Memorandum

Date: October 23, 2024

To: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

From: Daniella Levine Cava
Mayor

Subject: Report on the Feasibility of Implementing Multimodal Transit along the Coast of Miami-Dade County – Directive 231903

Executive Summary

On October 3, 2023, the Board of County Commissioners (Board) adopted Resolution No. R-903-23 sponsored by Chairman Gilbert, directing the County Mayor or County Mayor's designee to prepare two reports (a preliminary report followed by a final report), in consultation with a working group of public and private industry stakeholders, that study the feasibility of implementing multimodal transit along the coast of Miami-Dade County (County).

The Waterborne Transportation Feasibility Project Working Group (PWG) was established on February 5, 2024, to explore the feasibility of developing maritime mobility options along the coast and compiled the findings into one Report. The members of the PWG included the following organizations: Department of Transportation and Public Works; County Transportation Planning Organization; Seaport Department; Miami International Airport; Miami River Commission; United States Coast Guard; Florida Power and Light; Heritage Yacht Tour and Marine Academy, LLC; Marine Industries Associates of South Florida; Island Queen; Poseidon Ferry; Regent Seaglider; United States Army Corps of Engineers; and Water Taxi Miami.

The PWG Report incorporates the following three criteria:

A. Analysis of feasible sites to serve as terminals for multimodal transit options;
B. Recommended feasible days and hours of operation; and
C. Identification of any regulatory or legislative changes that may be required to support the success of multimodal transit options along the coast of the County, such as Seagliders.

Recommendation

The PWG findings emphasize that a successful waterborne transit operation should function as a network system, tailored to specific conditions such as hours of operation, permits, and proximity to other transit options. A single facility is insufficient for a sustainable operation; multiple facilities are needed. The PWG also recognizes various challenges, including federal and local regulations, but is not advocating for any changes to these regulations at this time.

Background

Prior to the establishment of the PWG, the Department of Transportation and Public Works prepared a Waterborne Transportation Study and identified potential sites to serve as water transit terminals. This PWG report analyzed these sites, identified as primary sites, as well as additional sites, referred to as secondary sites. Each site was reviewed to determine which types of waterborne transit options may be feasible. This analysis took into consideration factors such as marina design constraints, depths, length of travel distance, and proximity to public transportation. The following ten sites studied were considered feasible sites for at least one waterborne mode of transportation:

1. Haulover Marina
2. Sea Isle Marina
3. Sunset Harbour Marina
4. Chopin Plaza Dock
5. Miami Beach Marina
6. Kaseya Center – eastern bulkhead
7. Federal East Coast Rail (FEC) Slip
8. Perez Art Museum – eastern bulkhead
9. Resorts World Miami
10. PortMiami

The PWG findings concluded that the waterborne transit operation must operate as a network system reflecting a strategy tailored for success, that includes, but is not limited to, site specific hours of operation, permits, proximity to existing waterways and other area transit systems such as bus networks, train facilities and parking lots, and user demand profiles for times of day/week/year. More than one single facility is necessary to provide a comprehensive and sustainable operation.

The PWG acknowledges that challenges at various scales reflect many aspects associated with a waterborne transportation project, including federal regulations, such as the United States Coast Guard, site and operations permitting requirements, operator certification(s), Fish and Wildlife regulations, and other local regulations. However, the PWG is not suggesting regulatory or legislative changes at this time for waterborne transportation.

Overall, for any one of the identified modes of transportation to be successful, it is necessary that a network of waterborne terminals/hubs be established along a designated route.

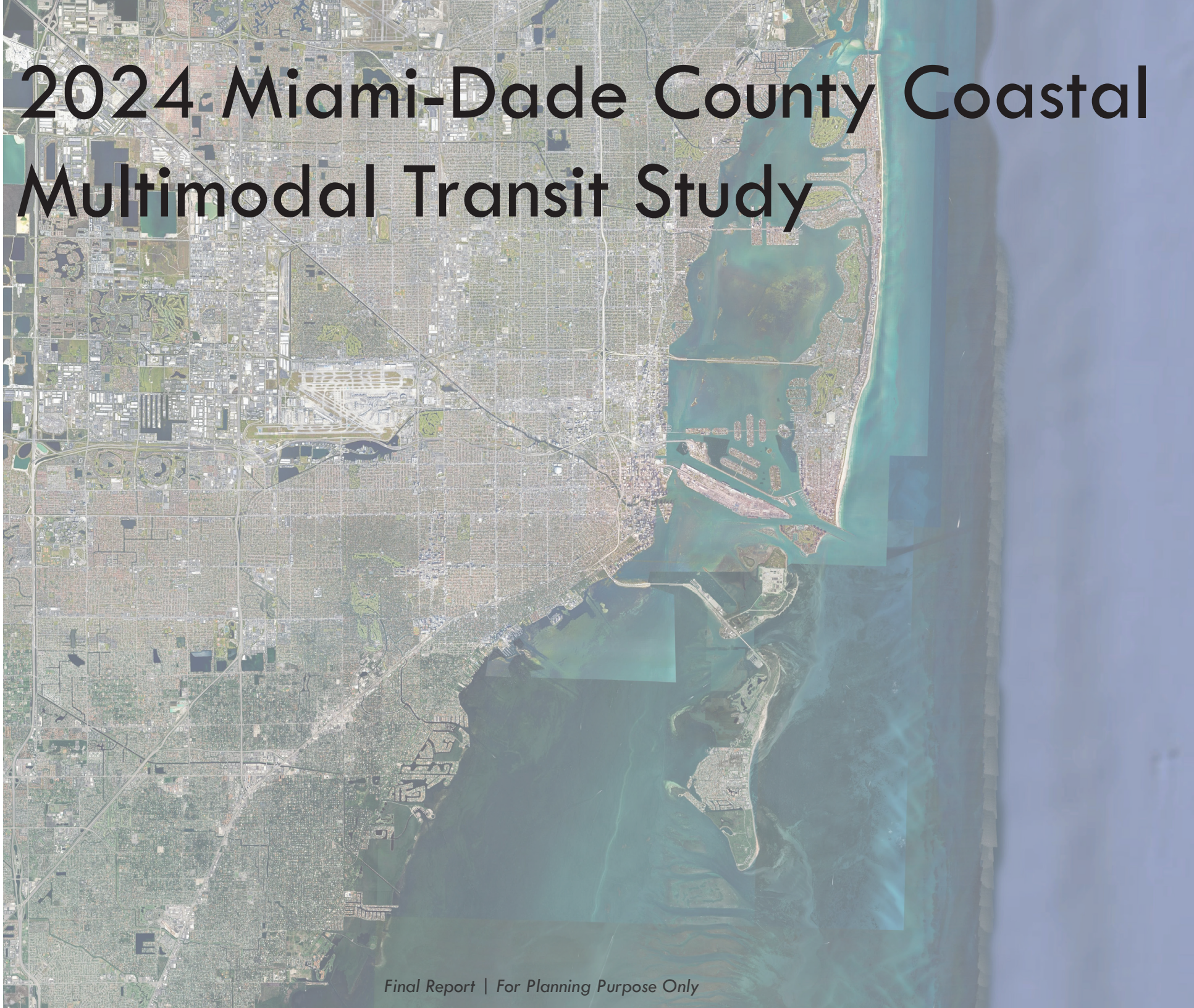
Separately, since the PWG concluded its study, it has been reported that a water taxi pilot program on Miami Beach was recently canceled after sailing for two months due to low ridership, maintenance concerns, and unreliable service.

This report will be placed on the next available Board meeting agenda, pursuant to rule 5.06(j) of the Board's Rules of Procedure. Should you require additional information, please contact Hydi Webb, Seaport Director and CEO at (786) 266-0453.

Attachment - 2024 Miami-Dade County Coastal Multimodal Transit Study

c: Geri Bonzon-Keenan, County Attorney
Gerald Sanchez, First Assistant County Attorney
Jess McCarty, Executive Assistant County Attorney
Office of the Mayor Senior Staff
Hydi Webb, Director, Seaport Department
Yinka Majekodunmi, Commission Auditor
Theresa Therilus, Interim Chief, Office of Budgetary and Policy Affairs
Basia Pruna, Director, Clerk of the Board
Eugene Love, Agenda Coordinator

2024 Miami-Dade County Coastal Multimodal Transit Study



Final Report | For Planning Purpose Only

EXECUTIVE SUMMARY

Miami-Dade County (County) is at the forefront of pioneering innovative maritime mobility solutions to improve transportation for residents, visitors, and commuters. As a coastal metropolis, the county recognizes its unique geographical position and actively explores the feasibility of integrating multi-modal transit along the coast of the County, including Seagliders, into its existing infrastructure. These efforts are part of a broader initiative to establish a multimodal transit system that not only caters to the growing travel demands of the population but also aligns with sustainability objectives and climate resilience strategies.

The County's commitment to mobility improvement is evident, as directed by the Board of County Commission's Resolution No. R-903-23 (Appendix A), by the establishment of a Project Working Group (PWG) to explore the feasibility of developing maritime mobility options. This study analyzes the feasibility of implementing multimodal transit along the coast of Miami-Dade County, including the consideration of new technologies, based on the following three criteria:

A. Analysis of feasible sites to serve as terminals for multimodal transit options;

B. Recommend feasible days and hours of operation; and

C. Identify any regulatory or legislative changes that may be required to support the success of multimodal transit options along the coast of Miami-Dade County, such as Seagliders.

A. Sites Analyzed

The study analyzed sites that were previously studied by some members of the PWG, known as primary sites, and newer sites, known as secondary sites. Each site was reviewed by the PWG to determine which types of waterborne transportation are practicable.

The primary sites are:

a. Haulover Marina
b. Sea Isle Marina
c. Sunset Harbour Marina
d. Chopin Plaza Dock
e. Miami Beach Marina

The secondary sites are:

a. Kesaya Center - eastern bulkhead
b. Federal East Coast Rail (FEC) Slip
c. Black Point Marina
d. Watson Island Marina
e. Perez Art Museum - eastern bulkhead
f. Resorts World Miami
g. The Miami Women's Club
h. Bayside's eastern peninsula
i. PortMiami

The PWG's analyzed feasible sites to serve as terminals for select waterborne multimodal transit options. Ten of the 14 sites analyzed were considered feasible sites for at least one mode of transportation, and four sites were not selected for any waterborne transportation mode. Criteria discussed included location, waterway conditions, proximity to public transportation, and capacity.

B. Hours of Operations

There are two feasible types of operations: a local-based schedule, and a regional based schedule. This is further explained below:

(1) Local-Based Schedule

It is expected that the service will be tailored to commuter trip occurrences and concentrate on morning and afternoon peak periods. The weekend service may be reduced as the demand is not as high.

(2) Regional-Based Schedule

The operation is based on longer distances and could be aligned with the Miami International Airport (MIA) schedule. This schedule could be 24 hours per day and seven (7) days per week, depending on minimum turnaround time (MTT), and demand.

EXECUTIVE SUMMARY (CONTINUED)

C. Regulatory / Legislative Challenges

The PWG acknowledges that challenges at various scales reflect many aspects associated with a waterborne transportation project which include, but are not limited to, environmental regulations and permitting, such as the Fish and Wildlife concurrence, United States Coast Guard (USCG) requirements, operator certification(s), and other federal, state, local regulations. However, the PWG is not suggesting regulatory or legislative changes at this time.

