Central Dade TRANSPORT ZONE Study

Final Report

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Prepared for

MIAMI-DADE MPO Metropolitan Planning Organization

Prepared by

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50300083.08

EXECUTIVE SUMMARY

INTRODUCTION

A significant portion of freight movement in Miami-Dade County takes place in its central region, which extends from the Port of Miami on the east to the Warehouse District on the west. The central region is home to several major freight generators and attractors including the Port of Miami, Port of Miami River, Miami International Airport, and the Warehouse/Industrial district in Doral. A significant majority of freight transport in central Miami-Dade County occurs through the roadway network. The roadways within the central region are characterized by significant levels of traffic congestion, which negatively impacts freight movement. As a result, the freight transportation industry and businesses depending on them are experiencing increased transportation costs, reduced efficiencies, and difficulties in meeting schedules. The negative consequences are also felt by the general public by way of increased cost of goods they consume. In light of the above-mentioned issues, the Miami-Dade Metropolitan Planning Organization (MPO) initiated the *Central Dade Transport Zone* study to identify potential solutions for freight movement.

The objectives of the *Central Dade Transport Zone* study include:

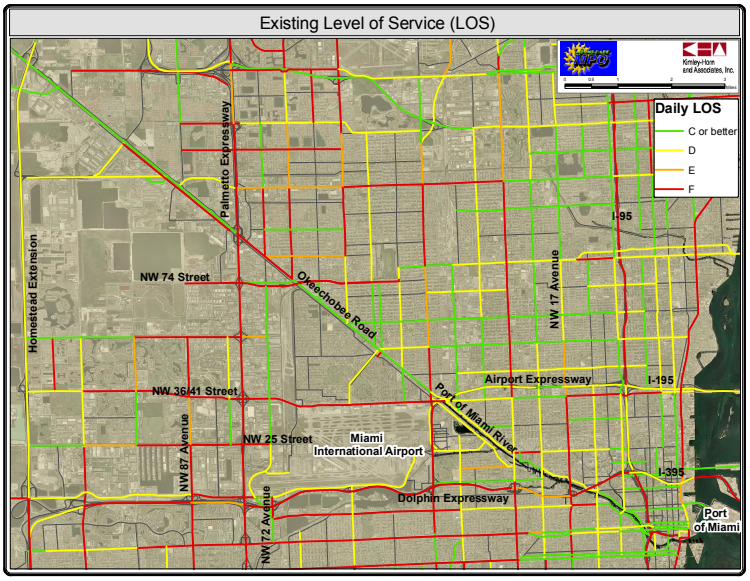
- identifying major obstacles to efficient movement of freight;
- identifying possible improvements to the existing infrastructure;
- identifying optional methods of moving freight such as short sea drayage; and
- identifying intelligent transportation systems (ITS) solutions to improve utilization of freight facilities.

LITERATURE RESEARCH

A literature review was performed for this study consisting of previous freight studies conducted within Miami-Dade County as well as studies from other regions of the country that have addressed freight transportation issues. The previous Miami-Dade County studies were reviewed to gain a better understanding of the freight transport issues within the central county, identify previously recommended improvements, and the status of implementation of proposed improvements. The previously recommended projects that have not yet been programmed or implemented were taken into consideration while developing recommendations for the central Miami-Dade region. The literature review ensured that the *Central Dade Transport Zone* study did not duplicate the previous work efforts. The literature review also consisted of a selection of studies from other major urban areas that have addressed freight transportation issues in varying capacities. Studies evaluating the feasibility of dedicated freight corridors were reviewed to learn the findings in order to assist this study's evaluation of the feasibility of dedicated truck routes in Miami-Dade County.

DATA ANALYSIS

The existing roadway network, traffic and truck flow characteristics, deficiencies of existing freight facilities, and interrelationships between major freight nodes were assessed. The evaluation of existing conditions formed the basis for the identification of potential improvements. The

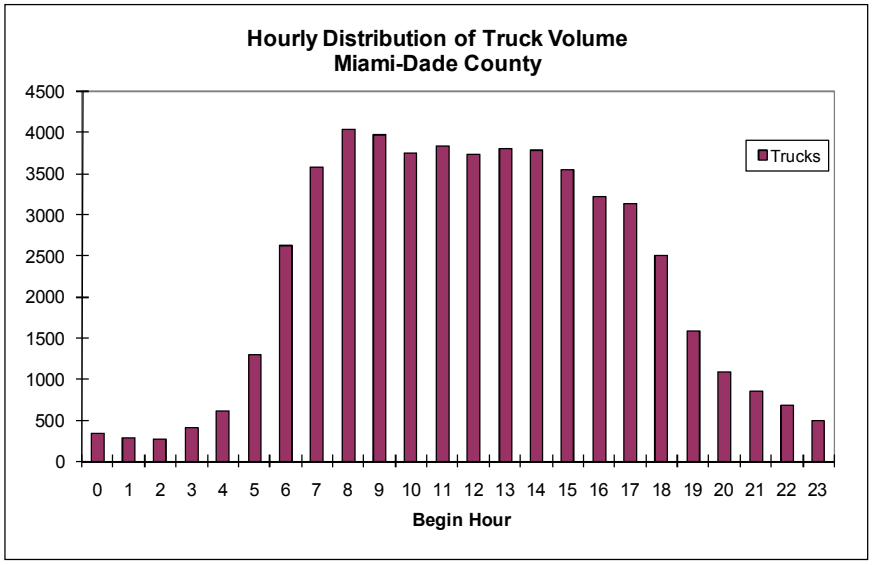


Existing Level of Service

major findings of the data analysis phase are summarized below.

Several major roadways in the western and central parts of the county currently operate at level of service (LOS) E or worse. The roadway grid network in the western part of the county is less defined (i.e., several roadway links that form the complete grid have not been built) in comparison to the eastern part of the county. As a result, arterials are used for both short and long distance trips. The lack of alternative roads results in increased traffic flow on major roadways, which leads to deterioration of level of service. Therefore, freight movement in the central corridor often experiences traffic congestion and excessive travel times.

The time-of-day distribution of truck and traffic flow on several major roadways within the study area was analyzed. The analysis indicated that approximately 86 percent of truck traffic and 80 percent of total traffic were observed between 6:00 A.M. and 7:00 P.M. In addition, the typical off-peak hours during the daytime (9:00 A.M. to 4:00 P.M.) are not evident in from the analysis. The data indicates that major roadways are experiencing at or near capacity conditions during much of the daytime. This analysis highlighted the need to develop strategies to encourage freight activities during the nighttime to take advantage of excess roadway capacity to move freight more efficiently.



Field reviews were conducted to examine the following freight facilities and roadways:

- Commercial loading zones in Downtown Miami
- Port of Miami access routes
- Port of Miami River and access routes
- Miami International Airport cargo operations
- Warehouse District in Doral

In Downtown Miami, the available commercial loading zones are often inadequate. This results in violation of parking rules such as parking in travel lanes, parking on sidewalks, exceeding time length restrictions, and double parking. Several potential strategies to address parking issues were identified, including commercial vehicle parking spaces in surface parking lots, extension of parking duration, and ITS applications to provide real time parking space availability information.

Delivery Vehicle Parked on Sidewalk in Downtown Miami

The roadway conditions of frequently utilized truck routes in Downtown Miami to access the Port of Miami were assessed. These roadways include Biscayne Boulevard, NE 5th and 6th Streets, and NE 1st and 2nd Avenues. Roadway improvements to better facilitate truck movements such as extension of left-turn storage, turn radii improvements, and roadway resurfacing were identified for further evaluation. The

desired improvements in the vicinity of the Port of Miami River include a truck staging area and resurfacing of North River Drive.

The Warehouse District is a transit point for a significant portion of freight arriving at the Port of Miami, Port Everglades, and Miami International Airport. The Dolphin Expressway, Palmetto Expressway, Florida's Turnpike, NW 41st Street, and NW 25th Street are used to access the warehouses. The majority of freight movement to and from the warehouses takes place during the daytime. This results in severe congestion on local streets such as NW 25th Street and NW 41st Street. There is need to develop alternate routes from Miami International Airport to the Warehouse District to relieve NW 25th Street. On NW 25th Street, both geometric improvements and signal timing improvements are desired. Another desirable improvement is better access to the Florida's Turnpike from the Warehouse District to reduce truck traffic on local streets.

NW 25th Street at Palmetto Expressway

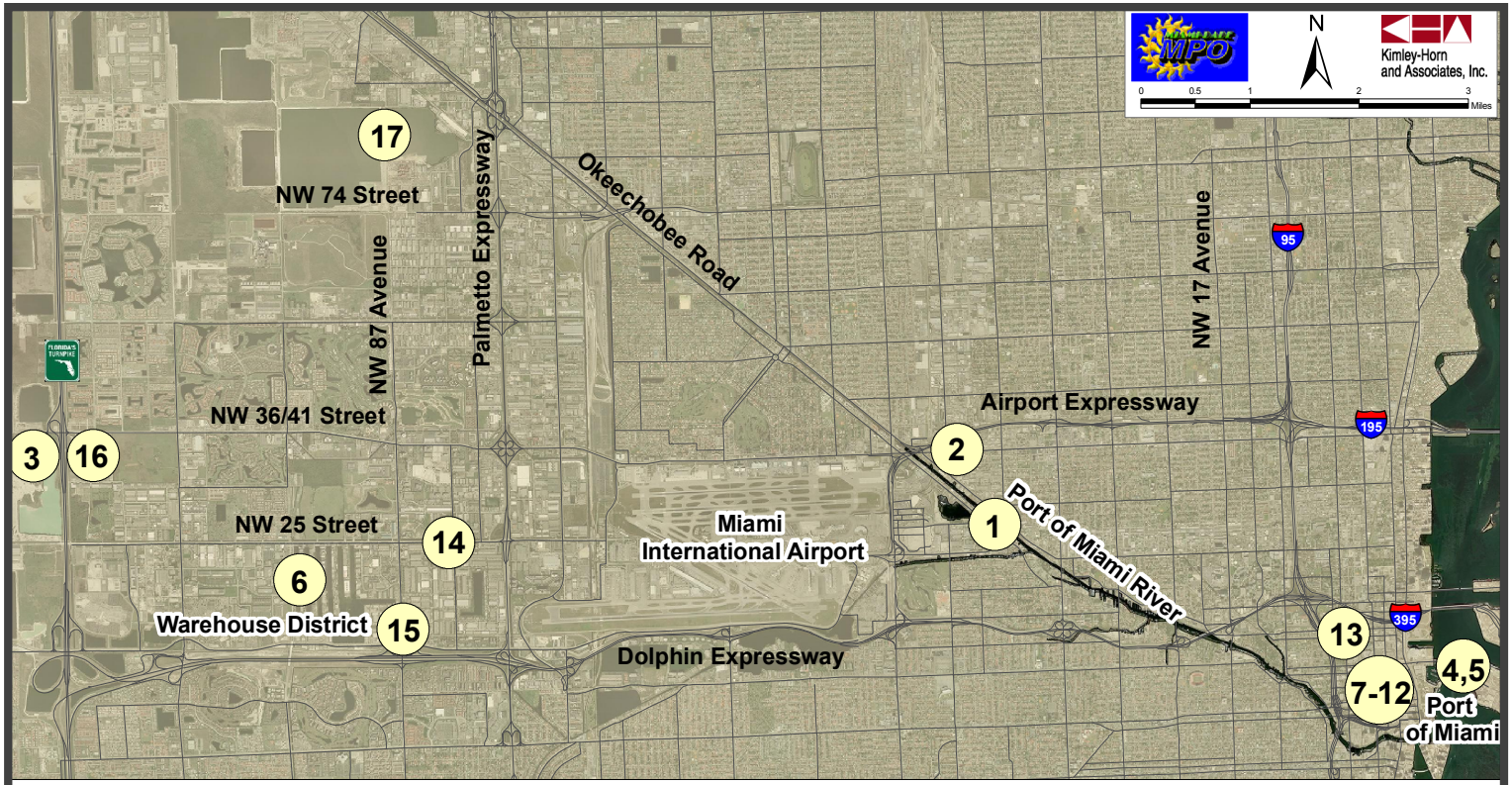
IMPROVEMENT STRATEGIES

The results of data analysis and input from the Freight Transportation Advisory Committee (FTAC) were used to identify several potential improvement strategies. The following strategies were evaluated to determine their potential to improve freight movement in central Miami-Dade:

- Strategy 1 – Short sea shipping
- Strategy 2 – Truck/intermodal freight facilities to serve the Port of Miami River and the Airport West Area
- Strategy 3 – Dedicated truck facilities
- Strategy 4 – Strategies to spread freight activity to off-peak periods
- Strategy 5 – Improvements to Downtown Miami commercial loading zones
- Strategy 6 – Roadway improvements
    - Port of Miami access routes
    - Intersection improvements along NW 25th Street
    - Intersection improvements along NW 12th Street
    - Connection of NW 117th Avenue between NW 25th Street and NW 41st Street
    - Complete "missing link" projects identified in the Miami-Dade MPO's *2030 Long Range Transportation Plan*.

An evaluation of a dedicated truck toll facility (Strategy 3) between the Port of Miami and the Airport West area concluded that factors such as the associated cost, construction impacts, funding sources, revenue generation potential, and projected level of service do not support a dedicated truck facility. The recommended projects are summarized in *Figure ES-1*. A notable recommendation is to re-evaluate the 6th Street Slip Ramp due to several benefits including the potential to serve as maintenance of traffic route during the reconstruction of I-395 and improved access to SR 836 west and I-95 from Downtown Miami.

Figure ES-1: Recommended Projects



Project Reference Number and Description

1. Short Sea Shipping Pilot Project
2. Truck Facility Near NW 36th Street & NW 37th Avenue
3. Truck Facility Near HEFT & NW 41st Street
4. A Study to Exam Expansion of POM Hours of Operation
5. PierPASS Feasibility Study
6. Congestion Pricing Study for Doral
7. Expand Commercial Loading Zones in Downtown Miami
8. Commercial Vehicle Parking in Downtown Miami Surface Parking Lots
9. ITS Applications for Downtown Miami Parking
10. Increase Left-Turn Storage on Biscayne Blvd. at Port Blvd
11. Intersection Improvements on NE 6th Street at NE 1st Avenue
12. Improve NE 2nd Avenue between NE 5th Street and I-395
13. Re-evaluate 6th Street Slip Ramp
14. NW 25th Street Corridor Study
15. NW 12th Street Flyover at NW 87th Avenue
16. NW 117th Avenue Connection to HEFT at NW 41st Street
17. Expedite NW 87th Avenue Construction between NW 74th Street and NW 103rd Street

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ACKNOWLEDGEMENTS

The Miami-Dade Metropolitan Planning Organization (MPO) initiated the Central Dade Transport Zone study to identify improvements to enhance freight movement in the Central Miami-Dade area. The Freight Transportation Advisory Committee (FTAC), which advises the MPO on freight movement and truck traffic needs, served as the Study Advisory Committee (SAC) for this project. The FTAC, which primarily consists of stakeholders from the freight industry, provided invaluable input by identifying roadway and intersection deficiencies, and reviewing interim results. Meetings were held throughout the course of the study with the FTAC. The members of the FTAC are listed below.

FTAC Members

- Sylvia Berstein (Chairperson)
- Jorge Rovirosa
- Stephen Armellini
- Ralph Puga
- Del Bryan
- Barbara Pimental
- Lee Karlinsky
- Mariella Marrero
- Lee Sandler
- John Johnson
- Eddie Rodriguez
- Douglas Tannehill
- Kornelia Tiede
- Felipe Muñoz
- Larry Foutz (FTAC Coordinator and MPO's Project Manager)

In addition, representatives from the following agencies attended the SAC meetings:

- City of Miami
- City of Doral
- Port of Miami
- Florida Department of Transportation
- Biscayne Bay Pilots
- Miami-Dade Public Works Department
- Miami-Dade Expressway Authority
- Miami-Dade Aviation Department
- Florida Highway Patrol

Meetings conducted by the Miami Parking Authority with major commercial delivery companies to address commercial vehicle parking issues in Downtown Miami also provided valuable input to the Central Dade Transport Zone study. Further, the Meeting Our Vehicular Needs (MOVN) committee reviewed and provided input on the Central Dade Transport Zone study recommendations for improving commercial vehicle parking in Downtown Miami.

INTRODUCTION

The ability to move goods efficiently is vital to the economic growth of a region. Often, modes of domestic freight transport, such as trucks and trains have to share the transport facilities with dominant other modes such as automobile and passenger rail. Roadways in the Miami Urbanized Area, one of the largest and most populated urban centers in the U.S., are experiencing severe congestion due to continuous growth over the last several decades. The lack of funding and space for the enhancing system capacity in proportion to the demand has caused an increased strain on the existing highways. As a result, the freight transportation industry and businesses are experiencing increased transport costs, inefficiency, and difficulties in meeting schedules and achieving just-in-time deliveries. The negative consequences are also felt by the general public by way of increased cost of goods they consume.

A significant portion of freight movement in Miami-Dade County takes place in its central region, which extends from the Port of Miami (POM) on the east to the warehouse district on the west. Major freight generators and attractors located in the central region include the Port of Miami, Port of Miami River, Miami International Airport (MIA), and the warehouse/industrial district in Doral. The transportation network in the central region is characterized by heavy levels of congestion, which impede the movement of goods.

In light of the above-mentioned issues, the Miami-Dade Metropolitan Planning Organization (MPO) initiated the *Central Dade Transport Zon*e study. This study was build upon previous and on-going study efforts in Miami-Dade such that the work is not duplicated. The objectives of the study are presented below:

- Identify major obstacles to the efficient movement of freight.
- Identify possible improvements to the existing infrastructure.
- Identify optional methods of moving freight such as short sea drayage.
- Identify intelligent transportation systems (ITS) solutions to improve the reliability of freight transport.

This report is divided into the following chapters, which approximates the steps performed in conducting the study:

- Study Area
- Literature Research
- Data Analysis
- Evaluation of Improvement Strategies
- Recommendations

Port of Miami

Source: http://www.metro-dade.com/portofmiami/home.asp

STUDY AREA

As illustrated in *Figure 1*, the approximate boundary of the study area consists of the Port of Miami to the east, the Airport Expressway (SR 112) and Okeechobee Road (SR 25) to the north, the Homestead Extension of Florida's Turnpike (SR 821) to the west, and the Dolphin Expressway (SR 836) to the south. Several major freight nodes are located within the study area including:

- Port of Miami
- Miami International Airport (the number one airport in U.S. for international cargo operations)
- Warehouse District (serves both the Port of Miami and Port Everglades)
- Port of Miami River
- Hialeah Rail Yard
- Free Trade Zone

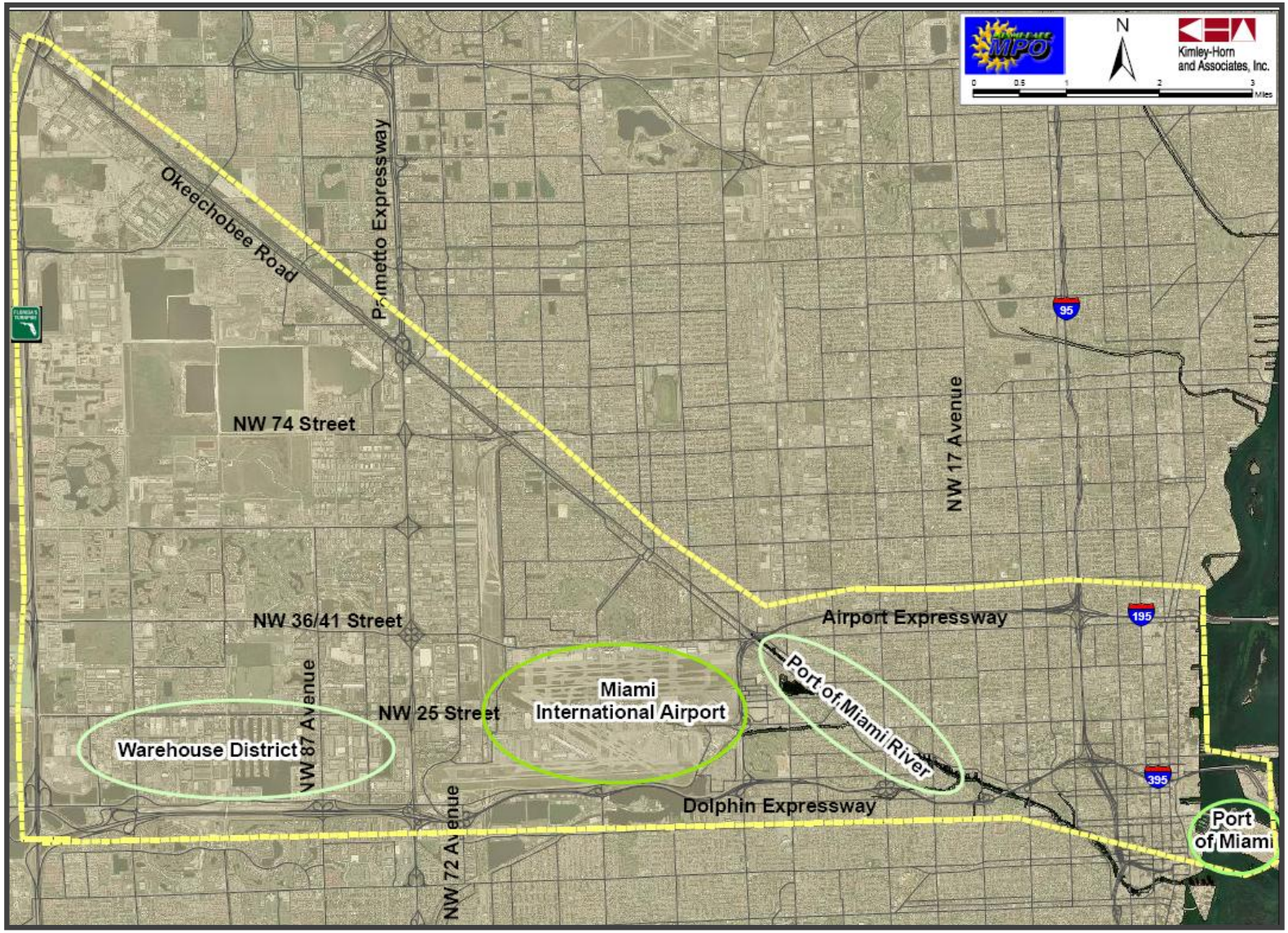
The major roadways that connect these freight nodes include:

- Dolphin Expressway (SR 836)
- Airport Expressway (SR 112)
- Palmetto Expressway (SR 826)
- Homestead Extension of Florida's Turnpike (SR 821)
- Okeechobee Road (SR 25)
- NW 36th/41st Street
- NW 25th Street

In addition, the Miami River is a major navigable waterway in Florida that serves shallow draft vessels originating from the Port of Miami River. Several cargo terminals and warehouses are located along the Miami River. Several active freight

rail corridors are also located within the study area. These rail corridors include the Florida East Coast (FEC) corridor that serves the Hialeah Rail Yard and rock mines in the Lake Belt area, and the South Florida Rail Corridor.

Figure 1: Study Area



LITERATURE RESEARCH

Literature review consisted of two elements: (1) review of past local freight studies conducted within Miami-Dade County and (2) review of major national studies relating to freight movement. Several local studies have been conducted to identify improvements to the freight transportation system. The following studies were identified for review to develop a better understanding of the freight transport related issues in the central county and the status of implementation of the previously proposed improvements.

The local studies included the following:

- Freight Movement Study
- Truck Route System for Miami-Dade County
- Short Range Truck Traffic Study for the Airport West Area
- Port Tunnel Project Development and Environment (PD&E) Study
- Port of Miami Freight Access Study
- NW 25th Street Viaduct
- Port of Miami 2020 Master Plan
- I-95 New Port Access Ramp to Westbound SR 836 PD&E Study
- Port of Miami City Street Improvements
- Miami Downtown Transportation Master Plan
- City of Doral Transportation Master Plan
- Truck Toll Facilities
- Florida Intracoastal and Inland Waterway Study
- Short Sea Shipping
- Exclusive Facilities for Trucks in Florida

The national studies included the following major freight related studies conducted in other parts of the country:

- Strategies for Separating Trucks from Passenger Vehicles
- Interstate 81, Virginia
- New Jersey Turnpike Dual-Dual Roadway
- SR 60 Truck Lane Feasibility Study

Local Studies

Freight Movement Study

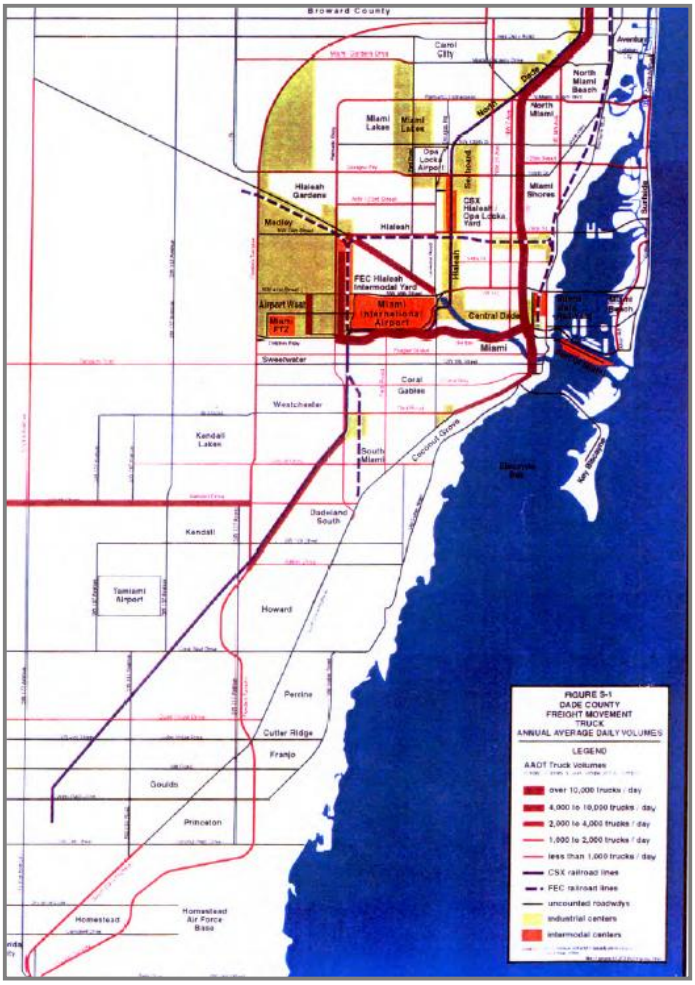
The study was completed by the Corradino Group, Inc. in 1996. This countywide study was conducted to identify ways to improve freight movement on roadways and incorporate freight transportation into Dade County's planning process and travel demand modeling. The findings and recommendations pertinent to the *Central Dade Transport Zone Study* are summarized below.

Findings:

- The majority of the truck travel in the County occurs from SR 836 to the north. The Port of Miami, Miami International Airport, and the FEC Intermodal Yard in Hialeah, all of which are located in the Central Dade region are identified as major freight generators.
- The heaviest truck traffic was observed on I-95, SR 112, SR 836, SR 826, NW 25th Street, NW 74th Street, US 27, and I-395.

Recommendations:

- Establish Dade County Freight and Truck Committee to participate in the transportation planning process.
    - *Comment: The Freight Transportation Advisory Committee (FTAC) now advises the Miami-Dade County Metropolitan Planning Organization (MPO) on freight movement and truck traffic needs.*
- Incorporate truck traffic forecasting capability to the Dade County travel demand model.
    - *Comment: The Miami Dade travel demand model currently does not have a freight trip generation module.*
- Improve monitoring of truck traffic on the roadways to facilitate identifying operational improvement opportunities.
- Port of Miami access improvements.
    - *Comment: FDOT is proceeding with the Tunnel Alternative.*
- NW 25th Street improvements between NW 67th Avenue and NW 87th Avenue.
    - *Comment: Phase I of*



the 25th Street Viaduct and 25th Street reconstruction project is currently under construction.

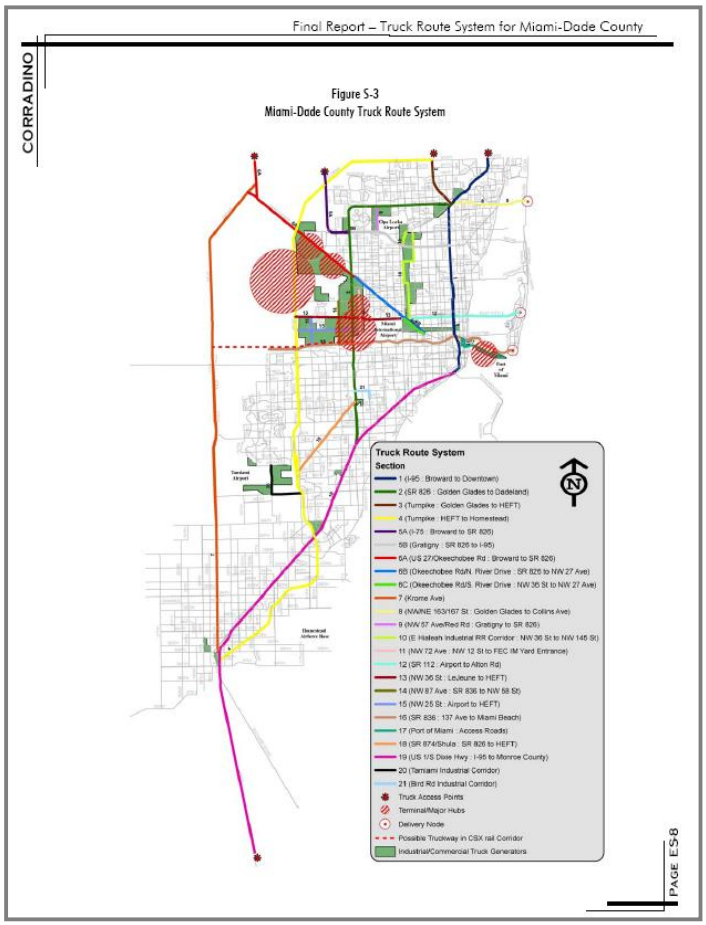
- Okeechobee Road improvements for greater utilization of the corridor by trucks. However, the study did not identify specific projects.
    - *Comment: The LRTP identifies the widening of roadway segments between W 12th Avenue and W 19th Street from 4 to 6 lanes, and additional lanes between SR 826 and W 12th Avenue, as Priority I projects. Grade separation of Okeechobee Road at Krome Avenue, NW 138th Street, and NW 95th Street are planned as Priority II projects. ITS improvements for the segment between Krome Avenue and NW 36th Street are also planned as Priority II projects.*

Truck Route System for Miami-Dade County

This study was conducted by the Corradino Group, Inc. in 2007. The study identified a system of truck routes consisting of 21 major corridor segments. Several recommendations were made to better accommodate trucks in the County's roadway network and near key freight hubs. The recommendations applicable to the central Miami-Dade include:

- US 27/Okeechobee Road – To support the corridor as a major truck route, replace bridges across the Miami River Canal and improve North River Drive.
    - *Comment: Although several improvements to the corridor are included in the LRTP, these improvements have yet to be implemented.*
- SR 836/Dolphin Expressway:
    - Bi-level travel lanes to separate auto and truck traffic or managed truck lanes.

- An east-west truckway on the CSX corridor that parallels SR 836.
- A connection to SR 112 is proposed.
- Implement the east-west passenger rail project to reduce auto travel.



- Port of Miami:
  - Expand entry/exit gates at the port.
  - Construct the tunnel.
  - Expand Port's hours of operation in coordination with the freight industry. Construct I-95 Slip Ramp at NW 6th Street.
  - Turning radii, horizontal and vertical clearance, signal timing, and pavement improvements on NE 1st Avenue, NE 2nd Avenue, and NE/NW 5th and 6th Streets.
  - Reduce port related truck traffic through Downtown Miami.
- SR 826/Palmetto Expressway:
  - Add lanes.
  - Complete full interchange with SR 836.
    - *Comment: The LRTP includes the widening of the interchange to 10 lanes as a Priority I project. As indicated in FDOT's*

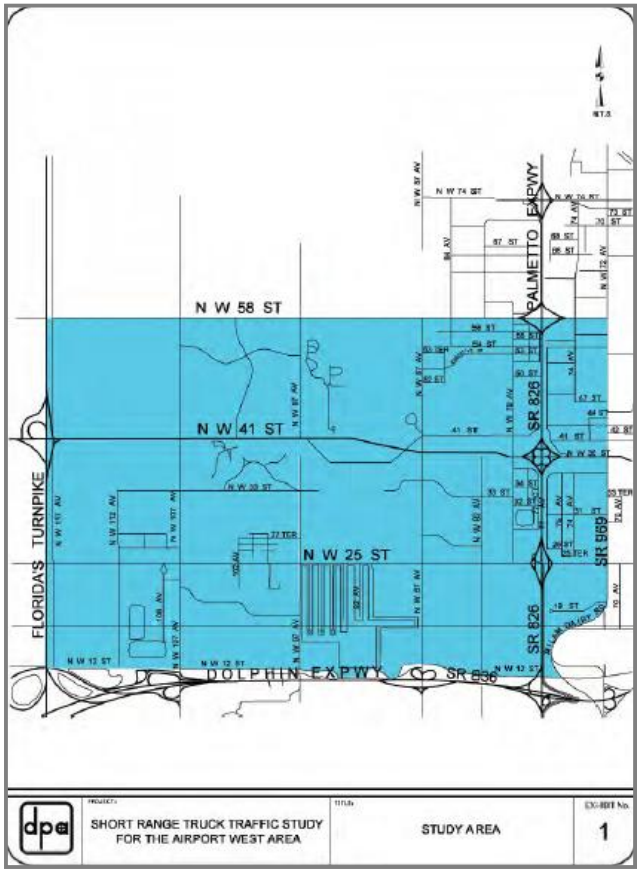
Palmetto/Okeechobee Construction web site, direct connector ramps between SR 836 and SR 826 (in all directions), direct exit ramps to main streets, and additional lanes will be provided. Construction is expected to commence in 2009.

  - Add ramps to increase storage for exiting trucks.
  - Elevated center lanes flyover for auto traffic at the Golden Glades interchange.
  - After adding capacity, create barrier-separated truck lane with manageable entry/exit. Trucks would not be allowed in traffic lanes.

- Homestead Extension of Florida's Turnpike (HEFT):
  - Dual-lane exit ramps at NW 41st and NW 106th Streets.
  - Truck-only interchange at NW 25th Street.
  - Improved oversize toll booth/lanes for trucks.
- NW 25th Street (Airport to HEFT):
  - Complete construction of the entire 25th Street Viaduct project.
    - *Comment: As previously stated, Phase I of the 25th Street Viaduct is currently under construction and the State has agreed to fund Phase II.*
  - Traffic signal improvements and truck-only interchange at the HEFT.
- NW 36/41 Street (LeJeune Road to HEFT):
  - Intersection improvements to accommodate trucks such as longer turn lanes, turning radii, and signal timing.
  - Redesign NW 36/41 Street as a superarterial per Superarterial Network Study.
- I-95 – Ramp metering, managed lanes, slip ramp at NW 6th Street, and truck access to the future HOT lanes.

Short Range Truck Traffic Study for the Airport West Area

The study was completed by David Plummer and Associates, Inc. in 2002. Its main objective was to develop recommendations for mitigating truck traffic problems in the Airport West Area, which was defined in the study as bounded by NW 58th Street to the north, SR 836 to the south, NW 72nd Avenue to the east, and SR 821 (Florida's Turnpike) to the west. The study recommendations include:



- Optimize traffic signal timing at the intersections of NW 36th Street and NW 72nd Avenue, NW 36th Street and NW 87th Avenue, NW 41st Street and NW 107th Avenue, and NW 12th Street and NW 87th Avenue.
    - *Comment: NW 107th Avenue is one of the ten corridors for which Miami-Dade County conducted corridor signal re-timing studies.*
- Access management strategies such as the closure of median openings and prohibiting turning movements at intersections along NW 36th Street and NW 87th Avenue.
- As long-term solutions, the study recommends the following roadway widening projects included in the Long Range Transportation Plan.
    - Widen NW 58th Street from NW 102nd Avenue to NW 107th Avenue from 4 to 6 lanes

- Widen NW 107th Avenue from NW 41st Street to NW 25th Street from 4 to 6 lanes
- Widen NW 87th Avenue from NW 36th Street to NW 58th Street from 4 to 6 lanes
    - *Comment: The widening of NW 87th Avenue between NW 36th Street and NW 58th Street is included in the Miami Dade 2030 Long Range Transportation Plan (LRTP) as a Priority II project, which is planned to be funded between 2010 and 2015.*

Port Tunnel Project Development and Environment (PD&E) Study

Post, Buckley, Schuh, and Jernigan, Inc. completed a PD&E study for FDOT in 1999 to develop a direct link between the Port of Miami and the expressway system, thereby avoiding the need for trucks to use streets in Downtown Miami. The study evaluated eight alternatives to develop an improved connection. The Watson Island Alternative was identified as the preferred alternative. The preferred alternative consists of a four-lane tunnel between Watson Island and Dodge Island that would connect to the MacArthur Causeway. The corridor would connect to I-95 and SR 836 via I-395. As part of the preferred alternative, an extra lane would be added to each direction of the MacArthur Causeway. The benefits of the preferred alternative include diverting a large amount of truck traffic away from the congested downtown streets with the least impact on historic/archeological sites and ship traffic during construction.

In May 2007, FDOT issued a "Notice of Intent to Select" a prospective contractor among three bidders to build the Tunnel Alternative. This notice is pending finalization of all financial arrangements between FDOT and local governments.

Port of Miami Freight Access Study

This study was completed by Cambridge Systematics, Inc. in 2007. The objective of the study was to evaluate a rail-only tunnel connection between the FEC railroad and the Port of Miami. Utilizing tunneling and open-cut below-grade techniques, the proposed railroad link would bypass downtown Miami and connect to the FEC railroad system. The study findings and recommendations are listed below.

Trucks at Port Entrance Gate
Source: Port of Miami Freight Access Study

<u>Findings:</u>

- The alternative was determined to be technically feasible. A conceptual level cost estimate places the cost to build the alternative at $1 billion. At present, only 11 percent of the Port of Miami's containers are transported to the Hialeah rail yard. The limited volume results in a very high per container cost.
- Significant environmental permitting obstacles that could further increase the cost were identified. The construction of a below-grade rail corridor could also significantly impact access to the port.
- Difficulties in funding, limited political and freight/shipping industry support, and the inability of rail to compete with trucks to economically serve the major destinations are some of the other obstacles identified in the report.

Recommendations:

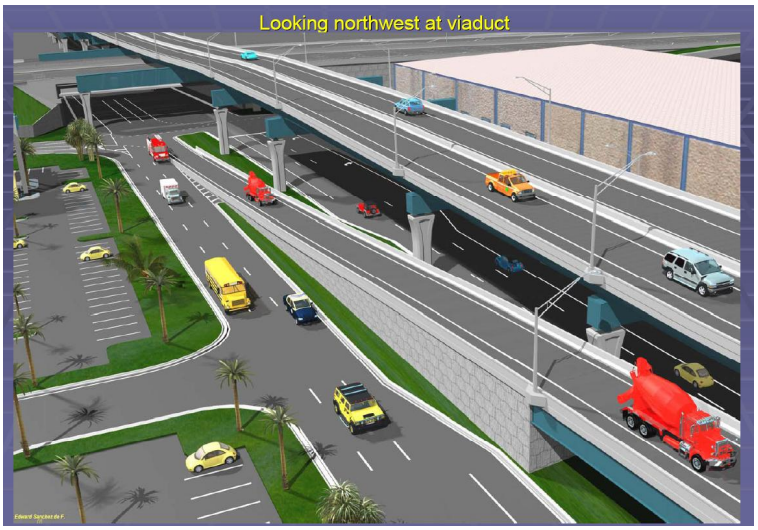
- Reduce passenger vehicular traffic and parking needs at the Port of Miami to eliminate congestion and increase cargo capacity. A feasibility study is recommended for providing mass transit access to the Port.

NW 25th Street Viaduct

This project was initiated to reduce traffic congestion and travel time on NW 25th Street (especially in the vicinity of the Palmetto Expressway), provide an alternative connection to the Airport West Cargo Area, and improve intersection turning radii for trucks. The Florida Department of Transportation is leading all aspects of this project. The project includes two components:

- Widening of NW 25th Street
- Construction of a new viaduct (an elevated bridge).

The roadway reconstruction calls for widening NW 25th Street by adding an additional west bound lane from the Palmetto Expressway (SR 826) to just west of NW 70th Avenue. Intersection improvements to allow for better truck turning movements, a landscaped median, improved lighting and drainage, and pedestrian features are also planned.



25th Street Viaduct
Source: FDOT Presentation – July 15, 2005

Viaduct Construction

The viaduct component calls for the construction of a two-lane (one lane in each direction) elevated bridge mainly situated over the north side of NW 25th Street using part of the North Line Canal right-of-way. The viaduct will begin just east of the Palmetto Expressway and will continue eastward eventually curving south from NW 25th Street onto NW 68th Avenue touching down just north of NW 22nd Street in the Airport West Cargo Area. A direct connection will be provided for vehicles leaving the Airport onto the northbound Palmetto Expressway. Viaduct traffic will be able to bypass the signalized intersections at NW 67th, NW 72nd, and NW 75th Avenues and three active railroad crossings between NW 68th and NW 70th Avenues.

Port of Miami 2020 Master Plan

The Port of Miami, with 518 acres of "made" land, was started originally on Dodge Island and later expanded to Lummus Island in Biscayne Bay. In 2001, the port handled over 955,000 TEUs (20-foot equivalent units) representing 8.2 million tons of cargo. The estimated container throughput by 2020 is two million TEUs. In addition, the Port of Miami is the world's largest cruise/passenger port. During fiscal year 2001, the port processed approximately 3.4 million revenue cruise passengers. Utilizing bigger ships and aggressive schedules, the passenger volumes could be increased to six million by 2020.

The Port of Miami 2020 Master Plan establishes capital investments identified as critical to accommodate port services for the next 20 years. Select goals, policies, and objectives of the Master Plan are presented below:

Port of Miami Gates
Source: Florida Seaport Transportation and Economic Development Council

- Construct additional railroad tracks, intermodal logistic transfer facilities, and access improvements for the efficient, competitive, and rapid movement of cargo (anticipated finish 2020).
- Work with the City of Miami, MPO, and FDOT to formulate a comprehensive multi-modal surface transportation plan for Downtown Miami to effectively address the access needs of the port (anticipated finish 2012).
- Work with other agencies to develop a comprehensive analysis of its transportation requirements for the next 20 years to meet additional cruise passenger and cargo transport needs. For cargo operation, the focus will be on better links from the port facilities to intermodal centers, industrial centers, and the interstate system (anticipated finish 2020).
- Work with other agencies to implement the direct port/interstate transportation link required to meet the needs of the port and the community (anticipated finish 2020).

- Request the MPO to modify the Miami-Dade County travel model to include truck trip generation and trip assignment related land uses, intermodal centers, truck routes, and freight modes. The port will support an origin/destination travel survey and industry/location survey for cruise and cargo ships (anticipated finish 2020).
- Work with other agencies to improve the County's roadway system, transit networks, and key problem intersections that are important to the movement of port-related freight and cruise passengers (anticipated finish 2020).

