# Miami River Commission
# Public Meeting Minutes
# January 6, 2025

The Miami River Commission's (MRC) public meeting convened at noon, January 6, 2025, in the Downtown Library Auditorium, 101 W Flagler. Sign in sheets are attached.

**Miami River Commission (MRC) Policy Committee Members and/or Designees attending:**
Horacio Stuart Aguirre, Chairman, Appointed by the Governor
James Murley, Vice-Chairman, designee for Miami-Dade County Daniela Levine Cava
Megan Kelly, designee for City of Miami Mayor Francis Suarez
Eddie Marti Kring, designee for County Commissioner Eileen Higgins
Betty Hermida, designee for City of Miami Commissioner Gabela
Theo Long, Neighborhood Representative appointed by Board of County Commissioners
Eileen Broton, Neighborhood Representative Appointed by City of Miami Commission
Richard Murphy, designee for Neighborhood Representative Appointed by City of Miami Commission
Bruce Brown, Miami River Marine Group
Spencer Crowley, Member at Large Appointed by the City Commission
Neal Schafers, designee for Downtown Development Authority

**MRC Staff:**
Brett Bibeau, Managing Director

## I) Chair's Report and "Voluntary Improvement Plan" (VIP) Update

The Miami River Commission unanimously adopted their December public meeting minutes.

MRC Chairman Horacio Stuart Aguirre provided the following report:

The MRC's 2024 Annual Report was distributed.

The free 26th Annual Miami Riverday will be held April 5, 2025, 1-6 PM, Lummus Park, 250 NW North River Drive, featuring free boat rides, live music, environmental education, historic reenactors, children's activities, food and drinks.

On behalf of the MRC, thank you to all the Miami Riverday sponsors, advertisers in the distributed 2025 Miami River Calendar and the upcoming 22nd Annual Miami River Map and Guide.

MRC Vice Chairman Jim Murley provided the following Miami River Voluntary Improvement Plan (VIP) Update:

The Miami River Commission has been actively assisting the efforts of the City, County, State, and private sector to clean up the Miami River District. The MRC pays professional maintenance companies every day to remove litter, invasive plant species, graffiti and provide landscaping,

pressure washing, vacuum truck, and Scavenger Water Decontamination Vessel services along the Miami River. In addition, the MRC thanks the Hands on Miami volunteers whom picked up garbage along the Miami River in Sewell Park on December 15, and in Curtis Park on December 22.

## II. Discussion regarding Miami Dade County's "Connect 2 Protect" Program Transferring Houses from Septic Tanks to the County's Sanitary Sewer System

Christine Wartman, Miami-Dade County Water & Sewer Department presented an excellent and detailed PowerPoint regarding the Connect 2 Protect Program, disconnecting septic sewer tanks and connecting homes to the County's sewer system, which improves water quality. Ms. Wartman presented a map of an area within the Miami River Water Basin where the homes currently have septic tanks, which the County completed the design and has secured funding to disconnect their septic tanks and connect all the homes to the County's Sewer System free of charge

### III. Discussion regarding Miami-Dade County's New "Smart Covers"

Galo Pacheco, M. Sc., P.E. Interim Chief, Water and Wastewater Division, Department of Regulatory and Economic Resources (RER), Division of Environmental Resources Management (DERM) presented an excellent and detailed PowerPoint titled, "RER-DERM Smart Cover Pilot Study." Smart Covers on sanitary sewer manholes have sensors which detect high levels of sanitary waters in the pipes and sends an alarm to the County and subject municipality so they may address the problem before a sanitary sewer overflow from the manhole into the Miami River, similar to the 2 sanitary spills Director Bibeau recently reported on South River Drive in Little Havana. Mr. Pacheco stated Phase I installed 192 Smart Covers and Phase II installed 234 Smart Covers, for a total of 426 current Smart Covers County Wide. Smart Covers also detects problematic infiltration, which the Department then eliminates. In only 1 year the new system detected 99 events which the Department repaired and therefore avoided sewage overflows, including 1 on Wagner Creek detected only 3 months after it was installed. The County's sewage lines get clogged with fats, oils, grease, rocks, etc.

## IV. New Business

MRC Director Bibeau stated for a year riverfront residents in Neo Lofts had repeatedly contacted the City of Miami Police Department and the MRC reporting an illegal drug dealer operating from the public Riverwalk beneath the Flagler Bridge in Little Havana. The location is cleaned by the MRC once a week, and twice the individual threatened to kill me, stating he had a 9mm handgun. The Police arrested him for drug dealing. Less than 24 hours later I witnessed the same individual had returned to the same location, hid a backpack in the bushes, and aggressively interfered with the MRC cleanup crew and myself trying to clean the area, therefore I called the police. The Police searched the individual's backpack which he had hidden in the bushes, and found a 9 mm handgun. He was arrested again and I have received a subpoena to testify as a witness in his upcoming trial. This is just one recent example of the extra value provided by the MRC's efforts to clean the Miami River.

The public meeting adjourned.

**Miami River Commission**

**Public Meeting**

January 6, 2025 – 12:00 PM

101 W Flagler, Miami FL - Main Library Auditorium

| Name | Organization | Telephone | Email |
|---|---|---|---|
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| Christine Wartman | Miami Dade Water & Sewer | 786-877-6734 | christine.wartman@miamidade.gov |
| Janet Mestril | Antillean Marine | 305-303-6230 | jmestril@antillean.com |
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**Miami River Commission**

**Public Meeting**

January 6, 2025 – 12:00 PM

101 W Flagler, Miami FL - Main Library Auditorium

| Name | Organization | Telephone | Email |
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| Eileen Broton | MRC/SGCA | 3/79-4284 | e bellsouth net |
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| Bruce L. Brown | MRMG | 305/788-6411 | brucel702@bellsouth.net |
| Brett Bibeau | MRC | | |
| Horacio Stuart Aguirre | MRC | | |

# 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.

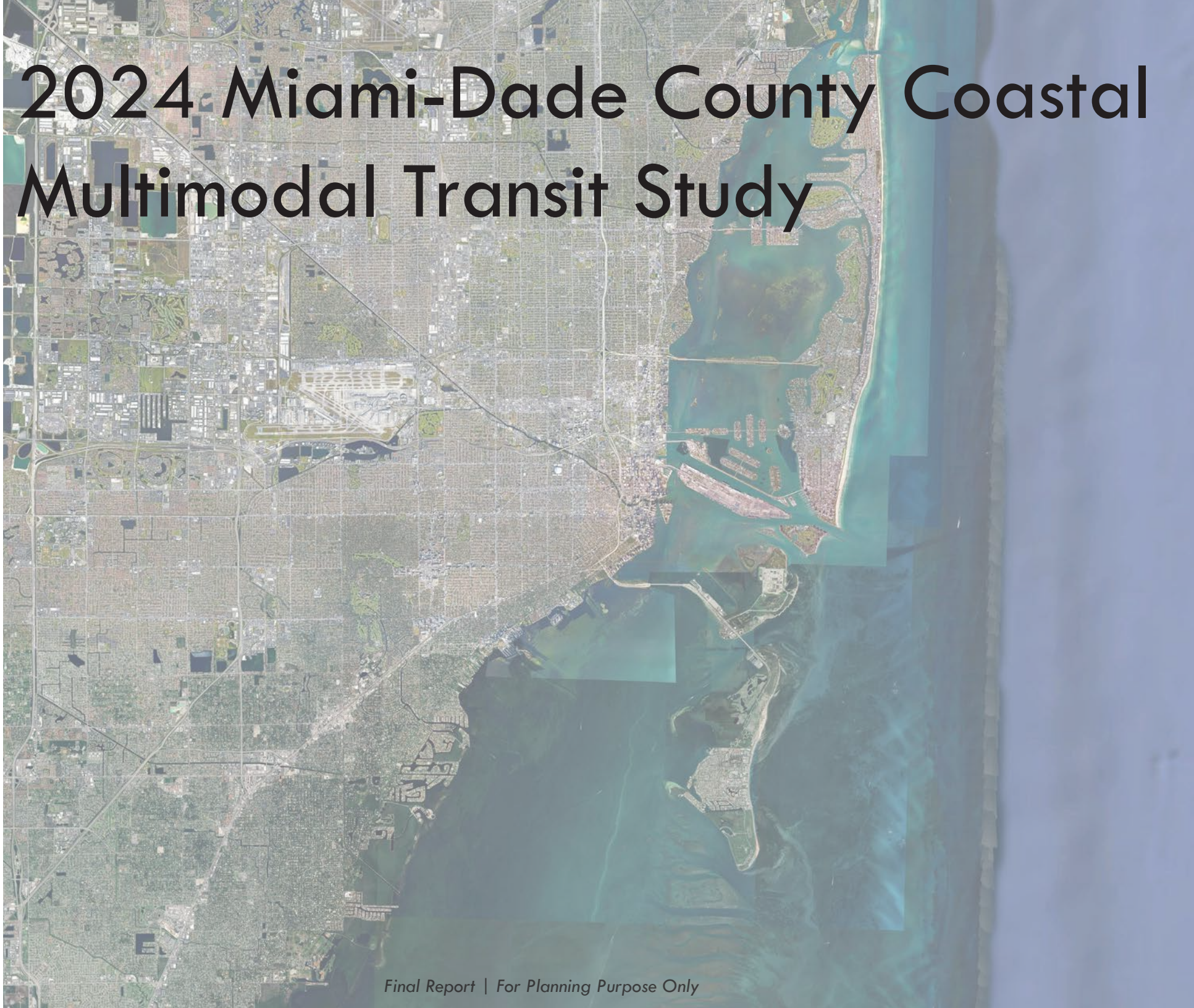
Separately, since the PWG concluded its study, it has been reported that a water taxi pilot program on Miami Beach was recently canceled after sailing for two months due to low ridership, maintenance concerns, and unreliable service.

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.

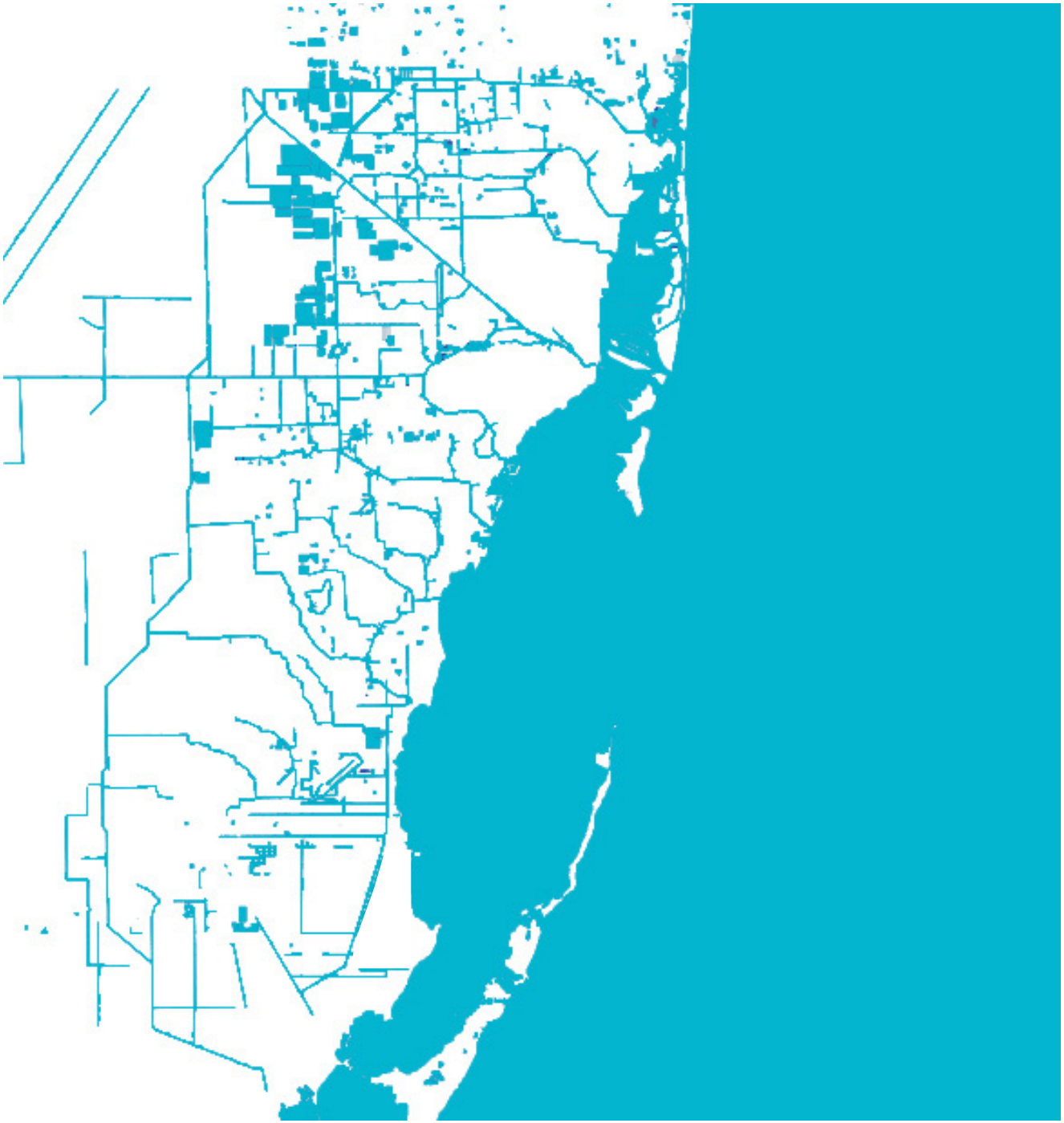
(2) Regional-Based Schedule

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.



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# 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.

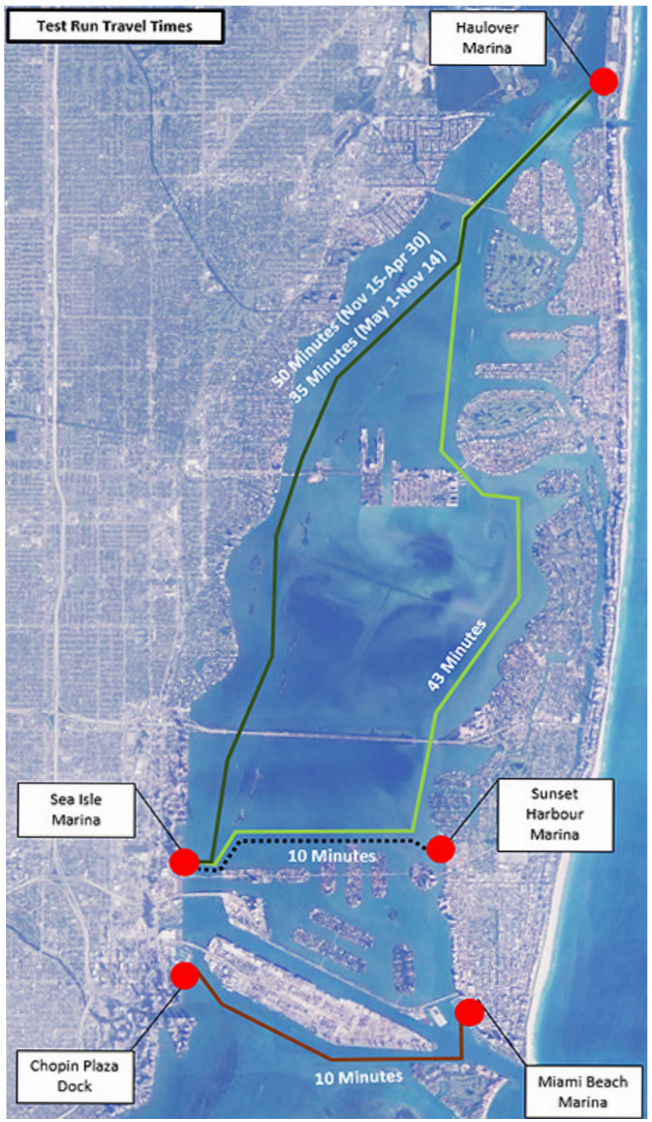
Primary Sites

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

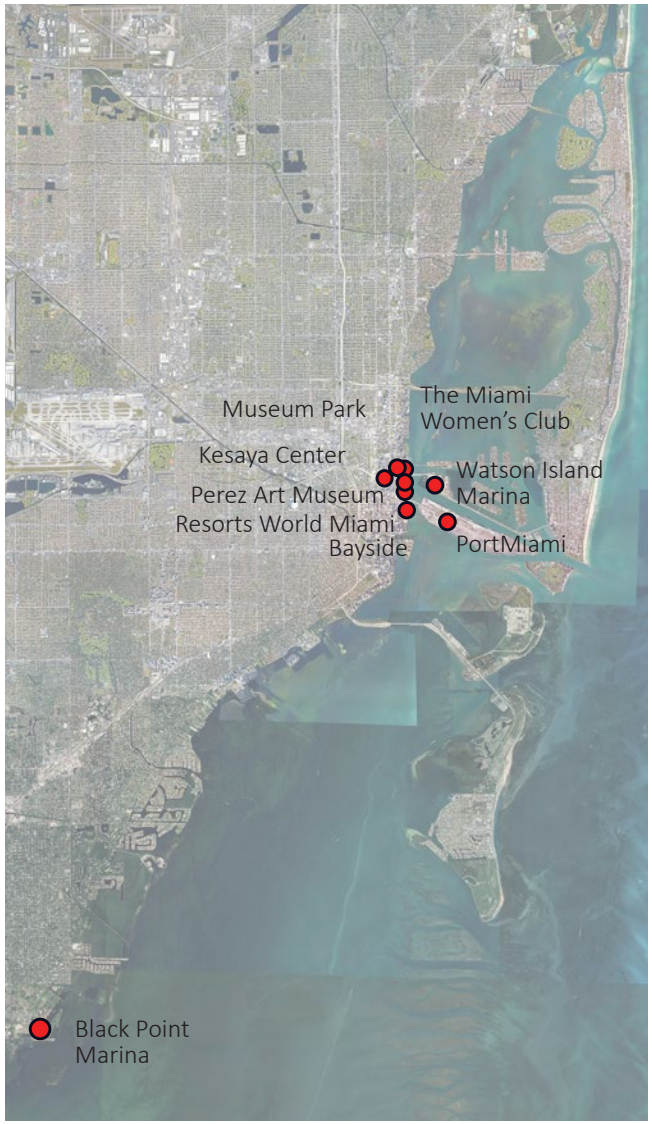
Secondary Sites

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**

| | |
|---|---|
| Black Text | Analysis Content |
| 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.