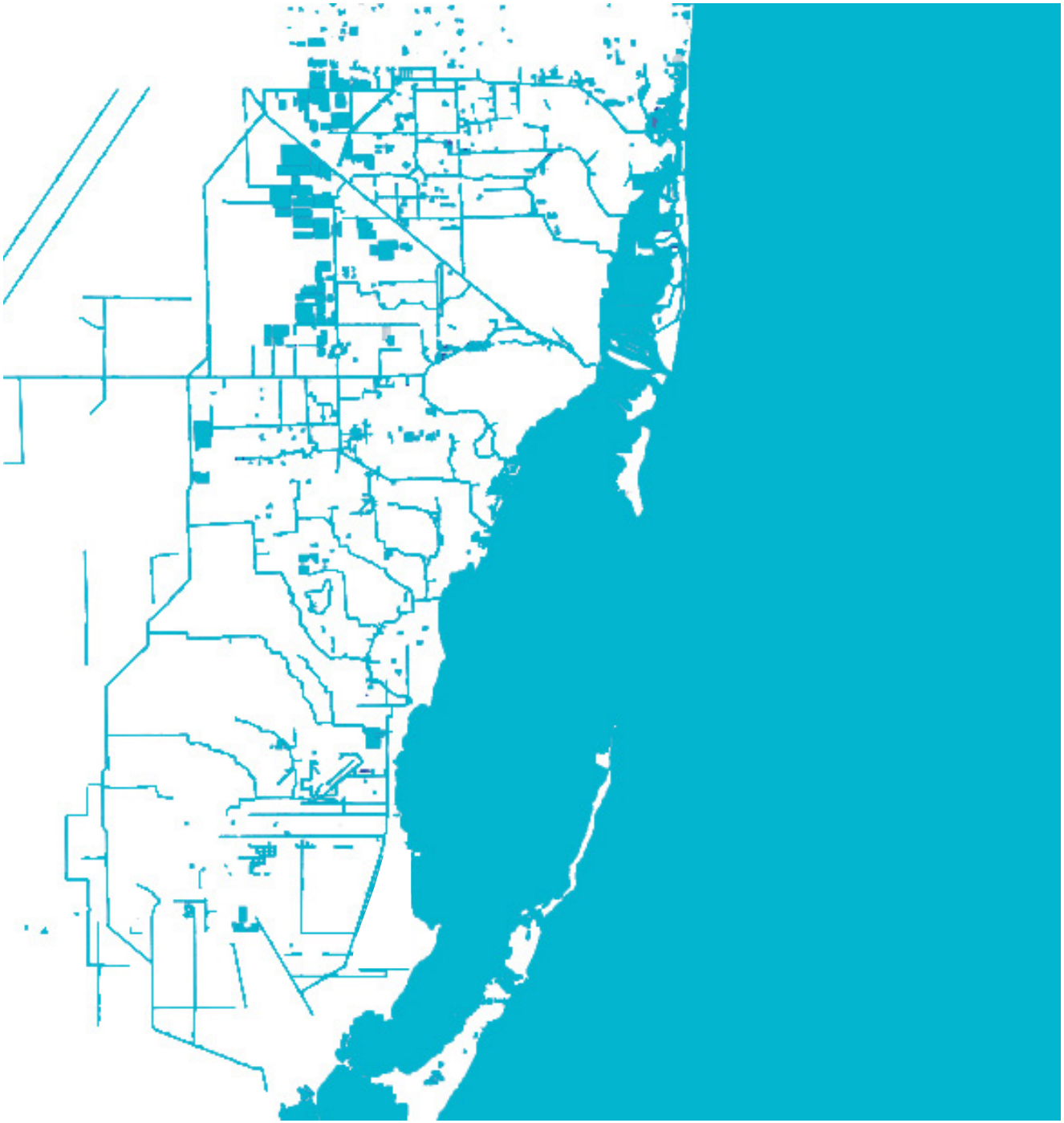


Table of Content

Introduction

INTRODUCTION

The County stands at the forefront of exploring innovative maritime mobility options to enhance the transportation network for various users such as residents, visitors, and commuters. Recognizing the unique geographical position as a coastal metropolis, the County is actively investigating the feasibility of integrating new technologies, such as Seagliders, into the existing infrastructure. These efforts are part of a broader initiative to create a multimodal transit system that not only meets the growing travel demands of the population but also aligns with sustainability goals and climate resilience strategies.

The County's commitment to improving mobility is evident in the establishment of a working group to study the potential maritime solutions along the coast. This report assesses the integration of such technologies into the current transportation framework and assesses seamless and efficient travel options that could redefine the boundaries between land and sea.

With an eye on the future, the County's exploration of maritime mobility is not just about addressing today's transportation challenges; it's about shaping a vision for a connected, sustainable, and economically vibrant community, at various scales, and leverages its coastal assets to the fullest.

PROJECT WORKING GROUP OBJECTIVES

At the request of Miami-Dade County Board of County Commissioner's (BCC) Resolution No. R-903-23 passed on October 3rd, 2023, a Project Working Group (PWG) was established to explore the feasibility of developing maritime mobility options, such as Seagliders, which could serve to breakdown the boundaries between land and sea.

This study, entitled the 2024 Miami-Dade County Coastal Multimodal Transit Study (2024 CMTS) evaluates the feasibility of implementing multimodal transit along the coast of the County, including the consideration of new technologies. This study is not intended to be a comprehensive waterborne transportation analysis or regional waterway study. The purpose of this study is to focus on coastal waterborne transit, and references more comprehensive County studies, including the 2023 County Waterborne Transportation Study (2023 WTS) (Appendix D) conducted by the County's Department of Transportation and Public Works (DTPW). The following was analyzed:

A. Feasible sites to serve as terminals for multimodal transit options

B. Feasible days and hours of operation

C. Any regulatory or legislative changes that may be required to support the success of multimodal transit options along the coast of the County.

The following sections and information are meant for planning purposes only.

WATERWAY CHARACTERISTICS

With over 470 miles of waterways, Miami-Dade County's waters represent a plethora of distinct and interdependent systems that serve significant cultural, ecological, and economic roles. The coastline where Miami meets the Atlantic Ocean spans approximately 45 miles. Biscayne Bay is a shallow inlet which connects to the Atlantic Ocean and encompasses an area of approximately 220 square miles.

This study focuses on Miami-Dade County's coastline waterways, and Biscayne Bay, which is home to various threatened and endangered species. Biscayne Bay is characterized by a relatively shallow water depth, generally in the range of one to ten feet in depth, with an average depth of approximately six feet.

In addition to water depth, environmental sensitivities such as manatee protection zones, sanctuary act, and other characteristics which include the bascule bridge and clearances, must be considered.

FOCUS AREA

This study focuses on potential points of departure for waterborne transit and comprises Miami-Dade County's eastern coastline, from its northern boundary near Golden Beach south to Homestead and includes Biscayne Bay. The PWG explored selected site's conditions to reveal opportunities and constraints related to access, environment, regulation, etc.

Criteria A | Primary & Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

The study broadly evaluates both primary and secondary sites based on their physical and regulatory conditions as well as previous related studies. The sites studied under the 2023 WTS are categorized as primary sites and additional sites proposed by the PWG are categorized as secondary sites. More information regarding the site findings can be found in Appendix C.

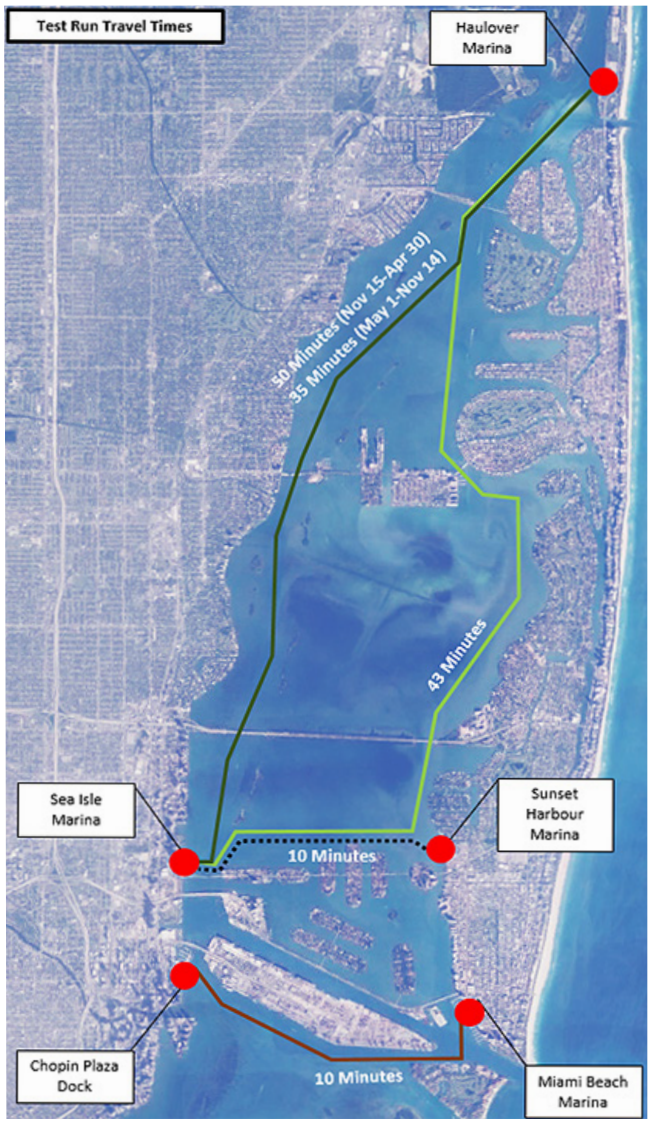
Primary Sites

a. Haulover Marina
b. Sea Isle Marina
c. Sunset Harbour Marina
d. Chopin Plaza Dock
e. Miami Beach Marina

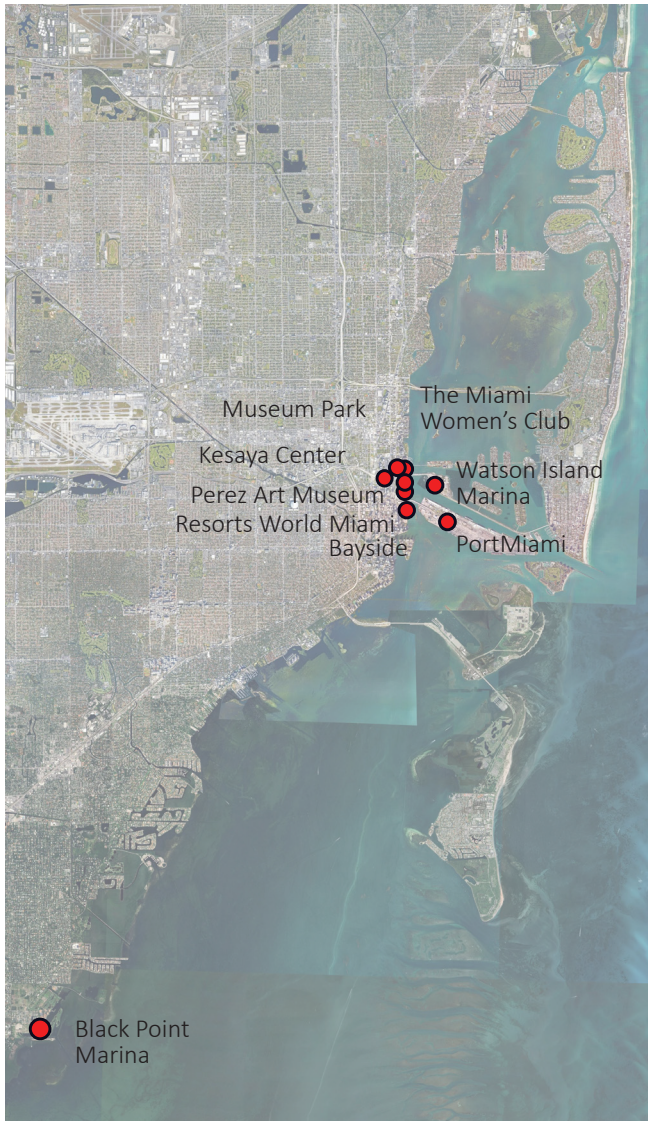
Secondary Sites

a. Kesaya Center - eastern bulkhead
b. Museum Park- Florida East Coast Rail (FEC) Slip
c. Black Point Marina
d. Watson Island Marina
e. Perez Art Museum - eastern bulkhead
f. Resorts World Miami
g. The Miami Women's Club
h. Bayside's eastern peninsula
i. PortMiami

PRIMARY SITES



SECONDARY SITES



Criteria A | Primary & Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

The secondary sites were generated during this study and intended to build on the 2023 WTS report and primary sites. The secondary sites, some of which were also explored in the 2023 WTS, are reviewed with focus on their feasibility for the following waterborne transportation typologies. Refer to Appendix B for more detail regarding each type of transit.

Boats
Watercrafts include various sizes, typically smaller than ferries, and can be propelled by different means, such as sails, oars, and engines.

Ferries
Ferries are larger vessels used to carry passengers and goods over various distances.

Yachts
Luxury boats used primarily for pleasure, cruising, or racing.

Catamarans
Catamarans are boats with two hulls that offer stability and space, often used for recreational sailing and racing.

Sea planes
Seaplanes are aircraft with the capability to land on water, often used for travel to and from areas without developed runways.

Seaglider
A seaglider is a new generation of flying boat called a wing-in-ground (WIG). Near the dock it floats on its hull. In the harbor it operates on hydrofoil. In open water it can fly on its wings.

Airboats
Airboats are flat-bottomed boats propelled by an aircraft-type propeller and used in shallow waters.

Other sites, such as the following, were reviewed but found to be infeasible for the intended waterborne transit services:

Pelican Harbor - Initial review finds the marina to not have enough land or water area available to develop the minimal program for all waterborne transit typologies to operate.

US Coast Guard Station (along McCarther Causeway) - Initial review finds the marina to not have any additional land or water area available to develop the minimal program for all waterborne transit typologies to operate and conflicts with US Coast Guard operations.

Terminal Island - Initial review finds the marina to not have any available land or water area to develop the minimal program for all waterborne transit typologies to operate.

