prepared for

Carlos A. Castro
District Freight Coordinator
Modal Development Office
FDOT District 6

prepared by

ATKINS, Member of the SNC-Lavalin Group

with

Caltran Engineering Group, Inc.
Transystems Corporation
Florida Transatlantic Holdings, LLC

Miami River
Freight Improvement Plan
Final Report

FM #437946-1-22-01 Contract C–9R48

March 2018

Miami River Freight Improvement Plan

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Executive Summary

The Miami River Freight Improvement Plan is one of several subarea freight studies being conducted by the Florida Department of Transportation - District 6 with the aim to enhance freight mobility in key districts of Miami-Dade County where freight and logistics operations are clustered. This study focuses on the subarea surrounding the western reach of the federally navigable section of the Miami River between NW 22nd Avenue and NW 36th Street where the shallow-draft marine shipping firms are situated (refer to **Figure 1**). A secondary study area was defined along the Downtown Lead rail spur which extends from South Florida Rail Corridor eastward along NW North River Drive and NW 23rd Street towards I-95 because of the freight activity associated with the adjacent industrial land uses. Another secondary study area was defined along the Miami River from NW 22nd Avenue to the river mouth, because of the connectivity to the ocean for marine shipping and two special studies included in the scope of services addressing the Miami River.

The study area street network situated within central Miami-Dade County is experiencing traffic growth and congestion and has other operational issues associated with truck movements and delivery staging. The purpose of the study is to address infrastructure and operational needs of the marine shipping community and surrounding industrial areas, and to identify improvements and actions that will increase access, enhance safety, preserve the existing transportation system, and improve freight flow in the region. The study researches, formulates and recommends a set of viable options to improve intermodal freight movement within the study area.

The study examines the existing and planned transportation infrastructure along the Miami River with an emphasis on how effectively the study area road network accommodates the existing and forecasted vehicular and truck traffic volumes. The transportation network was tested by applying the travel demand of growth scenarios using the regional travel demand model. Additionally, the study contemplated the interaction between freight and other modes of transportation. The study also included a River Capacity Analysis and a Short Sea Shipping Analysis.

The River Capacity Analysis created a simulation model of shipping movements on the river for existing conditions and for a growth scenario as well. That analysis determined that the river is operating at 50% of its capacity to move cargo, with substantial reserve capacity. The purpose of the Short Sea Shipping Analysis was to examine the potential of initiating a Container-on-Barge (COB) service between PortMiami and a proposed marine terminal on the Miami River. The analysis defined a concept, including operational, infrastructure, equipment, and vessel service requirements.

The study formulated a set of potential improvement actions centered around roadway, railroad, transit/bicycle/pedestrian, marine and intermodal modes, as well as a policy element. Recommendations were formulated through the review of other prior and relevant studies, roadway network analysis, the special studies, field reviews, and repeated outreach to key stakeholders in the study area, including the Miami River Commission and the Miami River Marine Group. This integrated approach was crucial in formulating the recommendations.

Proposed projects and actions were evaluated using a scoring matrix with weighted performance measures. Based on this analysis, relative cost, and ease of implementation, the plan recommendations were prioritized into three implementation time frames (short-, mid-, and long-term). Short-term projects are anticipated to fall within the next five years, mid-term projects between five and 10 years and long-term projects beyond 10 years. The list of recommended projects and actions follows.

Short Term (1 to 5 years)

Ranking	Project Name	Project Cost
1	Monitor implementation of ongoing "Iron Triangle" Study recommendations by FDOT.	N/A
2	Conduct transit circulator feasibility study to serve Palmer Lake and western Miami River corridor.	$50,000
3	Improve Miami River navigation channel signing and aids.	$150,000
4	Tunnel PD&E Study for Brickell Avenue Bridge	N/A
4	NW North River Drive railroad crossings.	Programmed
4	Upgrade private driveway rail crossings on NW North River Drive.	$300,000
7	Monitor NW 36th Street Corridor Planning Study	N/A
7	Improve signal coordination along NW 27th Avenue.	N/A
9	Route 36 extension to Dolphin Station.	N/A
10	Route 27 running time adjustments.	N/A
10	Route 32 running time adjustments.	N/A
12	Monitor and manage traffic signal time and coordination with bascule bridge operations along Miami River.	N/A
12	Install a Port of Miami River wayfinding sign system for NW North River Drive and NW South River Drive.	$50,000
12	NW 27th Avenue/NW North River Drive intersection.	N/A
12	Route 32 bus benches/shelters and lighting.	$150,000
16	NW South River Drive at NW 36th Street intersection	N/A
16	NW North River Drive at NW 36th Street intersection	N/A
18	Investigate potential FTZ warehouse sites or development as private sector lead.	N/A

Mid Term (5 to 10 years)

Ranking	Project Name	Project Cost
1	Develop truck staging area near NW 37th Avenue.	$1,650,000
2	Proposed ramps to and from the east on SR 112/Airport Expressway at NW 37th Avenue.	$750,000
3	Reconstruct NW South River Drive.	$4,500,000
3	NW North River Drive improvement.	$5,500,000
5	Access management along south frontage of NW North River Drive.	$450,000
6	Railroad crossing closures and repairs on Downtown Lead rail spur.	$500,000
7	Continue implementation of Miami River Greenway corridor.	$1,500,000
8	Local street improvements in industrial district north of NW North River Drive.	$4,250,000
8	Develop railroad intermodal ramp.	TBD
10	Explore development of a short sea shipping concept.	$150,000
11	Investigate bulkhead repair program utilizing SIS and other funds.	TBD

Long Term (10 or more years)

Ranking	Project Name	Project Cost
1	Develop truck travel center.	$8,500,000
2	Implement programmed bascule bridge maintenance and reconstruction projects.	N/A

1.0 Introduction

The Miami River Freight Improvement Plan is one of several subarea freight studies being conducted by the Florida Department of Transportation (FDOT) District 6 with the aim to enhance freight mobility in key districts of Miami-Dade County where freight and logistics operations are clustered.

1.1 Study Background

The study area street network situated within central Miami-Dade County is experiencing traffic growth and congestion and has other operational issues associated with truck movements and delivery staging. The purpose of the study is to address infrastructure and operational needs of the marine shipping community and surrounding industrial areas, and to identify improvements and actions that will increase access, enhance safety, preserve the existing transportation system, and improve freight flow in the region. The study researches, formulates and recommends a set of viable options to improve intermodal freight movement within the study area.

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1.2 Study Area

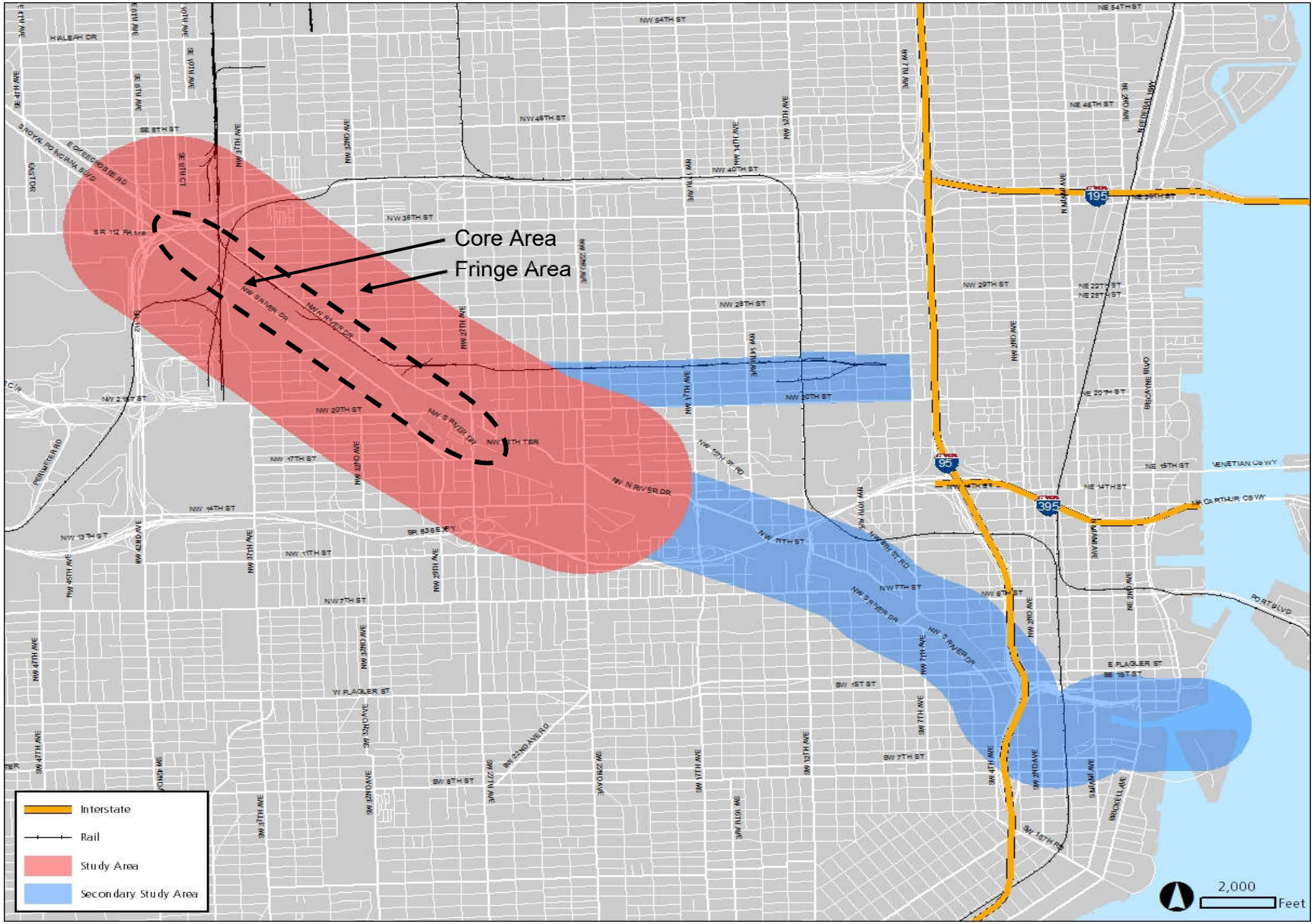
This study focuses on the subarea surrounding the western reach of the federally navigable section of the Miami River between NW 22nd Avenue and NW 36th Street where the shallow-draft marine shipping firms are situated. A secondary study area was defined along the Downtown Lead rail spur which extends from South Florida Rail Corridor eastward along NW North River Drive and NW 23rd Street towards I-95 because of the freight activity associated with the adjacent industrial land uses. Another secondary study area was defined along the Miami River from NW 22nd Avenue to the river mouth, because of the connectivity to the ocean for marine shipping and two special studies included in the scope of services addressing the Miami River. **Figure 1.1** on the following page displays the study area boundary.

1.3 Study Organization

This report is organized into five sections, summarized as follows:

- Section 1. Introduction: Describes the study background, study area, and report organization.
- Section 2. Existing Conditions: Details current conditions within the study area.
- Section 3. Purpose and Need: Sets out the reason for the study and the needs of the study area.
- Section 4. Capacity and Short Sea Shipping Analysis: Describes the special studies examining the shipping capacity of the river using a simulation model, and the proposal for a short sea shipping program in the form of container-on-barge operation.
- Section 5. Alternative Analysis: Presents the definition of study area growth scenarios and analysis of the transportation network for each scenario.
- Section 6. Freight Improvement Recommendations: Discusses the proposed improvements and actions, summarizes the evaluation and ranking process, and presents a prioritized set of recommendations.

Figure 1-1: Miami River Freight Plan Study Area



2.0 Existing Conditions Analysis

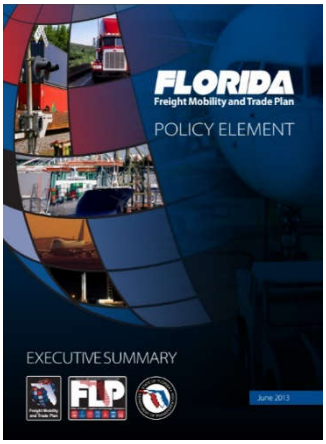
The objective of the existing conditions analysis is to assess current and planned infrastructure, land use, and environmentally sensitive areas prior to evaluating impacts on future freight improvements. The existing conditions analysis consists of: a synopsis of existing and ongoing freight related studies in the region; a list of programmed and long range priorities within the study area; an inventory of the existing infrastructure; traffic counts were collected to analyze vehicular and freight-related flow patterns; and environmental and socioeconomic conditions.

2.1 Review of Previous and On-going Studies

This section of the report summarizes various studies and reports relevant to the study area highlighting policies, key findings and recommendations. This study review addresses topics such as operational efficiency in goods movement, waterborne freight supply chain optimization, and infrastructure investments. This section of the report represents the first step toward identifying possible multimodal solutions for the corridor that will influence recommendations to improve freight mobility in the study area. The reviewed studies were:

- Freight Mobility Trade Plan, Policy Element (2013)
- Freight Mobility and Trade Plan, Investment Element (2014)
- Seaport and Waterways System Plan (2016)
- Florida Cruise Industry: A Statewide Perspective (2013)
- Southeast Florida Regional Freight Plan (2014)
- Miami-Dade County Freight Plan Update (2014)
- Miami-Dade County 2040 Long Range Plan (2014)
- Miami River Tunnel Feasibility Study (On-going, completion 2017)
- Miami River Greenway Action Plan (2001)
- Miami River Corridor Infill Plan (2002)
- PortMiami Master Plan 2035 (2011)
- Strategic Intermodal Systems Policy Plan (2016)
- Seaport Master Plan, Cargo Element (2011)
- Medley Freight Plan (On-going)
- Implications of Panama Canal Expansion on Southeast Florida Ports
- Medley Sub-Area Freight Study (2009)
- Miami River Corridor Economic Study (2008)
- Miami River Corridor Multi-Modal Transportation Plan (2007)
- Central Dade Transport Zone Study (2008)
- Palmer Lake Charrette Area Plan (2012)

Freight Mobility and Trade Plan (FMTP), Policy Element



Organization: FDOT

Date: June 2013

Link: http://www.floridaplanning.org/wp-content/uploads/2015/05/Freight-Mobility-and-Trade-Plan-COMPLETE.pdf

Summary: The policy element of the FMTP presents the objectives and strategies that will guide the programs, decisions, and actions of the FDOT, while informing the industry of freight-related decisions.

Objectives:

- Capitalize on the freight transportation advantages of Florida through collaboration on economic development, trade, and logistics programs.
- Increase operational efficiency of goods movement.
- Minimize costs in the supply chain.
- Align public and private efforts for trade and logistics.
- Raise awareness and support for freight movement investments.
- Develop a balanced transportation planning and investment model that considers and integrates all forms of transportation.
- Transform FDOT's organizational culture to include consideration of supply chain and freight movement issues.

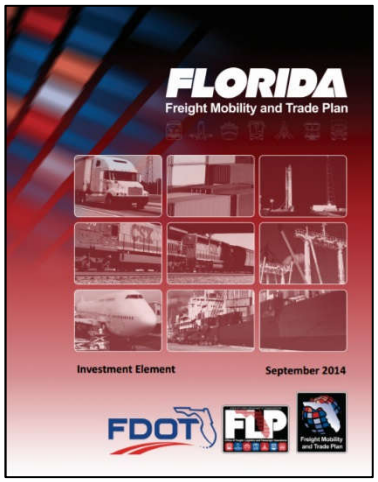
Key Findings and Recommendations Regarding Freight or Logistics:

- Only through continued strategic investment will Florida's multimodal freight system continue to answer future transportation challenges.
- FDOT is in the process of developing a statewide freight model with seaport simulations.

Key Regional Freight Implications:

- Projects and needs will be prioritized through the development of the Investment Element of the FMTP, which will be based on reaching out to freight stakeholders to gather specific project proposals.

Freight Mobility and Trade Plan (FMTP), Investment Element



Organization: FDOT

Date: September 2014

Link: http://freightmovesflorida.com/wp-content/uploads/2016/11/FMTP-Investment-Element_2014-09-11.pdf

Summary: The Investment Element of the FMTP builds upon the outcomes of the Policy Element. The Investment element established preliminary criteria based on the goals, objectives, and strategies developed during the Policy Element. A preliminary freight network, freight project definition, project prioritization process, a needs survey, project database, and project prioritization were also developed.

Objectives:

- Capitalize on the freight transportation advantages of Florida through collaboration on economic development, trade, and logistics programs.
- Increase operational efficiency of goods movement.
- Minimize costs in the supply chain.
- Align public and private efforts for trade and logistics.
- Raise awareness and support for freight movement investments.
- Develop a balanced transportation planning and investment model that considers and integrates all forms of transportation.
- Transform FDOT's organizational culture to include consideration of supply chain and freight movement issues.

Key Findings and Recommendations Regarding Freight or Logistics:

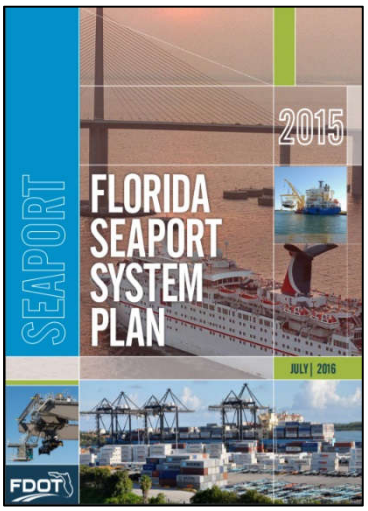
- Truck and rail are the dominant modes of transportation for the movement of goods in Florida.
    - Truck is the top mode for outbound, inbound, internal, and through freight movements.
    - Rail is second to truck, except for inbound movements where ship movements exceed rail in terms of weight.
- The Ft. Lauderdale/Miami area is identified as having high concentration of freight intensity.
- Ability to calculate travel times is vital to competitiveness.
- Rail tonnage has decreased by 38% from 2002-2011 (data not yet available for later years).
- Miami-Dade road segments comprise 15 of 20 statewide SIS highway bottlenecks.

- Roadways surrounding Port Everglades were also identified as bottlenecks.
- There are 26 project prioritization criteria, and a project can score up to 5 points per each criterion.
- There are 11 projects in FDOT District 6 that were identified as 'Very High Priority' for funding, including the PortMiami Tunnel, expansion of the Florida East Coast (FEC) Railroad, Hialeah Yards, and dredging and infrastructure improvements at PortMiami.

Key Regional Freight Implications:

- Florida's economic success is inescapably tied to freight activity.
- Maintenance and preservation are top priorities.
- Truck parking, permitted truck weight, and highway bottlenecks are top issues.
- A project will be defined as a freight project if it is on the Florida Freight Network and is either freight focuses, freight related, or freight impacted.

Seaport and Waterways System Plan – FDOT



Organization: FDOT

Date: July 2016

Link: http://www.fdot.gov/seaport/pdfs/2015%20Florida%20Seaport%20System%20Plan_Final.pdf

Summary: This plan details seaport and waterways conditions, challenges, trends, visions, goals, and areas of focus for the FDOT Seaport and Waterways Office. This plan also provides a historical view of the Florida Seaport System and insight into the economic contribution and partnerships for the seaport development, waterborne commerce, international trade, and cruise industry in Florida.

Objectives:

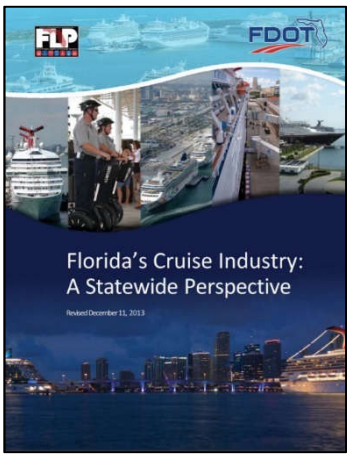
- Provide a history of the state seaport system.
- Provide seaport profiles for each of the 15 ports describing services, infrastructure, commodities, and trade partners.
- Analyze global, national, and statewide seaports, intermodal freight, along with industry statistics, trends, and conditions.
- Identify key issues impacting seaports and stakeholders.
- Summarize FDOT seaport related infrastructure investments and Florida's seaport Capital Improvement Programs (CIP).
- Summarize recent FDOT planning efforts and present focus areas and strategies to address seaport issues.

Key Findings and Recommendations Regarding Freight or Logistics:

- FDOT program focus areas are: seaport access enhancement, seaport capacity enhancement, seaport efficiency improvement, and waterborne freight supply chain optimization.
- PortMiami is the first Florida port to dredge to -50 feet, and features a direct connection to the Hialeah rail yard, and connection to the national rail system.

Key Regional Freight Implications: The near and long range plans for the FDOT Seaport Office are to continue to invest in facilities and processes that improve access, capacity, and efficiency at Florida's seaports.

Florida Cruise Industry: A Statewide Perspective



Organization: FDOT

Date: December 2013

Link: http://www.fdot.gov/seaport/pdfs/statewide-cruise-perspective.pdf

Summary: This report provides a statewide perspective on the cruise industry and future economic prosperity. The report assists in providing a framework for actions including engagement with cruise lines and cruise ports to ensure that Florida retains and enhances its longstanding position as the nation's leading cruise state.

Objectives:

- The findings will act as a catalyst for growth for the Florida cruise industry and statewide economy.
- Report on findings of the current cruise industry globally and locally.
- Provide implementation actions to be considered for further advancing the contribution to the cruise industry.

Key Findings and Recommendations Regarding Freight or Logistics:

- Decisions involving ports must consider passenger safety.
- Consider emission levels/proximity to Emission Control Areas (ECAs) for new projects.
- PortMiami: Cruise operations account for approximately 6% of port property over 7 cruise terminals, but require a good portion of the circulation roadway network and support property.
- A new cruise terminal is needed, along with an alternative method of baggage movement (beltway system), a walkway system, terminal complex, a new marketing strategy, and a detailed Master Plan for the new cruise terminals.

Key Regional Freight Implications:

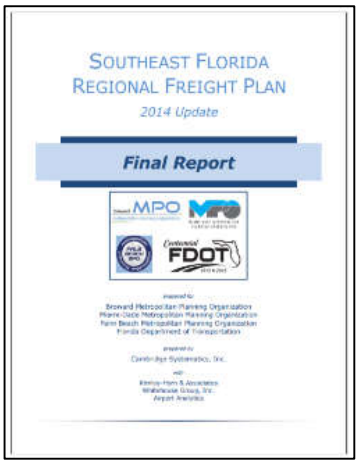
- Infrastructure investments such as two new berths with terminals and garages will be needed for PortMiami to maintain its title as Cruise Capital of the World.

Southeast Florida Regional Freight Plan

Organization: FDOT

Date: 2014

Link: http://www.browardmpo.org/images/WhatWeDo/SFRFPFINALREPORT.pdf



Summary: The plan provides an updated overview of the freight transportation system, presents an overview of key logistics infrastructure elements, identifies key state, national, and international developments and initiatives impacting the region, documents the economic impacts of the freight industry in Southeast Florida, presents a current list of prioritized freight needs, and provides strategies and key next steps.

Objectives:

- Provide key logistics of infrastructure elements.
- Identify state, national, and international development initiatives impacting region.
- Document economic impacts of freight industry in Southeast Florida.
- Present prioritized list of freight needs.
- Provide strategies and key next steps.

Key Findings and Recommendations Regarding Freight or Logistics:

- Truck parking is and will remain an issue.
- There are major missing links in Southeast Florida that reflect significant investment necessary to help complete the continuity of the freight network.
- Not many high-profile projects are planned for PortMiami as the tunnel and dredging are complete or near completion.
- Improvements for PortMiami focus on operations and maintenance of existing facilities to enhance benefits of large investments.
- Investments should be leveraged through public private partnership.

Key Regional Freight Implications:

- Truck parking must become a focal point within the region's identity as a global logistics hub.
- Investment needs to be made to fill in the missing links in the freight network.

2014 Miami-Dade County Freight Plan Update

Organization: Miami-Dade TPO

Date: August 2014

Link: http://www.miamidadetpo.org/library/studies/freight-plan-update-2014-08.pdf

Summary: This study provides a list of prioritized needs which have been incorporated in to the Miami-Dade 2040 LRTP, the Southeast Florida Regional Plan, the Southeast Florida Regional Freight Plan, and the Florida Freight Mobility and Trade Plan.

Objectives:

- Document key challenges to an efficient and competitive freight system.
- Identify new freight projects.
- Establish recommended priorities.
- Position Miami-Dade for the future to compete for increases in the trade industry.
- Provide input to the 2040 Miami-Dade LRTP and the Regional Freight Plan.

Key document findings and recommendations regarding freight or logistics

- Even with recent investments at PortMiami Tunnel and NW 25th St Viaduct, significant needs remain such as maintenance and improvements to existing infrastructure and new facilities.
- Major missing links in the freight system include: Gratigny Parkway, SR 826/SR 836 interchange, Golden Glades interchange, NW 25th Street Extension to the Homestead Extension of Florida's Turnpike (HEFT), and US 27 corridor.
- Critical investments are in place or under construction to modernize and advance the region.
- Miami-Dade County is well positioned for continued growth in freight related industries.
- Freight set aside included in the 2040 LRTP will help promote critical freight investments.
- Investment element of the state's Freight Mobility and Trade Plan should further advance needs of statewide significance.
- Formal adoption of the national freight highway network should also promote freight investments as Congress works to reauthorize the federal transportation bill.
- Key short-term and ongoing strategies to advance Miami-Dade County's freight program are as follows:
    - Promote economic contributions of freight and logistics industry.
    - Maximize use of available funding programs.
    - Leverage investments through public private partnerships.

- Evaluate the effectiveness of the freight system.
- Engage the freight community in the identification of freight bottlenecks.
- Ensure trade and logistics remains a targeted industry.
- Support work force development programs.
- Continue to develop, test and expand pilot program.
- Monitor intermodal logistics center developments and partner as appropriate.
- Support advancement of solutions for missing freight links.
- Promote regional freight mobility.

Key Regional Freight Implications: 2014 Miami-Dade County Freight Plan Update has allowed a consolidation of previous regional and corridor/sub-area freight plans and policy studies to continue to serve the region's major economy. It continues to prepare the region for its prominent role in national and international trade, and provides strong integration of freight needs into the overall regional transportation plan.

Miami-Dade 2040 Long Range Transportation Plan

Organization: Miami-Dade MPO

Date: October 2014

Link: http://miamidadempo.org/library/plans/2040-long-range-transportation-plan-final-2014-10.pdf

Summary: This study was a comprehensive transportation infrastructure plan for Miami-Dade County prepared in response to federal planning regulations, to guide funding of the region's transportation system. The 2040 LRTP serves as an instrument to identify the needed improvements to the transportation network, and provides a long-term investment framework to address current and future challenges.

Objectives:

- Document long-range transportation needs for the region.
- Establish goals and objectives to guide transportation investment.
- Examine alternative strategies for addressing transportation needs.
- Estimate financial resources available for system maintenance and improvements.
- Adopt a plan of prioritized transportation system improvements that can be implemented with anticipated financial resources.
- Document opportunities provided for public input into plan development.

Key document findings and recommendations regarding freight or logistics:

Freight movement is emphasized in the 2040 LRTP. The 2014 Miami-Dade Freight Plan is integrated within the LRTP cost feasible plan and includes a variety of freight related improvements identified to improve freight mobility and provide benefits to non-freight travel. The plan commits to improvements that will primarily improve freight movement (Freight Only Projects) will be funded with a predetermined financial set aside devoted to Freight Only Projects.

- Freight infrastructure needs are grouped as projects that will improve both freight and passenger vehicle movements, and are incorporated into Priorities I-IV and unfunded projects.
- 19 freight only projects are identified and prioritized, based on facility type, adjacent freight center density, truck ADT, project cost, attraction to general traffic, and type of project.
- Identifies truck parking as a critical issue to facilitate general regional economic and population growth and recognizes that it is necessary accommodate truck parking needs over the planning horizon. Key parking strategies are identified.
- Document opportunities provided for public input into plan development.
- Continued dialogue with the freight industry regarding truck parking needs and developments.

- Maintaining a current inventory of truck parking sites for future truck parking, based on appropriate criteria that is sensitive to community needs and trucking industry needs.
- Identifying land suitable for truck parking and to potentially acquire such properties when possible.
- Coordinating land development and other truck parking issues with local government to minimize impacts.

Key Regional Freight Implications: The Miami-Dade 2040 Long Range Transportation Plan has fully integrated the findings of the 2014 Miami-Dade County Freight Plan Update and, as such, has ensured that the region is aggressively and proactively working to ensure Miami-Dade County's prominent place in the global economy.

Miami-Dade TPO Miami River Tunnel Feasibility Study

Organization: Miami-Dade TPO

Date: Ongoing, completion in June 2017.

Link: Not currently available.

Summary: This study was commissioned by the TPO to investigate the technical feasibility of developing a tunnel facility that would connect the corridors of Brickell Avenue and Biscayne Boulevard on opposite sides of the Miami River near its mouth. The study has identified several potential alignment configurations which are technically feasible and are being evaluated to arrive at a ranking of options as part of the study's recommendations. The study report document is currently in final production and will be released by the TPO when ready.

Objectives:

- Compile relevant study area information.
- Develop potential tunnel alignment concepts.
- Review and refine tunnel alignment concepts.
- Prepare an evaluation of alternatives to include costs and implementation factors.
- Develop recommendations and next steps.

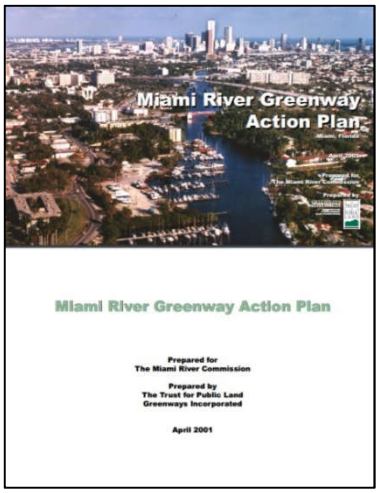
Key Findings and Recommendations Regarding Freight or Logistics:

- The study corridor is a highly constrained setting with relatively narrow street rights-of-way, horizontal and vertical alignment restrictions, and a number of other constraints and key considerations.
- A range of tunnel options and permutations were systematically defined and reviewed for workability.
- A final group of technically feasible alignment options were refined and evaluated.
- The study when completed will formulate recommendations and next steps.

Key Regional Freight Implications:

- Development of a tunnel in the study corridor could lessen the frequency of openings at the existing Brickell Avenue bridge, lessening a constraint on the movement of waterborne commerce and recreational vessels.

Miami River Greenway Action Plan



Organization: City of Miami

Date: 2001

Link: http://www.miamirivercommission.org/PDF/greenway.PDF

Summary: This plan develops a system of promenades and bicycle and pedestrian paths along the River and Biscayne Bay linking parks, neighborhoods, and activity centers along both sides of the Miami River.

Objectives:

- Provide specific recommendations and implementation strategies that will hasten physical improvement throughout the river corridor making the corridor more accessible.
- Promote marine and industrial shipping activity.
- Provide new recreational amenities to make the river a destination landscape.

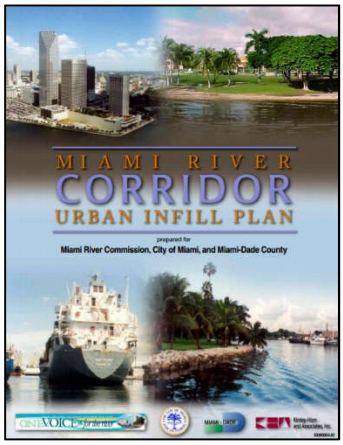
Key Findings and Recommendations Regarding Freight or Logistics:

- Supported dredging of the river.

Key Regional Freight Implications:

- Supports the growth of shipping and marine industries.
- Improves navigational and safety code enforcement on the river.

Miami River Corridor Infill Plan



Organization: Miami River Commission, City of Miami, Miami-Dade County

Date: September 2002

Link: http://www.miamirivercommission.org/PDF/UIP-Final.pdf

Summary: This is a strategic plan to guide the Miami River Commission's efforts to promote the Miami River corridor as a multi-modal transportation corridor. The intention of this plan is to provide one voice for the future of the river through vision, investment, transportation, neighborhoods, environment, and implementation.

Objectives: To establish a unified vision for the future development of the Miami River Corridor and:

- Promote and protect river interests.
- Encourage responsible redevelopment within the Miami River Urban Infill Area.
- Encourage public/private investment along the river.

- Expand public awareness of the river.
- Improve public perception of the river.
- Define and protect the quality of life along the river.

Key Findings and Recommendations Regarding Freight or Logistics:

- Some zoning and comprehensive plan designations may conflict with actual use of land (for example, water related industrial zoning placement).
- Maritime commerce is competing for land with other land uses.

Key Regional Freight Implications:

- Recommends the pursuit of a water-related industrial overlay.
- Recommends that the local governments and marine industry explore the creation of a state of the art customs inspection station, centralized freight warehouse, and consolidation facility in the upper river.
- Recommends a marine education facility on or near the river.

PortMiami Master Plan 2035

Organization: Miami-Dade County

Date: November 2011

Link: https://www.miamidade.gov/portmiami/library/ 2035-master-plan/complete-master-plan.pdf

Summary: This plan was a planning tool used to update the PortMiami Master Plan sub- element of Miami-Dade County's Comprehensive Development Master Plan (CDMP). By incorporating a market analysis for both cruise and cargo and a financial analysis of capital infrastructure, this master plan helps to better understand the direction and guidance of the port.

Objectives:

- Increase cargo and passenger throughput by adding services, upgrading infrastructure, enhancing efficiency, and increasing berthing capacity.
- Provide a phased implementation plan allowing for development depending on additional changes in the global market.
- Establish long and short-term capital programs.
- Achieve consensus among the political leadership on the long-term vision for the port.
- Provide sound public need and justification to support future environmental permits.
- Provide a potential planning for use in seeking grants.

Key Findings and Recommendations Regarding Freight or Logistics:

- The port needs to develop intermodal ties with the mainland if it wants to continue its sustainable growth track to serve the South Florida community. This includes additional means of ingress and egress through the tunnel, improvements to access via rail and off-site intermodal container yards.
- It is recommended that the port continue to work in conjunction with the Flagler Property and other involved parties including the FEC to market this site to carriers, developers, and DC operators.
- Sea level rise is a threat to all coastal communities and infrastructure.

Key Regional Freight Implications:

- Creation of port rail access to increase market opportunities.
- Creation of distribution centers for rail and road movements.

Strategic Intermodal Systems (SIS) Policy Plan

Organization: FDOT

Date: March 2016

Link: http://www.fdot.gov/planning/ftp/SIS-PolicyPlan.pdf

Summary: This plan establishes the policy framework for planning and managing Florida's Strategic Intermodal System (SIS) planning and investments. The primary emphasis of the plan is FTP implementation. The SIS is the state's highest priority for transportation capacity investments.

Objectives:

- Interregional Connectivity: Ensure the efficiency and reliability of multimodal transportation connectivity between Florida's economic regions and between Florida and other states and nations.
- Intermodal Connectivity: Expand transportation choices and integrate modes for interregional trips.
- Economic Development: Provide transportation systems to support Florida as a global hub for trade, tourism, talent, innovation, business, and investment.

Key Findings and Recommendations Regarding Freight or Logistics:

- The current and emerging trends impacting moving people and freight are: the growing population and economy, changing demographics, growing urban centers, growing economic regions, diversifying the economy, emerging global hubs, emerging technologies, and the continued importance of military, defense, and homeland security.
- The recently restored on-dock intermodal freight rail service connects PortMiami to 70% of the US population in four days or less.
- The recently completed PortMiami Tunnel provides a direct connection to I-395.
- The redirection of freight traffic from downtown Miami to the PortMiami tunnel has improved traffic flow in downtown Miami.

Key Regional Freight Implications:

- Urban congestion impedes interregional travel on many SIS corridors. Therefore, innovative approaches are needed to maximize the use and efficiency of the system.
- More quality options for interregional connections are needed across the state. Strategic efforts are needed to close key connectivity gaps.
- The policy plan supports public and private efforts to expand trade and logistics activity in Florida, aligning with the FMTP.

Seaport Master Plan (Cargo Element)

Organization: Miami-Dade County

Date: November 2011

Link: http://www.miamidade.gov/portmiami/library/2035-master-plan/cargo-sec-5.pdf

Summary: This section of the PortMiami Master Plan takes a closer look at the cargo and goods movements of the port as well as projects containerized cargo throughput through 2035.The forecasts are used as the baseline for the business plan and physical master plan efforts for the port to ultimately determine future annual throughput capacities and facility demand.

Objectives:

- Document movement of goods through PortMiami.
- Provide a forecast of goods movement through 2035.
- Analyze off-port and on-port cargo demand and capacity.

Key Findings and Recommendations Regarding Freight or Logistics:

- PortMiami handles over seven million tons of waterborne containerized cargo annually.
- Peak tonnage movement was in 2005 (9.5 million), but have since declined due to economic factors and the recession adversely affecting container growth. Relocation of carriers to competing ports, specifically to Port Everglades, have contributed to the decline.
- However, 2010 experienced an increase of 5% from 2009, which was the first year to year improvement in five years.
- Latin American cargoes typically account for 45-50% of annual tonnage and Northern European 10-15%.
- Asian cargoes have increased from 15-30%, while Mediterranean, Middle East, and African cargoes have been declining to less than 10%.
- PortMiami is heavily vested in an export market serving consumer goods and supplies that replenish the cruise and tourism industries to Latin America and the Caribbean.
- Low scenario container forecast is 3% growth from 2010.
- In order to increase density of on-port cargo terminal capacity, significant amounts of investments are required, including rail mounted gantry cranes (RMG), and other technology to minimize dwell times.
- The three main distribution markets in Florida are Miami-Dade/Broward counties, I-4 corridor (Tampa-Lakeland-Orlando), and the Greater Jacksonville Area.
- A Hialeah distribution center location with cargo moving via PortMiami offers the total logistics least cost routing per box to serve the Florida retail and wholesale market.
- It is recommended to expand cargo area along the southwest corner edge by approximately 13.46 acres to provide a platform for future cargo operations and compensate for loss of cargo yard reallocated to cruise.

- Based on cargo market demand projections, additional cargo land will be required in 2023 or 2030, depending on cruise alternatives. New berths for cargo will be required in 2029.

Key Regional Freight Implications:

- The port's volume has decreased due to the competing Port Everglades.
- PortMiami can compete with Central and North Florida DC locations to serve Florida through operations in Hialeah and Medley.

Town of Medley Freight Plan

Organization: FDOT District 6

Date: In progress

Link:http://miamidadempo.org/library/presentations/Freight-Transportation-Advisory-Committee/town-of-medley-freight-plan-2016-10-12.pdf

Summary: The purpose of the plan is improve freight movement and circulation within and around Medley's existing transportation system. The study assesses existing conditions, identifies existing infrastructure, collects and analyzes traffic and data, and documents stakeholders' input. The end products are the identification of improvements, conceptual designs, purpose and need, and program requirements.

Objectives:

- Improve freight movement and circulation around Medley's existing transportation system.
- Investigate freight corridors within Medley area.
- Develop a plan of viable alternatives to enhance freight connectivity and minimize conflicts.

Key Findings and Recommendations Regarding Freight or Logistics:

- Medley is a prime location for industrial development with a high concentration of industrial and freight-logistic facilities.
- Congestion and missing roadway connections are high, which causes impacts on freight mobility throughout the town.

Key Regional Freight Implications:

- Medley is essential to South Florida's economic prosperity as it is home to many warehouse and product distribution centers with a location close to major freight logistics facilities.

Implications of Panama Canal Expansion on Southeast Florida Ports

Organization: FDOT District 6

Date: October 2015

Link: N/A

Summary: This study analyzed the implications of the Panama Canal Expansion on PortMiami and PortEverglades. The study explored the challenges and opportunities, unique advantages of these locations, and what the ports needed to do to be successful in capturing the new market that will shift from the West Coast to the East Coast once the canal expansion is completed.

Objectives:

- Report on the status of PortMiami and Port Everglades.
- Evaluate the Implications of Panama Canal Expansion.
    - Freight shifts from east to west coast.
    - Transshipment opportunities.
    - Port preparedness.
- Research strategies of competing ports.
- Outline the next steps for Southeast Florida.

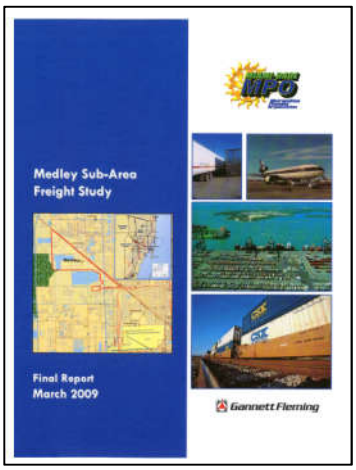
Key Findings and Recommendations Regarding Freight or Logistics:

- The region should invest in international distribution centers. The ability to provide the shipping boxes back to steamship lines helps promote port competitiveness.
- Truck parking and driver shortage remains a concern. The region has had difficulty attracting drivers due to large consumer market and small manufacturing sector. Truck parking, service centers, and driver availability should become a focal point.
- New and existing capacity for industrial use (such as for container management) should be preserved and protected.

Key Regional Freight Implications

- A port with northbound traffic could help with balancing the loads for trucking.
- A gap exists between what southeast Florida has today, in terms of available land for ports and terminals, and demand in the coming years for available land for container management. A new warehouse with increased distribution center capacity is needed within the region or in nearby, adjacent communities.

Medley Sub-Area Freight Study



Agency: Miami-Dade TPO

Adoption Date: March 2009

Link: http://miamidadempo.org/library/studies/medley-sub-area-freight-study-final-report-2009-03.pdf

Summary: This study examined the opportunities to improve infrastructure to meet the growing demand on the freight system in the Medley area. Medley was selected as a sub-area study because of its relatively concentrated degree of freight activity and its proximity to key facilities such as Miami International Airport (MIA). With a high concentration of warehouses and distribution centers, it is experiencing growing constraints as freight volumes continue to outpace system improvements – maintenance and capacity.

Objective: To identify Medley sub-area freight issues and needs and to make associated recommendations. This included transportation improvements and other non-infrastructure actions as appropriate.

This information was to be incorporated into the county-wide Miami-Dade Freight Plan as one of several plan inputs to help set the long-range freight direction for the County.

Key Findings and Recommendations Regarding Freight or Logistics:

The study found that Medley's existing infrastructure required additional investment for improved pavements, traffic signals, as well as intersection improvements and road widening projects. Reported opportunities to improve freight flow in the area included:

- Improving roadway conditions, both in terms of maintenance and geometrics, for better truck operations.
- Installing signing and wayfinding focused on truck operations.
- Increase capacity through selected roadway widening.
- Examine intermodal connectivity opportunities.

Key Regional Freight Implications

Medley's strategic advantage is access to the road system and other modes of transportation, making it an area of particular importance for intermodal connectivity. Safety and security is central to the business of Medley's freight stakeholders. Some of their concerns include improved lighting and signing and truck parking.

The value of this plan would be in potential application of freight improvement strategies to other subareas within the region. Findings from this and other regional or corridor studies could be compiled to be a compendium of best practices and lessons learned.

Miami River Corridor Economic Study

Organization: Miami River Commission

Date: April 2008

Link:
http://www.miamirivercommission.org/PDF/EconomicAnalysisoftheMiami%20River42808.pdf

Summary: A review of several economic studies and other research documents published since 1990 relevant to the Miami River economy.

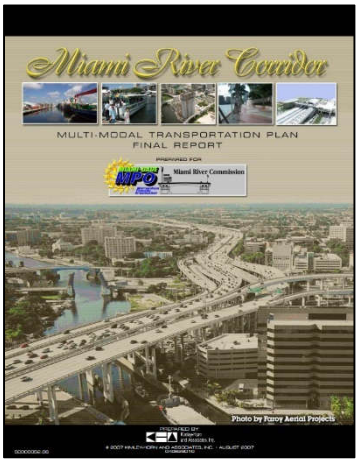
Objectives: Detail the significance of the Miami River economy.

Key Findings and Recommendations Regarding Freight or Logistics:

- In 2000, it was determined that the non-shipping industry had annual sales about equal the sales of the shipping industry.
- Waterborne commerce peaked in the mid 1990s with approximately 700,000 short tons annually. However, there was a declining trend towards the end of the decade.
- Foreign trade accounts for most of the commerce through Miami River Port (approximately 75%).
- Domestic trade has been declining since the 1970s.
- Mega yacht business important to the economy because of its size, growth, and source of high wage jobs.

Key Regional Freight Implications: The Miami River economy includes more than just the shipping industry; it also contains boat manufacturing and repair, commercial boating, commercial fishing, tour boats, and boats that serve the cruise industry and mega yachts.

Miami River Corridor Multi-Modal Transportation Plan



Organization: Miami-Dade MPO, Miami River Commission

Date: August 2007

Link: http://www.miamidadetpo.org/library/studies/miami-river-corridor-multi-modal-transportation-plan-final-report-2007-08.pdf

Summary: Analyzes transportation network on and along the corridor.

Objectives:

- Summarize existing planned improvements.
- Recommend new multi-modal projects to improve access, mobility, and livability along the river.
- Evaluate the Miami River as a potential facility within FDOT's SIS.

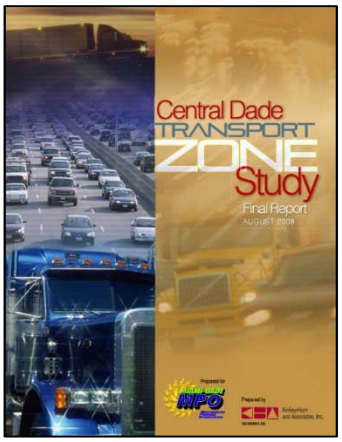
Key Findings and Recommendations Regarding Freight or Logistics:

- Approximately $430 million in infrastructure improvements planned through 2030.
- The 24 shipping terminals along the waterway are compliant with the Federal Maritime Security Act and certified by United States Coast Guard (USCG).
- Shipping terminals trade with over 100 Caribbean ports of call, which are not serviced by the large ships that access the PortMiami.
- "Special niche" port with shallow 15' draft, "foster[ing] its survival as a port amid an otherwise consolidating shipping industry".
- Freight infrastructure improvements are needed, with the targets extending from NW 36th Street near the South Florida rail Corridor (SFRC) southward across the river towards the Miami Intermodal Center (MIC).
    - 80 – 170 acres currently vacant.
- Recommendations:
    - Establish customs freight forwarding center.
    - Establish state-of-the-art cargo handling facility.
    - Link freight connectivity between MIA and PortMiami River by transporting freight via a secured rail connector.
    - Implement truck depot within the Upper River section.
    - Reserve land for water-related marine industrial uses in the Upper River section.

Key Regional Freight Implications:

- Freight Improvement: Implementation of the Short Seas Shipping Plan, which transports cargo containers from the PortMiami to a new facility in the PortMiami River where the containers would be transferred to trucks or rail. Potential sites include:
    - (1) Vacant 8-acre parcel east of NW 37th Avenue.
    - (2) West of South Florida Rail Corridor Crossing.
    - (3) Public right-of-way adjacent/beneath proposed Metrorail.
- Recommends a comprehensive plan for the areas at the west end of the Miami River to modernize and expand the River's marine industry.

Central Dade Transport Zone Study



Organization: Miami-Dade MPO

Date: August 2008

Link: http://www.miamidadetpo.org/library/studies/central-dade-transport-zone-final-report-2008-08.pdf

Summary: This report was commissioned to identify potential solutions for freight movement within the central region of Miami-Dade County. The study limits extend from PortMiami to the east to the Warehouse District to the west.

Objectives:

- Identify major obstacles to efficient movement of freight.
- Identify possible improvements to the existing infrastructure.
- Identify optional methods of moving freight.
- Identify intelligent transportation systems (ITS) solutions to improve utilization of freight facilities.

Key Findings and Recommendations Regarding Freight or Logistics:

- The freight generators of PortMiami, PortMiami River, Miami International Airport, and the Warehouse/Industrial District in Doral lead to a significant amount of freight traffic through the roadway network.
    - Leads to traffic and congestion.
    - Negatively impacts freight movement.
- Major roadways experiencing at or near capacity conditions during much of the daytime; typical off-peak hours (9:00 AM to 4:00 PM) were not evident in this study.
- Implement Short Sea Shipping.
- Two sites identified for truck/intermodal freight facilities:
    - 9-acre site at southeast corner of NW 36th Street and NW 37th Avenue.
    - 63-acre site at southwest corner of NW 41st Street and HEFT (located outside UDB).
- Spread freight activity to off-peak period.

Key Regional Freight Implications:

- Addresses need to develop strategies to encourage freight activities during night times and to provide freight infrastructure that will allow access to increased roadway capacity and increased freight mobility.

Palmer Lake Charrette Area Plan

Organization: Miami-Dade County, Sustainability, Planning and Economic Enhancement Department

Date: February 2012

Link: http://www.miamidade.gov/planning/small-area-studies-palmer-lake.asp

Summary: Formulated a future development plan for the Palmer Lake District, which is not binding as a land use regulation pending further government action.

Objectives:

- Formulate recommendations for long-range policies for the redevelopment of the study area.
- The intent is that plan recommendations be implemented as redevelopment naturally occurs or as property improvements become obsolete economically and are replaced.

Key Findings and Recommendations Regarding Freight or Logistics:

- Study recognizes the presence of a variety of uses that require direct access to the Miami River including cargo shipping, yacht manufacturing and repair, salvage operations, and other related uses.
- All uses currently permitted in this area should continue to be allowed and expanded.
- NW 37th Ave. should be extended south from NW North River Drive, across the river, and connecting with NW South River Drive at NW 28th St. The report notes that this would be a lift bridge unless the study of the existing rail crossing of the river is determined by a public decision-making process to be a fixed low-level bridge.
- The report also encourages the provision of multimodal freight services between the river port terminals and Miami International Airport, PortMiami, and freight railroads.

Key Regional Freight Implications:

- The development of the NW 37th Ave. river crossing would relieve the "Iron Triangle" intersection complex (NW 36th St./Okeechobee Rd./LeJeune Rd.) of traffic seeking to connect between NW North River Drive and NW South River Drive, and would enhance the connectivity between river-oriented land uses along both banks of the Miami River.
- Preserving marine-oriented land uses and activities along both sides of the Miami River was recognized as an important commitment towards preserving the vitality of the "working river".
- Enhancement of freight connectivity between the shipping activity of the upper river and the key regional transportation hubs and services was acknowledged as a future contribution to the livelihood of Miami River freight profile.

2.2 Programmed and Planned Improvements

The next step in the study process is to review improvement projects developed by local, regional, and statewide agencies to determine their possible relationship to the Miami River study area. This ensures consistency and coordination of proposed study recommendations to existing local, regional and statewide transportation plans.

TIP and LRTP

The Miami-Dade Transportation Improvement Program (TIP) and the 2040 Long Range Transportation Plan (LRTP) includes information regarding programmed and planned multimodal improvement projects along the Miami River study area. The current TIP covers the period from October 1, 2016 through September 30, 2021, and was approved by the TPO governing Board on May 19, 2016. A summary of the projects within the Miami River study area and in the TIP are highlighted in **Table 2.1,** and those in the 2040 LRTP are highlighted in **Table 2.2.** Note that some of the projects do not have funding in the current TIP, or are otherwise "active" with no construction date noted. Some projects in the 2040 LRTP did not have identified priorities.

Table 2.1: Study Area TIP Projects

Facility	From	To	Description	Const. Year	Funding
SR 90/SW 7th St/SW 8th Street	Brickell Avenue	SR 9/SW 27th Avenue	PD&E/EMO Study	-	$0
SR 90/SW 7th Street	SR 9/SW 27th Avenue	SR 5/Brickell Avenue	Pedestrian safety improvement	2018	$802,000
SR 5/Brickell Avenue	S of SE 25th Road	SE 4th Street	Rigid pavement rehabilitation	-	$0
South Miami Avenue	15th Road	5th Street	Roadway improvements	-	$0
Miami Avenue Bridge Over Miami River	-	-	Bridge deck replacement	-	$0
SR 9A/I-95	US-1/South Dixie Highway	S of SR 90/ SW 8th Street	PD&E/EMO study	-	$6,700,000
SR 968/SW 1st Street	Miami River (Bridge #870660)	-	Bridge replacement	2018	$91,964,000
SR 968/W Flagler Street	West 14th Avenue	West 2nd Avenue	Flexible pavement Reconstruct	2018	$400,000
SR 933/NW 12th Avenue	SW 22nd Street	NW 8th Terrace	Landscaping	2017	$1,028,000
SR 836/I-95 Interchange Ramps	NW 17th Avenue	I-95 (MDX)	Interchange improvement	2018	$207,900,000
SR 9/NW 27th Avenue	At NW 17th Street	-	Intersection improvement	2018	$444,000
SR 9/NW 27th Avenue Over Miami River Bridges 870731 & 870763	-	-	Bridge repair/ rehabilitation	2021	$4,485,000
NW South River Drive	NW 31st Street	Tamiami Swing Bridge	Widen to 3 lanes	2017	$8,206,000

Facility	From	To	Description	Constr. Year	Funding
Tamaimi Canal Bridge	-	-	Bridge replacement	2017	$1,000,000
Palmer Lake Bridge	-	-	Bridge replacement	2017	$3,000,000
SR 25/ Okeechobee Rd	W of SE 7th Avenue	N of NW 36th Street	Resurfacing	2018	$3,788,000
SR 948/NW 36th Street	W of Lee Drive	E of Okeechobee Road	Resurfacing	-	$0
SR 90/US-41/ Brickell Avenue Over Miami River Bridge # 870759	-	-	Bridge painting	2018	$5,499,000
SR 90/US-41/ SR 5/US-1/ Brickell	N of SE 5th Street	SE 3rd Avenue	Resurfacing	-	$0
SR 5/Biscayne Blvd	SE 3rd Avenue	SE 2nd Street	Resurfacing	2017	$1,223,000
SR 5/SE 2nd Avenue	SE 2nd Street	SE 4th Street	Resurfacing	2017	$1,558,000
SR 970/ Downtown Distributor	At I-95 NB to SR 970 EB Bridge	-	Bridge painting	2017	$171,000
City of Miami - Metromover Station Access Improvements	-	-	Sidewalk	2018	$392,000
SR 925/NW 3rd Court & NW 3rd Avenue	NW 1st Street	NW 8th Street	Resurfacing	2020	$11,871,000
SR 7/NW 7th Avenue	NW 8th Street	NW 36th Street	Flexible pavement reconstruct	2018	$1,200,000
Overtown Greenway Along NW 11th St	NW 7th Avenue	E of NW 12th Avenue	Bike path/trail	2018	$838,000

Facility	From	To	Description	Constr. Year	Funding
SR 933/NW 12th Avenue Over Miami River Bridge # 871005	-	-	Bridge repair/ rehabilitation	2019	$598,000
SR 836	NW 62nd Avenue	I-95/I-395	Infrastructure modifications for open road tolling east section	2016	$0
SR 823/NW 57th Avenue	West 19th Street	West 23rd Street	Add lanes and reconstruct	-	$0
SR 823/NW 57th Avenue	West 23rd Street	West 46th Street	Add lanes and reconstruct	-	$0
NW 37th Avenue	North River Drive	NW 79th Street	Widen to 5 lanes	2017	$17,528,000
Miami Intermodal Center Capacity Improvement	-	-	Rail capacity project	2017	$9,999,000
NW North River Drive	Mainline (Tri-Rail) Downtown Lead	-	Two railroad crossings repair and rehabilitation	-	-

Table 2.2: 2040 LRTP Projects in the Study Area

Facility	From	To	Description	Priority Project
M-Path GreenLink (short-term improvements)	SW 67th Avenue	Miami River Greenway	Trail improvements	1
M-Path GreenLink (long-term improvements	SW 67th Avenue	Miami River Greenway	Trail improvements	3
M-Path/Overtown Greenway	North of Miami River	-	Trail improvements	4
Miami River Greenway (complete missing segments)	NW 12th Avenue	SE 2nd Avenue	Trail improvements	1
Overtown Greenway (except portion between NW 3rd and 7th Avenue)	Miami River Greenway	Museum Park	Trail improvements	3
East of Little Havana	Greenways/ South River Drive	SW 12th Avenue to J. Marti Park	Pedestrian facility improvements	1
SW 1st Street	SW 5th Avenue	SW 2nd Avenue	Bicycle facility improvements	-
Miami Ave; SW 2nd Ave; SW 1st St; Flagler St; NW 7th Ave bridges over Miami River	-	-	Advanced bridge closing signs/ rerouting information signs	1
Flagler Street	NW 2nd Avenue	NW 24th Avenue	Bicycle facility improvements	-
East-West Corridor (Flagler Enhanced Bus)	Miami Downtown Terminal	FIU-MMC (SW 112th Ave)	Incremental improvement on PTP corridor	-
NW 7th St between NW 72nd Ave and NW 7th Ave	-	-	Signal timing optimization	1

Facility	From	To	Description	Priority Project
SR-836 (Dolphin) Improvements	NW 57th Avenue	NW 17th Avenue	Mainline widening and interchange improvements	1
SR 836/I-95 Interchange Ramps	NW 12th Avenue	I-95	Modify interchange	1
Miami River Greenway (complete missing segments)	NW 36th Street	NW 12th Avenue	Trail improvements	2
NW 22nd Avenue	SW 22nd Street	Airport Expressway/ SR 112	Bicycle facility improvements	4
NW 27th Ave/SW 27th Ave from SW 8th St (Tamiami Trail) to NW 36th St	-	-	Median/access improvements	Priority was not Identified
Miami River Intermodal Center Capacity Improvement Study	-	-	Double track remaining single track of Tri-Rail near Miami River	1
Miami Intermodal Center (MIC) Connection to NW 37th Avenue	Miami Intermodal Center (MIC)	NW 37th Avenue	New 2 lane road construction	1
Miami River Intermodal Center Capacity Improvement Study	-	-	Double track remaining single track of Tri-Rail near Miami River	1
MDX Connect 4 Express	Central Miami-Dade County	North Miami-Dade County	New expressway connecting SR-836, SR-112, SR-924, and SR-826	4
NW 36th Street	NW 42nd Avenue (LeJeune)	US-27 (Okeechobee)	Replace bridge and add lanes	1
NW South River Drive	NW 36th Street	-	Improve timing and coordination between South River Dr and Le Jeune Rd.	-

Facility	From	To	Description	Priority Project
NW 36th Street	East Drive	N Le Jeune Road	Pedestrian facility improvements	4
W Okeechobee Road	NW 103rd Street	W 18th Avenue	Pedestrian facility improvements	3
US-27 (Okeechobee)	NW 42nd Avenue (Le Jeune)	-	Improve access at intersection	3
NW 37th Avenue	North River Drive	NW 79th Street	Add 2 lanes and center turn lane and reconstruct	1
Truck Parking Improvement	NW 36th Street/ NW 37th Avenue	-	Develop a truck staging/ parking area near NW 36th Street and NW 37th Avenue for the PortMiami River	-
NW North River Drive	SR-112	NW 27th Avenue	Repave, mark center lane as truck standing permitted, widen where possible to provide side-or-road truck parking	-
NW 20th Street	NW 27th Avenue	I-95	Roadway infrastructure improvements	2
NW 14th Street	Civic Center	US-1	Widen to 3 lanes and resurface	4
NW 11th Street	NW 12th Avenue	SW 2nd Avenue	Bicycle facility improvements	-
NW 7th Avenue Enhanced Bus	Downtown Miami	Golden Glades Interchange Terminal	Premium limited stop transit service	2
NW 5th Avenue	NW 4th Street	NW 11th Street	Bicycle facility improvements	3
NW 3rd Court	NW 2nd Street	NW 8th Street	Pedestrian facility improvements	3

Facility	From	To	Description	Priority Project
I-95	I-95	S Miami Avenue	Ramp reconstruction/ reconfiguration of I-95 ramps in downtown Miami at S Miami Avenue	2
I-95	US-1	South of SR 836/I-395	Freeway preliminary design	1
I-95	I-95	E 2nd Avenue	Ramp reconstruction/ reconfiguration for the I-95 ramps leading into downtown Miami at E 2nd Avenue	2

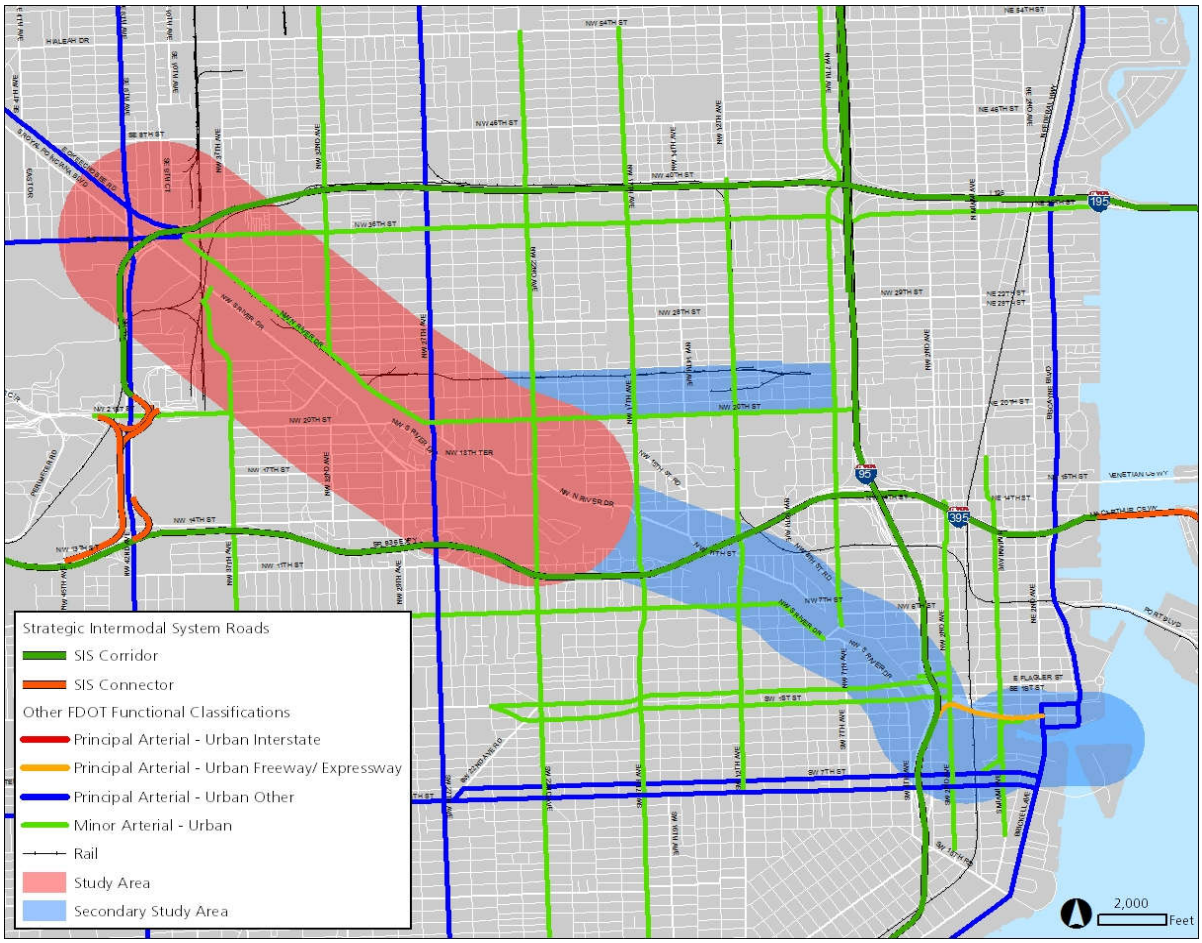
2.3 Existing Infrastructure

The Miami River study area includes infrastructure elements encompassing roadways, railways, waterway and freight hubs that enable freight movements. These elements complement one another to provide for the flow of goods locally and throughout the region. In addition, other transportation facilities such as bicycle, pedestrian, and transit that may affect truck, rail and waterway freight movement in the Miami River area were collected to evaluate a complete transportation system to facilitate freight mobility. By assessing the extent of infrastructure and how it functions, a framework for assessing improvement needs to enhance freight mobility is defined.