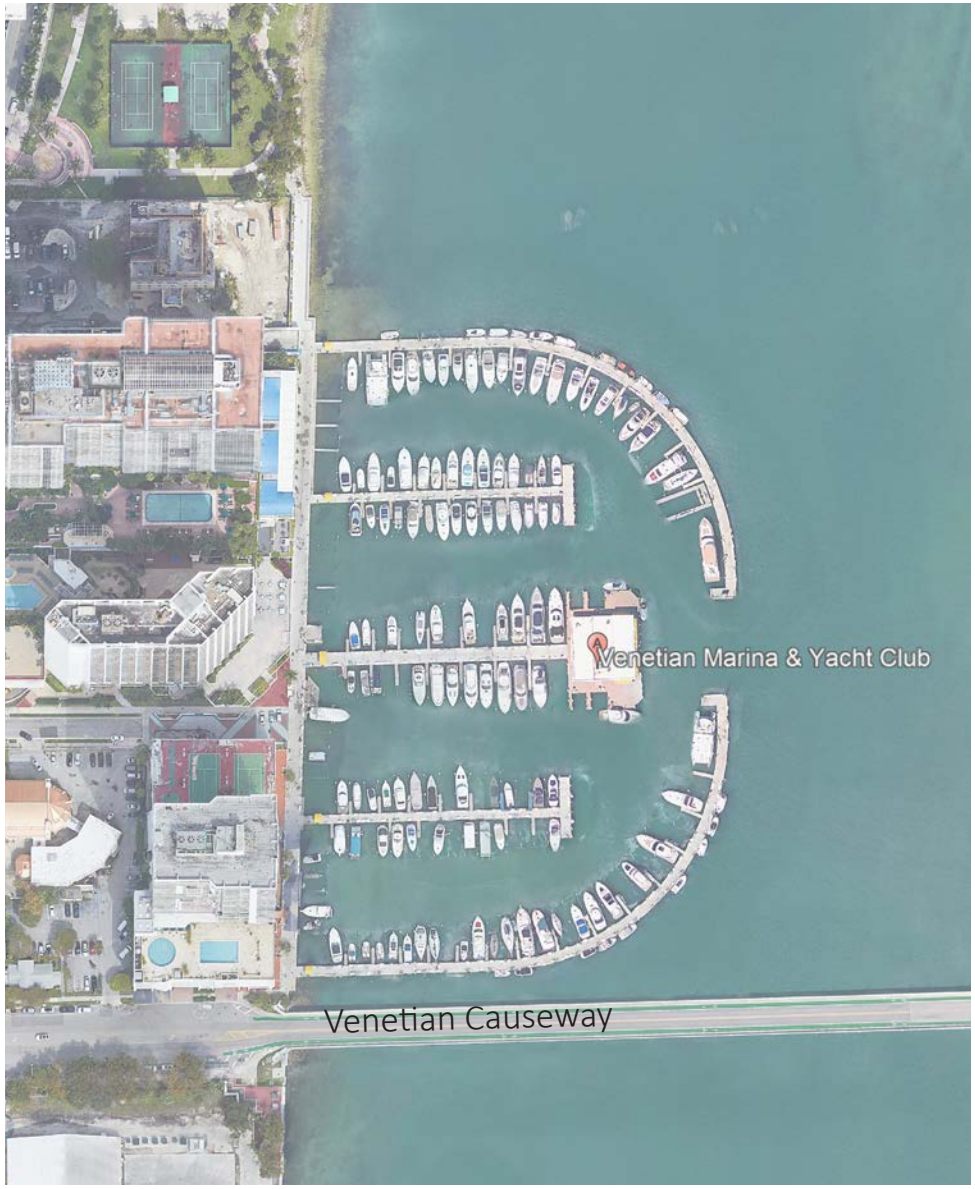
### 2024 CMTS PWG Findings

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*

**KEY**

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|---|---|
| Black Text | Analysis Content |
| 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**

| | |
|---|---|
| Black Text | Analysis Content |
| 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.

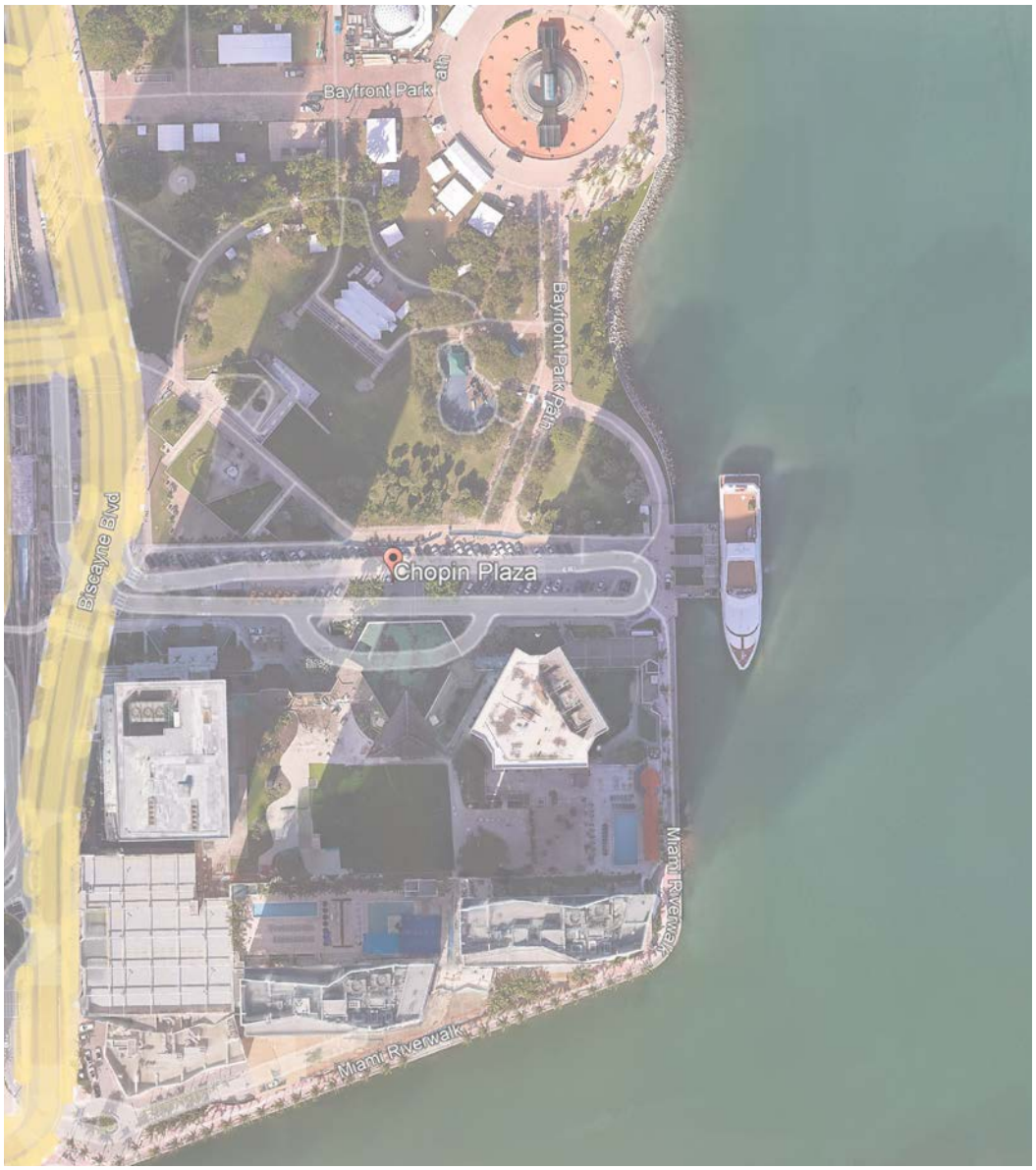
### 2024 CMTS PWG Findings

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*

**KEY**

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| Black Text | Analysis Content |
| 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**

| | |
|---|---|
| Black Text | Analysis Content |
| 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**

| | |
|---|---|
| Black Text | Analysis Content |
| 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*

**KEY**

| | |
|---|---|
| Black Text | Analysis Content |
| 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*

**KEY**

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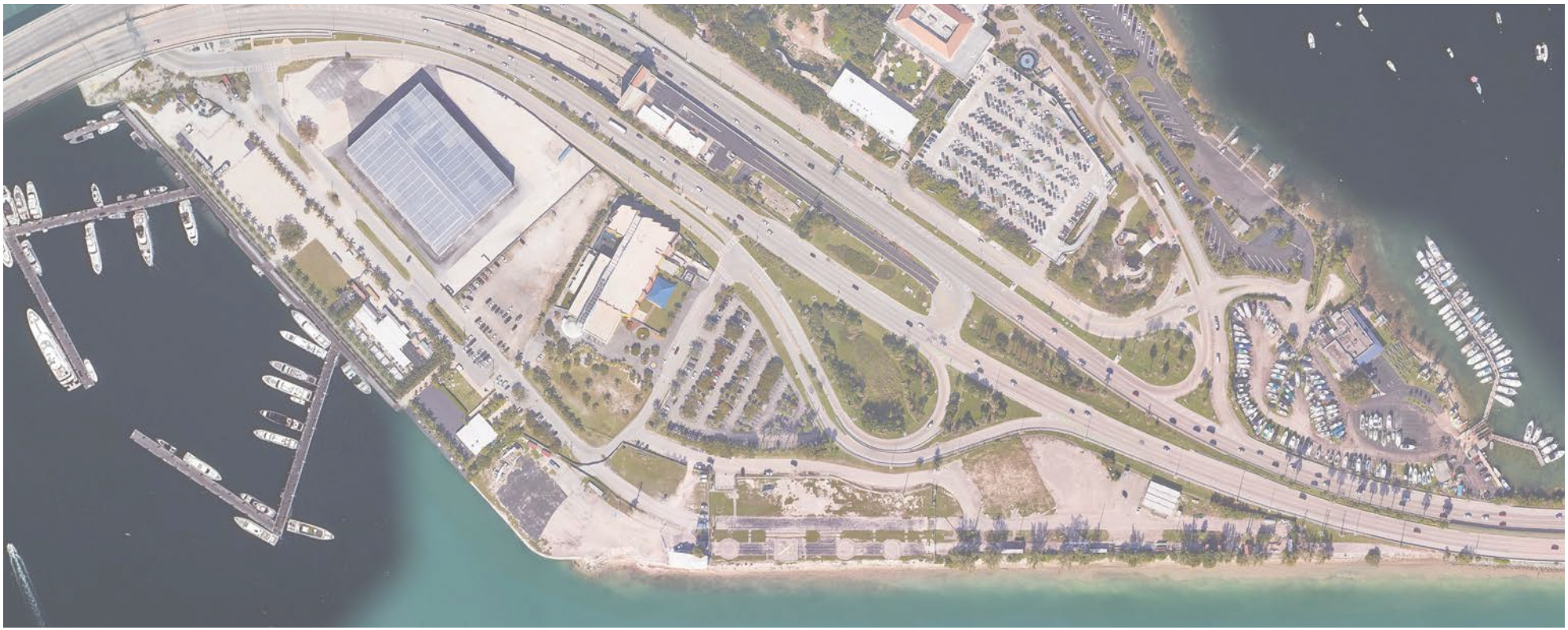
## WATSON ISLAND MARINA



### 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

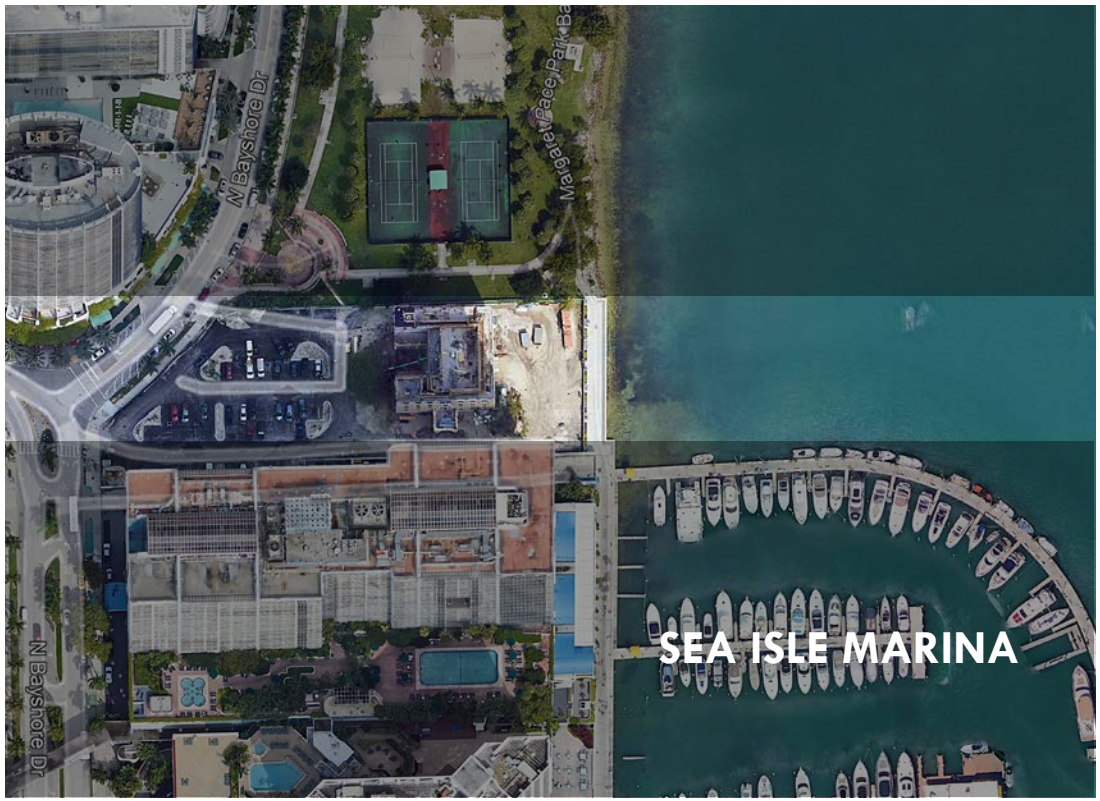
### 2024 CMTS PWG Findings

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*

**K E Y**

| | |
|---|---|
| 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**

| | |
|---|---|
| Black Text | Analysis Content |
| Blue Text | PWG Findings |

## BAYSIDE'S EASTERN PENINSULA

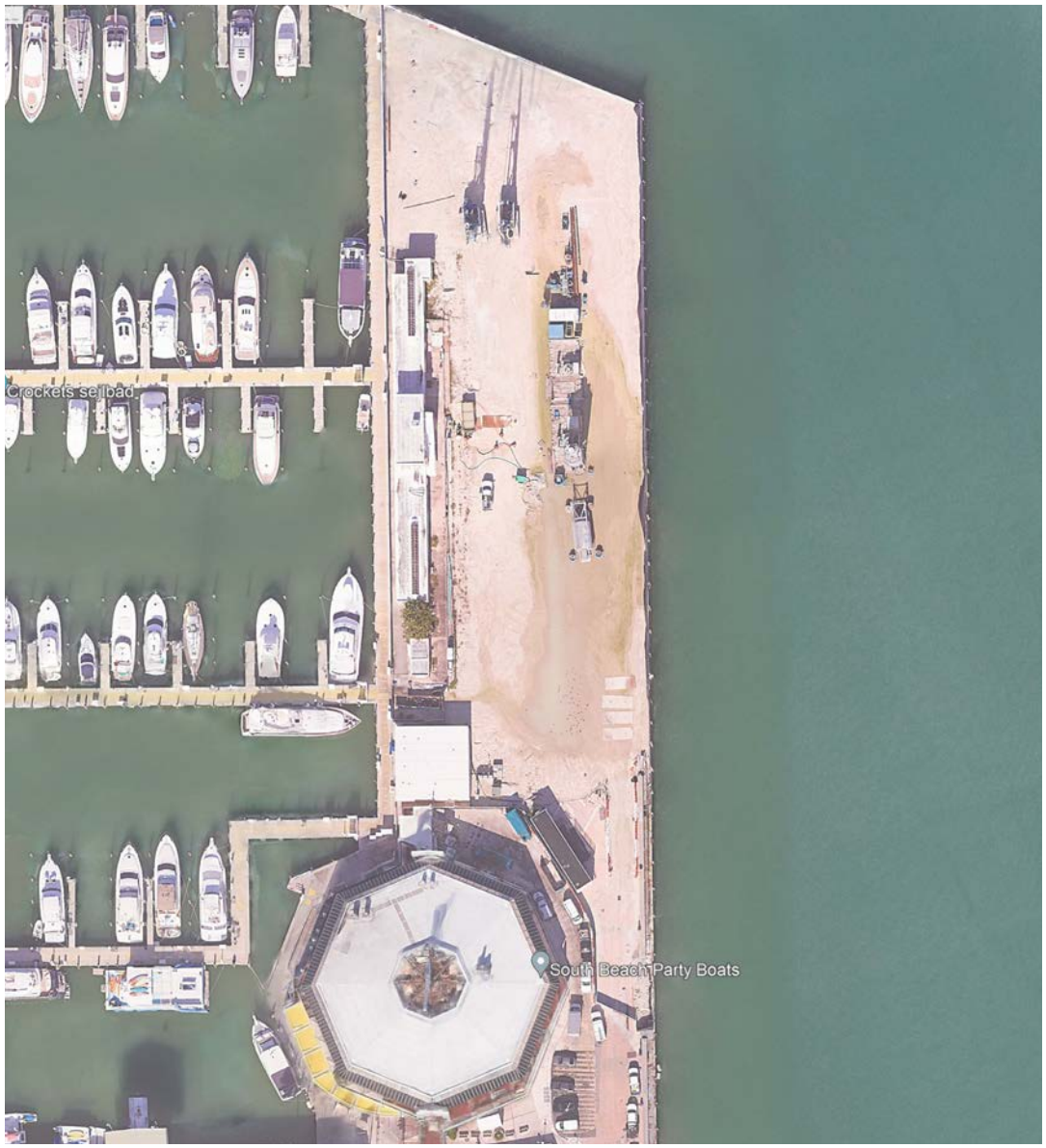
### 2024 CMTS PWG Findings

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<br>Intercostal Waterway Channel<br>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:<br>➢ Slow Speed: Nov. 15 – April 30<br>➢ Higher speed: 30 mph May 1 – Nov. 14<br>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.<br>Normal Headway: 35 minutes at an average speed of 24 mph (20.85 knots) between Nov. 15 and Apr. 30. |