PWG FINDINGS

Each site represents a context that provides site opportunities and/or challenges. The challenges could include the limits presented by bridges, depths, flight paths and other federal, state, and/or local regulations, limits in the turning basin, and rights along any channel. The environmental challenges include salt air spray, and consider the potential turbidity in the water and ecological disturbance due to operations. Regulatory challenges include fueling operations, storage, and cleaning the hulls. Electric boats are different and could pose additional challenges, and environmental permits from federal, state, and local agencies will be required for any in-water construction work. The infrastructure may also be required to be turnkey for operators.

Further research is required once a market analysis is completed and the waterborne transportation operator has selected one or more feasible sites. The research may include categorizing programs, such as existing and emerging companies by technologies, typologies, manufacturing headquarters, anticipated growth, and routes related to those sites.

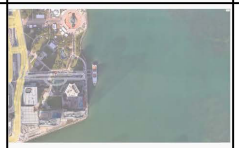
Criteria A | Primary & Secondary Site Findings

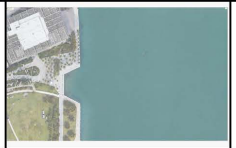
PWG FINDINGS

The PWG's analyzed feasible sites to serve as terminals for select waterborne multimodal transit options. The checked boxes represent the waterborne transportation typologies found by the PWG to potentially be most suitable for each site's specific opportunities and challenges. Ten of the 14 sites analyzed were considered feasible sites for at least one mode of transportation, and four sites were not selected for any waterborne transportation mode. Criteria discussed included location, waterway conditions, proximity to public transportation, and capacity. Further findings for each site can be found in Appendix C.

Seven types of waterborne transportation are evaluated in this study:

1. Boats
2. Ferries
3. Yachts
4. Catamarans
5. SeaPlanes
6. Seagliders
7. Airboats

Sites	Site Images	Water Transit Typology						
Primary Sites		Boat	Ferries	Yacht	Catamaran	Sea plane	Seaglider	Airboats
Haulover Marina		☑	☑	☐	☐	☐	☑	☐
Sea Isle Marina		☐	☐	☐	☐	☐	☑	☐
Sunset Harbour Marina		☑	☑	☐	☑	☐	☑	☐
Chopin Plaza Dock		☐	☐	☐	☐	☐	☑	☐
Miami Beach Marina		☑	☑	☐	☑	☐	☑	☐

Sites	Site Images	Water Transit Typology						
Secondary Sites		Boat	Ferries	Yacht	Catamaran	Sea plane	Seaglider	Airboats
Kesaya Center - eastern bulkhead		☑	☑	☑	☑	☐	☑	☐
Federal East Coast Rail (FEC) Slip		☑	☑	☑	☑	☐	☑	☐
Black Point Marina		☐	☐	☐	☐	☐	☐	☐
Watson Island Marina		☐	☐	☐	☐	☐	☐	☐
Perez Art Museum - eastern bulkhead		☑	☑	☑	☑	☐	☑	☐
The Miami Women's Club		☐	☐	☐	☐	☐	☐	☐
Resorts World Miami		☑	☑	☑	☑	☐	☑	☐
Bayside's eastern peninsula		☐	☐	☐	☐	☐	☐	☐
PortMiami		☐	☐	☐	☐	☐	☑	☐

Criteria B | Feasible Operating Hours

Recommend feasible days and hours of operation

SERVICE SPAN

While the vessel sizes, carrying capacity, headways, local and/or regional destinations, distances, and count vary depending on business structure, the service span focuses on the low, mid, and high peak demand time frames. As noted in the 2023 WTS, successful water transit systems are well-integrated with other metropolitan area transit systems, such as bus networks, rail lines and parking facilities.

Connections from the water transit system terminals to bus and rail transit are typically provided at numerous stations. As such, the daily service span for the water transit system should ideally approximate the service spans of the other transit services during rush traffic hours.

OPTION A - Local-Based Schedule

Option A estimates the operation would run during weekdays from 7:00 a.m. to 7:30 p.m. A reduced mid-day schedule may be appropriate as commuter trip occurrences are concentrated during the morning and afternoon peak periods. The weekend service may be reduced as the demand is not as high. During these times, including Friday night, the service may be modified to serve popular nighttime destinations on demand.

OPTION B - Regional-Based Schedule

The operation is based on longer distances and could be aligned with the Miami International Airport (MIA) schedule. This schedule could be 24 hours per day and seven (7) days per week, depending on minimum turnaround time (MTT), charge time (if electric), maintenance regime, and range. Connections between MIA, train service stops, and the selected site(s) could be filled by a bus/shuttle service.

Multiple company representatives, such as Candela, noted the peak commuter demand drops after 10 a.m. and picks up again around 4 p.m. Vessel operators may consider addressing this lull by providing a range of vessel sizes to mitigate consuming more fuel/energy than the craft's passenger count can feasibly offset. For example, the electric ferry business, Candela, determined that a minimum passenger count of 1/3 of its P-12 catamaran vessel (30 passenger capacity) size is feasible to operate. As another example, REGENT seaglider determined that they would align their peak operations with that of MIA's schedule to compliment the last leg of travel to/from MIA. REGENT's seaglider could also provide cargo and passenger transport and run up to 24 hours per day.

PWG FINDINGS

The hours of operations serve the users and the transport system to sustain its operations. Each route's hours of operations should be tailored to each destination's demand rates, such as peak and non-peak hours. Each transportation operation should develop a custom schedule of operation to address origin and destination feasibility by users and their purpose from and to each destination, whether local and/or regional.

Criteria C | Regulatory/Legislative Analysis

Identify any regulatory or legislative changes that may be required in order to support the success of multimodal transit options along the coast of Miami-Dade County.

LOCAL

Challenges at various scales are derived from the many aspects associated with a waterborne transportation project, that include but are not limited to, federal regulations such as FAA domain, (i.e., water runway and trajectory), site and operations permitting, operator certification(s), Fish and Wildlife regulations, and other local regulations. The following local regulatory research was conducted and reported in the 2023 WTS.

DEPARTMENT OF REGULATORY ECONOMIC RESOURCES (DERM)

On June 22, 2016, DERM staff produced a preliminary document. In summary, the use of existing docking facilities identified as Haulover Park Marina, Miami Beach Marina, Sea Isle Marina, Sunset Harbor Marina, and Chopin Plaza Park currently have authorizations that allow transitory slip use and may be used for waterborne transportation if there is adequate water depth for the proposed vessels to safely access the facilities. Waterborne transportation can utilize the permitted slips and operate in accordance with each facilities' Marine Operating Permit (MOP). Any work in, over, or upon tidal waters at these locations necessary for mooring of subject vessels will require a DERM Class I permit.

The Museum Park (FEC Slip) was also evaluated by DERM. The evaluation took into consideration the installation of a Spud Barge structure. This will require an in-depth evaluation of the potential impact to manatees, and any mitigation factors that will reduce or eliminate potential threats to manatees using this area.

The Miami River was also evaluated for Water Taxi service by DERM. Twelve specific sites were evaluated. It was determined that the sites are consistent with the Miami-Dade County Manatee Protection Plan (MDCMPP). Each site has its own characteristics, and each would require a Class I permit. Several of the sites were identified as having water depth issues (beneath 2nd Av. Bridge North Shore, Metrorail North Shore, Riverwalk Metromover station South Shore and Miami Circle Park).

The PWG focused on transit points of departure that are in close proximity to open waters for faster travel times. Rivers require slower speeds which impact commute times and headway.

STATE

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

The Florida Fish and Wildlife Conservation Commission (FWC) noted that as presented, the commuter routes appear to be viable if the speed zones are enforced. Further review will be required when the type of vessels and docking locations are identified.

- A comprehensive plan showing FWC is seeking locations for the commuter service and stops to be able to evaluate, as a whole, the impact on the proposed services on marine life.
- Pre-determined loading and unloading zones for the commuter water services.
- Types of vessels and number of vessels to be operating in the waterways.

THE FLORIDA MANATEE SANCTUARY ACT

The Florida Manatee Sanctuary Act is an important legislation to protect Florida's marine ecosystem and its marine mammals. The Act aims to safeguard manatees and their habitats from harmful collisions with motorboats and prevent harassment. Any marine transportation that requires any depth in South Florida's waters, such as boats, sea planes, and hydrofoils, must adhere to this act. Manatee habitats represent all of Miami's waters, including rivers, bays, canals, estuaries, and coastal areas. Manatees traverse freely between fresh, saline, and brackish water systems. Manatees visit these habitats seeking their primary food source, seagrass, and abundant freshwater aquatic vegetation.

Criteria C | Regulatory/Legislative Analysis

Identify any regulatory or legislative changes that may be required in order to support the success of multimodal transit options along the coast of Miami-Dade County.

FEDERAL LEGISLATIONS

US ARMY CORPS OF ENGINEERS

The US Army Corps of Engineering (USACE) will be included in the environmental permitting stage of any proposed project.

US COAST GUARD

The US Coast Guard (USCG) review is required for all sites. The USCG requires all vessels to be used for commercial purposes to transport passengers be Coast Guard Certified. Regulations are less restrictive for smaller passenger vessels (under 49 passengers). They strongly recommended that if purchasing vessels, that they be already Coast Guard certified. The certification is costly and time consuming. They also noted that the certification for vessels traveling south of the Rickenbacker Causeway is different as they travel on the open waters. They will require stability tests which test the incline of the keel for tipping conditions and seating weight.

The USCG cautioned maneuverability in the Miami River due to the space constraints when cargo ships are present.

Of note, the USACE and USCG did not have any comments during the 2024 phase of this study.

The following legislations were introduced to restrict non-US manufactured vessel and non-US owned vessel service to operate between two destinations within the United States. The purpose of the legislation is to maintain the United States businesses economic competitiveness with international businesses. Any waterborne transportation business seeking entry into the US market, including in Miami, will either be required to adhere to the following two acts, or provide a non-US intermediate destination, such as Bermuda, between all US destinations.

NATIONAL MARITIME REGULATIONS

<u>The Jones Act (Act) & Passenger Services Act</u>
The Jones Act, officially known as the Merchant Marine Act of 1920, provides that the transportation of merchandise between United States points is reserved for U.S.- built, owned, and documented vessels.

<u>The Passenger Vessel Services Act (PVSA)</u>
The PVSA places the same restrictions on the coast-wise movement of people and, consequently, may offer challenges to passenger transit along the MDC coast. This act prohibits non-US flagged vessels and commercial vessels, such as cruise ships, from allowing passengers to board at one U.S. port and debark at another U.S. port.

"Who is a Passenger? Generally, a passenger is any person carried on a vessel who is not directly and substantially connected with the operation of such vessel, her navigation, ownership, or business." For instance, the Act mandates that vessels transporting passengers within the US must meet the following criteria: Be built, owned, flagged in the United States, and must also be crewed by US citizens. This may lead to costly construction, limited options, and higher operating costs, which are passed to the consumer.

The U.S. Customs and Boarder Patrol (CBP) states that "the penalty imposed for the unlawful transportation of passengers between coast-wise points is $778.00 for each passenger so transported and landed after November 2, 2015."

Moreover, *the PVSA's 46 U.S.C. § 55103 - Transportation of Passengers statute stipulates the following, "No vessel may transport passengers between ports or places in the United States to which the coastwise laws apply, either directly or via a foreign port, unless the vessel is:*

(1) wholly owned by U.S. citizens; and

(2) has a certificate of documentation with a coastwise endorsement or, if exempt from documentation, would otherwise be eligible for such a certificate and endorsement."

PWG FINDINGS

The PWG is not recommending any regulatory or legislative changes regarding multimodal transit options along the coast of Miami Dade County at this time.

APPENDIX

Appendix A

MEMORANDUM

Agenda Item No. 11(A)(19)

TO:	Honorable Chairman Oliver G. Gilbert, III and Members, Board of County Commissioners	**DATE:**	October 3, 2023
FROM:	Geri Bonzon-Keenan County Attorney	**SUBJECT:**	Resolution directing the County Mayor to create a working group to study the feasibility of implementing multimodal transit along the coast of Miami-Dade County, including the consideration of new technologies such as Seagliders; and to prepare a report

Resolution No. R-903-23

The accompanying resolution was prepared and placed on the agenda at the request of Prime Sponsor Chairman Oliver G. Gilbert, III.

For
Geri Bonzon-Keenan
County Attorney

GBK/gh

MEMORANDUM
(Revised)

TO: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

DATE: October 3, 2023

FROM: Geri Bonzon-Keenan
County Attorney

SUBJECT: Agenda Item No. 11(A)(19)

Please note any items checked.