I-95 New Port Access Ramp to SR 836 West PD&E Study

This study was completed by Beiswenger, Hoch and Associates, Inc. in 2003. The objective of this study was to identify an access alternative to SR 836 westbound for the trucks leaving the Port of Miami. The current on-ramp to I-95 at NW 8th Street puts motorists in the extreme right lane of I-95. It is not possible to access westbound SR 836 ramps due to short distance and traffic weaving deficiencies. This study evaluated two main alternatives:

- New ramp at NW 6th Street.
- New ramp at NW 8th Street.

<u>Recommendation:</u>

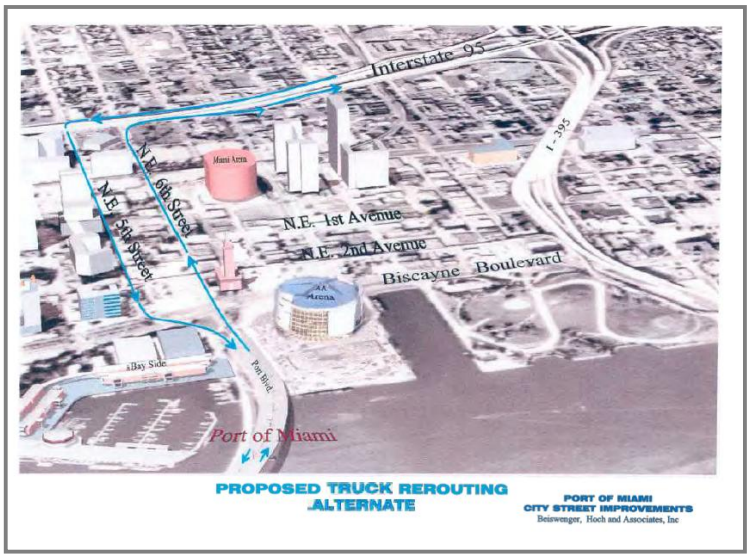
This study recommended the NW 6th Street on-ramp as the preferred alternative. This alternative provides the most direct connection between the Port of Miami and

I-95. However, southbound I-95 needs to be shifted to the west to accommodate the ramp between the northbound and southbound I-95 viaduct bridges. The other roadway modifications required to implement this alternative includes the realignment of NW 3rd Court and the reduction of number of lanes on NW 3rd Court from four to three between NW 4th and NW 8th Streets, and the permanent closure of NW 7th Street under I-95 between NW 3rd Court and NW 3rd Avenue. Both NW 5th and NW 6th Streets would also have to be improved to enhance their usage as alternate routes to the Port of Miami.

- *Comment: Attempts to construct a slip ramp to I-95, first at NW 8th Street and later at NW 6th Street, failed due to public opposition (Miami Today, August 31, 2006). FTAC is currently attempting to build political support for a northbound slip ramp to I-95 at NW 6th Street (Port of Miami Freight Access Study, Cambridge Systematics, 2007)*

Port of Miami City Street Improvements

The study was completed by Beiswenger, Hoch and Associates, Inc. in 2000. This study developed short-term improvements to mitigate the seaport truck traffic in the downtown Bayfront area. The pertinent recommendations of the study include:

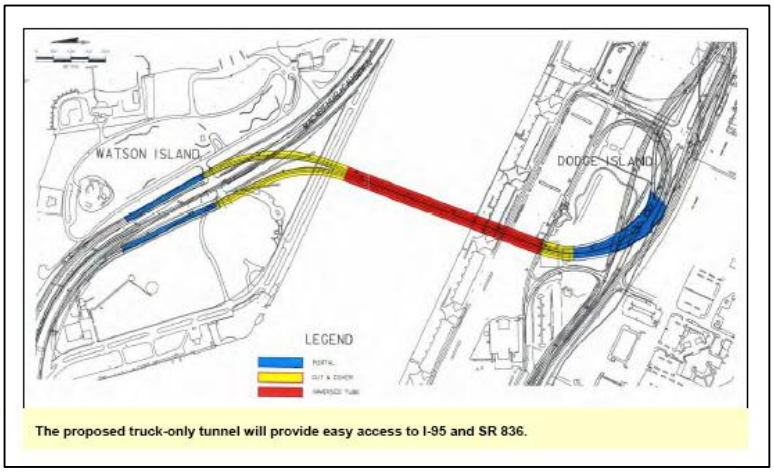


- Construct a new truck access ramp at I-95 and NW 8th Street to reroute traffic between the seaport and I-95 and SR 836.

- *Comment: As previously noted, attempts to construct a slip ramp to I-95, first at NW 8th Street and later at NW 6th Street, failed due to the public opposition (Miami Today, August 31, 2006). FTAC is currently attempting to build political support for a northbound slip ramp to I-95 at NW 6th Street (Port of Miami Freight Access Study, Cambridge Systematics, 2007)*

Miami Downtown Transportation Master Plan

The Miami Downtown Transportation Master Plan was completed by David Plummer & Associates, Leftwich Consulting, MRD Consulting, and Precision Engineering & Surveying in 2003. It focuses on multiple modes of transportation to help resolve mobility issues in Downtown Miami and better connect neighborhoods to this area. The study area extends from I-95 east to Biscayne Bay, and from I-195 south to SE 26th Road. The study recommendations were made based on year 2020 long-term growth projections. Some of the proposed improvements pertinent to the Central Dade Transport Zone study are listed below:



Truck-Only Tunnel to Port of Miami
Source: Miami Downtown Transportation Master Plan

- Provide a truck-only tunnel from the Seaport to Watson Island.
- Depress I-395 to connect the Omni/Overtown/Park West area with the Central Business District.

- *Comment: FDOT is currently nearing completion of the PD&E Study for the reconstruction of I-395. The depression of I-395 is no longer considered in the study.*

- Implement Intelligent Transportation System (ITS) technology alternatives to mitigate drawbridge openings. The concept of this recommendation is to provide an integrated communication system that would warn motorists well in advance (both in distance and time) of the impending opening of each bridge.

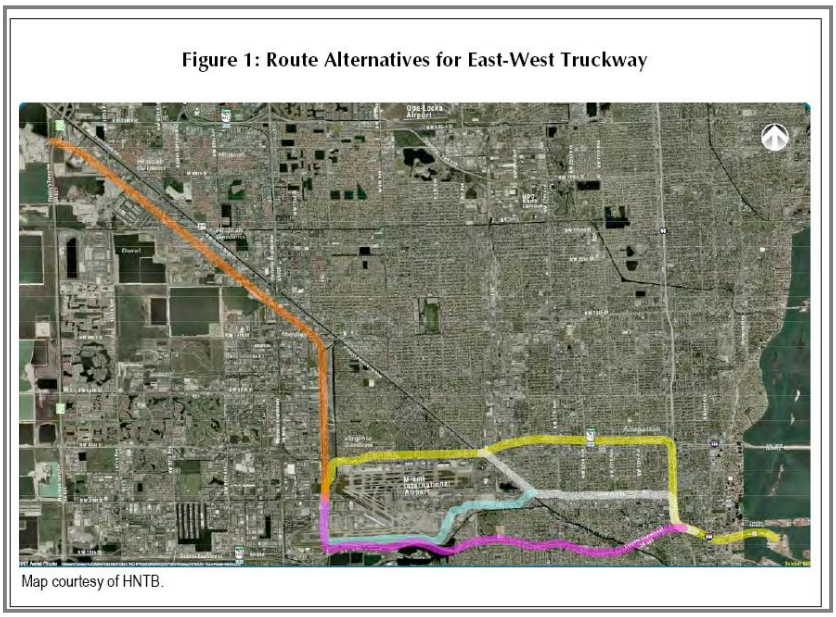
City of Doral Transportation Master Plan

This study, completed by the Corradino Group in 2007, identifies 27 roadway, transit, and transportation demand management (TDM) projects. The truck related projects identified in the Master Plan are listed below:

- Haul Road - The objective of this improvement is to provide a dedicated truck route to separate trucks from other traffic within the City. The truck route is proposed on the west side of HEFT between NW 41st Street and NW 12th Street to provide direct access for rock-hauling vehicles from the expressways.
- Peak Hour Truck Prohibition – As an interim solution to the peak hour traffic congestion, the Master Plan recommends the City to work with the freight and rock haulers to investigate the possibility of restricting trucks along NW 41st Street during the peak traffic periods.

Miami Toll Truckway – Preliminary Feasibility Study

This study was conducted by the Reason Foundation to investigate the feasibility of an east-west truck-only facility to serve the large volume of trucks plying between the Port of Miami and areas west of Miami International Airport (MIA) on congested highways. Four alternative alignments have been identified for the truckway. All these alternatives would connect to the proposed Port Tunnel along I-395 to I-95. The proposed alignments of the four options are presented below.



Source: Miami Toll Truckway (2007), Reason Foundation

- Option 1 recommends elevated lanes along I-95 that would connect to SR 112 crossing the Miami River at NW 36th Street and continuing west to MIA, where a tunnel beneath the northern part of the airport parallel to NW 36th Street would connect to Ludlum Road. Thereafter, one branch would connect to NW 25th Street using the FEC right-of-way and the other would terminate at a "Medley Extension" located northwest of the HEFT also on the FEC right-of-way.
- Option 2 would utilize a section of the South Florida Rail Corridor right-of-way from Downtown Miami to MIA to build an elevated structure. The Option

2 would head in a northwesterly direction to NW 36th Street and then utilize a tunnel as described in Option 1.

- Option 3 also would utilize a section of the South Florida Rail Corridor right-of-way and would cross the Miami River at NW 33rd Avenue and continue along NW 21st Street to MIA as an elevated facility. A tunnel is recommended along Perimeter Road that would turn north at Ludlum Road under MIA's southern runaway and follow the FEC right-of-way to NW 25th Street.
- Option 4 consists of an elevated facility above the SR 836 right-of-way from I-95 to LeJeune Road, where a tunnel would be built. This tunnel would follow the alignment described in Option 3.

The report identifies several challenges to building each alternative. Traffic volume projections and conceptual cost estimates are also provided. Because of the significant cost involved in constructing a truckway, the study recommends levying a toll amounting to $18 for a round-trip. This study assumes that truck traffic would grow linearly by three percent over the next 10 years and by five percent thereafter with the opening of this study's proposed truckway. The report presents travel time savings as a justification for levying tolls. The other aspects discussed in the report include the project feasibility, financing strategies, and legal aspects.

Florida Intracoastal and Inland Waterway Study

The Florida Intracoastal and Inland Waterway Study was completed for Florida Department of Transportation Seaport Office in 2003 by Wilbur Smith Associates, CH2M HILL, Nick Serianni, and Earth Tech. The goals of this study included:

- Document the importance of the navigable waterways and intracoastal system to the state's commercial activities;
- Inventory the operators and commodities currently utilizing the system;
- Identify primary commodities transported by the system;
- Highlight existing major impediments that restrict commercial use of the state's intracoastal and navigable waterways;
- Document the key waterside connection points of the shallow draft network with the landside transportation system; and
- Map the key features of Florida's intracoastal and inland waterway system.

The Miami River is one of the waterways studied in the report. The observations on the Miami River include:

- The build-up of contaminated sediments is a significant impediment to navigation. In particular, larger vessels cannot fill cargo to full capacity due to the shallow river basin and can use the river during periods of high tide only.
- An estimated $4 billion in trade takes place annually along Miami River.

Short Sea Shipping

A Short Sea Shipping concept for the Miami River has been presented by the Miami River Marine Group in part with P&L Towing and Transportation, Inc. Short Sea Shipping is an initiative that promotes the use of waterways for freight transport. Barges with cargo containers may be towed between the Port of Miami and facilities in the marine industrial "upper" Port of the Miami River in order to alleviate congestion in Downtown Miami and the Port of Miami. The facilities on the Miami River utilized for this operation would serve as distribution centers where containers could be picked up and trucked to their final destination; these same facilities could also be used for rail transport.

Cargo Vessel in the Miami River

The report estimates that Short Sea Shipping service could be put in service within 60 to 90 days. The estimates also indicate that a minimum of 200 containers daily could be initially transported using barges. Prior to shipping by barges, the clearance of containers by the Customs, Coast Guard and Immigration would be required. In addition, the containers would need to be scheduled for pick-up by truck or rail no more than 48 hours after leaving the Port of Miami. These requirements are necessary to keep the facilities working efficiently. Customs searching the containers at the Miami River shipping facilities would cause unwanted

delays to operations. Furthermore, storing or holding containers in the relatively small Miami River terminals would not be efficient.

The implementation of Short Sea Shipping would also assist truckers by reducing the time and fuel wasted while stuck in downtown traffic. Most truckers are owner/operator and/or small businesses that depend on the ability to move containers efficiently. Potential benefits of the Short Sea Shipping initiative are summarized below:

- Less trucks traveling through the downtown to and from the Port of Miami, which creates congestion.
- Improved safety for vehicular and pedestrian traffic within Downtown Miami.
- Improved quality of life for downtown residents by reducing trucks in the downtown core.
- Reduced security costs and risks by removing trucks that have to be searched at the Port of Miami.

Exclusive Facilities for Trucks in Florida

The Center for Urban Transportation Research (CUTR) at the University of South Florida conducted this study for FDOT to evaluate the feasibility of truckways and exclusive truck lanes. A geographic information systems (GIS) based method was primarily used to screen the Florida highways to identify potential truck corridors. The selection criteria used for identifying "hot spots" included truck crashes, truck volume, truck percentage, and highway level of service. The proximity to intermodal facilities, airports, and seaports was also considered in selecting potential highway segments. Three models were developed for the State Highways System (SHS) that serve the following trip types:

- Between cities – exclusive truck facilities linking one city to another.
- Within cities – additional truck facilities needed to move freight the "last mile" to an intermodal facility or distribution center.
- Regional facilities – a hybrid of the "between" and "within."

The study identified the following corridor segments that are located partially or fully within Miami-Dade County:

- I-95 corridor between Miami and Titusville. The roadway segment in southern Broward County received the highest score in the analysis. However, the report states that an exclusive truck facility would be difficult to build in the southern end of the corridor due to physical constraints.
- The "within cities" model identifies the segment of I-95 between the Palmetto Expressway and the Dolphin Expressway.
- An east-west truck facility connecting the Port of Miami and distribution centers to the west of the Miami International Airport is identified. An elevated facility on either the Airport Expressway or the Dolphin Expressway, with automobiles using the elevated facility and the existing lanes reserved for trucks. However, the report acknowledges that both alignments would be difficult to construct and extremely expensive.

Additional study recommendations include:

- The Florida Strategic Freight Network database needs to be updated.
- The construction of left-exits on the interstates should be carefully considered because they could impede special-use inside lanes (such as truck-only lanes).

- Prior to undertaking capital intensive solutions, potential operational changes to the existing facilities should be considered. The utilization of HOV lanes in the off-peak hours for truck traffic is one such possibility.

National Studies

Strategies for Separating Trucks from Passenger Vehicles

The objective of this study conducted by the Texas Transportation Institute in 2006 was to develop a set of criteria to evaluate the needs for special truck facilities and to use those criteria to identify the need for truck facilities in Texas. The report also provides a synthesis of other special truck treatment studies. Table 1 of the report (reproduced below) summarizes different truck treatments implemented in the U.S. As indicated in Table 1, there have not been any dedicated long-distance truckway facilities or exclusive truck lanes implemented in the U.S. However, relatively short-distance special-use facilities such as by-pass lanes for trucks mainly near interchanges and dual facilities, such as a 35-mile portion on the New Jersey Turnpike, have been implemented.

It is interesting to note that *NCHRP Synthesis 314* (Transportation Research Board, 2003) recognizes two examples of dedicated facilities for trucks that have already been built. The two facilities are Edgewater Road in New York and the South Boston Bypass in Massachusetts. However, these two roads are not built to function as high-speed facilities. The South Boston Bypass, formerly known as the South Boston Haul Road, is a two-lane facility built on an underutilized four-track railroad. It provides access to the Logan International Airport and is slightly over one-mile in length. The roadway primarily serves commercial vehicles. Information on the Edgewater Road truck facility could not be found.

The *Strategies for Separating Trucks from Passenger Vehicles* study also provides a summary of criteria developed to identify the need for special truck facilities. As indicated in Table 6 of the study report (reproduced below), truck-related crashes, truck and vehicle volume related measures, land use, connectivity, user perception, and financial feasibility variables have been used to determine if special truck facilities are warranted.

Table 1. Summary of Special Truck Treatments.

Special Truck Treatment	Description	Examples
Lane Restriction	Trucks are restricted to specified lanes. Other vehicles may travel in any lane. Restricted lanes are not separated from mainlanes.	Capital Beltway, Virginia; Houston, Texas; California
Exclusive Lanes	Trucks use only specified lanes that are designated for their exclusive use. Other vehicles may not travel in the exclusive lane. Exclusive lanes are not physically separated from mainlanes.	None implemented in U.S.
Exclusive Facilities	Trucks use a facility or lanes that are designated for their use only. These lanes are generally separated from the mainlanes by barriers or medians.	No freeway examples implemented in U.S.
Reserve Capacity Lanes	Trucks are provided access to reserve capacity lanes – i.e., high occupancy vehicle (HOV) lanes – in order to relieve congestion on mainlanes.	None implemented in U.S.
Separation and Bypass Facilities	Separation or bypass lanes are treatments used for a specific section or segment of roadway. The bypass lanes allow truck traffic to bypass or be separated from other traffic on the targeted segment. This treatment often addresses a roadway segment that has the following characteristics: weaving area, a significant grade, high percentage of truck traffic, and/or congestion.	Portland, Oregon; Los Angeles, California; and Paris A86 Ring.
Dual Facilities	Dual facilities have physically separated inner and outer roadways in each direction. The inner roadway is reserved for light vehicles or cars only, while the outer roadway is open to all vehicles.	New Jersey Turnpike
Multimodal Capacity Improvements	Uses two or more transportation modes, generally a roadway and rail combination, to improve operations and capacity.	Alp Transit St. Gotthard (under construction)
Time of Day Restrictions or Peak Period Bans	Time-of-day restrictions restrict all trucks or specified trucks from either designated lanes or routes during specific times of the day, usually peak hour traffic.	New York City
Route Restrictions	Route restrictions restrict either all trucks or specified trucks from traveling on certain routes or freeway sections.	Atlanta, Georgia
Speed Restrictions	Differential speed limits are imposed for trucks and other vehicles. The speed limit differentials vary from 5 mph to 10 mph, with truck speeds always being the lower speed.	Texas

Table 6. Summary of Truck Treatment Criteria.

Criteria	FDOT	Battelle	TxDOT 331	Douglas	Reasons	S.R. 60	I-81
Truck crashes	(5%)[a]	[≥ national average][b]	--	--	--	--	--
LOS_{car}	--	--	Included	--	--	Included	--
LOS_{mixed}	(15%)	[E-urban] [F-rural]	Included	--	--	Included	--
% Trucks	(5%)	[≥ 25%][c]	--	--	--	--	Included
Truck volume	(75%)	See %T	Included	[≥20k trucks Per day]	[≥10k trucks Per day] (35%) (+15%)[e]	Included	--
AADT or congestion	--	[≥100k][c]	--	--	(15%)	Included	--
Proximity to activity centers	Included (0%)	[≤2 mi from Interstate][d]	--	--	--	Included	--
Available median Width	--	--	Included	--	--	--	--
Minimum length	--	--	--	[10 mi]	--	--	--
Connectivity	--	--	--	--	(20%)[f]	--	--
Motor carrier interest	--	--	--	--	(15%)[f]	--	--
Cost elements	--	B/C Analysis	--	--	Included	Included	Included

[a] ( ) designates weight or priority; [ ] designates thresholds.
[b] Truck-involved fatal crash rate ≥ national average.
[c] Battelle: use 25% trucks in combination with average daily traffic (ADT) of 100,000 vpd.
[d] Battelle: Specifies activity center as intermodal facilities/processing centers.
[e] Reasons: If truck volume is high along the full length of the corridor.
[f] Reasons: Pertains to the LCV network.

Interstate 81 Corridor, Virginia

I-81 Improvement Concept
Source: http://www.improve81.com/mediainformation.asp

The 325-mile portion of the Interstate 81 in Virginia experiences a significant volume of truck traffic. As presented in the *I-81 Corridor Improvement Study: Existing and Future Conditions Data Analysis* (2004), the annual average daily traffic (AADT) on the four-lane corridor varied between 34,300 and 57,100 in 2003. The modal share of trucks varied between 21 and 35 percent. Long-range forecasts predict a two percent annual traffic growth that would increase AADT on some segments to approximately 115,000 by 2035. To address congestion and safety issues, several studies have been conducted. At one stage, the Virginia Department of Transportation (VDOT) had selected a proposal to widen I-81 to eight lanes that included four dedicated lanes for trucks. The concept plan for I-81 is illustrated below.

The key features of the proposed concept for I-81 include:

- Implementation of a long-term solution for I-81 in 15 years.
- Separation of cars and heavy commercial vehicles using Safe and Freight-Efficient (SAFE) lanes.
- A high-quality pavement to reduce the number of delays and lane closures for repairs.
- A 20-year pavement warranty for all new mainline/collector-distributor lanes and shoulders, which will lower VDOT's future maintenance costs and free up funds for other road projects.
- Six dual interchanges and eight truck-only flyovers, as well as other interchange improvements.
- Project cost of $6.3 billion, including a pavement warranty, with no finance gap.
- Trucks would pay $65 to travel the full length, based on a fee of 20 cents per mile.
- Rest areas for commercial trucks would also be placed in the median to avoid cross-over traffic into the passenger vehicle lanes.
- Intermodal freight movement which included numerous elements such as a rail plan that would move 560,000 trucks per year to rail.
- True public-private partnership – shared responsibilities and assumption of risk by private sector.
- Opportunities for VDOT to use the low-bid procurement process for elements of the project.

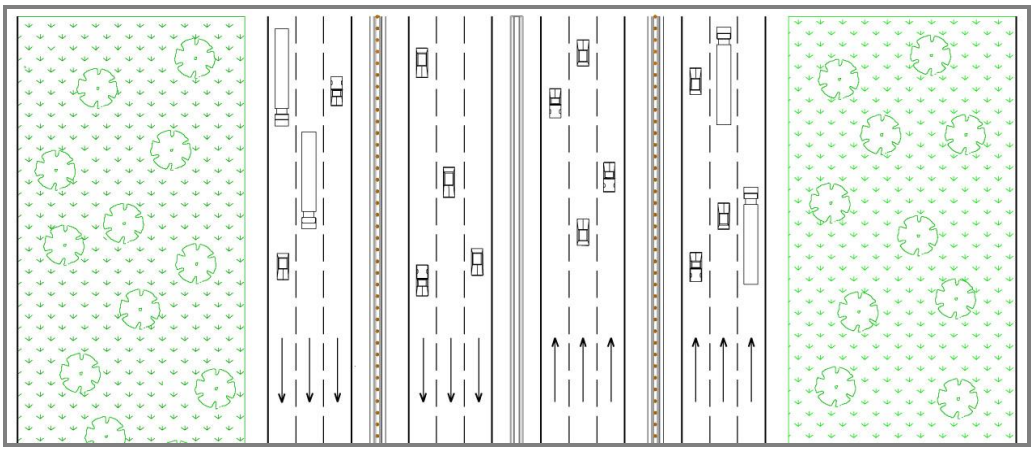
Source for the above facts: http://www.improve81.com/documents/0903STARfacts.pdf

Later, the above proposal was dropped citing that when measured against expected future traffic volumes, building separate lanes for use only by trucks would provide too many lanes for trucks and not enough for cars in most locations. Instead, VDOT is now planning to widen I-81 by adding not more than one or two general purpose lanes in each direction, where needed. In June 2007, the Final Environmental Impact Statement (FEIS) for the study was approved by the Federal Highway Administration (FHWA).

(Source: http://www.i-81.org)

New Jersey Turnpike Dual-Dual Roadway

A dual facility has both an inner and outer roadway in each direction. A 35-mile segment of the New Jersey Turnpike consists of interior passenger car lanes and exterior truck/bus/car lanes. The exterior roadway has three lanes in each direction and the interior roadway has two or three lanes in each direction. Each lane is 12 feet in width, and the inner and outer roadways are barrier separated. Approximately 60 percent of the traffic uses the inner roadway (*Truck Accident Countermeasures on Urban Freeways, Texas Transportation Institute, 1992*). Within the dual-dual portion of the turnpike, buses use the left lane and trucks use the right lanes of the exterior roadway. A typical cross section of the dual-dual segment is presented below and the following graphic presents separate access ramps to the inner and outer roadways.



Typical Cross Section of Dual-Dual Roadway

Separate Ramp Access for Inner and Outer Roadways

Source: Middleton, D., A. Clayton, C. Quiroga, and D. Jasek. Truck Accommodation Design Guidance: Final Report, Texas Transportation Institute, College Station, TX, October 2003.

SR-60 Truck Lane Feasibility Study

The Southern California Association of Governments commissioned the study to evaluate the benefits, costs, and impacts of operating exclusive truck lanes on an approximately 37-mile segment of the SR 60 freeway from Los Angeles to Ontario. SR 60 currently carries more than 20,000 trucks daily and this volume is projected to double by 2020. The study included design alternatives, operational and safety

analyses, a financial feasibility analysis, and a marketing analysis. The study determined that exclusive truck lanes are feasible in the corridor and the recommended strategy consists of four truck lanes (two lanes in each direction) built primarily at-grade. Elevated lanes are necessary in areas where roadway widening is improbable. Sixteen truck access ramps are identified within the study segment. The estimated cost of construction of the project is $4.3 billion. About $1.2 billion of the construction cost could be financed by leveraging the net revenue from truck-lane user fees. Additional local, state, and federal funding sources would be required to construct the facility.

Similar preliminary feasibility studies have also been conducted for I-710 and I-15, both of which connect to SR 60. A presentation given by the Southern California Association of Governments at the 11th TRB National Transportation Planning Applications Conference (Daytona Beach, May 2007) describes results of a cost benefit analysis for a conceptual 142-mile truck toll lane linking the three corridors. The total cost of truck lanes and associated operational improvements are estimated at $20 billion in 2005 dollars. Assuming a $0.86 per mile toll and a $75 per hour value for trucks, cost benefit analysis indicates a return-on-investment ratio ranging from $5 to $11 for every $1 of toll.

Truck Traffic on I-710
Source: *SR 60 Truck Feasibility Study (2001).*

Summary of Literature Review

This study reviewed local and national freight related studies. The local studies focused on the Port of Miami, Downtown Miami, "Airport West" area including the City of Doral, major corridors in Central Dade County such as the Dolphin and Palmetto Expressways, I-95, Okeechobee Road, and the Miami River. The key recommendations of these studies are summarized below.

New Facilities/Connections

- Port of Miami Tunnel.
- 25th Street Viaduct.
- Truck-only facilities along east-west corridors such as the Dolphin and Airport Expressways.
- I-95 slip ramp at NW 6th Street to westbound SR 836.
- Truck-only interchange on HEFT at NW 25th Street.
- Dedicated truck route (Haul Road) on the west side of HEFT between NW 41st Street and NW 12th Street to access expressways.
- East-west truckway along the CSX Corridor.

Capacity Enhancement

- Widen NW 107th Avenue from NW 41st Street to NW 25th Street from 4 to 6 lanes.
- Widen NW 87th Avenue from NW 36th Street to NW 58th Street from 4 to 6 lanes.
- Widen NW 58th Street from NW 102nd Avenue to NW 107th Avenue from 4 to 6 lanes

- Okeechobee Road - roadway widening, bridge improvements and interchanges.
- Dual exit lanes on HEFT at NW 41st and NW 106th Streets.

Operational and Traffic Management

- ITS applications to monitor trucks.
- Traffic signal improvements.
- Intersection turning radii improvements for trucks at several locations in Downtown Miami and Doral.
- Truck access to future high occupancy toll (HOT) lanes on I-95.
- Designate truck routes.

Concepts

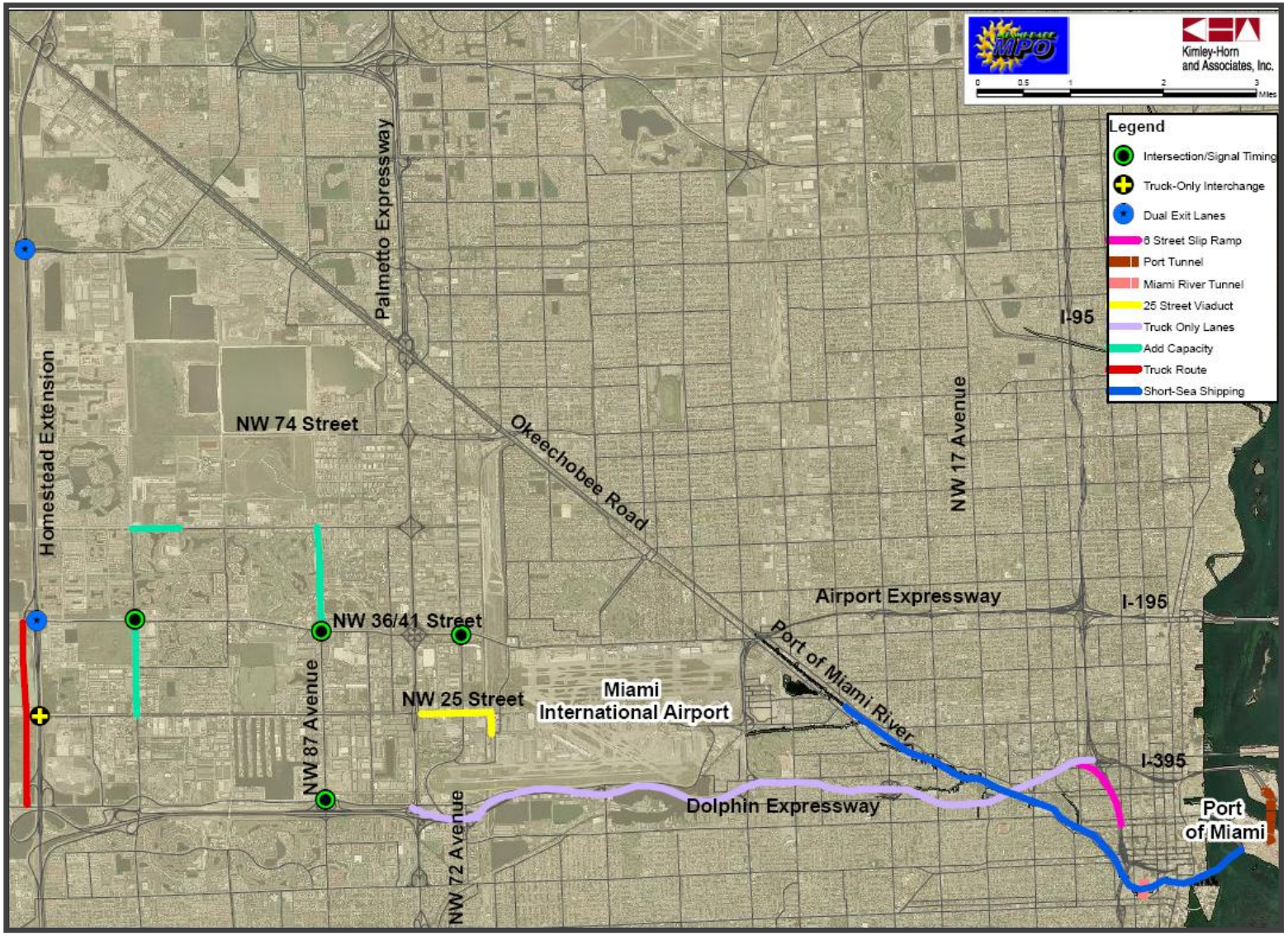
- Short-sea shipping on Miami-River to relieve congestion in Downtown Miami.
- Extended operation of the Port of Miami.

Design and Planning

- Build truck traffic forecasting capability in Miami-Dade County's travel demand model.
- Develop desirable roadway geometric standards to better accommodate trucks.

Please refer to *Figure 2* for a graphical representation of key freight related recommendations.

Figure 2: Major Freight Improvements Identified in Previous Studies



DATA ANALYSIS

This section presents an analysis of existing roadway conditions, traffic data, and geographic distribution of major industrial establishments. The results of data analysis will be used as the basis for identifying improvement strategies for the Central Dade Corridor and policy recommendations. The data gathered as part of this study include:

- Existing roadway network data
- Freight-facility interrelationships and roadway deficiencies
- Time-of-day distribution of traffic volume
- Geographic distribution of major industrial establishments

Existing Roadway Conditions

The roadway network of much of Miami-Dade County is comprised of a grid system of arterial roadways, collectors, and local streets. The benefits of a grid system include simplicity, several alternative travel paths, an easily-identifiable functional hierarchy centered around the section and half-section line roadways, and a logical naming convention. However, this type of roadway arrangement also presents several challenges including cut-through traffic on local streets, complex intersection geometries where diagonal roadways such as Okeechobee Road cross the grid system, and disregard for topography.

The number of lanes and existing level of service (LOS) of the section line and half-section line roadways are depicted in *Figures* 3 and 4, respectively. Figure 3 demonstrates that the roadway grid is less defined in the western part of the county

than in the eastern part. Therefore, drivers have to use major streets even for short trips. As such, the majority of roadways in the western part of Miami-Dade County currently operate at LOS E or worse. In particular, it is important to note that major portions of key freight corridors such as the Palmetto Expressway, Dolphin Expressway, NW 36th/41st Street, NW 25th Street, NW 87th Avenue, and NW 74th Street operate at LOS F within the study area.

Figure 5 shows Annual Average Daily Traffic (AADT) of state and major county/city roadways within the study area. As indicated in *Figure 5*, the Palmetto Expressway and Dolphin Expressway, two major freight corridors within the study area, typically carry in excess of 120,000 vehicles a day. The Airport Expressway, which is a toll facility, experiences 80,000 to 120,000 vehicles a day. The four-lane section of NW 25th Street between NW 87th Avenue and Milam Dairy Road carries more than 50,000 vehicles daily.

Figure 3: Bi-Directional Number of Lanes (2005)

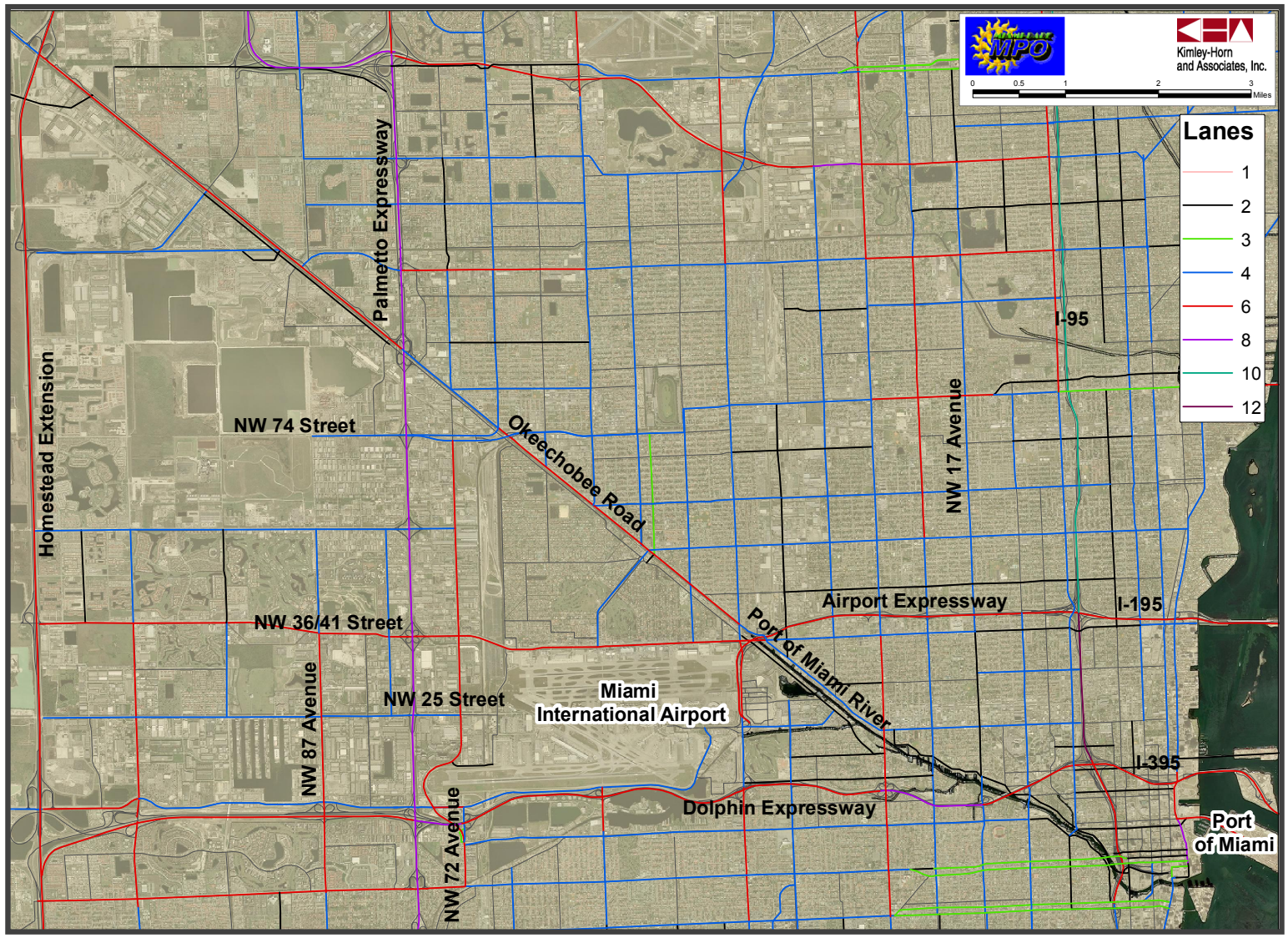


Figure 4: Daily Level of Service (2005)

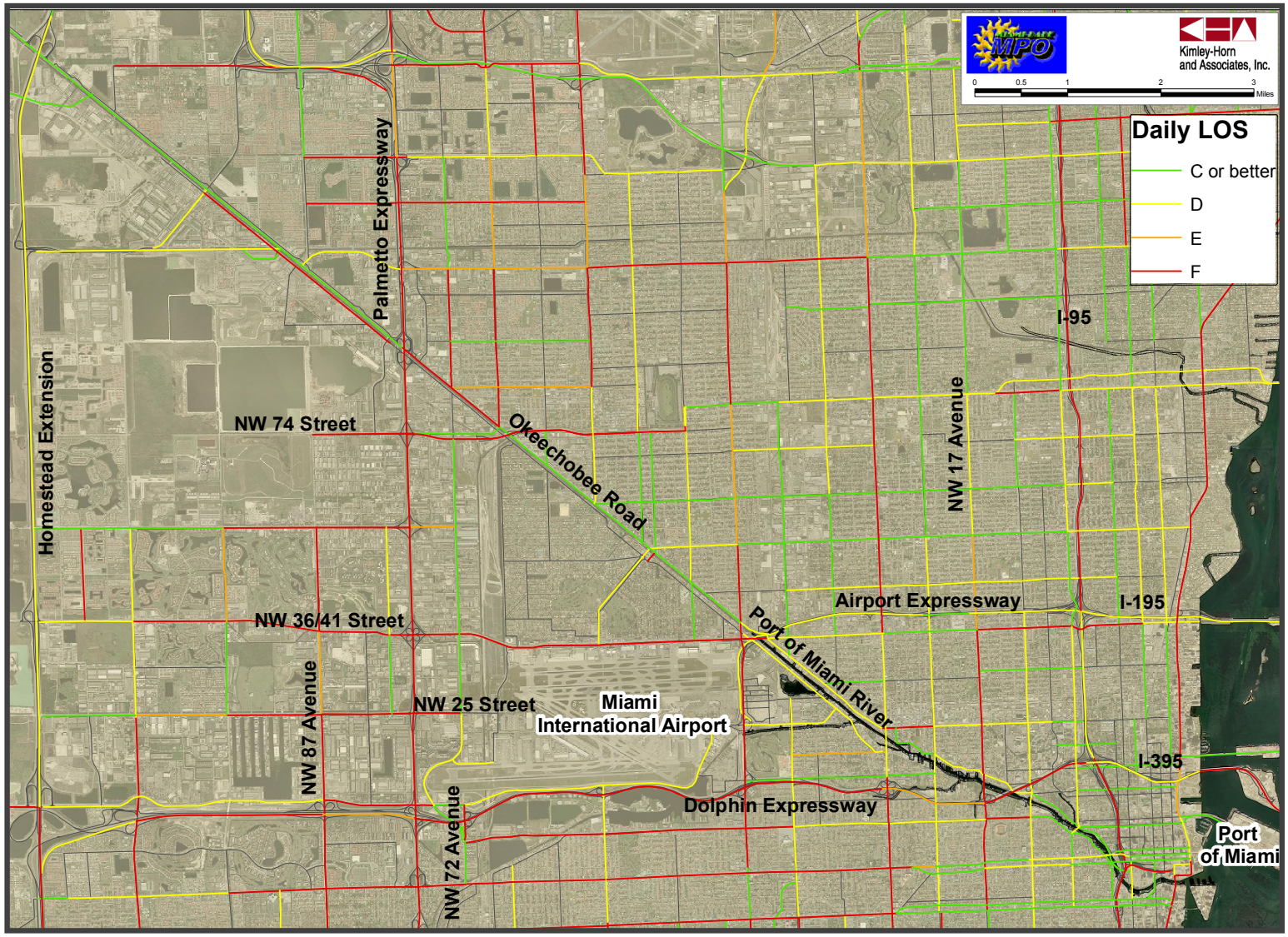
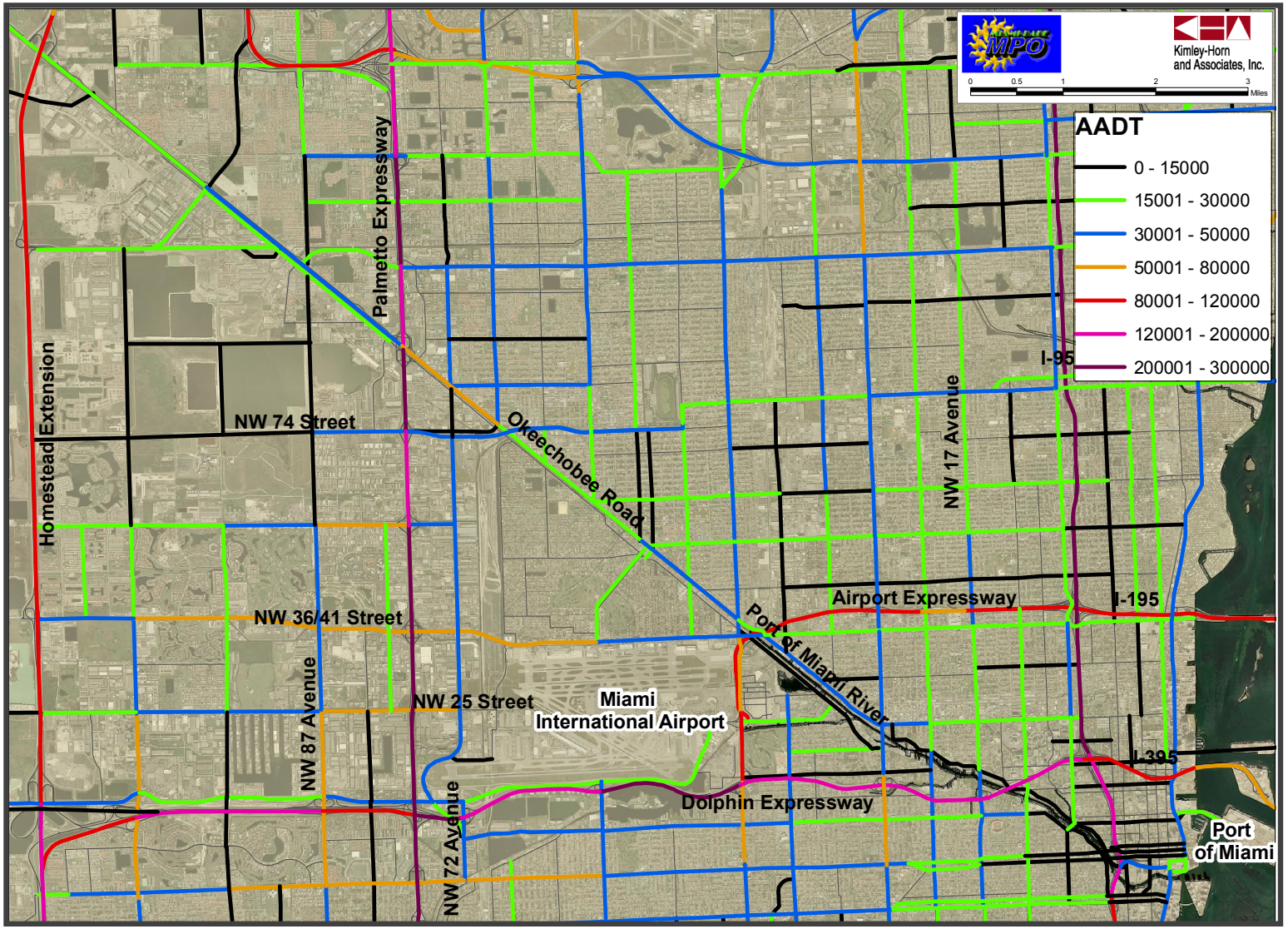


Figure 5: Existing Annual Average Daily Traffic



Freight-Facility Interrelationships and Roadway Deficiencies

To identify the need for roadway improvements to facilitate truck movement, this study collected several types of background information and data. Several previous freight studies were reviewed and roadway deficiencies identified in those studies were summarized (see Literature Research). Field reviews were conducted to observe interrelationships between major freight nodes, identify roadways that provide connectivity between those freight nodes, and develop roadway improvements needed to improve the efficiency of truck movement. Input from the FTAC members was obtained at a project kick-off meeting, via phone interviews, and e-mail requests. The information collected is summarized below.