**Test Run No. 2:**

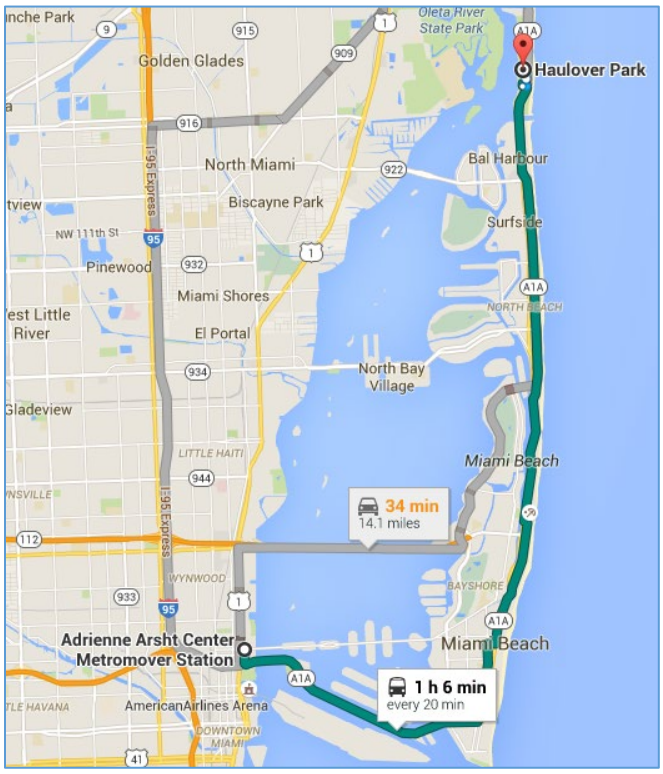
| | |
|---|---|
| Date: | April 27, 2016 |
| Time: | 10:00 AM to 1:00 PM |
| Weather Conditions: | Clear, Sunny and 80 degrees Fahrenheit |
| Water: | Optional – Clear |
| Route: | Express route - no stops – extension of bus service<br>Intercostal Waterway Channel<br>The test run measured headways for 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:<br>➢ Meloy Channel (North-South channel) allows for 30 to 35 mph for most of the length of the channel.<br>➢ Speed is reduced before sunset harbor to low speed year round before the Venetian Causeway<br>➢ Speed is increased (East-West) north of the Venetian Causeway.<br>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:**

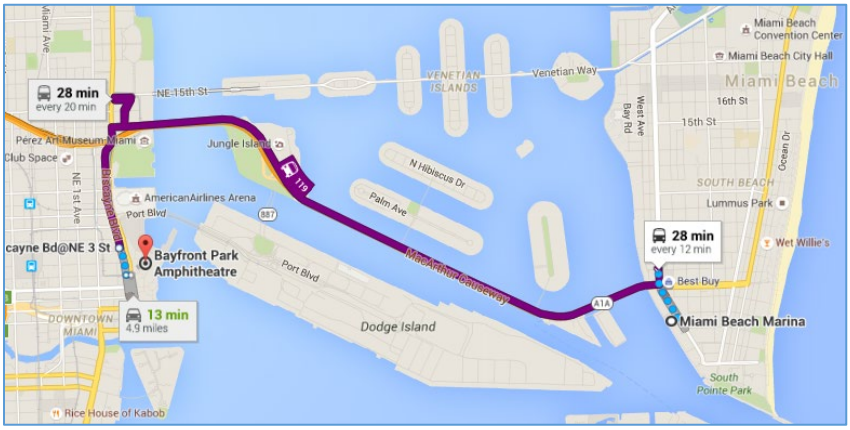
| | |
|---|---|
| Date: | March 17, 2016 |
| Time: | 10:00 AM to 1:00 PM |
| Weather Conditions: | Clear, Sunny and 80 degrees Fahrenheit |
| Water: | Optional – Clear |
| Route: | Express route - no stops – extension of bus service<br>Intercostal Waterway Channel<br>The test run measured headways for 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.



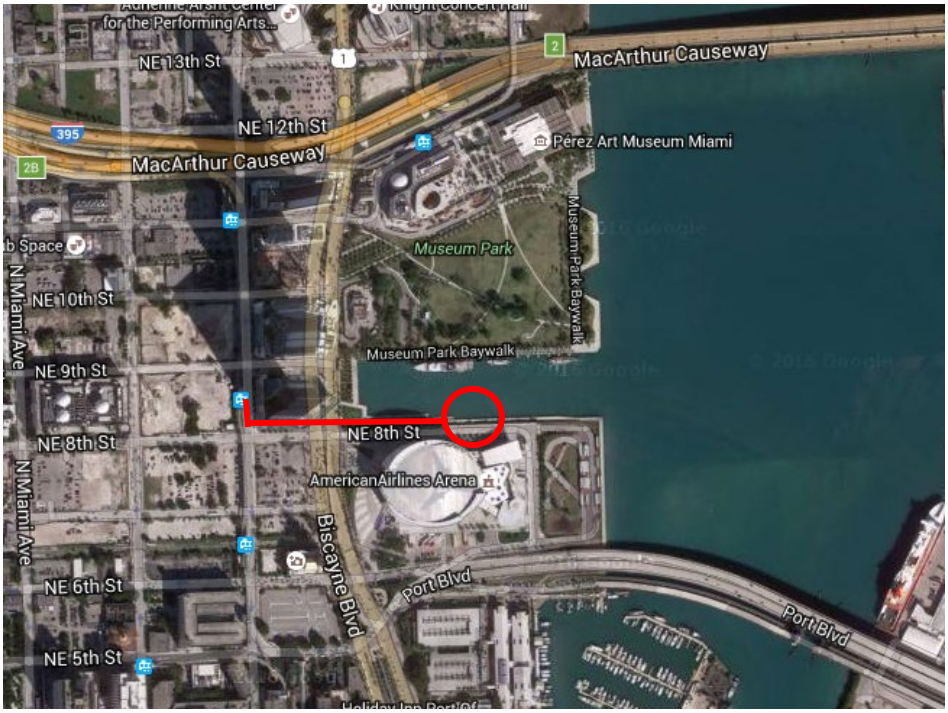

There are three routes providing one-seat ride from Miami Beach Marina to Bayfront Park, Routes 103, 119 and 120. Travel times between these two locations vary between 28 and 35 minutes depending on the traffic conditions along the route. The figure below shows time estimates using Google Trip Planner.



**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.

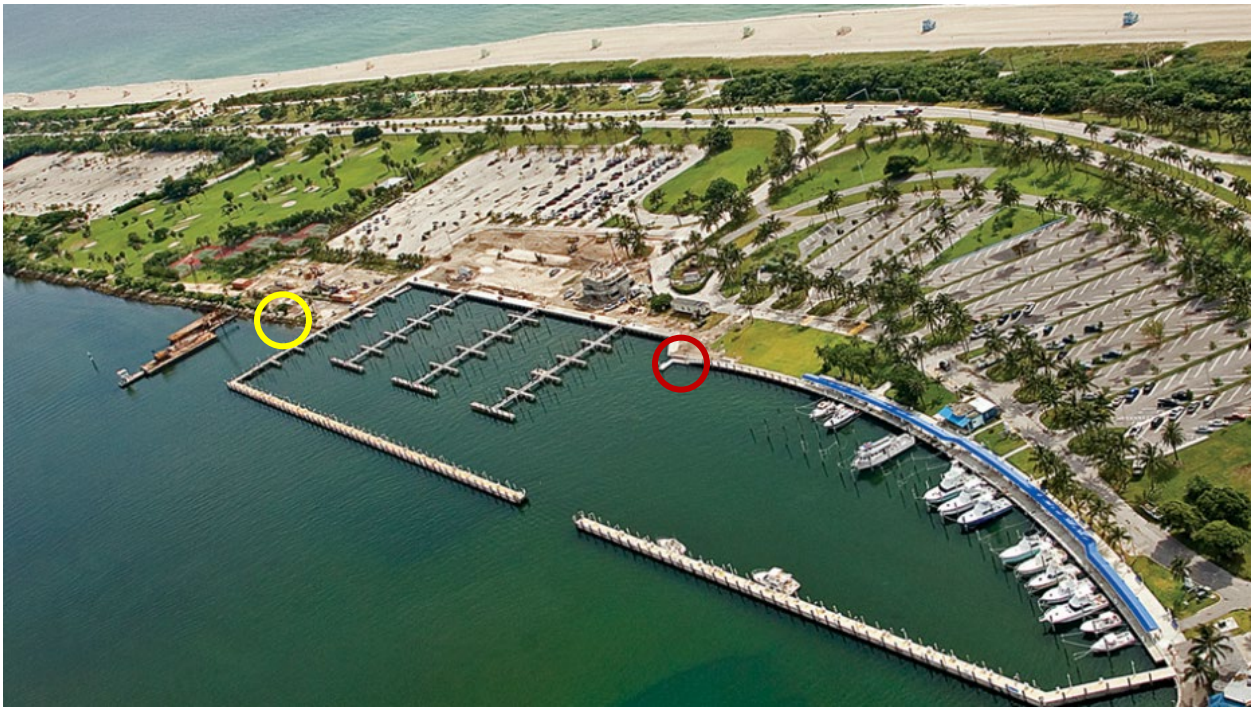
**FEC Dock:**



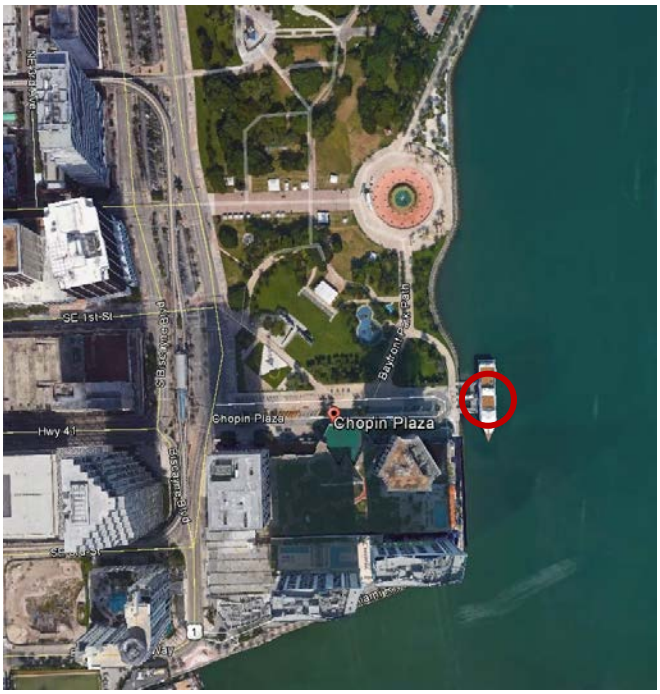

The FEC dock requires minor upgrades, is ADA accessible and within 1,000 feet of the Park West Metro mover station. DERM has indicated that this location is not viable because of it restrictions to large cargo ships.

**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.

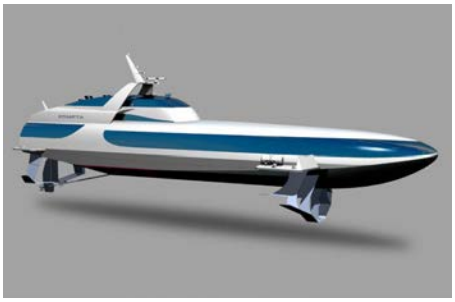
**Air Draft:** The max. Height of the vessel measured above the water line to its topmost point must be lower than the minimum structure clearance on the proposed service routes. This height has been identified as 12 feet (on the outer sides) and 14' feet (in the middle) for the Venetian Causeway Western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

# FEASIBILITY OF IMPLEMENTING A WATERBORNE TRANSPORTATION NETWORK IN MIAMI-DADE COUNTY

## PRIVATE STAKEHOLDER MEETING NO. 3
## OCTOBER 25, 2024


# Project Team

Miami-Dade Transportation Planning Organization

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# Agenda

- **Purpose of Study / Project Working Group**
- **Alternatives Analysis**
- **Project Schedule/ Next Steps**

# Project Working Group / Private Stakeholder Meetings

## Participating Agencies

**Purpose :** For PWG to provide valuable feedback and review materials on all project deliverables and approval/ endorsement of the results and recommendations for this study.

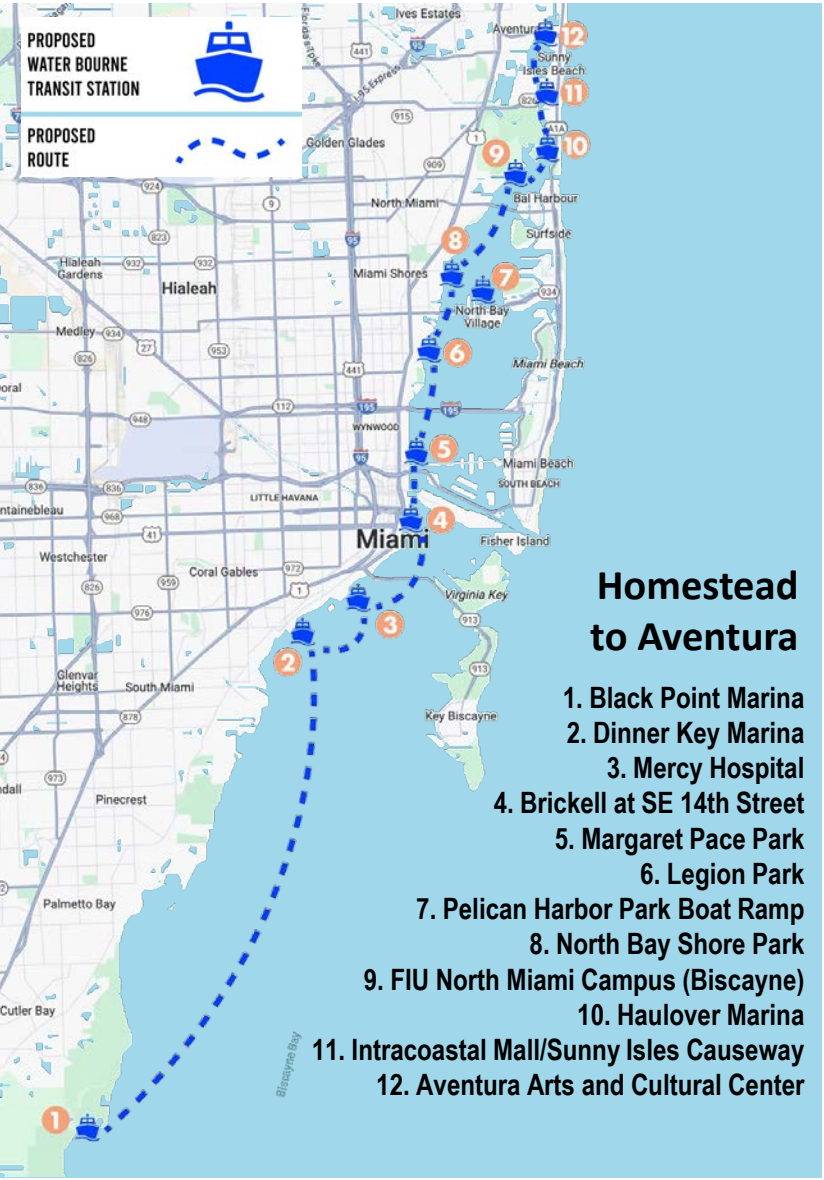
**Project Working Group and Private Stakeholder Meetings**

1. PWG Meeting No. 1 – March 12, 2024
2. PWG Meeting No. 2 – August 7, 2024
3. PWG Meeting No. 3 – October 25, 2024

# Alternatives Analysis: Initial three (3) Routes

Miami-Dade Transportation Planning Organization

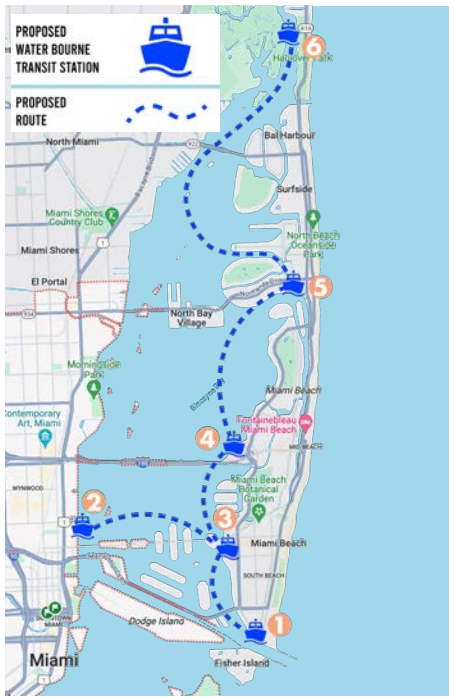
## Route 1: West Shoreline




### Homestead to Aventura

1. Black Point Marina
2. Dinner Key Marina
3. Mercy Hospital
4. Brickell at SE 14th Street
5. Margaret Pace Park
6. Legion Park
7. Pelican Harbor Park Boat Ramp
8. North Bay Shore Park
9. FIU North Miami Campus (Biscayne)
10. Haulover Marina
11. Intracoastal Mall/Sunny Isles Causeway
12. Aventura Arts and Cultural Center