2.3.1 Strategic Intermodal System

The Strategic Intermodal System (SIS) is Florida's high priority network of transportation facilities important to the state's economy and mobility. The Governor and Legislature established the SIS in 2003 to focus the state's limited transportation resources on the facilities most significant for interregional, interstate, and international travel. The current designated SIS is a network of high-priority transportation facilities which includes the state's largest and most significant commercial service airports, spaceport, deep water seaports, freight rail terminals, passenger rail and intercity bus terminals, rail corridors, waterways and highways. **Figure 2.1** includes the SIS network and other FDOT roadway classifications.

Figure 2-1: Strategic Intermodal System and Other FDOT Functional Classifications



2.3.2 Freight Roadway Facilities

The roadways listed in **Table 2.3** are the arterial roads and freeways that traverse through the study area. The selected roads were identified through FDOT's functional classification system as either principal or minor arterial urban roadways, which are typical for freight traffic. As defined by FDOT's Urban Boundary and Functional Classification Handbook, arterials are those roadways that serve the highest degree of through traffic movement and the largest proportion of total travel.

Table 2.3: Freight Roadways

Roadway Name	Classification	Classification Description	Toll
I-95	11	Principal Arterial-Interstate - Urban	No
Dolphin Expressway (SR 836)	12	Principal Arterial-Freeway and Expressway - Urban	Yes
Airport Expressway (SR 112)	12	Principal Arterial-Freeway and Expressway - Urban	Yes
E Okeechobee Road (US 27)	14	Principal Arterial - Other - Urban	No
Le Jeune Road/SE 8th	14	Principal Arterial - Other - Urban	No
Biscayne Boulevard (US 1)	14	Principal Arterial - Other - Urban	No
NE 2nd Avenue	14	Principal Arterial - Other - Urban	No
Brickell Avenue	14	Principal Arterial - Other - Urban	No
8th Street (US 41/SR 90)	14	Principal Arterial - Other - Urban	No
7th Street (US 41/SR 90)	14	Principal Arterial - Other - Urban	No
NW 36th Street	16	Minor Arterial - Urban	No
NW N River Drive	16	Minor Arterial - Urban	No
NW 32nd Avenue	16	Minor Arterial - Urban	No
NW 20th Street	16	Minor Arterial - Urban	No
NW 37th Avenue	16	Minor Arterial - Urban	No
NW 22nd Avenue	16	Minor Arterial - Urban	No
NW 17th Avenue	16	Minor Arterial - Urban	No
NW 7th Street	16	Minor Arterial - Urban	No
NW 12th Avenue	16	Minor Arterial - Urban	No
NW S River Drive	16	Minor Arterial - Urban	No
W Flagler Street	16	Minor Arterial - Urban	No
SW 1st Street	16	Minor Arterial - Urban	No
South Miami Avenue	16	Minor Arterial - Urban	No

2.3.3 Truck Parking Facilities

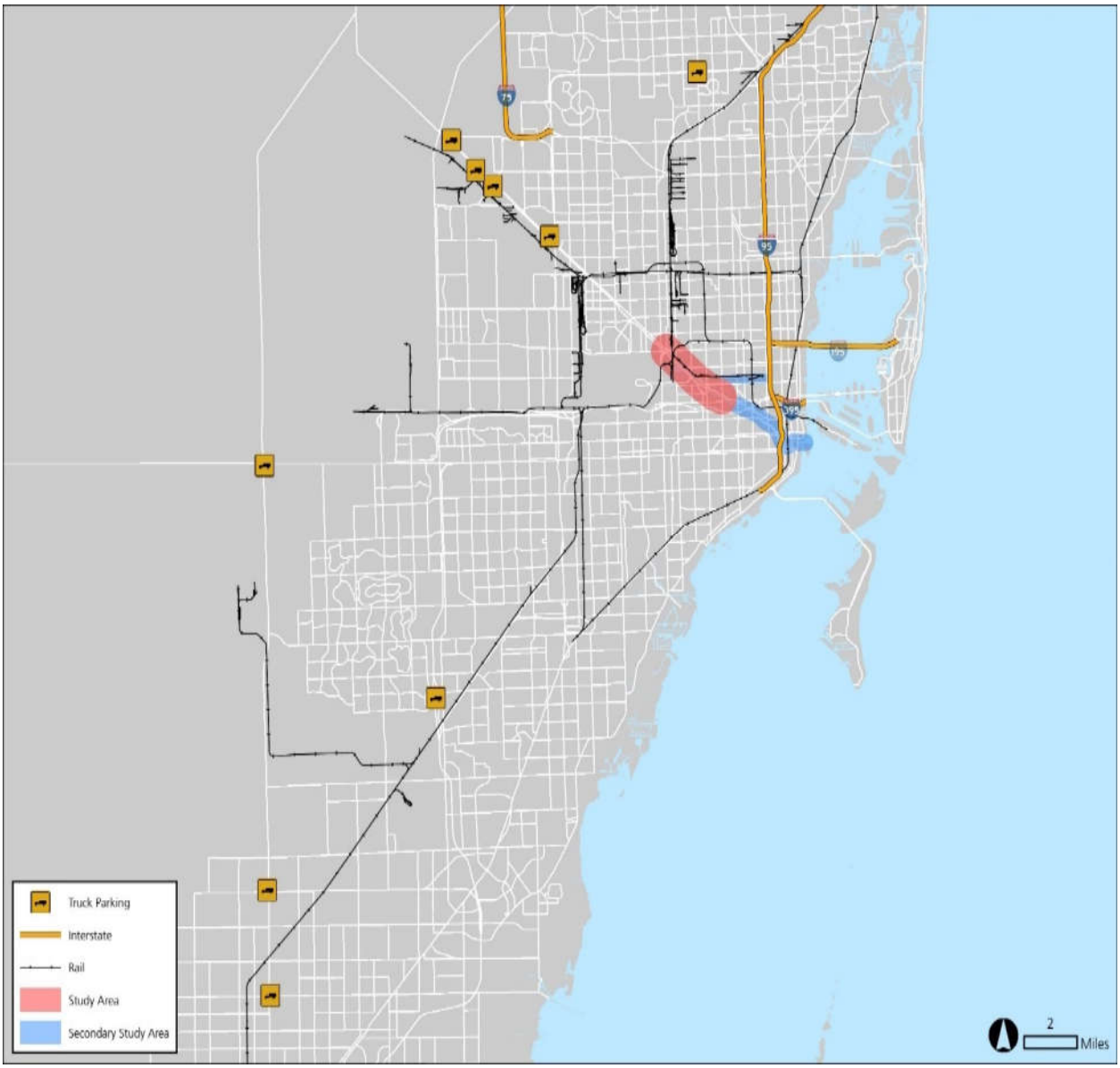
As stated by the Federal Highway Administration (FHWA), truck parking shortages are a national safety concern, which results in two negative consequences. The first is that tired truck drivers may continue to drive because they have difficulty finding a safe and legal place to park for rest. The second consequence is that truck drivers may then decide to park at unsafe locations such as road shoulders, exit ramps, or vacant lots. The FHWA also stated that truck activity is expected to grow, which will result in increased shortages of parking for trucks, lack of information on truck parking opportunities, and challenges due to limited delivery windows and specific rest requirements.

In response to the truck parking shortage, MAP-21 facilitates Jason's Law to evaluate truck parking throughout the country. As part of Jason's Law, a survey of truck parking availability was conducted in 2013. As displayed in **Table 2.4,** the survey indicated that there were 9 truck parking facilities located in Miami-Dade County, all of which are private facilities. The data reported that there were at least 244 parking spaces available across 7 of the facilities. The number of parking spaces was not reported for two of the facilities, and it was not specified what type of parking spaces they were. The locations of the truck parking facilities are displayed in **Figure 2-2.** The closest truck parking facility to the study area is approximately 6 miles, and the furthest is approximately 25 miles.

Table 2.4: Miami-Dade Truck Parking Facilities, 2013 (FHWA)

Facility No.	Type	Spaces	Distance from Study Area
1	Private	90	5 miles
2	Private	65	9 miles
3	Private	30	15 miles
4	Private	8	9 miles
5	Private	24	14 miles
6	Private	15	23 miles
7	Private	12	25 miles
8	Private	Unknown	8 miles
9	Private	Unknown	10 miles

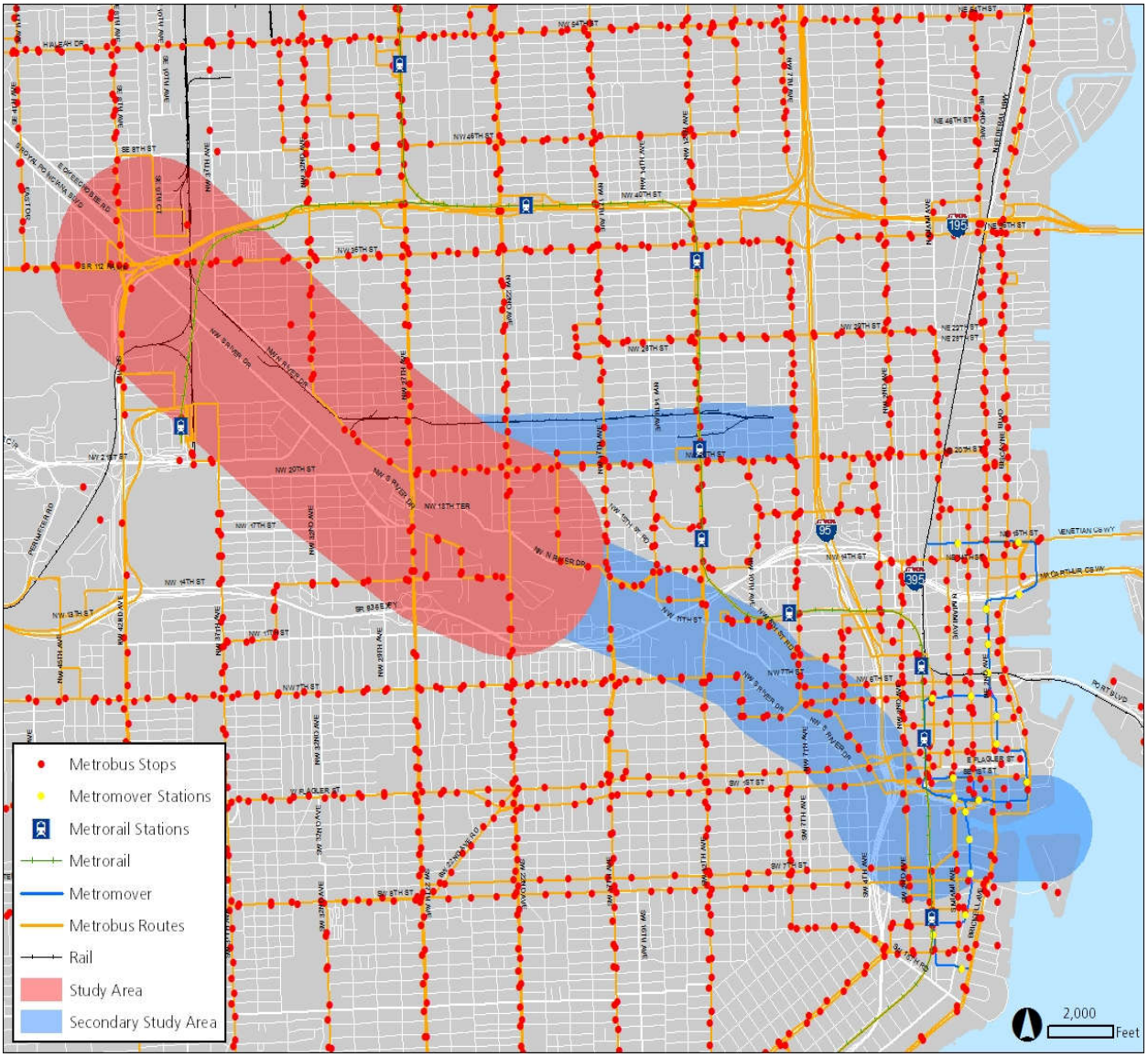
Figure 2-2: Truck Parking Facilities



2.3.4 Transit Services

The three transit systems that traverse the study area are the Metrorail, Metromover, and Metrobus. **Figure 2.3** displays the transit system routes and stops within and surrounding the study area.

Figure 2-3: Transit Systems



Metrorail

The Metrorail system consists of a 25-mile dual track elevated rapid transit system that operates 136 train cars with 23 stations. Metrorail provides service to the following locations:

- Miami International Airport
- Kendall through South Miami
- Coral Gables
- Downtown Miami
- Civic Center/Jackson Memorial Hospital area
- Brownsville
- Liberty City
- Hialeah
- Medley

Source:
http://www.miamidade.gov/transit/metrorail.asp

Metromover

Metromover is a 4.4-mile fully automated, electric-powered transit system. Metromover connects with Metrorail at the Government Center and Brickell stations, and connects with Metrobus downtown. The system operates seven days a week with cars arriving every 90 seconds during rush hours and every three minutes during off-peak hours. Major destinations of the Metromover are:

- American Airlines Arena
- Bayside Market Place
- Miami-Dade College
- Miami-Dade County School Board

Source:
http://www.miamidade.gov/transit/metromover.asp

Metrobus (Miami-Dade Transit)

Metrobus provides transit service throughout Miami-Dade County 365 days a year. With 95 Metrobus routes using more than 800 buses and traveling approximately 95 million miles per year, most routes are designed to intersect with Metrorail and Metromover to provide further coverage by the collective transit network.

Figure 2-4: Tri-Rail Service Map

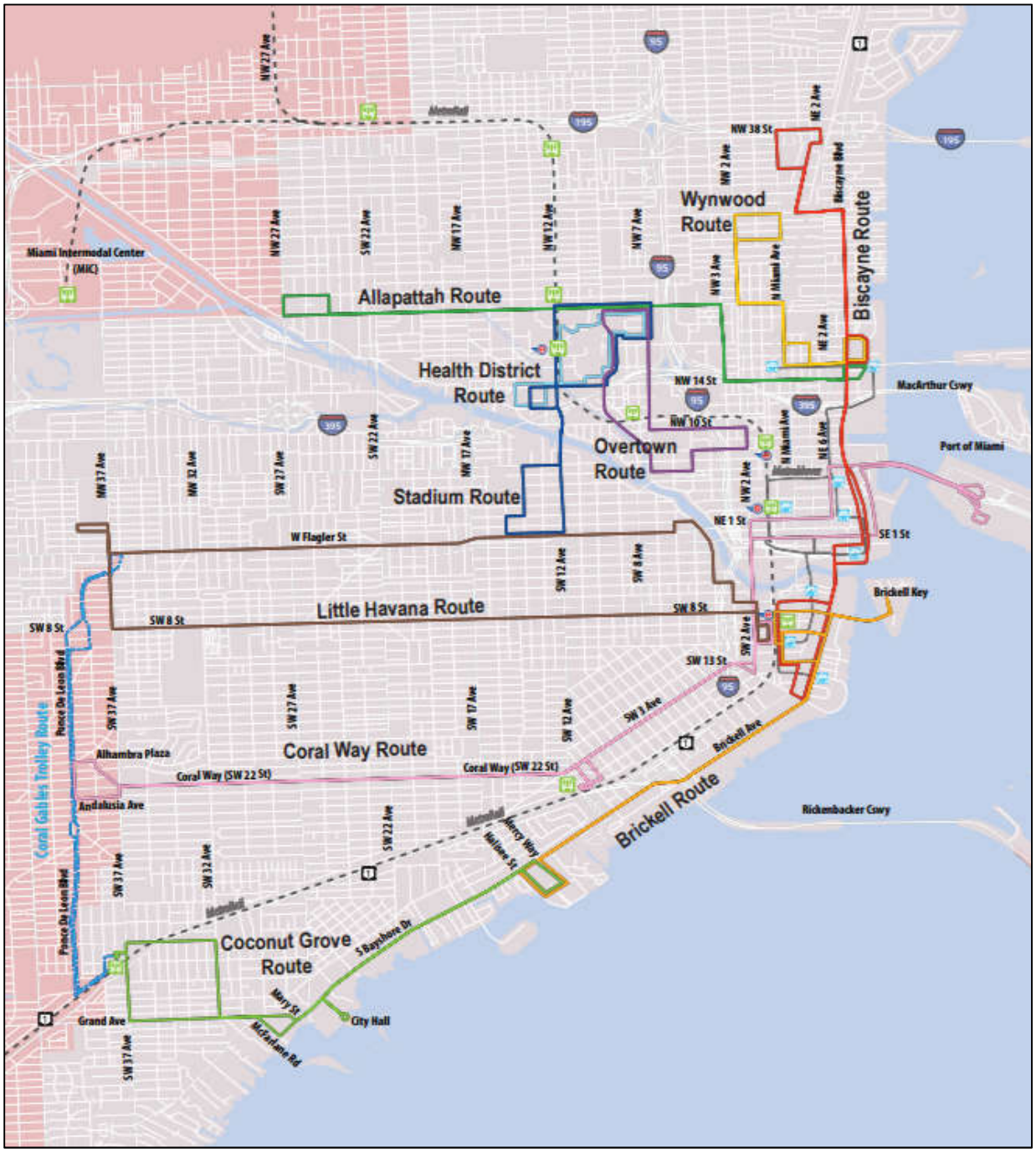
Tri-Rail

The expansion of Tri-Rail commuter service onto the Florida East Coast Railway (FECR) corridor has been sought for decades. This effort has evolved into the proposed Tri-Rail Coastal Link project, which would integrate the existing Tri-Rail service with new service on the FECR corridor between downtown Miami and Jupiter. While the ultimate project is still being studied and pursued, there is an exciting opportunity to extend current Tri-Rail service to downtown Miami. Service to downtown is expected by December 2017. **Figure 2-4** shows Tri-Rail service to Miami International Airport. MiamiCentral will serve as downtown Miami's multi-modal station providing connections to All Aboard Florida (AAF), Tri-Rail, the existing Miami-Dade County bus system, Metrorail, and Metromover.

Miami Trolley

The Miami Trolley provides transit services along the Miami River corridor. Some of the areas served include Overtown, Biscayne, Brickell, Little Havana and many other popular destinations near the Miami River such as the Brickell Financial District, Bayfront Park and sporting events in Marlin Stadium. Trolley service also includes connections to Metrorail and Metromover. **Figure 2-5** shows region wide routes of the Miami Trolley.

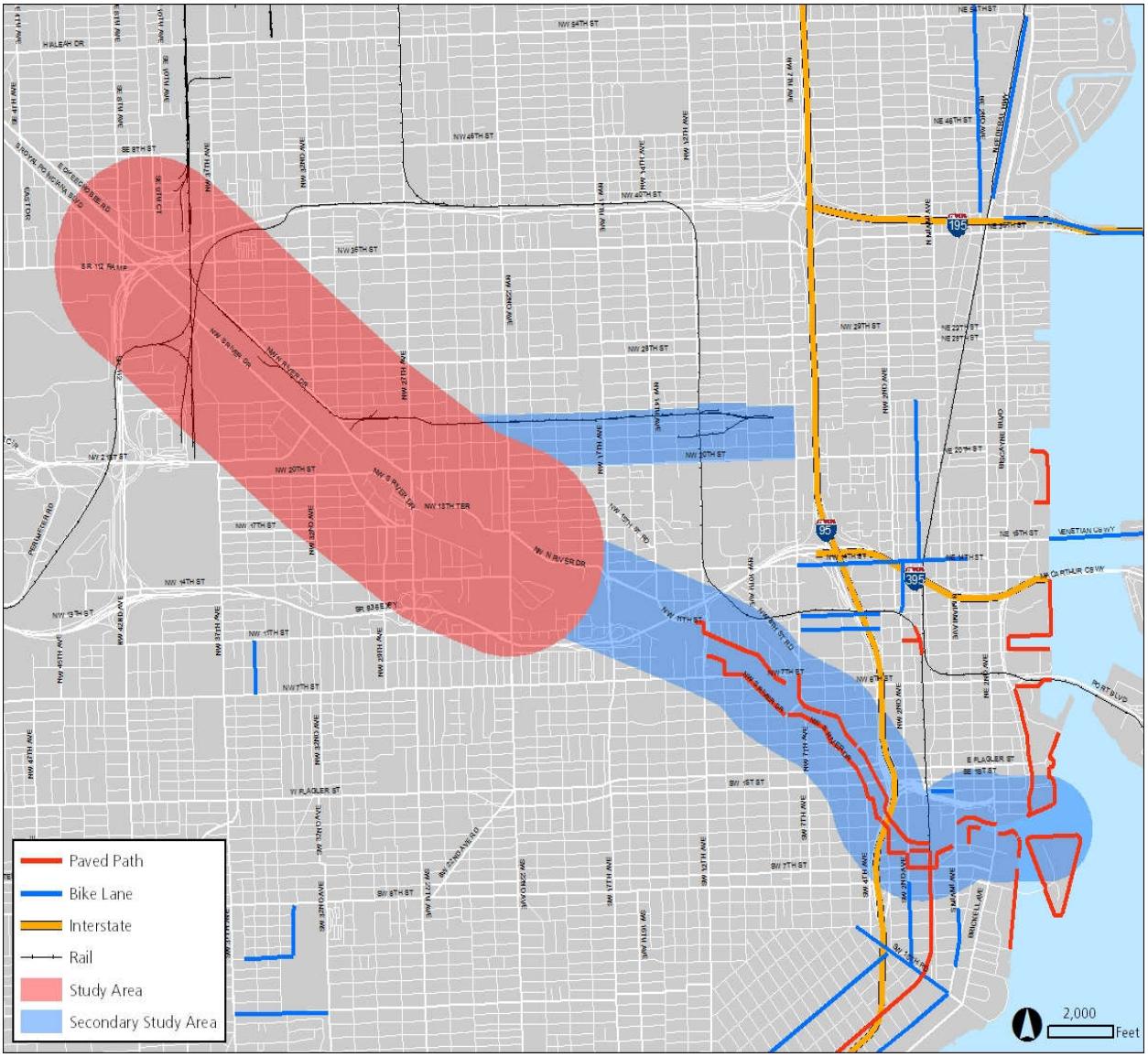
Figure 2-5: Miami Trolley Routes



2.3.5 Pedestrian and Bicycle Facilities

The Miami River Greenway ("Greenway") is an urban greenway project in Miami, Florida located along both banks of the Miami River. The plan is for the Greenway to eventually form an uninterrupted walkway from the mouth of the river in Downtown Miami to the Dolphin Expressway near the Civic Center area. In the long term, the Greenway will connect all the way to Miami International Airport. On the north bank, the Greenway is currently known as the Miami Riverwalk which currently extends beyond the river through Bayfront Park along Biscayne Bay, where it is known as 'Bay Walk'. Plans are to extend this as far north and south as the Julia Tuttle and Rickenbacker Causeways, respectively. **Figure 2-6** depicts the existing paved pathway and bicycle lanes surrounding the Miami River.

Figure 2-6: Paved Pathways and Bicycle Lanes



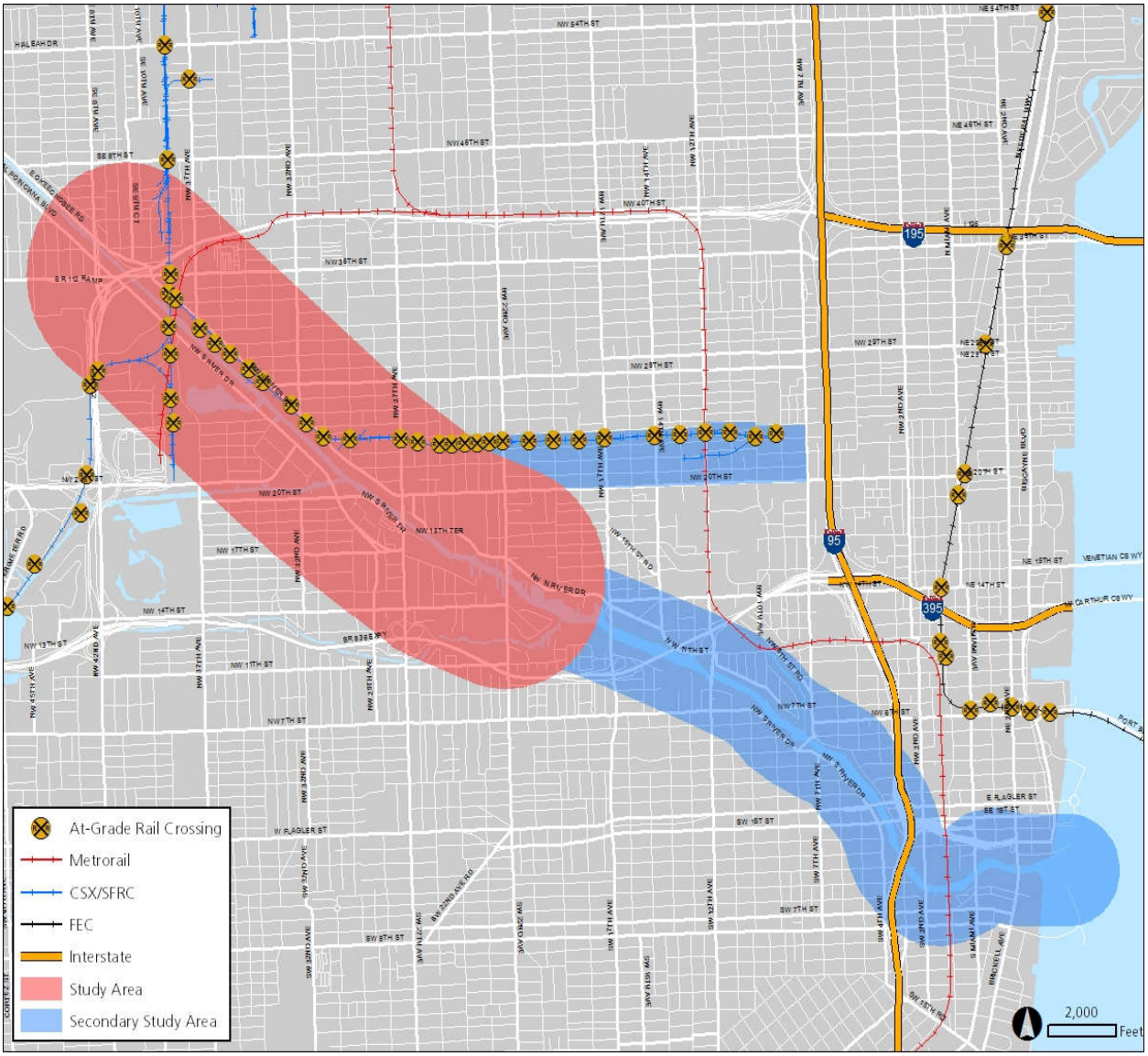
2.3.6 Freight Rail Lines and Crossing Facilities

CSX serves Miami-Dade County by way of operating rights on the South Florida Rail Corridor (SFRC) which extends from Mangonia Park in Palm Beach County southward to the Oleander Junction near the southwest corner of Miami International Airport, just east of NW 72nd Avenue. The SFRC was purchased from CSX for the purposes of the Tri-Rail commuter rail services operated by the South Florida Regional Transportation Authority. CSX retains ownership of several other rail lines in central and southern Miami-Dade County as well as the Downtown Lead which extends eastward from the SFRC at a point just south of NW 36th St for a length of 3.4 miles.

The SFRC corridor provides rail access to the Miami Intermodal Center (MIC) at LeJeune Rd. and NW 25th St. Passenger rail service currently includes 50 daily northbound and southbound Tri-Rail trains serving the MIC. There are also four daily Amtrak northbound and southbound trains to and from its platforms at the MIC. Freight trains range from one to three trains per day and there are some localized switching movements as well. This totals 57-59 daily trains on the SFRC north of the MIC. Rail traffic on the Downtown Lead is reported a few moves weekly focused on the western end of the corridor.

The Downtown Lead has 21 railroad crossings at public streets with all but one of these east of NW 31st Avenue; there are also 11 private drive railroad crossings between NW 37th Avenue and NW 31st Avenue for businesses between NW North River Drive and the Miami River. The Downtown Lead is a single-track rail line with a few short sidings serving business access. The SFRC has a single track extending north from the MIC across the single-track Miami River lift bridge. North of SR 112, there are two mainline tracks, as well as numerous sidings and spur lines serving local businesses, and a rail yard between NW 79th Street and NW 103rd Street. **Figure 2-7** on the following page displays the railroads within and adjacent to the study area.

Figure 2-7: Rail Lines and Crossing Facilities



2.3.7 Bridge Facilities

There are eleven low level lift bridges that cross the Miami River Corridor and two additional low level fixed bridges that span over connecting bodies of water. In addition, there are high level bridges that span the Miami River including Metromover, Metrorail, I-95 and SR 836. **Table 2.5** lists the bridges along the corridor including the bridge type, Annual Average Daily Traffic (AADT) on roadway segments over the bridge and the number of lanes or tracks on the bridge.

Table 2.5: Bridges in the Miami River Corridor

Location	Bridge Type	Bridge Clearance*	2016 AADT	T Factor	Number of Lanes/ Tracks
Brickell Avenue	Low Level Lift	23’	37,000	2.9	6
South Miami Avenue	Low Level Lift	21’	7,700	4.3	6
SW 2nd Avenue	Low Level Lift	11’	14,700	4	4
SW 1st Street	Low Level Lift	18’	8,800	2.3	4
West Flagler Street	Low Level Lift	35’	11,000	5.9	4
NW 5th Street	Low Level Lift	12’	7,000	3.9	5
NW 12th Street	Low Level Lift	22’	24,500	3.2	6
NW 17th Avenue	Low Level Lift	17’	20,100	5.2	4
NW 22nd Avenue	Low Level Lift	25’	17,400	13.5	4
NW 27th Avenue	Low Level Lift	21’	42,000	5.8	6
Palmer Lake (NW South River Drive)	Low Level Fixed	6’	2,700	4.5	2
Tamiami Canal (NW South River Drive)	Low Level Fixed	6’	2,700	4.5	2
CSX Rail Corridor	Low Level Lift	6’	N/A	N/A	1
Interstate 95	High Level Fixed	75’	167,000	4.0	10
Dolphin Expressway (SR 836)	High Level Fixed	75’	114,000	3.1	6
Metrorail North - Downtown	High Level Fixed	75’	N/A	N/A	2
Metrorail - Airport Extension	High Level Fixed	40’	N/A	N/A	2
Metromover	High Level Fixed	75’	N/A	N/A	2

** Bridge Clearance defined as the vertical bridge clearance when the bridge is closed, measured in feet.*
Vertical Bridge Clearance Source: NOAA charts through https://www.waterwayguide.com/.

2.4 Existing Traffic Data and System Performance

2.4.1 Annual Average Daily Traffic

The AADT data was collected from the Florida Department of Transportation (FDOT) Transportation and Data Analytics Office website. The data depicted in **Figure 2-8** is from 2016. The roadway segment with the highest number of daily vehicles is State Road 836 (Dolphin Expressway), between 12 Avenue and 27 Avenue (120,000 to 160,000). Most roadways within the study area has an AADT ranging from 5,000 to 30,000 vehicles. **Table 2.6** displays the AADT, K, T, and D factors for the freight roadway facilities in the study area that were identified in Section 2.3.2.

Figure 2-8: Annual Average Daily Traffic (AADT), 2016

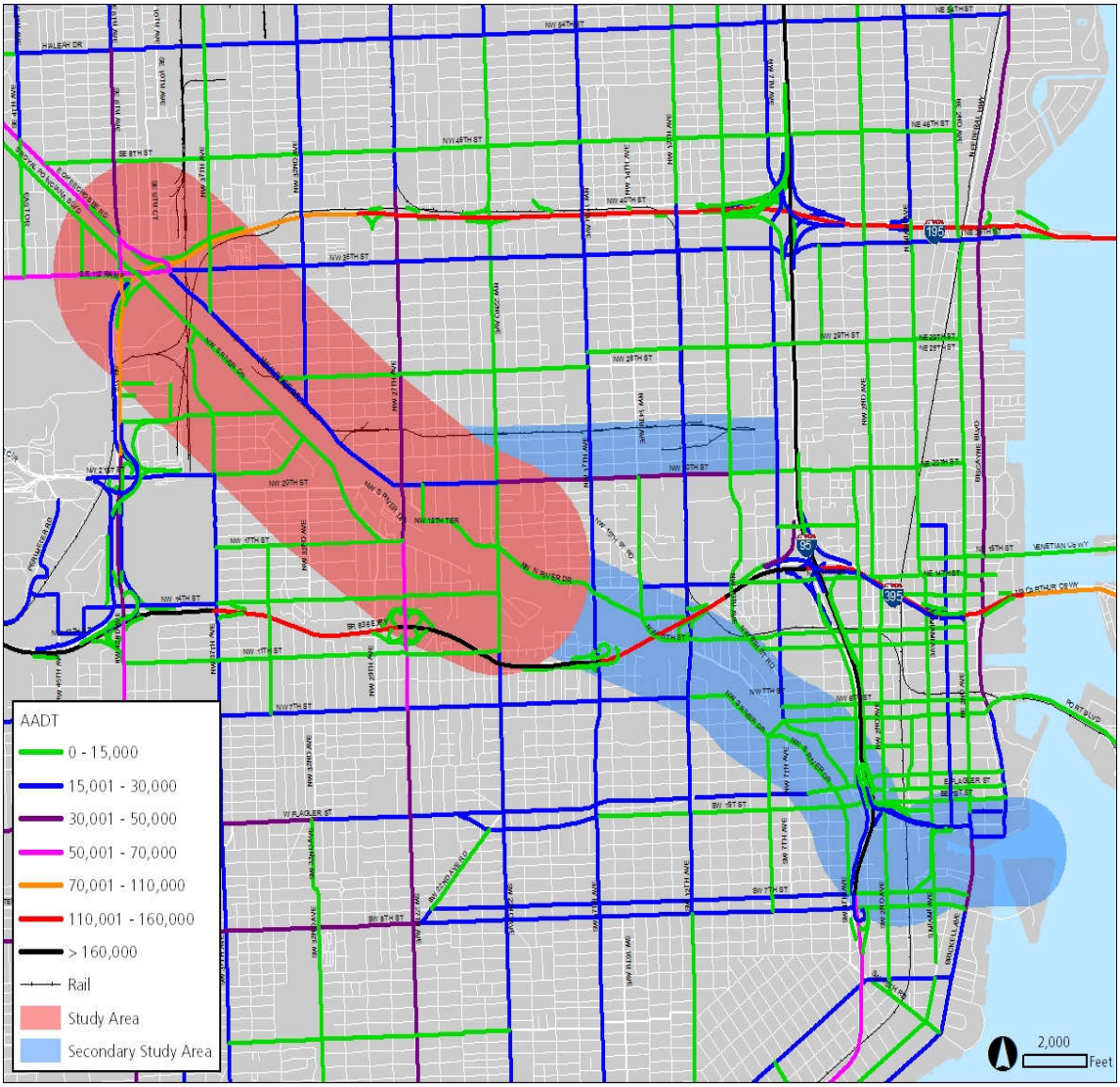


Table 2.6: Freight Roadway AADT, 2016

Roadway Name	Count Site	AADT	K Factor	D Factor	T Factor
Interstate 95 (I-95)	872505	167,000	8	55.5	4.0
Dolphin Expressway (SR 836)	872208	114,000	8	66.1	3.1
Airport Expressway (SR 112)	872065	105,500	8	51.3	3.3
E Okeechobee Road (US 27)	870200	64,000	9	54.5	7.2
Le Jeune Road/SE 8th	871179	42,000	9	54.5	4.9
Biscayne Boulevard (US 1)	875047	29,000	9	56.1	5.1
NE 2nd Avenue	873060	13,000	9	99.9	13.7
Brickell Avenue	870550	37,000	9	56.1	2.9
8th Street (US 41/SR 90)	875090	13,500	9	99.9	3.6
7th Street (US 41/SR 90)	875091	9,000	9	99.9	9.1
NW 36th Street	870107	18,200	9	54.5	3.8
NW N River Drive	878666	24,000	9	56.1	4.5
NW 32nd Avenue	877021	23,000	9	54.5	10.5
NW 20th Street	878296	25,000	9	54.5	13.5
NW 37th Avenue	878426	3,100	9	56.1	4.5
NW 22nd Avenue	878341	8,300	9	54.5	13.5
NW 17th Avenue	878259	17,300	9	54.5	13.5
NW 7th Street	875003	17,800	9	56.1	5.0
NW 12th Avenue	875012	24,500	9	56.1	3.2
NW S River Drive	877053	4,500	9	54.5	9.2
W Flagler Street	870099	15,800	9	56.1	5.9
SW 1st Street	870098	13,000	9	99.9	10.0
South Miami Avenue	878611	7,700	9	99.9	4.3

2.4.2 Annual Average Daily Truck Traffic and Truck Percentage, 2016

The Annual Average Daily Truck Traffic (AADTT) data was collected from the FDOT Transportation and Data Analytics Office website. The data depicted in **Figure 2-9** and **Figure 2-10** are for the year 2016. The roadway segment with the highest number of daily trucks is on State Road 836 (Dolphin Expressway) between NW 12th Avenue and NW 27th Avenue (about 4,000 to 5,500). Most roadways within the study area had an AADT ranging from 400 to 2,000 trucks. The roadway with the highest percentage of truck traffic within the study area is on SW 1st St, East of Miami River Bridge (about 15%). Most roadways within the study area have a truck percentage ranging from 5% to 10%.

Figure 2-9: Truck AADT, 2016

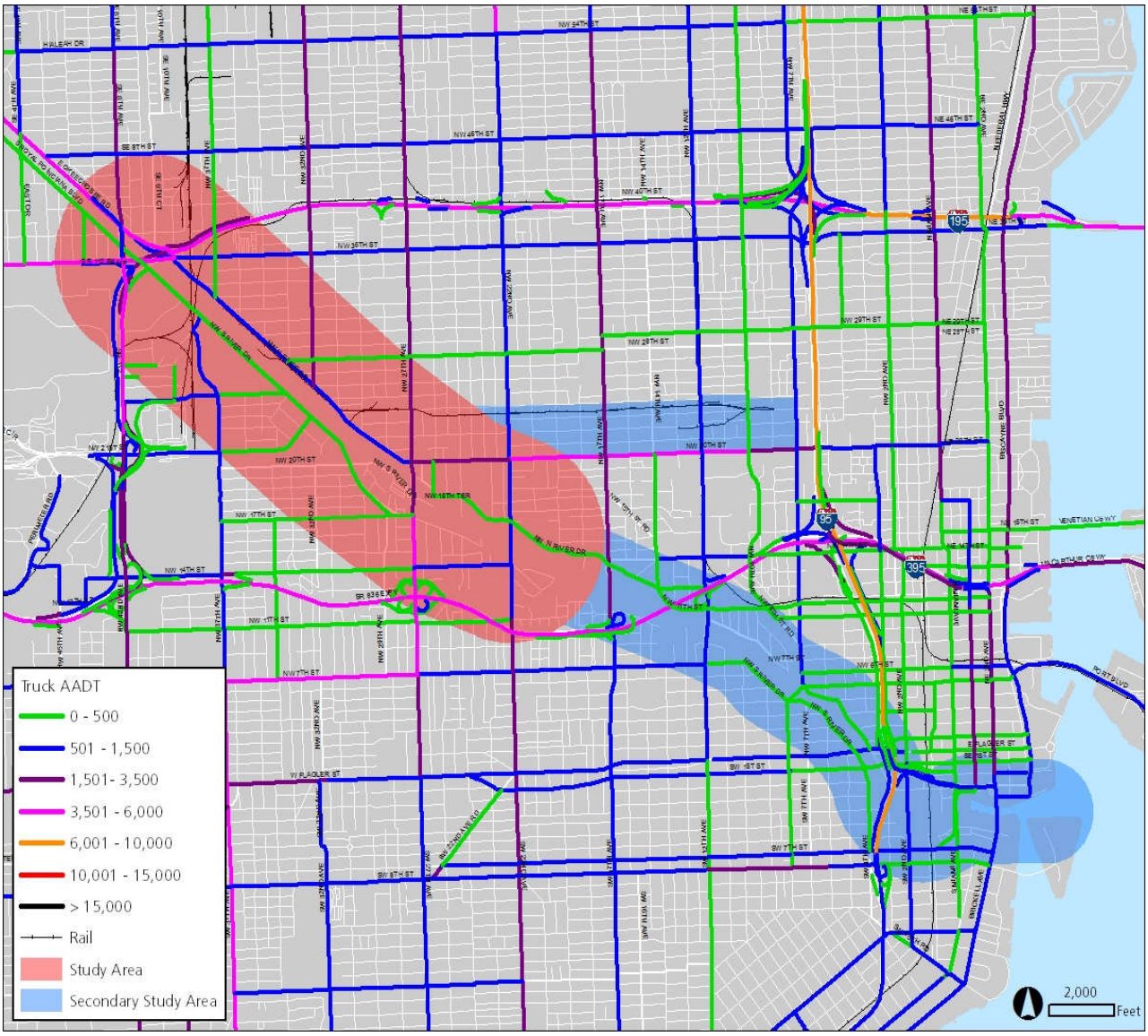
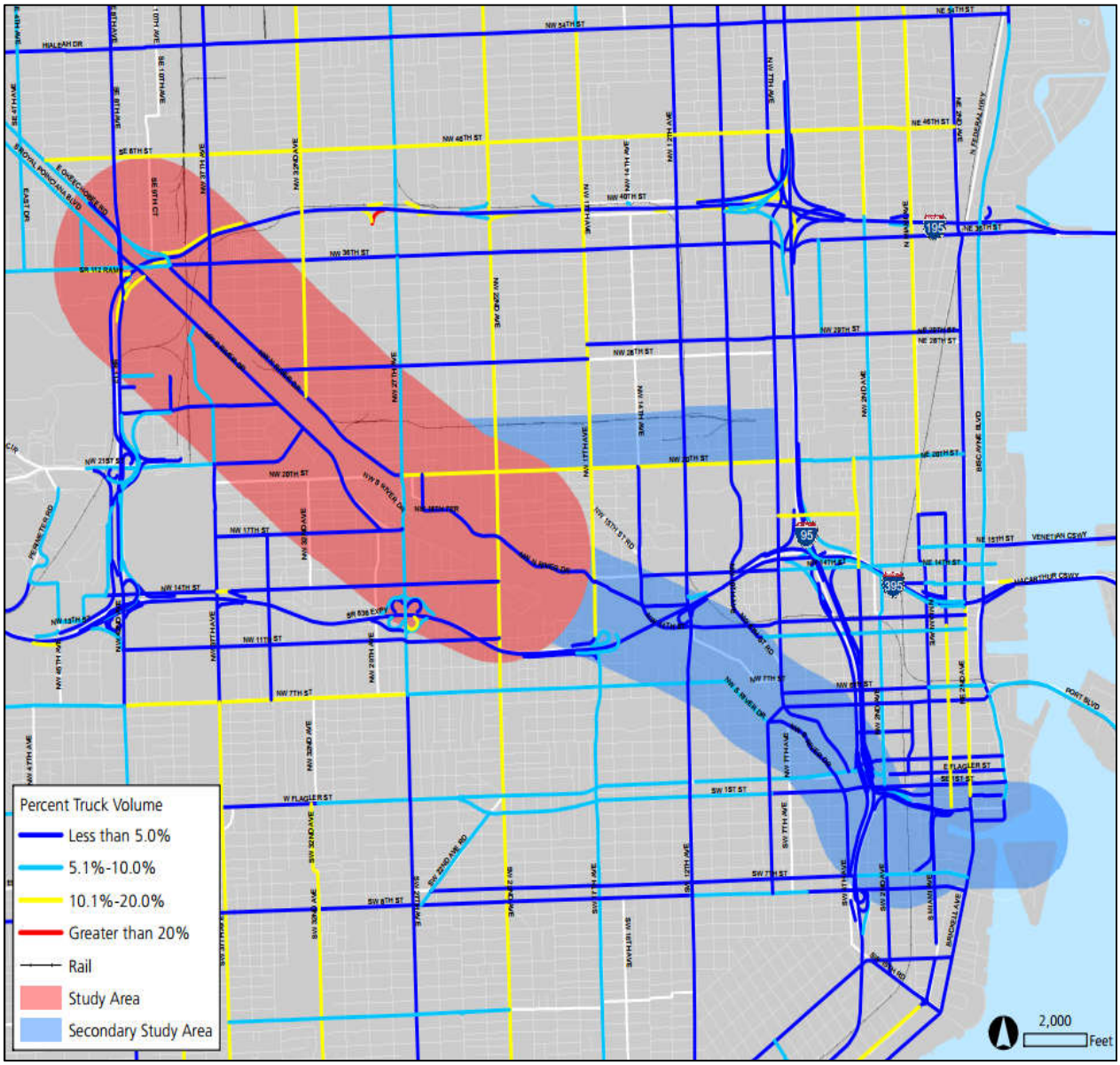


Figure 2-10: Truck Percentage, 2016

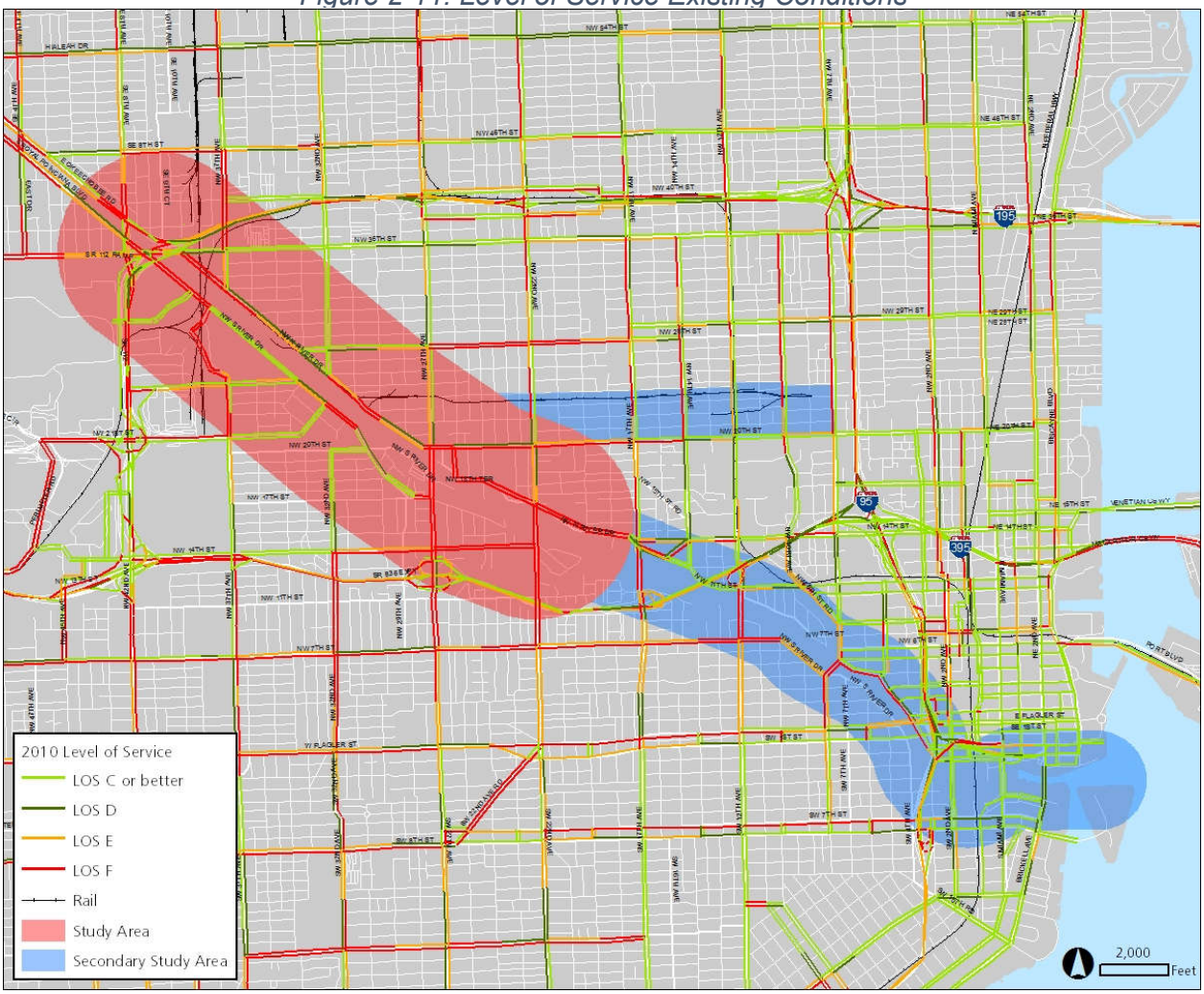


2.4.3 Level of Services

Level of Service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. The LOS of a facility is designated with a letter, A to F, with A representing the best operating conditions and F the worst.

The Southeast Florida Regional Planning Model was the tool used to assign a level of service letter grade based on the PM volume over capacity ratio. If the volume exceeded the capacity, then that roadway segment received a failing grade of F. If the volume was at or slightly less than capacity (0.85 to 1) than it received a letter grade of E. The other roadway capacities were adequate based on the model volumes assigned to the network, with adequate meaning a letter grade D or above. It is important to note level of service calculations may not adequately represent traffic conditions on roadways containing lift bridges**. Figure 2.11** depicts year 2010 segment level of service for the roadways within and surrounding the study area.

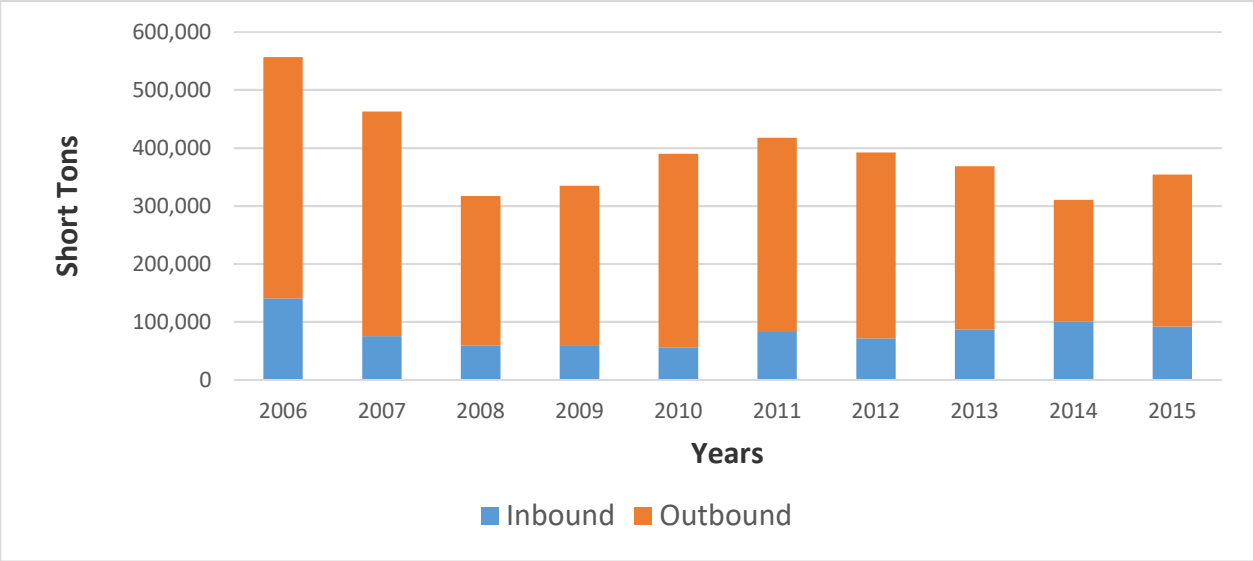
Figure 2-11: Level of Service Existing Conditions



2.4.4 Waterway Commodity Flow

The navigable section of the Miami River is 5.5-mile long and runs from the salinity dam near LeJeune Road to the Biscayne Bay. Use of this waterway for cargo transport has drastically declined since the high levels seen in the mid 1990s of nearly 900,000 short tons of cargo. Today, the Miami River handles roughly 350,000 short tons per year, with a strong emphasis on exports which make up roughly 75 percent of the total volume. The inbound and outbound trends over the past ten years are illustrated in **Figure 2.12**.

Figure 2-12: Waterway Commodity Flow Trends



2.4.5 Crash Data

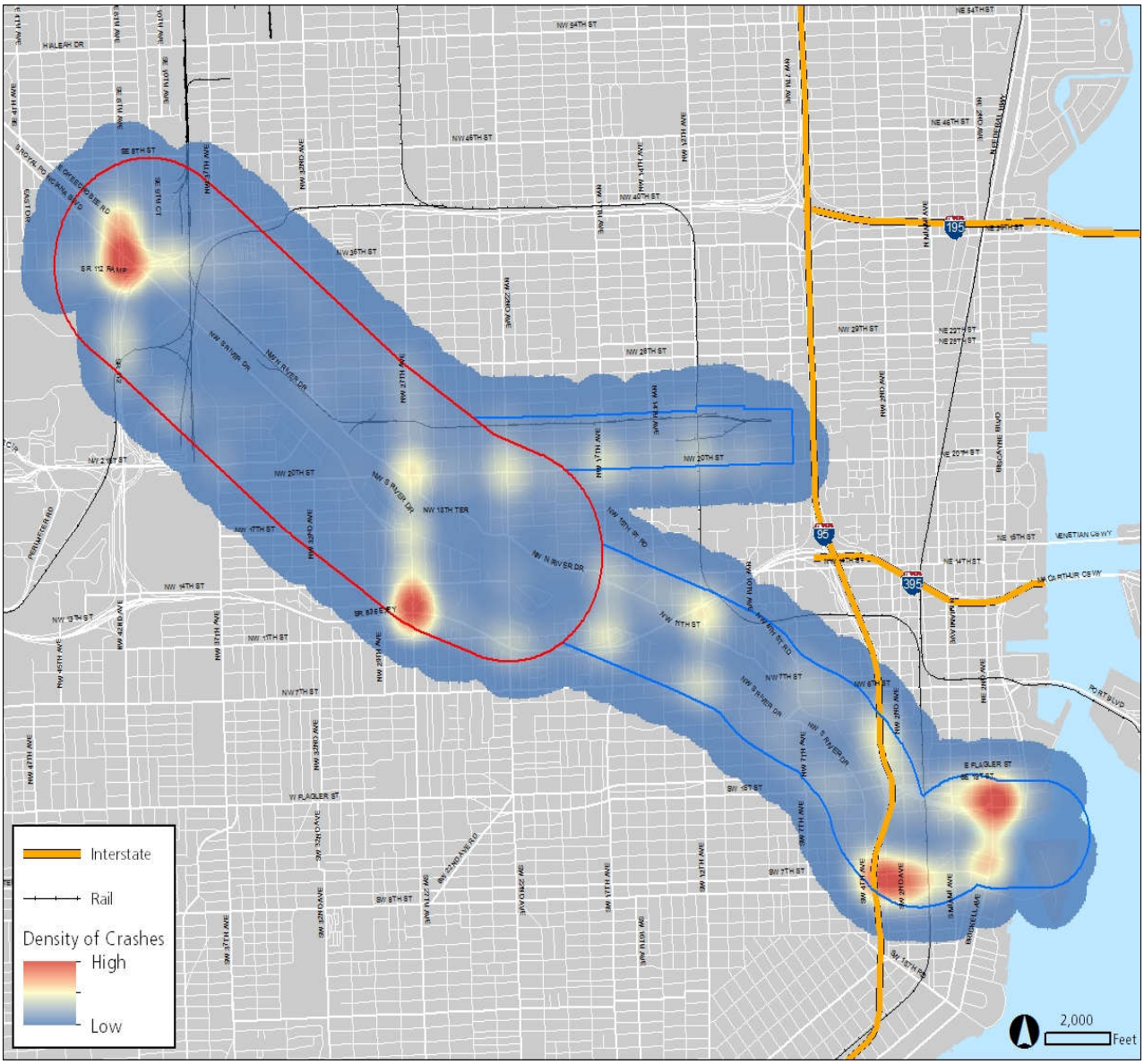
Crash data for the study area was obtained through the *Signal Four Analytics* database. *Signal Four Analytics* is a system developed by the GeoPlan Center at the University of Florida designed to support the crash mapping and analysis needs of law enforcement, traffic engineering, transportation planning agencies, and research institutes within the state of Florida.

From 2012 to 2016, there were 18,091 total crashes in the project study area. A breakdown of the number of crashes per year is displayed in **Table 2.7**. The amount of crashes remained relatively constant from 2014 through 2016, with around 3,900 crashes per year. The year 2012 had the least amount of crashes (3,011). **Figure 2.13** shows a heat map depicting high and low areas of crash concentration.

Table 2.7: Crashes per Year

Crash Year	Crash Count	Percent
2016	3,792	21.0%
2015	3,939	21.8%
2014	3,903	21.6%
2013	3,446	19.0%
2012	3,011	16.6%
Total	18,091	100.0%

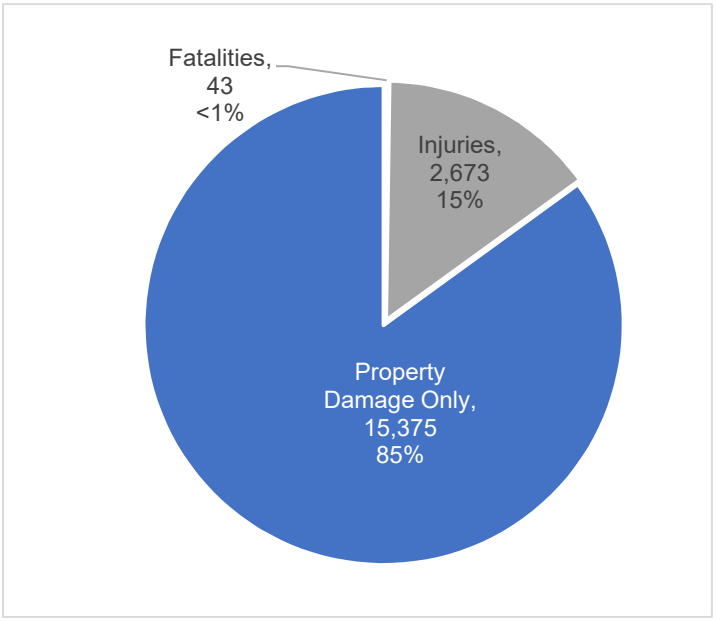
Figure 2-13: Crash Concentration



Crash Severity

As displayed in **Figure 2.14**, a majority of the crashes resulted in Property Damage Only (85%). Less than 1% of the total crashes resulted in a fatality, with a total of 43 fatalities the five-year period. Approximately 15% of the crashes resulted in injuries. Of the 43 fatalities, nine of them were pedestrians and onw was a bicyclist.

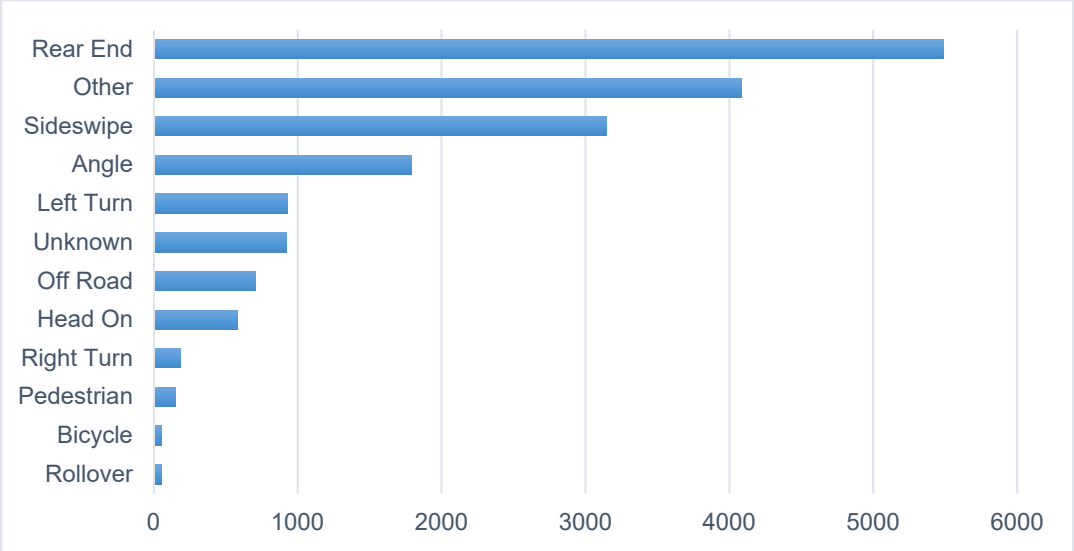
Figure 2-14: Crash Severity



Crash Type

Figure 2.15 displays the crash type. Rear ends, Other, and Sideswipes were the most frequent types of crashes. Rollover (54) and Bicycle (56) were the two least common types of crashes.

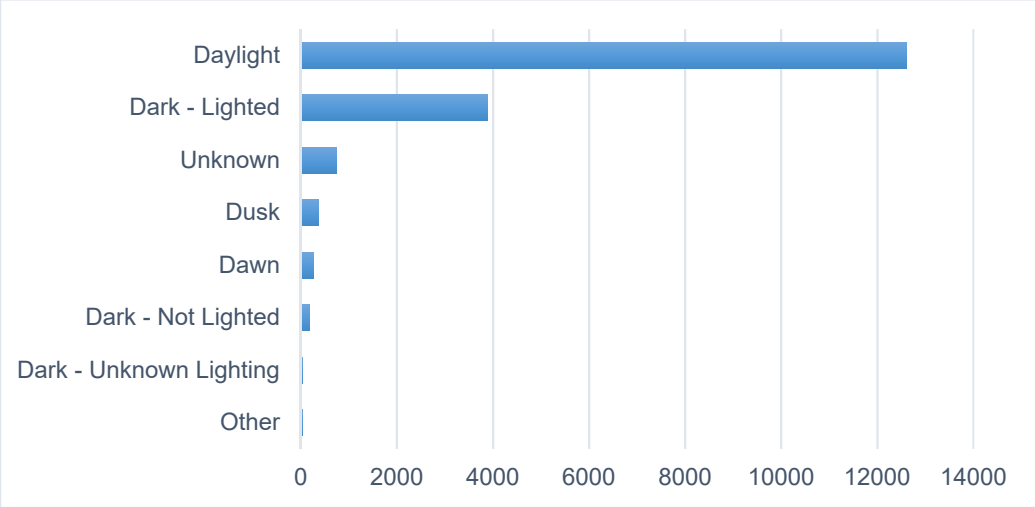
Figure 2-15: Crash Type



Lighting

As displayed in **Figure 2.16**, a large majority of the crashes occurred during the daylight. Dark-Lighted conditions had the second highest concentration of crashes. Other, Dark-Unknown, and Dark-Not Lighted had the three lowest concentrations of crashes.

Figure 2-16: Lighting Conditions



2.4.6 Origin – Destination Data

The Origin-Destination (O-D) data resulting from Bluetooth data collection are summarized in the following tables and illustrative maps (as provided in **Figure 2-17** through **Figure** 2-22). Six data stations were utilized as follows:

- NW North River Drive – SE of NW 36th St. (B1)
- SW South River Drive – SE of NW 36th St. (B2)
- PortMiami Tunnel – East of East Portal (B3)
- PortMiami Bridge – East of US 1 (B4)
- FEC Hialeah Railyard Entrance (B5)
- NW 25th St. Viaduct (B6)

O-D summaries are provided in **Table 2.8** and **Table 2.9** for the AM peak period and the PM peak period, respectively, by percentage of vehicles moving between each station. As an example, according to Bluetooth data collection, 28% of all vehicles passing through the NW 25th Street Viaduct passed through PortMiami Tunnel in the AM peak period, while only 8% passed during the PM peak period.

