Miami River Corridor





MULTI-MODAL TRANSPORTATION PLAN
FINAL REPORT

PREPARED FOR

MIAMI-DADE MPO Metropolitan Planning Organization

Miami River Commission

Photo by Faroy Aerial Projects

PREPARED BY

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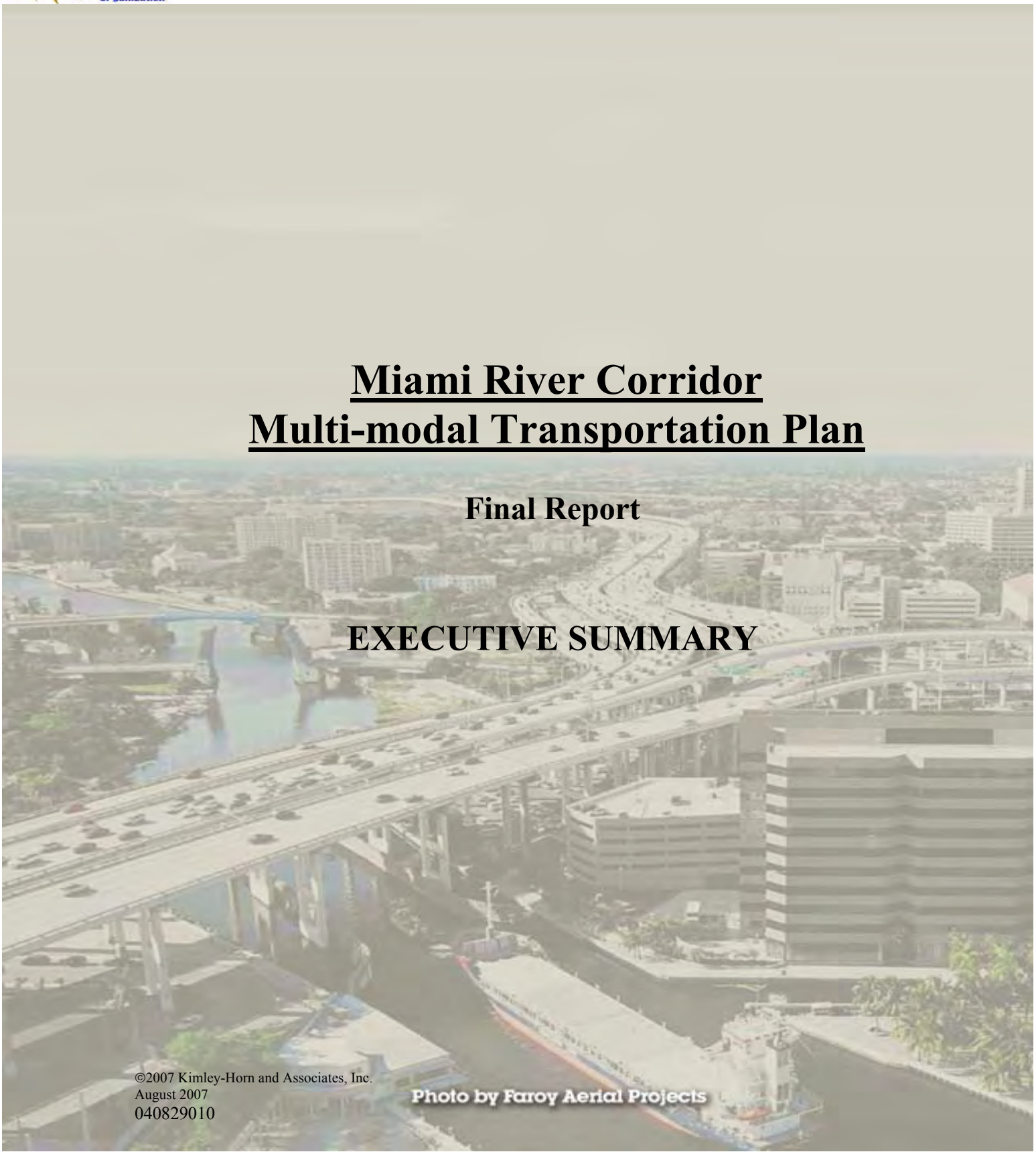
Miami River Corridor
Multi-modal Transportation Plan

Final Report

EXECUTIVE SUMMARY



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Kimley-Horn and Associates, Inc.

EXECUTIVE SUMMARY

Miami River Multi-modal Transportation Plan

Introduction

The Miami River Multi-modal Transportation Plan addresses the various types of transportation on and along the corridor. As Miami continues to become denser in economic and residential development, the surrounding transportation network needs to be enhanced. Utilizing the transportation opportunities on the River may help to reduce the traffic demand on the roads, which may intern reduce car emissions and ultimately improve the air quality. The Plan incorporates the Miami River Greenway Action Plan and details the relationship between the existing/proposed Greenway sections and the multiple modes of transportation along the corridor, including pedestrian, bicycle, transit, and roadway improvements.

The Miami River is the historical lifeblood of Miami's commerce and trade. The community that would later become Miami first settled at the mouth of the Miami River and then expanded along the River. As Miami expanded, life along the River did so hand-in-hand. Eventually, the River experienced an expansion of not only marine facilities, but industrial and transportation activities as well. To meet the needs of these expanding facilities, homes were built along the River. Recreational facilities were also constructed along the River to create a more desirable Miami. In 1905, City Park (now Lummus Park, which is recognized as the City's oldest park) was created on the north bank of the River. A street network soon developed around the River, which served land-based travel modes.

From 1909 to 1933, the River was lengthened and widened to support navigation and growing development. By the late 1930s, the Miami River was roughly in its present configuration as a 5.5-mile navigable channel. Today, the River remains an economically critical artery of commerce between Miami International Airport and Biscayne Bay. This working river is continuing to evolve into a vital urban waterscape flowing through the City of Miami's heart.

View of River at I-95

To aid in the expansion of Miami's economic development and beautification, in 1998 the Florida Legislature created the Miami River Commission (MRC), an 18 member board tasked with improving the Miami River Corridor. In 2000, the Legislature asked the MRC, City of Miami, and Miami-Dade County to create the *Miami River Corridor Urban Infill Plan*, in part to plan for future infill development within portions of the area that includes Miami's urban core. Today, there are over 15,000 new residential units either recently completed, under construction, or in final permitting, within over 50 new buildings along the Miami River. In addition, the Miami River rivals Tampa as the fourth largest port in the state, generating 6,700 jobs, $805 million in economic output, $406 million in economic income, and $44 million in tax revenues.

The Miami River Corridor stretches from NW 36th Street to the mouth of the River. The salinity dam just south of NW 36th Street, where water from the Miami Canal flows into the River, is the

northwestern end of the navigable portion of the Miami River. The mouth of the Miami River is in Downtown Miami, where the River flows into Biscayne Bay between SE 3rd Street and SE 5th Street. The study corridor extends one-quarter mile on either side of the River. Purposes for conducting this transportation plan include the following.

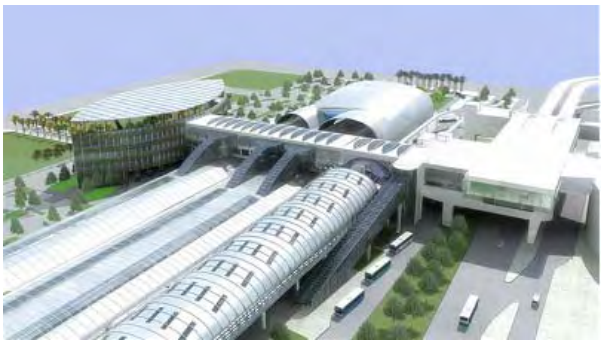
- To summarize existing planned improvements from various sources.
- To recommend new multi-modal projects to improve access, mobility, and livability along the River.
- To evaluate the River as a potential facility within the Florida Department of Transportation's Strategic Intermodal System (SIS).

Review of Previous and On-going Studies, Existing Transportation Programs/ Plans

A review of previous and on-going studies, existing transportation programs/plans, and additional multi-use developments along the Corridor was performed to determine their individual impact on enhancing the entire multi-modal connectivity network within the Miami River Corridor.

Relevant studies were reviewed to determine the status of proposed improvements within the Miami River Corridor including the following:

- Miami Downtown Transportation Master Plan
- Development of a Service Plan for Waterborne Transportation Service in Miami-Dade County
- Utilization of Miami-Dade County Waterways for Urban Commuting Travel
- City of Miami Streetcar Study
- Miami River Tunnel Feasibility Report
- Miami River Greenway Action Plan
- Bicycle Safety Program Plan Report
- Florida Intracoastal and Inland Waterway Study
- Comparing Cost of Options for Reconstructing the 12th and 27th Avenue Bridges Over the Miami River
- Freight Transportation – Short Sea Shipping
- Miami Civic Center Circulator Study
- Miami River Corridor Urban Infill Plan



Rendering of the Miami Intermodal Center (MIC), Programmed in the TIP

The existing Miami-Dade Transportation Improvement Program (TIP) Miami-Dade 2030 Long Range Transportation Plan (LRTP) and the City of Miami Capital Improvements Program were among the plans and programs that were reviewed to identify projects that are already being considered within the Miami River Corridor. This effort represents a key study component so that recommendations and strategies may be developed consistent with improvements that have already been identified in existing plans. The projects identified in the referenced programs and plans represent approximately $430 million in transportation infrastructure improvements.

EXECUTIVE SUMMARY

Miami River Multi-modal Transportation Plan

Existing Transportation Conditions

Existing transportation services along the Corridor were examined to define the existing conditions. The Miami River Corridor is served by numerous transportation modes for which data were gathered including the following.

- Transit Services
  - Metrobus
  - Metrorail
  - Metromover
- Pedestrian and Bicycle Facilities
  - Sidewalk
  - Greenways
  - Riverwalks
  - M-Path
- Vehicular Traffic
  - Roadway Network
  - Traffic Data
  - Level of Service
  - Annual Growth Rate
  - Intersection Capacity Analysis
- Waterborne Facilities
  - Water Transit
  - Freight and Goods Movement

New "Brickell on the River" Residential Development Adjacent to 5th Street Metromover Station

Identification of Needs and Strategies

Based on the existing conditions analysis presented in this report, transportation needs and deficiencies were identified for several transportation modes along the Miami River Corridor. Specific needs in each mode have been assessed for possible improvements to address the deficiencies. Each one of the needs is categorized into the following transportation categories.

- Greenway
- Pedestrian
- Bicycle
- Roadway
- Public Transit
- Freight

Lower, Middle, and Upper River transportation improvements developed in the Miami River Corridor Multimodal Transportation Plan are summarized in Tables ES-2, ES-3, and ES-4 for each section of the River, respectively.

Strategic Intermodal System

Statewide transportation authorities and transportation-related groups bound together to create the Strategic Intermodal System (SIS), based on the Economic Competitiveness Goal established in the

2020 Florida Transportation Plan. In 2003, Florida officially established the SIS, providing a united transportation network vital for the economy of Florida.

Sections 339.61-64, Florida Statutes, establish criteria for designating the SIS and Emerging SIS. The general outline of each is as follows:

- SIS – facilities that play a critical role in moving people and goods to and from other nations and states, as well as among regions within Florida.
- Emerging SIS – facilities that are of statewide or interregional significance, but do not currently meet the SIS thresholds.

The Miami River Corridor is intricate to the economic sustainability and growth of South Florida. Because of the diverse modes of transportation, the Corridor fulfills several different goals and thresholds for SIS and Emerging SIS facilities. The 24 shipping terminals along the waterway are compliant with the Federal Maritime Security Act and certified by the United States Coast Guard (USCG), and trade with over 100 Caribbean ports of call, which are not serviced by the large ships that access the Port of Miami.

The following table details that the Miami River meets and exceeds criteria for admission as a SIS facility. Note that the 2005 U.S. total for Twenty-foot Equivalent (TEU) containers was 26,444,652 TEU, and tonnage was 2,551,900,000 tons; the Miami River Corridor handled approximately 73,508 TEU and 1,007,238 tons.

Table ES-1: SIS Facility Thresholds

Type of Facility	SIS Threshold	Does it meet the threshold?	Emerging SIS Threshold	Does it meet the threshold?	Rational
Deep-Water Seaport	0.25% of U.S. total freight activity	0.28% > 0.25% yes	0.05% of U.S. total freight activity	0.28% > 0.05% yes	Located less then 50 miles from the Port of Miami, but the Port of the Miami River does not compete with the Port of Miami as it serves a niche by accommodating shallow draft vessels that serve numerous Caribbean Ports
			And		
			Located more than 50 miles from a SIS deepwater seaport	yes	
Waterway	Intercostal waterway and costal shipping lanes	yes	Provides interregional service	Yes	SIS criteria indicated importance of waterway connections to other states and nations
	Or		And		
	Inland interregional waterway with more than 0.25% of total U.S. inland waterway freight traffic	0.04% < 0.25% no	Carries more than 0.05% of total U.S. inland waterway freight traffic	0.04% < 0.05% no	
			And		
			Serves clusters of waterborne transportation-dependant industries located on or adjacent to countries with projected employment growth among the top 25% statewide	Yes	Over 6,700 jobs associated with waterborne transportation industries are clustered in the corridor

EXECUTIVE SUMMARY

Miami River Multi-modal Transportation Plan

The Miami River Commission (MRC) has previously requested that the River be included as a SIS facility. However, the MRC has not yet received a determination from FDOT. The Miami River Multi-modal Transportation Plan recommends that the Miami River Commission meet with FDOT and submit a formal application to be included as a SIS facility that includes this analysis as documentation. SIS designation will make the transportation facilities in the Miami River Corridor eligible for funding opportunities dedicated to the SIS.

Conclusion

The historic Miami River corridor is currently experiencing a renewal, including maintenance dredging, development of thousands of new residential units, riverwalks, restaurants, neighborhoods, parks, recreational boatyards, and international shipping terminals. The Miami River Corridor Multi-Modal Transportation Plan addresses means to increase safety and mobility of freight, pedestrians, transit, and vehicular traffic, while trying to reduce congestion. Implementing this Plan's recommendations are critical to providing the necessary multi-modal transportation infrastructure to accommodate this significant increase of population, commerce and local employment being generated by the Miami River's revitalization.

This study developed a multimodal transportation plan for the Miami River and the area surrounding the Miami River Corridor in Miami-Dade County. Envisioned are alternative modes of transportation including a network of pedestrian, and bicycle facilities, and public transit, which will help to alleviate the traffic congestion on the roads and increase the attractiveness and functionality of the Miami River Corridor. The Plan may be used as a tool for the Congress, State of Florida, Miami-Dade County, City of Miami, and the Miami River Commission to seek the funding to implement the transportation improvements. The Plan demonstrates that the Corridor has a comprehensive vision toward facilitating multimodal transportation opportunities, ultimately achieving the most efficient and attractive Miami River Corridor possible.

The Plan recommends that the Corridor should be examined periodically to assess the status of the implementation of the improvements identified within this Plan. The examination should include an evaluation of project scheduling, associated costs, infrastructure needs, and available funding sources. Based on the findings, the phasing of the projects should be adjusted over time in response to the changing needs of the community and be incorporated into future capital improvement plans.

A Section of the Port of Miami River

Table ES-2: Additional Lower River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

Mouth of River to 5th Street Bridge

Location	Improvement Type	Recommended Improvement
Roadway Improvements		
Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. I-95) indicating major attractions
Brickell Avenue, South Miami Avenue, SW 2nd Avenue, SW 1st Street, West Flagler Street, NW 5th Street	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and dynamic message signs
I-95 Downtown Distributor Ramps	Reconstruction	Study alternatives to replace existing ramp system (PD&E study removed from work program)
NW 4th Street from NW 8th Avenue to NW 9th Avenue	Traffic Flow Modification	Convert to one-way westbound traffic flow, as part of the 5th Street Bridge intersection modification
South River Drive @ NW 5th Street/ NW 8th Avenue/ NW 4th Street	Traffic Flow Modification	Close driveway within the intersection, leaving the east and west driveways serving the adjacent open
North River Drive and Flagler Street (surface street)	Traffic Flow Modification	Install raised median deflectors for traffic calming
Flagler Street from I-95 to North River Drive	Traffic Flow Modification	Continue implementation of 2-way traffic flow (this project has recently been completed)
SW 3rd Street @ S. Miami Avenue	Traffic Flow Modification	Modify intersection to permit eastbound through movement (improvement is under design - to be constructed as part of Riverfront development)
SW 3rd Avenue from SW 6th Street to SW 7th Street	Traffic Flow Modification	Convert to two-way traffic flow
NW 2nd Street and NW 3rd Street	Traffic Flow Modification	Convert the one-way pair to two-way streets from North River Drive to NW 3rd Avenue, where it is already two-way flow
North River Drive @ NW 2nd Street and southbound, north of NW 2nd Street	Signage	Street sign correction, change South River Drive sign to accurately read North River Drive. Add advance warning signage for low bridge clearance at SW 1st Street Bridge
North River Drive northbound @ NW 6th Avenue	Signage	Add advance signage in northbound direction indicating that left-turns are not permitted at NW 7th Avenue
NW 5th Street & NW 6th Street from NW 7th Avenue to NW 4th Avenue	Traffic Flow Modification	Convert the one-way pair to two-way streets and install streetscape improvements
North River Drive, northbound, south of SW 2nd Street	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
North River Drive, southbound, south of NW 5th Street/NW 7th Avenue	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
South River Drive, southbound, south of NW 8th Avenue/NW 4th Street/ 5th Street Bridge intersection	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
SW 4th Avenue, northbound, north of intersection with SW 6th Street	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
SW 2nd Street, westbound, west of intersection with SW 2nd Avenue	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
NW 1st Street from NW 6th Avenue to South River Drive	Traffic Flow Modification	Convert to two-way traffic flow
Transit Improvements		
Metrobus	Service Expansion	Improve service as demand warrants
Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
Metromover	Service Expansion	Extend service hours as development occurs and demand warrants
North River Drive @ West Flagler Street - NB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
North River Drive @ West Flagler Street - SB	Bus Stop	Provide pedestrian level lighting and bench with shelter at bus stop
North River Drive @ NW 2nd Street - NB	Bus Stop	Provide pedestrian level lighting and shelter at bus stop
North River Drive @ NW 2nd Street - SB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
North River Drive @ NW 3rd Street - NB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
North River Drive @ NW 3rd Street - SB	Bus Stop	Provide pedestrian level lighting and shelter at bus stop
Bicycle/Pedestrian Improvements		
Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
Miami River Corridor	Parking	Remove parking meters from sidewalk and replace with "Pay and Display" machines throughout the Corridor
Bridges in Lower River Section	Bicycle Facilities	Install wheel gutters for bicycles at all feasible pedestrian stairs on Brickell Avenue Bridge, SW 2nd Avenue Bridge, SW 1st Street Bridge, Flagler Street Bridge
Brickell Bridge Pedestrian staircase	Sidewalk	Install sidewalk connecting bridge to existing Riverwalk
North River Drive @ NW 5th Avenue/ NW 7th Street	Bicycle Facilities	Install a bike rack at bus stop
Maintenance on south side of River	Signage & Maintenance	Provide proper M-Path signage / and remove fences that restrict M-Path access
SW 7th Street @ SW 1st Court, M-Path	Crosswalk	Install crosswalk for M-Path and improve paved connectivity of M-Path
SW 1st Avenue between SW 7th Street & SW 8th Street	Sidewalk	Widen sidewalk to match sidewalk between SW 8th Street and Brickell Metrorail Station
Fort Dallas Park	Maintenance	Remove fence near the Park which disconnects the surrounding area to the Riverwalk
SW 4th Avenue and SW 4th Street	Crosswalk	Install pedestrian crosswalks at all approaches of the intersection
Beneath South Miami Avenue Bridge	Riverwalk/ On-street	Create riverwalk section connecting One Riverview Square to riverwalk section to the west of the bridge
South River Drive between NW 8th Avenue and NW 2nd Street	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks, specifically at the intersections of South River Drive & NW 2nd Street, NW 3rd Street, NW 7th Avenue and NW 8th Avenue
North River Drive from SW 2nd Street to NW 2nd Street	Sidewalk	Sidewalk along north side of road needs to be replaced and overgrown landscape needs to be removed
North River Drive and Flagler Street (surface street)	Maintenance	Remove chain link fence in front of pedestrian stairs at Flagler Street Bridge and move chain link fence to allow access to sidewalk on south side of street
SW 1st Street Bridge	Pedestrian Facilities	Provide ADA ramps, pedestrian level lighting at stairs, and enhance pedestrian pathway leading to bridge
Flagler Street Bridge	ADA Ramps	Provide ADA ramps
North River Drive from NW 1st Street to NW 3rd Street - west side	Sidewalk	Construct sidewalk, maintain streetscape
North River Drive @ NW 2nd Street	ADA Ramps	Reconstruct existing ADA ramps to feed directly into existing paved crosswalk
North River Drive @ NW 3rd Street	Lighting	Provide pedestrian level lighting adjacent to Lummus Park
North River Drive @ NW 5th Street/NW 7th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps on north leg of the intersection and north side of NW 5th Street/Provide crosswalks on north leg of the intersection

Table ES-3: Additional Middle River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

5th Street Bridge to NW 22nd Avenue

Location	Improvement Type	Recommended Improvement
Roadway Improvements		
Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. SR I-836) indicating major attractions
NW 12th Avenue, NW 17th Avenue, NW 22nd Avenue	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and dynamic message signs
NW 11th Street and NW 10th Street	Traffic Flow Modification	Convert to 2-way traffic flow in front of Culmer Metrorail Station, from NW 8th Street Road to west of Biscayne Boulevard. Include bike lanes, landscape, streetscape, and on-street parking
NW 17th Avenue and SR 836/NW 11th Street	Traffic Flow Modification	Restripe to provide two northbound through lanes on NW 17th Avenue at NW South River Drive, including signage. Widen NW 11th Street to allow for two eastbound lanes.
North River Drive and NW 17th Avenue	Signage	Improved directional signage to SR-836
North River Drive and NW 22nd Avenue	Signage	Install speed limit sign and install new NW 22nd Avenue Street sign
Transit Improvements		
Metrobus	Service Expansion	Improve service as demand warrants
Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
North River Drive and NW 17th Avenue	Bus Stop	Provide pedestrian level lighting
North River Drive and NW 19th Avenue	Bus Stop	Provide pedestrian level lighting and bench with shelter at bus stop
Bicycle/Pedestrian Improvements		
Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
Miami River Corridor	Parking	Remove parking meters from sidewalk and replace with "Pay and Display" machines throughout the Corridor
North River Drive @ NW 14th Avenue/ NW 12th Street	Bicycle Facilities	Install a bike rack at bus stop
North River Drive @ NW 17th Avenue/ NW 14th Street	Bicycle Facilities	Install a bike rack at bus stop
Bridges in Middle River Section	Bicycle Facilities	Install wheel gutters for bicycles at all feasible pedestrian stairs on the new NW 12th Avenue Bridge
North River Drive @ NW 22nd Court	ADA Ramps	Provide ADA ramps
North River Drive @ NW 17th Avenue /NW 14th Street	ADA Ramps/ Signal/ Crosswalks	Provide ADA ramps/ install pedestrian signal heads/ re-stripe crosswalks
North River Drive @ NW 15th Avenue	ADA Ramps/Signal	Provide ADA ramps, install pedestrian signal heads
North River Drive @ NW 14th Avenue/NW 12th Street	ADA Ramps/ Pedestrian Features	Provide ADA ramps, crosswalks and pedestrian refuge
NW 12th Avenue Bridge	ADA Ramps/ Lighting/Maintenance	Provide ADA ramps on bridge/ pedestrian level lighting at stairs/ remove fence south of bridge
North River Drive @ NW 11th Court	ADA Ramps	Provide ADA ramps
North River Drive @ NW 11th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
North River Drive @ NW 10th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
North River Drive @ NW 9th Court	ADA Ramps	Provide ADA ramps
North River Drive from NW 13th Avenue to NW 14th Avenue	Maintenance	Maintain streetscape
South River Drive & NW 17th Avenue	Pedestrian Features	Install pedestrian signalized crossing, pedestrian level lighting and crosswalk
North River Drive @ NW 13th Terrace	Signal	Install pedestrian signalized crossing
NW 22nd Avenue @ NW 14th Street	Crosswalks	Provide crosswalks
Durham Park @ NW 13th Street	Crosswalks	Provide crosswalks
North River Drive @ NW 22nd Avenue (surface street)	ADA Ramps	Provide ADA ramps and sign warning of staircase on east side of bridge
South River Drive @ NW 15th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
South River Drive @ NW 14th Court	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
South River Drive @ NW 11th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks

Table ES-4: Additional Upper River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

NW 22nd Avenue to NW 36th Avenue

Location	Improvement Type	Recommended Improvement
Roadway Improvements		
Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. SR 112) indicating major attractions
NW 27th Avenue Bridge	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and dynamic message signs
North River Drive @ NW 36th Street	Signal/Maintenance/ Signage	Re-hang signal heads on span wire, replace broken guardrail, resurface, add overhead North River Drive sign, and replace broken signs/add gateway signs for entrance into the Miami River Corridor
South River Drive @ NW 36th Street	Signal	Install gateway signs for entrance into the Miami River Corridor
North River Drive between NW 36th Street and NW 27th Avenue	Maintenance	Resurface roadway
South River Drive between NW 36th Street and NW 28th Street	Lighting/Maintenance	Install street lights, repair storm drain, resurface and grade shoulder
Transit Improvements		
Metrobus, Metromover and Metrorail	Service Expansion	Improve service as demand warrants
Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
North River Drive @ NW 21st Street	Bus Stop	Provide pedestrian level lighting and benches at bus stop on northbound and southbound sides
North River Drive @ NW 21st Terrace	Bus Stop	Provide pedestrian level lighting and benches at bus stop on northbound side
North River Drive @ NW 30th Avenue	Bus Stop	Provide pedestrian level lighting and benches at bus stop on southbound side
Freight Improvements		
Implement Short Seas Shipping Plan (1)	Major Marine Industrial Related Facility	Potential sites include:(1) vacant 8-acre parcel east of NW 37th Avenue ,(2) west of South Florida Rail Corridor Crossing, and (3) public right-of-way adjacent/beneath proposed Metrorail
Bicycle/Pedestrian Improvements		
Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
Bicycle/ Pedestrian connector from MIC to Greenway	Bicycle Facilities	Establish connectivity between MIC and Miami River Greenway
North River Drive @ NW 20th Street/ NW 27th Avenue	Signal	Install pedestrian signalized crossing
North River Drive @ NW 32nd Avenue	Signal/ Crosswalk	Repair existing pedestrian signal heads and crosswalk between NW 32nd Avenue and NW 26th Street
North River Drive @ NW 36th Street	Signal	Replace existing pedestrian signal heads
North River Drive between NW 36th Street and NW 27th Avenue	ADA/Maintenance	Provide ADA ramps and repair and reconstruct sidewalk

Note:
(1) Short Seas Shipping consists of transporting cargo containers from the Port of Miami to a new facility in the Port of Miami River where the containers would be transferred to trucks or rail.

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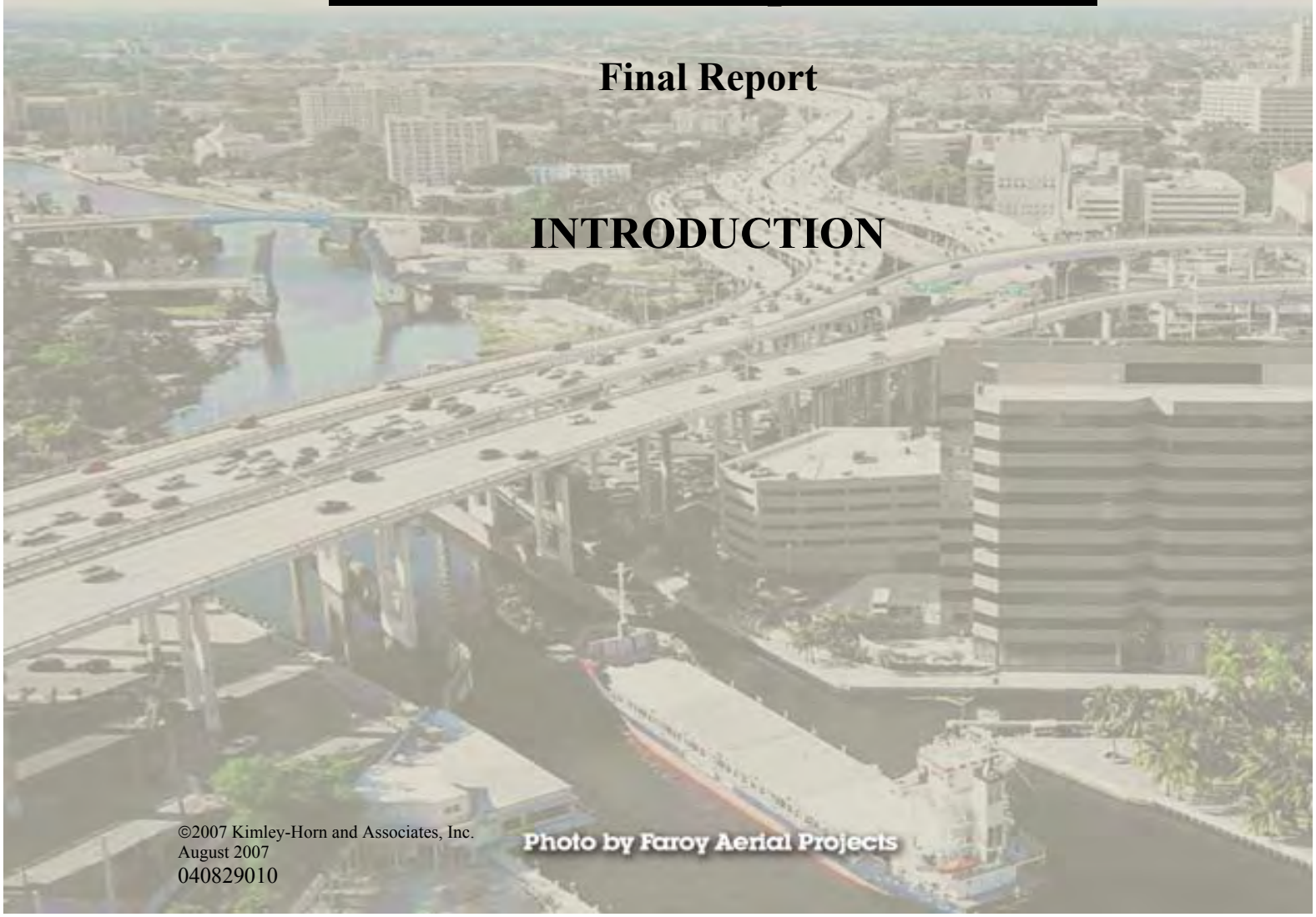

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MIAMI-DADE MPO Metropolitan Planning Organization

Miami River Commission

INTRODUCTION

The historic Miami River corridor is currently experiencing a renewal, including maintenance dredging, development of thousands of new residential units, riverwalks, restaurants, neighborhoods, parks, recreational boatyards, and international shipping terminals. The Miami River Corridor Multi-Modal Transportation Plan identifies means to increase safety and mobility of freight, pedestrians, transit, and vehicular traffic; therefore, helping to alleviate congestion. Implementing this Plan's recommendations are critical to providing the necessary multi-modal transportation infrastructure to accommodate this significant increase of population, international trade, commerce, and local employment being generated by the Miami River's revitalization.

The Miami River is the historical lifeblood of Miami's commerce and trade. The community that would later become Miami first settled on the Miami River and then expanded along the River. As Miami grew in the early 1900s, the River quickly became a working river. The Florida East Coast (FEC) Railroad constructed warehouse and dock facilities to serve Miami's growing trade and provide connections between the River and the railroad. Eventually, boat building and marine repair enterprises prospered along the busy river.

In addition to industrial activities that were established along the Miami River, recreational, residential, and transportation uses also were developed. In 1905, City Park (now Lummus Park, which is recognized as the City's oldest park) was created on the north bank of the River. Early homes were built along the River for convenience and larger residential neighborhoods were built over time to support the industrial employment along the River. A street network soon developed along the River to serve land-based travel modes. From 1909 to 1933, the River was lengthened and widened to support navigation and growing development.

By the late 1930s, the Miami River was roughly in its present configuration as a 5.5-mile navigable channel. Today, the River remains an economically critical artery of commerce between Miami International Airport and Biscayne Bay. This working river has evolved into an exotic, vital urban waterscape flowing through the heart of the City of Miami.

Years of pollution and socioeconomic change have taken their toll on the River. In 1998 the Florida Legislature created the Miami River Commission (MRC), with an 18 member board, to work towards improving the blighted Miami River corridor. In 2000, the Legislature asked the MRC, City of Miami, and Miami-Dade County to create the Miami River Corridor Urban Infill Plan, in part to plan for future infill development within portions of the area which includes Miami's urban core. Today, there are over 15,000 new residential units either recently completed, under construction or in final permitting, within over 50 new buildings along the Miami River. In addition, the Miami River rivals Tampa as the fourth largest port in the state, generating 6,700 jobs, $805 million in economic output, $406 million in economic income, and $44 million in tax revenues.

The objective of the Miami River Corridor Multi-modal Transportation Plan is to asses existing transportation conditions, to recommend multi-modal transportation projects, and to identify potential funding sources to accommodate the transportation needs for new residential growth along the Miami River Corridor, which is expected to generate approximately 45,000 new vehicular trips per day. The study corridor extends one-quarter mile on either side of the River. The salinity dam just south of NW 36th Street, where water from the Miami Canal flows into the River, is the northwestern edge of the study area. The mouth of the Miami River in Downtown Miami, where the River flows into Biscayne Bay between SE 3rd Street and SE 5th Street, is the southeastern edge of the study area. Purposes for conducting this study include the following.

- To summarize planned improvements.
- To recommend new projects to improve access and mobility along the River.
- To evaluate the River as a potential Strategic Intermodal System (SIS) facility.

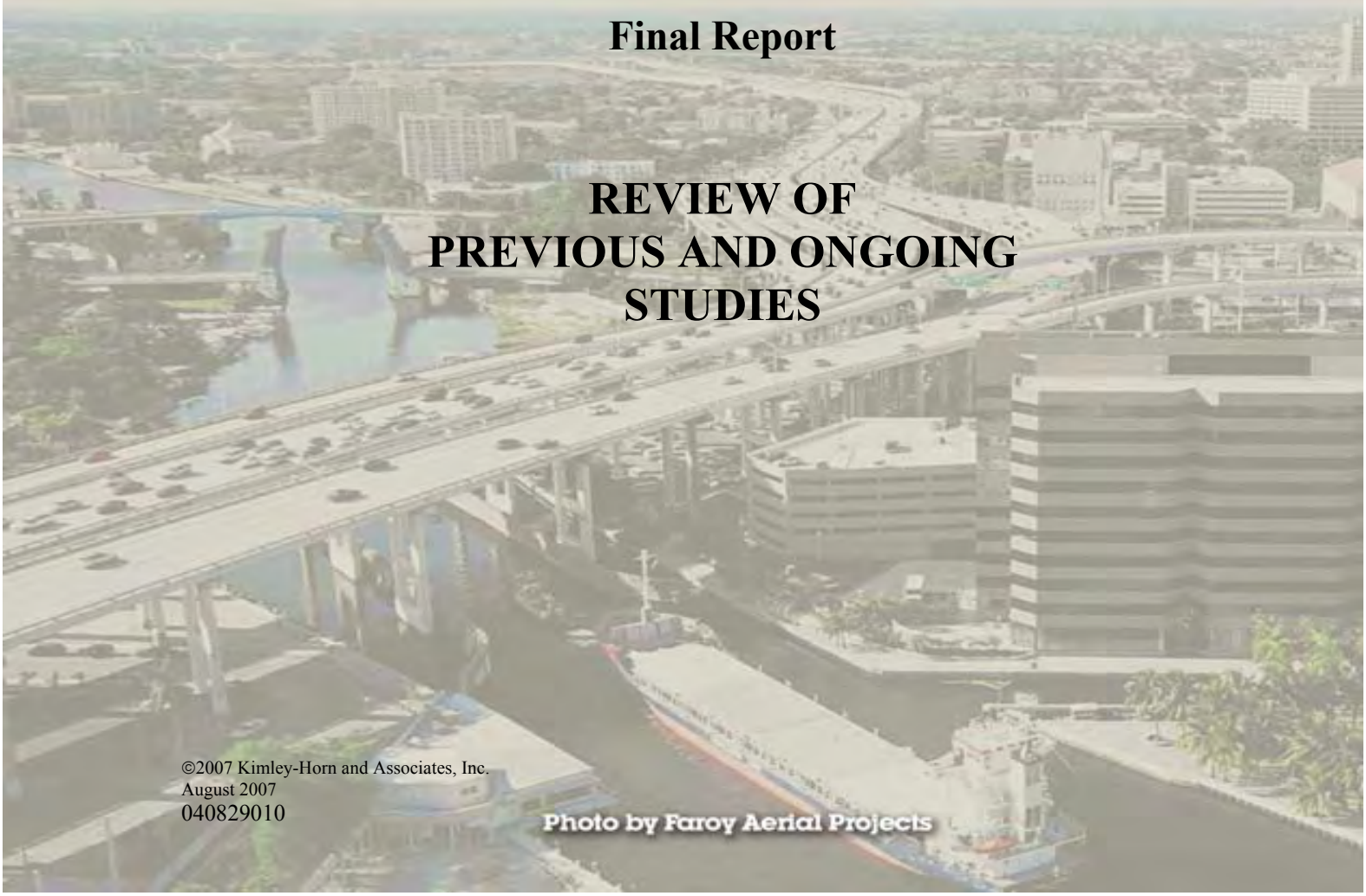
Given the importance of the River and its impact on surrounding activity, it is critical to consider many different modes of transportation. Land based transportation modes included in this study are pedestrian, bicycle, transit, automobile (roadway), and freight and goods movement. Water-based modes are considered for commercial freight operations and for the potential to provide waterborne transit service.

This Plan is generally divided into three components – existing conditions analysis, identification of recommended improvements, and Strategic Intermodal System (SIS) evaluation. The final report is a compilation of the technical memoranda produced for this Plan. The documentation for this Plan also includes several PowerPoint presentations developed throughout the course of the study for audiences such as the Study Advisory Committee (SAC) organized for this project, Miami-Dade Metropolitan Planning Organization's (MPO), the Transportation Planning Council (TPC), and the Miami River Commission (MRC).

Miami River Corridor
Multi-modal Transportation Plan

Final Report

REVIEW OF PREVIOUS AND ONGOING STUDIES



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REVIEW OF PREVIOUS AND ONGOING STUDIES

Relevant studies, plans, and programs have been reviewed to determine the status of proposed improvements within the Miami River Corridor and to determine the potential for enhancing multimodal connectivity. Please note that several of these studies are available on the internet. The website addresses for these studies have been provided in Appendix A. The studies that were reviewed are summarized below.

Miami Downtown Transportation Master Plan

The Miami Downtown Transportation Master Plan was completed in April 2003 for the City of Miami, Miami-Dade MPO, and Florida Department of Transportation (FDOT) District 6. This report was prepared by David Plummer & Associates, Leftwich Consulting, MRD Consulting, and Precision Engineering & Surveying. The Miami Downtown Transportation Master Plan (MDTMP) focuses on multiple modes of transportation to help resolve mobility issues for Downtown Miami and better connect neighborhoods to this area. The MDTMP recommends transportation system improvements needed to realize the vision of a Downtown Miami that is a unique, progressive, and vibrant place in which to work, live, and play–into reality.