Field Reviews

Downtown Miami Commercial Loading Zones

In Downtown Miami, approximately 40 parking spaces have been established for the use of commercial vehicles (source: Miami Parking Authority). The majority of commercial parking spaces carry parking duration limits (e.g., 30 minutes), time-of-day restrictions (e.g., 7:00 A.M. to 11:00 A.M.), weight restrictions (e.g., over 2.5 tons only), or vehicle length restrictions (e.g., 40 feet).

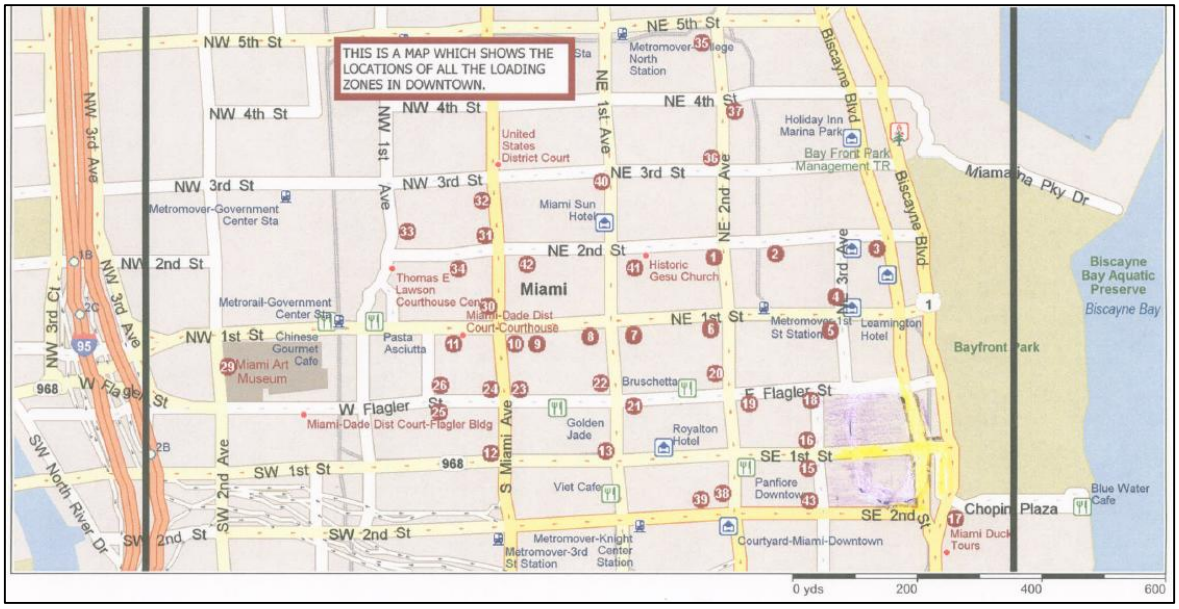
Commercial Loading Zone Sign

Delivery Vehicle Parked at a Bus Stop

Since the demand for commercial loading zones in Downtown Miami often outweighs the availability, it is common to see violation of these parking rules and spaces. The most common types of violations include commercial delivery vehicles parking in travel lanes, double parking, exceeding time length restrictions, parking on sidewalks, and non-commercial vehicles parking in commercial parking spaces. During field reviews, parking violations (commercial vehicles blocking travel lanes) were observed on NE 5th Street, which is a main truck access route to the Port of Miami. Construction activities also negatively impact the availability of commercial and non-commercial parking spaces in Downtown Miami. In general, commercial buildings in areas south of the Miami River appear to already have adequate loading areas built into the design.

Delivery Vehicle Parked in Travel Lane

Recently, the Miami Parking Authority began working with several commercial delivery companies to resolve commercial parking issues, identify additional commercial parking spaces, and develop possible changes to the existing parking space utilization restrictions. The streets that were identified with a high need for commercial parking spaces include NE 3rd Street, NE 1st Street, East Flagler Street, SE 1st Street, SE/NE 1st Avenue, and SE/NE 2nd Avenue. In addition, ways to provide additional parking spaces during peak delivery periods, such as renting no-parking zones to commercial delivery agencies, were discussed.



Locations of Downtown Miami Commercial Loading Zones

Source: Miami Parking Authority

Image: Streets and Trips, © 1988-2006 Microsoft Corporation

The current parking duration limits should be evaluated, especially for commercial loading zones located near high-rise buildings to ascertain the reasonableness of the existing parking durations. In addition, the feasibility of designating one or two parking spaces in off-street surface parking lots for commercial vehicles should be evaluated. To direct commercial delivery vehicles to the existing designated parking spaces and minimize the time spent searching for parking spaces, the potential for

using ITS/GPS technologies to gather and provide real time parking space availability information to delivery vehicles should be evaluated. In addition, continued enforcement of parking rules is recommended to mitigate traffic problems created by illegal commercial loading and unloading, and violation of designated commercial loading zones by other motorists.

Port of Miami Access Routes

In 2007 Port of Miami (POM), it handled approximately 880,000 TEUs (20-foot equivalent units) representing nearly 7.84 million tons of cargo. Between 2005 and 2007, there has been a slight decrease in TEUs handled by the POM. However, several on-going and planned infrastructure enhancements such as the deepening of the South Channel from 42 feet to 50 feet, which will enable the POM to handle larger cargo vessels; and the Port Tunnel project, which will connect the POM with the interstate highway system, are bound to increase the POMs capacity and enhance growth. Almost all the POM related inbound and outbound freight are presently transported via highways. The POM related truck movements have raised several capacity, safety, congestion, and environmental concerns.

This section discusses the most frequently utilized truck routes between the Port of Miami (POM) and the expressway system. NE/NW 5th Street, which is a one-way eastbound street, and NE 2nd Avenue, which is a one-way southbound street are most commonly used by inbound trucks to the POM. The daily volume on NE 5th Street is approximately 1,050 trucks and the daily volume on NE 2nd Avenue is approximately 2,650 trucks. NE/NW 6th Street, which is a one-way westbound street, and NE 1st Avenue, which is a one-way northbound street are most commonly used by outbound trucks from the POM. The daily volume on NE 6th Street is approximately 700 trucks and the daily truck volume on NE 1st Avenue is

approximately 1,700 trucks. The daily volume on Biscayne Boulevard north of Port Boulevard is approximately 1,900 trucks.

Trucks on NE 5th Street

On NE 5th Street, delivery vehicles were seen parked in travel lanes impeding traffic flow. These vehicles reduce available capacity and contribute to congestion. Westbound trucks on NE 6th Street are allowed to turn right onto NE 1st Avenue from the center lane due to a relatively tight turn radius. Along NE 2nd Avenue, construction activities significantly impede the flow of traffic. In addition, the pavement is in poor condition. The turn radius at the intersection of NE 2nd Avenue and NE 5th Street appears to be adequate for trucks. On northbound NE 1st Avenue, the turn radius at the access ramp to I-395 westbound appears to be inadequate and the pavement is in poor condition. On southbound Biscayne Boulevard, the left-turn bay at Port Boulevard is relatively short.

The adverse impacts of port-related trucks on local streets have been documented in several previous reports (see Literature Review). The Port of Miami tunnel is seen as the long-term solution to these problems. Another oft-mentioned problem is the absence of a direct connection to westbound SR 836. The 6th Street Slip Ramp was evaluated in an FDOT Project Development and Environment (PD&E) study (see Literature Review) as a potential solution to provide a direct link to westbound SR

836. Although the significance of the implementation of the 6th Street Slip Ramp appears to hinge upon the Port of Miami Tunnel project, the slip ramp could provide other benefits, including evacuation of Downtown Miami, an additional maintenance of traffic option during the reconstruction of I-395, and non-truck traffic alternative for direct connection to westbound SR 836 from Downtown Miami.

Port of Miami River and Access Routes

Shipping Operations in the Upper River Section

The Port of Miami River (POMR) is an important inland port in Florida. The widespread use of the Miami River by the shallow draft cargo ships began in the 1960s when cargo terminals and warehouses were built along the Miami River (Source: *An Economic Analysis of the Miami River Marine Industry*, Florida Atlantic University, April 2008). From the beginning, the majority of cargo shipments from the POMR have been serving the Caribbean destinations. The tonnage of shipments from the POMR increased from about 250,000 short tons in the early 1970s to about 500,000 in the early 2000s (excerpted from *An Economic Analysis of the Miami River Marine Industry*). Exports to foreign countries account for approximately 75 percent of the POMR's trade. The *Biscayne Bay Economic Study* (Hazen and Sawyer) estimated the economic impact of the Miami River shipping industry on the County (2004) to be $682.5 million, with 6,106 jobs and earnings of $338.9 million. The following sections present an assessment of potential

opportunities for expanding the role played by the POMR, especially in supporting the POM.

The proximity of the POMR to the POM makes it possible to potentially develop the POMR as a reliever to the POM. If containers reaching the POM could be efficiently and cost effectively shipped to the POMR, both clearance times and traffic congestion at the POM could be reduced. The short-sea-shipping concept, which was discussed in Literature Research, is viewed as a potential strategy to move containers from the POM to the POMR. Currently, navigation, drawbridge, storage, and other facility limitations restrict the productivity of the POMR. Since the POM is nearing its present capacity, it is important to conduct a detailed study to evaluate the feasibility of developing a short-sea shipping concept at the POMR.

North and South River Drives provide landside access to the POMR. Several container yards, scrap metal and recycling facilities, and boatyards are located along those two streets. The drainage system, pavement, and curb-and-gutter on South River Drive are in poor condition. In the absence of a truck staging area, trucks park in the center lane and the shoulders of the streets. There is demand for a facility where trucks can park until the POMR facilities open for business.

Truck Parked in the Median of North River Drive

Miami International Airport and Warehouse District

Miami International Airport (MIA) is the number one airport in the U.S. for international freight and the number four airport in the U.S. for total cargo (Source: Miami International Airport web page, 2006 statistics). The U.S. Department of Commerce's international trade data indicates that approximately 1.78 million tons of cargo was handled by MIA in 2007. Of those, approximately 973,000 tons were either originated or destined in MIA, whereas the remainder was shipped through MIA in transit to other destinations. The majority of import cargo comprises perishable products including seafood, flowers, fruits, and vegetables, along with assembled clothing. Approximately 70 percent of all U.S. perishable air imports were handled by MIA. In addition, MIA's share of U.S. flower imports is approximately 86 percent (Source: South Florida Business Journal, April 28, 2008). MIA's export cargo comprises computers and peripherals, machinery, medical equipment, telecommunications equipment, agricultural machinery, apparel articles and aircraft parts (Source: http://www.miami-airport.com/html/cargo_facts.html). In 2007, MIA's high-tech exports to international destinations averaged approximately $900 million a month (Source: South Florida Business Journal, April 28, 2008).

Located in the central part of Miami-Dade County, MIA relies upon surface roadways to transport cargo reaching MIA. A sizable portion of cargo reaching MIA is transported to the Warehouse District, which is located west of the Palmetto Expressway between NW 12th Street and NW 25th Street. Warehouses are often used to organize imported products for local distribution, which occurs during daytime. The major freight corridors in the Airport West area include NW 25th Street, NW 41st Street, NW 74th Street, NW 72nd Avenue, NW 87th Avenue, and the Palmetto Expressway.

NW 25th Street, which is a four-lane arterial, links MIA's West Cargo Area and the Warehouse District to the heavily traveled Palmetto Expressway. This roadway experiences significant truck traffic during daytime. The volume of perishable cargo related truck traffic experienced by NW 25th Street increases significantly in weeks ahead of the Mother's Day and the Valentine's Day festivities. During these weeks, it is not uncommon to see changeable message signs advising road users of increased truck traffic on NW 25th Street. The general pattern of truck traffic during the midday period is that a large number of trucks travel east on NW 25th Street from warehouses and make a left-turn onto northbound Palmetto Expressway. Currently, only one eastbound left-turn lane is provided on NW 25th Street at the Palmetto Expressway. The allotted green time for the eastbound left-turn movement appears to be inadequate during the midday period. As such, severe congestion and long queues were observed in the vicinity of the Palmetto Expressway ramps. Therefore, the difficulties encountered by trucks at this intersection include (i) inadequate storage and capacity for the eastbound left-turn movement and (ii) inadequate green time for eastbound left-turn movement, especially during the midday peak period.

NW 25th Street at Palmetto Expressway View Looking East

As short-term solutions, opportunities for optimizing signal timing and phasing plans to provide adequate green time for the exit ramps along with upgrades to the signal control system should be examined. Upon completion of the 25th Street Viaduct Project, an option is to examine the feasibility of converting one eastbound

NW 25th Street Viaduct Construction

through lane on NW 25th Street to an eastbound left-turn lane connecting to the northbound Palmetto Expressway on-ramp. An alternative connection between MIA and the warehouse district may be the best solution to relieve NW 25th Street. The 25th Street Viaduct project provides an elevated connection between the Palmetto Expressway and MIA. However, it does not improve NW 25th Street west of the Palmetto Expressway. A possible alternative route from MIA to the warehouse district could be provided through the development of NW 12th Street as an alternate truck corridor. Enhancements could include grade separation of east-west through lane(s) on NW 12th Street at NW 87th Avenue. As a result of truck turning movement restrictions at NW 12th Street and NW 97th Avenue and corresponding truck routes in the area, the intersection of NW 12th Street and NW 98th Court should be evaluated for signalization.

Other potential improvements in the Airport West area to facilitate efficient truck movement include:

- Improve NW 82nd Avenue between NW 12th Street and NW 41st Street
- Improve NW 84th Avenue between NW 12th Street and NW 25th Street

- Connect NW 117th Avenue between NW 25th Street and NW 41st Street via the northbound Turnpike off-ramp. This connection will facilitate access to the northbound Turnpike on-ramp at NW 41st Street from NW 117th Avenue.

FTAC Input

FTAC indicated that the implementation of the Port of Miami Tunnel and 6th Street Slip Ramp projects would ease congestion in Downtown Miami and improve efficiency of freight movement. In addition, FTAC members identified several locations that trucks experience difficulties. These locations include:

- NW 25th Street and NW 72nd Avenue
- NW 25th Street and NW 75th Avenue
- NW 25th Street and NW 79th Avenue
- NW 25th Street and Palmetto Underpass
- NW 25th Street and NW 97th Avenue
- NW 12th Street at Milam Dairy Road – long delays for eastbound left-turn movement
- NE 2nd Avenue in Downtown Miami

This study will verify if intersections along NW 25th Street to the east of the Palmetto Expressway will be improved substantially as part of the 25th Street Viaduct project. The other issues identified by the FTAC members include:

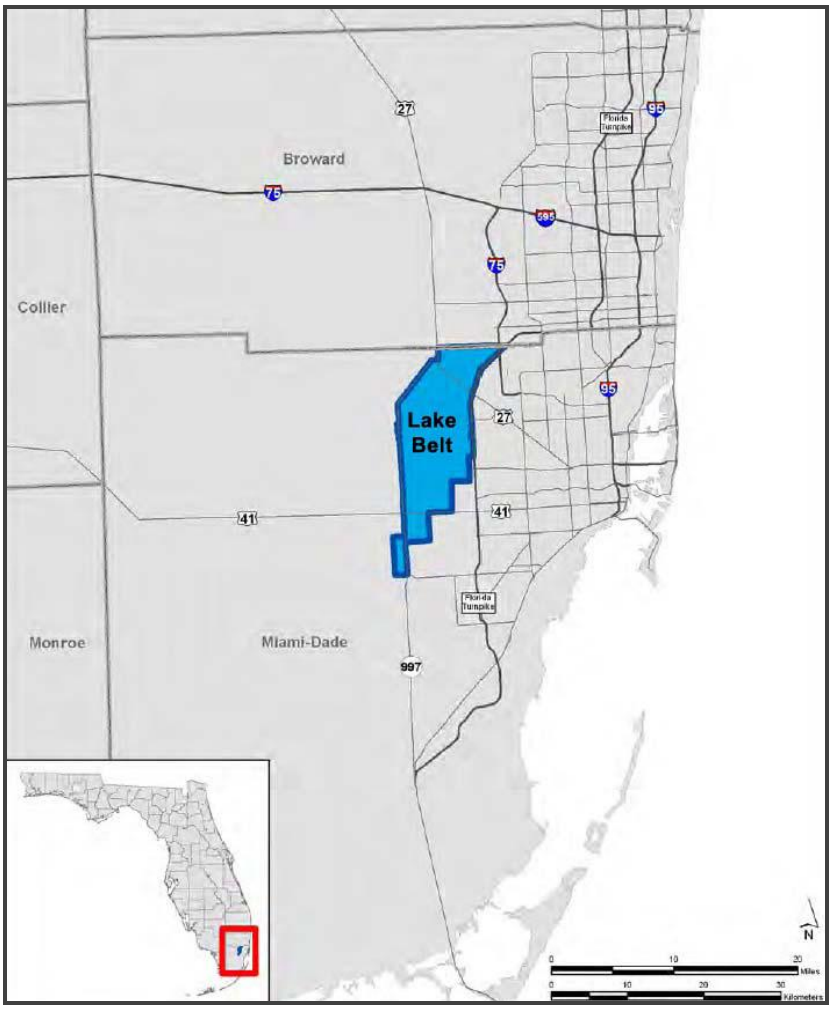
- The time taken to inspect and clear trucks at the Port of Miami gates needs to be improved
- The closure of warehouses early in the evening limits opportunities for processing and moving freight during nighttime

- Simulation techniques should be used to visualize and refine recommended transportation improvements before adopting for implementation

Rock Mining in Lake Belt Area

The Lake Belt area, which is located between the Homestead Extension of Florida's Turnpike (HEFT) and the Everglades National Park in western Miami-Dade County, was defined by the Florida Legislature in 1997 in the Miami-Dade Lake Belt Plan. Rock mining has been taking place in this area since 1950s. In 2006, the Lake Belt area produced over 54 million tons of limestone, which accounted for over 40 percent of the state's output (*Source: U.S. Army Corps of Engineers, August 2007*). The aggregates produced in this area are used throughout the state. Long distance shipments to areas such as Jacksonville are predominantly made by rail. The Hialeah extension of the Florida East Coast (FEC) rail-line serves as a major loading/unloading terminal for both rock and auto shipments. A schedule of trains originating from the Hialeah terminal that are used to haul rock is presented in *Table 1*. An estimate of aggregates shipped by rail and trucks was not readily available.

As indicated in the Literature Review, several previously recommended roadway improvements such as dual-lane exit ramps on HEFT at NW 41st Street, NW 58th Street, NW 74th Street, and NW 106th Street, and a new "Haul Road," which would be a dedicated truck route on the west side of HEFT between NW 12th Street and NW 41st Street, could benefit the flow of truck traffic generated by the Lake Belt area.



Lake Belt Area

(Source: Draft Supplemental Environment Impact Statement on Rock Mining in the Lake Belt Region of Miami-Dade County, Florida. U.S. Army Corps of Engineers, August 2007)

Table 1: Northbound Trains Hauling Rock from Hialeah on FEC Corridor

Train #	Departure/Arrival	Frequency	Departure Time	Load
208	Medley to Jacksonville	Tue – Fri	10:00 AM	Rock
208	Hialeah to Jacksonville	Mon	9:00 AM	Rock, Auto
290	Medley to Ft. Pierce	Mon – Fri	4:00 PM	Rock
336	Medley to Cocoa Beach	Mon – Sat	2:00 AM	Rock

(Source: www.fecrs.com/svc_plan.html © 2004 - 2007 Telecontext, Fort Lauderdale)

Hourly Distribution of Traffic Volume

The classified vehicle counts from 19 traffic count stations were obtained from the Florida Department of Transportation (FDOT) District Six. These counts reflect the hourly distribution of traffic movement at those locations. Time of day distribution of truck traffic and total traffic was plotted for each location. The count locations and location specific time-of-day plots are included in Appendix A. In general, time-of-day distribution of truck flow varies from location to location.

When all 19 locations are considered, approximately 86 percent of truck traffic and 80 percent of total traffic were observed between 6:00 A.M. and 7:00 P.M. Approximately 26 percent of truck traffic was observed during the A.M. (7:00 – 9:00) and P.M. (4:00 – 6:00) peak periods and 50 percent of truck traffic was observed between 9:00 A.M. and 4:00 P.M.

In general, traditional off-peak hours during daytime (9:00 A.M. to 4:00 P.M.) are not evident from the analysis. It indicates that the major highways are experiencing at or near capacity flow conditions during much of daytime. Excess roadway capacity is available during nighttime hours only. Therefore, potential steps for encouraging trucks to use the roadways at nighttime should be examined.

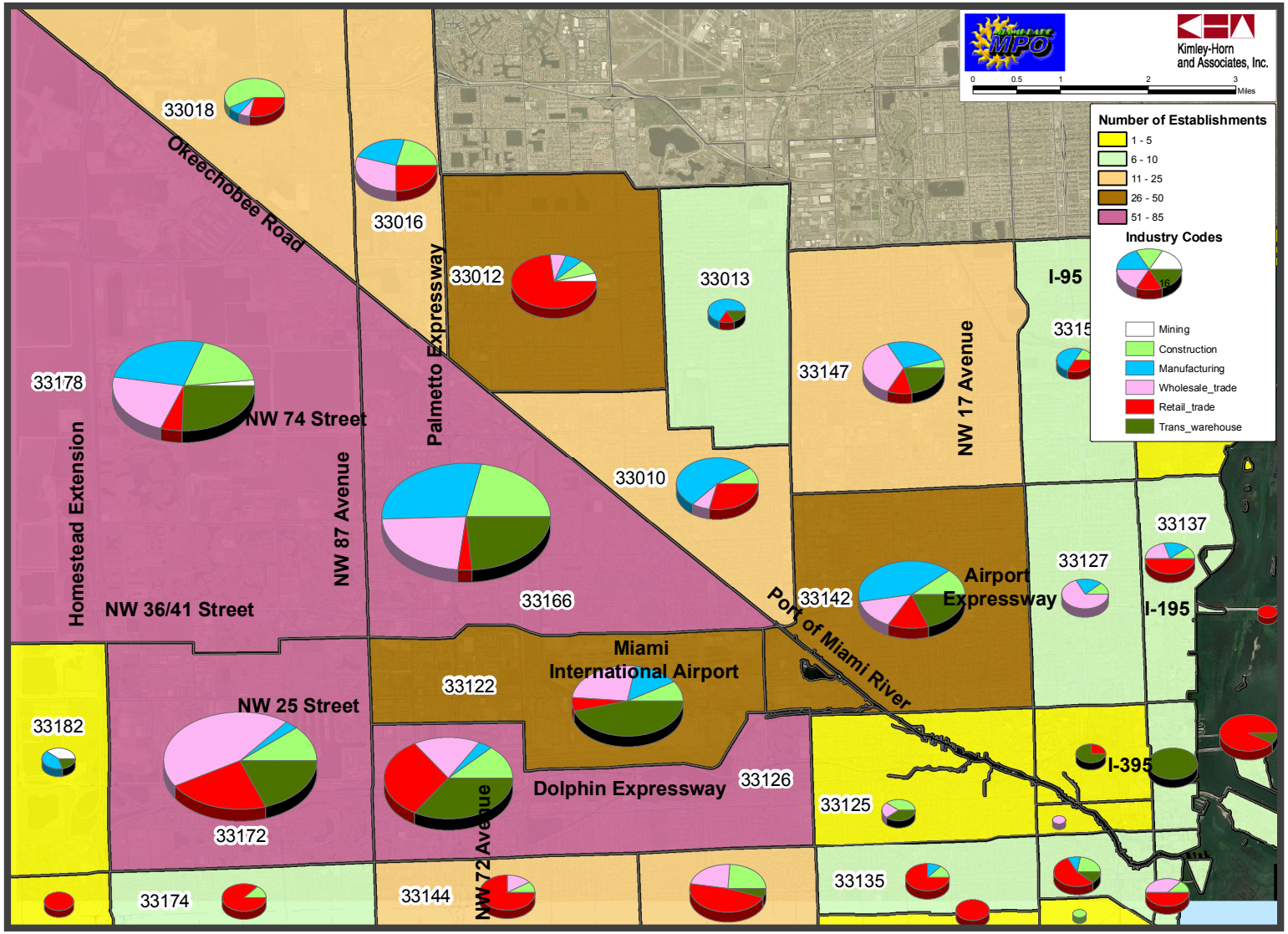
Geographic Distribution of Major Industrial Sector Employers

An analysis was performed using the Census based industrial sector employment data to determine the distribution of major industrial establishments within the study area. The industrial sector employment data was used as a surrogate measure to represent the geographic distribution of major freight trip generators. U.S. Bureau of Census' 2005 Business Patterns data was obtained for each ZIP code in the study area. Zip codes represent the smallest geographic entity for which business pattern data is available. These data were used to identify the number of businesses that employ more than 50 industrial sector employees. The employment categories considered include mining, construction, manufacturing, wholesale trade, retail trade, and transportation and warehouse.

As indicated in Figure 6, the major industrial sector employers are concentrated on either side of the Palmetto Expressway between Okeechobee Road and Flagler Street. The distribution of specific industry types are summarized below.

- Construction employment – area between Okeechobee Road and NW 36th 41st Street
- Manufacturing employment – area between Okeechobee Road and NW 36th 41st Street
- Wholesale trade employment – area to the west of NW 42nd Avenue between Okeechobee Road and Flagler Street
- Retail trade employment – area between Flagler Street and NW 36th 41st Street/MIA
- Transport and Warehouse employment – area to the west of NW 42nd Avenue between Okeechobee Road and Flagler Street

Figure 6: Distribution of Establishments with 50 or more Industrial Sector Employees



ANALYSIS OF IMPROVEMENT STRATEGIES

This section presents potential improvement strategies identified through data and analysis performed during the study. The potential improvement strategies were grouped into the following categories for ease of evaluation:

- Strategy 1 – Short sea shipping
- Strategy 2 – Truck/intermodal freight facilities
- Strategy 3 – Dedicated truck facilities
- Strategy 4 – Strategies to spread freight activity to off-peak periods
- Strategy 5 – Improvements to Downtown Miami commercial loading zones
- Strategy 6 – Roadway improvements
    - Geometric improvements to Port of Miami access routes
    - Intersection improvements along NW 25th Street
    - Intersection improvements along NW 12th Street
    - Connection of NW 117th Avenue between NW 25th Street and NW 41st Street
    - Complete "missing link" projects for the study area identified in the Miami-Dade MPO's *2030 Long Range Transportation Plan (LRTP)*.

These improvement strategies were defined and evaluated based on freight-related needs, the degree to which these needs are addressed, potential impacts, and consistency with transportation plans. The strategies with higher potential for improving freight movements were identified and further evaluated. Project summary sheets outlining the purpose of the improvement, lead agencies, planning level cost estimates, potential funding sources, and implementation timeframe were

prepared. The following sections describe the strategies identified through the study, evaluation of these strategies, and the strategy prioritization.

Strategy 1 – Short Sea Shipping

The U.S. Maritime Administration (MARAD) defines short sea shipping as "*…commercial waterborne transportation that does not transit an ocean. It is an alternative form of commercial transportation that* utilizes *inland and coastal waterways to move commercial freight from major domestic ports to its destination*."

European Short Sea Shipping Vessel
Source: *http://www.btinternet.com/~philipbparker/short_sea_shipping.htm*

One of the strategies identified through the Central Dade Transport Zone study process includes the implementation of short sea shipping to satisfy the demands for freight transport through water-based transportation in addition to land-based transportation. Two factors that have a significant impact on the feasibility of short sea shipping on the Miami River include (i) growth projections for the Port of Miami (POM) and (ii) the ability of planned improvements to reduce roadway congestion resulting from the POM growth. If the projected growth in the POM could be served by the planned infrastructure improvements, there is less need to develop alternatives such as short sea shipping to relieve the POM and the roadway network.

POM Growth Projections

According to the *Port of Miami 2020 Master Plan*, the major planning goals of the POM are to retain and strengthen its position as the top-ranking cruise port of the world and to expand its role as one of the leading container ports in the Southeastern United States. According to the *Port of Miami 2020 Master Plan*, the POM's estimated annual container throughput is projected to increase to two million TEUs (20-foot equivalent units) by 2020. In comparison to 2007 (with a container throughput of approximately 885,000 TEUs), the 2020 projections represent a 125 percent increase in TEUs. The POM experienced a negative growth in container throughput between 2006 and 2007. The downward trend may be related to the current state of the economy, which may limit the POM's short-term growth. For the purposes of this analysis, however, the estimates provided in the *2020 Master Plan* were used, as alternative forecasts are not available. The *Port of Miami 2020 Master Plan* also projects an increase in annual cruise passenger volumes from 3,400,000 to 6,000,000.

To support the projected growth, several infrastructure improvement projects are either underway or are planned for implementation. These improvements include:

- Provide 2,000 linear feet of additional container berth.
- Expand vessel unloading capacity by introducing additional cranes and upgrading existing cranes.
- Enhance storage capacity by introducing rubber tired gantry cranes to stack containers and encourage the development of off-port container yards.
- Expand gates, vehicle inspection mechanism, and command control center for more efficient clearance of trucks.

Other notable improvements in the *Port of Miami 2020 Master Plan* include plans to dredge the POMs channels to a depth of 50 feet to accommodate larger cargo and cruise ships, expand container cargo areas, create a new tunnel to provide direct access to I-395 from the POM (POM Tunnel), and implement rail system improvements. The POM Tunnel project, which is seen as the primary long-term solution to reduce truck traffic in Downtown Miami, is currently in the contract negotiation stage. The following section presents an analysis of the implications of the POM's projected growth.

Impacts of POM Growth on Roadways

Port Boulevard presently is the primary access route to the POM. The existing rail corridor is only used occasionally to transport oversized cargo. Therefore, trucks are the primary transport mode of POM cargo. According to the *Port of Miami 2020 Master Plan,* the existing six-lane bridge on Port Boulevard is functioning at 75 percent capacity. According to FDOT's Traffic Information Database, approximately 19,000 vehicles per day, including 3,400 trucks (both directions) were recorded on Port Boulevard in 2006. The *Port of Miami Traffic and Demand Study* (December 2005 Update by URS Corporation) developed projections for the year 2020, indicating an increase in average daily total traffic and heavy truck traffic to 42,300 and 5,800, respectively.

Upon completion of the Port Tunnel project, almost all port-bound trucks and buses, and a portion of automobile traffic are expected to be diverted to I-395/SR 836/MacArthur Causeway via the Port Tunnel. As part of the POM Tunnel project, the MacArthur Causeway Bridge is planned to be widened by adding one lane in each direction. In addition, a separate FDOT project is expected to widen I-395 by adding one lane in each direction.

Table 2 presents the existing (2005) roadway levels of service (LOS) on the MacArthur Causeway and I-395.

Table 2: Existing LOS of I-395 and MacArthur Causeway

Roadway	Facility Type	Existing Lanes	Existing AADT	Existing LOS
MacArthur Causeway (US 1 to Alton Road)	Class I Arterial	6	76,000	F
I-395 (I-95 to US 1)	Freeway	4	103,500	F

Source: FDOT District 6 Level of Service Inventory

Table 3 presents the projected level of service (LOS) on these two roadway segments assuming the completion of POM Tunnel and its connection to the MacArthur Causeway by 2020. The assumptions made in the 2020 level of service projections include:

- An annual background traffic growth rate of 0.5 percent;
- A 50 percent projected 2020 POM traffic assignment to the POM Tunnel; and
- Widening of I-395 and the MacArthur Causeway by one lane in each direction.

Table 3: Projected (2020) LOS of I-395 and MacArthur Causeway

Roadway	Facility Type	2020 Lanes	2020 AADT	2020 LOS
MacArthur Causeway (US 1 to Port Tunnel)	Freeway*	8	103,000	C
I-395 (I-95 to US 1)	Freeway	6	132,500	F

** With proposed improvements, it was assumed that the capacity of the MacArthur Causeway between US 1 and the Port of Miami Tunnel would be similar to a freeway.*

Even with an additional lane in each direction, I-395 is still expected to operate at LOS F. As such, the roadway improvements associated with the POM Tunnel and I-395 projects, while helping to reduce truck traffic on Downtown Miami streets, will not fully address congestion issues on the expressway system.

Overall, the POM's internal improvements may be adequate to sustain the growth projected in its Master Plan. However, roadway improvements have not been identified to fully address traffic impacts on the overall transportation system. The POM Tunnel is only anticipated to alleviate truck traffic within Downtown Miami. Therefore, additional measures to address the impacts of the POM truck traffic on the overall transportation system are still necessary. Potential strategies include the expansion of the POM hours of operation, increasing the mode share of rail, and short sea shipping. The strategy of expansion of the POM's hours of operation is discussed in the following section. However, the *Port of* Miami *2020 Master Plan* does not indicate specific plans to expand its current hours of operation.

The *Port of Miami Freight Access Study* (*Cambridge Systematics, Inc., 2007*) examined the possibility of developing a rail tunnel connection to the POM. This option would require a new 18- to 25-acre intermodal container transfer facility on the POM property. The study determined that although a rail corridor is technically feasible, several other factors would have to be overcome including the difficulties in obtaining land to build an intermodal facility within the port, significant financial commitment and competition, high cost per container, constructability issues, and political and industry support.

The third alternative of short sea shipping is further evaluated below. The following sections present decision factors that were recommended in published literature to

evaluate short sea shipping and an assessment of a potential short sea shipping alternative to relieve congestion at the POM and on the nearby roadway network.

Factors for Evaluating Short Sea Shipping

Short sea shipping is an established mode of freight transport in Europe. An evaluation of several short sea shipping initiatives in Europe (*A Decision Tool for Identifying the Process and Opportunities for Short Sea* Shipping, Mark Yonge and Lawrence Henesey) determined the following critical decision factors should be evaluated when determining the feasibility of short sea shipping:

- Congestion – level of area congestion, proximity to congested metropolitan areas, and alternatives to congested ports.
- Infrastructure capability – existing infrastructure, available capacity, depth of water, warehousing, cargo handling equipment, barge service, and container capability.
- Intermodal connectors – highway and rail.
- Cost – infrastructure investment, marketing/lobbying, and operational.
- Financing / government financing programs – federal, state, and private sector.
- Public support – political, state, residents and businesses.
- Environmental impacts – mitigation of existing regional impacts and local impact due to increased activity.
- Demand – shipper, marine operators, motor carriers, and port partners.
- Economic development – impact on region and job creation.
- Geographic location – proximity to distribution networks and major markets.

The roadway congestion in the proximity of the POM was discussed previously. An assessment of other factors related to short sea shipping on the Miami River is presented below.

Infrastructure Capability for Short Sea Shipping

- At the POM – At least one berth at the POM would be required to accommodate shallow draft vessels such as barges. In addition, a mechanism for security inspection of containers before loading them onto barges would need to be developed, unless container inspection could be performed at the Port of Miami River (POMR). A "roll on/roll off" loading and unloading approach, in which trucks drive on and off the ships might be best suited to transport containers from deep-draft vessels to customs inspections and, thereafter, to barges. The roll-on/roll-off approach could lower additional handling costs associated with short sea shipping.
- At the Port of Miami River – The existing storage facilities at the POMR are limited. Therefore, containers cannot be stored at the POMR for an extended period. A terminal along the Miami River would need to be developed to accommodate short sea shipping. One option is to expand an existing terminal in the Upper River area close to NW 37th Avenue. A terminal in this area could be served by the existing South Florida Rail Corridor spur that runs parallel to North River Drive and by a potential truck staging facility identified in this study (see Truck/Intermodal Freight Facilities). Another site, identified by Brickell One Realty, Inc., is located along the Comfort Canal (a tributary of the Miami River). This nine-acre site is located east of NW 22nd Avenue (see *Figure 7*). A major disadvantage of this site is the narrow width of the Comfort Canal, which makes navigation difficult. At the mouth of the Comfort Canal (where it meets the Miami River), its width is approximately 60 feet. In

addition, the Comfort Canal site is located near an existing residential neighborhood. The landside access options to this site are also limited. Therefore, a terminal located near NW 37th Avenue is preferable for short sea shipping.

Terminal in the Upper River

- Capacity of the Miami River – The POMR currently handles approximately 850,000 metric tons of containerized cargo annually (*Source: Miami River Marine Group, 2005*). However, its overall capacity is limited due to several constraints. The depth of water, which is approximately 15 feet, allows only shallow draft vessels to access the shipping terminals along the Miami River. At some sections, the width of the Miami River is approximately 150 feet, thus presenting bottlenecks where it would be difficult for two vessels to pass each other. The need to open drawbridges also impacts waterborne movement, especially during daytime hours. The impacts of drawbridge openings could be minimized if short sea shipping and other operations at the POMR could be shifted to nighttime.

Figure 7: Potential Site for Short Sea Shipping Terminal

(Source: *Miami River Property: 9 Acre Waterfront Property with Marina*, Brickell One Realty, Inc.)

Intermodal Connectors:

Currently, there is a shortage of staging facilities for trucks at the POMR. A truck staging area in the vicinity of NW 37th Avenue and North River Drive would be beneficial for short sea shipping. Another option is the usage of the South Florida Rail Corridor spur that runs along North River Drive to further enhance intermodal capacity. Currently, approximately 11 percent of the POM containers are drayed by trucks from the POM to the FEC rail terminal in Hialeah to be transported by rail (*Port of Miami Freight Access Study*, *Cambridge Systematics, Inc., 2007*). If the rail spur along North River Drive is developed, it could potentially reduce the need to transport containers from the POM to the Hialeah Rail Yard by trucks.

In addition, North River Drive needs be improved to facilitate truck mobility. A significant issue with a short sea shipping facility along the upper portion of the Miami River is the lack of access to the expressway network. As a result, it would be difficult to effectively connect short sea shipping facilities with the Airport West area through the expressway network. The Miami-Dade Expressway Authority (MDX) *Transportation Improvement Program* for fiscal years 2009-2013 identifies a SR 112/SR 836 interconnector. Funding has been assigned in FY 2009 and FY 2010 for preliminary engineering. This connector could facilitate better access to the expressway system from North River Drive.

Cost:

In the absence of a business model, an estimate of the implementation cost for short sea shipping is difficult to predict. However, moderate starts up costs have been reported in several European short sea shipping initiatives (less than $1 million). By utilizing the existing facilities at the POMR, a pilot short sea shipping project in the Miami River could be initiated with a relatively low investment to gauge its potential effectiveness.

Financing:

The availability of financing and funding partners will be an important consideration for the implementation of short sea shipping. Government financing and subsidies may be important during the initial stages to build confidence of the stakeholders and to offer a competitive service.

The Transportation Energy Security and Climate Change Mitigation Act of 2007 (H.R. 2701) was presented to the House of Representatives with the objective of reducing environmental emissions from a variety of modes of transportation and to increase

the energy efficiency of certain buildings operated by the federal government. The bill calls for the establishment of a short sea transportation program and supports short sea transportation projects to be conducted under the program to mitigate landside congestion. The program encourages the use of short sea shipping through the development and expansion of "documented vessels," "shipper utilization," "port and landside infrastructure," and "marine transportation strategies by State and local governments." For a short sea shipping project designated under this section, the Secretary of Transportation may (i) promote the development of short sea transportation services; (ii) coordinate, with ports, State departments of transportation, localities, other public agencies, and the private sector on the development of landside facilities and infrastructure to support short sea transportation services; and (iii) develop performance measures for the short sea transportation program. As part of this bill, the establishment of a $2 billion capital construction loan program to finance the construction, reconstruction, or reconditioning of a vessel used for a short sea transportation project is recommended. Later, these provisions were incorporated into H.R. 6, Energy Independence and Security Act, which was passed by the Congress and signed into law by the president on December 19, 2007.

The designation of the Miami River as a strategic intermodal facility (SIS) could also help access additional funding sources for improvements. It should be noted that the most recent attempts to designate the Miami River as a SIS facility were unsuccessful.

Public Support:

For the success of a relatively new strategy such as short sea shipping, it is important to identify political champions from the outset. Champions may help garner the necessary political support, clear administrative barriers, and access potential funding sources. A critical component of success would be a partnership between the POM and the POMR to develop necessary infrastructure improvements and operational agreements needed for short sea shipping.

Environmental Impacts

Short sea shipping on the Miami River could reduce the truck demand on local streets in Downtown Miami, thus reducing vehicle emissions. An increase in barge movement on the Miami River would not be expected to have significant negative environmental impacts.

Demand:

The demand for short sea shipping on the Miami River is unknown. Therefore, a pilot program may be necessary to evaluate logistics, handling capacity, inter-agency coordination, efficiency, growth potential, etc.

Economic Development:

During the initial stages, short sea shipping is not expected to have a major impact on the economy in terms of producing new jobs or increased tax base. Government subsidies may be required to begin operations and to make short sea shipping competitive against land-based truck transportation. However, ever increasing congestion and capacity limitations at the POM may be alleviated by short sea shipping.

Geographic Location:

The POMR is centrally located in a major freight corridor. It provides access to major highways and an active railroad, although connections to the expressway system require improvement.

Summary

The basic infrastructure for a short sea shipping pilot project could be developed within a relatively short time period with the availability of funding, support of the POM, and political support. Required improvements include a short sea shipping terminal, a truck staging area, and North River Drive improvements. Based on short sea shipping experiences in Europe, the initial capital investment may be relatively low. However, institutional barriers, cargo inspection, concerns of additional handling, and capacity constraints at POMR will need to be evaluated further. To better grasp the potential effectiveness of short sea shipping on the Miami River, including its ability to relieve the POM, to reduce congestion in Downtown Miami, its cost effectiveness, and its environmental impacts, it is recommended that a pilot project be implemented.