As per **Table 2.8** and **Table 2.9**, the majority of trips at the NW North River Drive station link with South River Drive and NW 25th Street Viaduct stations in the AM period. Most of the trips from NW South River Drive exchange with NW North River Drive and probably use this segment to reach PortMiami. In the PM peak period, only 5% of trips at the NW North River Drive station exchange with PortMiami. In summary, AM peak traffic generated at NW North and South River Drives toward PortMiami is significant, especially from North River Drive while in the PM peak period, fewer trips are exchanged with PortMiami.

Between the two stations for the PortMiami tunnel and bridge, there is a significant share of trips captured. Based on O-D data, 93% of all trips passing PortMiami will pass the Bridge, and 99% vice versa. The PM peak data also shows a similar pattern; 92% of trips at PortMiami will pass through the PortMiami Tunnel, and 90% is the detected percentage in the reverse direction.

A majority of the trips originating from the FEC Railroad Yard travel to PortMiami via the PortMiami Tunnel in both AM and PM peak periods. A portion of the trips (20%) in AM peak (which were generated at the FEC Railroad Yard) will travel to the Airport area using the NW 25th Street Viaduct in the AM peak period, while in the PM peak period only 3% connect with this destination. The NW 25th Street Viaduct receives trips which were generated in this area by the NW North River Drive (62% in AM peak and 72% in PM peak). A significant portion of the trips which were generated at this origin will also terminate at PortMiami in the AM peak (28%), but only 8% for the PM peak. On the other hand, 15% of the PM peak trips from this origin will connect to NW South River Drive, which is the second most attractive destination in the PM peak period after NW North River Drive.

Bluetooth O-D data was also collected for the study by FDOT of the “Iron Triangle”, comprising the NW 36th St./Okeechobee Rd./LeJeune Rd. intersections. There were stations on both NW North River Drive and NW South River Drive, just south of NW 36th St. These data stations yield the following additional information on travel patterns:

NW North River Drive

- 5% to/from east leg of SR 112 - Airport Expressway
- 18% to/from east leg of NW 36th St.
- 13% to/from north leg of LeJeune Rd.
- 50% to/from northwest leg of Okeechobee Rd.
- 3% to/from west leg of NW 36th St.
- 7% to/from south leg of LeJeune Rd.
- 3% to/from NW South River Drive

NW South River Drive

- 18% to/from east leg of SR 112 - Airport Expressway
- 20% to/from east leg of NW 36th St.
- 17% to/from north leg of LeJeune Rd.
- 14% to/from northwest leg of Okeechobee Rd.
- 2% to/from west leg of NW 36th St.
- 23% to/from south leg of LeJeune Rd.
- 5% to/from NW North River Drive

This data complements the other Bluetooth O-D data, and leads to these observations:

- Half of NW North River Drive movements are oriented towards Okeechobee Rd. with other significant movements oriented to the north leg of LeJeune Rd. and the east leg of NW 36th St.
- The larger movements for NW South River Drive are closely split between both legs of LeJeune Rd., Okeechobee Rd., NW 36th St., and the SR 112 corridor.

Table 2.8: O-D AM Peak

Origin \ Destination	North River Drive, East of NW 36th Street	South River Drive, East of NW 36th Street	PortMiami Tunnel, South of MacArthur Causeway	PortMiami Bridge, East of US 1	FEC Railyard Entrance	NW 25th Street Viaduct
North River Drive, East of NW 36th Street	0%	14%	38%	34%	11%	2%
South River Drive, East of NW 36th Street	66%	0%	21%	10%	0%	4%
PortMiami Tunnel, South of MacArthur Causeway	0%	0%	0%	93%	0%	7%
PortMiami Bridge, East of US 1	1%	0%	99%	0%	0%	0%
FEC Railyard Entrance	0%	0%	79%	0%	0%	21%
NW 25th Street Viaduct	62%	10%	28%	0%	0%	0%

Bluetooth data collection between 04/04/2017 and 04/06/2017.

Table 2.9: O-D PM Peak

Origin \ Destination	North River Drive, East of NW 36th Street	South River Drive, East of NW 36th Street	PortMiami Tunnel, South of MacArthur Causeway	PortMiami Bridge, East of US 1	FEC Railyard Entrance	NW 25th Street Viaduct
North River Drive, East of NW 36th Street	0%	61%	0%	5%	23%	11%
South River Drive, East of NW 36th Street	90%	0%	4%	0%	0%	6%
PortMiami Tunnel, South of MacArthur Causeway	2%	1%	0%	90%	4%	3%
PortMiami Bridge, East of US 1	4%	1%	92%	0%	3%	1%
FEC Railyard Entrance	14%	0%	68%	15%	0%	3%
NW 25th Street Viaduct	72%	15%	8%	5%	0%	0%

Bluetooth data collection between 04/04/2017 and 04/06/2017.

Figure 2-17: O-D Data, Stations B1 and B3 (AM Peak)

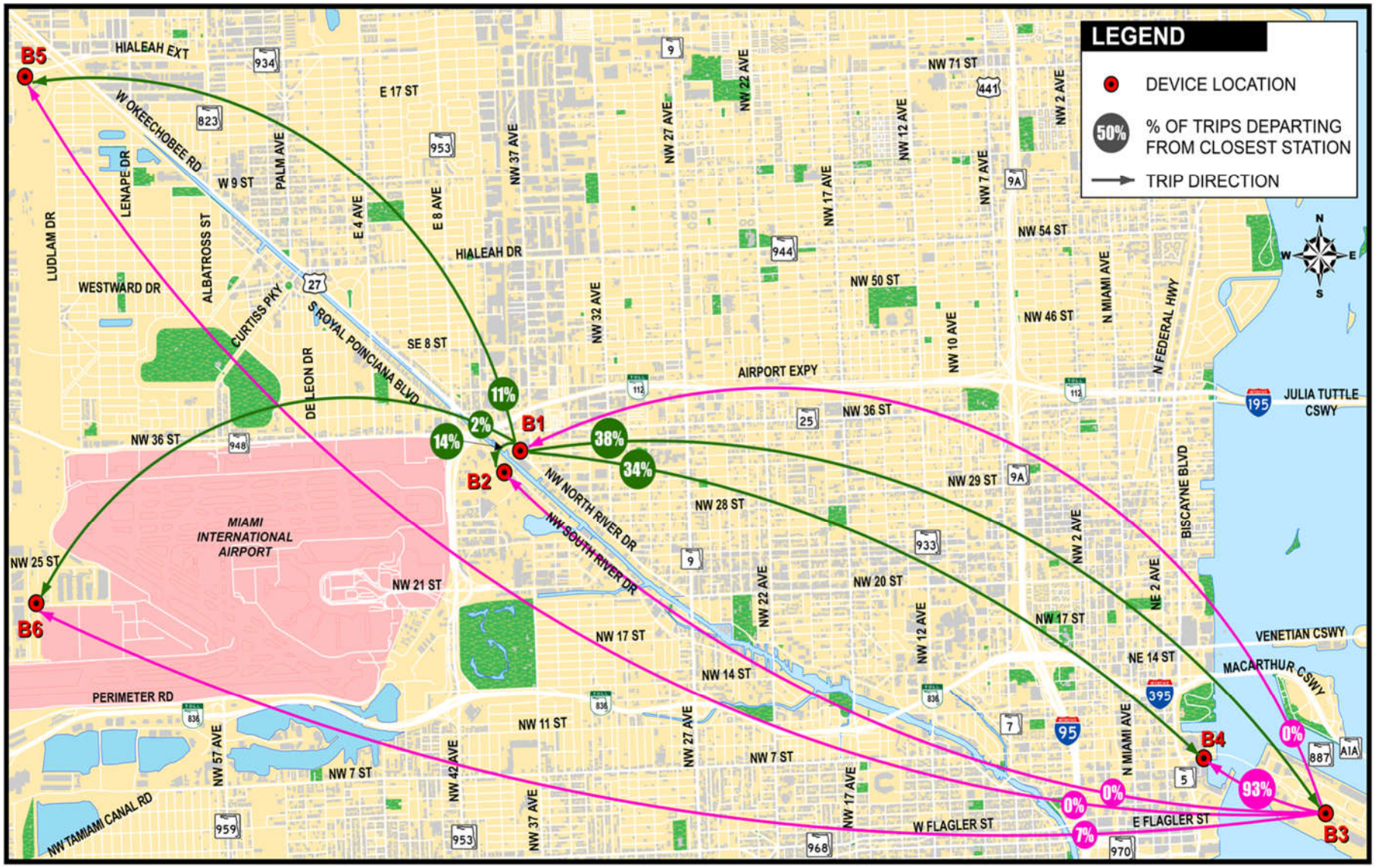


Figure 2-18: O-D Data, Stations B1 and B3 (PM Peak)

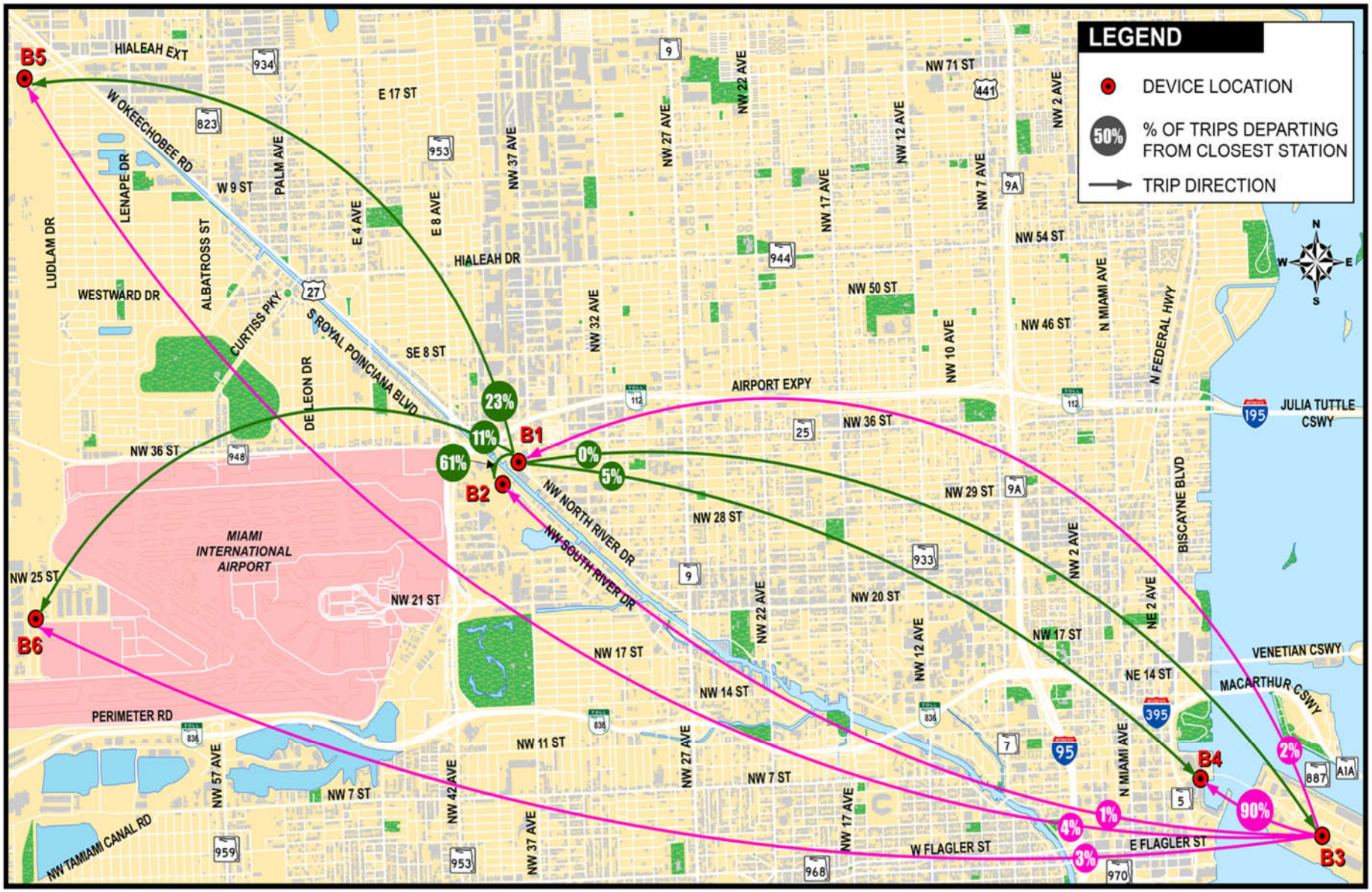


Figure 2-19: O-D Data, Stations B2 and B5 (AM Peak)

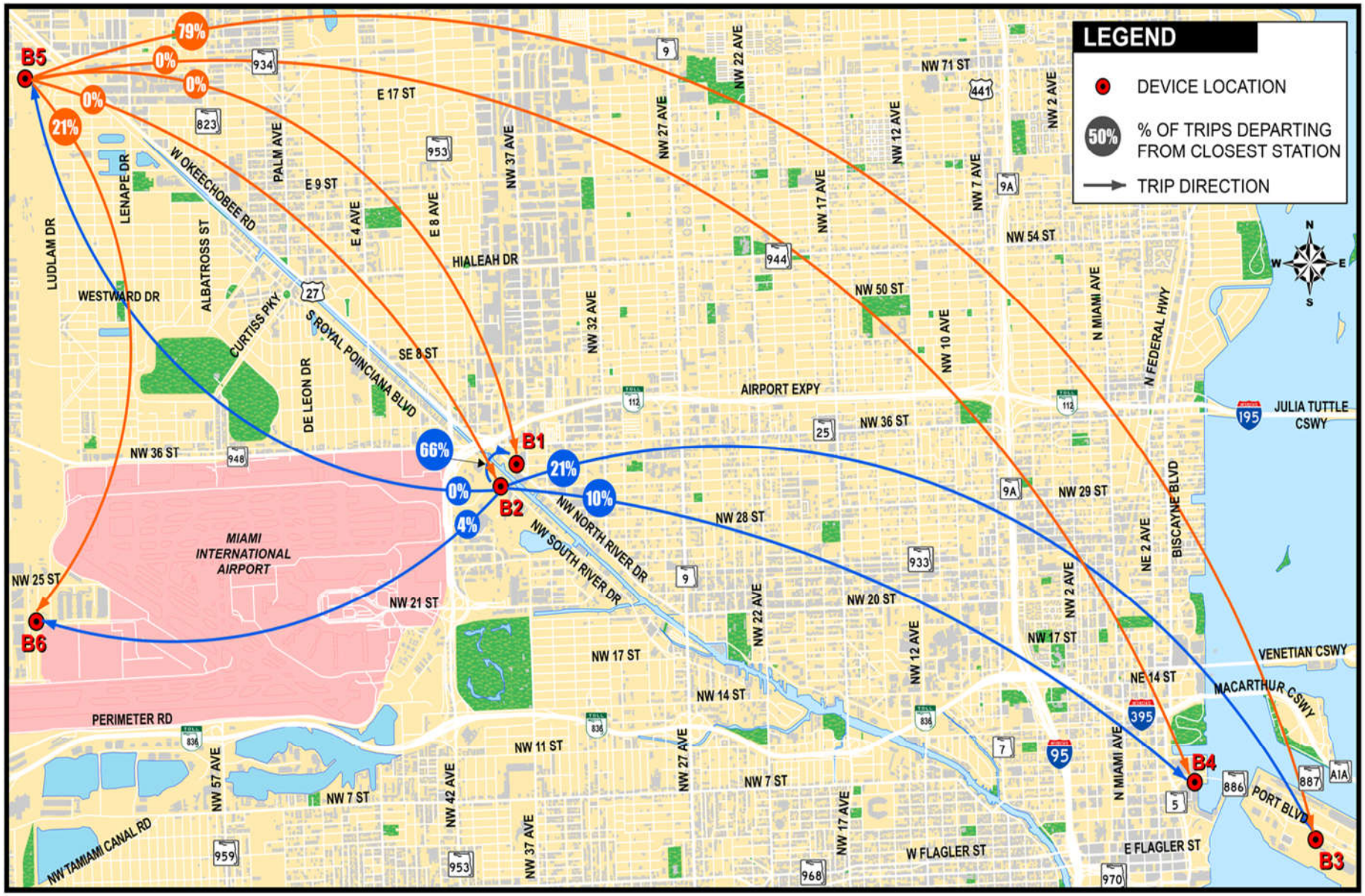


Figure 2-20: O-D Data, Stations B2 and B5 (PM Peak)

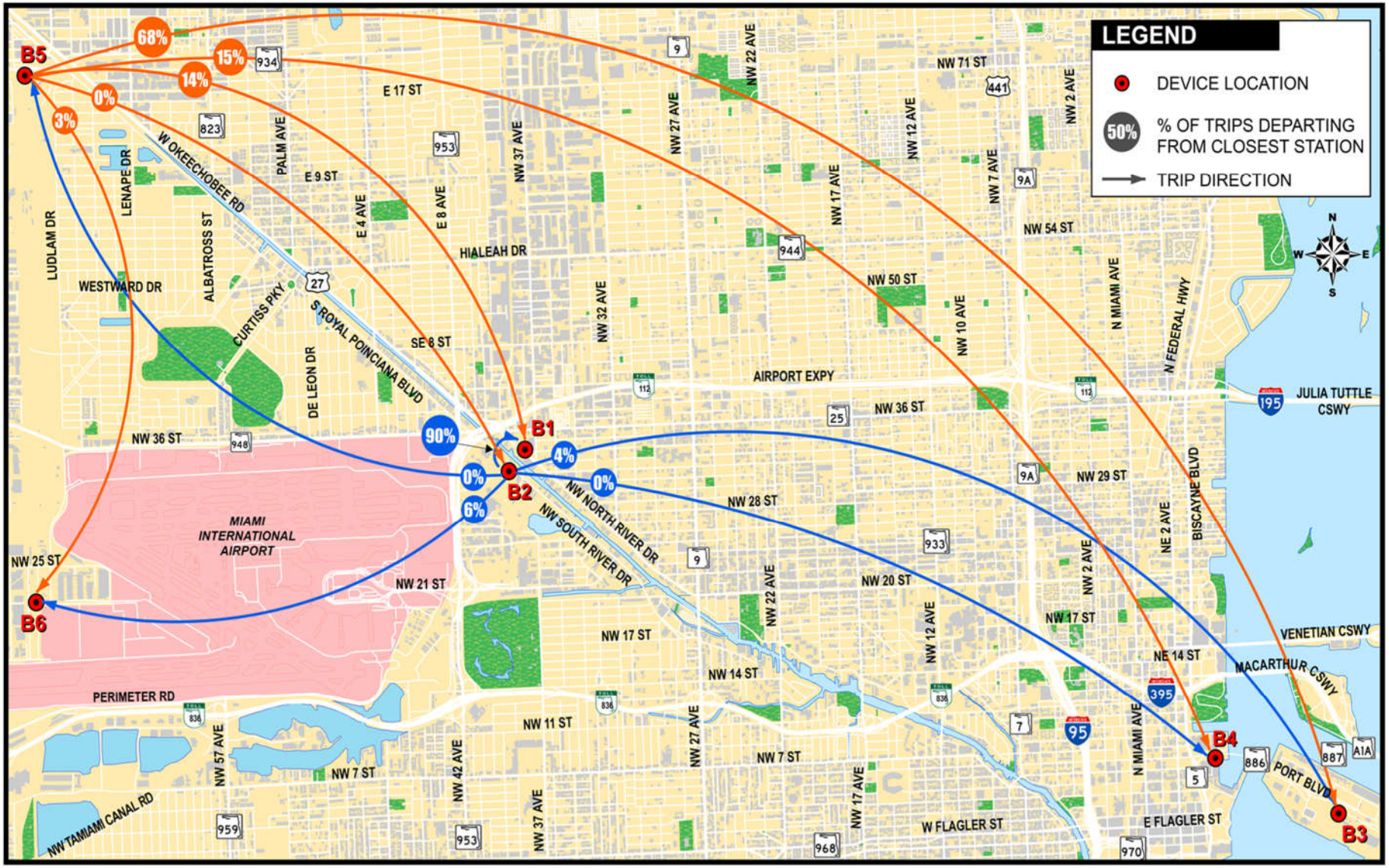


Figure 2-21: O-D Data, Stations B4 and B6 (AM Peak

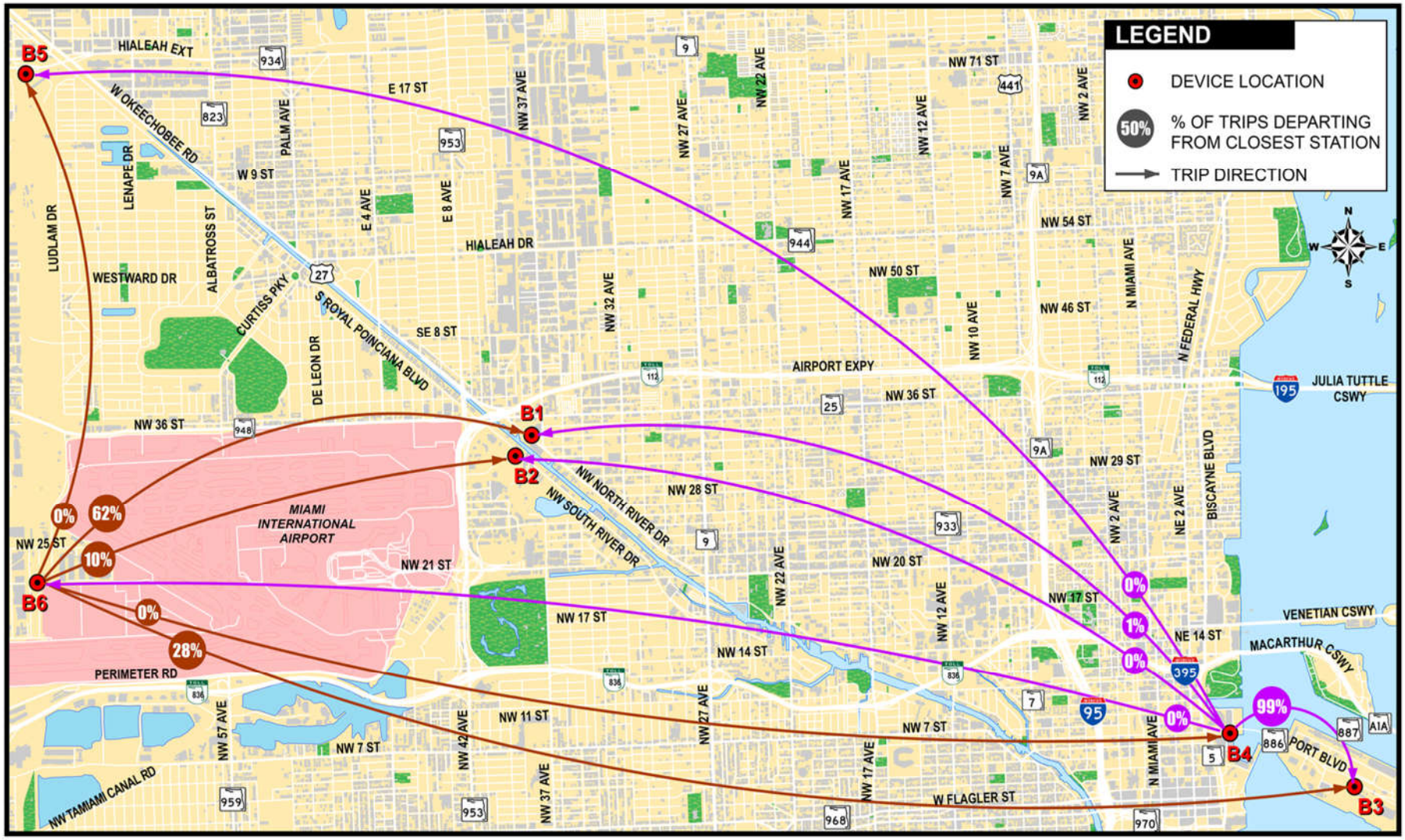
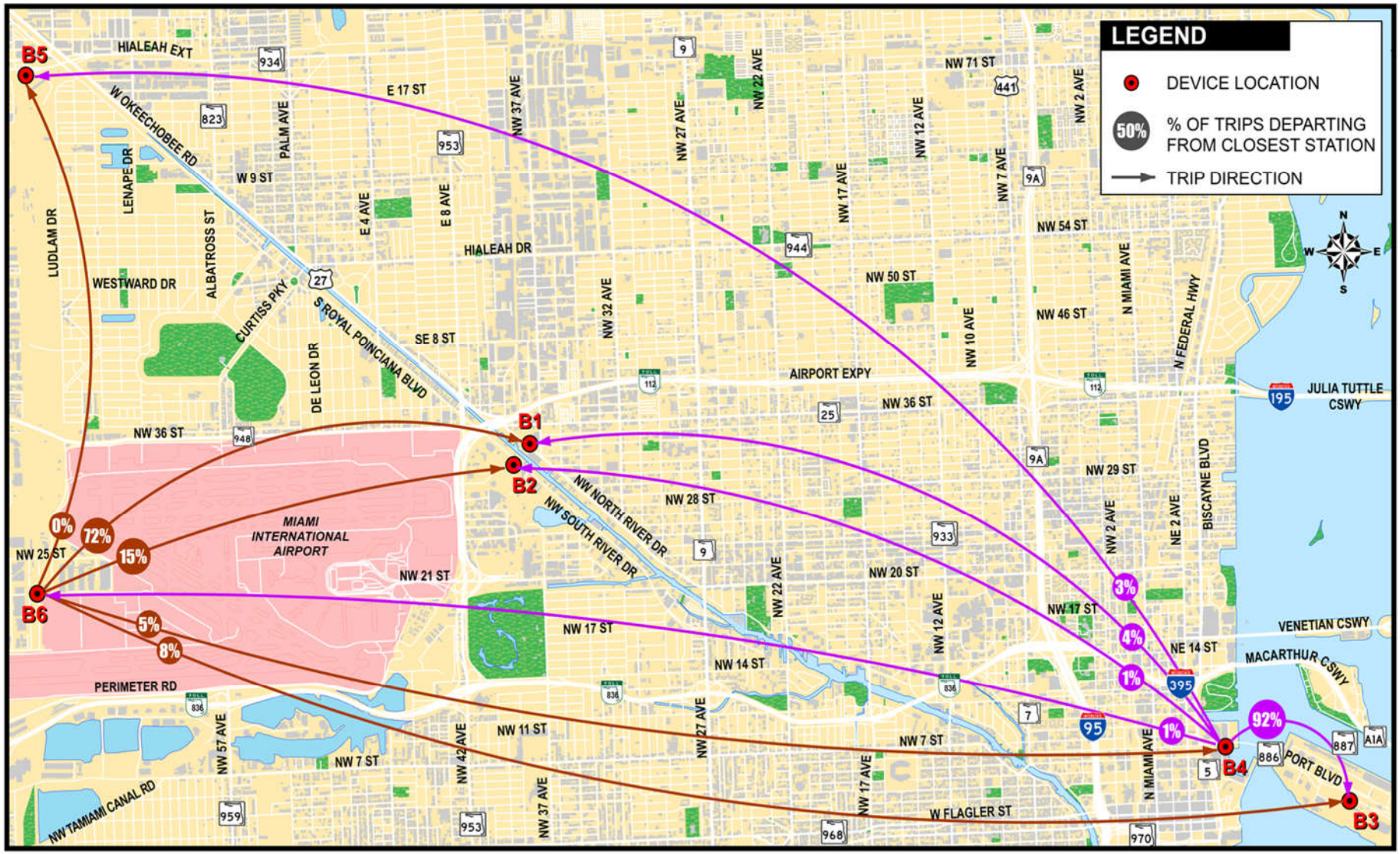


Figure 2-22: O-D Data, Stations B4 and B6 (PM Peak



2.5 Environmental and Socioeconomic Conditions

The main purpose of collecting cultural, historic, and demographic data is to be aware of any adverse impacts of implementing freight improvements. The environmental and socioeconomic conditions data collection effort includes natural and physical resources; demographic, social, and cultural features. This should include, but is not limited to: parks (recreation areas, conservation areas, wildlife refuges) and greenways. In addition, major medical facilities, educational facilities (public and private), religious institutions, cemeteries, archaeological areas and historic sites and districts.

2.5.1 Major Freight Generators

PortMiami, MIA, and the FEC Railroad Yard are among the state's most important freight and logistics centers. MIA is ranked 1st in US international air freight and 9th globally. MIA has a total trade value estimated at $69.9 billion. PortMiami is the 13th largest US mainland container port. The total trade of PortMiami is valued at $25.3 billion, or 30% of the dollar value of Florida's total sea imports and exports. Together, MIA and PortMiami account for nearly 60% of Florida's total air and sea imports and exports.

Within the study corridor, there are few large freight generators in terms of the scale of their operations and the size of property that they control or use. Five of the larger entities are Antillean Marine Shipping, Beruth Marine Shipping, Air Marine Terminal, Betty K, and Bimini Shipping. There are several other properties which likely have housed firms offering shipping services, but the properties appear vacant and unused, or are for lease. There are several other industrial uses in the corridor which are not shipping firms, but which utilize trucking to provide materials delivery to or from their sites. The larger of these are Allied Metals, Cliff Berry, East Coast Scrap Metal, Bracusa, Radiant Oil, and Sungas Corporation, of which the latter also receives some product deliveries by rail. There are many small parcel tenants in the area with industrial type uses, as well as many unoccupied sites. Just north of NW North River Drive at NW 32nd Avenue is a large Miami-Dade County Transportation and Public Works bus transit depot providing storage and maintenance for dozens of buses.

2.5.2 Social and Economic

Existing and Future Land Use

Figure 2-23 displays the generalized land use map for the study area. There is a high concentration of Industrial (purple) and Commercial/Office (red) land uses along the northern and eastern potions of the study area. Industrial land uses become more infrequent along the central and southern portions of the study area, while the Residential (yellow) and Commercial/Office land uses increase in frequency.

Figure 2-24 displays the municipal future land use designations for the study area. The future land uses along the canal are largely business and central business district land uses. Other common future land uses designations are industrial and residential.

Figure 2-23: Existing Land Use

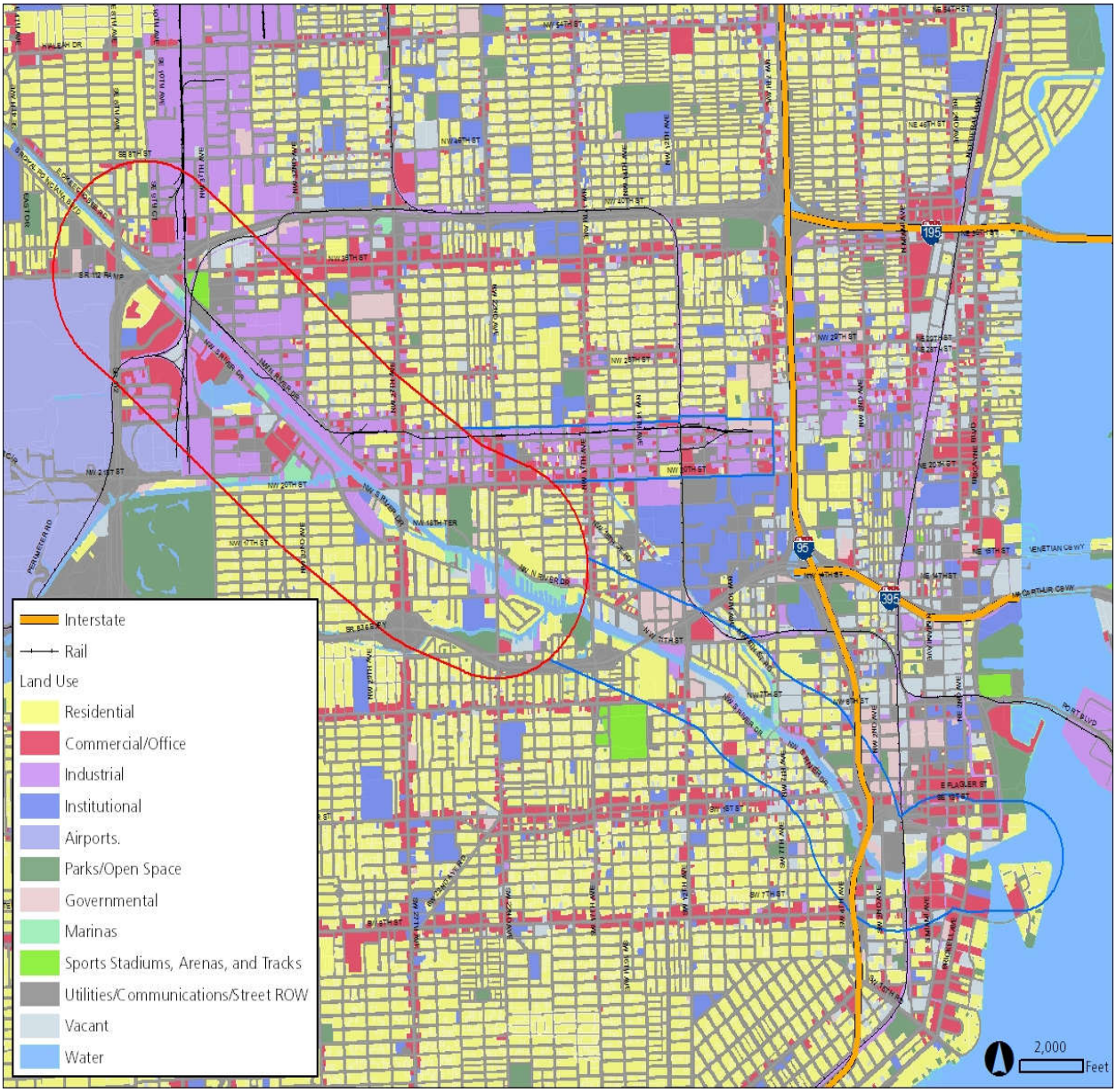
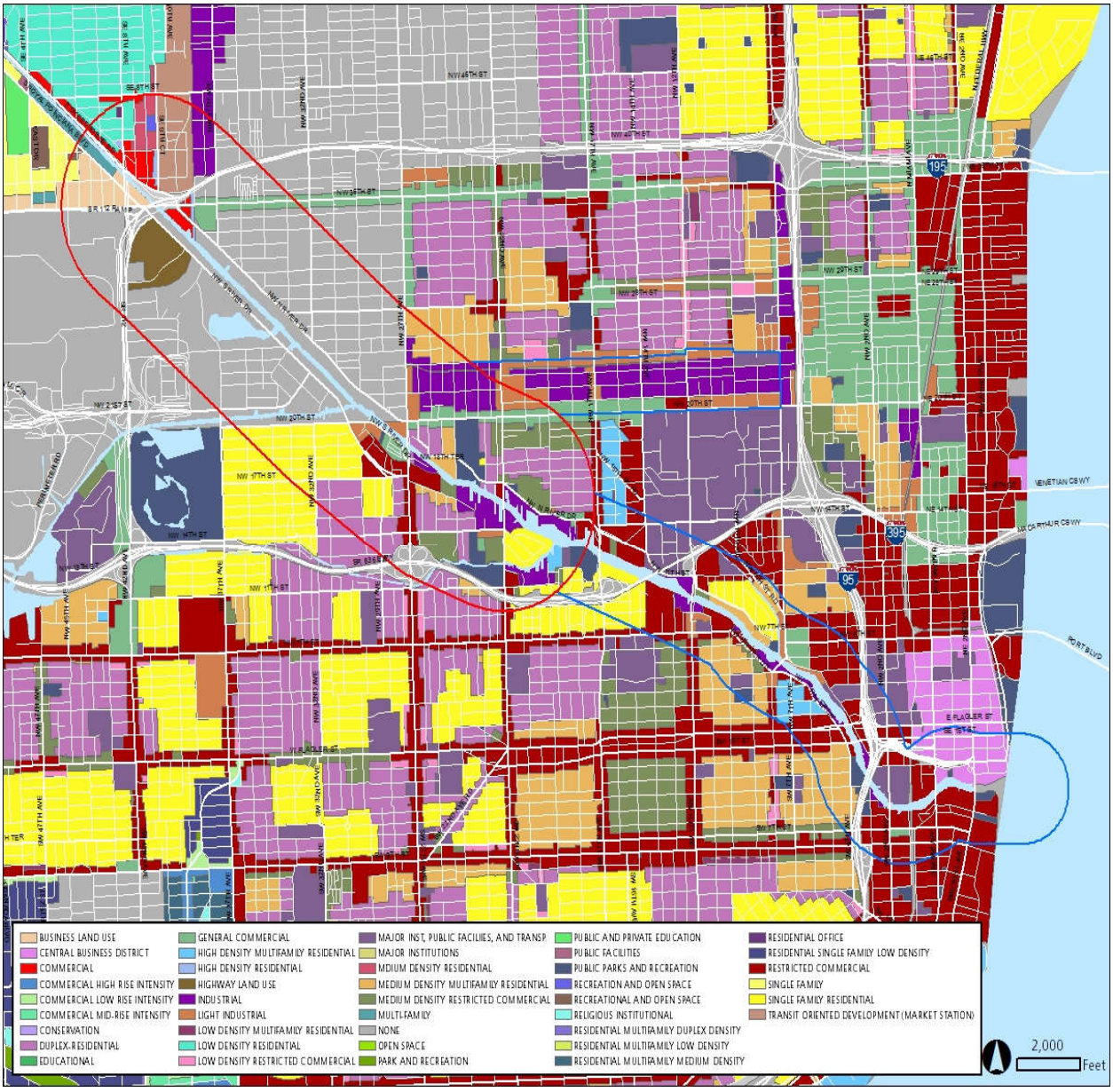


Figure 2-24: Future Land Use Designations



Statewide Land Use Land Cover

In addition to the existing land use and future land use designations data derived Miami-Dade County, Land Use and Land Cover data sets from the statewide water management districts (SFWMD) was also analyzed. The results are displayed in **Table 2.10**:. The SFWMD Florida Land Use and Land Cover dataset identified Residential (19.16%), Retail/Office (14.47%), Public/Semi-Public (11.69%), and Industrial (10.64%) as the top four land uses within the study area.

Table 2.10: SFWMD Land Use and Land Cover Acreages

Land Use Type	Acres	Percentage
Acreage Not Zoned For Agriculture	19	0.59%
Agricultural	0	0.00%
Centrally Assessed	9	0.28%
Industrial	345	10.64%
Institutional	41	1.26%
Mining	0	0.00%
Other	0	0.00%
Public/Semi-Public	379	11.69%
Recreation	42	1.30%
Residential	621	19.16%
Retail/Office	469	14.47%
ROW	0	0.00%
Vacant Residential	140	4.32%
Vacant Nonresidential	196	6.05%
Water	0	0.00%
Parcels With No Values	3	0.09%

Empowerment Zone

Miami Dade County, Florida Empowerment Zone (Introduced in 1993, the Empowerment Zone (EZ), Enterprise Community (EC), and Renewal Community (RC) Initiatives sought to reduce unemployment and generate economic growth through the designation of Federal tax incentives and award of grants to distressed communities. Local, Tribal, and State governments interested in participating in this program were required to present comprehensive plans that included the following principles: Strategic Visions for Change, Community-Based Partnerships, Economic Opportunities, and Sustainable Community Development. Communities selected to participate in this program embraced these principles and led projects that promoted economic development in their distressed communities).

Enterprise Zone

Enterprise Zone - Miami-Dade County (EX-1301) is located within the study area. An Enterprise Zone is a specific geographic area targeted for economic revitalizing. Enterprise Zones encourage economic growth and investment in distressed areas by offering tax advantages and incentives to businesses located within the zone boundaries.

Social

The Environmental Screening Tool (EST) Sociocultural Data Report (SDR) was used to derive demographic data for the study area. The SDR uses the Census 2015 American Community Survey (ACS) data and reflects the approximation of the population based on a project buffer intersecting the Census Block Groups along the project corridor. Using the study area, the SDR identified the following demographics:

Population and Income

The SDR identified 20,178 households with a population of 51,113 people within the study area. The median household income is $25,983. Several households are below poverty level (32.35%), and 1.56% of households receive public assistance**. Table 2.11** depicts some general population trends in the study area.

Table 2.11: General Population Trends

Description	1990	2000	2010 (ACS)	2015 (ACS)
Total Population	36,857	38,320	48,515	51,113
Total Household	13,468	14,300	20,269	20,178
Average Persons per Acres	23.33	26.29	50.73	51.28
Average Persons per Household	3.04	2.81	2.53	2.62
Average Persons per Family	3.50	3.55	2.98	3.61
Males	19,197	19,657	25,087	25,451
Females	17,660	18,663	23,429	25,662
Population Under Age 5	6.81%	6.47%	6.36%	6.68%
Population Ages 5-17	14.62%	15.36%	11.42%	12.03%

Race and Ethnicity

The minority population makes up 94.86% of the total population comprising of "Black or African American Alone" with a population of 5,300 persons (10.37%), "Some Other Race Alone" with a population of 1,557 people (3.05%), "Claimed 2 or More Races" with a population of 722 (1.41%), "Asian Alone" with a population of 601 (1.18%), and "American Indian or Alaska Native Alone" with a population of 14 people (0.03%) within the study area. There are 40,286 persons (78.82%) that have a "Hispanic or Latino of Any Race" ethnicity.

Age and Disability

The median age is 38 and persons age 65 and over comprise 14.54% of the population. There are 2,517 persons (7.69%) between the ages of 20 and 64 that have a disability.

Housing

There are 26,554 housing units. The housing consists of multi-family units (21,748), single family units (4,515), and mobile home units (259). These units are renter occupied (15,386), vacant units (6,376), and owner occupied (4,792).

Language

There are 8,583 people (18.0%) that speak English "not at all" and 8,221 people (17.24%) that speak English "not well". Based on US DOT Policy Guidance, the FDOT has identified four factors to help determine if Limited English Proficiency (LEP) services would be required as listed in the FDOT PD&E Manual, Part 1, Chapter 11, Section 11.1.2.2 Based on a review of these factors and the fact that LEP population accounts for 35.23% of the population for this project, LEP services will be required.

Community Features

According to the EST, the following types of facilities are located within the study area:

- American Indian Lands and Native Entities of Florida – Miccosukee Tribe of Indians – Lawrence Park
- Miami International Airport
- Nine Community Centers; Myers Senior Center, Scottish Rite Temple, Miami Association of Fire Fighters Local 587, Ukrainian American Club, Association of Retarded Citizens, Jack Orr Senior Center, Gran Logia De Cuba, Miami Bridge Youth and Family Services, and Mahi Temple Aaonms
- Two additional Community and Fraternal Centers; YWCA and Chamber of Commerce – French America Chamber
- Miami-Dade County Pre-Trail Detention Center
- Twelve Cultural Centers; Perez Art Museum Miami, Miami Springs Branch Library, Charlton W. Tebeau Library of Florida History, Squire Sanders & Dempsey Library, Holland & Knight Law Library, Office of the Public Defender - Public Defender Law Library, South Florida Evaluation & Treatment Center Library, Miami-Dade Public Library System - Main Library, Arts & Business Council of Miami Inc, Historymiami, Lyle O Reitzel Gallery, and Olympia Theatre at the Gusman Center for the Performing Arts
- Two Existing Recreational Trails; M-Path and Miami River Greenway

- Front Porch Community – Riverside Community (Front Porch Communities are neighborhoods, usually diverse and with a history of involvement in community-based efforts, that are eligible for and receive priority consideration for special community revitalization funds and grants from state, federal, and other sources.)
- Miami Fire Department and Rescue Station 3 and Miami Police Department
- Five Government Buildings; Miami-Dade Health Department, US Post Office – Metro Finance, Miami-Dade Marriage/Mortgage/Foreclosure, Miami-Dade Tax Collector, Miami-Dade Criminal and Traffic Courts
- Twenty-two Geocoded Healthcare Facilities
- Geocoded Hospital – Acute Care
- Five Geocoded Laser Facilities
- Ten Geocoded Social Service Facilities
- Twenty-five Group Care Facilities
- Twenty-four Local Parks and Recreational Facilities (described under Recreation)
- Eleven Schools; Eschool USA, American Academy High School, International Christian School, Downtown Miami Charter School, Miramar Elementary School, Florida International University – The Metropolitan Center, Miami Bridge North, Early Beginnings Academy, Mater Academy East Charter and Middle Schools, and George T. Baker Aviation School
- Seventeen Religious Centers; New Apostolic Church, Sanando Las Naciones, Ministerio Arbol De Vida Inc-Ad, Jehovah's Witnesses, Iglesia De Dios, Iglesia Bautista Efeso, Iglesias Evangelica Jesus, Iglesia Torre Fuerte, Mission La Milagrosa Corpus Christi Catholic Church, Iglesia De Dios Hispana, Soldiers of the Cross Evangelical Church, Miami River Mission Church, The Church of The Kingdom of God, Hungarian Church, First Presbyterian Church of Miami, Trinity Christian Methodist Episcopal Church, and Iglesia Bautista Jerusalem

Other Land Use Features

- Four Census Designated Places; Miami Springs, Miami, Hialeah, and Brownsville
- Four Mobile Home and RV Parks; Blue Belle Trailer Park, Carleys Mobile Home Park, Fronton Trailer Park, and River Park Trailer Park

Residential Land Use

- Fixed Single Family Units – 791.55 acres (24.42%)
- Multiple Dwelling Units, High Rise – 150.62 acres (4.65%)
- Multiple Dwelling Units, Low Rise – 142.54 acres (4.4%)
- Mobile Home Units – 23.65 acres (0.73%)

Commercial and Services land use

- 669.37 acres (20.65%)

Farmlands

- There are no Prime Farmlands

Economic Factors

- There are 11 Developments of Regional Impact (DRI) and no Planned Unit Developments
- Enterprise Zone – Miami-Dade County (EX-1301)
- Miami Dade County, Florida Empowerment Zone

Mobility

- Nine intermodal terminal facilities
- Fourteen fixed guideway transit network stations
- Fixed guideway transit network lists the Tri-County Commuter Rail, Metromover, and Metrorail
- Eighty-six bus transit routes
- Miami International Airport

2.5.3 Cultural

Section 4(f)

See resources listed under Historic and Archeological Sites and Recreation Areas. Note there are also Section 6(f) sites.

Historic and Archaeological Sites

- American Indian Lands and Native Entities of Florida – Miccosukee Tribe of Indians – Lawrence Park
- Nineteen Florida Site File (FSF) Archeological or Historic Sites
- Seventeen FSF Historic Bridges of which six are eligible for the National Register of Historic Places (NRHP); Seybold Canal Bridge, NW South River Drive Swing Bridge, NW 17th Avenue Bridge, CSXT Railroad Bridge #M.P. 1036.7, Southwest 1st Street Bridge, and NW 36th Street Bridge
- Four hundred and eighty (480) FSF Historic Standing Structures
- Twenty FSF Resource Groups
- Twelve NRHP; Olympia Theater and Office Building, J.W Warner House, Miami Circle at Brickell Point Site, Hialeah Seaboard Air Line Railway Station, Brickell Mausoleum, City National Bank Building, Huntington Building, Ingraham Building, South River Drive Historic District, Pal Cottage, Lummus Park Historic District, Downtown Miami Historic District.
- Two State Historic Highways; Brickell Avenue and Calle Ocho/SR 90

Recreation Areas

- Two Existing Recreational Trails; M-Path and Miami River Greenway
- Twenty Three Local Parks And Recreational Facilities; Allapattah Mini Park, Northwest 4th Avenue Playground, Ragan Park, Jose Marti Riverfront Park, Brickell Park, Sewell Park, Henderson Park, Lummus Park, Curtis Park / Sport Complex, Fern Isle Park, Miami River Rapids, Spring Garden Point, Jose Marti Park, Three Friends, Southeast Park, Allapattah Mini Park, Fort Dallas Mini Park, Miami River Walk, Grove Park (Median Strip), Allapattah Mini Residential, Miami River Greenway, Bayfront Park, and Stephen P. Clark Government Center Park
- Six National Parks Projects [Using Land and Water Conservation Funds (LWCF) – Section 6(f)]; Lummus Park, Southeast Park, Jose Marti Park, Miami River Bicycle Trail, Bayfront Park II, and Latin Community Riverfront Park

Natural

Wetlands

- National Wetlands Inventory (NWI) – 119.26 acres (3.68%) of estuarine wetlands, 54.37 acres (1.68%) of marine wetlands, 36.01 acres (1.11%) of riverine wetlands, and 16.44 acres (0.51%) of palustrine wetlands within the study area.
- Johnson Seagrass Critical Habitat – Northern Biscayne Bay
- Seagrass Beds – 3.14 acres (0.1%) of continuous and 8.29 acres (0.26%) of discontinuous

Water Quality and Quantity

- Seven waterbodies; C-6/Miami Canal, C-6/Miami River (Lower Segment), C-6/Miami River, Direct Runoff to the Bay, Wagner Creek, PortMiami, C-4/Tamiami Canal (All are Verified Impaired Florida Waters)
- Aquatic Preserve and Other Outstanding Florida Waters (OFW) – Biscayne Bay
- Major Dam – Structure No. 26 (FL00404) – Flood Control
- Principal Aquifer – Biscayne Aquifer (97.42%)
- Recharge Areas of the Florida Aquifer – Discharge/Less than 1
- Three SFWMD Canals; C-4, C-5, and C-6

Floodplains

- Special Flood Hazard Areas identifies Zone AE with 2,740.13 acres (84.53%) and Zone VE with 77.27 acres (2.38%) within the study area
- D-FIRM 100-year Flood Plain identifies Flood Zone AE with 2,539.87 acres (78.35%), Zone AH with 177.67 acres (5.48%), and Zone VE with 48.81 acres (1.51%) within the study area

Wildlife and Habitat

- Atlantic Coast Plants Consultation Area – 497.86 acres (15.36%)
- Critical Habitat in Florida for the West Indian Manatee – 1,136.39 acres (35.06%)
- West Indian Manatee Consultation Area – 606.0 acres (18.69%)
- American Crocodile Consultation Area – 100%
- FFWCC State Manatee Protection Zone – Idle Speed (all year) – 205.93 acres (6.35%) and Slow Speed (all year) – 34.37 acres (1.06%)
- FFWCC Wildlife Observations – Brazilian Free-Tailed Bat

- FNAI Element Occurrence for Gopher Tortoise Aphodius Beetle, Miami Chafer Beetle, Tropical White-Spotted Long-horned Beetle, and on data sensitive occurrence (contact FNIA for more information)
- Piping Plover Consultation Area – 1,200.46 acres (37.03%)
- Snail Kite Consultation Area – 2,402.29 acres (74.11%)
- Rare and Imperiled Fish - Mangrove Rivulus (waterbody not named) and Mountain Mullet (Tamiami Canal)
- Woodstork Core Foraging Areas – 2,924.85 acres (90.53%)

Coastal and Marine

- Johnson Critical Seagrass Critical Habitat – Northern Biscayne Bay
- Aquatic Preserve and Other Outstanding Florida Waters (OFW) – Biscayne Bay
- Seagrass Beds – 3.14 acres (0.1%) of continuous and 8.29 acres (0.26%) of discontinuous
- Submerged Lands Act – 248.01 acres (7.65%)
- Five Types of Environmentally Sensitive Shorelines totaling over 80,000 feet; 10D: Scrub-Shrub Wetlands, 5: Mixed Sand and Gravel Beaches, 8B: Sheltered Solid Man-made Structures, 8C: Sheltered RipRap, and 9B: Vegetated Low Banks.

Physical

Noise

- Residential Areas listed above
- No existing noise barriers.

Air Quality

- The project is not located within a USEPA-designated Air Quality Maintenance or Non-Attainment Area for any of the four pollutants (nitrogen oxides, ozone, carbon monoxide, and small particulate matter) specified by the USEPA in National Ambient Air Quality Standards. Therefore, the Clean Air Act conformity requirements do not apply to this project at this time.

Contamination

- Biomedical Waste Sites (76)
- Brownfield Location Boundaries (6)
- FDEP Off Site Contamination Notices (29)
- Hazardous Waste Facilities (172)
- National Priority List Site – Biscayne Aquifer - Varsol
- Onsite Sewage (313)
- Petroleum Contamination Monitoring Sites (224)
- Solid Waste Facilities (21)
- State Funded Hazardous Waste Cleanup Site – Upsilon Davis
- Storage Tank Contamination Monitoring Sites (317)
- Super Act Risk Sources (119)
- Super Act Well (6)
- Superfund Hazardous Waste Sites; Pure Lead, House of Radiators, and Lead Enterprises
- USEPA National Pollutant Discharge Elimination Systems (NPDES) (95)
- USEPA Resource Conservation and Recovery Act (RCRA) Regulated Facilities (229)

Infrastructure

- Miami International Airport
- Miami-Dade County Pre-trail Detention Center
- Ten Federal Aviation Administration Obstructions
- Major Dam – Structure No. 26 (FL00404) – Flood Control
- Geocoded Hospital – Acute Care
- Railroads
- Fourteen Wireless Antenna Structure Locations

Navigation

- Three Navigable Waterways: Miami River, Atlantic Intercostal Waterway, Intracoastal Access
- Three SFWMD Canals; C-4, C-5, and C-6
- Seventy-two US Army Corps of Engineers Ports
- Four US Coast Guard Aids to Navigation

Special Designations

- Aquatic Preserve and Other Outstanding Florida Waters (OFW) – Biscayne Bay

2.5.4 Land Use Market Conditions

A brief review of land use conditions in the study area was made to put the real estate economics of the Miami River study area in context to other industrial land districts in Miami-Dade County. One of the threats to the marine shipping community along the Miami River is pressure of generally rising land values in all land use categories across the county and the specific market demand pressures in select areas of interest and preference. It was reported anecdotally that active marine shippers have been approached in recent years to sell their properties. There can be other dockside operators who are tenants on land owned by others, who may not be so committed to the future of the working river.

Industrial land tends to be at the bottom of the real estate hierarchy in terms of its land cost/acre. Layered above it are single-family residential, single-story commercial, followed by multistory residential, and multistory commercial, and tower commercial/office and residential (condominium) uses. As a contrast, a representative industrial property near the river east of the airport might be valued presently at approximately $23/square foot (sf). At the extreme end, a wedge-shaped waterfront property 1.25 acres in size near the mouth of the river was sold recently for $125 million, or $2,300/sf, a multiplier of 100; that site is to receive the 66-story Aston Martin Residences. While these are extremes, land values are rising along the river west of downtown Miami.

Florida's State Legislature created the Miami River Commission in 1998 and it is the official clearinghouse for all public policy and projects related to the Miami River. The Commission plays an important role in optimizing the extraordinary resources – historic, cultural, economic, environmental and recreational – of this unique waterway. The City of Miami joined with Miami-Dade County and the Miami River Commission to comprehensively review at conditions along the River and create a unifying land use vision for the Miami River and its neighborhoods. With funds from the Miami River Commission, the Florida Department of Community Affairs, the County and the Empowerment Zone Trust, the Miami River Urban Infill Plan is intended to serve as a strategic blueprint, a broad planning guide and an action plan, to steer land use and growth along this important regional waterway. That plan calls for the western third of the river from west of NW 22nd Street to be a working river with marine industrial zoning.

It is that plan and zoning status, and the monitoring of conformance of development proposals with the Urban Infill Plan by the Miami River Commission which helps to protect the working river from development pressures such as:

- The proposed Palmer Lake district between the river and the airport which envisions a redevelopment of a large triangle of properties into a mixed use (office, residential, commercial) area. The plan and development code preserve the marine industrial uses between the river and NW South River Drive.
- The City of Miami annexed fronting properties along NW 36th Street west to and including the Magic City Casino site at NW 37th Avenue. Those street frontages have T-6 zoning under the Miami 21 comprehensive plan, allowing six-story buildings, and one has been built already.
- Development of waterfront properties with tall buildings is extremely active in downtown Miami, and such activity is moving up the river west of I-95. Proposals are occurring in the middle river which is also home to a number of boatyards and other marine operations.

The industrial corridor extending 2-3 blocks either side of the Downtown rail lead which extends eastward from the working river area parallel to NW 23rd Street nearly to I-95 is also subject to land development pressures. The east end is just north of the Jackson Medical Center district which has been developing northward, and the Wynwood/Midtown "new town in town" district is expanding westward and its influences are starting to be felt to the west side of I-95.

A cursory review was made of real estate market conditions within the primary study area including the working river and its adjacent industrial uses as well as the industrial land uses extending eastward along the rail line (see **Appendix E**). This work was performed by researching real estate databases. From that review, the following observations are provided:

- This defined area contains 1,185 commercial properties. Of these, 590 are industrial in use and 115 are vacant land.
- Warehousing and truck terminal uses account for 420, or 71%, of the industrial sites.
- Little new construction is underway or proposed in this area.
- There have been 500 property sales in this area over the last 10 years.
- Land sale prices are presently in the range of $23/sf to $40/sf. These values and the sales volume have been rising in recent years following the Great Recession.

The marine shipping community is confronting both the short-term challenge of growing its market to prior levels and the long-term challenge of maintaining its viability in terms of real estate market pressures. The described "eco-system" created by the presence of the Urban Infill Plan and zoning provisions of the City of Miami and Miami-Dade County, as monitored by the Miami River Commission, creates a supportive environment for the sustained existence of the Port of Miami River.

3.0 Purpose and Need

3.1 Background

In the crosswinds of uncertainty due to the Great Recession and an unforeseen dynamism due to new technologies, Florida's public and private leaders identified a "once-in-a-generation opportunity" to revitalize and catalyze the State's economy by becoming a "global hub for trade, logistics, and export-oriented manufacturing actives" (Florida Trade and Logistics Study, 2010). This opportunity came with the completion of the procurement process for the Panama Canal Expansion Project in 2010; a project which promised the world the safe and more frequent passage of container ships carrying approximately 150% to 200% more cargo than before (The Geography of Transport Systems, 2012, https://people.hofstra.edu/geotrans/eng/ch3en/conc3en/containerships.html). This promise and vision of growth comprised the essence of an overarching need for an improved freight infrastructure and logistics system that ensured the mobility of goods and enhanced the economic prosperity of the State.

Since then, Florida has pursued this opportunity with major investments in strategic transportation projects such as the $667 million PortMiami Tunnel, its first-ever statewide Freight Mobility and Trade Plan (FMTP) fully adopted in 2014 and in support from the Moving Ahead for Progress in the 21st Century Act (MAP-21, P.L. 112-141), innovative programs for employer-driven training and company-specific export developments (Florida: Made for Trade – Florida Trade and Logistics Study 2.0, 2013), and multiple other efforts of statewide, regional, and county scope.

At a granular level, this subarea freight study is the ultimate step in identifying specific needs and improvements that support the State's vision in becoming a global hub. Miami-Dade County is the most populous of Florida's 67 counties with a 2016 estimated population of 2.7 million people living in just over 2,400 square miles (approximately 13% of the total state population living on approximately 4.5% of the total area), and growing at a rate approximately 50% faster than the rest of the State. With increasing population come increasing demands for goods movement. Today, the main freight movement within the County originates and terminates along an axis that extends from PortMiami in the east to the rock quarries in the west. This east-west freight belt is comprised of the Miami International Airport (MIA), the Florida East Coast (FEC) Rail Yard, the Port of Miami River near the airport, and major warehouse districts along the Dolphin Expressway (SR 836). This unique study, along with its counterparts, will help extract the full potential out of Miami's existing freight assets while recognizing local opportunities for growth.

The Port of Miami River is a collection of private shipping companies operating on the western part of the shallow draft Miami River on parcels zoned marine industrial, mostly between NW 22nd Avenue and NW 39th Avenue. Their niche markets comprise the Bahamas, the Dominican Republic, Haiti and other Caribbean ports of call with shallow draft conditions. The few larger shippers focus on containerized goods, and some specialized cargos. Smaller shippers concentrate on palletized items, personal deliveries, and small-scale bulk and breakbulk commodities. The annual tonnage volume shipped through the Port of Miami River is a mere fraction of the PortMiami, in the range of 6%. However, its shippers provide a critical trade lane for their markets that would otherwise be difficult to serve. The recent dredging of the Miami River restored a uniform and slightly deeper waterway to help sustain both cargo and recreational boating activity in this historic and important waterway. Examination of the river corridor's issues, needs and opportunities will benefit not only marine shipping interests but secondarily can be expected to be of value to other marine and surface transportation interests as well.

To guide the study efforts, a purpose and need statement was defined early in the study process. This statement was informed by review of relevant studies and findings, initial input from study area stakeholders, and the team familiarity with and further review of the study area.

3.2 Purpose

The aim of this plan is to develop a set of viable improvement concepts to enhance freight connectivity and mobility. To accomplish that, the improvements to be proposed should broadly address these purposes:

- Address transportation congestion issues.
- Improve freight operational efficiency.
- Consider regional freight connectivity.
- Review river operational capacity.
- Seek opportunities for economic development of the freight and industrial land uses.
- Utilize input from study area stakeholders as to issues, needs, and opportunities.

3.3 Need

The Port of Miami River is situated within central Miami-Dade County near Miami International Airport and relies on the river connection to Biscayne Bay which traverses the City of Miami and the burgeoning downtown district. The major attractions in the central east-west corridor of the county generate significant traffic in their vicinity and on the roads and expressway which connect them together. This part of the county, as well as many others, are characterized by significant peak congestion extending over several hours of the morning and evening, and even in other periods of the day. Transportation forecasts show that the background traffic volumes are expected to continue to grow at a sizable rate, putting further stress on the transportation network. While the marine shipping traffic generates a relatively small share of the traffic in this sector of the county, its truck trips are as vital to the shippers and customers involved as those in more freight-oriented districts such as Doral and Medley.

The primary needs of the study area are to maintain and improve connectivity to the regional highway network and to improve the operational efficiency of the roadway network used by the marine shipping community and the adjacent industrial land uses. The following points expand upon this need statement:

- **Need to maintain and enhance connectivity to the regional highway system:** The principal portals for the Port of Miami River study area are NW 27th Avenue to both SR 112/Airport Expressway and SR 836/Dolphin Expressway, and NW North River Drive and NW SW South River Drive to NW 36th Street where connections to other major arterial corridors occur. Growing congestion on these portals threatens convenient access to and from the study area.
- **Heavy congestion saturates the surface street and expressway network.** Continued growth in population, employment and visitors to Miami-Dade County causes daily traffic volumes across the roadway network to broadly increase at a significant rate. Some of this traffic finds the spine roads of the marine shipping core, namely NW North River Drive and NW South River Drive as attractive bypass routes because of their diagonal orientation and lack of north-south arterial street interference. Likewise, NW 27th Avenue experiences high traffic volumes as a lengthy north-south cross-county arterial route

intersecting east-west expressways, and NW 36th Street plays a similar role in connecting with north-south expressways.

- **Infrastructure condition is lacking in the study area.** Deteriorated pavement and insufficient drainage infrastructure create deficiencies which hamper vehicular movements in the study area. Informal parking and driveways which have evolved over the years create unsafe and unorganized conditions which can contribute to crashes and difficulty in maneuvering. The existing railroad through the study area is in deteriorated condition, most of the private driveway crossings along NW North River Drive lack safety signing and are in poor condition. The excessive number of rail crossings east of NW North River Drive increases crossing maintenance cost and the number of conflict points.