The study area for the MDTMP extends from I-95 east to Biscayne Bay, and from I-195 south to SE 26th Road. Three development scenarios were examined: (1) the 2020 Baseline projection of "expected" growth anticipated by Miami-Dade County demographers, (2) the 2020 Enhanced projection which is a more aggressive growth scenario based on development trends in the downtown area over the past five to 10 years, and (3) the 2020 Visionary projection, which is the most aggressive growth scenario that includes approximately 48,000 more employees and 34,000 more dwelling units in the primary study area in comparison to 1999.

The MDTMP proposes a series of transit improvements, supplemented by roadway congestion treatments and the creation of a pedestrian-oriented environment for the Downtown Miami area. Improvements to facilities for alternative modes of travel like bicycles, mopeds, and waterborne transportation are introduced in the MDTMP to achieve a truly multimodal transportation system.

The MDTMP offers conceptual approaches and broad strategies, but it also provides recommendations for specific projects where appropriate.

Some of the improvements are directly related to the Miami River including the following:

- *Implement the recommendations from the Miami River Greenway Action Plan*:
- *Build a new tunnel under the Miami River at SW 1st Avenue:*

This recommendation provides a tunnel under the Miami River from SW 7/8th Street to SW 3rd Street. The tunnel will provide an alternate route to cross the Miami River when ships are traversing the area.

- *Implement Intelligent Transportation System (ITS) technology alternatives to help with bridge openings:*

The concept of this recommendation is to provide an integrated communication system that would warn motorists well in advance (both in distance and time) of the impending opening of each bridge.

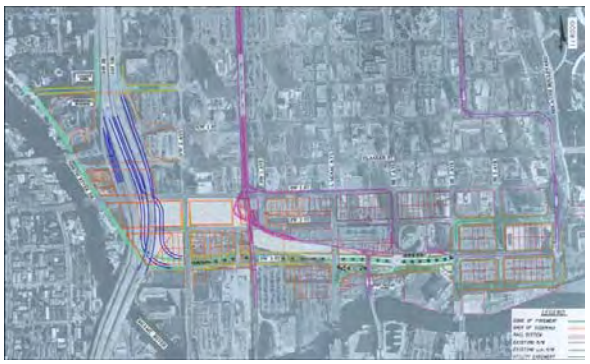
- *Provide a pedestrian walkway along Biscayne Bay from Pace Park to Bayside:* The goal is a continuous baywalk along Biscayne Bay from Pace Park to the Miami River, where the riverwalk would then continue west.
- *Extend SE 1st Avenue from SE 8th Street to SE 5th Street:* There are four city blocks in the Brickell area bounded by the Miami River and by the major arteries Brickell Avenue, SE 8th Street, and Miami Avenue. The proposed extension of SE 1st Avenue will relieve the traffic loadings on Brickell Avenue and simplify circulation in the area for buildings both south and north of SE 8th Street.

- *Widen and extend West 1st Avenue:*

The proposed improvements to West 1st Avenue include widening it to a four-lane divided arterial from NW 10th Street to NW 14th Street and extending the roadway south from SW 1st Street to the proposed tunnel under the Miami River.

- *Improve bicycle facilities:*

The M-Path is one of few bicycle facilities outside of parks in Miami-Dade County that is physically separated from traffic lanes. It extends most of the length of the Metrorail's south line beginning at the Miami River. Plans to extend the Busway to Florida City will further extend the M-Path, making it the longest continuous bike path in South Florida. This facility has potential for bicycle commuting trips and for connections to the Miami River corridor.



- *Remove I-95 Distributor Ramps and provide a "Grand Boulevard" on South 3rd Street*:

Through the removal of the ramps, a more cohesive development of the area near the Miami River could be promoted.

- *Provide a Brickell Key Water Taxi:*

One connection that is particularly attractive for water taxi/ferry service is between Brickell Key and the Central Business District (CBD). This connection would allow many trips to cross the river unimpeded and travelers could walk to their final destination in the CBD. Access to the rest of the Miami-Dade County would thus be greatly facilitated.

- *Provide a Water Taxi/Ferry to Watson Island:* The potential for a waterborne connection seems a viable necessary means of making this destination more accessible while further strengthening the relationship between Watson Island and Downtown Miami.

Service Plan Development for Waterborne Transportation Service in Miami-Dade County

The Development of a Service Plan for Waterborne Transportation Service in Miami-Dade County was prepared by Kimley-Horn and Associates in partnership with the Miami-Dade County Metropolitan Planning Organization (MPO). This report proposes to integrate a potential waterborne transportation system using low-wash catamaran ferries into the County's larger transportation system. It provides a service plan that addresses many pertinent issues related to waterborne transit implementation. The study also develops a route structure and service characteristics that are intended to provide service adequate to attract local commuters and provide visitors and tourists with an attractive transit alternative. A "Phase I" route structure was developed that included catamaran ferry routes within Biscayne Bay, and a water bus circulator system within the Miami River east of I-95, Bayfront Park, Bayside, and Brickell. The water bus circulator system would operate with smaller vessels and seating capacities that could range from 20 to 50 passengers. The service is proposed to integrate with Metrobus routes and Metromover.

Additionally, if water transit in Miami-Dade County proves to be successful, the system may be expanded beyond the initial "Phase 1" routes within Biscayne Bay to include other routes or extensions of existing routes, and more frequent services for routes not requiring drawbridge openings. Among projects proposed in "Phase 2," there is a primary ferry route along the Miami River to potentially connect to the Miami Intermodal Center (MIC). The Miami River ferry would also serve the Civic Center area and provide waterborne access to the Orange Bowl for special events.

Utilization of Miami-Dade County Waterways for Urban Commuting Travel

Utilization of Miami-Dade County Waterways for Urban Commuting Travel was completed in February 2003 by Gannett Fleming in coordination with Civil Works, Inc. and the Miami-Dade MPO. This report assesses the feasibility of using existing waterways within the Urban Growth Boundary of Miami-Dade County for commuter travel. This report was a predecessor of the study "Development of a Service Plan for Waterborne Transportation Service in Miami-Dade County." Utilization of Miami-Dade County Waterways for Urban Commuting Travel evaluates the physical and operating constraints and opportunities for the provision of urban commuting transportation on the waterways in Miami-Dade County. The study concludes that there are opportunities for service with transportation benefits and recommends further study for waterborne service routes evaluated in the study.

City of Miami Initial Streetcar Corridor Feasibility Study

The final report for the Miami Streetcar Initial Corridor Feasibility Study was completed in April 2005. The study area for this project is bounded by the Miami River, Miami Avenue (including Government Center), NE 79th Street and Biscayne Boulevard. The proposed project is intended to provide attractive and reliable transit connections between Downtown Miami and redevelopment

areas through the use of streetcars. The proposed project can operate on segments of selected roadway corridors without adversely impacting traffic flow, parking facilities, business operations, and other corridor characteristics. The recommended initial Phase I for streetcar service connects Downtown Miami to the Miami Design District and Buena Vista East Historic District, primarily via NE 2nd Avenue.

The recommended alignment will provide streetcar service in both directions, with stops located approximately every two to five blocks. This alignment effectively connects existing urban development in the downtown core with major destinations such as the Government Center, Miami-Dade Community College, Performing Arts Center, the Entertainment District, the planned Museum Park, Midtown Miami and the Miami Design District and Buena Vista East Historic District. The recommended alignment is fully integrated with the proposed Bay Link streetcar line being planned to connect Downtown Miami with Miami Beach to provide enhanced circulation within the downtown areas of both cities. By seamlessly expanding the possible trips which can utilize streetcars, the effectiveness and efficiency of both projects will be improved. The integration of these two projects will also allow the use of a joint maintenance and operations facility, again with cost and efficiency benefits.

There are multiple possibilities for future extensions of streetcar service, splitting from NE 2nd Avenue corridor at various points and from the downtown loop in several directions. Potential extensions include a line to the Civic Center area, with southern stops adjacent to the new dense riverfront developments. These potential extensions would only occur, however, after the initial line is built and opened. Figure 1 shows the most recent alignment of the Miami Streetcar.

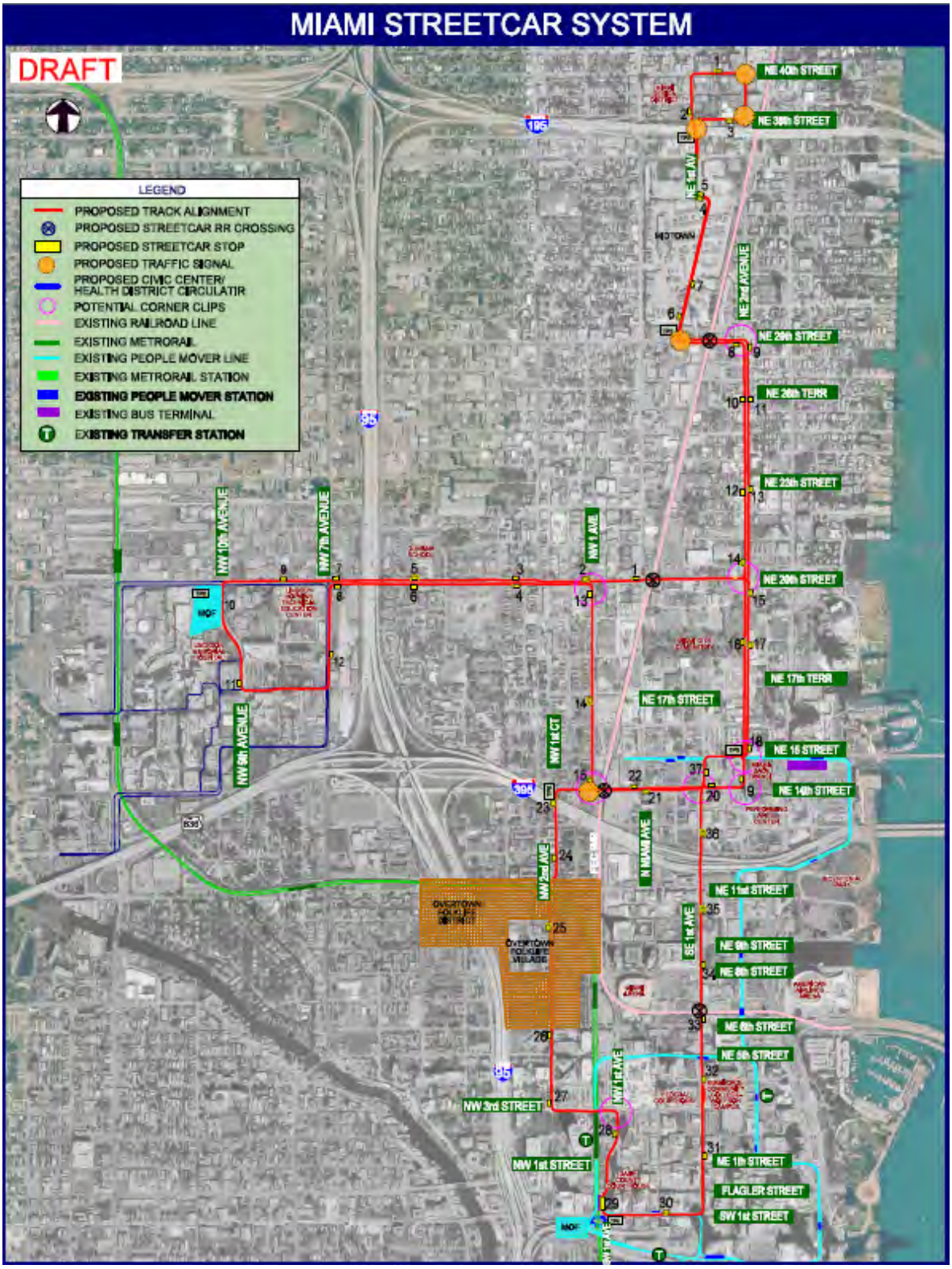


Figure 1: Most Recent Alignment of the Miami Streetcar

Miami River Tunnel Feasibility Report

The Miami River Tunnel Feasibility Report was prepared as a component of the Miami River Tunnel Feasibility Study to assist the City of Miami in identifying the feasibility of the project. The study was conducted in coordination with Miami-Dade County, Florida Department of Transportation (FDOT) and the Florida Turnpike Enterprise. This report includes all the engineering assumptions, design criteria, and the environmental data and analyses that support the engineering and environmental decisions for the Miami River Tunnel Feasibility Study. Also, this report presents the analyses conducted, describes the evaluation results and documents the recommendations.

The project is a study to evaluate a multi-lane tunnel under the Miami River from SW 1st Street to SW 8th Street, between SW 2nd Avenue and Miami Avenue. The study evaluated viable tunnel alignments and construction methods along with the associated environmental impacts. The study also considered viable bridge alignments. The project study area is bounded on the north by SW 1st Street, on the east by Miami Avenue, on the south by SW 8th Street, and on the west by SW 2nd Avenue.

The study determined that a tunnel could be constructed under the Miami River to connect SW 8th Street to SW 1st Street within the project study area. Three viable tunnel alignments were identified and evaluated along with various tunnel construction methods. The viable alternatives present no fatal flaws from a constructability or environmental perspective. However, the tunnel would be constructed at considerable costs, with minimal traffic benefits. These conclusions should be considered when determining the ultimate feasibility of the Miami River Tunnel.

Miami River Greenway Action Plan

The Miami River Greenway project was prepared by Greenways Incorporated in partnership with the Trust for Public Land for the Miami River Commission. The study area extends from the salinity dam located at approximately NW 36th Street to the mouth of the river at Biscayne Bay. This Greenway Plan envisions the Miami River's potential as a vital community resource.

From stakeholder meetings and an inventory of existing conditions, it was determined that there are different themes within the Miami River corridor that define the unique features, cultural influences and physical conditions of the River. The themes identified are listed below.

- *"The Miami River is our Home"* – The Miami River is home to a multi-cultural population, but currently, few gateways exist to encourage either visual or physical interaction with the River.
- *"The Miami River is a Working River"* – The Miami River is an international transfer point of cargo. The River constitutes one of the largest employers in Downtown Miami. The industrial complex along the River has grown steadily during the past fifty years.
- *"The Miami River is a Destination Landscape"* – The proposed Miami River Greenway and the long standing Miami Riverwalk are the key elements to creating a successful destination landscape along the River.
- *"The Miami River is an Environmental Resource at Risk"* – Even though the Miami River is polluted and supports a large industrial marine use, the river ecosystem remains an important functional element of the River. With mutual support for both industrial and recreational uses, the Miami River can continue to be a valuable natural resource for Miami and South Florida.
- *"The Miami River is an Economic Resource"* – After international trade, travel and tourism is the most important industry to the Miami economy. The Miami River landscape has not realized the full benefits of the tourism industry. The greenway will make the River's landscape accessible, attractive and connected.
- *"The Miami River is Part of Our Heritage"* – There are many important sites and features along the River that should be identified and interpreted. The greenway can become a land use that supports the interpretation of this heritage, providing pedestrian and water-based access to sites along the river corridor.

Key recommendations in the Miami River Greenway Action Plan include five (5) primary elements:

1. Points of public entry to the River.
2. A primary system of public trails and walkways.
3. Improvements and enhancements to existing parks.
4. Improvements and enhancements to existing bridges and roadways
5. Improvements and enhancements to river channel banks.

The most significant recommendation within this plan is for the completion of a comprehensive network of trails, bikeways, and walkways adjacent to the river corridor. Different segments of the greenway are anticipated to have different cross-sections as appropriate for the area. For example, for a shared pathway and promenade a minimum 20-foot (22-foot preferred) riverwalk, consisting of a 16-foot wide unobstructed pedestrian path with an additional four-foot passive zone featuring landscaping, benches, decorative lighting, wayfinding signage, etc. For a divided pathway and promenade, a 12-foot minimum width is recommended for the multi-purpose trail with a 10-foot minimum width for the pedestrian promenade.

Several projects that will create new facilities and improve the existing facilities are identified along the River. The Miami River Greenway system will be a riverwalk where feasible, and continue around marine industrial businesses and low-density residential area as an on-road Greenway with widened ADA compliant sidewalks, additional landscaping, benches, wayfinding signage, bike racks, historic markers, etc. The principal foundation of these recommendations is that the Greenway will be developed on public property and will not involve the condemnation of private property for greenway purposes.

The implementation of the greenway that is recommended in this Action Plan will be accomplished over the course of many years. At the time this plan was developed, it was estimated that the total cost of these improvements would exceed $23 million. Public and private sector sources were identified within the Action Plan. Possible implementation of a Special Tax

Increment Financing District is being considered for the river corridor, where tax revenue collected within the river corridor would be earmarked and used to fund the improvements to the River.

The Miami River Greenway Action Plan recommends the Miami River Commission as facilitator and coordinator of the greenway since a survey revealed that local residents prefer a public-private organization. Also, it was recommended to give consideration to creation of a Riverfront Corporation to help with the greenway coordination. The City of Miami, Miami-Dade County, the State of Florida and property owners will play important roles in advancing the development and management of facilities along the Miami River.

Bicycle Safety Program Plan Report

The Miami-Dade Metropolitan Planning Organization (MPO) developed a Geographic Information Systems (GIS) database of reported traffic crashes involving over 4,500 bicycle crash records for the years 1996 to 2002. The objective of this study was to use software developed for the Federal Highway Administration (FHWA) to identify common crash types occurring at locations throughout the County and develop countermeasures to address the physical conditions and bicyclist or driver behaviors at these locations to enhance safety for cyclists.

The study advisory committee was comprised of representatives of 10 local agencies that work within the bicycle safety arena including the County, police departments, hospitals, transportation agencies and the local bicycle advocacy group. Geographic analysis was used to identify areas where high densities of crashes were occurring. The study team visited a total of 22 crash hotspots throughout the County to carefully review site conditions with reference to the individual crash reports and developed engineering and programmatic countermeasures for implementation to enhance bicycle safety. The study found that physical treatments were applicable in approximately 50 percent of the high crash locations identified and that education and enforcement programs – aimed at both cyclists and drivers – would be needed in combination with engineering treatments to address the safety issues.

Behaviors that contributed to the bicycle crashes commonly included:

- Failure to adhere to signals and traffic control signs (both cyclists and drivers),
- Riding against traffic,
- Riding on sidewalks,
- Riding at night without lights, and
- Failure to yield to bicyclists (and pedestrians).

Recommendations for high-speed roads included:

- The addition of bike lanes
- Consider the shared line symbol when there is insufficient space to provide a bike lane
- If there is no practical treatment which can be applied to a high volume, high speed roadway, and an alternative low volume, low-speed route is available, this alternative route should be considered for route signage.

Recommendations for lower-speed roads (usually residential streets):

- The addition of bike lanes on collector roads
- Shared-use lane symbols – adjacent to on-street parking
- Appropriate signs
- Traffic calming treatments: curb extensions, mini-circles, contrasting shoulders, speed pillows (these are speed humps with a passage for bicyclists), chicanes, and choke points

Some additional potential engineering treatments were identified that may improve bicycle safety conditions at locations throughout Miami-Dade County and were considered for the locations identified in this study.

- Pavement surface treatments
- Lighting enhancements
- Drainage improvements
- Access control
- Advance bicycle stop bar
- Bicycle signal/detector
- No right-turn, or yield to pedestrians in crosswalk signs

Implementation of the physical, educational, and enforcement countermeasures should be the shared responsibility of County and local governments, schools, and local community organizations representing the people that are affected by bicycle crashes.

Florida Intracoastal and Inland Waterway Study

The Florida Intracoastal and Inland Waterway Study was completed for Florida Department of Transportation Seaport Office in May 2003 in cooperation with Wilbur Smith Associates, CH2M HILL, Nick Serianni, and Earth Tech. The purpose of this initial Florida Intracoastal and Inland Waterway Study was to document for the first time the importance of the navigable waterways and intracoastal system to the state's commercial activities; to inventory the operators and commodities currently utilizing the system; to identify primary commodities transported by the system; to highlight existing major impediments that restrict commercial use of the state's intracoastal and navigable waterways; to document the key waterside connection points of the shallow draft network with the landside transportation system; and to map the key features of Florida's intracoastal and inland waterway system. A future Phase II effort will most likely focus on the feasibility of enhancing the existing system and identifying critical needs and suggesting strategies for effecting improvements necessary to efficiently link the shallow draft system to landside transportation. Emphasis also will be placed on land side congestion mitigation through the use of barge transportation where proven practical and economically feasible.

According to this preliminary study, the build-up of contaminated sediments in the River's Federal Navigable Channel was significantly impeding navigation. The Miami River's international shipping vessels have been unable to fill cargo to full capacity, while larger mega-yachts are

unable to navigate the River to its numerous historic recreational boatyards for service. In addition, maintenance dredging will improve the natural environment of both the Miami River and Biscayne Bay.

Reconstruction Cost Comparison for the 12th and 27th Avenue.Bridges Over the Miami River

Comparing Cost of Options for Reconstructing the 12th and 27th Avenue Bridges over the Miami River was completed in February 2003 by Everglades Economics. It was prepared for the Miami River Commission. This report is not a comprehensive engineering study, but rather an effort to assess whether or not a tunnel can plausibly be a cost-effective competitive option to a bascule bridge.

According to the report, viewing the costs from a total 70-year life cycle perspective changes the calculations dramatically. While ordinary operating costs for the bridge and tunnel options may not be significantly different, the bridge solutions will likely require major rehabilitation every 20 years, at a cost equal to 40 percent of the original capital expenditure. Even more significantly, the bridge solutions continue the congestion delays generated by daily openings to accommodate commercial and recreational vessels. Quantifying these two cost considerations, which play out over the 70-year expected life of the crossings, more than reverses the initial capital cost disadvantage of the tunnels and demonstrates that the tunnels can be slightly less expensive solutions over the entire time period. Using a 100-year project life identifies a larger life-cycle cost advantage for the tunnel alternative, while using a 50-year project life identifies a small cost advantage for the bridge alternative. The findings indicate that on a life-cycle basis, bridges and tunnels compare more closely on an economic basis than if only initial project costs are considered.

The report states that economic evaluations based on total life-cycle costs are more appropriate than economic evaluations based on initial capital expenditures, and it concludes that both tunnel and bascule bridge options should be considered as viable options in the more detailed planning that should be undertaken to decide a course of action.

Approach to Public Investment Decisions

This report was completed in July 2005 by United States Government Accountability Office (GAO) per request of the Senate Committee on Commerce, Science, and Transportation and the House Committee on Transportation and Infrastructure. This study is a literature review of public- and private-sector reports and studies related to freight mobility issues and the waterborne transport of goods, and included interviews of known short sea shipping experts in the public and private sectors.

The Department of Transportation has established short sea shipping as a high priority component of the federal freight transportation strategy and has drafted a policy proposal to provide targeted incentives for short sea shipping projects. The Department of Transportation is already contemplating a potential role for the federal government; it has developed policy proposals that would include short sea shipping as a central component of increased federal investment in the maritime sector.

As the federal role is being defined and clarified, public transportation decision makers at the state and local levels are also actively considering short sea shipping and other options to address the freight mobility challenges affecting their jurisdictions. Increased funding constraints and compartmentalized funding programs, however, create challenges for public decision makers in setting transportation priorities and allocating resources to ensure that limited public dollars are wisely and effectively spent. This study developed a four-step approach that may be helpful for the public decision makers at all levels—federal, state, and local.

- The first step of the approach involves determining whether public support for a proposed project is warranted by considering whether it is expected to produce public benefits, such as reduced congestion, improved air quality, and economic development opportunities.
- The second step involves an analysis of the costs and expected benefits of the proposed project to determine if the project is the most cost-effective option among alternatives.
- The third step of the approach involves determining the level and type of public support to be provided.

- The final step involves the evaluation of ongoing and completed projects to determine if intended benefits have been achieved and to hold decision-makers accountable for their public investment decisions.

The study recommends that the Secretary of Transportation and the Administrator, Maritime Administration (1) ensure that a comprehensive understanding of key issues is developed before defining a federal role that would involve any substantial federal investment in short sea shipping projects and (2) use current mechanisms to encourage decision makers at all levels to take a more systematic approach to making decisions about freight mobility projects. In commenting on a draft of this report, the Department of Transportation generally agreed with its contents, and agreed with the recommendations.

Miami Civic Center Circulator Study

This report was completed in February 2006 by the Corradino Group. It was submitted to the City of Miami and the Miami Partnership. The Civic Center Implementation Plan encompasses studies of a transit circulator, wayfinding, gateways, and streetscape design. This report presents the results of Phase I of the Civic Center Circulator Study.

The planning process for this study included workshops with representatives of stakeholders in the Civic Center study area, a survey of people in the study area, and meetings with agencies and organizations. As a result of this work, it was determined that development of a circulator service was desirable. A consensus alternative was identified (Figure 2). The two-way loop is perceived as a bus or rubber-tired trolley vehicle operating on public right-of-way. The "tram" would be similar to those found in Disney World and Key West and operate principally on service drives and pedestrian pathways.

According to the report, a viable transit circulator can be established to enhance transportation opportunities at the Civic Center, contribute to the alleviation of parking and traffic concerns, and support the use of Metrorail and other non-single occupancy vehicles as primary transportation options for employees, residents, and visitors of the Civic Center.

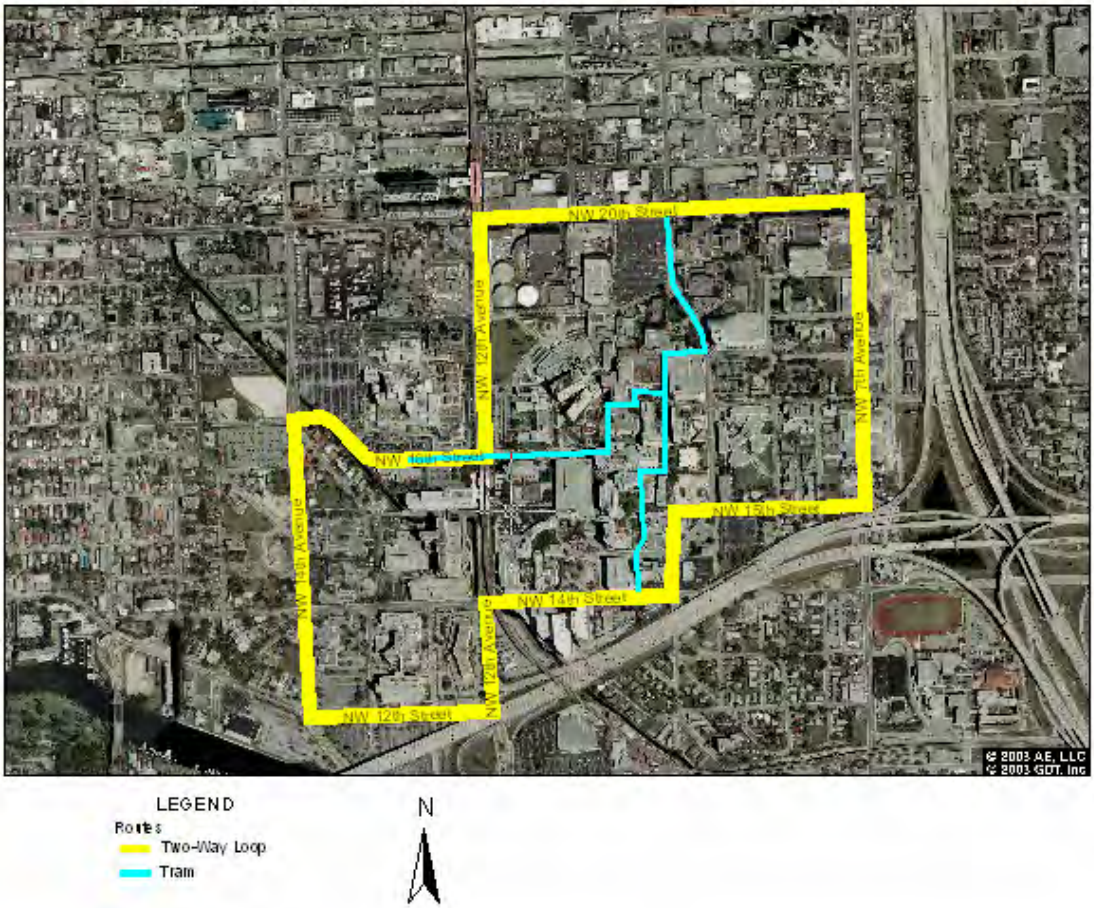


Figure 2: Consensus Alternative - Miami Civic Center Circulator Study

Miami River Corridor Urban Infill Plan

The Florida Legislature's 2000 Miami River Improvement Act asked the MRC, City and County to create the Miami River Corridor Urban Infill Plan. Under a Joint Planning Agreement and Memorandum of Understanding, the Plan was created through a two-year, 42-public hearing planning process. The Miami River Corridor Urban Infill Plan was recognized with an "Award of Excellence" from the American Society of Landscape Architects Florida Chapter in 2003, and the "Community Steward Award" for implementing the Plan from the 1000 Friends of Florida in 2005.

The Miami River Corridor Urban Infill Plan contains 71 "implementation steps" within the following categories:

- Dredging
- Greenways
- Transportation
- Neighborhoods and Improvements
- River Environment
- Investment in the River
- Governance
- Planning and Zoning

The Plan visions the Miami River in three sections, partially based on existing conditions and uses. The "Lower River" (Biscayne Bay to the NW 5th Street Bridge) includes downtown and the central business district. The "Lower River" is redeveloping with predominantly high density mixed-use projects consistent with the City Charter requiring 50-foot setbacks and publicly accessible riverwalks. The "Middle River" (NW 5th Street Bridge to the NW 22nd Avenue Bridge) is a mixed- use transitional zone including the historic low-density Spring Garden, Grove Park and Durham Park neighborhoods; marine industrial businesses; parks; and redevelopment supporting the Civic Center and its 26,000 employees. The "Upper River" (NW 22nd Avenue Bridge to the Salinity Dam) is the heart of the Miami River's marine industry.

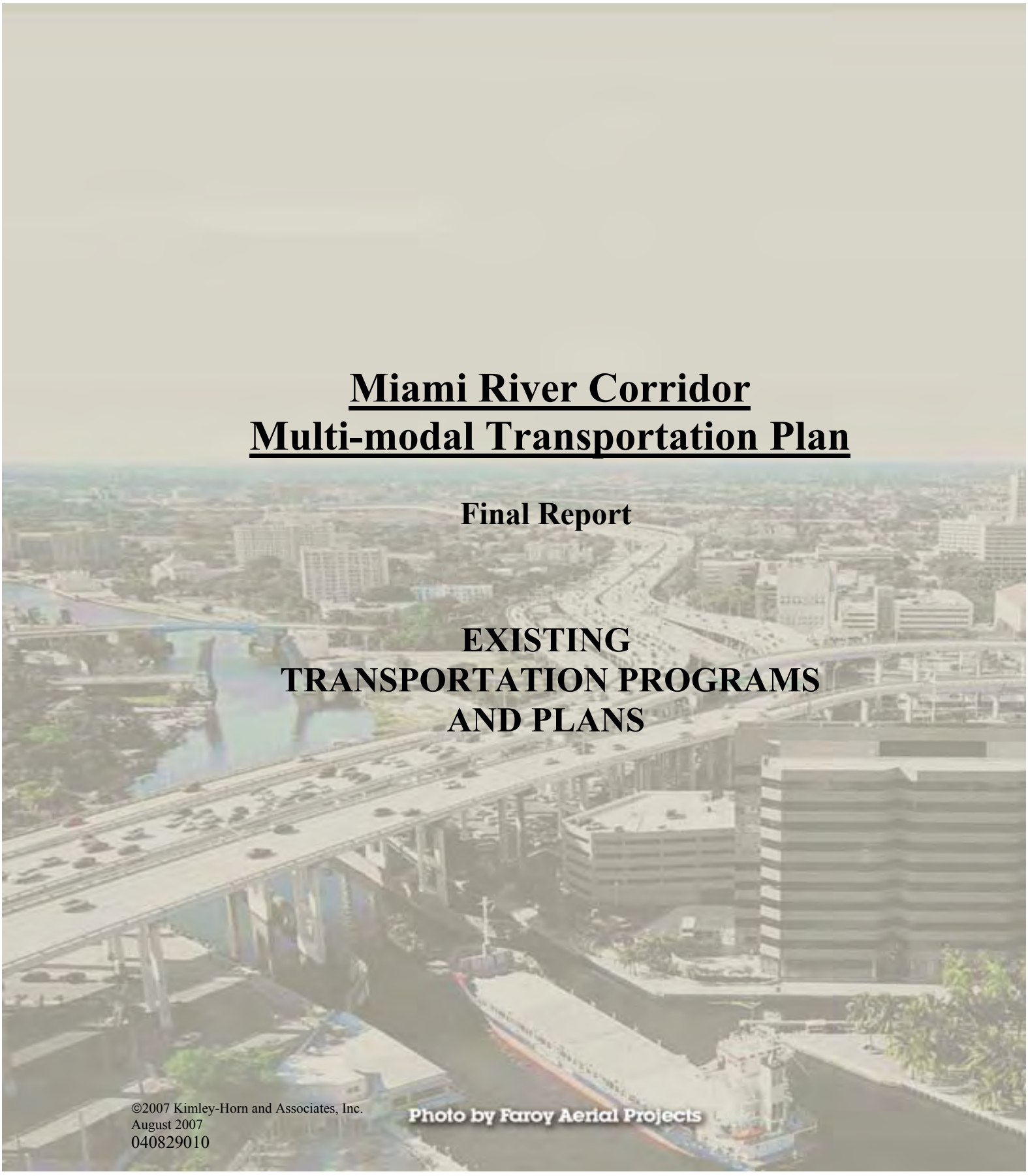
The Plan requires a public process to create an "Annual Update" on its implementation and allow the opportunity for amendments. The "3rd Annual Update" classified 60 of the 71 implementation steps as "Completed" or "Ongoing with Significant Progress," including commencing the Miami River maintenance dredging project in partnership between the City of Miami, Miami-Dade County, State of Florida, Florida Inland Navigation District, Congress, and the US Army Corps of Engineers. Dredging will allow the River's shipping vessels to fill cargo to full capacity and navigate regardless of tide for the first time in decades. Other steps include the creation of the Miami River Greenway and several new parks, increased tree canopy, new mixed-use and mixed

income redevelopment, etc. In only three years since its adoption, the public and private sectors have used the Miami River Corridor Urban Infill Plan in planning over 15,000 residential units (including 14 Major Use Special Permits) along the River's shores. The Plan included various multi-modal transportation improvement recommendations, which this Miami River Corridor Multi-Modal Transportation Plan will further analyze. The details and status of the Transportation Recommendations of the UIP can be found in Appendix B.

Miami River Corridor
Multi-modal Transportation Plan

Final Report

EXISTING TRANSPORTATION PROGRAMS AND PLANS



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EXISTING TRANSPORTATION PROGRAMS AND PLANS

Existing transportation programs and plans were reviewed to identify projects that are already being considered for the Miami River Corridor. This effort represents a key study component so that recommendations and strategies may be developed consistent with improvements that have already been identified in existing plans.

Miami-Dade Transportation Improvement Program

The Miami-Dade Transportation Improvement Program (TIP) was approved by the MPO in May 2006 for Fiscal Years 2006/2007 to 2010/2011. The TIP specifies programmed improvements to be implemented in Miami-Dade County over the next five years. The TIP is organized into the following three parts:

1. Three-Year Federal Funded Project Listing. As required by federal regulations, projects receiving federal funding must be chosen from this list.
2. Five-Year Project Listing. Projects beyond the third year are included as proposed so they will be periodically evaluated by the MPO.
3. Unfunded Priority Needs. This category includes MPO priorities not included in the other two sections.

Improvements included in the TIP are characterized as Intermodal, Highway, Transit, Aviation, Seaport, and Non-Motorized.

Projects programmed in the TIP that would affect transportation facilities within one-quarter mile of the Miami River are presented in Table 1. Figures 3-A, 3-B, and 3-C show the TIP and LRTP programmed projects in Miami River Corridor. Please see Figures 3-A, 3-B, and 3-C in conjunction with the line items in Tables 1 and 2.

Table 1: Transportation Improvement Program Improvements

MPO Project No.	Project Facility	From	To	Project Description	Proposed Funding Year	Proposed Funding ($000s)
DT4183341	Miami Avenue / SW 2nd Avenue- Riverwalk	SW 2nd Avenue Bridge	S. Miami Avenue Bridge	Bike Path	2009-10	1,000
DT4112051	SR 9/I-95 Port Ramp	NE/NW 5th Street	SR 836/I-395/I-95 Interchange	Interchange (Major)		
XA83611	SR 836/I-95 Interchange	NW 17th Avenue	I-95	Coordination of Operational Improvements	2006-07 / 2008-09	1,000 / 1,295
PW000052	NW 17th Avenue	NW 17th Avenue	Bridge over the Miami River	Bridge enhancements/renovations	2006-07	1,065
PW000048	NW 22nd Avenue	NW 22nd Avenue	Bridge over the Miami River	Structural analysis and design of repairs for the bridge tender house	Prior Years	1,000
DT4182361	SR 9/NW 27th Avenue	SW 8th Street	NW 16th Street	Pedestrian Safety Improvement	2006-07	16
PW000304a	NW 37th Avenue	North River Drive	NW 79th Street	Widen from 2 to 5 lanes	2006-07 / 2008-09 / 2009-10	519 / 4,000 / 7,087
DT4128081	SR 7/ NW 5th Street	Bridge from NW 3rd Street	NW 6th Street	Replace Movable Span Bridge	2006-07	54,469
DT4164191	SR 7/US 441/ NW 7th Avenue	SW 8th Street	NW 20th Street	Sidewalk	2007-08 / 2008-09	359 / 12
PW000051	Miami Avenue	Miami Avenue	Bridge over the Miami River	Bridge Enhancements Renovations	Prior Years	1,000
DT4182364	SR 933/SW 12th Avenue	SW 8th Street	NW 14th Street	Pedestrian Safety Improvement	2006-07	24
DT4146302	SR 968/Flagler Street	NW 27th Avenue	Miami River	PD&E/EMO Study	2006-07	50
PW610140	Flagler Street	NW 2nd Avenue	Biscayne Boulevard	Design & Construction administration. Convert from 1-way to 2-way	Prior Years	1,074
PW671203	NW 14th Street	NW 10 Avenue	I-95	Widen to 3 lanes and resurface	2009-10 / 2010-11	500 / 500
TA0000038	Passenger Activities Center	Transit hub at NW 7th Avenue and NW 62nd Avenue		Construct new and improved existing Passenger Activity Centers	2006-07 / 2007-08 / 2008-09 / 2009-10	2,050 / 933/ 2,821 / 3,940
DT2511563	Port of Miami Tunnel	Port of Miami	SR 836/I-395	New Road Construction	2006-07	658
DT2512811	Lummus Landing Riverwalk- Miami River Shoreline	NW 1st Street	NW 3rd Street	Riverwalk in Lummus Park	2006-07	900
DT2512621	Jose Marti Riverwalk - extension	NW 2nd Avenue	NW 3rd Avenue	On-Road Greenway on SW 6th Street	2006-07	1,260

Table 1 (Continued): Transportation Improvement Program Improvements

MPO Project No.	Project Facility	From	To	Project Description	Proposed Funding Year	Proposed Funding ($000s)
XA83603	SR 836/Interconnector	SR 836	NW 28th Street	Design & Construction: C-D roads/Acquisition: ROW	2006-07 / 2007-08 - 2008-09 / 2009-10	12,044 / 13,946 / 11,047 / 10,849
PW662472	NE 8th Street/Bayshore Drive	Biscayne Boulevard	Port Boulevard	Construction of 4 new lanes and Baywalk		
DT4166581	NW South River Drive	North of NW 20th Street		Bridge over Tamiami Canal. Bridge-Replacement	2007-08	611
DT2512623	E Little Havana Greenway	S River Drive – NW 1st street	SW 12th Avenue	Sidewalk	2006-07 / 2008-09	75 / 925
DT2496401	SR 933/SW 12th Avenue	Over Miami River		Replace Movable Span Bridge	2008-09	3,600
DT4209071	Miami River Greenway on 5th Street	I-95	NW 12th Avenue	Riverwalk on north and south shore, Access Improvement	2007-08	2,304
DT4209171	Overtown Greenway	NW 3rd Avenue	NW 7th Avenue	Bike Path	2006-07	1,063
DT2491022	SR 5/US 1/Brickell	270 'S of SE 4th Street	S.E. 4th Street	Add Lanes	2006-07	100
DT4068002	Miami Intermodal CTR	(MIC) Tri Rail Relocation		Intermodal capacity	2006-07 / 2007-08 - 2008-09 / 2009-10	700 / 700 / 700 / 700
DT4183122	SR 968/SE 1st Street	SW 12th Avenue	Biscayne Boulevard	ADA (B) Sidewalk Improvements	2009-10	657
410578-1	City of Miami Riverwalk Extension – North River Drive (A)	I-95	West of Flagler Bridge	On-road Greenway from I-95 to Flagler	2006-07	1,000
416508-1	East Allapattah Greenway – North River Drive(A)	NW 7th Avenue	NW 12th Avenue	On-road Greenway along North River Drive from NW 7 Ave to NW 12 Avenue	2008-09	1,000

Notes –

(A) – Project listed in FDOT work program but not in Miami-Dade TIP

(B) – Americans with Disabilities Act

Miami-Dade 2030 Long Range Transportation Plan

The Miami-Dade 2030 Long Range Transportation Plan (LRTP), adopted by the Miami-Dade County Metropolitan Planning Organization (MPO), was developed to guide long-term transportation investments in Miami-Dade County. The LRTP focuses on the County's transportation infrastructure needs including connections to major activity centers. The LRTP also addresses transit facilities, bicycle facilities, pedestrian facilities, and other modes of transportation.