Strategy 2: Truck / Intermodal Freight Facilities

The focus of this section is to identify potential sites for truck/intermodal freight facilities within the study area. Central Dade County, despite being the major freight generator in Miami-Dade County, lacks truck staging areas. Potential sites for truck staging areas were examined using aerial photographs and land use maps. Based on the review, the following potential sites were identified for further investigation:

- A nine-acre site located at the southeast corner of NW 36th Street and NW 37th Avenue – This site is located close to the Miami River, an existing railroad spur, and near the preferred area for a proposed short sea shipping terminal (see previous section).
- A 63-acre site located at the southwest corner of NW 41st Street and Homestead Extension of Florida's Turnpike (HEFT) – This site is located outside of the Urban Development Boundary (UDB). However, the site is located in close proximity to the HEFT interchange at NW 41st Street, the warehouse district, and Lake Belt rock mines.

Site #1 – Near NW 36th Street and NW 37th Avenue

This nine-acre facility, located at the southeast corner of NW 37th Avenue and NW 36th Street (see *Figure 8*), was selected for evaluation for a potential truck/intermodal freight facility due to several favorable factors. This property is located close to the northern end of the POMR and a spur of the South Florida Rail Corridor. A potential truck/intermodal freight facility at this location could address truck staging deficiencies at the POMR. Currently, trucks often park along the shoulders and in the median of North River Drive. This truck facility could also help serve alternative freight movement methods such as short sea shipping, thereby reducing truck traffic

in Downtown Miami. Both the *Port of Miami 2020 Master Plan* and the *Port of Miami Freight Access Study* (*Cambridge Systematics, Inc., 2007*) identified the constraints to development of intermodal facilities within the POM due to inadequate land. The facility could be developed with services for trucks and their drivers such as fuel and service stations, showers, convenience stores, and restaurants.

The site is owned by the Miami-Dade Aviation Department and has an assessed value of approximately $7 million (2007). The site is currently vacant and is zoned for industrial use.

Site #2 – Near Homestead Extension of Florida's Turnpike and NW 41st Street

This 63-acre site, located at the southwest corner of HEFT and NW 41st Street (see *Figure 9*), is considered favorable for the development of a truck facility due to several factors. A potential truck facility at this location could serve major freight generators in the area including the warehouse district and rock mines in the Lake Belt area. In addition, the site is located in close proximity to the HEFT interchange at NW 41st Street. The proximity of the site to the HEFT means that trucks will be able to access this facility without having to travel through congested surface streets. The site's strategic location can be utilized as a focal point for regional freight transport. The site could be developed with facilities such as overnight parking, fuel and service stations, convenience stores, and restaurants.

This site is owned by Turnberry/Doral Development Ltd. The site is vacant and its zoning classification is GU (interim). An obstacle to the development of this site is its location outside of the UDB. The site's assessed value is approximately $17 million (2007). The possibility of developing a truck facility through a public-private partnership (PPP) should be considered.

Figure 8: Potential Site #1 for Truck/Intermodal Freight Facility

Figure 9: Potential Site #2 for Truck/Intermodal Freight Facility

Strategy 3 – Dedicated Truck Facilities

To facilitate the growth of major freight generators such as the POM and Miami International Airport (MIA), an efficient roadway system is required. Based on the POM's 2020 Master Plan, truck traffic generated by the POM could double by 2020. MIA desires to maintain and strengthen its position as the leading airport for international cargo movement in the U.S. Hence, it is necessary to develop a transportation system that caters to truck demand while maintaining mobility for other modes of transportation. Therefore, the need and feasibility of providing dedicated truck facilities was identified as a potential improvement strategy.

Truck Demand on Major Roadways

Table 4 presents average annual daily traffic, truck volumes, and anticipated growth rates for major freight corridors within the Central Dade Transport Zone study area. The existing traffic volume data were obtained from the FDOT's 2006 traffic database. The traffic growth rates were estimated using FDOT's growth rate projection spreadsheet (see Appendix B).

Table 4: Traffic Data for Major Study Area Highways

Route	Existing AADT	Truck AADT	% Trucks	LOS E Capacity	Annual Growth Rate
Airport Expressway (E of NW 27th Avenue)	100,000	8,000	8.0%	120,200	0.8%
Dolphin Expressway (E of Palmetto Expressway)	199,500	7,980	4.0%	163,900	< 0.5%*
Palmetto Expressway (N of NW 12th Street)	205,000	9,640	4.7%	163,900	< 0.5%*
Florida's Turnpike (N of NW 41st Street)	102,800	8,330	8.1%	120,200	10.9%
Okeechobee Road (NW of Palmetto Expressway)**	45,000	5,175	11.5%	51,800	2.9%
NW 36/41 Street (E of Milam Dairy Road)**	66,500	6,780	10.2%	51,800	< 0.5%*
NW 25 Street (W of Milam Dairy Road)	40,000	6,440	16.6%	32,900	***

Notes:
* Recent traffic volumes indicate a negative growth rate.
** 2005 data.
*** Only two years of historical data is available for NW 25th Street. Hence, an annual growth rate was not estimated due to absence of data.

As indicated in *Table 4*, the existing traffic volumes on the Dolphin Expressway, Palmetto Expressway, NW 36th/41st Street and NW 25th Street already exceed the LOS E capacity threshold. The Florida's Turnpike data indicate a rapid growth in traffic. *Table 4* also indicates that arterial roadways such as Okeechobee Road, NW 36th/41st Street, and NW 25th Street are currently experiencing a significant modal share of trucks (> 10 percent) in the vicinity of the Palmetto Expressway. However, the percent of truck traffic on the Dolphin and Palmetto Expressways, which exhibit the highest daily traffic volumes and serve a significant portion of truck traffic generated by the POM and MIA, is less than five percent.

Dedicated Truck Facility Concept
Source: *I-70 Dedicated Truck Lanes – Overview (2008), Keith Bucklew, Indiana DOT*

The Miami-Dade MPO's *2030 Long Range Transportation Plan* (2030 LRTP) projects traffic increase in the Central Dade Corridor by approximately 32 to 45 percent between 2000 and 2030. These projections translate to an annual growth rate between 0.9 and 1.25 percent. In the absence of a freight forecast model for Miami-Dade County, the projection of freight traffic volumes is difficult. Based on the above data, the following observations are made:

- The majority of freight corridors are currently operating at a poor level of service.
- Both truck and non-truck volumes are expected to continue to increase.
- On major expressways, the modal share of trucks is less than eight percent. These modal shares do not appear to warrant truck only lanes.
- The impact of truck traffic seems to be most significant (based on modal share) on arterial roadways such as Okeechobee Road, NW 36th/41st Street, and NW 25th Street.

As presented in Literature Research, several potential improvements were previously identified, including dedicated truck facilities, truck-only lanes, truck-only interchanges, and managed lanes.

Truck-only lanes are not recommended on the existing roadways due to relatively low modal share of truck traffic. Dedicated truck facilities have been studied in several areas of the U.S. to improve the efficiency of freight movement, reduce congestion, and improve safety. Notable studies include Southern California Toll Truckway, Georgia Truck Lanes Needs Identification Study, the I-70 Dedicated Truck Lanes Study, and the I-81 Corridor Improvement Study (Virginia).

Dedicated Truckway Toll Facility Evaluation

The Reason Foundation presented a preliminary concept to develop a dedicated east-west truck-only toll facility connecting the POM with warehouses, distribution centers, and the FEC rail yard in the Airport West area (see Literature Review). The key elements of the proposed truck facility are summarized below:

- A two-lane toll truckway (one-lane each direction).
- Truckway to be a combination of an elevated structure and a tunnel between I-395 and NW 25th Street west of MIA (four alignments presented).
- Operating speed of 60 mph. With improved travel time, the study forecasts an increase in the daily number of round trips between the POM and warehouses.
- The opening year was assumed to be 2016.

- Cost estimates for alternatives range from $1.1 to $1.32 billion in 2007 dollars. These cost estimates assume $45 million per mile for the elevated portion and $200 million per mile for the tunnel portion.
- As indicated in Table 5, the existing truck traffic volume on five east-west corridors was used as a basis for estimating the demand for the truckway. "Low %" and "High %" refer to percentages of truck traffic on east-west corridors that are assumed to use the proposed truckway. Based on the 2005 traffic volumes, approximately 3,800 to 5,500 trucks per day were forecast to use the truckway. The estimated truck volume is between 29 and 42 percent of the total truck traffic on those five corridors.
- Based on input from the POM, the analysis assumes that 65 percent of containers reaching the POM would be drayed to warehouses in the Airport West area and an additional 11 percent would be drayed to the FEC rail yard. Therefore, approximately 76 percent of the POM related trucks were forecast to use the truckway. The study notes that the current daily POM truck volume is 2,100.

Table 5: Potential Truckway Traffic, 2005

East-West Route	Truck AADT	"Low" %	Truckway "Low"	"High" %	Truckway "High"
SR 932	2,078	5	104	10	208
US 27, SR 112 avg.	2,797	40	1,119	60	1,678
SR 836	3,735	60	2,241	80	2,988
SR 986 (Flagler)	1,849	10	185	20	370
US 41 (SW 8th Street)	2,762	5	138	10	276
Total	13,221		3,787		5,520

Source: Miami Toll Truckway: Preliminary Feasibility Study, Reason Foundation, 2007.

- To forecast future truck volume, a 3-percent annual growth rate was assumed between 2007 and 2016. Beyond 2016, a 5-percent annual growth rate was assumed for the POM related truck traffic and a 3-percent annual growth rate was assumed for other truck traffic that would use the truckway.
- For drayage and non-drayage trips, one-way tolls of $9 and $6 were assumed (in 2007 dollars). These tolls were adjusted by applying an annual 3.5-percent consumer price index.
- Based on a 40-year projection period, the study determined that approximately 54 to 58 percent of the investment could be supported through tolls.

The study also elaborates other benefits of the truckway, including the reduction of trucks on the existing major east-west roadways, safety, and environmental benefits. The report indicates that each truck is equivalent to two to three passenger cars; hence, the benefits are much greater than the actual number of trucks removed from those facilities.

Analysis of the Truckway Proposal

The following observations are provided on the preliminary feasibility study for the east-west toll truckway:

- The study presents a broad conceptual analysis of potential alternatives that uses cost, toll revenue, and other factors to evaluate the truckway concept for Central Miami-Dade County. As the report indicates, an engineering analysis is required to evaluate the alternatives for constructability, right-of-way and legal issues, environmental impacts, construction duration, funding sources, revenue analysis, etc.

- The study used compound annual growth rates ranging between 3 to 5 percent over a period of 40+ years to forecast traffic on the truckway. An annual truck traffic growth rate of 3 to 5 percent appears to be consistent with the *POM 2020 Master Plan*. However, to maintain such a sustained long-term growth rate in the east-west corridor, a significant increase in freight related activities would need to occur in the Airport West area. This area is already experiencing severe congestion and it is unlikely that local roadways in the Airport West Area could serve a seven fold increase in truck volumes by 2055.
- The construction activities, especially obtaining necessary clearance to tunnel under MIA, would be extremely difficult due to security concerns and impact to the operation of the airport. Overall, a 2016 opening of the truckway appears to be ambitious given the right-of-way needs, permitting, local stakeholder concerns, financing, etc.
- The traffic projections for the truckway were compared against the capacity/LOS thresholds presented in the Florida Department of Transportation's (FDOT's) 2002 *Quality/*Level *of Service Handbook*. The proposed truckway volumes were compared against capacity thresholds extrapolated from the four-lane freeway capacity. Capacity thresholds for two-lane freeways have not been established in the handbook; hence, 50 percent of the four-lane freeway capacity was used. The use of 50 percent of the four-lane freeway capacity results in a high estimate of the two-lane freeway capacity, as passing opportunities are limited on the proposed two-lane truckway. *Table 6* presents capacity thresholds for two-lane freeways (extrapolated from four-lane freeways). It should be noted that the level of service thresholds presented in the handbook are for general purpose lanes, which assumes 6 percent of the traffic to be heavy vehicles. To estimate

truckway capacity, the values given in the handbook were divided by two (assuming one truck is equivalent to two cars).

Table 6: Estimation of Truckway Capacity Thresholds

	Adopted Service Volumes				
	A	**B**	**C**	**D**	**E**
Vehicles per day (1)	11,900	19,800	27,600	33,550	37,300
Trucks per day	5,950	9,900	13,800	16,775	18,650

(1) Based on Table 4-1 of FDOT's Quality / Level of Service Handbook for freeways with interchange spacing greater than 2 miles. The two-lane capacities were estimated from four-lane capacities.

The LOS determination of the truckway for the low and high traffic scenario based on the service volumes from *Table 6* are presented in *Table 7*.

Table 7: Estimation of Level of Service of Truckway

Truck Volume and Level of Service(1)		**Analysis Year**				
		2016	**2025**	**2035**	**2045**	**2055**
"Low" traffic scenario	Truck Volume	5,089	7,169	10,582	15,767	23,706
	Level of service	A	B	C	D	F
"High" traffic scenario	Truck Volume	7,419	10,209	14,668	21,258	31,085
	Level of service	B	C	D	F	F

(1) Truck volumes presented in Tables 3 and 4 of the Miami Toll Truckway were used.

As indicated in the above table, the level of service for the two-lane truckway would deteriorate over the 40-year analysis period. This deterioration would negatively impact the ability to maintain an operating speed of 60 mph as stated in the proposed concept. Consequently, increased travel times could negatively impact the willingness of truckers to pay the assumed toll. Due to the POM's present hours of operation, the level of service of the facility could deteriorate more rapidly than

estimated based on the daily level of service, as most of the truck traffic will occur during the POM's hours of operation.

The report estimates that approximately 54 to 58 percent of the $1.1-1.3 billion investment could be supported through tolls. Several additional potential funding strategies have been identified. However, with the likely investments to other major transportation projects such as the Port Tunnel and the I-395 reconstruction, which are at advanced stages requiring large-scale investments, finding potential funding sources for the truckway project could be challenging.

The proposed facility primarily benefits trucks, which represent a small portion of the traffic on the east-west expressways (less than 8 percent). Since the major east-west highways are already at or nearing capacity, any improvements anticipated from a reduction in truck traffic on these highways is most likely to be offset by latent demand and diverted traffic. The *Georgia* Truck *Lanes Needs Identification Study* (see Appendix C) reached a similar conclusion and recommended against truck-only lanes.

Summary

Based on the above concerns, the following alternatives to a toll truckway may be more desirable:

- Investigate the possibility of constructing and operating managed lanes on SR 836. The managed lanes with variable pricing could provide travel time benefits for trucks. These managed lanes could be connected to the I-95 Express Lanes, thus providing potential benefits for both trucks and automobiles.

The feasibility of extended hours of operation for the POM to promote freight transport during off-peak hours should be evaluated as a long-term option (discussed in detail separately). A time of day analysis of traffic data presented in Data Analysis indicated that 86 percent of truck traffic and 80 percent of total traffic was observed between 6:00 A.M. and 7:00 P.M. The costs associated with additional nighttime shifts at the POM, regional competitiveness issues, and relatively low truck traffic generated in comparison to other ports where these programs have been successfully implemented are some of the major obstacles for extending hours at the POM.

Strategy 4 – Strategies to Spread Freight Activity to Off-Peak Period

Given the heavy traffic volumes and congestion during the peak travel periods, the feasibility of increasing freight movement during off-peak periods was assessed. The initial step of the analysis was to develop an understanding of the existing traffic patterns in Central Miami-Dade County. The Data Analysis section presented an analysis of traffic data for major roadways within the study area. *Figures 10* and *11* show the hourly distribution of truck traffic and total traffic, respectively, based on data from 19 count locations. *Figure 10* also illustrates hourly truck traffic as a percent of total traffic within each hour.

In general, total traffic volume is heaviest between 8:00 A.M. and 8:00 P.M. Similarly, the truck traffic volume is heaviest between 7:00 A.M. and 6:00 P.M. Based on *Figures 10* and *11*, traditional off-peak hours during the daytime (9:00 A.M. to 4:00 P.M.) are not evident. Approximately 86 percent of truck traffic and 80 percent of total traffic occurs between 6:00 A.M. and 7:00 P.M. Conversely, only 14 percent of truck traffic and 20 percent of total traffic use the roadways between 7:00 P.M. and 6:00 A.M. Therefore, substantial unused roadway capacity is available at nighttime. The benefits of off-peak truck operations include:

- Utilization of roadways when excess capacity is available to move freight more efficiently.
- Increased productivity for freight movers and industries due to travel time and fuel savings.
- Potential savings in investments on freight related roadway improvements that are necessary to accommodate trucks during peak periods.
- Potential safety and environmental benefits due to reduced truck movement during peak traffic periods.

Figure 10: Hourly Distribution of Truck Volume

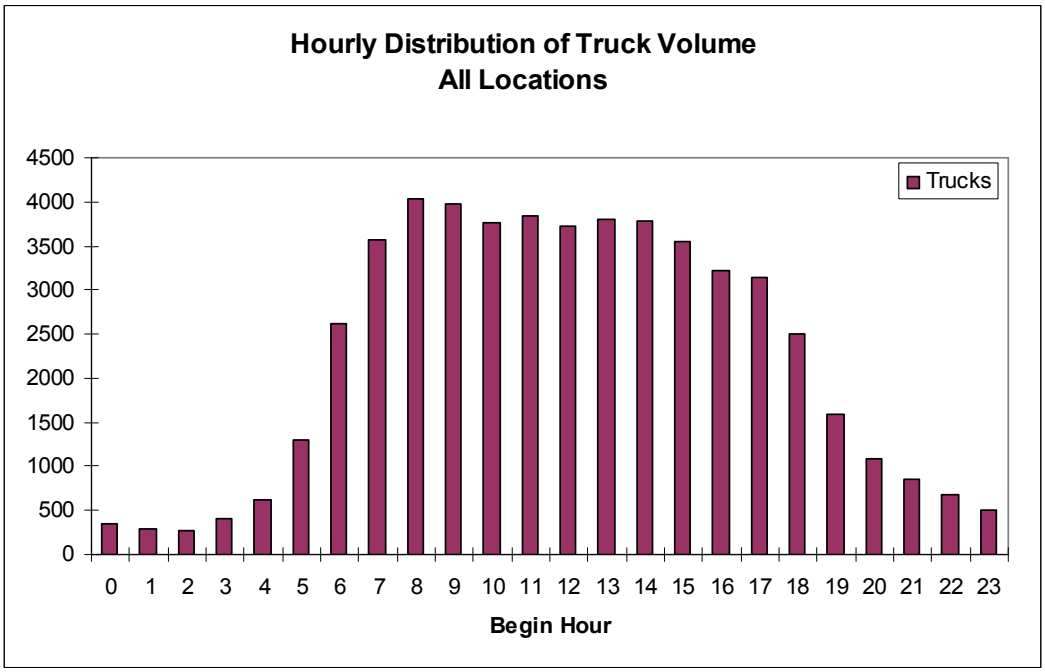
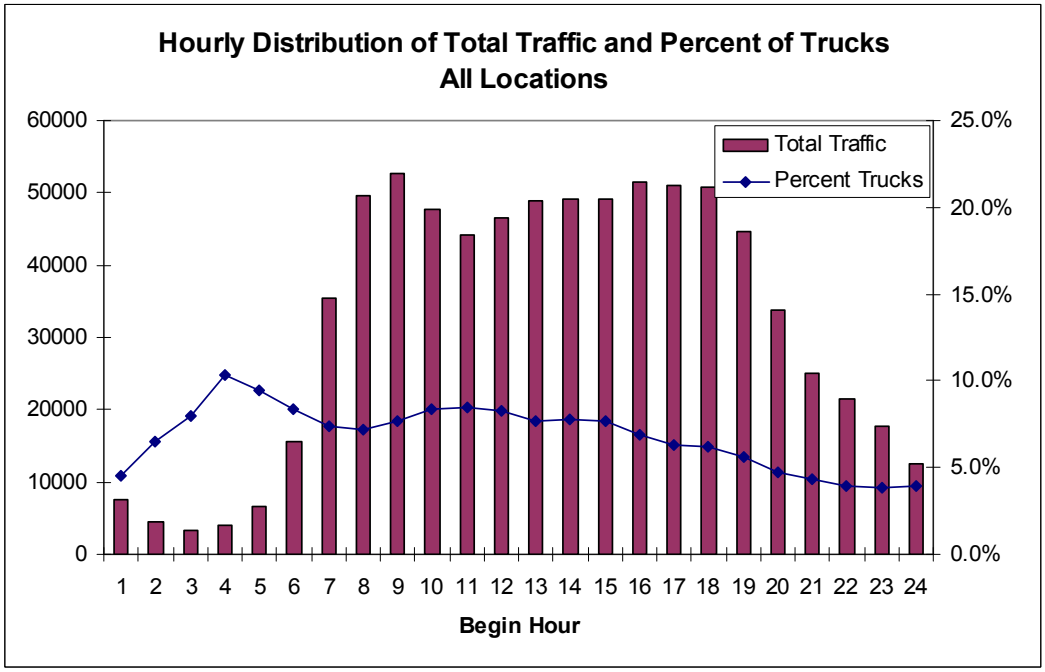


Figure 11: Hourly Distribution of Total Traffic and Percent of Trucks



Evaluation of Potential Strategies

To spread hours of truck movement to off peak *hours*, the following potential strategies were evaluated:

Expand Port of Miami Hours of Operations

The POM is the nucleus of freight movement in Miami-Dade County. Therefore, the POM's growth and its hours of operation have a significant impact on the businesses that are dependent on the POM, as well as roadways that are used to move freight to and from the POM. Presently, the majority of POM operations occur between 6:00 A.M. and 6:00 P.M. on weekdays. These hours correspond with the most congested periods of the roadway system. Since the majority of POM generated cargo has destinations within a 50-mile radius, rail is a relatively expensive mode of transportation. If the POM expanded its hours of operation, less congested roadways could be used to move freight more efficiently at nighttime. The major benefits and impediments to expanding the POM hours of operation are presented in the table below.

Table 8: Impacts of Expansion of POM Hours of Operation

Benefits	Impediments
▪ Travel time reductions for trucks ▪ Increased productivity and reduced waiting time at the POM ▪ Accommodate POM growth ▪ Potential safety and environmental benefits ▪ Potential savings in roadway improvements	▪ Requires additional shifts and resources ▪ Will have to pay higher wage rates for nighttime shifts (labor unions) ▪ Necessary to coordinate with several stakeholders for successful implementation ▪ Potential negative impacts of increased costs on POM's regional competitiveness ▪ Truck trips generated by POM are not as high as at the ports that have successfully implemented off-peak operations ▪ Absence of quantitative data to assess congestion costs and other inefficiencies ▪ Need to implement incentives/strategies to encourage nighttime operations (e.g., PierPASS)

At present, concerns about extra costs associated with additional shifts to expand the POM hours of operation seem to weigh unfavorably. However, inefficiencies associated with landside freight movement due to increased roadway congestion and the inability to provide roadway capacity to meet the traffic demand should be also be given equal consideration. A study providing a qualitative and quantitative assessment of benefits and costs associated with expanding the hours of operation could be undertaken to understand the impacts of expanding the POM's hours of operation. Consideration should be given to establishing a regional ports authority to oversee the operations of the Port of Miami and Port Everglades, and to promote enhanced coordination between the two ports to address maritime and landside access issues more effectively. Such an agency could help address concerns such as competition among regional ports, which are a major deterrent to implementing off-peak operations.

PierPASS at Port of Miami

In early 2000s, both the Los Angeles and Long Beach ports experienced a sharp increase in container traffic. To mitigate the impacts of container traffic, elected officials considered imposing a container fee on daytime port use; however, the revenue was to be used for the general state budget rather than mitigating congestion at the ports. In response, the goods movement industry recommended an alternative (called *OffPeak*) that would use tolls on daytime container movement to fund nighttime shifts. To implement this program, PierPASS was created. PierPASS is a non-profit organization created by marine terminal operators at the Los Angeles and Long Beach ports. *OffPeak* imposes a

traffic mitigation fee on cargo movement between 3:00 A.M. and 6:00 P.M. Monday through Friday. To support off-peak cargo movement, five additional shifts were established at the ports to deliver and receive containers between 6:00 P.M. and 3:00 A.M. The current traffic mitigation fee is $50 per TEU (20-foot equivalent unit). Since its inception in 2005, the traffic mitigation fee has been able to fund an increasing percentage of the *OffPeak* program expenses. At these two ports, *OffPeak* shifts handle approximately 37 percent of container movements.

In August 2006, the POM presented this concept at a Sea Port Access Stakeholder Workshop. The consensus building efforts thus far have not yielded desired results due to fears that increased costs would make the POM less competitive than other regional ports. However, once the POM *Tunnel* is built, a toll will be levied on trucks accessing the POM. A variable toll system that encourages off-peak freight movement could help the POM expand its hours of operation. A study to determine costs and benefits of PierPASS at the POM should be considered.

Congestion Pricing in City of Doral

Congestion pricing, also called variable pricing, value pricing, and peak-period pricing, is a transportation demand management approach, where tolls are employed to reduce congestion during peak travel periods. In congestion pricing, higher tolls are used during peak periods to discourage vehicles entering certain congested areas, whereas lower tolls are used during off-peak periods. These methods have been successfully implemented in London, Stockholm, and Singapore. In the U.S., New York City and Chicago are

Congestion Pricing Sign in London, UK

considering similar congestion pricing systems. Successful congestion pricing systems often include high occupancy or managed lane facilities, transit improvements, carpooling programs, and opportunities for flexible work hours.

Miami is one of the most congested urbanized areas in the U.S. In 2005, Miami was ranked number five among major U.S. metropolitan areas in terms of congestion cost, excess fuel consumed, and travel demand (*The 2007 Urban Mobility Report*, Texas Transportation Institute). To improve mobility, several initiatives are in the planning stages, including I-95 Express Lanes, transit projects, and upgrades to the traffic signal system. Within the study area, the potential for implementing congestion management strategies was examined. The City of Doral, which experiences severe congestion, is a potential area for congestion management strategies.

In its Transportation Master Plan, the City of Doral recommends several transportation demand management strategies including banning trucks during peak periods. A less restrictive measure would be to implement a congestion pricing system that would use tolls to discourage travel during peak periods. In an areawide congestion pricing system, "cordon tolls" are commonly used, whereby tolls are charged from vehicles at entry/exit points to an area. The Palmetto Expressway, Florida's Turnpike, and Dolphin Expressway offer potential cordon locations where toll mechanisms could be installed. An electronic toll collection system (ETC), such as SunPass, could be used for toll collection. The toll rates could vary by time of day and by number of axels. The potential challenges for congestion pricing include local resistance, especially from automobile users; traffic on local roads that may not pass through cordon points; sources of funding for implementation; and the uses of revenue generated by the tolls. In addition, coordination with public and private

organizations, public education, and improvements to public transportation systems are necessary. A more detailed study to evaluate the feasibility of a congestion management program in the City of Doral is recommended.

Assessment of Freight Activities at Miami International Airport (MIA)

MIA is the busiest airport for international cargo movement in the U.S. Its cargo operations take place around the clock. A significant portion of cargo, especially perishables, arrives during nighttime. The nighttime cargo movements are scheduled to take advantage of limited passenger flight operations during that time period. After obtaining clearance, trucks transport cargo from MIA to warehouses and destinations. A major portion of perishable cargo is transported from MIA to the Warehouse District to be processed for distribution. Thereafter, trucks transport these perishables from warehouses to destinations during the daytime. These trucks contribute to the severe congestion during the daytime on NW 25th Street. The fact that perishable cargo needs to be transported quickly to destinations limits the flexibility of truck schedules.

Trucks Waiting to Enter MIA's Cargo Area

MIA has programmed several capital improvement projects to further expand its passenger and cargo operations. Therefore, airport related freight movement is expected to grow. While acknowledging constraints, further emphasis should be given to scheduling freight operations to occur during nighttime. The NW 25th Street Viaduct Project is

expected to provide capacity enhancements and reduce truck traffic on NW 25th Street between the Palmetto Expressway and the Airport Cargo area. However, strong interconnections between MIA and warehouses mean that trucks still have to use local arterials in the area. The capacity and intersection improvements along NW 25th Street and NW 12th Street (discussed later in this chapter) will help improve truck traffic movement and mitigate congestion.

Strategy 5 – Improvements to Downtown Miami Commercial Loading Zones

Currently, there is a significant amount of truck delivery activity within Downtown Miami serving the needs of businesses and residents. However, there are issues with commercial loading zones and truck parking. Data Analysis identified the following issues related to commercial loading zones in Downtown Miami:

- Inadequacy of existing 30-minute parking duration limit in areas near high-rise buildings
- Inadequate number of on-street commercial loading zones
- Difficulties in finding vacant commercial loading zones
- Violation of commercial loading zones
- Illegal parking by commercial vehicles blocking traffic lanes, bus stops, and sidewalks

Potential Improvements to Commercial Loading Zones

The following potential improvements to commercial loading and parking within downtown were identified *and* evaluated.

Increase parking duration limit or implement a usage based toll rate for commercial loading zones near high-rise buildings – During discussions among the Miami Parking Authority and delivery companies, concerns were raised that the current 30-minute parking limit is inadequate to complete deliveries to high-rise buildings. As such, the Miami Parking Authority should consider increasing the parking duration limit in commercial loading zones.

Designate a minimum of one commercial vehicle parking space in surface parking lots – This requirement could be applied to both public and private parking lots. The Miami Parking Authority could evaluate the strategy and coordinate with the operators of private parking lots. These additional commercial parking spaces could help offset a potential reduction in available parking opportunities if the parking duration is extended in commercial loading zones near high-rise buildings.

Use of ITS technologies to monitor parking space occupancy – Real-time information systems could be used to minimize the time spent by commercial delivery vehicles searching for vacant parking spaces. In general, these systems consist of a detection device that monitors the usage of parking spaces and transmits the information to a local display unit or a central workstation for wide-area dissemination.

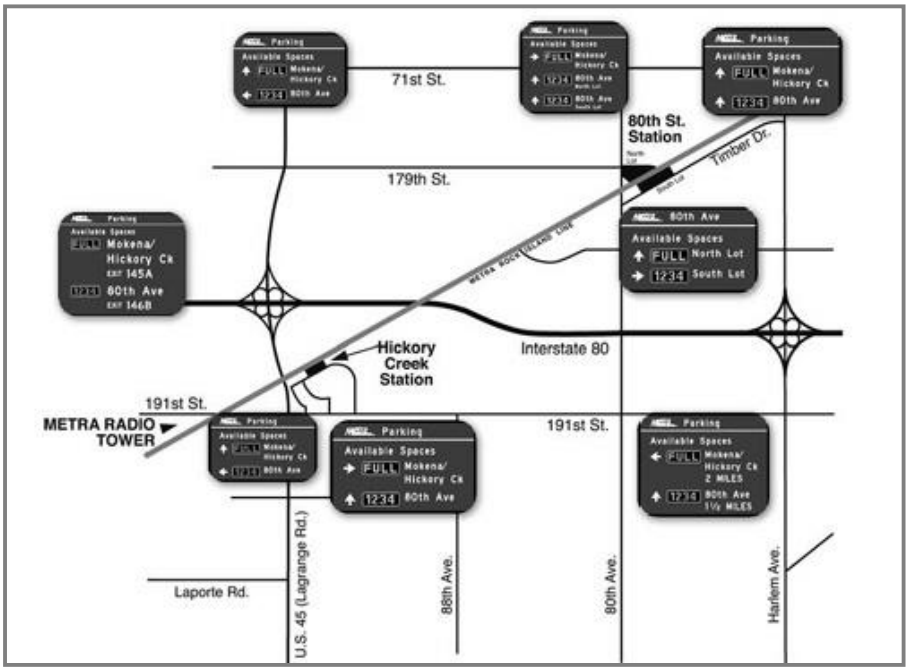
A low cost option is to use dynamic message signs at select street corners to display the number of available spaces within a block. The potential drawbacks of these signs include visual clutter, space requirements for display signs, and drivers not being able to learn the availability status until they are sufficiently close to the display messages. However, this option would minimize instances where several drivers converge on the same parking space based on wide-area information systems.

Real-Time Parking Utilization Information System
Source: Advanced Parking Management Systems (2007), Federal Highway Administration

A more advanced but expensive option is to broadcast the parking information via web based, GPS, telephone, or other technologies. These systems provide real-time parking space availability information to delivery vehicles. The City of San Francisco

is planning to implement a similar system to cover approximately 18,000 parking spaces, including curb-side parking spaces, parking garages and surface parking lots. As part of the program, the parking rates will be adjusted based on demand and time of day. The San Francisco system is estimated to cost approximately $23 million. The magnitude of the system in Downtown Miami will be much smaller but will still require a significant start-up cost to implement the system.

In Downtown Miami, the shortage of on-street commercial loading zones is most evident in the area north of Miami River, where a majority of the buildings were built several decades ago. In comparison, the recently constructed buildings in the Brickell area usually have built-in commercial loading facilities. As such, the area in need of better management of commercial loading zones is relatively small. Therefore, it may be more economically feasible to expand a potential ITS system application in Downtown Miami to include all public parking spaces in order to realize better economies of scale.



Chicago Metra's Advanced Parking Information System
Source: Advanced Parking Management Systems (2007),Federal Highway Administration

Continued enforcement of parking rules – Enforcement of parking rules is recommended to mitigate traffic problems created by illegal commercial loading and unloading, and the violation of designated commercial loading zones.

Strategy 6 – Roadway Improvements

Several improvements were identified for roadways within the study area to enhance truck traffic flow. These improvements include:

- Geometric improvements on Port of Miami access routes
- Intersection improvements along NW 25th Street
- Intersection improvements along NW 12th Street
- Connection of NW 117th Avenue between NW 25th Street and NW 41st Street
- Complete "missing link" projects identified in the Miami-Dade MPO's *2030 Long Range Transportation Plan (LRTP)*.

Geometric Improvements on Port of Miami Access Routes

Based on the deficiencies identified during *field* reviews, the following improvements are recommended:

Increase left-turn storage length on southbound Biscayne Boulevard at Port Boulevard – Biscayne Boulevard is a primary truck access roadway to the POM. A primary ingress to the POM is provided via the southbound left-turn lanes at the intersection of Biscayne Boulevard and Port Boulevard. Currently, one relatively short left-turn storage lane and a longer shared lane for left-turns and through movement are provided. This lane configuration resulted from a Biscayne Boulevard reconstruction project completed several years ago with an objective of making the corridor more pedestrian friendly. Modifications to the subject intersection included realignment of approaches, reduction of through lanes, and increase of median

width on Biscayne Boulevard. Prior to these modifications, a second exclusive southbound left-turn lane with additional storage capacity existed at the intersection. The present lane configuration results in storage capacity deficiencies for inbound trucks during peak truck arrival periods. As a result, long queues often impact the southbound through vehicles. Extending the southbound exclusive left-turn lane will provide additional storage capacity for trucks while improving traffic flow along Biscayne Boulevard. The wide median provides adequate space for extending this lane. However, coordination with the City of Miami, Miami-Dade County, and the Florida Department of Transportation is required to further evaluate this recommendation. In addition, the demand for this southbound left-turn movement may decrease in the future after the opening of the Port of Miami Tunnel. Figure 12 presents a schematic representation of the proposed improvement.

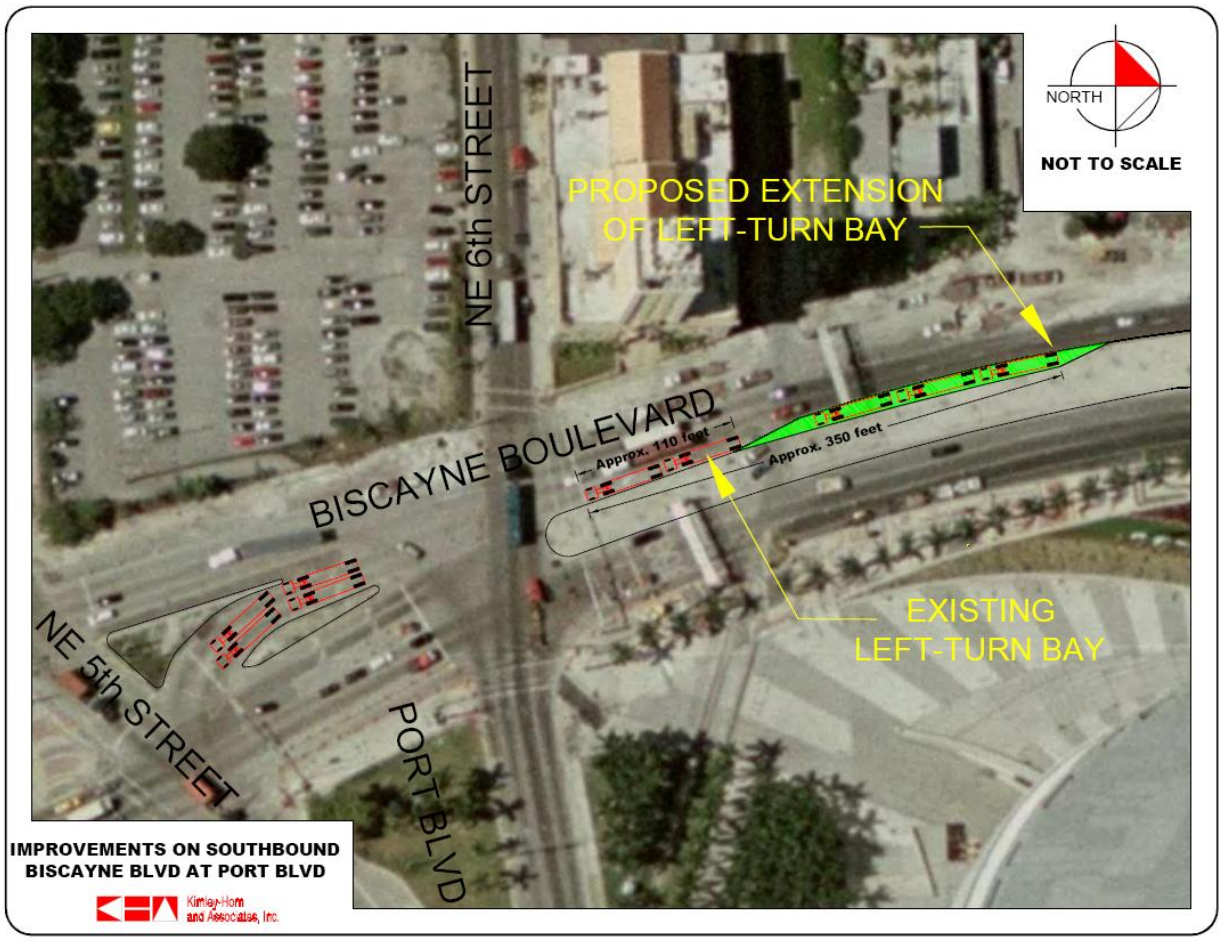


Figure 12: Improvements to Southbound Biscayne Boulevard at Port Boulevard

Intersection Improvements on NE 6th Street at NE 1st Avenue – Both NE 6th Street and NE 1st Avenue are one-way streets, which are used by outbound trucks from the POM to access I-395 west. Westbound trucks on NE 6th Street are allowed to turn right onto northbound NE 1st Avenue from the center lane due to inadequate turn radius for large trucks. In general, trucks accessing I-395 west use the center lane on NE 6th Avenue to turn right onto northbound NE 1st Avenue as the on-ramps *are* located on the left side of NE 1st Avenue. The use of the center lane for right turns present potential conflicts with vehicles turning right from the right lane.

Existing truck traffic patterns are expected to change with the completion of the POM Tunnel and I-395 reconstruction projects. The POM Tunnel project will reduce truck traffic on surface streets in Downtown Miami. As part of the I-395 project, it is expected that on-ramps will be relocated to Miami Avenue to access I-395. Therefore, potential short-term improvements at the intersection of NE 6th Street and NE 1st Avenue should be considered. These improvements include additional signage on NE 6th Street to inform drivers of the use of center lane for right turns, closure of the right lane on NE 6th Street at NE 1st Avenue, and turn radius improvement. As indicated in *Figure 13*, turn radius improvement will require the acquisition of right-of-way from the property at the northeast corner of the intersection, reconstruction of the sidewalks, and potential relocation of utility poles.

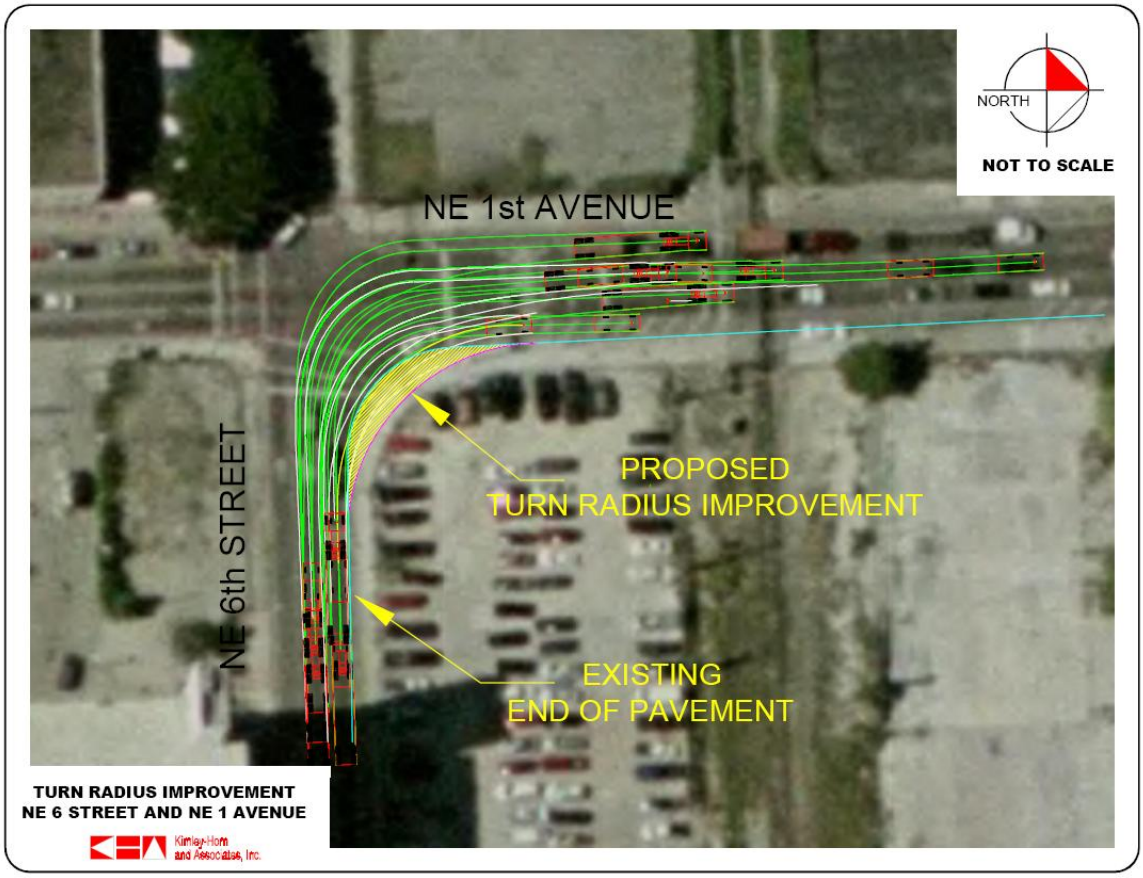


Figure 13: Improvements at NE 6th Street and NE 1st Avenue

Improve NE 2nd Avenue – The pavement on NE 2nd Avenue between NE 5th Street and I-395 is in poor condition with signs of rutting and cracking. NE 2nd Avenue is a primary route used by inbound traffic to the POM. In addition, ongoing construction activities along NE 2nd Avenue are impeding traffic flow. A resurfacing or rehabilitation project is recommended along this segment of NE 2nd Avenue. FDOT and Miami-Dade County recently completed a reconstruction project on NE 2nd Avenue between NE 12th Street and NE 14th Street. The projected included milling and resurfacing, drainage, curb and gutter, sidewalk, and lighting improvements. A similar project is recommended for NE 2nd Avenue between NE 5th Street and I-395.