- **Amenities for non-vehicular movements are lacking.** While the study focus is on improving freight mobility, the role of transit, bicycle paths, and sidewalks is important in providing job commute choices to workers in the study area. Sidewalk condition and discontinuities impairs walking mobility in some areas, and there are no designated bicycle facilities presently. The primary study area has some transit route coverage, but there are essential no transit user amenities such as benches, shelters and lighting.

- **Potential for improved intermodal connectivity.** Opportunities existing within the study are for enhanced intermodal connectivity, beyond the marine/trucking connection that exists. A small community of rail users exists and expansion of this group would help to justify selective rail corridor improvements. Maintaining the efficiency of ship movements up and down river will aid in preserving the business economics of the shipping community.

- **Need to address improved trucking operations.** The shippers along the Miami River operate on relatively shallow, compact sites. Onsite room allowing for truck maneuvering, processing, loading and unloading, and parking is very limited. Oftentimes trucks are waiting in the median of NW North River Drive or on intersecting side streets to enter into shipping yards. Truck staging is needed to facilitate these operational needs. Similarly, there is no designated truck parking and servicing facility in the vicinity, which is a recognized county-wide issue.

- **Need to support economic development and redevelopment.** The industrial uses within the corridor have rare access to both water and rail modes, as well as trucking on the surface roadway system. These unique attributes should be preserved and enhanced as a county freight resource. Economic development of these assets will create jobs and important freight capacity resources. Expansion of the waterborne shallow-draft shipping market would help immensely in cementing the continued business viability of the river's marine shipping community.

4.0 Capacity and Short Sea Shipping Analysis

4.1 Bridge Tender Data Analysis

Bridge tender data was received from FDOT and Miami-Dade County. Data was provided for several bridges along the Miami River for the period of July 2015 through June 2016. Review of this data focused on three bridges based on the division of the river between residential, commercial, and industrial including: Brickell Avenue, NW 17th Avenue, and NW 27th Avenue.

Data was reviewed and analyzed in two ways. The first analysis focused on vessels, barges, and tugs moving through each bridge area to determine the total number amount of "scheduled' and "unscheduled" cargo traffic that transits the river. The second analysis was a follow up to provide additional information. This analysis reviewed the times at which cargo vessel traffic transits the Miami River compared to recreational vessels. A review of each report is as described within this section and submitted reports are available in Appendix B.

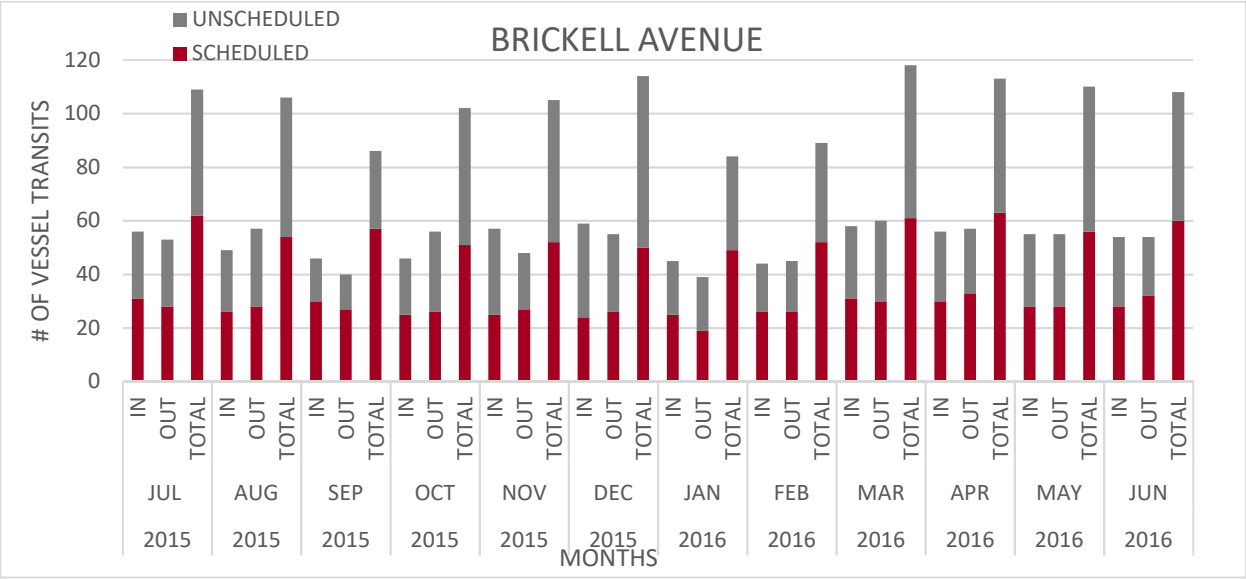
4.1.1 Cargo Vessel Analysis

Data was categorized as "scheduled" and "unscheduled" traffic. "Scheduled" vessels were defined as those shipping companies that post their shipping schedules on their company websites, making them readily available for the study. Shippers that were defined as "scheduled" included: Antillean Shipping, Betty K, and Bimini Shipping. "Unscheduled" vessels were defined as all remaining cargo vessels transiting the Miami River during the described period. Bridge tender data includes only those vessel movements requiring the opening of a lift bridge. All cargo vessels plying the Miami River require lift bridge openings; however, not all non-cargo vessels require bridge openings.

Brickell Avenue

Brickell Avenue is located near the mouth of the river and every vessel is required to pass this bridge to obtain access to the remainder of the Miami River. This bridge incurred an average of 104 vessel moves per month requiring a lift bridge opening, approximately 54% of which were defined as scheduled. The heaviest traffic month from the data set provided was March with a total of 118 moves, approximately 52% of which were scheduled as shown in **Figure 4-1**.

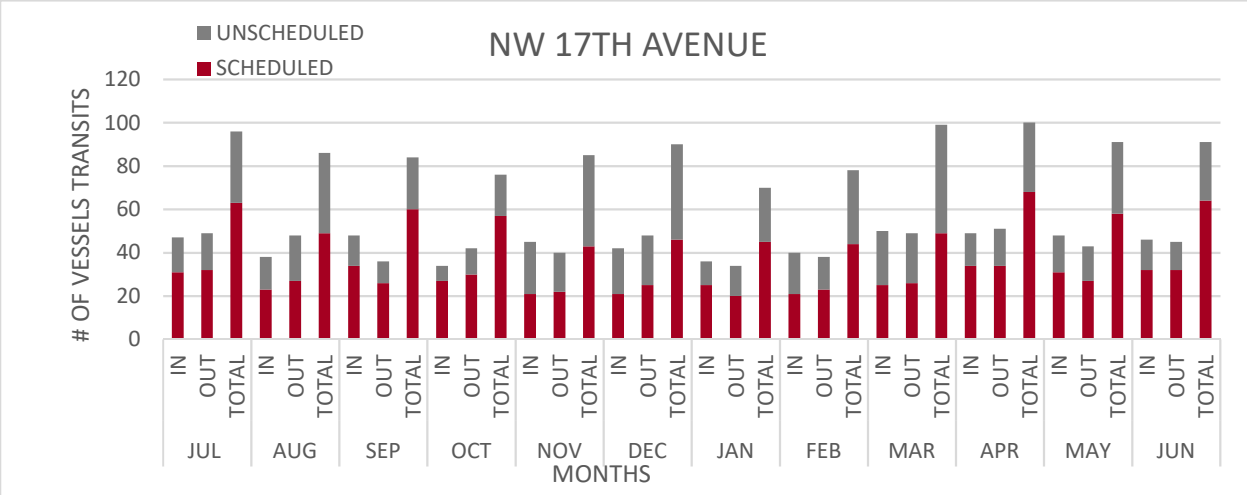
Figure 4-1: Brickell Avenue Vessel Transits Review



NW 17th Avenue

NW 17th Avenue is located approximately one third of the way up the navigable portion of the Miami River and was estimated as a point of transition between the residential and commercial area of the City of Miami. This bridge incurred approximately 87 vessel moves on average per month where approximately 62% was defined as schedule. The NW 17th Avenue Bridge had a peak month in April 2016 with 100 vessel transits as shown in **Figure 4-2**.

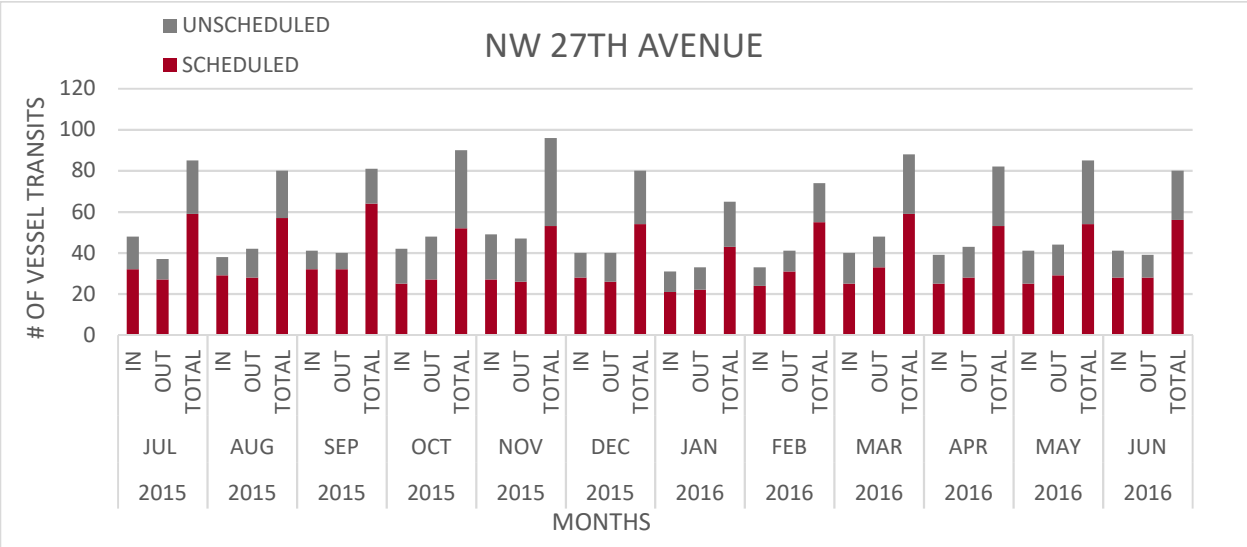
Figure 4-2: NW 17th Ave. Vessel Transits Review



NW 27th Avenue

NW 27th Avenue is the last movable bridge at the north end of the navigable river and is located south of the terminal operators defined as “scheduled”. The average vessel transits for NW 27th Avenue was 83 per month for the reviewed duration, where approximately 67% were scheduled. The peak month was November with 96 vessel moves, as shown in **Figure 4-3**.

Figure 4-3: NW 27th Ave. Vessel Transits Review



Cargo Vessel Analysis Conclusion

There was an overall decrease in vessels that transit the three bridges as they move upriver. That said, there are three terminal operators located closer to the mouth of the river that were not included within the stakeholder analysis phase. To account for these vessels within the capacity analysis, the team allocated approximately 54% of vessels to be assumed to move on the river that the team could not account for within the model, 21% for those that passed NW 27th Avenue as unscheduled and 33% for those that did not reach NW 27th Avenue.

4.1.2 Vessel Time of Transit Analysis

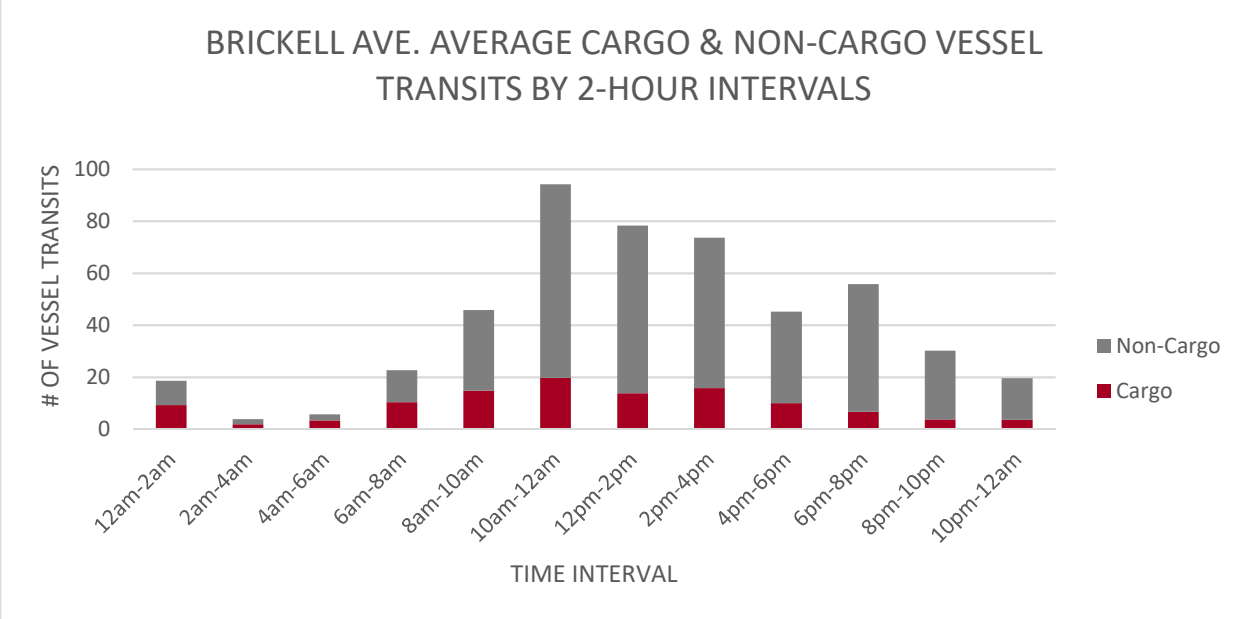
Data for this review was based on the average number of times the bridge was opened in two-hour intervals per month. This was intended to provide an understanding of the vessel movement by month that will affect the local road vehicle traffic patterns.

Based on information provided in stakeholder interviews, a curfew is in place during high traffic hours relating to the morning commutes, lunch hours, and evening commutes for local vehicular traffic. Curfews are only in place for recreational vessels; however, recreational vessels are known to 'piggyback' on cargo vessels when required to transit up or down the river as needed through curfew hours.

Brickell Avenue Bridge

On average, a total of 494 vessels transit past the Brickell Avenue Bridge each month requiring bridge openings; approximately 406 of which are recreational vessels. **Figure 4-4** provides cargo vessel and non-cargo vessel average transits per month in two-hour intervals. Overall, vessel movement is heavier during business hours and commuting hours, where approximately 75% of cargo vessel transits occur between 6am and 6pm on average and approximately 73% of recreation vessel transits occur in the same time period.

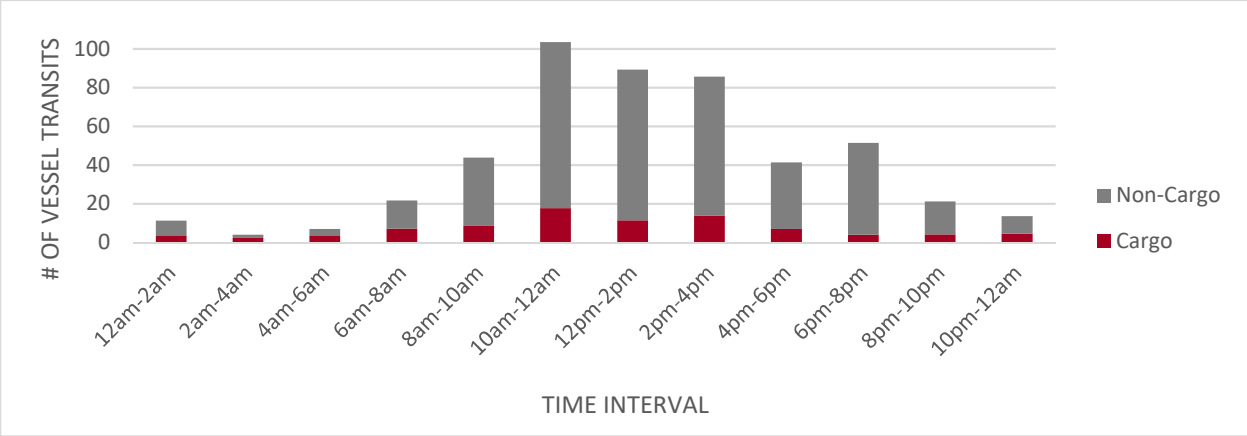
Figure 4-4: Brickell Ave. Average Cargo and Non-Cargo Vessel Transits



NW 17th Avenue Bridge

On average, a total of 495 vessels transit past the NW 17th Avenue Bridge each month, approximately 406 of which are recreational vessels. **Figure 4-5** provides the cargo vessels and non-cargo vessel average transits per month in two-hour intervals. Overall, vessel transits are heavier during business hours and commuting hours, where approximately 74% of cargo vessel transits occur between 6am and 6pm on average, and approximately 65% of recreational transits occur in the same time period.

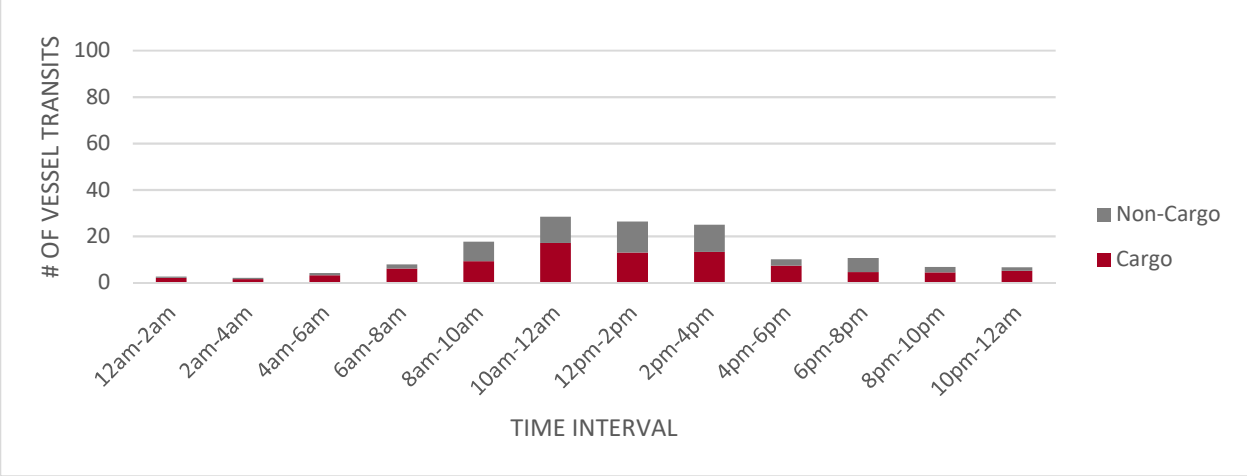
Figure 4-5: NW 17th Ave. Average Cargo and Non-Cargo Vessel Transits



NW 27th Avenue Bridge

On average, a total of 148 vessels transit past the NW 27th Avenue Bridge each month, approximately 62 of which are recreational vehicles. The number of transits is expected to be lower for this bridge because it is the furthest north on the navigable portion of the river, and the majority of the area north of this bridge is primarily designated to cargo terminals. **Figure 4-6** provides the cargo vessel and recreational vessel average transits per month in two-hour intervals. Overall, vessel transits are heavier during business hours and commuting hour, approximately 75% of cargo vessel transits occur between 6 am and 6 pm on average and approximately 79% of recreational vessel transits occur in the same period of time.

Figure 4-6: NW 27th Ave. Average Cargo Vessel Transits by Hour



4.2 Miami River Capacity Analysis

The capacity analysis was broken down into two components. The first component was to review the Miami River current throughput and theoretical throughput capacity. A dynamic model was used to review the current cargo traffic that transits the river and determine additional vessel transit capacity. The second component, Short Sea Shipping Analysis, is reviewed in Section 4.3.

4.2.1 Capacity Model

This analysis was performed using Transportation Modeling Studio (TMS) software. The software was used primarily to analyze the capacity of existing and proposed freight and passenger transportation systems. The framework of the software use AnyLogic simulation software to determine performance of the conveyance mode and to develop scheduling decisions. Additionally, a user interface built in .NET Framework and supported by Microsoft Office allowed for the defining of schedules, routing layouts, and other operating parameters.

Furthermore, various reporting utilities have been built to assist in analyzing and communicating results. This tool suite has been customized and enhanced over the years by a dedicated staff of in-house simulation professionals and programmers. This software is particularly well-suited for the modeling of cargo terminal areas, allowing demonstration of their capacity and testing of proposed infrastructure improvement alternatives. It has been used in a variety of freight and passenger transportation studies around the United States.

Overall, TMS software is typically used to evaluate, model and analyze cargo operations, including mainline capacity, terminal operations and area operating requirements. It provides the capability to allow an analyst to quickly iterate among a number of proposed designs to assist the design process as well as provide comparative analysis to support planning level decisions. TMS allows rapid configuration of network design changes, and represents the expected vehicle performance including speeds, grades, and vehicle types. TMS also provides the ability to identify "bottlenecks" with unique tools that facilitate "root-cause" analysis. This provides valuable insight to the design team to isolate specific design areas where improvements can be made. The ability to find-tune designs allows adjustments to be made to lower cost infrastructure designs that often allow them to perform the same or better than higher cost designs.

4.2.2 Capacity Analysis Assumptions

Assumptions for the capacity analysis included the following:

1. Movements upriver are referred to as northbound, and those downriver as southbound.
2. Turnaround times of vessels was obtained from a combination of estimated times of historical data from bridge tender data and schedules found on terminal operator websites.
3. Tugs and crews are required to move cargo vessels along the Miami River and for the purposes of this study are considered available upon request and are not a constraint.
4. Vessels transiting the river are expected to be assisted by two tugs, which are assumed to move as one unit for simulation purposes. These tugs are assumed to be stored at the North end of the river and must transit to the South end prior to assisting a vessel. Time for tugs to move back to their normal storage position as a "light tug" move, not in towing mode, will not be modeled as the team assumes these moves will occur when not interfering with vessel moves.
5. Vessel movements into/out of the river are executed on a first come, first served basis.
6. Vessels are always available to navigate the river to assess the "growth scenario", which represents maximum capacity.

7. Vessel sizes include: large vessels, those that are draft restricted; small vessels or barges, those that are not draft restricted; tugs, that are actively moving down the river to retrieve a vessel.
8. The model run period is based on one week. The schedule for the week was based on current vessel schedules and bridge tender logs for March 2016 which was the heaviest month for cargo vessels entering into the Miami River from the data set provided.
9. Prior to a vessel entering the river, an empty berth must be available.
10. Once at the berth, the vessel will occupy the designated berth until its scheduled departure, has met tidal restrictions, and it can have access to the river.
11. Three terminal operators currently operate based on what was defined as "scheduled" services for the purposes of the model. "Scheduled" operators for the model account for seven berths and include: Antillean Shipping, Betty K, and Bimini Shipping. Schedules for these terminal operators were verified between information available on their company websites and the bridge tender data. These vessels accounted for approximately 46% of all cargo vessels that navigate the Miami River. This information was used to determine the baseline of the dynamic model.
12. Vessels that were defined as "unscheduled" were all other vessels within this study and account for approximately 54% of all cargo vessels that navigate the Miami River and 13 additional cargo berths. Based on interviews with terminal operators, these vessels can dwell up to approximately 30 days.
13. Large vessels are assumed to travel with the tides based on a draft restriction of 14 feet at mean low water.
14. This model does not include curfew restrictions because, based on interviews with terminal operators, cargo vessels are not restricted by the bridge curfews.
15. Each vessel transit occurs with 3 moves as shown in **Figure 4-7**: 1) Tugs moving south on the river to retrieve a cargo vessel, 2) tugs and a cargo vessel moving north to a berth, and 3) tugs and a cargo vessel moving south to exit the river mouth. An estimated dwell is built into Gantt "timeline" charts to ensure no berth is over utilized.

Figure 4-7: Vessel Transits Options Appearing as One Vessel within the Model

16. Vessels were estimated to dwell at each bridge for approximately 4 minutes and to transit the river at approximately 5.75 mph, approximately 5 knots. Between the stop and go efforts of the vessels, vessels travel at an estimated average overall speed of 2.8 knots navigating the river for a total estimated travel time of 1.5 hours and an additional .5 hours for securing/un-securing requirements. An example of a vessel input is as shown in **Figure 4-8**. In this example, a tug moves southbound to retrieve a vessel and then the vessel returns northbound.
17. Recreational vessels are not considered a critical component within the river capacity analysis based on general navigation rules giving larger vessels priority over recreational vessels (dictated by the United States Coast Guard, 33 CFR 83.18), maneuverability, etc.

Figure 4-8: Input Example Betty K VI

Vessel Name	Direction	Operator	Type	Vessel Length (ft)	M	T	W	Th	F	Sa	Su	Start Time hh:mm	From Platform Arrival Time	From Start Location	To Stop Location	Destination Dwell Time (mins)
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						8:35	8:48	Betty K Berth 2	NW 27th Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						8:52	8:58	NW 27th Ave. North	NW 22nd Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:02	9:08	NW 22nd Ave. North	NW 17th Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:12	9:18	NW 17th Ave. North	NW 12th St. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:22	9:28	NW 12th St. North	NW 5th St. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:32	9:37	NW 5th St. North	W Flagler St. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:41	9:42	W Flagler St. North	SW 1st St. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:46	9:50	SW 1st St. North	SW 2nd Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						9:54	9:57	SW 2nd Ave. North	S Miami Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						10:01	10:04	S Miami Ave. North	Brickell Ave. North	4
BETTY K VI TUG 2	SB	Betty K	Tug	100		TRUE						10:08	10:13	Brickell Ave. North	River Mouth	
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						10:33	10:38	River Mouth	Brickell Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						10:38	10:41	Brickell Ave. South	S Miami Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						10:45	10:48	S Miami Ave. South	SW 2nd Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						10:52	10:56	SW 2nd Ave. South	SW 1st St. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:00	11:01	SW 1st St. South	W Flagler St. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:05	11:10	W Flagler St. South	NW 5th St. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:14	11:20	NW 5th St. South	NW 12th St. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:24	11:30	NW 12th St. South	NW 17th Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:34	11:40	NW 17th Ave. South	NW 22nd Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:44	11:50	NW 22nd Ave. South	NW 27th Ave. South	4
BETTY K VI 3	NB	Betty K	Vessel	300		TRUE						11:54	12:07	NW 27th Ave. South	Betty K Berth 2	

18. Terminal operators are assumed to have additional storage agreements for those vessels not in use or have limited use during the selected week. In the growth model, if required for berth access, vessels scheduled for departure dwelling in excess of 3 days were assumed to be stored at other facilities on the river after unloading operations were complete. These vessels were assumed to move when not interfering with other vessel moves. Vessels would remain at the owner's berth for a minimum of 12 hours to unload and must be moved back a minimum of 12 hours prior to departure for loading operations.
19. In the growth scenario, large vessels added into the simulation to determine the maximum capacity were assumed to dwell at the berth for a minimum of 24 hours.
20. In the growth scenario, small vessels added into the simulation to determine the maximum capacity were assumed to dwell at the berth for a minimum of 12 hours based on analysis of the bridge tender data, such as the Legend II.
21. In the growth scenario, barges for a short sea shipping operation were included. Tugs are assumed to remain with the barge to accommodate two turns of one vessel per day. Therefore, each move conducted by a short sea shipping barge would always be represented by two tugs and the barge for the purposes of the model.

4.2.3 Baseline Throughput Review, Analysis, and Findings

A dynamic simulation model was developed based on inputs including area mapping and routing and schedules. The routing for the simulation was created based on area mapping and interviews with Hempstead Marine. Bridge tender data, information from shippers' websites, and information from interviews were used to develop a schedule for the "scheduled" shippers and various other inputs for the model. Each cargo vessel was scheduled to use a specific berth based on assumed ownership of the vessel. There are a total of seven berths: three berths located at Antillean Shipping, two berths located at Betty K, and two berths located at Bimini Shipping. To verify the assumed berth assignments, a Gantt "timeline" chart was used to verify realistic berth usage. This schedule was used for the baseline simulation.

Results of this model showed 23 cargo vessels completing transits over the span of one week where each cargo vessel can account for three transits each time it is in Miami, FL as stated in Section 4.1. Within the baseline model, eight of the total 23 transits were "light tug" moves and the remaining 15 transits included a cargo vessel.

Based on the information presented in Section 4.1, "scheduled" cargo vessels account for approximately 46% of total cargo vessels that transit the river; therefore, approximately 50 total vessel transits likely occur on the river during the selected week based on the stated assumptions and as shown in **Table 4.1**. This information will be considered in the growth model to determine the additional vessel transits that could be added to the schedule.

Table 4.1: "Scheduled" Baseline and Estimated "Unscheduled" Moves

Tug Only or Cargo Move	Baseline Vessel Transits Weekly
Tug Only	8
Cargo Transit North Bound	7
Cargo Transit South Bound	8
"Unscheduled" Transits	27
Total Transits	50

In this scenario, passing areas were not required for use and the maximum delay incurred by any vessel did not exceed 2.5 minutes caused by other vessels. **Table 4.2** provides a summary of vessels run within the baseline.

Table 4.2: Average Speed and Congestion Delays – Baseline Model

Bimini Shipping			Betty K			Antillean Shipping		
Avg. Speed (MPH)		Avg. Congestion Time	Avg. Speed (MPH)		Avg. Congestion Time	Avg. Speed (MPH)		Avg. Congestion Time
No Dwell	With Dwell	HH:MM:SS	No Dwell	With Dwell	HH:MM:SS	No Dwell	With Dwell	HH:MM:SS
5.8	3.2	0:00:00	5.8	3.3	0:00:08	5.8	3.2	0:00:00

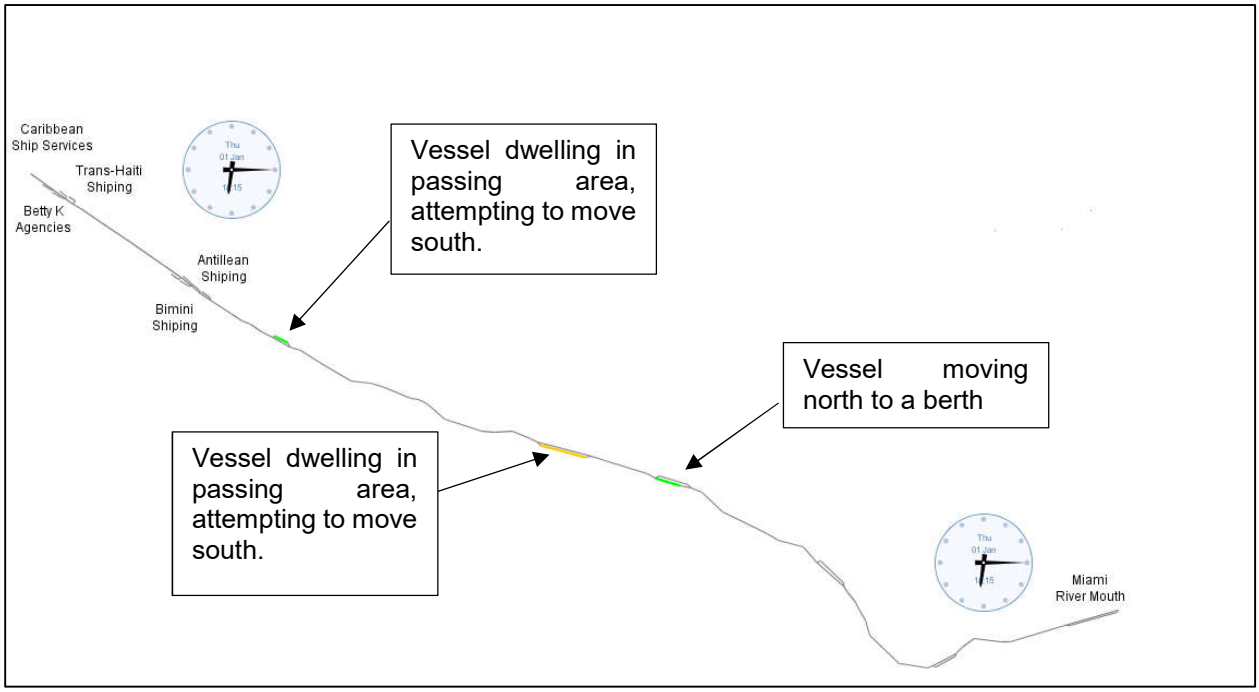
The consultant team found no issues with the current vessel traffic capacity and the ability to add additional traffic. Additional berth capacity is available; berth capacity is the limiting factor for capacity on the Miami River. This was deemed reasonable based on the confidence level of the interviewed shippers to take on more volume.

4.2.4 Growth Capacity Review, Analysis, and Findings

Once the baseline model was reviewed, the schedule was expanded to include additional vessel calls. Vessels calls were developed based on bridge tender data, tidal charts, and assumptions stated in Section 4.1.

Based on visual confirmation from Google Earth, there are approximately 20 berths along the Miami River. These berths were used within the Growth Simulation to account for the "unscheduled" vessels as well. The additional traffic was added to the schedule based on the bridge tender data and available space within the model until all berths were considered at capacity within the week.

Figure 4-9: Dynamic Model Snapshot



In this expanded scenario, a total of 111 cargo vessels weekly would transit the Miami River where 83 were designated for typical current vessel transits and the remaining 28 were designated for the potential short sea shipping program. **Figure 4-9** provides a snapshot representation of the growth model where on the first day of the model at approximate clock time of 18:15 (6:15 pm) in which there are two vessels attempting to transit south on the river dwelling in passing areas while a third is transiting north towards a berth. Within this scenario there were delays experienced by vessels because passing areas were used; however, no delays were considered in excess of the system's capabilities. The maximum delay for a vessel trying to enter a system or dwelling in a passing area was approximately 32 minutes. **Table 4.3** provides a representation of the same vessels when including additional vessels into the system.

Table 4.3: Average Speed and Congestion Delays – Growth Model

Bimini Shipping			Betty K			Antillean Shipping		
Avg. Speed (MPH)		Avg. Congestion Time	Avg. Speed (MPH)		Avg. Congestion Time	Avg. Speed (MPH)		Avg. Congestion Time
No Dwell	With Dwell	HH:MM:SS	No Dwell	With Dwell	HH:MM:SS	No Dwell	With Dwell	HH:MM:SS
6.5	**3.2**	**0:00:11**	**6.4**	**3.3**	**0:00:22**	**6.5**	**3.1**	**0:00:22**

Of the 111 vessel moves described above, 85 moves included a cargo vessel within the transit and the remaining 26 were "light tug" transits on the river. As described in Section 4.1, an estimated 50 vessel transits occurred on the selected week. These vessels were either moving northbound towards a berth or southbound towards the river mouth and include "scheduled" and "unscheduled" vessels. An estimated additional 35 vessel transits, where a transit is a vessel moving northbound or southbound, remain available each week or approximately 17 cargo vessels, or 884 cargo vessels per year, based on the selected week and an even distribution between northbound and southbound vessels. The distribution can be adjusted from week to week; however, average distribution would need to be equal.

Table 4.4: Review of Baseline and Growth Vessel Transits

Tug Only or Cargo Move	Baseline Vessel Transits (per week)	Baseline Vessel Transits (per year)	Growth Vessel Transits (per week)	Growth Vessel Transits (per year)
Tug Only	8	416	26	1,352
Cargo Transit North Bound	7	364	40	2,080
Cargo Transit South Bound	8	416	45	2,340
"Unscheduled" transits	27	1,404	N/A	N/A
Total Transits	50	2,600	111	5,772

Table 4.4 provides a summary of the various vessel transits that occurred within the model including the additional estimated "unscheduled" transits added to the baseline model. The following considerations were included in developing yearly figures for **Table 4.4** and **Table 4.5**:

- An uneven distribution of vessels transits were used to accommodate the variable dwell that vessels incur at a berth and those vessels that may arrive towards the end of a week or depart at the beginning of the week.
- Baseline estimates are based on what was considered a heavy week and are likely higher than what actually moves on the Miami River. This was done to provide a conservative estimate on the estimated actual and growth scenarios.
- Yearly figures are based on 365 day operations; however, operations for various terminal operators may be shut down on holidays limiting the overall capabilities to ship on those days.

Table 4.5 provides a summary of the growth capability of the Miami River based on vessel transits and vessel availability. Vessel transits refer to a northbound or a southbound move and a vessel refers to both a northbound and southbound move.

Table 4.5: Growth Opportunity by Month and by Year

Cargo Vessel Growth Availability	Per week	Per Year
Available Cargo Vessel Transits (NB or SB)	35	1,820
Available Vessels (NB and SB)	17.5	910

Based on the analysis conducted, the team estimates that the berths along the river are currently only utilized approximately 58%; however, this will vary based on berth dwell. Once berth capacity is reached, there will still be additional capacity for cargo vessel transit along the river and a determination would need to be generated whether to add additional cargo berths along the river to increase freight movement further.

4.3 Short Sea Shipping Analysis

The purpose of the Short Sea Shipping Analysis is to determine the feasibility of initiating a Container-on-Barge (COB) service between PortMiami and a proposed marine terminal on the Miami River. The analysis will develop a conceptual service that identifies the feasibility of implementing the service by identifying the operational, infrastructure, equipment, and vessel service requirements. The analysis will also assess feasibility and identify additional requirements to help identify the financial, regulatory, constructability, and operational requirements for establishing proposed COB service.

Approximately 35,000 TEU that arrive at PortMiami annually are destined for rail above and beyond what is currently loaded on-dock at the Port with plans for growth in the future based on the current PortMiami Master Plan. All of these containers are required to be transferred from the Port to Hialeah Yard by truck. This extra move increases traffic at the ingress/egress tunnel leading to PortMiami and on local roads and highways in the Miami area. By moving a portion or all of the rail-oriented containers by barge up the Miami River, the Port would have an opportunity to avoid street congestion and provide a shorter truck haul to the Hialeah Yard or other local destinations.

The short sea shipping concept would have a similar objective to that of the proposed PortMIami inland terminal currently under exploration – namely, to free up valuable space at the port proper and to contribute to an increase in port operational efficiency. These strategies may come at an incremental cost, both capital and operating, but would be pursued potentially to optimize port throughput given its various constraints including berths and working space for operations. The reestablishment of the rail access and near dockside rail terminal is a similar investment. Clearly, a detailed benefit-cost analysis would need to be conducted by the port and any partners to confirm the economic viability of any of these operational investments.

Since the shipping volume on the Miami River is currently less than half of its peak, there is reserve capacity to handle a container-on-barge service. The river currently handles less than 6% by volume of the PortMiami volume, and is thus a smaller player in the South Florida logistics scene. However, it too has significant economic impact in terms of jobs, tax base, and providing vital transport service to its customer base. Its impact on the regional freight and logistics network is dwarfed by the combined marine and aviation cargo activity generated by PortMiami and Miami International Airport, and it possesses a unique and distinctive market niche. Its linkages to other regional freight centers and trade lanes is very limited, but as a niche player, Port of Miami River serves as well an important role regionally.

4.4 Short Sea Shipping Infrastructure and Equipment Needs

The analysis completed for this study was intended to avoid additional infrastructure requirements where possible. Reducing upfront infrastructure requirements would allow the Port to reduce the risk of project implementation.

To implement the concept, a barge would need to be purchased and constructed. An estimate for a purchase based on industry expert knowledge of a barge this size is approximately $1,500,000.

4.5 Short Sea Shipping Site Review and Requirements

The consultant team has reviewed various locations and has selected two potential locations at PortMiami to load containers to the barge and a location in the industrial region of the Miami River to off-load those containers.

4.5.1 Short Sea Shipping Recommended Loading Location

PortMiami is a space constrained facility and is limited to the current footprint. The barge loading location is dependent on finding an area where cranes are available and preferably with direct access to the mouth of the Miami River. The consultant team has reviewed the facility and recommends one of two alternatives for loading at the Port. The first potential location for the barge loading operation is adjacent to Pier J as shown in **Figure 4-10**. The second potential location would be adjacent to Shed G as shown in **Figure 4-11**. Either of these options would keep containers within the vicinity of the vessel un-loading area and containers could be temporarily stored in a "barge block" prior to loading.

There are concerns with location access and operations requirements from local stakeholders. The consultant team met with representatives from PortMiami who stated major concerns with the barge operations seemed to be proximity to cruise operations and union labor rules.

Figure 4-10: PortMiami Pier J Potential Loading Area

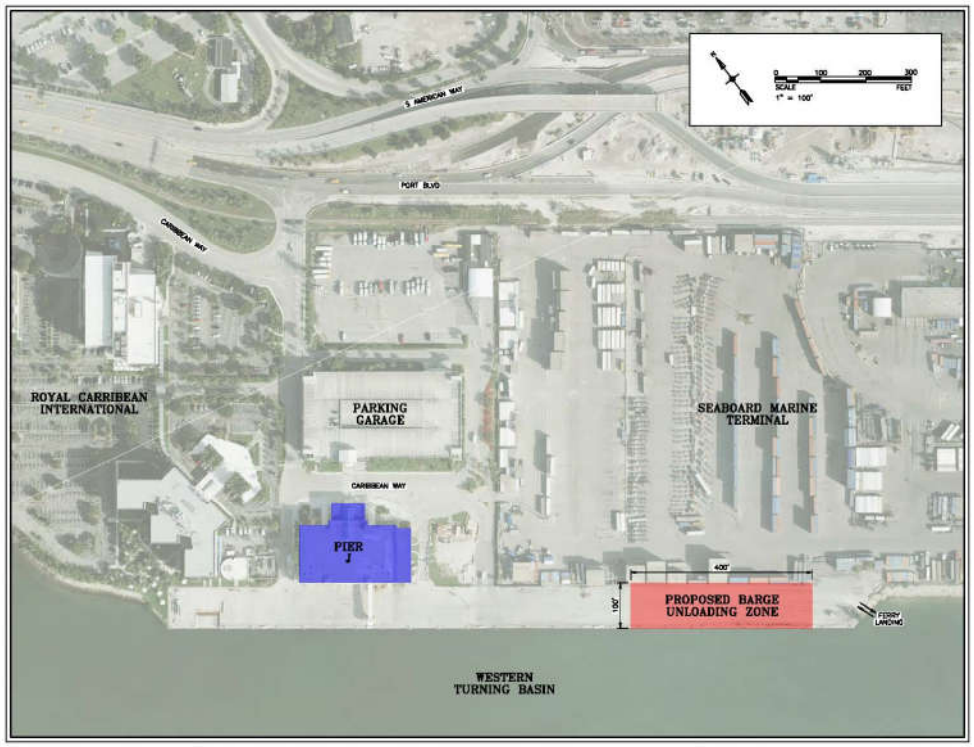
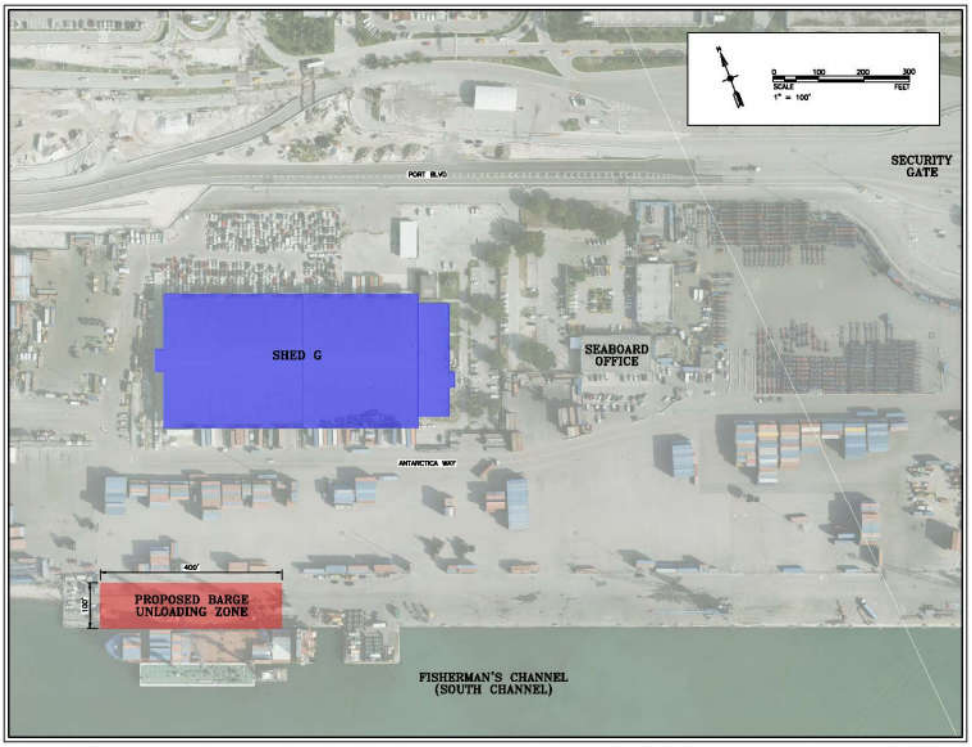


Figure 4-11: PortMiami Shed G Potential Loading Area



4.5.2 Short Sea Shipping Unloading Location Requirements

The consultant team met with various stakeholders along the Miami River. Major concerns for the terminal operators focused on the off-loading and storage location, labor requirements, and customs requirements. Space along the Miami River designated for freight movement has become increasingly more limited as property values have increased in the Miami region. All freight vessel operations have been forced to the northwestern end of the navigable river and make up approximately one third of the navigable area.

To accommodate 35,000 twenty-foot equivalent units (TEU) for a short sea shipping operation, the consultant team believes that it would require the following infrastructure:

- Ship-to-shore cranes
- Side loader or reach stacker cranes
- Container storage
- Berth access
- An administrative building
- Ingress and egress for both the terminal operators and trucks, including security requirements (this could be one access point)
- Mobile maintenance ability

Ship-to-Shore Cranes

Ship-to-shore cranes will be required to move all container from the barge to land. These cranes are expected to be small in stature and will be required to unload a 180 TEU barge within 3 hours based on the time allotted within the capacity analysis. For space and cost savings, the cranes

are expected to be sized similar to those currently at Antillean Shipping and the Port of Palm Beach as shown in **Figure 4-12**. Vessels of this size have an estimated 30 TEU lifts per hour; therefore, two cranes would be required to turn a barge in three hours or less.

Figure 4-12: Ship to Shore Crane

Side Loader or Reach Stacker Cranes

Reach stackers or side loaders would be required to stack containers in storage areas and provide assistance to drivers picking up containers, as shown in **Figure 4-13**. Typical reach stacker and side loader cranes can perform approximately 25 lifts per hour where an estimated 60% are 40-foot containers; therefore, these cranes can likely handle approximately 16 TEU per hour. This operation would be based on a grounded operation; therefore, each container is estimated to be lifted three times while once in the storage area as a conservative estimate. If the facility is open 360 days for 12 hours per day and based on the other considerations previously stated, two reach stackers or side loaders would be required for the operation.

Figure 4-13: Reach Stacker and Side Loader Cranes

Container Storage

Container storage is required for containers dwelling on the property prior to being moved to the Hialeah Yard. Containers are estimated to dwell for approximately five days or less based on a 360-day operation; therefore, one container space can be turned 70 times in one year and would require 500 TEU parking locations. Based on information found from the DOT, a container yard designated as mid-density can typically accommodate 100-200 TEU per acre. As a fairly conservative estimate, the consultant team estimates that the ship to shore operation could function with approximately 125 TEU per acre pending a layout that accommodates efficient storage. Based on this information, approximately 4 acres would be required for container storage.

Berth Access

Berth access would be required for one vessel. The schedule assumed within the parameters of the short sea shipping operation would use one barge with two turns per day. This berth would be required to accommodate a barge 300 feet length overall.

Administrative Building

An administrative building, ingress and egress for terminal staff and trucks, and mobile maintenance are typical any port or intermodal operations. Based on the size of the facility each of these requirements would be appropriately sized to maximize the overall footprint of the facility. **Table 4.6** summarizes short see shipping facility requirements.

Table 4.6: Short Sea Shipping Requirements

Short Sea Shipping Requirement	Quantity Required
Ship to shore crane	2 cranes
Reach stack or side loader	2 cranes
Container storage	4 acres
Berth access	300 linear feet
Administrative building	1 building
Ingress/egress point	1 lane each direction
Mobile maintenance	1 truck

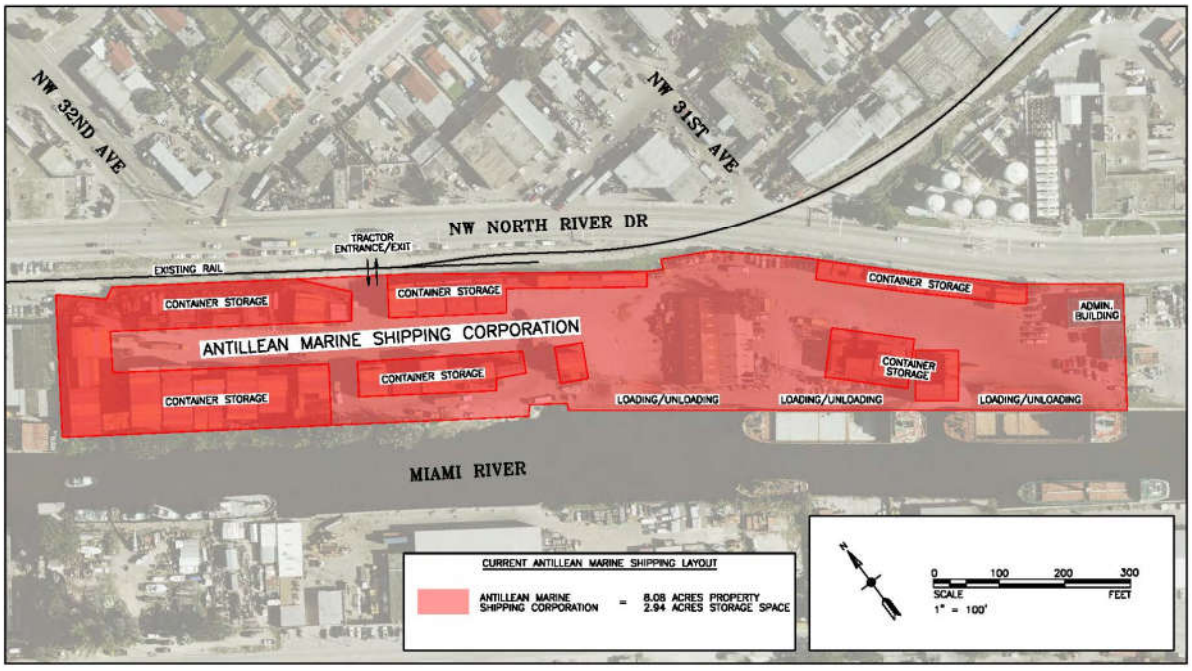
After reviewing locations along the Miami River, the consultant team believes that using an existing terminal operator that handles containers is ideal for this operation. Antillean is located approximately 0.5 miles up the river from NW 27th Avenue and approximately 5.6 miles from Hialeah Yard. Alternatively, currently underutilized parcels could be developed to serve as a terminal. The Antillean site would provide for improved logistics efficiencies between their traditional shipping business and the potential container-on-barge program that a single-purpose site might not.

4.5.3 Short Sea Shipping Recommended Unloading Location

As a terminal operator, Antillean shipping is one of two shippers on the river that transports containers and one of three shippers that operates based on a schedule with five vessels currently in service. While exact volumes were not received from Antillean, the consultant team estimates approximately 34,500 TEU moved per year based on vessel sizing and schedules. **Figure 4-14** provides a visual representation of Antillean Shipping property as it is today. Antillean Shipping currently has three berths. Truck access to the facility is located on the northern third of the facility where the majority of the containers are currently stored. An administrative building is located on the south end of the facility with an employee ingress/egress area.

During an onsite interview, Antillean stated that they do have access to offsite container storage. The amount of storage has not been determined and is not considered within this study; however, these additional storage locations may enable Antillean to lower the onsite container dwell and increase the total containers per year that could move through the facility. Any containers that would be moved to offsite storage would be Antillean containers to reduce the drayage cost associated to PortMiami containers.

Figure 4-14: Antillean Current Property Line and Layout



If the property is selected the consultant team would recommend the layout to be adjusted to better accommodate the anticipated volumes. The following considerations were used in the recommended layout of the Antillean facility:

- Containers would only be stacked three high for easier access upon request of longer dwelling or “buried” containers.
- To provide sufficient driving space, no more than approximately 125 TEU would be placed on an acre of land on average.
- Where possible, infrastructure such as berths, buildings, and ingress/egress would remain in place to reduce capital cost requirements.

If this property is selected and the layout is adjusted as described, the consultant team believes the site has a static capacity of approximately 936 TEU as shown in **Figure 4-15**. Based on an average dwell of five days and a recommended 80% desirable maximum capacity for flexibility in operations, the facility could likely handle approximately 52,416 TEU per year as shown in **Table 4.7**.

Based on the estimated throughput of 35,000 TEU from PortMiami and 34,500 TEU of current Antillean throughput, this would not be a viable alternative when assuming a five-day container dwell and 80% desired capacity. This would, however, provide an opportunity to test the concept within the region with minimal capital requirements. PortMiami would have the potential to ship a portion of freight, that is currently trucked, by barge and determine any internal or external risks that may affect the operation.

Table 4.7: Summary of Antillean Facility Storage

	Current Antillean Facility	Expanded Antillean Facility
Storage	936 TEU	1,416 TEU
Assumed avg. dwell	5 days	5 days
Desired maximum capacity	80%	80%
Containers per year	52,416 TEU	79,296 TEU

Figure 4-15: Antillean Adjusted Layout

If the appropriate stakeholders determine they require the full throughput of approximately 69,500 TEU per year upon starting the operation or after testing the operation, additional storage capacity and berth capacity may be achieved through the purchase of land adjacent to Antillean which is currently operated by Laser International Freight as shown in **Figure 4-16**. The consultant team estimates that two additional berths, approximately 1,416 TEU of storage, and an emergency ingress/egress could be added as shown in **Figure 4-17**. Based on an average dwell of five days and a recommended 80% desirable maximum capacity for flexibility in operations, the facility could accommodate approximately 79,296 TEU per year as shown in **Table 4.7**.

Figure 4-16: Antillean and Laser International Freight Yards

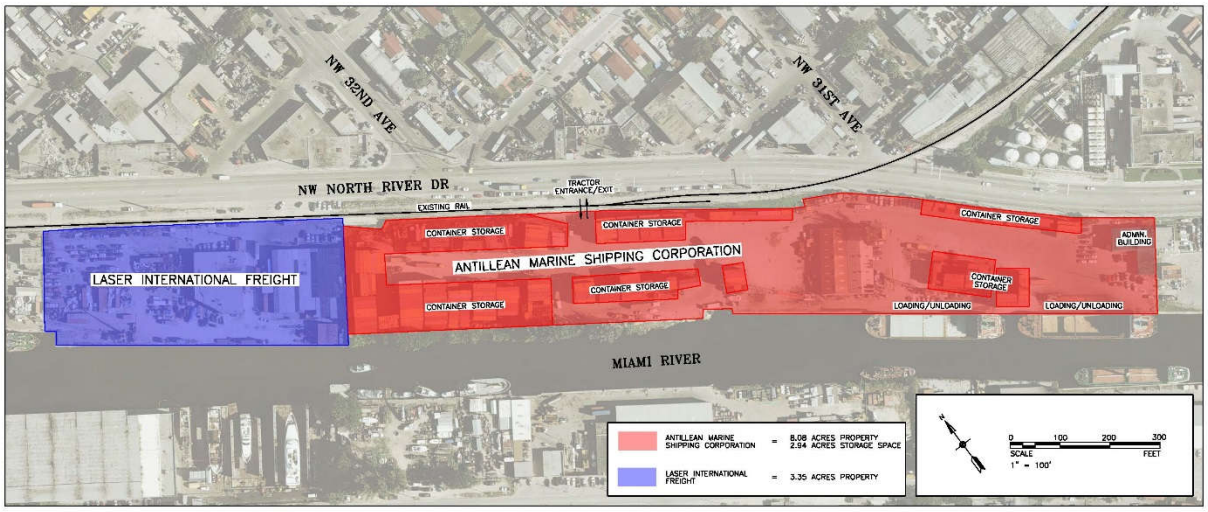
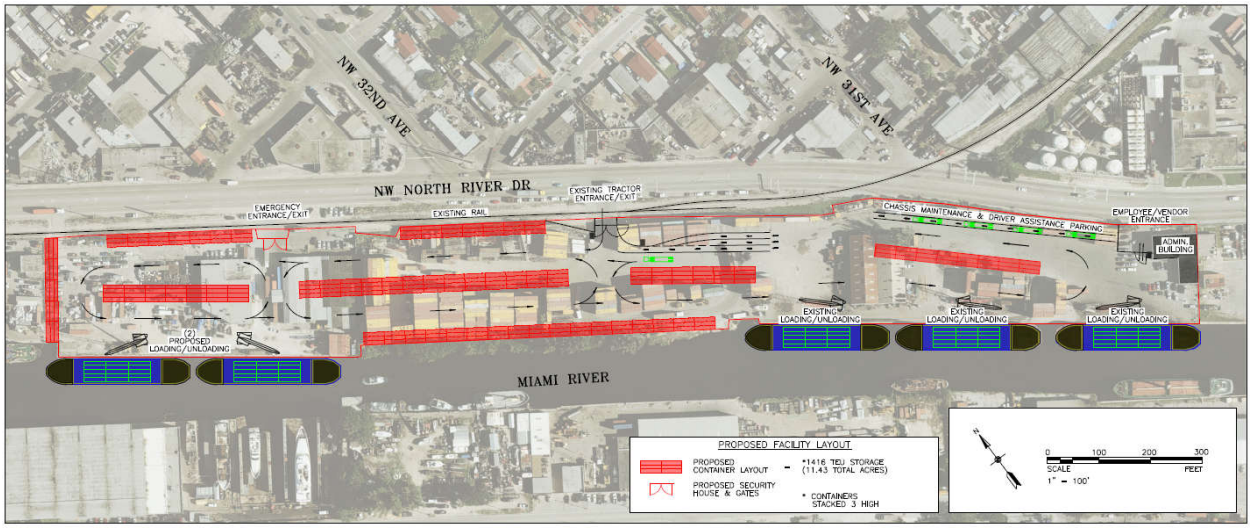


Figure 4-17: Potential Layout for Antillean Expansion



4.6 Short Sea Shipping Traffic Assumptions

Assumptions for the short sea shipping container operation include, but are not limited to, these:

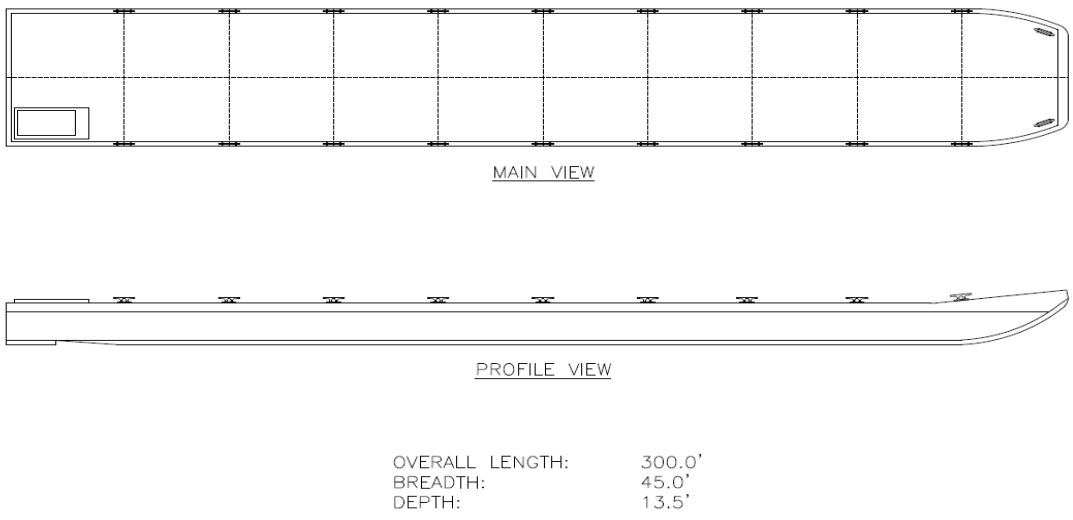
1) For the purposes of this study, union labor was not deemed as required; however, labor negotiations may determine that union labor is required to be used at PortMiami, Miami River, or both.
2) A vessel was selected for the service based on overall length and beam feasible to navigate the river.
3) Three operators on the river currently operate on scheduled services. Any new operations, container barge or otherwise, would require PortMiami to operate around the schedules currently in place.
4) Any customs restrictions would be conducted at PortMiami and containers would not be transported up the river until cleared.
5) Containers would not dwell for more than an average of three days at the selected river location.
6) PortMiami currently transfers approximately 35,000 containers to the Hialeah Yard annually.
7) Additional cranes could be added as required based on demand at both PortMiami and Antillean Shipping.
8) Automated gate systems were not included as an addition to the Antillean facility; however, these could be provided in future conceptual or full design. Manual entry would be required at in-gate and out-gate movements for each container. A queueing area was provided for trucks prepared to depart the facility as shown in Figures 4.15 and 4.17.
9) Additional manpower could be added as required based on demand at Antillean Shipping.

4.7 Short Sea Shipping Barge Service Evaluation

It is recommended that a barge be constructed to best suit the restrictions of the river. The ideal barge is a flat bottom barge with a draft not to exceed 13.5 feet, a beam of 45 feet, and a length of 300 feet, as shown in **Figure 4-18**. This vessel would accommodate the following statements:

1) The MLW is approximately 14 feet based on information provided by Jordan Shipping.
2) Hempstead Marine stated the widest a vessel can be to navigate the river is 45 feet.
3) Betty K currently operates the longest vessel on the river, 300 feet.

Figure 4-18: Sample Barge Sizing Recommendation



A vessel of this size is estimated to hold approximately 180 TEU per trip when stacked five high, based on a conservative estimate provided by an industry expert. Assuming 360 day operations per year and two barges per day, the Port could move approximately 64,800 TEU per year. This would accommodate current requirements from PortMiami as well as provide room to grow. From there, PortMiami would be required to increase the number of barges transported up river per day.

4.8 Short Sea Shipping Container on Barge Throughput Capacity

The implementation of the container-on-barge concept is heavily dependent on the availability of capacity on the Miami River. Based on the analysis in Section 4.2, there is capacity available for additional freight movement; however, there may be an opportunity cost to moving a barge loaded with freight already in the region not providing additional revenue to the Miami region compared to current terminal operators increasing their volumes with new or growing services to the Caribbean.

If a decision is made to maintain the current Caribbean volumes and add the PortMiami traffic, the consultant team estimates that two barges per day could accommodate approximately 64,800 TEU year based on a 360 days per year operation. This maximum level of activity would consume approximately 60% of the current reserve capacity of the river.

If a decision is made to increase both Caribbean volumes and add PortMiami traffic, additional analysis would need to be conducted to determine a schedule that would accommodate all vessel and barge requirements. Additional benefit-cost analysis may be required to determine if priority for growth should be provided to current terminal operators or to PortMiami.

4.9 Short Sea Shipping Findings

Based on the information reviewed, a short sea shipping container barge operation is a feasible river transit operation; however, there are concerns with loading and unloading operations. Concerns that may need to be reviewed further include, but are not limited to:

1. Terminal operations on the Miami River are currently non-union. Depending on the operations to load the barge at PortMiami, there may be requirements for union labor to unload the barges on the Miami River as well.
2. Union requirements for loading and unloading operations would increase the operating cost considerably.
3. Terminal operations at the PortMiami would likely need to occur in close proximity to cruise operations which is not ideal for ingress and egress for either vessels into the port area and may restrict the times at which the barges are permitted to access PortMiami.
4. Antillean may currently have plans for growth that have not been considered within this study. As noted previously, vacant parcels could be used as an alternative site.
5. Containers would remain in the Miami region for longer periods of time because of multiple dwelling locations and increase the time for a container to reach its final destination by truck or rail. The added dwell may or may not be significant, and depending upon the cargo, this may or may not affect the shipment volume.
6. Overall operating costs would likely incrementally increase for those containers destined for rail. Customers would not likely want to incur the increased cost and may move their traffic to other Ports if the cost was applied to the price of shipping. However, the participation of PortMiami may be driven by the need to improve operational efficiency and throughput at the port itself, justifying the investment and shipment cost differential against other key gains.