_____	**"3-Day Rule" for committees applicable if raised**
_____	**6 weeks required between first reading and public hearing**
_____	**4 weeks notification to municipal officials required prior to public hearing**
_____	**Decreases revenues or increases expenditures without balancing budget**
_____	**Budget required**
_____	**Statement of fiscal impact required**
_____	**Statement of social equity required**
_____	**Ordinance creating a new board requires detailed County Mayor's report for public hearing**
✓	**No committee review**
_____	**Applicable legislation requires more than a majority vote (i.e., 2/3's present ____, 2/3 membership ____, 3/5's ____, unanimous ____, CDMP 7 vote requirement per 2-116.1(3)(h) or (4)(c) ____, CDMP 2/3 vote requirement per 2-116.1(3)(h) or (4)(c) ____, or CDMP 9 vote requirement per 2-116.1(4)(c)(2) ____) to approve**
_____	**Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required**

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 11(A)(19)
10-3-23

RESOLUTION NO. R-903-23

RESOLUTION DIRECTING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE TO CREATE A WORKING GROUP TO STUDY THE FEASIBILITY OF IMPLEMENTING MULTIMODAL TRANSIT ALONG THE COAST OF MIAMI-DADE COUNTY, INCLUDING THE CONSIDERATION OF NEW TECHNOLOGIES SUCH AS SEAGLIDERS; AND TO PREPARE A REPORT

WHEREAS, an efficient transportation network lowers the cost of moving people, increases connectivity, and provides accessibility for commuters of all economic brackets to job locations; and

WHEREAS, creating and supporting an efficient and reliable transportation network will increase economic productivity and encourage economic growth; and

WHEREAS, some of the goals of Miami-Dade County are to enhance the mobility of the urban population, achieve a balanced transportation system, meet energy conservation needs, improve air quality, as well as to preserve or enhance the physical and social environment of the community; and

WHEREAS, southeast Florida is considered among the most susceptible to the impacts of climate change including rising sea levels where Miami-Dade County has been on the forefront of these issues for many years; and

WHEREAS, there is a recognized need by Miami-Dade County as set forth in the Miami-Dade County Climate Action Plan to increase efforts to mitigate or reduce greenhouse gases while moving forward with adaptation planning, as well as a demand to transform operations into more sustainable practices; and

WHEREAS, this Board wishes to explore the feasibility of developing maritime mobility options, such as Seagliders, which could serve to breakdown the boundaries between land and sea, thereby increasing connectivity and efficiency, and providing multimodal choices that integrate into the existing transportation infrastructure; and

WHEREAS, Miami-Dade County is considered the gateway to Latin America and the Caribbean, and emerging maritime mobility technologies could create new vehicles of commerce and travel between the County and Latin America and the Caribbean; and

WHEREAS, emerging maritime mobility technologies, such as Seagliders, could increase commerce opportunities within Miami-Dade County and across the greater South Florida area, bringing economic growth and potentially new high-tech maritime job opportunities for County residents; and

WHEREAS, establishing a working group of public and private industry stakeholders to evaluate the feasibility of implementing various multimodal transit options along the coast of Miami-Dade County may result in recommendations that would enhance mobility options which could spur commercial opportunities and enhance our local and global economies,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board:

Section 1. Directs the County Mayor or County Mayor's designee to create a working group to study the feasibility of implementing multimodal transit options along the coast of Miami-Dade County, including the consideration of new technologies such as Seagliders. Such working group should consist, at a minimum, of representation from the seaport department, the transportation planning organization, the transportation and public works department, the aviation department, the transportation safety industry, mobility operators and platforms, public or private

utility companies, and other representatives focused on the success of the maritime mobility industry. The County Mayor or County Mayor's designee shall provide adequate staff and support services to the working group, subject to budgetary limitations.

Section 2. The working group shall, at a minimum: (i) analyze feasible sites to serve as terminals for these multimodal transit options; (ii) recommend feasible days and hours of operation; and (iii) identify any regulatory or legislative changes that may be required in order to support the success of multimodal transit options along the coast of Miami-Dade County such as Seagliders.

Section 3. Further directs the County Mayor or County Mayor's designee to prepare a preliminary written report regarding the directives in section 1 and section 2 above within 180 days of the effective date of this resolution. A final report from the working group shall be prepared by the County Mayor or County Mayor's designee prior to the sunset date of the working group. Both completed reports shall be placed on an agenda of the full Board without committee review pursuant to rule 5.06(j) of the Board's Rules of Procedure.

Section 4. The working group shall sunset and stand dissolved on the 365th date from the effective date of this resolution, unless the Board approves an ordinance extending the life of the working group.

The Prime Sponsor of the foregoing resolution is Chairman Oliver G. Gilbert, III. It was offered by Commissioner **Anthony Rodriguez**, who moved its adoption. The motion was seconded by Commissioner **Danielle Cohen Higgins** and upon being put to a vote, the vote was as follows:

Oliver G. Gilbert, III, Chairman	**aye**		
Anthony Rodríguez, Vice Chairman	**aye**		
Marleine Bastien	**aye**	Juan Carlos Bermudez	**aye**
Kevin Marino Cabrera	**aye**	Sen. René García	**absent**
Roberto J. Gonzalez	**aye**	Keon Hardemon	**aye**
Danielle Cohen Higgins	**aye**	Eileen Higgins	**aye**
Kionne L. McGhee	**aye**	Raquel A. Regalado	**aye**
Micky Steinberg	**aye**		

The Chairperson thereupon declared this resolution duly passed and adopted this 3rd day of October, 2023. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this resolution and the filing of this approval with the Clerk of the Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

JUAN FERNANDEZ-BARQUIN, CLERK

By: **Basia Pruna**
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

Annery Pulgar Alfonso
Cynji A. Lee

Typology

TYPES OF MARITIME MOBILITY OPTIONS

There are the seven types of waterborne transportation evaluated in this study

1. Boats
2. Ferries
3. Yachts
4. Catamarans
5. SeaPlanes
6. Seagliders
7. Airboats

The following section reviews some, but not all, waterborne transit examples through their existing and emerging product/service offerings relevant to the County. Since this market is continuously growing and evolving, as new watercraft types become available they would need to be evaluated individually.

These are just a few examples of the wide variety of watercraft that facilitate travel and transport across waterways. Refer to the 2023 WTS for a broader and more detailed analysis.

Typology

BOATS, FERRIES & YACHTS

Boats, ferries, and yachts, amongst other purposes, transport people and/or goods/cargo from point to point. While boats are similar to taxi cabs, ferries can be considered similar to a bus or small train. Ferries can carry cargo and/or passengers. In South Florida, all three are used for ecotourism, site seeing, commuting, and private leisure. These operate with and without the hydrofoil application.

Advantage
Boats, ferries, and yachts are traditionally flexible with docking and navigating unique waterways like the County's water systems. These means of transit reduce traffic congestion and have a variety of carrying capacities available.

Disadvantage
These means of water transportation may introduce challenges, such as sea sickness, slower travel headway if there are too many destinations, drawbridge delays, and limited available sites.

Boat hydrofoil applications present wildlife and ecosystem challenges that would require a detection system.

Size
Varies / Min. 30'+

Carrying Capacity
Varies

Fuel Type
Boat/ferry/yacht systems can be designed to run on various fuels with diesel/gas currently being the primary option. The future is introducing electric power.

Speed
Gas/Diesel: Varies
Electric: 40 MPH; 35 knots at top speed

Range (Single fueling/charge)
Diesel/Gas: Varies
Electric: ~86 miles

Case Study
Poseidon, Water Taxi, Island Queen, and Heritage Yacht and Marine Academy are existing businesses operating boats and ferry services throughout the County and the surrounding South Florida areas.

Water Taxi Miami
Offers cruises to Miami Beach and Downtown Miami, including a route from Bayside Marketplace to the Miami Beach Marina. Water Taxi Miami runs seven days a week on different routes between Bayside Marketplace, Miami River, and Miami Beach.

Typology

BOATS, FERRIES & YACHTS

Poseidon Ferry
Poseidon offers weekly rides from Miami to Miami Beach, Coconut Grove, Bimini, and Nassau.

Island Queen
Island Queen offers activities, attractions, and transportation. They also offer private yacht charters. Island Queen offers a variety of cruises, including a 90-minute sightseeing cruise around Biscayne Bay. The cruise includes a fully narrated tour, views of Millionaire's Row, Fisher Island, PortMiami, and Brickell Key

Heritage Yacht and Marine Academy
This organization primarily operates in the Skill Training Center business / industry.

Other businesses that operate utilizing boats, with or without hydrofoils or electric battery or gas power, include:

Navier
Navier is a startup business based in Northern California and is expanding its fleet to serve the San Francisco region. Its introductory route is from the city's central downtown area to the airport. Navier anticipates expanding to 30-passenger fleets. Navier manufactures its boats in Maine.

Sea Bubble
SeaBubbles designs and builds a line of "zero-wave, zero-noise, zero-emission" flying boats.

Boundary Layer Technologies
Boundary Layer Technologies is a California based company that is also introducing an electric hydrofoil ferry, named Electra.

Typology

CATAMARANS

A catamaran is a boat with two hulls, connected by a bridge deck. The various purposes of the catamaran typology is short and long-distance transportation, scenic tours, access to areas with undeveloped or no infrastructure, and search and rescue.

Advantage
Catamarans offer various advantages, including providing more stability with their parallel hulls, provide greater deck space, and have shallow drafts. A shallow profile fits well with Miami's manatee, wildlife, and debris conditions.

Disadvantage
Catamarans tend to operate at lower speeds because of their design. They require more area to dock and can also be vulnerable to larger waves. Cost to construct a catamaran is another challenge.

Size
Varies / 40' L x 15' W

Carrying Capacity
30- 150 passengers

Fuel Type
Catamaran systems are designed to run on various sources. The future is introducing all-electric power.

Speed
30 MPH or 25 knots

Range (Single fueling/charge)
Diesel, etc.: 40-50 miles
Electric: 50-100 miles

Case Study
Candela has developed the P-12, designed and built in Sweden, that runs on the surface of the water without environmental disruptions. The P-12 also has an articulate access ramp, which is inherently flexible many elevations where they dock.

Typology

SEA PLANES

Sea planes are powered aircrafts with the capability to take off and land on water. The various purposes of the sea plane typology is short and long distance transportation, scenic tours, access to areas with undeveloped or no infrastructure, and search and rescue. Two pontoons provide the seaplane's buoyancy.

Advantage
Sea planes provide access to areas that have little to no infrastructure, and provide beneficial search and rescue services.

Disadvantage
In addition to limited maneuverability due to its design, sea planes could have difficulty landing due to low wave tolerance and high wind conditions.

Size
Varies

Carrying Capacity
6-19 passengers

Fuel Type
Sea planes systems are designed to run on various fuels with gas/diesel currently being the primary fuel choice. The future is introducing electric power.

Speed
190 MPH or 160 knots true air speed (ktas)

Range (Single fueling/charge)
Aviation Gas: 1000 miles (875 Nautical Miles)
Electric: 100 miles (Up to 2 hours of flight time)

Takeoff Water Distance
~3,660 feet

Landing Water Distance
~1,853 feet

Maximum Operating Altitude
~20,000 feet

Case Study
In 2019, Harbour Air announced a partnership with Washington based maniX to create the world's first all-electric commercial airline.

Miami Sea Plane Base is a public use airport, located on Watson island, with an operation schedule of Mon-Sun, 8 a.m.- 4 p.m.

Typology

SEAGLIDER

Seaglider is a new maritime technology that resembles a blend of maritime and aviation technologies. The seaglider is a high-speed, zero-emission, regional transit low-flying hydrofoil vessel that operates only over water.

Advantage
The seaglider offers zero emission travel while providing enhanced regional access that can serve to reduce road traffic. It has a low-level flight capability leveraging wing-in-ground-effect technology. Like the sea plane, seagliders could be utilized as a regional mode of transportation offering similar connection times. Unlike a seaplane, seagliders are zero carbon and dramatically less expensive to operate. The seagliders wave tolerance is four to five times greater than a traditional seaplane. The seaglider addresses wildlife and obstacles, both above and below water line, by equipping their vessels with detection systems to maintain situational awareness and separate from marine life, including whales and manatees.

Disadvantage
Like all small vessels, it is limited in its ability to operate in inclement weather. The technology remains under development with commercial service beginning in 2025.

Size
Viceroy: 55' L x 65' Wingspan

Carrying Capacity
Viceroy: 12 passengers, Monarch 50-100 passengers

Fuel Type
All- electric power

Speed
180 MPH or 156 knots

Takeoff Distance
Approximately 1,000 ft

Landing Distance
Approximately 800 ft

Range (Single charge)
Electric: 180 miles, approximately

Case Study
REGENT's Viceroy will be a 12-passenger seaglider. REGENT is also designing the Monarch seaglider to carry 50-100 passengers. The Viceroy will begin full-scale prototype testing in 2025.

Companies, such as Japan Airlines, Lockheed Martin, Hawaiian Airlines and Founders Fund are among REGENT's investors and supportive of developing seaglider service. Several maritime and aviation operators have placed orders for seagliders based on their ability to withstand the rough ocean conditions and swells such as those between the Hawaiian Islands. REGENT's perception systems allow it to address other challenges such as humpback whales and marine debris. Challenges unique to Miami coastal waters such as manatees, other sea life, and shallow waters may also be addressed by these systems.