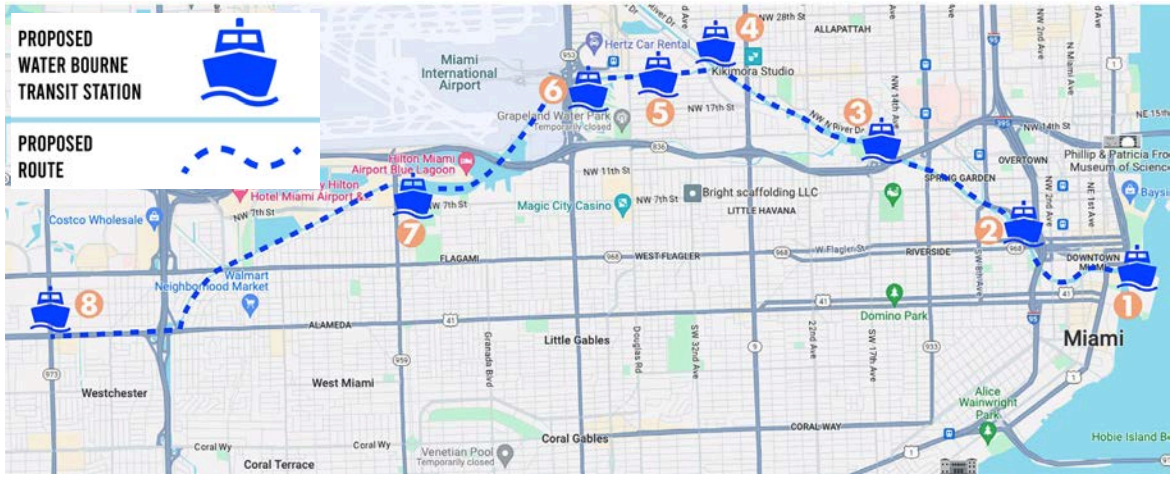
## Route 2: South & North Miami Beach




### South Beach to North Miami Beach

1. Washington Avenue (South Pointe Park)
2. Margaret Pace Park
3. Lincoln Road
4. Mt. Sinai Hospital
5. North Beach (69th Street)
6. Haulover Marina

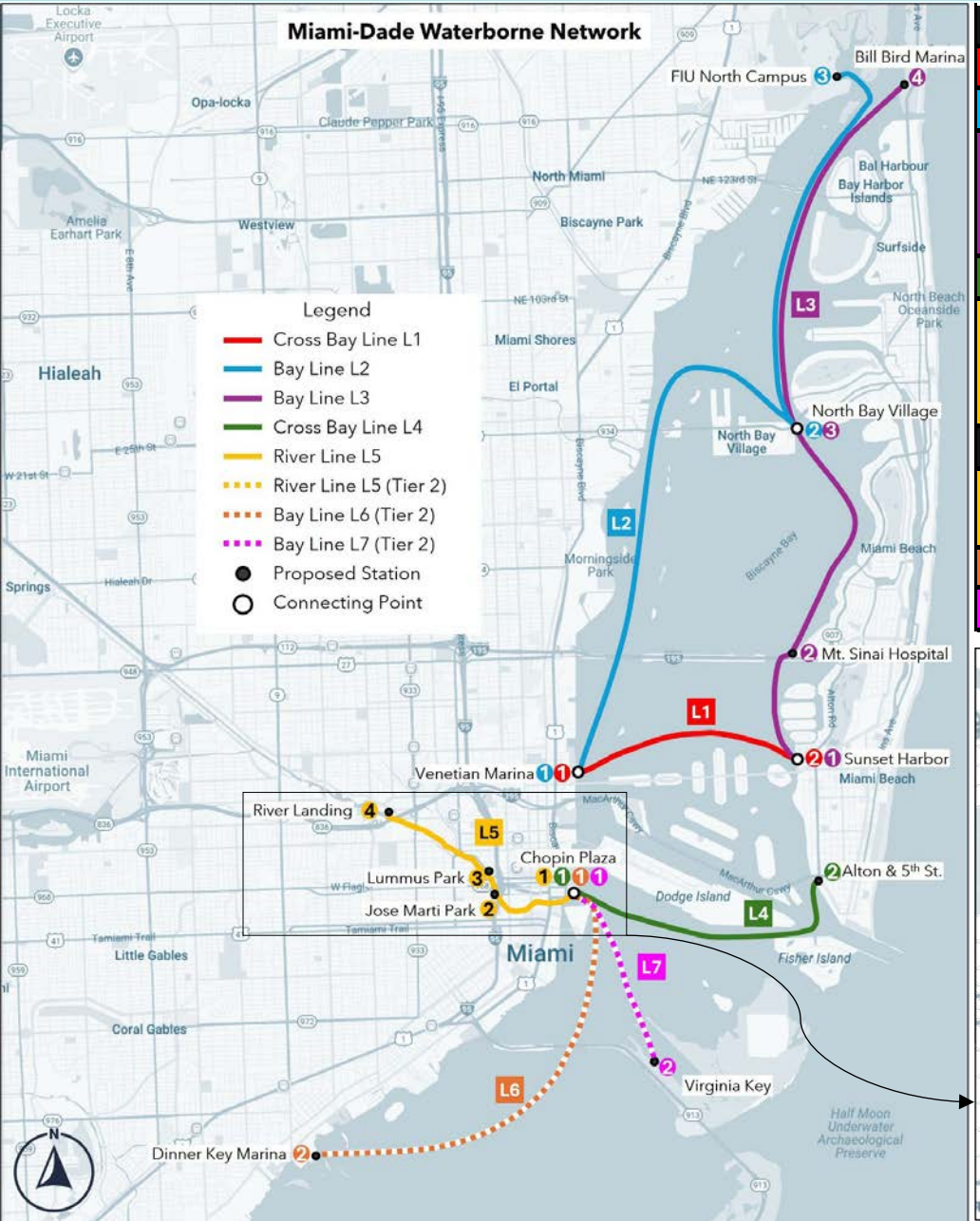
## Route 3: Miami River



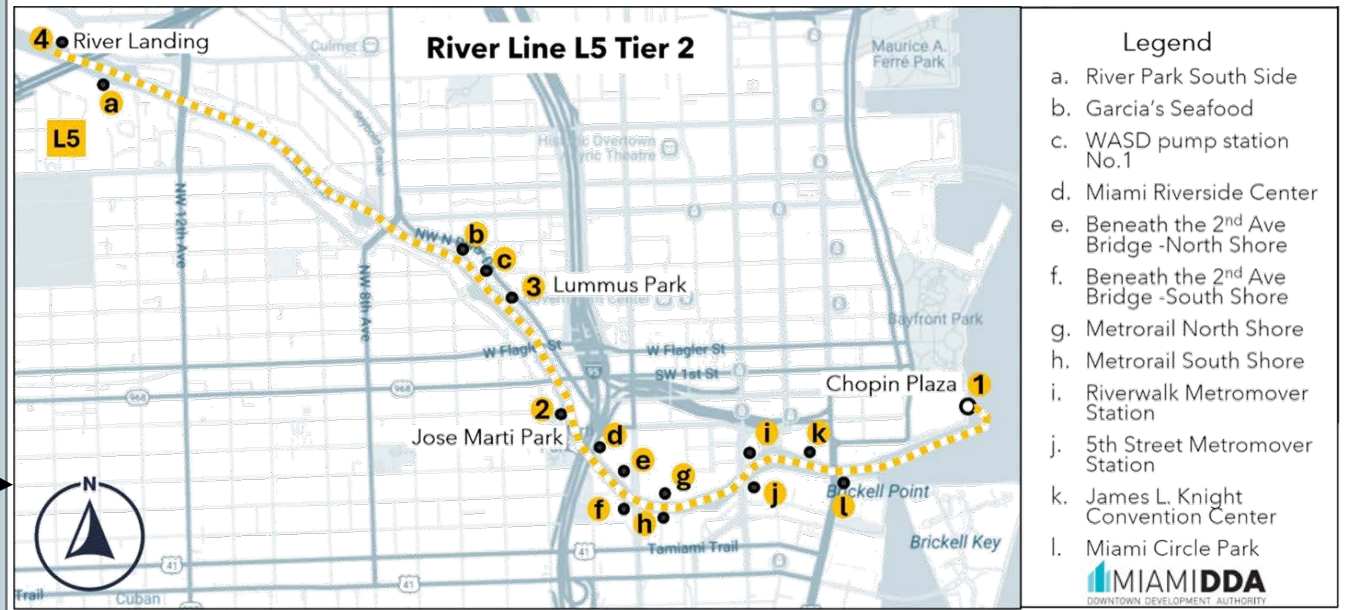

### Miami River

1. Mouth of River
2. The Riverside Wharf
3. NW 17th Avenue @ NW 14th Street
4. Tamiami Canal
5. NW 37th Avenue @ NW 33rd Street
6. SE Le Jeune Road
7. Red Road
8. NW 87th Avenue

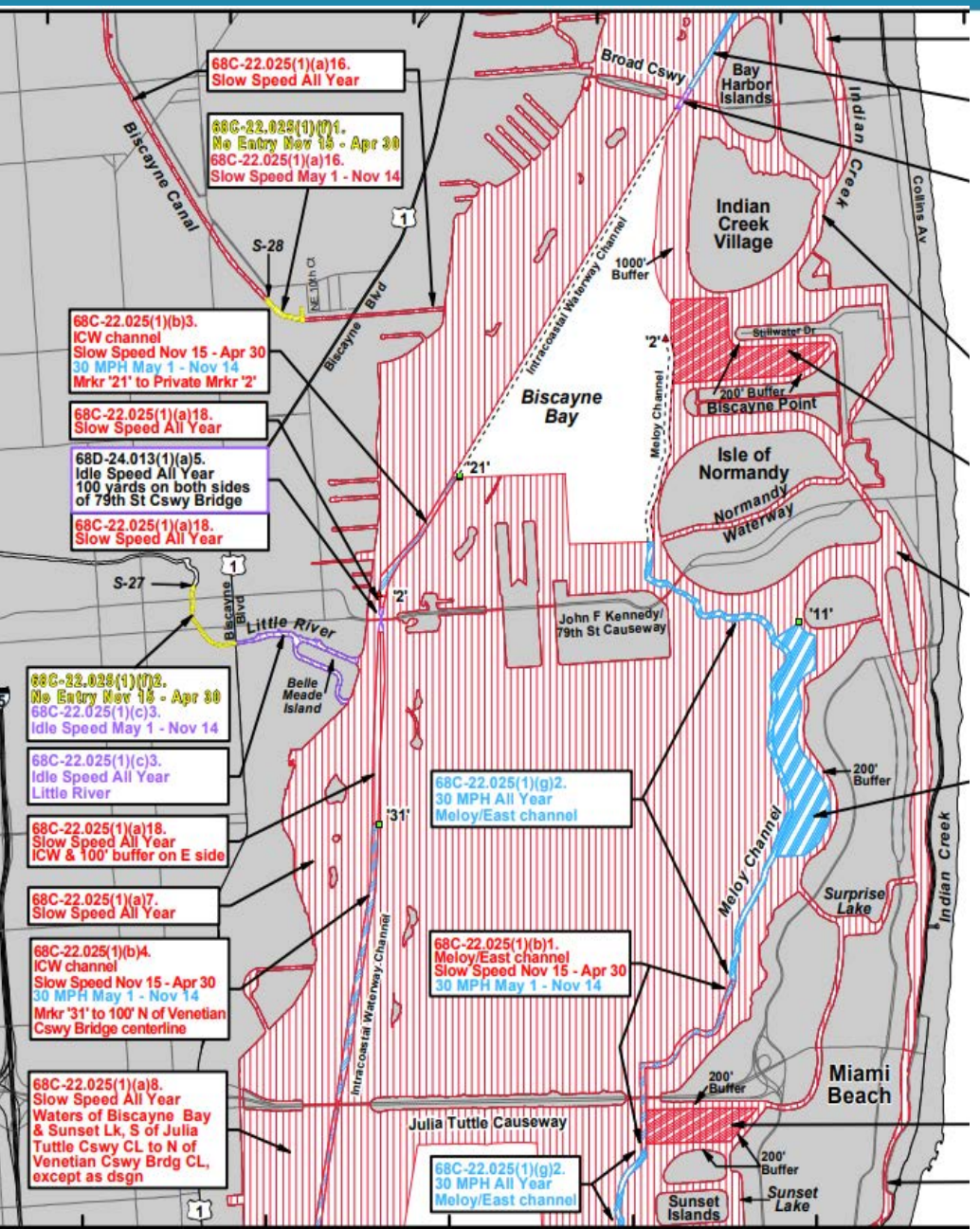
# Alternatives Analysis: Recommendations




| Recommended Routes Tier 1 | | | | |
|---|---|---|---|---|
| Cross Bay L1 | 1 | Venetian Marina | 2 | Sunset Habour |
| Bay Line L2 | 1 | Venetian Marina | 2 | North Bay Village |
| Bay Line L3 | 1 | Sunset Habour | 2 | Mt. Sinai Hospital |
| | 2 | Mt. Sinai Hospital | 3 | North Bay Village |
| | 3 | North Bay Village | 4 | Bill Bird Marina |
| Cross Bay L4 | 1 | Chopin Plaza | 2 | Alton & 5th St |
| River Line L5 | 1 | Chopin Plaza | 2 | Jose Marti Park |
| | 2 | Jose Marti Park | 3 | Lummus Park |
| | 3 | Lummus Park | 4 | River landing |
| **Recommended Routes Tier 2** | | | | |
| River Line L5 Additional Stops | Per Miami Downtown Development Authority Resolution 007/2024- Possible Dockage Sites | | | |
| Bay Line L6 | 1 | Chopin Plaza | 2 | Dinner Key Marina |
| Bay Line L7 | 1 | Chopin Plaza | 2 | Virginia Key |



# Alternatives Analysis: Manatee Protection Zones




Idle Speed All Year

Slow Speed All Year

Slow Speed Nov 15 - Apr 30
30 MPH May 1 - Nov 14

Slow Speed Nov 15 - Apr 30
35 MPH May 1 - Nov 14

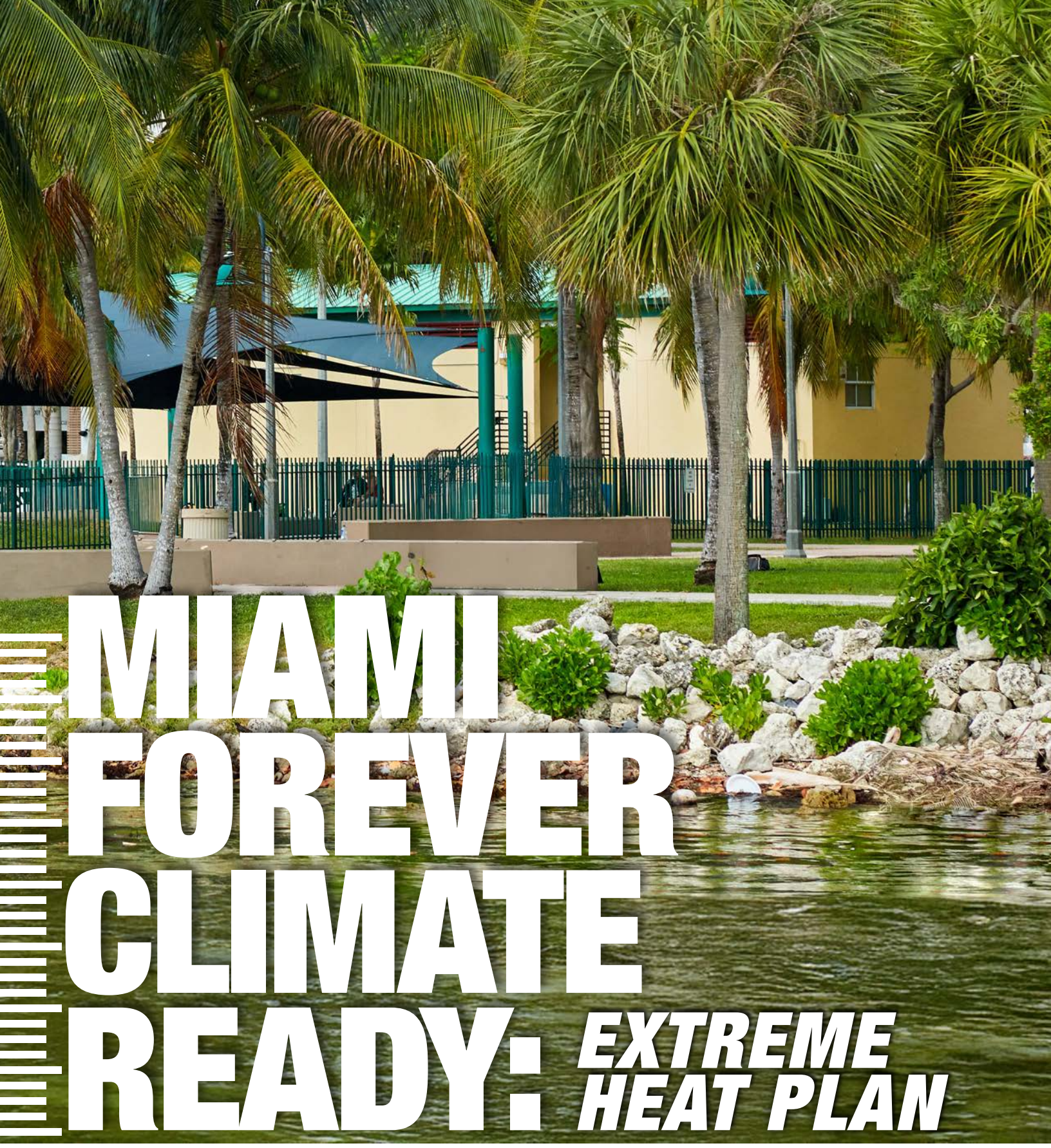
30 MPH All Year

35 MPH All Year

- Most Stops in the Biscayne Bay are in Slow Speed Zones all Year with access to channels with different speed restrictions.
- The Miami River is Idle Speed All Year