Evaluate Benefits of 6th Street Slip Ramp – The 6th Street Slip Ramp was examined in an FDOT Project Development and Environment (PD&E) study (see Literature Research) to provide a direct link from Downtown Miami to westbound SR 836. This project was subsequently removed from FDOT's work program due *to* public opposition. The 6th Street Slip Ramp improvements considered in the previous FDOT study included a hook ramp to accommodate trucks from the Buena Vista yard. However, this hook ramp is no longer needed as the Buena Vista yard site has been redeveloped into a mixed-use development (Midtown Miami).

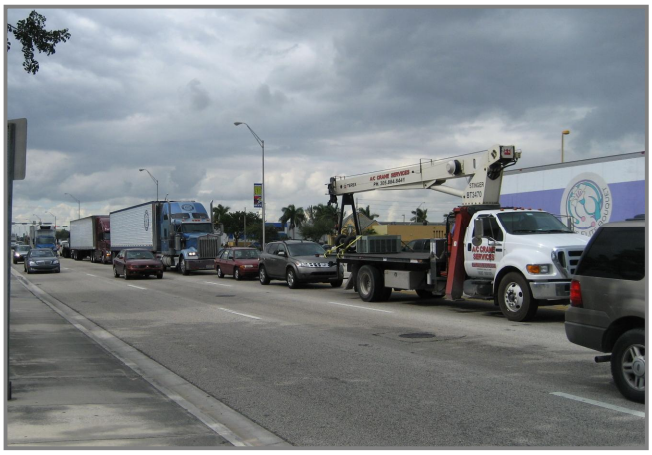
In prior studies, the 6th Street Slip Ramp was primarily viewed as a short-term solution until the Port of Miami tunnel is built. However, the slip ramp could also provide several benefits, including serving as maintenance of traffic route during the reconstruction of I-395 and as a secondary egress route from Downtown Miami. The 6th Street Slip Ramp could also provide an alternative direct connection to westbound SR 836 for non-truck traffic leaving Downtown Miami. As identified in the PD&E study, improvements to NE 6th Street and other local streets may be required as part of this improvement.

FDOT is currently nearing completion of the PD&E Study for the reconstruction of I-395. In a presentation given to FTAC on May 21, 2008, FDOT indicated that the I-395 reconstruction study does not include the 6th Street Slip Ramp as a potential maintenance of traffic option. FDOT anticipates the reconstruction of I-395 to begin after the completion of the Port Tunnel. The final design phase is not anticipated to be completed before 2012 and construction is expected to last several years. Therefore, it is recommended that the 6th Street Slip Ramp should be advanced as a separate project and preferably built prior to the beginning of I-395 reconstruction.

Intersection Improvements along NW 25th Street

NW 25th Street is a four-lane arterial that serves as a major access road to warehouses and distribution centers. NW 25th Street is heavily utilized by trucks transporting freight from the POM and MIA to warehouses and distribution centers. Based on field reviews and input from the FTAC members, the following intersections along NW 25th Street were identified for potential improvements:

- NW 72nd Avenue – inadequate turn radii and signal timing improvements
- NW 75th Avenue – inadequate turn radii and signal timing improvements
- Palmetto Expressway – inadequate storage and signal timing for eastbound left turns
- NW 79th Avenue – inadequate turn radii and signal timing improvements
- NW 82nd Avenue – inadequate turn radii and signal timing improvements
- NW 84th Avenue – inadequate turn radii and signal timing improvements
- NW 97th Avenue – inadequate turn radii and signal timing improvements



Congestion on NW 25th Street

The 25th Street Viaduct Project should address intersection deficiencies along NW 25th Street to the east of the Palmetto Expressway. Therefore, a corridor study is recommended to evaluate turn lanes, turn radii, and signal timing improvements at intersections along NW 25th Street between the Palmetto Expressway and NW 97th Avenue. This project could be funded through the congestion management process. At the intersection of NW 25th Street and the Palmetto Expressway ramps, the following options should also be evaluated:

- Possibility of upgrading the existing signal controller system to improve the signal phasing plan.
- Feasibility of converting one eastbound through lane on NW 25th Street to an eastbound left-turn lane, upon completion of the Viaduct Project.

Intersection Improvements along NW 12th Street

Improving NW 12th Street between the Airport Cargo area and NW 97th Avenue could help relieve congestion along NW 25th Street. To enhance NW 12th Street as an alternative freight corridor, congestion issues at NW 87th Avenue need to be addressed. The feasibility of grade-separating one westbound through lane on NW 12th Street at NW 87th Avenue ("12th Street Flyover") was examined. A connection from the westbound Dolphin Expressway off-ramp could also be provided to the 12th Street Flyover to accommodate trucks traveling from the POM to warehouses. As

indicated in *Figure 14*, the 12th Street Flyover and the connection from the Dolphin Expressway off-ramp appear to be feasible. However, several potential impacts of the proposed project were identified:

- Eastbound lanes of NW 12th Street between NW 84th Avenue and NW 87th Avenue will have to be shifted to accommodate the flyover. The assumed width of the flyover, including one travel lane, shoulders, bridge railing, and guardrail, is 25 feet. The shift in travel lanes was estimated to be approximately five feet.
- The impact of the shift of the eastbound lanes on NW 12th Street and connection from the SR 836 off-ramp to the NW 12th Street Flyover on the existing roadway drainage and stormwater systems must be assessed. In addition, a drainage system for the flyover will have to be designed.
- The construction of a flyover will require modification to the existing traffic signals along NW 12th Street at the SR 836 ramps and at NW 87th Avenue. Additional signal heads may be required due to the flyover limiting sight distance.
- The center two-way left-turn lane on NW 12th Street between NW 87th Avenue and NW 89th Court will have to be closed to construct the flyover landing. The closure will restrict left turns to and from NW 12th Street to adjacent developments.

As indicated in *Figure 14*, the vertical clearance at the railroad crossing must be 24 feet per FDOT design guidelines, whereas the vertical clearance at the SR 836 ramps and at NW 87th Avenue must be 17 feet. If determined cost feasible, the construction of this project is recommended to commence upon completion of the 25th Street Viaduct Project.

Several other intersections along NW 12th Street also should also be evaluated for geometric and signal timing improvements. These intersections include:

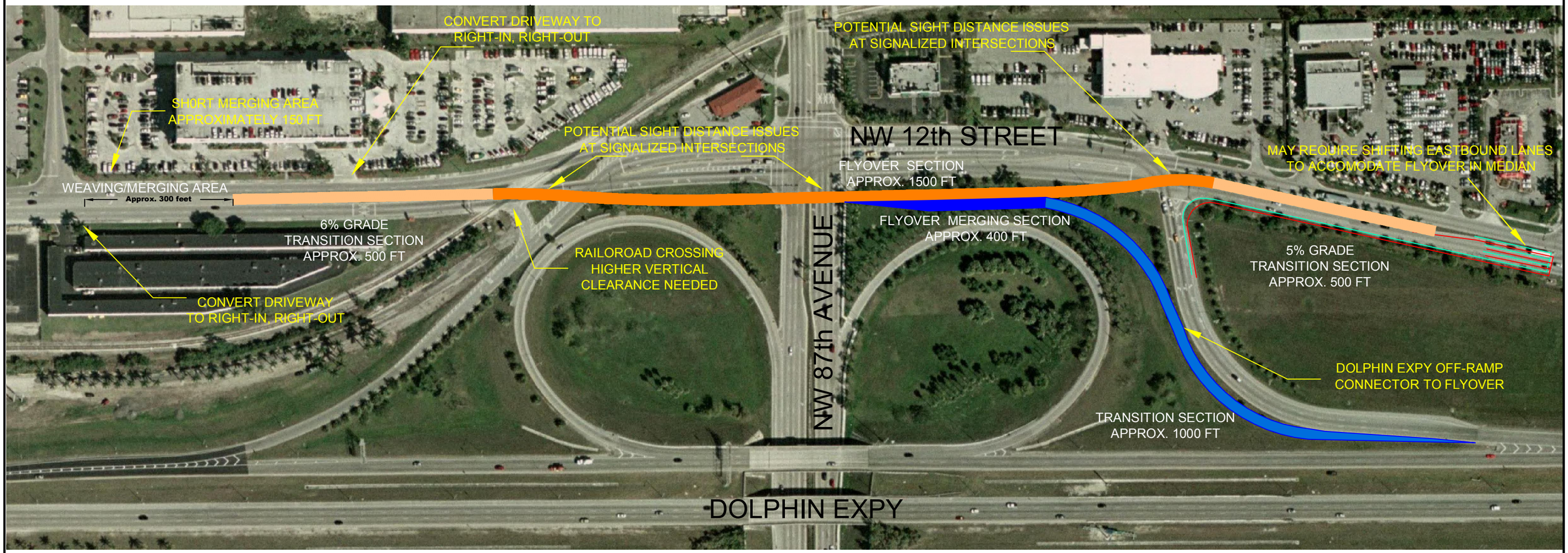
- NW 72nd Avenue – southbound left-turn movement currently experiences significant delays.
- NW 82nd Avenue – geometric improvements
- NW 84th Avenue – geometric improvements
- Possible signalization of the intersection at NW 98th Court due to truck diversions resulting from turning movement restrictions at the intersection of NW 12th Street and NW 97th Avenue.

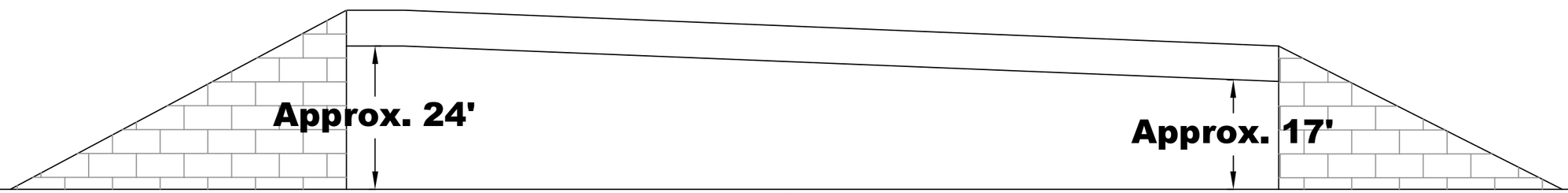
A corridor study similar to the proposed NW 25th Street *study* may be required to analyze these improvements in detail. This study could be funded through the congestion management process.

WESTBOUND NW 12TH STREET FLYOVER

NORTH

NOT TO SCALE





NW 12th STREET FLYOVER
ELEVATION PROFILE

Kimley-Horn and Associates, Inc.

FIGURE 14
POTENTIAL WESTBOUND FLYOVER ON NW 12TH STREET AT NW 87TH AVENUE

Connection of Northbound NW 117th Avenue to HEFT at NW 41st Street

Potential strategies to improve access to the expressway system from the warehouse district were examined. As previously indicated, the NW 25th Street interchange at Palmetto Expressway is experiencing heavy truck volumes. Currently, there is no interchange on the Homestead Extension of Florida's Turnpike (HEFT) at NW 25th Street. Two existing interchanges on the HEFT within the study area are located at NW 12th Street and NW 41st Street. To improve access options to the expressway system from the warehouse district, the possibility of connecting NW 117th Avenue to northbound HEFT at NW 41st Street was examined.

NW 117th Avenue does not connect to NW 41st Street from the south. The land uses on the east side of NW 117th Avenue between NW 25th Street and NW 41st Street are primarily industrial. The HEFT is located immediately to the west of NW 117th Avenue. NW 117th Avenue's geographic location makes it a strong candidate for a truck corridor. Two conceptual alternatives to connect northbound NW 117th Avenue to the northbound HEFT on-ramp at NW 41st Street were assessed: an at-grade connection and a grade-separated connection. In both these alternatives, NW 117th Avenue is recommended to be converted to a one-way northbound roadway north of NW 34th Street. A brief description of the two alternatives is presented below.

At-grade Alternative – As illustrated in *Figure 15*, this alternative recommends merging northbound NW 117th Avenue with the northbound HEFT off-ramp downstream from the toll plaza. A new northbound through lane is recommended at the intersection of the northbound HEFT off-ramp and NW 41st Street. Minor geometric modifications and signal timing adjustments will be required at this

intersection to accommodate the northbound through lane. In comparison to the grade separated option, the at-grade option is less costly and results in minimal environmental impacts. However, the main drawback of this option is the short weaving distance (700 feet) between the toll plaza and NW 41st Street. Since a majority of the vehicles exiting the HEFT make a right-turn, conflicts between the exiting right-turn vehicles and trucks merging from northbound NW 117th Avenue connection would be significant. Therefore, this option is not recommended.

Grade Separated Alternative – As illustrated in *Figure 15*, a grade separated connection between NW 117th Avenue and the northbound HEFT on-ramps could eliminate the merging conflicts associated with the at-grade alternative. The flyover could be connected to the existing on-ramp as a merge lane. This alternative is functionally superior to the at-grade alternative. In addition, this improvement can be considered as an alternative to constructing truck-only ramps at NW 25th Street (*Truck Route System for Miami-Dade County*, 2007). The drawbacks of this option include higher costs and visual and noise impacts that could negatively impact the residential communities located at the northeast corner of NW 41st Street and the northbound HEFT on-ramp.

At Grade Alternative

Overpass Alternative (Preferred)

Kimley-Horn
and Associates, Inc.

FIGURE 15
POTENTIAL CONNECTION
OF NORTHBOUND 117th AVENUE TO
TURNPIKE AT NW 41st STREET

Complete Missing Links Identified in 2030 LRTP

An analysis of the existing roadway network (see Figure 4) indicated that the grid network in western Miami-Dade County is not as well defined as in eastern Miami-Dade County. There are several gaps in the grid network in the Doral and Medley areas. The completion of missing links will provide additional travel routes, help relieve congestion, and improve roadway levels of service on existing corridors. The Miami-Dade MPO's 2030 LRTP identifies the construction of the following missing links:

- NW 87th Avenue between NW 58th Street and Okeechobee Road as a four-lane road. This is a Priority I project and is scheduled to be funded by 2009.
- NW 74th Street between HEFT and approximately NW 82nd Avenue. According to the LRTP, the initial phase includes the construction of three lanes and subsequent widening to six lanes. The initial phase is listed as a Priority I project and the subsequent phase is listed as a Priority II project (funded by 2015). In addition, a new HEFT interchange at NW 74th Street is presently under construction.
- NW 122nd Avenue between NW 25th Street and NW 41st Street as a two-lane road. This is a Priority I project and is programmed to be funded by private-sector developers.
- NW 25th Street between NW 117th Avenue and NW 127th Avenue as a four-lane road. This is also a Priority I project and is programmed to be funded by private-sector developers.

FDOT's 2008-2013 Five-Year Work Program and Miami-Dade County's Capital Improvement Program were researched to determine the status of the above-listed

projects. FDOT's Work Program indicates funding allocation in 2009 and 2010 for the construction of NW 87th Avenue between NW 58th Street and NW 74th Street. However, the Work Program does not identify construction funding for the segment of NW 87th Avenue between NW 74th Street and NW 103rd Street. For the remaining segment, funding has been assigned for preliminary engineering between 2005 and 2008, and environmental evaluation in 2013. Currently, there are no north-south arterial streets connecting NW 25th Street and Okeechobee Road between the Palmetto Expressway and HEFT. In the absence of a direct connection between Okeechobee Road and the warehouse district, the already heavily congested NW 25th Street, NW 41st Street, and the Palmetto Expressway are being used by truck traffic. Therefore, the connection of NW 87th Avenue to Okeechobee Road would benefit freight movement and relieve congestion along other roadways. It is recommended that the second phase of the NW 87th Avenue project be expedited.

NW 74th Street has been constructed between NW 107th Avenue and NW 114th Avenue. The FDOT Work Program indicates funding in 2008 for the construction of NW 74th Street between NW 84th Avenue and NW 107th Avenue. The 2008 TIP also indicates funding from the People's Transportation Plan (PTP) for the construction of NW 74th Street.

Both the NW 25th Street and NW 122nd Avenue extensions are developer funded projects. These two projects are included in the 2008 Transportation Improvement Program (TIP). The extensions of NW 122nd Avenue and NW 25th Street could provide an alternative route to access the HEFT interchange at NW 41st Street from NW 25th Street. It should be noted that both these streets are located outside of the Urban Development Boundary (UDB).

RECOMMENDED PROJECTS

Based on the evaluation of proposed improvement strategies presented in the previous sections, a list of recommended improvement projects were identified for the study area to improve freight movement. The recommended improvements are based on evaluation of strategies as well as input from FTAC members.

Freight Transportation Advisory Committee Input

On May 21, 2008, a list of potential projects was presented to the Freight Transportation Advisory Committee (FTAC). The projects were prioritized with input from the FTAC, based on the level of support for a project and the project's implementation timeframe. The following measures were used to measure the level of support and implementation timeframe:

Support:

1. Must happen
2. Moderate support
3. Low support

Implementation Timeframe:

1. Short term (within next 3 years)
2. Medium term (3 – 10 years)
3. Long term (10+ years)

The FTAC evaluation results are presented in *Appendix D*. A total of 10 FTAC members completed project ranking forms. In general, the survey results indicated a strong support for the 6th Street Slip Ramp, geometric improvements in Downtown Miami, intersection improvements along NW 25th Street (including the Palmetto Expressway interchange), and improvements along NW 12th Street including a

potential westbound flyover at NW 87th Avenue. The survey results generally indicated a low to moderate level of support for travel demand management measures involving tolls. All improvement strategies analyzed in the previous section were included in the survey.

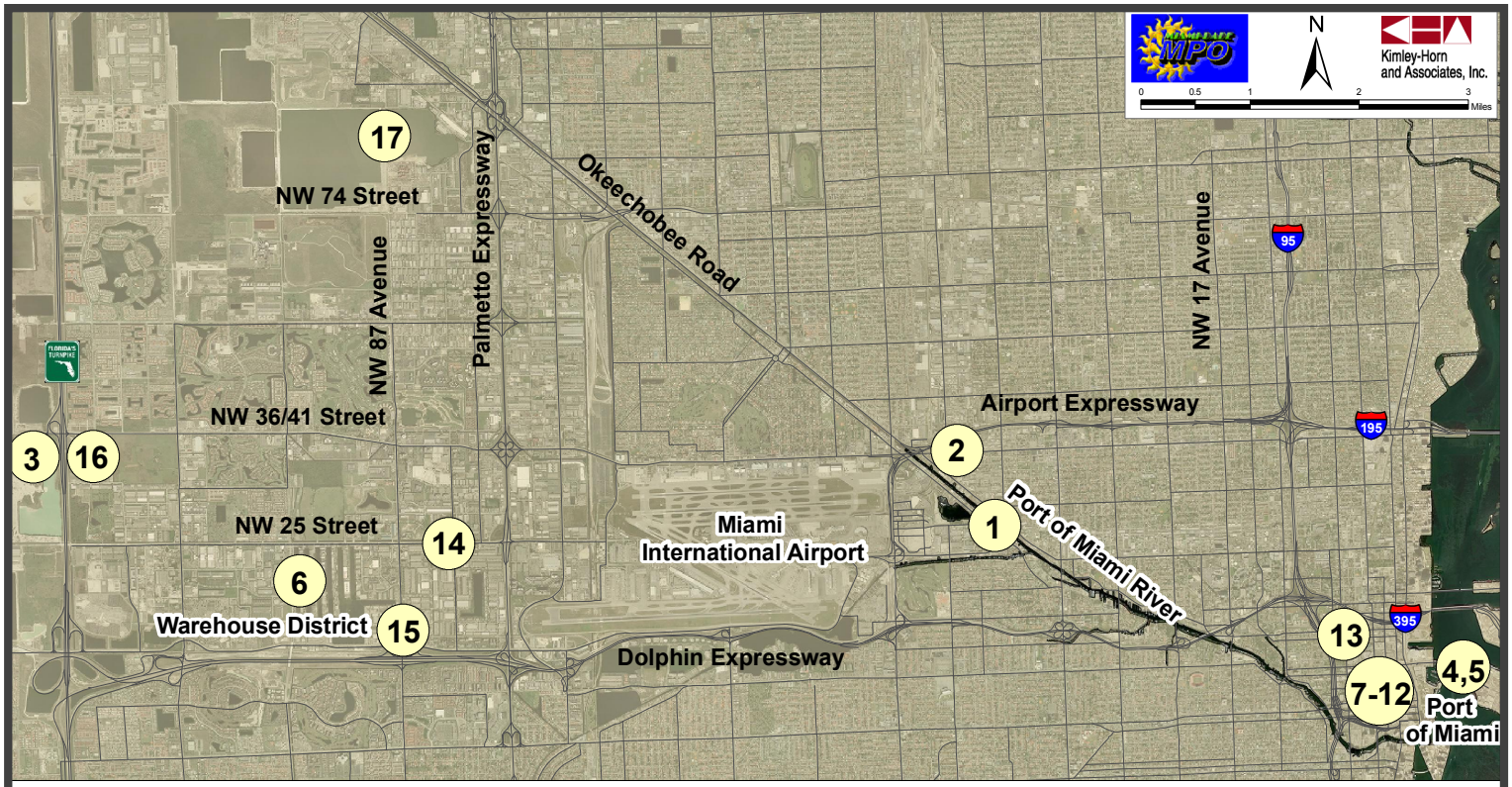
Project Summary Sheets

Based on the evaluation of potential improvement strategies, evaluation of projects by FTAC members, planning level cost estimates, possible schedule timeframe, and funding sources, the following list of projects are recommended to improve freight transport within the Central Dade study area:

- Short sea shipping on the Miami River
- Truck / intermodal terminal freight facilities
- Evaluation of strategies to spread hours of freight activity
- Improvements to Downtown Miami commercial loading zones
- Geometric improvements to Port of Miami access routes
- Intersection improvements along NW 25th Street
- Intersection improvements along NW 12th Street
- Extension of NW 117th Street between NW 25th Street and NW 41st Street
- Support/expedite the extension of NW 87th Avenue between NW 74th Street and NW 103rd Street

Figure 16 illustrates the recommended improvement projects. A summary of each recommended project, along with key issues, lead agencies, cost estimates, potential funding sources, implementation timeframe, and FTAC rankings, is presented in the following pages.

Figure 16: Recommended Projects



Project Reference Number and Description

1. Short Sea Shipping Pilot Project
2. Truck Facility Near NW 36th Street & NW 37th Avenue
3. Truck Facility Near HEFT & NW 41st Street
4. A Study to Exam Expansion of POM Hours of Operation
5. PierPASS Feasibility Study
6. Congestion Pricing Study for Doral
7. Expand Commercial Loading Zones in Downtown Miami
8. Commercial Vehicle Parking in Downtown Miami Surface Parking Lots
9. ITS Applications for Downtown Miami Parking
10. Increase Left-Turn Storage on Biscayne Blvd. at Port Blvd
11. Intersection Improvements on NE 6th Street at NE 1st Avenue
12. Improve NE 2nd Avenue between NE 5th Street and I-395
13. Re-evaluate 6th Street Slip Ramp
14. NW 25th Street Corridor Study
15. NW 12th Street Flyover at NW 87th Avenue
16. NW 117th Avenue Connection to HEFT at NW 41st Street
17. Expedite NW 87th Avenue Construction between NW 74th Street and NW 103rd Street

PROJECT 1: SHORT SEA SHIPPING

Project	Short Sea Shipping on the Miami River – Pilot Project
Description	A pilot short sea shipping project to evaluate if containers could be transported cost effectively from the POM to POMR using shallow draft vessels to relieve congestion at the POM and reduce truck traffic generated by the POM.
Tasks Involved	▪ Identify champions for consensus building ▪ Identify funding sources ▪ Develop a short sea shipping terminal at POMR (a location in the Upper River is recommended) ▪ Identify one POM terminal to serve shallow draft vessels ▪ Improve North River Drive ▪ Develop cargo inspection and clearance facilities at POMR ▪ Develop a truck staging area at POMR
Lead Agencies	Miami River Commission, Miami River Marine Group
Cost	~$1 million (European experience)
Funding Sources	TBD; Energy Independence and Security Act funds for vessels
FTAC Input	Moderate support
Implementation	Short term (next three years)

PROJECT 2: TRUCK FACILITY NEAR NW 36TH ST AND NW 37TH AVE

Project	Truck Facility near NW 36th Street and NW 37th Avenue
Description	Develop the 9-acre vacant industrial site that is owned by the Miami-Dade Aviation Department as a truck staging area. This facility could help ease truck parking issues around the POMR and serve the proposed short sea shipping operations.
Tasks Involved	▪ Contact Miami-Dade Aviation Department regarding the site ▪ Formulate a site development strategy and identify funding sources ▪ Coordinate with the short sea shipping initiative
Lead Agencies	Miami River Commission, FTAC
Cost	TBD
Funding Sources	TBD
FTAC Input	Moderate support
Implementation	Short term (next three years)

PROJECT 3: TRUCK FACILITY NEAR NW 41ST ST AND HEFT

Project	Truck Facility near NW 41st Street and HEFT
Description	Explore the possibility of developing the 62-acre vacant site located at the southwest corner of HEFT and NW 41st Street as a truck staging area/overnight parking facility. The site is located outside of the Urban Development Boundary (UDB). Therefore, approval to expand the UDB and land use reclassification is required. The site is located in proximity to the Doral warehouse district and rock mines. The site is owned by Turnberry/Doral Development Ltd.
Tasks Involved	▪ Contact the owner regarding the development proposal ▪ Initiate the process to expand UDB and classify site for development ▪ Formulate site development and funding strategies including potential public-private partnerships ▪ Identify the need for roadway/intersection improvements
Lead Agencies	FTAC; FDOT
Cost	Land is currently valued at $17 million. Implementation costs TBD
Funding Sources	TBD
FTAC Input	
Implementation	Medium term (3 -10 years)

PROJECT 4: EXPANSION OF POM HOURS OF OPERATION

Project	A Study to Examine the Expansion of POM Hours of Operation
Description	To utilize excess roadway capacity available during nighttime to move freight faster and more efficiently on the existing roadway network; reduce waiting times at the POM; provide congestion relief, and safety and environmental benefits.
Tasks Involved	▪ Present the study proposal to the POM. ▪ Review the POMs 2020 Master Plan and determine if the planned growth is consistent with the local and global economic trends ▪ Review off-peak operations in other ports and determine the applicability ▪ Evaluate financial and logistic implications of expanding the POMs hours of operation ▪ Identify potential strategies to increase nighttime freight operations ▪ Present recommendations and alternatives
Lead Agencies	POM; MPO/FTAC; FDOT
Cost	$100,000 to perform the study
Funding Sources	POM/MPO
FTAC Input	Moderate support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

PROJECT 5: PierPASS FEASIBILITY STUDY

Project	PierPASS Feasibility Study
Description	To examine the feasibility of implementing PierPASS congestion mitigation system to provide incentives for freight movement during off-peak periods, and to assess revenue generation potential of PierPASS to partially fund nighttime shift(s) at the POM. This study could be performed as part of the previously described POM hours of operation study.
Tasks Involved	▪ Present the study proposal to the POM. ▪ Review PierPASS system at Los Angeles and Long Beach ports. ▪ Examine truck arrival patterns and roadway congestion levels ▪ Perform a sensitivity analysis (impacts of varying toll rates) on peak-hour truck arrivals ▪ Evaluate PierPASS system operating costs and the need for off-peak operations at the POM ▪ Assess impacts of additional costs on the POM in terms of regional competitiveness ▪ Present recommendations and alternatives
Lead Agencies	POM; MPO
Cost	$60,000 to perform the study
Funding Sources	POM; MPO
FTAC Input	Moderate support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

PROJECT 6: CONGESTION PRICING STUDY FOR CITY OF DORAL

Project	**Congestion Pricing Study for City of Doral**
Description	The City of Doral is experiencing heavy traffic congestion during peak periods. In its Transportation Master Plan, the City of Doral identified the need for travel demand management strategies to mitigate congestion. This study would examine the feasibility of implementing a congestion pricing system to toll vehicles entering the City during peak hours.
Tasks Involved	▪ Present the study proposal to the City of Doral ▪ Obtain input from the community and businesses ▪ Collect and analyze traffic data and O-D patterns ▪ Identify cordon points to install toll mechanisms ▪ Perform an analysis to determine benefits and costs ▪ Assess potential impacts to the community ▪ Present recommendations and alternatives
Lead Agencies	City of Doral; MPO
Cost	$100,000 to perform the study
Funding Sources	City of Doral; MPO (Congestion management plan)
FTAC Input	Moderate support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

PROJECT 7: EXPAND COMMERCIAL LOADING ZONE DURATION IN DOWNTOWN MIAMI

Project	Expand Commercial Loading Zone Parking Duration near High-Rise Buildings in Downtown Miami
Description	Several commercial delivery companies indicated that the current 30-minute parking limit is inadequate to complete deliveries to high-rise buildings. The study recommends increasing the parking limit.
Tasks Involved	▪ Present the study proposal to the Miami Parking Authority ▪ Working with delivery companies, identify loading zones where increased loading durations are required
Lead Agencies	Miami Parking Authority
Cost	
Funding Sources	
FTAC Input	Moderate support
Implementation	Short term (next three years)

PROJECT 8: DESIGNATE COMMERCIAL PARKING SPACE IN DOWNTOWN MIAMI

Project	Designate a Minimum of One Commercial Vehicle Parking Space in Downtown Miami Surface Parking Lots
Description	To increase commercial vehicle parking locations in Downtown Miami, examine the feasibility of designating at least one parking space per surface parking lot for commercial vehicles.
Tasks Involved	▪ Present the study proposal to the Miami Parking Authority ▪ Consider providing commercial parking spaces in both publicly and privately owned surface parking lots. ▪ Coordinate with owners of private parking lots ▪ Identify necessary signage and geometric modifications at entrances to accommodate commercial vehicles.
Lead Agencies	Miami Parking Authority
Cost	
Funding Sources	
FTAC Input	Strong support
Implementation	Short term (next three years)

PROJECT 9: DEVELOP INTELLIGENT TRANSPORTATION SYSTEM (ITS) APPLICATIONS

Project	Develop ITS Applications to Manage Downtown Miami Commercial Loading Zones
Description	To provide real-time parking space availability information and to minimize the time taken to find vacant parking spaces, examine the feasibility of implementing an ITS system in Downtown Miami.
Tasks Involved	▪ Present the study proposal to the Miami Parking Authority ▪ Determine the appropriate technology, costs, and implementation issues. ▪ Examine if the system could be expanded to cover non-commercial parking spaces to achieve better economies of scale. ▪ Coordinate with major commercial delivery agencies to determine their support. ▪ Formulate strategies for financing the implementation.
Lead Agencies	Miami Parking Authority
Cost	
Funding Sources	
FTAC Input	Moderate support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

PROJECT 10: INCREASE LEFT-TURN STORAGE ON BISCAYNE BLVD

Project	Increase Left-Turn Storage on Southbound Biscayne Boulevard at Port Boulevard
Description	To increase storage capacity of the southbound left-turn lane on Biscayne Boulevard for trucks entering the POM. The existing wide median could be modified to provide a longer left-turn lane.
Tasks Involved	▪ Present the proposal to FDOT, City of Miami, and Miami-Dade County. ▪ Examine the potential impacts of the POM Tunnel project. ▪ Incorporate the project into the TIP.
Lead Agencies	FDOT; City of Miami
Cost	$200,000 (total project cost)
Funding Sources	FDOT
FTAC Input	
Implementation	Short term (next three years)

PROJECT 11: INTERSECTION IMPROVEMENTS ON NE 6TH ST AT NE 1ST AVE

Project	Intersection improvements on NE 6th Street at NE 1st Avenue
Description	Evaluate potential short-term improvements at the intersection of NE 6th Street and NE 1st Avenue to address safety concerns due to the use of the center lane for right turns. These improvements include additional signage on NE 6th Street to inform drivers of the use of center lane for right turns, closure of right lane on NE 6th Street at NE 1st Avenue, and turn radius improvement.
Tasks Involved	▪ Coordinate with the City of Miami / Miami-Dade County ▪ Evaluate potential improvements by taking into consideration the impacts of the POM Tunnel and I-395 reconstruction projects on truck traffic on surface streets in Downtown Miami ▪ If necessary, coordinate with the property owner (property at NE corner) regarding right-of-way acquisition for turn radius improvement ▪ Include the project to Miami-Dade County's work program
Lead Agencies	Miami-Dade County; City of Miami
Cost	
Funding Sources	TBD
FTAC Input	Strong support
Implementation	Short term (next three years)

PROJECT 12: IMPROVE NE 2ND AVE. BETWEEN NE 5TH ST. AND I-395 RAMPS

Project	Improve NE 2nd Avenue between NE 5th Street and I-395 Ramps
Description	NE 2nd Avenue is a major truck access route to the POM. The pavement, drainage system, curb-and-gutter, and sidewalks require improvements. A reconstruction / resurfacing project is recommended to improve NE 2nd Avenue between NE 5th Street and I-395 ramps.
Tasks Involved	▪ Coordinate with the FDOT/Miami-Dade County to incorporate the project to FDOT/Miami-Dade County's work program
Lead Agencies	Miami-Dade County; FDOT
Cost	
Funding Sources	TBD
FTAC Input	Strong support
Implementation	Short term (next three years)

PROJECT 13: RE-EVALUATE 6TH STREET SLIP RAMP

Project	Re-evaluate 6th Street Slip Ramp
Description	Previously, the 6th Street Slip Ramp was viewed as a short-term alternative to the POM Tunnel. However, several other benefits of this project were identified. The slip ramp could provide an alternative direct connection to westbound SR 836 for both trucks and passenger vehicles.
Tasks Involved	▪ Request FDOT to examine the 6th Street Slip Ramp ▪ Determine if additional planning and analysis is required to supplement the previous 6th Street Slip Ramp PD&E study ▪ Incorporate the project into FDOT's work program
Lead Agencies	FDOT
Cost	$15-20 million (approximate value based on FDOT's 6th Street Slip Ramp PD&E study)
Funding Sources	TBD
FTAC Input	Strong support
Implementation	Completion prior to commencement of I-395 reconstruction project is recommended.

PROJECT 14: NW 25TH STREET CORRIDOR STUDY

Project	NW 25th Street Corridor Study
Description	NW 25th Street is heavily utilized by trucks that transport freight from the POM and MIA to warehouses and distribution centers. It is anticipated that the 25th Street Viaduct Project will address intersection deficiencies along NW 25th Street to the east of the Palmetto Expressway. However, improvements are desired along NW 25th Street at the Palmetto Expressway ramps and at intersections to the west to better accommodate trucks and mitigate congestion. A corridor study is recommended to evaluate turn lanes, turn radii, and signal timing improvements at intersections along NW 25th Street between the Palmetto Expressway and NW 97th Avenue.
Tasks Involved	▪ Coordinate with FDOT, Miami-Dade County, and City of Doral ▪ Examine the feasibility of utilizing congestion management process funds for the project implementation ▪ Incorporate the project to appropriate work program(s)
Lead Agencies	MPO; City of Doral
Cost	$40,000 for a corridor study
Funding Sources	TBD
FTAC Input	Strong support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

PROJECT 15: NW 12TH ST./NW 87TH AVE. FLYOVER INTERSECTION IMPROVEMENTS

Project	NW 12th Street / NW 87th Avenue Flyover and Intersection Improvements
Description	To relieve congestion on NW 25th Street, NW 12th Street should be evaluated as an alternative freight corridor. As part of improvements, one westbound through lane on NW 12th Street at NW 87th Avenue should be grade separated. In addition, a connection from the westbound Dolphin Expressway off-ramp to the 12th Street Flyover may be provided to serve trucks traveling from the POM to warehouses. A corridor study is recommended to evaluate the NW 87th Avenue Flyover and other intersection improvements along NW 12th Street between the Airport Cargo area and NW 97th Avenue.
Tasks Involved	▪ Coordinate with FDOT, MDX, and City of Doral ▪ Examine the feasibility of utilizing congestion management process funds for the project implementation ▪ Incorporate the project to appropriate work program(s)
Lead Agencies	FDOT; MPO; MDX
Cost	$60,000 for a corridor study
Funding Sources	TBD
FTAC Input	Strong support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years); Implementation should begin after the completion of the 25th Street Viaduct Project

PROJECT 16: CONNECT NORTHBOUND NW 117TH AVE. TO TURNPIKE

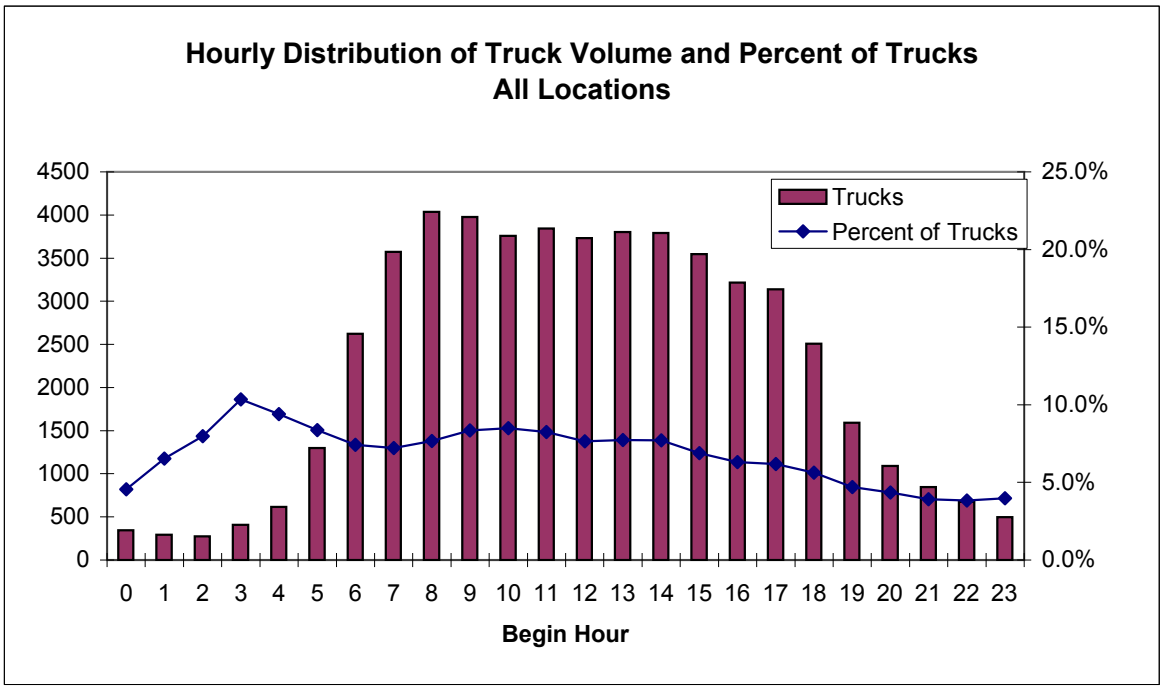
Project	Connect Northbound NW 117th Avenue to Turnpike at NW 41st Street
Description	To improve access options to the expressway system from the warehouse district, a grade separated connection from NW 117th Avenue to northbound HEFT at NW 41st Street is recommended. The 2030 LRTP identifies the construction of NW 25th Street between NW 117th Avenue and NW 127th Avenue, and NW 122nd Avenue between NW 25th Street and NW 41st Street as Priority I projects. These are developer funded projects and are in the 2008 TIP. The completion of these two connections would provide an alternative access to the HEFT ramp at NW 41st Street from NW 25th Street. Therefore, this option should be considered as a potential alternative to the NW 117th Avenue connection.
Tasks Involved	▪ Coordinate with FDOT/Turnpike Authority and City of Doral ▪ Perform a study and evaluate alternatives
Lead Agencies	FDOT/Turnpike Authority
Cost	
Funding Sources	TBD
FTAC Input	Moderate support
Implementation	Complete study - short term (next three years); Potential implementation – medium term (3-10 years)

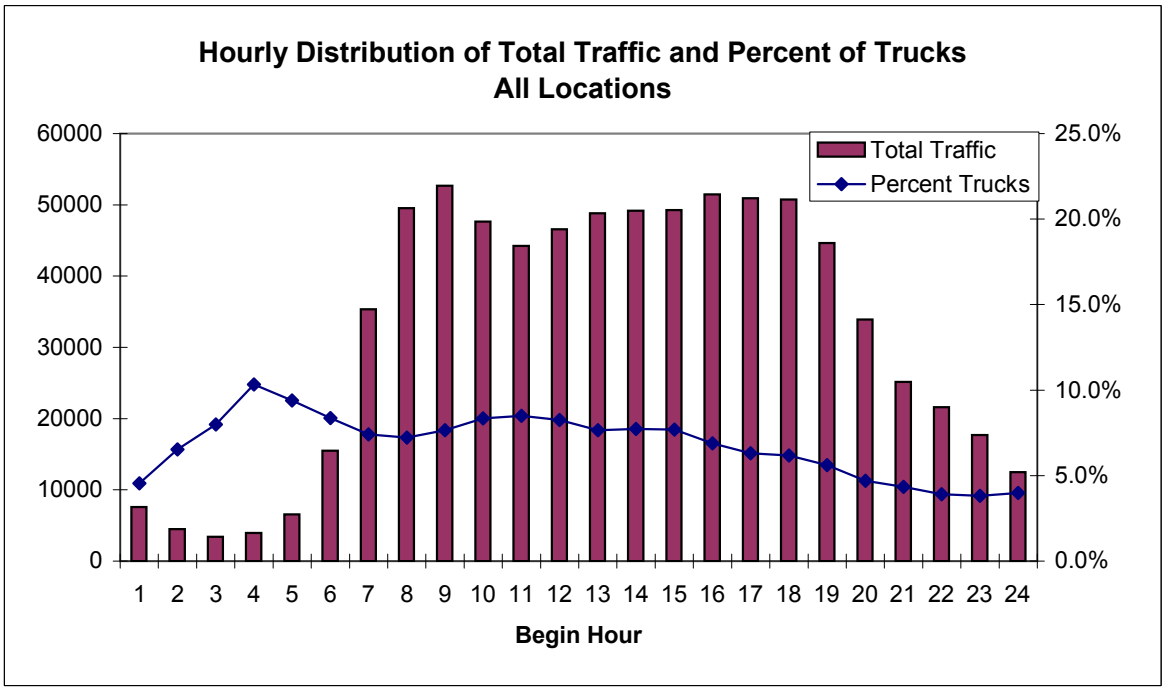
PROJECT 17: EXPEDITE NW 87TH AVENUE CONSTRUCTION

