goods Movement in the Region?

Miami-Dade's freight infrastructure handled over 137 million tons of domestic and international freight in 2010. Trucks handled the largest volume of traffic by weight (75%), followed by the railroads (11%), the waterborne system (5%), and aviation system (8%). Domestically, goods were primarily transported to/from other counties within Florida, and to a lesser degree Alabama, Georgia, Tennessee, and the Carolinas.

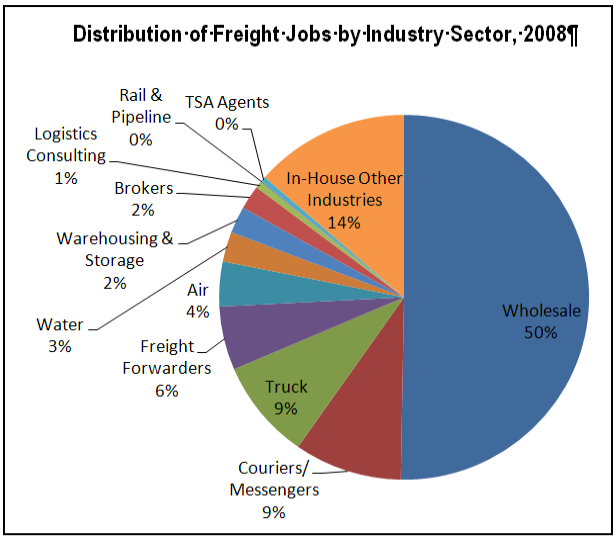
In terms of international trade, Miami is known as the World's gateway to Latin America, through the use of MIA and the POM. MIA is the leader in trade with the Americas and the world's largest gateway to Latin America and the Caribbean, making it the dominant north/south cargo operation in the Western Hemisphere. The airport handles 83% of all air imports and 81% of all exports from the Latin American / Caribbean region; MIA serves as the hub for distribution of perishable products, hi-tech commodities, telecommunications equipment, textiles, pharmaceuticals and industrial machinery. The POM connects the United States to key trading partners in Central, South America, and the Caribbean, including the Bahamas, with over 1 million tons of freight, the Dominican Republic (619,000 tons), and Honduras (436,000 tons). The Port also does significant trade with China and other Asian countries, a market that is projected to continue increasing significantly over the next decade.

Why Is Freight Important to Miami-Dade County?

Miami-Dade is home to approximately 2.5 million people. These residents rely on freight transportation to obtain goods needed on a daily basis, including milk, bread, coffee, oranges, medicine, office supplies, to name just a few. Efficient and reliable freight movement is critical to the local economy – the higher the cost of moving goods, the higher the price of the products we buy and the higher the cost of living and doing business in the County, resulting in a reduced ability to attract and retain jobs in the region. An efficient freight transportation system allows businesses to import and export goods at a more competitive rate, which enhances the quality of life in Miami-Dade County and supports ongoing economic expansion.

In order to quantify the impact of the freight activity in the County, the industry was defined as: ***the transportation (and related services) of goods from point of production or import through delivery at retail locations or ports for export.*** This definition covers hauling goods from production sources or point of import to wholesale distributors, and subsequently to retail outlets, as well as from point of production to point of export. The supporting services provided by warehouses, freight forwarders, brokers, and logistics companies are also included.

The freight industry sector was directly responsible for 151,000 jobs in Miami-Dade County in 2008. Approximately half of these jobs consist of wholesale trade, while couriers/messengers, truckers, and forwarders each make up over five percent of the industry. As a group, in-house freight transportation jobs accounted for the second largest source of jobs within freight. These relate to establishments that handle their own goods movement in-house, such as Wal-Mart owning and managing their own fleet of trucks.



These jobs in turn produce an additional 123,000 jobs in Miami-Dade through indirect (business-to-business transactions) and induced (business-to-direct employees transactions) impacts, for a total 274,552 jobs in the County, with an average compensation of $54,374 (including benefits). Indirect jobs are focused primarily in business services such as banking, finance, and insurance, while induced jobs are more diverse covering retail trade, health care, finance, leisure/hospitality, and others. Taken together, the direct, indirect, and induced jobs generate over $42 billion in economic output in the County and a gross regional product of $25 billion. This represents a sizeable portion of Miami-Dade's economy, which hosts 1.4 million jobs and a Gross Regional Product of $111 billion.

Metric	Direct	Indirect	Induced	Total	Multiplier
Jobs	151,314	48,841	74,397	274,552	1.81
Labor Income (millions)	$ 9,124	$ 2,589	$ 3,173	$ 14,886	1.63
Average Compensation	$ 60,297	$ 53,009	$ 42,655	$ 54,219	------
GRP (millions)	$15,098	$ 4,111	$ 5,897	$ 25,106	1.66
Economic Output (millions)	$25,845	$ 7,146	$ 9,805	$ 42,796	1.66

In addition to the employment, GRP, and economic output, freight activity in the County also generates other positive and negative contributions to the local economy. The positive impacts include tax revenue from equipment, truck registrations, fuel sales, real estate, and business taxes, as well as the influx of construction dollars from non-County sources for freight related projects. The tax revenues in 2008 amounted to $542 million, while the freight related construction projects brought in $310 million during that same year, for an overall positive impact of $852 million. Negative impacts or costs included pavement deterioration and congestion generated by truck traffic, and delay at rail-grade crossings from FEC and CSX traffic. These externalities had an adverse impact of approximately $400 million on the county's residents and visitors in 2008.

Impact Type	Metric	2008 Impact (millions)	Source
Positive	Equipment Taxes	$9	Miami-Dade County
	Truck Registrations	$272	Miami-Dade County
	Fuel Taxes	$11	FL Dept of Revenue
	Real Estate Taxes	$249	Miami-Dade County
	Business Taxes	$1	Miami-Dade County
	Freight-Related Construction Projects	$310	Miami-Dade County
Negative	Road Maintenance	$102	FDOT/FHWA
	Congestion	$297	FDOT/FHWA
	Rail Crossings	$2	CS/FDOT

The net impact from freight in the county amounts to $25.5 billion in economic activity annually. This is the result of adding together the positive impacts (GRP, various sources of tax revenue, and the freight-related construction impacts) and subtracting the negative impacts.

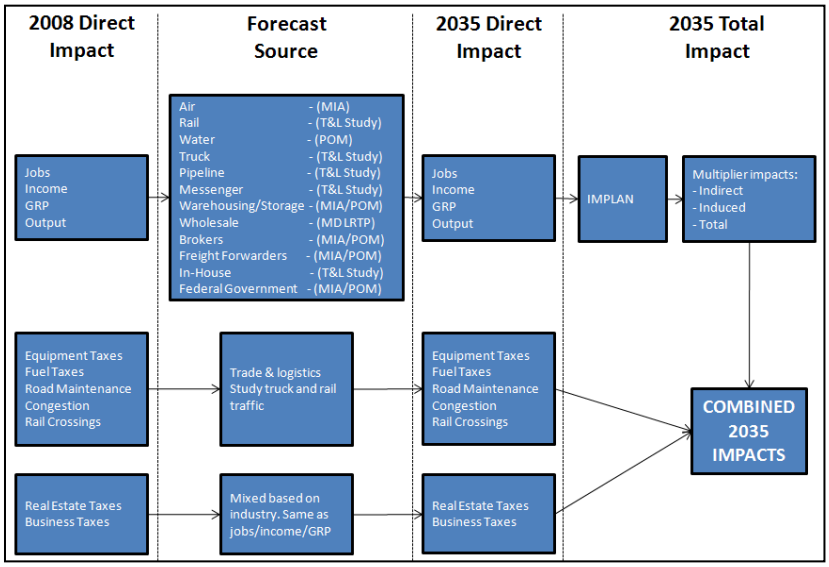
Impact Type	Metric	2008 Impact (millions)
Positive	Gross Regional Product	$25,106
	Tax Revenue	$542
	Freight-Related Construction Projects	$310
Negative	Maintenance, congestion, delay	$401
Net	Combined Impact	$25,557

How Much Freight-Related Economic Activity Will There Be in the Future?

There are numerous trends that are likely to impact future freight traffic in the region, including population and employment growth, and the expansion of the Panama Canal and the region's ability to attract additional Asian-cargo through the airport and seaport gateways. Using data from the MPO population forecast, the POM and MIA cargo forecasts, and the Florida Trade and Logistics Study, total freight volumes are projected to grow by approximately 60 percent throughout the region between 2010 and 2035. The POM and MIA traffic are projected to see the largest growth over the next 25 years, with annual rates of around four percent, while truck and rail traffic see more modest increases. In total freight traffic is projected to grow at a two percent rate annually from 138 million tons to 222 million tons in 2035.

Mode	2010 Tons (millions)	2035 Tons (millions)	Annual Growth Rate	Source
Truck	103	159	1.7%	T&L Study
Rail	15	18	0.7%	T&L Study
Seaport	7	21	4.4%	POM
Air	2	5	3.7%	MIA
Other	11	21	2.5%	T&L Study
Total	**138**	**222**	**1.9%**	**Total**

Using the forecast freight data for each mode, economic activity was estimated for 2035. The freight industry is projected to have strong growth in Miami-Dade County, with most of the key economic metrics rising nearly two percent annually over the next 25 years. Total jobs (direct, indirect, and induced) are projected to increase a combined 65 percent reaching 450,000, with an average compensation of $53,000 per year. This activity will result in over $870 million in tax revenue for the county, and an average annual influx of $417 million from freight related construction projects. Negative impacts or costs are projected to cost the county's residents and visitors $640 million annually in road maintenance, congestion, and rail crossings delay.

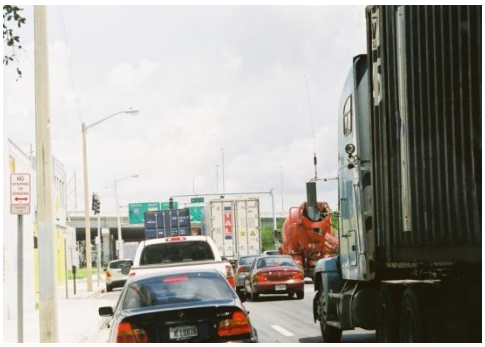


Impact Type	Metric	2008 Impact	2035 Impact	Resulting CAGR*
	Jobs	274,552	453,949	1.9%
	Output	$42,796	$70,648	1.9%
	Labor Income	$14,886	$24,025	1.8%
	Value Added (GDP)	$25,106	$40,088	1.7%
Positive	Equipment Taxes	$9	$13	1.4%
	Truck Registrations	$272	$433	1.7%
	Fuel Taxes	$11	$17	1.7%
	Real Estate Taxes	$249	$412	1.9%
	Business Taxes	$1	$1	1.1%
	Net Construction Impact	$310	$417	1.1%
Negative	Road Maintenance	$102	$163	1.7%
	Congestion	$297	$474	1.7%
	Rail Crossings	$2	$3	0.7%

* CAGR – Compounded Annual Growth Rate

How Will This Report Be Used?

The ***Transportation and Economic Impacts of the Freight Industry in Miami-Dade Study*** will provide the County with a valuable instrument to help understand the magnitude of the freight industry. This understanding will help build support for ongoing investments and improvements to our freight transportation system. The world economy becomes more global and integrated with the passing of every new free trade agreement and efficiency improvement



in the transportation industry. The free trade agreements with South Korea, Colombia and Panama are anticipated to have significant impacts over the next decade. The ongoing shift to larger container vessels will also change the economies of scale, particularly for the select number of seaports that are successful in becoming a first port of call for Asian cargo. It is critical that Miami-Dade County remain committed to preparing for and competing for these new and expanded opportunities for growth in international trade. This will remain a challenge in an environment with less and less funding. However, this report provides freight transportation leaders with an additional resource to help continue building support for our freight transportation system by documenting the significant benefits of the freight community on the strength of our regional economy today and in the future.

1.0 Introduction

1.1 STUDY BACKGROUND

Miami-Dade County is home to a well-established freight transportation system. This system serves as the cornerstone of the region's economy, providing goods and services to Florida's largest consumption market as well as connecting the region to the global economy through major sea and air gateways. The ***Transportation and Economic Impacts of the Freight Industry in Miami-Dade County Study*** provides the County with a critical tool to help promote the magnitude of the freight industry. This is critical as Miami-Dade continues to position itself to compete on a global scale.

Miami-Dade's landscape illustrates the strength and impact of the freight system. The following provides a high level summary of the regional system today:

- Miami-Dade County is home to a multi-cultural community; it is an international destination dominated by tourism, international trade, agriculture and mining, and natural resources – home to Everglades National Park;
- In 2008 Port of Miami was the largest container port in Florida and is known as the cruise capital of world;
- Miami International Airport handles almost 80 percent of Florida's air cargo and was the 10th busiest cargo airport in world in 2008;
- 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;
- Mature warehouse/distribution center infrastructure is in place in western Miami-Dade County that supports all of South Florida; this includes a significant international banking and brokerage infrastructure to facilitate international trade;
- Well established network of roadways provide regional mobility as well as gateways to Florida and more distant markets; and
- Two railroads serve the region connecting South Florida to the rest of North America, providing intermodal and carload services.

Within this context, there are several major developments recently completed, underway and/or planned that continue to build upon what Miami-Dade County already has in place. Since completion of the first MPO-sponsored freight study in Florida in 1996, the Miami-Dade MPO has continued to expand its freight program. Today, it has a library of work and an active Freight

Transportation Advisory Committee (FTAC) in place to ensure the freight industry has a voice. Other key developments include:

- Widening of the Panama Canal is underway and will allow for larger vessels to serve the East Coast from the Far East; this is creating new opportunities for the Port of Miami as it competes to be an East Coast first port of call;
- The Florida Trade and Logistics Study was recently completed; it recommends potential strategies to help Florida achieve improved global status for its supply chain infrastructure;
- Port of Miami is dredging to 50 feet; currently, it is the only seaport in Florida approved by the United States Army Corp of Engineers (USACE) to deepen to 50-feet; the Florida Legislature committed the final financial resources in early 2011 to make the project a reality;
- Port of Miami Tunnel is under construction, which will connect the port directly to the Interstate System, removing the need to travel on city streets in downtown Miami;
- Port of Miami is rehabilitating its on-port rail system; using TIGER II funding, the Port will repair the bascule bridge and construct a small rail yard on-port that will be used to build intermodal train segments;
- FEC Railway, in close coordination with the Port of Miami, is improving its line between the port and its Hialeah Yard; Flagler Development is also moving forward with plans to construct the Flagler Logistics Hub within the Hialeah complex to further leverage the logistics, air and marine industries;
- Phase 1 of the 25th Street Viaduct project is complete; Phase 2 will be begin construction in 2012, which will provide an improved connection between cargo operations at Miami International Airport and SR 826;
- South Florida is exploring the use of technology to improve the operation of the freight system; the Virtual Freight Network concept is under development as part of the Transportation System Management and Operations (TSM&O) program being developed by FDOT;
- Port of Miami and Miami International Airport have undertaken detailed economic impact analyses to document their contributions to the South Florida economy; this included updates to their master plans;
- South Florida Regional Freight Plan was completed in 2010 by FDOT in partnership with the three MPOs; and
- ***Southeast Florida Freight Summit: Implementing the Plan*** was held at Port Everglades on November 18, 2011. This summit brought together over 100 regional freight stakeholders to discuss opportunities to improve the region's freight transportation system, as well as discuss new opportunities in international trade.

1.2 STUDY PURPOSE

With all of these developments underway, it is critical that Miami-Dade County position itself to maximize the benefits and opportunities offered by its freight transportation system and supporting industry. One of the key ways to do this is to build and expand community support for the direct and indirect elements of the freight system. This is particularly important given the desires of industry in the region. Quantifying the overall impact of freight and logistics activity through completion of this study serves as one key tool to facilitate this goal.