Based on a review of expected financial resources, funding was assigned to transportation improvements in Miami-Dade County for the Plan period. As a result of evaluating and prioritizing projects and applying the projected revenue identified, a "fiscally constrained" or Cost Feasible Plan was developed. The Cost Feasible Plan identifies projects for which funding is projected to be available. Projects in the Cost Feasible Plan were grouped into Priorities based on funding availability. The Priorities are defined as follows:

Priority I: Projects scheduled to be funded by 2009. This group includes those projects needed to respond to the most pressing and current urban travel problems. Funds for these improvements are programmed in the Miami-Dade Transportation Improvement Program 2005 – 2009.
Priority II: Projects to be funded between 2010 and 2015.
Priority III: Projects to be funded between 2016 and 2020.
Priority IV: Projects to be funded between 2021 and 2030.
Priority IV: Unfunded – Projects that have been identified as needed in the Needs Plan. However, revenues are not anticipated to be available to fund these projects.

The projects presented in Table 2 were listed as improvements in the 2030 LRTP and would affect transportation facilities within one-quarter mile of the Miami River. Figures 3-A, 3-B, and 3-C show the TIP and LRTP programmed projects in the Miami River Corridor. Please see Figures 3-A, 3-B, and 3-C in conjunction with the line items in Tables 1 and 2.

Table 2: Long Range Transportation Plan Improvements

No.	Project Facility	From	To	Project Description	Priority Project
1	SW 1st Avenue	SW 8th Street	SW 1st Street	4-lane tunnel under River	I
2	SR 836/I-395	West of NW 17th Avenue	I-95	Corridor Improvement/ C-D Road	III
3	NW 37th Avenue	NW North River Drive	NW 79th Street	Widen 2 to 5 lanes	I
4	Miami River Greenway	SR 836	Palmer Lake/NW 37th Avenue	New/improved paved path along both sides of the Miami Canal	*
5	Miami River Greenway	Metrorail	SW 2nd Avenue	New paved path along the south side of the Miami River	*
6	Miami River Greenway	SW 12th Avenue	SR 836	New paved path along the south side of the Miami River	*
7	Miami River Greenway	SW 7th Street	Mouth of Miami River	Connecting portion from M Path Trail along Miami River to Baywalk	*
8	Seaport Tunnel Expressway	I-395	Seaport	Tunnel connecting seaport to I-395 (4 lanes) (Partially funded, remainder is in unfunded needs)	III
9	Unfunded portion of Seaport Tunnel Expressway	I-395	Seaport	Tunnel connecting seaport to I-395 (4 lanes)	IV

* Prioritization has not been identified for specific greenway projects. Please note that the Greenways will occur on public property and will not involve the condemnation of private property

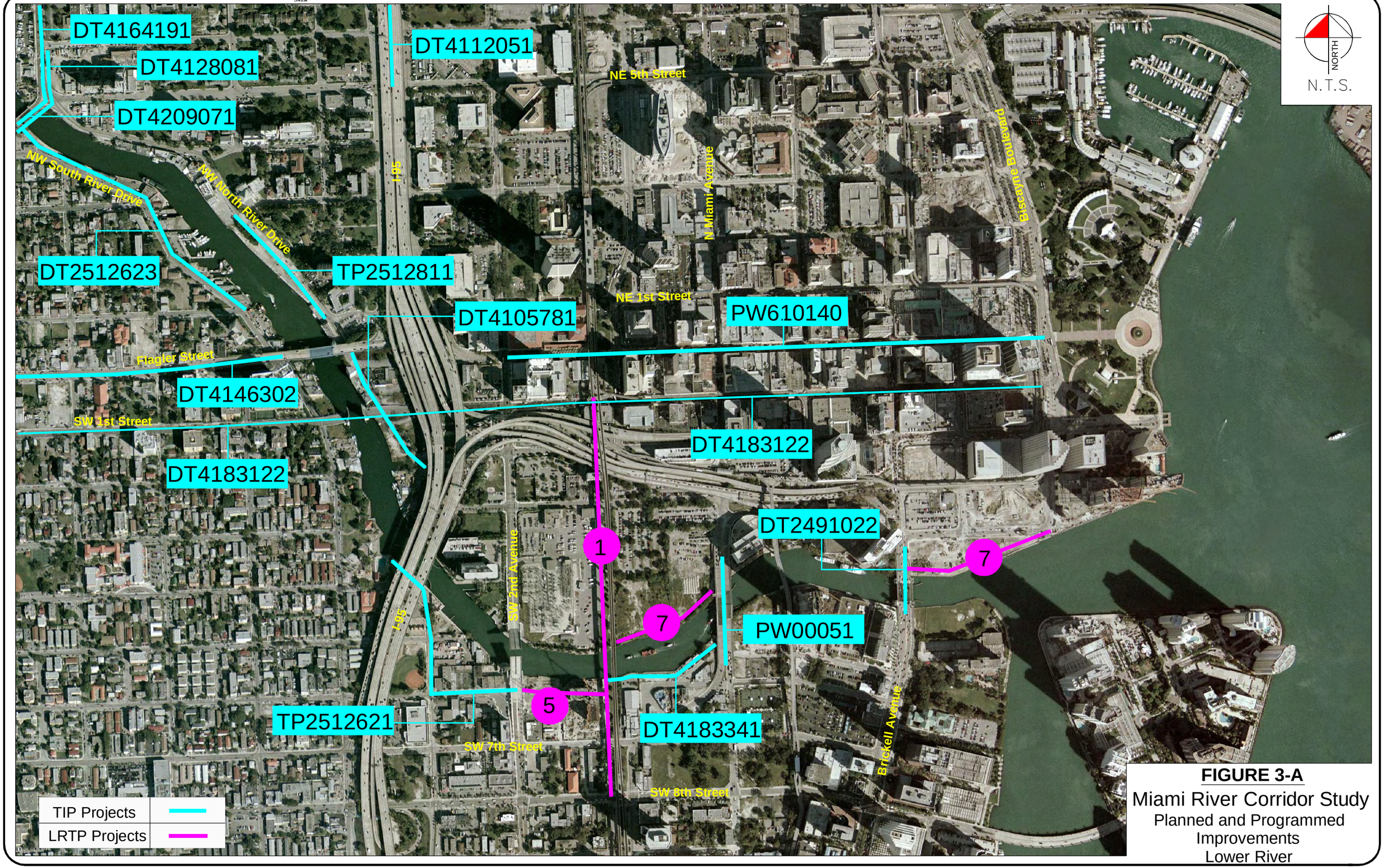


FIGURE 3-A

Miami River Corridor Study

Planned and Programmed Improvements

Lower River

N.T.S.

NW 17th Street
NW North River Drive
NW 17th Avenue
NW 14th Avenue
NW 14th Street
NW 22nd Avenue
NW 7th Avenue
NW 11th Street
Dolphin Expressway
NW 7th Street
NW 19th Avenue
NW 12th Avenue
NW South River Drive

PW000048
PW000052
PW671203
DT4182364
XA83611
DT2496401
DT4165081
DT4164191
DT4128081
DT2512623

4
4
4
4
4
2
6
6

TIP Projects
LRTP Projects

FIGURE 3-B

Miami River Corridor Study

Planned and Programmed Improvements

Middle River

PW671203

3

PW000304a

NW 36th Street

NW 33rd Street

NW 32nd Avenue

N Le Jeune Road

NW North River Drive

NW 28th Street

4

NW 27thAvenue

NW 24th Street

NW South River Drive

DT4068002

DT4166581

4

NW 20th Street

4

NW 22nd Avenue

NW 37thAvenue

DT4182361

NW 14th Street

Dolphin Expressway

TIP Projects	
LRTP Projects	

NORTH

N.T.S.

FIGURE 3-C

Miami River Corridor Study

Planned and Programmed Improvements

Upper River

Miami River Corridor
Multi-modal Transportation Plan

Final Report

MIAMI RIVER
DEVELOPMENT PROJECTS

August 2007
040829010

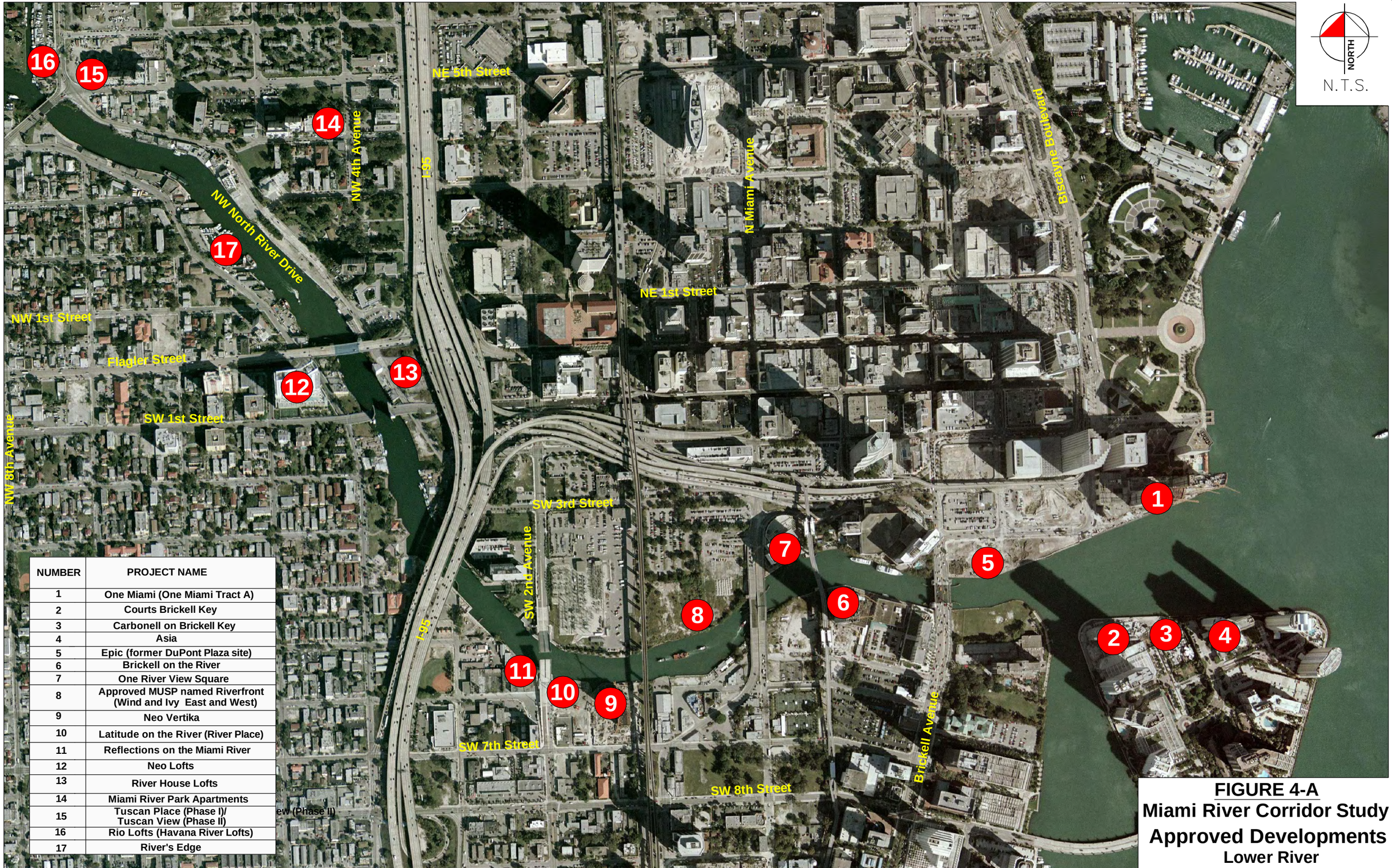
Miami River Commission

MIAMI RIVER DEVELOPMENT PROJECTS

The Miami River Corridor is experiencing a period of rapid growth in new residential and commercial projects that is attracting many new residents and employees to the River. A list of development projects was provided by the Miami River Commission (MRC) staff as part of the Miami River Corridor Multi-modal Transportation Plan to identify the growth areas along the River. Development projects may impact transportation network components such as roadways, transit stations, greenways, and sidewalks; the development projects underscore the need for transportation improvements.

Miami River Corridor development projects include riverfront residential units and mixed-use projects that have either been constructed, are currently under construction, or are in the permitting and or/design phase. The 32 projects will provide Miami with approximately 15,000 additional residential units and can be seen in Figures 4-A, 4-B, and 4-C for the lower, middle and Upper River, respectively. These new dwelling units are expected to generate over 45,000 new trips per day; trip generation was forecast using rates and equations contained in the Institute of Transportation Engineers' (ITE) *Trip Generation*, Seventh Edition.

Appendix C contains the project list provided by MRC staff that includes information on the projects provided by developers, architects, and a variety of other sources associated with each project. The status of each project as of February 2007 is also provided. Also included in Appendix C is a series of photographs and descriptions of noteworthy places along the Miami River.



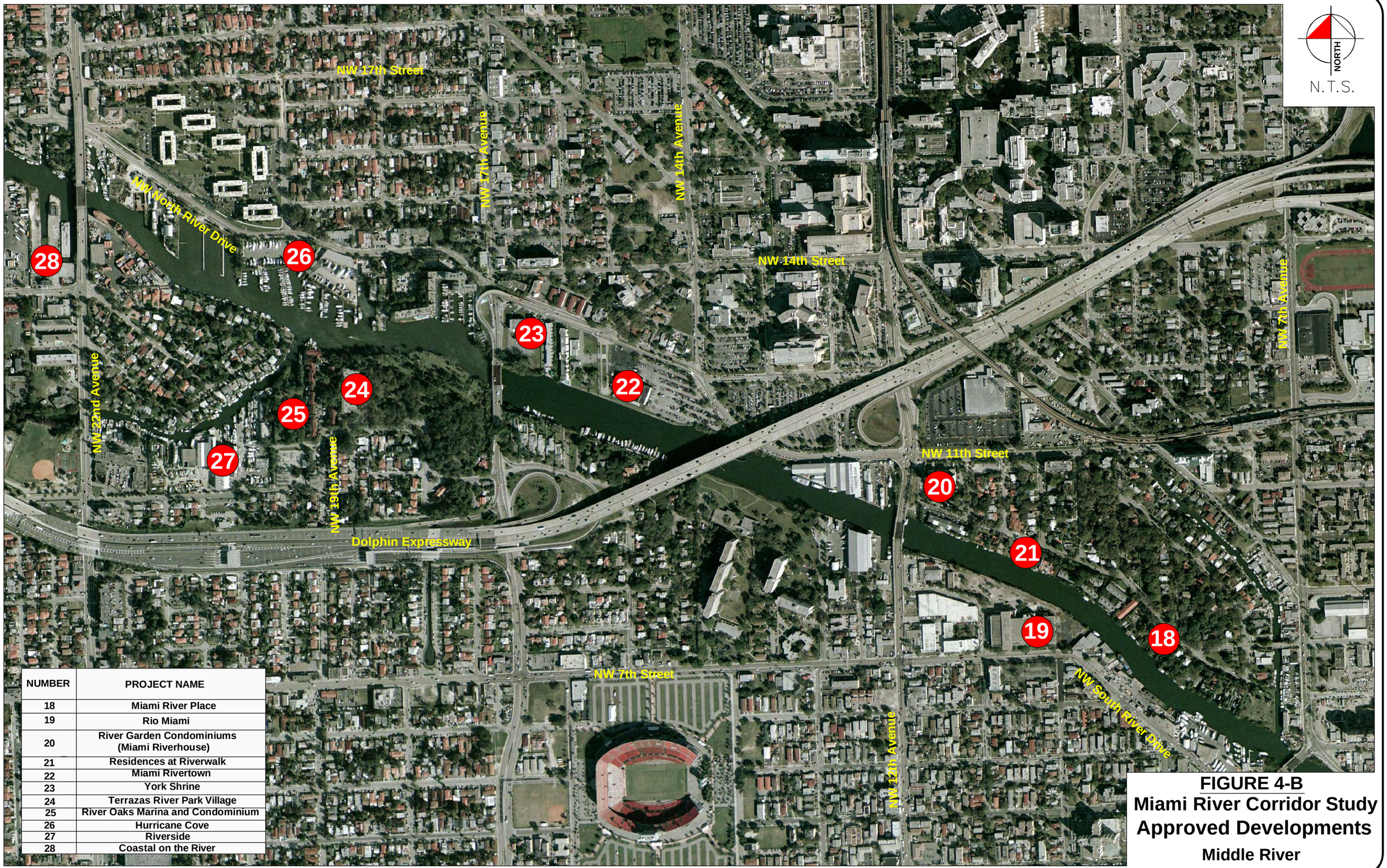
NUMBER	PROJECT NAME
1	One Miami (One Miami Tract A)
2	Courts Brickell Key
3	Carbonell on Brickell Key
4	Asia
5	Epic (former DuPont Plaza site)
6	Brickell on the River
7	One River View Square
8	Approved MUSP named Riverfront (Wind and Ivy East and West)
9	Neo Vertika
10	Latitude on the River (River Place)
11	Reflections on the Miami River
12	Neo Lofts
13	River House Lofts
14	Miami River Park Apartments
15	Tuscan Place (Phase I)/ Tuscan View (Phase II)
16	Rio Lofts (Havana River Lofts)
17	River's Edge

FIGURE 4-A

Miami River Corridor Study

Approved Developments

Lower River



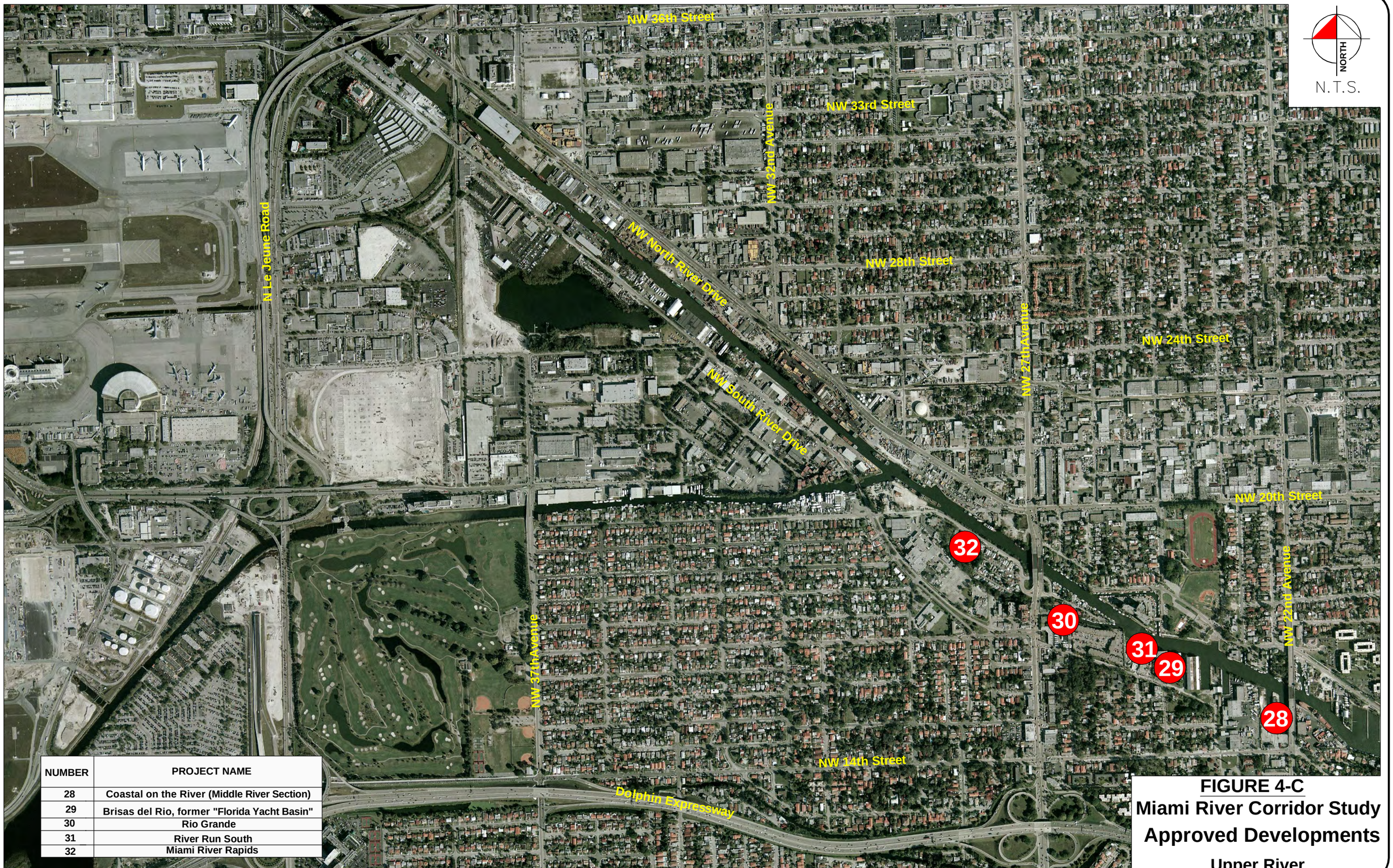
NUMBER	PROJECT NAME
18	Miami River Place
19	Rio Miami
20	River Garden Condominiums (Miami Riverhouse)
21	Residences at Riverwalk
22	Miami Rivertown
23	York Shrine
24	Terrazas River Park Village
25	River Oaks Marina and Condominium
26	Hurricane Cove
27	Riverside
28	Coastal on the River

NORTH

N.T.S.

FIGURE 4-B

Miami River Corridor Study
Approved Developments
Middle River



NUMBER	PROJECT NAME
28	Coastal on the River (Middle River Section)
29	Brisas del Rio, former "Florida Yacht Basin"
30	Rio Grande
31	River Run South
32	Miami River Rapids

NORTH

N.T.S.

FIGURE 4-C

Miami River Corridor Study

Approved Developments

Upper River

Miami River Corridor
Multi-modal Transportation Plan

Final Report

EXISTING TRANSIT SERVICE

August 2007
040829010

Miami River Commission

EXISTING TRANSIT SERVICE

Existing transit service within the study area was inventoried to gauge current transit service levels. Characteristics that were identified for this study include route alignments, hours of operation, headways, ridership, and planned service expansion.

Increasing the use of pedestrian, bicycle and public transportation helps to reduce the use of single occupancy vehicles and, therefore, helps in the reduction of traffic. The Miami River Corridor is a densely populated area, including Little Havana which is one of the most densely populated neighborhoods in the City of Miami. Pedestrians will be able to walk, bicycle, roller-blade, etc., along the Greenway, which directly connects to the major stops within the public transportation network. Most Metrobus routes, and all Metrorail and Metromover routes, allow bicycles to be taken aboard.

Transit service within the study area is provided by Miami-Dade Transit (MDT). MDT operates the 16th largest public transit system in the United States and the largest transit system in Florida. Within Miami-Dade County, MDT's fixed-route transit service consists of (1) the Metrobus bus system, (2) the Metrorail rapid transit system, and (3) the Metromover automated people mover (APM) system.

The study area is currently serviced by twenty (20) Metrobus routes including Routes M, 6, 7, 8, 11, 12, 17, 22, 24, 27, 32, 48, 77, 95x/Aventura Mall, 95x/Brickell Norwood, 95x/Carol City, Airport Owl 236, B/102, Flagler Max 51, Little Havana Circulator 207, Little Havana Circulator 208, and M/113 Connection. In addition, the corridor is served by the Metromover and Metrorail. The alignments of the Metrobus, Metromover and Metrorail routes are illustrated in Figures 5-A, 5-B, and 5-C, and each routes connection to the Miami River is described below.

- **Metrobus Route M** runs parallel to the Miami River along North River Drive, from NW 22nd Court to NW 12th Avenue. Route M has connections to the Civic Center Metrorail Station as well as the Omni Bus Terminal. Route M operates Monday through Friday on 30-minute headways. Weekend service is also provided with 1-hour headways.

- **Metrobus Route 6** crosses the Miami River on Miami Avenue. Also, Route 6 runs parallel to the River on NW 16th Street Road between NW 26th Avenue and NW 24th Avenue. Route 6 connects Downtown Miami on the east with SW 32nd Avenue and SW 37th Avenue on the west. Route 6 operates Monday through Friday on 10-minute headways during peak hours and on 20-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 7** crosses the Miami River on the bridge at NW 5th Street. This route connects Downtown Miami on the east with SW 112th Avenue in west Miami-Dade County. The route also connects with the Miami International Airport. Route 7 operates Monday through Friday on 15-minute headways during peak hours and on 20-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 8** crosses the Miami River on Miami Avenue and connects Downtown Miami on the east with the Florida International University South Campus on the west. Route 8 operates Monday through Friday on 10-minute headways during peak hours and on 15-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 11** crosses the Miami River on W. Flagler Street and connects Downtown Miami on the east with the Florida International University South Campus on the west. Route 11 operates Monday through Friday on 8-to 10-minute headways during peak hours and on 15-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 12** crosses the Miami River on NW 12th Avenue. This route connects Mercy Hospital on the south with NW 79th Street on the north. There is also a connection with Jackson Memorial Hospital. Route 12 operates Monday through Friday on 30-minute headways during peak hours and on 30-to 50-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 17** crosses the Miami River on NW 17th Avenue. This route connects the area around Little Havana on the south with the area around Carol City on the north. The Liberty City area is also part of this route. Route 17 operates Monday through Friday on 15-minute headways during peak hours and on 30-to 60-minute headways during off-peak hours. Weekend service is also provided.

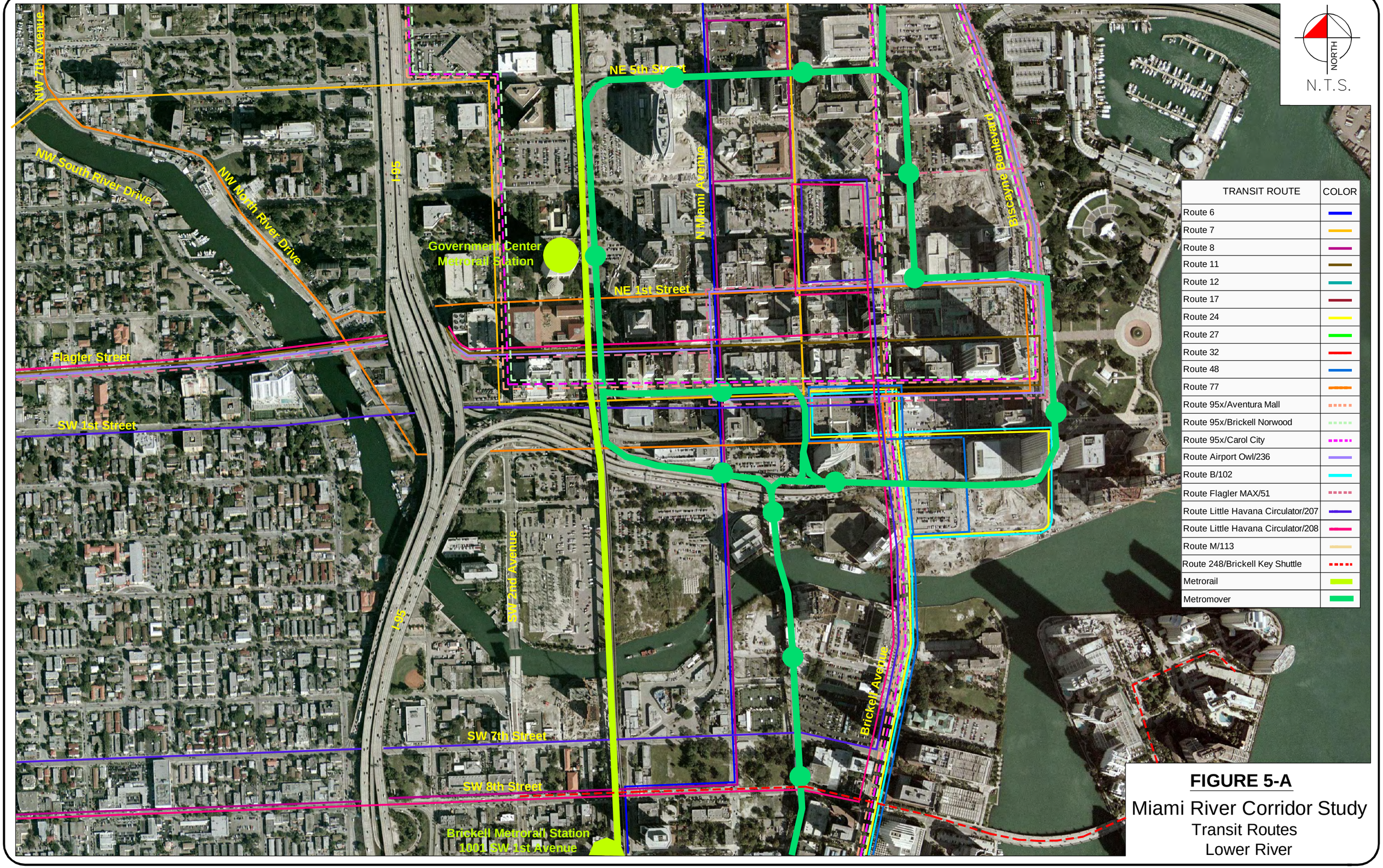
- **Metrobus Route 22** crosses the Miami River along NW 22nd Avenue. This route connects North Miami to Coconut Grove along the NW 22nd Avenue corridor. Stops along the route include Earlington Heights Metrorail Station and the Civic Center. Route 22 operates on 15-minute headways. Weekend service is also provided.
- **Metrobus Route 24** crosses the Miami River along Brickell Avenue. This route connects Downtown Miami on the east with the area around Coral Way and SW 137th Avenue on the west. There is also a connection with the Coral Gables area. Route 24 operates Monday through Friday on 15-minute headways during peak hours and on 15-to 60-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 27** crosses the Miami River on NW 27th Avenue. This route connects the area around Coconut Grove on the south with the area around NW 211th Street on the north. Miami-Dade Community College (North) is also served by this route. Route 27 operates Monday through Friday on 15-minute headways during peak hours and on 15-to 60-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 32** runs parallel to the Miami River on North River Drive between NW 32nd Avenue and NW 20th Street, and connects the Liberty City area on the south with the Carol City area on the north. Route 32 operates Monday through Friday on 15-to 20-minute headways during peak hours and on 30-to 60-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 48** crosses the Miami River along Brickell Avenue. This route connects Downtown Miami on the east with SW 70th Street on the south. Route 48 operates Monday through Friday on 30-minute headways during peak hours and on 30-to 40-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 77** runs parallel to the Miami River on NW North River Drive between SW 2nd Street and NW 7th Avenue, and connects the Downtown Miami area on the south with the North Miami area on the north. Route 77 operates Monday through Friday on 8-minute headways during peak hours and on 8-to 60-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route 95x/Aventura Mall** crosses the Miami River along Brickell Avenue. This route connects SE 13th Street on the south with the North Miami Beach area on the

north. Route 95x/Aventura Mall operates Monday through Friday on variable headways during peak and off-peak hours. No weekend service is provided.

- **Metrobus Route 95x/Brickell Norwood** crosses the Miami River along Brickell Avenue. This route connects SE 13th Street on the south with NW 199th Street on the north. Route 95x/ Brickell Norwood operates Monday through Friday on variable headways during peak and off-peak hours. No weekend service is provided.
- **Metrobus Route 95x/Carol City** crosses the Miami River along Brickell Avenue. This route connects SE 13th Street on the south with the Carol City area on the north. Route 95x/ Carol City operates Monday through Friday on variable headways during peak and off-peak hours. No weekend service is provided.
- **Metrobus Route Airport Owl** crosses the Miami River on W. Flagler Street and connects the Miami Beach area on the east with Le Jeune Road (42nd Avenue) on the west. This route operates Monday through Friday on 8-to 10-minute headways during peak hours and on 15-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route B/102** crosses the Miami River along Brickell Avenue. This route connects the Key Biscayne area on the south with the Downtown Miami area on the north. Route B/102 operates Monday through Friday on variable headways during peak and off-peak hours. No weekend service is provided.
- **Metrobus Route Flagler MAX** crosses the Miami River on W. Flagler Street and connects the Miami Beach area on the east with the Coral Way area on the west. This route operates Monday through Friday on 15-minute headways during peak hours and on 15-to 30-minute headways during off-peak hours. No weekend service is provided.
- **Metrobus Route Little Havana Circulator/207** crosses the Miami River on SW 1st Street and connects the Downtown Miami area on the east with SW 25th Avenue on the west. This route operates Monday through Friday on 15-minute headways during peak hours and on 15 to 20-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route Little Havana Circulator/208** crosses the Miami River on W. Flagler Street and connects the Downtown Miami area on the east with SW 27th Avenue on the west. This route operates Monday through Friday on 15-minute headways during peak

hours and on 15-to 20-minute headways during off-peak hours. Weekend service is also provided.

- **Metrobus Route M/113** runs parallel to the Miami River on NW North River Drive between NW 13th Terrace and NW 19th Avenue, and connects Miami Beach on the east with SW 22nd Court on the west. Route M/113 operates Monday through Friday on 20-minute headways during peak hours and on 20-to 30-minute headways during off-peak hours. Weekend service is also provided.
- **Metrobus Route Brickell Key Shuttle/248** connects Brickell Key on the east with SW 2nd Avenue on the west and the Coral Way area on the south. Route Brickell Key Shuttle/248 operates Monday through Friday on 15-minute headways during peak hours and on 20-to 30-minute headways during off-peak hours. Weekend service is not provided.
- **Metrorail** crosses the Miami River on SW 1st Avenue and connects the Kendall area on the south with Hialeah on the north. Metrorail runs from 5 A.M. until midnight seven days a week. Trains arrive every six minutes during weekday rush hours, every 8-10 minutes at midday, and every 15-30 minutes after 6 P.M. until closing. Weekend service is also provided; headways alternate from 10-, 15- to 30-minutes depending on time of day and direction.
- **Metromover** crosses the Miami River on a bridge east of Miami Avenue and connects the Brickell area on the south with the Omni area on the north. The Metromover inner and outer loops run from 5 A.M. to midnight weekdays, Saturday, and Sunday. Trains arrive every 90 seconds during rush hours and every three minutes during off-peak hours. This schedule changes during special events.



TRANSIT ROUTE	COLOR
Route 6	
Route 7	
Route 8	
Route 11	
Route 12	
Route 17	
Route 24	
Route 27	
Route 32	
Route 48	
Route 77	
Route 95x/Aventura Mall	
Route 95x/Brickell Norwood	
Route 95x/Carol City	
Route Airport Owl/236	
Route B/102	
Route Flagler MAX/51	
Route Little Havana Circulator/207	
Route Little Havana Circulator/208	
Route M/113	
Route 248/Brickell Key Shuttle	
Metrorail	
Metromover	

FIGURE 5-A

Miami River Corridor Study

Transit Routes
Lower River

NORTH

N.T.S.

NW 17th Street

NW 22nd Avenue

NW North River Drive

NW 17th Avenue

NW 14th Avenue

NW 14th Street

Civic Center Metrorail Station

NW 7th Avenue

NW 11th Street

Culmer Metrorail Station

Dolphin Expressway

NW 7th Street

NW South River Drive

NW 19th Avenue

NW 12th Avenue

TRANSIT ROUTE
Route 6
Route 7
Route 8
Route 11
Route 12
Route 17
Route 22
Route 24
Route 27
Route 32
Route 48
Route 77
Route 95x/Aventura Mall
Route 95x/Brickell Norwood
Route 95x/Carol City
Route Airport Owl/236
Route B/102
Route Flagler MAX/51
Route Little Havana Circulator/207
Route Little Havana Circulator/208
Route M/113
Route 248/Brickell Key Shuttle
Metrorail
Metromover

FIGURE 5-B

Miami River Corridor Study

Transit Routes

Middle River

TRANSIT ROUTE	COLOR
Route 6	
Route 7	
Route 8	
Route 11	
Route 12	
Route 17	
Route 24	
Route 27	
Route 32	
Route 48	
Route 77	
Route 95x/Aventura Mall	
Route 95x/Brickell Norwood	
Route 95x/Carol City	
Route Airport Owl/236	
Route B/102	
Route Flagler MAX/51	
Route Little Havana Circulator/207	
Route Little Havana Circulator/208	
Route M/113	
Route 248/Brickell Key Shuttle	
Metrorail	
Metromover	

FIGURE 5-C

Miami River Corridor Study

Transit Routes

Upper River

Listed in Table 3 are service and performance data for the Metrobus routes in the vicinity of the Miami River Corridor. This information was obtained from Metrobus route schedules and Miami-Dade Transit Ridership Technical Reports prepared by MDT for January 2006.