Typology

AIRBOATS

Originating for the purpose of short distance transportation, airboats are presently a popular ecotourism business in South Florida. Airboats are commonly used to traverse marshy and/or shallow areas since all of the propulsion mechanisms reside above water.

Advantage
Airboats do not redirect natural water currents, alter hydrology, do not cause soil or organic particles to be disrupted or impact fish and wildlife during operations. Airboats can also go in shallow or deep waters.

Disadvantage
Airboats are noisy and consume a large amount of fuel since their engines power a fan that generates momentum. Airboat's wake also pose a significant impact to surrounding properties.

Size
Varies / 12'-16' L x 9' W

Carrying Capacity
14 passengers, on average

Fuel Type
Airboat systems are designed to run on various fuels with diesel currently being the primary fuel option. The future is introducing electric power.

Speed
Up to 35 MPH or 30 knots

Range (Single fueling/charge)
Diesel: 40- 80 miles
Electric: 4 to 13 miles (anticipated)

Case Study
Hypercraft USA has partnered with American Airboat to create the first all-electric airboat. This type of airboat anticipates a near-term release.

Miami currently operates airboats in the Everglades for guided tours and short transportation.

Criteria A | Primary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

Black Text	Analysis Content
Blue Text	PWG Findings

HAULOVER MARINA

2023 WTS Findings

At Haulover Marina, the distance between the dock and bus drop-off/pick-up location would be roughly 180 feet. This marina appears to have sufficient parking to serve as a park + ride, it has fueling facilities and an ADA compliant public slip. PROS recommended the use of the area shown which would require a new floating dock and will be near the existing parking lot.

2024 CMTS PWG Findings

Physical

- Further coordination with the property owner.
- Existing slips are accounted for and additional services will require an expansion of the marina.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Primary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

SEA ISLE MARINA

2023 WTS Findings

There is approximately 1,150 to 1,200 feet from the Sea Isle Marina entrance to the Omni Transit Station depending on the path taken. DTPW met with Sea Isle Marina representatives who identified potential docking sites within the marina. This marina also has fueling capabilities.

2024 CMTS PWG Findings

Physical

- Further coordination with private property owner
- Existing slip is accounted for and will likely require an expansion agreement.
- The site's fueling facilities have clearance restrictions.
- A gangway is required.
- Currents are difficult.
- County public transportation is nearby.

Regulatory

- Existing wetlands in the area proposes development challenges.
- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.
- An additional slip may not be required if this marina is used for pick-up/drop-off. Vessels can come in onto the fueling area and passenger's can walk to the nearest metromover station for multi-modal connectivity.

Criteria A | Primary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

SUNSET HARBOUR MARINA

2023 WTS Findings

The City of Miami Beach is adding an additional docking slip for Waterborne Transportation. The South Beach Local provides access to this location.

2024 CMTS PWG Findings

Physical

- Further coordination with the City of Miami Beach and/or other ownerships pertinent to any development is needed.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Primary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

CHOPIN PLAZA DOCK

2023 WTS Findings

This location has an existing dock and connectivity to several modes of transportation. The Bay Front Park Metromover station is 793 ft of walking distance from the Dock.

2024 CMTS PWG Findings

Physical

- Further coordination with the City of Miami would be required.
- Existing slip is accounted for and may require an expansion agreement for additional users.
- Locations near the mouth of the Miami River may conflict with large vessels entering and exiting the river.
- Seawall is established.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Primary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

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Blue Text	PWG Findings

MIAMI BEACH MARINA

2023 WTS Findings

Water Taxi service is already available at this location as well as fueling stations. The marina is accessible by the Miami Beach local bus services and trolleys. The operators of Miami Beach Marina are opposed to commuter service docking at this facility due to the heavy foot traffic and parking space demand.

2024 CMTS PWG Findings

Physical

- Further coordination with the City of Miami Beach Redevelopment Agency is needed.
- Additional docks will likely require an expansion agreement.
- Constructing a docking location along the outer sea wall may be possible.
- Connects to existing inlets.
- The marina has 40’ of real estate available at its southernmost point that may be expanded to within that area, or a barge may be placed at this location. However, the US Army Corps of Engineers is studying. navigation expansions nearby that may prevent this expansion.
- Currents could be challenging in this area.
- Parking areas are a challenge.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

KESAYA CENTER - EASTERN BULKHEAD

2024 CMTS Findings

Physical

- Additional docks will likely require an expansion agreement.
- Challenges include event programming.
- Coordination with City of Miami would be required.
- Seawall is established.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

MUSEUM PARK (FLORIDA EAST COAST - FEC) SLIP

2023 WTS Findings

The FEC dock requires minor upgrades, is ADA accessible and within 1,000 feet of the Park West Metro mover station.

2024 CMTS PWG Findings

Physical

- North side is deeper draft, depending on vessel draft, the south side may require dredging.
- Further coordination with the City of Miami would be required.
- This site area currently welcomes various private boating and businesses, and has direct multimodal access (i.e. metromover station, bus, auto, pedestrian).
- Intermodal areas must be studied to include public transportation, buses, rideshare, private vehicles, including drop off zones.
- Seawall is established.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

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Blue Text	PWG Findings

BLACK POINT MARINA

2024 CMTS PWG Findings

Physical

- This site is outside of the urban area, at least 1,000 feet distance to navigable waters, and is highly susceptible to weather.
- This site is south of commuter density spheres and would not be a high traffic area.
- Existing docks may require expansion agreement.
- Any new additional dock construction may require a bulkhead and dredging.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

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Blue Text	PWG Findings

WATSON ISLAND MARINA

2024 CMTS PWG Findings

Physical

- Marina slip/dock may only be built in the existing marina.
- Further coordination with the City of Miami would be required.
- Additional docks will likely require an expansion agreement.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

Black Text	Analysis Content
Blue Text	PWG Findings

PEREZ ART MUSEUM (PAMM) - EASTERN BULKHEAD

2024 CMTS PWG Findings

Physical

- Further coordination with the City of Miami would be required.
- Challenges may include land lease agreement to allow for expansion.
- Direct multimodal access (i.e. metromover station, bus, auto, pedestrian) is nearby.
- Seawall is established.
- Docking depends on currents and ability to stay clear of port traffic operating within the Main Turning Basin.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

Black Text	Analysis Content
Blue Text	PWG Findings

THE MIAMI WOMEN'S CLUB

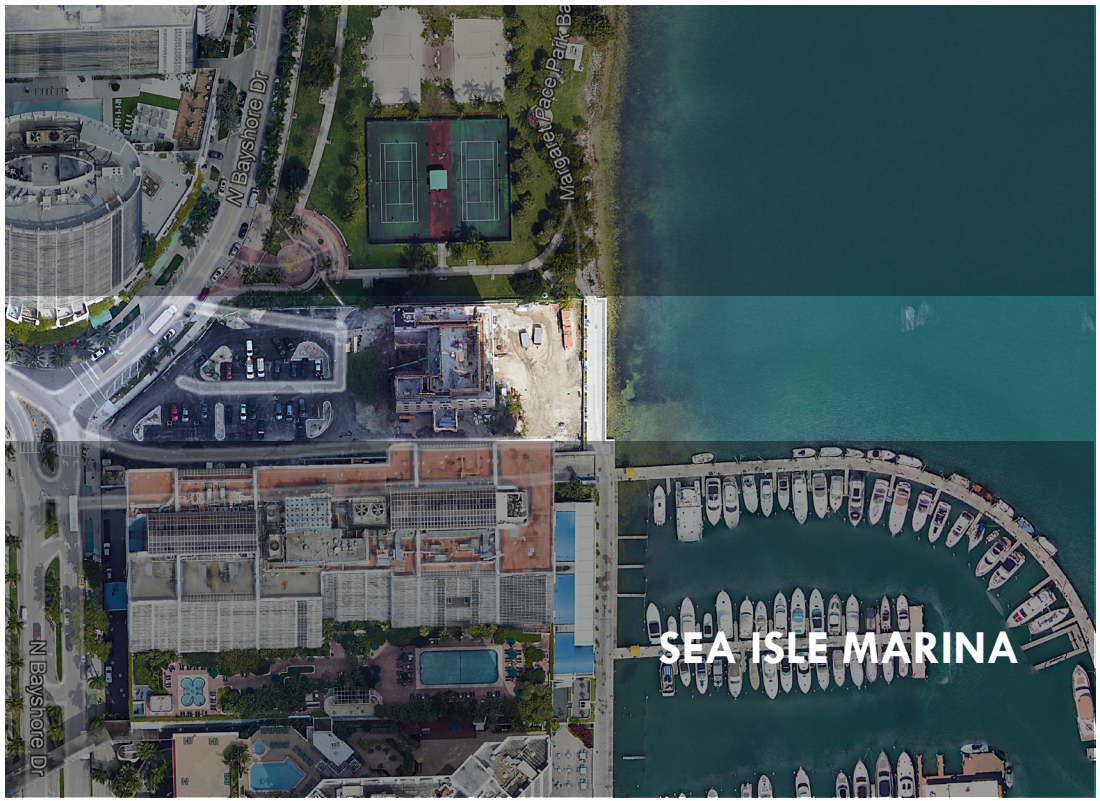
2024 CMTS PWG Findings

Physical

- Further coordination with private property owner
- A gangway is required.
- Currents are difficult.
- County public transportation is nearby.

Regulatory

- Shallow waters along the bulkhead.
- Existing wetlands in the area proposes development challenges.
- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.



Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

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Black Text	Analysis Content
Blue Text	PWG Findings

RESORTS WORLD MIAMI

2024 CMTS PWG Findings

Physical

- Further coordination with the City of Miami would be required since there are long-term plans for a future marina.
- Currently utilized for temporary event docking and will require an agreement with the City of Miami.
- Seawall is established.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

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Blue Text	PWG Findings

BAYSIDE'S EASTERN PENINSULA

2024 CMTS PWG Findings

Physical

- Further coordination with the pertinent property lessee would be required.
- Additional docks will likely require an expansion agreement.
- Seawall is established.
- County public transportation is nearby.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Criteria A | Secondary Site Findings

Analyze feasible sites to serve as terminals for these multimodal transit options

K E Y

Black Text	Analysis Content
Blue Text	PWG Findings

PORTMIAMI

2024 CMTS PWG Findings

Physical

- Further coordination with the County Seaport as owner is required.
- Additional docks will likely require an expansion agreement.
- Docking depends on existing preferential berthing rights with existing partners and lease agreement.
- Parking and intermodal challenges.
- Seawall is established.

Regulatory

- Environmental permits from federal, state, and local agencies will be required for any in-water construction work.

Appendix D

WATERBORNE TRANSPORTATION

MIAMI-DADE COUNTY

WATERBORNE TRANSPORTATION

Waterborne transportation has the potential for improving mobility, increasing accessibility and supporting development objectives. As part of a seamless transportation system, water-based modes can extend the coverage and enhance the viability of public transportation in congested and constrained corridors. Successful waterborne transportation fills a need when other transit modes are absent, congested or delayed because of traffic conditions. In this role, waterborne transportation act as an essential tool in unlocking the development potential of underutilized waterfront areas and diminishing congestion. Because waterborne transportation landings are relatively inexpensive to build and boats can be flexibly deployed, the services have been proven to be viable transportation solution in areas surrounded by population density. High population density and a strong network of established transit systems ensure that bus and rail continue to be the preferred means of transportation moving large volumes of people across the county. However, waterborne transportation can act as a cost-effective tool to fill transit gaps across the County's extensive shoreline and supplement such existing transit infrastructure.

Waterborne transportation provides both social and recreational trips and one that enables commuters to reach destinations along coastal waterways. Feasibility may be depended on our willingness to pursue private partners. Public funding will be required to invest in starting up the service and keeping fares to a reasonable level. Its long term operational success may be dependent on our ability to create a strong public-private partnership that ties marketing, promotion, destinations, facilities and equipment into a unified program.

Waterborne transportation has several intrinsic advantages over other modes of transportation. Visitors may be more willing to use the system and view it as an extension of the local tourist activities and initial routes can be implemented relatively quickly.

ADVANTAGES:

Transit Congestion relief: Ferries and water taxis enable load-shedding from highly congested lines that operate at or near capacity and face sometimes insurmountable challenges to increase capacity. When these highly congested lines span or border our waterways, ferries can provide a lower cost solution to help shoulder the load.

Service Route Flexibility: As our development pattern continue to evolve and new communities and job centers emerge, waterborne transportation provides a transit mode that can be implemented quickly, serving routes that are easily modified to meet demand in a constantly evolving county. In many respects, waterborne transportation can serve as development-oriented transit, rather than the more traditional (and significantly more expensive) transit-oriented development.