The overall objective of this study is to document the primary and secondary impacts of the freight industry and apply economic multipliers to determine the full impact on the economy of Miami-Dade County. This analysis builds upon the economic impact work that has already been completed by key partners, like the Port of Miami and Miami International Airport. It also considers work that has been completed at the state level. In addition, low and high growth scenarios are presented to identify the potential of the Port of Miami becoming a first port of call for the mega-container vessels moving through the expanded Panama Canal.

1.3 METHODOLOGY

This section summarizes the methodology used to produce the transportation and economic impacts of all freight activity within Miami-Dade. The methodology is composed of five key steps:

1. Identify freight industry segments. Most aspects of the economy are touched by freight operations, directly or indirectly. Economic impact studies have been conducted by the Port of Miami and Miami International Airport that summarize their areas of impact. Additional impacts are generated by other key freight operations, like Port of Miami River, CSX, FEC, and the warehousing/distribution center network. In addition to specific segments defined by these local sources, a Miami-Dade County-specific IMPLAN model was acquired and used. Transportation Satellite Accounts, developed by the Bureau of Transportation Statistics were also used to illustrate the connection of each industry to transportation.
2. Estimate freight activity in the county today and in the future (2010 and 2035). Understanding the current and future volume of freight moving in Miami-Dade County is critical to estimate future economic impacts. These data have been collected from the Florida Chamber Foundation's Trade and Logistics Study as well as from local freight hub master plans (Port of Miami and Miami International Airport). Activity was measured and summarized in terms of tons by mode and direction, in addition to truck miles traveled. Freight activity was then forecasted to 2035 using the POM and MIA Master plans, in addition to data from the Trade and Logistics study.

3. Estimate direct economic impacts from freight activity in the county. The Miami-Dade County IMPLAN model was used to estimate the number of jobs and economic output related to freight transportation in Miami-Dade County. In addition, other direct economic impacts such as business tax revenues generated by the county, truck licenses and fees, congestion delay, rail at grade crossing delay, and road maintenance were calculated.
4. Estimate indirect and induced economic impacts. In addition to the direct economic impacts, indirect and induced impacts are generated. The Miami-Dade County IMPLAN model was used to estimate the indirect and induced impacts from the data generated in Step 3.
5. Forecast direct, indirect and induced economic impacts (2035). Based on the growth in traffic by mode, the base direct, indirect, and induced economic impacts were projected to 2035. The forecasts take into account two scenarios, which hinge on the POM's ability to become a global hub after the Panama Canal expansion is completed in 2014.
6. Incorporate information from relevant literature. Additionally, the study team has completed an in-depth review of the available relevant literature on the subject, including:
   - 2010 Florida Rail System Plan
   - 2060 Florida Transportation Plan
   - Central Dade Transport Zone Study
   - Comprehensive Parking Study for Freight Transport in Miami-Dade County
   - Florida Strategic Intermodal System Plan
   - Hialeah Yard Master Plan
   - Miami-Dade Freight Plan
   - Miami River Multi-Modal Transportation Plan
   - Port of Miami 2020 Master Implementation Plan
   - Port of Miami Freight Access Study
   - South Florida Inland Port Feasibility Study
   - South Florida Regional Freight Plan
   - US 27 Rail Feasibility Study

   Findings from these studies have been incorporated throughout the report.

2.0 Current Transportation Impacts of Freight Activity in Miami-Dade County (2010)

This chapter covers the impacts of freight activity on the transportation infrastructure within Miami-Dade County. It is divided into three sections detailing major elements of freight infrastructure, freight activity within the County, and major upcoming developments impacting the freight infrastructure.

2.1 MAJOR ELEMENTS OF FREIGHT INFRASTRUCTURE IN MIAMI-DADE COUNTY

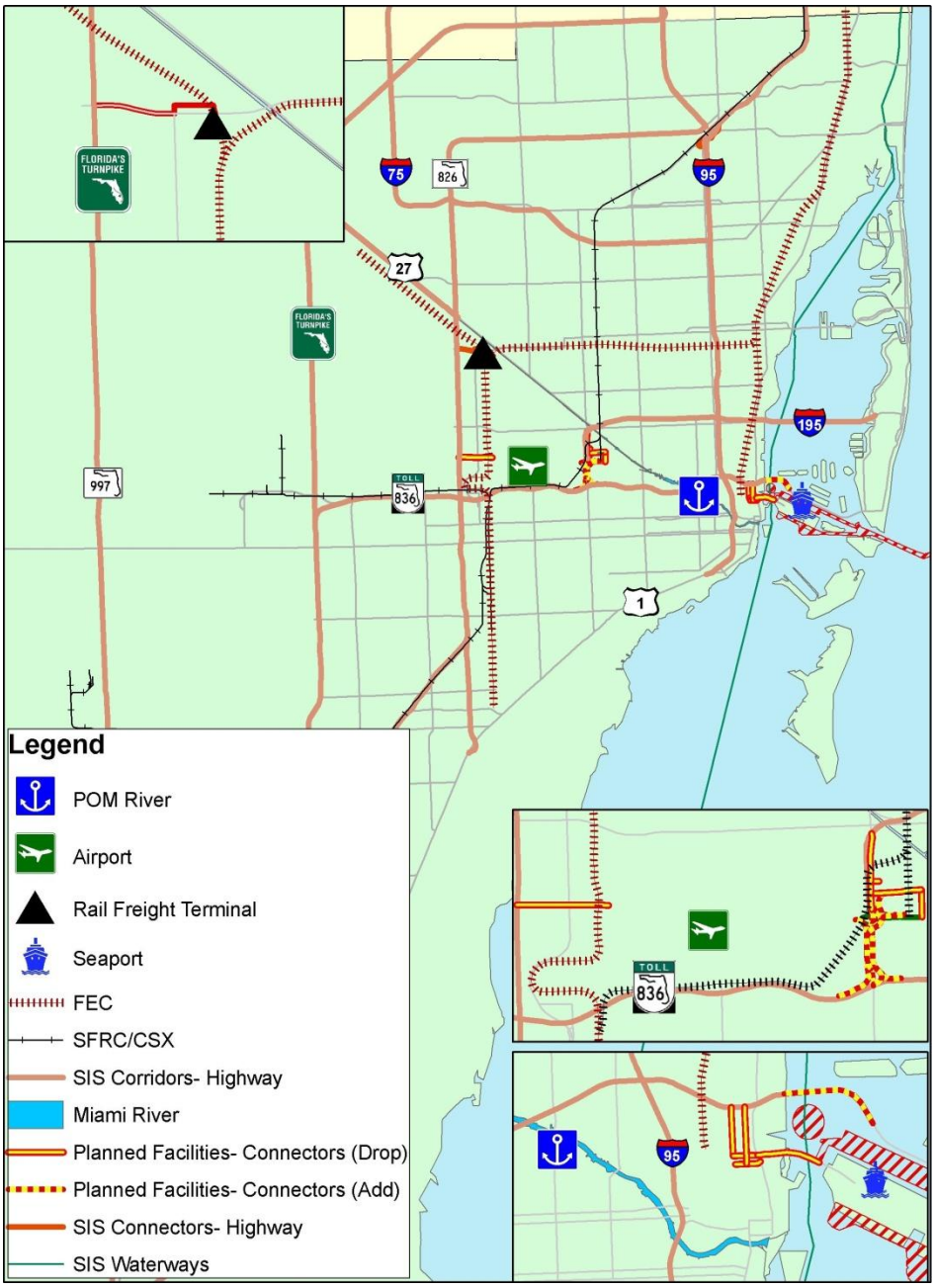
This section provides an overview of the major roadways and intermodal infrastructure that support freight movement within Miami-Dade County. The most visible freight infrastructure elements include Port of Miami, the Port of Miami River, Miami International Airport, FEC's intermodal terminal, FEC and CSX rail corridors, and key roadway corridors (See Figure 2.1). The major key freight corridors and freight transportation hubs within the County are described below.

Port of Miami/ Port of Miami River

Port of Miami - The Port of Miami is the largest container port in the state, handling approximately 30 percent of all containers moving through Florida ports, and the 11th busiest in the continental U.S.[1] The Port is the largest home-based cruise port handling over a third of all cruise passengers in Florida, with 4.1 million revenue passengers in 2010. The Port exclusively handles international containers, with major import trading partners in the Pacific Rim, Europe, and Central and South America, and major export trading partners in the Caribbean, Central and South America, and the Far East in 2010. The Port's sphere of influence extends from the South Florida counties of Miami-Dade, Broward, Monroe, and Palm Beach, throughout the rest of the state. The Port handled 7.4 million tons of containerized cargo in 2010, representing nearly 850,000 TEUs (twenty-foot equivalent container units). Imports and exports were split nearly evenly, with exports marginally outpacing imports, as illustrated in Table 2.1.

[1] A Five-Year Plan to Achieve the Mission of Florida's Seaports, 2010/2011-2014/2015.

Figure 2.1 Freight Infrastructure within Miami-Dade County



Source: Cambridge Systematics, FDOT, ESRI GIS, 2011

Table 2.1 Breakdown of International Cargo at the Port of Miami, 2010

Direction	Tons (thousands)	% Share
Imports	3,524	47.7%
Exports	3,865	52.3%
Grand Total	**7,389**	**100.0%**

Source: Florida Seaport Transportation and Economic Development Council

Table 2.2 illustrates the top commodities being imported and exported from the Port of Miami. The primary commodity group in either direction is "Freight All Kind" which basically incorporates a large number of commodities being transported in containers, such as consumer goods and food/food products.

Table 2.2 Top Commodities Handled at the Port of Miami, 2010

Exports	Tons	Imports	Tons
Freight All Kind	1,545,207	Freight All Kind	2,545,981
Paper/Non-Printed Paper: Newsprints, Towel	106,251	Stone, Clay, Cement, Tile, Bricks, Concrete	838,182
Textiles: Woven/Kinitted Fabrics, Carpet	93,877	Beverages (alcoholic): Beer, Wine, Spirits	155,664
Other Food Products, Non-Refrigerated	72,012	Apparel and Other Finished Textiles	138,105
Building Materials	51,309	Fruits and Vegetables Refrigerated	126,403

Source: Port of Miami

The Port of Miami is currently underway with development of a highway tunnel to connect the port directly to the Interstate system, will be restoring on-port intermodal rail service, and is currently the only Florida port authorized to dredge to 50 feet in anticipation of the Panama Canal expansion in 2014. This is discussed in more detail in Section 2.3.

The Port of Miami is currently served exclusively by trucks as the connecting rail spur, owned by FEC, is in disrepair. The Port generates approximately 4,500 freight and service trucks daily.[2]

Port of Miami River- The Port of Miami River is a 5.5 mile-long shallow draft river that houses 24 marine terminals[3] between Biscayne Bay to NW 37th Avenue near the Miami International Airport, which has developed niche markets in international freight. The terminals along the river typically engage foreign-flag vessels from neighboring countries in the Caribbean with similar shallow draft ports, mostly the Dominican Republic, Haiti, and the Bahamas. Table 2.3 identifies the major commodities carried by the Port of Miami River, as reported and classified by the USACE Waterborne Statistics Center in 2009.

[2] FDOT – Port of Miami Tunnel Project. http://www.portofmiamitunnel.com/

[3] Miami River Commission

Table 2.3 Major Commodities of the Port of Miami River, 2009

Commodity Type	Tons	% Share
Petroleum and products	4	1%
Chemicals and products	16	5%
Crude materials	11	3%
Primary manufactured goods	36	11%
Food/farm products	55	16%
Manufactured equipment, machinery, and products	152	45%
Other	61	18%
Total	**335**	**100%**

Source: US Army Corps of Engineers Waterborne Statistics, 2009

Miami International Airport

Miami International Airport plays a key role as the fourth largest cargo airport in the country and the 11th busiest airport worldwide, handling over 2 million tons of freight in 2010.[4] The airport is the gateway to Latin American and Caribbean markets, handling 83 percent of all air imports and 81 percent of all exports from this region. MIA's cargo operations include 17 warehouses with over 2.7 million square feet of space, and provides a centralized center for trade documentation processing with the Customs and Border Protection (CBP), the Food and Drug Administration (FDA) and the Fish and Wildlife Service (FWS) located in one facility.

[4] Airports Council International 2010

Table 2.4 identifies the major export and import commodities handled by the Miami International Airport. It should be noted that while exports seem much larger than imports, this is in part due to goods being shipped in-transit from one country to another through MIA. In fact about 56 percent of MIA's total international tonnage actually originated or cleared at the Airport, while the remaining 44 percent was shipped in-transit from one country to another

Table 2.4 Major Commodities of Miami International Airport, 2010

Exports	Tons	Dollars (000s)	Imports	Tons	Dollars (000s)
Computer/Peripherals	44,794	$4,758,424	Flowers	177,850	$770,001
Telecommunications Equipment	32,790	$4,131,734	Fish/Crustaceans	107,845	$742,236
Industrial Machinery/Parts	30,627	$1,674,451	Vegetables & Roots	95,212	$178,591
Metals and Metal Products	22,337	$254,206	Fruits & Juices	37,064	$111,916
Vehicle Parts/Tires	21,546	$525,780	Grains- Raw	22,328	$58,535

Source: Miami International Airport "Cargo Hub 2011-2012"

MIA is the leading airport in the US for imports of several goods including perishables (MIA handles 69% of all US perishable import), flowers (89%), fruits and vegetables (73%) and fish (51%). These shipments come from all over the world, but the primary trading partner/region is South America, which represents over half of all the cargo by value, and over 70 percent of the cargo by weight. Other key partner regions include Central America, Europe, the Caribbean, and Asia.

Miami International Airport is served exclusively by truck, with a majority of the cargo originations and destinations to the nearby industrial and warehousing districts in the Doral and Medley areas. The airport generates thousands of trucks daily to and from these districts.

Rail Network: CSX and FEC

There are two freight operating railroads serving Miami-Dade County, consisting of CSX Transportation and the Florida East Coast Railway (FEC).

CSX- CSX Transportation is a Class I railroad that operates the most extensive rail network in Florida. Its freight network within Miami-Dade County is limited, consisting of carload and bulk service, including aggregate and general merchandise. It has a yard in Hialeah that supports its carload operations. It operates on the South Florida Rail Corridor (SFRC), which is owned by the state of Florida and used by Tri-Rail and Amtrak. As Tri-Rail service expands, the freight windows of operation continue to decrease, limiting growth for CSX. The main commodities of CSX are nonmetallic minerals, chemicals and allied products, coal, and miscellaneous mixed shipments.

FEC- The FEC Railway is a Class II railroad that provides north-south service along the Atlantic Coast between Miami and Jacksonville. The FEC provides exclusive rail service to the Port of Miami, Port Everglades, and Port of Palm Beach. It maintains the second largest railroad network in the State after CSXT. Its major South Florida facility is located in Hialeah, consisting of an intermodal ramp, auto terminal, and general yard. The intermodal facility in Hialeah had volumes exceeding 300,000 20-foot equivalent units in 2007. Additional cargo includes aggregate and automobiles. The FEC operates only freight service

within the County, with an 80 percent intermodal and 20 percent carload mix of traffic. Container traffic is driven by the Port of Miami and Port Everglades as well as domestic consumer goods traveling southbound via the Jacksonville gateway. The railroad currently operates seven daily trains in each direction with a heavy imbalance – more products moving southbound.

Highways

The major roadway system within the County has been designated as part of either the Strategic Intermodal System (SIS) or the Southeast Florida Transportation Council (SEFTC)'s Corridors of Regional Significance. These two systems are described below.