Table 4 lists the corridors within one-quarter mile of the Miami River and the number of buses per hour that pass along each corridor. Transit level of service in a corridor can be calculated based on the number of buses that serve a corridor per hour according to FDOT's LOSPLAN software. This level of service is determined as follows:

- LOS A > 6 buses per hour
- LOS B > 4 buses per hour
- LOC C ≥ 3 buses per hour
- LOS D ≥ 2 buses per hour
- LOS E ≥ 1 bus per hour
- LOS F = no bus service on the corridor

Figures 6-A, 6-B, and 6-C present the transit level of service based on frequency for corridors along and across the Miami River.

Table 3: Metrobus Route Information

Route	Closest Street to the River	Weekdays Hours of Operation	Peak Headway	Off – Peak Headway	Average Weekday Ridership	Boardings per Revenue Hour
24	Brickell Avenue	4:41 am to 12:40 am	15 min	15 to 60 min	4,324	27.1
B/102	Brickell Avenue	5:51 am to 12:28 am	Variable	Variable	1,800	27.8
95x/Brickell Norwood	Brickell Avenue	5:27 am to 8:59 pm	Variable	Variable	2,049	21.3
95x/Carol City	Brickell Avenue	5:27 am to 8:59 pm	Variable	Variable	2,049	21.3
95x/Aventura Mall	Brickell Avenue	5:27 am to 8:35 pm	Variable	Variable	2,049	21.3
6	S. Miami Avenue	8:07 am to 6:35 pm	10 min	20 to 30 min.	918	16.4
48	Brickell Avenue	5:05 am to 8:30 pm	30 min	30 to 40 min	590	8.7
8	S. Miami Avenue	4:40 am to 12:47 am	10 min	15 to 30 min	7,651	41.0
77	SW/SE 1st Street	4:36 am to 4:57 am	8 min	8 to 60 min	10,884	45.1
11	SW/SE 1st Street	4:32 am to 5:51 am	8 to 10 min.	15 to 30 min	13,833	55.2
7	NW 4th Street	4:50 am 10:50 pm	15 min	20 to 30 min.	4,569	32.6
M/113	N. River Drive	5:43 to 11:31 pm	20 min.	20 to 30 min.	1,975	22.1
32	N. River Drive	4:51 am to 12:26 am	15 to 20 min.	30 to 60	4,493	27.7
27	NW 27th Avenue	4:52 am to 5:06 am	15 min	15 to 60 min.	10,298	46.0
Airport Owl/236	NW 36th Street	11:17 pm to 7:09 am	8 to 10 min.	15 to 30 min	474	24.1
12	SW 12th Avenue	5:10 am to 5:22 am	30 min	30 to 50 min.	3,701	37.5
17	NW 17th Avenue	4:47 am to 1:22 am	15 min	30 to 61 min.	5,186	37.7
Flagler MAX/51	SW/SE 1st Street	4:59 am to 9:19 pm	15 min.	15 to 30 min.	4,173	30.8
Little Havana Circulator/207	NW 2nd Avenue	5:55 am to 8:30 pm	15 min.	15 to 20 min.	1,637	38.0
Little Havana Circulator/208	NW 2nd Avenue	6:03 am to 8:40 pm	15 min.	15 to 20 min.	1,873	42.8
Brickell Key Shuttle/248	SW 8th Street	6:30 am to 6:43 pm	15 min.	15 to 20 min.	155	6.6

Table 4: Metrobus Route Information in Corridors

Roadway	Routes	Directional Buses per Hour
Brickell Avenue	48, 102 B , 24, 95X Brickell Norwood, 95 Carol City, 05X Aventura, Little Havana Circulator 207, Little Havana Circulator 208	45.7
Flagler Street	Flagler Max, Airport Owl, 11, Little Havana Circulator 208	21
N Miami Avenue	8, 6	12
NW North River Drive (from SE 2nd Street to NW 5th Street)	77	7
NW 7th Avenue Bridge	77	7
NW 16th Street Road (from NW 24th Court to NW 26th Avenue)	6	6
SW 1st Street	Little Havana Circulator 207	4
NW 17th Avenue	17	4
NW 27th Avenue	27	4
NW North River Drive (from NW 20th Street to NW 32nd Avenue)	32	4
NW South River Drive (from NW 10th Avenue to NW 12th Avenue)	7	4
NW North River Drive (from NW 17th Avenue to NW 19th Avenue)	M	3
NW 12th Avenue	12	2
SW 1st Avenue	Metrorail	10

NORTH

N.T.S.

NW 7th Avenue

NW South River Drive

NW North River Drive

I-95

NE 5th Street

N Miami Avenue

Biscayne Boulevard

NE 1st Street

SW 2nd Avenue

Flagler Street

SW 1st Street

I-95

SW 7th Street

Brickell Avenue

SW 8th Street

CORRIDOR LOS	COLOR
LOS A > 6 Buses per hour	
LOS B > 4 Buses per hour	
LOS C >= 3 Buses per hour	
LOS D>= 2 Buses per hour	
LOS E>= 1 Buses per hour	
LOS F = 0 Buses per hour	

FIGURE 6-A

Miami River Corridor Study

Bus Frequency LOS

Lower River

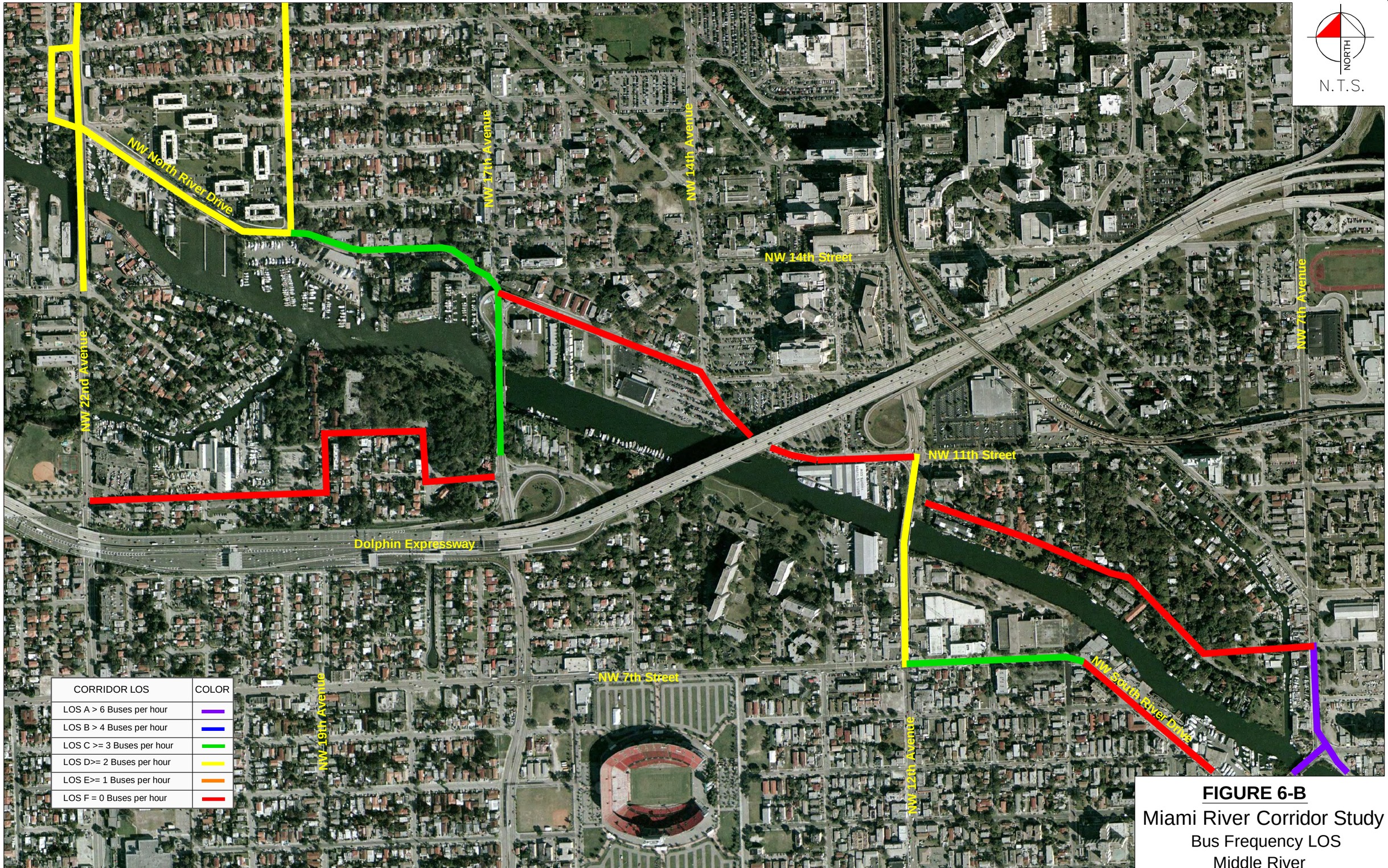


FIGURE 6-B

Miami River Corridor Study

Bus Frequency LOS

Middle River

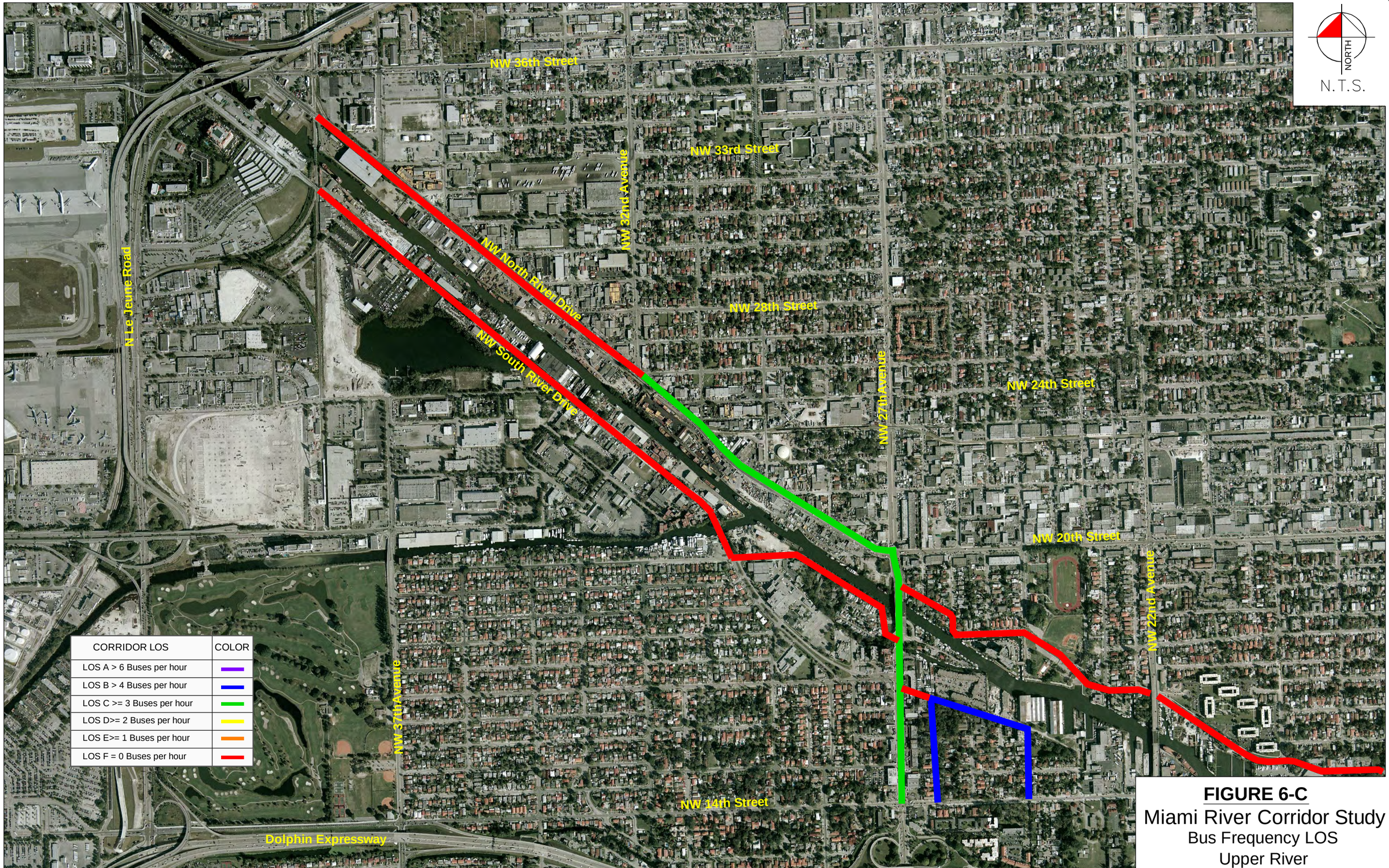


FIGURE 6-C

Miami River Corridor Study

Bus Frequency LOS

Upper River

Miami River Corridor
Multi-modal Transportation Plan

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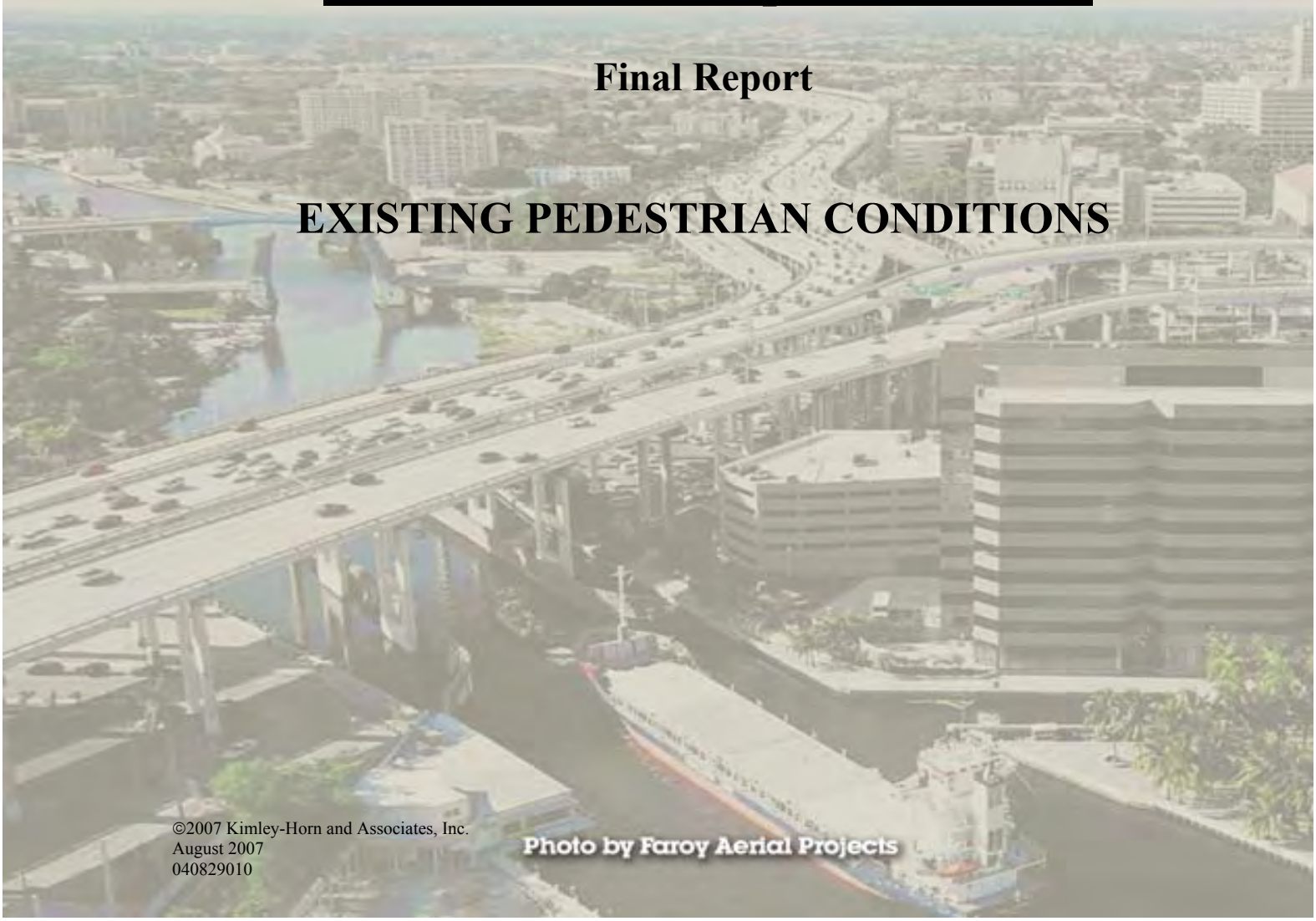
EXISTING PEDESTRIAN CONDITIONS



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Miami River Commission

EXISTING PEDESTRIAN CONDITIONS

The availability of pedestrian and bicycle facilities, and amenities, plays a crucial role in encouraging the use of alternative modes of travel to the automobile. Not only do walking and bicycling serve as independent modes of transportation, the presence of pedestrian and bicycling facilities can enhance access to public transportation. Benefits associated with walking and bicycling may include reduced traffic congestion, less use of gas and oil, reduction of global warming, enhanced personal health and recreation, reduced need for automobile parking facilities, fewer emissions, cleaner air and promotion of economic development by creating a pedestrian realm.

Pedestrian Facilities

Complete implementation of the Miami River Greenway Action Plan, which was unanimously adopted by the City of Miami, Miami-Dade County, and the Miami River Commission in 2001, is critical to improving pedestrian facilities within the corridor. Generally, the Plan is being implemented from east to west. Significant progress has been made and several new sections were recently completed or are currently under construction. The Greenway system will achieve maximum benefits when the continuous route is completed. Figures 7-A, 7-B and 7-C show the existing sidewalk deficiencies along North and South River Drives. As shown in Figures 7-A, 7-B, and 7-C, sidewalk deficiencies become more prevalent further up the River.

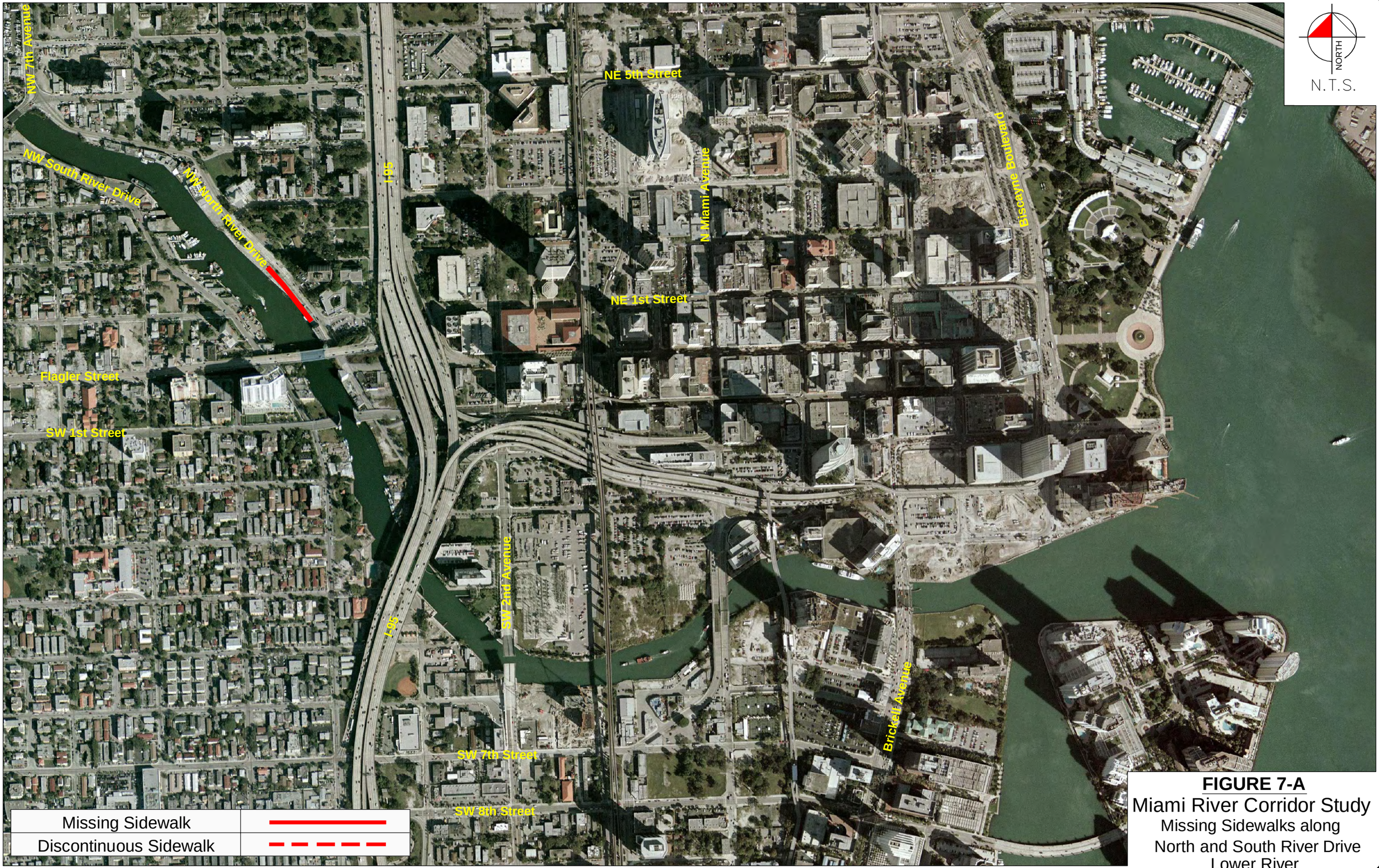

FIGURE 7-A

Miami River Corridor Study

Missing Sidewalks along

North and South River Drive

Lower River

NW 17th Street
NW 22nd Avenue
NW North River Drive
NW 17th Avenue
NW 14th Avenue
NW 14th Street
NW 7th Avenue
NW 11th Street
Dolphin Expressway
NW 7th Street
NW 19th Avenue
NW 12th Avenue
NW South River Drive

NORTH
N.T.S.

Missing Sidewalk	
Discontinuous Sidewalk	

FIGURE 7-B

Miami River Corridor Study

Missing Sidewalks along

North and South River Drive

Middle River

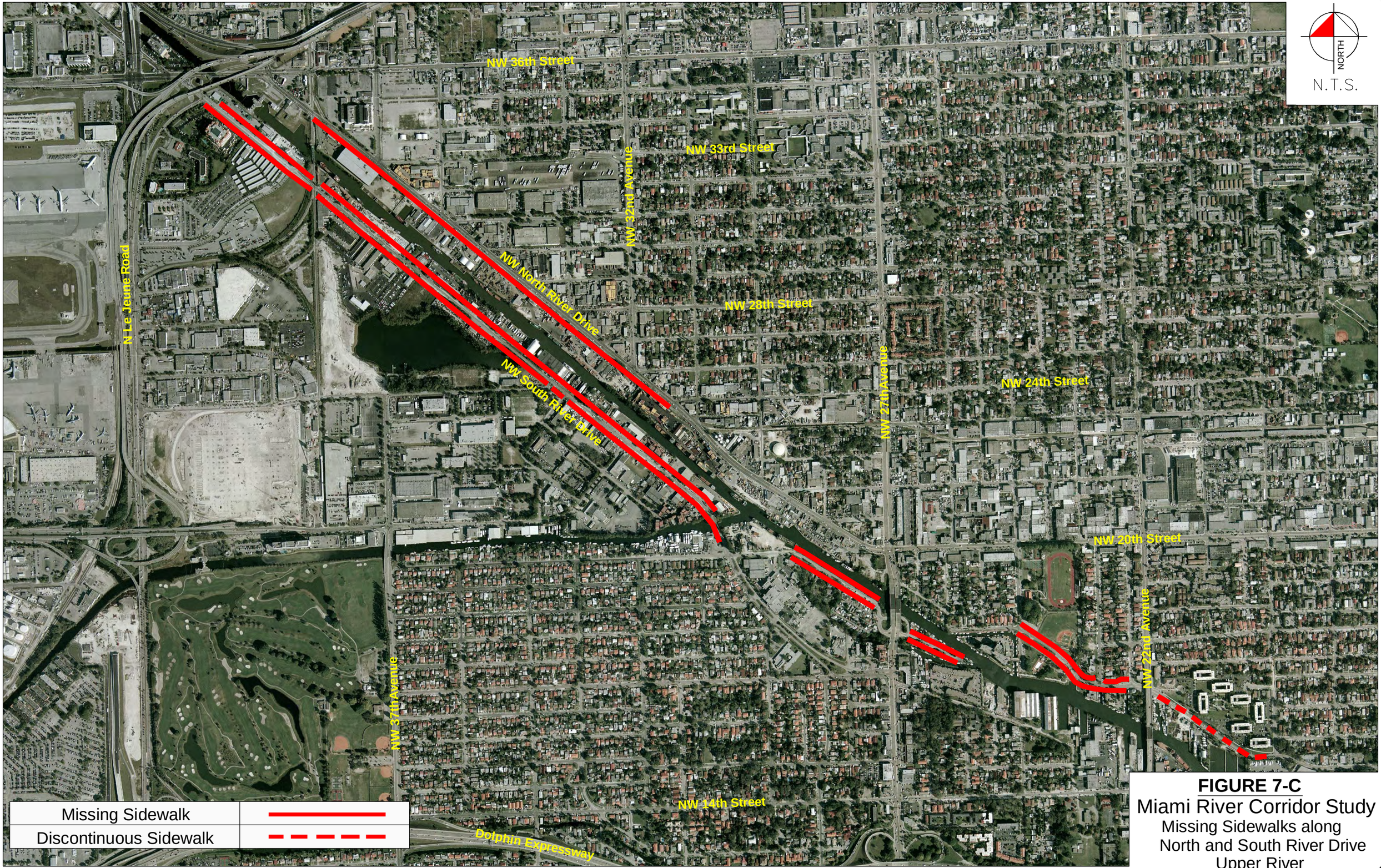

FIGURE 7-C

Miami River Corridor Study

Missing Sidewalks along
North and South River Drive
Upper River

Miami River Corridor
Multi-modal Transportation Plan

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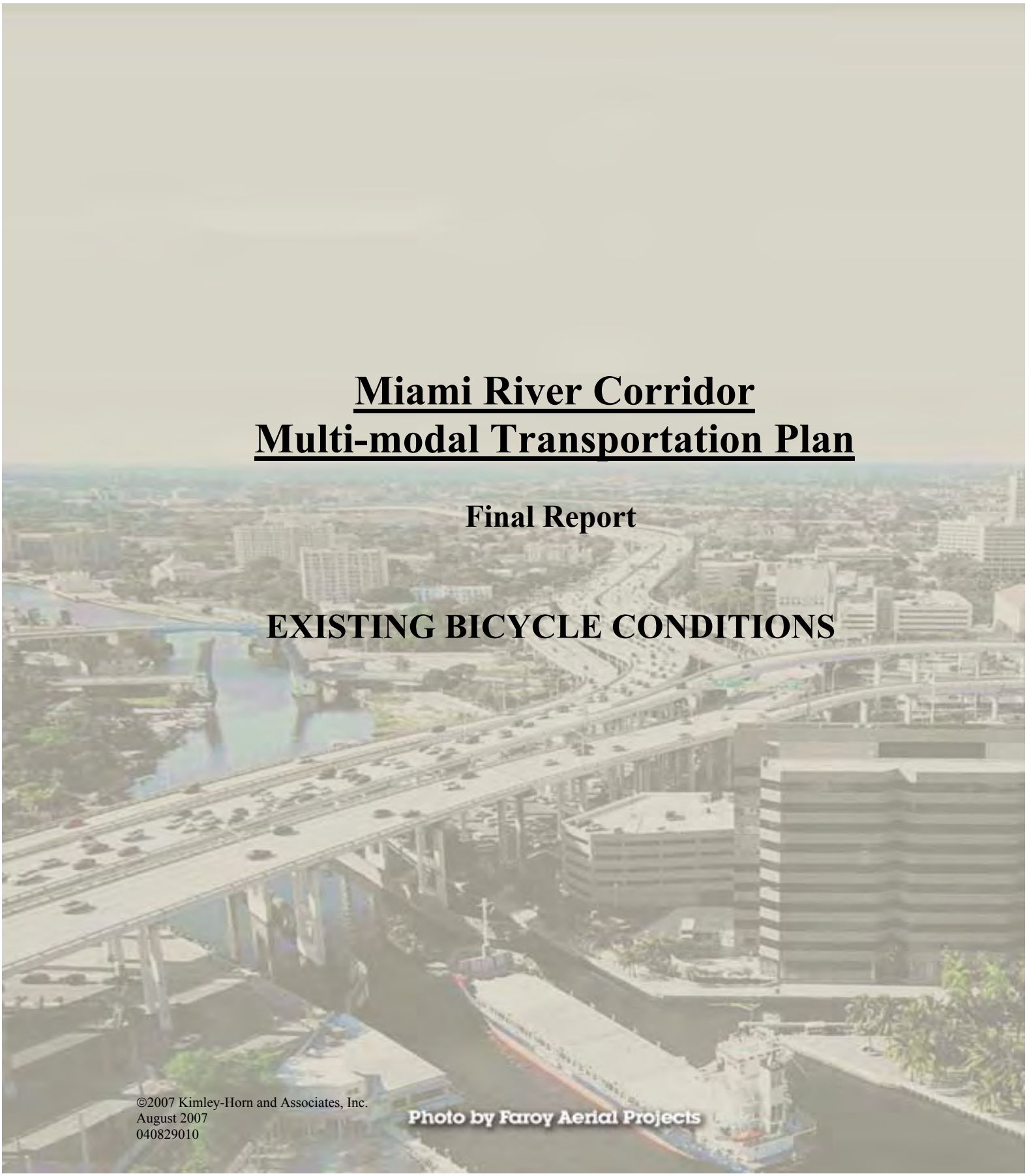
EXISTING BICYCLE CONDITIONS



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EXISTING BICYCLE CONDITIONS

According to information maintained by the Miami-Dade County MPO and a field review of the corridor, no dedicated bicycle facilities exist along North and South River Drives within the Miami River Corridor study area. However, the Miami River is designated as a greenway. Implementation of the Miami River Greenway Action Plan will result in a linear park system following the course of the River from its mouth in Downtown Miami to the Miami Intermodal Center. The Greenway will be developed on public property and will not involve the condemnation of private property for greenway purposes. The Miami River Greenway will be located along the River's shore, where feasible, but will proceed around marine industrial business and historic single family neighborhoods as an on-road greenway.

Complete implementation of the Miami River Greenway Action Plan, which was unanimously adopted by the City of Miami, Miami-Dade County, and the Miami River Commission in 2001, is critical to improving bicycle facilities within the corridor. Eventually, the Greenway will encompass landscaped pathways, street improvements, lighting, seating, signage, historic markers, and other amenities including bicycle facilities throughout the entire river corridor. Figures 8-A, 8-B, and 8-C present the Miami River Greenway alignment and portions of the potential Overtown Greenway alignments. Please note that the Overtown Greenway is still under study and these alignments may possibly change.

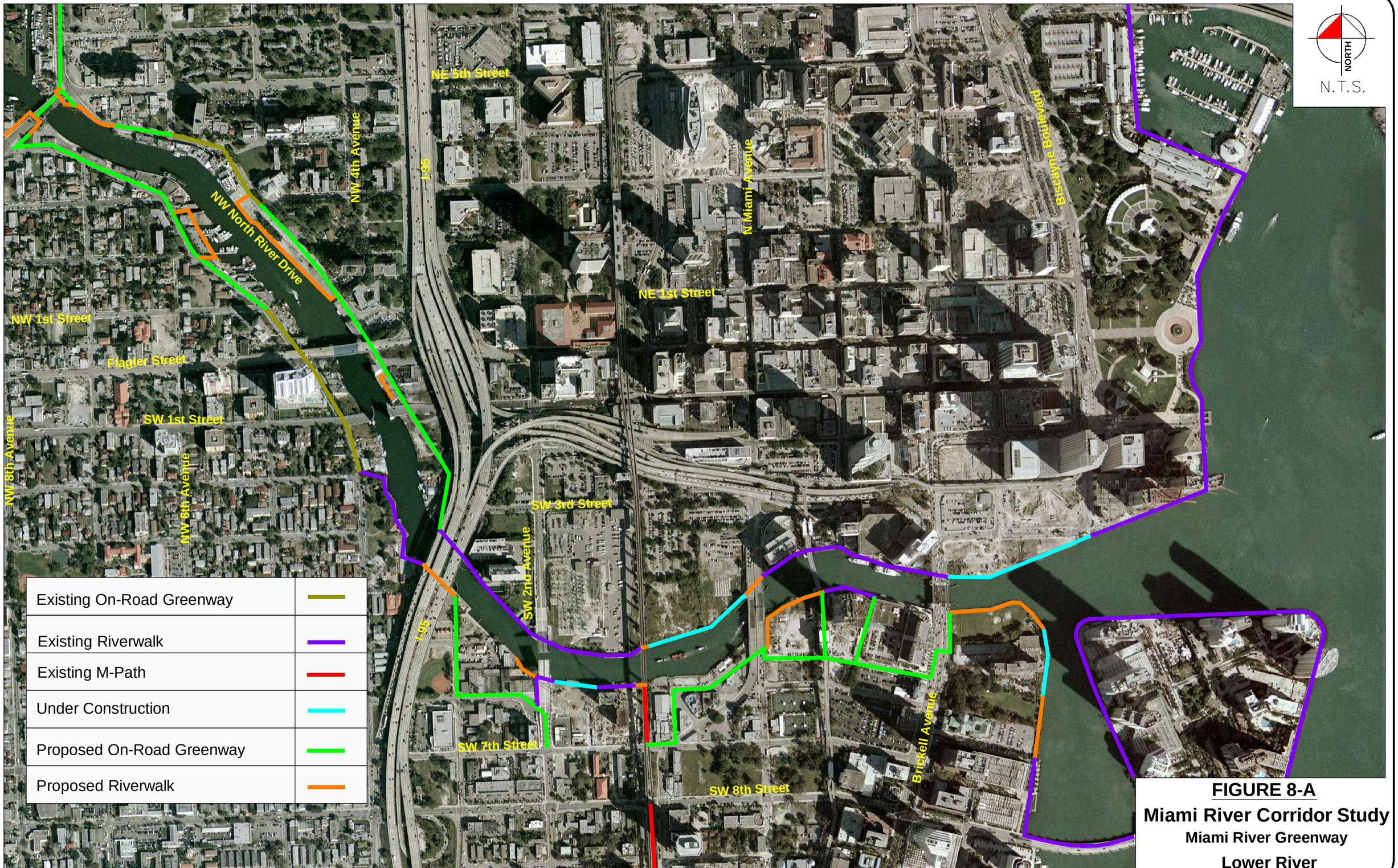


FIGURE 8-A

Miami River Corridor Study

Miami River Greenway

Lower River

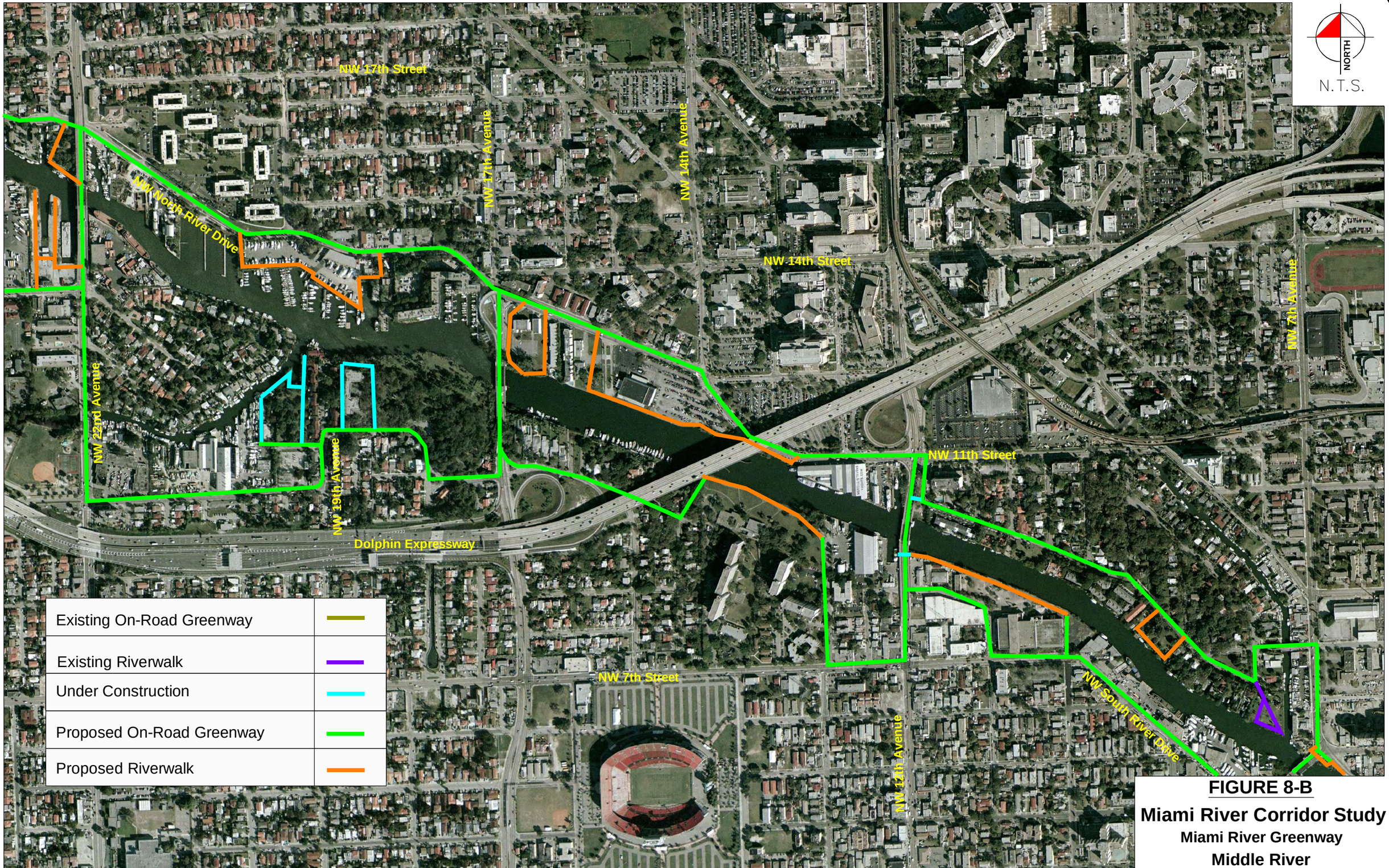
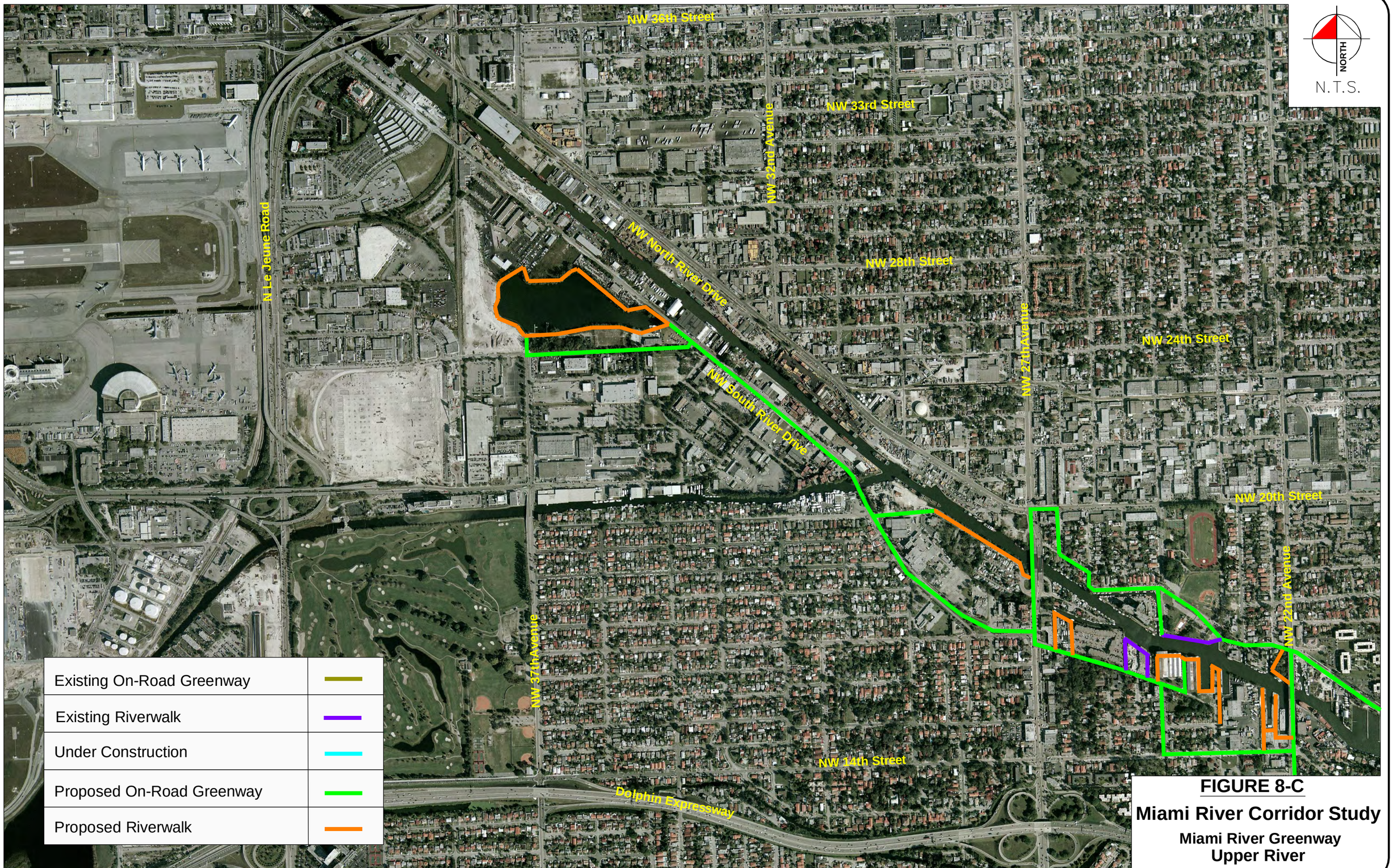


FIGURE 8-B

Miami River Corridor Study

Miami River Greenway

Middle River



NORTH

N.T.S.