# Project Schedule/ Next Steps

1. Final Report and Executive Summary – December 2024
2. Next Steps – Seeking Implementation



# MIAMI FOREVER CLIMATE READY: *EXTREME HEAT PLAN*

CITY OF MIAMI FLORIDA

MIAMI FOREVER CLIMATE READY

# ACKNOWLEDGEMENTS


**Francis X. Suarez**
Mayor

## Board of City Commissioners

**Miguel Angel Gabela**
District 1

**Damian Pardo**
District 2

**Joe Carollo**
District 3

**Manolo Reyes**
District 4

**Christine King**
District 5

**Arthur Noriega V**
City Manager

**Todd B. Hannon**
City Clerk

**Natasha Colebrook-Williams**
Deputy City Manager

**George K. Wysong, III**
City Attorney

**Asael Marrero**
Assistant City Manager
Chief of Infrastructure

**Barbara Hernandez**
Assistant City Manager
Chief of Operations

**Larry M. Spring, Jr.**
Assistant City Manager
Chief Financial Officer

The development of the Miami Forever Climate Ready: Extreme Heat Plan was led by the Office of Resilience and Sustainability and the Office of the City Manager, in collaboration with City of Miami departments and their staff that provided input and considerations to inform this plan:

Department of Building
Office of Capital Improvements
Department of Code Compliance
Office of Communications
General Services Administration
Office of Film and Entertainment
Department of Fire-Rescue
Department of Housing and Community Development
Department of Human Services
Department of Innovation and Technology
Department of Planning
Department of Parks and Recreation
Department of Real Estate and Asset Management
Department of Resilience and Public Works
Department of Risk Management
Department of Solid Waste
Office of Zoning

We also express gratitude for the contributions received from public stakeholders, local organizations, and universities during the preparation of this report.

Allapattah CDC
Catalyst Miami
City of Miami Climate Resilience Committee
City of Miami Residents
Coconut Grove Sailing Club
Earthlink
Florida Clinicians for Climate Action
Florida Immigrant Coalition
Florida International University
Florida Sea Grant Extension Agent
Massachusetts Institute of Technology
Miami Climate Alliance
Miami Parking Authority
Miami Waterkeeper
P.E.E.R. Group
Sunrise Miami
The CLEO Institute
The Underline
University of Miami
Urban Paradise Guild
Volunteer Cleanup
WeCount
Youth Environment Alliance


MIAMI FOREVER
CLIMATE READY

MIAMI FOREVER
CLIMATE READY

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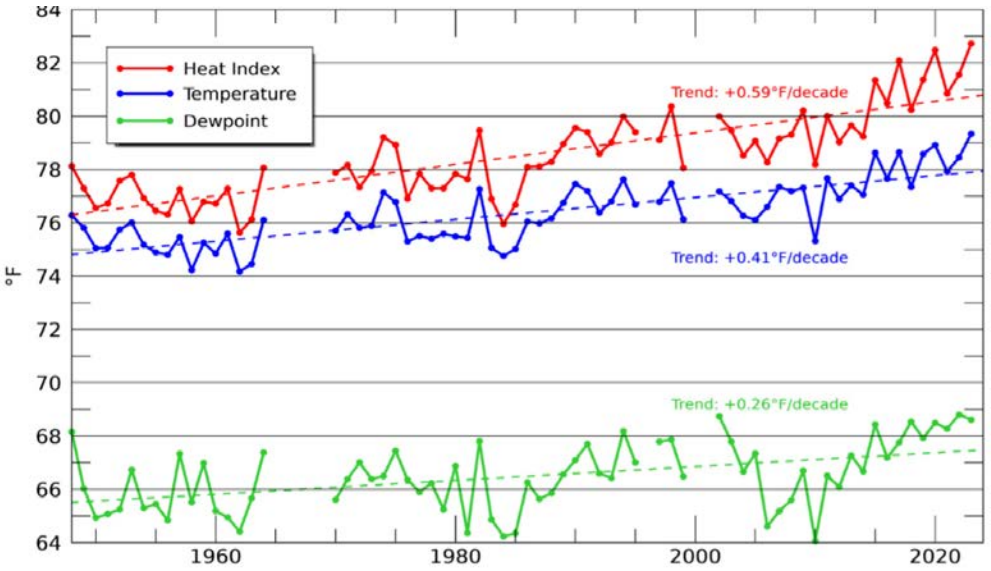
# BACKGROUND ON EXTREME HEAT IN MIAMI

In 2023, Miami experienced 42 days reaching a heat index of 105°F or more, compared to an average of 6 days/year over the previous 14 years. In 2024, two days in May reached record breaking heat indices of 112°F.[1] Projections suggest that by mid-century, Miami could face 88 days annually with a heat index of 105°F or greater, equivalent to roughly three months of extreme heat.[2] Research from the University of Miami indicates that the annual average heat index in Miami has increased by 0.59°F per decade since the 1950s, emphasizing the need for a local extreme heat plan (Figure 1).

**Figure 1.** Annual Average Heat Index, Temperature, Dewpoint in Miami, Florida

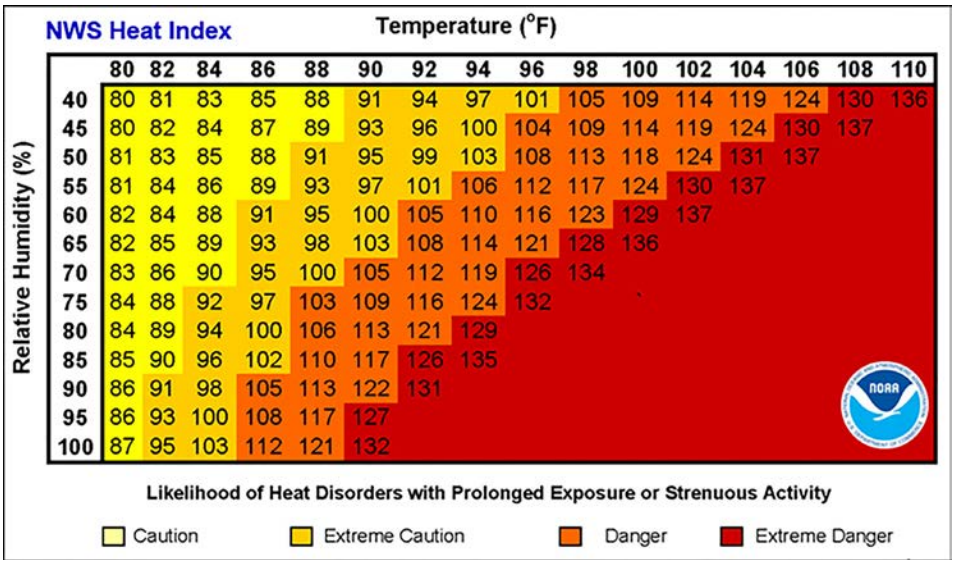



**Source:** McNoldy, Brian. Annual Average High Temperature and Dew Point in Miami. [3]

In response to the growing number of high heat days, Miami-Dade County has officially recognized a "Heat Season" spanning from May 1 to October 31 every year. In addition, in May 2023, the National Weather Service Miami - South Florida Weather Forecast Office began an experimental pilot program for Miami-Dade County to reduce the Heat Index threshold for Heat Advisories and Heat Warnings, so community members receive alerts before heat indices reach highly dangerous levels. National Weather Service began this pilot in Miami-Dade County in 2023 and extended it to Broward County in 2024.[4]

- Heat Advisory - heat index reduced from 108°F for 2 hours, to 105°F for 2 hours.
- Heat Warning - heat index reduced from 113°F for 2 hours, to 110°F for 2 hours.

**Figure 2.** NOAA National Weather Service (NWS) Heat Index




**Source:** National Oceanic and Atmospheric Administration (NOAA)

Text "**ALERTMIAMI** to 888777 to receive emergency updates including declared extreme heat advisories and warnings.

# CAUSES OF EXTREME HEAT AND GLOBAL TRENDS

Greenhouse gas emissions, driven by human activities such as energy production, transportation, industry, agriculture, and deforestation, are the main contributors to global climate change. With cities responsible for 70 percent of global carbon dioxide emissions (the primary human-driven greenhouse gas), it is crucial for local governments to lead the way in committing and implementing ambitious measures that drastically reduce emissions to avoid the worst impacts of climate change like extreme heat.

According to the National Oceanic and Atmospheric Administration (NOAA), the 2022 global average land and ocean surface temperature was 1.55°F warmer than the 20th-century average of 57°F and 1.9°F warmer than the pre-industrial period (1880 - 1900).[5a] This increase in global average temperature disrupts historic climate patterns leading to extreme changes in weather and natural disasters. In Miami, these impacts are experienced as increased flooding due to sea level rise, intensified hurricanes and storms, and growing periods of extreme heat.

The City of Miami has set a long-term target of net-zero greenhouse gas emissions by 2050 in alignment with the Paris Climate Agreement, which stipulates that global average temperature rise should be kept to well below 3.6°F (2°C) above preindustrial levels, and ideally be limited to 2.7°F (1.5°C).

## EXTREME HEAT DATA AND RESEARCH IN MIAMI

The City has participated in several studies and initiatives to get a better understanding of the City's heat profile and areas in most need of cooling interventions. For many years the City only had land surface temperature maps, which are helpful in showing variations in heat throughout the City but they misrepresent ambient temperatures as surface temperatures are known to be higher.[5b] Due to this, the City of Miami participated in a project supported by NOAA and CAPA Strategies in summer 2020 called Heat Watch which engages local communities in a heat mapping campaign to gather data and create high-resolution maps of ambient heat at the human level. Teams of citizen scientists drove designated routes throughout the City in the morning, afternoon, and evening with sensors that tracked temperature, humidity, and GPS coordinates to create a Citywide heat model.

Additionally, Florida International University, University of Miami, and Catalyst Miami teamed up for another heat-related citizen science initiative called Shading Dade which placed small iButton sensors throughout the County, for 3 months at a time, to measure the impact of shade interventions. Temperature readings can vary significantly by location and these measurements have demonstrated that many sites in the City and County often record a heat index above the local threshold value for a heat advisory even when no advisory has been issued. The data does require processing and analysis so findings from sensor deployments are not immediate. Most recently, the City worked with Google Environmental Insights Explorer and was selected as a pilot city for their Tree Canopy Lab which uses aerial imagery and machine learning to provide estimates of tree canopy density at the Census Tract level.

## HEALTH RISKS AND VULNERABLE POPULATIONS

According to the National Weather Service, extreme heat conditions are typically defined as when the heat index exceeds 105°F to 110°F for at least two consecutive days.[6] Climate change impacts health both directly (e.g., through extreme weather events) and indirectly (e.g., through alterations in environmental systems affecting diseases and resources). When expriencing extreme heat, one's body works harder to maintain a normal temperature, increasing the risk of heart attack and strokes, which can be fatal. According to the National Oceanic and Atmospheric Administration (NOAA), heat is the leading cause of weather-related deaths in the United States.[7]

City of Miami's Department of Fire-Rescue, Division of Emergency Management is working with the 911 call center and the Florida Department of Health to track emergency calls related to heat. From May to August 2024 the City received nearly 150 heat-related emergency calls. Additionally, a hotter, wetter climate will continue to increase the length of mosquito season, which can make residents more susceptible to vector-borne diseases like Zika virus.

**Extended periods of high heat can affect Miamians in the following ways:**

- Increasing risk of heat exhaustion and heat stroke
- Increasing the risk of dehydration due to significant fluid loss from prolonged exposure to high temperatures
- Exacerbating risks from chronic health conditions, including asthma and some heart conditions
- Exacerbating poor air quality
- Impairing cognitive function and physical coordination, raising the risk of accidents
- Declining mental health including mental fatigue and increased aggression and violence

# HEALTH RISKS AND VULNERABLE POPULATIONS (cont'd.)

Extreme heat and humidity are particularly dangerous for infants and young children, elderly adults, low-income individuals, pregnant people, and outdoor workers. According to 2022 Census data, 5.5 percent of City residents are under the age of 5 years and 16.5 percent are aged 65 years and older. The City of Miami also faces a high poverty rate of 20 percent.[8]

In Miami- Dade County, over 300,000 outdoor workers represent about a quarter of the County's total workforce. The County also faces socioeconomic challenges, with a poverty rate of 14.7 percent - meaning 1 in 6 residents live in poverty. Moreover, 34 percent of the County's population, or 488,180 residents, fall below the Asset-Limited, Income- Constrained and Employed (ALICE) threshold, higher than state average.[9]

Historically marginalized communities in Miami, shaped by discriminatory redlining practices, are disproportionately affected by urban heat islands. Redlining, a 20th century practice that designated certain neighborhoods as "hazardous" for mortgage lending based largely on race, has resulted in lower home values, less homeownership, and fewer resources for these communities. Consequently, historic Black neighborhoods, like Overtown and Liberty City, typically have less tree cover and more heat-absorbing surfaces like concrete and asphalt, making them significantly hotter than more affluent areas.[10]

Additionally, research by the American Council for an Energy-Efficient Economy (ACEEE) reveals that Miami households face significant energy burdens. The median energy burden (percentage of income used to pay for energy) in Miami is 3 percent, while the median low-income energy burden is 6.9 percent. A quarter of low-income households in Miami have an energy burden above 11 percent, which is more than 3.5 times higher than the median energy burden. Black and Hispanic households in Miami experience higher energy burdens, with 29 percent of Black households and 24 percent of Hispanic households facing high energy burdens.[11]

Statewide, in response to the risks posed by extreme heat, Florida passed the Zachary Martin Act in 2020, aimed at protecting student athletes from heat-related illnesses, including heat strokes. The legislation mandates that schools provided water-filled tubs at games and practices to rapidly cool the body.[12] The law also requires schools to train personnel on how to recognize signs of heat-related ailments, including potentially deadly heat strokes, and to take life-saving actions.

# LEVERAGING CITY OF MIAMI STRATEGIES

**RESILIENT305 STRATEGY** identifies extreme heat as a chronic stressor for Miami-Dade County and integrates heat as a consideration for actions related to community resilience building and infrastructure improvements. These initiatives prioritize equity and support for vulnerable populations to enhance Miami's resilience to climate change.

**MIAMI FOREVER CLIMATE READY PLAN** set forward a plan to help the City prepare for, adapt to, and mitigate current and future climate risks. This includes efforts to manage flooding, heat, and storm impacts, which are crucial for protecting residents' health and safety.

**MIAMI FOREVER CARBON NEUTRAL PLAN** establishes an ambitious interim 2035 target of 60 percent greenhouse gas emissions reduction below 2018 levels and outlines actions the City and its stakeholders can take to reach that target.

**REIMAGINE PARKS MASTER PLAN** outlines strategies to develop and maintain green spaces, which help reduce urban heat islands through shade and cooling areas. In addition, to expanding access to water for cooling and hydration, the plan also aims to ensure that all residents are within a 15-minute walk to a park, enhancing accessibility, and promoting active lifestyles.

**SOUTHWEST STREETSCAPE MASTER PLAN** focuses on enhancing the urban tree canopy and streetscape, providing shade, reducing surface temperatures, and improving air quality.

By leveraging these strategies, the City of Miami can create a cooler and more resilient urban environment.

# MIAMI FOREVER CLIMATE READY: EXTREME HEAT PLAN

Pursuant to City Commission Resolution R-23-0354, the City of Miami has developed an Extreme Heat Plan to identify actions that can be taken to address extreme heat in the City.

A RESOLUTION OF THE MIAMI CITY COMMISSION DIRECTING THE CITY MANAGER TO EXPLORE OPTIONS AND SOLUTIONS FOR THE CITY OF MIAMI ("CITY"), INCLUDING BUT NOT LIMITED TO CITY PARKS, TO ADDRESS THE EXTREME HEAT IN THE CITY.

This Extreme Heat Plan is organized into three Cooling Solutions and a Heat Season Protocol detailing actions departments will take prior to and during Heat Season.

## COOLING SOLUTIONS

Cooling Solutions are organized into objectives with corresponding actions and implementation steps. The implementation steps have associated timelines for completion:

- **Short-term** = completed within **2-3 years** (by the 2027 Heat Season)
- **Medium-term** = completed within **5 years** (by the 2029 Heat Season)

Actions and implementation steps that reference time frames are subject to change based on current needs.

The Office of Resilience and Sustainability will track progress on the Cooling Solutions in alignment with existing monitoring protocols.

## THE THREE COOLING SOLUTIONS FOR THE CITY OF MIAMI EXTREME HEAT PLAN ARE:

### 1. SHADE

Includes actions to help people stay cool in shaded environments.