Strategic Intermodal System (SIS) - The Strategic Intermodal System (SIS) was established in 2003 to enhance Florida's economic competitiveness by focusing state resources on the transportation facilities most critical for statewide and interregional travel. The SIS is a statewide network of high priority transportation facilities, including the state's largest and most significant commercial service airports, spaceport, deepwater seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways, and highways. The highway facilities account for more than 70 percent of all truck traffic and 55 percent of total traffic on the State Highway System. Table 2.5 details the SIS highway facilities within Miami-Dade County.

Table 2.5 SIS Roadway Facilities within Miami-Dade County

Interstates
• I-95, I-195 (entire length)
Turnpikes and Expressways
• Florida's Turnpike(SR 91) • Homestead Extension of Florida's Turnpike (HEFT) (SR 821) • East-West (Dolphin) Expressway (SR 836) • Palmetto Expressway (SR 826)
Other FIHS Facilities
• US 27 from SR 826/Palmetto Expressway to Florida's Turnpike at exit 289 • US 1 from Key Largo to HEFT

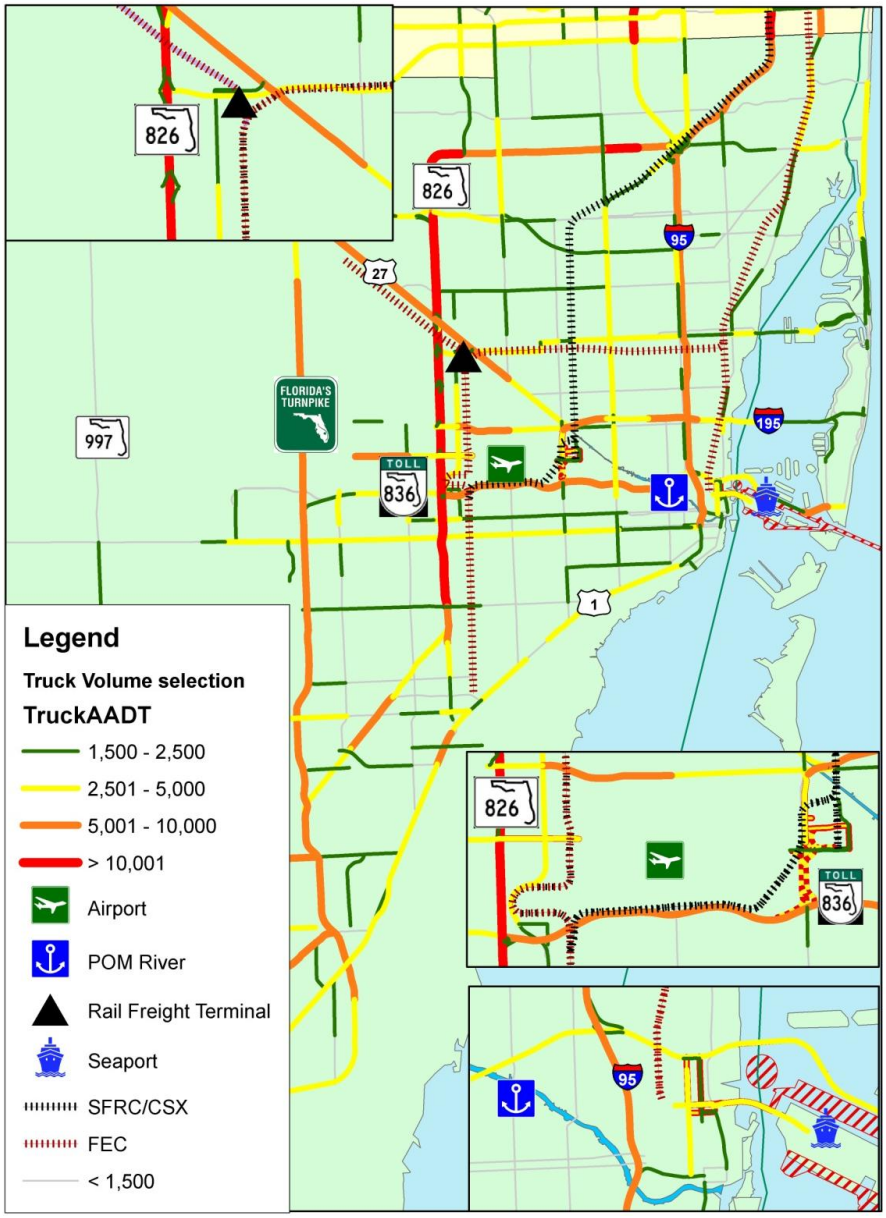
Corridors of Regional Significance- The SEFTC designated Corridors of Regional Significance within Broward, Miami-Dade, and Palm Beach Counties, which consist of 66 significant roadways. Table 2.6 details the regional interstate, expressways and major regional facilities within Miami-Dade County.

Table 2.6 Corridors of Regional Significance within Miami-Dade County

Regional Interstate and Expressway Facility	Major Regional Facility
• Homestead Extension of FL Turnpike • SR-826/ Palmetto Expressway • SR-924 / Gratigny Expressway • I-195 • SR-836/ Dolphin Expressway • I-395 • SR-878 • SR 874 • SR-112	• US- 1 • A1A/Collins Ave • SW 8th Street/ Tamiami Trail/ US-41 • NW 27th Ave/ SR-9 • NW 57th Ave/ Red Rd/ SR- 823 • Krome Ave/ SR-997 • • •

Figure 2.2 details the truck AADT of the roadways within Miami –Dade County. The roadways with the most truck traffic include the Homestead Extension of Florida's Turnpike (HEFT), Palmetto Expressway (SR 826), Dolphin Expressway (SR 836), I-95, and US 27. Key points of congestion (including NW 36th Street, SR 836, SR 826, and US 27) occur around the industrial and warehousing districts in Doral and Medley near the airport and rail freight terminal.

Figure 2.2 Truck AADT of Major Roadways within Miami-Dade County, 2010



Source: Cambridge Systematics, FDOT

Warehousing and Wholesale Industries

In addition to the physical transportation infrastructure covered in the previous sub-sections Miami-Dade is also home to an extensive network of warehouses and wholesale business establishments that enhance the supply chain behind the movement of freight in the County. This section presents a snapshot of geographic distribution and types of warehouse and wholesale establishments in the county.

Warehousing Industry

Using 2010 InfoUSA data, four industry subsectors, representing businesses within the Transportation and Warehousing Industry, were identified as the Freight Warehousing Industry. Within these four subsectors, businesses were identified and categorized based on facility size (square footage) and annual sales volume. For this section, only facilities with over 10,000 square feet of storage are discussed. These are likely to handle most of the containerized freight moving through the Miami-Dade County. In 2010, there were 140 warehouse establishments with over 10,000 square feet, accounting for 83 percent of the total warehousing establishments and 81 percent of the total Annual Sales volume of warehousing establishments within the County (there are 169 total warehousing establishments within the county, when all sizes are considered). The following explanations provide a closer look at each of these groups of businesses.

Table 2.7 Warehousing Industry Sectors within Miami-Dade County by NAICS Code, with Square Footage of 10,000+

NAICS	Industry	Establishments	Annual Sales Volume (000s)
493110	General Warehousing and Storage	66	$67,032
493120	Refrigerated Warehousing and Storage	15	$27,645
493130	Farm Product Warehousing and Storage	58	$80,614
493190	Other Warehousing and Storage	1	$795
	TOTAL	**140**	**$176,086**

Source: 2010 InfoUSA data

General Warehousing and Storage (NAICS 493110) - This details establishments primarily engaged in operating merchandise warehousing and storage facilities. There are 66 establishments within the County, which collectively reported $67,032,000 in annual sales.

Refrigerated Warehousing and Storage (NAICS 493120) - This details establishments primarily engaged in operating refrigerated warehousing and storage facilities. In Miami-Dade this includes establishments engaged in the temporary storage of imported fruits and flowers from places such as South America through either the Port of Miami or Miami International Airport. There

are 15 establishments within the County, which collectively reported $27,645,000 in annual sales.

Farm Product Warehousing and Storage (NAICS 493130) - This details establishments primarily engaged in operating bulk farm product warehousing and storage facilities (except refrigerated). There are 58 establishments within the County, which collectively reported $80,614,000 in annual sales.

Other Warehousing and Storage (NAICS 493190) - This details establishments primarily engaged in operating warehousing and storage facilities (except general merchandise, refrigerated, and farm product warehousing and storage). There is one establishment within the County, which reported $795,000 in annual sales.

Figure 2.3 shows the Warehousing Industry establishments that are located inside the Study Area. The establishments are spread out across the County, but cluster around the major freight roadway and rail corridors; primarily SR-826, SR-836 and US-27. There is a major concentration of Warehousing establishments within the Doral and Medley industrial areas.

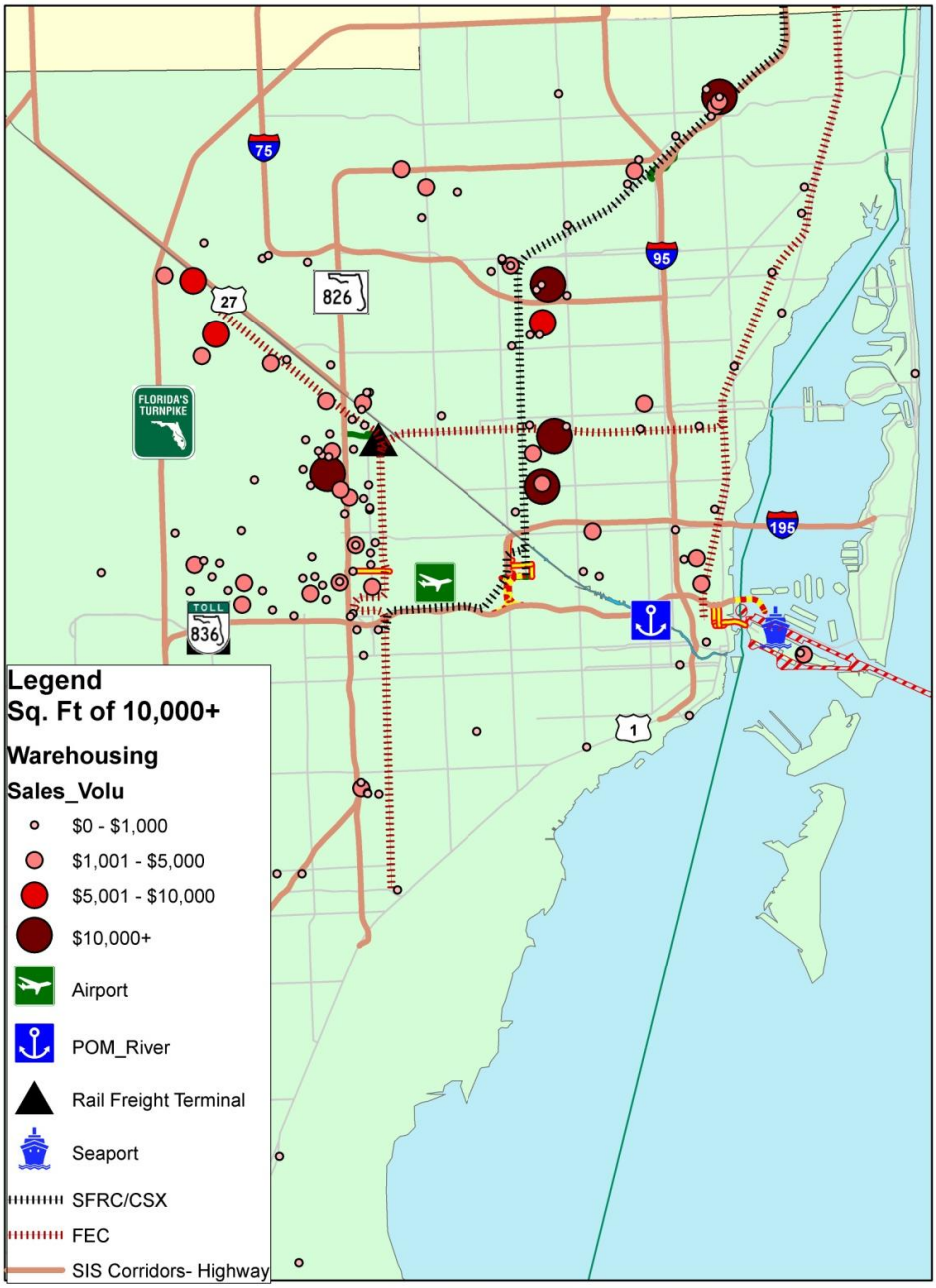
As Figure 2.3 illustrates, there are five establishments in Miami-Dade County that have sales volumes in excess of $10M per year. These are described in Table 2.8 below.

Table 2.8 Warehousing Establishments with $10M+ in Sales in Miami-Dade

Warehouse Type	Company	City	Sales Volume (Millions)
Refrigerated	Spiegel Meats inc	Miami	$ 22.00
Farm Products	Hamersmith Distributors	Miami	$ 14.90
Farm Products	Seaboard Warehouse	Miami	$ 13.25
General	Price Smart Inc	Miami	$ 10.71
Farm Products	Integrated Distribution System	Miami	$ 10.60

Source: 2010 InfoUSA data

Figure 2.3 Warehousing Establishments within Miami-Dade County, with Square Footage over 10,000, by Annual Sales Volume, 2010



Source: 2010 InfoUSA data

Wholesale Industry

InfoUSA 2010 data was also used to identify wholesale trade businesses in Miami-Dade County, however given that sales volume data was not fully available for this sector, establishments have been illustrated based on number of employees. As illustrated in Figure 2.4, wholesale trade businesses follow a similar distribution to pattern to warehouses, but with an even stronger concentration of businesses in the Doral and Medley industrial areas. Other pockets of concentration revolve around CSX/SFRC rail tracks east of MIA, and at the end of I-75 near the Palmetto Expressway.