FIGURE 8-C

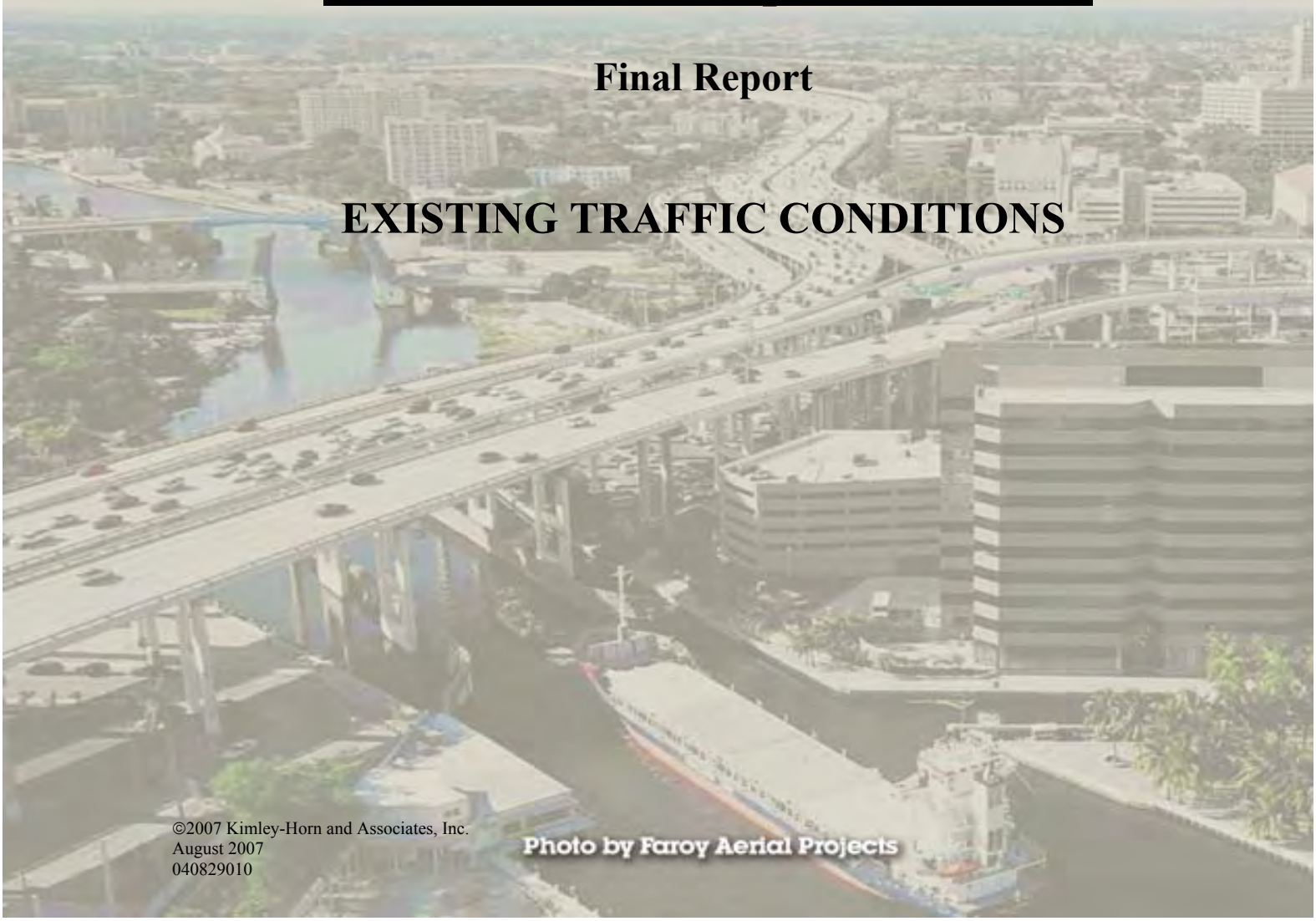
Miami River Corridor Study

Miami River Greenway
Upper River

Miami River Corridor
Multi-modal Transportation Plan

Final Report

EXISTING TRAFFIC CONDITIONS



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Miami River Commission

EXISTING TRAFFIC CONDITIONS

Existing traffic conditions within the Miami River Corridor were assessed to evaluate demand on the existing street network and identify deficient roadway segments. Traffic data collected by the Florida Department of Transportation (FDOT) and the Miami-Dade County Public Works Department (MDPWD) were assembled along with data from previous traffic studies conducted within the study corridor. Upon examining the available traffic count data from existing sources, gaps in the available data were identified. New traffic counts were subsequently collected at key locations to provide a more complete database of traffic information for the Miami River corridor. Traffic counts are included in Appendix D.

Included in the analysis of existing traffic conditions are the identification of the primary roadway network (functional classification and number of lanes), traffic volumes, level of service measurements, and the status of the existing bridges. The existing traffic conditions provide a base to assist in the determination of needs for various transportation studies and improvements.

Roadway Network

For transportation planning purposes, roadway facilities are grouped by functional classification to help define the roadway's character. In urban areas the hierarchy of the functional system consists of principal arterials, minor arterials, collectors and local streets. Principal arterials primarily serve through traffic and carry the highest traffic volumes; minor arterials augment principal arterials at a somewhat lower level of mobility; collector roadways carry lower traffic volumes and provide a connection between high traffic corridors and the local street network; and local streets provide access to adjacent land uses.

Figure 9 presents the functional classification of the roadway network within the study area. Please note that there are sections of North and South River Drive that are not shown on the map. These sections of North and South River Drives are considered local streets under the jurisdiction of the City of Miami.

FDOT Functional Classification

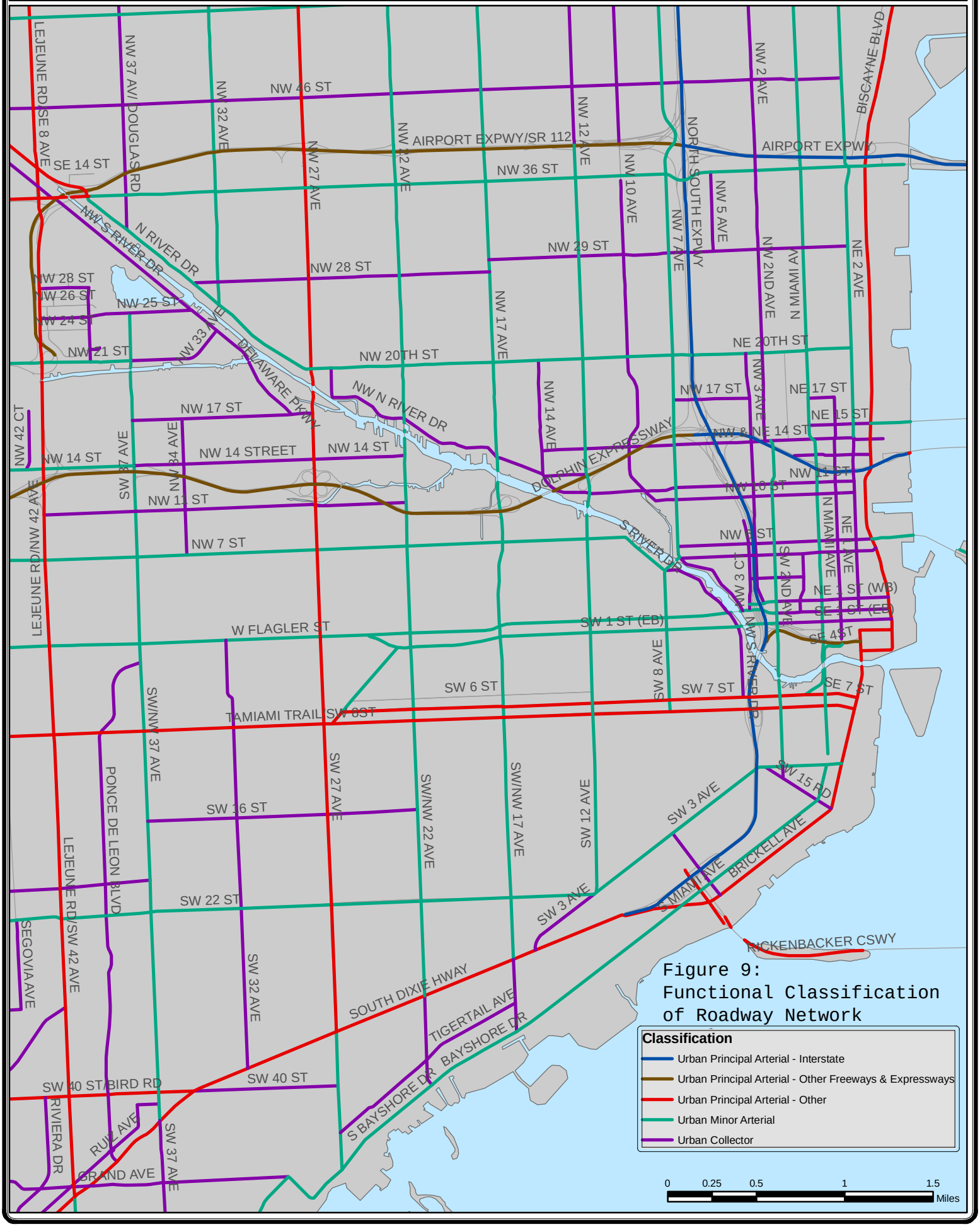

Figure 9:
Functional Classification
of Roadway Network

Traffic Data

Traffic count data were compiled from information provided by the Florida Department of Transportation (FDOT), Miami-Dade County Public Works Department (MDPWD), and various traffic studies within the Miami River corridor. New traffic counts were conducted in key locations where data were not available.

Level of Service

Level of service (LOS) is a quality measure describing operational characteristics within a traffic stream generally in terms of such characteristics as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The level of service for a roadway segment is represented by one of the letters A through F, with LOS A representing the best operating conditions and LOS F the worst. Analytical methods specified in the *Highway Capacity Manual* (HCM 2000) establish methodologies to approximate level of service based upon quantitative measures such as maximum traffic flow rates, volume-to-capacity ratios, and travel speeds.

The existing level of service for roadways within the study area was determined for each location where traffic volume data were analyzed. Levels of service were based upon the maximum flow rates provided in FDOT's *2002 Quality/Level of Service Handbook*, which provides generalized level of service tables. These service volume tables estimate the number of vehicles a facility can carry at various levels of service considering factors such as functional classification, number of lanes, and density of traffic signals.

Table 7 presents the annual average daily traffic level of service (AADT LOS) for roadway segments within the Miami River corridor. This analysis relied upon "Table 4-1" from FDOT's *2002 Quality/Level of Service Handbook*, which provides annual average daily volume thresholds. Please note that the level of service calculations may not adequately represent the traffic conditions on facilities containing bascule bridges, as the bridge openings effectively reduce the capacities of these facilities. Figure 10 presents the existing level of service for roadways within the study area.

Table 5: Roadway Segments Level of Service

Road Name	From	To	Functional Classification	AADT*	AADT LOS (1)
NW 5th St (EB)	NW 7th Ave	Biscayne Blvd	Urban Collector	4543	C
NW 7th St	NW 12th Ave	NW 17th Ave	Urban Minor Arterial	35026	F
NW 10th St (EB)	NW 7th Ave	Biscayne Blvd	Urban Collector	2103	C
NW 17th St	NW 27th Ave	NW 37th Ave	Urban Collector	15323	E
NW 20th St	NW 10 Ave	NW 22nd Ave	Urban Minor Arterial	26380	D
NW 20th St	NW 22 Ave	NW 27th Ave	Urban Minor Arterial	35850	F
NW 21st St	S River Dr	NW 42nd Ave	Urban Minor Arterial	26506	D
NW 28th St	NW 27th Ave	NW N River Dr	Urban Collector	7710	C
North River Dr	NW 2nd Ave	SW 7th Ave	Urban Collector	5703	C
North River Dr	NW 27th Ave	NW 36th St	Urban Minor Arterial	30293	D
South River Dr	NW of NW 17th St	NW 42nd Ave	Urban Collector	11506	D
Miami Ave	SW 7th St	SW 2nd St	Urban Minor Arterial	10320	C
N River Dr	NW 7th Ave	NW 12th Ave	Urban Collector	240	C
N River Dr	NW 12th Ave	NW 17th Ave	Urban Collector	10480	D
N River Dr	NW 17th Ave	NW 22nd Ave	Urban Collector	9310	D
N River Dr	NW 22nd Ave	NW 27th Ave	Urban Collector	7210	C
NW 14th St	NW 22nd Ave	NW 42nd Ave	Urban Collector	5515	C
NW 17th Ave	N River Dr	SW 8th St	Urban Minor Arterial	38745	F
NW 17th Ave	NW 36th St	N River Dr	Urban Minor Arterial	18235	F
NW 22nd Ave	N River Dr	SW 8th St	Urban Minor Arterial	30610	D
NW 22nd Ave	N River Dr	NW 36th St	Urban Minor Arterial	28000	D
NW 37th Ave	SW 8th St	NW 25th St	Urban Minor Arterial	30670	D
NW 37th Ave	N River Dr	NW 7th 9 St	Urban Collector	5800	C
NW th 7 St	NW 17th Ave	NW 37th Ave	Urban Minor Arterial	28240	D
S River Dr	NW 8th Ave	SW 7th St	Urban Collector	2200	C
S River Dr	NW 12th Ave	NW 8th Ave	Urban Minor Arterial	4650	C
SW 2nd Ave	SW 7th St	SW 2nd St	Urban Minor Arterial	11700	D
SR 836 / Dolphin Expwy	NW 27th Ave	NW 17th Ave	Principal Arterial-Freeways and Expressways	161000	E

* AADT: is defined as the total volume of traffic on a highway segment for one year, divided by the number of days in the year. This volume is usually estimated by adjusting a short-term traffic count with weekly and monthly factors.

(1) AADT LOS calculations may not adequately represent the traffic conditions on facilities containing bascule bridges, as the bridge openings effectively reduce the capacities of these facilities.

Table 5 (Continued): Roadway Segments Level of Service

Road Name	From	To	Functional Classification	AADT*	AADT LOS (1)
SR 836 / Dolphin Expwy	NW 17th Ave	I-95 (SR 9A)	Principal Arterial-Freeways and Expressways	136500	F
SR 5/Brickell Avenue	SE 13th St (Coral Way)	SE 2nd Ave	Urban Principal Arterial-Other	34000	F
SR 5/US1/Biscayne Blvd NB	SE 2nd Ave	SE 2nd St	Urban Principal Arterial-Other	23500	F
SR 5/US1/Biscayne Blvd SB	SE 2nd St	SE 4th St	Urban Principal Arterial-Other	20000	D
SR 7 / SW 8th Ave	SW 8th St	Flagler St	Urban Minor Arterial	7400	D
SR 7 / NW 8th Ave	Flagler St	NW S. River Dr	Urban Minor Arterial	10100	C
SR 7 / NW 7th Ave	NW S. River Dr	NW 20th St	Urban Minor Arterial	17000	D
SR 7 / NW 7th Ave	NW 20th St	NW 36th St	Urban Minor Arterial	30500	D
SR 9 / NW 27th Ave	W Flagler St	NW 7th St	Urban Principal Arterial-Other	57000	F
SR 9 / NW 27th Ave	NW 7th St	NW 14th St	Urban Principal Arterial-Other	65000	F
SR 9 / NW 27th Ave	NW 14th St	NW 36th St	Urban Principal Arterial-Other	44000	D
SR 25 / Okeechobee Rd	SR 953 / Le Jeune Rd	NW 27th Ave	Urban Minor Arterial	26500	D
SR 90/US41/SW 7th St WB	US 1	SW 4th Ave	Urban Principal Arterial-Other	11500	C
SR 90/US41/SW 7th St WB	SW 4th Ave	SR 933/SW 12th Ave	Urban Principal Arterial-Other	19500	C
SR 90/US41/SW 7th St WB	SR 933/SW 12th Ave	SR 90 / SW 8th St	Urban Principal Arterial-Other	18000	C
SR 933 / NW 12th Ave	SW 13th St	West Flagler St	Urban Minor Arterial	15300	D
SR 933 / NW 12th Ave	West Flagler St	NW 14th St	Urban Minor Arterial	26000	D
SR 933 / NW 12th Ave	NW 14th St	SR 112	Urban Minor Arterial	22500	D
SR 948 / NW 36th St	NW 57th Ave / Red Rd	Okeechobee Rd	Urban Principal Arterial-Other	49500	F
SR 968 / Flagler St WB	Beacon Blvd	NW 12th Ave	Urban Minor Arterial	20500	C
SR 968 / Flagler St WB	NW 12th Ave	SW / NW 2nd Ave	Urban Minor Arterial	13300	D
SR 968 / Flagler St WB	SW / NW 2nd Ave	US 1 / Biscayne Blvd	Urban Collector	4600	C
SR 968 / SW 1st St EB	SW 17th Ave	SW 8th Ave	Urban Minor Arterial	14000	D
SR 968 / SW 1st St EB	SW 8th Ave	SW 2nd Ave	Urban Minor Arterial	9500	B
SR 968 / SW 1st St EB	SW 2nd Ave	US 1 / Biscayne Blvd	Urban Collector	9300	C
SR 968/ NW / NE 1st St WB	US 1	NW 3rd Ct	Urban Collector	4600	C

* AADT: is defined as the total volume of traffic on a highway segment for one year, divided by the number of days in the year. This volume is usually estimated by adjusting a short-term traffic count with weekly and monthly factors.

(1) AADT LOS calculations may not adequately represent the traffic conditions on facilities containing bascule bridges, as the bridge openings effectively reduce the capacities of these facilities.

Level of Service Map

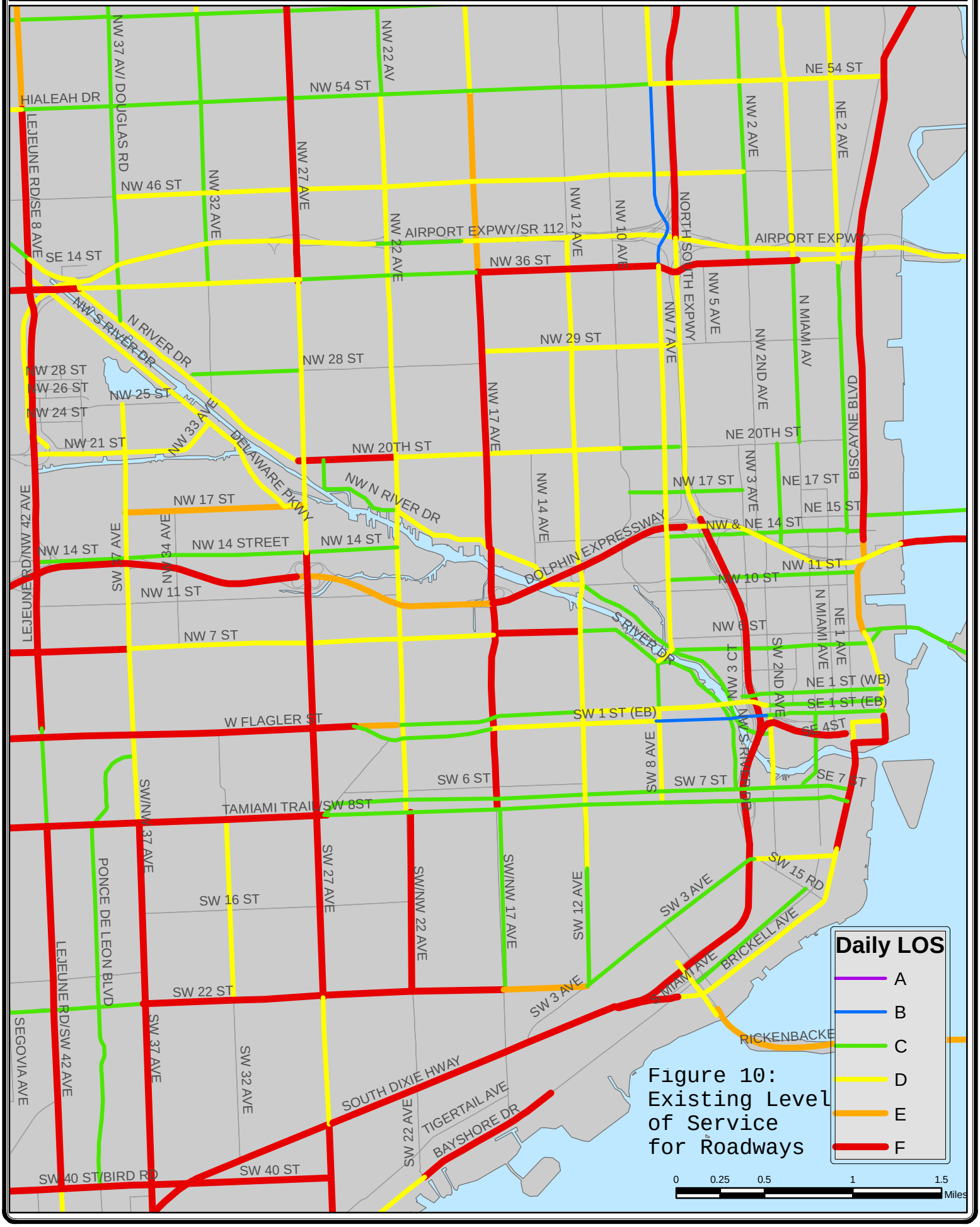

Figure 10: Existing Level of Service for Roadways

Annual Growth Rate

An annual growth rate for the transportation network in the study area was determined based upon historic growth trends at nearby FDOT traffic count stations. The following FDOT count stations were referenced for this analysis:

- Count station 0107 is located on SR 25/US 27/NW 36th Street west of NW 37th Avenue
- Count station 0552 is located on SR 9/SW/NW 27th Avenue south of SR 836
- Count station 5003 is located on SR 7/US 441/NW 7th Avenue north of NW 6th Street
- Count station 5045 is located on SR 5/US 1 east of SE 2nd Avenue
- Count station 5091 is located on SR 90/US 41/SW 7th Street west of SR 5/US1

The growth rate analysis determined a growth rate of 0.42 percent (0.42%) for count station 0107, a growth rate of 3.61 percent (3.61%) for count station 0552, a growth rate of 0.98 percent (0.98%) for count station 5003, a growth rate of 1.64 percent (1.64%) for count station 5045, and a growth rate of 2.53 percent (2.53%) for count station 5091. An average traffic growth rate of 1.8 percent (1.8%) was determined for the study area. It is important to note that with the addition of over 15,000 new residential units either recently completed, under construction or in final permitting along the Miami River, future growth may exceed what has been historically experienced in the Miami River Corridor. However, for analysis purposes of adjusting prior year traffic counts to year 2006 conditions, an average traffic growth rate of 1.8 percent (1.8%) was applied to traffic counts collected before 2006. The annual background growth worksheets are included in Appendix E.

The traffic volumes were adjusted to reflect peak season traffic conditions. This adjustment was performed using the appropriate FDOT Peak Season Conversion Factor. The Peak Season Category Factor table is included in Appendix F and turning movement volume worksheets used to develop intersection volumes are included in Appendix G.

Intersection Capacity Analysis

The operating conditions for the A.M. and the P.M. peak hours were analyzed at key intersections in the study corridor using *Trafficware's SYNCHRO 6.0 Software*, which applies methodologies outlined in the *Highway Capacity Manual,* 2000 Edition. It is important to note that at several of the study intersections traffic could be worse during non-peak hours as a result of bascule bridge openings, since the bascule bridges are locked down during peak traffic periods. However, this analysis was done for the A.M. and the P.M. peak hours following the methodology outlined in the *Highway Capacity Manual,* 2000 Edition.

Analysis worksheets for the study intersections are included in Appendix H. A summary of the intersection analyses is shown in Table 6. The majority of the study intersections currently operate at LOS D or better during the A.M. and the P.M. peak hours. However, the signalized intersection of NW 27th Avenue and North River Drive currently operates at LOS E during the P.M. peak hour, with an overall intersection delay of 66.1 seconds per vehicle. Also, traffic conditions frequently deteriorate in corridors with bascule bridges due to bridges openings.

Table 6: 2006 P.M. Peak Hour Intersection Conditions

Intersection	2006 P.M. Peak Hour Overall Level of Service (Existing Timings)	
	Overall LOS (AM/PM)	Overall Delay (seconds) (AM/PM)
North Miami Avenue and S 7th Street	B / B	19.4 / 18.8
SW 1st Avenue and SW 7th Street	A / B	7.3 / 10.8
SW 2nd Avenue and SW 7th Street	B / C	11.4 / 34.7
SW 2nd Avenue and SW 3rd Street	B / B	12.8 / 13.8
NW 12th Avenue and NW 7th Street	C / C	30.7 / 26.3
NW 12th Avenue & NW 11th Street & NW North River Drive	C / C	29.0 / 29.5
NW 17th Avenue & NW South River Drive	B / D	10.1 / 50.3
NW 17th Avenue & NW 14th Street & NW North River Drive	C / C	20.6 / 17.1
NW 22nd Avenue & NW 14th Street & NW South River Drive	C / C	21.7 / 30.9
NW 22nd Avenue & NW North River Drive	C (1) / C (1)	17.5 (1) / 17.1 (1)
NW 27th Avenue & NW 17th Street	C / C	21.0 / 26.8
NW 27th Avenue & NW 20th Street/NW North River Drive	D / E	40.8 / 66.1

(1) Overall intersection LOS not provided for two-way stop controlled intersections. The worst minor street movement is indicated.

Bridges along the Corridor

There are low level bridges that cross the Miami River Corridor and two additional low level bridges that span over connecting bodies of water. Several of these low level bridges, are currently within a maintenance/reconstruction program. Table 7 lists the low level bridges and details the location, program, description and status of low level bridge projects in the corridor. In addition, there are high level bridges that span the Miami River including Metromover, Metrorail, I 95 and SR 836.

Note that several of the low level bridges are draw bridges. The opening of the draw bridges is governed by Federal regulations. In general, the bridges are locked down during the morning and afternoon peak traffic periods. The drawbridge operation regulations are included as Appendix I.

Table 7: Low Level Bridges along the Miami River Corridor

River Section	*Location*	*Program*	*Description*	*Status*
Lower	Brickell Avenue	TIP	Adding northbound lane	On-going
	South Miami Avenue	GOB	Replace bridge deck, upgrade electrical system, and refurbish bascule leafs	$3,200,000 allocated in 2004 Building Better Communities Bond Program
	SW 2nd Avenue	*no planned or programmed projects for this bridge*		
	SW 1st Street	*no planned or programmed projects for this bridge*		
	West Flagler Street	*no planned or programmed projects for this bridge*		
	NW 5th Street	TIP	Replace movable bridge span	Funded for $43,727,000 in FY 2007, Project is Under Construction
Middle	NW 12th Street	TIP	Replace movable bridge span	Funded for $53,056,500 in FY 2008-09
	NW 17th Avenue	TIP	Replace bridge machinery, controllers & install new roof deck	Funded for $7,000,000 in FY 2007-08
	NW 22nd Avenue	TIP	Structural analysis and design of repairs for the bridge tender house	Funded for $1,074,000 in Prior Fiscal Years
		GOB	Replace or upgrade tender house and refurbish bascule leafs	$1,000,000 allocated in 2004 Building Better Communities Bond Program
Upper	NW 27th Avenue	*no planned or programmed projects for this bridge*		
	Palmer Lake	GOB	Replace bridge and construct lanes	$3,000,000 allocated in 2004 Building Better Communities Bond Program
	Tamiami Canal	GOB	Replace existing swing bridge with single leaf bascule bridge	$19,000,000 allocated in 2004 Building Better Communities Bond Program
	CSX Rail Corridor	*no planned or programmed projects for this bridge*		

Miami River Corridor
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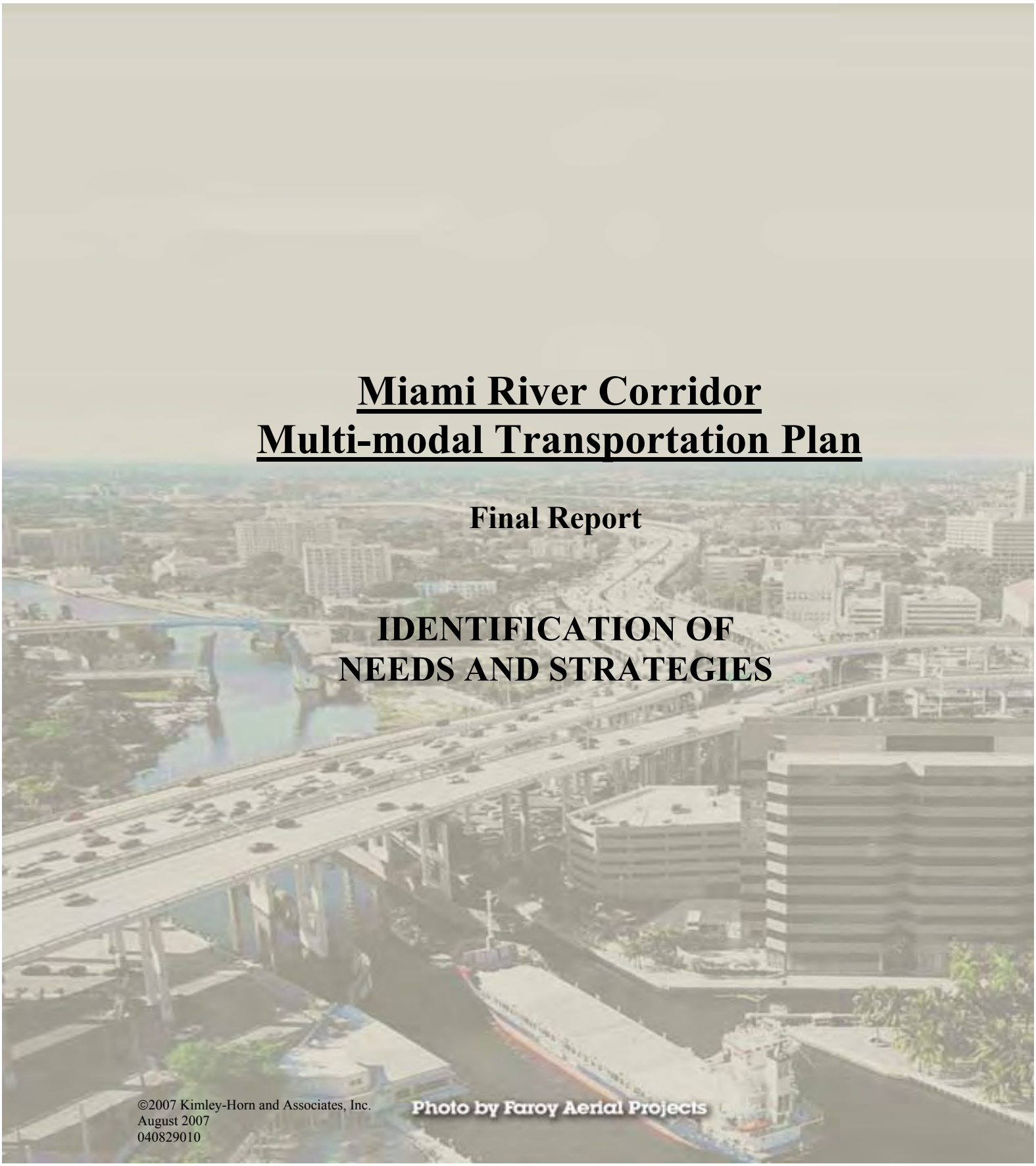
Final Report

IDENTIFICATION OF NEEDS AND STRATEGIES



August 2007
040829010

Miami River Commission

IDENTIFICATION OF NEEDS AND STRATEGIES

Based on the existing conditions analysis presented in this report, transportation needs and deficiencies were identified for several transportation modes along the Miami River corridor. Specific needs for each mode have been assessed for possible improvements to address the deficiencies. Each one of the needs is categorized into the following categories.

- Greenway
- Pedestrian
- Bicycle
- Roadway
- Public Transit
- Freight

Transportation improvements and strategies are listed in Tables 7 through 12, and referenced in the appropriate sections of the text.

- Lower, Middle and Upper River Transportation Improvements in Existing Plans/ Programs are summarized in Tables 7, 8, and 9 for each section of the River, respectively
- Additional Lower, Middle and Upper River Transportation Improvements developed in the Miami River Corridor Multimodal Transportation Plan are summarized in Tables 10, 11, and 12 for each section of the River, respectively

Each line item in the tables is described in detail in the following respective transportation modal sections and located in the corresponding figures.