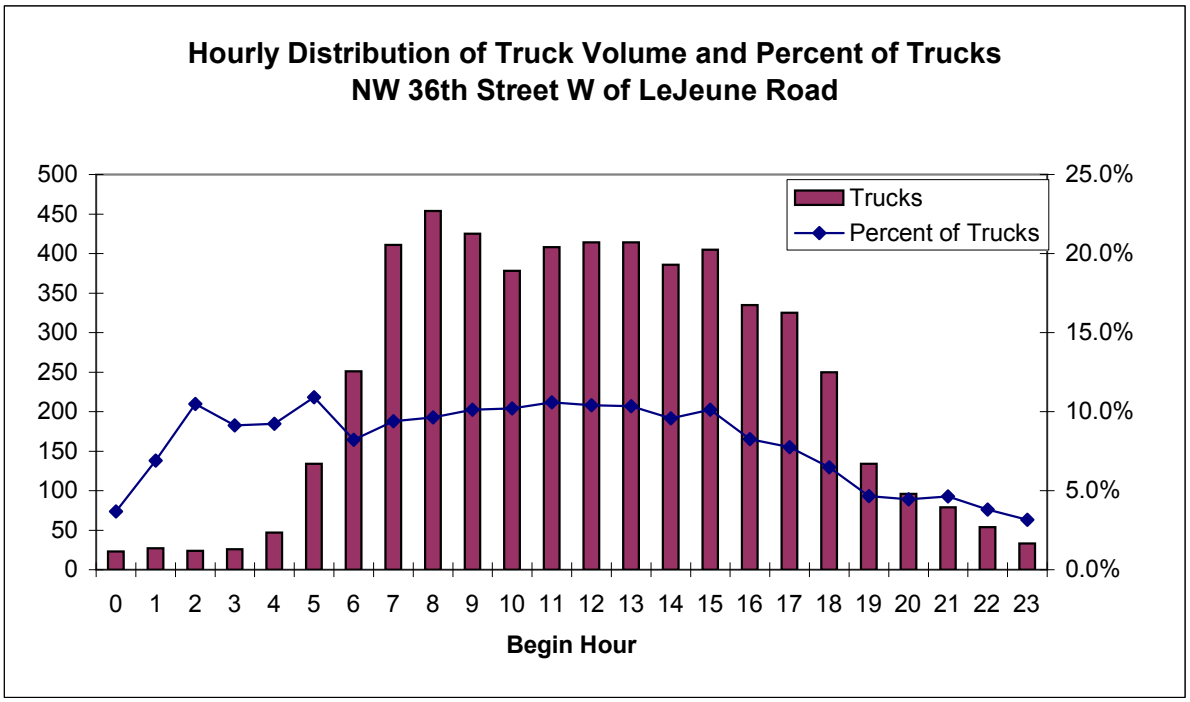
Project	Expedite NW 87th Avenue Construction between NW 74th Street and NW 103rd Street
Description	The NW 87th Avenue construction between NW 58th Street and NW 103rd Street is identified in the 2030 LRTP as a Priority I project. Priority I projects are to be funded by 2009. FDOT's 2008-2013 Work Program allocates construction funding for the segment between NW 58th Street and NW 74th Street. However, construction funds have not been indicated in the 2008-2013 Work Program for the remaining segment. The extension of NW 87th Avenue to Okeechobee Road, is beneficial for freight movement as it provides a direct connection between warehouses and Okeechobee Road and eliminates the need to use the Palmetto Expressway for those trips.
Tasks Involved	▪ Request FDOT to expedite all phases of the project
Lead Agencies	FDOT
Cost	
Funding Sources	
FTAC Input	
Implementation	Medium term

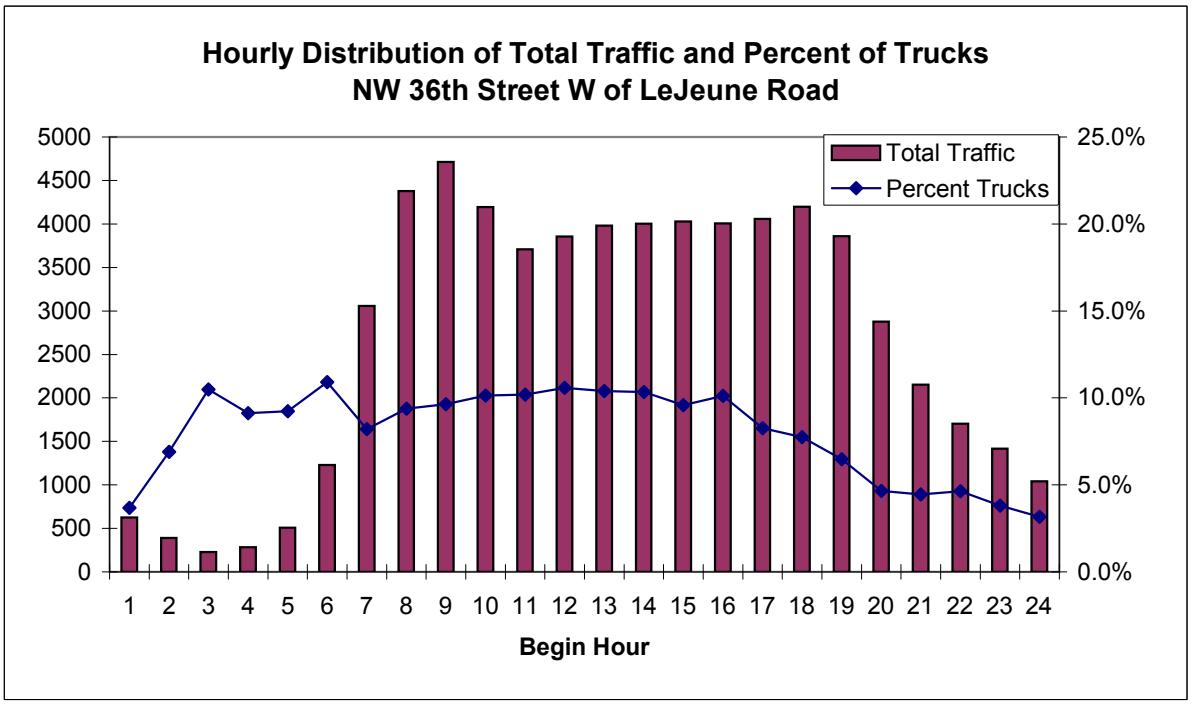
Appendix A

Hourly Distribution of Truck and Total Traffic Volume


Hourly Distribution of Truck Volume and Percent of Trucks
All Locations
4500
4000
3500
3000
2500
2000
1500
1000
500
0
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Trucks
Percent of Trucks
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Begin Hour


Hourly Distribution of Total Traffic and Percent of Trucks
All Locations
60000
50000
40000
30000
20000
10000
0
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Total Traffic
Percent Trucks
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Begin Hour

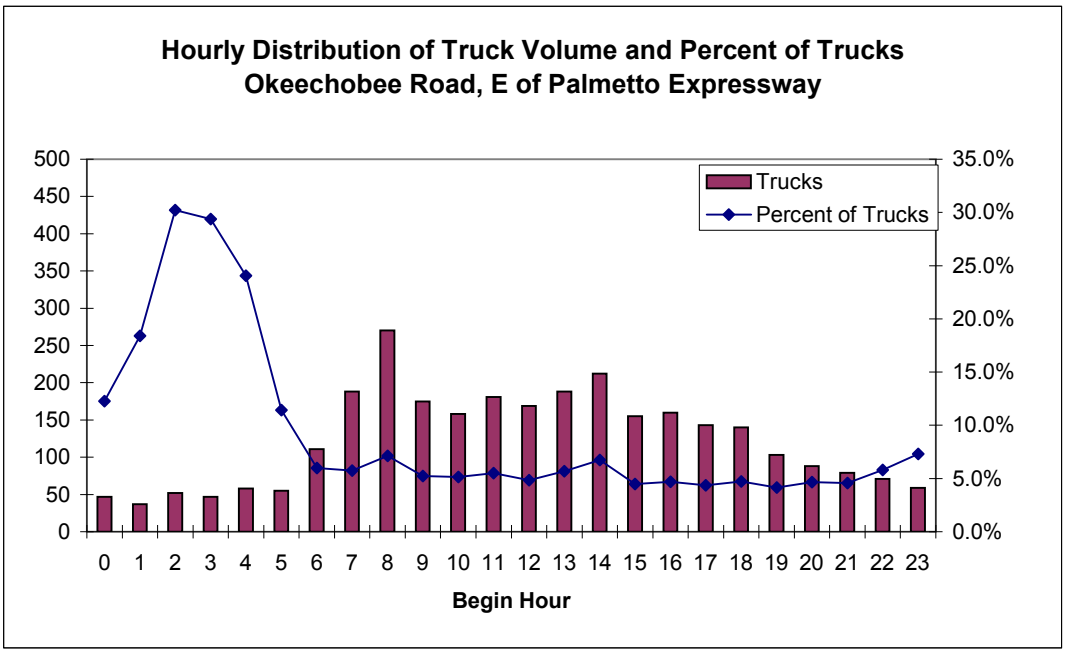


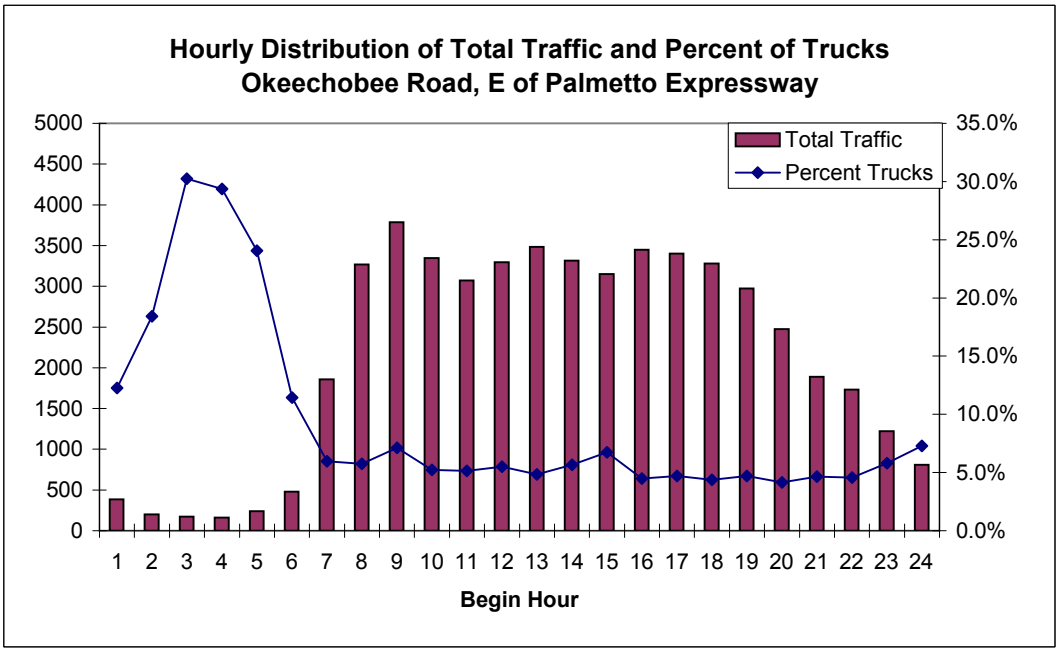


SUMMARY:

Trucks accounted for approximately 9 percent of total traffic.
Daily truck volume was approximately 5,500 and daily total volume was approximately 65,500.
The varation of hourly truck volume is similar to the variation of total volume.
Peak truck traffic periods follow peak total traffic periods.
Approximately 79 percent of truck traffic and 70 percent of total traffic reported between 7 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

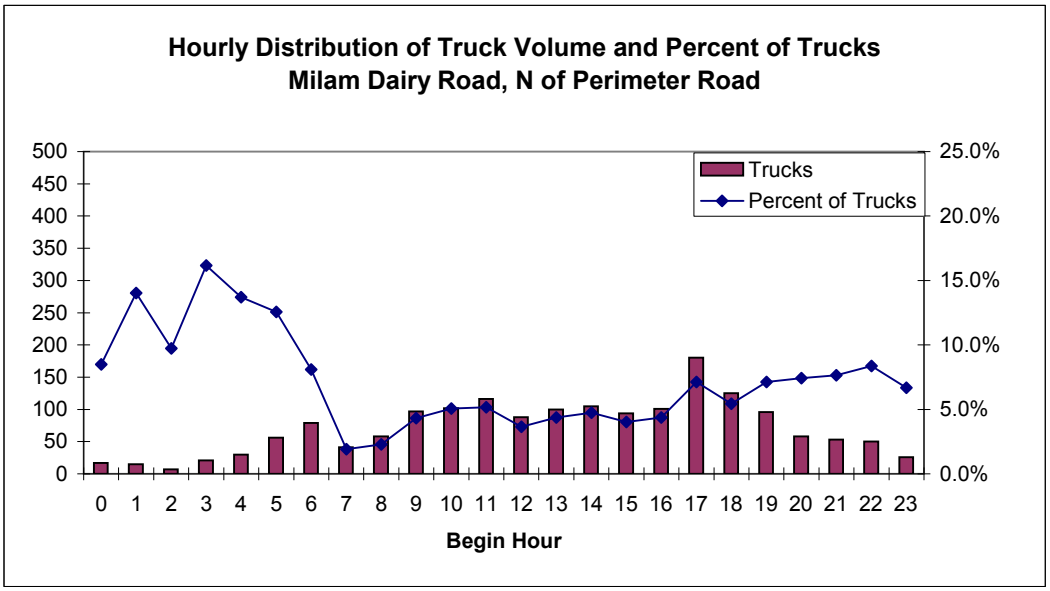


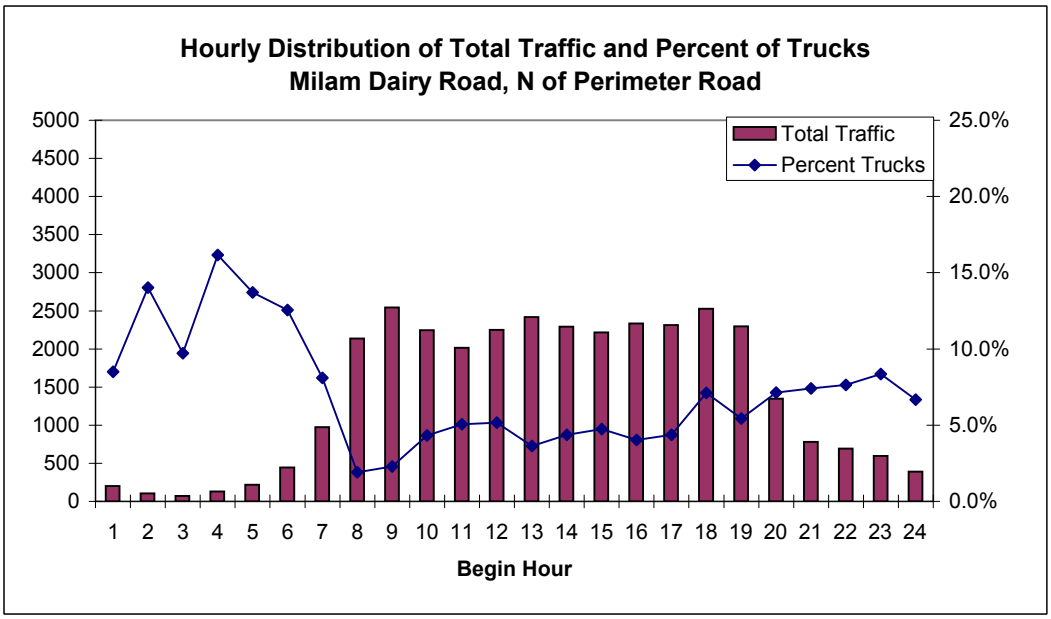


SUMMARY:

Trucks accounted for approximately 6 percent of total traffic.
Daily truck volume was approximately 3,000 and daily total volume was approximately 51,500.
The varation of hourly truck volume is similar to the variation of total volume.
Peak truck traffic periods follow peak total traffic periods.
A higher truck traffic modal share was observed between 12 AM and 6 AM due to low volume of other traffic.
Approximately 73 percent of truck traffic and 77 percent of total traffic reported between 7 AM and 7 PM.

Note: These observations are based on 2004 traffic volumes.

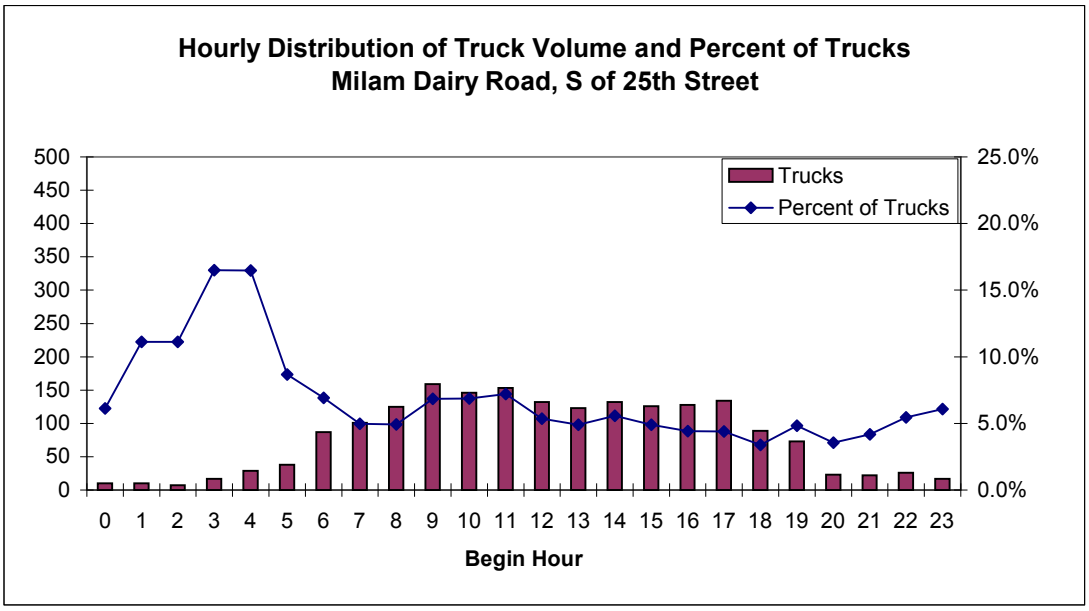


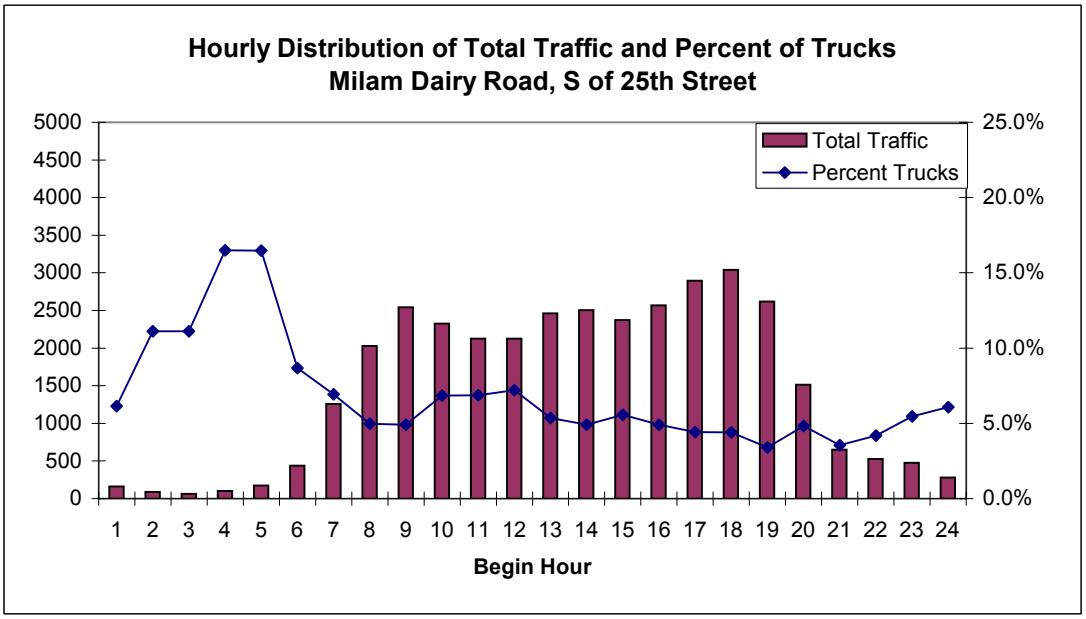


SUMMARY:

Trucks accounted for approximately 5 percent of total traffic.
Daily truck volume was approximately 1,700 and daily total volume was approximately 33,500.
The varation of hourly truck volume is similar to the variation of total volume.
A higher truck traffic modal share was observed between 12 AM and 6 AM due to low volume of other traffic.
Approximately 70 percent of truck traffic and 72 percent of total traffic reported between 9 AM and 8 PM.

Note: These observations are based on 2006 traffic volumes.

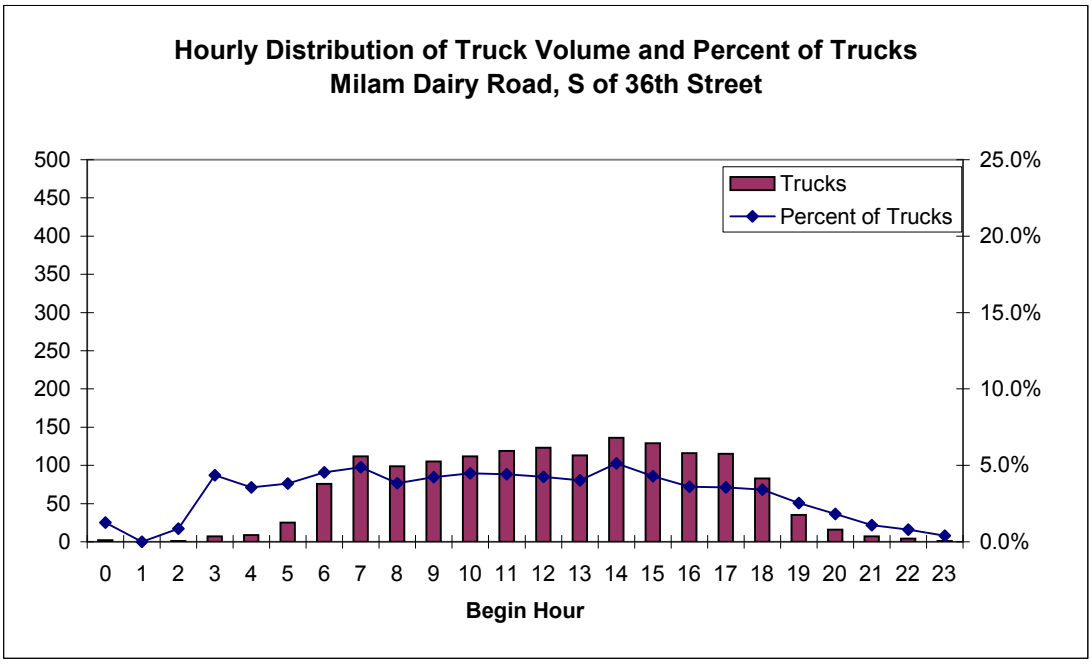


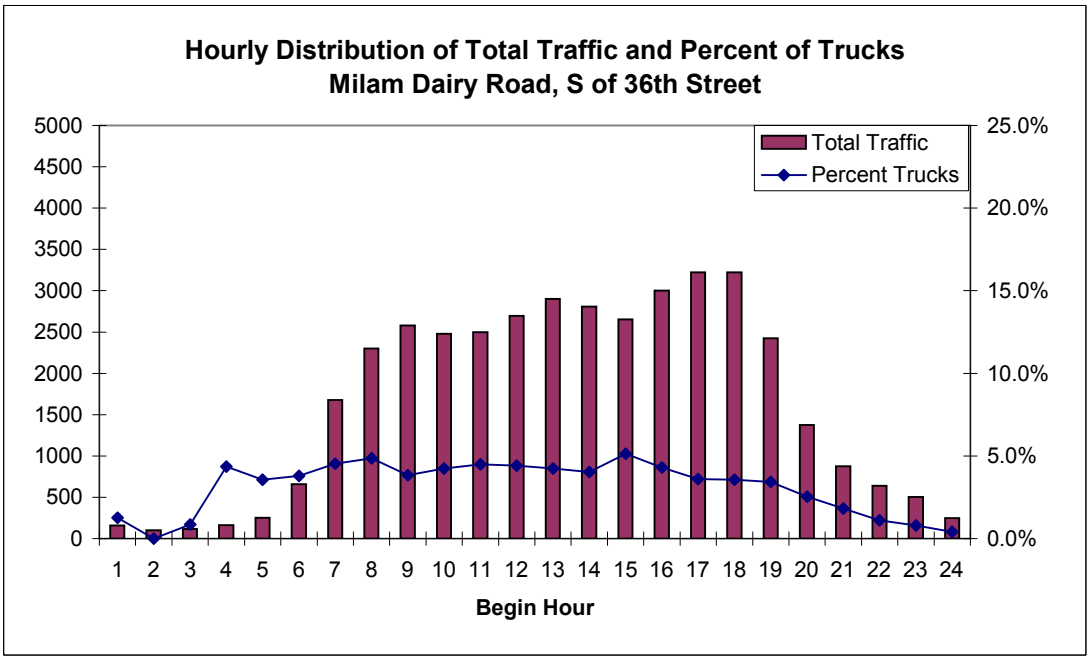


SUMMARY:

Trucks accounted for approximately 5 percent of total traffic.
Daily truck volume was approximately 1,900 and daily total volume was approximately 35,500.
The varation of hourly truck volume is similar to the variation of total volume.
A higher truck traffic modal share was observed between 12 AM and 6 AM due to low volume of other traffic.
Approximately 77 percent of truck traffic and 76 percent of total traffic reported between 7 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

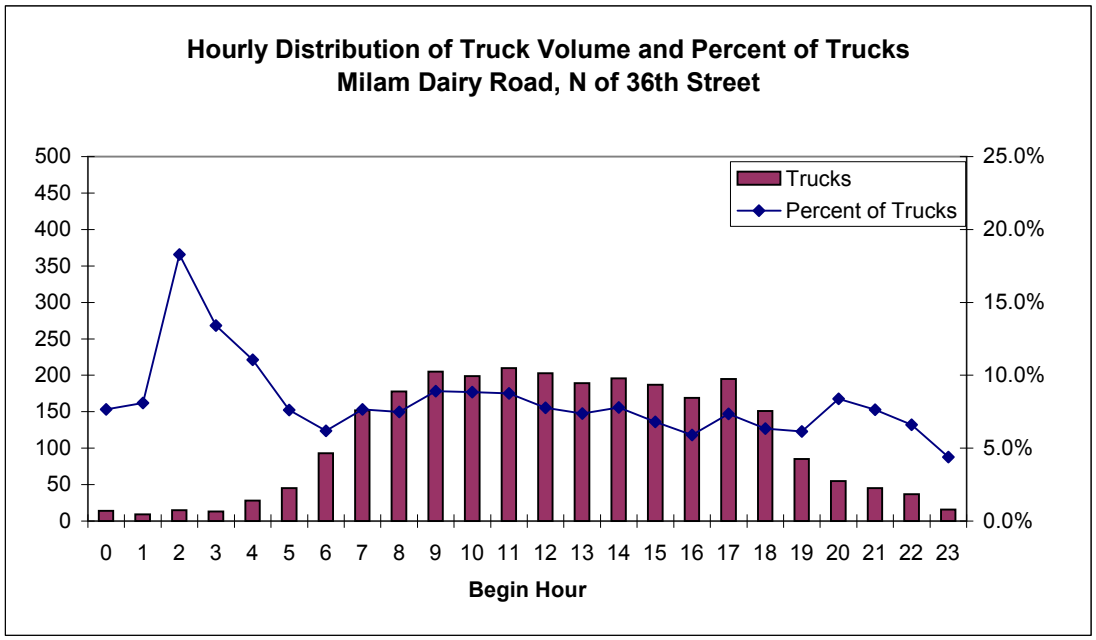


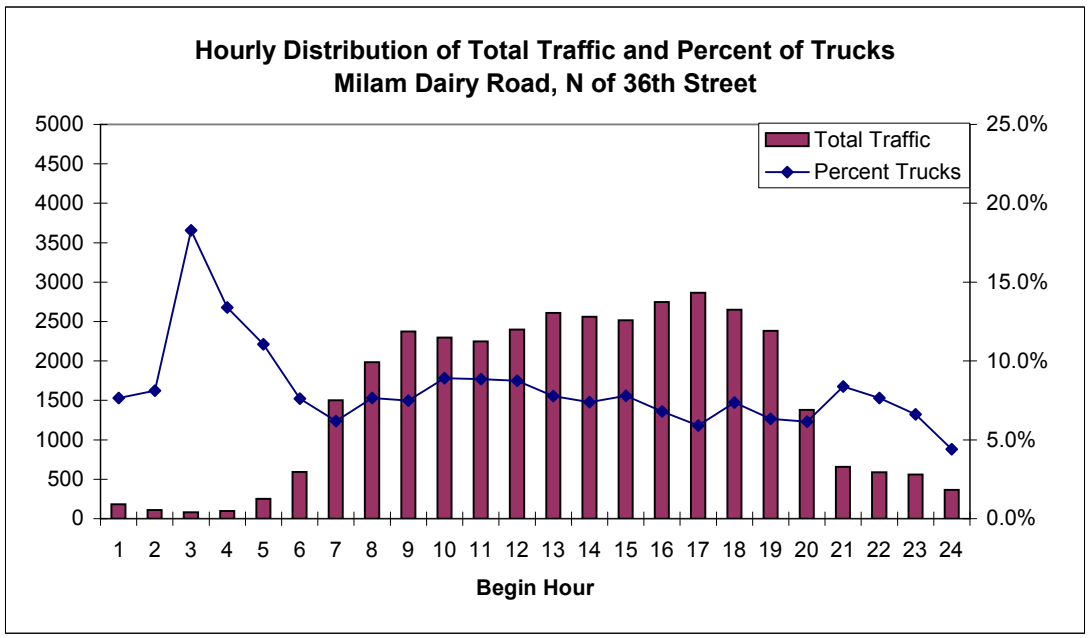


SUMMARY:

Trucks accounted for approximately 4 percent of total traffic.
Daily truck volume was approximately 1,500 and daily total volume was approximately 39,500.
The varation of hourly truck volume is similar to the variation of total volume.
Approximately 83 percent of truck traffic and 77 percent of total traffic reported between 7 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

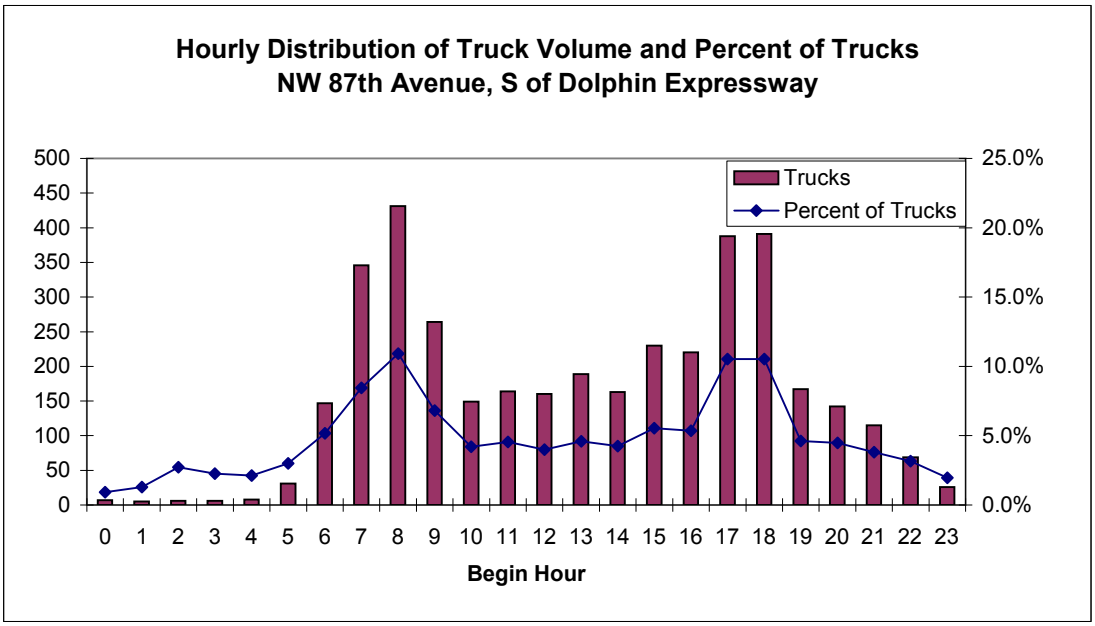


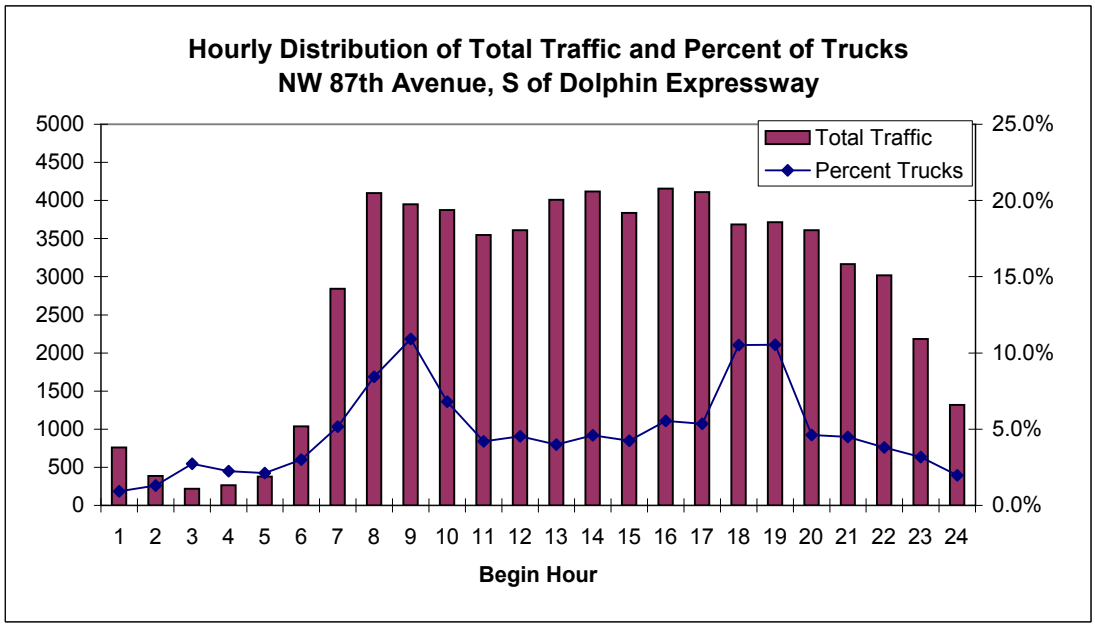


SUMMARY:

Trucks accounted for approximately 8 percent of total traffic.
Daily truck volume was approximately 2,700 and daily total volume was approximately 36,000.
The varation of hourly truck volume is similar to the variation of total volume.
A higher truck traffic modal share was observed between 12 AM and 6 AM due to low volume of other traffic.
Approximately 83 percent of truck traffic and 82 percent of total traffic reported between 7 AM and 7 PM.

Note: These observations are based on 2006 traffic volumes.

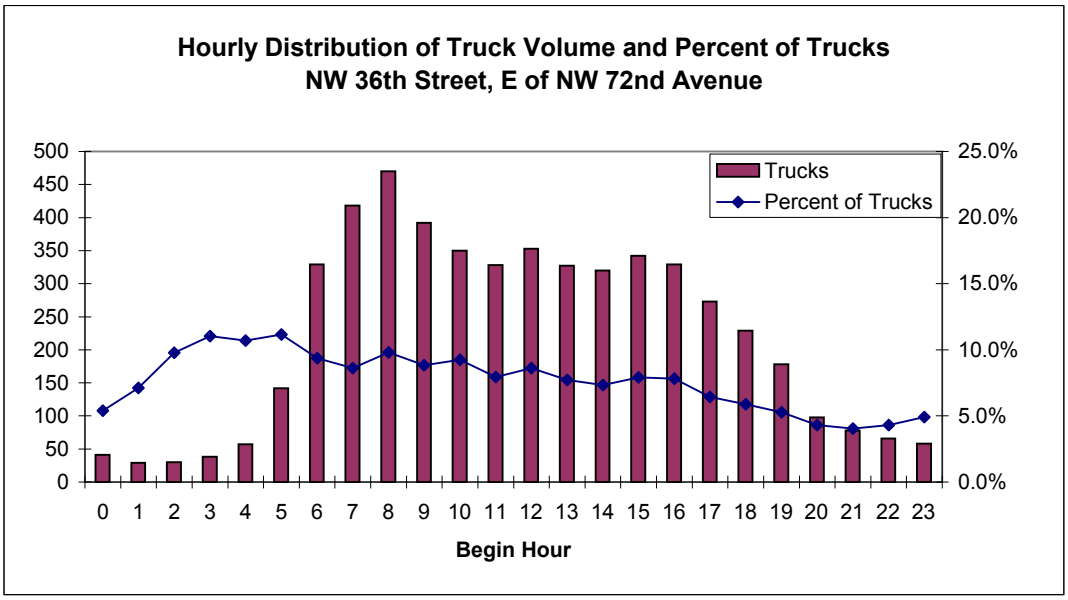


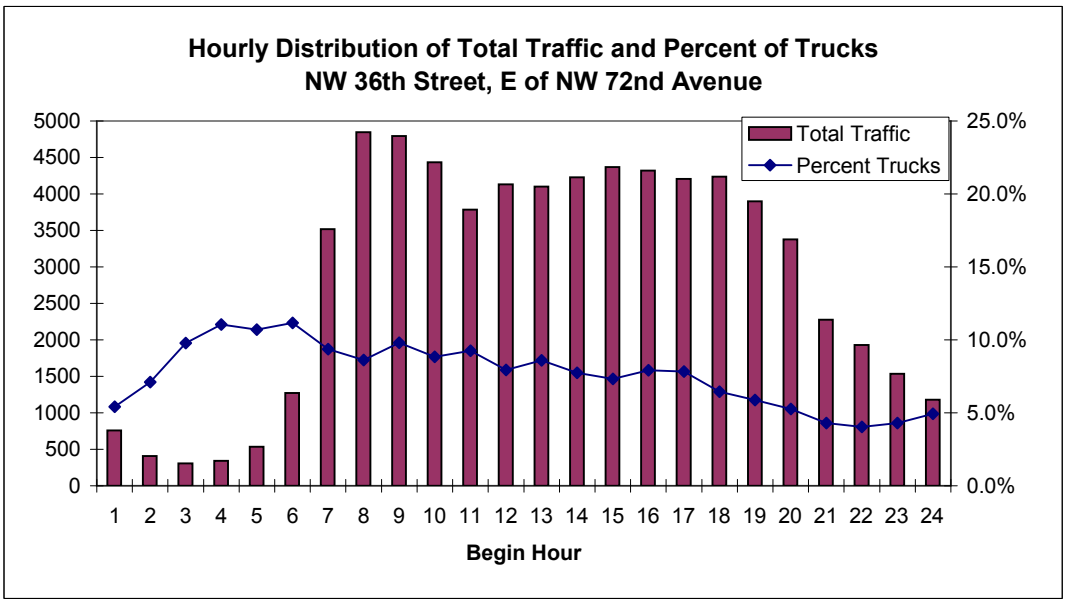


SUMMARY:

Trucks accounted for approximately 6 percent of total traffic.
Daily truck volume was approximately 3,800 and daily total volume was approximately 66,000.
Distinct peaks in truck volume evident between 7 AM and 9 AM, and between 5 PM and 7 PM.
Approximately 81 percent of truck traffic and 71 percent of total traffic reported between 7 AM and 7 PM.

Note: These observations are based on 2006 traffic volumes.