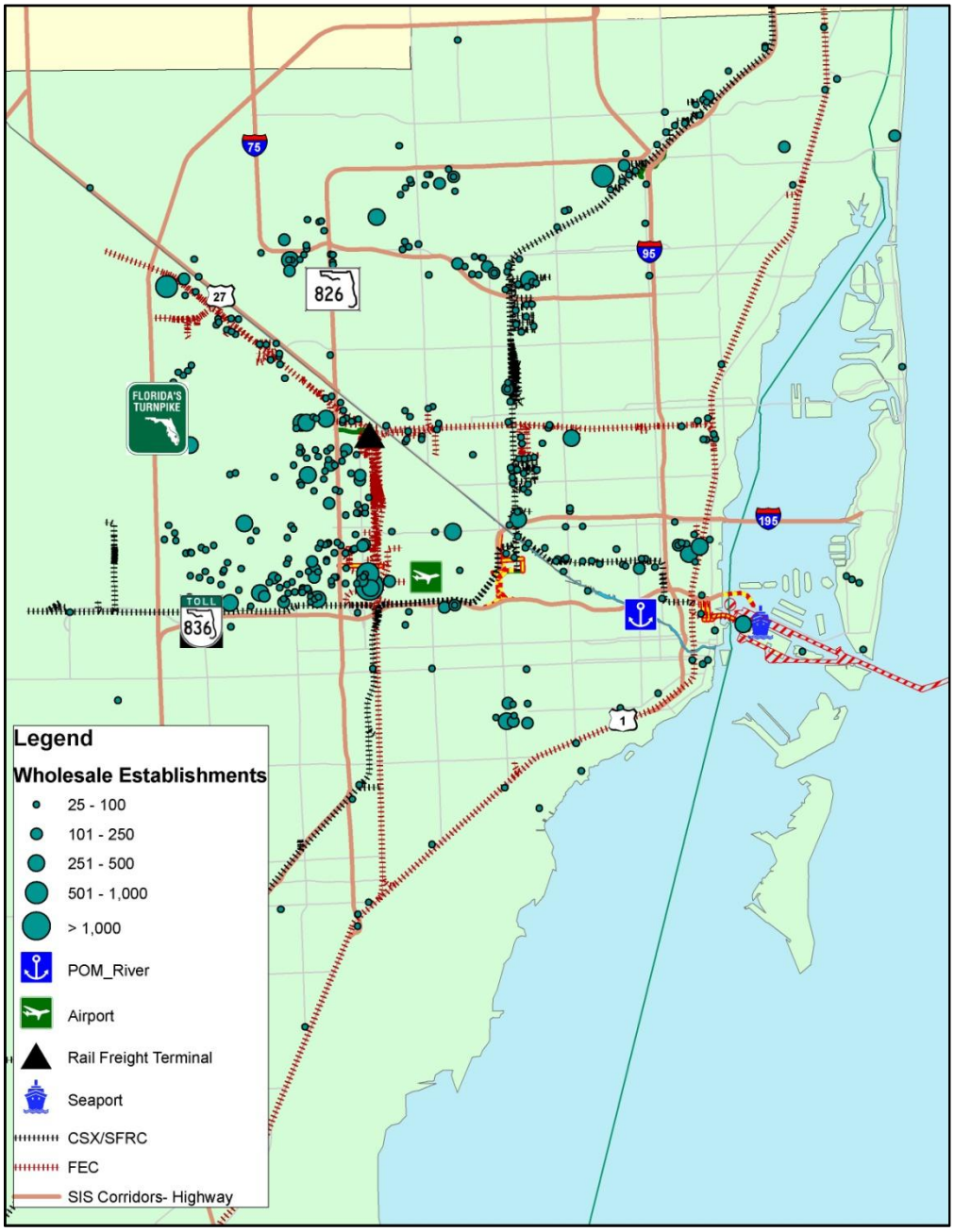
In total there are 509 wholesale trade establishments in Miami-Dade County that have at least 25 employees. The majority of these establishments are in the food and liquor distribution business. As Table 2.9 illustrates, 4 out of the top 5 wholesale trade establishments in the County distribute raw or processed food and liquors.

Table 2.9 Top 5 Wholesale Trade Establishments in Miami-Dade by Employees

Product Type	Company	City	Employees
Food/Liquor	Apollo Ship Chandlers Inc	Miami	5,000
Food/Liquor	Brooks Tropicals Inc	Miami	1,700
Medical Supplies	Doctor Diabetic Supply Inc	Miami	860
Food/Liquor	Southern Wine & Spirits	Miami	700
Food/Liquor	Sunburst Farms	Miami	700

Source: 2010 InfoUSA data

Figure 2.4 Wholesale Establishments within Miami-Dade County, with over 25 employees, 2010



Source: 2010 InfoUSA data

2.2 CURRENT FREIGHT ACTIVITY IN THE COUNTY (2010)

This section provides an overview of the freight activity that takes place in Miami-Dade County. The primary source used for this section is the Florida Chamber Foundation's Trade and Logistics Study published in March of 2011, which looked at the state's opportunities to take advantage of changing global trade patterns such as the Panama Canal's expansion in 2014. As a result of work on this study, FDOT created a combined dataset of freight flows in the base year (2010) and forecast years (2035 & 2060). The database was put together using IHS Global Insight's Transearch, PIERS international maritime data, the rail carload waybill sample, and a mix of socio-economic data covering population, GDP, and output projections by various industry sectors.

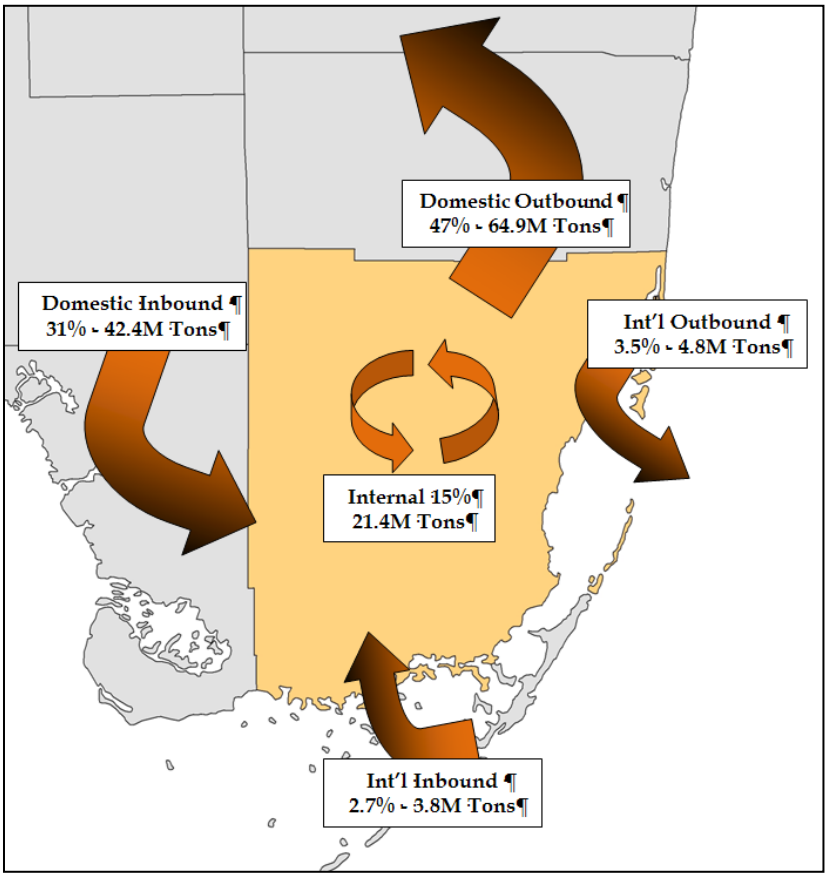
For this study, the summary tables presented in the Appendix of the Trade and Logistics Study report were used. These contain flows by direction and mode for the top counties and seaports in the State. This information was compared and verified by existing, available hub data, such as the Port of Miami Master Plan and the Miami International Airport annual Cargo Hub brochure.

Traffic by Direction

According to the Florida Trade and Logistics Study, Miami-Dade County's transportation infrastructure handled over 137 million tons of domestic and international freight in 2010 by truck, rail, water, air, and pipeline. The data from the Trade and Logistics Study was combined with information from the Port of Miami and Miami International Airport to produce a breakdown of flows by direction. As shown in Figure 2.5, just over 50% of these flows were headed outside of the county (either to international locations or to nearby counties within Florida), representing a combined 69.7 million tons of goods. Inbound movements accounted for 46.2 million tons of goods, or roughly 34 percent of the total, while internal flows (origin and destination in Miami-Dade County) accounted for 21.4 million tons or 15 percent of the total. The imbalance of outbound to inbound flows is directly related to the role Miami-Dade plays throughout South Florida. That is, many of the outbound shipments are destined for Broward and Palm Beach counties, representing intraregional trips.

It should be noted that there are through flows in the county, which may not be listed as such due to the nature of the data collected. This includes flows from an international location going to Broward County via a Miami-Dade County gateway; within this dataset it is counted as both an inbound flow (by water from its international origin), and an outbound flow (by truck to Broward County).

Figure 2.5 Freight Traffic by Direction (millions of tons)



Source: 2011 Trade & Logistics Study, Florida DOT, Miami International Airport, Port of Miami

Traffic by Mode

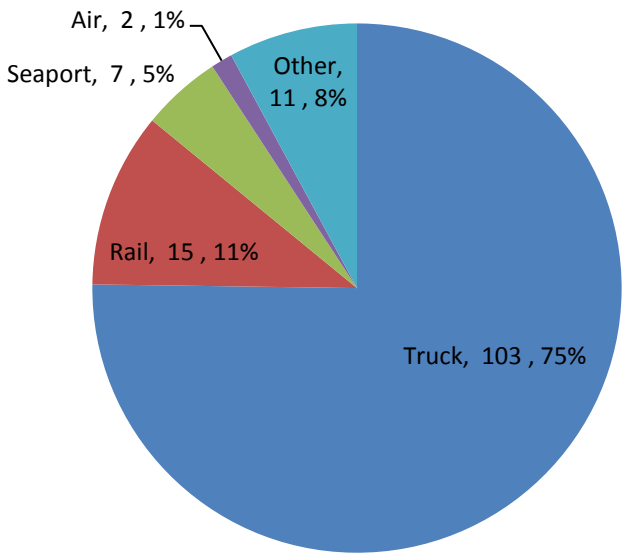
Like most counties, Miami-Dade is dependent on motor carriers for the transportation of the vast majority of its freight. In addition to being the primary mode of transport for a large majority of shipments, trucks also generally provide the last link in the transportation chain, carrying all types of commodities from intermediate destinations, such as seaports, rail terminals and distribution facilities to their final destinations. As shown in Figure 2.6, trucks moved 75 percent of the tonnage going into, out of, through, and within the County. This amounted to just over 103 million tons in 2010. The modal share for truck is in line with the rest of the State, which transports roughly 75 percent of all its freight by truck.

The Port of Miami handled approximately 7 million tons of freight (5%) while the railroads handled a combined 15 million tons (11%), and Miami International Airport handled almost 2 million tons (1.3%). It is important to understand that all of these flows by different modes are highly inter-connected and dependent on each other. As such it should not be assumed that trucks are solely responsible for bringing 75 percent of goods to the County, instead trucks handle

a significant portion of the traffic moving between the seaport/airport/rail terminals, the warehouses located in Western Miami-Dade County, and the final destination for these goods within Miami-Dade as well as the surrounding counties. Furthermore, due to the nature of the data collected, goods moving over multiple modes may be counted separately as individual moves by each mode.

Finally, while air and seaport traffic make up a small share of traffic by tonnage, they make up a much more significant portion of traffic by dollar value due to type of goods moved. This disparity between shipment weight and shipment value occurs because POM and MIA handle a higher share of high-value, low-weight commodities such as electronics, food, and other consumer goods. On the other hand, a significant share of goods handled by railroads, and to a lesser degree trucks, consists of denser, lower value goods such as aggregate, rocks, and other similar products.

Figure 2.6 Freight Traffic by Mode (millions of tons)



Source: 2011 Trade & Logistics Study, Florida DOT

International Trade Partners

Nearly 90% of the cargo handled at Miami International Airport is international trade. The airport's top trading partners by region are South America ($27.7B), Europe ($9.5B), and Central America ($7.4B). Within South America, the largest individual countries doing business with MIA are Brazil ($11.1B), Colombia ($5.2B) and Costa Rica ($3.7B). The airport imports a high volume of perishables from all of these countries, including flowers, fruits and vegetables, and fish.

The Port of Miami's largest trading partner in terms of tonnage is the Bahamas, with over 1 million ton of freight, followed by China (808k tons), the Dominican Republic (619k tons), and Honduras (436k tons). Top outbound shipments include general containerized cargo, paper, textiles, and food/food products.

2.3 MAJOR DEVELOPMENTS IN FREIGHT INFRASTRUCTURE

There are several key planned infrastructure improvement projects that have the potential to impact the efficiency of Miami-Dade's freight transportation system in the short and long term. This section briefly discusses some of the major developments and the type of impact they could have on Miami-Dade's future transportation network. In Chapter 3, the economic repercussions of these projects are discussed, including the amount of external funding that each of these attract to Miami-Dade, and how these funds flow through the economy.

Panama Canal Expansion

As discussed in the Florida Trade and Logistics Study, the Panama Canal is in the process of constructing a new set of locks that will allow it to handle the larger type of ships that are currently being used in the Asia-USA trade lane via mega ports on the West Coast, such as the Ports of Los Angeles and Long Beach. The Canal's current dimensions allow passage of container ships with up to 4,400 TEUs, known as Panamax vessels. The expansion will accommodate larger, post-Panamax vessels carrying up to 12,600 TEUs, which require 50 feet of draft in fresh water (equivalent to 48 feet in salt water). Industry estimates suggest post-Panamax vessels account for about 30 percent of all ships today, but a large majority of all ships on order. Over 150 post-Panamax ships currently call on west coast seaports, and some can be redirected to the Panama Canal route if their owners believe the overall economics warrant the change.[5]

Currently, a significant portion of the Asia-US East Coast trade is handled by west coast ports, with railroads hauling them to distribution centers in major urban areas. With the expansion of the Canal in 2014, several ports on the Gulf and East Coast are hoping to capitalize on the opportunity to attract these larger vessels and serve as hubs for their local economy, their State, and surrounding states.

The Port of Miami has been anticipating this opportunity, in addition to the natural expansion in cargo due to continued growth in local demand, and is undertaking three large infrastructure projects that will put it in better position to become a key international trade hub. These three projects are: the Port of

[5] Florida Chamber Foundation's Trade and Logistics Study, 2011 – http://www.flfoundation.com/FloridaTradeandLogisticsStudy.asp

Miami Tunnel, deepening of the channel to 50 feet, and the rehabilitation of its on-port rail and rail access infrastructure (through both on-port and off-port intermodal yards).

Deep Dredge for POM

Having already received approval from the USACE to deepen, the POM has secured Federal and State funds to dredge the harbor to minus 50-feet, making it one of only three U.S. seaports on the eastern seaboard that can accommodate the new generation (post-Panamax) of container vessels that will be crossing the Panama Canal upon completion of the expansion in 2014. The port is currently 42 feet deep. The Port estimates that this project will allow it to double cargo output and create up to 33,000 new trade-related jobs in the next 10 years, thus ensuring South Florida's role as a global leader in international trade and commerce.

Port of Miami Tunnel[6]

As documented on the Port of Miami Tunnel website, the Port of Miami Tunnel (POMT) project is currently being built by MAT Concessionaire, LLC, in partnership with the Florida Department of Transportation (FDOT), Miami-Dade County and the City of Miami. By connecting S.R. A1A/MacArthur Causeway to Dodge Island, the project will provide direct access between the seaport and highways I-395 and I-95, create another entry to the Port of Miami besides the Port Bridge, and keep the Port of Miami, the community's second largest economic generator, competitive in an increasingly global economy.