- Bicycle/Pedestrian Improvements and Miami River Greenways are located in Figures 11-A, 11-B, and 11-C
- Recommended and Existing, Roadway and Transit Improvements are located in Figures 12-A, 12-B, and 12-C

Table 8: Lower River Transportation Improvements in Existing Plans/Programs

Mouth of River to 5th Street Bridge

	Location	Project Description	Status
	Transportation Improvement Program (TIP) Projects		**Total Funding = $87,611,515**
	Roadway Improvements		
1	Brickell Avenue/SR 5/US-1 from 270' South of SE 4th Street to SE 4th Street	Add NB lane and sidewalk with ADA ramps and resurface	Funded for $100,000 in FY 2006-07, Project is Under Construction
2	SR 7/ NW 5th Street	Replace Movable Span Bridge	Funded for $43,727,000 in FY 2007, Project is Under Construction
3	NW 1st Street from North River Drive to NW 3rd Court	Resurfacing roadway	Funded for $582,000 in FY 2007-08
4	Flagler Street from west of SW 2nd Avenue to Biscayne Boulevard	Convert from 1-way to 2-way	Recently Completed Construction
5	Flagler Street from NW 12th Avenue to Biscayne Boulevard	Flexible pavement reconstruction	Funded for $5,386,000 in FY 2009-10
	Bicycle/Pedestrian Improvements		
*	SW 2nd Ave Riverwalk from SW 2nd Ave Bridge to S. Miami Ave. Bridge	Add to Miami River Greenway	Funded for $1,000,000 in FY 2009-10
+	Bicycle Parking for Transit Stations	Purchase Equipment	Funded for $15,706,704 in FY 2010
*	E Little Havana Greenway along S. River Dr from NW 1st St. to NW 5th St. Bridge	Add landscaping, signage, curb & gutter, and bike racks	Funded for $75,000/ $925,000 in FY 2006-07/08-09
*	On road greenway along SW 6th Street from 2nd Avenue to 3rd Avenue, proceeding along 3rd Avenue, west into Jose Marti Park connecting with existing riverwalk	Jose Marti On-road and Riverwalk Extension of Greenway	Funded for $1,260,000 in FY 2010-11
	Lummus Park, on shoreline, from NW 1st Street to NW 3rd Street	Lummus Landing Riverwalk	Funded for $900,000 in FY 2010-11
*	Miami River Greenway from I-95 to NW 12th Avenue	Access improvements	Funded for $2,304,000 in FY 2007-08
	Transit Improvements		
+	Miami Dade CO – MDTA	Fixed Guideway Improvements	Funded for $4,401,000/ $6,341,000 in FY 2006-07/07-08
+	City of Miami, Streetcar Project	Implement streetcar service and provide connection to Miami River	Funded for $2,450,000 in FY 2006-07
6	Golden Glades to Downtown Miami	MDTA – 7th Ave Max Premium Bus Service Transit Demonstration	Funded for $841,000 in FY 2006-07
	Long Range Transportation Plan (LRTP) Projects		
	Roadway Improvements		
7	SW 1st Avenue from SW 8th Street to SW 1st Street	Construct a 4-lane Tunnel under the Miami River	Miami River Tunnel Feasibility Report concluded tunnel costs outweigh benefits
	Bicycle/Pedestrian Improvements		
*	Along south bank of Miami River from Metrorail to SW 2nd Avenue	Add Greenway and paved path	Project is not prioritized in the LRTP
*	Along south bank of Miami River from SW 7th Street to the mouth of the river	Connect portion from Metrorail Path along Miami River to Baywalk	Project is not prioritized in the LRTP
	Miami-Dade County General Obligation Bond (GOB) Projects		**Total Funding = $12,677,000**
	Roadway Improvements		
8	South Miami Avenue Bridge over Miami River	Replace bridge deck, upgrade electrical system, and refurbish bascule leafs	$3,200,000 allocated in 2004 Building Better Communities Bond Program
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Complement other funding sources to complete the Miami River Greenway	$7,500,000 allocated in 2004 Building Better Communities Bond Program
*	Metrorail Path from SW 67th Ave. to Miami River	Misc. surface and intersection improvements	$1,400,000 allocated in 2004 Building Better Communities Bond Program
*	Board of County Commissioners District 5	Infrastructure improvements including sidewalks, resurfacing, and guardrails	$577,000 allocated in 2004 Building Better Communities Bond Program
	City of Miami Capital Improvements Program (CIP)		**Total Funding = $886,000**
	Transit Improvements		
9	Streetcar	Implement streetcar service and provide connection to Miami River	Funded for $886,000 in FY 2006-07
	Miami River Corridor Urban Infill Plan (UIP)		**Total Funding = $16,705,701**
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	All sections	Complete Miami River Greenway to create a continous Greenway surrounding corridor
*	Along the Corridor	Encourage a walkable community, and establish urban design standards	City drafted Miami River Greenway Urban Design Standards and Guidelines
	Transit Improvements		
10	Water Bus Service	Connect River to land based transportation	MPO launching a pilot water bus service in Biscayne Bay
	Roadway Improvements		
11	DuPont Plaza Traffic Circulation	PD&E Study	Funded for $67,298/ $16,638,403 in FY 2006-07 and Prior Fiscal Years
2	5th Street Bridge	Replace bridge	Under Construction
	People's Transportation Plan (PTP), projects funded by the 0.5 cent sales tax		**Total Funding = $288,000**
	Transit Improvements		
+	District 5	General improvement of public transportation	Funded for $288,000 in FY 2006-11

Notes:

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

+ Locate as needed throughout Corridor

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Table 9: Middle River Transportation Improvements in Existing Plans/Programs

5th Street Bridge to NW 22nd Avenue

	Location	Project Description	Status
	Transportation Improvement Program (TIP) Projects		**Total Funding = $76,175,500**
	Roadway Improvements		
12	SR 836/I-95 Interchange from NW 17th Avenue to I-95	Coordination of Operational improvements	Funded for $1,000,000/$1,295,000 in FY 2006-07/08-09, PD&E Study is currently ongoing
13	NW 22nd Avenue Bridge	Structural analysis and design of repairs for the bridge tender house	Funded for $1,074,000 in Prior Fiscal Years
14	NW 17th Avenue Bridge	Replace bridge machinery, controllers & install new roof deck	Funded for $7,000,000 in FY 2007-08
15	NW 14th Street from NW 10th Avenue to I-95	Widen road to 3 lanes and resurface	Funded for $500,000/$500,000 in FY 2009-10/ 2010-11
16	NW 12th Avenue Bridge	Replace movable span bridge	Funded for $53,056,500 in FY 2008-09
17	NW 12 Ave – NW 7 ST to SW 13 ST	Flexible pavement reconstruction	Funded for $7,900,000 in FY 2007-08
	Bicycle/Pedestrian Improvements		
*	North River Drive from NW 7th Avenue to NW 12th Avenue - East Allapattah Greenway	On-road Greenway along North River Drive from NW 7th Avene to NW 12th Avenue	Funded for $1,000,000 in FY 2008-09
*	SW/SE 1st Street from SW 12th Avenue to Biscayne Blvd.	Sidewalk improvement, provide ADA ramps	Funded for $581,000 in FY 2009-10
*	SW/NW 12th Avenue from SW 8th Street NW 14th Street	Provide ADA ramps	Funded for $24,000 in FY 2006-07
*	Bicycle parking for transit stations	Purchase equipment	Funded for $886,000 in FY 2006-07
*	SW/NW 7th Avenue from SW 8th Street to NW 20th St	Build sidewalk	Funded for $359,000/$12,000 in FY 2007-08/2008-09
*	Miami River Greenway, South River Drive NW 7 Ave to NW 7 ST	On-road Greenway along South River Drive from NW 7th Avene to NW 17th Street	Funded for $1,000,000 in FY 2010-11
	Long Range Transportation Plan (LRTP) Projects		
	Roadway Improvements		
12	SR 836/I-395 from west of NW 17th Avenue to I-95	Corridor improvement/collector-distributor road	Priority III Project (2016-2020)
	Bicycle/Pedestrian Improvements		
*	From NW 12th Avenue to SR 836	New paved path along the south side of the Miami River	Project is not prioritized in the LRTP
	Miami-Dade County General Obligation Bond (GOB) Projects		**Total Funding = $9,077,000**
	Roadway Improvements		
13	NW 22nd Avenue Bridge	Replace or upgrade tender house and refurbish bascule leafs	$1,000,000 allocated in 2004 Building Better Communities Bond Program
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Complement other funding sources to complete the Miami River Greenway	$7,500,000 allocated in 2004 Building Better Communities Bond Program
+	Board of County Commissioners District 5	Infrastructure improvements including sidewalks, resurfacing and guardrails	A portion of the $577,000 allocated in 2004 Building Better Communities Bond Program, is designated for this project
	City of Miami Capital Improvements Program (CIP)		**Total Funding = $1,000,000**
	Transit Improvements		
18	Health District Circulator	New Service	Implement transit health district/ civic center circulator service, rubber tire and tram
	Bicycle/Pedestrian Improvements		
19	North Spring Garden Greenway from 5th St Bridge to 12th Avenue	FDOT Transportation Improvement	Funded for $1,000,000 in FY 2007-08 (TIP funding source)
	Miami River Corridor Urban Infill Plan (UIP)		
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	All sections	Complete Miami River Greenway to create a continous Greenway surrounding corridor
*	Along the Corridor	Encourage a walkable community, and establish urban design standards	City drafted Miami River Greenway Urban Design Standards and Guidelines
	Transit Improvements		
20	Water Bus Service	Connect River to land based transportation	MPO launching a pilot water bus service in Biscayne Bay
	Roadway Improvements		
17	NW 12th Avenue from NW 7th Street to Miami River	Improve access on east side of NW 12th Avenue by repaving business property frontage and constructing a sidewalk	
	People's Transportation Plan (PTP), projects funded by the 0.5 cent sales tax		**Total Funding = $288,000**
	Transit Improvements		
+	District 5	General improvement of public transportation	Funded for $288,000 in FY 2006-11

Notes:

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

+ Funding is for projects in County Commission District 5

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Table 10: Upper River Transportation Improvements in Existing Plans/Programs

NW 22nd Avenue to NW 36th Avenue

	Location	Project Description	Status
	Transportation Improvement Program (TIP) Projects		**Total Funding = $193,185,000**
	Roadway Improvements		
21	NW 37th Avenue from North River Drive to NW 79th Street	Widen roadway from 2 to 5 lanes	Funded for $519,000/$4,000,000/$7,087,000 in FY 2006-07/2008-09/2009-10
22	South River Drive north of NW 20th Street	Replace bridge over Tamiami Canal	Funded for $611,000 in FY 2007-08
23	Miami International Airport (MIA) SR 112 Interconnector	State highway connector to the MIC	Funded for $6,936,000 in FY 2006-07, and $21,305,000 in Prior FY
-	NW North River Drive	Install Railroad signal	Funded for $300,000 in FY 2006-07
	Transit Improvements		
24	MDTA- MIC to Earlington Heights Connector	Metrorail extension from Earlington Heights Station over River to the MIC	Funded for $23,000,000/$23,644,000/$13,896,000/$12,290,000 in FY 2006/07-08/08-09/09-10
25	Miami Intermodal Center (MIC)	Intermodal terminal - Tri-Rail relocation	Funded for $100,000,000 with estimated completion in FY 2010
	Bicycle/Pedestrian Improvements		
*	Bicycle parking for transit stations	Purchase equipment	Funded for $886,000 in FY 2006-07
*	NW 27th Avenue from SW 8th Street to NW 16th Street	Provide ADA ramps	Funded for $16,000 in FY 2006-07
	Long Range Transportation Plan (LRTP) Projects		
	Bicycle/Pedestrian Improvements		
*	From SR 836 to Palmer Lake/NW 37th Avenue	New/improved paved path along both sides of the Miami River	Project is not prioritized in the LRTP
	Transit Improvements		
+	East-West Corridor, Metrorail Connector	Provide connection from Miami Airport to MIC to Downtown to Port of Miami	Project is not prioritized in the LRTP
+	Airport People Mover	Automated people mover to connect MIA to MIC	Planning and Design phase
	Miami-Dade County General Obligation Bond (GOB) Projects		**Total Funding = $30,077,000**
	Roadway Improvements		
26	Palmer Lake Bridge	Replace bridge and construct lanes	$3,000,000 allocated in 2004 Building Better Communities Bond Program
22	Tamiami Swing Bridge	Replace existing swing bridge with single leaf bascule bridge	$19,000,000 allocated in 2004 Building Better Communities Bond Program
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Complement other funding sources to complete the Miami River Greenway	$7,500,000 allocated in 2004 Building Better Communities Bond Program
*	Board of County Commissioners District 5	Infrastructure improvements including sidewalks, resurfacing and guardrails	$577,000 allocated in 2004 Building Better Communities Bond Program
	City of Miami Capital Improvements Program (CIP)		**Total Funding = $2,627,911**
	Roadway Improvements		
27	NW 21st Street	Beautification- Phase 1	Funded for $2,627,911 in FY 2006-07
	Miami River Corridor Urban Infill Plan (UIP)		
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	All sections	Complete Miami River Greenway to create a continous Greenway surrounding corridor
*	Along the Corridor	Encourage a walkable community, and establish urban design standards	City drafted Miami River Greenway Urban Design Standards and Guidelines
	Transit Improvements		
28	Water Bus Service	Connect River to land based transportation	MPO launching a pilot water bus service in Biscayne Bay
	People's Transportation Plan (PTP), projects funded by the 0.5 cent sales tax		**Total Funding = $240,288,000**
	Transit Improvements		
+	District 5	General improvement of public transportation	Funded for $288,000 in FY 2006-11
+	East-West Corridor, Metrorail Connector	Provide connection from Downtown to Port of Miami to MIC to MIA to FIU	Project is also funded by the PTP
25	Miami Intermodal Center (MIC)	Intermodal capacity - Tri-Rail relocation	Funded for $240,000,000 with estimated completion in FY 2010

Notes:

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

- Project is illustrated on Miami River Transit/Roadway project map

+ Alignment is not yet determined

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Table 11: Additional Lower River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

Mouth of River to 5th Street Bridge

	Location	Improvement Type	Recommended Improvement
	Roadway Improvements		
R0	Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. I-95) indicating major attractions
R1	Brickell Avenue, South Miami Avenue, SW 2nd Avenue, SW 1st Street, West Flagler Street, NW 5th Street	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and all dynamic message signs
R2	I-95 Downtown Distributor Ramps	Reconstruction	Study alternatives to replace existing ramp system (PD&E study removed from work program)
R3	NW 4th Street from NW 8th Avenue to NW 9th Avenue	Traffic Flow Modification	Convert to one-way westbound traffic flow, as part of the 5th Street Bridge intersection modification
R4	South River Drive @ NW 5th Street/ NW 8th Avenue/ NW 4th Street	Traffic Flow Modification	Close driveway within the intersection, leaving the east and west driveways serving the adjacent site open
R5	North River Drive and Flagler Street (surface street)	Traffic Flow Modification	Install raised median deflectors for traffic calming
R6	Flagler Street from I-95 to North River Drive	Traffic Flow Modification	Continue implementation of 2-way traffic flow (this project has recently been completed)
R7	SW 3rd Street @ S. Miami Avenue	Traffic Flow Modification	Modify intersection to permit eastbound through movement (improvement is under design - to be constructed as part of Riverfront development)
R8	SW 3rd Avenue from SW 6th Street to SW 7th Street	Traffic Flow Modification	Convert to two-way traffic flow
R9	NW 2nd Street and NW 3rd Street	Traffic Flow Modification	Convert the one-way pair to two-way streets from North River Drive to NW 3rd Avenue, where it is already two-way flow
R10	North River Drive @ NW 2nd Street and southbound, north of NW 2nd Street	Signage	Street sign correction, change South River Drive sign to accurately read North River Drive. Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R11	North River Drive northbound @ NW 6th Avenue	Signage	Add advance signage in northbound direction indicating that left-turns are not permitted at NW 7th Avenue
R12	NW 5th Street & NW 6th Street from NW 7th Avenue to NW 4th Avenue	Traffic Flow Modification	Convert the one-way pair to two-way streets and install streetscape improvements
R13	North River Drive, northbound, south of SW 2nd Street	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R14	North River Drive, southbound, south of NW 5th Street/NW 7th Avenue	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R15	South River Drive, southbound, south of NW 8th Avenue/NW 4th Street/ 5th Street Bridge intersection	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R16	SW 4th Avenue, northbound, north of intersection with SW 6th Street	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R17	SW 2nd Street, westbound, west of intersection with SW 2nd Avenue	Signage	Add advance warning signage for low bridge clearance at SW 1st Street Bridge
R18	NW 1st Street from NW 6th Avenue to South River Drive	Traffic Flow Modification	Convert to two-way traffic flow
	Transit Improvements		
+	Metrobus	Service Expansion	Improve service as demand warrants
T1	Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
T2	Metromover	Service Expansion	Extend service hours as development occurs and demand warrants
T3	North River Drive @ West Flagler Street - NB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
T4	North River Drive @ West Flagler Street - SB	Bus Stop	Provide pedestrian level lighting and bench with shelter at bus stop
T5	North River Drive @ NW 2nd Street - NB	Bus Stop	Provide pedestrian level lighting and shelter at bus stop
T6	North River Drive @ NW 2nd Street - SB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
T7	North River Drive @ NW 3rd Street - NB	Bus Stop	Provide pedestrian level lighting and bench at bus stop
T8	North River Drive @ NW 3rd Street - SB	Bus Stop	Provide pedestrian level lighting and shelter at bus stop
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
*	Miami River Corridor	Parking	Remove parking meters from sidewalk and replace with "Pay and Display" machines throughout the Corridor
BP1	Bridges in Lower River Section	Bicycle Facilities	Install wheel gutters for bicycles at all feasible pedestrian stairs on Brickell Avenue Bridge, SW 2nd Avenue Bridge, SW 1st Street Bridge, Flagler Street Bridge
BP2	Brickell Bridge Pedestrian staircase	Sidewalk	Install sidewalk connecting bridge to existing Riverwalk
BP3	North River Drive @ NW 5th Avenue/ NW 7th Street	Bicycle Facilities	Install a bike rack at bus stop
BP4	Maintenance on South side of River	Signage & Maintenance	Provide proper M-Path signage/ remove fences that restricts M-Path access, and riverwalk section between Brickell on the River and 5th Street Metromover station
BP5	SW 7th Street @ SW 1st Court, M-Path	Crosswalk	Install crosswalk for M-Path and improve paved connectivity of M-Path
BP6	SW 1st Avenue between SW 7th Street & SW 8th Street	Sidewalk	Widen sidewalk to match sidewalk between SW 8th Street and Brickell Metrorail Station
BP7	Riverwalk / 5th Street Metromover Station	Maintenance	Remove fence which disconnects the surrounding area to the Riverwalk
BP8	SW 4th Avenue and SW 4th Street	Crosswalk	Install pedestrian crosswalks at all approaches of the intersection
BP9	Beneath South Miami Avenue Bridge	Riverwalk/ On-street	Create riverwalk section connecting One Riverview Square to riverwalk section to the west of the bridge
!	South River Drive between NW 8th Avenue and NW 2nd Street	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks, specifically at the intersections of South River Drive & NW 2nd Street, NW 3rd Street, NW 7th Avenue and NW 8th Avenue
!	North River Drive from SW 2nd Street to NW 2nd Street	Sidewalk	Sidewalk along north side of road needs to be replaced and overgrown landscape needs to be removed
BP10	North River Drive and Flagler Street (surface street)	Maintenance	Remove chain link fence in front of pedestrian stairs at Flagler Street Bridge and move chain link fence to allow access to sidewalk on south side of street
BP11	SW 1st Street Bridge	Pedestrian Facilities	Provide ADA ramps, pedestrian level lighting at stairs, and enhance pedestrian pathway leading to bridge
BP12	Flagler Street Bridge	ADA Ramps	Provide ADA ramps
!	North River Drive from NW 1st Street to NW 3rd Street - west side	Sidewalk	Construct sidewalk, maintain streetscape
!	North River Drive @ NW 2nd Street	ADA Ramps	Reconstruct existing ADA ramps to feed directly into existing paved crosswalk
BP13	North River Drive @ NW 3rd Street	Lighting	Provide pedestrian level lighting adjacent to Lummus Park
BP14	North River Drive @ NW 5th Street/NW 7th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps on north leg of the intersection and north side of NW 5th Street/Provide crosswalks on north leg of the intersection

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

! This project will be completed in the various Greenways along the Corridor

+ Locate as needed throughout Corridor

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Table 12: Additional Middle River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

5th Street Bridge to NW 22nd Avenue

	Location	Improvement Type	Recommended Improvement
	Roadway Improvements		
+	Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. SR I-836) indicating major attractions
R19	NW 12th Avenue, NW 17th Avenue, NW 22nd Avenue	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and all dynamic message signs
R20	NW 11th Street and NW 10th Street	Traffic Flow Modification	Convert to 2-way traffic flow in front of Culmer Metrorail Station, from NW 8th Street Road to west of Biscayne Boulevard. Include bike lanes, landscape, streetscape, and on-street parking
R21	NW 17th Avenue and SR 836/NW 11th Street	Traffic Flow Modification	Re-stripe to provide two northbound through lanes on NW 17th Avenue at NW South River Drive, including signage. Widen NW 11th Street to allow for two eastbound lanes.
R22	North River Drive and NW 17th Avenue	Signage	Improved directional signage to SR-836
R23	North River Drive and NW 22nd Avenue	Signage	Install speed limit sign and install new NW 22nd Avenue Street sign
	Transit Improvements		
+	Metrobus	Service Expansion	Improve service as demand warrants
T9	Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
T10	North River Drive and NW 17th Avenue	Bus Stop	Provide pedestrian level lighting
T11	North River Drive and NW 19th Avenue	Bus Stop	Provide pedestrian level lighting and bench with shelter at bus stop
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
*	Miami River Corridor	Parking	Remove parking meters from sidewalk and replace with "Pay and Display" machines throughout the Corridor
BP15	North River Drive @ NW 14th Avenue/ NW 12th Street	Bicycle Facilities	Install a bike rack at bus stop
BP16	North River Drive @ NW 17th Avenue/ NW 14th Street	Bicycle Facilities	Install a bike rack at bus stop
BP17	Bridges in Middle River Section	Bicycle Facilities	Install wheel gutters for bicycles at all feasible pedestrian stairs on the new NW 12th Avenue Bridge
!	North River Drive @ NW 22nd Court	ADA Ramps	Provide ADA ramps
BP16	North River Drive @ NW 17th Avenue /NW 14th Street	ADA Ramps/ Signal/ Crosswalks	Provide ADA ramps/ install pedestrian signal heads/ re-stripe crosswalks
BP18	North River Drive @ NW 15th Avenue	ADA Ramps/Signal	Provide ADA ramps, install pedestrian signal heads
!	North River Drive @ NW 14th Avenue/NW 12th Street	ADA Ramps/ Pedestrian Features	Provide ADA ramps, crosswalks and pedestrian refuge
BP19	NW 12th Avenue Bridge	ADA Ramps/ Lighting/Maintenance	Provide ADA ramps on bridge/ pedestrian level lighting at stairs/ remove fence south of bridge
!	North River Drive @ NW 11th Court	ADA Ramps	Provide ADA ramps
!	North River Drive @ NW 11th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
!	North River Drive @ NW 10th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
!	North River Drive @ NW 9th Court	ADA Ramps	Provide ADA ramps
!	North River Drive from NW 13th Avenue to NW 14th Avenue	Maintenance	Maintain streetscape
BP20	South River Drive & NW 17th Avenue	Pedestrian Features	Install pedestrian signalized crossing, pedestrian level lighting and crosswalk
BP21	North River Drive @ NW 13th Terrace	Signal	Install pedestrian signalized crossing
BP22	NW 22nd Avenue @ NW 14th Street	Crosswalks	Provide crosswalks
BP23	Durham Park @ NW 13th Street	Crosswalks	Provide crosswalks
BP24	North River Drive @ NW 22nd Avenue (surface street)	ADA Ramps	Provide ADA ramps and sign warning of staircase on east side of bridge
!	South River Drive @ NW 15th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
!	South River Drive @ NW 14th Court	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks
!	South River Drive @ NW 11th Avenue	ADA Ramps/Crosswalks	Provide ADA ramps and crosswalks

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

+ Locate as needed throughout Corridor

! This project will be completed in the various Greenways along the Corridor

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Table 13: Additional Upper River Transportation Improvements Developed in Miami River Corridor Multimodal Transportation Plan

NW 22nd Avenue to NW 36th Avenue

	Location	Improvement Type	Recommended Improvement
	Roadway Improvements		
+	Along Miami River Corridor	Signage	Install wayfinding signage along corridor and on the local major highways (i.e. SR 112) indicating major attractions
R24	NW 27th Avenue Bridge	ITS/Signalization	Implement an automated drawbridge traffic management system, including extended green times following bridge openings and all dynamic message signs
R25	North River Drive @ NW 36th Street	Signal/Maintenance/ Signage	Re-hang signal heads on span wire, replace broken guardrail, resurface, add overhead North River Drive sign, and replace broken signs/add gateway signs for entrance into the Miami River Corridor
R26	South River Drive @ NW 36th Street	Signal	Install gateway signs for entrance into the Miami River Corridor
R27	North River Drive between NW 36th Street and NW 27th Avenue	Maintenance	Resurface roadway
R28	South River Drive between NW 36th Street and NW 28th Street	Lighting/Maintenance	Install street lights, repair storm drain, resurface and grade shoulder
	Transit Improvements		
+	Metrobus, Metromover and Metrorail	Service Expansion	Improve service as demand warrants
T12	Water bus	New Service	Implement water bus service to provide mobility between downtown terminal/port and MIC
T13	North River Drive @ NW 21st Street	Bus Stop	Provide pedestrian level lighting and benches at bus stop on northbound and southbound sides
T14	North River Drive @ NW 21st Terrace	Bus Stop	Provide pedestrian level lighting and benches at bus stop on northbound side
T15	North River Drive @ NW 30th Avenue	Bus Stop	Provide pedestrian level lighting and benches at bus stop on southbound side
	Freight Improvements		
F1	Implement Short Seas Shipping Plan (1)	Major Marine Industrial Related Facility	Potential sites include: (1) vacant 8-acre parcel east of NW 37th Avenue ,(2) west of South Florida Rail Corridor Crossing, and (3) public right-of-way adjacent/beneath proposed Metrorail
	Bicycle/Pedestrian Improvements		
*	Miami River Greenway	Riverwalk/ On-street	Complete the Miami River Greenway
*	Bicycle/ Pedestrian connector from MIC to Greenway	Bicycle Facilities	Establish connectivity between MIC and Miami River Greenway
BP25	North River Drive @ NW 20th Street/ NW 27th Avenue	Signal	Install pedestrian signalized crossing
BP26	North River Drive @ NW 32nd Avenue	Signal/ Crosswalk	Repair existing pedestrian signal heads and crosswalk between NW 32nd Avenue and NW 26th Street
BP28	North River Drive @ NW 36th Street	Signal	Replace existing pedestrian signal heads
BP27	North River Drive between NW 36th Street and NW 27th Avenue	ADA/Maintenance	Provide ADA ramps and repair and reconstruct sidewalk

* Project is illustrated on Miami River Bicycle/Pedestrian and Greenway project map, Figures 11 A, 11B and 11C

+ Locate as needed throughout Corridor

Projects for Transit and Roadway Improvements can be located on Figures 12 A, 12 B and, 12 C; Projects for Bicycle/ Pedestrian Improvements can be located on Figures 11 A, 11B and 11C

Note:

(1) Short Seas Shipping consists of transporting cargo containers from the Port of Miami to a new facility in the Port of Miami River where the containers would be transferred to trucks or rail.

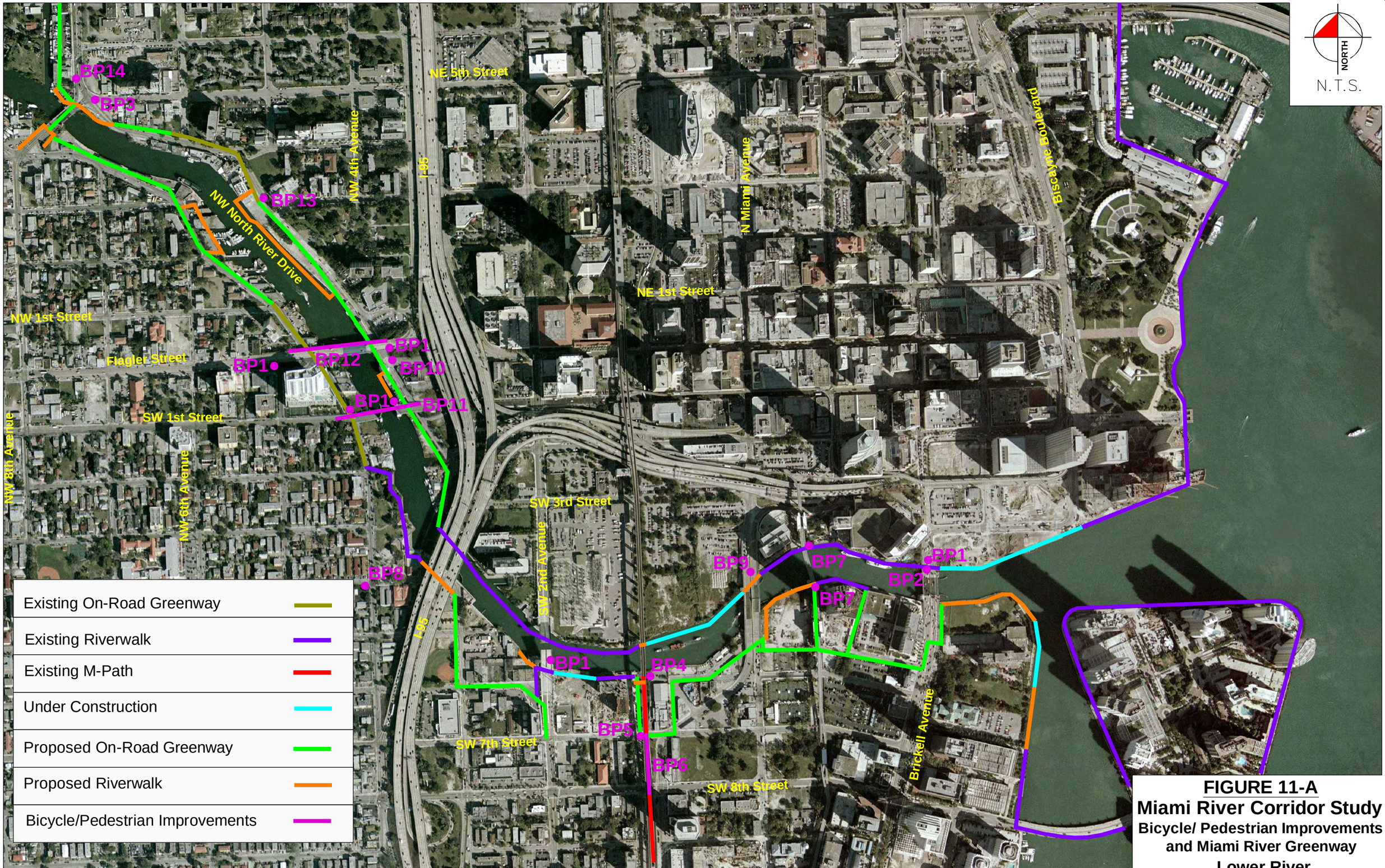


FIGURE 11-A

Miami River Corridor Study

Bicycle/ Pedestrian Improvements and Miami River Greenway

Lower River

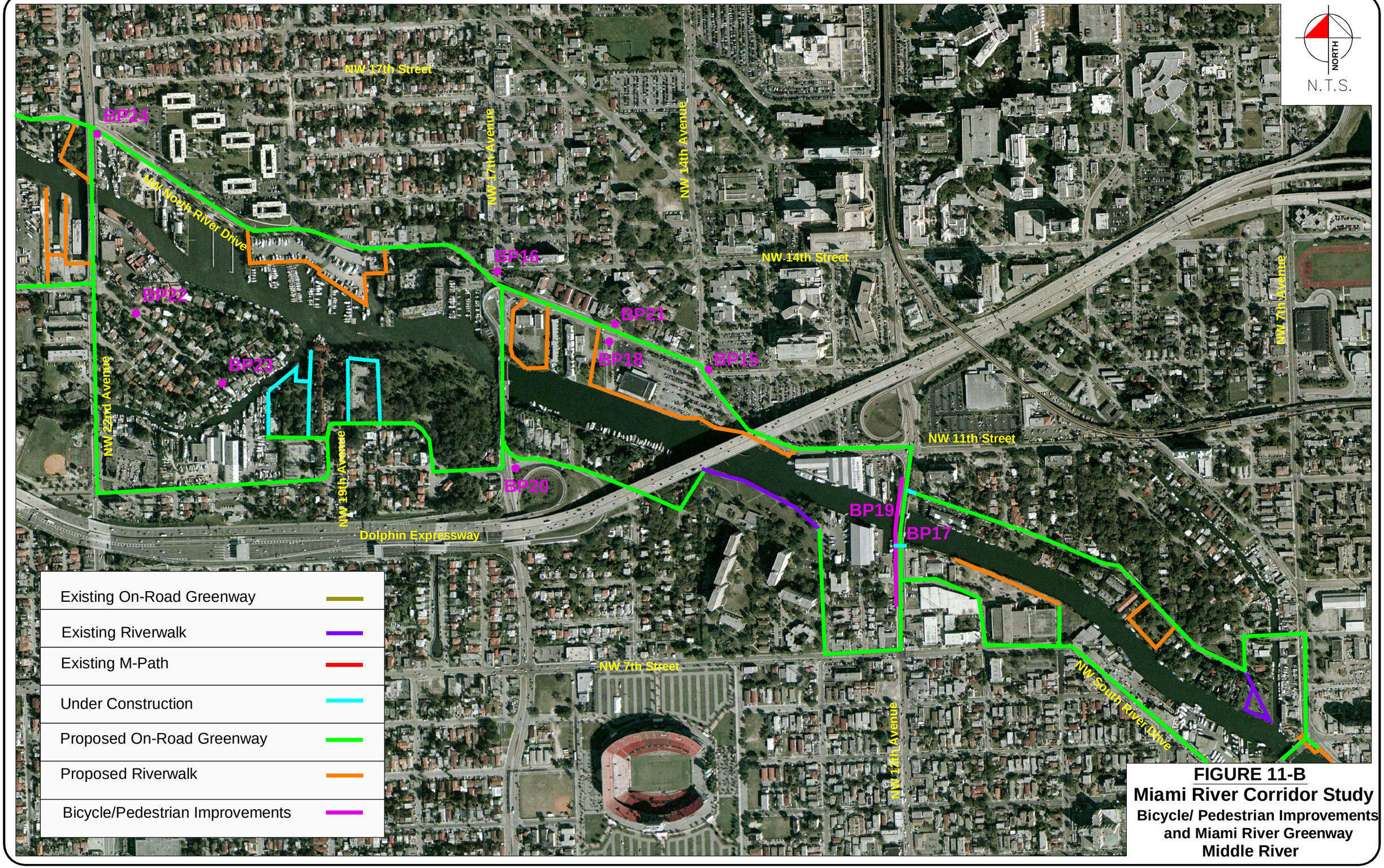


FIGURE 11-B

Miami River Corridor Study

Bicycle/ Pedestrian Improvements and Miami River Greenway

Middle River

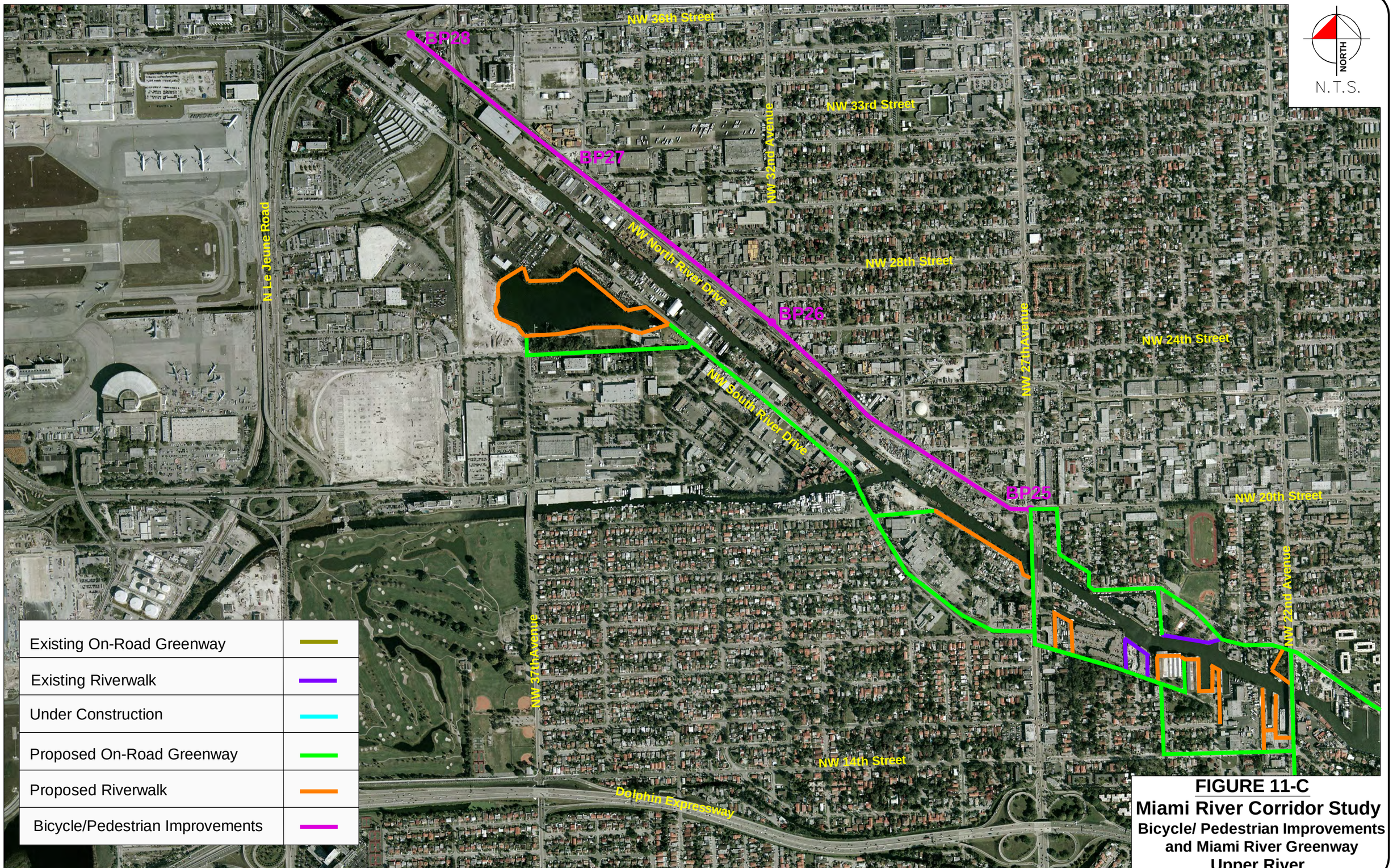


FIGURE 11-C

Miami River Corridor Study

Bicycle/ Pedestrian Improvements and Miami River Greenway

Upper River

N.T.S.

Existing Roadway Improvements	
Existing Transit Improvements	
Additional Roadway Improvements	
Additional Transit Improvements	

FIGURE 12-A

Miami River Corridor Study

Recommended and Existing Roadway and Transit Improvements

Lower River

NORTH

N.T.S.