### 2. WATER

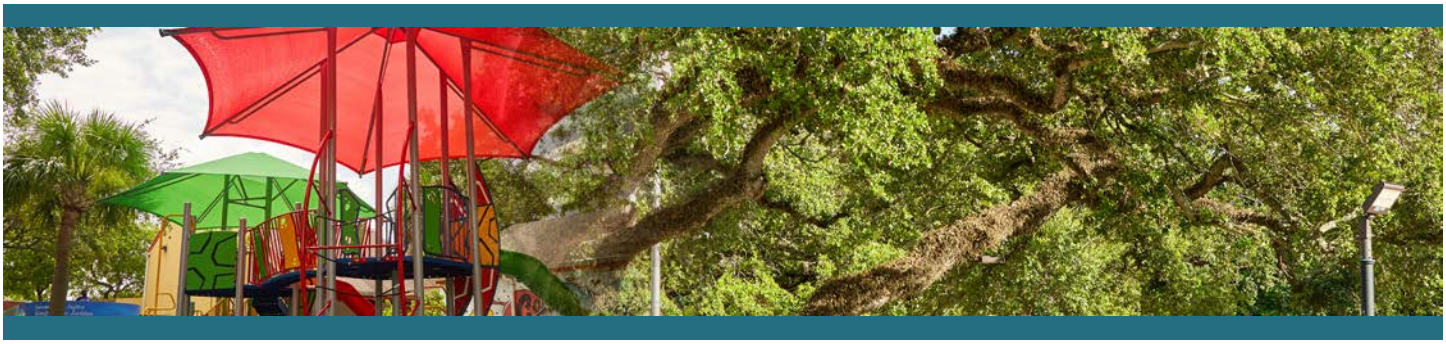
Includes actions to help people stay cool and hydrated by increasing access to water resources.

### 3. DESIGN

Includes actions to help people stay cool in their homes, work, and community.

## SHADE

S1. Ensure Shaded Shelters and Structures on City-Owned Land
S2. Increase Tree Canopy on City-Owned Land
S3. Increase Tree Canopy Communitywide



## WATER

W1. Increase Recreational and Waterfront Access to Biscayne Bay, Miami River, and Little River
W2. Provide Additional Drinking Water Fountains with Reusable Bottle Fillers
W3. Increase Access to Pools, Splash Pads, and Misting Stations

## DESIGN

D1. Protect Residents During Heat Season and Events
D2. Implement Heat Safety Measures for Outdoor Workers
D3. Expand City's Climate Ready Residential Programs
D4. Provide Public Data to Better Inform Heat Response Efforts
D5. Ensure City of Miami Buildings Provide Adequate Cooling and Operate Efficiently
D6. Utilize Site Design Strategies that Reduce Urban Heat Islands

NEW INITIATIVE  CURRENT INITIATIVE, CONTAINS A NEW ACTIVITY  REDUCES GREENHOUSE GASES

# SHADE

Shaded areas provide refuge from direct sunlight and reduce land surface temperatures, creating a more comfortable environment while addressing thermal radiation that drives the urban heat island effect. Shade can be created through both green and gray infrastructure, with different interventions yielding different thermal cooling effects. Across all actions, the City will focus efforts on areas with relatively less shade, less tree canopy, and higher amounts of hardscaping.

**City of Miami Authority:** As the custodian of the public right-of-way, the City of Miami Department of Resilience and Public Works is responsible for its maintenance and has the authority to plant trees and install shade structures in public spaces. The City has a Tree Ordinance within Chapter 17 of the City Code, aimed at protecting existing trees and regulating the planting of new trees on both public and private properties. Additionally, the City maintains a Tree Trust Fund as a mitigation resource. The Department of Building and Office of Zoning oversee the regulation of shade structures on both public and private properties, ensuring compliance of all structures with Miami21 and Florida Building Code requirements. The Department of Parks and Recreation currently ensures that all new playgrounds at City operated parks are equipped with shade structures.

| Action | Description | Implementing Departments |
|---|---|---|
| **S1. Ensure Shaded Shelters and Structures on City-Owned Land** | | |
| **S1.1. Provide Additional Shading at Bus and Trolley Stops** | Shaded areas are valued by those waiting for buses and trolleys. Trees and awnings can assist in shading bus and trolley stops. | **Lead:**<br>**Resilience & Public Works** |
| TIMELINE:<br>**Short-term** | *Implementation Step S1.1a: Inventory bus and trolley stops, including existing bus shelters, and cross-reference this data and information on heat, shade, and transit routes to evaluate shading needs.*<br>Analysis of expenses to be undertaken. | Data<br><br>Innovation & Technology |
| TIMELINE:<br>**Short-term** | *Implementation Step S1.1b: Develop a prioritized needs list for shade at bus and trolley stops that evaluates where additional protection and accommodation is needed. Recommended interventions will be compliant with ADA sidewalk requirements.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Medium-term** | *Implementation Step S1.1c: Implement prioritized needs list and install additional shade solutions at bus and trolley stops.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **S1.2. Identify Shade Structure Options for Parks** | Many Parks across the City utilize a variety of shade structures to provide access to more comfortable temperatures. | **Lead:** **Parks & Recreation** |
| TIMELINE: **Short-term** | *Implementation Step S1.2a: Develop a list of the types and costs of shade structures being used at Parks, the types of additional structures that can be used in Parks, and community preferences. This can be used to guide future investments.* Additional expenses not anticipated. | Capital Improvements |
| TIMELINE: **Medium-term** | *Implementation Step S1.2b: For existing unshaded playgrounds, explore steps to shade the playgrounds, including cost estimates, potential funding sources, and technical requirements.* Analysis of expenses to be undertaken | |
| **S1.3. Utilize Solar Canopies** | Solar canopies can be utilized in public spaces and parking lots to mitigate the heat island effect by reducing heat absorption from asphalt, generate renewable energy to power City infrastructure, and can integrate electric vehicle (EV) charging stations to support electric vehicle adoption. Notably, Miami21 has recently been updated to allow for encroachments broadening the potential for canopies and shade structures. The City currently has solar canopies at Bayfront Park, Margaret Pace Park, and West End Park. | **Lead:** **Parks & Recreation** Capital Improvements |
| TIMELINE: **Short-term** | *Implementation Step S1.3a: Conduct a feasibility study to assess potential sites for solar canopies at City properties and parking lots and garages The study will evaluate the structural integrity of existing parking lots and garages, as well as identify locations where electric vehicle (EV) charging stations can be integrated within the solar canopies, utilizing GIS mapping.* Analysis of expenses to be undertaken. | |
| TIMELINE: **Medium-term** | *Implementation Step S1.3b: Install a solar canopy at a parking lot within the City.* Analysis of expenses to be undertaken. | |
| TIMELINE: **Short-term** | *Implementation Step S1.3c: For specific sites, develop an analysis including cost estimates, potential funding, and technical needs to facilitate installation of additional solar canopies at public properties.* Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **S1.4. Investigate Vegetative Awnings and Shade Sails** | Alternative shading methods, such as vegetated awnings or green awnings can provide natural shade. This can significantly lower cooling costs for buildings and make outdoor spaces more comfortable. | **Lead:**<br>**Building**<br><br>General Services Administration<br><br>Parks & Recreation<br><br>Planning<br><br>Zoning |
| TIMELINE:<br>**Medium-term** | *Implementation Step S1.4a: Conduct research to assess the potential benefits, costs, suitable locations, and permitting requirements for vegetated awnings. Additionally, consider integrating these with Art in Public Spaces (AIPP) and Site Approval Permits (SAPs) as avenues for implementation. Identify private opportunities, such as street closures, which could facilitate the installation of vegetated awnings.*<br>Analysis of expenses to be undertaken. | |

## S2. Increase Tree Canopy on City-Owned Land

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| **S2.1. Advocate for increase in Stormwater Utility Fee and rebrand to Include Green Infrastructure** | The City's stormwater infrastructure is being expanded to address sea level rise, king tides, and flooding from storms. Public engagement reflects the desire to incorporate green infrastructure into these upcoming projects. Stormwater Utility Fees could be used to fund green infrastructure in the public right-of-way which promotes better drainage and cooler neighborhoods. | **Lead:**<br>**Resilience & Public Works** |
| TIMELINE:<br>**Short-term** | *Implementation Step S2.1a: Increase the Stormwater Utility Fee to include funding for green infrastructure. Continue to explore and advocate for additional funding mechanisms that support nature-based initiatives, ensuring compliance with Florida State Statute, Section 403.0893(1).* [13]<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step S2.1.b: Rebrand name of fee to include green infrastructure, publicly launch the initiative (example rebranding includes 'Storm to Shade' or 'Showers to Shade'), and provide information on its impact.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **S2.2. Implement the Southwest Streetscape and Street Tree Master Plan** | City Commission passed Resolution R-23-0338 to accept and approve the Southwest Streetscape Master Plan. This plan outlines a street tree right-of-way planting program focusing on native and naturalized canopy trees to alleviate hardscaped areas in the City. This plan currently includes the neighborhoods of Little Havana, Parkdale, Douglas Park, Shenandoah, and Silver Bluff. The project is being expanded Citywide to include additional hardscaped areas within the City. | **Lead:**<br>**Resilience & Public Works**<br><br>Communications<br><br>Planning<br><br>Resilience & Sustainability<br><br>Zoning |
| TIMELINE:<br>**Short-term** | Implementation Step S2.2a: Consider integrating recommendations from the Streetscape Master Plan into ongoing Sea Level Rise and Flood Prevention projects, including soil treatments and landscaping improvements.<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | Implementation Step S2.2b: Determine budget for implementation of demonstration project(s). Explore additional funding mechanisms.<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | Implementation Step S2.2c: Develop guidance and an updated process to incorporate relevant recommendations from the Southwest Streetscape Master Plan into ongoing Sea Level Rise and Flood Prevention projects to enhance green infrastructure and improve community resilience.<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Medium-term** | Implementation Step S2.2d: Construct a Southwest Streetscape demonstration project. Explore collaboration with local stakeholders to promote the initiative, while considering the reclamation of parking areas for swales and additional tree planting.<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **S2.3. Increase Trees and Greenery in City Parks** | Parks, natural areas, and areas designated as City of Miami Natural Forest Communities are managed by Parks & Recreation. Information on tree and greenery coverage is available in the Reimagine Parks Master Plan, updated July 2023. | **Lead:** **Parks & Recreation**<br><br>Building<br><br>Resilience & Public Works |
| TIMELINE: **Short-term** | *Implementation Step S2.3a: Identify Parks with shade needs where additional trees can be planted and plant trees where feasible. This will be informed by urban heat and shade data and typical use of Park space.* Analysis of expenses to be undertaken. | |
| TIMELINE: **Short-term** | *Implementation Step S2.3b: Identify Dog Parks with needs for shaded areas for pets and plant trees where feasible.* Additional expenses not anticipated. | |
| TIMELINE: **Short-term** | *Implementation Step S2.3c: Identify Parks that need additional ADA considerations for shaded walkways and plant trees where feasible.* Analysis of expenses to be undertaken. | |
| TIMELINE: **Short-term** | *Implementation Step S2.3d: Establish a dedicated tree planting capital account for Parks & Recreation. This initiative will create a structured plan for utilizing funds from the Tree Trust Fund.* Analysis of expenses to be undertaken. | |

## S3. Increase Tree Canopy Communitywide

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| **S3.1. Improve Access to Information about the City's Tree Initiatives** | Members of the public have indicated high interest in learning about tree plantings and maintenance throughout the City. | **Lead:** **Resilience & Public Works**<br><br>Building<br><br>Communications<br><br>Data<br><br>Innovation & Technology<br><br>Planning<br><br>Resilience & Sustainability |
| TIMELINE: **Short-term** | *Implementation Step S3.1a: Create a webpage on City website to educate and inform the public about tree initiatives. This webpage will provide information on the benefits of trees, Tree Ordinance language per the City Code, and, planting requests.* Additional expenses not anticipated. | |
| TIMELINE: **Short-term** | *Implementation Step S3.1b: Launch Urban Tree Dashboard including right-of-way tree inventory and quantitative tree benefits utilizing i-Tree methodologies.* Additional expenses not anticipated. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **S3.2. Increase Fruit Tree & Small Shrub Giveaways to City Residents**  | Currently the City holds Fruit Tree & Small Shrubs Giveaways throughout April to celebrate Arbor Day. The City participates in the Tree City USA program and meets the four standards: 1) a tree committee, 2) a tree ordinance, 3) a community forestry program of an annual budget of at least $2 per capita (Tree Trust Fund), and 4) annual Arbor Day observance. The City's tree ordinance requires for a tree to be preserved either on or off site, with a last resort of mitigation (replacement cost of the tree canopy lost). Funds for mitigation are currently used to fund the street tree program. | **Lead:**<br>**Building** |
| TIMELINE:<br>**Short-term** | *Implementation Step S3.2a: Increase the number of giveaway events from annually to biannually or quarterly each year.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step S3.2b: Provide education and training on post-planting care and maintenance at tree and shrub giveaways. Expand training requirements to include residents as well as employees. This will ensure participants receive proper guidance on tree planting techniques and care. Identify optimal local partners for collaboration.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step S3.2c: Develop a tree giveaway monitoring methodology that allows the City to estimate planting and survival rates.*<br>Analysis of expenses to be undertaken. | |

NEW INITIATIVE  CURRENT INITIATIVE, CONTAINS A NEW ACTIVITY  REDUCES GREENHOUSE GASES

# WATER

Water can help thermoregulate the body and prevent heat related illnesses. Proximity to water can create a cooling effect and help mitigate urban heat island effects. In addition, consuming water is vital on hot days and the City can increase access to safe drinking water in the public spaces it stewards.

**City of Miami Authority:** The City of Miami operates over 150 parks including 12 swimming pool facilities and the Grapeland Water Park. The City also provides public access to waterbodies at its multiple waterfront parks and the Historic Virginia Key Beach Park. The City has established plans and secured funding to construct additional swimming pools and splash pads within the park system.

| Action | Description | Implementing Departments |
|---|---|---|
| **W1. Increase Recreational and Waterfront Access to Biscayne Bay, Miami River, and Little River** | | |
| **W1.1. Provide Information on Public and Private Recreational Opportunities**<br><br>TIMELINE:<br>**Short-term** | Many recreational activities, both public and private, are available on the Biscayne Bay, Miami River, and Little River. These activities are posted on park webpages.<br><br>*Implementation Step W1.1a: Expand outreach on these opportunities by regularly including in newsletters, social media, flyers, and other public outreach.*<br>Additional expenses not anticipated. | **Lead:**<br>**Parks & Recreation**<br><br>Communications |
| **W2. Provide Additional Drinking Water Fountains with Reusable Bottle Fillers** | | |
| **W2.1. Provide Additional Drinking Water Fountains with Reusable Bottle Fillers in City Parks**<br><br>TIMELINE:<br>**Short-term** | All new buildings in City parks include drinking water fountains with reusable bottle fillers and dog bowl fillers to reduce plastic waste. Parks & Recreation maintains an inventory of all their water fountains and specifies if they have water bottle refills and dog bowl fillers. Parks & Recreation is currently developing water fountain standards for all parks to ensure consistency and accessibility.<br><br>*Implementation Step W2.1a: Update existing water fountain inventory and develop a process to ensure data remains current. Use inventory and park usage information to determine high-traffic parks where additional touchless or sensor-activated bottle filling stations/water fountains are needed.*<br>Analysis of expenses to be undertaken. | **Lead:**<br>**Capital Improvements**<br><br>Data<br><br>Innovation & Technology<br><br>Parks & Recreation |
| TIMELINE:<br>**Short-term** | *Implementation Step W2.1b: Develop a map-based data set of water fountains and add to the City's Heat Data set.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Medium-term** | *Implementation Step W2.1c: Plan and install new water fountains with chiller systems in identified high-traffic parks to improve accessibility and convenience for park visitors.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **W2.2. Encourage Large Events held at City Properties to provide Tap Water to Attendees** | The City of Miami is home to many large-scale events like street fairs, music festivals, concerts, and more. The City permits these events and holds agreements with event coordinators. | **Lead:**<br>**Resilience & Sustainability**<br><br>Emergency Management<br><br>Film & Entertainment<br><br>Parks & Recreation<br><br>Real Estate & Management |
| TIMELINE:<br>**Short-term** | *Implementation Step W2.2a: Develop boilerplate language to include the provision of tap water into future event agreements held during the Heat Season, to hydrate participants free of charge and reduce plastic waste at events on City properties.*<br>Analysis of expenses to be undertaken. | |

## W3. Increase Access to Pools, Splash Pads, and Misting Stations

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| **W3.1. Increase Availability and Installation of Pools, Splash Pads, and Misting Stations in City Parks** | Public engagement shows that pools, splash pads, and misting stations are desired components of City parks. Map of City parks with pools and a map of City parks with splash pads are available in the Reimagine Parks Master Plan. Pools and splash pads are also included on the City park webpages. Ongoing planned projects aim to enhance park amenities and infrastructure, further supporting the development of these water features. | **Lead:**<br>**Parks & Recreation**<br><br>Capital Improvements |
| TIMELINE:<br>**Short-term** | *Implementation Step W3.1a: Extend pool and splash pad operating hours during the Heat Season (May 1 - October 31) to include additional days of the week and longer hours, aligned with the school year.*<br>Analysis of expenses to be undertaken, noting that early assessments indicate minimal additional costs, as staff schedules can be adjusted to accommodate later closing times. | |
| TIMELINE:<br>**Medium-term** | *Implementation Step W3.1b: Develop a comprehensive list of City parks with existing misting stations and identify suitable locations for installing additional misting stations. This will include determining the operational requirements and feasibility of installing and maintaining the new misting stations.*<br>Analysis of expenses to be undertaken. | |

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# DESIGN

Beyond public spaces, the City can help residents stay cool in their homes, workspaces, and communities. The City can help residents cool their homes by providing funding and resources to improve building envelopes and install cooling solutions. It is important for the City to proactively plan for and attempt to mitigate situations wherein residents are unable to cool off in their homes.