Nearly 16,000 vehicles travel to and from the Port of Miami (POM) through downtown streets each weekday. Truck traffic makes up 28% (or 4,480) of this number (Source: 2009 PB Americas Traffic Study). Existing truck and bus routes restrict the port's ability to grow, drive up costs for port users and present safety hazards. They also congest and limit redevelopment of the northern portion of Miami's Central Business District. Construction began May 24, 2010, and the tunnel is expected to be open to the public in May 2014

Rail Connection for POM

The last piece of the expansion and connectivity effort for the Port of Miami is the rail intermodal connection to the western part of the County and the main FEC line that leads to Jacksonville and out of the State. Some of the planned improvements (highlighted in Figure 2.7) include:

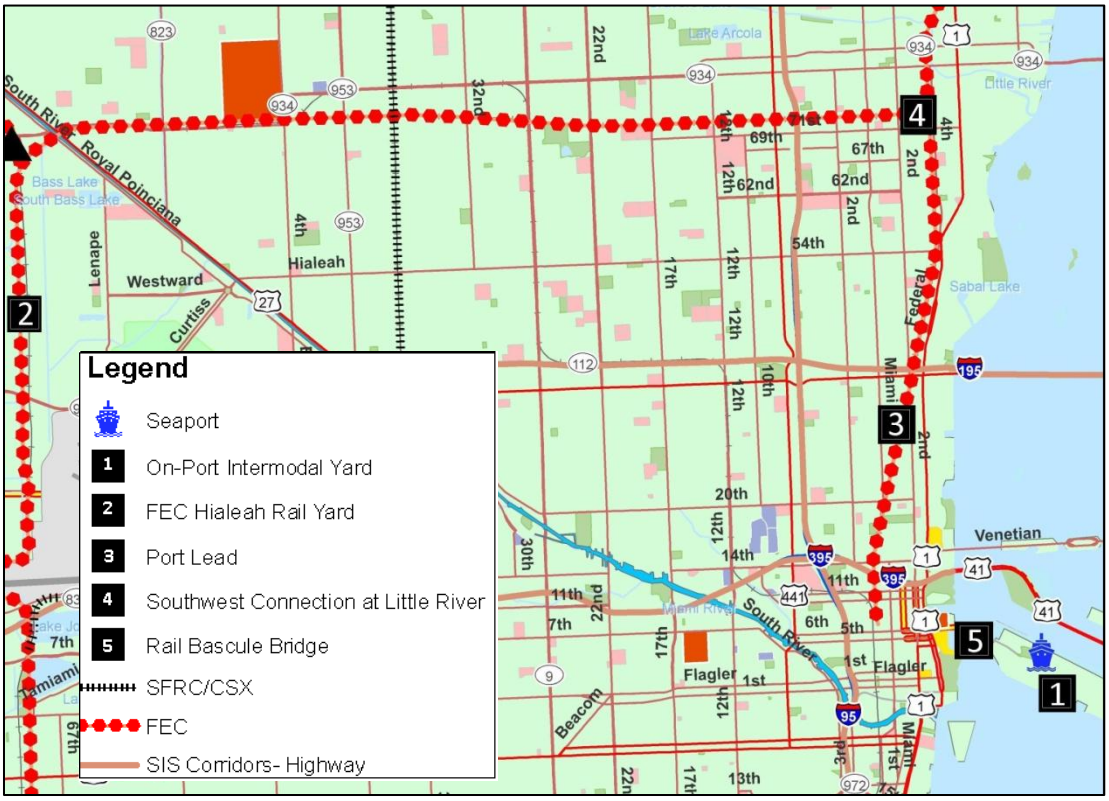
1. On-Port Intermodal Yard. A new intermodal yard will be constructed. The intermodal yard will be served by the single track port lead via a bascule bridge. The yard will consist of two tracks parallel to each other (both 4,000

[6] http://www.portofmiamitunnel.com/

feet long). Apron areas on either side of the tracks will allow simultaneous loading of two trains.

2. FEC Hialeah Rail Yard. New warehouse space will be developed within the existing yard footprint. This is envisioned as a logistics hub for the region.
3. Port Lead. A 4.7 mile segment of the existing rail line that runs directly to the Port will be reconstructed to allow both cargo and passenger rail in the future. The work will include reconstruction of all of the tracks and their placement to one side of the corridor.
4. Southwest Connection at Little River. This work will include the Southwest connection at Little River, which will allow trains to move from the port to the FEC's Hialeah yard without stopping and making reverse moves.
5. Rehabilitate Existing Rail Bascule Bridge. The rail Bascule Bridge providing access to the POM can only be operated manually. There are substantial repairs needed to the electrical system, the motors, the switching system, repainting, and minor structural repairs.

Figure 2.7 Planned Rail Improvements



Reconstruction of 836/826 Interchange

The interchange of SR-836 and SR-826 is critical to overall mobility for passenger and freight traffic in Miami-Dade County. Specifically, the movement of cargo between the Port of Miami and the warehouse/distribution center complex and

FEC intermodal terminal located in western Miami-Dade County relies on the efficient operation of these two highways. Reconstruction will be a multi-year project, currently underway. Effective work zone management techniques will be critical over the course of this project to preserve mobility for this critical freight route. Once complete, this improved interchange will provide for enhanced reliability and capacity.

25th Street Viaduct

25th Street in western Miami-Dade County is the key access road for Miami International Airport's air cargo operation. The viaduct project will provide a grade separated, elevated connection to SR-826. This will significantly improve the capacity and reliability of this key connector. Phase 1 is complete; Phase 2 will begin construction in 2012.

3.0 Economic Impacts of Freight Activity in Miami-Dade County (2008)

This chapter documents the impacts freight activity have on Miami-Dade's economy, measured in direct, indirect, and induced creation of jobs, gross regional product, economic output, and tax revenue. The generation of negative economic impacts such as congestion, highway deterioration, and crashes were also documented. While the results presented in this chapter are limited only to Miami-Dade County, it should be noted that the economic impact of freight activity in the County extends well beyond its borders, including other counties in Florida, states throughout the country, and international trading partners. For this report, these impacts have been removed in order to focus on the effect within the Miami-Dade.

The chapter is divided into three sections covering the methodology, direct impacts (positive and negative), and the multiplier impacts (indirect and induced). Impacts are presented using 2008 data, while Chapter 4 presents projected impacts in 2035.

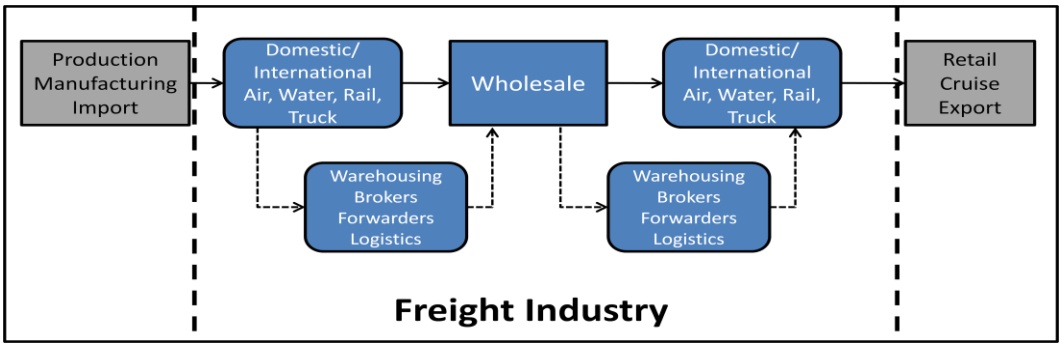
3.1 INDUSTRY DEFINITION AND METHODOLOGY

Goods movement affects all sectors of a modern economy. In Miami-Dade County, most of the goods being moved represent domestic and international trade activities; with the exception of mining (aggregate) and agriculture, the region's economy is driven by financial services, tourism, retail trade, and professional services. Thus, the county's residents and businesses rely on freight transportation services to obtain the majority of products needed on a regular basis, such as groceries, medical supplies, office supplies, automobiles, and gasoline, from a well established wholesale/distribution infrastructure. Consequently, the economic impact of freight transportation to Miami-Dade's economy is much more than the defined transportation industry sector.

The first step in evaluating the impact of freight on Miami-Dade's economy was to define the core economic sectors that make up the freight industry. After meeting and coordinating with a diverse group of stakeholders, the freight industry was defined as: ***the transportation (and related services) of goods from point of production or import through delivery at retail locations or ports for export.*** As illustrated in Figure 3.1, this definition covers hauling goods from production sources or point of import to wholesale distributors, and subsequently to retail outlets. It also covers the supporting services provided by

warehouses, freight forwarders, brokers, and logistics companies. This definition, however, does not include the production/manufacturing of goods in the county (such as rock mining or agricultural production) or the sale of finalized goods at retail channels.

Figure 3.1 Definition of Miami-Dade County's Freight Industry



In order to evaluate the economic impact of these industry sectors, data from a variety of sources were collected, including the Port of Miami (POM) and Miami International Airport (MIA) economic impact studies, the US Census County Business Patterns (CBP), Florida's Highway Safety and Motor Vehicles office (FHSMV), Florida Department of Revenue (DOR), Florida Department of Transportation (FDOT), the Bureau of Transportation Statistics' Transportation Satellite Accounts (TSA), and several offices within Miami-Dade County. The data collected and/or calculated and sources used are illustrated in Table 3.1 and Figure 3.2. Results are covered in Sections 3.2 and 3.3.

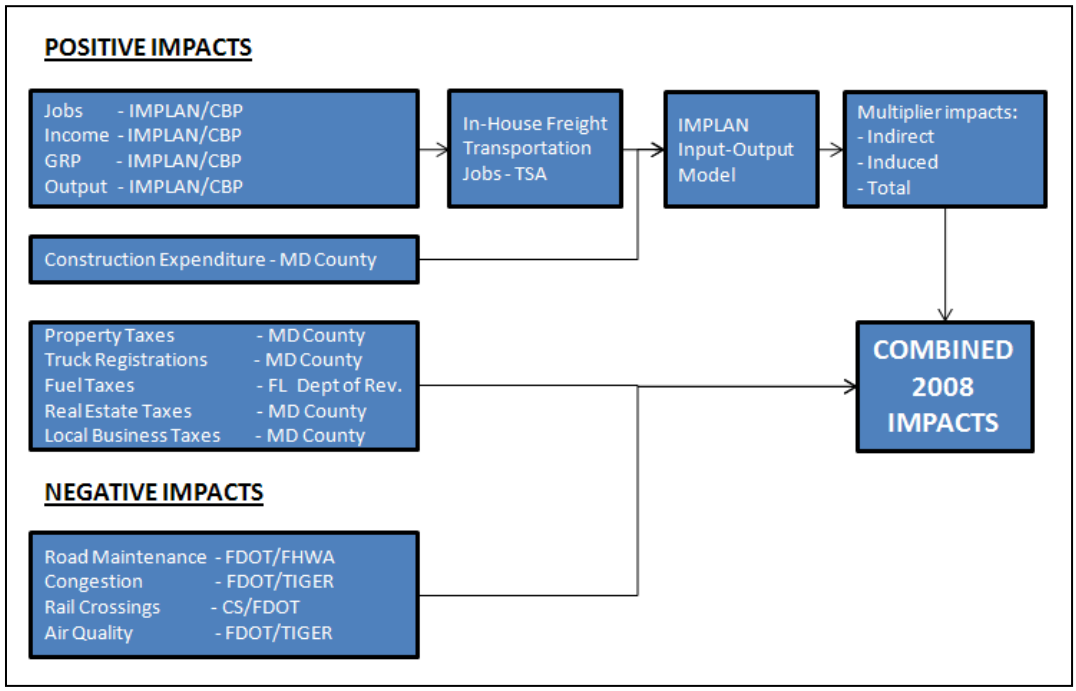
Table 3.1 Economic Impacts Measured

Impact Type	Metric	Source
Positive	Jobs	IMPLAN/CBP/TSA
	Output	IMPLAN/CBP
	Labor Income	IMPLAN/CBP
	Gross Regional Product (GRP)	IMPLAN/CBP
	Tangible Property Taxes	Miami-Dade County
	Truck Registrations	Miami-Dade County
	Fuel Taxes	FL Dept of Revenue
	Real Estate Taxes	Miami-Dade County
	Local Business Taxes	Miami-Dade County
	Construction Expenditure	Miami-Dade County
Negative	Road Maintenance	FDOT/FHWA
	Congestion	HERS/NHTSA
	Rail Crossings	CS/FDOT
	Air Quality	FDOT/TIGER

As illustrated in Figure 3.2, direct impacts were collected from a variety of sources. In-house freight transportation jobs (along with income, GRP, and Output) were calculated using the Bureau of Transportation Statistics Transportation Satellite Accounts, and these along with the freight-related construction expenditure were run through a Miami-Dade IMPLAN input-output model to obtain total economic impact. The output from IMPLAN was combined with the tax revenue information and the negative impacts to calculate the 2008 economic impact of the freight transportation industry in Miami-Dade County.

The direct impacts are documented in section 3.2, while the IMPLAN model and accompanying multiplier effects are discussed in section 3.3, and the combined results are presented in section 3.4.

Figure 3.2 Base Year Economic Impacts Methodology



3.2 EXISTING ECONOMIC IMPACT ANALYSES

This study builds upon previous economic impact studies published by the Port of Miami and Miami International Airport. The findings from these two reports have been integrated into this report, and complemented by adding in the remaining pieces (e.g., trucking, wholesale, tax revenue, construction impacts). This section provides a brief overview of the findings from both economic impact studies.

The Local and Regional Economic Impacts of the Port of Miami. The study was published in 2008 and covers impacts for passenger and freight activity during

the 2007 fiscal year, however only freight economic impacts are being used in this report. As illustrated in Table 3.2 below, over 4,000 people are directly employed in cargo activity at the port, which in turn generate another 8,500 indirect and induced jobs. These 13,000 jobs carry an average annual wage of $68,000, while generating business service revenue for the seaport, spending on the local economy, and accounting for over $80 million in tax revenues for the State and County.

Table 3.2 Economic Impact of the Port of Miami Cargo Activity, FY 2007

Metric	Direct	Indirect	Induced	User Jobs	Total
Jobs	4,345	7,035	1,527	147,669	160,576
Personal Income ($000)	$204,415	$600,958	$73,663	$4,563,654	$5,442,690
Average Wages ($000)	$ 47.0	$85.4	$48.2	$30.9	$33.9
Business Services Revenue ($000)					$686,298
User Output ($000)					$14,298,866
Local Purchases ($000)					$140,582
State + Local Taxes ($000)					$83,508
User Taxes ($000)					$433,547

Source: Port of Miami, 2008.

In addition to the direct, indirect, and induced employment activity, the POM economic impact study identifies nearly 150,000 jobs associated with shippers and consignees (exporters and importers) using the marine terminals for shipment and receipt of cargo. These jobs include impacts at each stage of handling the imported/exported cargo, such as the port activity, trucking and rail activity to move the cargo to and from the Port, all the way out to retail jobs. These jobs have an average annual wage of $31,000 and generate over $433 million in tax revenue for the State's economy.

For this report, the study team used the 4,345 direct jobs at the port and ran it through the Miami-Dade IMPLAN model to obtain estimates of the indirect and induced activity (along with the same corresponding impacts from other sectors). The user jobs were not included as those do not necessarily lie within Miami-Dade County's borders, and, more importantly, include sectors of the economy that will be accounted for separately. These include trucking, warehousing, railroads, and brokers, amongst others.

The Port of Miami supports 4,345 direct jobs in freight activity at its facilities.

The Economic Impacts of Miami International Airport and the General Aviation Airports within the Miami-Dade County Airport System.

Miami International Airport published its economic impact study in 2009, covering impacts for passenger and freight activity during the 2008 fiscal year. As with the POM study, only the economic impacts stemming from freight

activity were used in this report. The study shows that 6,300 people are directly employed in freight activity at the airport, including freight airlines, couriers, freight forwarders, and freight-specific jobs within passenger airlines. These jobs in turn generate over 3,700 indirect, and 4,200 induced jobs for a total impact of 14,282 (see Table 3.3).

Table 3.3 Jobs Generated by MIA's Cargo Operation

Impact Category	Direct	Indirect	Induced	Total
Freight Airlines & Couriers	4,747	2,824	3,190	10,761
Freight Forwarders	916	545	616	2,077
Passenger Airlines (freight)	637	379	428	1,444
Freight Total	**6,300**	**3,747**	**4,234**	**14,282**

Source: Miami International Airport, 2009.

As with the POM study numbers, the direct impacts from this study (6,300 jobs) were run through the Miami-Dade IMPLAN model to obtain estimates of the indirect and induced activity (along with the same corresponding impacts from other sectors). This was done, to have consistent multipliers across all industry sectors, and to avoid double-counting impacts from different sources. The indirect and induced impacts shown for both POM and MIA in Tables 3.2 and 3.3 are for background information only.

MIA supports 6,300 direct jobs in freight activity at its facilities, including freight airlines, couriers, and forwarders.