NW 17th Street

NW 14th Street

NW 11th Street

NW North River Drive

NW South River Drive

NW 17th Avenue

NW 14th Avenue

NW 7th Avenue

NW 22nd Avenue

NW 19th Avenue

Dolphin Expressway

R23

T9/20

13

R19

T11

R22

T10

14

R19

R21

R0

R0

R0

18

18

18

15

15

12

R0

17

R20

16

R19

19

17

T9/20

Existing Roadway Improvements	
Existing Transit Improvements	
Additional Roadway Improvements	
Additional Transit Improvements	

FIGURE 12-B

Miami River Corridor Study

Recommended and Existing Roadway and Transit Improvements

Middle River

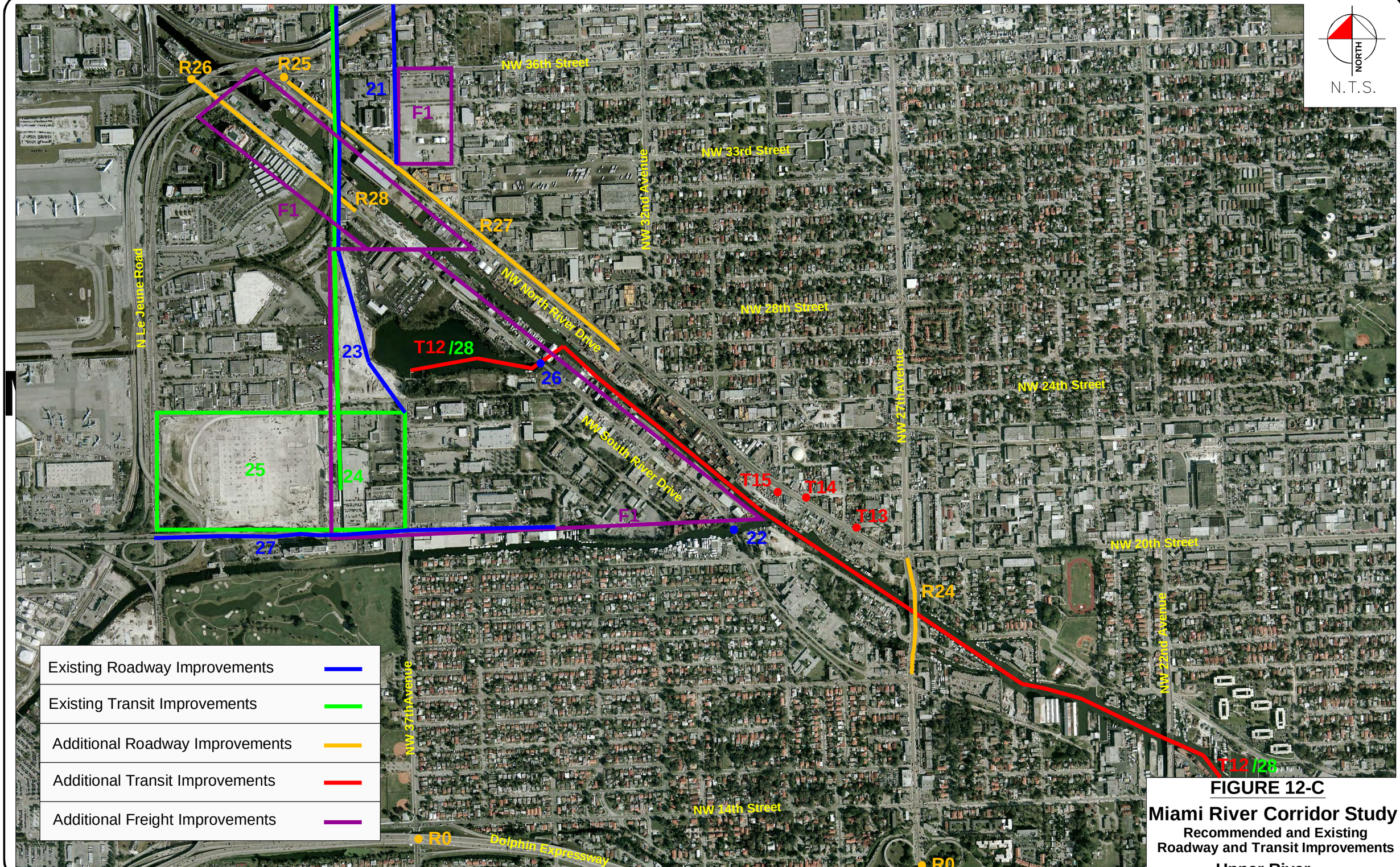


FIGURE 12-C

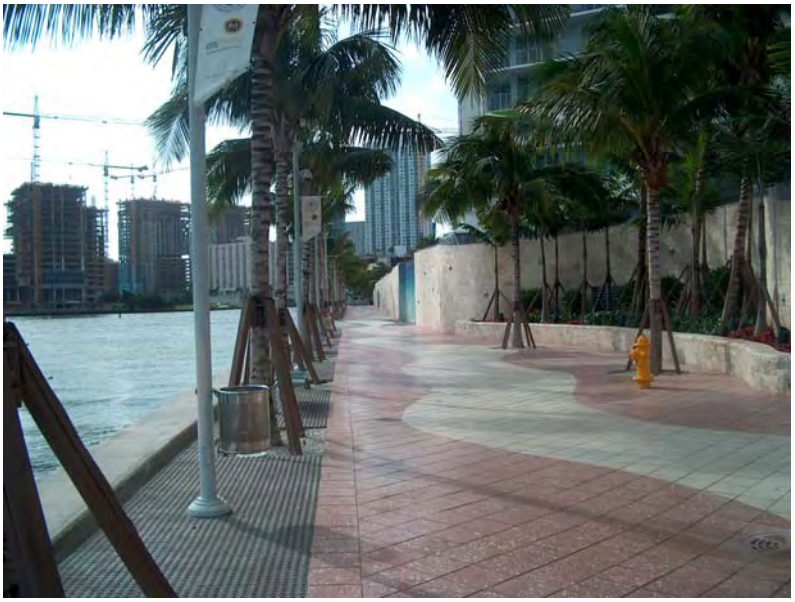
Miami River Corridor Study

Recommended and Existing Roadway and Transit Improvements

Upper River

Miami River Greenway

The Miami River is currently undergoing a beautification and transportation project that will not only make Miami a more attractive city, but will also help to improve pedestrian, bicyclist, and automotive mobility along the Miami River Corridor. The goal is to shape the corridor to create space for alternative modes of transportation from the downtown area to Miami International Airport. The Miami River Greenway Action Plan, which is described in more detail in the Review of Previous and Ongoing Studies section of this Plan, as well as the Existing Bicycle Conditions section, details the existing and proposed facilities along the Corridor. Some of the Greenway sections are directly on the River's edge (Riverwalk), while other Greenway sections are on-road, with the appropriate streetscaping, wayfinding signage, bike-racks, decorative lighting and street furniture. The on-road Greenway sections will avoid the marine industries and low density residential riverfront area.



One Miami Riverwalk

Once all the proposed greenways are constructed, there will be a continuous linear greenway connection along the Corridor. The Greenway projects can be found in the Bicycle/Pedestrian Improvements and Miami River Greenways Figures 11-A, 11-B and 11-C for the Lower, Middle, and Upper River respectively. Some of the Greenway sections are being completed by the

private sector. The list of private sector projects along the River is referenced in Figures 4A, 4B and 4C, and is included in Appendix C.

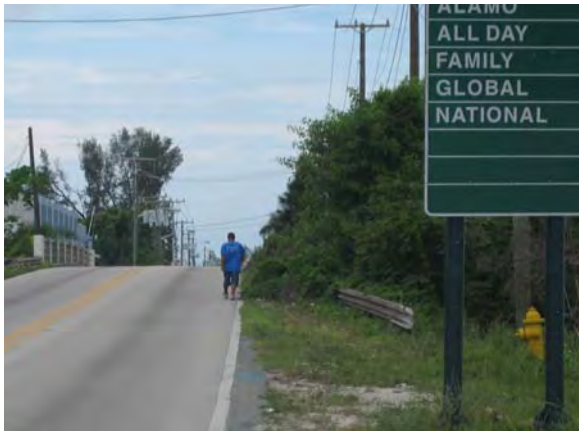
The Greenway system will provide a direct link between pedestrian/bicycle use and the 15,000 plus residential units listed in the Miami River Developments Projects section. The Miami River Multi-modal Transportation Plan recommends that the remaining sections of the Greenway be completed as outlined in the Miami River Greenway Action Plan.

Riverfront East and West - Wind, Cima, and Ivy

Pedestrian

In order for walking to be considered a realistic transportation alternative, existing conditions need to be favorable for pedestrian use. Several areas of the Miami River Corridor do not have sidewalks and/or ADA ramp access.

West of NW 27th Avenue the majority of North and South River Drives do not have sidewalks. While this is principally an industrial area, integration of the entire Miami River Corridor makes certain sidewalk improvements necessary. Sidewalks are also missing along North River Drive in the vicinity of Curtis Park and Lummus Park. Many intersections do not have ADA compliant pedestrian ramps. Crosswalk improvements should also be made to improve access to local communities and the Greenway, as well as major trip attractions along the corridor such as the Judicial Center and Culmer Metrorail Station. Enhanced crosswalks, including textured surfaces and pedestrian bulb-outs, are needed in several areas to provide enhanced pedestrian refuge and additional motorist awareness of the presence of pedestrians.



Pedestrian on South River Drive near Rental Car Return

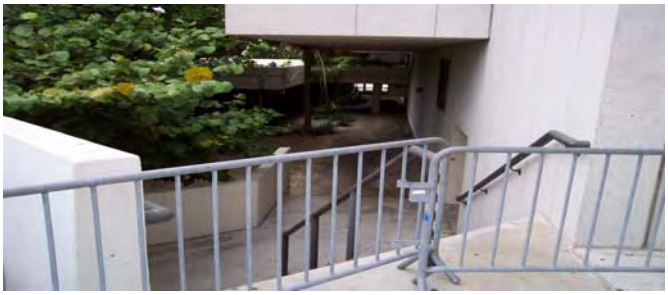
Pedestrians on NW 12th Avenue Bridge

Refer to Tables 10, 11, and 12 for the Lower, Middle, and Upper River, respectively, which summarize the additional Transportation Improvements that were developed in the Miami River Corridor Multimodal Transportation Plan. The pedestrian improvements projects can be found in the Bicycle/Pedestrian Improvements and Miami River Greenways Figures 11-A, 11-B, and 11-C for the Lower, Middle, and Upper River, respectively. Additional pedestrian improvements recommended are described below.

Remove parking meters from sidewalk and replace with "Pay and Display" machines throughout Corridor. This improvement would remove parking meters that clutter sidewalks and inhibit pedestrian flow in areas that have on-street parking. Typically, one "Pay and Display" machine can replace 8 to 10 meters and may operate on solar power. These machines may also simplify maintenance and revenue collection procedures.

Parking Meters Impact the Usable Width of the Sidewalk

Install sidewalk connecting Brickell Bridge pedestrian staircase to existing Riverwalk (BP2). On the north and west side of the Brickell Avenue Bridge, the pedestrian staircase leading from the bridge to the back of the Hyatt does not connect to the existing Riverwalk. The staircase currently leads to a dirt area and is only approximately 45 feet from the Riverwalk.



Brickell Bridge

Fence on riverwalk section between *Brickell on the River* and 5th Street Metromover station

Remove fence blocking access to Riverwalk and 5th Street Metromover Station (BP7). Remove the chain link fence at the Riverwalk and 5th Street Metromover Station, which blocks connectivity between publicly accessible Riverwalk.

Remove fence Metrorail (BP4). Remove Miami-Dade County Transit owned fence and create riverwalk section along South shore, to connect Neovertika riverwalk with the M-Path.

Install pedestrian crosswalks on all approaches at the intersection of SW 4th Avenue and SW 4th Street (BP8). This intersection provides an important connection between Jose Marti Park and the residential community west of SW 4th Avenue. In addition, schoolchildren from Centro Mater use the intersection to access the park.

School Children Crossing SW 4thAvenue at SW 4th Street, Looking West

Connect Riverwalk sections (BP9). Create riverwalk section on the north shore, in Miami-Dade County owned public right-of-way beneath the South Miami Avenue Bridge, connecting the "One Riverview Square" riverwalk to the east and the riverwalk section currently under construction to the west of the South Miami Avenue Bridge.

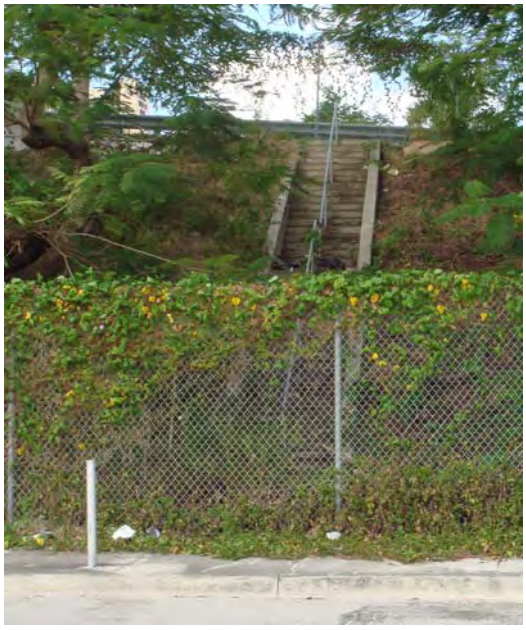
South Miami Avenue Bridge

Install ADA ramps and pedestrian crosswalks along South River Drive between NW 2nd Street and NW 8th Avenue. This section of South River Drive provides a connection from the surrounding community to the existing Jose Marti Park section of the Greenway; however, this area is deficient in ADA ramps and pedestrian crosswalks, specifically at the locations of South River Drive and NW 2nd Street, NW 3rd Street, NW 7th Avenue, and NW 8th Avenue. This project should be included in the East Little Havana Greenway Project.

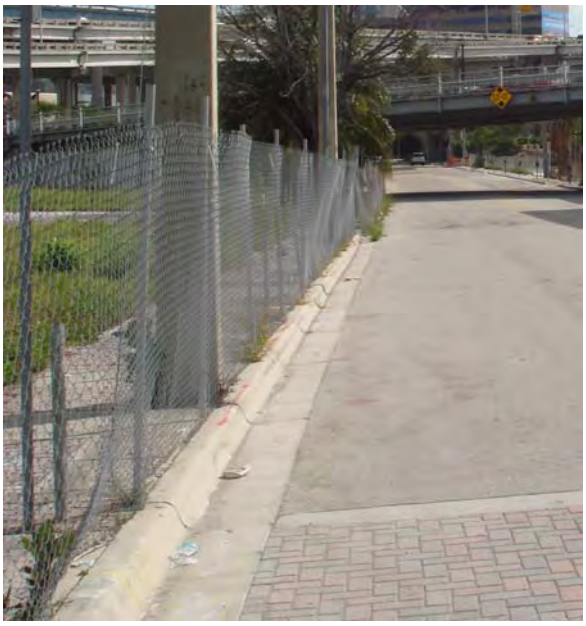
East side of North River Drive and SW 1st Street Bridge

Conduct sidewalk maintenance on North River Drive from SW 2nd Street to NW 2nd Street. From SW 2nd Street to NW 2nd Street along North River Drive, the existing sidewalk needs to be repaired and overgrown landscape needs to be maintained. The weeds that have grown within cracks in the sidewalk create a safety concern and a visual detriment to the area. This project should be included in the Miami River Extension: Flagler Street Bridge Area and Flagler Street Extension Projects.

Remove fence blocking the sidewalk in the vicinity of the North River Drive and Flagler Street (surface street) intersection (BP10). The fence blocking the sidewalk creates a safety deficiency for pedestrians. In addition, the fence extends east along Flagler Street for a block. The fence blocking access to the staircase leading to the Flagler Street Bridge also needs to be removed and the stairs need to be refurbished and maintained.



Fence Blocking Flagler Street Stairs



Fence Blocking Access to Sidewalk along North River Drive

Install pedestrian amenities at SW 1st Street Bridge (BP11). Provide pedestrian crosswalks and enhance pedestrian pathway leading up to the SW 1st Street Bridge staircase and repair and/or replace all staircases serving bridge. These pedestrian amenities would allow for access to the bus service on the bridge. Also install lighting at the pedestrian bridge crossing, on both the east and west sides of the River.

Staircase at SW 1st Street Bridge

Flagler Street Bridge at SW 3rd Court

Install ADA ramps and pedestrian crosswalks on Flagler Street Bridge (BP12). Provide ADA ramps and enhance existing pedestrian crosswalks leading up to and across the Flagler Street Bridge to allow for continuous pedestrian facilities across the Miami River Corridor.

Construct sidewalk along the west side of North River Drive between NW 1st Street and NW 3rd Street. No sidewalk currently exists on the west side of North River Drive across from Lummus Park. This represents a gap in the sidewalk network and hinders access from bus stops to the surrounding community, the existing on-road greenway, and area attractions. This project should be included in the Miami River Extension: Flagler Street Bridge Area.

Bus Stop on the West Side of North River Drive with No sidewalk

Reconstruct existing ADA ramp at North River Drive and NW 2nd Street. Reconstruct the existing ADA ramp to feed directly into the existing paved crosswalk connecting to Lummus Park. Currently, the ADA ramp does not align with the crosswalk. This project should be included in the Miami River Extension: Flagler Street Bridge Area

North River Drive and NW 2nd Street

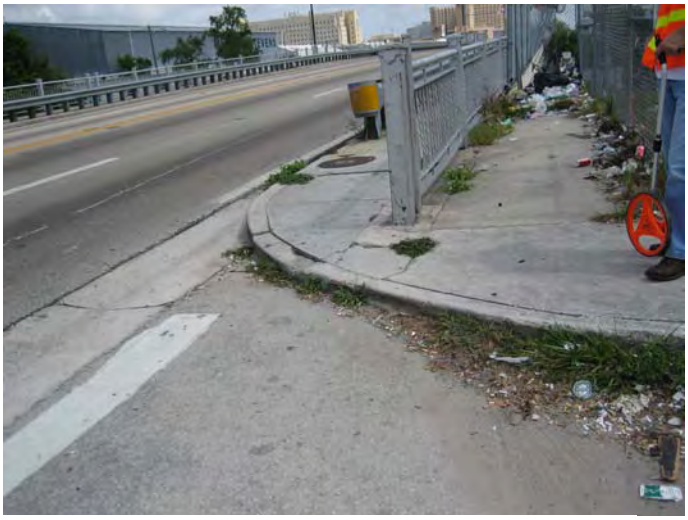
Install pedestrian level lighting on North River Drive and NW 3rd Street (BP13). The on-street greenway is complete with streetscape and furniture; however, pedestrian level lighting needs to be installed near Lummus Park, on both sides of the street and existing streetscaping needs to be maintained.

North River Drive and NW 3rd Street

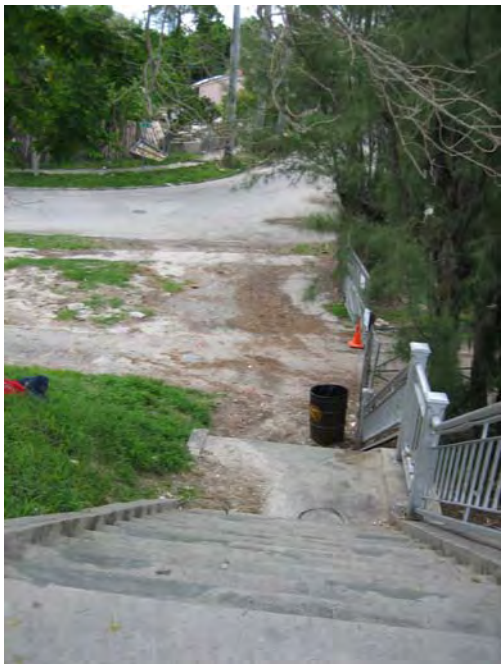
Install ADA ramps and pedestrian crosswalks at the intersection of North River Drive, NW 5th Street, and NW 7th Avenue (BP14). ADA ramps are needed along the north leg of the intersection of NW 5th Street and NW 7th Avenue to allow for a connection from the 5th Street Bridge to the proposed on-street greenway. In addition, enhanced pedestrian crosswalks are needed to provide a well-defined path for pedestrians at this skewed intersection.

Northeast Corner of NW 5th Street and NW 7th Avenue

Install ADA ramps on North River Drive, Middle River section. Due to the high pedestrian traffic connecting to major attractions, such as the Judicial Center, and to serve as continuous pedestrian facilities surrounding the Corridor, install ADA ramps at the following intersections with North River Drive: NW 22nd Court, NW 22nd Avenue (surface street) ***(BP24)***, NW 17th Avenue ***(BP16)***, NW 15th Avenue ***(BP28)***, NW 14th Avenue/NW 12th Street, NW 12th Avenue Bridge ***(BP19)***, NW 11th Court, NW 11th Avenue, NW 10th Avenue, and NW 9th Court. In addition, a metal fence needs to be removed on NW 12th Avenue south of the bridge that narrows the width of the sidewalk and causes maintenance problems with debris piling up between the metal fence and the right-of-way chain-link fence. These improvements should be included in the Miami River Greenway Project.



Sidewalk on South End of NW 12th Avenue Bridge



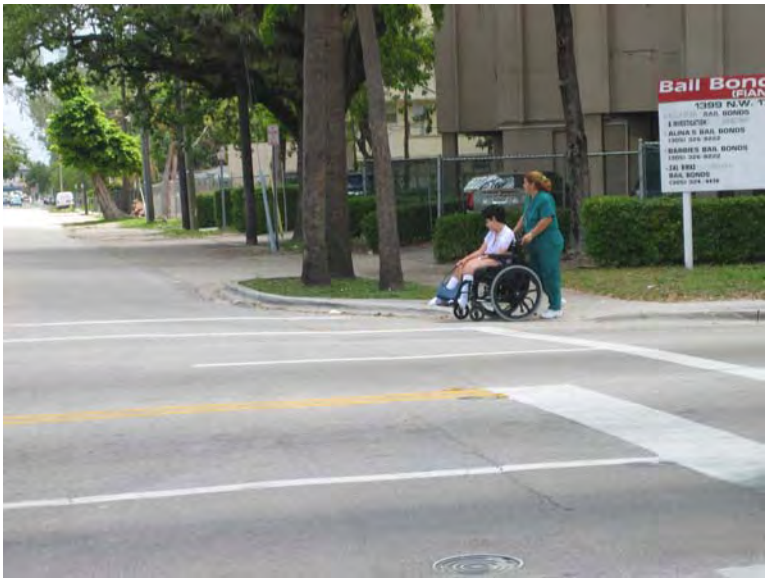
Install pedestrian level lighting on NW 12th Avenue Bridge (BP19). To encourage the local community to use the on-street Greenway connections to nearby neighborhoods and to solve existing lighting deficiencies, install pedestrian level lighting at North River Drive and NW 12th Avenue Bridge. In addition, improve path to the pedestrian steps from NW 12th Avenue to the Spring Garden neighborhood by installing a paved path.

Pedestrian Steps at NW 12th Avenue Bridge

Maintain Streetscaping on North River Drive from NW 13th Avenue to NW 14th Avenue. Once the beautification process is complete, the streetscaping needs to be maintained throughout the Corridor. On North River Drive between NW 13th Avenue and NW 14th Avenue, the overgrown landscape needs to be trimmed back to allow full access of the sidewalk. These improvements should be included in the Miami River Greenway Project.

North River Drive Sidewalk between NW 13th Avenue and NW 14th Avenue

Install pedestrian signalized crossings on North River Drive, Middle River section. For a complete connection of pedestrian facilities along the Corridor, install pedestrian signalized crossings at the following intersections with North River Drive: NW 17th Avenue ***(BP20)***, NW 13th Terrace ***(BP21)***, and NW 11th Street/NW 12th Avenue.



NW 17th Avenue and NW 14th Street

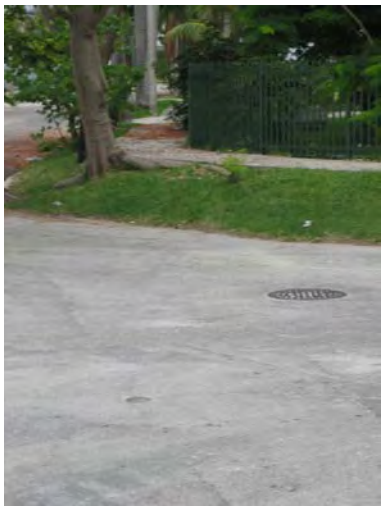
Enhance existing pedestrian crosswalks at the intersection of North River Drive and NW 14th Avenue / NW 12th Street. Provide enhanced pedestrian facility connections to the Miami-Dade Justice Building, which is situated across North River Drive from the Public and Jury Parking Lot. Enhance existing crosswalks on the north and south approaches to the intersection with pavers. In addition, provide landscaped pedestrian bulb-outs on the south approach to the intersection, for additional pedestrian refuge. Currently, pedestrians must cross a wide paved expanse with diagonal markings on the south side of the intersection.

South Crosswalk at North River Drive and NW 14h Avenue

On the north side of the intersection, provide a landscaped raised pedestrian refuge between the southbound through lanes and the southbound right-turn lane. Currently, pedestrians have little separation from traffic and debris builds up within the crosswalk.

North Crosswalk at North River Drive and NW 14h Avenue

Install pedestrian crosswalks on North River Drive, Middle River section. This is a high pedestrian traffic area, due to the proximity of residential neighborhoods and attractions such as the Miami-Dade Justice Building, medical centers, and the Culmer Metrorail Station. Install pedestrian crosswalks at North River Drive and the following intersections: NW 11th Avenue and NW 10th Avenue. These enhancements should be included in the Miami River Greenway Project.



North River Drive and NW 11th Avenue

Install pedestrian features on South River Drive and NW 17th Avenue (BP20). This intersection is a major connection between the local residential community, Sewell Park, the NW 17th Avenue Bridge, and future on-street greenways. Pedestrian facilities are lacking at this skewed geometry intersection, which may create a safety concern. Therefore, install a pedestrian signalized crossing, pedestrian level lighting, and pedestrian crosswalk at South River Drive and NW 17th Avenue.

South River Drive and NW 17th Avenue

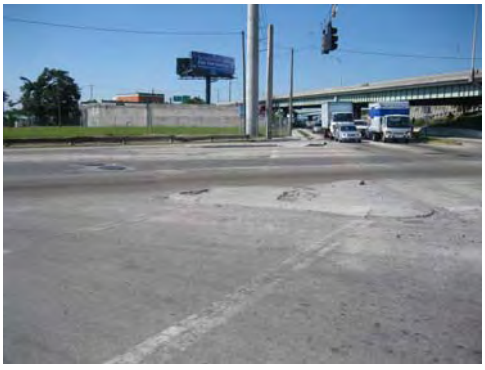
Install pedestrian features on South River Drive, Middle River section. To connect the local community to the River, install pedestrian crosswalks at the following intersections: NW 14th Street ***(BP22)***, NW 13th Street ***(BP23)***, NW 15th Avenue, NW 14th Court, and NW 11th Avenue. The crosswalk on the north side of the NW 11th Avenue intersection appears to have been improperly installed or partially removed. These enhancements should be included in the Miami River Greenway Project.

North River Drive at the NW 32nd Avenue/NW 26th Street intersection

Install ADA ramps on South River Drive, Middle River section. To provide accessible pedestrian facilities along South River Drive, install ADA ramps at the following intersections: NW 15th Avenue, NW 14th Court, NW 12th Avenue, and NW 11th Avenue. These enhancements should be included in the Miami River Greenway Project.

Repair existing pedestrian features on North River Drive at NW 36th Street (BP28). Replace existing pedestrian signal and crosswalks at NW 36th Street. Existing pedestrian features appeared to be non-responsive during field review.

Install pedestrian signal and crosswalk on North River Drive, Upper River section (BP25,26,28). Install pedestrian signal at intersection with NW 20th Street. Install a pedestrian signal and crosswalk on the north side of NW 32nd Avenue intersection. Install a sidewalk connection between NW 32nd Avenue and NW 26th Street. Install a crosswalk connecting to the existing sidewalk across NW 26th Street.



North River Drive and NW 36th Street

North River Drive at NW 32nd Street, facing northwest

North River Drive between NW 36th Avenue and NW 32nd Street, facing northwest

Repair and install pedestrian features on North River Drive from NW 27th Avenue to NW 36th Street (BP27). The area is primarily industrial with large trucks traversing the road, thus creating a safety concern for the public due to the lack of pedestrian features. Sidewalks are in a state of severe disrepair, which also creates a safety concern. In addition, Metrobus service also utilizes portions of North River Drive in the upper river area, enhancing the need for pedestrian improvements. Therefore, it is necessary to repair the existing sidewalk and provide ADA ramps and pedestrian crosswalks along North River Drive between NW 27th Avenue and NW 36th Street.

Bicycle

SW 1st Street Bridge

There are currently no existing bicycle lanes along North and South River Drives. In addition, bridges in the corridor do not provide bicycle lanes or convenient bicycle access. Parks in the area are also not easily accessible by bicycle. However, certain segments of the Greenway (Riverwalk and on-street sections) have been implemented and, therefore, provide bicycle facilities. However, these facilities are currently discontinuous. When completed, the proposed Miami River Greenway would improve bicycle connectivity. In addition, the M-Path begins at SW 7th Street and provides bicycle connectivity to the south along the Metrorail corridor. Bicycle facilities should be built close to public transit stops to provide a connection between modes and to provide alternative transit options. It should also be noted that Miami-Dade buses, Metrorail, and Metromover allow bicycles on board. In general, bicycle lanes should be considered where feasible.

Recommendations for bicycle improvements associated with the Miami River Greenway can be found in the previous Greenway section of this chapter. The additional bicycle improvements recommended in the Miami River Corridor are listed below and can be found in Tables 10, 11, and 12, and Figures 11-A, 11-B and 11-C, respectively.

Install bike racks at major bus stops along the River including:

- NW 7th Avenue and NW 5th Street (Routes 7 and 77) ***(BP3)***
- NW 17th Avenue and NW 14th Street (Routes 17 and 113) ***(BP16)***
- NW 14th Avenue and NW 12th Street (Route 12) ***(BP15)***

Example of Bus Stop with Bike Rack

Bike racks should be installed at other key locations as appropriate or as demand warrants, such as near new residential developments.

Improve connectivity of M-Path at SW 7th Street. An existing paved section of the M-Path exists under Metrorail between SW 7th Street and the Miami River. However, this section is not connected to the M-Path south of SW 8th Street, and is fenced off from the adjacent residential development.

End of M-Path Route Sign near SW 7th Street

- Install crosswalks for the M-Path at the intersection of SW 7th Street and SW 1st Court, and improve paved connectivity between the intersection and the paved M-Path section between SW 7th Street and the Miami River ***(BP5).***
- Widen sidewalk on SW 1st Avenue between SW 7th and SW 8th Streets to match sidewalk width between SW 8th Street and the Brickell Metrorail Station ***(BP6).***

M-Path Sidewalk Narrows at SW 8th Street

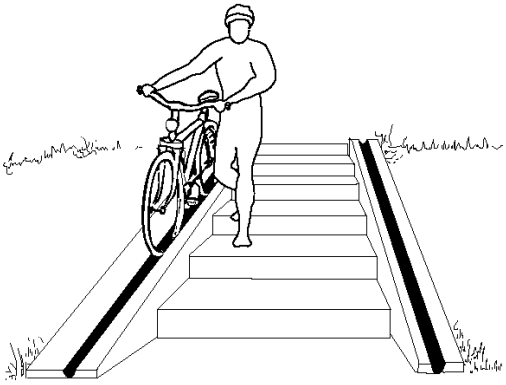
M-Path Entrance at SW 7th Street

- Provide additional M-Path signage in the area.
- Remove fence that restricts access to the M-Path from surrounding residential communities at the River's edge.

Riverwalk Connector between New Neo Vertika Development and M-Path

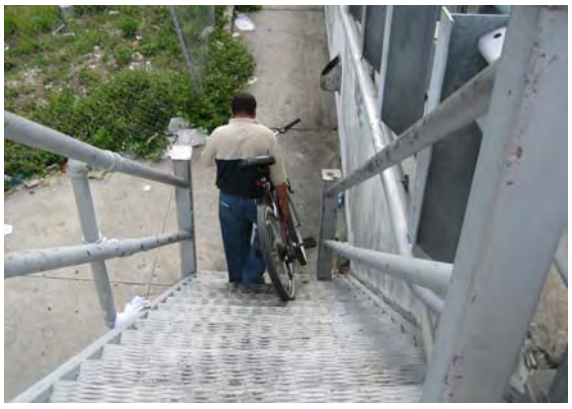
Install bicycle wheel gutters at all pedestrian stairs for bridges crossing the Miami River including (BP1, BP17):

- Brickell Avenue
- SW 2nd Avenue
- SW 1st Street
- Flagler Street
- NW 12th Avenue



Schematic of Wheel Gutter

A wheel gutter is a trough that runs along the side of the stairs, so that a bicyclist can easily roll their bicycle up and down the incline. Hand rails can still be provided in the center of the stairs or on the far outside edge.



Bicyclist Using Stairs at SW 1st Street Bridge

Stairs on the West Side of the Flagler Street Bridge

Establish bicycle connectivity between the Miami Intermodal Center (MIC) and the Miami River Greenway (BP4). The Miami River Greenway includes a proposed section of on-street greenway along South River Drive. A bike path connection should be established between the upcoming MIC, which will become the primary multimodal transportation hub in Miami-Dade County, and the Miami River Greenway. The most likely route for the bike path connection is along NW 25th Street.

Roadway Improvements

To improve traffic flow in the Corridor, widening North and South River Drives was first examined. The conclusion reached that widening those roads is not feasible due to right-of-way constraints. However, other roadway and traffic flow modifications have been identified to address specific needs and deficiencies in the Miami River Corridor. These recommendations are intended to improve traffic flow along the Corridor, and enhance mobility between the Downtown Miami area and the Miami Intermodal Center (MIC). Such improvements include traffic flow modifications, improved signage, enhanced signalized intersections, maintenance, and reconstruction of the roadway. The improvements that are described in detail below are listed in Tables 11, 12, and 13, and can be located in the Recommended and Existing, Roadway and Transit Improvements, Figures 12-A, 12-B and 12-C, respectively.

Intelligent Transportation Systems (ITS) and signalization consistency throughout the Miami River Corridor (R1,19,24). To improve the traffic congestion throughout Downtown Miami and the Miami River Corridor, implement an automated drawbridge traffic management system, including signal preemption providing extended green times to flush traffic after bridge openings, driver information (i.e. dynamic message signs to provide information regarding bridge openings such as direction of vessel and potential alternate routes), detectors (i.e. video image or radar), gates on drawbridges, flashers on gates, and appropriate signage per MUTCD. The affected bridges along the corridor include:

- Brickell Avenue
- South Miami Avenue
- SW 2nd Avenue
- SW 1st Street
- West Flagler Street
- NW 5th Street
- NW 12th Avenue
- NW 17th Avenue
- NW 22nd Avenue
- NW 27th Avenue.

NW 5th Street Bridge

Reconstruct I-95 Downtown Distributor Ramps (R2). Study alternatives to replace the existing ramp system to create a more attractive entrance to Downtown Miami, as well as improve the traffic flow on and off Interstate 95.

Traffic flow modifications at the intersection of the 5th Street Bridge, NW 4th Street, NW 8th Avenue and South River Drive (R3,4). The following two traffic flow modifications were identified for the five-legged intersection of South River Drive, 5th Street Bridge, NW 4th Street, and NW 8th Avenue.

Intersection of NW 5th Street, NW 4th Street, NW 8th Street, and NW South River Drive

- Convert NW 4th Street from two-way to one-way west-bound traffic flow from NW 8th Avenue to NW 9th Avenue. This traffic flow modification will help to improve the intersection capacity by reducing signal phases via eliminating the fifth approach. Install proper signage in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).
- Upon completion of NW 5th Street Bridge replacement project, examine closing the driveway within the northwest quadrant of the intersection, which functions as an approach not controlled by the traffic signal.

NW 5th Street Bridge Intersection, Facing NW 4th Street to the Right and NW 8th Avenue to the Left

5th Street Bridge Intersection, Showing Driveway Entrance into North Leg of Intersection

Traffic flow modifications on North River Drive at Flagler Street (surface street) (R5). Install raised median deflectors (channelization islands) on the three approaches to this intersection to reduce vehicular speeds and provide pedestrians refuge for crossing. Currently, the wide intersection has no channelization and facilitates high vehicular speeds. In addition, street signage needs to be installed to identify the intersection. A chain link fence that blocks access to the sidewalk also needs to be moved to the inside of the sidewalk.

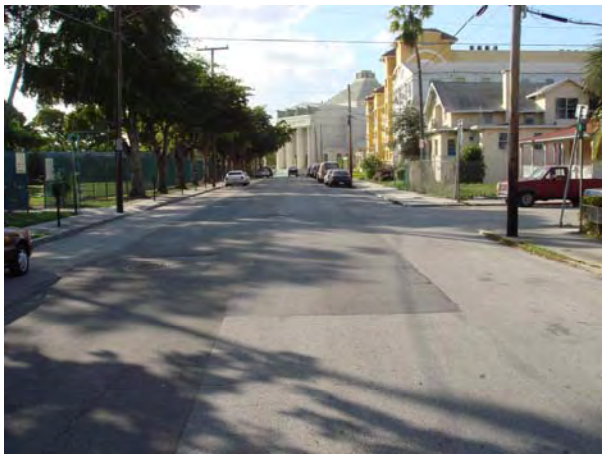
North River Drive and Flagler Street

Traffic flow modifications on Flagler Street from I-95 to North River Drive (R6). To help alleviate traffic congestion in the Downtown district, continue the conversion of the existing one-way street to a two-way street. Include proper signage in accordance with MUTCD standards.

Traffic flow modifications on SW 3rd Street and South Miami Avenue (R7). To improve the traffic congestion in the Downtown area and create improved access to the Miami River Corridor, modify the intersection to permit eastbound through movements on SW 3rd Street at South Miami Avenue. This project has currently been designed for improvements and will be implemented by the developers of the Riverfront projects.

Traffic flow modifications on SW 3rd Avenue from SW 6th Street to SW 7th Street (R8). To improve traffic congestion and accessibility in the area, convert the one block of existing one-way northbound SW 3rd Avenue to a two-way traffic flow. Adding the southbound traffic flow on SW 3rd Avenue would result in a signal modification at the intersection with SW 7th Street, but would enhance access from the surrounding neighborhood to northbound I-95. Proper signage would need to be added in accordance with MUTCD standards.

Traffic flow modifications on NW 2nd Street and NW 3rd Street (R9). Convert the existing one-way pair to two-way traffic flow between North River Drive and NW 3rd Avenue. Both streets are already two-way streets east of NW 3rd Avenue. Currently, both streets are not well-defined with limited pavement markings. The two-way conversion would enhance and simplify access to the River, Greenway, and Lummus Park. Parking could still be accommodated on at least one side of these streets.

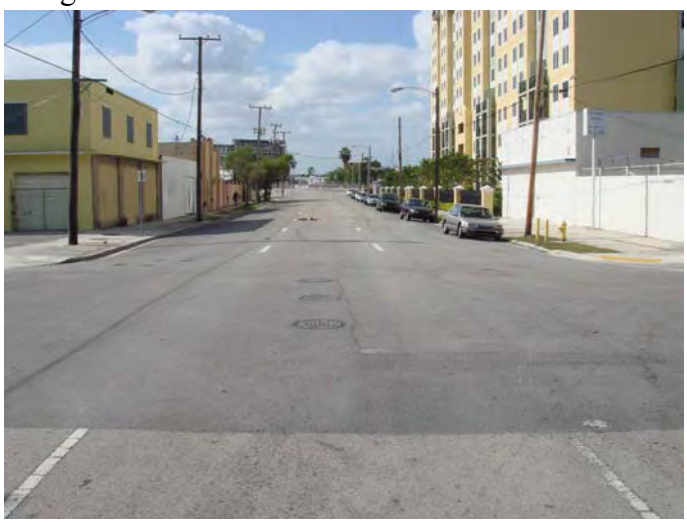


NW 3rd Street near Lummus Park looking westbound

Replace "South River Drive" street sign located on North River Drive at NW 2nd Street (R10). The sign should be replaced with a "North River Drive" sign panel.

Improve signage on North River Drive, Lower River section (R11). The route required to proceed over the 5th Street Bridge needs updated signage. Advance warning signs should be added in the northbound direction on North River Drive, indicating that left turns are not permitted at NW 7th Avenue. Directional guidance signage for southbound NW 7th Avenue should be placed on northbound North River Drive at NW 6th Avenue, and on westbound NW 6th Street at NW 6th Avenue.

Traffic flow modifications on NW 5th Street and NW 6th Street from NW 7th Avenue to NW 4th Avenue (R12). Implement streetscape and two-way conversion improvements along NW 5th Street and NW 6th Street between NW 7th Avenue and NW 4th Avenue. This project would improve access to the 5th Street Bridge, which is a critical link across the River (no other bridges are accessible from North River Drive between SW 2nd Avenue and NW 12th Avenue). In addition, both NW 5th Street and NW 6th Street appear wider than necessary, which causes poor definition of the public right-of-way and hinders pedestrians.



NW 5th Street at NW 6th Avenue looking west toward the 5th Street Bridge

The 5th Street Bridge is currently only accessible from the north along NW 7th Avenue. NW 5th Street is currently one-way eastbound. In addition, no left-turn is allowed from North River Drive to southbound NW 7th Avenue. Therefore, directional guidance signage for southbound NW 7th Avenue should be placed on northbound North River Drive at NW 6th Avenue pointing north toward NW 5th Street, which could provide access to southbound NW 7th Avenue.

On-street parking can be maintained along both NW 5th Street and NW 6th Street. NW 4th Avenue should be the eastern boundary of the two-way conversion in order to not impact traffic flow in and out of the Port of Miami (NW 5th Street and NW 6th Street are a one-way pair east of I-95 that provide access to the Port). Additional traffic operational studies must be performed at the 5th Street Bridge / North River Drive intersection to determine lane configuration and signalization modifications. Furthermore, it may be possible to remove the traffic signal at NW 6th Street, if NW 5th Street is converted to provide two-way traffic flow. In accordance with MUTCD standards, proper signage should be included.