The City is committed to proactively planning for and implementing initiatives to help residents maintain comfortable temperatures in their homes. In response to rising average temperatures, population growth, and increasing reliance on electric powered technology, the City will work closely with our electricity utility, Florida Power & Light, to ensure the energy grid can adequately support this growing demand. Insufficient planning and preparation can lead to blackouts which could be extremely dangerous and even deadly during a heat event.

**City of Miami Authority**: The City of Miami's Department of Housing and Community Development coordinates programs to ensure fair, safe, and affordable housing for residents. The Department of Housing and Community Development has the ability to provide loans and grants to improve living conditions. Since 2021, the Department of Building has conducted yearly inspections of Assisted Living Facilities and Nursing Homes to ensure compliance with emergency power requirements, resulting in over 90 percent compliance. These inspections ensure facilities have sufficient backup power to maintain a temperature below 81 degrees Fahrenheit for 96 hours. The City also has its own emergency management team, the Department of Fire-Rescue, Division of Emergency Management that coordinates the City's preparation, response, and recovery for emergency events. The Division of Emergency Management oversees the City's implementation of the Heat Response Protocol. In cases of declared disasters, the Division of Emergency Management will coordinate response with Miami-Dade County's Office of Emergency Management. In the 2024 State of Florida Legislative Session, the legislature passed HB433 preempting local governments from awarding contracts based on the employment benefits of the applying entities. However, the City has the ability to provide optional initiatives for those that work in the City and set up programs that benefit City of Miami employees.

| Action | Description | Implementing Departments |
|---|---|---|
| **D1. Protect Residents During Heat Season and Events** | | |
| **D1.1. Implement Coordinated Heat Response Protocol** | Miami-Dade County has designated May 1 - October 31 as "Heat Season." Within Heat Season, there are episodic heat events wherein the heat index reaches levels that pose a risk to human health. | **Lead:**<br>**Emergency Management**<br><br>Communications<br><br>Resilience & Sustainability |
| **TIMELINE:**<br>**Short-term** | *Implementation Step D1.1a: Refine and operationalize the Citywide Heat Response Protocol that outlines City operational adjustments as well as public safety measures departments will take. Include identifying specific operational changes before the Heat Season begins. This approach will parallel the Continuity of Operations Plan (COOP) and ensure that all teams are prepared with clear guidelines.*<br>Additional expenses not anticipated. | |
| **TIMELINE:**<br>**Short-term** | *Implementation Step D1.1b: Develop an extensive strategic communications campaign of personal preparedness for extreme heat through signage, visual banners throughout the City, social media platforms, key media outlets (TV and radio broadcasts), and videos on the importance of staying hydrated for vulnerable groups such as young, aging, and pregnant persons, and signs of heat stress. Develop "Free Ways to Cool Off" campaign directing people to Cooling Centers, pools, and parks, via the City trolley. Identify external partners and stakeholders for collaboration in communication strategy, to expand outreach.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D1.2. Define Cooling Centers & Identify Cooling Centers within the City** | Cooling Centers provide places for people to go to stay cool during heat events. The City began to pilot operationalizing Cooling Centers in 2024. | **Lead:**<br>**Parks & Recreation** |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.2a: Define criteria and standard operating procedures (SOPs) for Cooling Centers, focusing on accessibility, capacity, and available resources. Designate facilities to serve as Cooling Centers within the City.*<br>Analysis of expenses to be undertaken. | Communications<br>Emergency Management<br>General Services Administration |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.2b: Launch Cooling Center network with supporting public outreach campaign targeting populations in the City that are most at risk for heat-related health impacts.* | Resilience & Sustainability |
| **D1.3. Request No FPL Shut-Offs During Heat Advisories** | Heat Advisories are issued within 12 hours of the onset of extremely dangerous heat conditions - when the maximum heat index reaches 105°F or higher for 2 hours. Being without AC or a fan during heat events, especially overnight, is a life safety issue. | **Lead:**<br>**City Manager**<br>Housing & Community Development |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.3a: Advocate for FPL to suspend utility shut-offs during declared Heat Advisories issued by the National Weather Service.*<br>Additional expenses not anticipated. | Resilience & Sustainability |
| **D1.4. Accelerate Development of Resilience Hubs** | The City is developing a network of neighborhood Resilience Hubs that will assist with post-disaster response and access to social services, information, and City resources; they will also serve as Cooling Centers. Grant funding has been received to enhance the Carrie P. Meek Center at Charles Hadley Park to be a Resilience Hub and identified City park buildings are currently being designed with Resilience Hub criteria. Suggested Resilience Hubs are included in the Reimagine Parks Master Plan updated July 2023. | **Lead:**<br>**Capital Improvements**<br>Emergency Management<br>Parks & Recreation<br>Resilience & Sustainability |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.4a: Conduct needs assessments and feasibility studies of existing park sites to determine needed improvements, cost estimates, and timeline to operationalize new Resilience Hubs.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.4b: Ensure that new park buildings in these identified locations are designed with Resilience Hub criteria and capabilities to rapidly grow the Citywide network.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D1.4c: Formalize the City's Resilience Hub program with established standard criteria and operations protocols. Train staff on how to operate the Resilience Hubs, incorporating integration with the Emergency Management's point-of-distribution (POD) plan and operations, to ensure cohesive response during emergencies.*<br>Additional expenses not anticipated. | |

| Action | Description | Implementing Departments |
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| **D2. Implement Heat Safety Measures for Outdoor Workers** | | |
| **D2.1. Promote Construction Hours Waiver Program** | Currently, the City Code limits construction hours to 8:00AM-6:00PM, Monday through Saturday. No work is permitted on Sundays and holidays. | **Lead:**<br>**Building** |
| TIMELINE:<br>**Short-term** | *Implementation Step D2.1a: Allow construction sites to apply for a Noise Waiver to extend construction hours from 6:00AM-8:00PM during Heat Season (May 1 - October 31) to allow for construction workers to work outside of peak heat hours. While the City does not currently have a standardized method for ensuring compliance with worker break requirements, the City will explore its ability to allow heat as a consideration to apply for a Noise Waiver. Waiver requests will be evaluated on a case-by-case basis, with all waivers requiring approval from the City Manager.*<br>Additional expenses not anticipated | Capital Improvements<br>Code Enforcement<br>Resilience & Public Works |
| **D2.2. Implement Heat Operations Plan for City Employees who Work Outdoors** | City employees who work outdoors face increased exposure and risk from extreme heat. To prevent heat-related injuries or heat stress and ensure the safety of our workforce, it is essential to establish and enforce comprehensive heat safety measures. | **Lead:**<br>**Human Resources** |
| TIMELINE:<br>**Short-term** | *Implementation Step D2.2a: Purchase modified uniforms made from breathable fabrics (designed for high-heat environments) and provide additional water and ice for employees who work outdoors during the Heat Season (May 1 - October 31) to mitigate heat stress risks.*<br>Analysis of expenses to be undertaken. | Capital Improvements<br>General Services Administration<br>Parks & Recreation<br>Resilience & Public Works<br>Risk Management<br>Solid Waste |
| TIMELINE:<br>**Short-term** | *Implementation Step D2.2b: Develop and administer a comprehensive heat safety training for supervisors of outdoor workers. Focus on recognizing heat stress symptoms, safe working practices in extreme heat, and emergency response measures. The training will incorporate existing safety protocols and resources, emphasizing the importance of monitoring worker wellbeing, ensuring proper hydration, and include guidelines for proper use of personal protective equipment (PPE) to mitigate heat-related risks.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D3.1. Provide Incentives to Multifamily Buildings (renters)** | Programs are needed to equip affordable housing owners and operators with tools to assess their buildings' resilience to climate change and natural disasters, and provide them with actionable strategies and guidance on financing to address these vulnerabilities. The Keep Safe Miami program aimed to achieve these goals but faced challenges in implementation. The program was opt-in and would provide forgivable loans, approximately $100,000, if a building maintains affordable rents for at least 10 years. | **Lead:**<br>**Housing & Community Development**<br><br>Building<br><br>Resilience & Sustainability |
| TIMELINE:<br>**Short-term** | *Implementation Step D3.1a: Identify incentives to successfully implement a resilient multifamily building program. Examples of incentives could include providing technical assistance on investment plans to implement the assessments, subsidies for relocation costs (if needed), and increasing the overall loan amount to include subsidized partial rent-boost payments to the property owners. By emphasizing the importance of building affordable housing, these measures can help ensure that property owners are supported in maintaining affordable rents while improving their properties.*<br>Analysis of expenses to be undertaken. | |
| **D3.2. Continue the Homeownership Preservation Program (homeowners)** | The Homeownership Preservation Program (HPP), currently funded through the Miami Forever Bond, provides up to $70,000 in rehabilitation assistance to qualified City of Miami homeowners to fund exterior repairs consisting of repair or replacement of roofs, replacement of windows or doors, and/or installation of hurricane shutters, necessary to bring the home to decent, safe, and sanitary conditions, and to reinforce the property's exterior to better withstand natural weather occurrences while maximizing the home's energy efficiency. This program can assist households up to 140 percent of Area Median Income (AMI), based on household size and currently is closed to new applicants. Experience with the program shows that in some areas the demand exceeds the supply of funding. It also shows that some properties were not able to be selected due to extensive termite damage that needed funding above what the program allocated per home. | **Lead:**<br>**Housing & Community Development** |
| TIMELINE:<br>**Short-term** | *Implementation Step D3.2a: Advocate for additional and/or recurring funding to support the operation of the Homeownership Preservation Program (HPP), aiming to increase the number of residents served and affordable housing stock. This includes advocating for an increase in funding per household to cover truss replacements and insulation repairs as an option.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D3.3. Re-initiate and Expand Miami Cools Program (renters)** | In 2019, the City launched the Miami Cools program wherein free window AC units were distributed to senior and special needs residents to address health concerns associated with heat. | **Lead:**<br>**Housing & Community Development** |
| TIMELINE:<br>**Medium-term** | *Implementation Step D3.3a: Develop program outline for Miami Cools including typical costs, application process, and funding solutions. The program will prioritize portable AC units, along with tower fans and dehumidifier giveaways for renters for rapid relief and explore including heat pumps and split units. The program will focus on solutions that can be easily installed and maintained, recognizing that many low-income households lack access to effective cooling systems. Explore funding options to ensure sustainability and assess whether alternative solutions, such as heat pumps, can be included. The program will aim to provide rapid relief to those in need, addressing this critical health concern.*<br>Analysis of expenses to be undertaken | Human Services |
| TIMELINE:<br>**Medium-term** | *Implementation Step D3.3b: Reinitiate this program, focusing on advertising to residents that are low-income, senior, and/or have disabilities. Fund contractors to assist with installation of the cooling solutions (if needed).*<br>Analysis of expenses to be undertaken. | |

## D4. Provide Public Data to Better Inform Heat Response Efforts

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| **D4.1. Publish a Citywide Heat Data Set** | To support future urban planning and reducing urban heat islands in both public and private spaces, the City will provide public data to better inform heat response efforts. | **Lead:**<br>**Resilience & Sustainability**<br><br>Building<br><br>Emergency Management<br><br>Innovation & Technology<br><br>Parks & Recreation<br><br>Resilience & Public Works<br><br>Zoning |
| TIMELINE:<br>**Short-term** | *Implementation Step D4.1a: Compile and publish a Citywide data set with information related to land temperatures, ambient temperatures, and shade coverage. The City will identify and address any data gaps as necessary.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Medium-term** | *Implementation Step D4.1b: Develop an Interactive Heat Map that displays real-time heat index levels across various neighborhoods.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D4.2. Develop a 'Cool Routes' Tool** | For those walking, biking, or otherwise commuting through the elements, a shaded route is desirable and often the safest path to take (heat-wise). | **Lead:**<br>**Resilience & Sustainability** |
| TIMELINE:<br>**Medium-term** | *Implementation Step D4.2a: Develop a web-based tool where people can see the coolest route they can take to their destination. These maps will include cooling amenities such as Cooling Centers, pools, and water fountains. Collaborate with Miami-Dade County on tool development and local organizations to reach individuals through both digital and non-digital format.*<br>Analysis of expenses to be undertaken. | Communications<br>Innovation & Technology<br>Parks & Recreation<br>Resilience & Public Works |
| TIMELINE:<br>**Medium-term** | *Implementation Step D4.2b: Create and install maps at bus stops and digital kiosks to highlight green corridors and best walking paths. Incorporate educational signage about heat.*<br>Analysis of expenses to be undertaken. | |

## D5. Ensure City of Miami Buildings Provide Adequate Cooling and Operate Efficiently

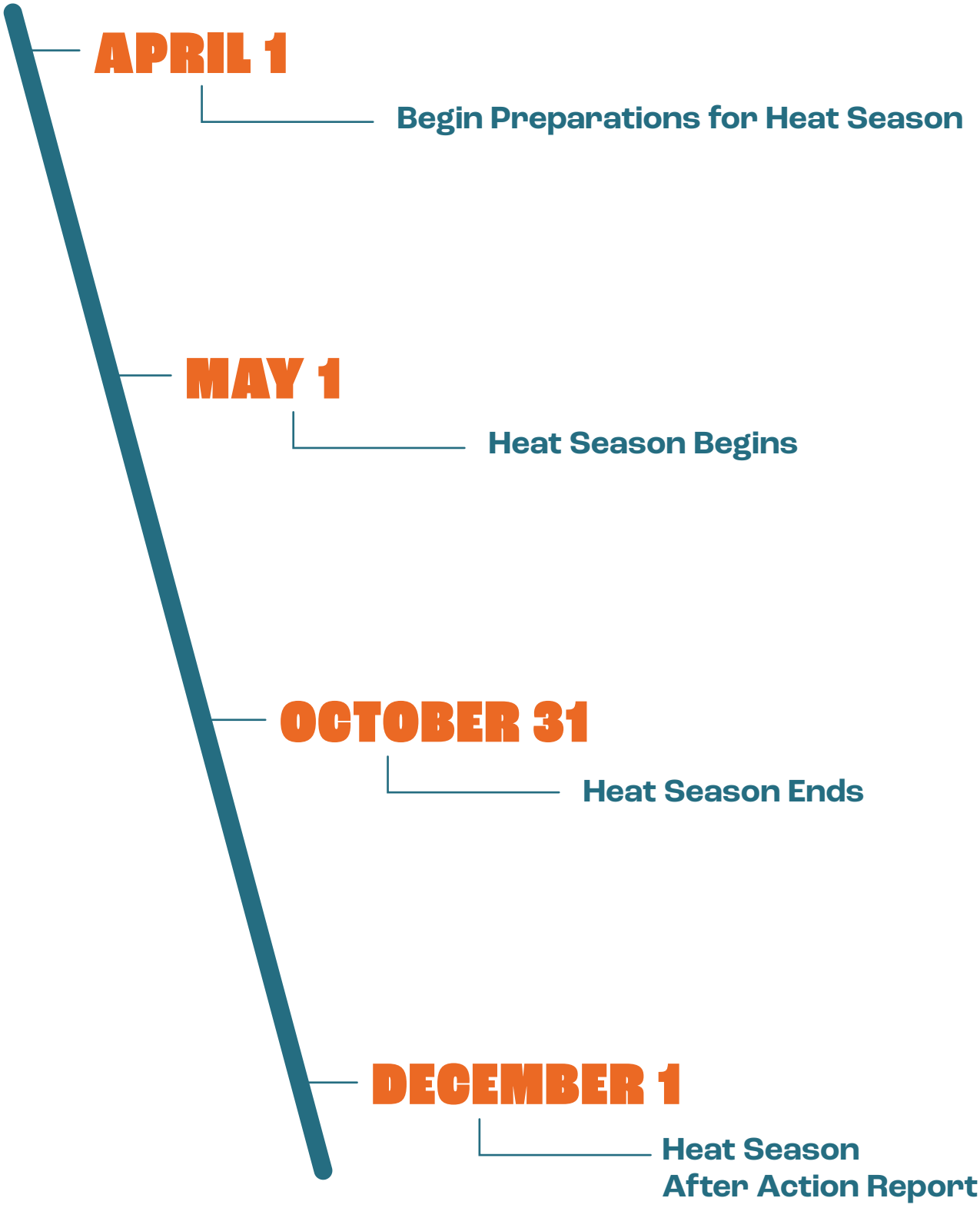
| | | |
|---|---|---|
| **D5.1. Perform Assessment of AC Units Citywide** | Assessing AC Units in each City-owned building will identify opportunities to replace AC Units at or before their end of life can reduce operational costs and enhance energy efficiency in City facilities. | **Lead:**<br>**General Services Administration** |
| TIMELINE:<br>**Short-term** | *Implementation Step D5.1a: Assess AC Units in municipal buildings Citywide to evaluate effectiveness and efficiency to determine cost savings that can be seen for AC Units that are replaced with more energy efficient models.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D5.1b: Prepare a preventative maintenance plan for AC Units across municipal buildings to ensure their durability, efficiency, and optimal performance.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D5.1c: Develop protocols for when AC Units cease operations such as having ready access to portable AC Units to provide immediate relief.*<br>Analysis of expenses to be undertaken. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D5.2. Utilize Low-Energy Methods to Reduce Heat in City-Owned Facilities** | Inexpensive and low-energy heat reducing measures can be installed in City-owned facilities to reduce thermal heat and therefore lower cooling needs which can save money on utility bills. | **Lead:**<br>**Capital Improvements**<br><br>General Services Administration<br><br>Parks & Recreation<br><br>Real Estate & Asset Management |
| TIMELINE:<br>**Short-term** | *Implementation Step D5.2a: Evaluate facilities where installation of window film, curtains and/or blinds on windows, air curtains at entries, and dehumidifiers could be utilized to enhance energy efficiency.*<br>Analysis of expenses to be undertaken. | |
| TIMELINE:<br>**Medium-term** | *Implementation Step D5.2b: Identify where smart thermostat technology can be incorporated in City-owned buildings, to optimize energy use and potentially lower costs.*<br>Analysis of expenses to be undertaken. | |
| **D5.3. Accept DOE's Invitation to Join the Better Climate Challenge** | The U.S. Department of Energy's voluntary, non-binding Better Climate Challenge provides technical assistance to cities to set an energy reduction goal for municipal buildings. | **Lead:**<br>**City Manager**<br><br>General Services Administration<br><br>Parks & Recreation<br><br>Resilience & Sustainability |
| TIMELINE:<br>**Short-term** | *Implementation Step D5.3a: Join the U.S. Department of Energy's Better Climate Challenge to access resources and technical assistance aimed at reducing greenhouse gas emissions from energy use, while also providing increased cooling solutions for the public.*<br>Additional expenses not anticipated. | |