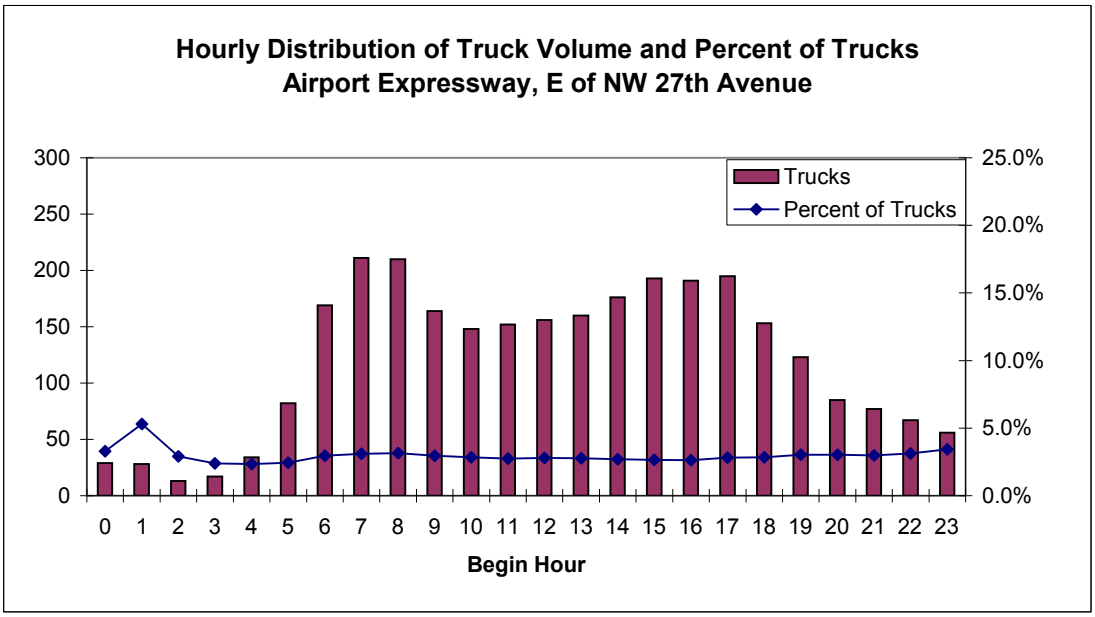


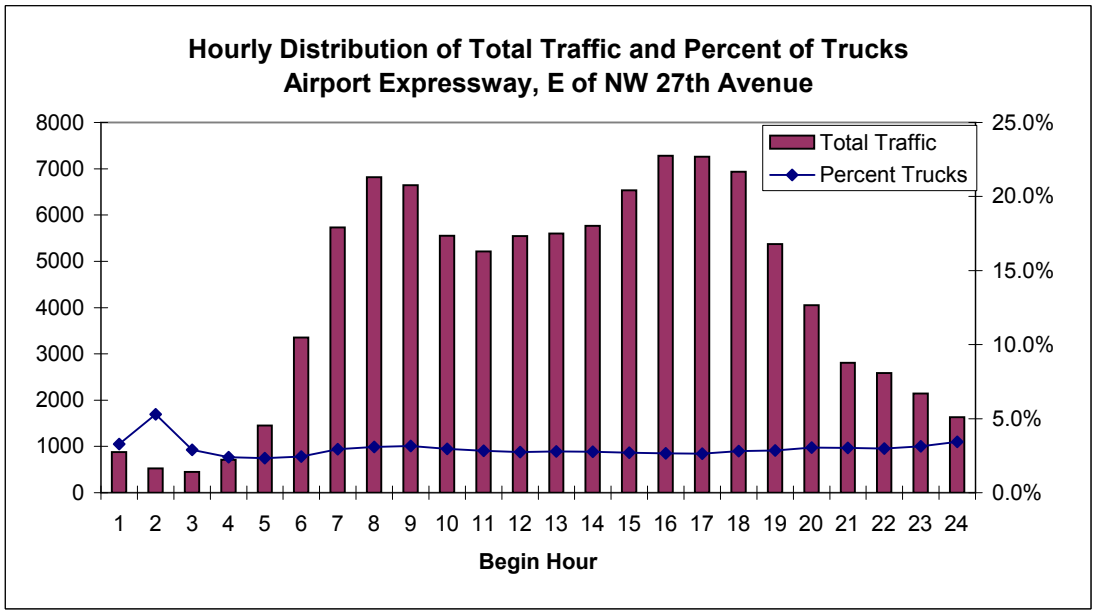


SUMMARY:

Trucks accounted for approximately 8 percent of total traffic.
Daily truck volume was approximately 5,300 and daily total volume was approximately 69,000.
Peak in truck volume evident between 7 AM and 9 AM.
Approximately 80 percent of truck traffic and 74 percent of total traffic reported between 6 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

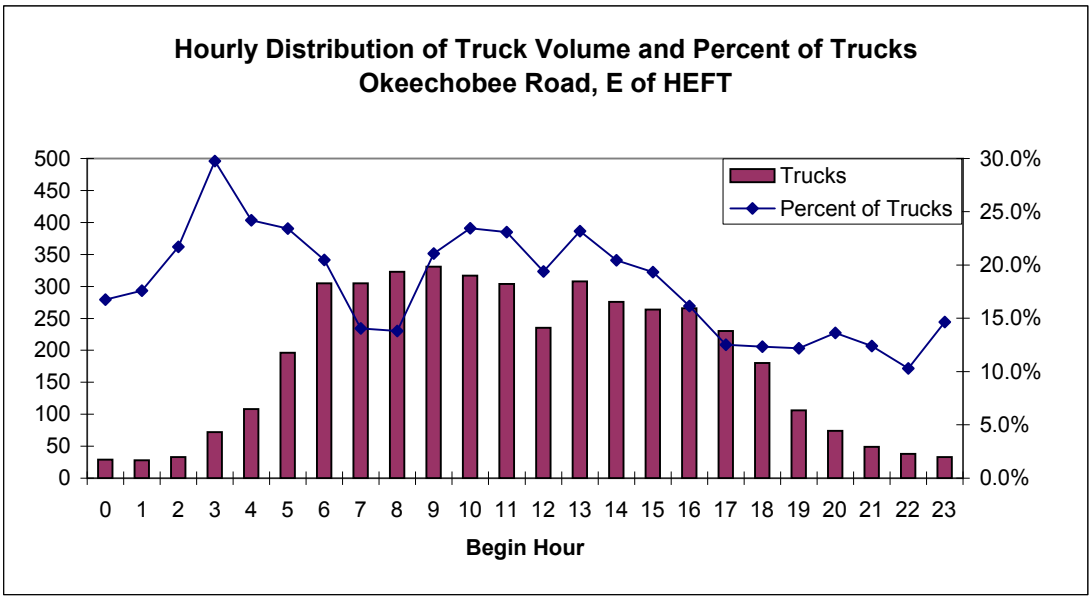


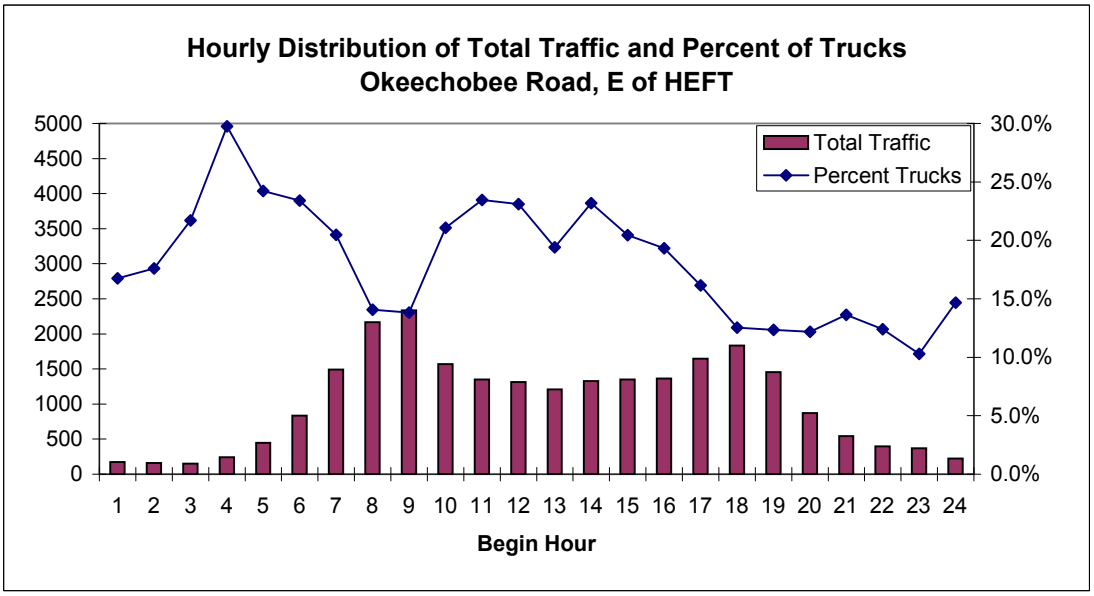


SUMMARY:

Trucks accounted for approximately 3 percent of total traffic.
Daily truck volume was approximately 2,900 and daily total volume was approximately 101,000.
Peak truck traffic periods follow peak total traffic periods.
Approximately 68 percent of truck traffic and 69 percent of total traffic reported between 7 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

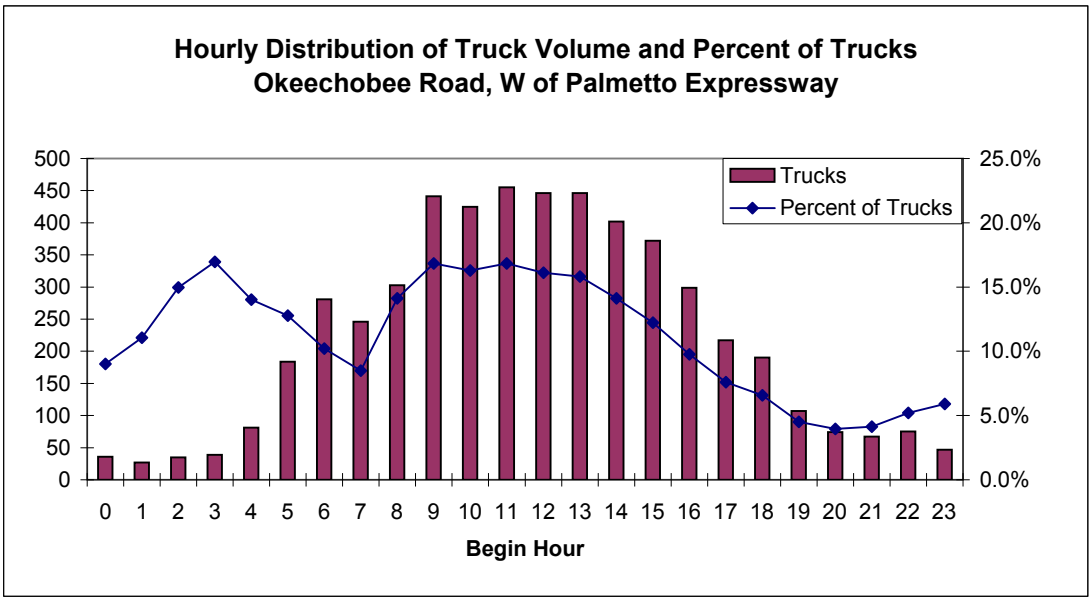


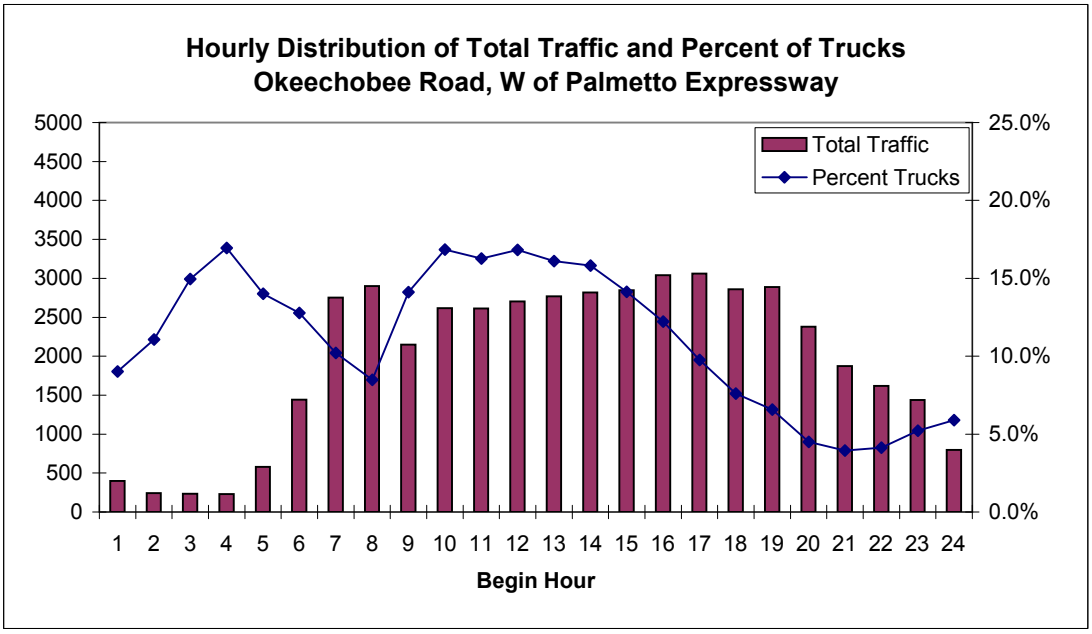


SUMMARY:

Trucks accounted for approximately 18 percent of total traffic.
Daily truck volume was approximately 4,400 and daily total volume was approximately 25,000.
Steady volume of trucks between 6 AM and 3 PM.
Approximately 73 percent of truck traffic and 69 percent of total traffic reported between 6 AM and 5 PM.

Note: These observations are based on 2006 traffic volumes.

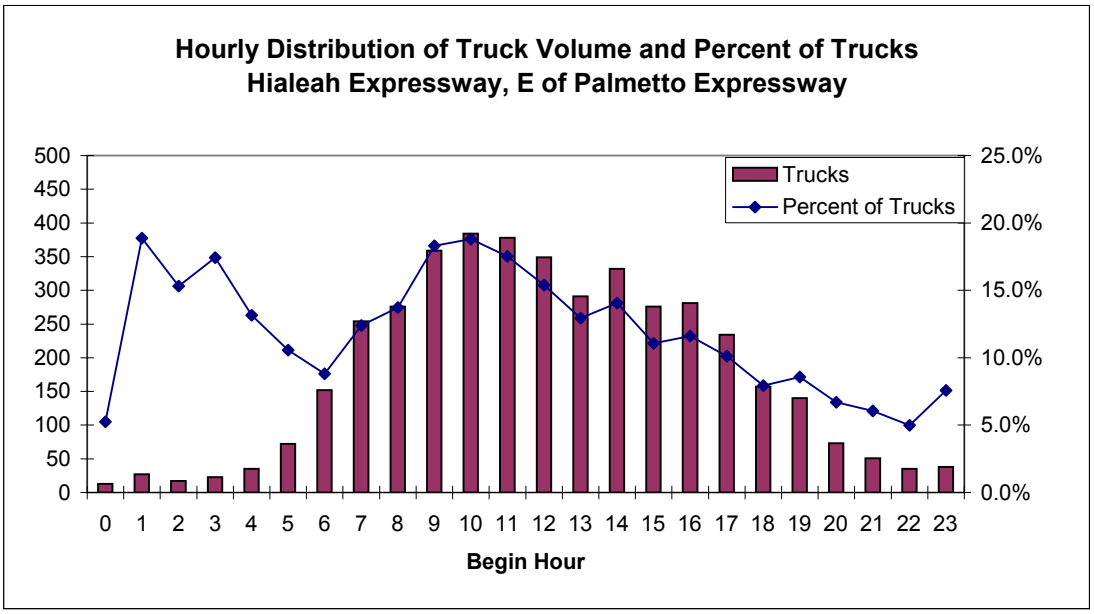


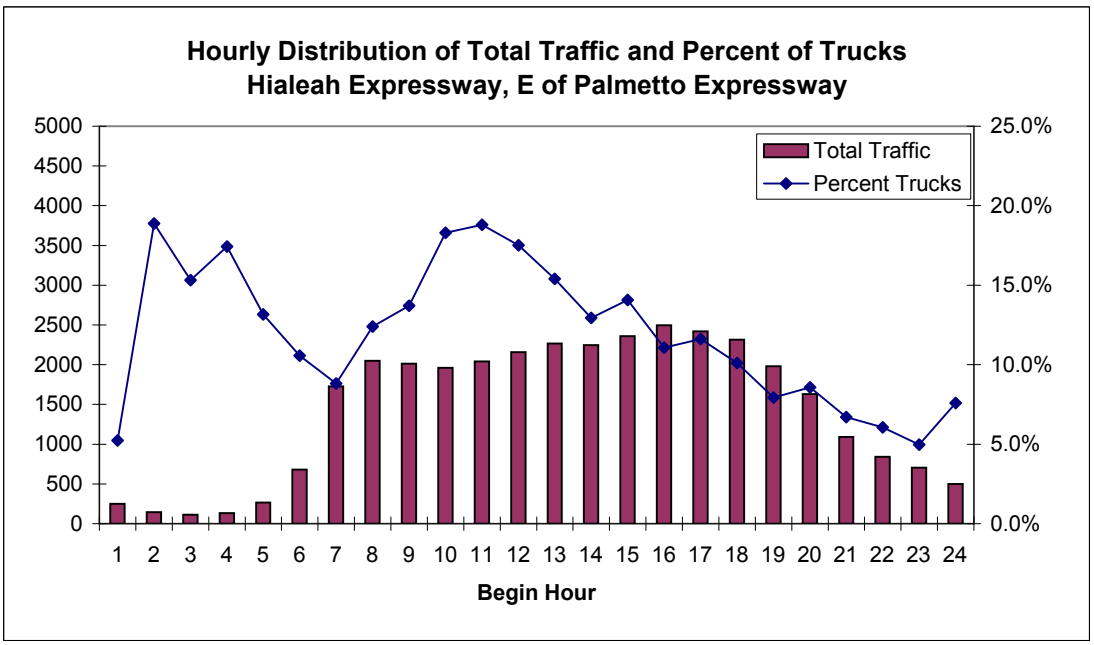


SUMMARY:

Trucks accounted for approximately 11 percent of total traffic.
Daily truck volume was approximately 5,300 and daily total volume was approximately 47,500.
Steady volume of trucks between 9 AM and 4 PM.
Approximately 78 percent of truck traffic and 70 percent of total traffic reported between 6 AM and 5 PM.

Note: These observations are based on 2005 traffic volumes.

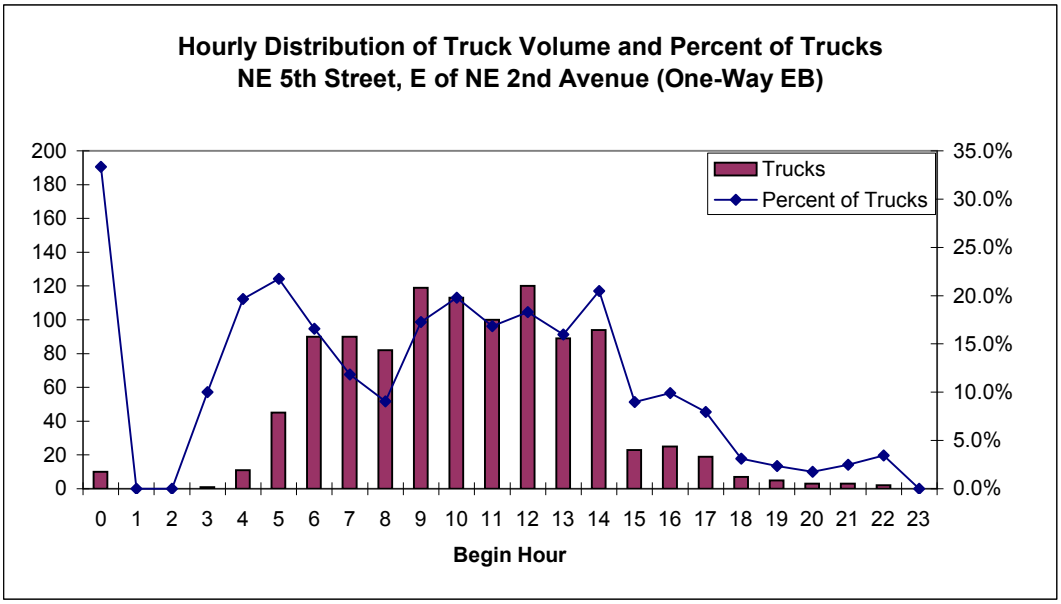


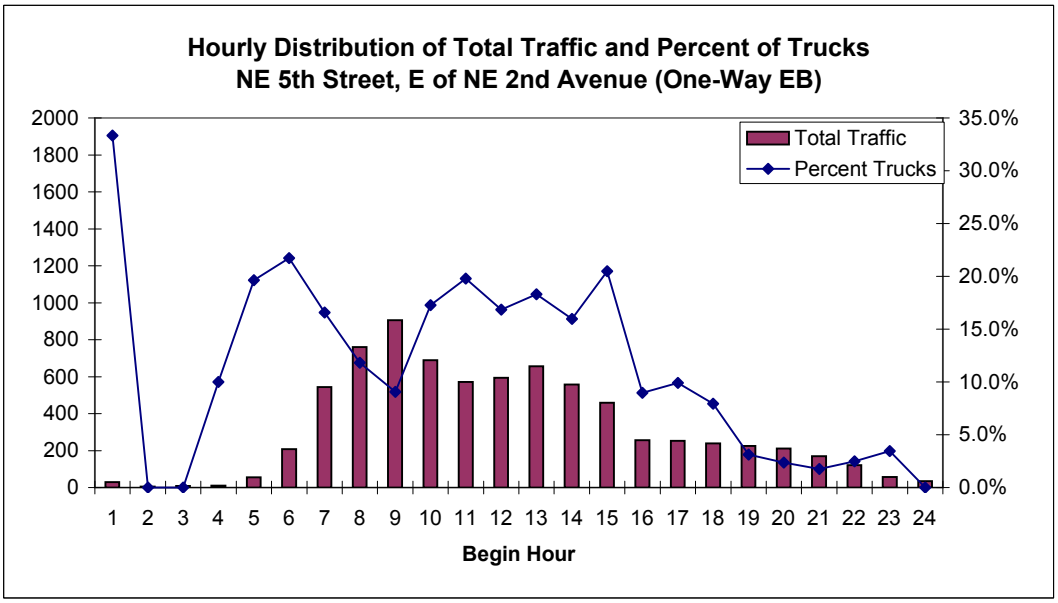


SUMMARY:

Trucks accounted for approximately 12 percent of total traffic.
Daily truck volume was approximately 4,200 and daily total volume was approximately 34,500.
Steady volume of trucks between 9 AM and 3 PM.
Approximately 80 percent of truck traffic and 71 percent of total traffic reported between 7 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

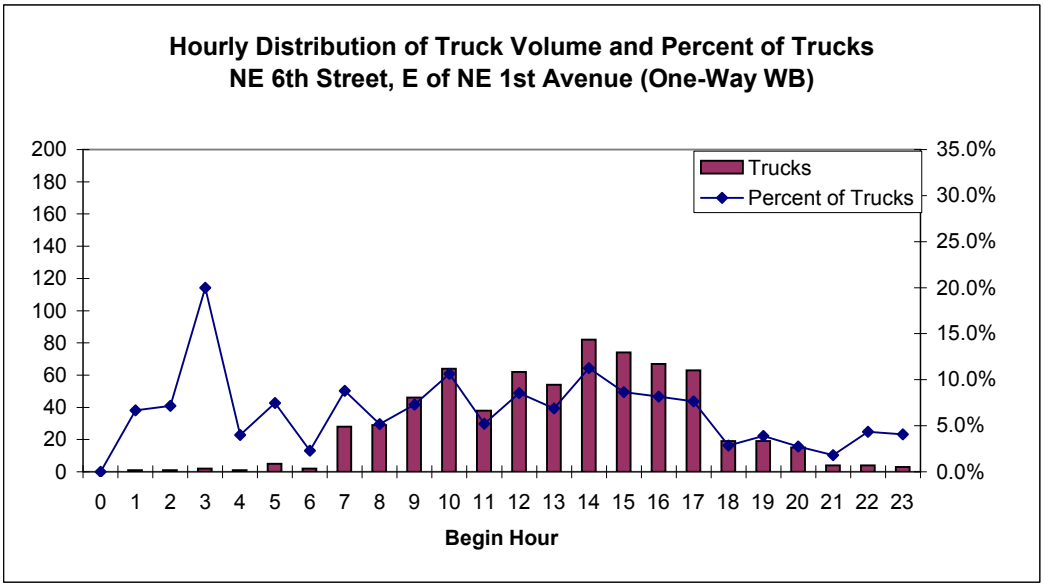


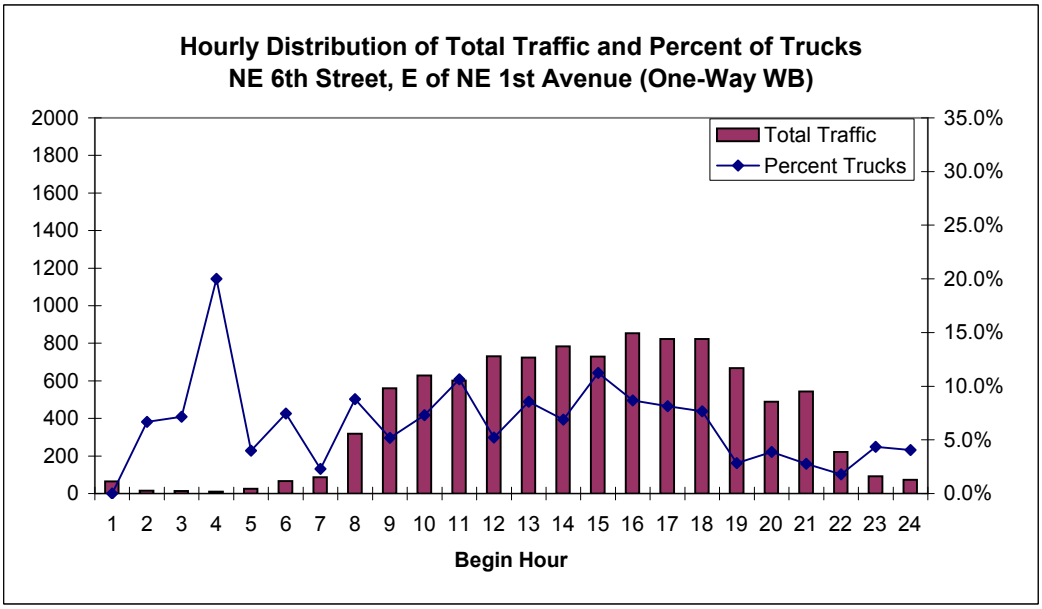


SUMMARY:

Trucks accounted for approximately 14 percent of total traffic.
Daily truck volume was approximately 1,050 and daily total volume was approximately 7,600.
More truck traffic during the A.M. and midday peak periods than during the P.M. peak period.
Approximately 85 percent of truck traffic and 75 percent of total traffic reported between 6 AM and 3 PM.

Note: These observations are based on 2006 traffic volumes.

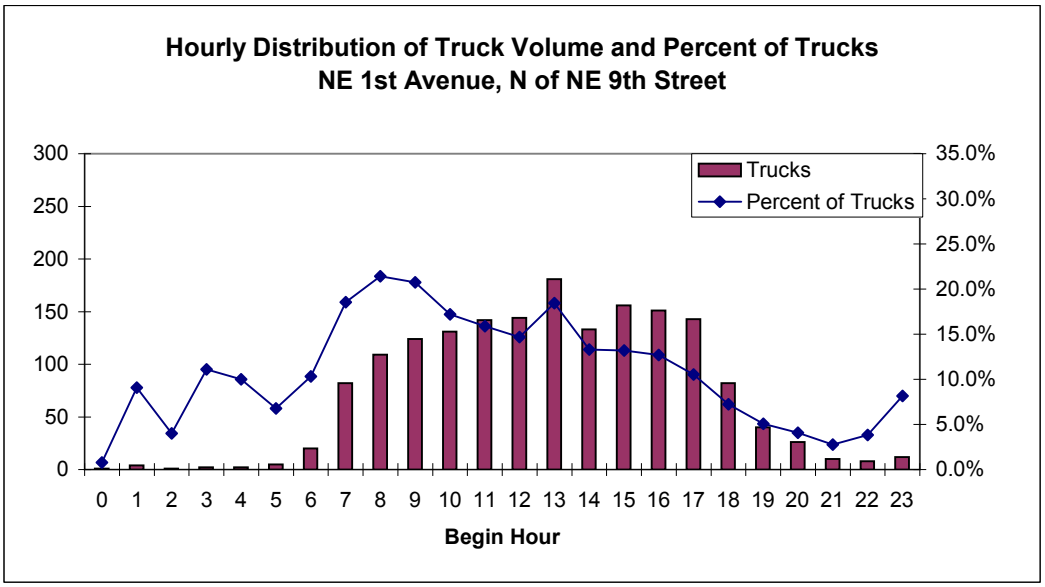


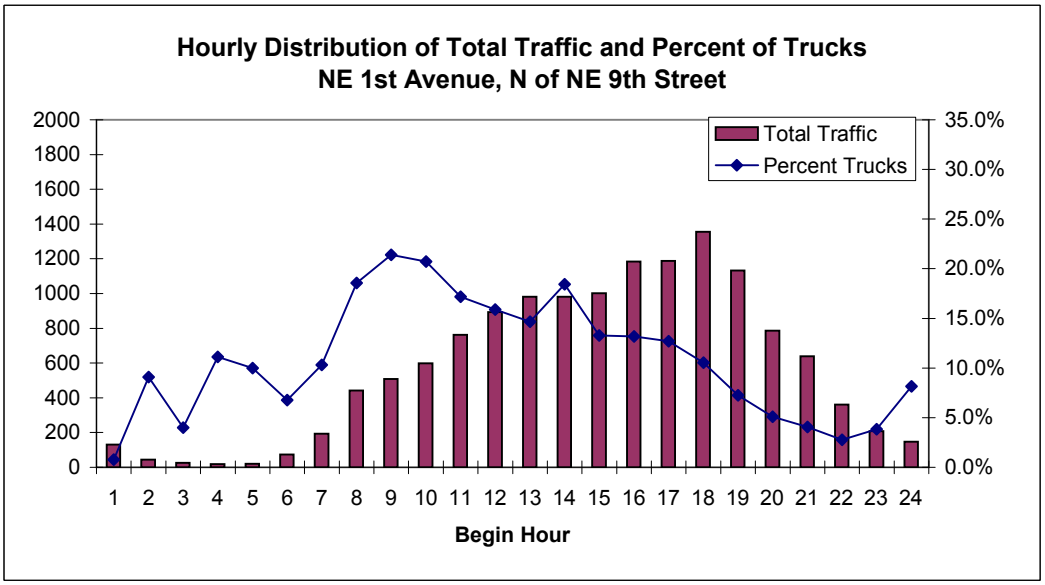


SUMMARY:

Trucks accounted for approximately 7 percent of total traffic.
Daily truck volume was approximately 700 and daily total volume was approximately 10,000.
Approximately 81 percent of truck traffic and 67 percent of total traffic reported between 9 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

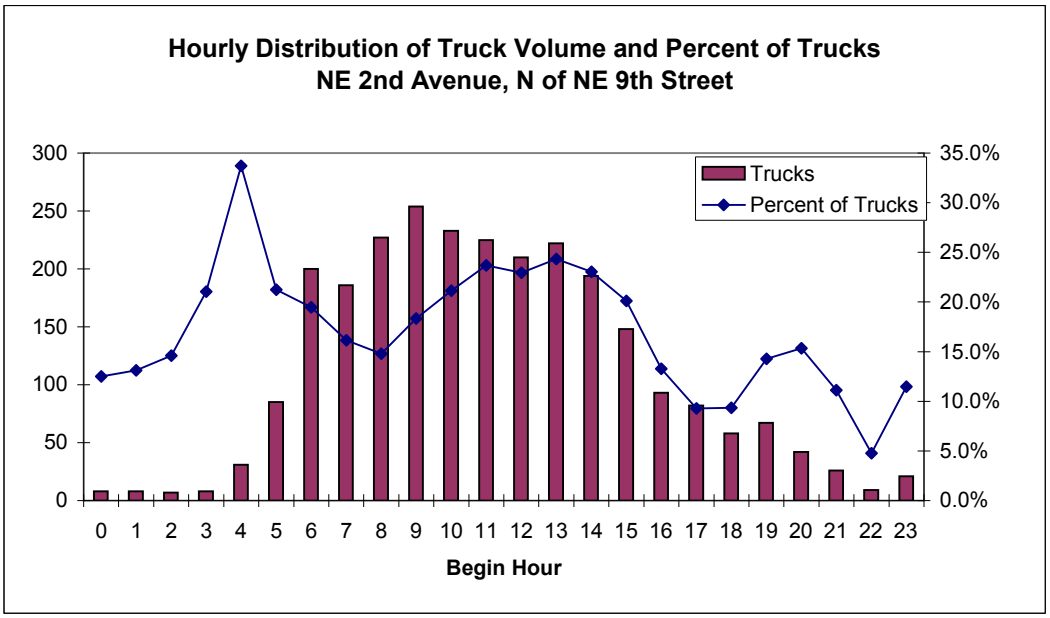


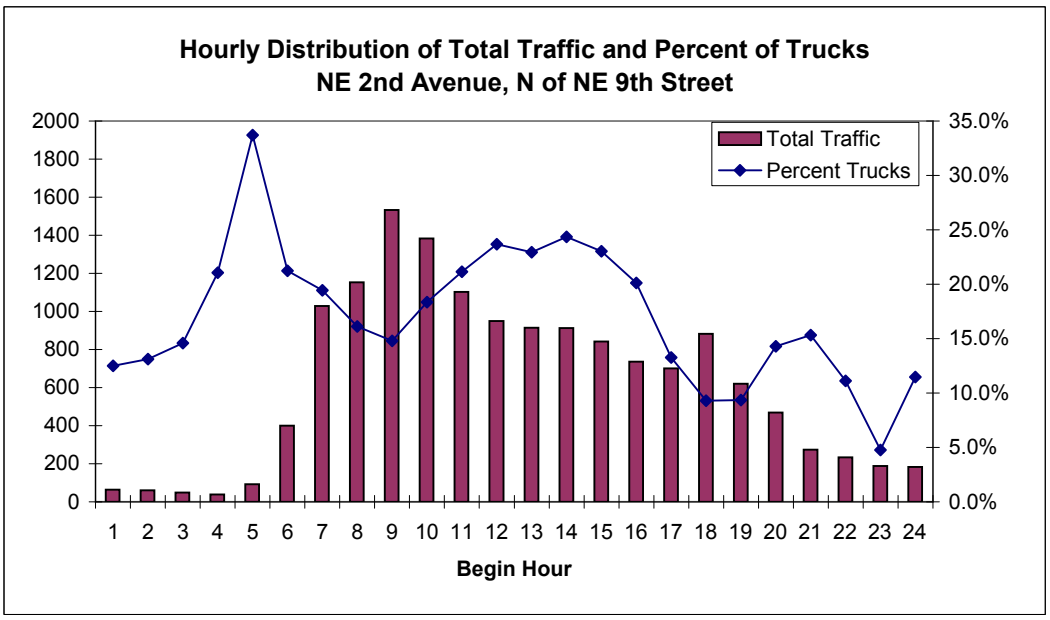


SUMMARY:

Trucks accounted for approximately 13 percent of total traffic.
Daily truck volume was approximately 1,700 and daily total volume was approximately 13,700.
The peaking of truck traffic curve occurs during the midday and the peaking of total traffic curve occurs during the evening.
Approximately 83 percent of truck traffic and 69 percent of total traffic reported between 8 AM and 6 PM.

Note: These observations are based on 2006 traffic volumes.

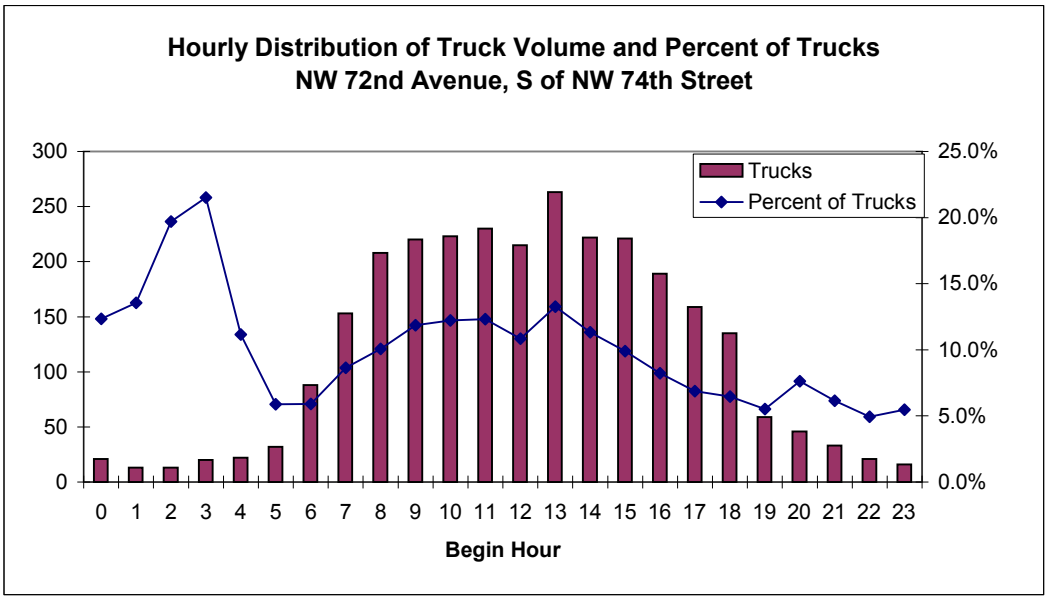


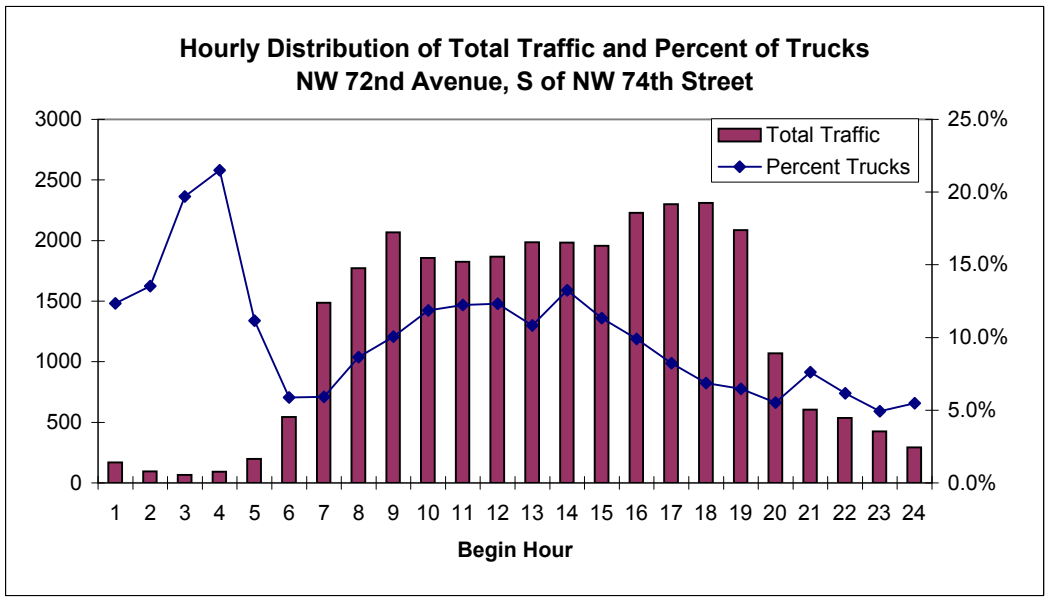


SUMMARY:

Trucks accounted for approximately 18 percent of total traffic.
Daily truck volume was approximately 2,650 and daily total volume was approximately 14,800.
The peaking of truck traffic and total traffic curves occur during the mid-morning period.
Approximately 74 percent of truck traffic and 66 percent of total traffic reported between 6 AM and 3 PM.

Note: These observations are based on 2006 traffic volumes.

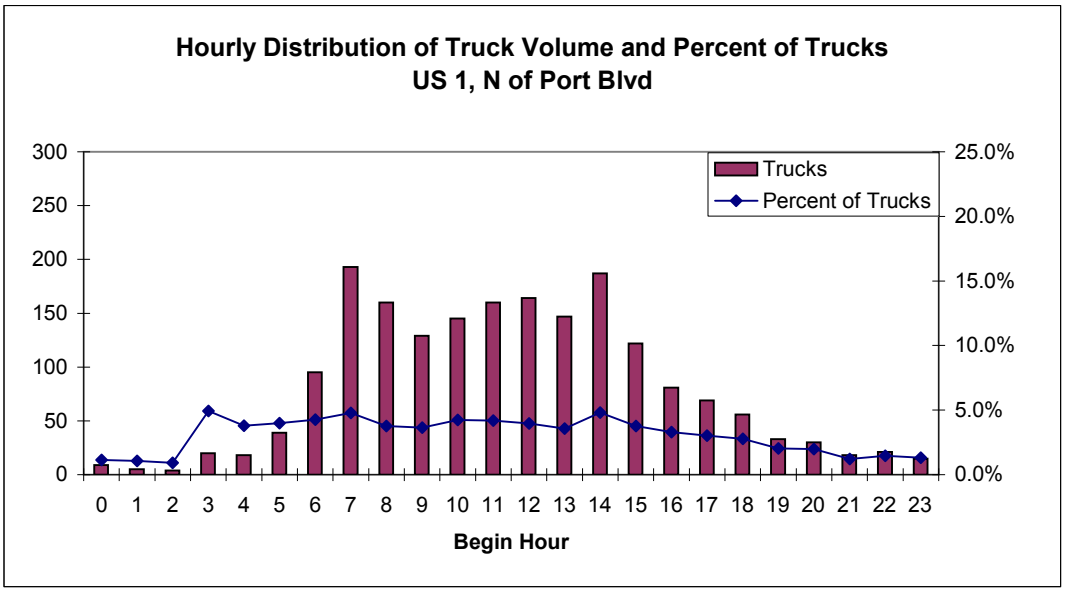


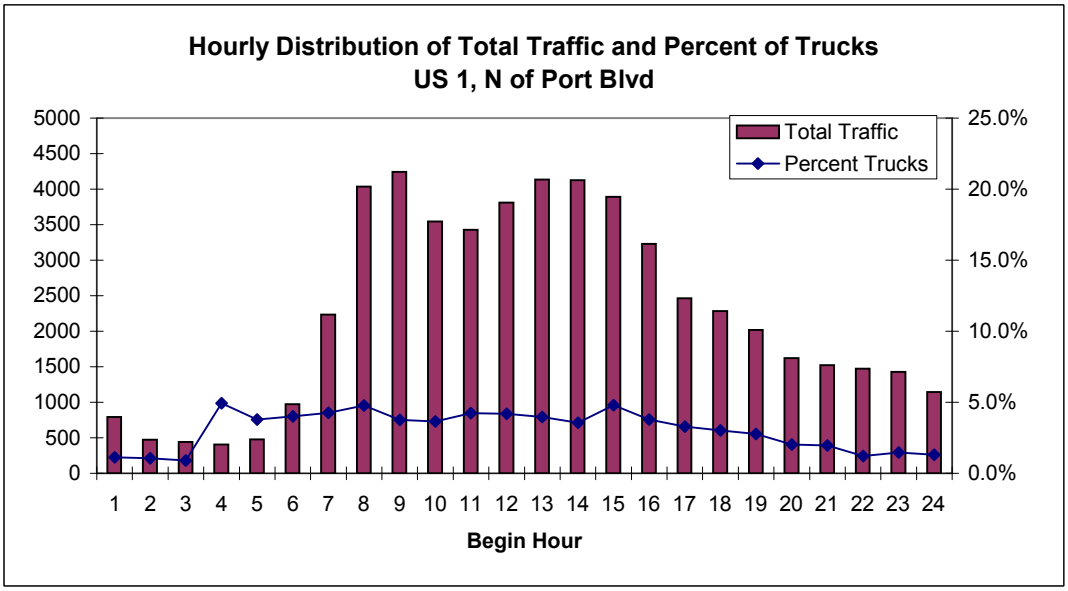


SUMMARY:

Trucks accounted for approximately 10 percent of total traffic.
Daily truck volume was approximately 2,650 and daily total volume was approximately 14,800.
The peaking of truck traffic and total traffic curves occur during the mid-morning period.
Approximately 74 percent of truck traffic and 66 percent of total traffic reported between 6 AM and 3 PM.

Note: These observations are based on 2006 traffic volumes.





SUMMARY:

Trucks accounted for approximately 4 percent of total traffic.
Daily truck volume was approximately 1,900 and daily total volume was approximately 54,200.
The varation of hourly truck volume is similar to the variation of total volume.
Approximately 73 percent of truck traffic and 64 percent of total traffic reported between 7 AM and 4 PM.

Note: These observations are based on 2006 traffic volumes.