Improve low clearance signage for SW 1st Street Bridge. The SW 1st Street Bridge is a low clearance bridge, standing just 12 feet over the road. Additional advance warning signs should be added at the following locations.

- Southbound on North River Drive north of NW 2nd Street ***(R13)***.
- Northbound on North River Drive south of SW 2nd Street ***(R13)***.
- Southbound on North River Drive south of NW 5th Street and NW 7th Avenue intersection ***(R14)***.
- Southbound on South River Drive, south of the intersection with NW 8th Avenue, NW 4th Street, and NW 5th Street Bridge ***(R14)***.
- Northbound on SW 4th Avenue north of intersection with SW 6th Street ***(R16)***.
- Westbound on SW 2nd Street west of intersection with SW 2nd Avenue ***(R17)***.

North River Drive and SW 1st Street

Traffic flow modifications on NW 1st Street from NW 6th Avenue to South River Drive (R18). To allow for improved access to and from South River Drive, and to re-route trucks from the low clearance SW 1st Street Bridge, convert the two blocks of existing one-way eastbound traffic on NW 1st Street to a two-way flow; include proper signage in accordance with MUTCD standards. Currently, trucks must backtrack several blocks to avoid the low clearance SW 1st Street Bridge.

NW 1st Street at South River Drive looking west

Traffic flow modifications on NW 11th Street and NW 10th Street between NW 8th Street Road and Biscayne Boulevard (R20). Implement streetscape and two-way conversion improvements along NW 11th Street and NW 10th Street between NW 8th Street Road and Biscayne Boulevard (U.S. 1). This project would improve access to the Culmer Metrorail Station from the Miami River Corridor. In addition, the corresponding streetscape improvements would help define the public right-of-way and encourage urban revitalization opportunities within Overtown. The wide expanses of pavement along NW 11th Street and NW 10th Street provides more vehicular capacity than necessary and hinders pedestrian activity.

NW 11th Street at NW 8th Street Road Looking East toward Culmer Metrorail Station

Currently, NW 11th Street is one-way westbound. On-street parking could be maintained between the Culmer Metrorail Station and NW 8th Street Road. In addition, on-street parking could be maintained east of NW 7th Avenue on at least one side of the street. This project could be combined with access improvements to the park located under I-95 between NW 10th Street and NW 11th Street. Proper signage would need to be added in accordance with MUTCD standards.

NW 11th Street at NW 7th Avenue Looking East

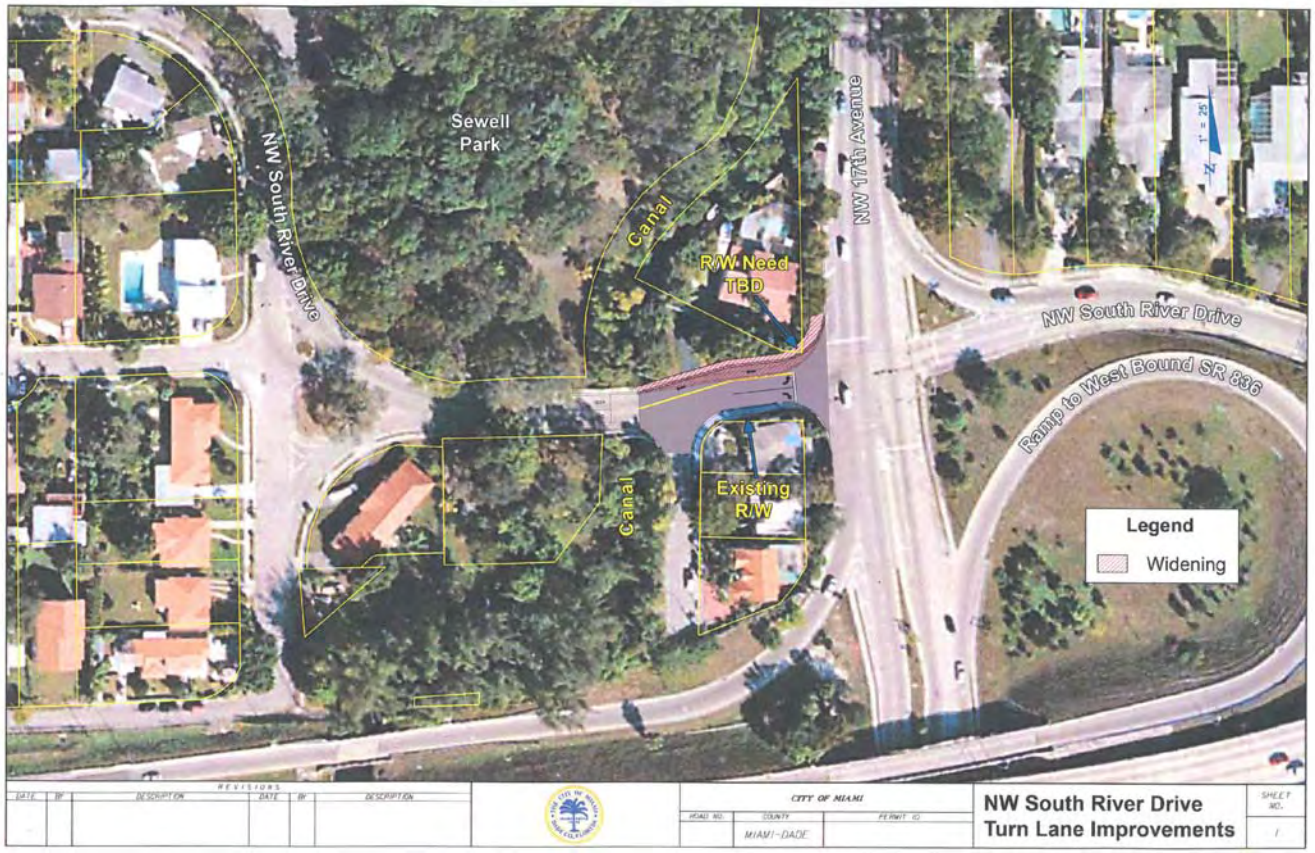
Traffic flow modifications on NW 17th Avenue at South River Drive/S.R. 836 Eastbound exit ramp (R21,22). Currently, three northbound lanes on NW 17th Avenue are channelized down to one through lane at the S.R. 836/South River Drive intersection. One northbound lane becomes a drop lane for the S.R. 836 westbound entrance ramp. However, the pavement is wide enough for two northbound through lanes. Two northbound through lanes on NW 17th Avenue can be provided by restriping the pavement. This improvement would enhance northbound traffic flow in the NW 17th Avenue corridor, which currently operates at LOS F.

NW 17th Avenue Northbound Lanes Narrow from Three Lanes to One Through Lane at South River Drive

This improvement would require converting the westbound South River Drive right-turn lane from a free-flow condition to a yield condition. Proper signage should be included at the entrance of South River Drive to NW 17th Avenue in accordance with MUTCD standards. This improvement could be combined with pedestrian improvements identified for this intersection that are described in the Pedestrian section of this chapter.

NW 17th Avenue at South River Drive/ S.R. 836 Exit Ramp

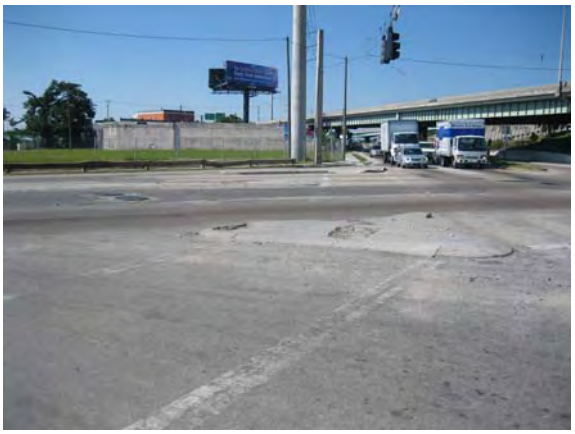
Traffic flow modifications on NW 11th Street at South River Drive/ NW 17th Avenue (21). Currently, there is one lane for eastbound travel and one lane for westbound travel on NW 11th Street to the west of the intersection with NW 17th Avenue. NW 11th Street should be widened at allow for two eastbound lanes, and a larger turning radius from NW 17th Avenue onto NW 11th Street.



Schematic of Intersection Improvements at NW 17th Avenue, NW 11th Street and NW South River Drive
Note: Conceptual design provided by City of Miami

Improve signage on North River Drive, Middle River section (R23). Add speed limit signage between NW 22nd Avenue and NW 19th Avenue. Install new NW 22nd Avenue street sign at intersection of North River Drive and NW 22nd Avenue.

Improve northern gateway into the Miami River Corridor from NW 36th Street (R25). The intersection of North River Drive and NW 36th Street should be revamped, as it serves as the entrance into the Miami River Corridor from the north and west, and provides an initial impression of the River area. Replace the signal heads over NW 36th Street, resurface the roadway, replace broken guard rail on the southbound side of North River Drive, install new overhead North River Drive sign, and add proper wayfinding and gateway signs to identify the Miami River Corridor. The gateway signage could be a monument sign indicating the entrance to the Port of the Miami River.



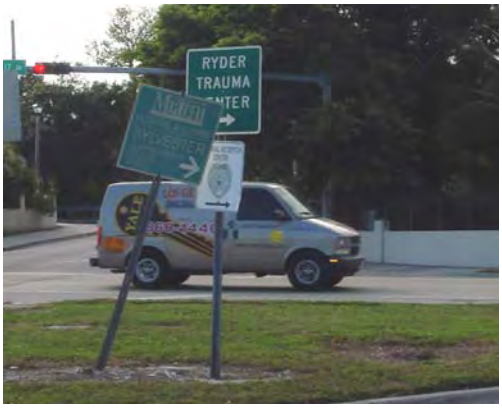
North River Drive and NW 36th Street

Install gateway signage for the Miami River Corridor on South River Drive at NW 36th Street (R26). The intersection of South River Drive and NW 36th Street serves as the northern entrance to the south side of the River and could also be enhanced with a monument sign indicating the entrance to the Port of Miami River, as described above.

Maintenance of North and South River Drives, Upper River section (R28). Resurface roadway on North River Drive between NW 36th Street and NW 27th Avenue ***(R28)***. Install street lights, repair storm drain, resurface and grade shoulder on South River Drive between NW 36th Street and NW 28th Street ***(R28)***.

South River Drive at SR 112 Interchange

Install decorative wayfinding signage throughout the Miami River Corridor. To improve the accessibility of the various attractions along the River and reduce driver confusion, install wayfinding signs along North River Drive and South River Drive throughout the Miami River Corridor, as well as on I-95, SR-836 and SR-112 where appropriate. Wayfinding signs provide directions to nearby attractions and help provide an identity for the River. Wayfinding signs should be strategically located in advance of major intersections and should provide arrows pointing toward nearby destinations. Wayfinding signs should be of consistent appearance throughout the Corridor.



Corridor Wayfinding Signage Could Provide Consistency

Destinations listed on wayfinding signs include historic, cultural, civic, and recreational attractions. Examples of destinations to provide on signs include:

- Orange Bowl
- Miami-Dade Justice Building
- City of Miami Administration Building
- Medical Centers
- Sewell Park
- Curtis Park
- Jose Marti Park
- Miami Intermodal Center (upcoming)
- Culmer Metrorail Station
- Existing Riverwalk sections of Miami River Greenway

Example of Decorative Wayfinding Signage

General Traffic Calming amenities throughout the Miami River Corridor. In response to traffic concerns and analysis of traffic data, conceptual traffic calming alternatives were examined for the Miami River Corridor, specifically along North and South River Drives. Traffic calming has become a common term for addressing a wide range of local traffic concerns including slowing traffic speeds; reducing cut-through traffic; improving the aesthetics of the street; and enhancing safety for pedestrians, bicyclists, and vehicles. Two basic strategies are available to reduce the impacts of cut-through traffic within a neighborhood – volume control measures and speed control measures.

- Volume control measures influence traffic patterns by physically restricting certain traffic movements or posting regulatory signs that prohibit specific movements.
- Speed control measures influence travel speeds through redesigning certain geometric elements of streets to encourage slower traffic speeds, thereby reducing the timesaving benefit of cutting through on the neighborhood streets.

The decision to implement either a volume control measure or a speed control measure is dependent upon the type of traffic problem being experienced at a specific location and requires site-by-site analysis. Effective traffic calming should also incorporate enhancements to the streetscape. This concept includes design and landscaping features that not only improve the aesthetics and livability of a neighborhood, but also increase the effectiveness of many of the traffic calming devices. These improvements can be noted throughout the Identifications of Needs and Strategies.

Bridges spanning the Miami River Corridor. All the bridges could be painted decorative colors, similar to Flagler Bridge spans recently painted light blue, during routine maintenance/refurbishing projects. In addition, consideration should be given to lighting bridges using colored lights, similar to the Metrorail bridge over the River and the Port of Miami Bridge. Alternative power sources (i.e. solar power) for the lights should be given strong consideration.

Public Transit Improvements

The Miami River Corridor links many different modes of transportation; the following list outlines the different modes of transportation that exist or being considered along the Corridor.

- Waterborne freight shipping
- Rail freight shipping
- Truck freight shipping
- Public waterborne transit, which includes watertaxi and waterbus
- Public land based transit, which includes Metrobus, Metromover, and Metrorail
- Commuter rail (Tri-Rail)
- Pedestrian/Bicycle – On-street Greenways and Riverwalks; sidewalks
- Roadway – Automobile traffic
- Air – Miami International Airport
- Multimodal link – linking the Airport, automobile traffic, public transit, Greenways, and rail together including the Miami Intermodal Center (MIC)

Public Transit and Freight improvements will be discussed in detail, in the next two sections and can be found within the Additional Improvements Tables 10, 11, and 12, and Recommended and Existing, Roadways and Transit Improvements Figures 12-A, 12-B and 12-C for the Lower, Middle and Upper Rivers, respectively.

North and South River Drives are the two roadway corridors that run parallel alongside the Miami River. Because of the orientation of the Miami River and the interface with the established grid roadway system, North and South River Drives are not continuous in nature and, therefore, do not provide an attractive route for continuous public transit service. The Miami River itself is the only continuous corridor within the area. Therefore, vehicular public transit should work in conjuncture with waterborne transit to allow for a continuous transit network along the Miami River Corridor.

The Miami Intermodal Center (MIC) is a proposed multi-modal transportation hub situated next to the Miami International Airport at the northeast corner of Le Jeune Road (NW 42nd Avenue)

and NW 21st Street. The MIC will link the Airport, Metrorail, Metrobus, Tri-Rail, Amtrak, charter services, and a single consolidated facility for rental car agencies. A proposed connection to the MIC through waterbus and taxi has also been examined through the Tamiami Canal or Palmer Lake. Once complete, the estimated MIC project cost is $2.25 billion, and estimated completion in 2009.

Public Land Based Transit Improvements

The bus routes that run along the Miami River Corridor are sporadic, do not serve the entire corridor, and currently are disconnected from the River. This disconnection is due to the lack of pedestrian facilities at many of the bus stops and/or the limited bus service. The bus stops along the corridor have been analyzed and those that need improvements are listed below along with the suggested recommendation.

Provide pedestrian level lighting on North River Drive, Lower River section. Install pedestrian level lighting at the following bus stops on North River Drive, near the listed intersections: West Flagler Street – north and southbound ***(T3,4)***; NW 2nd Street – north and southbound ***(T4,5)***; and NW 3rd Street – north and southbound***(T7,8)***.

North River Drive and NW 2nd Street

Provide pedestrian level lighting on North River Drive, Middle River section. Install pedestrian level lighting at the following bus stops on North River Drive near the following intersections: NW 17th Avenue and NW 19th Avenue ***(T10,11)***.

North River Drive and NW 17th Avenue

North River Drive Approximately 300 Feet North of NW 30th Avenue

Provide pedestrian level lighting on North River Drive, Upper River section. Install pedestrian level lighting at the following bus stops on North River Drive: NW 21st Street ***(T13)***; NW 21st Terrace ***(T14)***; and NW 30th Avenue ***(T15)***.

Provide a bench for bus stops on North River Drive, Lower River section (T3,4,5,6,7,8). Install a bench at the following bus stops on North River Drive: West Flagler Street – north and southbound; NW 2nd Street – southbound; and NW 3rd Street – northbound.

North River Drive South of NW 3rd Street, Looking Northbound

North River Drive and Flagler Street, Looking Southbound

Provide a shelter for bus stops on North River Drive, Lower River section (T4,5,8). Install a shelter at the following bus stops on North River Drive: West Flagler Street – southbound; NW 2nd Street – northbound; and NW 3rd Street – southbound.

Provide a bench and shelter for bus stop on North River Drive, Middle River section (T11). Install a bench and shelter at the bus stop near the intersection of North River Drive and NW 19th Avenue.

North River Drive and NW 19th Avenue

North River Drive and NW 21st Terrace, Northbound

Provide a bench for bus stops on North River Drive, Upper River section (T13,14,15). Install a bench at the following bus stops: NW 21st Street – north and southbound; NW 21st Terrace – northbound; and NW 30th Avenue – southbound. The northbound bus stop at NW 21st Terrace should be moved slightly toward the intersection to accommodate a bench in the open space between the hedge and the intersection.

Metromover service expansion and consistency along Miami River Corridor (T2). Currently, the Metrorail and Metromover operate until midnight. A program to extend the service for the full 24-hours was discontinued due to low rider ship. The extended hours should be reexamined as development occurs, population grows and demand warrants.

Waterborne Transit

The Miami River Corridor is not only a functional waterway, but also an attractive focal point unique to Miami. Therefore, it is recommended to use the Corridor as an alternative mode of transportation not only because it would help to alleviate the traffic congestion on the roads, but also serve as a desirable attraction. The Miami River Multi-modal Transportation Plan recommends a waterbus service to be implemented along the Miami River. The waterbus service should connect to the future Miami Intermodal Center (MIC), and provide access to new residential developments as well as existing public transit along the Corridor. Potential waterbus stops include Palmer Lake or the Tamiami Canal, parks, restaurants and feasible Metromover and Metrobus stops. The waterbus service should be operated with vessels ranging in size from 20 to 70 passengers yet be short enough to pass under as many bascule bridges as possible without requiring opening. The most cost feasible and environmentally sound vessels should be explored.

Active WaterBus Service at Annual Miami Riverday Festival

The Miami River waterbus system would connect to a larger proposed waterbus service recommended for Miami-Dade County in the Development of a Service Plan for Waterborne Transit Service. The hub for the waterbus system is proposed near the mouth of the Miami River at Chopin Plaza or Bayfront Park. This location would provide connections from the River to proposed waterbus routes in Biscayne Bay being considered by the County to link to Haulover, Aventura, Coconut Grove, and Miami Beach. Low wake-wash catamaran waterbus are recommended for Biscayne Bay routes with seating capacity for 100 to 149 passengers. An additional advantage for the waterbus transit is the ability to provide transit to the major employment centers including the central business district and civic center.

Consideration should be given to creating waterbus landings where appropriate along the Miami River. For example, the seawall depicted in the picture below of a new residential development on the Fort Lauderdale riverwalk, which has a waterbus service, features a step down area, that makes it easier to board a vessel.

Existing Fort Lauderdale Riverwalk with Acceptable Landing for Waterbus

Figure 13, which is taken from the Development of a Service Plan for Waterborne Transit Service, represents the potential water transit system in Miami-Dade County. The figure shows the potential for a route along the Miami River Corridor, and its connection to the Port of Miami and the surrounding area. This recommendation can be found as line items T1, T9 and T12 in Tables 10-12, as well as on Figures 12 A, 12B and 12C.

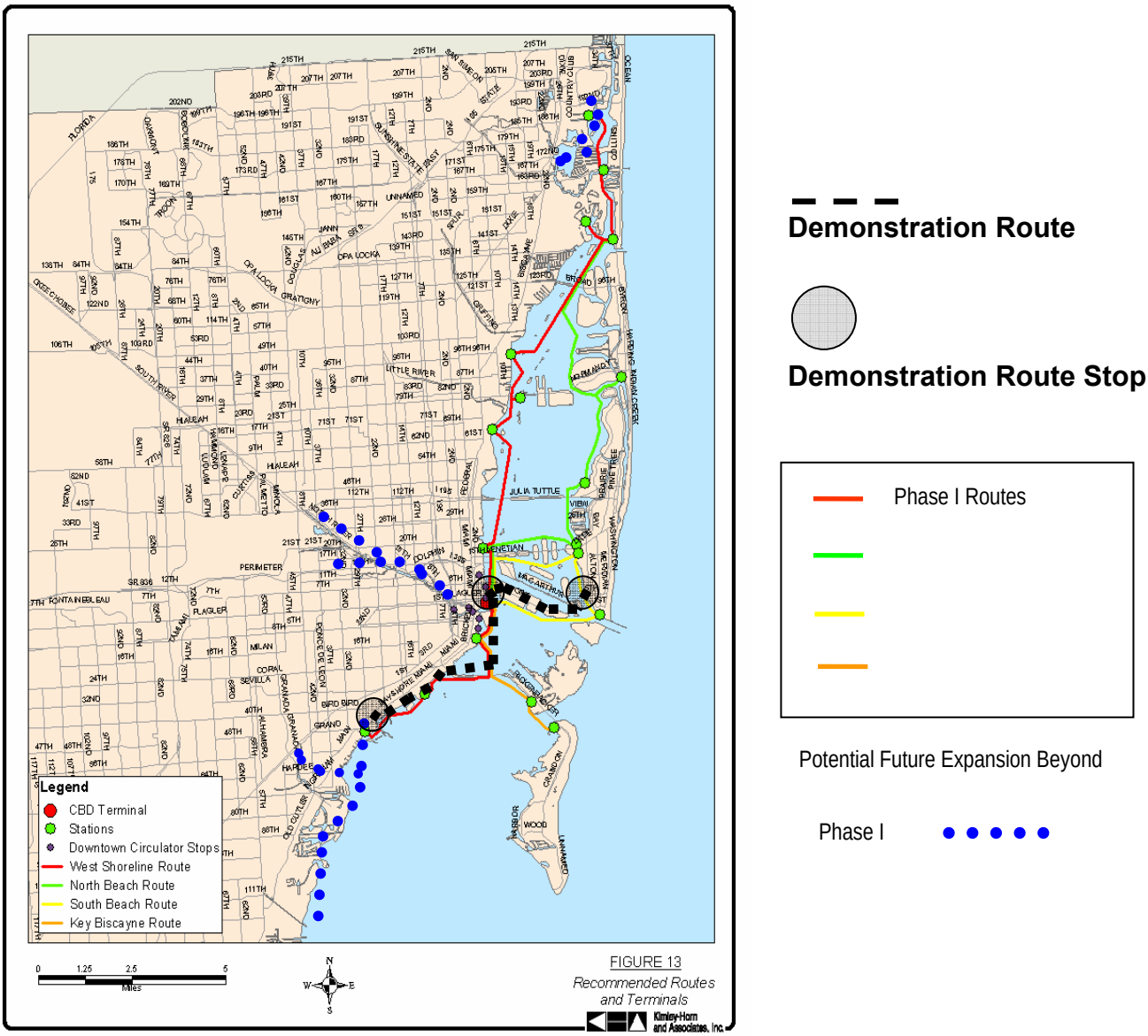


Figure 13: Miami-Dade County Water Transit Recommended Routes and Terminals

Freight Transportation Improvements

The Miami River Corridor Multi-Modal Transportation Plan recommends a comprehensive plan for the areas at the west end of the Miami River's federal navigable channel, including the airport, the Port of Miami River, and the programmed transportation linkages. This area can be instrumental toward helping to modernize and expand the River's marine industry, subsequently benefiting Miami-Dade County.

Presently, the Miami River rivals Tampa as Florida's fourth largest port based on value of cargo traded. "In Florida, (in 2004), Miami River Shipping activities generated $842 million in output, $427 million in income, 7,500 jobs, and $45 million in tax revenues (Biscayne Bay Economic Study, SFWMD, April 2005)." When considering cargo value, the Miami River is calculated to trade $4 billion dollars annually. The federal government has recognized the importance of the River's trade by investing up to $86 million in a maintenance dredging project that will remove accumulated sediments from the channel for improved navigation, and by investing additional funds for security improvements on the Miami River.

Shipping Operations in the Upper River Section

Additionally, the Miami River functions as a "special niche" port with its shallow (15') draft. This niche fosters its survival as a port amid an otherwise consolidating shipping industry. Instead of joining the race to get bigger and bigger ships, the Port of the Miami River serves over 100 shallow draft ports in the Caribbean by retaining its smaller scale. Cargo vessels found at conventional ports like the Port of Miami are simply too large and too deep to reach most of the Miami River's ports of call. People in the Caribbean are dependent on the River as a lifeline for the trade of staples and food commodities that they need

to survive. Even island nations that do have deep-water ports (like Haiti, for example) rely on the River's special niche because they lack the infrastructure to load cargo shipped on deep draft vessels.

Shipping Operations in the Upper River Section

The vision developed for the Miami River's marine industry looks at Miami and its location within the world, its hemispheric strategic advantage and the River's special niche as a port, with the idea of taking advantage of the River to maximize Miami's trade potential. Looking at the current and future needs of Miami's International Airport and the nearby Port of the Miami River, there is potential for integrating the River, road, and rail to maximize cargo and logistic services that would benefit both the airport and River port by creating a modern infrastructure for cargo processing. There is clearly a need for such infrastructure for the Port of Miami River, and a window of opportunity is available with the development of the MIC and associated transportation linkages.

The potential area targeted for freight transportation improvements is the area which is often referred to as "J." The section begins on NW 36th Street, goes over to the Miami River on the east, and comes back around and meets LeJeune at the entrance to the airport, forming a "J" pattern. A review of the area shows that about 80 of the 170 acres are currently vacant.

To the east of the LeJeune Road/NW 36th Street intersection is the western portion of the Miami River, where the majority of the river's cargo terminals are located. Most of the termianls are congested, suffering from limited upland space, and are overcrowded with containers, cars,

trucks and equipment. Some sporadic vacant properties also exist along North and South River Drives between the busy terminals. These areas could be modernized to process cargo more efficiently, creating valuable space for overcrowded terminals. Additionally, the rental car facilities proximate to the area will soon be eliminated and centralized in a 12,000-car facility in the MIC. This consolidation of rental car services will free up land for much needed capital improvement projects that can benefit the Port of the Miami River. For example, a future Miami River cargo zone with truck staging, a marine service area, and much needed warehouse space.

In addition to the private venture opportunities for the River's freight transportation improvements brought forward by airport improvements and the MIC, there is also opportunity within the public sector. As planned today, transportation improvements around the River jeopardize the River's port capabilities as evidenced in the plans for the Earlington Heights Metrorail Connector and the SR-112 Inter-Connector. The construction of the Earlington Heights Metrorail Connector will remove approximately 1,800 feet of working federal navigable channel from the Miami River. The proposed fixed metrorail bridge's limited 42-foot vertical clearance (75-feet is provided at SR-836 and I-95) will preclude the area west of the Earlington Heights Connector from being used for traditional ship loading. Similarly, the adjacent proposed SR-112 Interconnector's fixed bridge also imposes a 40-foot height restriction over the River.

Fortunately, the taking of approximately 1800 feet of channel for alternative transportation uses can be mitigated to benefit the River's future port infrastructure. In further studying a comprehensive transportation plan for the Upper River, transportation agencies should investigate how properties taken by public agencies can be reused by River port users once the transit projects are completed. The proposed fixed bridges will require acquisition of all or part of several riverfront parcels. These parcels could be used to fulfill a variety of port needs (other than the loading of big ships) that are compatible with safe operations and maintenance of the transit system.

On the north side of the River, for example, there is a large slip that would be ideal for river barge operations. The site is also one of several that could serve as a staging area for Short Sea Shipping, an initiative that would reduce trucks in the downtown area by transporting cargo from

the Port of Miami to the Port of the Miami River before transferring to alternative modes (truck or rail). The Short Sea Shipping concept is discussed in more detail in the next section of the report. The same slips could also serve smaller vessel shipping operations and/or tugboat operations. Additional surplus parcels could fill the need for a truck staging depot, which may alleviate the congestion on North and South River Drives. Truckers now often stage along these roadways to wait for their appointments to enter River terminals. Surplus parcels could also be used for the consolidation of cargo or for a mobile Customs and Border Protection (CBP) agency office. CBP recently announced that by 2008 all cargo containers will be required to be scanned through radiation portals, thereby creating a need to house portable radiation scanning units in close proximity to River terminals

Freight transportation improvements recommended for the Miami River corridor include:

- Establish a customs freight forwarding center.
- Establish a state-of-the-art cargo handling facility, to include customs clearing; bonded, on-site, break-bulk handling/warehousing/loading; cold storage; and secure rail link to MIA cargo
- Link freight connectivity between Miami International Airport and Port of Miami River by transporting freight via a secured rail connector between the airport and adjacent portions of the Port of Miami River, where a state-of-the-art freight facility may be created. Ships may be topped off with goods from the airport before heading out to sea.
- Implement a truck depot within the Upper River section.
- Reserve land for water-related marine industrial uses in the Upper River section

Potential Sites for a Freight Forwarding Center Include the 8-acre County Site East of NW 27th Avenue, and a Site on the River Just West of the South Florida Rail Corridor Crossing

Short Sea Shipping

Short Sea Shipping is a nationally recognized initiative that promotes the use of our nation's waterways. Barges with cargo containers may be towed between the Port of Miami and facilities in the marine industrial "upper" Port of Miami River in order to alleviate congestion in Downtown Miami and Port of Miami. The facilities on the Miami River utilized for this operation would serve as distribution centers where containers could be picked up and trucked to their final destination; these same facilities could also be used for rail services.

Short Sea Shipping would require that the containers being transported would have already been cleared by (Customs, Coast Guard and Immigration) and scheduled for pick-up by truck or rail no more than 48 hours after leaving the Port of Miami. These requirements are necessary to keep the facilities working efficiently. Customs searching the containers at the Miami River shipping facilities would cause unwanted delays to operations. Furthermore, storing or holding containers in the relatively small Miami River terminals would not be efficient. This general short sea shipping concept is based on input from several enterprises along the Port of Miami River, including but not limited to P&L Towing, Miami River Marine Group, etc.

This recommended service would also assist the truckers who use it by reducing the time and fuel wasted while stuck in downtown traffic. Most truckers are owner/operator and/or small

businesses that depend on the ability to move containers the most efficient way possible. Potential benefits of the Short Sea Shipping initiative are summarized below:

- Less trucks traveling through the downtown to and from the Port of Miami which create traffic jams.
- Improved safety for vehicle and pedestrian traffic in the downtown corridor.
- Improved quality of life for downtown residents by reducing trucks in the downtown core.
- Reduced security costs by removing trucks that have to be searched at the Port of Miami.

Additional information about Short Sea Shipping developed by Miami River Group in part with P&L Towing is provided in Appendix J.

Miami River Corridor
Multi-modal Transportation Plan

Final Report

STRATEGIC INTERMODAL SYSTEM (SIS)

August 2007
040829010

MIAMI-DADE MPO Metropolitan Planning Organization
Miami River Commission

STRATEGIC INTERMODAL SYSTEM (SIS)

SIS Background

According to the United States Census Bureau, a net of 1,000 people move into Florida each day. This drastic growth in population has caused the sprouting of economic centers across the state and a critical need for a continuous transportation network. Several statewide transportation authorities and transportation-related groups bound together to create the SIS based on the Economic Competitiveness Goal established in the 2020 Florida Transportation Plan.

Florida established the Strategic Intermodal System (SIS) in 2003 to provide a transportation network vital for the economy of Florida. In doing so, Florida has created a plan for each individual transportation facility to work together as a system to maximize limited State resources.

The Florida Legislature and Governor adopted in Sections 339.61-64, Florida Statutes criteria for designating the SIS and Emerging SIS. The general outline of each follows:

- SIS – facilities that play a critical role in moving people and goods to and from other nations and states, as well as among regions within Florida.
- Emerging SIS – facilities that are of statewide or interregional significance, but do not currently meet the SIS thresholds.

The facilities that have been included in the SIS are the most significant transportation systems in Florida. These facilities include most of the airports, freight rail terminals, passenger rail terminals, bus terminals, deepwater seaports, waterways, highways, interstates, and spaceports. According to the Florida Department of Transportation, "these facilities are the workhorses of Florida's transportation system, carrying more than 99 percent of all commercial air passengers, virtually all waterborne freight tonnage, almost all rail freight, and more than 68 percent of all truck traffic and 54 percent of total traffic on the State Highway System." This section of the report examines the Miami River Corridor for comparison with statistics that determine inclusion as a SIS facility.

Once a transportation system has been given the SIS designation, it helps the competitive growth of the State of Florida in the following ways:

- Makes area eligible for transportation funding.
- Clarifies roles and responsibilities throughout the system.
- Aids the transportation corridors by creating planning and funding projects.
- Allows for increased technological implementation (i.e. Intelligent Transportation Systems).
- Provides information for the Florida Transportation Plan.

Request and Recommendations for SIS Designation

The Miami River Commission (MRC) has previously requested for the Miami River to be included as a SIS facility. However, the Commission has not yet received a determination from the Florida Department of Transportation. The following information details the facts and statistics that indicate the Miami River meets and exceeds criteria for admission as a SIS facility.

According to data collected by the Miami River Commission, the Port of the Miami River rivals Tampa as the 4th largest port in Florida. The 24 shipping terminals along the waterway are compliant with the Federal Maritime Security Act and certified by the United States Coast Guard (USCG). These shipping terminals trade with over 100 Caribbean ports of call, which are not efficiently serviced at the Port of Miami because of its focus of serving larger vessels. The Miami River Corridor provides connectivity to the following SIS facilities, which are all located within the Miami River Corridor and meet adopted SIS criteria and thresholds:

- SIS Commercial Airports – Miami International Airport
- SIS Deepwater Seaports – Port of Miami
- SIS Interregional or Interstate – Miami Greyhound Intercity Bus Terminal
- Passenger Terminals – Tri-Rail Station at Miami International Airport
- SIS Intermodal Freight Rail – FEC Intermodal Terminal in Miami
- SIS Highways – Interstate 95 and East-West (Dolphin) Expressway (SR 836)

- SIS Freight Rail Corridors – Florida East Coast (FEC) Railroad line from Miami north to Jacksonville, and South Florida Rail Corridor (owned by FDOT, operated by CSX) from Miami north to Mangonia Park
- SIS Interregional or Interstate Passenger Rail Corridor – Amtrak Corridor from Miami north (along South Florida Rail Corridor)
- Passenger Rail Corridors – Tri-Rail Corridor from Miami north to Mangonia Park (along South Florida Rail Corridor)
- SIS Multi-Modal System – Miami Intermodal Center (MIC)

The SIS has a series of goals and criteria. The Miami River Corridor meets several of them as follows:

- ***Goal 1: Policy Objective – Improve the safety and security of freight movement.*** The Miami River is implementing the recently submitted Security Plan, as mandated by the Federal Maritime Security Act: the 24 shipping terminals along the corridor are certified by the United States Coast Guard.
- ***Goal 2: Policy Objective – Adequately maintain facilities to protect the public's investment for the future.*** Maintaining the infrastructure required for the function of the shipping terminals and their associated trade.
- ***Goal 3: Policy Objective – Increased mobility for people and for freight with integration and connectivity across and between modes for the future.*** The Miami River Corridor contains, but is not limited to, the following facilities: Miami Intermodal Center, Miami International Airport, Port of Miami, Metrorail, Metromover, Interstate 95, SR 836, waterbuses and watertaxies, etc.
- ***Goal 4: Policy Objective – Expands commerce of goods, services, and visitors to existing and new domestic and international markets.*** International trade is met by servicing over 100 ports of call in the Caribbean by the Port of Miami. The port is 15 feet deep and, therefore, is a "special niche" in its market; the port can efficiently serves boats from shallow draft ports in the Caribbean.

- ***Goal 5: Policy Objective – Enriched quality of life and responsible environmental stewardship.*** This goal will be fully obtained when funding is secured, which will enable full time schedule (40 hours per week) for The Scavenger, a de-pollution and decontamination vessel. SIS Funding opportunities could facilitate this service.

Although the facts listed above are convincing, to be admitted as a SIS facility the Miami River needs to meet the minimum specific criteria set forth by FDOT. The thresholds for the two closest related types of facilities that the Miami River can fulfill are provided in Table 14. As Table 14 demonstrates, the Miami River Corridor meets several thresholds set forth for SIS facilities.

The Miami River Multi-modal Transportation Plan recommends that the Miami River Commission meet with the Florida Department of Transportation and submit a formal request to be included as a SIS facility that includes this analysis as documentation. In addition, the Miami River Commission should participate in the upcoming criteria definition that will be undertaken by FDOT as part of the SIS update. Table 14 details the facts and statistics that indicate the Miami River meets and exceeds criteria for admission as a SIS facility.

Table 14: SIS Facility Thresholds

Type of Facility	SIS Threshold	Does it meet the threshold?	Emerging SIS Threshold	Does it meet the threshold?	Rational
Deep-Water Seaport	0.25% of U.S. total freight activity	0.28% > 0.25% yes	0.05% of U.S. total freight activity	0.28% > 0.05% yes	Located less then 50 miles from the Port of Miami, but the Port of the Miami River does not compete with the Port of Miami as it serves a niche by accommodating shallow draft vessels that serve numerous Caribbean Ports
			And		
			Located more than 50 miles from a SIS deepwater seaport	yes	
Waterway	Intercostal waterway and costal shipping lanes	yes	Provides interregional service	Yes	SIS criteria indicated importance of waterway connections to other states and nations
	Or		And		
	Inland interregional waterway with more than 0.25% of total U.S. inland waterway freight traffic	0.04% < 0.25% no	Carries more than 0.05% of total U.S. inland waterway freight traffic	0.04% < 0.05% no	
			And		
			Serves clusters of waterborne transportation-dependant industries located on or adjacent to countries with projected employment growth among the top 25% statewide	Yes	Over 6,700 jobs associated with waterborne transportation industries are clustered in the corridor

Miami River Corridor
Multi-modal Transportation Plan

Final Report

CONCLUSION

August 2007
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CONCLUSIONS

This study developed a multimodal transportation plan for the Miami River and the area surrounding the Miami River Corridor in Miami-Dade County. Today, there are over 15,000 new residential units either recently completed, under construction, or in final permitting, within over 50 new buildings along the Miami River. The rapid redevelopment occurring in the corridor will place additional demands on the transportation infrastructure. Envisioned for the Corridor are projects to improve vehicular flow and freight movement as well as alternative modes of transportation including a network of pedestrian, bicycle, and public transit that will help to alleviate the traffic congestion on the roads and increase the attractiveness and functionality of the Miami River Corridor.

Within existing transportation programs and plans there is already approximately $430 million in transportation infrastructure improvements targeted for the Corridor. This Plan identifies complimentary improvements to further enhance transportation in the Corridor. The Plan may be used as a tool for the policy-makers to seek the funding to implement the transportation improvements, as the plan demonstrates that the Corridor has a comprehensive vision toward providing multimodal transportation opportunities.

The Plan should be examined periodically to assess the status of the implementation of its improvements. The examination should include an evaluation of project scheduling, associated costs, updated infrastructure needs, and available funding sources. Based on the findings, the phasing of the projects should be adjusted over time in response to the changing needs of the community and be incorporated into the capital improvement plans.

Afterward

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