3.3 DIRECT IMPACTS OF FREIGHT ACTIVITY IN MIAMI-DADE COUNTY (2008)

Direct impacts are the result of immediate activity in the freight industry as defined in Section 3.1. This includes jobs, wages, and revenue from businesses involved in freight transportation, wholesale trade, warehousing, brokerage, freight forwarding, and logistics, as well as in-house transportation services in other sectors. Direct impacts also include tax revenues generated from ongoing freight activity, negative impacts associated with the transport of goods, and finally impacts from freight related construction projects in Miami-Dade County.

Positive Impacts

Economic Indicators

The freight industry sector was directly responsible for 151,000 jobs in Miami-Dade County in 2008. This includes jobs in the sectors previously defined in Section 3.1 in addition to in-house freight transportation jobs in other industry sectors, as

The freight industry sector generates 151,000 jobs, $14.4 billion in GRP, and $26 billion in economic output.

calculated using the Transportation Satellite Accounts (the calculation of in-house transportation jobs is discussed in detail below). These employees received a total of $8.0 billion in compensation, translating to approximately $60,000 per employee annually, a figure that includes wages and benefits. Furthermore, this activity generated roughly $26 billion in total economic output (gross revenue) and an equivalent GRP of $14.4 billion (see Table 3.4).

Table 3.4 Direct Economic Impacts of Freight Industry in Miami-Dade, 2008

Metric	For-Hire	In-House	Total Direct
Jobs	130,723	20,591	151,314
Labor Income (millions)	$8,298	$826	$9,124
Avg Compensation	$63,474	$40,127	$60,297
GRP (millions)	$13,722	$1,376	$14,349
Economic Output (millions)	$23,169	$2,676	$25,845

Source: CBP, IMPLAN, CS

As indicated in Figure 3.3 and Table 3.5 below, half of the jobs involved in freight activity in the County are related to wholesale trade business (about 76,000 jobs). The majority of these businesses are located in the Doral and Medley industrial areas (see Figure 2.4 in the previous chapter), and use the POM and MIA to import/export and distribute food and food products such as meats, fruits, and liquor.

Couriers/messengers and truckers represent the second and third largest industry sectors directly related to freight activity (each with roughly 9% of all freight jobs), followed by freight forwarders (6%), air cargo (4%), POM freight employees (3%), warehousing (2%), brokers (2%), logistics providers (1%) and finally rail/pipeline and Transportation Security Administration agents (<1%).

Figure 3.3 Distribution of Freight Jobs by Industry Sector, 2008

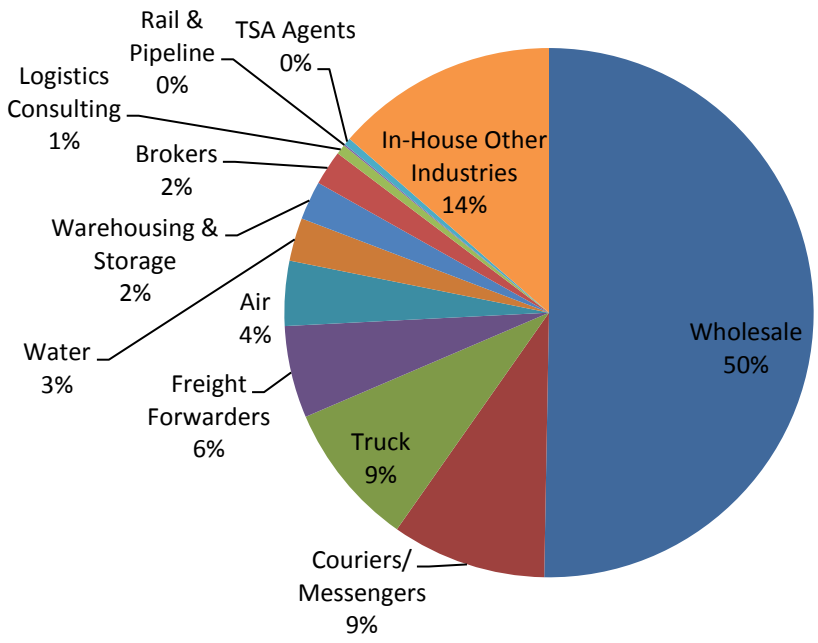


Table 3.5 Distribution of Freight Transportation Impacts by Industry Sector, 2008

Industry Sector	Jobs	Output (millions)	Labor Income (millions)	GRP (millions)
Wholesale trade	76,075	$14,871	$5,589	$9,660
Messenger	14,302	$1,007	$449	$744
Truck	13,347	$1,338	$410	$548
Freight Forwarders	8,513	$680	$466	$611
Air	6,300	$1,882	$579	$765
Water	4,345	$2,283	$340	$652
Warehousing & Storage	3,581	$206	$121	$165
Brokers	3,212	$628	$236	$408
Logistics Consulting	915	$125	$67	$77
Rail & Pipeline	134	$148	$41	$93
In-House	20,591	$2,676	$826	$1,376
Total	**151,314**	**$25,845**	**$9,124**	**$15,098**

Source: County Business Patterns, IMPLAN, Miami International Airport, Port of Miami, Cambridge Systematics

In-House Transportation Activity

In-house freight transportation jobs relate to establishments that handle their own goods movement in-house, such as Wal-Mart owning and managing their own fleet of trucks. To account for this impact (which is not included in the Census' County Business Patterns or IMPLAN), data from the Transportation Satellite Accounts were used. The TSAs provide a way to measure the direct industry requirements for in-house transportation services for all sectors of the economy. These figures, presented as percent of total industry output spent on in-house transportation, were used to estimate the number of jobs, economic output, and GRP that is attributable to in-house freight transportation in the county.

Table 3.6 below presents a snapshot of the application of this methodology to five industry sectors. The first two columns show total industry output and employment, the middle one shows the percent of total output spent on in-house transportation directly from the TSAs, and the last two columns show the output and jobs related to in-house transportation activity based on the TSA number.

Table 3.6 In-House Freight Transportation Impact

Industry Sector	Industry Output (millions)	Total Industry Employment	% of output spent on in-house transportation	Output spent on in-house transport (millions)	In-house transportation jobs
Construction	$12,189	97,072	5.73%	$699	5,072
Retail Trade	$11,324	154,775	3.87%	$439	5,395
Professional Services	$18,259	146,260	1.44%	$262	1,334
Leisure & Hospitality	$9,966	119,734	2.24%	$223	2,316
Health Care	$11,133	112,604	1.29%	$144	1,523
Manufacturing	$17,330	48,833	0.74%	$128	360
Miscellaneous Business Services	$7,254	76,647	1.44%	$104	1,506
Other Services	$6,354	85,343	1.44%	$91	1,469
Information	$11,784	30,250	3.47%	$62	174
Farming	$644	6,413	5.24%	$34	452
All Other	$85,939	569,664	0.15%	$127	1,442
Total	**$191,533**	**1,441,183**	**1.19%**	**$2,280**	**20,591**

Source: Census' County Business Patterns, IMPLAN, BTS Transportation Satellite Accounts

In total, there are nearly 21,000 in-house transportation jobs in the county coming primarily from the retail sector (26%), construction (25%), leisure and hospitality (11%), health care (7%) and different business services. In-house transportation represents $719 billion in employee compensation for an average of $35,000 per person.

Tax Revenue

In addition to the abovementioned impacts, Miami-Dade also receives over $540 million in tax revenues annually from on-going freight activity in the county. This comes from equipment taxes, truck registrations, fuel tax, property taxes, and business taxes as summarized in Table 3.7 and described below.

Miami-Dade freight activity generates over $540 million in tax revenues.

Table 3.7 Tax Revenue from Freight Activity in County, 2008

Revenue Source	Annual Revenue
Tangible Property Taxes	$ 9,098,080
Truck Registrations	$ 271,627,137
Fuel Taxes	$ 10,654,403
Real Estate Taxes	$ 249,149,740
Local Business Taxes	$ 936,891
Total	**$ 541,466,252**

Source: Miami-Dade County, Florida Department of Revenue, 2008

- Tangible Property Tax – This ad valorem tax is assessed according to the value of the assets used in a business to derive income such as equipment, fixtures, leased equipment or furniture and appliances used in a rental property or any attachment made to a mobile home or manufactured in a rental park located in businesses and rental property.

  The Miami-Dade County Tax Collector office maintains statistics of property taxes paid by individual businesses, and also categorizes them based on their NAICS industry. For this study, data from businesses classified under wholesale, transportation, or warehousing were used to calculate the total of nearly $10 million paid in 2008. The list of businesses was reviewed thoroughly to ensure that companies involved in passenger transportation were not included.

- Truck Registrations – Using Miami-Dade County records for truck registrations, along with the registration fee by vehicle category, the study team estimated roughly $270 million is collected annually by the County.

- Fuel Tax – The Florida Department of Revenue publishes annual statistics about gallons of fuel consumed in each County within the State, and the tax rates for the Federal, State, and County governments. In 2008 just over 152 million gallons of diesel were sold in Miami-Dade County with a local tax of $0.07 per gallon, which equates to $10.7 million in tax

revenue.[7] Additional taxes are collected by the State and Federal Government.

- Real Estate/Property Tax – Real estate property taxes are ad valorem taxes assessed according to the value of land, buildings and improvements to the land to include single family, multi-family, residential, condominium, cooperatives, townhouses, time share developments and mobile homes. Real estate property taxes also include taxes based on the assessed value for vacant land, residential land, commercial land or agricultural land.

  For this study, statistics for businesses that were classified as either manufacturing, industrial, warehousing/storage,, or food processing were counted, in addition to the land owned by CSX, FEC, and NS railroads. In total these businesses paid nearly $250 million in taxes in 2008.

- Local Business Tax – The Local Business Tax is imposed for the privilege of doing business in Miami-Dade County. Persons who provide merchandise, entertainment, or services to the public, even if only a one-person company or home-based business, must obtain a Local Business Tax Receipt before starting to operate. Given limitations in the format in which the data is collected for this tax, only businesses classified under wholesale trade were included, and they accounted for nearly $1 million in taxes in 2008.

Impacts from Construction Expenditure

The final component of the positive economic impacts from freight activity in the county is the influx of cash from freight-related construction projects that come from non-county sources. For the 5 year period covering Fiscal Years 2011-16 this impact is projected to reach nearly $500 million, for projects related to the Port of Miami, Miami International Airport, and connecting roadways. These impacts, along with the corresponding multipliers are discussed in detail in Section 3.3.

Negative Impacts

While the overall impact of freight activity in Miami-Dade is decidedly positive from an economic standpoint, hauling goods across the County's infrastructure has some negative impacts

Truck and rail traffic generate over $400 million annually in negative impacts.

[7] According to the DOR, in 2008 152.2 million gallons of diesel were sold in Miami-Dade County, however the DOR does not classify which portion was sold to trucks vs. diesel passenger automobiles. For this study it was assumed that all diesel was consumed by trucks, which may slightly overstate the overall tax impact attributable to trucks. Given the low volume of passenger vehicles that operate with diesel engines, the volume of gallons consumed by these is likely to be minimal compared to trucks.

that merit discussion. As illustrated in Table 3.8 and discussed below, truck and rail activity generate over $400 million annually in direct costs and/or negative impacts to the County and its residents. These include pavement deterioration, congestion caused by truck traffic, delay at rail-grade crossings, and pollution.

Table 3.8 Negative Impacts from Freight in Miami-Dade, 2008

Impact	Value (millions)	
Road Maintenance	$	102.35
Congestion	$	297.11
Rail Crossings	$	2.44
Total	**$**	**401.90**

Source: Cambridge Systematics, FDOT, FHWA, FEC

- Road Maintenance – To estimate the dollar amount of annual maintenance that is attributable to trucks, all road maintenance projects for Florida DOT's District 6 (Miami-Dade and Monroe Counties) were extracted from FDOT's latest adopted work program (2012-2016). The dollar amount was then apportioned to Miami-Dade County based on its current share of road miles within the District. These projects included primarily resurfacing, routine maintenance, bridge repair, pavement reconstruction and rehabilitation, signage, and pavement markings.

  An annual investment of approximately $150 million is spent in Miami-Dade County on roadway maintenance. Pavement deterioration rates, from the FHWA[8], were used in combination with vehicle-miles traveled (VMT) data from FDOT, to allocate the cost between trucks and autos. Over $100 million was attributed to truck traffic vs. $46 million for automobiles. The difference is the result of a truck pavement deterioration rate that is 40 times larger than those from automobiles ($0.0278/truck-mile vs. $0.0007/auto-mile). Note this estimate is conservative in that it does not include maintenance on non-state roadways.

- Congestion –FDOT truck VMT data were used in conjunction with factors from the FHWA's "Highway Economic Requirements System" (HERS) to estimate the congestion impacts resulting from truck traffic. The output from the HERS model suggests that every truck-mile traveled in urban areas generates approximately 1 minute of combined delay for all travelers along the road (0.018 hours). In 2008, roughly 677 million truck miles took place in Miami-Dade County, which translates to approximately 12.2 million hours of delay annually. The travel time

[8] FHWA Federal Highway Cost Allocation Study – Table V-9
http://www.fhwa.dot.gov/policy/hcas/final/five.htm

impacts were then monetized based on a value of time of $24.62 per hour (from the National Highway Traffic Safety Administration – NHTSA), to an annual impact of $297 million in total delay in Miami-Dade's roadways.[9]

- Rail Crossings – Rail crossing delay impacts were calculated for FEC and CSX trains traversing the county in 2008. The volume of trains was obtained from the "US-27 Rail Corridor Study" published by FDOT District 4 in 2010. The study breaks down the number of trains each carrier operates through Fort Lauderdale by time of day. FEC operates 27 freight trains on a typical day while CSX operates 6 freight trains daily.

  Using data from FDOT's Florida Traffic Information DVD[10], AADT information was extracted for each of the affected rail crossings by time of day. A percent of traffic affected was estimated based on the length of time that the trains would be blocking traffic during each time period (crossing times were estimated at 90 seconds based on a study from FEC Railway)[11]. An occupancy rate of 1.7 persons per vehicle was used to calculate the number of person-hours affected; this figure was obtained from the 2009 National Household Travel Survey.[12] Based on these numbers nearly 200,000 person-hours of delay per year are generated from FEC's trains, while CSX generates roughly 37,000 person-hours more (see Table 3.9).

  The final step was to monetize the hours of delay, which was done by first categorizing the trips by purpose using the Florida Standard Urban Transportation Model Structure from 2008. Forty six percent of trips were projected to be Home-Based Work or Non-Home Based trips. An average hourly rate of $30.16 was used for these trips (from the 2008 Miami-Dade IMPLAN model). No value of time was used for the remaining 54% of the traffic which represent Home-Base Non-Work trips. Using this approach, a combined hourly rate of $13.84 per person-hour affected was used. As illustrated in Table 3.9, FEC's train crossings resulted in $2.2 million in travel delay for Miami-Dade travelers in 2008, while CSX trains caused $208,140 for a combined $2.4 million.

[9] TIGER Discretionary Grants - http://ops.fhwa.dot.gov/freight/infrastructure/tiger/index.htm

[10] FDOT - http://www.dot.state.fl.us/planning/statistics/trafficdata/fti.shtm

[11] FEC Railway - Train Crossings and Traffic Operational Analysis, August 2010.