Quality of Life: Commuters and tourists value the relative serenity that this type of service offers, there is a benefit in enjoying a pleasant commute or a ferry trip to a waterfront event on the weekend. Like a room with a view, waterborne transportation offers more than just a ride often becoming as important to the rider as the destination itself.

PARAMETERS FOR SUCCESS:

Miami-Dade County Department of Transportation and Public Works is interested in deploying Water Transportation as a commuter service. This deployment must be smart and specific. It must allow the service to commence operation in a manner that is concise, flexible, and utilizes existing infrastructure. These elements allow us to evaluate the performance of the routes, services and provides us with the opportunity for modification and, if successful, expansion of the routes with a minimum infrastructure investment. These parameters are not different than those for transitional transportation safety, frequency of service and appropriate hours of operation. Factors for success important to the growth of the service include:

- **Right Routes:** Creating the right routes that attract the greatest number of potential riders at the lowest cost is critical for the waterborne transportation success. Balance of service with the right locations attract riders while avoiding becoming so expensive that travel times become too long.
- **Service Frequency:** Service frequency is critical in order to attract enough ridership to sustain the service. At the same time, the design of the route is equally important as we must connect the points where riders want to go and easily get on other forms of transportation.
- **Connectivity**: Connecting points must be close together as servicing more distance locations increases operating costs because of greater fuel usage and the need to deploy more vessels to maintain service frequency. Allowing the connection to other modes of transportation for transfer purposes is essential.
- **Seasonality:** responding to market needs that vary based on weather and special events is another major consideration when defining routes. While commuters require year-round service regardless of weather and operating conditions, seasonal service and operating frequency can be varied to reduce costs. For example, we need to maintain peak commuting service patterns year round, but reduce frequency of service on weekends to reduce costs when demand is lower. We can also

expand the routes to serve special events. These consideration require a balance approach among providing a reasonable service frequency, minimizing operating costs and maximizing ridership revenue to offset costs.

- **Time Savings:** Travel times is appealing to riders, particularly commuters.

OPERATING CONSTRAINS:

In Miami-Dade County, there are several critical components of waterborne transportation that affect deployment of services, routes, feasibility and adaptability. These are:

- Water depth – The Biscayne Bay is one of the shallowest basins in the county – generally in the range of 1'-10'
- Speed Zones
- Vertical clearance – bascule bridges
- Control structure locations
- Manatee and sea grass protected zones
- Existing dock locations
- Fuel costs
- ADA accessibility

Managing Fuel Costs: Diesel fuel costs comprise over half of the operating expenses associated with Waterborne commuter service operations. To address this challenge, fuel costs can be minimized in several ways:

- Operating boats appropriately sized to meet rider demand
- Operating vessels at fuel-efficient speeds
- Maximizing the number of riders served per operating mile
- Using fuel efficient engines
- Supporting and monitoring ongoing research to alternate fuels (compressed natural gas, liquefied natural gas)

TO CONSIDER:

There are many considerations that must take place when deploying a Waterborne Service. Some may be applicable to our conditions and circumstances and others may not; however, it is important to recognize and learn from other municipalities and their problem solving approach.

Phased Growth: Phased growth is recommended in order to maintain sustainable waterborne transportation services. Planning exercises such as County Wide waterborne transportation study enable informed decision-making on the growth of the system as the city's population and travel patterns change.

Waterfront Development: This is a significant justification for the provision of the service, but it also provides opportunity for resources to support waterborne transportation, as one often complements the

other. The timing of such developments is important to consider when determining the initiation of a new or expanded service. An opportunity exists within the City of Miami. The city of Miami is one of the most densely populated municipalities (after Sunny Isles Beach) occupying a great deal of the waterfront and servicing as the principal employment generator in South Florida.

Vessel Ownership: A potential strain on piloting a route relies on private operators being able to finance the purchase of the required vessels without long-term contracts.

Vessel Design: The MPO study suggests that the best vessel for this service is a catamaran – monohaul with a maximum vertical height of 12 to 14' the opening of bascule bridges. The vessels need to have a low wake and have efficient engines.

Vessel Landings: A new landing facility costs between $2 and $7 million, depending on factors such as water depth, soil and shoreline conditions, and access to utility infrastructure such as power. Passengers must have access to the shoreline through the use of catwalks (hinged gangway that allows for vertical movement with the tides). Other consideration when constructing landings include supporting amenities such as passenger shelters and ticketing infrastructure. NYC's landing sites are publicly owned, managed and operated allowing the City to deploy landings in response to changes in travel patterns and demand. They also allow for multiple operators to use a single landing site. There are times where private ownership of landing sites is necessary. ADA accessibility must be considered and the proper equipment provided.

Private Sponsorship: Private sector participation provides an opportunity for expansion of services through assistance with landing and upland amenities, particularly from waterfront developers seeking to increase property values and accessibility for residents and employees.

Amenities: Amenities are a major factor in attracting ridership. To keep commuters using the system throughout the year, passenger shelters for protection against the elements need to be provided at all landings. These shelters must also provide a view to identify approaching vessels. Upland areas must allow space for queuing without preventing access to the waterfront or adjacent pathways. Proximity to parks and other nearby upland destinations, clear way finding signage, adequate lighting, convenient ticketing solutions, vending, kiosks and Wi-Fi to name a few provide additional conveniences for riders.

Flexibility: It is recommended that landings accommodate for front-and-side loading vessels, and that they also accommodate the vessels for emergency use.

OPERATIONS

Management: design and operation of these services benefit from the expertise of a transportation agency that oversees its operations; however, transportation agencies are not structured to allow for the proven and growing model of private funding contributions toward the services. The transportation agency is unable to accept funds in escrow form a private developer who might want to contribute towards operating or capital costs associated with providing the waterborne transportation service.

Regulations: The environmental approvals and permitting processes associated with the construction of waterborne transportation landings may take a long time and may weaken competitive applications for grant funding. However, a solution to these regulatory challenges would be for the County to apply for a U.S. Army Corps of Engineers nationwide permit to allow for standard ferry landings. The general permit would last for 10 years, and any specific conditions of proposed new landing could be addressed by supplemental

reviews, saving significant time and money. The use of existing marinas and piers is the most effective approach.

COSTS AND RECOVERY

Fares: Setting the fare level for any transit mode is a balancing act between attracting enough riders and earning enough revenue to sustain service. Pricing can have a significant impact on ridership and needs to be carefully designed to provide the greatest value to the largest possible number of potential riders while still optimizing financial viability. Waterborne transportation, like most other transit modes, often require financial support to reduce fares to a level that is attractive to riders.

WHAT HAS BEEN DONE?

Several studies were been performed. The latest study, conducted by Kimley-Horn and Associates, Inc. and prepared for the MPO identified several elements:

- In response to our generally shallow waterways, with environmental sensitive areas where sea grass and manatee protected zones take place, a *low wake was vessel is most appropriate*.
- *The maximum air draft clearance of the vessel should be 12 feet* in order to travel under the Venetian causeway and avoid opening the draw bridges.
- 4 routes were developed – these routes are complimented with circulators and are in close proximity to public transportation.
- *The proposed headway was 20 minutes* during peak times and 30 to 60 minutes during non-peak portions of the day.
- Capital costs were identified and included the cost of vessels, terminal costs and land/right-or-way costs.
- The demonstration project suggested:

    - From Miami Beach Marina in South Beach to Chopin Plaza dock
    - At Chopin Plaza, two to 4 weather shelters
    - Assure that public transportation connects to these points and/or trolleys
    - An additional leg was added connecting Chopin Plaza to Dinner Key marina

Funding sources were identified:

- The Ferry Boat Discretionary Program (FBDP)
- Congestion Mitigation and Air Quality (CMAQ) improvement program funds
- Bus and Bus related capital investments grants available from the federal government with a 20% local match for 3 years
- Urbanized are formula grants are available to urbanized areas for transit-related projects including planning, engineering design, and capital investments
- Job Access and reverse Commute grants are intended to encourage transit service to assist welfare recipients and other low-income individuals with access to jobs, training, and other social services.
- The Clean Fuels Formula Grant Program is design to ac celebrate the deployment of advanced bus technologies and incorporate low emission vehicles into the nation’s transit fleets

- Federal grant programs supporting capital projects include Transportation Investment Generating Economic Recovery (TIGER); Federal Transit Administration (FTA 5307); and Moving Ahead for Progress in the 21st century (MAP-21).

MIAMI-DADE COUNTY DEPLOYMENT OF WATERBORNE TRANSPORTATION-COMMUTER SERVICE

TEST OF POTENTIAL SERVICE ROUTES

Background:

Miami-Dade County Department of Transportation and Public Works has focused on the development of a Demonstration Project for two express routes. These routes meet the requirements for a successful deployment (list below) and if successful, the service can then be expanded to other locations with high density and congestion problems. The selection of these routes was based on parameters for ultimate success and considered the following elements:

- Points of high ridership adjacent to the water that have the potential for attracting the greatest number of potential riders.
- Location of existing dock infrastructure with convenient and easy access. It is important to note that not all access to the water have adequate parking or adequate accessibility.
- Speed zones through the bay are intended to protect marine life and sea grasses. A study of the existing protected environmental zones and regulated speeds took place. The selected routes were carefully evaluated to provide the least disruption to the environmental zones, provide the shortest time travel from point A to point B and maintain a comfortable speed within the regulated speed zones to reduce travel time.
- Distance to be travelled and its impact on fuel consumption and potential disruption to waterfront property.
- Height and width of bridges. Every effort was made to avoid traversing a route that requires the opening of a bascule bridge.

The evaluation of the routes took into consideration the information provided in the Miami-Dade County Boating Safety and Manatee Protection Zones, Miami Dade County Manatee Protection Areas issued on January 2015 and experience/knowledge of the City of Miami Marine Patrol.

These are the 3 routes that were tested:


Test Run Travel Times
Haulover Marina
50 Minutes (Nov 15-Apr 30)
35 Minutes (May 1-Nov 14)
43 Minutes
Sea Isle Marina
Sunset Harbour Marina
10 Minutes
Chopin Plaza Dock
10 Minutes
Miami Beach Marina

Test Run No. 1:

Date:	April 27, 2016
Time:	10:00 AM to 1:00 PM
Weather Conditions:	Clear, Sunny and 80 degrees Fahrenheit
Water:	Optional – Clear
Route:	Express route - no stops – extension of bus service Intercostal Waterway Channel The test run measured headways for one of the two potential North-South pilot routes to be implemented. The route provides connection between the Sea Isle Marina (near Omni Transit Station) and Haulover Marina in the Bal Harbor Area.
Length:	9.1 miles
Characteristics:	This is the shortest North-South route. 9.1 miles in one direction
Speeds:	Speeds vary based on the time of the year. The Miami-Dade County Manatee Protection Areas document outlines the various channels and required boating speeds: ➢ Slow Speed: Nov. 15 – April 30 ➢ Higher speed: 30 mph May 1 – Nov. 14 This route was tested at low speed of 4 mph (3.47 knots). It is important to note that Low Speed varies on the type of Vessel. Low speed is measured by the ability of the vessel's bow (most forward point of the vessel) to stay level with the water surface. Heavier vessels can travel at slightly higher speed without lifting the bow from the water surface.
Time Travelled:	Worst case scenario: This run achieved a headway of 50 minutes at 4 mph (3.47 knots) between May 1 and Nov. 14. Normal Headway: 35 minutes at an average speed of 24 mph (20.85 knots) between Nov. 15 and Apr. 30.