7. Antillean was selected as a viable location to for the short sea shipping operation. However, if the company chooses not to participate in the operation, additional property research would be required to find a suitable alternative.

4.10 Final Recommendations and Next Steps

The primary study findings indicate that there is available capacity on the Miami River. An estimated 35 additional vessel transits, or 17.5 cargo vessels on average, could occur each week for a total of approximately 1,820 vessel transits per year, or 910 cargo vessels, in and out of the Miami River. Based on this analysis, the berths are the bottleneck and will reach capacity prior to the Miami River reaching transit capacity.

There is an opportunity to include a short sea shipping barge operation between PortMiami and a predetermined terminal operator on the Miami River; however, buy-in from all stakeholders would be required to ensure that the barge remains on schedule each day. Delays to the barge with increased volume on the Miami River could increase delays to all vessels on the river. This study recommends one barge conducting two turns per day; however, an opportunity cost analysis and benefit-cost analysis would likely need to be performed to determine how to split the additional capacity of the river between traffic growth from the Caribbean and a short sea shipping operation.

5.0 Alternatives Analysis

The alternative analysis for the Miami River Freight Improvement Plan considers several future freight growth scenarios in the Miami River study area, while recognizing a continuing presence of marine-oriented freight operations along the west end of the corridor. Sources of background information for the alternative analysis conducted as part of this study include: the Miami River capacity and short sea shipping reports; existing conditions report, including traffic data collection; and the regional travel demand model. These sources were used to understand maximum throughput of the river, the potential for short sea shipping along the river, traffic flow at key intersections, and trip distribution in relation to the primary study area.

The alternative scenarios considered transportation improvements that are financially committed and planned over the next twenty years. Performance measures are also developed to test and compare improvement actions. The intent of the analysis is to test the study area transportation network with alternative freight-related land use conditions to identify the extent of capacity needs of the transportation roadway network, and to test prospective capacity improvements that would address freight mobility or congestion reduction needs that would enhance the movement of goods.

For reference, the study area was divided into a Primary Study Area (PSA) consisting of the main cargo-oriented part of the working river west of NW 22nd Avenue, and two Secondary Study Areas (SSA). **Figure 1.1** depicts the study area including the primary and secondary subareas. The PSA is also subdivided into a core PSA and a fringe PSA for purpose of the scenario analysis. The first of the SSA's is the Downtown Lead rail corridor extending eastward from NW North River Drive along NW 23rd Avenue to I-95. This area will be subjected to scenario testing and network analysis as for the PSA. Traffic impacts in this area are embedded within the broader street network review. The other SSA is the Miami River corridor east of NW 22nd Street; this area is included to embrace the river capacity analysis and short sea shipping study conducted as part of this study, but is not subjected to detailed network analysis.

The logic driving the selection of the study area and subareas is largely related to cargo uses. Figure 2.23 is the existing land use map. The land use map shows that the industrial uses are in the primary and secondary rail corridor while the secondary area on the lower end of the river is primary commercial uses.

5.1 Approach

This section describes the approach to conducting the roadway network analysis, including the freight planning scenarios, basic assumptions, methodology, and a summary of the additional truck trip demands to be tested on the network according to the methodology.

5.1.1 Freight Planning Scenarios

The purpose of this section of the report is to present the approach to performing an analysis of the roadway network within the study area for this plan. Specifically, this methodology for roadway network analysis addresses the scope requirements under Task 5 – Alternatives Analysis in terms of travel demand analysis and associated network deficiencies. For conceptual alternatives, improvement options with multiple complementary elements were developed in relation to the following four concepts:

1. Overall freight mobility for current and expected freight movements;
2. High-freight growth scenario of post-Panamax vessels entering Florida ports and higher than average overall economic growth;

3. Low-freight growth scenario of post-Panamax vessels entering Florida ports and lower than average overall economic growth, and;
4. No-build scenario, where no additional improvements are proposed beyond programmed improvements.

These concepts have been translated by adjusting underlying daily truck trips in the regional travel demand model into the following four freight planning scenarios with multiple complimentary element. The lower than average growth was not evaluated because the declining trend over the past 20 years has moderated. The decline was in part due to the desire of some port operators wanting to switch to larger ships which require a lower channel depth. Recent trends are either flat to slow growth. Figure 2.12 depicts the waterway commodity flow trends over the past 10 years. In place of the lower than average growth this study is evaluating the moderate growth scenario.

- No Build Scenario:
  - Status quo/trend forecast as embodied in the adopted LRTP.
  - Applies to the core and fringe PSA, and both SSAs.
  - No infrastructure investments beyond the TIP. Other LRTP cost-feasible projects in the vicinity of the study area are not included.
- Trend Scenario:
  - Status quo/trend forecast as embodied in the adopted LRTP.
  - Marine shipping continues on current trajectory, modest supportive actions are taken.
  - Applies to the core and fringe PSA, and both SSAs.
  - All cost-feasible infrastructure investments in the adopted LRTP.
- Moderate Growth Scenario:
  - All cost-feasible infrastructure investments in the adopted LRTP.
  - Zoning protects the working river, cargo market stabilizes and improves, marine shippers experience continued growth.
  - Extent of growth:
    - An increase of 50% in cargo volumes shipped by 2040, affecting the core PSA. This is based on the river shipping volumes reaching half their former peak.
    - Other industrial zones experience a 25% increase in business activity/ redevelopment, affecting the fringe PSA and the Downtown Lead SSA.
    - River secondary study area is assumed to grow per the LRTP trend conditions.
- Aggressive Growth Scenario: employment growth that supports robust cargo activity growth, possibly including a short sea shipping component tied to PortMiami.

- Freight growth by a combination of current container and break-bulk mix and/or implementation of a short sea shipping program.
- All cost-feasible infrastructure investments in the adopted LRTP.
- Zoning protects the working river; cargo market recovers and grows significantly, marine shippers thrive under improved climate.
- Extent of growth:
    - 100% increase in cargo volumes shipped by 2040, affecting the core PSA. This is based on the river shipping volume attaining a level near its former peak.
    - Other industrial zones experience a 50% increase in business activity/redevelopment, affecting the fringe PSA and the Downtown Lead SSA.
    - River secondary study area is assumed per LRTP trend.

5.1.2 Basic Assumptions

The roadway network analysis methodology was developed to support the development and definition of the conceptual alternatives described above, and comprises four companion scenarios.

The Southeast Florida Regional Planning Model (SERPM), referred to herein as the Travel Demand Model (TDM), underpinned the development of the 2040 Miami-Dade Long Range Transportation Plan. That TDM will be used as the foundation for a segment-based analysis of the study area roadway network, examining segment volume-to-capacity (V/C) ratios and levels of service (LOS).

5.1.3 Network Analysis Methodology

This section describes the approach to conducting the roadway network analysis, including the basic methodology, and a summary of the additional truck trip volumes to be tested on the network according to the methodology. Specifically, this methodology for roadway network analysis addresses the scope requirements under Task 5 – Alternatives Analysis in terms of travel demand analysis and associated network deficiencies.

A matrix was developed, as presented later in this section, to summarize proposed improvements with project-related information, project impacts and costs to illustrate local and regional importance of alternatives for ultimate recommendation.

a. Travel Demand Model (TDM) and Other Data Collection

The following information will be compiled for use in the analysis process:

1. Base year and forecast year daily traffic volumes on each lift bridge in the Miami River study area.
2. Traffic volume growth (base year and forecast year) for primary and secondary study area.
3. TAZ demographic data along the Miami River in the core of the PSA.
4. TAZ demographic data in the fringe of the PSA.

5. TAZ demographic data in the SSA along the Downtown Lead rail corridor.
6. TAZ demographic data in the SSA along the river.
7. Parcel data – calculate vacant parcels in acreage.
8. Parcel data – calculate redevelopment parcels in acreages.
9. TAZ base year and forecast year trip generation by trip type including truck trips.
10. Existing plus committed network.
11. 2040 cost feasible network.
12. Other projects:
    a. Those in planning by public agencies but not yet programmed.
    b. Those developed as part of this study.
13. Total volume, truck volume, percent trucks.
14. Segment level of service.
15. Trips generated for each aggregated TAZ subarea for each scenario.

b. Scenario Analysis

1. Baseline:
    a. Compare 2010 base year and 2040 horizon year total truck volumes from SERPM. Calculate growth rate over 2010-2040 timeframe.
    b. Based on TAZ data, identify existing working river truck trips for subsequent adjustment and analysis.
    c. Compare trips generated for each aggregated TAZ group.
    d. Identify 2010 truck trip distribution to travel analysis zones (TAZs) in the Miami River study area per the TDM, total volume and percentage of truck trips.
2. No-Build Scenario:
    a. This scenario is considered equivalent to the travel forecast conditions and growth rate embodied in the currently adopted LRTP, except only the cost-feasible projects currently adopted in the TIP would be considered. This could also be referred to as the Existing Plus Committed (E+C) scenario.
    b. The road network coding within the study area would be reviewed and revised to retain only committed TIP projects. LRTP cost-feasible projects in the vicinity of the study area are removed and not included in the analysis.
    c. Truck trips, both existing and future, would be isolated from the data.
    d. Traffic service would be reviewed to assess impact of the removed cost feasible projects.

3. Trend Scenario:
    a. This scenario is considered equivalent to the travel forecast conditions embodied in the currently adopted LRTP, including travel demand forecasts and cost-feasible transportation improvements contained therein.
    b. Truck trips both existing and future would be isolated from the data.
    c. Roadway network performance and improvement needs would then be evaluated.
4. Moderate Growth Scenario:
    a. Truck trips in the core PSA would be presumed to grow 50% by 2040, and the TDM trip table modified accordingly.
    b. Truck trips in the fringe PSA and Downtown Lead SSA would be presumed to grow by an additional 25%, and the TDM trip table modified accordingly.
    c. Traffic service at selected locations would be reviewed to assess impacts on the level of traffic service.
    d. Roadway network performance and improvement needs would be evaluated based on TDM outputs.
    e. Selected network improvements would be tested for their positive impacts on study area freight mobility.
5. Aggressive Growth Scenario:
    a. Truck trips in the core PSA would be presumed to grow by 100% by 2040 and the TDM trip table modified accordingly.
    b. Truck trips in the fringe PSA and Downtown Lead SSA would be presumed to grow by an additional 50%, and the TDM trip table modified accordingly.
    c. The modified trip table would be reassigned to the network, and truck trips both existing and future would be identified from the data.
    d. Traffic service at selected locations would be reviewed to assess impacts on the level of traffic service.
    e. Roadway network performance and improvement needs would be evaluated based on TDM outputs.
    f. Selected network improvements would be tested for their impacts on study area freight mobility.

5.2 Testing and Analysis of Alternatives

5.2.1 Truck Trip Analysis

Based on the described methodology and defined scenarios, additional truck trips were incorporated into the trip table for network assignment. **Table 5.1, Table 5.2, Table 5.3,** and **Table 5.4** summarizes the truck trips by time period and subarea within the Miami River study area for each scenario. Only the PM period was considered in the network analysis.

The time periods are as follows:

- EA is Early Morning (10:00 PM – 5:59 AM)
- AM is Morning (6:00 AM – 8:59 AM)
- MD is Midday (9:00 AM – 2:59 PM)
- PM is Afternoon (3:00 PM – 6:59 PM)
- EV is Evening (7:00 PM – 9:59 PM)

The subareas are the primary study area along the working river (PSAR), the primary study area along the fringe (PSANR), the secondary study area in the rail corridor (SSARAIL), and the secondary study area outside the rail corridor (SSANOTRAIL).

The Miami River study area was estimated to generate about 19,000 daily truck trips in base year 2010 and between 29,000 and 37,000 daily truck trips in year 2040 depending on the scenario. The growth rate within the fringe of the primary study area and inside the rail corridor is estimated to grow at half the rate of the working river boundary. The growth in the remaining study area that leads into Biscayne Bay was estimated to remain at the LRTP Trend level. The truck trips on the primary study area along the working river doubles when comparing the Trend to the Aggressive Growth Scenarios from 5, 712 to 11,425. The truck trips on the fringe of the primary study area and the rail corridor grew by 50 percent. The secondary study area leading to Biscayne Bay was relatively flat with about 20,000 truck trips.

Table 5.1: Truck Trips 2010 Base Scenario

Time Period	Study Subareas				
	PSAR	PSANR	SSARAIL	SSANOTRAIL	Total
EA	368	82	183	1,105	1,738
AM	651	145	324	1,956	3,076
MD	1,550	345	772	4,659	7,326
PM	1,100	245	548	3,308	5,201
EV	375	84	187	1,128	1,774
Total	**4,044**	**901**	**2,014**	**12,156**	**19,115**

Table 5.2: Truck Trips 2040 Trend Scenario

Time Period	Study Sub Areas				
	PSAR	PSANR	SSARAIL	SSANOTRAIL	Total
EA	519	115	228	1,816	2,678
AM	919	203	404	3,215	4,741
MD	2,190	485	964	7,666	11,305
PM	1,554	344	684	5,441	8,023
EV	530	117	233	1,854	2,734
Total	**5,712**	**1,264**	**2,513**	**19,992**	**29,481**

Table 5.3: Truck Trips 2040 Moderate Growth Scenario

Time Period	Study Sub Areas				
	PSAR	PSANR	SSARAIL	SSANOTRAIL	Total
EA	778	144	286	1,829	3,037
AM	1,378	255	507	3,238	5,378
MD	3,285	608	1,209	7,719	12,821
PM	2,332	431	858	5,479	9,100
EV	795	147	292	1,867	3,101
Total	**8,568**	**1,585**	**3,152**	**20,132**	**33,437**

Table 5.4: Truck Trips 2040 Aggressive Growth Scenario

Time Period	Study Sub Areas				
	PSAR	PSANR	SSARAIL	SSANOTRAIL	Total
EA	1,038	173	344	1,841	3,396
AM	1,838	307	609	3,260	6,014
MD	4,380	731	1,453	7,772	14,336
PM	3,109	519	1,031	5,517	10,176
EV	1,060	177	351	1,880	3,468
Total	**11,425**	**1,907**	**3,788**	**20,270**	**37,390**

5.2.2 Network Scenarios

Traffic Assignment Results

The results of traffic assignments for the five scenarios (Base, No Build, Trend, Moderate Growth, Aggressive Growth) and two network cases are presented graphically in the following series of study area maps depicting the resulting daily traffic volumes, daily truck volumes, percent trucks, PM volumes, PM level of service, and PM truck volumes by segment within the study area.

The PM volumes shown in the figures are period volumes. This is a standard model output for SERPM. The PM volumes were provided because generally the worst period for LOS is PM. The SERPM model uses the FDOT Generalized Tables (in the Quality/Level of Service Handbook) to determine volume to capacity ratios. The interrupted and uninterrupted facility types were considered. The capacities in the existing model are based on Level of Service E (not LOS D) threshold service volumes. In the model, the capacities have been reduced to reflect the peak hour factors. The LOS E value is numeric and ranges from 0 to over 1. That scale is: 0.00 – 0.75=A-C, 0.75 – 0.85=D, 0.85-1.00=E, >1.00=F.

Miami Dade TPO Transportation Plan Scenarios

The SERPM model was used to develop each scenario. The base model estimates the number of truck trips produced and attracted by each internal TAZ. The trip rate models estimate truck trip ends using the TAZ employment and household attributes (households, industrial employment, commercial employment, and service employment). The model estimates trip ends for three classes of trucks: four-tire, single units with more than four tires, and combinations.

Truck trip ends are distributed using a destination choice model. This model approximates the trip length distributions of the truck trip purposes. It uses network drive-alone time as the impedance, the size term is truck attractions, and it creates daily truck trip tables for the three types of trucks.

Below are the scenarios from the Miami Dade TPO model.

- Base Scenario - Includes year 2010 roadways network and socioeconomic by TAZ. **Figures 5.1, 5.2, 5.3, 5.4, 5.5, and 5.6** present the output graphics for Scenario 1 - Base for the study area roadways.
- No Build Scenario – Includes the existing plus committed network with the future year 2040 socioeconomic by TAZ. **Figures 5.7, 5.8, 5.9, 5.10, 5.11, and 5.12** present the output graphics for Scenario 2 - No Build for the study area roadways.
- Trend Scenario – Includes the existing plus committed plus cost feasible network with the future year 2040 socioeconomic by TAZ. **Figures 5.13, 5.14, 5.15, 5.16, 5.17, and 5.18** present the output graphics for Scenario 3 - Trend for the study area roadways.

Miami River Freight Improvement Plan Growth Scenarios

Using the 2040 LRTP trip tables, truck trips by period were increased by direct manipulation according to the growth scenario relative to the trend scenario, with the trend as the growth between the 2010 base year and 2040 LRTP horizon year. In the moderate growth scenario Truck trips were increased by an additional 50% over the trend scenario in the Primary Study Area (PSA) TAZs on the river, and 25% over trend in the PSA TAZs not on the river and the Secondary Study Area (SSA) adjacent to the rail line. In the aggressive growth scenario, growth over trend truck trips was an additional 100% in the PSA TAZs on the river and 50% over trend in the PSA TAZs not on the river and the SSA TAZs adjacent to the rail line, making the change in truck trips double in the aggressive growth scenario relative to the moderate growth scenario.

ITE Trip Generation Version 9 states that truck trips account for 60 percent of all trips at break bulk terminals. Assuming the remaining trips are auto and light truck trips, the ratio of the increase in auto trips per increased truck trips is 0.67 (i.e. 40/60). Using this relationship, auto trips by period for the TAZs within the study area were increased at the rate of 0.67 auto trips for each increase in truck trips indicated by the growth scenario for the PSA TAZs on the river, the PSA TAZs not on the river, and the SSA TAZs along the rail line, to reflect additional auto trips expected to be made to these TAZs.

Below are the scenarios developed for the Miami River Freight Improvement Plan.

- Moderate Growth Scenario –Includes the Trend scenario network and socioeconomic data by TAZ with additional trip table growth adjustments described in the text above based on historical waterway commodity flow data in the Miami River. **Figures 5.19, 5.20, 5.21, 5.22, 5.23, and 5.24** present the output graphics for Scenario 4 - Moderate Growth for the study area roadways.
- Aggressive Growth Scenario - Includes the Trend scenario network and socioeconomic data by TAZ with additional trip table growth adjustments described in the text above based on historical waterway commodity flow data in the Miami River. **Figures 5.25, 5.26, 5.27, 5.28, 5.29, and 5.30** present the output graphics for Scenario 5 - Aggressive Growth for the study area roadways.

Network Improvement Cases

The network improvements tested are mostly unfunded projects of high priority to MDX. The idea is to provide an entire north-south arterial along NW 37th Avenue to relieve traffic congestion on LeJeune Road and to provide new access to MIA and the MIC. The model results showed that increasing capacity and connectivity at NW 37th Avenue while providing better connections on SR-112 resulted in an increase in traffic on those roadways while reducing traffic and generally providing better segment level of service on LeJeune Road/ SR-112 and NW 27th Avenue.

Figures 5.31, 5.32, 5.33, 5.34, 5.35, and 5.36 present the output graphics for Case 1 - Aggressive Growth without the 37th Avenue bridge over the Miami River. **Figures 5.37, 5.38, 5.39, 5.40, 5.41, and 5.42** present the output graphics for Case 2 - Aggressive Growth with the 37th Ave. bridge over the Miami River. The output graphics include maps for daily traffic volumes, daily truck volumes, percent trucks, PM volumes, PM level of service, and PM truck volumes by segment within the study area for each case.

Below is the list of changes to the cost feasible network in the aggressive growth scenario for each case.

Case 1 Improvements

1. New SR-112 half diamond interchange with EB on ramp and WB off ramp at NW 37th Ave.
2. New SR-112 WB flyover ramp to WB NW 36th St.
3. New SR-112 WB flyover ramp to WB Okeechobee Rd.
4. New SR-836 EB exit ramp to NW 37th Ave.
5. Widen NW 37th Ave. to four lanes from NW North River Dr. to NW 79th St.

Case 2 Improvements

1. New SR-112 half diamond interchange with EB on ramp and WB off ramp at NW 37th Ave.
2. New SR-112 WB flyover ramp to WB NW 36th St.
3. New SR-112 WB flyover ramp to WB Okeechobee Rd.

4. New SR-836 EB exit ramp to NW 37th Ave.
5. Widen NW 37th Ave. to four lanes from NW North River Dr. to NW 79th St.
6. New four-lane bridge over the Miami River on NW 37th Ave.

Figure 5-1: Scenario 1 – Base 2010 Daily Bi-directional Volumes

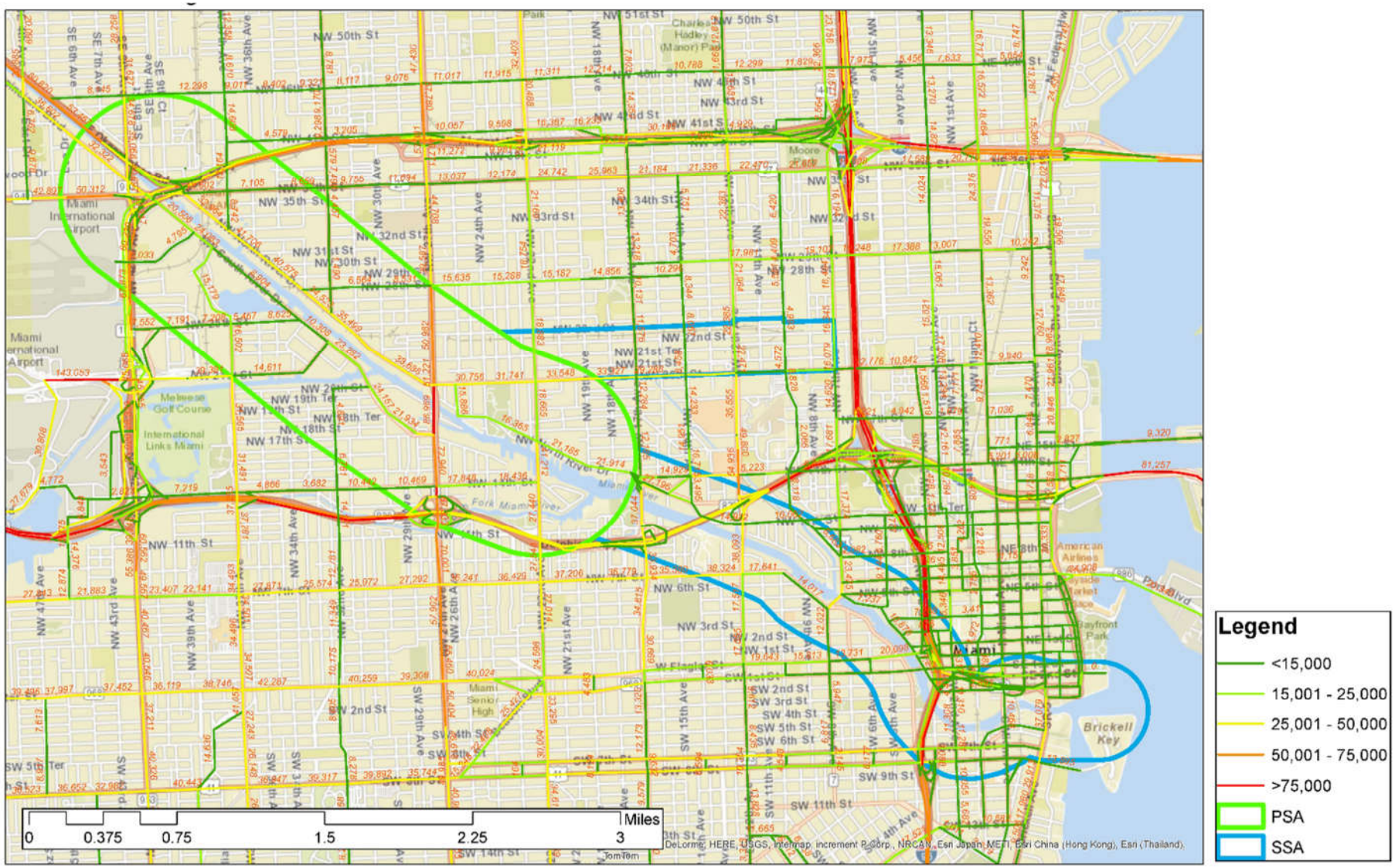


Figure 5-2: Scenario 1 – Base 2010 Truck Daily Bi-directional Volumes

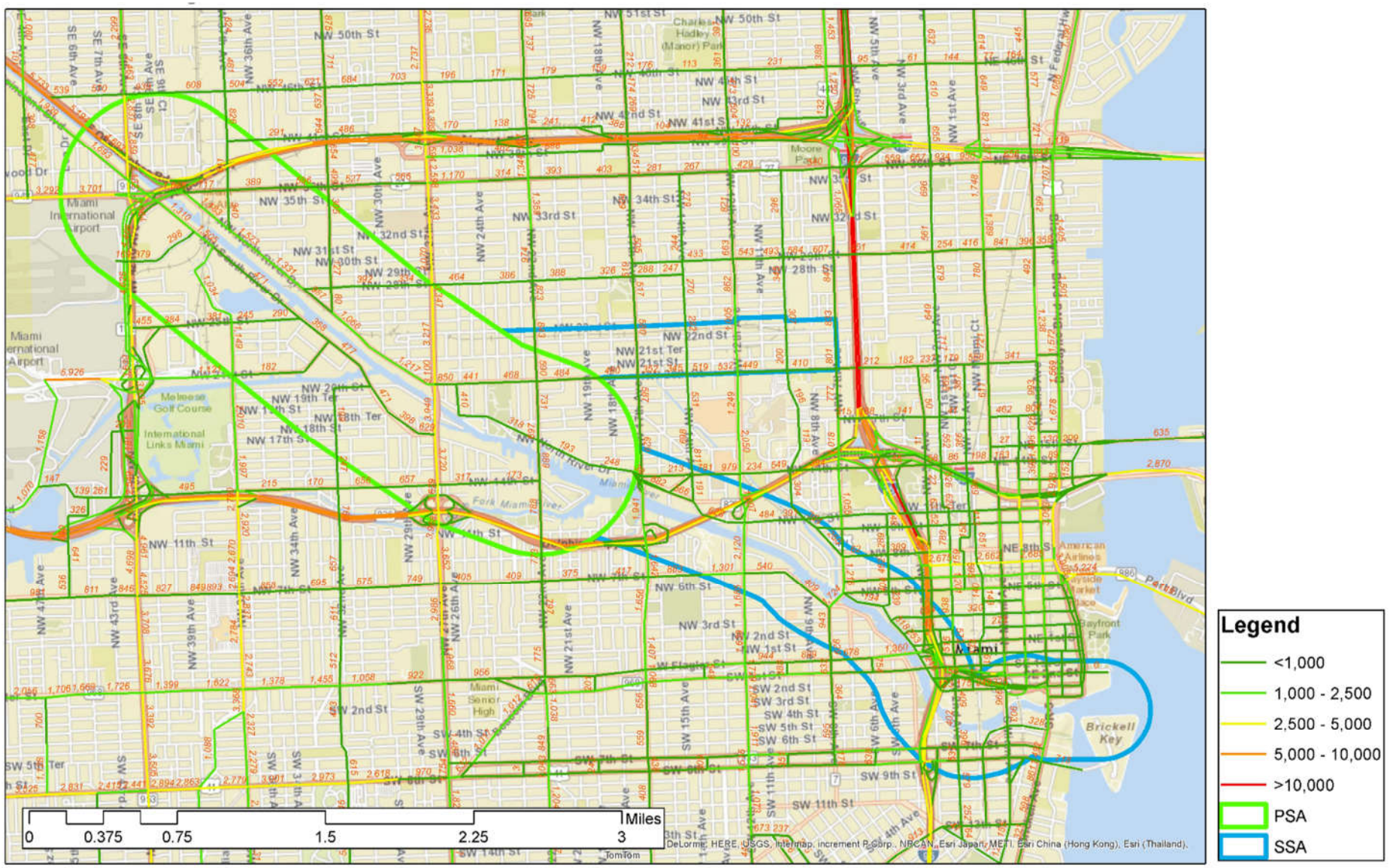


Figure 5-3: Scenario 1 – Base Percent Trucks of 2010 Daily Volumes

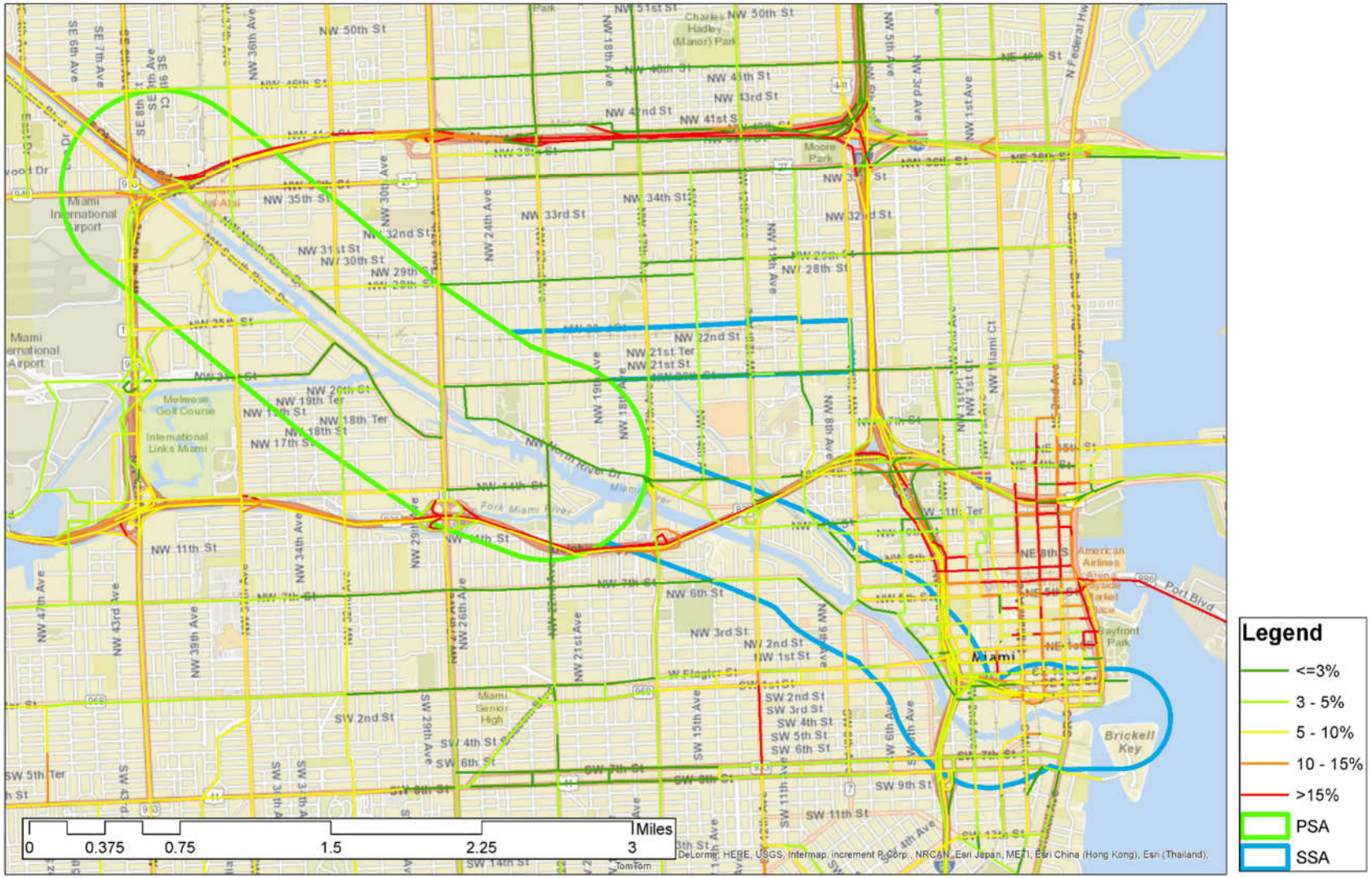


Figure 5-4: Scenario 1 – Base 2010 PM Peak Period Bi-directional Volumes

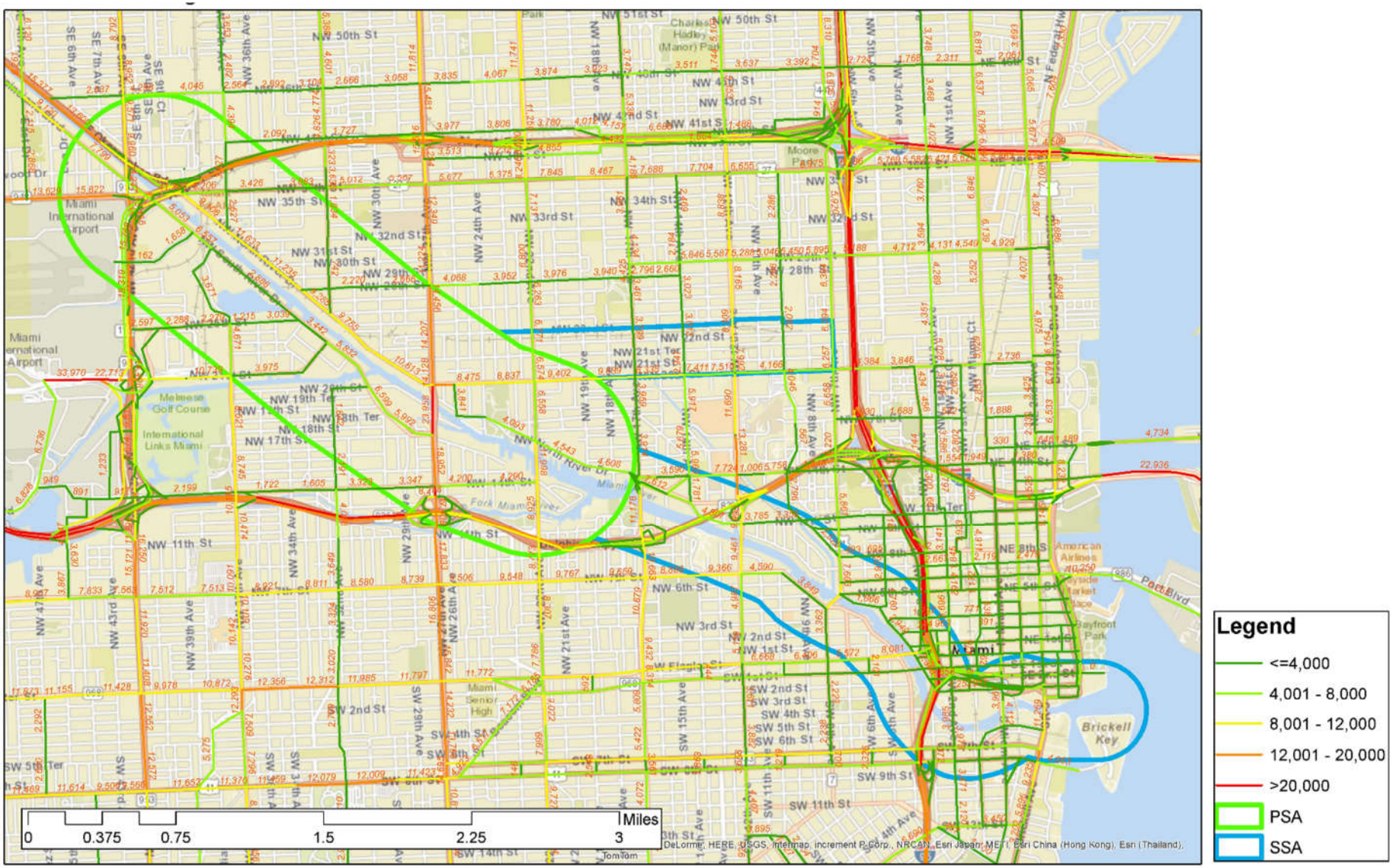


Figure 5-5: Scenario 1 - Base 2010 PM Peak Period LOS

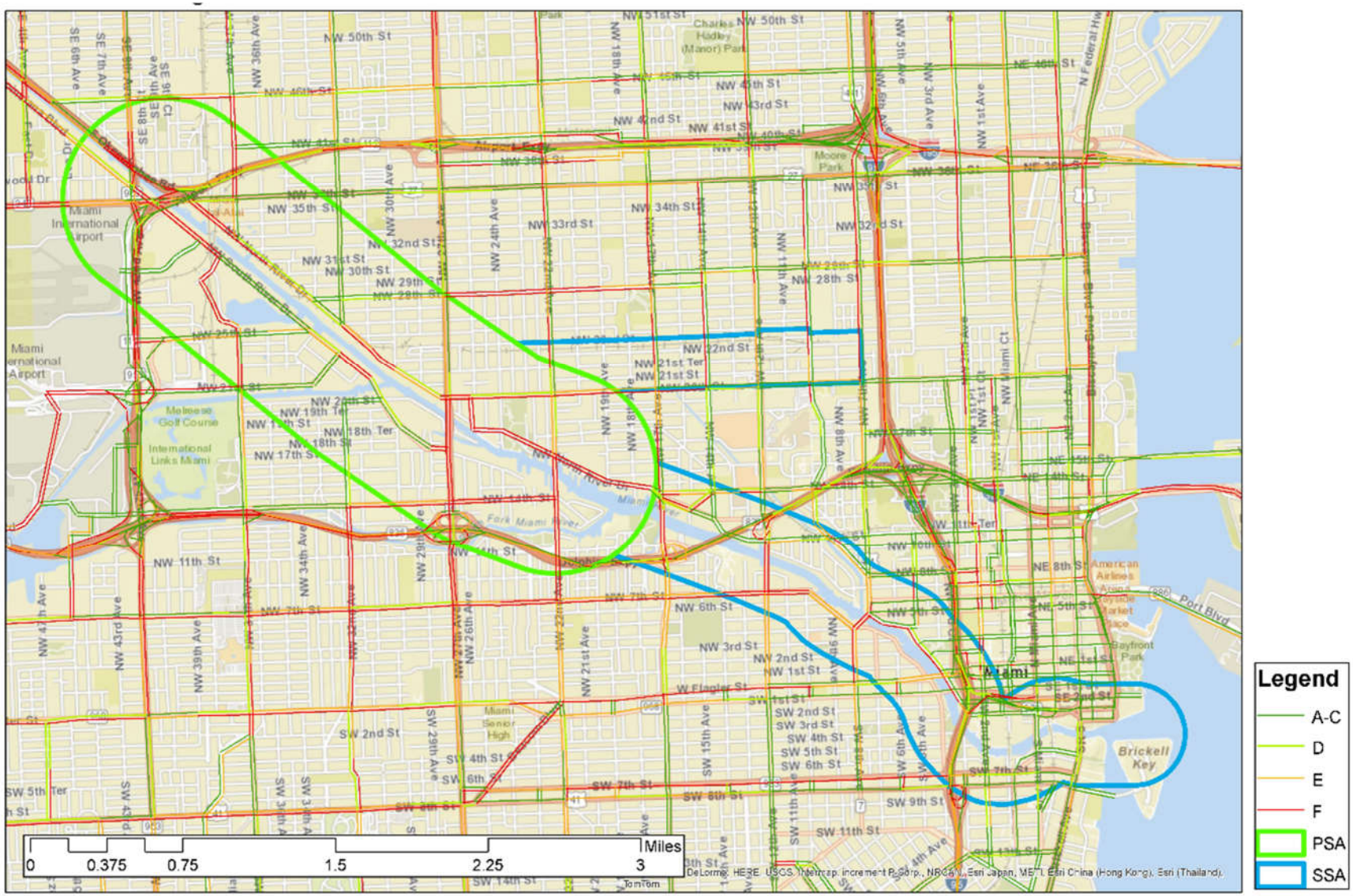


Figure 5-6: Scenario 1 – Base 2010 PM Peak Period Trucks Bi-directional Volumes

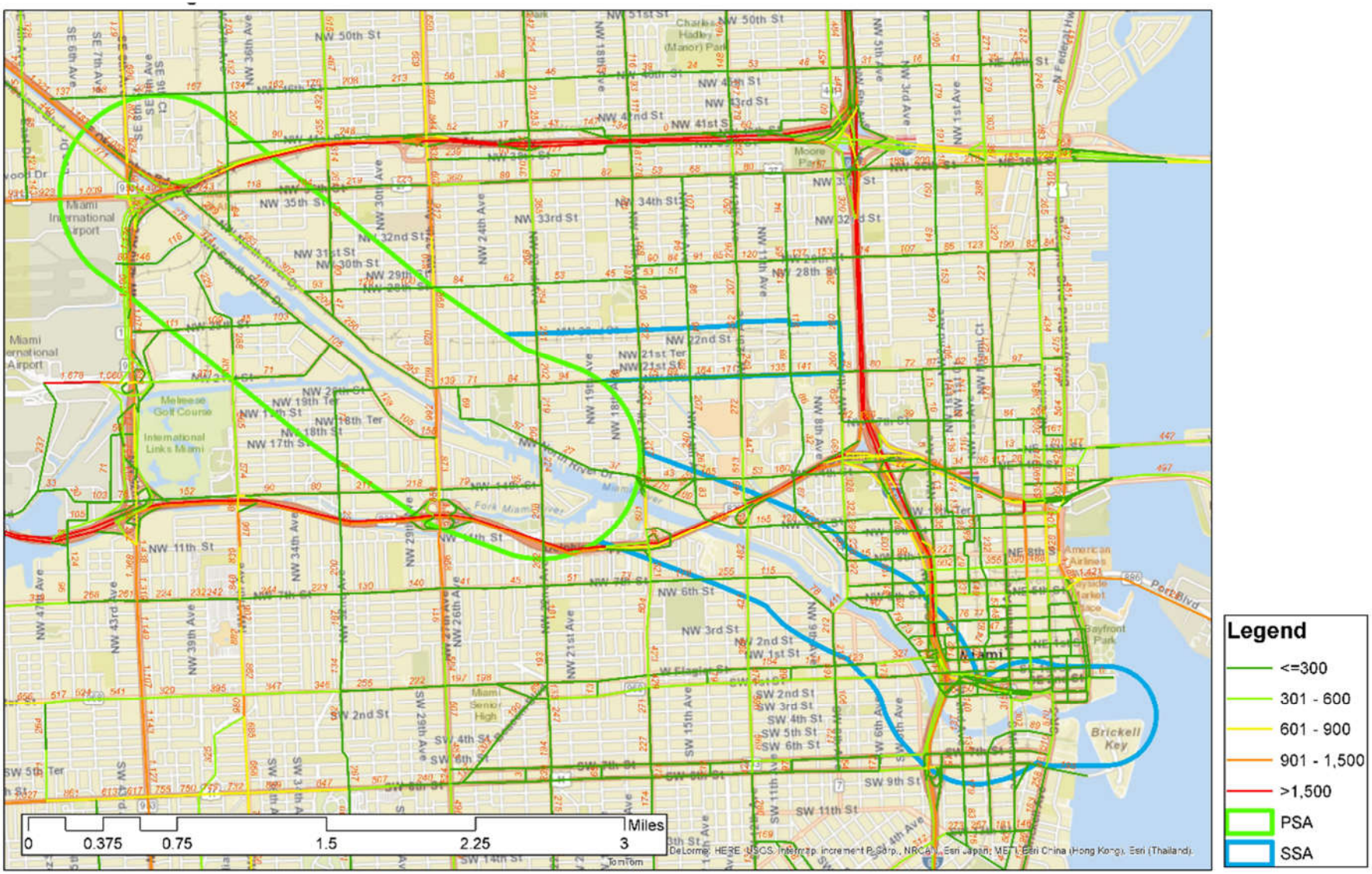


Figure 5-7: Scenario 2 – No Build 2040 Daily Bi-directional Volumes

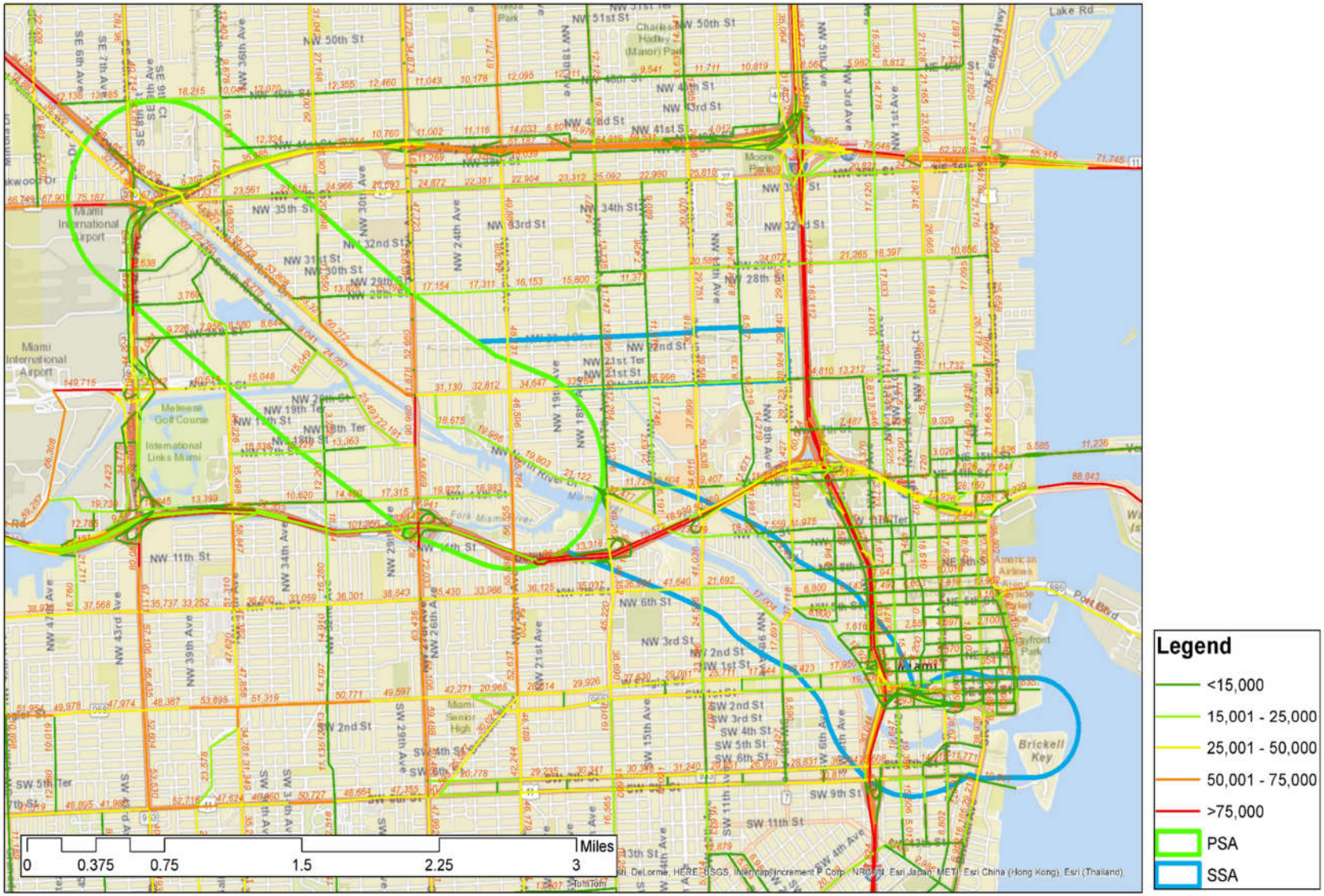


Figure 5-8: Scenario 2 – No Build 2040 Truck Daily Bi-directional Volumes

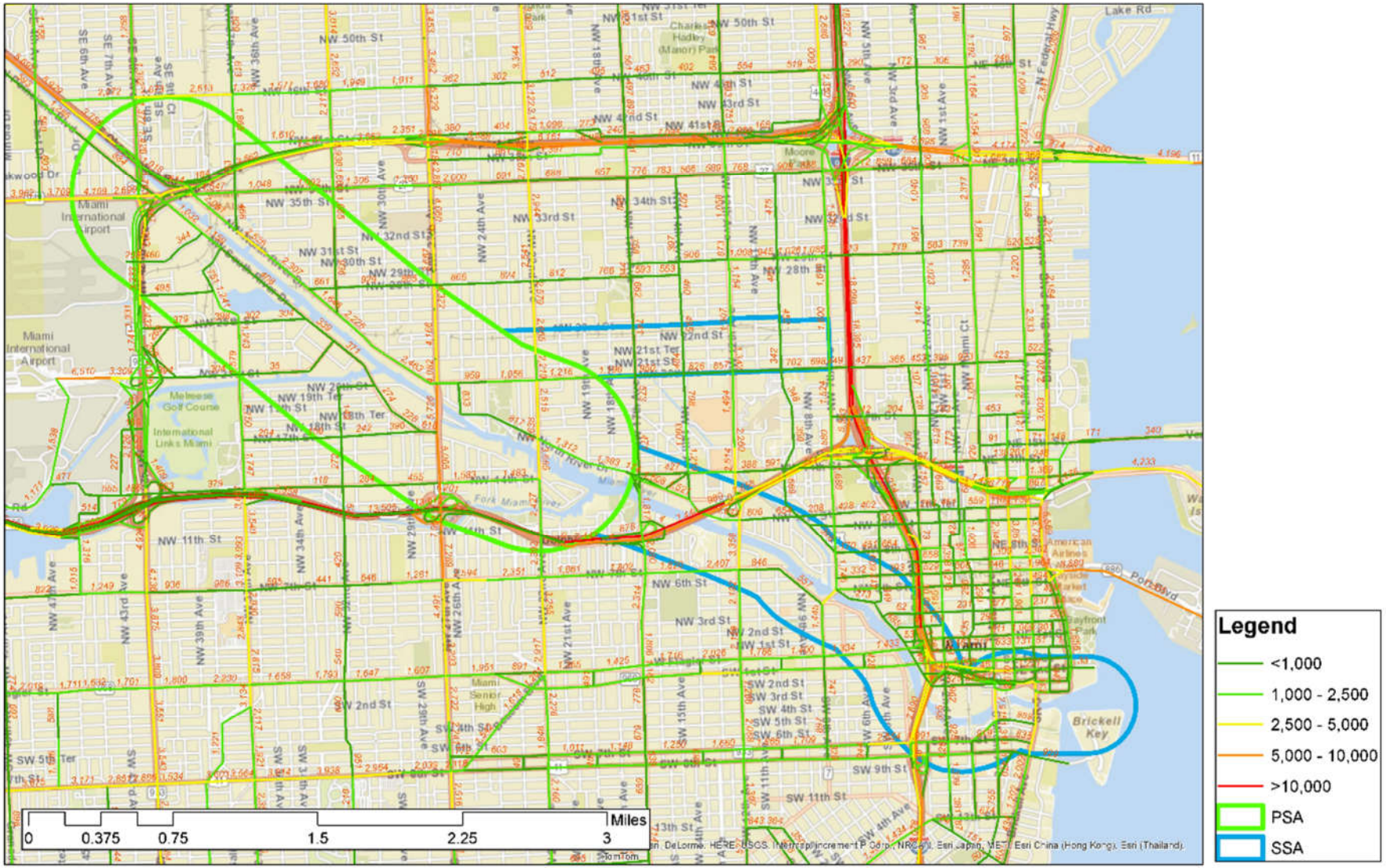


Figure 5-9: Scenario 2 – No Build Percent Trucks of 2040 Daily Volumes

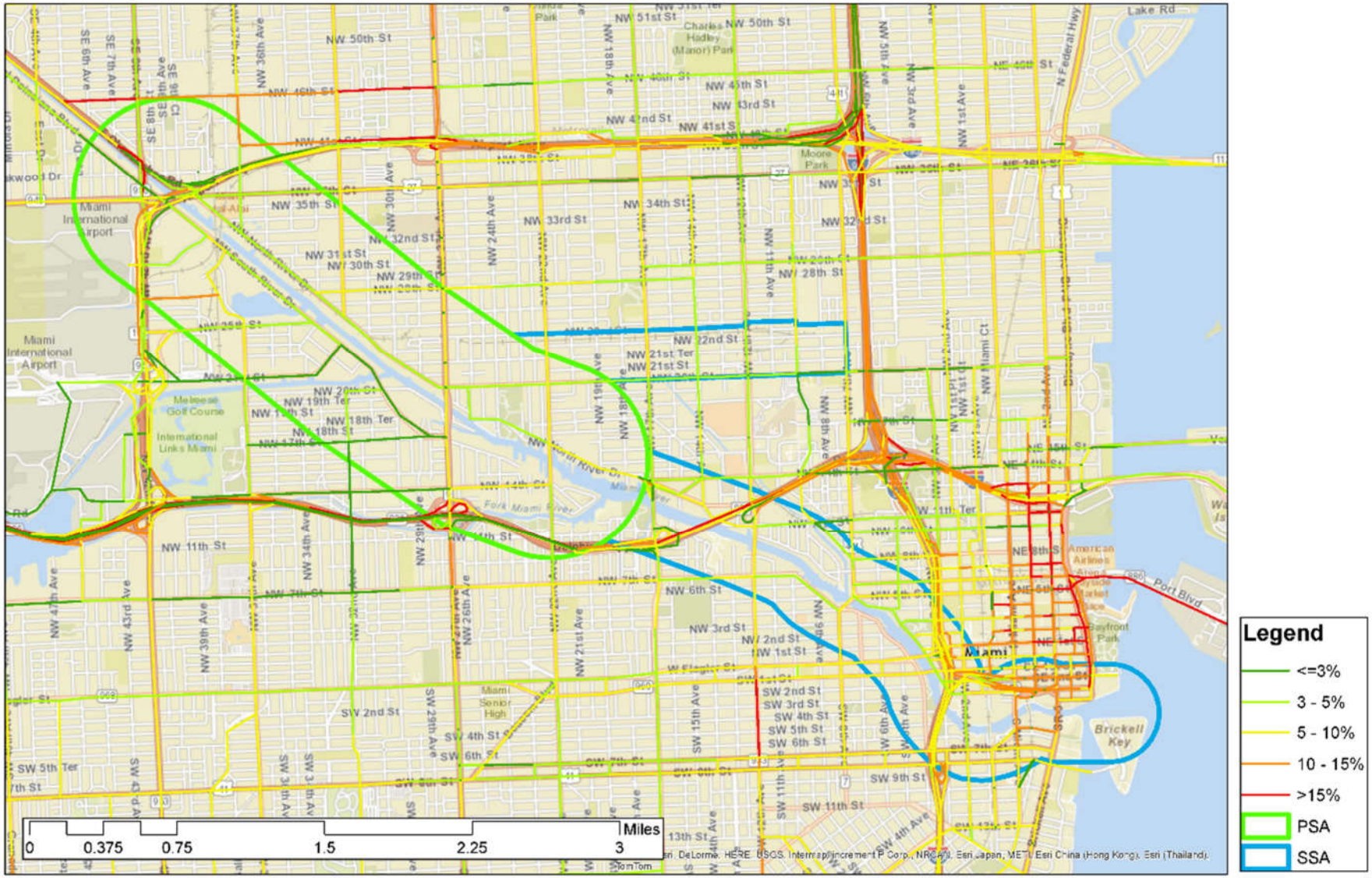


Figure 5-10: Scenario 2 – No Build 2040 PM Peak Period Bi-directional Volumes

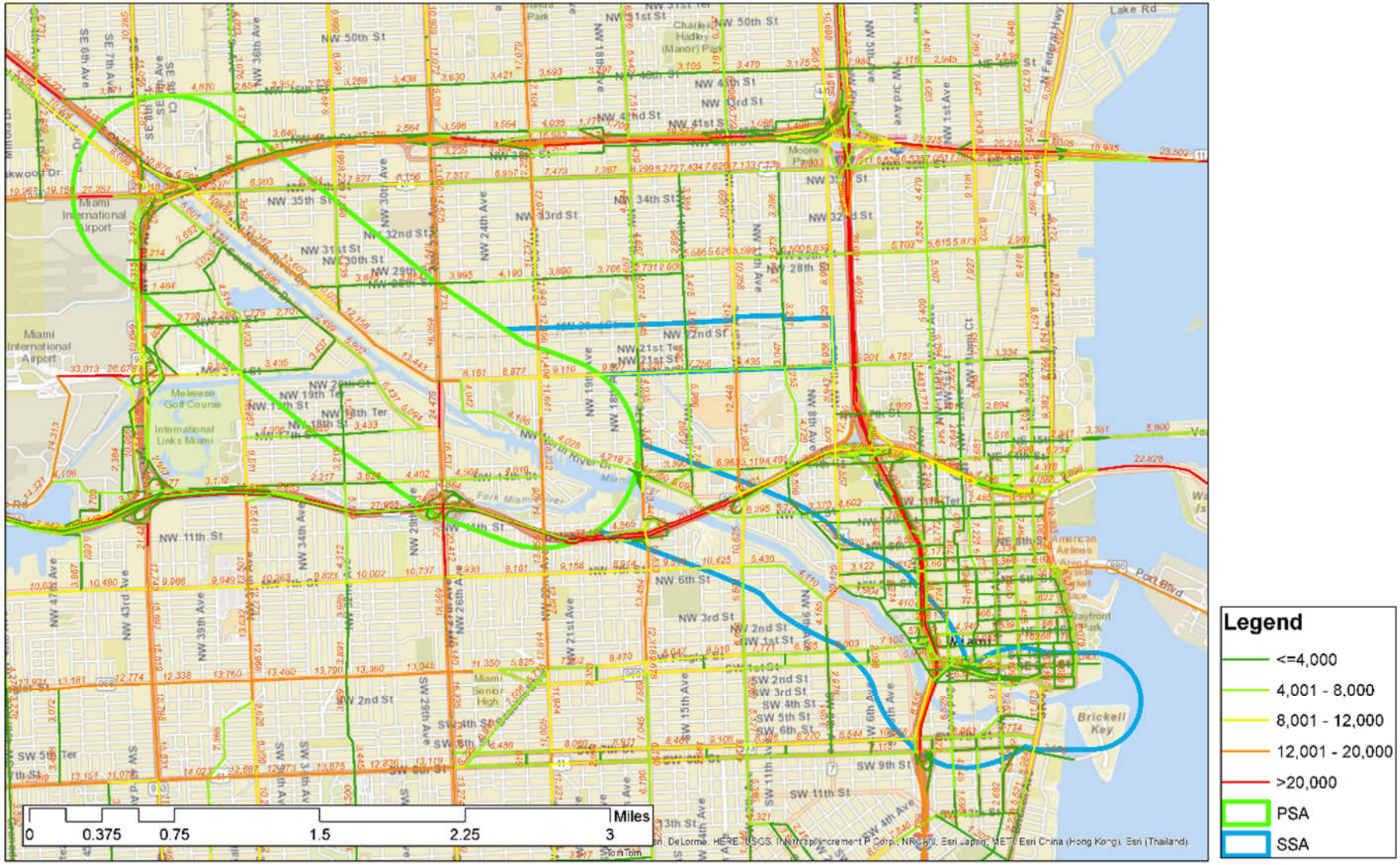


Figure 5-11: Scenario 2 – No Build 2040 PM Peak Period LOS

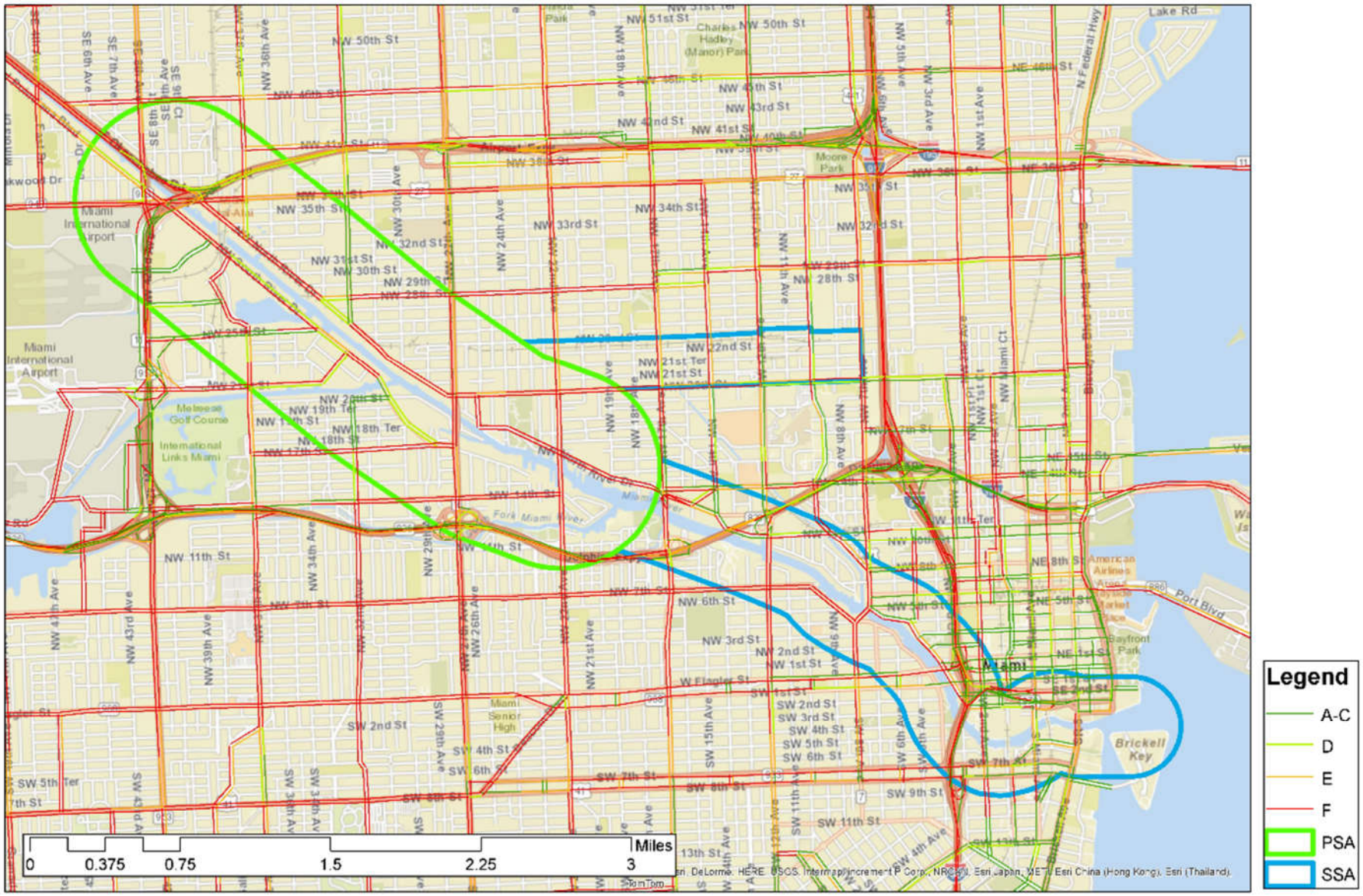


Figure 5-12: Scenario 2 – No Build 2040 PM Peak Period Trucks Bi-directional Volumes