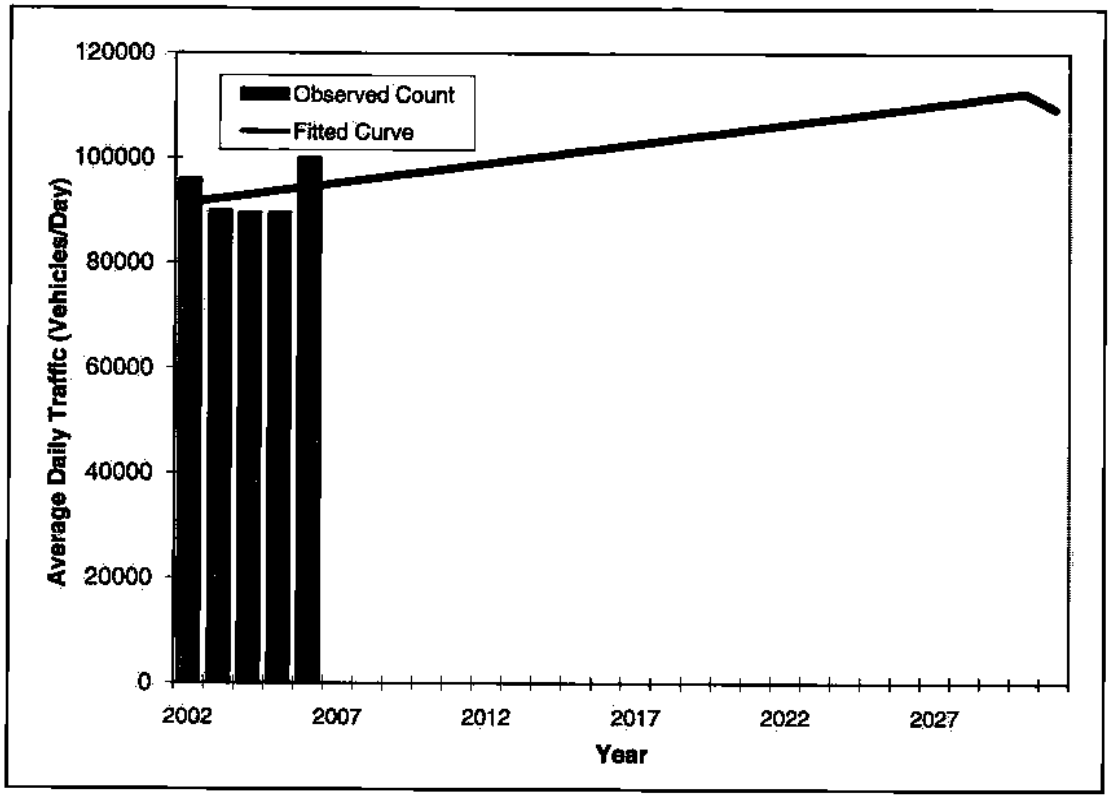
Appendix B

Traffic Volume Growth Rates

TRAFFIC TRENDS

Airport Exp – E of NW 32 Street

County:	MIAMI-DADE
Station #:	2055
Highway:	Airport Exp



Year	Traffic (ADT/AADT) Count*	Trend**
2002	96000	91500
2003	90000	92300
2004	89500	93000
2005	89500	93800
2006	100000	94500
2013 Opening Year Trend		
2013	N/A	99800
2020 Mid-Year Trend		
2020	N/A	105000
2030 Design Year Trend		
2030	N/A	112500
TRANPLAN Forecasts/Trends		

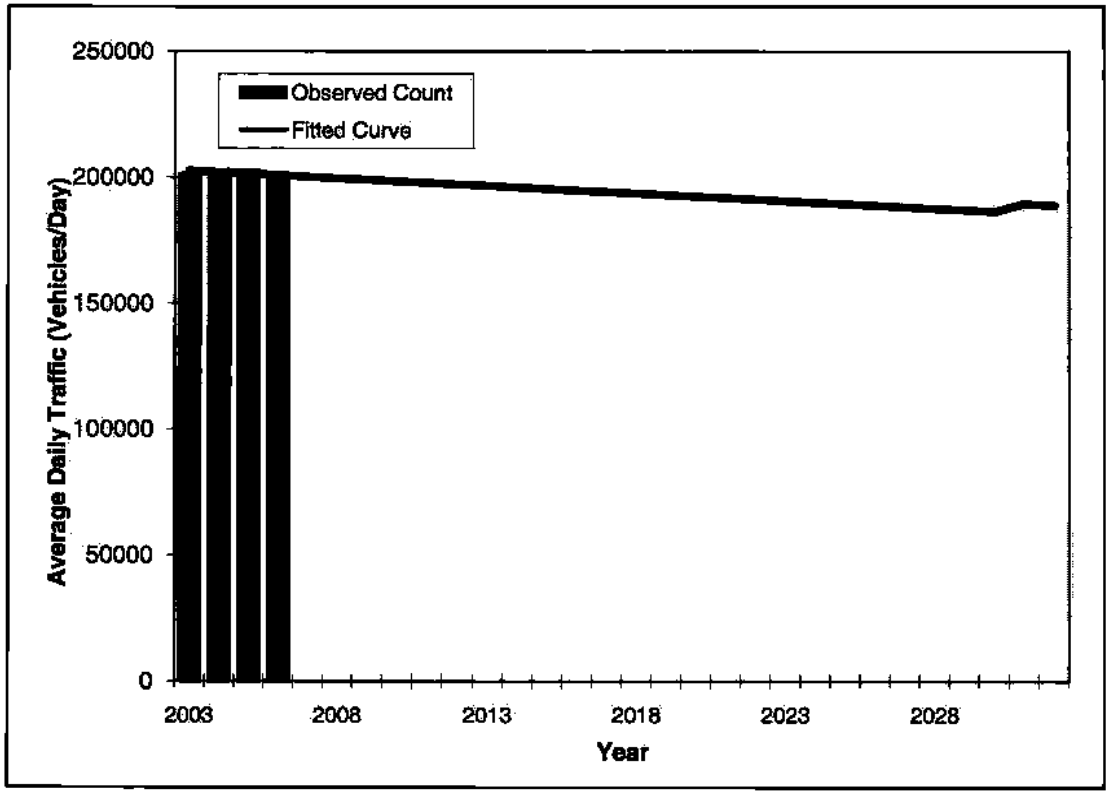
**** Annual Trend Increase:**	750
Trend R-squared:	6.1%
Trend Annual Historic Growth Rate:	0.82%
Trend Growth Rate (2006 to Design Year):	0.79%
Printed:	27-May-08
Straight Line Growth Option	

***Axle-Adjusted**

TRAFFIC TRENDS

Dolphin Exp – E of SR 826

County:	MIAMI-DADE
Station #:	2188
Highway:	Dolphin Exp



Year	Traffic (ADT/AADT) Count*	Trend**
2003	201500	202700
2004	203000	202100
2005	203000	201500
2006	199500	200900
2013 Opening Year Trend		
2013	N/A	196700
2020 Mid-Year Trend		
2020	N/A	192500
2030 Design Year Trend		
2030	N/A	186500
TRANPLAN Forecasts Trends		

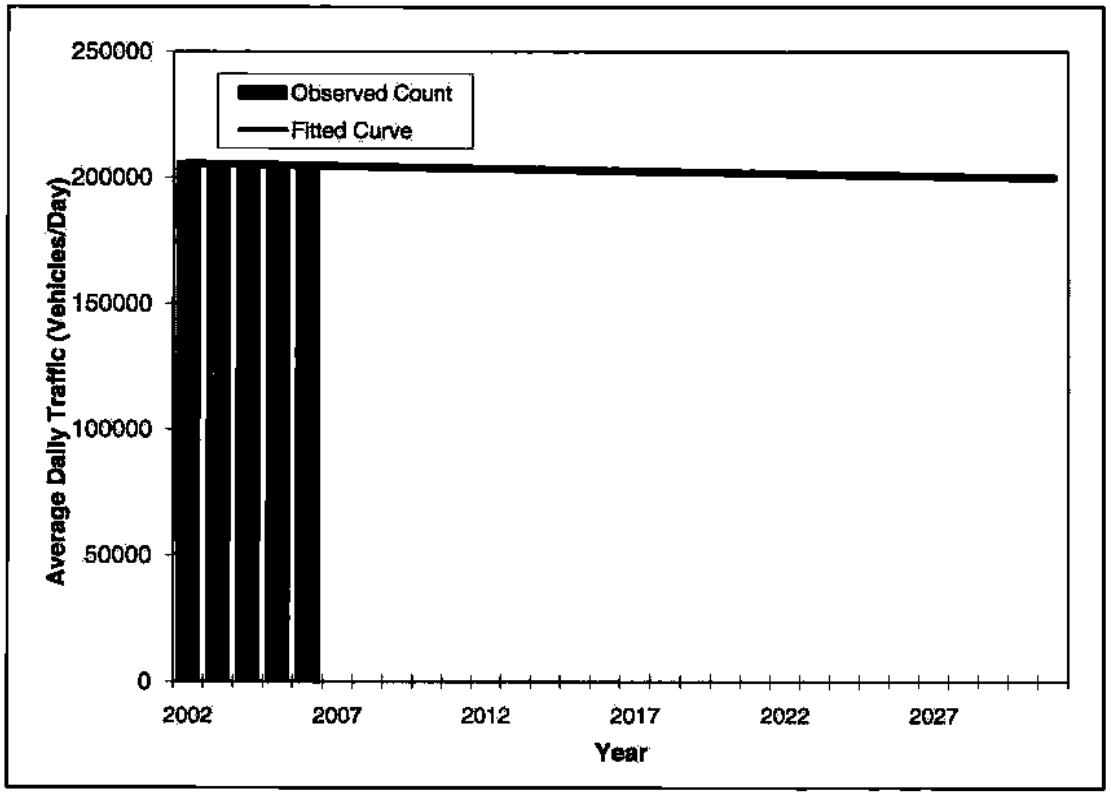
*Axle-Adjusted

** Annual Trend Increase:	-600
Trend R-squared:	21.8%
Trend Annual Historic Growth Rate:	-0.30%
Trend Growth Rate (2006 to Design Year):	-0.30%
Printed:	27-May-08
Straight Line Growth Option	

TRAFFIC TRENDS

Palmetto Exp – N of NW 12th Street

County:	MIAMI-DADE
Station #:	570
Highway:	Palmetto Exp



Year	Traffic (ADT/AADT) Count*	Trend**
2002	206000	205600
2003	205000	205400
2004	205000	205200
2005	205000	205000
2006	205000	204800
2013 Opening Year Trend		
2013	N/A	203400
2020 Mid-Year Trend		
2020	N/A	202000
2030 Design Year Trend		
2030	N/A	200000
TRANPLAN Forecasts/Trends		

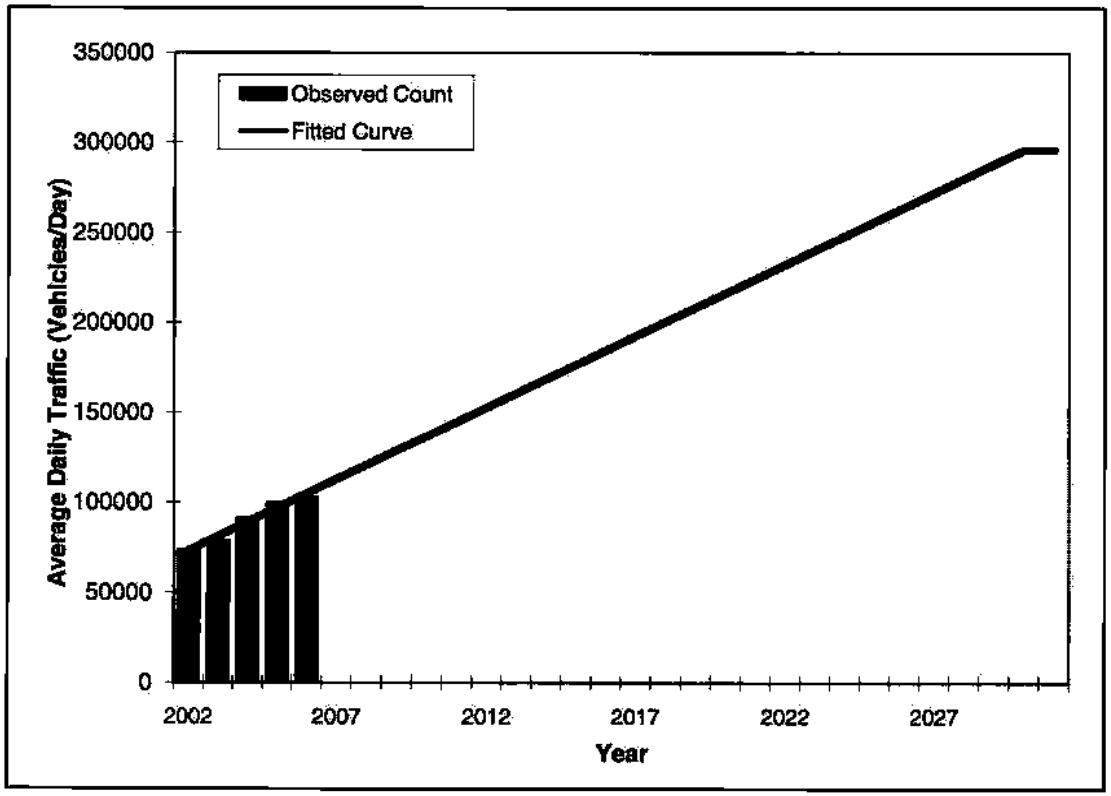
*Axle-Adjusted

**** Annual Trend Increase:**	-200
Trend R-squared:	50.0%
Trend Annual Historic Growth Rate:	-0.10%
Trend Growth Rate (2006 to Design Year):	-0.10%
Printed:	27-May-08
Straight Line Growth Option	

TRAFFIC TRENDS

HEFT -- Okeechobee Plaza

County:	MIAMI-DADE
Station #:	2268
Highway:	HEFT



Year	Traffic (ADT/AADT) Count*	Trend**
2002	73400	73300
2003	79000	81300
2004	91300	89300
2005	99800	97200
2006	102800	105200
2013 Opening Year Trend		
2013	N/A	160900
2020 Mid-Year Trend		
2020	N/A	216600
2030 Design Year Trend		
2030	N/A	296200
TRANPLAN Forecasts/Trends		

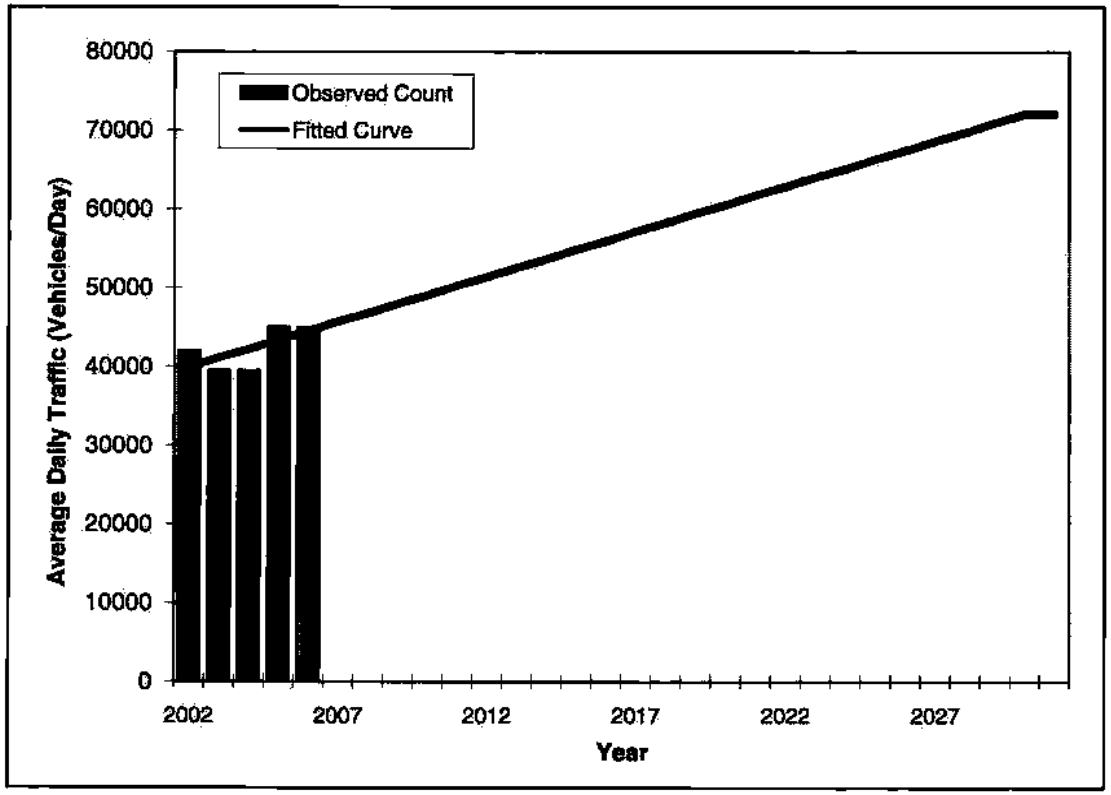
*Axle-Adjusted

**** Annual Trend Increase:**	7,960
Trend R-squared:	96.7%
Trend Annual Historic Growth Rate:	10.88%
Trend Growth Rate (2006 to Design Year):	7.56%
Printed:	27-May-08
Straight Line Growth Option	

TRAFFIC TRENDS

Okeechobee Road – NW of SR 826

County:	MIAMI-DADE
Station #:	2537
Highway:	Okeechobee Road



**** Annual Trend Increase:**	1,150
Trend R-squared:	43.6%
Trend Annual Historic Growth Rate:	2.88%
Trend Growth Rate (2006 to Design Year):	2.58%
Printed:	27-May-08
Straight Line Growth Option	

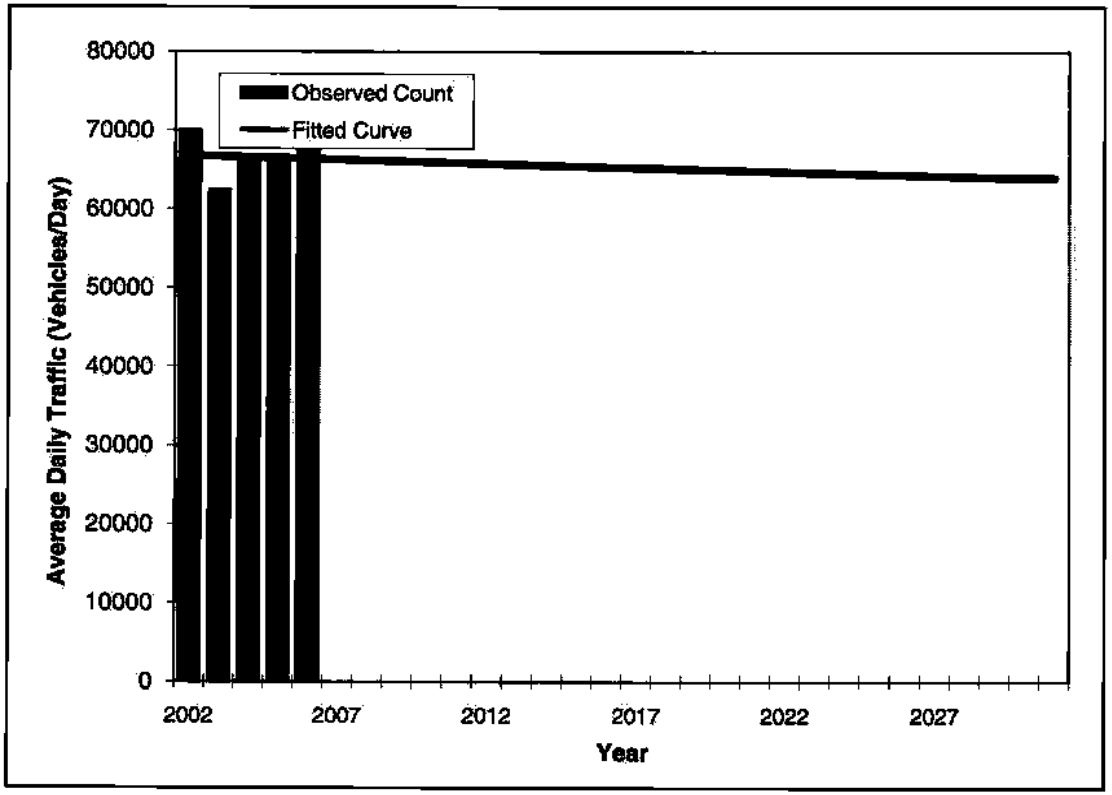
	Traffic (ADT/AADT)	
Year	**Count***	**Trend****
2002	42000	39900
2003	39500	41100
2004	39500	42200
2005	45000	43400
2006	45000	44500
2013 Opening Year Trend		
2013	N/A	52600
2020 Mid-Year Trend		
2020	N/A	60600
2030 Design Year Trend		
2030	N/A	72100
TRANPLAN Forecasts/Trends		

***Axle-Adjusted**

TRAFFIC TRENDS

NW 36 Street -- E of Milam Dairy Road

County:	MIAMI-DADE
Station #:	1172
Highway:	NW 36 Street



Year	Traffic (ADT/AADT) Count*	Trend**
2002	70000	66800
2003	62500	66700
2004	66500	66600
2005	66500	66500
2006	67500	66400
2013 Opening Year Trend		
2013	N/A	65700
2020 Mid-Year Trend		
2020	N/A	65000
2030 Design Year Trend		
2030	N/A	64000
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	-100
Trend R-squared:	0.3%
Trend Annual Historic Growth Rate:	-0.15%
Trend Growth Rate (2006 to Design Year):	-0.15%
Printed:	27-May-08
Straight Line Growth Option	

Appendix C

Georgia Truck Lanes Needs Identification Study

Georgia Truck Lane Needs Identification Study

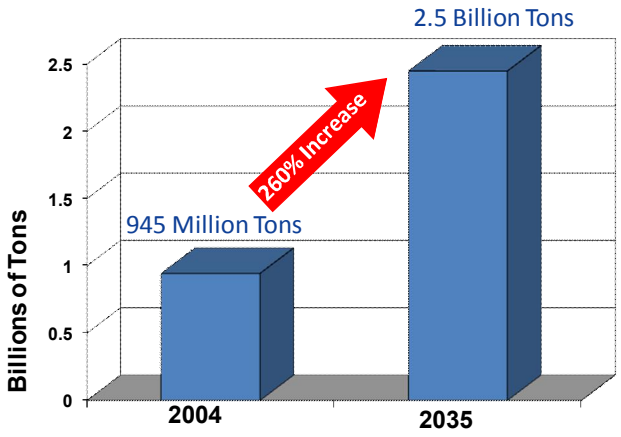
Talking Freight Seminar
March 19, 2008

Matthew Fowler, P.T.P
Assistant State Planning Administrator

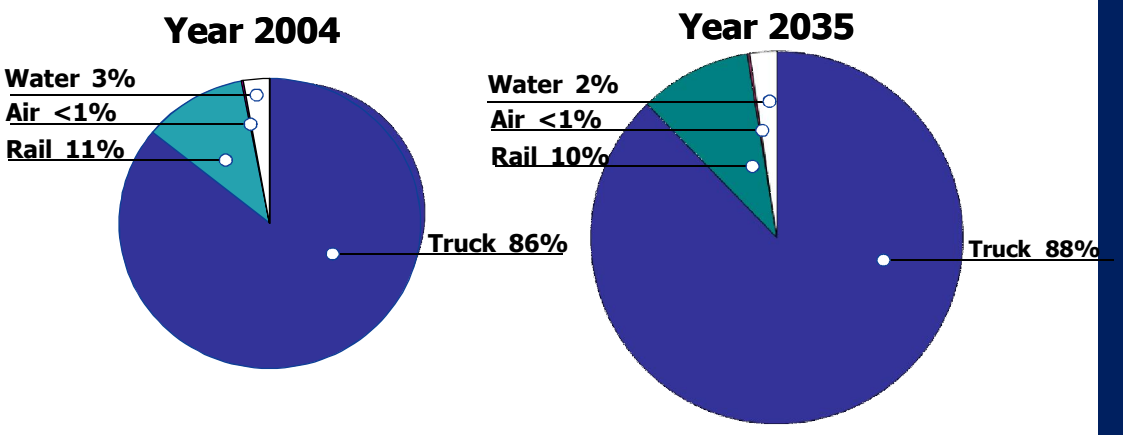
Georgia Department of Transportation

Freight Growth in Georgia

- Freight flows in Georgia are forecast to increase 260% by the year 2035.
- Trucks currently carry 86% of the freight moving through the state.
- Truck Traffic is growing twice as fast as car traffic.



Georgia Freight Movement, By Mode Share



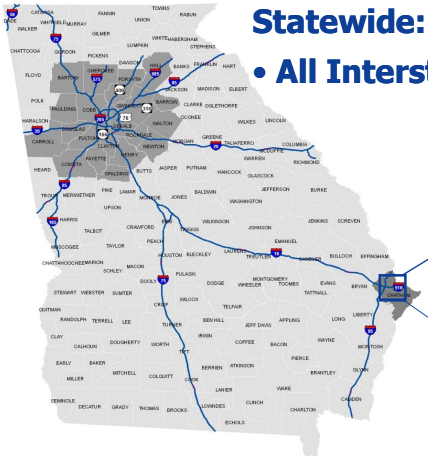
(Based on the weight, not value of the freight)

Source: Transearch data

Overview of Truck Lane Study

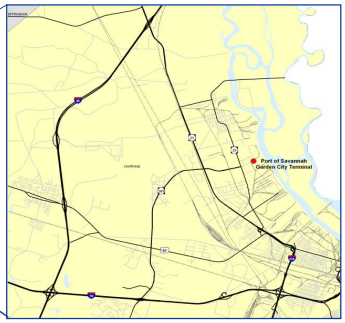
- Questions
  - Do truck-only lanes significantly reduce peak-period congestion, corridor wide?
  - If so, where should we build them?
  - How much would truck-only lanes cost?
  - Are there benefits to truck-only lanes?
- Study assumptions
  - Follow existing freeway alignments
  - **No tolls**
  - **Voluntary** usage

Study Area



Statewide:

- **All Interstates plus select U.S. and State Routes**

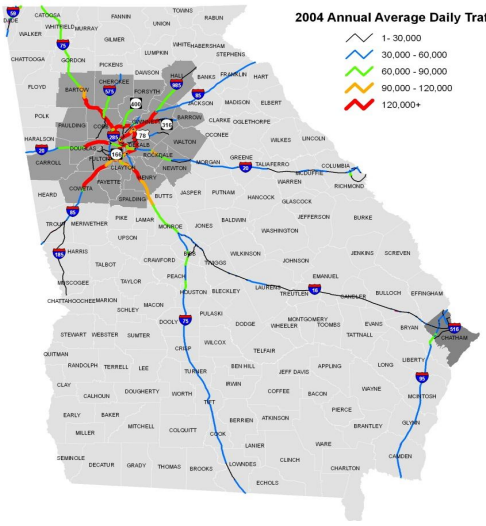


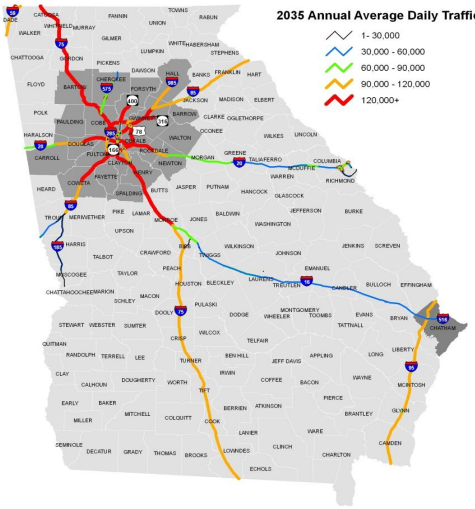
Savannah Sub-Area Inset

Data Collection and Inputs

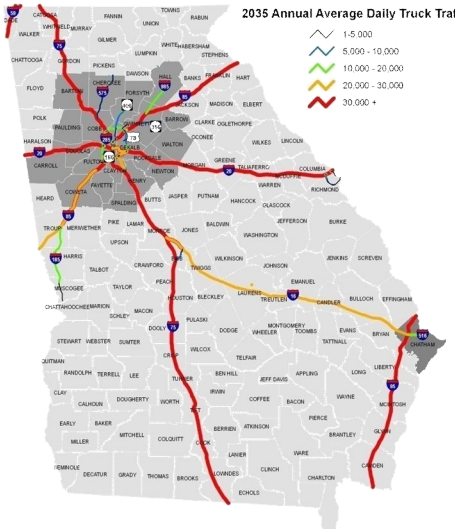
- Total Traffic Volumes
- Truck Traffic Volumes
- Congestion Levels (existing and future year)
- Freight “Origin & Destination” Surveys
- Establishment Surveys
- Freight Bottleneck Locations
- Major Freight Generators

Traffic Volumes – 2004 & 2035

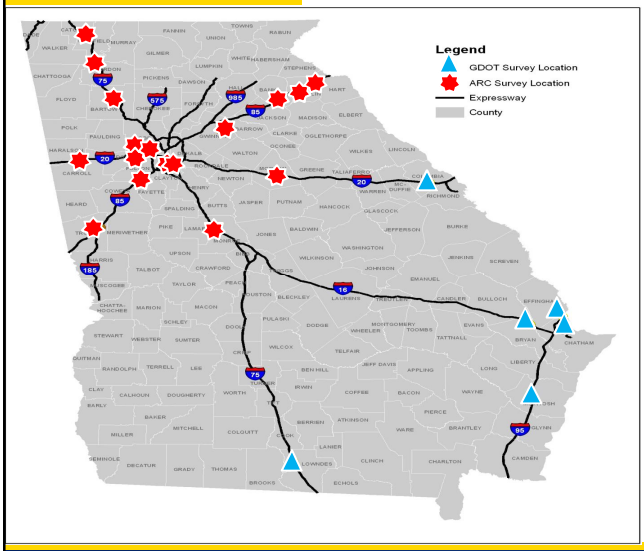




Truck Volumes- 2004 & 2035



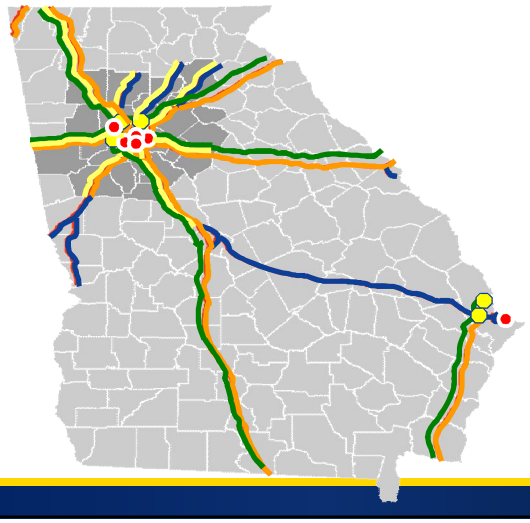
"Origin-Destination" Survey



- Weigh Stations
- Truck Stops
- Intermodal Facilities
- Ports
- Approximately 5,600 total surveys

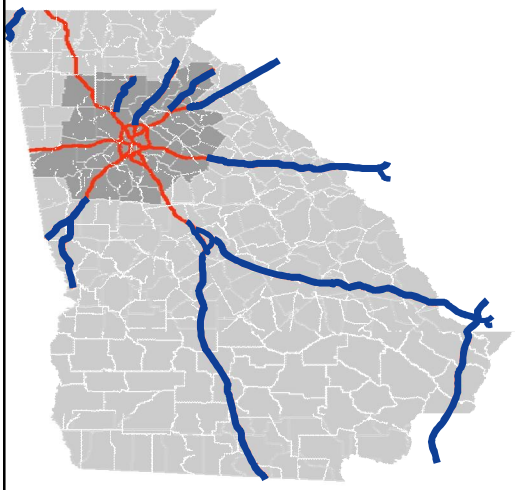
Initial Evaluation Results (2035)

as presented to GDOT Board in April 2007



- Average Daily Truck Traffic >30,000
- Congested Conditions – Level-of-Service "E" or "F"
- Major 'Through' Travel Movements
- Major Truck Generators
- Freight Bottlenecks

Candidate Corridors



Routes meeting the initial evaluation criteria (further studied):

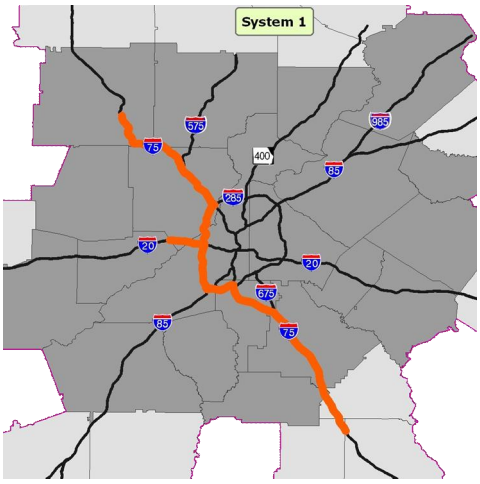
- I-75 North (I-285 to Chattanooga)
- I-75 South (I-475 to I-285)
- I-85 North (I-285 to Barrow/Gwinnett County Line)
- I-85 South (Coweta/Meriwether County Line to I-285 South)
- I-20 West (Georgia/Alabama Border to I-285)
- I-20 East (I-285 to Newton/Morgan County Line)
- I-285 (All)
- I-675

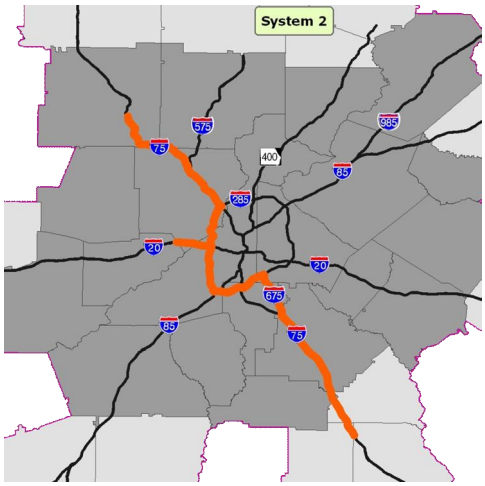
Routes that did **not** meet the initial evaluation criteria:

- I-16
- I-59
- I-24
- SR 400
- SR 166
- US 78

System-Level Alternatives

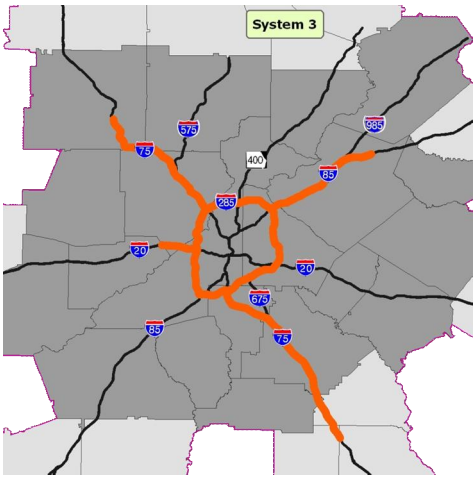
Metro Atlanta

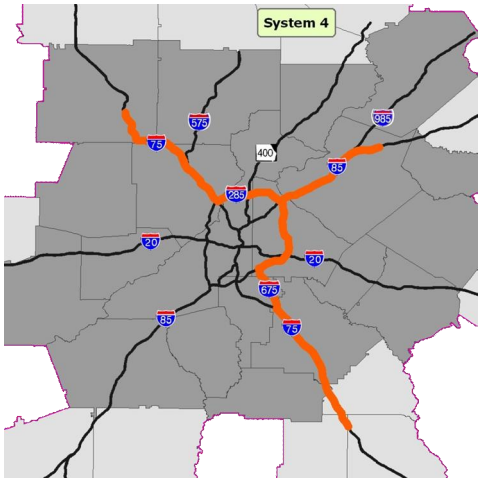




System-Level Alternatives (cont'd.)

Metro Atlanta

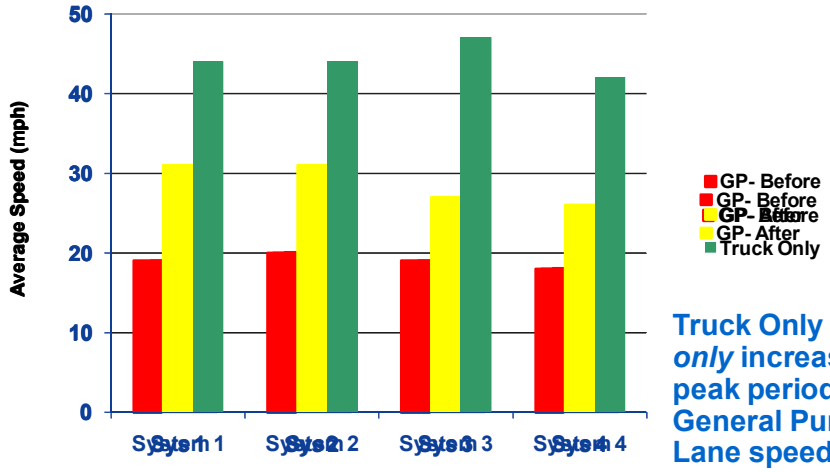




System-Level Evaluation

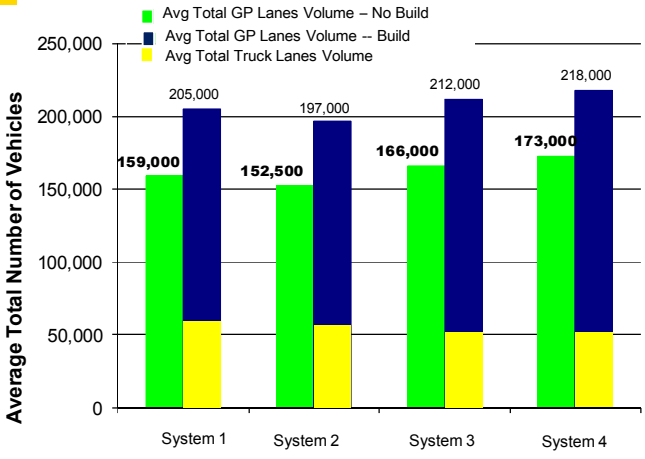
- Traffic Flow and Speeds
- Traffic Volumes
- Benefits and Costs

2035 PM Peak Period Speeds

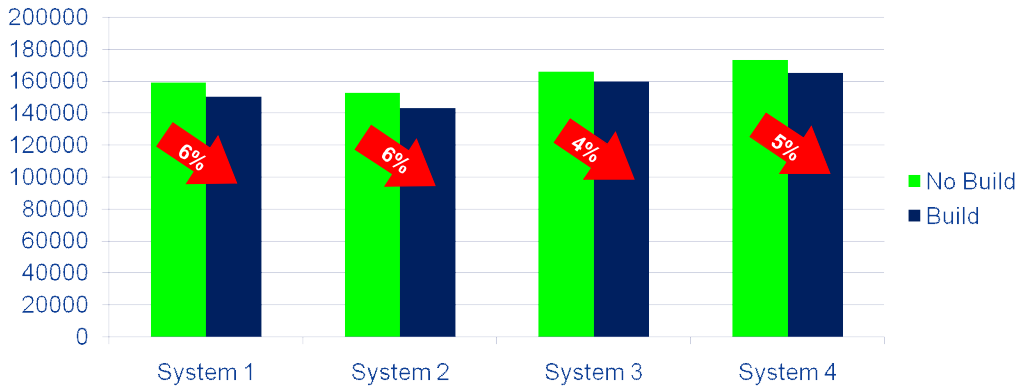


Truck Only Lanes *only* increase peak period General Purpose Lane speeds by 10 mph, on avg

2035 Daily Traffic Volumes

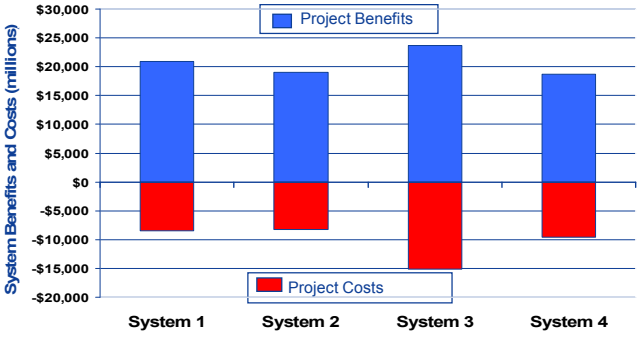


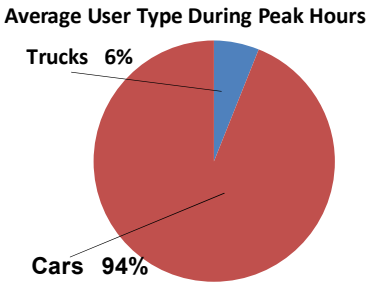
2035 GP Lane Daily Traffic Volumes



Trucks shifting to Truck Only Lanes frees up capacity in General Purpose Lanes; however, the capacity is "consumed" by new travelers attracted from parallel arterials (latent demand/diverted traffic), resulting in minimal reductions in General Purpose Lane congestion

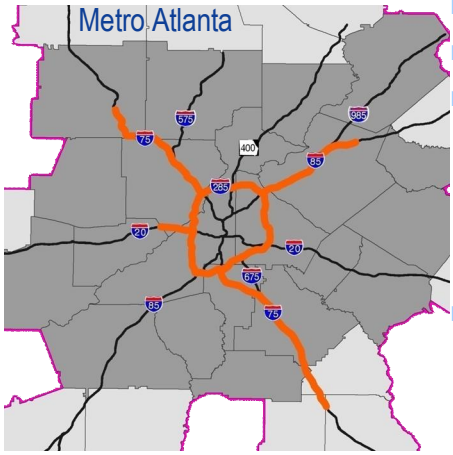
30-Year User Benefits and Costs (in 2007 Dollars)





Truck Only Lanes generate benefits (VMT and VHT reductions, secondary economic benefits); however, benefits primarily accrue to trucking community

System 3



- System 3 yields greatest benefits
- Complete, comprehensive network
- Cost:
  - ***$13.2 Billion (current year dollars)***
  - ***$21.69 Billion (future year dollars)***
- $13.2 Billion represents approximately 14 years worth of eligible federal-aid highway funding available for Georgia (in current year dollars)

(Estimated current year cost per lane-mile: $20 Million)

Study Findings

- Traffic Flow and Speeds
  - Truck Only Lanes *only* increase 'peak period' General Purpose Lane speeds by approximately 10 mph
  - Any substantial improvements to speeds in General Purpose Lanes are "consumed" by motorists attracted from parallel arterials (latent demand/diverted traffic)

Study Findings

- Traffic Volumes
  - Trucks are not the largest number of customers in a corridor
    - On a daily basis, trucks average 10%-15% of traffic volume on Metro Atlanta Interstates
    - During peak periods, trucks average approximately 6% of total traffic volume on Metro Atlanta Interstates
    - Atlanta mirrors national trends; in metropolitan regions, cars overwhelmingly dominate vehicle mix during peak travel periods
  - Truck Only Lanes result in minimal reductions in General Purpose Lane traffic volumes, due to latent demand/diverted traffic

Study Findings

- Benefits and Costs
  - Overall, Benefits exceed Costs; however, the primary benefit is to the 6% of traffic (trucks) travelling in the peak periods
  - Other motorists, representing 94% of the vehicle mix, do not realize direct and significant benefits in General Purpose Lanes
  - Truck Only Lanes are cost prohibitive based on funding availability and study assumptions

Study Conclusion

- Do not pursue stand-alone Truck Only Lanes
  - Truck Only Lanes provide direct benefits for trucks, which comprise only 6% of peak period traffic
  - Vehicles in General Purpose Lanes (94% of vehicle mix in peak periods) would not realize direct and significant benefits
  - Truck Only Lanes do not significantly reduce peak period congestion in General Purpose Lanes
- Truck Only Lanes are not the only strategy to address truck traffic

Next Steps

- GDOT's Metro Atlanta Managed Lane System Plan (MLSP) is underway
- MLSP will explore all managed lane options (HOV/HOT/TOL/TOT/ETL or a combination thereof) in order to serve ***all*** of GDOT's travelling customers
- Findings from Truck Only Lane Study will feed into MLSP
- Anticipate realizing increased benefits for all customers with MLSP
- Presently working with our Metro Atlanta transportation planning partners

www.gatrucklanestudy.com

Appendix D

FTAC Evaluation of Potential Projects

Central Dade Transport Zone Study - Potential Improvements

Summary of Assessment by FTAC on May 21, 2008

Project Name	**Support[(1)]**	**Implementation Timeframe[(2)]**
Short sea shipping	2	2
Truck staging area – Upper River site	2	1
Truck staging area – Turnpike/Okeechobee Road site	2	2
Extend Port of Miami hours of operation	2	2
PierPASS at Port of Miami	2	2
Congestion pricing for City of Doral	2	2
Dedicated truck lanes/facilities	2	2
Managed lanes on Dolphin Expressway	2	2
Develop freight infrastructure in other areas of County	2	2
Increase parking duration of loading zones near high-rise buildings (Downtown Miami)	2	2
Designate one space on surface parking lots for commercial vehicles (Downtown Miami)	1	1
ITS applications to provide loading zone availability information	2	2
Increase turn radius at NE corner of NE 6th Street and NE 1st Avenue	1	1
Resurface NE 2nd Avenue (between NE 5th Street and I-395)	1	1
6th Street Slip Ramp	1	1
NW 25th Street intersection improvements	1	1
NW 12th Street flyover at NW 87th Avenue and intersection improvements	1	1
NW 117th Avenue connection to NW 41st Street and Turnpike	2	2

The above table indicates the rounded average value of project priority rankings based on 10 responses.

(1) Support:

1. Must happen
2. Moderate support
3. Low support

(2) Implementation Timeframe:

1. Short term (within next 3 years)
2. Medium term (3 – 10 years)
3. Long term (10+ years)