| Action | Description | Implementing Departments |
|---|---|---|
| **D6. Utilize Site Design Strategies to Reduce Urban Heat Islands** | | |
| **D6.1. Simplify and Encourage Cool Surfaces and Other Heat Reduction Strategies in Miami21** | Miami21 is the Zoning Code for the City of Miami, designed to guide urban development and land use in a sustainable and organized manner. Notably, for zoning districts T5 and T6, the requirement for onsite trees has increased from 25 percent to 40 percent allowing for a greater emphasis on greenery in urban settings. Additionally, green roofs are permitted to increase lot coverage from 80 percent to 90 percent if they include a habitable rooftop, which typically incorporates cooling features to mitigate heat.<br><br>Multiple groups have reviewed Miami21 in recent years and made recommendations on how the Zoning Code can better integrate climate resilience and sustainability goals. There are opportunities for cool roofs, cool and porous pavements, passive cooling, and more to be integrated or enhanced in Miami21. Through definitions, updated policies, and the public benefits program, the City can engage the private sector in cooling the City. | **Lead:**<br>**Planning**<br><br>Building<br><br>Resilience & Sustainability<br><br>Zoning |
| TIMELINE:<br>**Short-term** | *Implementation Step D6.1a: Determine pathways forward for heat-related recommendations from the Miami21 Task Force report and the Urban Land Institute Miami21 to 2100 report.*<br>Additional expenses not anticipated. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D6.1b: Identify additional ways cooling initiatives and heat reducing design can be integrated into Miami21, including incorporating Section 9.8 on Landscaping in Parking Lots. This could involve proposing improvements to landscaping requirements that promote cooling, as well as incorporating incentives for solar installations in parking areas.*<br>Additional expenses not anticipated. | |
| TIMELINE:<br>**Short-term** | *Implementation Step D6.1c: Create a webpage on the City's website with information about allowances for cool surfaces in the Miami21 and local material guidelines.*<br>Additional expenses not anticipated. | |
| **D6.2. Increase use of Vegetated Living Shorelines** | Areas near waterbodies can be noticeably cooler than surrounding areas and green areas can reduce the severity of urban heat island effects. | **Lead:**<br>**Parks & Recreation** |
| TIMELINE:<br>**Short-term** | *Implementation Step D6.2a: Incorporate elements from the Resilient Waterfront Enhancement Plan developed in June 2023 into City-owned waterfront redevelopments. This involves exploring innovative design features such as vegetated living shorelines and other approaches that incorporate natural habitat with protective structures, tailored to the specific conditions of each site.*<br>Analysis of expenses to be undertaken. | Capital Improvements<br><br>Real Estate & Asset Management<br><br>Resilience & Public Works<br><br>Resilience & Sustainability |

# HEAT SEASON PROTOCOL

## ANNUAL TIMELINE



# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST

As the protocol is implemented, the City will determine alignment with Hurricane Season activities and combine where possible.

| Department | Task | Timeline |
|---|---|---|
| **PREPARATION FOR HEAT SEASON (APRIL 1 - APRIL 31)** | | |
| **Building** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |
| | **ASSISTED LIVING FACILITIES (ALF)**<br>Ensure compliance with ALF ordinance requiring that an alternate source of power (generator) is available for when the temperature is > 81 F. The deadline for compliance is June 1. | **April 1** |
| **Capital Improvements** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **PREPARATION FOR HEAT SEASON (APRIL 1 - APRIL 31)** | | |
| **Communications** | **PSA CAMPAIGN**<br>Review and update Heat Season outreach materials. Topics to include: the importance of staying cool and hydrated, practical tips for residents to manage heat effectively, and places to go to stay cool. | **April 1** |
| | **EXTERNAL PARTNERS AND ORGANIZATIONS**<br>Work with local organizations and stakeholders to support in the dissemination of information to the public, including digital and traditional (newspaper, radio, and television) communication outlets. | **April 15** |
| **Fire-Rescue, Emergency Management** | **NOTIFY DEPARTMENTS**<br>Contact Departments notifying them of the upcoming start of Heat Season and responsibilities per the Heat Season Protocol. | **April 1** |
| **General Services Administration** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |
| **Human Resources** | **OUTDOOR WORKERS - CITY EMPLOYEES**<br>Train supervisors of outdoor workers on signs of heat stress and how to ensure worker safety. | **April 15** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **PREPARATION FOR HEAT SEASON (APRIL 1 - APRIL 31)** | | |
| **Human Services** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |
| **Parks & Recreation** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |
| | **FACILITIES**<br>Inspect all water fountains to ensure fountains with coolers and water bottle refill access are working properly. Regularly replace filters in water fountains and refill stations. | **April 1** |
| | **FACILITIES**<br>Purchase/ensure working condition of wet bulb globe thermometers.<br>Analysis of expenses to be undertaken | **April 1** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **PREPARATION FOR HEAT SEASON (APRIL 1 - APRIL 31)** | | |
| **Resilience & Public Works** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |
| **Resilience & Sustainability** | **PSA CAMPAIGN**<br>Review and update Heat Season outreach materials. Topics to include: the importance of staying cool and hydrated, practical tips for residents to manage heat effectively, and places to go to stay cool. | **April 1** |
| | **EXTERNAL PARTNERS AND ORGANIZATIONS**<br>Work with local organizations and stakeholders to support in the dissemination of information to the public, including digital and traditional (newspaper, radio, and television) communication outlets. | **April 15** |
| **Solid Waste** | **ORDER SUPPLIES**<br>Order Heat Season supplies and apparel, so department is able to distribute at the beginning of the season.<br><br>Purchase different types of uniforms and/or accessories for staff working in extreme heat conditions. Explore different types of materials (moisture-wicking fabrics, lightweight cotton, and UV-protective materials) and styles of shirts (ventilation panels and mesh inserts for better airflow). Explore adjusting uniform requirements (e.g., instead of long pants, staff can wear shorts and lighter-colored clothing to reflect sunlight), and purchase cooling accessories such as cooling towels, rash guards, sun hats, and sunglasses. | **April 1** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **DURING HEAT SEASON (MAY 1 - OCTOBER 31)** | | |
| **Building** | **OUTDOOR WORKERS - PERMITTEES**<br>Send Advisory to contractors on occupational safety for excessive heat. Notify permittees of ability to apply for a Noise Waiver for an expanded work schedule (begin work at 6:00AM, end at 8:00PM) during Heat Season. | **May 1** |
| **Communications** | **SOCIAL MEDIA**<br>Post PSAs, videos, notices to social media for educational purposes, including information on personal protective measures and Cooling Centers. Additional messaging may be beneficial July through September (peak season). | **Weekly** |
| **Capital Improvements** | **OUTDOOR WORKERS - CONTRACTORS**<br>Send Advisory to contractors on occupational safety for excessive heat. | **May 1, then monthly** |
| **Film & Entertainment** | **TEMPORARY USE AND EVENT PERMITS**<br>Encourage large festivals and events to provide **free** drinking water stations from May to October (during Heat Season period) as part of their temporary use/event permits. | **May 1 - October 31** |
| **Fire-Rescue, Division of Emergency Management** | **EMERGENCY CALLS**<br>Collaborate with responders to maintain accurate records of all heat-related 911 calls, providing daily logs of heat-related 911 calls to the National Weather Service. | **Daily** |
| | **ALERT MIAMI**<br>Send Heat Advisory and Heat Warnings directly to Department Directors (Building; City Manager's Office; Capital Improvements; Code Compliance; Commission Offices; Fire-Rescue, Division of Emergency Management; Human Services; Parks & Recreation; Police; Resilience & Public Works; Resilience & Sustainability; Solid Waste) that oversee outdoor workers. This will ensure timely communication and enable departments to take necessary precautions for their team. | **As Needed** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **DURING HEAT SEASON (MAY 1 - OCTOBER 31)** | | |
| **Human Services** | **UNSHELTERED PERSONS ASSISTANCE**<br>Outreach Teams to provide transportation to homeless shelters when there are Heat Warnings. Homeless shelters act as Cooling Centers. | **As Needed** |
| | **UNSHELTERED PERSONS ASSISTANCE**<br>Outreach Teams to provide drinking water to unsheltered persons (currently donated by the Homeless Trust).<br>Analysis of expenses to be undertaken | **As Needed** |
| | **UNSHELTERED PERSONS ASSISTANCE**<br>Outreach Teams to provide cooling supplies (cooling gaiters, electrolytes, cooling towels, and ice packs) to unsheltered persons (currently donated by the County).<br>Analysis of expenses to be undertaken | **As Needed** |
| | **CHILD LEARNING CENTERS**<br>Utilize mist cooling fans for outdoor activities and provide children with electrolyte hydration drinks.<br>Analysis of expenses to be undertaken (early estimates of startup costs are $6,500 and $5,000 annually). | **Daily** |
| **Parks & Recreation** | **OUTDOOR WORKERS - CITY EMPLOYEES**<br>Distribute Heat Season apparel and supplies including large hats, reusable water bottles, fans, cooling towels, and moisture-wicking clothing. | **May 1** |
| | **COOLING CENTERS**<br>Launch Cooling Centers. Ensure relief area has signage, appropriate seating, and supplies. | **May 1 - October 31** |
| | **AQUATICS**<br>Extend operations for seasonal pools and evening operations, to include additional days of the week and longer hours, aligned with the school year. | **Daily** |
| | **OUTDOOR WORKERS - CITY EMPLOYEES**<br>Ensure regular access to ice and drinking water and encourage frequent hydration. Integrate breaks in shaded or air-conditioned areas to prevent heat-related illnesses. | **Daily** |

# HEAT SEASON PROTOCOL

## DEPARTMENT ACTIVATION TASK LIST (CONT'D.)

| Department | Task | Timeline |
|---|---|---|
| **DURING HEAT SEASON (MAY 1 - OCTOBER 31)** | | |
| **Parks & Recreation (cont'd.)** | **YOUTH SUMMER PROGRAMS**<br>Adjust youth summer programs to avoid peak heat hours and/or reduce extensive outdoor time (e.g., activities that occur in late morning or afternoon). | **As needed** |
| | **OUTDOOR WORKERS - CITY EMPLOYEES (AQUATICS)**<br>Explore adjusting working schedule for Aquatics workers (shortened lifeguard rotation, swim instructor rotation, uniform modifications, etc.). | **As Needed** |
| **Real Estate & Asset Management** | **SPECIAL EVENT PERMITS**<br>Encourage large festivals and events to provide free drinking water stations from May to October (during Heat Season period) as part of special event permits. | **May 1 - October 31** |
| **Resilience & Public Works** | **OUTDOOR WORKERS - CITY EMPLOYEES**<br>Distribute Heat Season apparel and supplies including large hats, reusable water bottles, fans, cooling towels, and moisture-wicking clothing. | **May 1** |
| | **BUS SHELTER SIGNAGE**<br>Schedule Extreme Heat PSA materials to be displayed at bus shelters throughout the Heat Season. | **Daily** |
| | **OUTDOOR WORKERS - CITY EMPLOYEES**<br>Ensure regular access to ice and drinking water and encourage frequent hydration. Integrate breaks in shaded or air-conditioned areas to prevent heat-related illnesses. | **Daily** |

| Department | Task | Timeline |
|---|---|---|
| **AFTER HEAT SEASON (NOVEMBER 1 AND LATER)** | | |
| **Fire, Emergency Management** | **AFTER ACTION REPORT**<br>Develop post-Heat Season After Action Report detailing the City's adherence to the Heat Season Protocol, public health data, and any notable heat events that occurred throughout the season. | **December 1** |

# HEAT SEASON SUPPLIES

## Outdoor Workers - City Employees

**CLOTHING**
Brimmed hats
Sunglasses
Moisture-wicking shirts
Shorts

**COOLING AIDS**
Motorized fans
Reusable water bottle
Personal mister
Cooling towels

## Work Site Supplies

Ice
Electrolyte powder
Cooling towels
Shade tents (if needed)
Sunscreen

## Supplies for Distribution

Cold water bottles
Hand fans
Electrolyte powder

# KEY TERMS

**1. ASSET LIMITED, INCOME CONSTRAINED, EMPLOYED (ALICE):**
Households that earn above the Federal Poverty Level but cannot afford the basic cost of living in their county. Despite struggling to make ends meet, these households often do not qualify for public assistance.

**2. CAPA STRATEGIES HEAT WATCH:**
As part of a national campaign led by CAPA Strategies and NOAA's National Integrated Heat Health Information System (NIHHIS), community scientists in over 50 U.S. cities have helped measure the distribution of ambient heat across urban environments. City of Miami conducted a Heat Watch study in summer 2020.

**3. CLIMATE JUSTICE COMMUNITIES:**
In Miami, climate justice communities are historically underinvested neighborhoods (which tend to be inland), populated by individuals that are low-income, predominantly Black, and recent immigrants. These neighborhoods tend to be viewed as less physically vulnerable to climate change since flooding is less common, but they are still vulnerable to climate impacts (hurricanes, extreme heat, flooding, pandemic, recession) and their residents are relatively more socially vulnerable than other parts of the City. Neighborhoods of note in Miami include: Allapattah, Liberty City, Little Bahamas/West Grove, Little Havana, Little Haiti/Ti Ayiti, and Overtown.

**4. HEAT EVENT:**
Extended period (several days or more) with unusually hot weather conditions that potentially can harm human health. Episodic, usually during the Heat Season.

a. Heat Watches: Issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. It means that the risk of a heat wave has increased, but its occurrence and timing are still uncertain.
b. Heat Advisories: Issued within 12 hours of the onset of dangerous heat conditions. In Miami-Dade County, this is when the heat index is expected to reach 105°F or higher for at least two hours.
c. Excessive Heat Warnings: Issued when the heat index is expected to reach 110°F degrees for at least two hours.

**5. HEAT EXHAUSTION:**
Occurs when your body cannot cool itself through sweating. Untreated, it can progress to heat stroke. Symptoms include dizziness, confusion, and nausea. They usually improve by drinking water and resting in a cool place.

**6. HEAT INDEX:**
A function of both temperature and humidity – it is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature. The National Weather Service will issue alerts when the heat index is expected to exceed 105 degrees Fahrenheit for at least two consecutive days. Heat indices are localized and based on physiological assumptions that assess the impacts of hot and humid weather on humans. Variations in clothing thickness, height, weight, age, health, and physical activity are not accounted for in the heat index calculation. The index also does not include wind speed, cloudiness, shade levels, or any other factors, although those are known to affect heat-related impacts.

**7. HEAT SEASON:**
Miami-Dade County has established Heat Season to be May 1 through October 31.

# KEY TERMS

**8. HEAT STROKE:**
The most severe form of heat illness, with primary symptoms that include confusion, altered mental status and a very high core body temperature above 104 degrees Fahrenheit (40 degrees Celsius). Often, people with heat stroke stop sweating.

**9. SOUTHWEST STREETSCAPE MASTER PLAN:**
City Commission passed Resolution R-23-0338 to accept and approve this plan. On February 9, 2023, the City Commission approved the expansion of the Plan to include the entire City.

**10. TREE ORDINANCE:**
Chapter 17 of the City Code is intended to protect, preserve, and restore the tree canopy within the City of Miami by regulating the removal, relocation, pruning, and trimming of trees. The purpose of the tree protection article is to assure that the design and construction of all development activity within the City of Miami is executed in a manner consistent with the preservation of existing trees and to maximize the City's tree canopy to the greatest extent possible.

**11. TREE TRUST FUND:**
Special revenue fund that was established with money collected pursuant to Chapter 17 and Section 9.5.5.c of Miami21. The fund collects money from various sources, including fees from tree removal permits and mitigation contributions required when trees are removed or replaced.

**12. URBAN HEAT ISLANDS:**
Urbanized areas that experience higher temperatures than outlying areas. Structures such as buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and waterbodies. Urban areas, where these structures are highly concentrated and greenery is limited, become "islands" of higher temperatures relative to outlying areas.

# ABBREVIATIONS AND ACRONYMS

**AC**: Air Conditioners
**ACEEE**: American Council for an Energy-Efficient Economy
**ADA**: American with Disabilities Act
**AIPP**: Art in Public Spaces
**ALFs**: Assisted Living Facilities
**ALICE**: Asset Limited, Income Constrained, Employed
**COOP**: Continuity of Operations Plan
**EV**: Electric Vehicle
**FPL**: Florida Power & Light
**NOAA**: National Oceanic and Atmospheric Administration
**POD**: Point-Of-Distribution
**PSA**: Public Service Announcement
**SAPs**: Special Area Plans
**SLRFP**: Sea Level Rise and Flood Prevention
**SOP**: Standard Operating Procedures
**UV**: Ultraviolet

# END NOTES

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CITY OF MIAMI FLORIDA

MIAMI **FOREVER**
CLIMATE READY