Test Run No. 2:

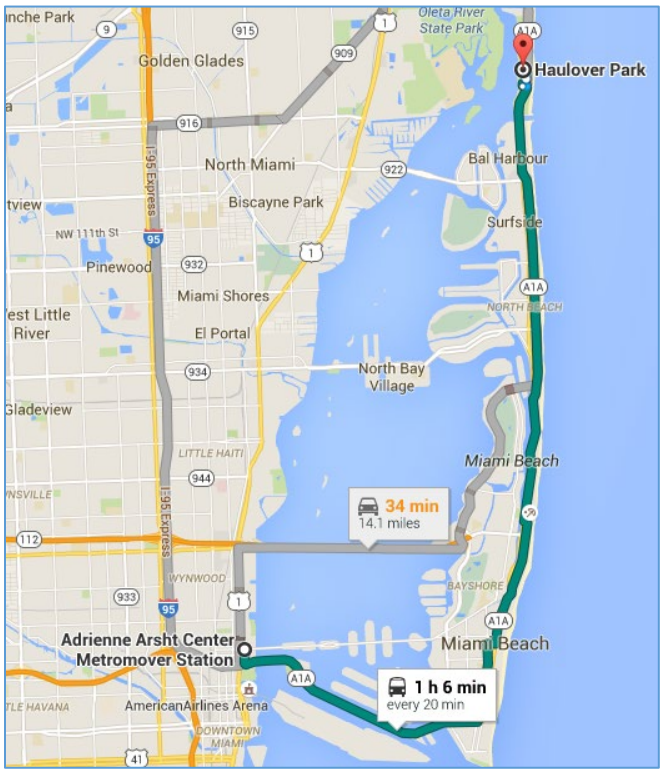
Date:	April 27, 2016
Time:	10:00 AM to 1:00 PM
Weather Conditions:	Clear, Sunny and 80 degrees Fahrenheit
Water:	Optional – Clear
Route:	Express route - no stops – extension of bus service Intercostal Waterway Channel The test run measured headways for one of the two potential North-South pilot routes to be implemented. The route provides connection between the Sea Isle Marina (near Omni Transit Station) and Haulover Marina in the Bal Harbor Area. This routes differs from the previous one in that it can be travelled at a higher speed for most of the route.
Characteristics:	This is the longest North-South route. 11 miles in one direction
Speeds:	The Miami-Dade County Manatee Protection Areas document outlines the various channels and required boating speeds: ➢ Meloy Channel (North-South channel) allows for 30 to 35 mph for most of the length of the channel. ➢ Speed is reduced before sunset harbor to low speed year round before the Venetian Causeway ➢ Speed is increased (East-West) north of the Venetian Causeway. This route was tested at an average speed of 24 mph (20.85 knots). It is important to note that Low Speed varies on the type of Vessel. Low speed is measured by the ability of the vessel bow (most forward point of the vessel) to stay level with the water surface. Heavier vessels can travel at slightly higher speed without lifting the bow from the water surface.
Time Travelled:	This run achieved a headway of 43 minutes.

Test Run No. 3:

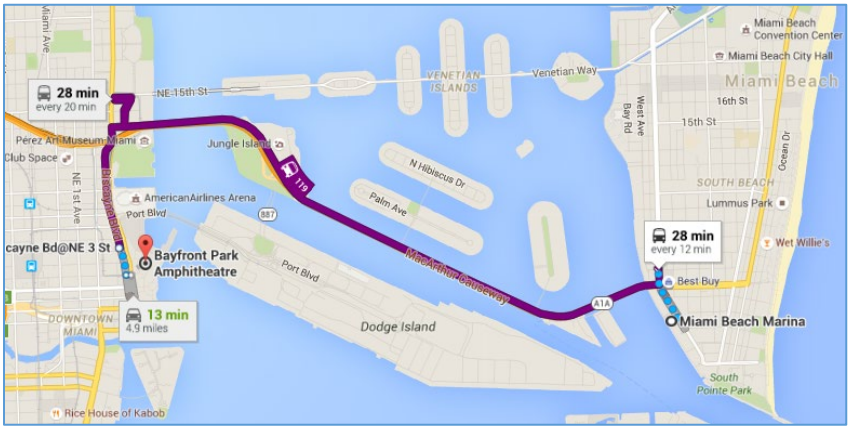
Date:	March 17, 2016
Time:	10:00 AM to 1:00 PM
Weather Conditions:	Clear, Sunny and 80 degrees Fahrenheit
Water:	Optional – Clear
Route:	Express route - no stops – extension of bus service Intercostal Waterway Channel The test run measured headways for one of the two potential East-West pilot routes to be implemented. The route provides connection between the Chopin Plaza dock (near Bayfront Metromover Station) and Miami Beach Marina in the South Beach Area. This route can be travelled at a higher speed for most of the route.
Characteristics:	This route travels a distance of 3.3 miles on each direction between the Chopin Plaza street-end and Miami Beach Marina (dock is located adjacent to Monty's restaurant)
Speeds:	This route was tested at an average speed of 24 mph (20.85 knots).
Time Travelled:	This run achieved a headway of 10 minutes.

HEADWAY COMPARISON

Currently, Miami-Dade County Bus routes 119 and 120 provide service between Haulover Marina and the Omni Transit Station. The typical travel time between the two locations using any of this routes varies between 50 minutes and 70 minutes (1 hr. 10 min.) depending on the traffic conditions along the route. The figure below shows time estimates using Google Trip Planner.



There are three routes providing one-seat ride from Miami Beach Marina to Bayfront Park, Routes 103, 119 and 120. Travel times between these two locations vary between 28 and 35 minutes depending on the traffic conditions along the route. The figure below shows time estimates using Google Trip Planner.

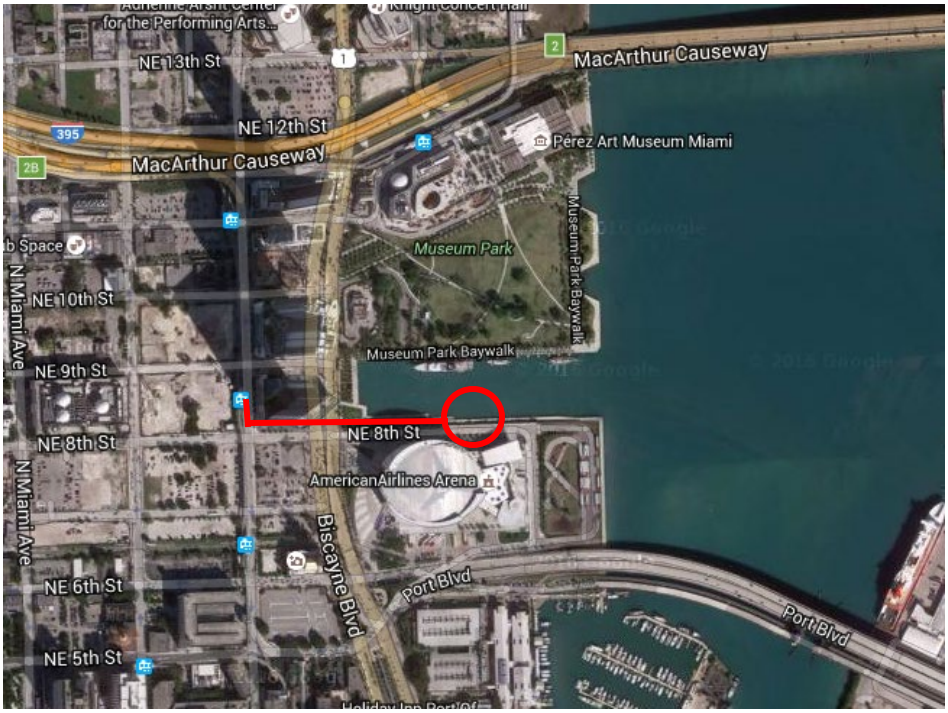


FIELD OBSERVATIONS

Downtown Miami – Potential Docking Sites:
Sea Isle Marina

There are approximately 1,150 to 1,200 feet from the Sea Isle Marina entrance to the Omni Transit Station depending on the path taken DTPW met with Sea Isle Marina representatives who identified potential docking sites within the marina. This marina also has fueling capabilities.

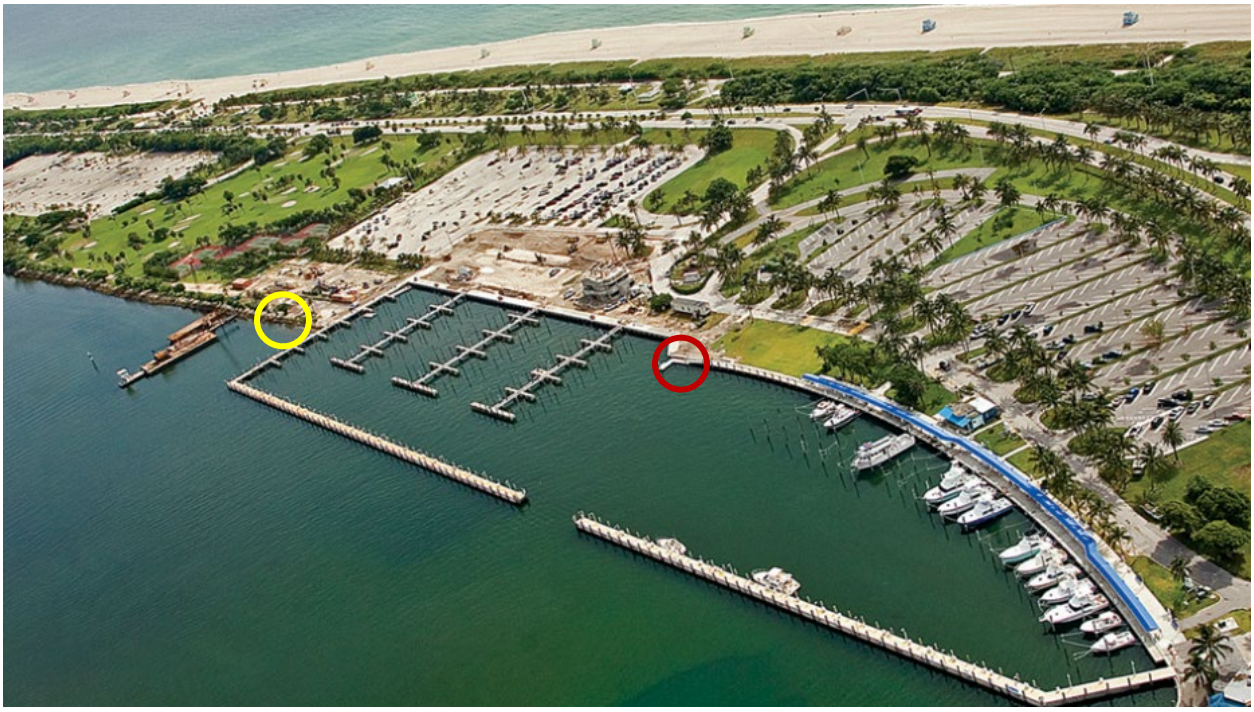
FEC Dock:



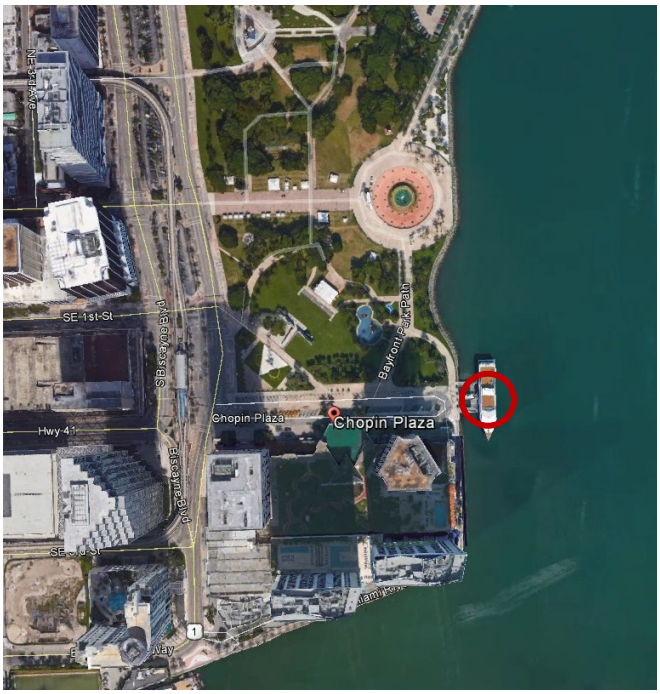
The FEC dock requires minor upgrades, is ADA accessible and within 1,000 feet of the Park West Metro mover station. DERM has indicated that this location is not viable because of it restrictions to large cargo ships.

Haulover Marina:

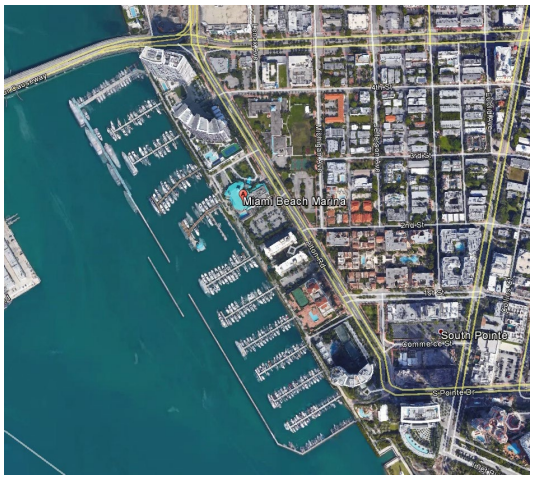
At Haulover Marina, the distance between the dock and bus drop-off/pick-up location would be of roughly 180 feet. This marina appears to have sufficient parking to serve as a park + ride, it has fueling facilities and an ADA compliant public slip. PROS recommended the use of the area shown in the yellow circle which would require a new floating dock and will be near the existing parking lot.



Chopin Plaza Dock:
This location has an existing dock and connectivity to several modes of transportation. The Bay Front Park Metromover station is 793 ft of walking distance from the Dock.