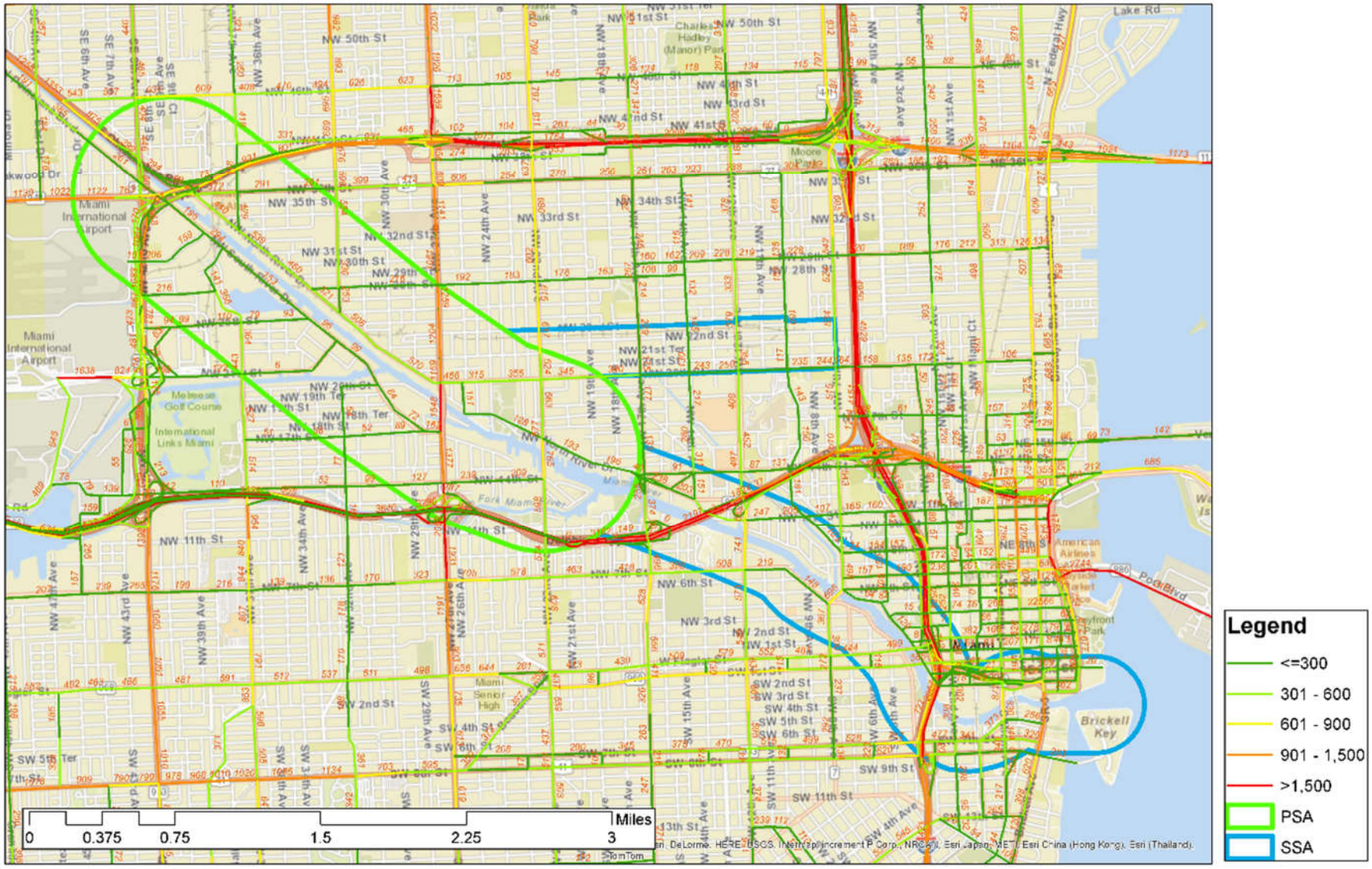


Figure 5-13: Scenario 3 – Trend 2040 Daily Bi-directional Volumes

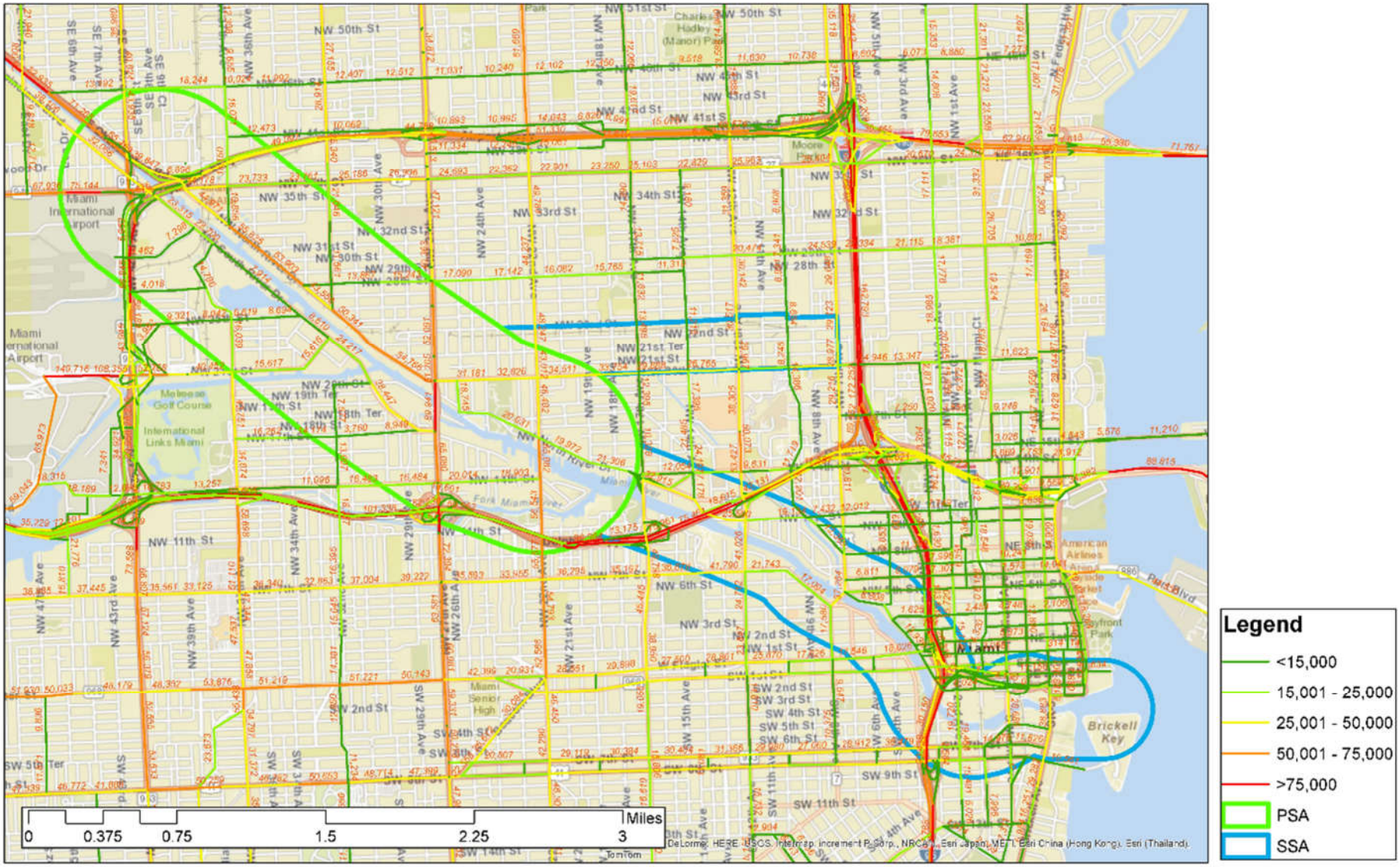


Figure 5-14: Scenario 3 – Trend 2040 Daily Trucks Bi-directional Volumes

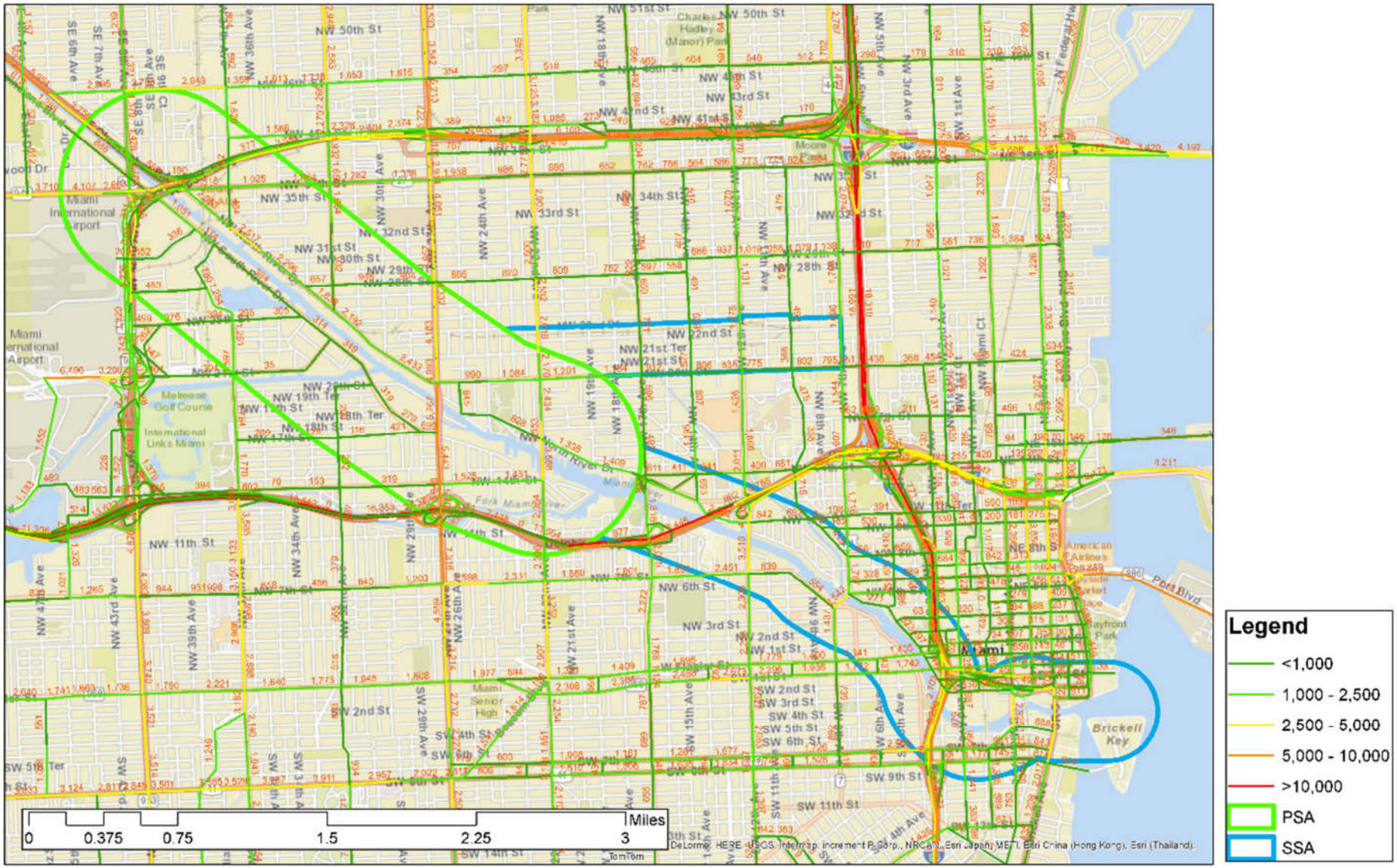


Figure 5-15: Scenario 3 – Trend Percent Trucks of 2040 Daily Volumes

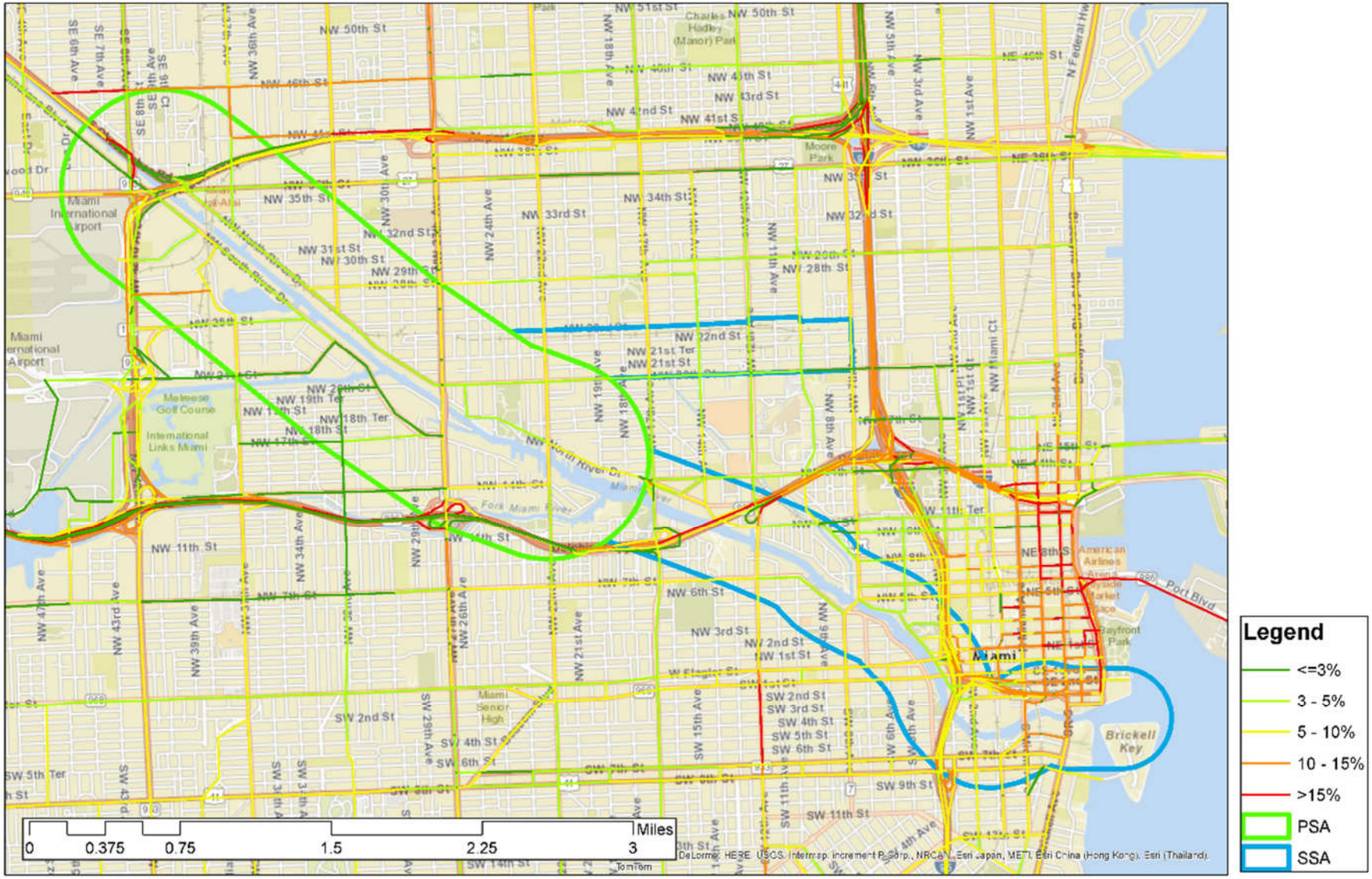


Figure 5-16: Scenario 3 – Trend 2040 PM Peak Period Bi-directional Volumes

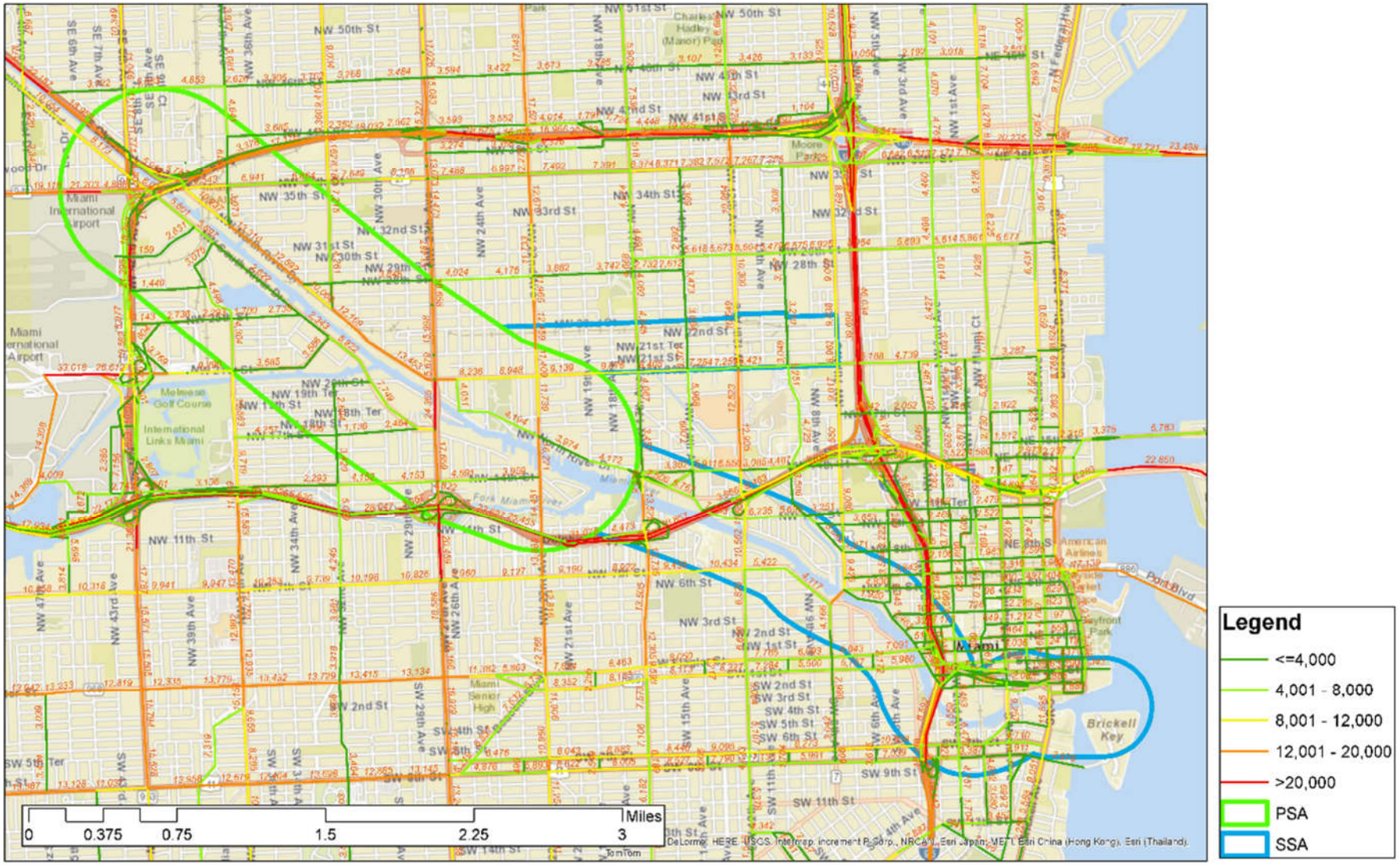


Figure 5-17: Scenario 3 – Trend 2040 PM Peak Period LOS

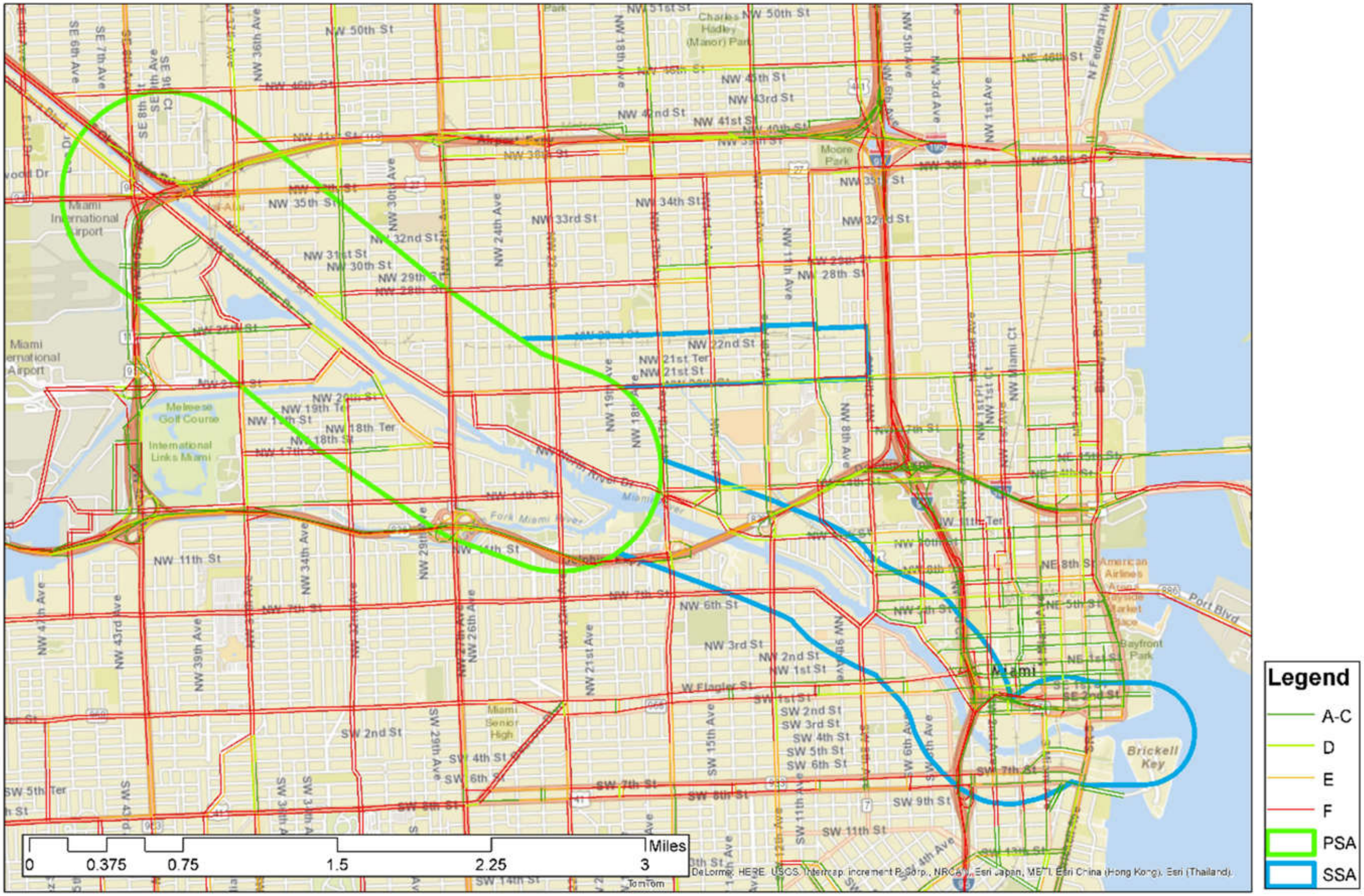


Figure 5-18: Scenario 3 – Trend PM Peak Period Trucks Bi-directional Volumes

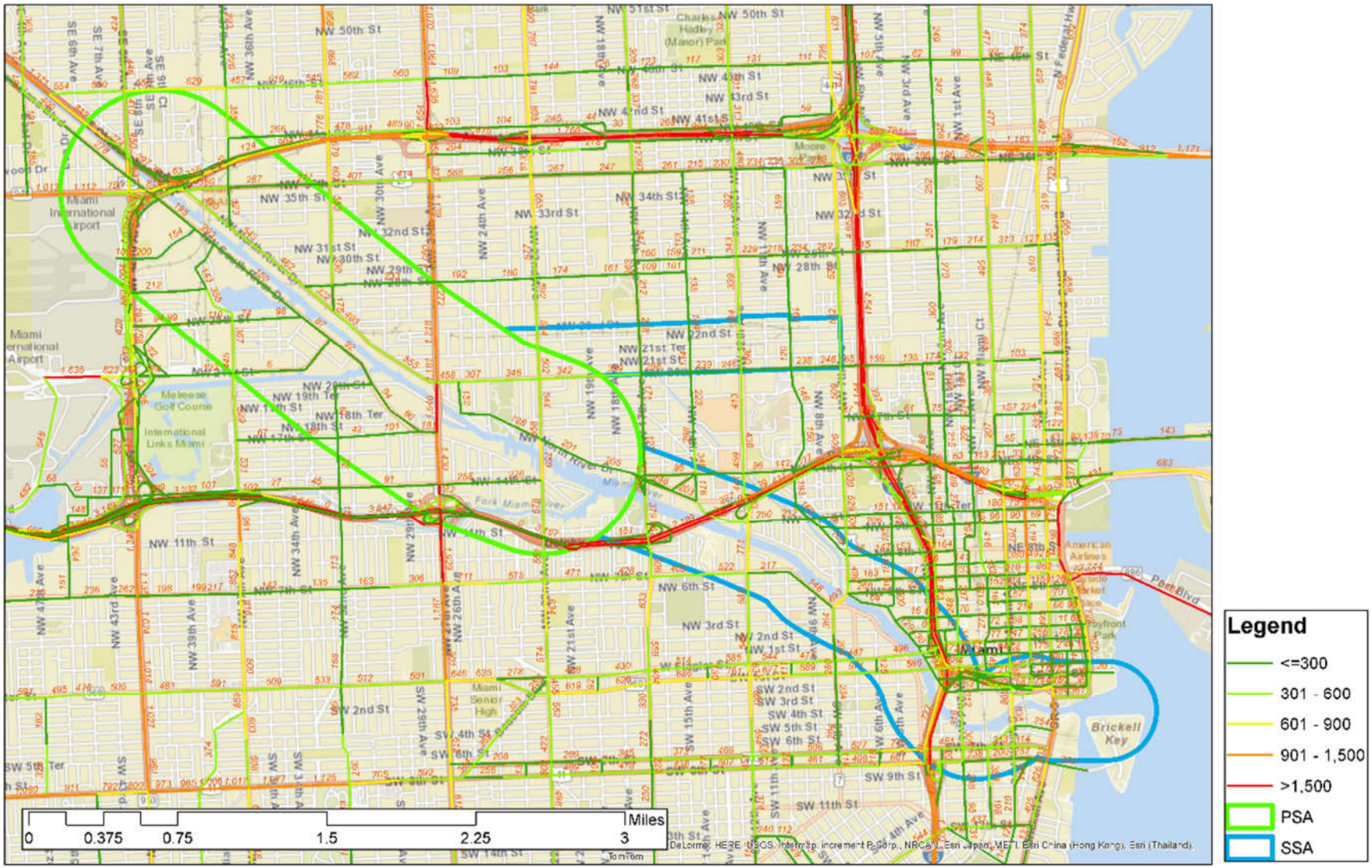


Figure 5-19: Scenario 4 – Moderate Growth 2040 Daily Bi-directional Volumes

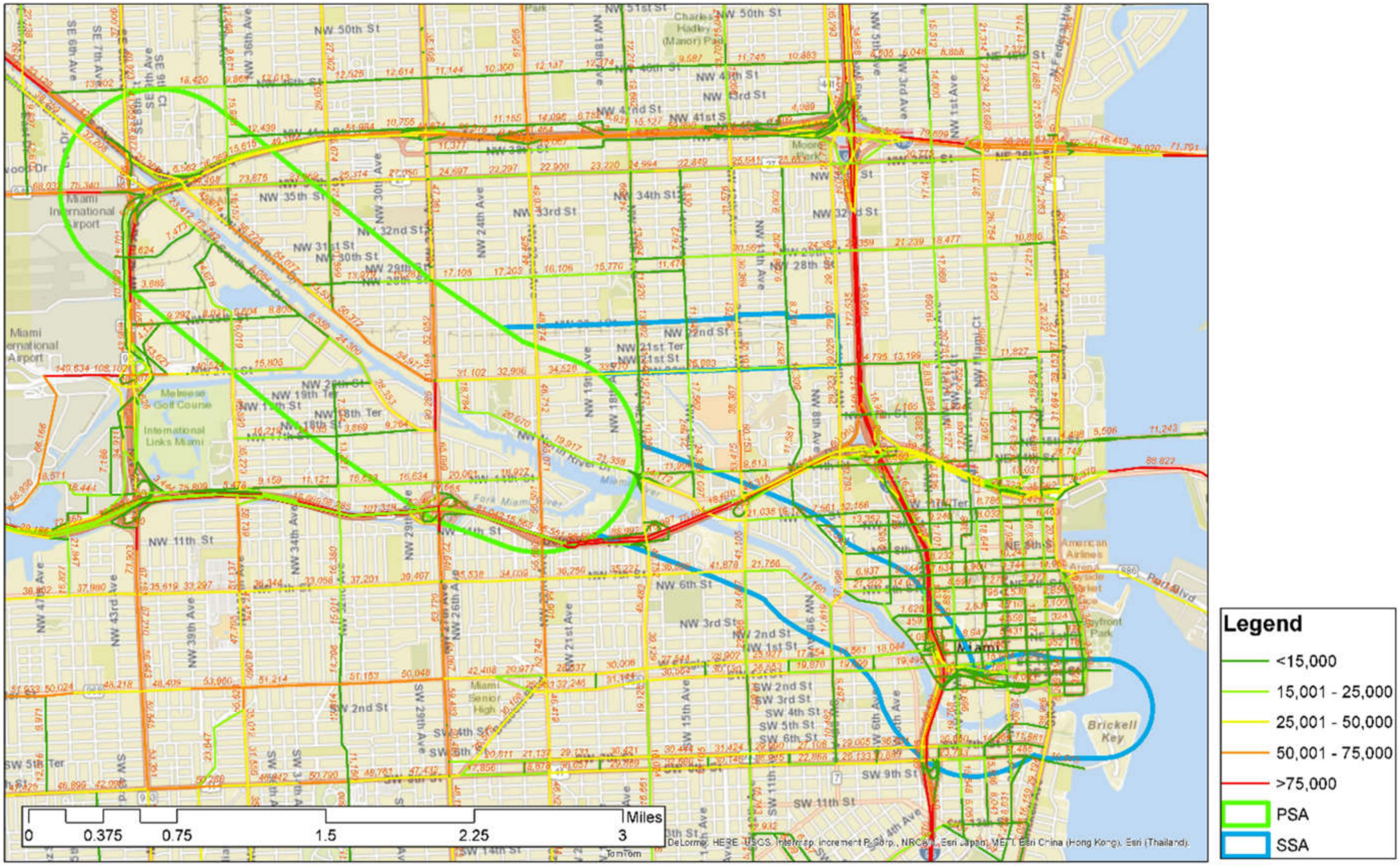


Figure 5-20: Scenario 4 – Moderate Growth 2040 Daily Trucks Bi-directional Volumes

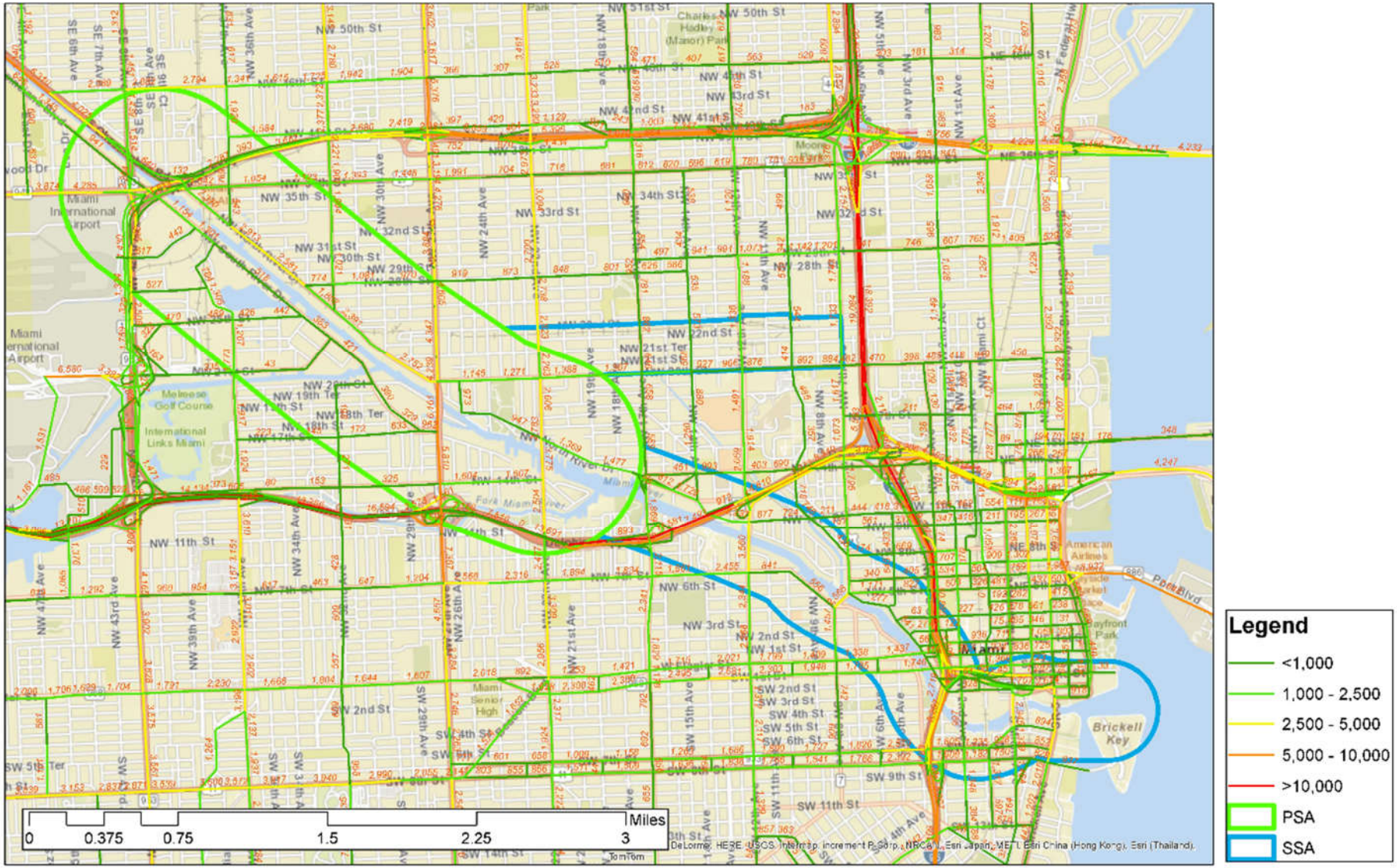


Figure 5-21: Scenario 4 – Moderate Growth Percent Trucks of 2040 Daily Volumes

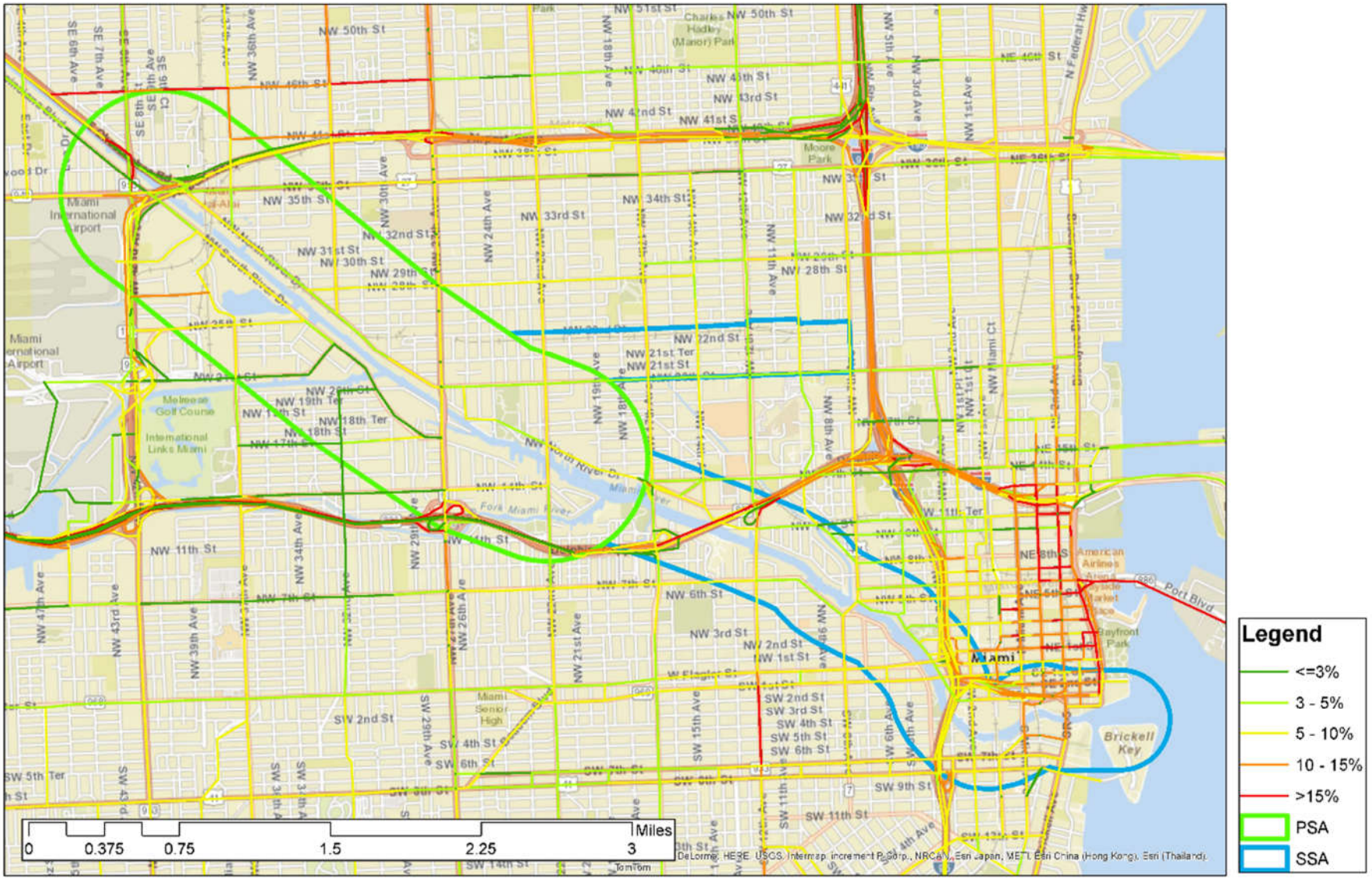


Figure 5-22: Scenario 4 – Moderate Growth 2040 PM Peak Period Bi-directional Volumes

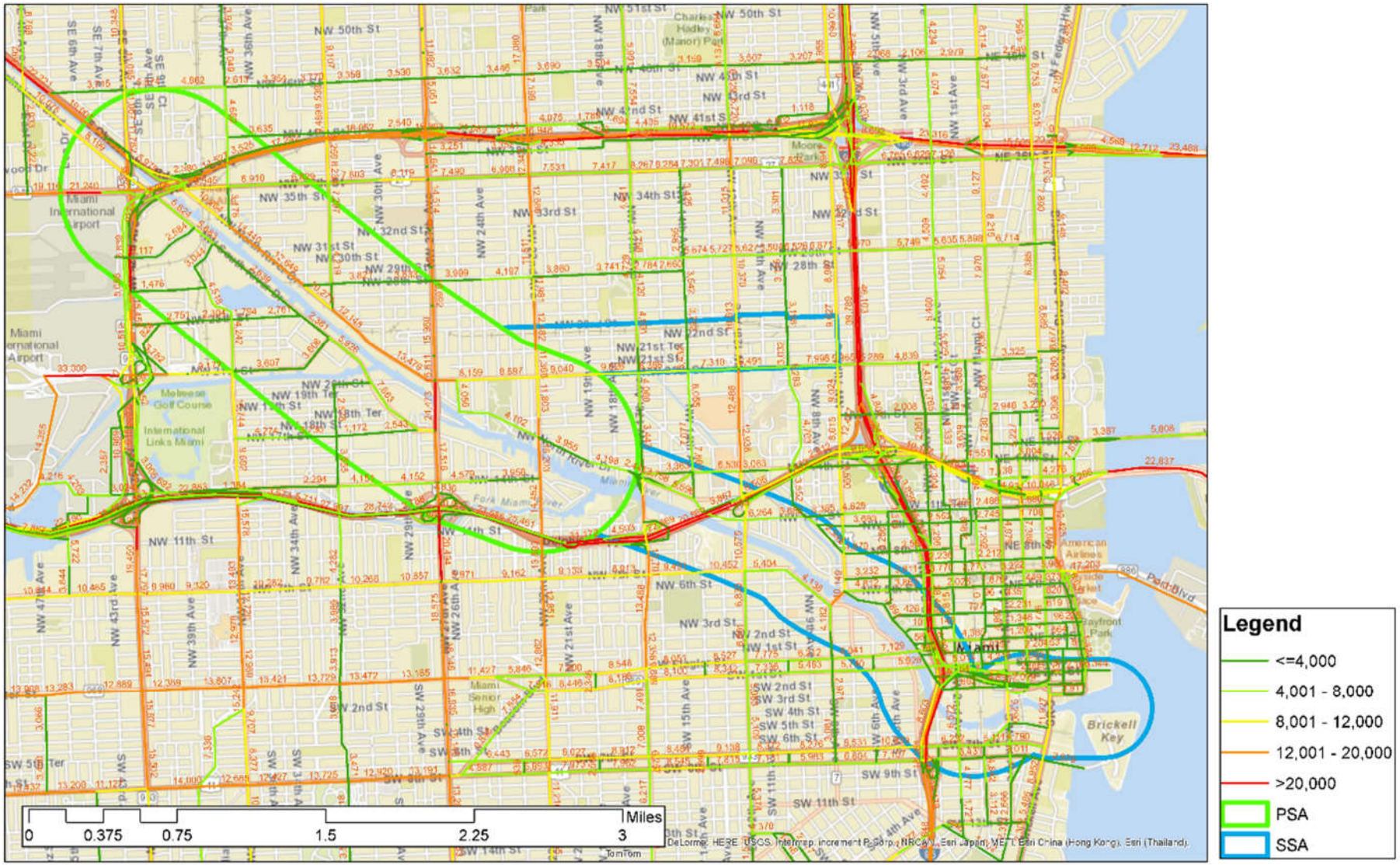


Figure 5-23: Scenario 4 – Moderate Growth 2040 PM Peak Period LOS

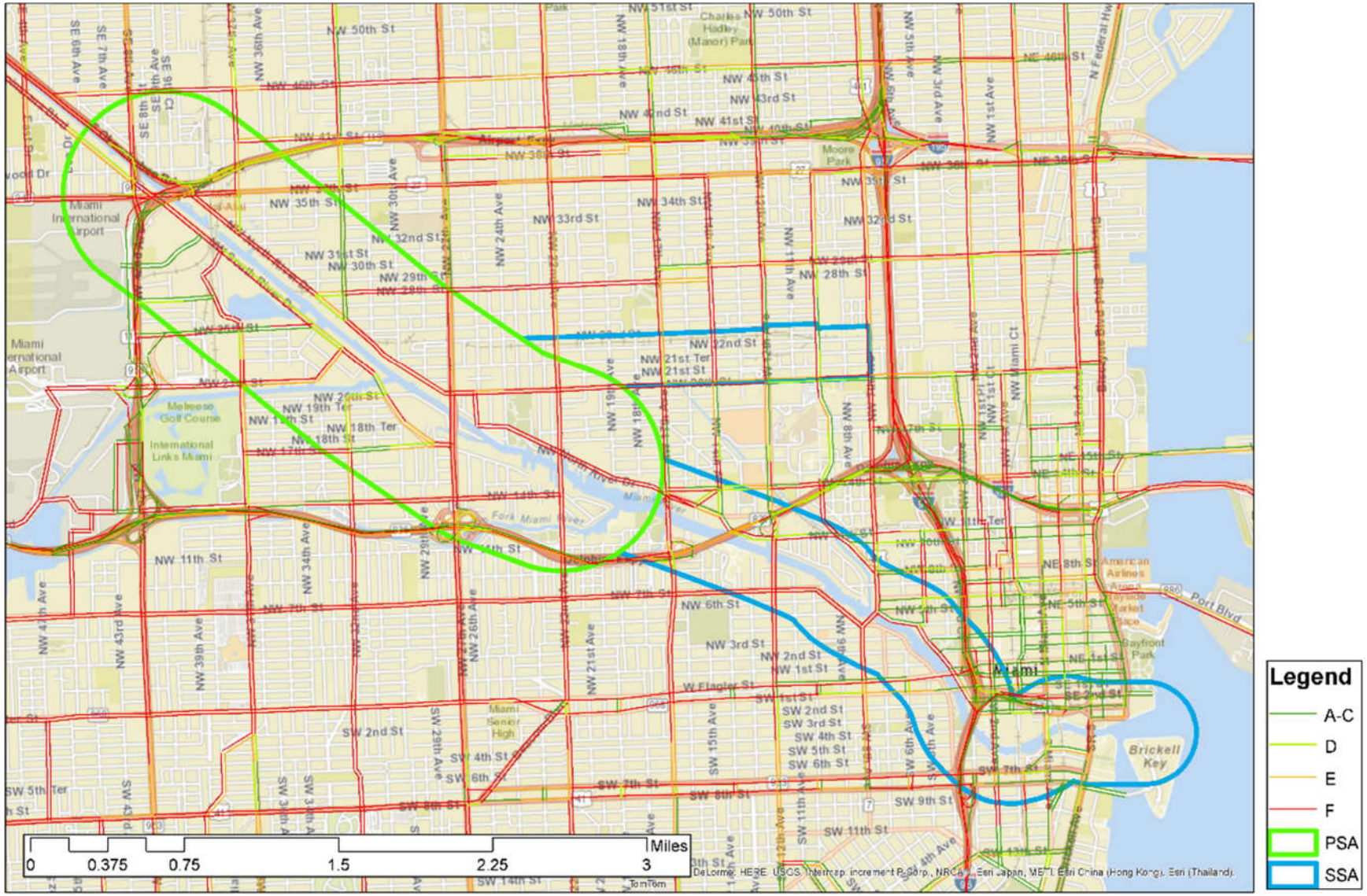


Figure 5-24: Scenario 4 – Moderate Growth 2040 PM Peak Period Trucks Bi-directional Volumes

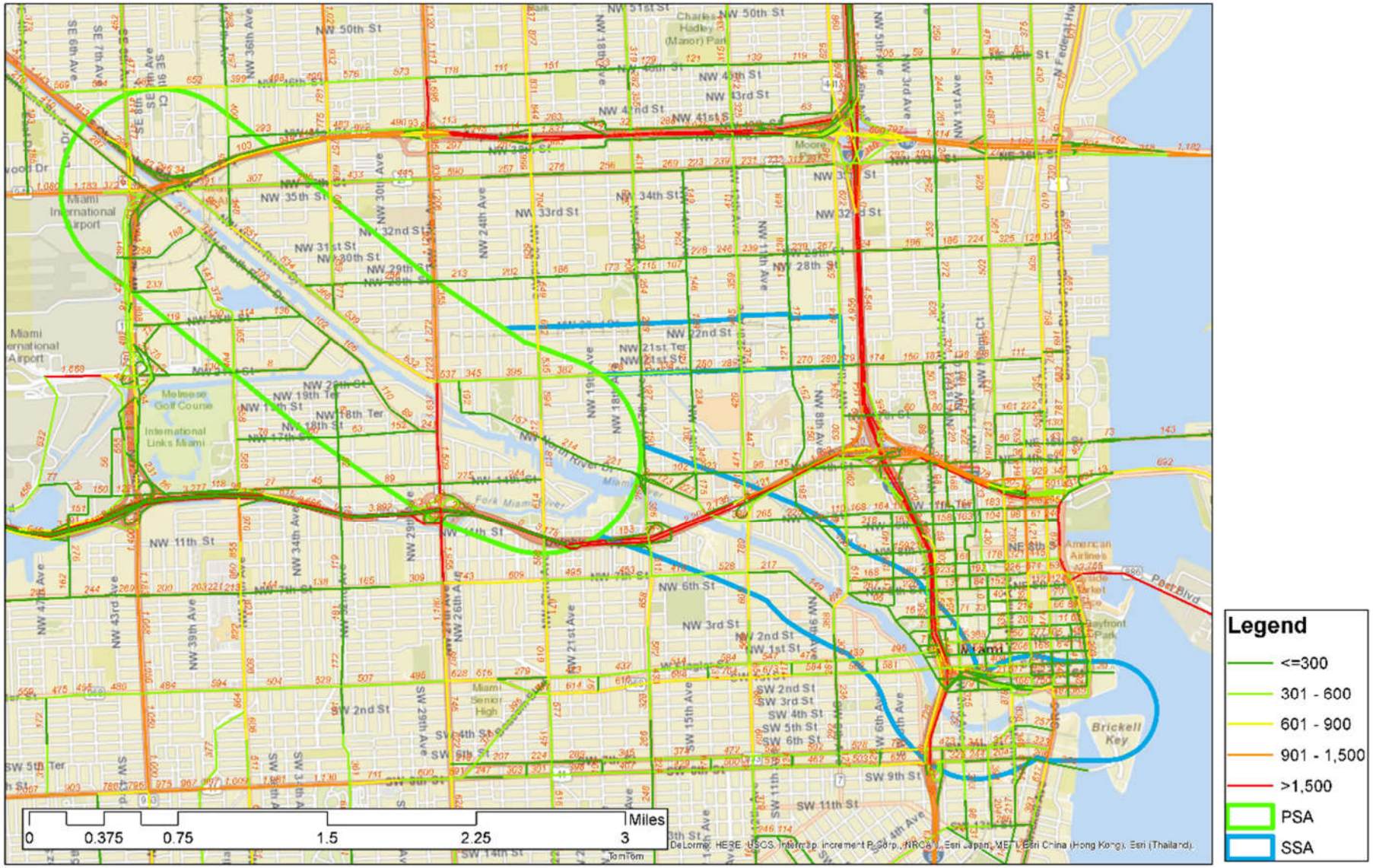


Figure 5-25: Scenario 5 – Aggressive Growth 2040 Daily Bi-directional Volumes

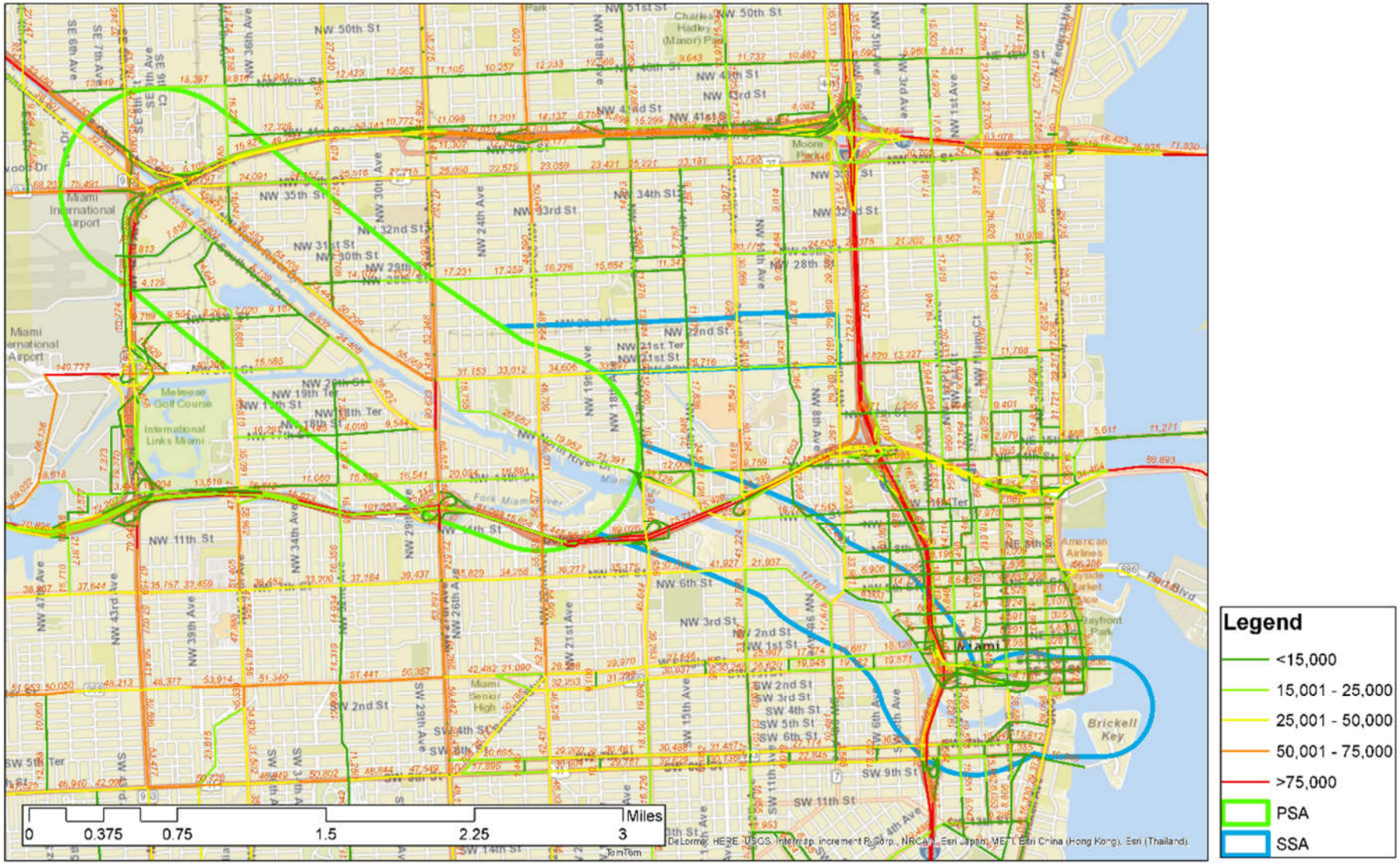


Figure 5-26: Scenario 5 – Aggressive Growth 2040 Daily Trucks Bi-directional Volumes

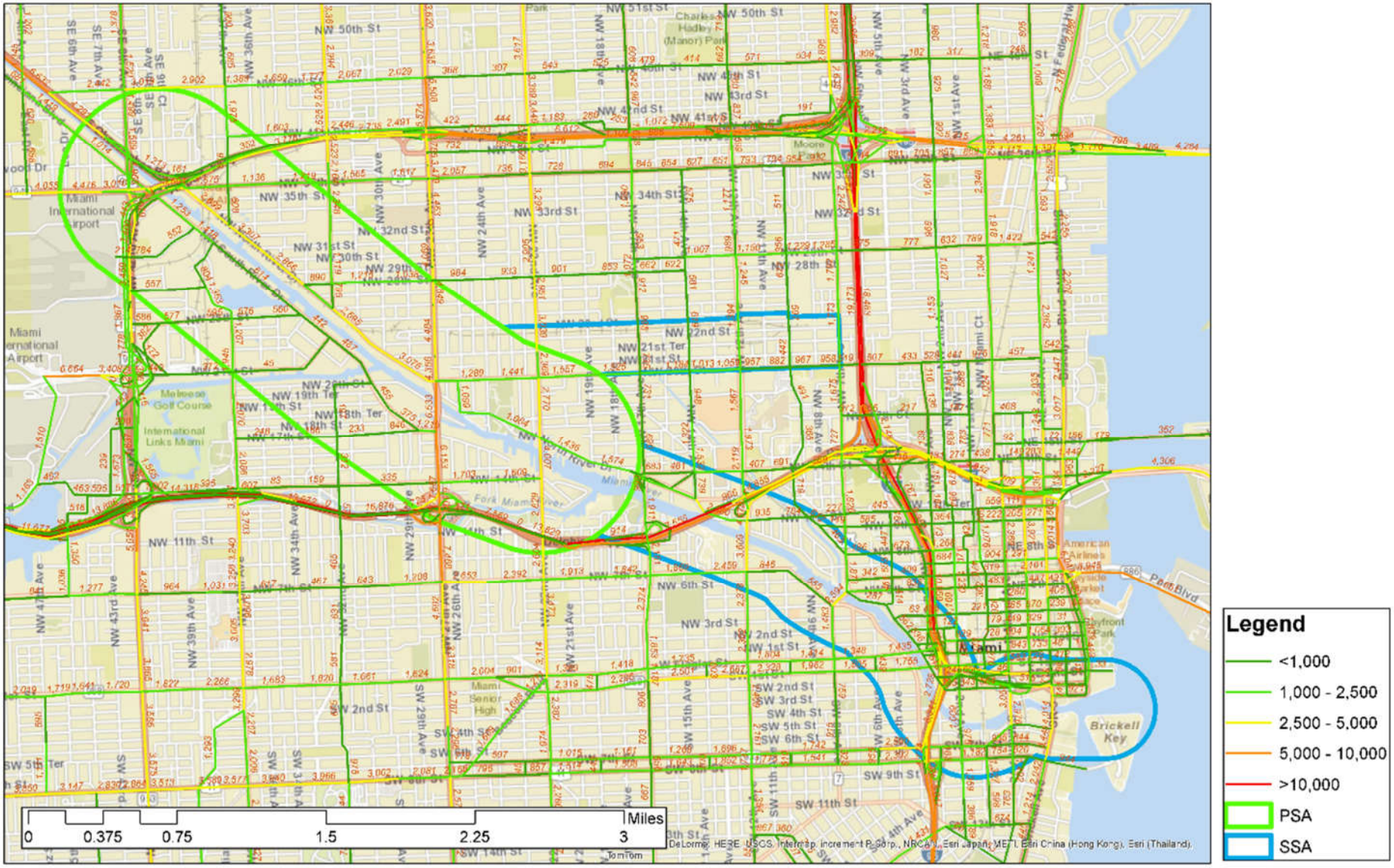


Figure 5-27: Scenario 5 – Aggressive Growth Percent Trucks of 2040 Daily Volumes

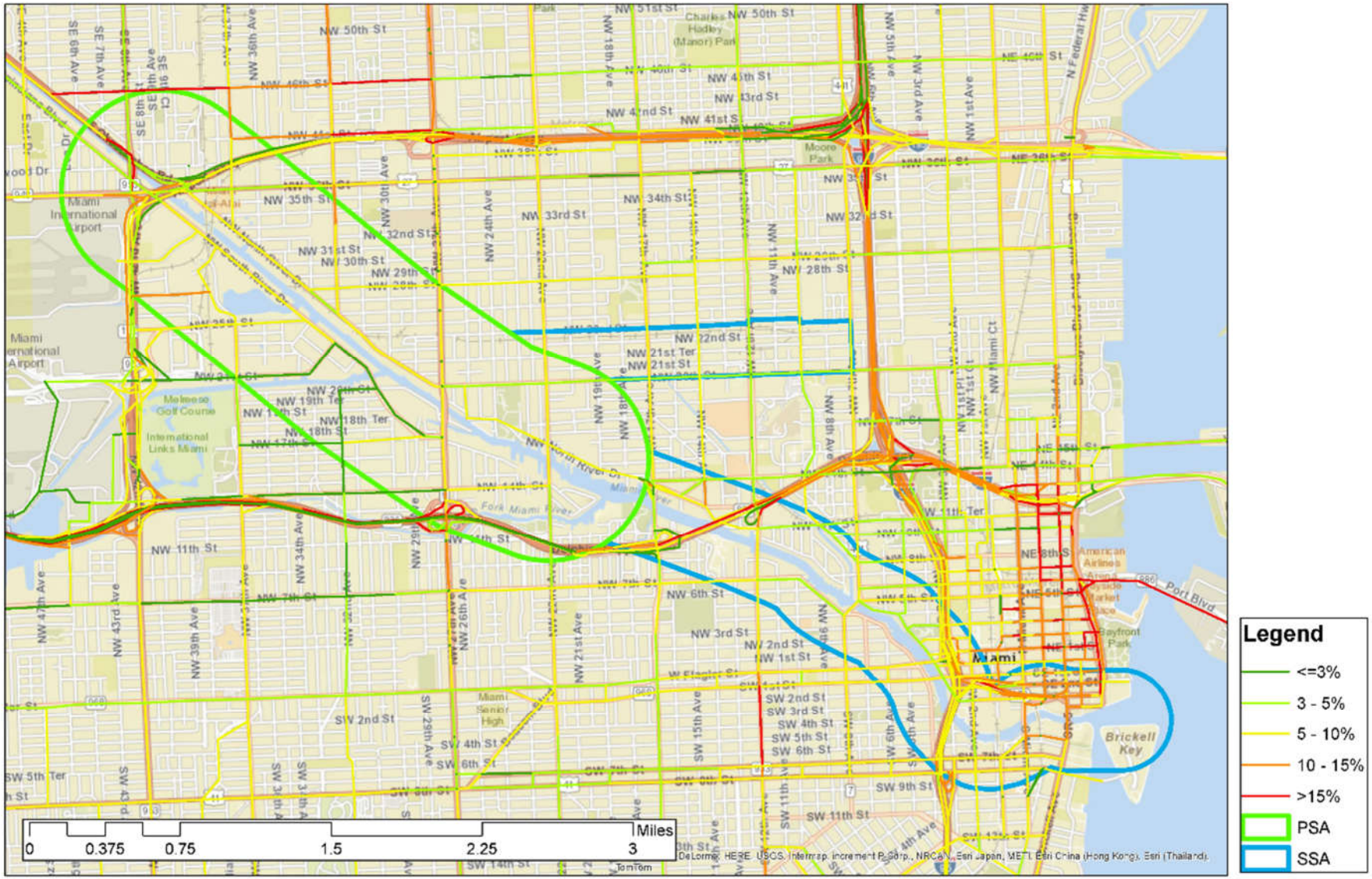


Figure 5-28: Scenario 5 – Aggressive Growth 2040 PM Peak Period Bi-directional Volumes