[12] Summary of Travel Trends – 2009 National Household Travel Survey - http://nhts.ornl.gov/2009/pub/stt.pdf

Table 3.9 Traffic Delay from Rail Crossing, 2008

	Annual Delay (hours)		Monetized Impact		
Time	**FEC**	**CSX**	**FEC**	**CSX**	**Total**
Midnight - 6AM	19,353	5,843	$ 267,749	$ 80,842	$ 48,591
6AM - 9AM	32,843	-	$ 454,393	$ -	$ 54,393
9AM - 4PM	42,669	-	$ 590,339	$ -	$ 90,339
4pm - 7PM	38,960	-	$ 539,023	$ -	$539,023
7PM - Midnight	27,703	9,201	$ 383,281	$127,298	$510,579
Total	**198,589**	**36,643**	**$2,234,785**	**$208,140**	**$2,442,925**

Source: CS, IMPLAN, FDOT, NHTSA

- Air Quality – In addition to the above-mentioned economic impacts, freight activity in Miami-Dade also has an impact on air quality. Fuel used to transport goods by truck, rail, water, and air produces carbon dioxide (CO2), nitric oxide (NO_X), and particulate matter (PM) which can have negative impacts on the health of the County's residents and visitors. While efforts have been made recently to monetize the impact of these emissions, a consensus has not been reached yet, and the values suggested in published studies vary significantly. As a result, these impacts have not been monetized for this study; instead a measure of the volume of emissions is presented in Table 3.10.

  Truck VMT data were used to estimate diesel consumption, which were combined with factors from the EPA and the Texas Transportation Institute's MOBILE6 model to estimate the volume of CO2, NO_X and PM produced. As illustrated, over 900,000 tons of CO2 are emitted annually in Miami-Dade, in addition to 7,678 tons of NO_X and 189 tons of PM.

Table 3.10 Air Quality Impacts from Truck Traffic in Miami-Dade

Impact	Tons	Source
Carbon Dioxide (CO2)	914,396	EPA
Nitric Oxide (NOX)	7,678	TTI (MOBILE6)
Particulate Matter (PM)	189	TTI (MOBILE6)

3.4 MULTIPLIER IMPACTS OF FREIGHT TRANSPORTATION IN MIAMI-DADE COUNTY (2008)

The direct economic impacts highlighted in Section 3.2 have a multiplying effect in Miami-Dade as a result of freight-related businesses spending on supplies and services necessary for their supply chain, and then those direct employees spending on personal needs for their households. This section describes these impacts, along with the methodology used to calculate them.

There are two types of multiplier impacts that will be discussed in this section:

- Indirect. These are jobs and output generated as part of business to business transactions. Examples include trucks purchasing fuel, warehouses purchasing pallets, real estate costs, insurance, and banking.
- Induced. These are jobs and output generated from local personal spending on goods and services by people working in the freight industry. Examples include rent/mortgage payments, groceries, clothing, entertainment, and medical needs, amongst others.

To measure these impacts, a 2008 Miami-Dade IMPLAN model was purchased from the Minnesota IMPLAN Group (MIG). IMPLAN is an economic impact modeling system developed by MIG to create complete, extremely detailed Social Accounting Matrices and Multiplier Models of local economies. The model, based on public sources such as County Business Patterns, contains detailed industry data at a county level. Its multipliers are used as a basis in several other major economic impact tools such as MARAD's PortKit model and EDRG's Tredis model.

Based on IMPLAN, the 151,314 direct freight jobs covered in section 3.2 generate a total of 274,552 jobs in Miami-Dade County, with an average compensation of $54,374 (including benefits). These jobs, and their corresponding activity, generate over $42 billion in economic output and a gross regional product of $25 billion, as illustrated in Table 3.11. A breakdown of the indirect and induced multipliers is covered below.

Table 3.11 Combined Economic Impacts from Freight Activity in Miami-Dade County, 2008

Metric	Direct	Indirect	Induced	Total	Multiplier
Jobs	151,314	48,841	74,397	274,552	1.81
Labor Income (millions)	$ 9,124	$ 2,589	$ 3,173	$ 14,886	1.63
Average Compensation	$ 60,297	$ 53,009	$ 42,655	$ 54,219	------
GRP (millions)	$15,098	$ 4,111	$ 5,897	$ 25,106	1.66
Economic Output (millions)	$25,845	$ 7,146	$ 9,805	$ 42,796	1.66

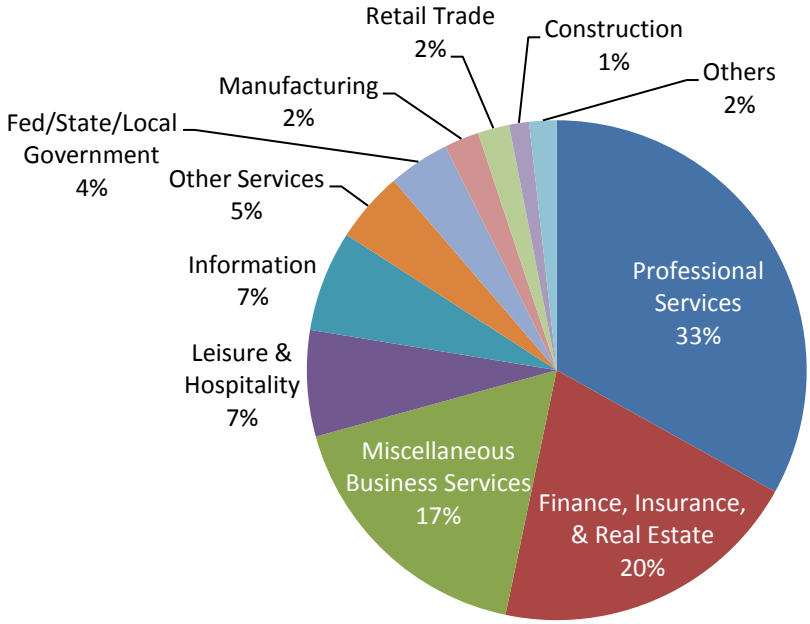
Source: CBP, IMPLAN, CS

Indirect Impacts

The freight industry in Miami-Dade County generates nearly 50,000 indirect jobs, which support its on-going activities. Most of these jobs are in the service sector, providing freight-related businesses such as truckers and wholesalers with real estate, property management, employment services, consulting, legal advice and mail delivery. A breakdown of the distribution of indirect jobs by industry sector is presented in Figure 3.4 below. As illustrated, the top three categories fall in the services sector and make up 70 percent of all indirect jobs (about 34,000 jobs). These are professional services (employment, accounting, legal, and engineering services), FIRE (finance insurance and real estate), and miscellaneous business services (facilities management, security, and equipment rental). Other key sectors include leisure and hospitality, information services, manufacturing, retail, and construction.

Freight activity in the county generates 50,000 indirect jobs in Miami-Dade, primarily focused in business services.

Figure 3.4 Breakdown of Indirect Jobs by Industry Sector, 2008



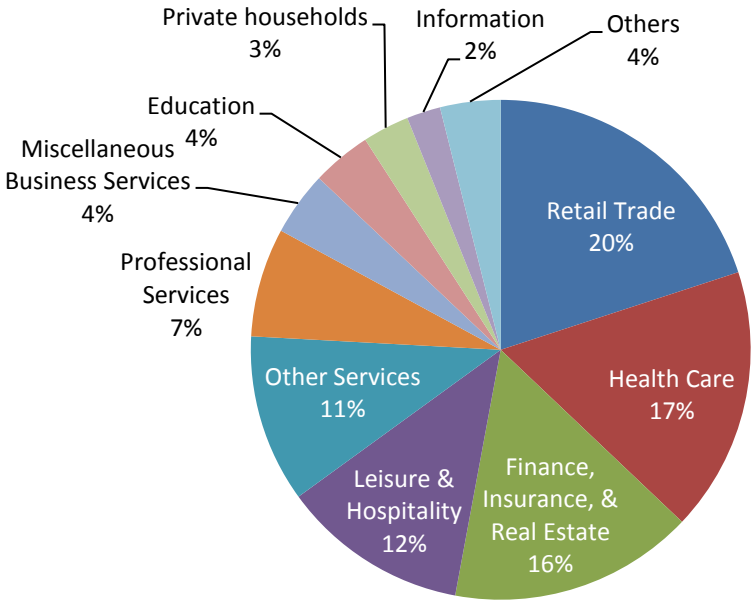
Source: CBP, IMPLAN, CS

Induced Impacts

In addition to the services paid by the freight businesses, the staff directly employed in freight related jobs also spends on the local economy for personal reasons. This expenditure supports 74,000 jobs in Miami-Dade. The distribution of their personal expenditure is significantly different than those for the indirect impacts. As illustrated in Figure 3.5, the primary beneficiary of this activity is the retail sector, followed by healthcare, FIRE, and leisure and hospitality sectors.

Freight activity in the county generates 74,000 induced jobs throughout the economy in Miami-Dade.

Figure 3.5 Breakdown of Induced Jobs by Industry Sector, 2008



Source: CBP, IMPLAN, CS

Impacts from Construction Expenditure

The final component of the economic impacts from freight activity in the county is the influx of cash from freight-related construction projects that come from non-county sources. These sources primarily include Federal or State matches for projects and private investments. Using the 2012 Transportation Improvement Program adopted by the Miami-Dade MPO, all of the planned freight-related construction projects for the next five years were extracted. These projects cover improvements at the Port of Miami (dredging, FEC rail expansion, the tunnel…), Miami International Airport (air cargo apron, taxiways), and projects that affect

key highway corridors (SR826/836 lane additions, 25th Street lane additions…). For roadway projects, the level of investment was weighted down based on the percentage of truck traffic currently traversing the road.

Once all projects were extracted, the current sources indicated in the TIP were used to determine local vs. external expenditures for the five year period covering FYs 2011-2016. As illustrated in Table 3.12, $1.2 billion will be invested in the County during this period, with $730 million projected to be covered by the County (60%) and the remaining $490 million coming mainly from the Federal and State governments (40%).

These investments were run through the County IMPLAN model to obtain multiplier effects, which result in total gross output (sales) of $2.3 billion in the County, and a net impact for Miami-Dade of $1.55 billion in output after the local expenditure is subtracted, for an annual average of $310 million. This is money that is flowing into and stimulating the local economy in Miami-Dade, and would likely not be materializing without the local freight activity.

Table 3.12 Construction Investment for Freight Projects in Miami-Dade, Fiscal Years 2011-16 (in millions)

Impact	Imported Dollars	Local Dollars	Total
Construction Expenditure	$ 490	$ 730	$ 1,220
Indirect Output	$ 218	$ 325	$ 544
Induced Output	$ 208	$ 309	$ 517
Total Output	**$ 917**	**$ 1,365**	**$ 2,281**
Net Impact (Total Output - Local Investment)			**$ 1,551**
Annual average impact			**$ 310**

Source: Miami-Dade FY 2012 TIP, IMPLAN

3.5 SUMMARY OF IMPACTS AND PERSPECTIVE

In summary, the freight industry has a significant presence in Miami-Dade County, supporting over 270,000 jobs, with an average compensation of $54,000 per year, and generating a gross regional product of $25 billion. This activity generates over $540 million in tax revenue for the County, and an average annual influx of $310 million from freight related construction projects. Freight transportation also costs the county's residents and visitors $401 million annually in road maintenance, congestion, and rail crossings delay (see Table 3.13).

Table 3.13 Economic Impacts of Freight Transportation in Miami-Dade County (in millions of dollars), 2008

Impact Type	Metric	2008 Impact	Source
Positive	Jobs	274,552	IMPLAN/CBP/CS
	Output	$42,796	IMPLAN/CBP/CS
	Labor Income	$14,886	IMPLAN/CBP/CS
	GRP	$25,106	IMPLAN/CBP/CS
	Equipment Taxes	$9	Miami-Dade County
	Truck Registrations	$272	Miami-Dade County
	Fuel Taxes	$11	FL Dept of Revenue
	Real Estate Taxes	$249	Miami-Dade County
	Business Taxes	$1	Miami-Dade County
	Freight-Related Construction Projects	$310	Miami-Dade County
Negative	Road Maintenance	$102	FDOT/FHWA
	Congestion	$297	FDOT/FHWA
	Rail Crossings	$2	CS/FDOT

As illustrated in Table 3.14, the net impact from freight activity in the county amounts to $25.5 billion annually. This is the result of adding together the positive impacts (GRP, various sources of tax revenue, and the freight-related construction impacts) and subtracting the negative impacts.

Table 3.14 Net Economic Impact of Freight Activity in Miami-Dade County

Impact Type	Metric	2008 Impact (millions)
Positive	Gross Regional Product	$25,106
	Tax Revenue	$542
	Freight-Related Construction Projects	$310
Negative	Maintenance, congestion, delay	$401
Net	Combined Impact	$25,557

These figures illustrate that the freight industry is an integral part of Miami-Dade County's economy. As Table 3.15 indicates, the freight industry represented 19 percent of the County's 1.44 million jobs in 2008, and an even higher share of employee compensation (25 percent) and GRP (23 percent), which highlights the fact that the freight industry supports jobs with higher than average compensation in the County.

Table 3.15 Freight Industry Contribution to Miami-Dade Economy

Metric	Miami-Dade Total	Freight Direct	% of Miami-Dade	Freight Total	% of Miami-Dade
Employment	1,441,182	151,314	10.5%	274,552	19.1%
Employee Compensation (millions)	$ 60,674	$ 9,166	15.1%	$14,929	24.6%
Output (millions)	$ 191,533	$25,893	13.5%	$42,845	22.4%
GRP (millions)	$ 111,191	$15,149	13.6%	$25,157	22.6%

Source: CBP, IMPLAN

The direct employment in freight (151,000), makes up 11 percent of the county's total jobs, a figure that is line with the other top three industry sectors in the county (FIRE, retail, and professional services), as highlighted in Table 3.16 below.

Table 3.16 Top Industry Sectors by Jobs in Miami-Dade, 2008

Industry Sector	Direct Employment	% of County's Employment
Total Employment	1,441,183	100%
Finance/insurance/real estate	181,472	12.6%
Retail	154,775	10.7%
Freight	151,314	10.5%
Professional Services	146,260	10.1%
Leisure and Hospitality	119,734	8.3%
Healthcare	112,604	7.8%

Source: CBP, IMPLAN

4.0 Future Economic Impacts of Freight Activity in Miami-Dade County (2035)

This chapter presents a summary of the economic impact that the freight industry is projected to have in Miami-Dade in 2035. The forecast is based on available publications from the Port of Miami, Miami International Airport, the Florida Chamber's Trade and Logistics Study, and Miami-Dade's 2035 Long Range Transportation Plan (LRTP). Section 4.1 discusses the 2035 projected freight flows from these publications while section 4.2 covers the economic impact resulting from that traffic.

4.1 FREIGHT FLOWS FORECAST

Port of Miami Master Plan

The Port of Miami is in the process of finalizing its 2035 Master Plan and has released preliminary numbers for container growth at the port. Currently the port serves primarily the South Florida market with containerized traffic from/to Latin America (Caribbean, Central and South America), Europe, and the Pacific Rim. The Port is planning to expand this reach through three key projects, as described earlier and summarized below, that will allow it to attract Post-Panamax Asian vessels traversing through the widened Panama Canal after 2014:

- Deep Dredge. The Port's entrance channel will be deepened to 52 feet and the south shipping channel to 50 feet in order to accommodate larger vessels.
- On-port rail rehabilitation. Through the use of the on-port rail connection to FEC, cargo moving through the port can reach hinterland markets quicker and at a more affordable rate, allowing POM to compete with out-of-state ports such as Savannah for South Atlantic traffic.
- Tunnel. The tunnel will connect the port directly to the Interstate System, removing the need to travel on city streets in downtown Miami, and reducing total delivery cost and time for shippers

The POM has produced three scenario forecasts based on its anticipated success in attracting additional traffic as a result of these three projects. As illustrated in Table 4.1, the low/base scenario assumes market penetration does not change, and that POM simply continues to serve primarily the South Florida market. The

second scenario (Penetration of Local Markets), assumes that the port expands its reach to the rest of Florida, particularly the Orlando and Jacksonville markets. Finally, the third scenario assumes that POM can capture a significant share of out-of-state traffic through the use of the direct rail connection at the port.