Miami Beach Marina:
Water Taxi service is already available at this location as well as fueling stations. The marina is accessible by the Miami Beach Local bus service and trolleys. The operators of Miami Beach Marina are opposed to commuter service docking at this facility due to the heavy foot traffic and parking space demand.



Sunset Harbor Marina:
Miami Beach is adding an additional docking slip for Waterborne Transportation. The South Beach Local provides access to this location.

SERVICE FREQUENCY:

Miami-Dade County Department of Transportation and Public Works is proposing one test route. As stated before, they provide the most direct routes North-South and East-West between areas of high congestion located adjacent to the waterways, they create the least disruption to waterfront properties, wild life and sea grasses and complies with the speed zones.

Headways, which dictate the number of vessels required, were selected to work with existing bus routes, minimize layovers and reduce travel times.

North-South Express Route: Worse case scenarios were measured using speeds of 4 and 24 mph. The route will vary between 35 minutes (May 1 thru November 14th) and 50 minutes (Nov 15 thru April 30th). In order to maintain a frequency of 15 to 20 minutes (estimating boarding in an average of 10 minutes) we would require 4 vessels.

East-West Express Route: The east-West route travel time is approximately 10 minutes. In order to maintain a frequency of 15 minutes, 2 vessels will be required.

It is important to note that the test project proposes short headways only during rush traffic hours (7:00 am to 10:00 am and 3:30 pm to 6:30 pm). The service could be modified after rush traffic hours in such manner that and longer headways could be provided allowing for service extension to other destinations.

INTERLINING:

Interlining routes may be appropriate once the test project provides data on ridership interest and actual usage of the system. Interlining of water transit routes in Miami-Dade County would involve the extension of a route into various geographical locations within the City of Miami. The use of Channels is limited because of width, sea walls and drainage infrastructure blocking access to vessels and making the waterway non-navigable. Several channels and rivers have been identified and have a high potential for docking. At this time, these locations can be served by On-Demand Water Transportation rather than Commuter Service Water Transportation.

SERVICE SPANS:

As mentioned before, successful water transit systems are well-integrated with other metropolitan area transit systems, such as bus networks, rail lines and parking facilities. Connections from the water transit system terminals to bus and rail transit are typically provided at numerous stations. As such, the daily service span for the water transit system should ideally approximate the service spans of the other transit services during rush traffic hours. It is expected that the service will be provided from about 7:00 AM to 10 AM and between 4:30 PM to 7:30 PM. A reduced mid-day schedule may be appropriate as commuter trip occurrences are concentrated during the morning and afternoon peak periods. The weekend service may be reduced as the demand is not as high. During these times, including Friday night, the service may be modified to serve popular night time destinations; however, this is not part of the test project.

DERM

DEPARTMENT OF REGULATORY ECONOMIC RESOURCES

As part of the study, the Department of Transportation and Public Works met with the staff of the Department of Regulatory Economic Resources (DERM) in order to start the evaluation of the proposed routes and docking facilities/sites. The goal is to identify potential hurdles that would require modification of our strategy and obtain an insight as to the permitting requirements and site constrains if any.

On June 22, 2016, DERM staff produced a preliminary document. They reviewed the conceptual locations to accommodate vessels for the purpose of providing Waterborne transportation/Taxi services within the Miami-Dade County, Florida. The Memorandum is attached to this document as Exhibit A. In summary, the use of existing docking facilities identified as Haulover Park Marina, Miami Beach Marina, Sea Isle Marina, Sunset Harbor Marina and Chopin Plaza Park currently have authorizations that allow transitory slip use and may be use for waterborne transportation provided that there is adequate water depth for the proposed vessels to safely access the facilities. Waterborne transportation can utilize the permitted slips and operate in accordance with each facilities' MOP. No further approval from DERM is required. Any work in, over, or upon tidal waters at these locations necessary for mooring of subject vessels will require a DERM Class I permit.

The Museum Park (FEC Slip) was also evaluated. The evaluation took into consideration the installation of a Spud Barge structure, similar to the one described in page 4 of this document which are easy to relocate and adapt to changes in demand. According to the MDCMPP the shoreline along Museum Park including within the "FEC" slip is an area that is recommended for freight terminal and large vessels (<100 ft.) berthing. Its use for waterborne transportation is not within the parameters of the MDCMPP and will require an in depth evaluation of the potential impact to manatees, and any mitigation factors that will reduce or eliminate potential threats to manatees using this area.

The Miami River was evaluated for Water Taxi service. 12 specific sites were evaluated. It was determined that the sites are consistent with the MDCMPP. Each site has its own characteristics and each would require a Class I permit. Several of the sites were identified as having water depth issues (beneath 2nd Av. Bridge North Shore, Metrorail North Shore, Riverwalk Metromover station South Shore and Miami Circle Park).

US CORPS OF ENGINEERS

The department of Transportation and Public Works have been sharing information with the US Corps of engineering regarding the proposed location for the commuter service and requesting assistance in identifying any potential issues that may affect the deployment of the demonstration project. On an email dated June 24, 2016, US Corps of Engineers states that as long as there are no changes to existing structure(s) or additional new structure(s) or dredging there is no reason for them to get involved.

US Coast Guard

On Friday July 22, 2016, the team met with the US Coast Guard to share the information and to get feedback on requirements and potential issues that we may encounter. The meeting was very positive and informative. We met with Lieutenant Marguerite Mullen and CWO Shad Hudgins. All vessels to be used for commercial purposes transporting passengers must be Coast Guard Certified. Regulations are less strict for smaller passenger vessels (under 49 passengers). They strongly recommended that if purchasing vessels, that they be already coast guard certified. The certification is costly and time consuming. This applies for brand new and already built vessels. They also noted that the certification for vessels travelling south of the Rickenbacker Causeway is different as they travel on the open waters. They will require stability tests which tests the incline of the keel for tipping conditions and seating weight. They recommended that the department use vessels for under 49 passenger capacity, made out of fiberglass (easy to repair and very durable). Also noted that aluminum vessels are very durable but require more maintenance overtime. Vow loading and unloading is the easiest to maneuver into the various docks but not necessary. They caution maneuverability in the Miami River due to the space constraints when cargo ships are present.

Florida Fish and Wildlife Conservation Commission

On July 21, 2016, a conference call took place with members of the Florida Fish and Wildlife Conservation Commission. Information was sent to them several weeks prior to the conference call for their review. They noted that as presented, they commuter routes appear to be viable as long as the speed zones are enforced. They would like to see the types of vessels to be used as this will have an impact on their comments. They explained that in general, the On-Demand Water Transportation (water taxis) raises some concerns. They would like to see the docking locations, evaluate speed zones and proposed vessels. They would prefer:

- A comprehensive plan showing all locations for the commuter service and water taxi stops in order to be able to evaluate, as a whole, the impact on the proposed services on marine life.
- Pre-determined loading and unloading zones for both the commuter and the water taxi services.
- Provide types of vessels and number of vessels to be operating in the waterways. We explained that this is unknown at this time and the municipalities will be responsible for their own RFP; however, as soon as this information is available it will be forwarded to their attention for review and commenting.
- They would prefer to limit the number of water taxi services allowed to operate on the bay.

The Florida Fish and Wildlife Conservation team requested that data be collected and kept for the test project. After a year, they will review the records, any proposed expansion of the service(s) and evaluate manatee data to determine if the manatee population was affected by the service(s).

VESSEL INFORMATION

The MPO document outlined the vessel requirements for passenger-only commuter and tourist waterborne transportation services on Biscayne Bay to serve Miami and surrounding municipalities. Data from other locations around the world was obtained and as a result technical requirements were presented. Our new approach intends to reduce the scope of the test project and create a true extension of the already existing Metrobus commuter service. As a result, a smaller vessel is envisioned.

Hull Form: Low wash catamaran with a ratio of 20:1 length-to-beam ratio – this provides the least disturbance to protected zones throughout the bay. Wake heights of 250 mm (9.8") trough to crest, would be considered an acceptable and low level of wake wash.

Capacity: 42 to 52 passengers (instead of 149 passengers as outlined in the MPO document)

Speed: Capable of reaching 28 mph (24 knots). This is a sound speed for commuter/tourist service.

Climate and Weather Considerations: Air conditioned vessels are required and ideally the vessels will have an open deck. Biscayne Bay's subtropical climate is characterized by warm, wet summers. High temperatures in the 90's. Most of the precipitation falls in summer in brief intense afternoon thunderstorms.

Seaworthiness Considerations: the vessels are to be designed for safe and effective operation in waves up to 4 feet high. Above this height, temporary cancellation of the service would be likely. Winds of 10-20 knots are not uncommon on Biscayne Bay, especially in the fall and winter months. A catamaran hull form, with widely spaced demi-hulls should have an adequate height clearance above the water to reduce wave impacts and provide more stability.

Water Depths: Due to the shallow waters at entrances of canals and near shorelines, the vessel is required to have shallow draft properties. Fuel tanks and water tanks should be sized to supply a single day wort h of service with a 20% margin. Passenger seats should be a light weight. This will allow the vessel to be lighter and keep the operating draft of the vessel to a minimum.

Air Quality Considerations: To minimize harmful environmental air emissions, diesels employed by the vessels should meet the Environmental Protection Agency (EPA) emissions requirements and be electronically controlled. The fleet should be operated with low-sulfur fuel.

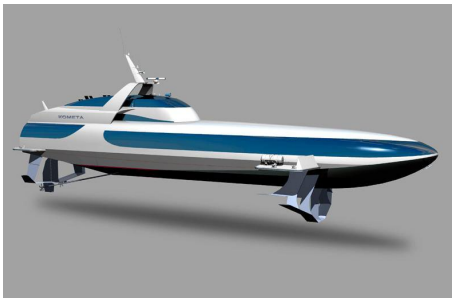
Air Draft: The max. Height of the vessel measured above the water line to its topmost point must be lower than the minimum structure clearance on the proposed service routes. This height has been identified as 12 feet (on the outer sides) and 14' feet (in the middle) for the Venetian Causeway Western Bridge span next to Sea Isle Marina.

Hydrofoil Technology:

Hydrofoil technology vessels were also studied. These vessels consists of a wing-like structure mounted on struts below the hull (placement varies). As the vessel increases speed the hydrofoil structures develop enough lift to raise the vessel's hull out of the water and therefore reducing drag. The reduced drag provides for greater fuel efficiency and higher speeds.

Hydrofoils have been in decline in popularity for many reasons:

- Hydrofoils are sensitive to impacts with floating objects such as floating logs, floating grasses, weeds, and marine animals
- Hydrofoils have sharp edges that reside in the water while in operation. These edges can fatally injure marine animals
- These vessels are significantly more expensive than catamarans (about 3 times more expensive)
- They are technically complex and require high maintenance
- Heavy seas or other conditions involving substantial wave action affect the stability of the vessel



We are currently researching technical information for comparison with the guidelines already established. The Us Coast Guard noted that this type of vessel is built for speed; however, because the lift (blades) are still below the water, the vessels are required to stay within the speed limits for the various channels. A vessel designed for 80 mph will not be allowed to travel at such speeds in the bay where the speed limit is 35 mph.

Jet Propulsion Technology:

This technology has been around for over 50 years and it is rapidly increasing in popularity because of their many advantages:

- Excellent maneuverability:
  - Precise steering,
  - “Zero speed” steering,
  - Sidewalk movement possible with multiple jet installations
  - High efficiency astern thrust with “power –braking” ability s peed
- High efficiency at medium to high speeds
- Low drag and shallow draught:
  - Absence of underwater appendages reduces hull resistance
- Low maintenance:
  - No protruding propulsion gear eliminates impact damage or snags
  - Minimum downtime and simple maintenance routines
  - Fewer moving parts
- Smooth and quiet
- Maximum engine life

Disadvantages:

In Shallow waters the jets will create turbidity and bring up debris that may interfere with the water jets intakes. The intake grill can become clogged with debris: e.g. sea weed. The effects of this can be mitigated by having a reversing gearbox between the engine and the water jet.

Could be less efficient than a propeller system at low speeds

More expensive that the conventional propeller type propulsion system

The US Coast Guard explained that there are many ferry and commuter service that use this type of propulsion successfully. They mentioned that our waterways are some of the shallowest in the nation and warned that water jets may create turbidity and disrupt the bottom. Disturbance to the bottom means sea weed and debris which may clog the jets.

PILOT PROJECT BASE LINE:

Number of Routes	1
Types of Routes	Express
Service between routes	None
Routes:	N-S: Haulover Marina to Sea Isle Marina
Travel times:	N-S: 50 min. (Nov 15 thru April 30th) 35 minutes (May 1 thru Nov 14th)
Headways:	20 minutes (7:00 am – 10:00 am and 4:30 pm to 7:30 pm)
Number of Vessels required:	4 + 1(spare)
Vessel Capacity:	42 to 52 passengers (same as a bus)
Type of Vessel:	Low Wash Catamaran – Air Conditioned