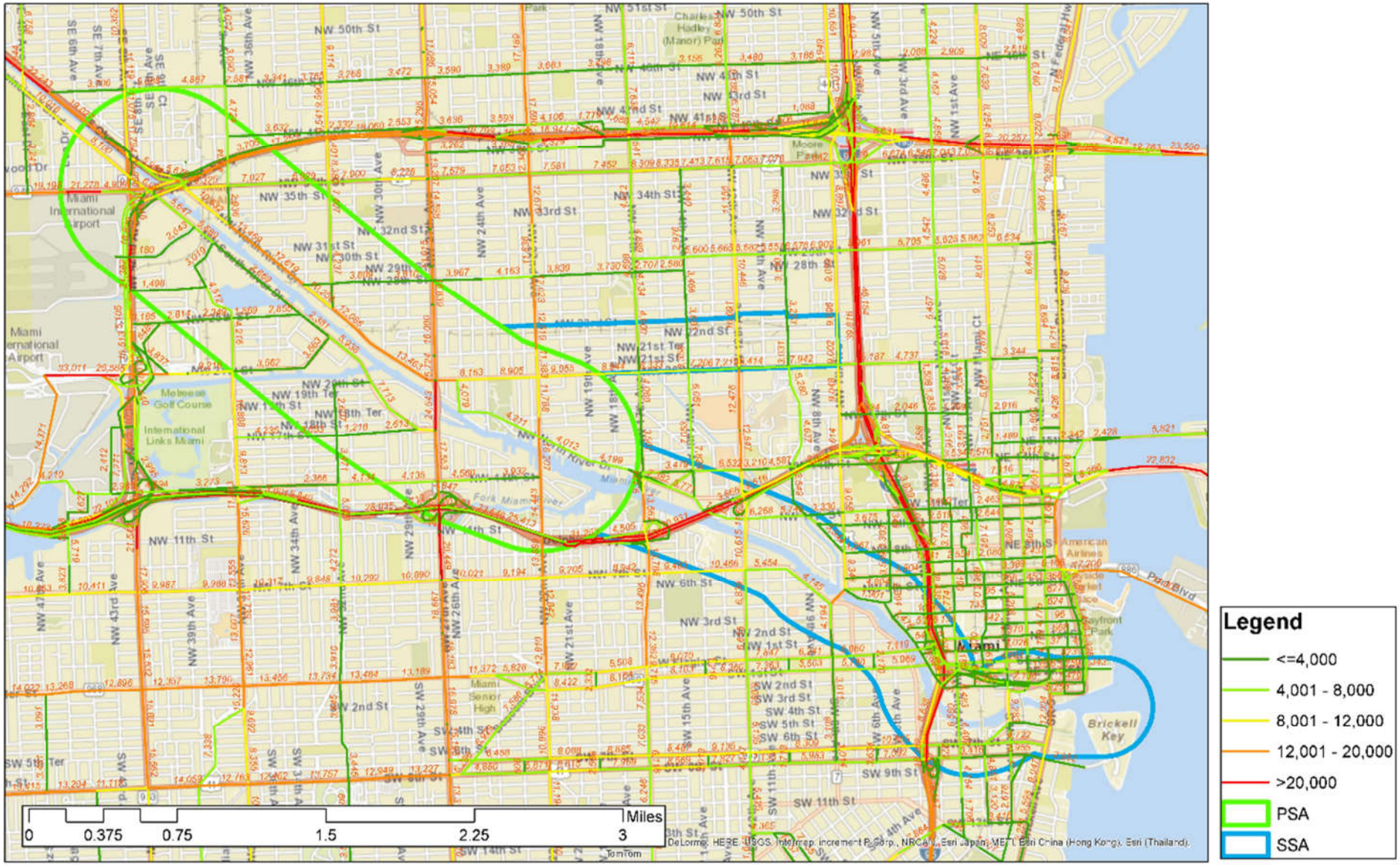


Figure 5-29: Scenario 5 – Aggressive Growth 2040 PM Peak Period LOS

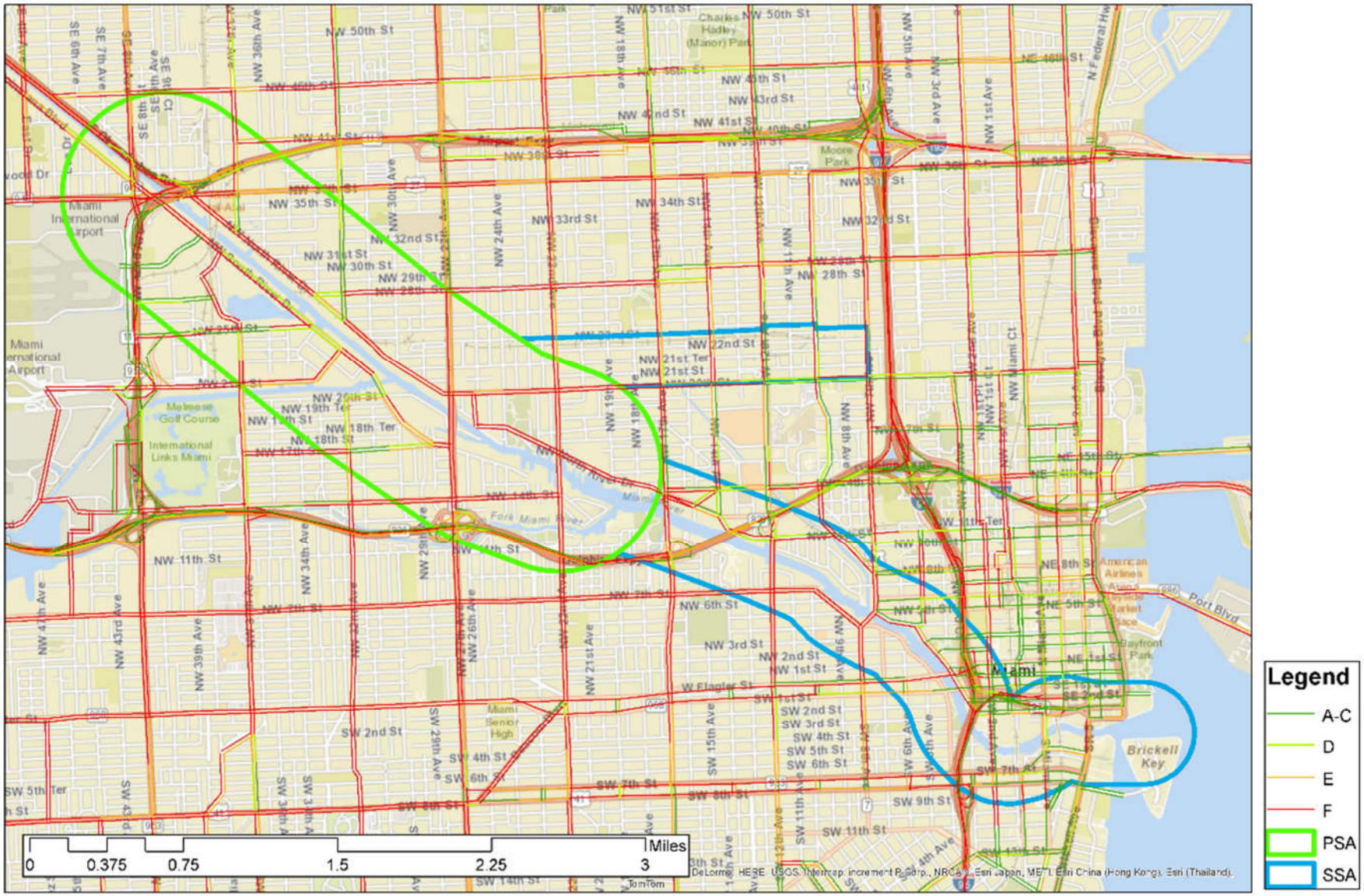


Figure 5-30: Scenario 5 – Aggressive Growth 2040 PM Peak Period Trucks Bi-directional Volumes

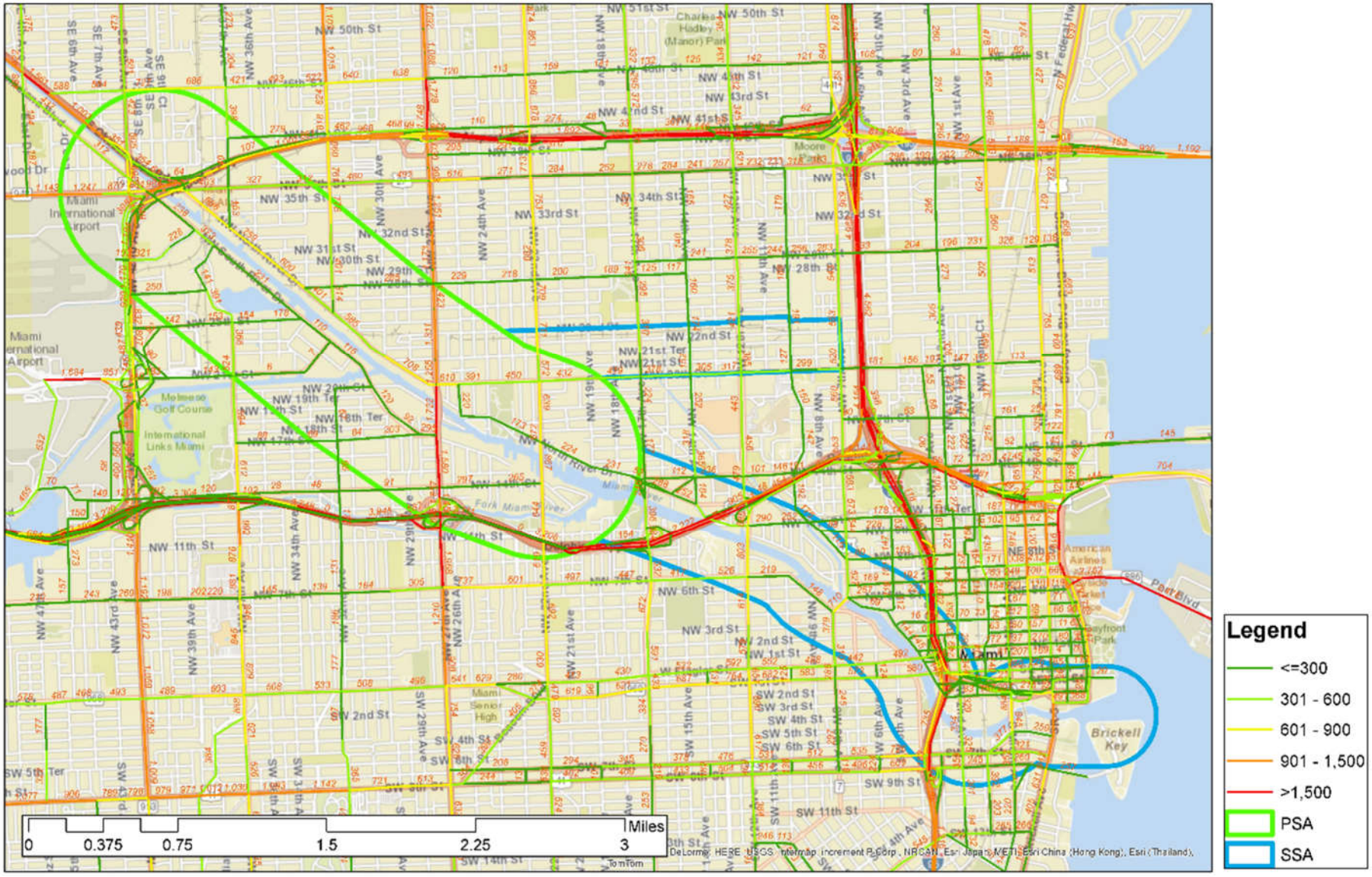


Figure 5-31: Case 1 – Aggressive Growth 2040 Daily Bi-directional Volumes

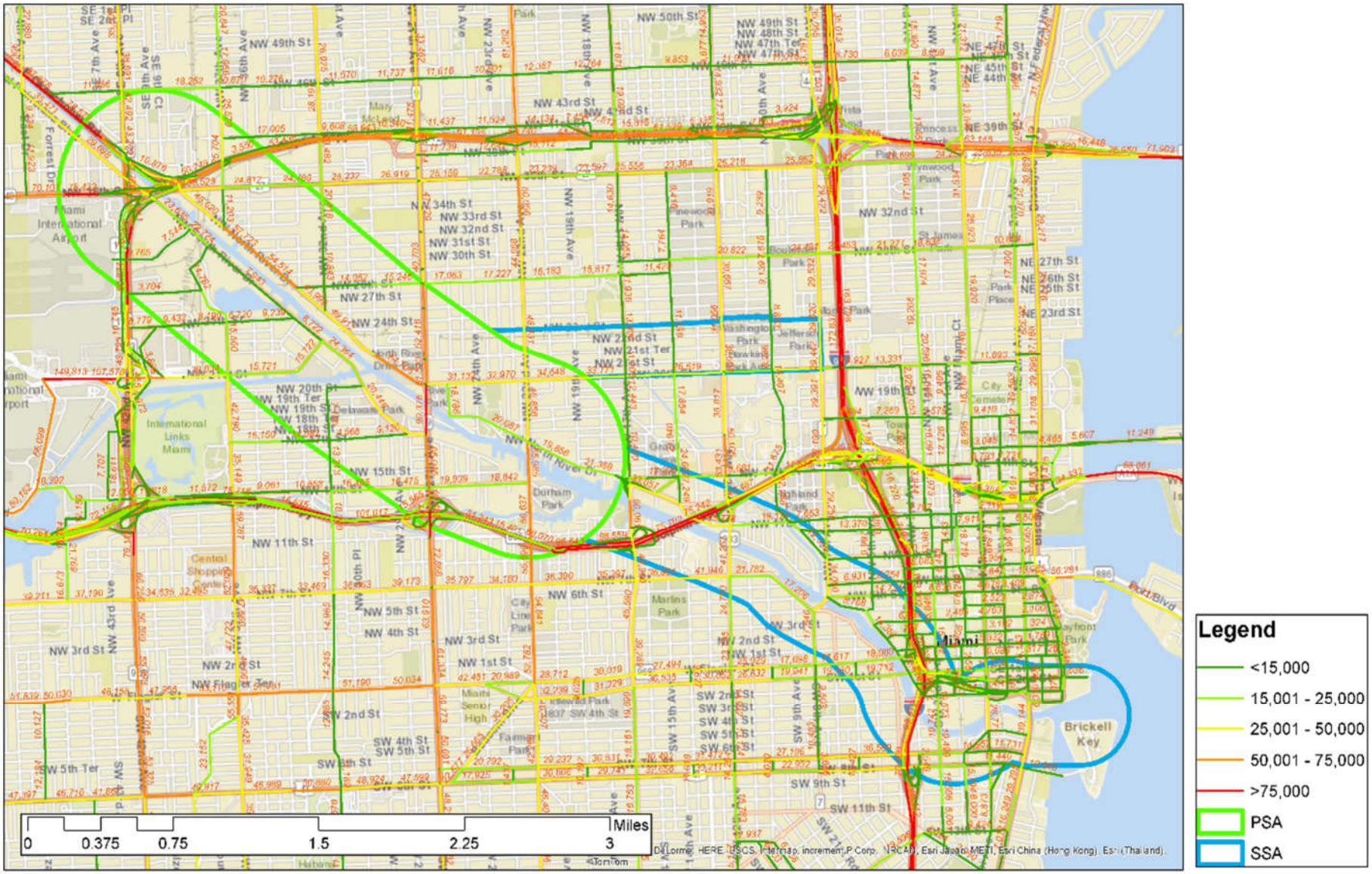


Figure 5-32: Case 1 – Aggressive Growth 2040 Daily Trucks Bi-directional Volumes

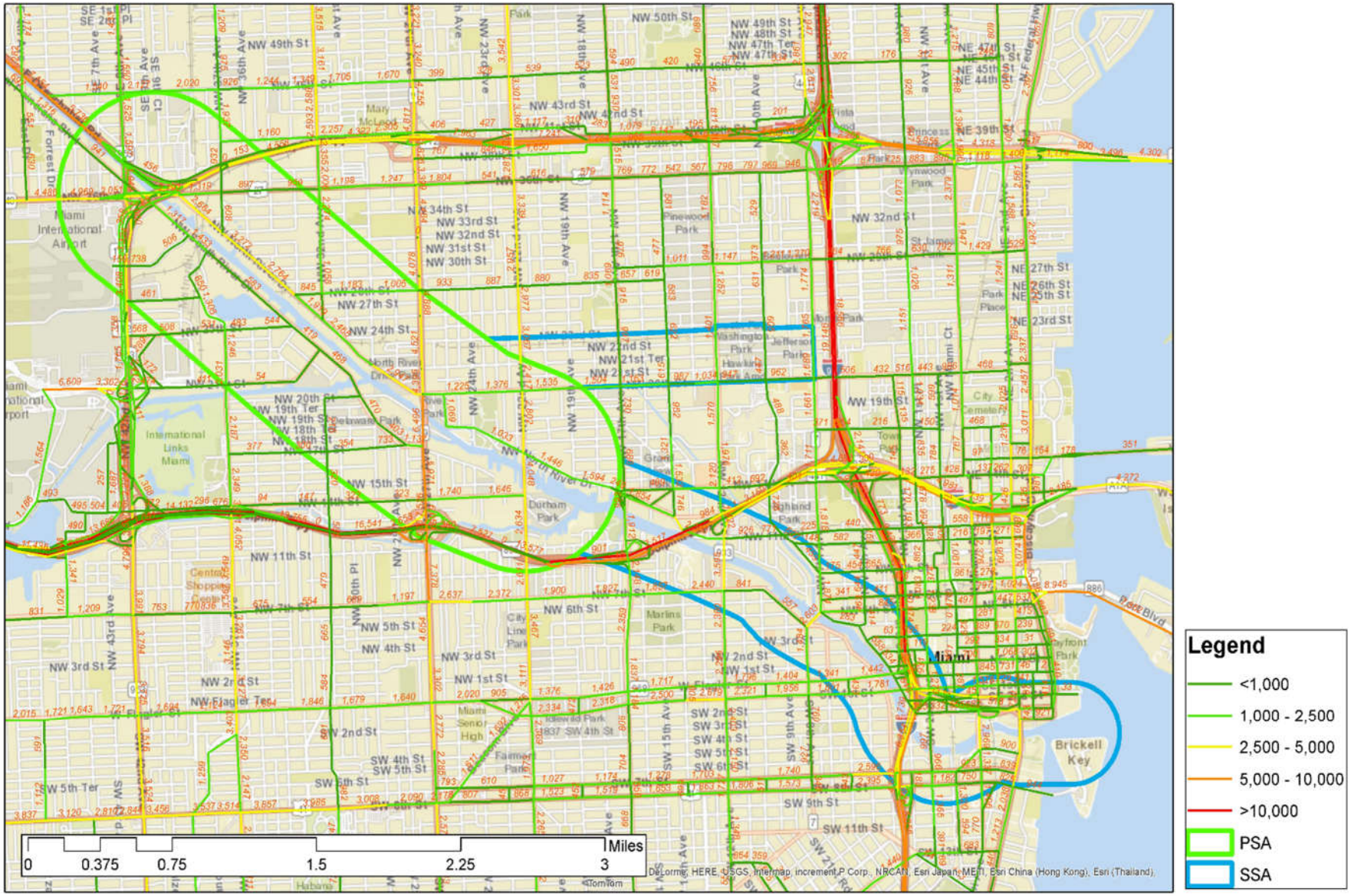


Figure 5-33: Case 1 – Aggressive Growth Percent Trucks of 2040 Daily Volumes

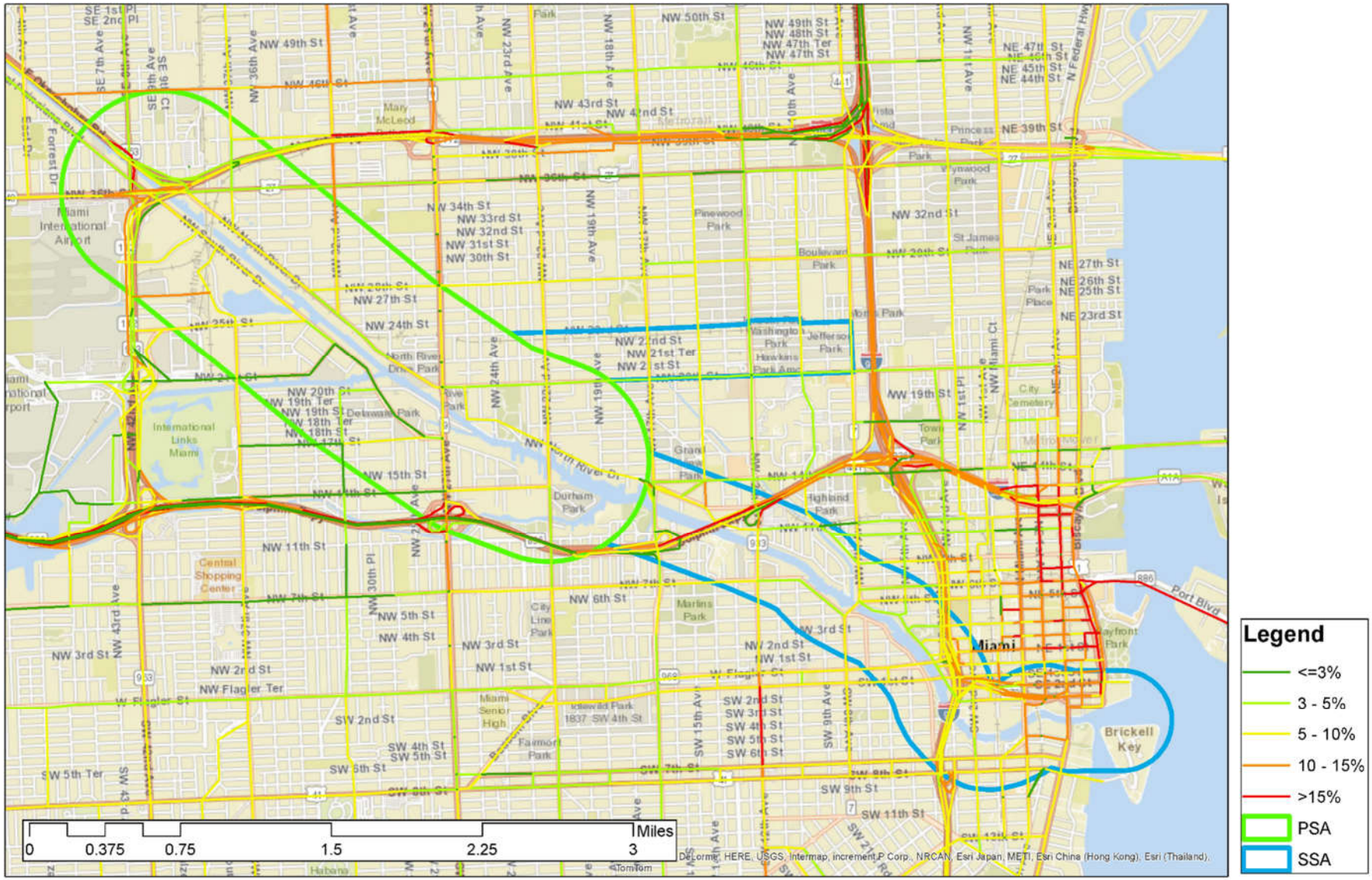


Figure 5-34: Case 1: – Aggressive Growth 2040 PM Peak Period Bi-directional Volumes

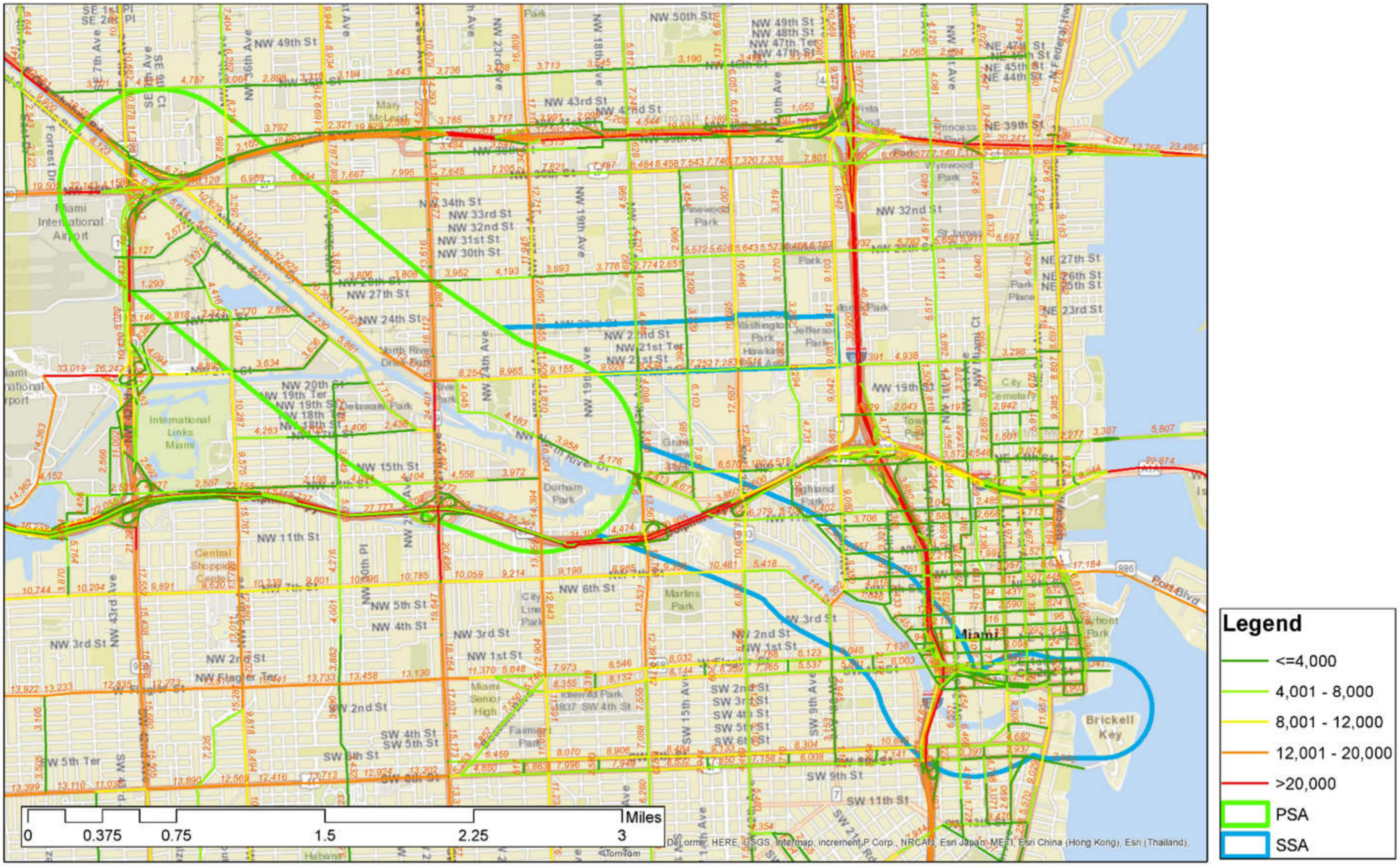


Figure 5-35: Case 1: – Aggressive Growth 2040 PM Peak Period LOS

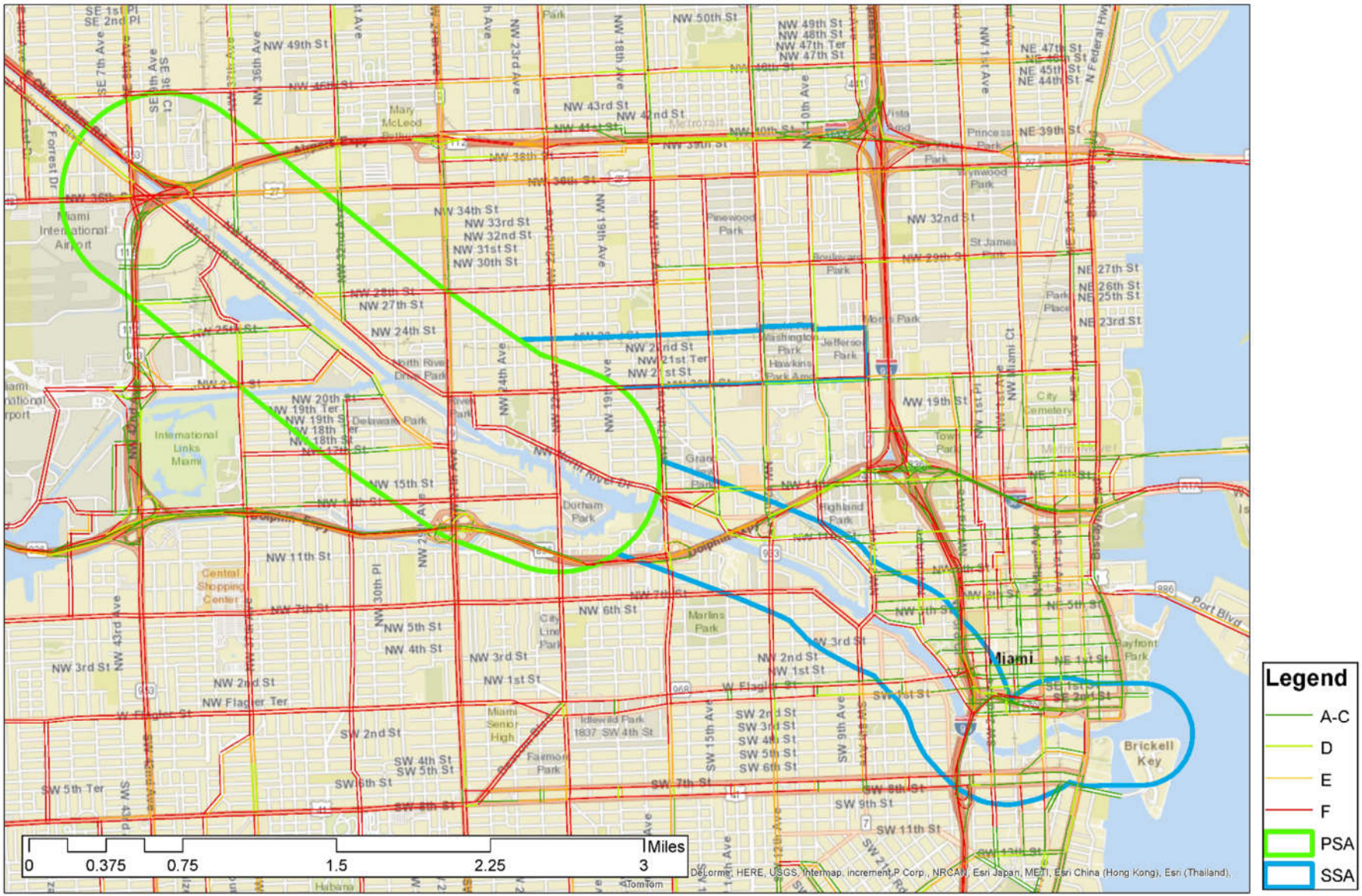


Figure 5-36: Case 1: – Aggressive Growth 2040 PM Peak Period Trucks Bi-directional Volumes

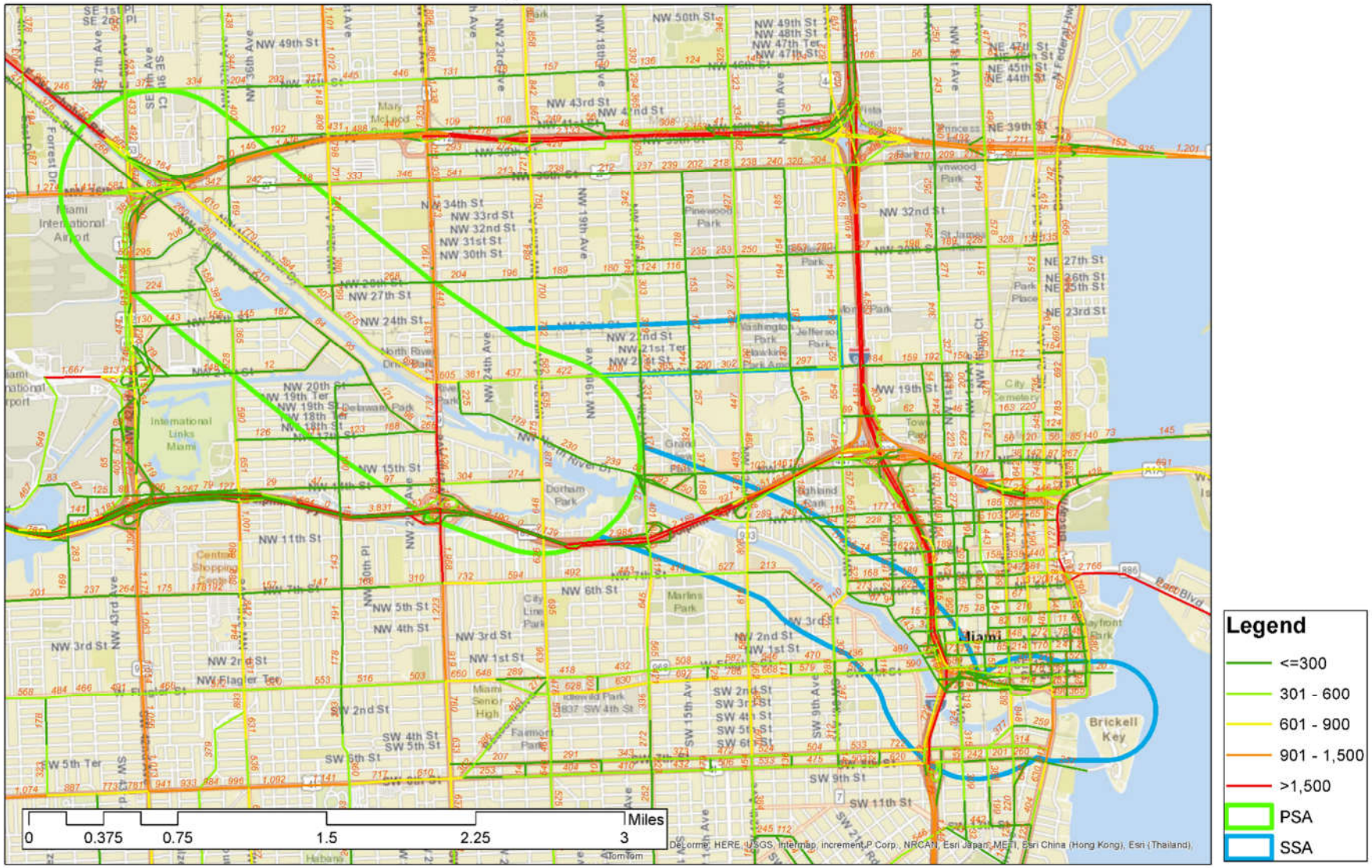


Figure 5-37: Case 2 – Aggressive Growth 2040 Daily Bi-directional Volumes

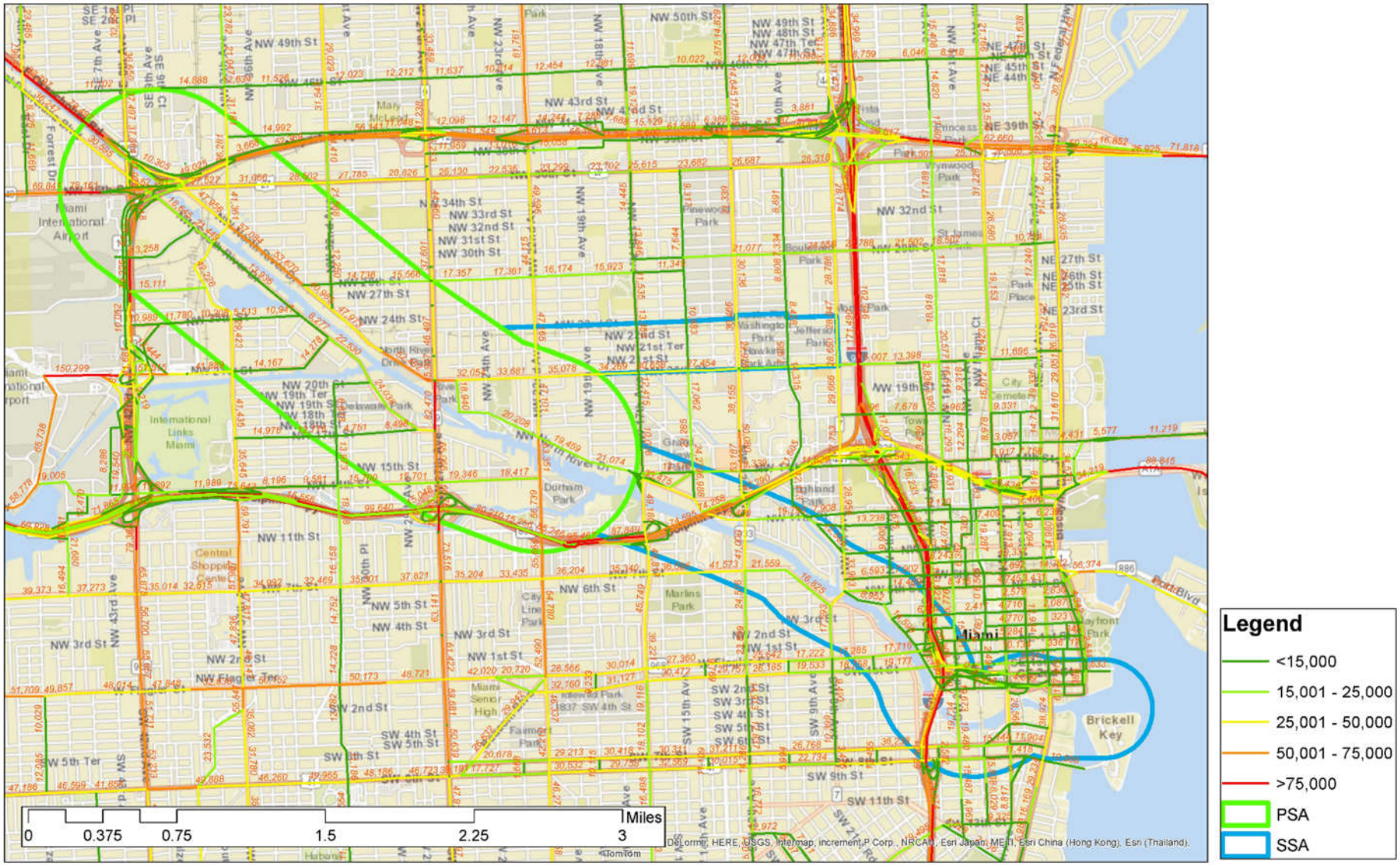


Figure 5-38: Case 2 – Aggressive Growth 2040 Daily Trucks Bi-directional Volumes

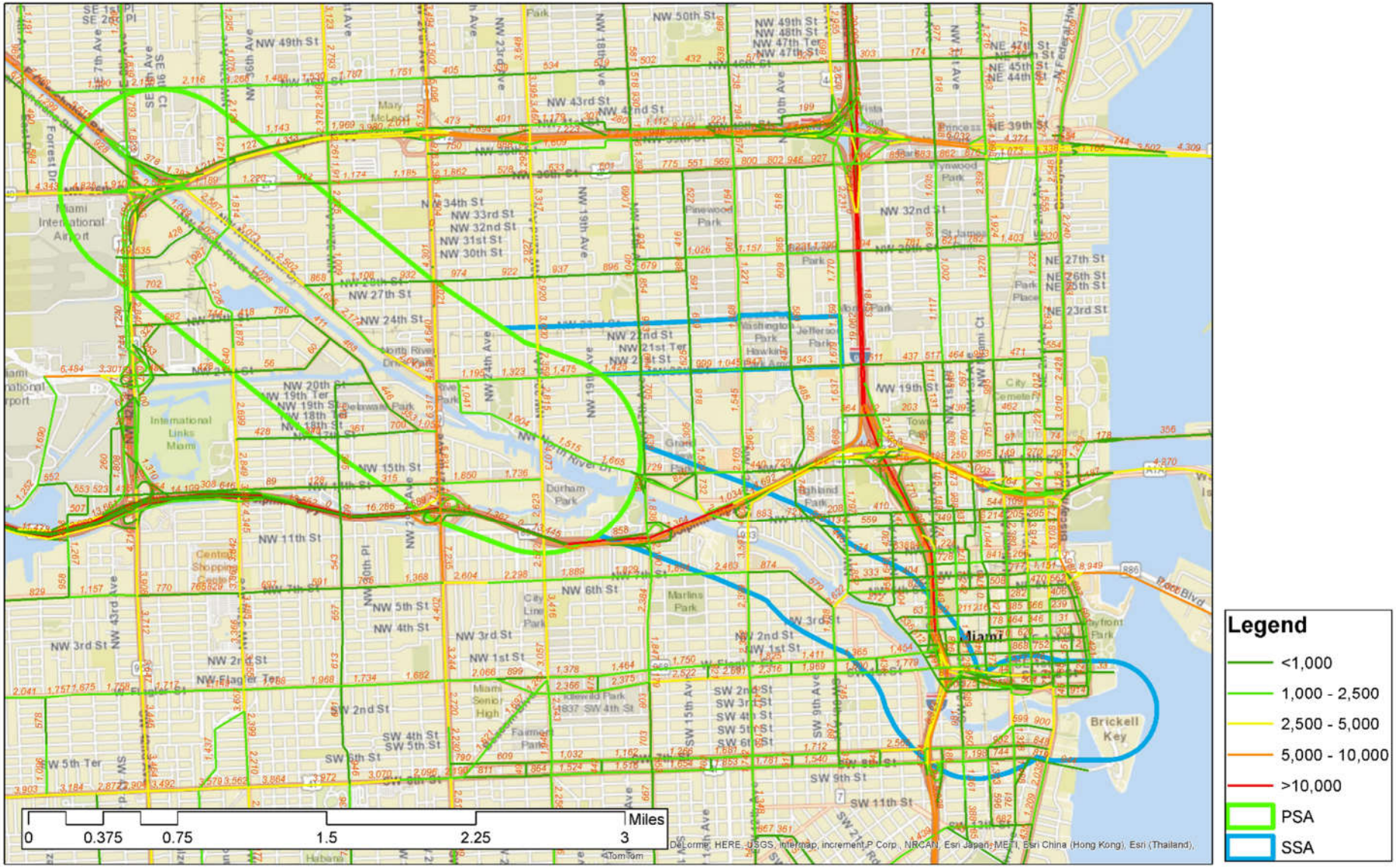


Figure 5-39: Case 2 – Aggressive Growth Percent Trucks of 2040 Daily Volumes

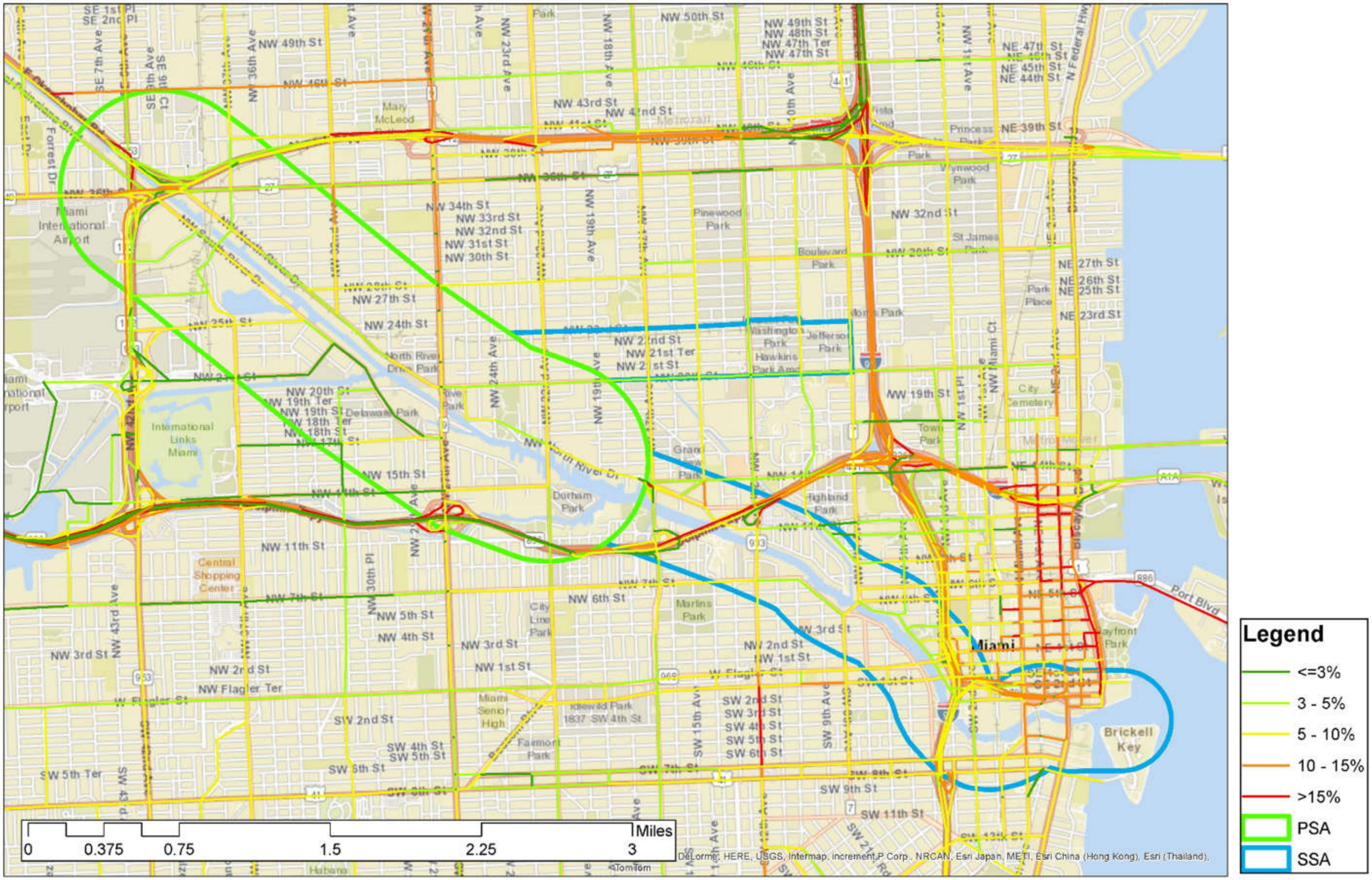


Figure 5-40: Case 2: – Aggressive Growth 2040 PM Peak Period Bi-directional Volumes

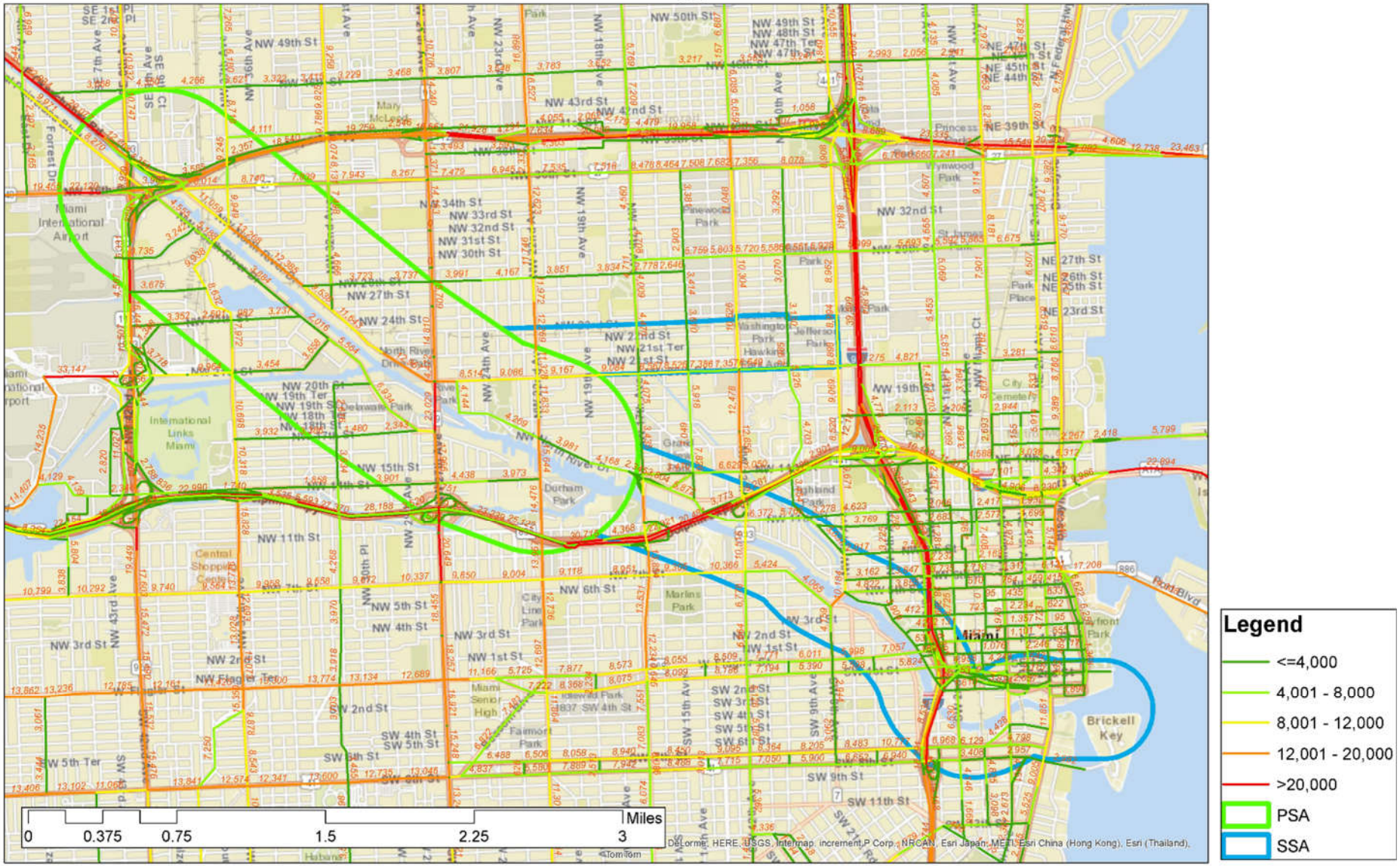


Figure 5-41: Case 2: – Aggressive Growth 2040 PM Peak Period LOS

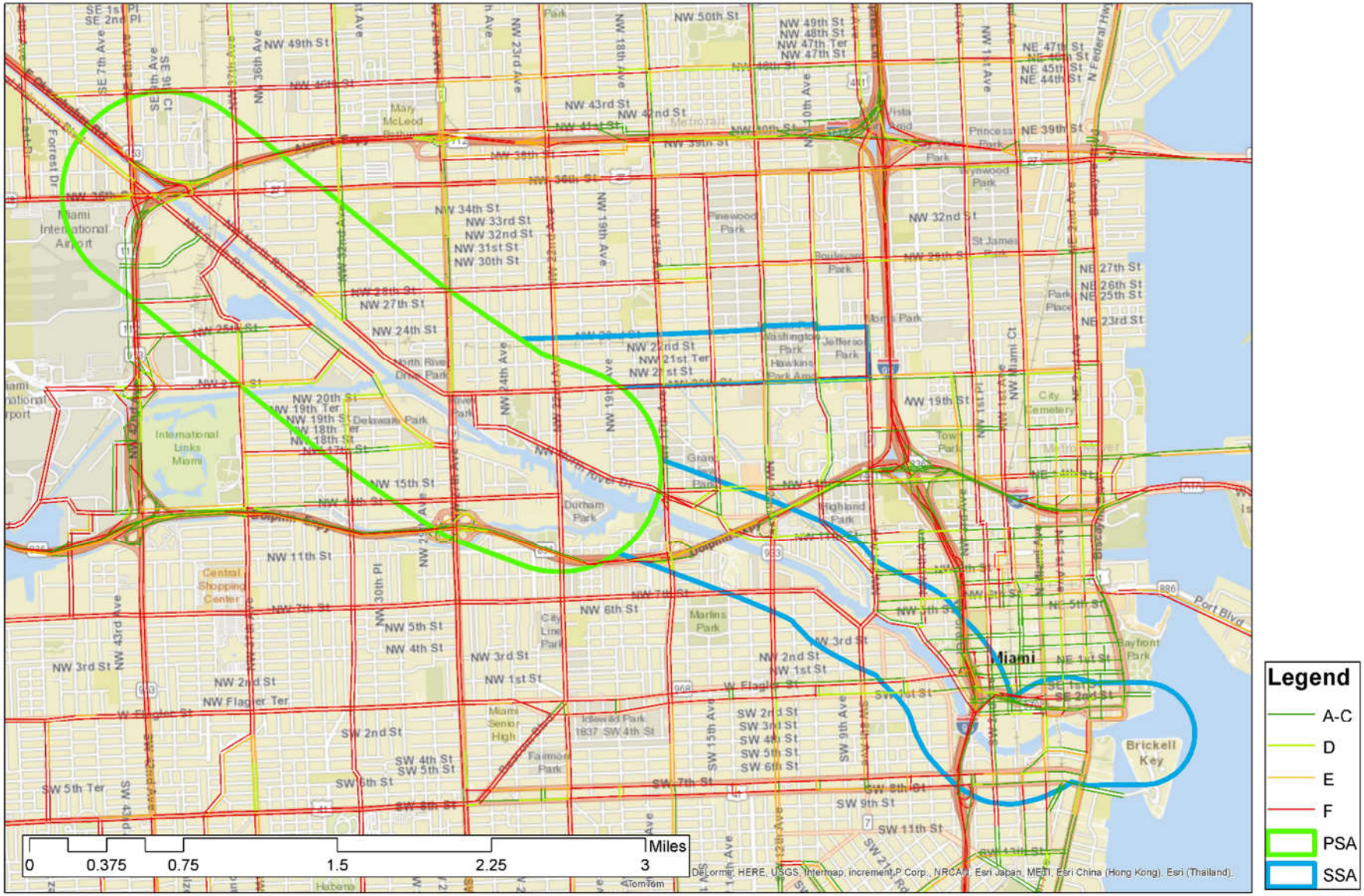
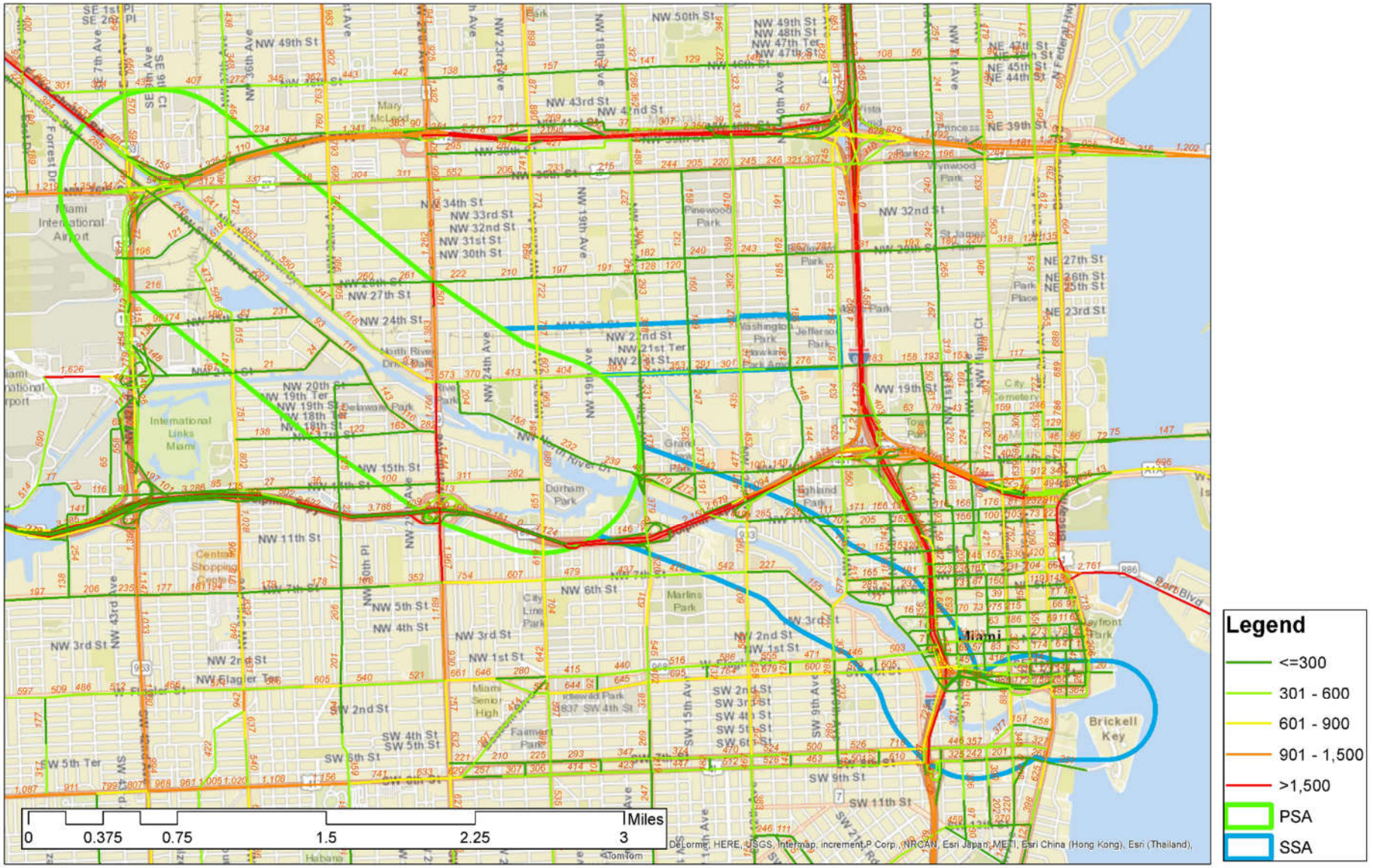


Figure 5-42: Case 2: – Aggressive Growth 2040 PM Peak Period Trucks Bi-directional Volumes



Level of Service Analysis

There are subtle and minor level of service (LOS) changes across the scenarios as compared to the Trend conditions. The No Build scenario includes short-term (5-year) improvements. The remaining scenarios include cost-feasible projects in the 2040 LRTP and incrementally higher truck volumes. Keeping in mind that TDM traffic assignments are dynamic, certain capacity projects can change routing patterns for some trips, triggering volume and possible LOS changes as LOS thresholds are crossed. **Table 5.5** below includes the most congested roadways during the PM peak period in forecast year 2040 within the primary study area, and summarizes changes in LOS across all scenarios.

Table 5.5: 2040 PM LOS on Congested Roadways in the Primary Study Area by Scenario

Roadway	Segment	Trend	Moderate Growth	Aggressive Growth	Case 1 Trend	Case 1 Aggressive Growth	Case 2 Trend	Case 2 Aggressive Growth
NW 14th St.	NW 32nd Ave. to NW 22nd Ave.	F	F	F	F	F	F	F
NW 21th St.	NW 37th Ave. to South River Dr.	E/ F	E/ F	E/ F	E/ F	E/ F	D/ E/ F	D/ E/ F
South River Dr.	NW 46th St. to NW 27th Ave.	C/ D/ E/ F	D/ E/ F	D/ E/ F	C/ D/ E/ F	C/ D/ E/ F	C/ D/ E/ F	C/ D/ E/ F
NW 27th Ave.	SR 836 to NW 28th St.	E/ F	E/ F	E/ F	E/ F	E/ F	D/ E/ F	D/E/F
NW 22nd Ave	SR 836 to NW 20th St.	F	F	F	F	F	F	F
North River Dr.	NW 46th St. to NW 17th Ave.	D/ F	D/ E/ F	D/ E/ F	E/ F	E/ F	D/ E/ F	D/F
NW 20th St.	NW 27th Ave. to NW 17th Ave.	E/ F	E/ F	E/ F	E/ F	E/ F	F	F
NW 28th St.	NW 32nd St. to NW 27th Ave.	F	F	F	F	F	F	F
NW 36th St.	North River Dr. to NW 32nd St.	E/ F	E/ F	E/ F	E/ F	E/ F	F	F
LeJuene Road/ SR-112	Interchange	C/E/F	C/E/F	C/E/F	D/E/F	D/E/F	C/ D/ E/ F	C/ D/ E/ F

Daily 2040 Volumes

As is the case for LOS results across the scenarios, there are generally subtle changes in daily 2040 link volumes. The only direct change in network demand across the analysis scenarios was an adjustment to the number of truck trips. However, due to the added truck trips and the vagaries of TDM network assignments, there can be slight shifts in general (non-truck) traffic routings.

Table 5.6 below provides a summary of changes in daily 2040 traffic and daily 2040 truck traffic for a representative set of major roadway links within the study area. The changes between Trend and Aggressive Growth scenarios for daily traffic range from +0.10% to +6.65%, with a weighted average of +1.11%. For daily truck traffic, the changes in traffic between the scenarios are all positive, ranging from +11.45% to +99.52%, with a weighted average of +24.47%.

Table 5.6: Daily 2040 Traffic Volumes and Truck Volumes

Location	Trend		Moderate Growth		Aggressive Growth		Percent Change: Trend and Aggressive Growth	
	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume
NW 27th Ave. S. of NW South River Drive	65,080	5,443	65,099	5,810	65,515	6,153	0.67%	13.04%
NW 14th St. E. of NW 27th Ave.	20,014	1,528	20,061	1,604	20,034	1,703	0.10%	11.45%
NW 25th St. W. of NW South River Drive	8,694	305	8,808	442	9,187	560	5.67%	83.61%
NW 28th St. East of NW 42nd Ave.	4,018	483	3,885	527	4,125	557	2.66%	15.32%
NW 31st St. W. of NW South River Drive	9,462	452	9,624	617	9,813	784	3.71%	73.45%
NW North River Drive SE. of NW 37th Ave.	55,825	2,517	56,225	2,913	56,463	3,307	1.14%	31.39%
NW South River Drive N. of 25th St.	7,914	394	8,064	518	8,159	614	3.10%	55.84%
NW 20th St. E. of NW 22nd Ave.	34,511	1,201	34,528	1,388	34,606	1,557	0.28%	29.64%
NW 17th St. W. of NW South River Drive	8,949	421	9,264	633	9,544	840	6.65%	99.52%
NW 22nd Ave. N. of NW North River Drive	46,482	2,434	46,712	2,606	46,709	2,770	0.49%	13.80%
NW North River Drive NW of NW 27th Ave.	54,766	2,433	54,977	2,752	55,059	3,076	0.54%	26.43%
Weighted Average	28,701	1,601	28,841	1,801	29,019	1,993	1.11%	24.47%

Table 5.7 below provides a summary of changes in 2040 traffic for the bridge locations over the Miami River within the study area. The changes between Trend and Aggressive Growth for daily traffic ranges from +0.10% to +3.10%, with a weighted average of +0.40%. For daily truck traffic, the changes in traffic between the scenarios are all positive as would be expected, ranging from +0.01% to +55.84%, with a weighted average of +3.83%. The percent change between the Trend and Moderate Growth for daily traffic ranges from +0.01% to +1.90%, with a weighted average of +.19%. It is seen that for daily truck traffic, the changes in traffic between the scenarios are all positive as would be expected, ranging from +.14% to +31.47%, with a weighted average of +1.94%.

Table 5.7: Daily 2040 Traffic and Truck Volumes for Bridges Comparison with Trend Scenario

Bridge Location	2040 Trend		2040 Moderate Growth		2040 Aggressive Growth		Percent Change: Trend and Moderate		Percent Change: Trend and Aggressive	
	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume
Brickell Ave.	38,883	3,948	38,986	3,984	39,098	4,014	0.26%	0.91%	0.55%	1.67%
South Miami Ave.	28,686	2,925	28,804	2,945	28,880	2,976	0.41%	0.68%	0.68%	1.74%
SW 2nd Ave.	19,720	979	19,768	997	19,829	1,009	0.24%	1.84%	0.55%	3.06%
SW 1st St.	19,453	1,742	19,496	1,746	19,571	1,755	0.22%	0.23%	0.61%	0.75%
West Flagler St.	18,026	1,435	18,044	1,437	18,128	1,435	0.10%	0.14%	0.57%	0.01%
NW 5th St.	47,238	2,542	47,326	2,566	47,430	2,594	0.19%	0.94%	0.41%	2.05%
NW 12th Ave.	41,026	3,510	41,105	3,560	41,224	3,609	0.19%	1.42%	0.48%	2.82%
NW 17th Ave.	49,812	1,816	49,784	1,869	49,946	1,911	0.01%	2.92%	0.27%	5.23%
NW 22nd Ave.	65,882	3,568	65,871	3,775	66,031	4,007	0.01%	5.80%	0.23%	12.30%
NW 27th Ave.	89,941	5,767	90,285	6,161	90,633	6,533	0.38%	6.83%	0.77%	13.28%
NW South River Dr. (Palmer Lake)	7,914	394	8,064	518	8,159	614	1.90%	31.47%	3.10%	55.84%
NW South River Dr. (Tamiami Canal)	24,217	349	24,300	421	24,408	487	0.34%	20.63%	0.79%	39.54%
I-95	193,478	15,682	193,645	15,779	193,678	15,843	0.09%	0.62%	0.10%	1.03%
SR 836	150,722	18,940	151,021	19,074	151,135	19,247	0.20%	0.71%	0.27%	1.62%
Weighted Average	56,786	4,543	56,893	4,631	57,011	4,717	0.19%	1.94%	0.40%	3.83%

Table 5.8 on the following page provides a summary of changes in daily 2010 and 2040 traffic for the bridge locations over the Miami River within the study area. The changes between Base and Trend for daily traffic ranges from -11.11% to +174.01%, with a weighted average of +33.55%. It is seen that for daily truck traffic, the changes in traffic between the scenarios are not all positive, ranging from -26.83% to +301.35%, with a weighted average of +75.45%. The percent change between the Base and Moderate Growth for daily traffic ranges from -10.22% to +175.14%, with a weighted average of +33.80%. It is seen that for daily truck traffic, the changes in traffic between the scenarios are not all positive, ranging from -11.74% to +226.14%, with a weighted average of +78.86%. The percent change between the Base and Aggressive Growth for daily traffic ranges from -9.80% to +175.86%, with a weighted average of +34.08%. It is seen that for daily truck traffic, the changes in traffic between the scenarios are not all positive, ranging from -1.55% to +350.73%, with a weighted average of +82.17%.