The first scenario results in traffic doubling from 900,000 TEUs (twenty-foot equivalent container units) to 1.8 million for a compounded annual growth rate (CAGR) of 2.8 percent. In the second scenario traffic grows at an annual pace of 4.4 percent to a total of 2.65 million TEUs, while the third scenario projects 3.2 million TEUs and 5.2 percent growth per year. For this analysis, the second scenario growth rate was used.

Table 4.1 Container Traffic Forecasts at Port of Miami (in TEUs)

Scenario	2010	2035	CAGR*
Low/Base	900,000	1,800,000	2.81%
Penetration of Local Markets	900,000	2,650,000	4.41%
Penetration of Local Markets + 15% Intermodal	900,000	3,200,000	5.20%

Source: Port of Miami, 2035 Master Plan Briefing. March, 2011
Note: Numbers estimated from graphs in available material.
* CAGR – Compounded Annual Growth Rate

Miami International Airport Strategic Master Planning Study

In 2010, Miami International Airport released its strategic master planning study, which presented an overview of current cargo and passenger operations at the airport, in addition to forecasts to 2035. The forecast presents low, base, and high scenarios that vary from a 2010 level of approximately 1.75 million tons to anywhere from 4.04 to 4.84 million tons in 2035 for an annual growth rate ranging between 3.4 and 4.1 percent (see Table 4.2). The base growth rate of 3.65 percent was used for this study.

The projections are based on detailed econometric models that quantify associations between air cargo and one or more variables, such as gross domestic product (GDP), employment, population, income, and/or fuel prices. It combined assumptions about growth rates for domestic and international mail and freight traffic, and finally, results were validated/calibrated using forecasts from aircraft manufacturers Boeing and Airbus.

The driving force of the forecasts is international freight, which will increase its share from approximately 85 percent of current MIA total cargo to over 90 percent by FY2035. In particular, Chinese shipments to North America and Latin America (in-transit) are projected to boost MIA cargo significantly, with projected growth rates exceeding 8 percent over the next 20 years.

Table 4.2 Miami International Airport Cargo Forecast

Scenario	2010	2035	CAGR
Low	1.75	4.04	3.40%
Base	1.76	4.32	3.65%
High	1.76	4.84	4.12%

Source: Miami International Airport, 2010

Trade and Logistics Study Forecast

The Florida Trade and Logistics Study, commissioned by the Florida Chamber Foundation, studied the potential impact of Florida becoming a global hub for trade, logistics, and export oriented manufacturing activities. Over the next decade, the study suggests that Florida will be in position for a larger, more commanding role as a trade hub, as a result of:

- The State's location in the fastest growing U.S. business and consumer market, the arc of southern states from Texas to Virginia.
- The State's location at the crossroads of growing north-south and east-west trade lanes, with access to more than 1.1 billion consumers in the Western Hemisphere by 2035.
- The widening of the Panama Canal, together with the growth in Latin American and Caribbean markets, will realign global trade lanes and increase flows through this region in the coming decades.

The study produced trade forecasts for all of Florida, including breakdowns by County and seaport with the underlying assumptions that Florida can:

- Capture a larger share of the containerized imports originating in Asia and serving Florida businesses and consumers, about half of which enter the nation through seaports in other states today;
- Expand export markets for Florida businesses by filling these import containers with Florida goods and using more efficient logistics patterns to attract advanced manufacturing and other export related industries to Florida; and
- Emerge as a global hub for trade and investment, leveraging its location on north-south and east-west trade lanes to become a critical point for the processing, assembly, and shipping of goods to markets throughout the eastern United States, Canada, the Caribbean, and Latin America.

A summarized forecast by mode for Miami-Dade County is presented in Table 4.3 below. These numbers do not match up those from the POM and MIA presented above; they are based on different sources and the forecasts are based on different assumptions. The study projects overall freight flows in the county to grow at an annual pace of 1.73 percent. Seaport traffic is forecast to grow at a significantly faster pace (3.0 percent for containerized traffic), while air falls just

below the average, and truck traffic is average. While overall rail traffic is projected to grow slowly, mainly due to the decrease in bulk traffic coming from the aggregate mines in Miami-Dade, containerized traffic from the Port of Miami is expected to pick up significantly, netting an overall rail growth rate of 0.7 percent.

Table 4.3 Miami-Dade Freight Flow Forecast

Mode	2010 Tons (millions)	2035 Tons (millions)	CAGR
Truck	103.31	159.15	1.74%
Rail	14.69	17.37	0.67%
Seaport	6.70	12.77	2.61%
Seaport TEUs	*0.60*	*1.25*	*3.00%*
Air	0.37	0.56	1.64%
Other	10.83	20.21	2.53%
Total	**136.34**	**210.07**	**1.73%**

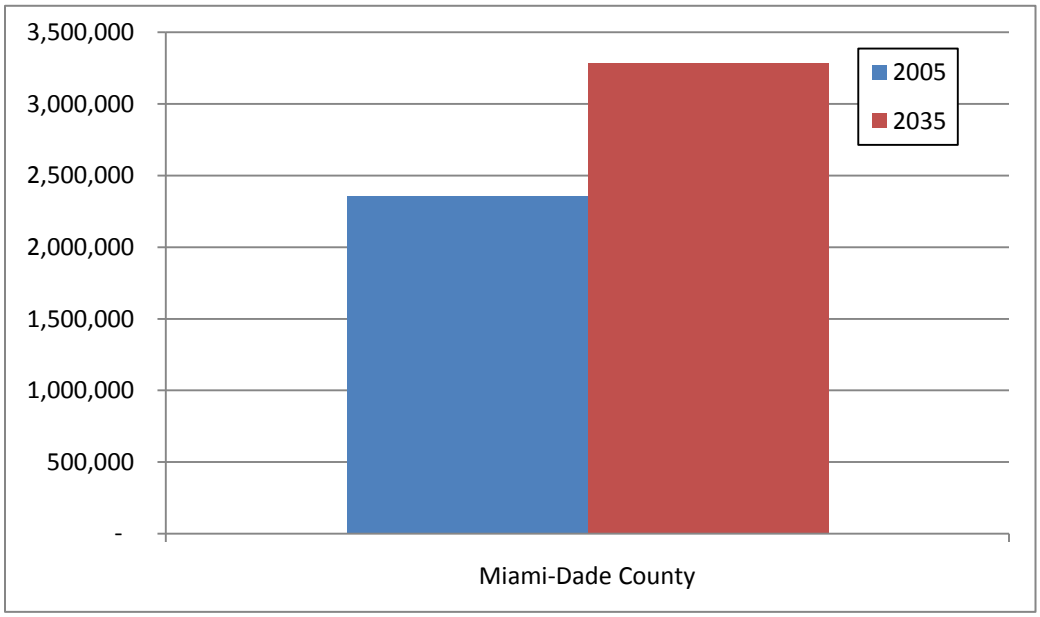
Source: Florida Chamber Trade and Logistics Study

Miami-Dade Long Range Transportation Plan

In addition to the abovementioned sources, the study team also looked at the population forecast from the 2035 Miami-Dade Long-Range Transportation Plan (LRTP). This forecast was used in the projection of several key economic indicators, discussed in Section 4.2.

In 2035, the population in Miami-Dade County is projected to increase by 919,000 persons (Figure 4.1), resulting in a total population in 2035 of more than 3 million persons and an annual growth rate of 1.1 percent. The population density in the County will also experience an increase, from an average of 1,180 persons per square mile in 2005 to 1,639 persons per square mile in 2035.

Figure 4.1 Miami-Dade Population Forecast

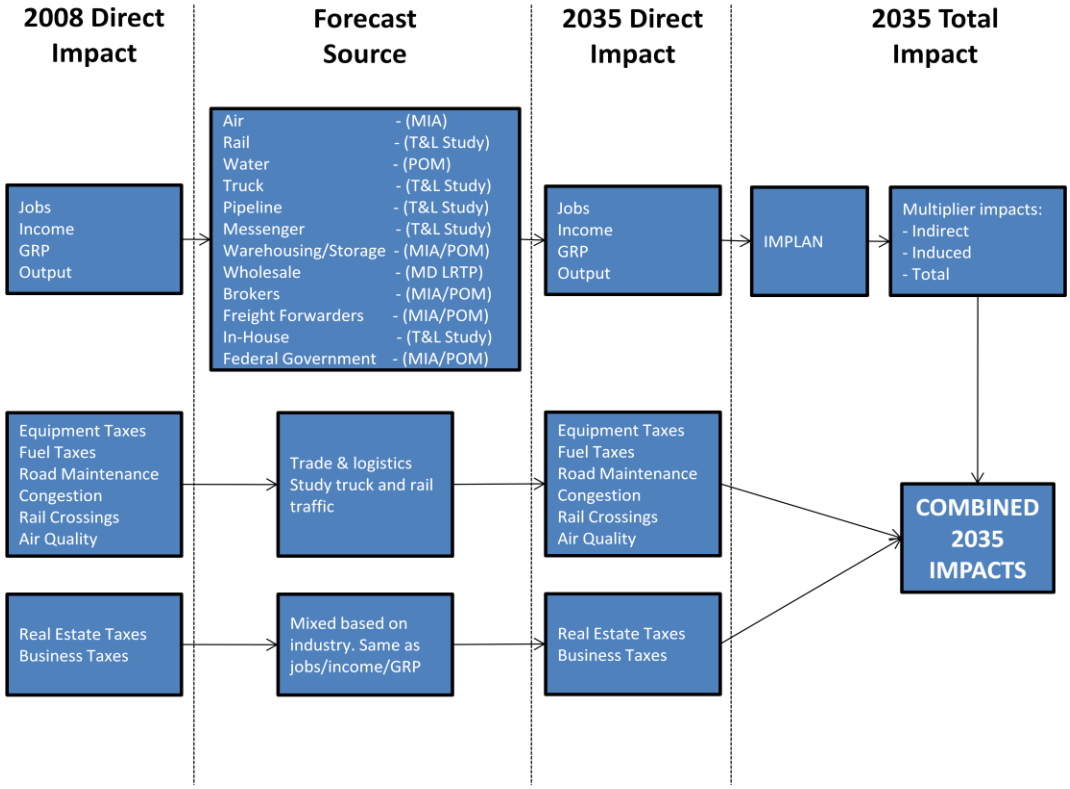


Source: Miami-Dade 2035 Long Range Transportation Plan

4.2 FUTURE ECONOMIC IMPACTS (DIRECT/INDIRECT/INDUCED)

To forecast the economic impacts of freight activity described in Chapter 3, a combination of growth rates from the sources described above were used. As illustrated in Figure 4.2, the direct impacts from 2008 were multiplied by the corresponding annual growth rates to obtain 2035 direct impacts, and the 2035 economic indicators (jobs, income, GRP, and output) were run through the County's IMPLAN model to obtain the multiplier effects.

Figure 4.2 Forecast Methodology



Base economic indicators were multiplied by the growth rate of the corresponding mode. For example, the MIA forecast was used for aviation-related freight jobs and the POM forecast was used for marine jobs. For brokers, freight forwarders, and warehousing/storage, a combined average growth rate for POM and MIA was used, given that these jobs rely heavily on the use of these two gateways. Finally, the population growth rate from the LRTP was applied to the wholesale jobs; this was done because wholesale jobs represented roughly 50 percent of the freight industry, and the growth rates from the POM and MIA are very aggressive (just over 4 percent per year compared to 1.1 percent for population). Applying the POM/MIA growth rates to the wholesale jobs would have resulted in exceedingly high numbers.

The results for future direct jobs are summarized in Table 4.4 below. In total, 258,000 people are projected to be employed directly in the Freight Industry in Miami-Dade County in 2035, for a combined growth rate of 2 percent per year. Wholesale trade is forecast to remain as the largest sector within the industry, with over 102,000 jobs, but other sectors are projected to grow faster. High growth sectors include waterborne transportation, freight forwarders, brokers, warehousing/storage, and air freight, with each seeing annual growth rates of close to 4 percent.

Table 4.4 Growth of Freight Transportation Jobs by Industry Sector

Macro Industry	2008 Jobs	2035 Jobs	CAGR*	Source*
Wholesale trade	76,075	102,339	1.1%	Population LRTP
Messenger	14,302	22,805	1.7%	T&L Study Truck Traffic
Truck	13,347	21,283	1.7%	T&L Study Truck Traffic
Freight Forwarders	8,513	26,360	4.3%	Mixed MIA and POM
Air	6,300	16,602	3.7%	Miami International
Water	4,345	13,948	4.4%	Port of Miami
Warehousing & Storage	3,581	11,089	4.3%	Mixed MIA and POM
Brokers	3,212	9,946	4.3%	Mixed MIA and POM
Logistics Consulting	915	1,457	1.7%	Average from T&L
Rail & Pipeline	134	161	0.7%	T&L Study
In-House	20,591	32,793	1.7%	Average from T&L
Total	**151,314**	**258,785**	**2.0%**	

* CAGR – Compounded Annual Growth Rate

Tax revenue from truck registration and fuel was forecast using the truck flows annual growth rate while revenue from equipment, real estate, and business taxes was forecast based on the industry classification for the businesses paying these taxes. Finally, negative impacts from truck and rail traffic were forecast using the corresponding annual growth rate for each mode from the Trade and Logistics Study.

The future direct jobs from Table 4.4 were run through IMPLAN to obtain the multiplier effects, and the results, along with the additional positive and negative impacts, are illustrated in Table 4.5 below. In summary, the freight industry is projected to have strong growth in Miami-Dade County, with most metrics rising nearly 2 percent annually over the next 25 years. Total jobs (direct, indirect, and induced) are projected to increase a combined 65 percent reaching 450,000, with an average compensation of $53,000 per year. This activity will also result in over $870 million in tax revenue for the county, and an average annual influx of $417 million from freight related construction projects; it should be noted that the volume of construction expenditure in the future may vary significantly as some of the major infrastructure projects are completed (such as the POM tunnel and dredging projects). Negative impacts are projected to cost the county's residents and visitors $640 million annually in road maintenance, congestion, and rail crossings delay.

Table 4.5 Economic Impacts of Freight Transportation in Miami-Dade County (in millions of dollars), 2008 and 2035

Impact Type	Metric	2008 Impact	2035 Impact	Resulting CAGR*
	Jobs	274,552	453,949	1.88%
	Output	$42,796	$70,648	1.87%
	Labor Income	$14,886	$24,025	1.78%
	Value Added (GRP)	$25,106	$40,088	1.74%
Positive	Equipment Taxes	$9	$13	1.41%
	Truck Registrations	$272	$433	1.74%
	Fuel Taxes	$11	$17	1.74%
	Real Estate Taxes	$249	$412	1.88%
	Business Taxes	$1	$1	1.10%
	Net Construction Impact	$310	$417	1.10%
Negative	Road Maintenance	$102	$163	1.74%
	Congestion	$297	$474	1.74%
	Rail Crossings	$2	$3	0.67%

* CAGR – Compounded Annual Growth Rate

Table 4.6 Net Economic Impact of Freight Activity in Miami-Dade County

Impact Type	Metric	2008 Impact (millions)	2035 Impact (millions)
Positive	Gross Regional Product	$25,106	$40,088
	Tax Revenue	$542	$876
	Freight-Related Construction Projects	$310	$417
Negative	Maintenance, congestion, delay	$401	$640
Net	Combined Impact	$25,557	$40,741

As illustrated in Table 4.6, the net impact from freight activity in the county amounts to $40.7 billion in 2035, a significant increase from the $25.5 billion in 2008. This is the result of adding together the positive impacts (GRP, various sources of tax revenue, and the freight-related construction impacts) and subtracting the negative impacts.