Table 5.8: Daily Traffic and Truck Volume for Bridges Comparison with Base Scenario

Bridge Location	2010 Base		2040 Trend		2040 Moderate Growth		2040 Aggressive Growth		Percent Change: Base and Trend		Percent Change: Base and Moderate		Percent Change: Base and Aggressive	
	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume	Daily Volume	Truck Volume
Brickell Ave.	37,079	1,909	38,883	3,948	38,986	3,984	39,098	4,014	4.87%	106.81%	5.14%	108.70%	5.45%	110.27%
South Miami Ave.	10,469	903	28,686	2,925	28,804	2,945	28,880	2,976	174.01%	223.92%	175.14%	226.14%	175.86%	229.57%
SW 2nd Ave.	11,308	402	19,720	979	19,768	997	19,829	1,009	74.39%	143.53%	74.81%	148.01%	75.35%	151.00%
SW 1st St.	15,770	632	19,453	1,742	19,496	1,746	19,571	1,755	23.35%	175.63%	23.63%	176.27%	24.10%	177.69%
West Flagler St.	20,098	1,359	18,026	1,435	18,044	1,437	18,128	1,435	-10.31%	5.59%	-10.22%	5.74%	-9.80%	5.59%
NW 5th St.	36,255	1,724	47,238	2,542	47,326	2,566	47,430	2,594	30.29%	47.45%	30.54%	48.84%	30.82%	50.46%
NW 12th Ave.	38,093	2,120	41,026	3,510	41,105	3,560	41,224	3,609	7.70%	65.57%	7.91%	67.92%	8.22%	70.24%
NW 17th Ave.	37,043	1,941	49,812	1,816	49,784	1,869	49,946	1,911	34.47%	-6.44%	34.40%	-3.71%	34.83%	-1.55%
NW 22nd Ave.	41,212	889	65,882	3,568	65,871	3,775	66,031	4,007	59.86%	301.35%	59.83%	324.63%	60.22%	350.73%
NW 27th Ave.	86,789	3,949	89,941	5,767	90,285	6,161	90,633	6,533	3.63%	46.04%	4.03%	56.01%	4.43%	65.43%
NW South River Dr. (Palmer Lake)	8,903	471	7,914	394	8,064	518	8,159	614	-11.11%	-16.35%	-9.42%	9.98%	-8.36%	30.36%
NW South River Dr. (Tamiami Canal)	23,282	477	24,217	349	24,300	421	24,408	487	4.02%	-26.83%	4.37%	-11.74%	4.84%	2.10%
I-95	166,453	9,508	193,478	15,682	193,645	15,779	193,678	15,843	16.24%	64.93%	16.34%	65.95%	16.36%	66.63%
SR 836	62,522	9,964	150,722	18,940	151,021	19,074	151,135	19,247	141.07%	90.08%	141.55%	91.43%	141.73%	93.17%
Weighted Average	42,520	2,589	56,786	4,543	56,893	4,631	57,011	4,717	33.55%	75.45%	33.80%	78.86%	34.08%	82.17%

5.2.3 Project Evaluation

The list of proposed improvements is categorized by type of project: roadway, transit/ bicycle/ pedestrian, marine and intermodal, and policy. Projects listed are within the working river of the Miami River study area, and are intended to improve safety, preservation, environment, economy, and mobility.

A preliminary list of transportation improvements was developed using a combination of sources from: previous studies, adopted plans, field work analysis, and stakeholder meetings. The project list was presented to members of the Miami-Dade Transportation Planning Organization Freight Technical Advisory Committee on November 8, 2017. Also, the list was presented to the Miami River Commission Economic Development and Commerce Subcommittee and the Miami River Marine Group the following week. Input from the meetings was reflected in the list of projects.

The next step was to score the projects based on the evaluation criteria that correlate with FDOT goals and specific performance measures identified for the study. The overall scores are a function of the weights associated with each measure and individual project scores depending on the project relevance to each goal. The performance measure with the highest weights are enhance safety, support state of good repair, and relative investment cost. These measures were weighted at three times the individual project score while the other measures were weighted at twice the individual project score.

Each alternative was evaluated against each of the criteria elements and based on that assessment received a rating or score of one (“1”) through four (“4”), with four (“4”) being the most important and zero (“0”) being the least important. A weight was then applied to each score to give a relative value of importance of the rating. Symbols were used to visual communication qualitative information:

- ● The alternative received a score of 4. The alternative may produce positive impact if implemented in the study corridor and meets a majority of the goals and objectives of the project.
- ◕ The alternative received a score of 3. The alternatives may produce a positive impact in the study corridor and nearly meets all of the goals and objectives of the project.
- ◑ The alternative received a score of 2. The alternatives may produce a positive impact in the study corridor and meets some of the goals and objectives of the project.
- ◔ The alternative received a score of 1. The alternatives may produce a positive impact in the study corridor and minimally supports the goals and objectives of the project.
- ○ The alternative received a score of 0. The alternatives may produce no positive impact in the study corridor and does not support the goals and objectives of the project.

Table 5.9 includes FDOT goals and specific supporting performance measures developed for this study. FDOT uses these performance measures to make informed decisions and assess projects based on existing financial policies for allocating funds among programs such as highway preservation, system expansion, and public transportation. In this study, the goals and performance measures are used to develop criteria and score projects for potential funding prioritization of best performing projects.

Table 5.10 includes a list of recommended improvements with sources and justification. The recommendations were determined based on literature review, site visits, stakeholder's interviews, and committee recommendations. The following is a sample of projects in the improvement list.

- The project list from both the Central Dade Transport Zone Study and the Miami River Corridor Multimodal Transportation Plan were reviewed for relevance to this study. Projects related to truck staging sites, Miami River Greenway Corridor, and short sea shipping were recommended as part of this study.
- This scope included a study of short sea shipping and an analysis of the Miami River capacity.
- Stakeholders were interviewed to gain their insight as to needs for the working river. One of their recommendations was to investigate potential FTZ warehouse sites or private sector lead development.
- The Miami River Marine Group and the Miami River Commission Economic Development and Commerce Subcommittee provided recommendations to protect the working river. Some of the recommendations included a policy to designate the Miami River as a Marine Highway and installing wayfinding signs on North and South River Drive. In addition, the Commission and Subcommittee suggested improving the navigation channel for the safety and shared use of the river by cargo and recreational vessels.
- The Miami-Dade County Transit Development Plan included recommendations on transit operations changes and a new transit service.
- The Miami-Dade Transportation Planning Organization published a report studying the feasibility of building a tunnel underneath the Miami River.
- This study conducted an intersection analysis of NW 27th Avenue and NW North River Drive. The analysis indicated that there is an opportunity to improve intersection operations with lane redesignations and an improved turning radius on the southwest corner of the intersection. This analysis is contained in Appendix J.

Table 5.11 includes a list of recommended improvements with project scores. The table includes performance measures that support FDOT goals and the score for each measure. Projects that support safety and preserve the existing transportation system were given greater consideration through this weighting. Thus, safety and preservation projects were weighted slightly higher, but all goals were considered in the assessment of all listed projects.

The following are observations from the list of recommendations:

- The highest scoring project was the "Iron Triangle" study. The Iron Triangle was identified as a hot spot based on the crash analysis contained in the existing conditions chapter of this report.
- Another high scoring project was the prioritization of lift bridge power restoration in case of storm events. This project scored high in almost every measure with wide range positive impacts at a relatively low cost.
- Lower scoring projects tend to focus on a few measures rather than broader scale projects with greater impacts to the regional system, such as signal and signage projects. These projects are relatively lower cost but less of an impact on a wider scale.
- Projects that scored somewhere in the middle to high range preserve the existing transportation system with minor impacts to the environment while enhancing efficiency. Examples of these types of projects are construction of truck staging areas and a potential transit circulator.

- In general, multimodal projects scored about average. These projects did well in preserving the existing system and the environment while improving efficiency at a relatively low cost but had minor positive impacts to safety and mobility.
- Railroad projects scored well because they had positive impacts to the environment and state of good repair while improving mobility.

Table 5.9: FDOT Goals and Performance Measures

Safety	Preservation	Environment	Economy	Travel Quantity	Travel Quality	Accessibility	Utilization
Fatality Rate	*Lane Mile Resurfacing Projects*	*Carbon Dioxide (CO2)*	*Capacity Funds for the SIS*	*Vehicle Miles of Travel*	*Level of Service (LOS)*	*Commute Times Less Than 30 Minutes*	*Miles Severely Congested*
Fatalities involving:	*Bridges with Weight Restrictions*	*Water Quality – Wetland Mitigation*	*Florida-Originating Exports*	*Vehicle Miles Traveled per Capita*	*Pedestrian and Bicycle LOS*	*Bicycle and Pedestrian Facilities*	*Travel Severely Congested*
Lane Departures	*Bridge Repair Projects*	*Project Screenings*	*Florida Share of US Trade Flow*	*Combination Truck Miles Traveled*	*Vehicle Hours of Delay*	*Aviation, Rail, and Seaport Highway Adequacy*	
Intersections	*Bridge Replacement Projects*	*Recycled Pavement*	*Total Value of Freight*	*Transit Passenger Trips*	*Combination Truck Hours of Delay*		
Construction Work Zones	*Roadway Maintenance*	*Alternative Fuel Vehicles*	*Jobs by Transportation Intensive Sectors*	*Aviation Passenger Boardings*	*Travel Time Reliability*		
Impaired/ Aggressive/ Distracted Driving	*Roadside Maintenance*	*Miles of Noise Walls*		*Seaport Passenger Trips*	*Aviation and Rail Departure Reliability*		
Drivers 65 and Over	*Traffic Services Maintenance*	*Wildlife Crossings*		*Rail Passenger Trips*	*Transit Headways*		
Teen Drivers	*Drainage Maintenance*	*Designated Scenic Highways*		*TEU Containers*			
Pedestrians/ Bicyclists/ Public Transit	*Vegetation Aesthetics Maintenance*	*Roadside Attractiveness*		*Freight Tonnage*			
Rail Crossings	*ITS Miles Managed by FDOT*	*Roadsides Kept Litter Free*					
Aviation	*Florida 511 Program (FL511)*	*Alternatives/Transportation Enhancements*					
Seat Belt Usage	*Road Rangers Service Assists*	*Transportation Disadvantaged Trips*					
Commercial Vehicle Crash Rate	*State Average Roadway Clearance Times*	Satisfaction with Florida Highways					
Railroad Derailments	State Average Rapid Incident Scene						
Transit Miles Between Safety Incidents							

Table 5.10: Recommended Improvements with Sources and Justification

Project ID Code	Project Name	Begin	End	Description	Source	Basis
Roadway						
MR01	NW South River Drive at NW 36th Street intersection.			Traffic signal operational improvements.	2014 Miami-Dade Freight Plan Update	Traffic Operations Improvements
MR02	NW North River Drive at NW 36th Street intersection.			Traffic signal operational improvements.	Miami River Freight Improvement Plan	Traffic Operations, Capacity, and Safety Improvements
MR03	Monitor implementation of ongoing "Iron Triangle" Study			Comprehensive analysis of the NW 36th Street/LeJeune Road/Okeechobee Road. Expected to lead to PD&E study	Subject of ongoing FDOT Study, Miami River Freight Improvement Plan	Traffic Operations, Capacity, and Safety Improvements
MR04	Access management along south frontage of NW North River Drive.			Includes corridor segment from NW 27th Avenue westward along NW North River Drive to NW 36th Street.	Miami River Freight Improvement Plan	Access Management
MR05	Monitor NW 36th Street Corridor Planning Study.	SR 826	US 1	Multimodal planning study to consider street cross-section, traffic operations, bicycle/pedestrian/transit and freight elements. Planned FDOT corridor study. Expected to lead to PD&E.	FDOT, Miami River Freight Improvement Plan	Multimodal Corridor Study
MR06	Reconstruct NW South River Drive.	NW 36th Street	NW 27th Avenue	Reconstruction of NW South River Drive to include bicycle lanes and sidewalks. Incorporate freight elements such as truck staging lane along north frontage.	Palmer Lake Charrette Plan	Roadway Reconstruction for Infrastructure Conditions, Safety, and Multimodal Connections
MR07	NW 27th Avenue/NW North River Drive intersection.			Intersection geometric and operational improvements.	Miami River Freight Improvement Plan	Traffic Operations Improvements
MR08	Proposed ramps to and from the east of SR 112/Airport Expressway at NW 37th Avenue.			Proposed ramps to and from the east of SR 112/Airport Expressway at NW 37th Avenue. Planning and project development by MDX.	MDX	Capacity Improvement
MR09	NW North River Drive improvement	NW 36th Street	NW 27th Avenue	Partial reconstruction of NW North River Drive to include missing or damaged curb and gutter, sidewalks,, drainage issues, driveway definition, and partial median construction. Note Miami Dade LRTP wayfinding project priority 2.	Miami River Corridor Multimodal Transportation Plan	Roadway Reconstruction for Infrastructure Conditions, Safety, and Multimodal Connections
MR10	Improve signal coordination along NW 27th Avenue.	SR 836	SR 112	Improve signal coordination along NW 27th Avenue.	Miami River Freight Improvement Plan	Traffic Operations Improvements
MR11	Local street improvements in industrial district north of NW North River Drive.	NW 37th Avenue	NW 27th Avenue	Identification of needs and development of capital improvement program for pavement, drainage and sidewalk upgrades for street frontages north of NW North River Drive with industrial land uses.	Miami River Freight Improvement Plan	Roadway Reconstruction for Infrastructure Condition, Drainage, Lighting and Sidewalks
MR12	Monitor and manage traffic signal timing and coordination with bascule bridge operations along Miami River.	All Miami River lift bridges.	US 1	Monitor and manage traffic signal time and coordination with bascule bridge operations along Miami River.	Miami River Freight Improvement Plan	Traffic Operations Improvements
MR13	Tunnel PD&E Study for Brickell Avenue Bridge.			FDOT to perform follow-up analyses to TPO tunnel feasibility study concluded in 2017 and potentially a PD&E study.	Miami-Dade Transportation Planning Organization	Network Capacity and Operations
MR 14	Install a Port of Miami River wayfinding sign system for NW North River Drive and NW South River Drive.	NW 36th Street	NW 27th Avenue	Install a Port of Miami River wayfinding sign system for NW North River Drive and NW South River Drive. Note Miami Dade LRTP wayfinding project priority 2.	Miami River Commission Economic Development and Commerce Subcommittee, Miami River Marine Group, Miami River Corridor Multimodal Transportation Plan	Traffic Operations Improvements
MR15	Implement programmed bascule bridge maintenance and reconstruction projects.	Entire Navigable Miami River		Implement programmed bascule bridge maintenance and reconstruction projects.	Miami River Freight Improvement Plan	Bridge Maintenance and Reconstruction
Transit/Bicycle/Pedestrian						
MR16	Route 27 running time adjustments.			Adjustments to Route 27 operating schedule.	Miami-Dade County Transit Development Plan (2017-2018)	Transit Operations
MR17	Route 32 running time adjustments.			Adjustments to Route 32 operating schedule.	Miami-Dade County Transit Development Plan (2017-2018)	Transit Operations
MR18	Route 36 extension to Dolphin Station.			Route 36 alignment to be extended west to new Dolphin Station transit hub.	Miami-Dade County Transit Development Plan (2017-2018)	Transit Operations
MR19	Route 32 bus benches/shelters and lighting.	NW 27th Avenue	NW 32nd Avenue	Install bus benches/shelters on Route 32 stops along NW North River Drive.	Miami River Freight Improvement Plan	Transit Improvements
MR20	Conduct transit circulator feasibility study to serve Palmer Lake and western Miami River corridor.			Transit Circulator to serve Palmer Lake and Miami River Corridor, connecting to the Miami Intermodal Center and its large set of transit travel options (Tri-Rail, Metrorail, transit	Miami River Freight Improvement Plan	Transit Operations

Project ID Code	Project Name	Begin	End	Description	Source	Basis
MR21	Continue implementation of Miami River Greenway corridor.	NW 27th Avenue	NW 36th Street	Includes corridor segment westward along NW South River Drive. Bicycle path from NW 27th Ave westward along NW 25th St. to the MIC. Incorporate freight-friendly design elements into designs.	Miami Dade County Palmer Lake Ordinance, Miami River Corridor Multimodal Transportation Plan	Non Motorized Improvements
Railroad						
MR22	NW North River Drive railroad crossings.	NW 34th Street	NW 31st Street	Reconstruct two NW North River Drive railroad crossings on SFRC mainline and NW North River Drive.	Programmed FDOT project.	Reconstruct Railroad Crossings
MR23	Railroad crossing closures and repairs on Downtown Lead rail spur.	NW 31st Avenue	NW 7th Avenue	Consider closure of several crossings along the Downtown Rail lead east of NW North River Drive to reduce safety exposure and maintenance requirements; identify priority crossing repair needs.	Miami River Freight Improvement Plan	Traffic Operations Improvements
MR24	Upgrade private driveway rail crossings on NW North River Drive.	NW 31st Avenue	NW 37th Avenue	Coordinate with private property owners and FDOT on pavement and safety improvements for multiple private rail crossings.	Miami River Freight Improvement Plan	Reconstruct Railroad Crossings
Marine and Intermodal						
MR25	Develop truck staging area near NW 37th Avenue.			Site would utilize MDT/MDX ROW committed for "marine industrial uses" per MRC resolution in Dec. 2006.	Originally noted in the Central Dade Transport Zone Study. Palmer Lake Charrette Plan	Truck Staging Area Improvements
MR26	Investigate potential FTZ warehouse sites or development as private sector lead.			Investigate potential FTZ warehouse sites or development as private sector lead.	Stakeholder	Freight warehouse site location.
MR27	Develop railroad intermodal ramp.			Develop railroad intermodal ramp location (existing shipper site or new open facility) to facilitate use of rail shipping.	Originally noted in the Central Dade Transport Zone Study.	Railroad Operations Improvements
MR28	Develop truck travel center.			Potential sites north of NW 36th Street adjacent to SR 112, fronton parking site, west end of navigable river.	Originally noted in the Central Dade Transport Zone Study.	Truck Travel Center
MR29	Explore development of a short sea shipping concept.			Utilize vacant waterfront parcels, or consider partnership with existing marine shipping company.	Originally noted in the Central Dade Transport Zone Study, Miami River Corridor Multimodal Transportation Plan	Short Sea Shipping Improvements
MR30	Investigate bulkhead repair program utilizing SIS and other funds.			Program would address missing or deteriorated bulkhead sections to increase berth capacity.	Miami River Economic Development and Commerce Subcommittee	Berth Capacity Improvements
MR31	Improve Miami River navigation channel signing and aids.			Project would support improved navigation safety and shared use of the river by cargo and recreational vessels.	Miami River Marine Group	Navigation Channel Operations Improvements
Policy						
MR32	Continue coordination with Miami River Commission per Urban Infill Plan.			Utilize Miami River Commission monitoring and oversight of Urban Infill Plan to preserve marine industrial land uses and the "working river".	Miami River Freight Improvement Plan	Preservation of Marine Industrial Land Use
MR33	Investigate formation of a Community Redevelopment Authority (CRA) to support implementation of study findings.			Investigate formation of a Community Redevelopment Authority (CRA) to support implementation of study findings.	Miami River Freight Improvement Plan	Implementation Strategy
MR34	Request prioritization of power restoration by FPL for lift bridges after storm events.			Request prioritization of power restoration by FPL for lift bridges after storm events.	Miami River Commission Economic Development and Commerce Subcommittee, Miami River Marine Group	Emergency Management, Traffic Operations
MR35	Preserve rail-served properties along Downtown Lead.			Both within City of Miami and in unincorporated Miami-Dade County.	Miami River Freight Improvement Plan	Preservation of Industrial Land Use
MR36	Pursue designation of the Miami River as a Marine Highway.			Reference the US Maritime Administration regulations.	Miami River Commission Economic Development and Commerce Subcommittee	Marine Highway Designation for Funding
MR37	Conduct an updated economic impact study of the Miami River commerce.			Conduct an updated economic impact study of the Miami River commerce.	Miami River Marine Group	Economic Impact Study

Table 5.11: Recommended Improvements with Project Scores

Project Priority	Project ID Code	Project Name	Begin	End	Scale of Impact	Enhance Safety	Support State of Good Repair	Relation to the Environment	Improve Efficiency	Relative Investment Cost	Travel Quantity	Travel Quality	Accessibility	Project Score
Weight						**3**	**3**	**2**	**2**	**3**	**2**	**2**	**2**	
1	MR03	Monitor implementation of ongoing "Iron Triangle" Study			Regional	●	●	●	●	◔	◕	●	●	**65**
2	MR34	Request prioritization of power restoration by FPL for lift bridges after			Regional	●	●	●	●	●	◔	◑	◕	**64**
3	MR25	Develop truck staging area near NW 37th Avenue.			Local	◕	●	●	●	◑	◑	◑	⛶	**59**
4	MR20	Conduct transit circulator feasibility study to serve Palmer Lake and			Local	◑	●	●	●	◑	◕	◑	●	**58**
5	MR31	Improve Miami River navigation channel signing and aids.			Local	●	●	●	●	◕	◔	◔	◑	**57**
6	MR08	Proposed ramps to and from the east of SR 112/Airport Expressway at NW			Regional	◕	◑	◑	◕	◕	●	◕	◕	**54**
6	MR36	Pursue designation of the Miami River as a Marine Highway.			Regional	◑	●	●	◕	●	◑	⛶	◑	**54**
8	MR06	Reconstruct NW South River Drive.	NW 36th Street	NW 27th Avenue	Regional	⛶	●	◕	◕	◔	◑	◑	◕	**53**
8	MR09	NW North River Drive improvement	NW 36th Street	NW 27th Avenue	Regional	●	●	◕	⛶	◔	◑	◑	◕	**53**
8	MR13	Tunnel PD&E Study for Brickell Avenue Bridge.			Regional	◑	◕	◕	●	○	●	●	●	**53**
8	MR22	NW North River Drive railroad crossings.	NW 34th Street	NW 31st Street	Local	◕	●	●	◑	◑	◑	◕	◑	**53**
8	MR24	Upgrade private driveway rail crossings on NW North River Drive.	NW 31st Avenue	NW 37th Avenue	Local	◕	●	●	◕	◑	◑	◑	◑	**53**
13	MR05	Monitor NW 36th Street Corridor Planning Study.	SR 826	US 1	Regional	●	◕	◑	◕	◔	◕	◕	◕	**52**
13	MR10	Improve signal coordination along NW 27th Avenue.	SR 836	SR 112	Local	◕	◔	◕	◕	●	◑	◕	◕	**52**
13	MR28	Develop truck travel center.			Regional	◕	●	●	●	◔	◔	◔	●	**52**
16	MR04	Access management along south frontage of NW North River Drive.			Local	●	◕	◑	●	◑	◔	◑	◕	**51**
16	MR32	Continue coordination with Miami River Commission per Urban Infill Plan.			Regional	◔	●	●	●	●	◔	◔	◑	**51**
18	MR18	Route 36 extension to Dolphin Station.			Regional	◔	●	●	◕	◕	◑	◑	◑	**50**
18	MR23	Railroad crossing closures and repairs on Downtown Lead rail spur.	NW 31st Avenue	NW 7th Avenue	Local	◕	◕	●	●	⛶	◑	⛶	◔	**50**

Project Priority	Project ID Code	Project Name	Begin	End	Scale of Impact	Enhance Safety	Support State of Good Repair	Relation to the Environment	Improve Efficiency	Relative Investment Cost	Travel Quantity	Travel Quality	Accessibility	Project Score
Weight						3	3	2	2	3	2	2	2	
20	MR16	Route 27 running time adjustments.			Local									49
20	MR17	Route 32 running time adjustments.			Local									49
20	MR35	Preserve rail-served properties along Downtown Lead.			Regional									49
20	MR37	Conduct an updated economic impact study of the Miami River commerce.			Regional									49
24	MR07	NW 27th Avenue/NW North River Drive intersection.			Local									47
24	MR12	Monitor and manage traffic signal timing and coordination with bascule	All Miami River lift bridges.	US 1	Regional									47
24	MR 14	Install a Port of Miami River wayfinding sign system for NW North River Drive and NW South River Drive.	NW 36th Street	NW 27th Avenue	Local									47
24	MR19	Route 32 bus benches/shelters and lighting.	NW 27th Avenue	NW 32nd Avenue	Local									47
28	MR15	Implement programmed bascule bridge maintenance and reconstruction	Entire Navigable Miami River		Regional									46
29	MR01	NW South River Drive at NW 36th Street intersection.			Local									44
29	MR02	NW North River Drive at NW 36th Street intersection.			Local									44
29	MR21	Continue implementation of Miami River Greenway corridor.	NW 27th Avenue	NW 36th Street	Safety Preservati									44
29	MR33	Investigate formation of a Community Redevelopment Authority (CRA) to support implementation of study			Local									44
33	MR11	Local street improvements in industrial district north of NW North River Drive.	NW 37th Avenue	NW 27th Avenue	Local									40
33	MR27	Develop railroad intermodal ramp.			Regional									40
35	MR29	Explore development of a short sea shipping concept.			Regional									38
36	MR30	Investigate bulkhead repair program utilizing SIS and other funds.			Local									36
37	MR26	Investigate potential FTZ warehouse sites or development as private sector lead.			Local									30

6.0 Freight Improvement Recommendations

The Miami River Freight Improvement Plan recommendations include a wide range of transportation projects. The projects serve to improve mobility and safety for the movement of freight goods to increase the economic vitality of the region. The recommendations include relevant projects from the adopted Miami Dade TPO LRTP, 2014 Miami Dade Freight Plan, Miami Dade County Palmer Lake Charrette Plan, Miami Dade River Corridor Multimodal Transportation Plan, and the Central Dade Transport Zone Study.

The recommendations developed in this report were based on the following: alternative analysis growth scenarios within the study area, a review of prior studies and plans, and input from stakeholder interviews and presentations. The travel demand model was used to review existing conditions and evaluate growth scenarios. The growth scenarios did not negatively impact the trend scenario cost feasible network based on segment level of service comparisons. The trend scenario includes the LRTP projects which are depicted in **Figure 6.1.** The figure also includes supporting tables listing the projects recommended in this study based on stakeholder interviews, committee meetings, site visits and previous studies.

The recommendations are categorized as short-term, mid-term, and long-term with respect to their implementation schedules. The consideration of the relative ease of implementation and National Environmental Policy Act (NEPA) compliance played significant roles in determining the time period the proposed improvements can be practically implemented.

The Efficient Transportation Decision Making (ETDM) Environmental Screening Tool was applied to a defined Area of Interest (AOI) for each project recommendation with a physical location. The results of this analysis are provided in **Appendix K**.

Finally, the information and documentation developed as part of this study will be useful background and possibly justification for future investment priorities for improving freight mobility for the marine shipping industry of the Miami River. It is planned that the study database be distributed to the key involved agencies including FDOT District 6, the Miami River Commission, and the Miami River Marine Group, as well as the FDOT Seaport and Waterways Office and the FDOT Transportation Data and Analytics Office.

Figure 6-1: Proposed Recommended Transportation Projects

Map ID #	Project Number	Project Name	From	To	Type of Work	CON Year	Funding
1	DT4124739	SR 5 / BISCAYNE BLVD	SE 3RD AVENUE	SE 2ND STREET	RESURFACING	2018	$60,000
2	DT4379151	SR 5 / BISCAYNE BLVD	SE 2ND STREET	NE 11TH TERRACE	INTERSECTION IMPROVEMENT	2019	$1,256,000
3	DT4124737	SR 5 / SE 2ND AVENUE	SE 2ND STREET	SE 4TH STREET	RESURFACING	2018	$40,000
4	DT4366091	CITY OF MIAMI - METROMOVER STATION ACCESS			SIDEWALK	2018	$392,000
5	DT4124738	SR 90 / US-41 / SR 5 / US-1 / BRICKELL	N OF SE 5 STREET	SE 3 AVENUE	RESURFACING		$0
6	DT4124731	SR 5 / BRICKELL AVENUE	S OF SE 25TH ROAD	SE 4TH STREET	RIGID PAVEMENT REHABILITATION		$0
7	PW000116	TRAFFIC SIGNALS AND SIGNS ROW					$275,000
8	PW000728	SOUTH MAIMI AVENUE	15 ROAD	5 STREET	ROADWAY IMPROVEMENTS		$0
9	DT4377921	SR 90 / SW 7 ST	E OF SR9 / SW 27AVE	SR5 / BRICKELL AVE & SR9 @ SW7ST	PEDESTRIAN SAFETY IMP	2018	$982,000
10	DT4326396	SR 90 / SW 8 ST / SW 7 ST	SR 9 / SW 27 AVE	BRICKELL AVENUE	PD&E/EMO STUDY		$3,600,000
11	DT4290371	SR 90 / SW 8 & SW 7 ST	AT SW 4 AVE AND AT SW 3 AVE		INTERSECTION IMPROVEMENT		$2,655,000
12	DT4293004	SR 925 / NW 3RD COURT & NW 3RD AVENUE	NW 1ST STREET	NW 8TH ST	RESURFACING	2020	$5,480,000
13	DT4146331	SR 968 / W FLAGLER ST	WEST 14TH AVENUE	WEST 2ND AVENUE	FLEXIBLE PAVEMENT RECONST	2018	$400,000
14	DT4244071	SR 968 / SW 1ST STREET	AT MIAMI RIVER (BRIDGE #870660)		BRIDGE REPLACEMENT	2018	$90,534,000
15	DT4183122	SR 968 / SW 1ST STREET	SW 17TH AVENUE	E OF SW 6TH AVE	FLEXIBLE PAVEMENT RECONST	2018	$400,000
16	DT4209172	OVERTOWN GREENWAY ALONG NW 11 ST	NW 7 AVE	E OF NW 12 AVE	BIKE PATH/TRAIL	2018	$838,000
17	DT4365361	SR 933 / NW 12 AVENUE OVER MIAMI RIVER BRIDGE # 871005			BRIDGE-REPAIR/REHABILITATION	2019	$584,000
18	XA83611	SR 836/I-95 INTERCHANGE IMPROVMENTS	NW 17TH AVE	I-95	WIDENING AND OPERATIONAL	2018	$215,461,000
19	DT4231261	SR 836 / I-95 INTERCHANGE RAMP S	NW 17 AVE	I-95 (MDX)		2018	$15,605,000
20	PW000931	NW 22 AVENUE	NW 7 STREET	NW 20 STREET	RESURFACING		$15,605,000
21	DT4365371	SR 9 / NW 27 AVENUE OVER MIAMI RIVER BRIDGES 870731 & 870763			BRIDGE-REPAIR/REHABILITATION	2021	$4,083,000
22	DT4363851	SR 9 / NW 27 AVENUE	AT NW 17TH STREET		INTERSECTION IMPROVEMENT	2018	$820,000
23	PW000870	NW SOUTH RIVER DRIVE	NW 31 STREET	TAMIAMI BRIDGE	WIDEN FROM 2 TO 3 LANES		$4,044,000
24	PW000786	TAMIAMI CANAL BRIDGE REPLACEMENT			BRIDGE REPLACEMENT (#874135)		$4,044,000
25	PW000792	PALMER LAKE BRIDGE			BRIDGE REPLACEMENT (#874134)	2017	$0
26	TR0000019	MIAMI RIVER INTERMODAL CENTER CAPACITY IMPROVEMENT STUDY			RAIL CAPACITY PROJECT	2018	$27,204,000
27	PW000304a	NW 37 AVE	NORTH RIVER DR	NW 79 STREET	WIDEN FROM 2 TO 5 LANES	2018	$13,200,000
28	AP4292712	PERIMETER ROAD	NW 57 AVENUE	NW 18 STREET	PD&E/EMO STUDY		$0
29	XA20001	MDX CONNECT 4 EXPRESS			NEW EXPRESSWAY CONNECTING SR 836, SR 112, SR 924 and SR 826.		$5,551,000
30	DT4259792	SR 25 / OKEECHOBEE RD	W OF SE 7 AVENUE	N OF NW 36 STREET	RESURFACING	2018	$3,672,000
31	DT4259791	SR 948 / NW 36TH ST	W OF LEE DRIVE	E OF OKEECHOBEE	RESURFACING		$0
32	DT4364261	SR 948 / NW 36 ST	826/PALMETTO EXP	SR 5 / US1	MODAL SYSTEMS PLANNING		$805,000
33	XA11212	SR 112 RAMP IMPROVEMENTS at NW 37TH AVE	SR 112	NW 37TH AVENUE	INTERCHANGE IMPROVEMENTS	2019	$12,939,000
34	PW671204	N 20 STREET	CIVIC CENTER	BISCAYNE BLVD	RESURFACE/RESTIPE		$1,200,000
35	DT4255981	SR 7 / NW 7 AVENUE	NW 8 STREET	NW 36 STREET	FLEXIBLE PAVEMENT RECONST	2018	$1,200,000

Map ID #	Project Code	Facility	From	To	Description	Priority Project
1	NM16	M-Path GreenLink(short-term improvements)	SW 67th Avenue	Miami River Greenway	Trail Improvements	1
2	NM11	M-Path GreenLink (long-term improvements	SW 67th Avenue	Miami River Greenway	Trail Improvements	3
3	NM140	M-Path / Overtown Greenway	North of Miami River		Trail Improvements	4
4	NM10	Miami River Greenway (complete missing segments)	NW 12th Avenue	SE 2nd Avenue	Trail Improvements	1
5	NM108	Overtown Greenway (except portion between NW 3rd and 7th Avenue)	Miami River Greenway	Musuem Park	Trail Improvements	3
6	NM15	East of Little Havana	Greenways/South River Drive	SW 12th Avenue to J. Marti Park	Pedestrian Facility Improvements	1
7	NM34	SW 1st Street	SW 5th Avenue	SW 2nd Avenue	Bicycle Facility Improvements	
8	CMP20	Miami Ave; SW 2nd Ave; SW 1st St; Flagler St; NW 7th Ave bridges over Miami River			Advanced bridge closing signs/rerouting information signs	1
9	NM32	Flagler Street	NW 2nd Avenue	NW 24th Avenue	Bicycle Facility Improvements	
10	MDT131	East-West Corridor (Flagler Enhanced Bus)	Miami Downtown Terminal	FIU-MMC (SW 112th Ave)	Incremental improvement on PTP corridor	
11	CMP26	NW 7th St between NW 72nd Ave and NW 7th Ave			Signal timing optimization	1
12	XA83628	SR-836 (Dolphin) Improvements	NW 57 Ave	NW 17 Ave	Mainline widening and interchange improvements	1
13	DT4231261	SR 836/I-95 Interchange Ramps	NW 12 Ave	I-95	Modify interchange	1
14	NM68	Miami River Greenway (complete missing segments)	NW 36th Street	NW 12th Avenue	Trail Improvements	2
15	NM154	NW 22nd Avenue	SW 22nd Street	Airport Expressway/SR 112	Bicycle Facility Improvements	4
16	CMP8	NW 27th Ave/SW 27th Ave from SW 8th St (Tamiami Trail) to NW 36th St			Median/access improvements	NA
17	SFRTA110	Miami River Intermodal Center Capacity Improvement Study			Double track remaining single track of Tri-Rail near Miami River	1
18	DT2502347	Miami Intermodal Center (MIC) Connection To NW 37 Ave	Miami Intermodal Center (MIC)	NW 37 Ave	New 2 lane road construction	1
19	SFRTA110	Miami River Intermodal Center Capacity Improvement Study			Double track remaining single track of Tri-Rail near Miami River	1
20	MDX103	MDX Connect 4 Express	Central Miami-Dade County	North Miami-Dade County	New expressway connecting SR-836, SR-112 , SR-924, and SR-826	4
21	DT4180652	NW 36 St	NW 42 Ave (LeJeune)	US-27 (Okeechobee)	Replace bridge and add lanes	1
22	FP12	NW South River Drive	NW 36th Street		Improve timing and coordination between South River Dr and Le Jeune Rd.	
23	NM112	NW 36th Street	East Drive	N Le Jeune Road	Pedestrian Facility Improvements	4
24	NM94	W Okeechobee Road	NW 103rd Street	W 18th Avenue	Pedestrian Facility Improvements	3
25	FP1072	US-27 (Okeechobee)	NW 42 Ave (Le Jeune)		Improve access at intersection	3

Map ID #	Project Code	Facility	From	To	Description	Priority Project
26	PW000304a	NW 37 Ave	North River Dr	NW 79 St	Add 2 lanes and center turn lane and reconstruct	1
27	FP3	Truck Parking Improvement	NW 36th Street/NW 37th Avenue		Develop a truck staging/parking area near NW 36th Street and NW 37th Avenue for the Port of Miami River	
28	FP17	NW North River Drive	SR-112	NW 27 Ave	Repave, mark center lane as truck standing permitted, widen where possible to provide side-or-road truck parking	
29	CoM107	NW 20 St	NW 27th Ave	I-95	Roadway infrastructure improvements	2
30	PW184	NW 14 St	Civic Center	US-1	Widen to 3 lanes and resurface	4
31	NM46	NW 11th Street	NW 12th Avenue	SW 2nd Avenue	Bicycle Facility Improvements	
32	MDT171	NW 7 Ave Enhanced Bus	Downtown Miami	Golden Glades Interchange Terminal	Premium limited stop transit service	2
33	NM89	NW 5th Avenue	NW 4th Street	NW 11th Street	Bicycle Facility Improvements	3
34	NM92	NW 3rd Court	NW 2nd Street	NW 8th Street	Pedestrian Facility Improvements	3
35	CoM111	I-95	I-95	S Miami Ave	Ramp reconstruction/reconfiguration of I-95 ramps in downtown Miami at S Miami Ave	2
36	DT4149647	I-95	US-1	South of SR 836/I-395	Freeway Preliminary Design	1
37	CoM112	I-95	I-95	E 2 Ave	Ramp reconstruction/reconfiguration for the I-95 ramps leading into downtown Miami at E 2 Ave	2

Project Type Symbols											
Roadway		Transit		Bicycle		Pedestrian					
Railroad		Marine		Intermodal							

Map ID #	Ranking	Project Type	Project Name	Leads/ Participating Agency	Project Cost
Short Term (1 - 5 years)					
3	1		Monitor implementation of ongoing "Iron Triangle" Study recommendations by FDOT.	FDOT	N/A
20	2		Conduct transit circulator feasibility study to serve Palmer Lake and w estern Miami River corridor.	Miami Dade County	$50,000
31	3		Improve Miami River navigation channel signing and aids.	FDOT	$150,000
13	4		Tunnel PD&E Study for Brickell Avenue Bridge	FDOT	N/A
22	4		NW North River Drive railroad crossings.	FDOT	Programmed
24	4		Upgrade private drivew ay rail crossings on NW North River Drive.	FDOT	$300,000
5	7		Monitor NW 36th Street Corridor Planning Study	FDOT	N/A
10	7		Improve signal coordination along NW 27th Avenue.	FDOT	N/A
18	9		Route 36 extension to Dolphin Station.	Miami Dade County	N/A
16	10		Route 27 running time adjustments.	Miami Dade County	N/A
17	10		Route 32 running time adjustments.	Miami Dade County	N/A

Project Type Symbols								
Roadway		Transit		Bicycle		Pedestrian		
Railroad		Marine		Intermodal				

Map ID #	Ranking	Project Type	Project Name	Leads/ Participating Agency	Project Cost
12	12		Monitor and manage traffic signal time and coordination w ith bascule bridge operations along Miami River.	FDOT	N/A
14	12		Install a Port of Miami River w ayfinding sign system for NW North River Drive and NW South River Drive.	FDOT	$50,000
7	12		NW 27th Avenue/NW North River Drive intersection.	FDOT	N/A
19	12		Route 32 bus benches/shelters and lighting.	Miami Dade County	$150,000
1	16		NW South River Drive at NW 36th Street intersection	FDOT	N/A
2	16		NW North River Drive at NW 36th Street intersection	FDOT	N/A
26	18		Investigate potential FTZ w arehouse sites or development as private sector lead.	FDOT	N/A
Medium Term (5 - 10 years)					
25	1		Develop truck staging area near NW 37th Avenue.	FDOT	$1,650,000
8	2		Proposed ramps to and from the east on SR 112/Airport Expressw ay at NW 37th Avenue.	FDOT	$750,000
6	3		Reconstruct NW South River Drive.	FDOT	$4,500,000
9	3		NW North River Drive improvement.	FDOT	$5,500,000

Project Type Symbols								
Roadway		Transit		Bicycle		Pedestrian		
Railroad		Marine		Intermodal				

Map ID #	Ranking	Project Type	Project Name	Leads/ Participating Agency	Project Cost
4	5		Access management along south frontage of NW North River Drive.	FDOT	$450,000
23	6		Railroad crossing closures and repairs on Dow ntow n Lead rail spur.	FDOT	$500,000
21	7		Continue implementation of Miami River Greenw ay corridor.	Miami Dade County	$1,500,000
11	8		Local street improvements in industrial district north of NW North River Drive.	Miami Dade County	$4,250,000
27	8		Develop railroad intermodal ramp.	FDOT	TBD
29	10		Explore development of a short sea shipping concept.	FDOT	$150,000
30	11		Investigate bulkhead repair program utilizing SIS and other funds.	FDOT	TBD
Long Term Term (10 or more years)					
28	1		Develop truck travel center.	FDOT	$8,500,000
15	2		Implement programmed bascule bridge maintenance and reconstruction projects.	FDOT	N/A

6.1 Potential Funding Sources for Improvements

Federal-Aid highway funds are authorized by Congress to assist the States in providing for construction, reconstruction, and improvement of highways and bridges on eligible Federal-Aid highway routes and for other special purpose programs and projects. The programs listed below are subject to change based on legislative action and available resources in addition to FDOT's District and MPO discretion when applicable.

The following is a list of state and federal transportation programs including the purpose and eligible activities. The information was gathered from both FDOT and United States Department of Transportation (USDOT) websites.

The Intermodal Logistics Center (ILC) Infrastructure Support Program

Managed by FDOT's Office of Intermodal Systems Development, the ILC Infrastructure Support Program (ISP) provides funds to assist with local government or private sector projects that enhance transportation facilities for the shipment of goods through a seaport to or from an intermodal logistics center. These projects may include investments in road, rail, or other infrastructure. FDOT must allocate at least $5 million annually from its Work Program to these activities.

Project proposals from local government or private sector entities are evaluated based on criteria including whether or not the project can serve a strategic state interest, facilitate the cost-effective and efficient movement of goods, and interact with and support the transportation network. To qualify, there must be a commitment of a funding match and demonstrated local financial support and commitment of the project. The amount of investment or commitments made by the owner or developer of the existing or proposed facility and the extent to which the owner has commitments with private sector businesses planning to locate operations at the ILC will also be considered. Selected applicants must provide at least 50 percent of the total project costs.

Generally, the ILC Infrastructure Support Program is used to support on-site investments at a designated ILC, such as site access and internal circulation roads, rail spurs, truck loading ramps, and trans-loading facilities. This program requires the applicant to cover at least 50 percent of the total project cost.

Intermodal Logistics Center (ILC) and the Strategic Intermodal System

Florida's Strategic Intermodal System (SIS) is a statewide network of high priority transportation facilities that are integral to the economic competitiveness of Florida Intermodal. Intermodal Logistics Centers (ILCs) that meet defined criteria may be designated as part of the SIS and certain projects would be eligible for SIS funding. Statewide SIS funding could be used for improvements to interregional corridors or intermodal connectors serving ILCs, augmenting onsite investments through the ILC Infrastructure Support Program and other sources. Planned ILCs may be designated as part of the SIS if they demonstrate that they:

- Are likely to meet SIS criteria within three years of becoming operational;
- Have partner consensus around their development; and
- Are financially feasible.

For those ILCs that meet SIS criteria, statewide SIS managed funds can be used to support improvements to designated SIS intermodal connectors or other infrastructure that link the ILC to the state's major highway and rail corridors, and from there to consumer and business markets in Florida and other states. A state match up to 75% is available for rail connections to SIS facilities

and a state match up to 100% is available for roadway connections to a SIS facility. SIS funding typically requires a match when used on private sector or locally owned facilities.

Environmental Protection Agency (EPA) Land Revitalization Program

EPA's Land Revitalization Program promotes the integration of sustainable reuse considerations into all cleanup and redevelopment decisions. Whether a property is an abandoned industrial facility, a waste disposal area, a former gas station, or a Superfund site, the Land Revitalization Initiative seeks to turn these places into productive, sustainable, and welcoming environments.

Land Revitalizations programs at EPA:

- **Brownfields Program**, designed to empower communities to work together to clean up and sustainably reuse brownfields areas.
- **Superfund Redevelopment**, ensures that every superfund site has the tools necessary to return the country's most hazardous sites into productive use.
- **Underground Storage Tanks**, supports the cleanup and reuse of abandoned properties that were contaminated with petroleum from underground storage tanks.
- **Cleanups at Federal Facilities**, works with other federal entities to facilitate faster, more effective, and less costly cleanup and reuse of federal facilities.
- **Resource Conservation and Recovery Act (RCRA) Brownfields**, helps facilities in need of corrective action to locate opportunities for reuse.
- **Brownfields and Land Revitalization Technology Support Center**, provides support to states, grantees, and EPA staff. It also includes the Directory of Technical Assistance for Land Revitalization.

Marine Highway Program (U.S. Marine Administration MARAD)

The America's Marine Highway Program is a Department of Transportation-led program to expand the use of our Nation's navigable waterways to relieve landside congestion, reduce air emissions, provide new transportation options, and generate other public benefits by increasing the efficiency of the surface transportation system. The program works with public and private stakeholders to achieve these goals.

The America's Marine Highways Program helps to generate "public benefits" that are not normally considered by shippers. These public benefits include:

- Creating and sustaining jobs in U.S. vessels and in U.S. ports and shipyards;
- Increasing the state of good repair of the U.S. transportation system by reducing maintenance costs from wear and tear on roads and bridges;
- Increasing our nation's economic competitiveness by adding new, cost-effective freight and passenger transportation capacity;
- Increasing the environmental sustainability of the U.S. transportation system by using less energy and reducing air emissions (such as greenhouse gases) per passenger or ton-mile of freight moved. Further environmental sustainability benefits come from the mandatory use of modern engine technology on designated projects;
- Increasing public safety and security by providing alternatives for the movement of hazardous materials outside heavily populated areas;
- Increasing transportation system resiliency and redundancy by providing transportation alternatives during times of disaster or national emergency;
- Increasing national security by adding to the nation's strategic sealift resources.

The Office of Marine Highways reviews call for projects applications on every 6 months until December 31, 2018. These projects represent concepts for new services or expansion of existing Marine Highway services that have the potential to offer public benefits and long-term sustainability without long-term Federal support. These projects receive preferential treatment for any future federal assistance from the Department of Transportation and MARAD.

Infrastructure for Rebuilding America (INFRA) Grants

The FAST Act establishes the Nationally Significant Freight and Highway Projects (NSFHP) program to provide financial assistance—competitive grants, known as INFRA grants, or credit assistance—to nationally and regionally significant freight and highway projects that align with the program goals to:

- Improve the safety, efficiency, and reliability of the movement of freight and people;
- Generate national or regional economic benefits and an increase in global economic competitiveness of the U.S.;
- Reduce highway congestion and bottlenecks;
- Improve connectivity between modes of freight transportation;
- Enhance the resiliency of critical highway infrastructure and help protect the environment;
- Improve roadways vital to national energy security; and
- Address the impact of population growth on the movement of people and freight.

Eligible activities under this program include:

- A highway freight project on the National Highway Freight Network;
- A highway or bridge project on the National Highway System, including:
    - A project to add capacity to the Interstate System to improve mobility; or
    - A project in a national scenic area;
- A freight project that is:
    - A freight intermodal or freight rail project; or
    - A project within the boundaries of a public or private freight rail, water (including ports), or intermodal facility and that is a surface transportation infrastructure project necessary to facilitate direct intermodal interchange, transfer, or access into or out of the facility,
    - Provided that the project will make a significant improvement to freight movements on the National Highway Freight Network, that the Federal share of non-highway portions of the project funds only elements of the project that provide public benefits, and that the total of Federal INFRA grants for non-highway portions of these projects does not exceed $500 million for fiscal years 2016 through 2020; or
- A railway-highway grade crossing or grade separation project. [23 U.S.C. 117(d)]

National Highway Performance Program

The purposes of the National Highway Performance Program (NHPP) are to provide support for the condition and performance of the National Highway System (NHS); to provide support for the construction of new facilities on the NHS; and to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.

NHPP funds may be obligated only for a project on an "eligible facility"; that is a project, part of a program of projects, or an eligible activity supporting progress toward the achievement of national performance goals for improving infrastructure condition, safety, congestion reduction, system

reliability, or freight movement on the NHS. Projects must be identified in the Statewide Transportation Improvement Program (STIP)/Transportation Improvement Program (TIP) and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan(s).

Eligible activities under this program are as follows:

- Construction, reconstruction, resurfacing, restoration, rehabilitation, preservation, or operational improvement of segments of the NHS. The terms "Construction"; and "Operational improvement"; are defined in 23 U.S.C. 101(a).
- Construction, replacement (including replacement with fill material), rehabilitation, preservation, and protection (including scour countermeasures, seismic retrofits, impact protection measures, security countermeasures, and protection against extreme events) of bridges on the NHS.
- Construction, replacement (including replacement with fill material), rehabilitation, preservation, and protection (including impact protection measures, security countermeasures, and protection against extreme events) of tunnels on the NHS.
- Inspection and evaluation, as described in 23 U.S.C. 144, of bridges and tunnels on the NHS, and inspection and evaluation of other highway infrastructure assets on the NHS. This includes, but is not limited to, signs, retaining walls, and drainage structures.
- Training of bridge and tunnel inspectors, as described in 23 U.S.C. 144.
- Construction, rehabilitation, or replacement of existing ferry boats and ferry boat facilities, including approaches that connect road segments of the NHS. Eligible ferry approaches are described in 23 U.S.C. 129(b). Eligible ferry boats and facilities are described in 23 U.S.C. 129(c).
- Construction, reconstruction, resurfacing, restoration, rehabilitation, and preservation of, and operational improvements for, a Federal-aid highway not on the NHS, and construction of a transit project eligible for assistance under chapter 53 of Title 49, U.S.C., if: the highway project or transit project is in the same corridor as, and in proximity to, a fully access-controlled highway on the NHS; the construction or improvements will reduce delays or produce travel time savings on the fully access-controlled highway described in clause and improve regional traffic flow; and the construction or improvements are more cost-effective, as determined by benefit-cost analysis, than an improvement to the fully access-controlled highway on the NHS.
- Bicycle transportation and pedestrian walkways in accordance with 23 U.S.C. 217. The project or activity must be associated with an NHS facility.
- Highway safety improvements on the NHS. The term "Safety improvement project" is defined in 23 U.S.C. 101(a).
- Capital and operating costs for traffic and traveler information monitoring, management, and control facilities and programs. The project or activity must be associated with an NHS facility.
- Development and implementation of a State asset management plan for the NHS, including data collection, maintenance, and integration and the cost associated with obtaining, updating, and licensing software and equipment required for risk-based asset management and performance-based management.
- Infrastructure-based intelligent transportation systems capital improvements, including the installation of vehicle-to-infrastructure communication equipment. The project or activity must be associated with an NHS facility.
- Environmental restoration and pollution abatement in accordance with 23 U.S.C. 328. The project must be associated with an NHS facility.

- Control of noxious weeds and aquatic noxious weeds and establishment of native species in accordance with 23 U.S.C. 329. The project or activity must be associated with an NHS facility.
- Environmental mitigation efforts related to projects funded under this section, as described in 23 U.S.C. 119(g). The project or activity must be associated with an NHS facility.
- Construction of publicly owned intracity or intercity bus terminals servicing the NHS.

Surface Transportation Block Grant Program

The Fixing America's Surface Transportation (FAST) Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant Program (STBG) acknowledging that this program has the most flexible eligibilities among all Federal-aid highway programs and aligning the program's name with how the Federal Highway Administration (FHWA) has historically administered it. The STBG promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. (FAST Act § 1109(a)).

Projects must be identified in the Statewide Transportation Improvement Program (STIP)/Transportation Improvement Program (TIP) and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan(s). When obligating sub-allocated funding (discussed below), the State must coordinate with relevant metropolitan planning organizations (MPO) or rural planning organizations (23 U.S.C. 133(d)(3)). Programming and expenditure of funds for projects shall be consistent with 23 U.S.C. 134 and 135.

Eligible activities include:

- Construction, as defined in 23 U.S.C. 101(a)(4), of the following:
    - Highways, bridges, and tunnels, including designated routes of the Appalachian development highway system and local access roads under 40 U.S.C. 14501;
- Ferry boats and terminal facilities eligible under 23 U.S.C. 129(c);
- Transit capital projects eligible under chapter 53 of title 49, United States Code;
- Infrastructure-based intelligent transportation systems capital improvements, including the installation of vehicle-to-infrastructure communication equipment;
- Truck parking facilities eligible under Section 1401 of MAP-21 (23 U.S.C. 137 note); and
- Border infrastructure projects eligible under Section 1303 of SAFETEA- LU (23 U.S.C. 101 note).
- Operational improvements and capital and operating costs for traffic monitoring, management, and control facilities and programs. Operational improvement is defined in 23 U.S.C. 101(a)(18).
- Environmental measures eligible under 23 U.S.C. 119(g), 328, and 329, and transportation control measures listed in Section 108(f)(1)(A) (other than clause (xvi) of that section) of the Clean Air Act (42 U.S.C. 7408(f)(1)(A)).
- Highway and transit safety infrastructure improvements and programs, including railway-highway grade crossings.
- Fringe and corridor parking facilities and programs in accordance with 23 U.S.C. 137 and carpool projects in accordance with 23 U.S.C. 146. Carpool project is defined in 23 U.S.C. 101(a)(3).
- Recreational trails projects eligible under 23 U.S.C. 206, pedestrian and bicycle projects in accordance with 23 U.S.C. 217 (including modifications to comply with accessibility requirements under the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.)),

and the Safe Routes to School Program under Section 1404 of SAFETEA-LU (23 U.S.C. 402 note).

- Planning, design, or construction of boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.
- Development and implementation of a State asset management plan for the National Highway System (NHS) and a performance-based management program for other public roads.
- Protection (including painting, scour countermeasures, seismic retrofits, impact protection measures, security countermeasures, and protection against extreme events) for bridges (including approaches to bridges and other elevated structures) and tunnels on public roads, and inspection and evaluation of bridges and tunnels and other highway assets.
- Surface transportation planning programs, highway and transit research and development and technology transfer programs, and workforce development, training, and education under chapter 5 of title 23, United States Code.
- Surface transportation infrastructure modifications to facilitate direct intermodal interchange, transfer, and access into and out of a port terminal.
- Projects and strategies designed to support congestion pricing, including electronic toll collection and travel demand management strategies and programs.
- Upon request of a State and subject to the approval of the Secretary, if Transportation Infrastructure Finance and Innovation Act (TIFIA) credit assistance is approved for an STBG-eligible project, then the State may use STBG funds to pay the subsidy and administrative costs associated with providing Federal credit assistance for the projects.
- The creation and operation by a State of an office to assist in the design, implementation, and oversight of public-private partnerships eligible to receive funding under title 23 and chapter 53 of title 49, United States Code, and the payment of a stipend to unsuccessful private bidders to offset their proposal development costs, if necessary to encourage robust competition in public-private partnership procurements.

Highway Safety Improvement Program

The FAST Act continues the Highway Safety Improvement Program (HSIP) to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.

The FAST Act continues the overarching requirement that HSIP funds be used for safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem. Under MAP-21, the HSIP statute listed a range of eligible HSIP projects. However, the list was non-exhaustive, and a State could use HSIP funds on any safety project (infrastructure-related or non-infrastructure) that met the overarching requirement. In contrast, the FAST Act limits HSIP eligibility to only those listed in statute—most of which are infrastructure-safety related.

National Highway Freight Program

National Highway Freight Program (NHFP) funds may be obligated for projects that contribute to the efficient movement of freight on the National Highway Freight Network (NHFN), and are consistent with the planning requirements of sections 134 and 135 of title 23, United States Code. Beginning 2 years after the date of enactment of the FAST Act, a State may not obligate NHFP funds apportioned to the State unless the State has developed a State Freight Plan (SFP) in accordance with 49 U.S.C. 70202, except that the multimodal components of the SFP may be incomplete. Projects must be identified in the Statewide Transportation Improvement Program (STIP)/Transportation Improvement Program (TIP) and consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan(s). 23 U.S.C. 167(i)(7).

Eligible projects shall contribute to the efficient movement of freight on the NHFN, and be identified in a freight investment plan included in a SFP (required in FY 2018 and beyond). NHFP funds may be obligated for one or more of the following:

- Development phase activities including planning, feasibility analysis, revenue forecasting, environmental review, preliminary engineering and design work, and other preconstruction activities.
- Construction, reconstruction, rehabilitation, acquisition of real property (including project land and improvements to land), construction contingencies, acquisition of equipment, and operational improvements directly relating to improving system performance.
- Intelligent transportation systems and other technology to improve the flow of freight, including intelligent freight transportation systems.
- Efforts to reduce the environmental impacts of freight movement.
- Environmental and community mitigation for freight movement.
- Railway-highway grade separation.
- Geometric improvements to interchanges and ramps.
- Truck-only lanes.
- Climbing and runaway truck lanes.
- Adding or widening of shoulders.
- Truck parking facilities eligible for funding under section 1401 of MAP-21
- Real-time traffic, truck parking, roadway condition, and multimodal transportation information systems.
- Electronic screening and credentialing systems for vehicles, including weigh-in-motion truck inspection technologies.
- Traffic signal optimization, including synchronized and adaptive signals.
- Work zone management and information systems.
- Highway ramp metering.
- Electronic cargo and border security technologies that improve truck freight movement.
- Intelligent transportation systems that would increase truck freight efficiencies inside the boundaries of intermodal facilities.
- Additional road capacity to address highway freight bottlenecks.
- Physical separation of passenger vehicles from commercial motor freight.
- Enhancement of the resiliency of critical highway infrastructure, including highway infrastructure that supports national energy security, to improve the flow of freight.
- A highway or bridge project to improve the flow of freight on the NHFN.
- Any surface transportation project to improve the flow of freight into and out of a freight intermodal or freight rail facility.

Transportation Alternatives (TA) Set-Aside

The Fixing America's Surface Transportation (FAST) Act replaced the Transportation Alternatives Program (TAP) with a set-aside of Surface Transportation Block Grant (STBG) Program funding for transportation alternatives (TA). These set-aside funds include all projects and activities that were previously eligible under TAP, encompassing a variety of smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to storm water and habitat connectivity.

The following are eligible projects under this program.

- Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.).
- Construction, planning, and design of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, older adults, and individuals with disabilities to access daily needs.
- Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other nonmotorized transportation users.
- Construction of turnouts, overlooks, and viewing areas.
- Community improvement activities, which include but are not limited to: i. inventory, control, or removal of outdoor advertising; ii. historic preservation and rehabilitation of historic transportation facilities; iii. vegetation management practices in transportation rights-of-way to improve roadway safety, prevent against invasive species, and provide erosion control; and iv. archaeological activities relating to impacts from implementation of a transportation project eligible under title 23.
- Any environmental mitigation activity, including pollution prevention and pollution abatement activities and mitigation to: i. address stormwater management, control, and water pollution prevention or abatement related to highway construction or due to highway runoff, including activities described in sections 23 U.S.C. 133(b)(3) [as amended under the FAST Act], 328(a), and 329 of title 23; or ii.(ii) reduce vehicle-caused wildlife mortality or to restore and maintain connectivity among terrestrial or aquatic habitats (Former 23 U.S.C. 213(b)(2)-(4)).
- The recreational trails program under 23 U.S.C. 206 of title 23. See the Recreational Trails Program section.
- The safe routes to school program eligible projects and activities listed at section 1404(f) of the SAFETEA-LU.
- Planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

National Significant Freight and Highway Projects Program

The FAST Act establishes the Nationally Significant Freight and Highway Projects (NSFHP) program to provide financial assistance – grants or credit assistance – to nationally and regionally significant freight and highway projects that align with the program goals to:

- improve safety, efficiency, and reliability of the movement of freight and people;
- generate national or regional economic benefits and an increase in global economic competitiveness of the U.S;
- reduce highway congestion and bottlenecks;
- improve connectivity between modes of freight transportation;
- enhance the resiliency of critical highway infrastructure and help protect the environment;
- improve roadways vital to national energy security;
- address the impact of population growth on the movement of people and freight, and
- mitigate the impacts of freight movements on communities.

The following are eligible projects:

- A highway freight project on the National Highway Freight Network;
- A highway or bridge project on the National Highway System, including:
    1. A project to add capacity to the Interstate system to improve mobility; or
    2. A project in a national scenic area;
- A freight project that is:
    - A freight intermodal or freight rail project; or
    - A project within the boundaries of a public or private freight rail, water (including ports), or intermodal facility and that is a surface transportation infrastructure project necessary to facilitate direct intermodal interchange, transfer, or access into or out of the facility,
    - The project will make a significant improvement to freight movements on the National Highway Freight Network and that the Federal share of the project funds only elements of the project that provide public benefits, and that the total assistance for these projects does not exceed $500 million over the period 2016-2020; or
- A railway-highway grade crossing or grade separation project.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

The FAST Act continued the CMAQ program to provide a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas).

The following are eligible activities:

Funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and that is included in the metropolitan planning organization's (MPO's) current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP) in areas without an MPO.

- Establishment or operation of a traffic monitoring, management, and control facility, including advanced truck stop electrification systems, if it contributes to attainment of an air quality standard.
- Projects that improve traffic flow, including projects to improve signalization, construct HOV lanes, improve intersections, add turning lanes, improve transportation systems management and operations that mitigate congestion and improve air quality, and implement ITS and other CMAQ-eligible projects, including projects to improve incident and emergency response or improve mobility, such as real-time traffic, transit, and multimodal traveler information.
- Purchase of integrated, interoperable emergency communications equipment.
- Projects that shift traffic demand to nonpeak hours or other transportation modes, increase vehicle occupancy rates, or otherwise reduce demand.
- Purchase of diesel retrofits or conduct of related outreach activities.
- Facilities serving electric or natural gas-fueled vehicles (except where this conflicts with prohibition on rest area commercialization) are explicitly eligible.
- Some expanded authority to use funds for transit operations.

6.2 FDOT Efficient Transportation Decision Making (ETDM)

The project recommendations from this study potentially will be entered in the Environmental Screening Tool (EST) and screened for either planning or programming using FDOT Efficient Transportation Decision Making (ETDM) process. These tools are described as follows:

- Planning Screen - comments received from the Environmental Technical Advisory Team (ETAT) members and the public help FDOT and MPOs/TPOs to identify environmental considerations that assist in assessing projects for inclusion or advancement in Long Range Transportation Plans (LRTPs) and further into the Cost Feasible Plan.
- Programming Screen - qualifying projects are reviewed when being considered for funding in the FDOT Five Year Work Program or MPO Transportation Improvement Program (TIP), or if already funded, before advancing to the PD&E phase.

The EST manages early and efficient interaction with agencies and the affected community through the two screening events which are completed and incorporated into the transportation planning process. The EST brings together information about a project and provides analytical and visualization tools that help synthesize and communicate that information.

The EST and Sociocultural Data Report (SDR) were used to support this study within the Area of Interest (AOI) for environmental and demographic considerations. The AOI includes the entire Miami River and another with only the working river and rail spur combined.